Addendum to the Certified Final Program Environmental Impact Report for the Beach Preservation Initiative Ordinance
SCH No. 88092919

2936 Camino Del Mar Seawall Project

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TABLE OF CONTENTS

Acronyms and Abbreviations iii

1.0 Introduction 1

- 1.1 EIR Background 1

2.0 Project Description 2

- 2.1 Project 2
- 2.2 Lead Agency 2
- 2.3 Contact Person and Phone Number 2
- 2.4 Project Location 2
- 2.5 Project Applicant/Sponsor 2
- 2.6 General Plan Designation and Zoning 2
- 2.7 Description of Project 2
- 2.8 Relationship to the Program EIR 3
- 2.9 Surrounding Land Uses and Project Setting 3
- 2.10 Other Required Agency Approvals or Permits Required 3

3.0 Environmental Analysis 8

- 3.1 Aesthetics 8
- 3.2 Agricultural and Forestry Resources 9
- 3.3 Air Quality 9
- 3.4 Biological Resources 11
- 3.5 Cultural and Tribal Cultural Resources 11
- 3.6 Energy 11
- 3.7 Geology and Soils 12
- 3.8 Greenhouse Gas Emissions 12
- 3.9 Hazards and Hazardous Materials 13
- 3.10 Hydrology and Water Quality 14
- 3.11 Land Use and Planning 15
- 3.12 Mineral Resources 16
- 3.13 Noise 16
- 3.14 Population and Housing 17
- 3.15 Public Services 17
- 3.16 Recreation 17
- 3.17 Transportation 17

TABLE OF CONTENTS (cont.)

3.18 Utilities and Service Systems 18
3.19 Wildfire 18

4.0 Conclusions 18

5.0 Mitigation Monitoring and Reporting Program 19

6.0 References 23

FIGURES

1: Regional Location 4
2: Project Location on USGS Map 5
3: Project Location on Aerial Photograph 6
4: Proposed Seawall 7

TABLE

1: Mitigation Monitoring and Reporting Program 20

ATTACHMENTS

1: City of Del Mar Beach Preservation Initiative Ordinance Final Environmental Impact Report prepared by P&D Technologies, Inc. (August 1989)
2: Coastal and Geotechnical Engineering Report prepared by ENGEO Incorporated (February 2025)
3: Preliminary Geotechnical Investigation prepared by UES (January 2025)

Acronyms and Abbreviations

AB	Assembly Bill
BMP	Best Management Practices
BPI	Beach Preservation Initiative
CAL FIRE	California Department of Forestry and Fire Protection
CAPCOA	California Air Pollution Control Officers Association
CEQA	California Environmental Quality Act
City	City of Del Mar
Coastal Commission	California Coastal Commission
EIR	Environmental Impact Report
GHG	greenhouse gas
MMRP	Mitigation Monitoring and Reporting Program
MT CO_2E	metric tons of carbon dioxide equivalent
Municipal Code	City of Del Mar Municipal Code
NAVD88	North American Vertical Datum of 1988
NGVD29	National Geodetic Vertical Datum of 1929
project	2936 Camino Del Mar Seawall Project
RAQS	Regional Air Quality Strategy
SDAPCD	San Diego Air Pollution Control District
SPA	Shoreline Protection Area

1.0 Introduction

A Final Program Environmental Impact Report (EIR) for the Beach Preservation Initiative Ordinance (State Clearinghouse Number 88092919; Program EIR) was certified on August 21, 1989, by the City of Del Mar (City) and is included as Attachment 1. This addendum describes the 2936 Camino Del Mar Seawall Project (project) in relation to the actions evaluated in the 1989 Program EIR, pursuant to the California Environmental Quality Act (CEQA) Guidelines Section 15164.

1.1 EIR Background

The 1989 Program EIR addressed implementation of the City's Beach Preservation Initiative (BPI) Ordinance. The purpose of the BPI Ordinance is to regulate the uses of the City's beach area, including protection of public access to and along the shoreline, and to provide for the protection of private property. The BPI Ordinance established a Shoreline Protection Area (SPA) seaward of a designated north/south SPA line. The SPA line is defined in the City's Zoning Ordinance, Beach Overlay Zone, Del Mar Municipal Code (Municipal Code) Chapter 30.50. References to the BPI and Beach Overlay Zone refer to the same area in this document.

The BPI Ordinance regulates new development within the SPA. The ordinance also provides for the abatement (removal) of existing non-complying structures located within the SPA. The ordinance and its guidelines outline the permit application procedures for any development and/or construction of shoreline protective structures within the SPA and contain regulations for the issuance of permits. Development westward of the SPA line requires a Shoreline Protection Permit and, in some cases, a user fee to be determined by the City Council (Municipal Code Section 30.50.080). Seawalls constructed east of the SPA line require a Setback Seawall Permit.

The project area evaluated in the Program EIR included the City's entire coastline, from the northern city limits at Solana Beach to the southern city limits at Torrey Pines State Natural Reserve, a distance of approximately 2.9 miles. The Program EIR considered construction, demolition, and relocation of shoreline protection measures situated along the City's coastline.

The Program EIR addressed public access/beach encroachment, visual quality, coastal processes, and construction impacts. All other issues were determined to be less than significant, as detailed in the City Council's resolution approving the BPI and certifying the Program EIR (Resolution No. 89-56). As part of the Program EIR, public access/beach encroachment and visual quality/aesthetics impacts were determined to be less than significant without mitigation. The issues of coastal processes and construction impacts were found to be less than significant with implementation of mitigation. The Program EIR mitigation measures and their applicability to the project are detailed in Section 5.0: Mitigation Monitoring and Reporting Program.

2.0 Project Description

2.1 Project

2936 Camino Del Mar Seawall Project

2.2 Lead Agency

City of Del Mar
1050 Camino Del Mar
Del Mar, California 92014

2.3 Contact Person and Phone Number

Ms. Jean Crutchfield
Associate Planner
City of Del Mar
Planning Department
(858) 704-3647
jcrutchfield@delmar.ca.us

2.4 Project Location

2936 Camino Del Mar, Del Mar, California 92014

2.5 Project Applicant/Sponsor

Oceans Investments, LLC
2936 Camino Del Mar
Del Mar, California 92014

2.6 General Plan Designation and Zoning

Zoning Designation: Low Density Residential Beach (R1-10B)
Overlays: Floodplain Overlay and Beach Overlay

2.7 Description of Project

The project would demolish an existing seawall with rock revetment providing shoreline protection at 2936 Camino Del Mar and construct an approximately 80-foot-long vertical cantilevered seawall located landward of the SPA line. The proposed seawall would have a top-of-wall of Elevation 17 feet (North American Vertical Datum of 1988 [NAVD88])/ 14.8 (National Geodetic Vertical Datum of 1929

[NGVD29]) and a bottom-of-wall Elevation -22 feet NAVD88/ -24.2 (NGVD29). The replacement seawall would connect to the existing seawall to the north protecting the residence at 2938 Sandy Lane and would include an access stairway with a wave deflector at the northern end of the seawall. The project would introduce a return wall at the southern end of the seawall. No other improvements are proposed on the applicant's property. Demolition of the existing seawall with rock revetment and construction of the replacement seawall would require approval of both a Coastal Development Permit and a Setback Seawall Permit.

Figure 1 provides the regional location of the project, Figure 2 shows that the project is located within Township 14 South, Range 04 West of the U.S. Geological Survey, Del Mar quadrangle. Figure 3 shows the project and surrounding land uses via aerial photography. Figure 4 shows the proposed seawall design. During construction, access to alleys, sidewalks, private driveways, and public streets would be maintained, and construction activity in the beach area would not restrict lateral public access. All excavated beach sand would be redeposited on the beach.

2.8 Relationship to the Program EIR

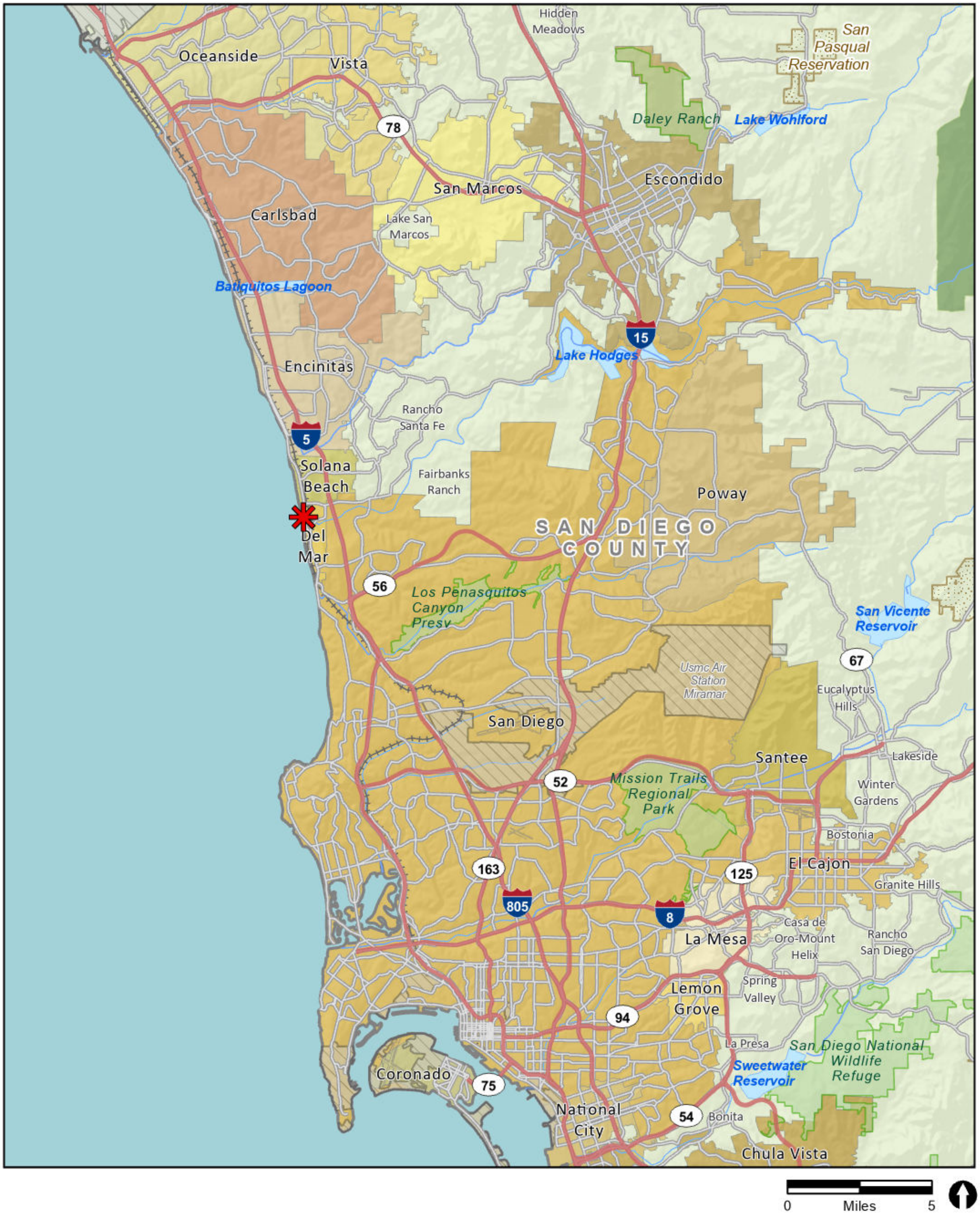
The purpose of the Program EIR for the BPI was to analyze the environmental consequences of implementation of the subsequent ordinance (Municipal Code Chapter 30.50), which requires removal of existing unpermitted and non-conforming structures, and the subsequent construction and maintenance of new shoreline protection structures (including seawalls). While the BPI/Municipal Code Chapter 30.50 are applicable only to proposed actions within the SPA (westward of the SPA line), the Program EIR considered more broadly the environmental impacts of seawall replacement both landward and seaward of the SPA line. Thus, the project implements activities anticipated in the certified Final Program EIR for the BPI and Ordinance.

2.9 Surrounding Land Uses and Project Setting

The project property consists of an existing two-story residential structure surrounded by residential uses to the north and south. The project property is bordered to the west by the Pacific Ocean and to the east by Camino Del Mar The project site is located approximately 0.15 miles south of the San Dieguito River mouth and approximately 0.30 miles southwest of the Del Mar Fairgrounds and Racetrack.

2.10 Other Required Agency Approvals or Permits Required

The project site is located within the California Coastal Zone. The project requires approval of a Coastal Development Permit and Setback Seawall Permit by the City, which are both subject to appeal to the California Coastal Commission (Coastal Commission). Additionally, the Coastal Commission would require a Coastal Development Permit for the project components located west of the SPA line. The applicant has submitted a request to the City and Coastal Commission to consolidate the Coastal Development Permit review with the Coastal Commission.



Project Location

RECON

FIGURE 1
Regional Location

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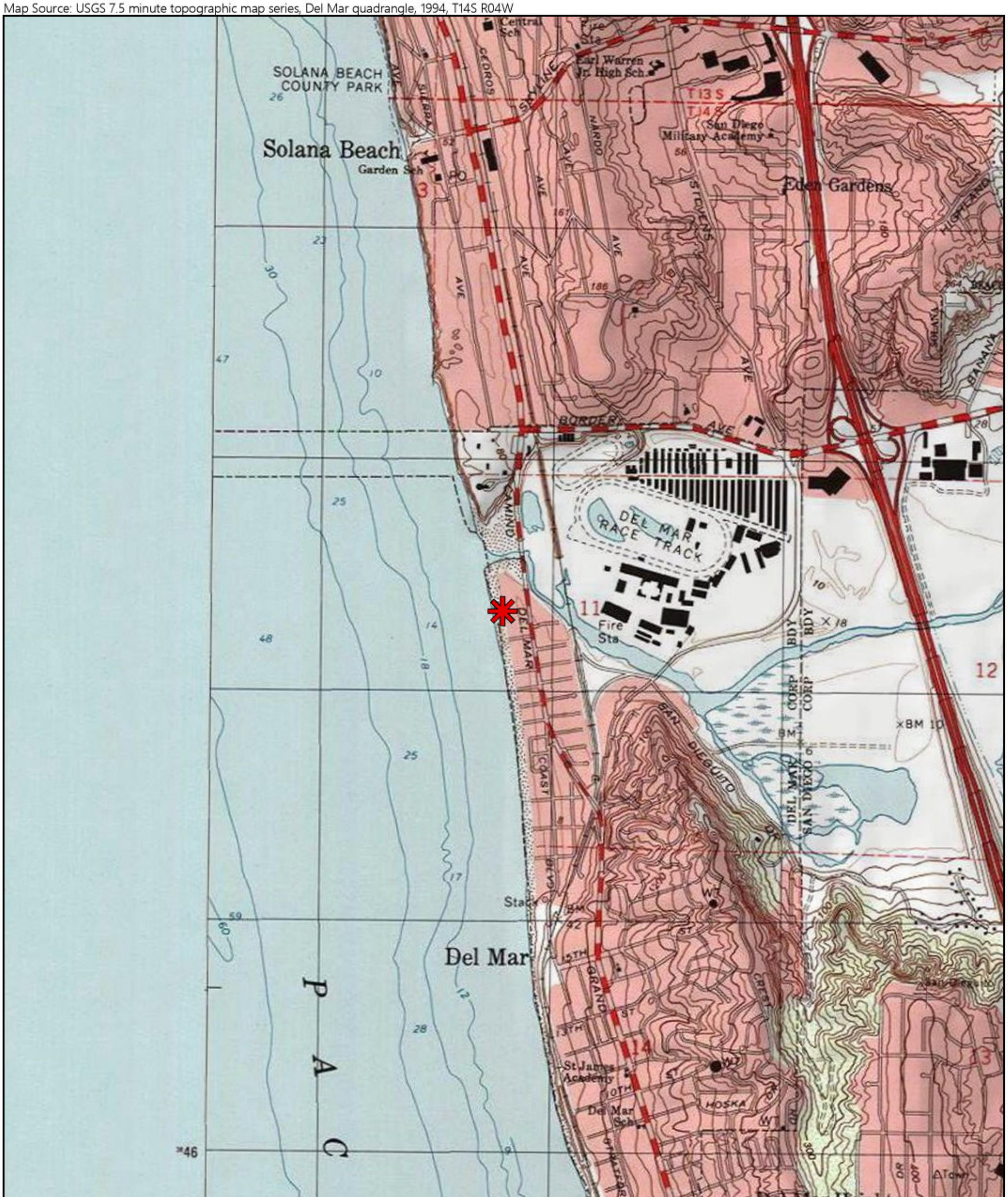
Map Source: USGS 7.5 minute topographic map series, Del Mar quadrangle, 1994, T14S R04W



0 Feet 2,000

Project Location

FIGURE 2
Project Location on USGS Map

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Image Source: Nearmap (flown January 2025)

FIGURE 3
Project Location on Aerial Photograph

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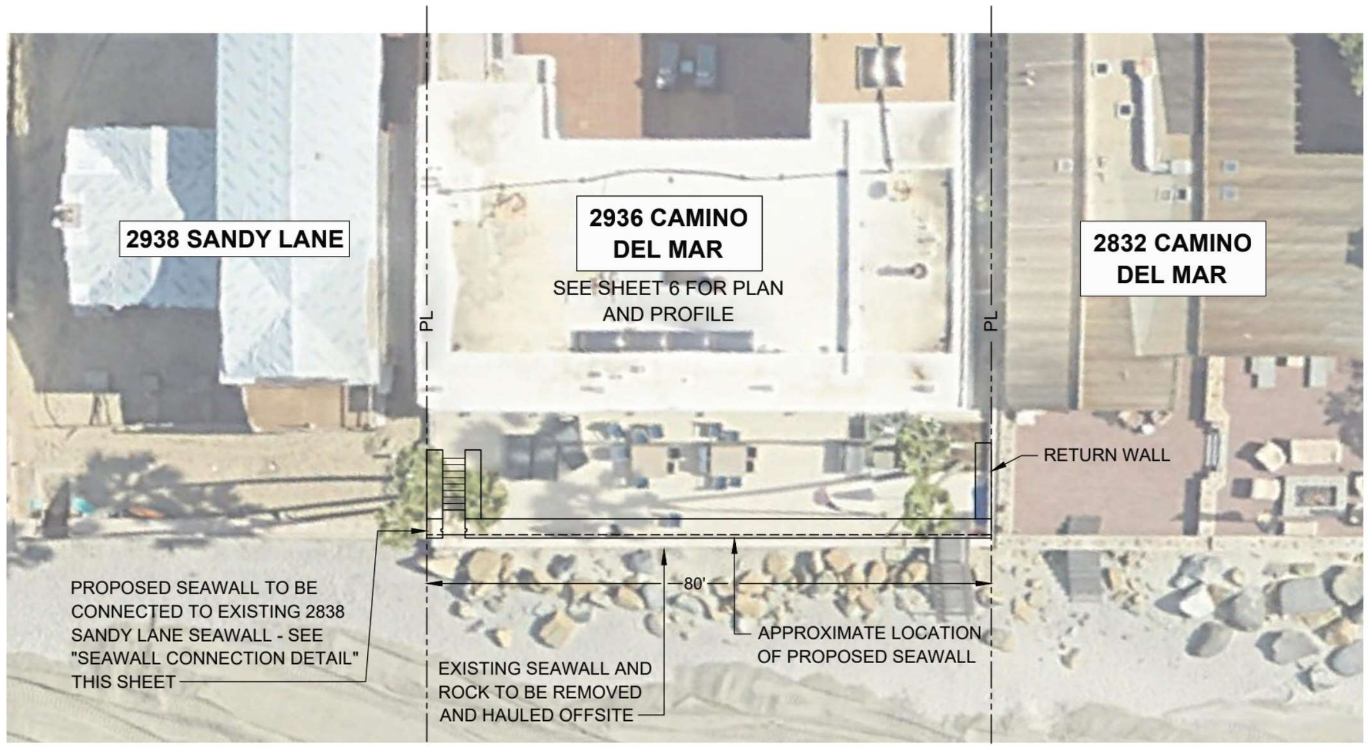
Map Source: ENGO



NOTE:
THE ENTIRE SEAWALL FRONTING 2936 CAMINO DEL MAR WILL BE CONSTRUCTED EAST OF THE SPA LINE.

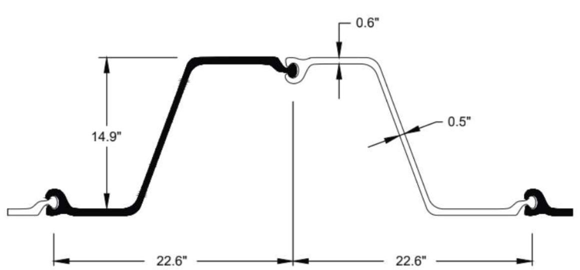
PROPOSED SITE PLAN

NOT TO SCALE

N

PROPERTIES & WEIGHTS PZ 35					
	WEIGHT IN POUNDS			SECTION MODULUS, IN.^{3}	
SECTION DESIGNATION	PER LIN. FT. OF PILE	PER SQ. FT. OF WALL	MOMENT OF INERTIA IN.^{4}	ELASTIC	PLASTIC
PZ 35	66.0	35.0	361.2	48.5	57.2

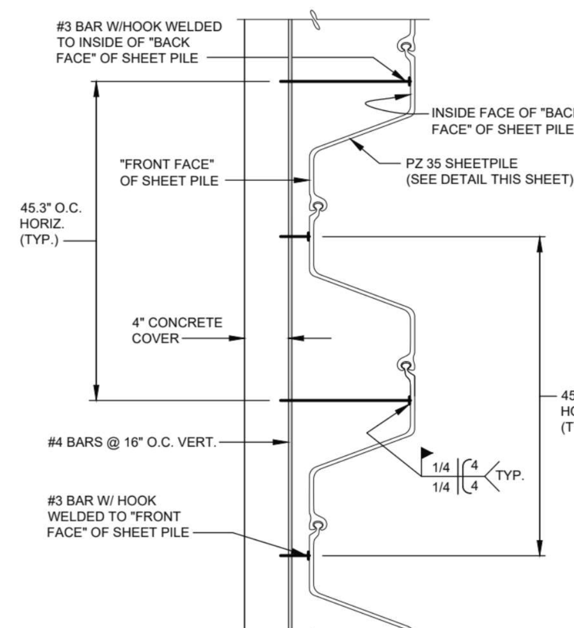
NOTE:
NO CORROSION PROTECTION REQUIRED ON SHEET PILE.



PLAN VIEW PZ 35 SHEETPILE DETAIL

A
–

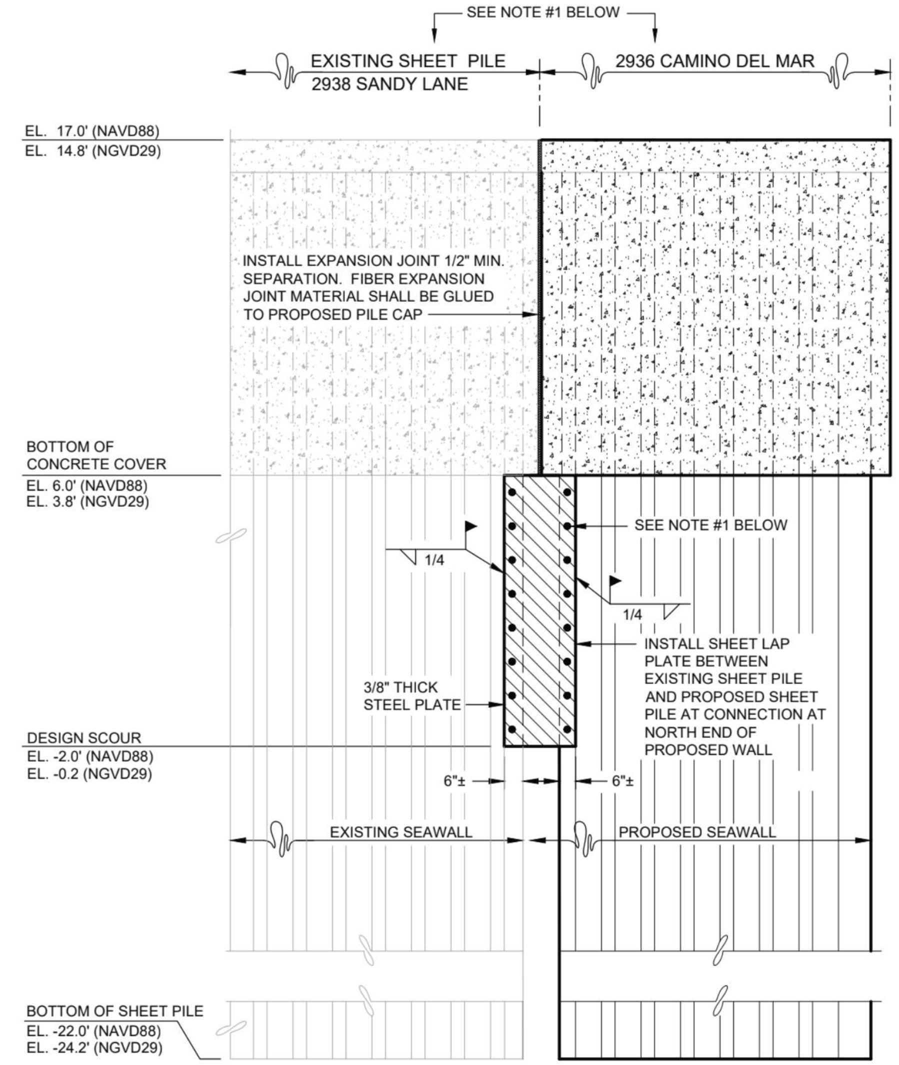
NOT TO SCALE



PLAN VIEW REINFORCING WELD DETAIL

B
–

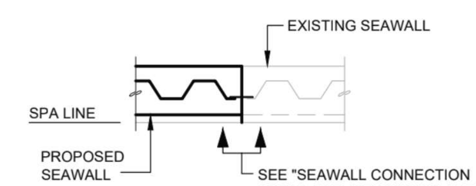
NOT TO SCALE



SEAWALL CONNECTION DETAIL - ELEVATION

NOT TO SCALE

NOTES:
1. TO SEAL THE JOINT BETWEEN THE NEW AND EXISTING SHEET PILES, THE STEEL LAP PLATE MAY EITHER BE WELDED TO SHEET PILES BETWEEN BOTTOM OF CONCRETE COVER AND DESIGN SCOUR ELEVATION, OR BOLTED USING 1" DIA., A325 BOLTS @ 12" O.C.
2. SEE ADDITIONAL NOTES ON PLAN SHEETS 2 & 5 REGARDING CHEMICAL GROUTING BEHIND THE CONNECTIONS.



NOTE: IF DRAWING IS NOT FULL SIZE (24x36) THEN REDUCE SCALE ACCORDINGLY
0 1 2 3
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

PLAN VIEW PROPOSED @ EXISTING SEAWALL

NOT TO SCALE

FIGURE 4
Proposed Seawall

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3.0 Environmental Analysis

CEQA Guidelines Sections 15162 through 15164 set forth the criteria for determining the appropriate additional environmental documentation, if any, to be completed when there is a previously certified EIR for the project. CEQA Guidelines, Sections 15162(a) and 15163 state that when an EIR is certified for a project, no Subsequent or Supplemental EIR or Subsequent Negative Declaration shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in light of the whole public record, one or more of the following:

1. Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete, shows any of the following:

    a. The project will have one or more significant effects not discussed in the previous EIR; or

    b. Significant effects previously examined will be substantially more severe than shown in the previously certified EIR; or

    c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

    d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

The following analysis is provided to determine whether the project is within the scope of the prior EIR as specified in CEQA Guidelines Sections 15162 through 15164.

3.1 Aesthetics

The Program EIR determined that impacts related to aesthetics would be less than significant. Specifically, regarding the replacement of shoreline protection devices, the Program EIR concluded that views from the beach toward the east would not change significantly because beach walls and riprap were currently in place, and shoreline protection device replacement or relocation would not be noticeable. The Program EIR concluded that with the implementation of City codes, including enforcement of the Design Review Ordinance, the construction of seawalls would have a less than significant visual impact and no mitigation is required.

Since the certification of the Program EIR, no new information has been identified that would result in a change to the conclusions summarized above. The existing visual conditions described in the Program EIR are similar to what exists today. Although some new development and redevelopment have occurred along the City's beach area, these projects were approved consistent with City process, including design review requirements to minimize impacts related to aesthetics and prevent substantial blockage of public views, thereby preserving the existing visual character. The project is limited to demolition of an existing seawall with rock revetment and construction of a replacement seawall landward of the SPA line, which would not alter the broader visual character surrounding the project site. Additionally, removal of the existing rock revetment would increase the amount of usable width and visibility of sandy beach, thereby improving visual character.

The City-certified Local Coastal Program Land Use Plan identifies the need to protect and preserve public views of the ocean and other significant natural resources (Policy II-2; City of Del Mar 1993). Direct views of the ocean from Camino Del Mar are currently blocked by the existing single-family residence on the project parcel landward of the proposed seawall, as well as other existing structures to the north and south. The existing seawall has a top-of-wall elevation of approximately Elevation 16 feet (NAVD88), and the slight increase in height of the proposed seawall to Elevation 17 feet (NAVD88) would not substantially change existing views of the ocean. Therefore, the project would not have a substantial adverse effect on a scenic vista, and impacts would be less than significant.

Replacement of shoreline protection devices was an anticipated action in the Program EIR, and the proposed replacement seawall would not introduce new features that would contrast with the visual character of the surrounding area. Therefore, the project would not result in any new significant impacts, nor increase the severity of any impacts, compared to those identified for aesthetics in the Program EIR.

3.2 Agricultural and Forestry Resources

There are no agriculture or forestry resources in the project area. Therefore, the project would not result in new significant impacts, nor increase the severity of any impacts, compared to those identified for agricultural or forestry resources in the Program EIR.

3.3 Air Quality

The Program EIR disclosed that removal of non-complying rock revetment and construction of new seawalls would involve the use of heavy construction equipment. The Program EIR recommended a phased, block-by-block construction schedule to minimize adverse construction impacts. Project construction would be limited to the footprint of the existing seawall with rock revetment and surrounding sandy beach area immediately seaward. Therefore, the project would be consistent with the Program EIR's phasing recommendation, which would minimize air quality impacts associated with construction.

The Regional Air Quality Strategy (RAQS) is the applicable regional air quality plan that sets forth the San Diego Air Pollution Control District's (SDAPCD's) strategies for achieving the National Ambient Air Quality Standards and California Ambient Air Quality Standards. The San Diego Air Basin is designated non-attainment for the federal and state ozone standard. Accordingly, the RAQS was developed to identify feasible emission control measures intended to progress toward attaining the state standard for ozone. The growth forecasting for the RAQS is based in part on San Diego Association of Governments growth projections and the land uses established by local general plans. The project is limited to demolition of an existing seawall with rock revetment and construction of a replacement seawall. The project would not construct any residential or other land uses that would result in growth in the region. Therefore, the project would be consistent with the City's General Plan land use designation and San Diego Association of Governments growth projections and is considered consistent with the RAQS. Emissions associated with short-term construction activities would be localized and would not affect RAQS compliance. Once constructed, the seawall would not generate any operational emissions. Therefore, the project would comply with the assumptions used in the development of the RAQS and would not conflict with or obstruct implementation of the applicable air quality plan.

Project construction would result in an increase in short-term, temporary air emissions of criteria pollutants. Off-road construction equipment for the project would likely include at a maximum an excavator, loader, crawler crane and crawler-mounted casing drill rig, vibratory hammer, backhoe, concrete pump, generator, and air compressor; on-road equipment would include dump trucks, delivery trucks, and employee trucks. Construction activities (e.g., equipment and materials delivery, and construction workers driving to and from the sites) would result in air pollutant emissions from ground disturbance and vehicle exhaust (both off-road construction and on-road vehicles). Emissions would vary from day to day, depending on the level of activity, specific type of construction activity, and prevailing weather conditions.

Project construction emissions of particulate matter less than 10 microns in diameter and particulate matter less than 2.5 microns in diameter would be minimal based on the short duration (three months) and small scale of construction and would not exceed state or federal air quality standards for these pollutants with implementation of appropriate dust abatement measures including compliance with SDAPCD Rules 50 (Visible Emissions), 51 (Nuisance), 52 (Particulate Matter), and 54 (Dust and Fumes).

Volatile organic compounds (also referred to as reactive organic gases) and diesel particulate matter emissions in the exhaust from off-road construction equipment would be secondary emissions from construction vehicles. The emissions from vehicles are not subject to permits by SDAPCD but would be minimal, because the emissions would be temporary and associated only with the construction phase of the project. Therefore, the project would not contribute substantially to an existing or projected violation. Construction of the project would not result in emissions that exceed applicable thresholds for criteria pollutants. Additionally, due to the short exposure period, and the implementation of the U.S. Environmental Protection Agency and California Air Resources Board requirements for cleaner fuels, diesel engine retrofits, and new low-emission diesel engine types, diesel particulate matter generated by project construction would not adversely affect any sensitive receptors. Therefore, the project would not result in any new significant impacts, nor increase the severity of any impacts, compared to those identified for air quality in the Program EIR.

3.4 Biological Resources

The Program EIR did not identify any impacts related to biological resources. Demolition of the existing seawall with rock revetment and construction of the replacement seawall would generally occur within the existing rock revetment footprint and surrounding sandy beach area. Consequently, the project would not impact any sensitive habitats or plant or wildlife species. Permanent impacts would occur landward of the existing rock revetment, which does not function as a wildlife corridor. The project site is not located within an approved Multiple Species Conservation Program Subarea Plan, and no sensitive biological resources occur within the project area. Therefore, the project would not result in any new significant impacts, nor increase the severity of impacts, compared to those identified for biological resources in the Program EIR.

3.5 Cultural and Tribal Cultural Resources

The Program EIR did not identify any impacts to cultural resources. The Program EIR did not address tribal cultural resources as this was not a required topic of analysis at the time. However, the addition of tribal cultural resources to the CEQA Guidelines and the passage of Assembly Bill (AB) 52 addressing tribal cultural resources are not considered new information that could not have been known with the exercise of reasonable diligence at the time of preparation of the Program EIR. AB 52 was not applicable to the previously approved project due to the timing of adoption of the bill. Since certification of the Program EIR, the City initiated the AB 52 consultation process by contacting Native American tribes to determine their interest in being included in formal consultation for new projects in the city of Del Mar. Tribes who are traditionally and culturally affiliated with the geographic area of the project were sent a notification letter on May 7, 2025, inviting them to consult regarding potential impacts to tribal cultural resources pursuant to Public Resources Code Section 21080.3.1, consistent with AB 52. The City did not receive any responses to the notification letter requesting consultation. Therefore, no additional actions were taken, and the City has satisfied the requirements of AB 52.

Replacement of shoreline protection devices along the coastline was anticipated in the Program EIR. The existing rock revetment does not qualify as an historical resource as defined in CEQA Sections 15064.5 and 21083.2(g). Impacts related to cultural resources and human remains typically occur during grading and excavation activities on previously undisturbed land. However, the proposed construction footprint was disturbed during construction of the existing seawall. Furthermore, the proposed seawall footprint would be located in an area of historical tidal action, and it is not anticipated that cultural resources or human remains would exist on-site. Therefore, the project would not result in any new impacts, nor increase the severity of impacts, compared to those identified for cultural resources in the Program EIR.

3.6 Energy

The Program EIR did not address energy, and this was not a required topic of analysis at the time of certification. However, the issue of energy was known at the time and is not considered new information that could not have been known with the exercise of reasonable diligence. The limited duration of construction would avoid wasteful, inefficient, or unnecessary consumption of energy resources. Additionally, there are no known conditions in the project area that would require nonstandard equipment or construction practices that would increase fuel-energy consumption above typical rates. Once constructed, the seawall would not consume any energy resources. Therefore, the project would not result in the use of excessive amounts of fuel or other forms of energy during construction, nor would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency, and impacts would be less than significant.

3.7 Geology and Soils

The Program EIR identified the need to conduct a geotechnical analysis of sea cliff stability on a site-by-site basis to establish the need for shore protection in the sea cliff regions. However, the project is located within a relatively flat residential neighborhood along the City's beach area and is not adjacent to any sea cliffs. Therefore, the project would not be subject to cliff instability or landslides, and a geotechnical analysis of sea cliff stability would not be required. The Coastal and Geotechnical Engineering Report (Attachment 2) completed for the project determined there are no known active or potentially active faults near, or projecting toward the project. Similarly, the project is not located within a mapped Alquist-Priolo fault zone. Although, the potential exists for liquefaction or seismically induced ground settlement, adherence to the recommendations provided in the Preliminary Geotechnical Investigation (Attachment 3) would ensure that the proposed seawall would not be adversely affected by potential seismic and geologic hazards. Potential adverse effects related to soil erosion from the Pacific Ocean would not occur as the project would construct the proposed seawall landward of the SPA line, and all excavated sand would be deposited onto the beach. Impacts related to paleontological resources typically occur during grading and excavation activities on previously undisturbed land, or redevelopment where much deeper grading in native soil is proposed. However, the proposed construction footprint was disturbed during construction of the existing seawall. Furthermore, the proposed seawall footprint is located in an area of historical tidal action, and it is not anticipated that paleontological resources would exist on-site. Therefore, the project would not result in any new impacts, nor increase the severity of impacts, compared to those identified for geology or soils in the Program EIR. Refer to Section 3.10: Hydrology and Water Quality for additional discussion of coastal erosion issues.

3.8 Greenhouse Gas Emissions

The Program EIR did not address greenhouse gas (GHG) emissions, and this was not a required topic of analysis at the time of certification. However, the issue of GHG emissions was known at the time and it is not considered new information that could not have been known with the exercise of reasonable diligence. The City adopted a Climate Action Plan (CAP) in June 2016 which sets targets for reducing GHG emissions by 2020 and 2035; identifies strategies to meet the targets; and formulates a plan for implementation (City of Del Mar 2016). The CAP aims to reduce GHG emissions from the baseline year (2015) levels by 15 percent by 2020, and 50 percent by 2035. The CAP also includes a renewable energy goal of 50 percent by 2020 and 100 percent by 2035. Additional CAP strategies include reducing water consumption and waste generation, promoting energy efficiency, and encouraging sustainable transportation alternatives. However, the GHG reduction strategies and actions contained in the CAP are not applicable to the project construction activities, nor are construction emissions included in the City GHG emissions inventory. An appropriate screening level threshold would be a more conservative approach to determining the significance of the project's GHG emissions. This analysis utilizes an annual 900 metric tons of carbon dioxide equivalent (MT CO_2E) threshold, consistent with the applicable guidance set forth in the California Air Pollution Control Officers Association (CAPCOA) report *CEQA & Climate Change* (CAPCOA 2008). The 900 MT CO_2E guideline is referenced as a conservative threshold that if exceeded by a project, would require further analysis and mitigation. Project GHG emissions that would be compared to the 900 MT CO_2E threshold are based on the amount of construction activities (amortized over the lifetime of a project), vehicle trips, energy and water use, waste, and other factors associated with projects. Projects that would not exceed the 900 MT CO_2E threshold are not required to prepare a detailed GHG analysis. CAPCOA identifies project types and sizes that are estimated to emit approximately 900 MT CO_2E of GHG emissions annually. As estimated by CAPCOA, construction and operation of 50 single-family residential units would generate 900 MT CO_2E of GHG emissions annually (CAPCOA 2008).

The project is limited to demolition of an existing seawall with rock revetment and construction of a replacement seawall. Project GHG emissions would be generated by off-road construction equipment and on-road vehicles associated with hauling, equipment and materials delivery, and construction workers driving to and from the project sites. Construction emissions would be minor as a minimal amount of construction equipment would operate at one time, and construction would only last for approximately three months. Once constructed, the seawall would not generate any operational GHG emissions. Therefore, GHG emissions generated by demolition of the existing seawall with rock revetment and construction of the replacement seawall would be well below the 900 MT CO_2E, and impacts would be less than significant.

3.9 Hazards and Hazardous Materials

The Program EIR did not identify any impacts related to hazards and hazardous materials. Project construction would require transport, temporary storage, and use of fuels, oils, paints, and solvents. However, these materials are not acutely hazardous, and use of these common hazardous materials in small quantities would not represent a significant hazard to the public or environment. Additionally, project construction would be required to be undertaken in compliance with applicable federal, state, and local regulations pertaining to the proper use of these common hazardous materials. Once constructed, the seawall would not require the use of any hazardous materials.

The Hazardous Waste and Substances Sites (Cortese) List is a planning document that provides information about the location of hazardous materials release sites in the state. Government Code Section 65962.5 requires the California Environmental Protection Agency to develop at least annually an updated Cortese List. The California Department of Toxic Substances Control is responsible for a portion of the information contained in the Cortese List that is provided by the Envirostor Database. A review of the EnviroStor Database determined that the closest potentially hazardous materials site is located approximately 0.5 miles northeast of the project site on the Del Mar Fairgrounds, which stated that the property's former use as a U.S. Marine Corps base made it eligible for funding under the Defense Environmental Restoration Program (California Department of Toxic Substances Control 2025). Due to this distance, construction of the project would not have the potential to encounter hazardous materials at the Del Mar Fairgrounds, although it should be noted, that the entry for this site on the EnviroStor Database did not identify any specific hazardous materials. The State Water

Resources Control Board is also responsible for a portion of the information contained in the Cortese List that is provided in the Geotracker Database. Review of the Geotracker Database determined that there are no sites located within 0.5 miles of the project site (State Water Resources Control Board 2025). Therefore, the project would not result in any new impacts, nor increase the severity of impacts, compared to those identified for hazards and hazardous materials in the Program EIR.

3.10 Hydrology and Water Quality

The Program EIR addressed coastal conditions along the Del Mar coastline, implementation of the Beach Preservation Initiative Ordinance, and replacement of seawalls. The analysis focused on beach erosion issues, sea cliff erosion, and the overall impacts of removing non-conforming sea protection structures and replacing seawalls along the coast, including the potential for coastal/beach erosion and ocean flooding. The Program EIR concluded broadly that removal of existing encroachments would generally widen the sandy beach area, incrementally reducing sand erosion, but that offsets in seawall alignments could cause a localized concentration of wave energy, resulting in a greater potential for sand erosion. The Program EIR identified mitigation that would reduce potential adverse impacts related to these coastal processes to less than significant. The applicability of each of the measures is detailed in Section 5.0: Mitigation Monitoring and Reporting Program.

The replacement seawall would not be offset from the existing seawall to the north and south of the project and would not encroach beyond the SPA line. The project would construct a replacement seawall that would be contiguous with the adjacent seawalls protecting the properties immediately to the north and south consistent with the provisions of the BPI Ordinance. By providing a seawall that would be contiguous with the adjacent seawalls, the project would not increase the potential for sand erosion.

The Coastal and Geotechnical Engineering Report (see Attachment 2) evaluated the design of the proposed replacement seawall in relation to local coastal processes. In order to comply with the Program EIR mitigation measures referenced in Section 5.0: Mitigation Monitoring and Reporting Program, the project would be required to comply with the design recommendations presented in the Coastal and Geotechnical Engineering Report (see Attachment 2), which provides design criteria for the proposed vertical seawall, and addresses its effectiveness in providing protection for residential structures from periodic storm waves in the area. Specifically, the Coastal and Geotechnical Engineering Report (see Attachment 2) includes appropriate design criteria for the seawall to protect the existing residential structure on-site from wave overtopping. Although overtopping could still be a risk, the geotechnical investigation identified that a cantilevered vertical sheet-pile wall as the most effective form of shore protection device for the property; the project is designed to meet the specifications within the Coastal and Geotechnical Engineering Report (see Attachment 2) evaluated throughout this analysis. Furthermore, the replacement seawall would increase the height by one foot, resulting in an increase in the stability of shoreline protection compared to the existing seawall. This would be consistent with the City's Sea-Level Rise Adaptation Plan, which states that "improving North Beach sea walls and revetments provides an adaptation measure to offset the increase in flood risk with sea-level rise" (City of Del Mar 2018).

Potential impacts associated with tsunami are present in the existing condition, and the project would reduce the level of risk by increasing the height of the seawall by one foot, which would increase the stability of shoreline protection compared to the existing seawall to be replaced.

Finally, implementation of Best Management Practices (BMPs) during construction would be consistent with the requirements of the Stormwater Pollution Prevention Plan (prepared and submitted with the project's Building Permit) and the City's Construction BMP Manual in order to minimize potential impacts to water quality. Example construction BMPs include perimeter silt fences, fiber rolls, designated and contained storage areas for materials and waste, and on-site materials for spill control or containment. As part of the project, the contractor would monitor the water quality BMPs including conducting routine inspections of disturbed areas to ensure that the BMPs remain intact and effective. Therefore, the project would not result in any new impacts, nor increase the severity of impacts, compared to those identified for hydrology and water quality in the Program EIR.

3.11 Land Use and Planning

The Program EIR addressed consistency of implementation of the BPI Ordinance with coastal protection and access policies contained in the Coastal Act. The Program EIR recognized that "protective structures, whether they be vertical seawalls or rip rap, potentially pose direct obstacles to the public to access the beach both laterally (parallel along the beach) and vertically (from the east)," and that only streets perpendicular to and that terminate at the beach, provide beach access. Residences along the beachfront generally provide no vertical public access to the beach. The Program EIR also stated that lateral access to the beach could be reduced if the rip rap element of proposed structures extends the maximum 20 feet westward from the SPA line but concludes that the maximum encroachment would not be excessive. The Program EIR concludes that implementation of the ordinance would maintain public access and avoid any impacts to shoreline access.

The proposed seawall would be consistent with the City's Beach Overlay Zone (Municipal Code Chapter 30.50), which allows for "[t]he construction and maintenance of a privately owned protective structure in accordance with the regulations of this ordinance (Municipal Code Section 30.50.080,B,1)." The project has been designed to be consistent with City Shoreline Protection Structure requirements outlined in Municipal Code Section 30.50.060. The project would also achieve consistency with the Beach Overlay Zone by removing the existing rock revetment westward of the SPA line and constructing the replacement seawall landward of the SPA line through processing of a Setback Seawall Permit (City of Del Mar 2025). Furthermore, the replacement seawall would be consistent with the City's Sea-Level Rise Adaptation Plan, which states that "Improving North Beach sea walls and revetments provides an adaptation measure to offset the increase in flood risk with sea-level rise" (City of Del Mar 2018). Therefore, the project would not conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

Demolition of the existing seawall with rock revetment and construction of the replacement seawall would be consistent with the actions analyzed in the Program EIR. The project would be consistent with the Coastal Act through compliance with the City's Local Coastal Program Implementing

Ordinances. No conflicts with any environmental plans, policies, or regulations with jurisdiction over the project have been identified. Therefore, the project would not result in any new impacts, nor increase the severity of impacts, compared to those identified for land use in the Program EIR.

3.12 Mineral Resources

The Program EIR did not identify any impacts to mineral resources. The project is located within a residential neighborhood along the City's beach area. Mining operation in this area would conflict with uses surrounding the project site, making mineral resource extraction infeasible. Additionally, removal of the existing rock revetment would widen the sandy beach area. Furthermore, all excavated sand removed during construction of the replacement seawall would be deposited back on the beach. Therefore, the project would not result in any new significant impacts, nor increase the severity of any impacts, compared to those identified for mineral resources in the Program EIR.

3.13 Noise

The Program EIR disclosed that removal of rock revetment and construction of new seawalls would involve the use of heavy construction equipment, and that local streets and neighboring properties could be affected during construction. Project construction noise would be generated by diesel engine-driven construction equipment used for demolition, site preparation, and reconstruction of the seawall. Also, diesel engine-driven trucks would bring materials and debris to and from the project site.

Construction noise is regulated within the City by the Noise Ordinance, which limits construction noise to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, and 9:00 a.m. to 7:00 p.m. on Saturdays. Construction noise is prohibited on Sundays and City holidays. The City does not set a specific numerical noise level limit on construction activity. Although the existing adjacent residences would be exposed to construction noise levels that may be heard above ambient conditions, the exposure would be temporary. All construction would occur daytime hours consistent with the Noise Ordinance. Once construction activities are complete, the project would not be a source of operational noise.

The Program EIR determined that implementation of appropriate mitigation measures would reduce impacts related to construction noise to a level less than significant. As detailed below in Section 5.0: Mitigation Monitoring and Reporting Program, the Program EIR included a measure stating that project construction hours shall be consistent with the City Noise Ordinance Chapter 9.20 of the Municipal Code. The project would implement this mitigation measure to ensure that impacts related to construction noise would be less than significant. The Coastal and Geotechnical Engineering Report (see Attachment 2) stated it is reasonable to conclude that groundborne vibration associated with installation of conventional sheet-pile walls would cause damage to structures within 12 feet of the seawall alignment, and potentially severe damage to structures within four feet of the seawall alignment. However, the existing residential structure on-site and the neighboring residences are all more than 12 feet away from the proposed seawall alignment and would not be affected by vibration associated with installation of sheet piles. Once constructed, the seawall would not generate any operational noise or vibration. Therefore, the project would not result in any new impacts, nor increase the severity of impacts, compared to those identified for noise in the Program EIR.

3.14 Population and Housing

The project is limited to the demolition of an existing seawall with rock revetment and construction of a replacement seawall. The project would not construct any housing or expand existing infrastructure facilities that could induce growth, nor would it displace any existing housing or people. Therefore, the project would not result in any new impacts, nor increase the severity of impacts, compared to those identified for population and housing in the Program EIR.

3.15 Public Services

The Program EIR did not identify any impacts related to public services. The project is limited to the demolition of existing seawall with rock revetment and construction of a replacement seawall. As described in Section 3.14 above, the project would not generate population growth that would increase demand for fire protection or police services, increase use of Del Mar Beach or any other parks within the City, nor increase demand for school services or other public facilities such as libraries. Therefore, the project would not result in any new impacts, nor increase the severity of impacts, compared to those identified for public services in the Program EIR.

3.16 Recreation

The Program EIR did not identify any impacts related to recreation. Implementation of the BPI Ordinance did not include construction of recreational facilities but maintained public access to the beach, thereby providing ongoing opportunity for public recreation. The project is limited to the demolition of an existing seawall with rock revetment and construction of a replacement seawall. As described in Section 3.14 above, the project would not generate population growth that would increase the use of existing parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. Furthermore, removal of the rock revetment structure seaward of the SPA line and construction of the replacement seawall landward of the SPA line would increase sandy beach area available for public use. Therefore, the project would not result in any new impacts, nor increase the severity of impacts, compared to those identified for recreation in the Program EIR.

3.17 Transportation

The Program EIR did not identify any impacts related to transportation. The Program EIR recognized that replacement of shoreline protection devices and implementation of the Beach Preservation Initiative Ordinance would require construction equipment; however, construction vehicles would be temporary and would not have the potential to result in significant transportation impacts. Project construction activities would temporarily contribute to additional vehicle trips on the local circulation system. Construction traffic would likely use Interstate 5, Via de la Valle, Jimmy Durante Boulevard, and Camino Del Mar. Project construction would not require a substantial amount of vehicle trips because it is limited to the demolition of an existing seawall with rock revetment structure and construction of a replacement seawall. Consequently, it is not anticipated that project construction would degrade traffic level of service on the surrounding roadway system, and the minimal delays that would occur would cease once construction was completed. Once constructed, the seawall would not generate any operational vehicle trips. The project would not conflict with an applicable plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle, and pedestrian facilities, and impacts would be less than significant. Therefore, the project would not result in new impacts, nor increase the severity of impacts, compared to those identified for transportation in the Program EIR.

3.18 Utilities and Service Systems

The Program EIR did not identify any impacts related to utilities and service systems. As described in Section 3.14 above, the project would not generate population growth that would increase demand for utility services. Any debris generated during demolition of the existing seawall with rock revetment and construction of the replacement seawall would be required to comply with Municipal Code Chapter 11.20, Management of Solid Waste, which provides guidance for the disposal of solid waste and recycling. Therefore, the project would not result in any new impacts, nor increase the severity of impacts, compared to those identified for utilities and service systems in the Program EIR.

3.19 Wildfire

The Program EIR did not address wildfire, and this was not a required topic of analysis at the time of certification. However, the issue of wildfire was known at the time and is not considered new information that could not have been known with the exercise of reasonable diligence. The California Department of Forestry and Fire Protection (CAL FIRE) has mapped areas of significant fire hazards in San Diego County into different Fire Hazard Severity Zones based upon fuels, terrain, weather, and other relevant factors. Review of CAL FIRE mapping determined that the project is not located in an area designated as a Fire Hazard Severity Zones (CAL FIRE 2025). Furthermore, the project site is surrounded by existing development and located immediately adjacent to the Pacific Ocean. Therefore, the project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires, and impacts would be less than significant.

4.0 Conclusions

Based on the information provided in this Addendum, demolition of the existing seawall with rock revetment and construction of the replacement seawall would not result in any new environmental impacts compared to the previously certified Program EIR. Replacement of shoreline protection devices was anticipated and analyzed in the Program EIR for the Beach Preservation Initiative Ordinance. The project would not result in any new significant impacts, nor increase the severity of impacts, compared to those identified in the Program EIR. The applicable mitigation measures identified in the certified Program EIR, as detailed in Section 5.0: Mitigation Monitoring and

Reporting Program, would be carried through to this project, reducing all potential impacts to a level less than significant.

5.0 Mitigation Monitoring and Reporting Program

Mitigation Monitoring and Reporting Programs (MMRPs) are required by CEQA Section 21081.6 to be incorporated into Final EIRs for projects having the potential to cause significant environmental impacts. The mitigation measures included in the certified EIR for the BPI Ordinance are included in the MMRP (Table 1) and a discussion provided as to the applicability of the measures to the project.

The applicable mitigation measures will become conditions of project approval. The City is required to verify that all mitigation measures are implemented as defined in the MMRP. To ensure compliance, the following checklist shall be adopted by the City for administration by City personnel. The MMRP is intended to be referred to by grading/construction contractors and personnel from the City. The information contained within the checklist clearly identifies each mitigation measure, defines the conditions required to verify compliance, and delineates the monitoring schedule. Specific responsibilities are delineated for each measure, which may be delegated to qualified City staff or consultants.

Table 1 Mitigation Monitoring and Reporting Program for the 2936 Camino Del Mar Seawall Project				
Beach Preservation Initiative Ordinance EIR Mitigation Measure	Measure Required?	Discussion	Schedule	Responsibility
Coastal Processes To mitigate site specific and cumulative impacts related to coastal processes, place the following measures, as appropriate, as standard conditions of approval on Shoreline Protection Permits to remove exiting structures and/or to build a new structure:				
1. Encourage and where appropriate require, construction or reconstruction of walls as part of a continuous line of walls	Yes	1. The proposed seawall would be constructed to align continuously with adjacent seawalls to the north and south. The replacement seawall would connect to the existing seawall protecting the residence at 2938 Sandy Lane to the north and construct a return wall to the south. The project design is consistent with this EIR mitigation measure.	During Construction	City of Del Mar
2. Provide flank protection in cases where non-continuous walls or offsets or angle points occur, including street ends	Yes	2. No wall offsets are proposed. The replacement seawall would connect to the existing seawall protecting the residence at 2938 Sandy Lane to the north and construct a return wall to the south. The project design is consistent with this EIR mitigation measure.	During Construction	City of Del Mar
3. If property owners cooperate, develop a schedule with property owners for the timing and location of construction and reconstruction of protective devices, including removal of existing encroachments, at least on a block-by-block basis and within the parameters of the Beach Preservation Initiative	Yes	3. Demolition of the existing seawall with rock revetment and construction of the replacement seawall would be consistent with the parameters of the EIR. Implementation of this measure would require, to the extent feasible, construction schedules would be coordinated with nearby properties.	Prior to Construction	City of Del Mar
4. Design protective structures to include structural features to minimize wave overtopping	Yes	4. The replacement seawall shall comply with the recommendations of the Coastal and Geotechnical Engineering Report (see Attachment 2) to ensure the seawall minimizes the potential for wave overtopping.	Prior to Construction	City of Del Mar

Table 1 Mitigation Monitoring and Reporting Program for the 2936 Camino Del Mar Seawall Project				
Beach Preservation Initiative Ordinance EIR Mitigation Measure	Measure Required?	Discussion	Schedule	Responsibility
5. Encourage the use of window shutters designed for hurricane-force winds where practical	No	5. The project would not make any changes to the existing residence on-site. Implementation of this mitigation measure would not be required.	Not Applicable	City of Del Mar
6. Provide toe protection (such as stone and filter cloth) for vertical walls when possible. If not possible, then design the wall so that the majority of wave energy is deflected upward and/or that the wall is stable to the maximum depth of expected toe scour	Yes	6. The replacement seawall shall comply with the recommendations of the Coastal and Geotechnical Engineering Report (see Attachment 2).	Prior to Construction	City of Del Mar
7. Provide toe protection for stone revetments (such as toe apron stone with filter cloth)	No	7. The project does not include any stone revetments. Implementation of this mitigation measure would not be required.	Not Applicable	City of Del Mar
8. Conduct a geotechnical analysis of sea cliff stability on a site-by-site basis to establish the need for shore protection in the sea cliff regions of section 1 and 2	No	8. Sea cliffs are not present in the vicinity of the project site. Implementation of this mitigation measure would not be required.	Not Applicable	Not Applicable
9. Setbacks from the SPA line should be established on a site specific basis depending on the potential wave runup and overtopping effect on the proposed shoreline protection structure and the structures behind the protective structure (In no case will the setback be more than 5 feet west of the SPA line)	No	9. The project does not propose seawalls west of the SPA line. Implementation of this mitigation measure would not be required.	Prior to approval of the Shoreline Protection Permit	City of Del Mar

Table 1 Mitigation Monitoring and Reporting Program for the 2936 Camino Del Mar Seawall Project				
Beach Preservation Initiative Ordinance EIR Mitigation Measure	Measure Required?	Discussion	Schedule	Responsibility
Construction Impacts				
1. Construction hours shall be consistent with the City Noise Ordinance Chapter 9.20 of the Municipal Code	Yes	1. Construction hours shall be consistent with the City Noise Ordinance Chapter 9.20 of the Municipal Code.	During Construction	City of Del Mar
2. The sandy beach area within the construction zone would be restored at the end of each workweek	Yes	2. During the demolition of the existing seawall with rock revetment and construction of replacement seawall, the sandy beach area within the construction zone shall be restored at the end of each workweek.	During Construction	City of Del Mar
3. Construction shall not occur west of the permitted shoreline protection line between Memorial Day and Labor Day (except for emergencies)	Yes	3. Construction hours shall be consistent with the City Noise Ordinance Chapter 9.20 of the Municipal Code, which prohibits noise on City holidays and no construction would be allowed west of the permitted shoreline protection line between Memorial Day and Labor Day.	During Construction	City of Del Mar
4. The City shall develop a schedule with private property owners for the timing of wall construction so that construction occurs on a block-by-block basis	Yes	4. Demolition of the existing seawall with rock revetment and construction of the replacement seawall would be consistent with the parameters of the BPI. Construction schedules would be coordinated with adjacent property owners to the extent feasible. Thus, the project would be consistent with this EIR mitigation measure.	During Construction	City of Del Mar
5. The City shall minimize usurpation of public parking areas during the construction period	Yes	5. During construction of the seawall, the City shall minimize usurpation of public parking areas during the construction period.	During Construction	City of Del Mar

6.0 References

Aesthetics

Del Mar, City of

1993 Local Coastal Program Land Use Plan. March 18. http://www.delmar.ca.us/DocumentCenter/View/261.

Greenhouse Gas Emissions

California Air Pollution Control Officers Association (CAPCOA)

2008 CEQA and Climate Change – Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act, January.

Del Mar, City of

2016 Del Mar Climate Action Plan. Adopted June 6, 2016.

Hazards and Hazardous Materials

California Department of Toxic Substances Control

2025 EnviroStor Database. https://www.envirostor.dtsc.ca.gov/public/.

State Water Resources Control Board

2025 Geotracker Database. https://geotracker.ecointeractive.com/.

Hydrology/Water Quality

Del Mar, City of

2018 City of Del Mar Sea-Level Rise Adaptation Plan. May. https://www.delmar.ca.us/DocumentCenter/View/3580/Revised-Adaptation-Plan-?bidId=.

Land Use

Del Mar, City of

2018 City of Del Mar Sea-Level Rise Adaptation Plan. May. https://www.delmar.ca.us/DocumentCenter/View/3580/Revised-Adaptation-Plan-?bidId=.

2025 Municipal Code. https://www.delmar.ca.us/171/Municipal-Code.

Wildfire

California Department of Forestry and Fire Protection (CAL FIRE)

2025 Very High Fire Hazard Severity Finder. https://experience.arcgis.com/experience/6a9cb66bb1824cd98756812af41292a0.

ATTACHMENTS

ATTACHMENT 1

City of Del Mar Beach Preservation Initiative Ordinance
Final Environmental Impact Report (August 1989)

CITY OF DEL MAR

BEACH PRESERVATION INITIATIVE ORDINANCE
FINAL ENVIRONMENTAL IMPACT REPORT

Prepared for:

City of Del Mar
1050 Camino del Mar
Del Mar, CA 92014

Prepared by:

P&D Technologies, Inc.
401 West "A" Street
Suite 2500
San Diego, CA 92101

August 1989

STATE OF CALIFORNIA—OFFICE OF THE GOVERNOR GEORGE DEUKMEJIAN, Governor

OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO CA 95814

RECEIVED
JUN -1 1989
CITY OF DEL MAR
PLANNING DEPARTMENT

Monica Tuchscher
City of Del Mar
1050 Camino del Mar
Del Mar, CA 92014

May 30, 1989

RESPONSES TO COMMENTS
DEL MAR BPI/EIR

Subject: Beach Preservation Initiative Ordinance/ SCH# 88092919

Dear Ms. Tuchscher:

The State Clearinghouse submitted the above named draft Environmental Impact Report (EIR) to selected state agencies for review. The review period is closed and the comments of the individual agency(ies) is(are) enclosed. Also, on the enclosed Notice of Completion, the Clearinghouse has checked which agencies have commented. Please review the Notice of Completion to ensure that your comment package is complete. If the package is not in order, please notify the State Clearinghouse immediately. Remember to refer to the project's eight-digit State Clearinghouse number so that we may reply promptly.

Please note that Section 21104 of the California Public Resources Code requires that:

> "a responsible agency or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency."

Commenting agencies are also required by this section to support their comments with specific documentation.

These comments are forwarded for your use in preparing your final EIR. If you need more information or clarification, we recommend that you contact the commenting agency at your earliest convenience.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact Garrett Ashley at 916/445-0613 if you have any questions regarding the environmental review process.

Sincerely,

David C. Nunenkamp
Chief
Office of Permit Assistance

cc: Resources Agency

Enclosures

State of California

The Resources Agency of California

Memorandum

Date : May 3, 1989

To : Gordon F. Snow, Ph.D.
Assistant Secretary for Resources

From : Department of Parks and Recreation

Subject: Beach Preservation Initiative Ordinance - Draft E.I.R.
City of Del Mar, San Diego County
SCH No. 88092819

The attached comments from our Southern Region constitutes the comments for the Department of Parks and Recreation.

James M. Doyle for
Richard G. Rayburn, Chief
Resource Protection Division

SCH # 89042319

1. Project Title: Beach Preservation Initiative Ordinance
2. Lead Agency: City of Del Mar
3. Contact Person: [illegible]
3a. Street Address: 1050 Camino del Mar
3b. City: Del Mar
3c. County: San Diego
3d. Zip: 9201[illegible]
3e. Phone: 619 [illegible]
Project Location: 4. County: San Diego
4a. City/Community: City of Del Mar
4b. Assessor's Parcel No.: N/A

5. Within 2 miles: a. State Hwy #: 5
c. Waterways: San Dieguito River

7. Document Type: CEQA: X [illegible]
8. Local Action Type: X Rezone
9. Development Type: X Other: No individual project is proposed.

RECEIVED [illegible] CLEARINGHOUSE

11. Project Issues Discussed in Document:
X Aesthetic/Visual
X Flooding/Drainage
X Soil Erosion
X Coastal Zone
X Noise
X Cumulative Effects
X Other: Public Access

14. Present Land Use and Zoning:
Current zoning is varied and will remain the same with the addition of the overlay zone.

15. Project Description:
The Beach Overlay Zone / Ordinance regulates new development on the ocean front and provides for the abatement (removal) of existin non-complying structures located on the beach front in the City of Del Mar.

CLEARINGHOUSE CONTACT: GARRETT ASHLEY
916-445-0613

STATE REVIEW BEGAN: 4-14-89

DEPT REV TO AGENCY: 5-22

AGENCY REV TO SCH: 5-26

SCH COMPLIANCE : 5-30

PLEASE RETURN NOC WITH ALL COMMENTS

AQMD/APCD: 27 (Resources File Date: 4/15)

FAX TELEPHONE: 916-323-3749

W/C N/C
e Resources
[redacted]
e Conservation
e Fish & Game
[redacted]
e Parks & Rec/OHP
[redacted]
e Coastal Comm
[redacted]
e State Lands
[redacted]

W/C N/C
e RWQCB # 9
e Caltrans # 11
[redacted]
e [illegible]
[redacted]

Alec C. McDonald*
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Darryl O. Solberg*
Jerold H. Goldberg*
Paul E. Robinson*
Thomas C. Nelson*
Roberta S. Robinson
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May 26, 1989

PERSONAL DELIVERY

Honorable Mayor Brooke Eisenberg and
City Council Members
City of Del Mar
1050 Camino del Mar
Del Mar, California 92014

Re: Draft Environmental Impact Report,
Beach Preservation Ordinance, April 1989

Dear Mayor Eisenberg and City Council Members:

This firm represents Mr. Harry L. Summers of 3008 Sandy Lane and Mr. William Kennedy of 3006 Sandy Lane. This correspondence has been prepared on behalf of our clients in response to the above referenced draft Environmental Impact Report ("EIR").

Sandy Lane is located immediately south of the San Dieguito River in the area designated as "Section 2" in the EIR. The beach from San Dieguito River to 27th Street is very narrow. The protective devices located west of Sandy Lane, with the exception of one residence, consists of a continuous seawall and riprap on the westerly side of this wall. This seawall defines the easterly boundary of the Shoreline Protection Area ("SPA") Line and is constructed entirely on our clients' properties.

1 The seawall along Sandy Lane is located approximately 15 to 20 feet west of the buildings. The optimum distance for protection of buildings is 25 to 30 feet from such structures. In addition, there are setback requirements for newly constructed seawalls. (p.51) These restrictions, combined with the narrowness of the beach along Sandy Lane, severely limit the placement of protective devices.

2 Although we generally concur with the EIR, the EIR does not address the unique status of the existing seawalls located along Sandy Lane which are presently located within inches of the SPA line. The current EIR takes a general approach in evaluating the impact of relocating existing protective structures. This approach may be sufficient when dealing with protective devices that encroach on the public beach or well beyond the SPA line.

1. Does not address the adequacy of the EIR; therefore, no response is necessary. As noted on page 51 of the Draft EIR, the setback distance provided between a primary structure and a shore protection structure depends on several design features; therefore, the comment that the optimum distance for protection of buildings is 25 to 30 feet from such structures is not true in all cases.

2. This is a Program EIR and in accordance with CEQA, the impacts are discussed at the level of specificity of the project. Section 3.4 (Construction Impacts) describes the impacts of removal of non-complying revetments and vertical walls as well as removal and reconstruction of revetments and vertical walls at an appropriate level of detail. Additional environmental review will occur when the applicant submits an application for a Shoreline Protection Permit which is required for any development (both existing and proposed) on or west of the SPA line. The City of Del Mar will conduct additional environmental review for each application to determine if the subject shoreline structure is consistent with the Program EIR. The unique status of the existing seawalls along Sandy Lane will be addressed at that time. The BPI allows for placement of walls 5 feet west of the SPA line only if no other environmentally feasible location exists. As stated on page 64 of the EIR, in some cases, the "No Project" alternative may be environmentally preferable over the project. The City will make this determination on a site-by-site basis.

However, it does not adequately evaluate the environmental consequences of removing walls presently located within the five (5) foot encroachment area allowed by the Beach Preservation Initiative ("BPI") ordinance.

It is difficult to imagine that the encroachment of a
protective device inches west of the SPA line will result in an
3 increase in beach erosion. In fact protective devices built
along Sandy Lane serve to prevent erosion along the frontal beach
area. This was recognized in the Environmental Impact Report of
October 1986 for the Beach Overlay Zone proposed by the City of
Del Mar, which stated that "the incorporation of rock revetments
utilized along this entire section does help to reduce frontal
beach erosion for the lower beach profile." (p. 34)

If seawalls along Sandy lane are relocated it could result
4 in the construction of discontinuous walls along the SPA line
resulting in increased erosion. The EIR states that the five
foot allowance provided by the BPI ordinance would be
environmentally preferable to a discontinuous wall with offsets.
(p.55)

Noncomplying walls may be relocated at different times and
to different locations than the adjacent walls since existing
development on the property and varying soil conditions may
5 constrain the type and location of the relocated walls. This
potential for numerous offsets in the alignment of the relocated
walls could cause a localized concentration of wave energy
resulting in greater potential for erosion, flooding and
structural damage. (p.47)

In addition the removal and reconstruction of existing walls require the use of many types of equipment such as cranes, jack hammers, backhoes, vibrating pile driving hammers, rock hauling vehicles and front-end loaders. It would take from one to five days to remove the wall with an initial mobilization of equipment that may take one to three weeks. The area of disturbance would be approximately 200 to 800 linear feet by 50 to 100 feet in width or 10,000 square foot to 80,000 square foot per day. (pp.55-60)

There are three types of protective devices that are
addressed by the BPI ordinance; structures located more then
6 five feet west of the SPA line, devices located within five foot
of the SPA line as provided by the BPI ordinance and structures
located on the SPA line. The removal of each of these types of
structures have a different environmental impact which must be

3. As stated on page 47 of the EIR, the higher on the beach profile and the farther landward on the beach the structure is constructed, the less the impacts on the shoreline will be. In the case where a structure would be relocated a matter of inches to the east (landward) of the existing structure the reduction in the amount of erosion would be incremental.

4. Comment acknowledged. The level of impacts associated with construction of discontinuous walls compared to the impacts associated with the location of the existing structure within five feet west of the SPA line will be determined during the processing of the Shoreline Protection Permit (response #2).

5. Does not address the adequacy of the EIR; therefore, no response is necessary (response #6).

6. Section 3.4 of the EIR (Construction Impacts) provides a general discussion of potential construction activities associated with implementation of the BPI. This impact assessment is consistent with the level of detail of the project and is in conformance with the requirements of a Program EIR. Additional environmental review will be conducted by the City on a case-by-case basis. Under the BPI, any development on the SPA line or west of it requires the approval of a Shoreline Protection Permit.

recognized and evaluated by the EIR. There must be a recognition that the environmental consequences in removing a protective device located on the public beach or five feet beyond the SPA line is different than removing such a device located within five feet of the SPA line, particularly those devices located only inches from the SPA line.

The BPI ordinance recognizes this distinction and provides for a maximum of 5 feet of encroachment if there is no other feasible location for effectively protecting the principal structure; there is no feasible, less damaging alternative; and feasible mitigation measure have been provided to minimize any adverse environmental effects.

In summary the EIR does not address the unique nature of the protective structures located along Sandy Lane. There are unique
7 environmental consequences in removing these protective devices in order to reconstruct such devices a few inches west that must be addressed by the EIR.

7. See comment #2.

Should you or any member of your staff have any questions, please do not hesitate to call.

Sincerely yours,

Charles R. Gill

Charles R. Gill
McDonald, Hecht & Solberg

Ann Y. Moore

Ann Y. Moore
McDONALD, HECHT & SOLBERG

CRG/AYM/ek
cc: Ms. Gloria Curry, City Manager
Mr. Roger Krauel, City Attorney
Mr. James Sandoval, Planning Director
Ms. Patti Barnes, City Clerk
Ms. Monica Tuchscher, Planner
Mr. Harry L. Summers
Mr. William Kennedy
Mr. Philip Benton, Benton Engineering

RECEIVED
MAY ? 1989
CITY OF DEL MAR
PLANNING DEPARTMENT

P. O. Box 327
La Jolla, Calif. 92038

27 May 1989

Planning Department
City of Del Mar
attn.: Monica Tuchscher
1050 Camino Del Mar
Del Mar, Calif. 92014

Reference: Beach Preservation
Initiative Ordinance
Draft E I R, April 89

Greetings:

Thank you for the opportunity to comment on the referenced draft environmental impact report. Comments are as follows:

1. Section 2.3, Background/History, and Executive Summary, p.S-1

8 Statements are made regarding "development encroachment into public lands". It should be clarified that a considerable amount of what is today "non-complying development" was done well before the City obtained full title to the beachfront upon the dissolution of the Del Mar Civic Association. Much of this was done with the consent of the then-owner Civic Association, and some done even with the permission of the City and other state and federal agencies. Some "development" pre-dates the Civic Association, other parts were built before incorporation of the City of Del Mar, and much of the rest was done prior to the Coastal Initiative of 1971 and the Coastal Act of 1976. As such, the "development" was built at the time on private property over which the public always had certain rights under the State Constitution, Article X, Section 4, but not on truly "public land". It is unfair to commence with a misstatement that implies beachfront owners illegally have taken something belonging to their fellow citizens.

2. Section 2.3, Background/History, p.8

9 On the subject of "temporary" sand berms, these did not first come into being in the 1970's. Sand berms, probably created in the process of leveling building sites, excavating basements, etc., were the most common shoreline protection devices from the days of initial beachfront construction in the 1920's forward. Most often the berms were planted with "pickle weed" or other low-lying shrubery compatible with the marine environment in attempt to have the roots "anchor" the berm. Many of these berms survived 20 or 30 years. Although those I remember all washed away in the 1983 winter season, they were not "temporary". Beginning in the late 1960's the beachfront area underwent a transition from predominantly summer-only residence to predominantly year-round residence, and with this transition came a greater concern for protection from winter surf action.

8. Comment acknowledged. It should be noted that while some of the landowners dispute the information in the EIR, it has never been litigated to conclusion with the exception of the Crabtree vs. Goode which did recognize certain public rights in the area. See comment #17.

9. Comment acknowledged. Although sand berms are not specifically referenced in the BPI, they are covered under Section 30.50.060.H (Authorized Protection Structures) which states that construction of a protective structure within the SPA zone may be authorized by the issuance of a Shoreline Protection Permit. If sand berms are proposed as a permanent solution to protect primary structures, then they would require a Shoreline Protection Permit. If sand berms are built as temporary protection of property being immediately threatened by ocean flooding or wave damage, they would be regulated under Section 30.540.090 (Emergency Reinforcement) of the BPI. As such, they would also be subject to the requirements contained in the California Coastal Act.

Beginnig then there were more or less annual berm renewal campaigns. Furthermore, it should be pointed-out that the sand berms of the 1970's were built by the City of Del Mar in cooperation with and on behalf of the beachfront property owners, the residents and Civic Association, with the Coastal Commission permits taken-out in the City's name. Every year sand berms still appear just prior to, or more often the day after, the first big storm of the winter season in front of at least some houses along the beach, and it is doubtful that any of these have been through any permit process. The sand berm continues to be the City's method of protecting its lifeguard stations and the street ends over the storm season.

I mention the above not just to rectify the EIR's discussion of the historical setting, but to underscore that once the beachfront owners/residents and the City of Del Mar saw a common objective in protecting the first line of homes from winter waves and floods. I also bring-up the historical berm issue as preamable to the next comment.

10 3. Nowhere in the draft EIR, in the Beach Preservation Initiative ordinance nor in the City's Guidelines is the matter of sand berms specifically addressed. Will they be allowed or not? I asked this of the City Manager, and he has answered both ways: they would be considered shoreline protective devices subject to the Initiative, and they would be also continue to be used in "emergency" situations, presumably exempted somehow from the Initiative Ordinance. Since so many beachfront owners and in fact the City have used sand berms as a routine method of protection every year, it would seem that one can expect the continued regular "emergency" appearance of bulldozers on the beach. There ought to be a criterion established delineating their use. It seems to me there has to be discussion in the EIR of this exemption, which may be unwritten but has been clearly expressed by the Manager.

4. Section 3.3, Other Design Measures, p.52, and Executive Summary, p.S-4

11 In the discussion of mitigation of the environmental impacts of discontinuities in the removal, relocation and construction of walls and other devices in accordance with the Initiative, it is stated that "this may necessitate changing the required timing or schedule for relocation of existing structures". From my reading of the Initiative and the Guidelines, there is no leeway beyond January 1990 for anything on the beach not covered by the amortization exemption or for which a permit is not in process or approved. Furthermore, from my attendance at numerous meetings of the committee which prepared the Guidelines, there was no talk of any other variance procedure to accomplish such a change in requirements to mitigate the staggered protection. Please explain.

12 5. On the same subject, although it is not directly related to the environmental impact, it may deserve elaboration that if the City permits or requires staggered seawalls and the predicted strutural damage attributable to the stagger occurs, then the City is probably liable for the damage, regardless of any co-insurance or "hold

10. Refer to response #9.

11. It is the City's objective to encourage the construction of walls on a block-by-block basis to avoid possible offsets and/or gaps in the wall(s). The statement on page 53 "This may necessitate changing the required timing or schedule for relocation of existing structures." is hereby clarified as follows: If a property owner on a given block has a longer amortization period than that of the adjoining property, then the applicant with the longer amortization period would be encouraged to remove their non-complying structure and reconstruct a wall at the same time as their neighbors build their walls.

12. Does not address the adequacy of the EIR; therefore, no response is necessary.

harmless" clauses in the permit language.

13 6. On the same subject, it is stated that in the event of staggered walls, "City would require the applicant to provide flank protection". I find this requirement nowhere in the Initiative or in the Guidelines. How is this to be assured? Can you be specific that it is the applicant who builds further out that will provide the flank protection? What of the case of a wall that is being allowed under the amortization clause? Who provides the flank protection in the case one or more owner chooses to litigate the Initiative beyond the January 1990 deadline for encroachment removal? I think the EIR should be more emphatic in the requirement that flank protection be assured prior to any coerced removal of non-conforming protection.

7. Section 4, Alternatives, p.62

Absent are two real alternatives with the same, very
14 significant impact. In both the owner of a beachfront property now protected by adequate but non-conforming development removes it but does not build the seawall City now encourages. In one alternative scenario there is a desire to replace the protection, but it is not done. This might be for the reason that cost is too great or required insurance cannot be found or that schedules cannot be met or that the home is to be rebuilt and the lot stands empty through a storm season. The other alternative is that a home is built on piers and, there being no incentive for a seawall, the non-conforming protective development is removed without replacement on a permanent basis.

The impact of both is a breach in the barrier between the ocean and the low lying area behind the beachfront houses. Several hundred homes could be damaged, and there is the prospect of injury or loss of life. Such flooding will also be an eventuality with major economic impact on the City and a significant portion of its residents. In fact, if the Initiative Ordinance were strictly applied, the City itself might be the cause of this situation with respect to the end of each street. Certainly the imposition of a regulation which could have this impact deserves discussion in the EIR, since it serves the objective of informed public paricipation mandated by CEQA.

8. A negative environmental impact which should be included is the concurrent decision of the City to abandon replacement of the
15 sidewalk along the west side of the beachfront properties. The historical discussion covers the intent of the original Del Mar development to include this latteral access feature and its decline into disrepair. (The history might be more complete if it added the fact that the coastal walk included light standards the full length of the beach along the sidewalk. The standards fell or were removed in the 50's and 60's.) In Del Mar City Council deliberations on the beachfront issue in the early 1980's the restoration of the sidewalk was considered because of its value to pedestrian-oriented circulation and beach access.

9. Does the Initiative Ordinance permit the engineered rock

13. The Draft EIR recommends that flank protection be required as a mitigation measure. In accordance with recent California legislation (AB 3180) a mitigation monitoring program will be adopted in conjunction with the certification of the Final EIR. The purpose of the monitoring program is to assure implementation of recommended mitigation measures by identifying who is response for carrying out the mitigation and who is responsible for reporting compliance with the recommended mitigation.

14. As stated on page 62 of the EIR, under CEQA, the alternatives discussion shall focus on alternatives capable of eliminating any significant environmental effects or reducing them to a level of insignificance. The scenarios presented in the comment are both potential impacts of the project. As discussed on page 49 of the EIR, areas of discontinuity introduce a potential for instability of adjacent structures as a result of sand erosion. It is also noted that there is a greater potential for flooding. A non-continuous line of walls would result in potentially significant environmental impacts that would require mitigation. As recommended on page 52, in cases where offsets (or gaps) occur, the City would require the applicant to provide flank protection. Such protection could be required as a condition of removal if necessary to avoid adverse impacts.

15. The BPI does not include provisions for removing the sidewalk and therefore is not addressed in the EIR. To the extent that some or all of the remnants of the sidewalk are removed under the BPI, the impacts are considered below a level of significance.

16 revetment which the BOZO seemed to prohibit? The Noble report of 1983 on pages 31-32 states that such a revetment will both result in less wave overtopping and less beach erosion than the other alternatives, especially the vertical wall. Before the Council in 1984 there was also an expert testifying to the undesirability of the vertical wall. In this light, shouldn't the EIR reach a conclusion regarding the relative desirability of the vertical wall and other alternatives allowed by the Initiative Ordinance?

Yours sincerely,

Dan Allen

16. Comment acknowledged. Section 30.50.060.I (Authorized Protection Structures) of the BPI states that a Shoreline Protection Permit may be issued for a riprap element (revetment) if the City Council makes findings that the riprap extends no more than 20 feet westward from the SPA line and that the riprap has a westward slope beginning no higher than a 5.7 foot elevation (NGVD) at the SPA line, decreasing in height at a minimum slope of 1.5:1. As stated on pages 49-51 of the EIR, wave-induced scour and wave overtopping are potential impacts of vertical shoreline protection structures. The mitigation measures recommended on page 53 (i.e., toe protection) will serve to mitigate the potential impacts associated with vertical structures and stone revetments to below a level of significance. With mitigation, either shoreline protection solution would be environmentally acceptable.

GOEBEL, SHENSA & BEALE

A PARTNERSHIP INCLUDING A PROFESSIONAL CORPORATION

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May 25, 1989

City of Del Mar
Department of Planning
and Community Development
1050 Camino Del Mar
Del Mar, CA 92014

Attn: Mr. James D. Sandoval, Planning Director

Re: Draft Environmental Impact Report regarding Beach Preservation Initiative Ordinance

Ladies and Gentlemen:

This firm represents Gordon M. and Kathleen G. Denyes, owners of beachfront commercial property commonly known as Jake's Restaurant. This property is located in Block 111 of Del Mar resubdivision No. 1 and extends from Coast Boulevard on the east to the Mean High Tide Line on the west. This property lies within the Section 2 study area, as designated by the April 1989 Draft Environmental Impact Report (EIR).

By this letter and referenced exhibits, we submit the following comments to the EIR for your review and response.

Very truly yours,

GOEBEL, SHENSA & BEALE

By: [signature]
Louis E. Goebel

LEG/JAC/sdm

cc: P&D Technologies, Inc.
401 West A Street, Ste. 2500
San Diego, CA 92101

THE DENYES' COMMENTS TO

THE DRAFT ENVIRONMENTAL IMPACT REPORT (EIR)

I. <u>The EIR is factually inaccurate and must be corrected</u>.

A. At page 9, the EIR states:

17

> From 1910 to 1922 the 15-foot public sidewalk and alley running seaward of the private lots was dedicated. A 7 1/2 foot concrete walk was constructed in the right-of-way from 15th to 25th, but it fell into disrepair.... In 1938, land west of the sidewalk and alley was deeded to the Del Mar Civic Association, prior to community incorporation for use as beachlands for Del Mar residents.

Similary, at page 18 the report continues:

> The properties between 27th Street and 240 feet south of 17th Street were subdivided in the 1920's.... At the time of development, strips of property of varying widths were dedicated and recorded as public property west of the property lines.

The Denyes' property was subdivided and improved as part of the Hotel Del Mar in 1910. The seaward boundary extends to the mean high tide line. There is absolutely no evidence that the westerly portion of this property was

- dedicated or recorded asapublic sidewalk or alley, or
- deeded to the Del Mar Civic Association.

18

B. At pages 20 and 24 the report asserts Jake's Restaurant operates under a conditional use permit requiring lateral public access across the property. The City of Del Mar Conditional Use Permit 77-2, approved on May 9, 1977, does not so restrict the Denyes' property.

These factual inaccuracies allow the EIR to skirt

17. It should be noted that the <u>Crabtree v. Goode</u> decision recognized a public walkway across the Denyes property to the old bath house. Although it appears that the public acquired prescriptive rights on the sandy beach portion of the Denyes property this issue is currently the subject of dispute.

18. Comment acknowledged. Condition #6 of CUP 77-2 states that the owner and future owners are bound to approval and support of an improvement district (or other means of financing) for financing, design and constructing public access improvement along the beach frontage in front of the property. This information does not affect the evaluation in the EIR.

specific enviromental impacts on the Denyes' property and accordingly must be corrected.

II. The EIR's characterization of existing protective <u>structures is erroneous and unwarranted</u>.

19 Throughout, the EIR characterizes existing protective structures as "encroachments." (See, <u>e.g.</u>, EIR, pp. 8, 9, 15, 22, 23.) This characterization <u>presumes</u> these structures are not properly and lawfully sited. However, this question is not resolved and is currently in litigation. (See, <u>Denyes, et al. v. City of Del Mar,</u> San Diego Superior Court Case No. N41775; <u>Glanz, et al. v. City of Del Mar</u>, San Diego Superior Court Case No. N41774; <u>Lang v. City of Del Mar</u>, San Diego Superior Court Case No. N31478.) Indeed, some property owners constructed their present seawall on various claims of right going back more than 50 years. In the Denyes' case, their claim of right is grounded on <u>deeded</u> <u>title</u>. (Exhibit A.)

The EIR's characterization is not <u>fact</u>, but is instead a speculative legal conclusion beyond the drafters' statutory authority to make. This error is easily remedied by identifying "encroachments" as existing structures or protective devices.

III. There is no support for the EIR's statement regarding <u>placement of the Shoreline Protection Area (SPA) line</u>.

A. At page 7, the EIR states:

20 The easterly boundary of the SPA zone is the SPA line which was also established by the Ordinance. The location of the line is based on numerous factors including existing seawalls, location consistency with existing seawalls, and property boundaries.

Yet, nowhere do

- The Beach Overlay Zone Ordinance ("Ordinance") (Chapter 30.50; appendix B to the EIR);
- The Implementation Guidelines for the Beach Preservation Initiative (Appendix B to the EIR); and
- The Official Supplemental to the Sample

19. **The term "encroachment" as used in the EIR describes structures which appear to be on public property and/or structures which are located within the SPA zone. The EIR does not address the legal status of ownership of portions of the beach.**

20. The EIR analyzes the BPI Ordinance but does not analyze why the SPA line was proposed by the citizens of Del Mar in its current location. According to City staff, the location of the SPA line was determined after considerable study of the factors noted in the EIR. The BPI initiative proponents then simply "borrowed" the legal description for the SPA line from the City. When the initiative passed the SPA line was adopted.

identify <u>any factors</u> determining the ultimate placement of the SPA line. These documents constitute the people's <u>official pronouncement</u> on the Ordinance. Thus, there is simply no legislative support for the EIR's statement.

B. Also, the EIR purports that the location of the SPA line is not intended to alter ownership. (EIR, p. 7.) For the Denyes, this statement is simply false.

21 Their property extends to the mean high tide line, and the SPA line traverses their lot well landward of this boundary. Further, it appears the SPA line was located mistakenly across this property as a result of an attempted but unconsummated compromise with the City of Del Mar, which was wholly unrelated to the Ordinance. As presently drawn, the SPA line divests the Denyes of all ownership rights except, of course, the obligation to pay property taxes. These circumstances evidence the arbitrariness with which the SPA line was drawn. This whimsy simply cannot be overlooked.

IV. As drafted, the EIR is insufficiently detailed and <u>unjustifiably incomplete</u>.

The California Environmental Quality Act (CEQA) mandates that the EIR must function as an <u>informational tool</u> to analyze significant environmental impacts and to disclose possible remedies. (Pub. Res. Code, §21202.1; Cal. Code Reg., tit. 14, §15362.) An EIR "should be prepared with the sufficient degree of analysis to provide decisionmakers with information which enables them to make a decision which intelligently takes account of environmental consequences." (<u>Citizens of Goleta Valley v. Bd. of Sup'rs</u>. (1988) 197 Cal.App.3d, 1167, 1176.)

In essence, the EIR serves "as an environmental 'alarm bell' whose purpose is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return." (<u>Citizens for Qual. Growth v. The City of Mt. Shasta</u> (1988) 198 Cal.App.3d 433, 439.) Unsupported assertions and undocumented technical conclusions have no place in such a report. (<u>Whitman v. Board of Supervisors</u> (1979) 88 Cal.App.3d 397, 411.)

These legal guidelines are every report's target, yet this EIR consistently misses the mark. The specific flaws listed below provide apt examples of the EIR's deficiencies.

21. As noted on page 3 of the EIR, the BPI Ordinance establishes a Shoreline Protection zone (SPA zone) seaward of a designated north/south SPA line which is comparable to a setback line. Use regulations within the SPA zone are typical of those within any setback (i.e., the City reserves the right to regulate uses within the setback but the property owner pays taxes on their entire ownership).

One shortcoming is so pervasive, it must be specially noted.

22 A. The Ordinance purports to balance public shoreline access with protection of private property. (Ordinance, §30.50.010.) Yet, the EIR addresses the adequacy of the SPA restrictions on private property protections in only one sentence:

> Generally, the limits of the SPA line and zone will provide an adequate area to construct shoreline protection devices, if required, and provide an adequate recreational beach area. (EIR, p. 24.)

This statement is made without technical authority and ignores engineering reviews readily available to the City of Del Mar.

In 1983 R. M. Noble and Associates conducted a preliminary engineering study of beach and river protection devices for the City of Del Mar ("Noble Report"). This report, which is attached as Exhibit A to the Fletcher Group's Comments and incorporated in its entirety by this reference, is apparently referenced only once in the EIR, and then not by name. (See, EIR, p. 10.)

The EIR's conclusionary statement and omitted reference to the Noble Report are astonishing in light of the report's finding that protective structures are optimally located 25 to 30 feet seaward of existing residences and commercial property. (Exhibit A, pp. 15-16, 28.)

- By placing the SPA line at or near the faces of existing structures and barring vertical protective structures 5 feet seaward of that line, the Ordinance all but assures the inadequacy of new "protective" construction.

The City of Del Mar has already recognized this point in its 1984 Response to comments to the Noble Report:

> A seawall located on the property line would maximize public use of the beach and minimize effects on beach erosion. This alternative would not provide adequate protection to all of the structures. Damage from splash and

22. The issue of adequate protection of private property under the BPI Ordinance is addressed on pages 51 and 54 of the EIR. As stated on page 51, the setback distance that should be provided between a primary structure and a shore protection structure depends on several design features: wave characteristics and water levels, height of shore protection structure; type of structure, and location of shore protection structure on the beach profile. To mitigate for potential impacts to primary structures the EIR states that setback distances would have to be established on a site specific basis (page 54). Although the Nobel Report is not included in this EIR, it was reviewed along with other engineering information. The Nobel Report addresses six wall types at various locations and varying heights. This information does not apply to this EIR because as stated on page 32 of the EIR, the BPI Ordinance does not directly regulate the height or design of walls. The Guidelines implementing the Ordinance state that the City Code would apply, and that would include enforcement of the Design Review Ordinance. The adequacy of design will be assessed on a case-by-case basis. The City's Coastal Engineers, Moffatt & Nichol, Engineers, has stated that engineering solutions can be constructed under the BPI.

overtopping waves would be most severe under this alternative because little room would be provided for overtopping waves and splash to dissipate before reaching the structures. (Response 30.)

This conflict with the Ordinance's stated purpose cannot be brushed aside with a single, unsupported assertion.

23 B. The EIR's lack of specificity and technical detail is made more critical by the fact it is a program environmental impact report. Such a report allows the City of Del Mar to review simultaneously a number of activities now and to avoid further environmental assessment later by deeming subsequent activities as being within the scope of the original report. (Cal. Code Regs., tit. 14, §15168.) If this EIR is to serve "double duty" as a report of present and future impacts, a thorough and detailed analysis is paramount. (Cal. Code Regs., tit. 14, §15168(c)(5).) If it is not, this limitation should be plainly stated.

Nor is it a satisfactory response that this EIR only reaches a zoning ordinance and not construction-related activities. (Cal. Code Regs., tit. 14, §15146(b).) The Ordinance requires demolishing old and constructing new protective devices within specific tolerances and boundaries. The scope of this demolition and construction is readily notable and reasonably foreseeable. As such, it too must be addressed in detail.

V. The EIR omits or mischaracterizes specific and significant environmental impacts.

As drafted, the EIR inadequately addresses the following impacts, each of which requires further investigation, analysis and planned mitigation:

24 A. The EIR decries existing protective structures as a psychological barrier, reducing visual attractiveness and creating the impression of private ownership. (See, e.g., EIR, p. 13.) But, there is no scientific or empirical data stated to support this position.

Ironically, the report finds new seawalls constructed on the SPA line would be "hardly noticeable, if at all," and that jogs in newly constructed walls would not be considered "visually unpleasant or adverse,

23. See response #2.

24. The statement on page 13 of the EIR is taken from Chapter 3 of the California Coastal Act of 1976. The issue of visual quality is presented in the EIR as an impartial analysis of existing conditions and potential impacts of implementation of the BPI. The conclusion in the EIR (page 32) is that views from the beach toward the east would not change significantly in the long term. This conclusion is based on how implementation of the BPI would change the existing visual environment. It should also be noted that any walls proposed under the BPI would be subject to the approval of the Design Review Board. The review of individual wall design(s) will occur at the time of permit processing.

as this would serve to break up the monotony of a long, continuous straight line of walls." (EIR, page 32.) Based on the EIR, it would appear that seawalls are not visually unpleasant, as long as they are located at or eastward of the SPA line. Such a conclusion tests the credibility of this report.

B. The visual impact of new vertical seawalls is not properly analyzed. As the Noble Report states and the City of Del Mar recognized in its July 1987
25 Environmental Impact Report Supplement, the closer vertical seawalls are located to a building face, the higher the crest elevation has to be raised to provide adequate protection. When seawalls are placed at or near a building's face, as is the case in much of Section 2, existing seaward views would be lost. The EIR cursorily notes this consequence at page 32, but again does so without any empirical estimate of harm, even though this data is readily available. (See, e.g., Environmental Impact Report Supplement, July 1987, pp. 15; identifying numbers of properties affected by various setback distances.)

The EIR does not, however, address the visual impact of landward views from the beach. The specter of 13 to 15 foot concrete or wooden monoliths rising directly from the beach cannot be said to be "hardly noticeable." Indeed, visual impact can only be accurately measured by assessing the difference between the existing beachfront and post-construction and demolition conditions.

C. Between 18th and 19th Streets, the public are assured lateral access to the beach by a dedicated public walkway commonly known as Lot 22.

Dedicated public access to this area has been a
26 settled question for almost 40 years. (See, Exhibit B, to the Fletcher Groups Comments. The Ordinance permits rip-rap protections to intrude into and usurp this settled public way. This is not solely a legal matter; it is an Ordinance-endorsed private encroachment into a dedicated public access way. As such, its impact must be addressed.

27 D. Similarly, a concrete public sidewalk traverses most of the properties between 18th and 19th Streets. This walkway affords greater access to handicapped and elderly beach users, and has survived the ravages of the

25. See response #24.

26. Encroachment of structures, riprap or otherwise into "Lot 22" is not necessarily required by the BPI. If such encroachments were authorized on a case-by-case basis appropriate mitigation would be required or needed. It is not anticipated that these enroachments will result in any significant impacts to the environmental issues addressed including access, sand transport, visual quality, etc. Properly designed protective devices in this area, coupled with removal of existing encroachments, will have a net positive impact.

27. See response #26. Handicapped access will be provided by the City at appropriate locations along the beach in conjunction with handicapped parking facilities, access to the sandy beach and restrooms will be provided by the City at appropriate locations. The City is unaware of any evidence that the fragments of the old sidewalk "Lot 22" are currently used by the handicapped. Overall, handicapped access will be improved by the project.

ATTORNEY VIRGINIA G. BONAR

AND WHEN RECORDED MAIL TO

Name: Gordon M. and Kathleen G. Denyes
Address: 282 Ocean View Avenue
City & State: Del Mar, CA 92014

THE ORIGINAL OF THIS DOCUMENT WAS RECORDED
ON 5-9-86 FILE/PAGE NO. 86-184237
VERA L. LYLE, COUNTY RECORDER

SPACE ABOVE THIS LINE FOR RECORDER'S USE

MAIL TAX STATEMENTS TO

Name: Gordon M. and Kathleen G. Denyes
Address: 282 Ocean View Avenue
City & State: Del Mar, CA 92014

Documentary transfer tax $ -0- *
☐ Computed on full value of property conveyed, or
☐ Computed on full value less liens & encumbrances remaining thereon at time of sale.

Signature of declarant or agent determining tax - firm name

☐ Unincorporated area City of

299-230-03
PARCEL NO. 299-230-04

Quitclaim Deed

This Form Furnished By Founders Title Company

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged,

Gordon M. Denyes and Kathleen G. Denyes, husband and wife as tenants in common

hereby REMISE(S), RELEASE(S) AND FOREVER QUITCLAIM(S) to

GORDON MacLEAN DENYES and KATHLEEN GLASGOW DENYES, husband and wife, Trustees of the Denyes Family Trust established under Declaration of Trust dated March 7, 1986.

the following described real property in the City of Del Mar
county of San Diego, state of California:

See Exhibit "A" attached for full and complete legal description.

*Re: Documentary Transfer Tax: Grantors are the current owners of the Property and are transferring said Property to a revocable inter vivos trust of which they are the Beneficiaries.

Dated March 7, 1986

Gordon M Denyes
Gordon M. Denyes

Kathleen G Denyes
Kathleen G. Denyes

STATE OF CALIFORNIA
COUNTY OF San Diego } SS.
On March 7, 1986 before me, the undersigned, a Notary Public in and for said State, personally appeared Gordon M. Denyes and Kathleen G. Denyes

personally known to me (or proved to me on the basis of satisfactory evidence) to be the person S whose name S are subscribed to the within instrument and acknowledged that they executed the same.

Katharine Lynne Snider
Signature of Notary

Katharine Lynne Snider
Name (Typed or Printed) of Notary

FOR NOTARY SEAL OR STAMP

OFFICIAL SEAL
KATHARINE LYNNE SNIDER
NOTARY PUBLIC CALIFORNIA
PRINCIPAL OFFICE IN
SAN DIEGO COUNTY
My Commission Expires Aug. 27, 1988

Title Order No. Escrow No.

MAIL TAX STATEMENTS AS DIRECTED ABOVE

PARCEL 1 (the Waggaman Parcel)

That portion of Block 111, DEL MAR RESUBDIVISION NO. 1, according to the Map No. 1268, filed in the office of the County Recorder of San Diego County, June 13, 1910, and is more completely described as follows:

Commencing at the Northeasterly corner of said Block 111; thence South 23°05' West along the Easterly line of said Block, 116.32 feet to the TRUE POINT OF BEGINNING; thence South 86°31' West, 125.00 feet; thence South 03°29' East, 72.00 feet; thence North 86°31' East to the Easterly line of said Block; thence North 23°05' East along said Easterly line to the TRUE POINT OF BEGINNING.

PARCEL 2 (the DeMangus Parcel)

That portion of Block 111, DEL MAR RESUBDIVISION NO. 1, in the County of San Diego, State of California, according to Map thereof No. 1268, filed in the Office of the County Recorder of San Diego County, June 13, 1910, described as follows:

Beginning at the Northeasterly corner of said Block 111; thence South 23°05' West along the Easterly line of said Block, 116.32 feet to the TRUE POINT OF BEGINNING; thence continuing South 23°05' West along said Easterly Block line, 115.63 feet; thence leaving said line, South 86°30' West to the mean high tide line of the Pacific Ocean; thence Northerly along said mean high tide line to an intersection with a line that bears South 86°31' West from the true point of beginning; thence North 86°31' East to the true point of beginning.

EXCEPTING therefrom that portion of said land described as follows:

Commencing at the Northeasterly corner of said Block 111; thence South 23°05' West along the Easterly line of said Block 116.32 feet to the TRUE POINT OF BEGINNING; thence South 86°31' West 125.00 feet; thence South 03°29' East 72.00 feet; thence North 86°31' East to the Easterly line of said Block; thence North 23°05' East along said Easterly line to the TRUE POINT OF BEGINNING.

ALSO EXCEPTING therefrom the Northerly 3.42 feet thereof; said Northerly 3.42 feet being measured along the Easterly line of said Block.

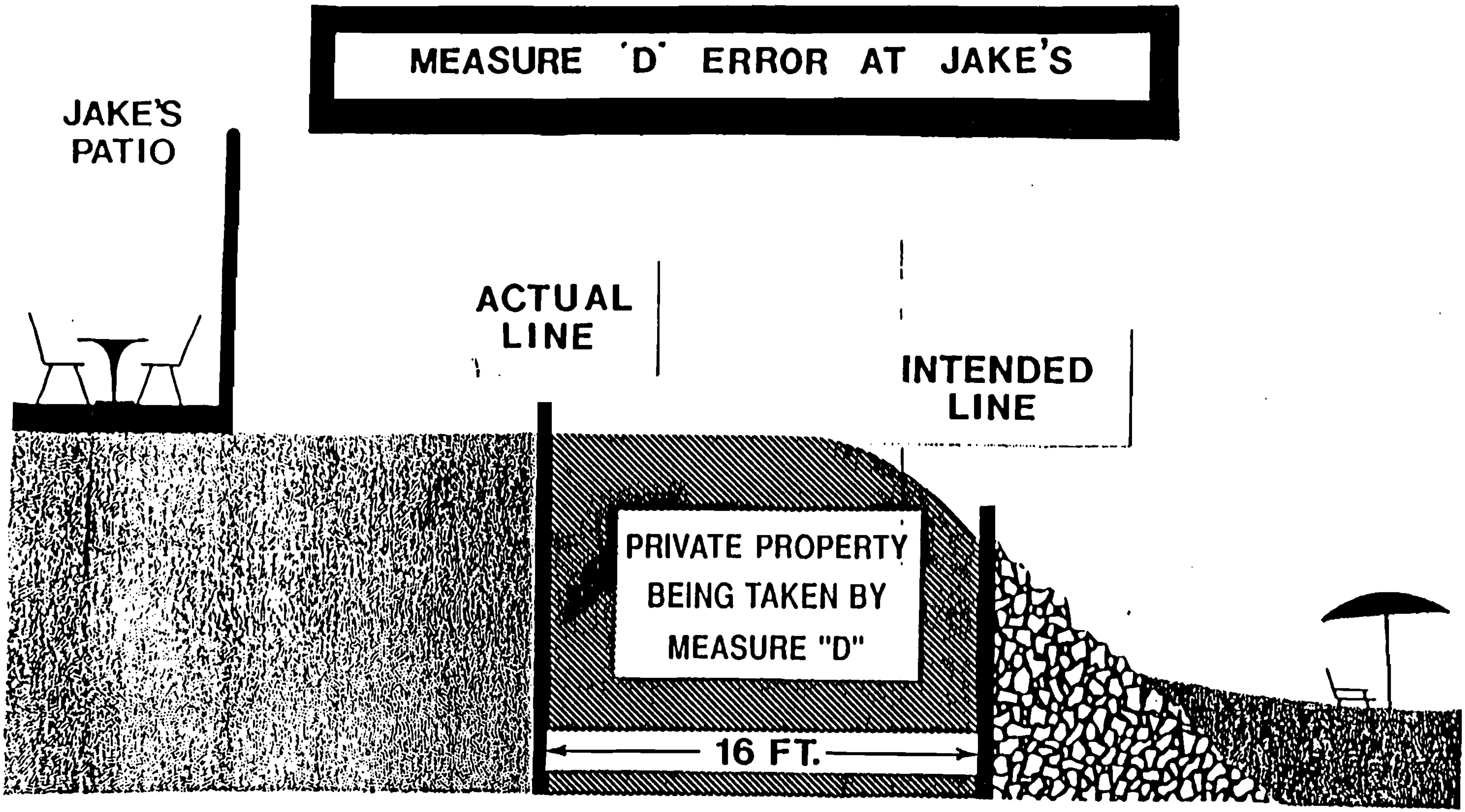
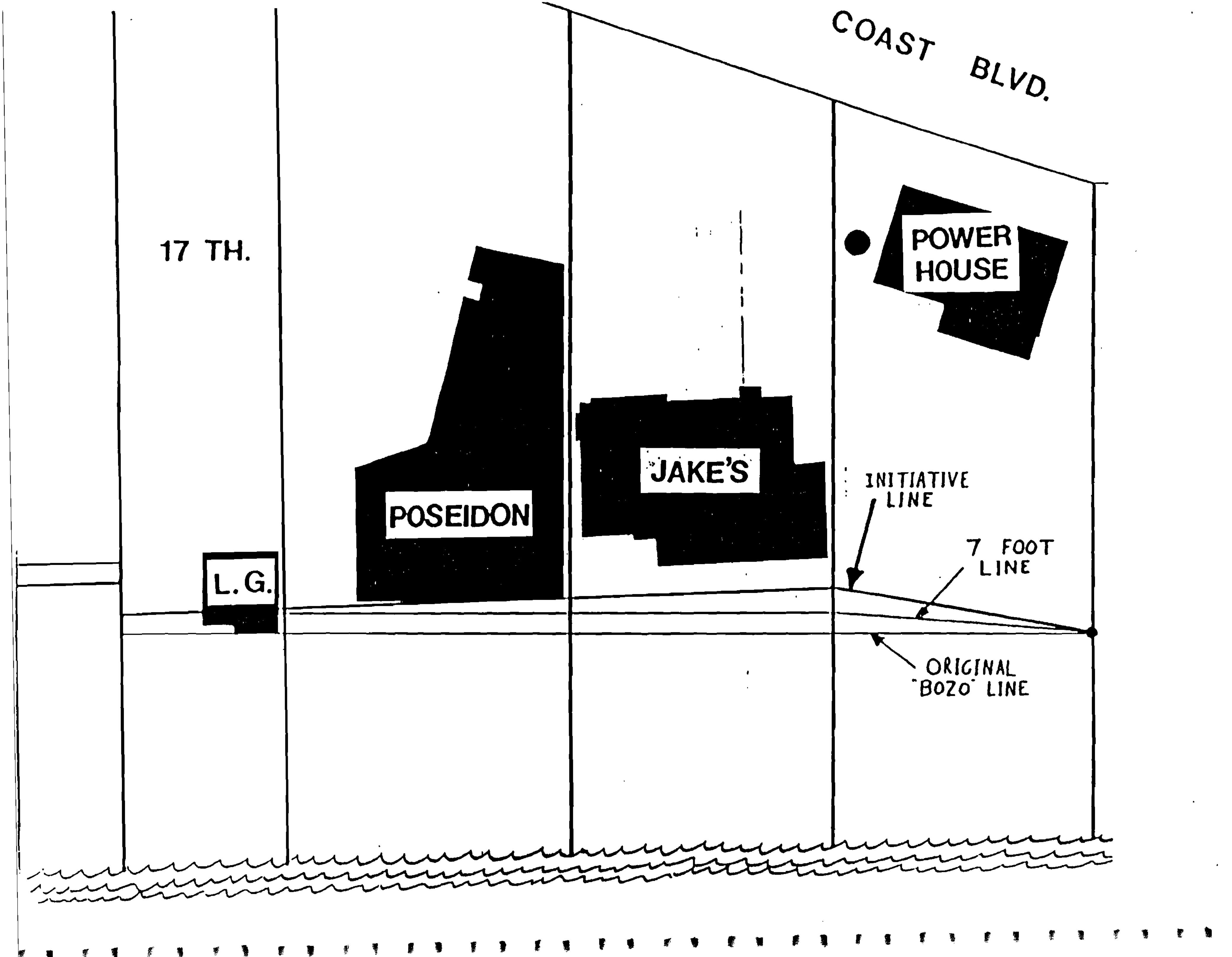

MEASURE 'D' ERROR AT JAKE'S
JAKE'S PATIO
ACTUAL LINE
INTENDED LINE
PRIVATE PROPERTY BEING TAKEN BY MEASURE "D"
16 FT.

EXHIBIT B


COAST BLVD.
17 TH.
POWER HOUSE
JAKE'S
POSEIDON
L.G.
INITIATIVE LINE
7 FOOT LINE
ORIGINAL "BOZO" LINE

ocean because of the existing westward and lateral protections. Demolition of these structures, as the Ordinance requires, will leave this public walkway unprotected. This exposure, as evidenced in the northern part of Section 2, will all but assure its eventual destruction.

28 E. Public health concerns have gone unreported. For example, a sewer line serving homes between 18th and 19th street occupies the westerly five feet of Lot 22. This line is presently protected by existing seaward and lateral structures. The need for this protection was evidenced in 1983 when storm-driven waves breached seawalls destroying approximately 125 feet of the sewer line and spreading raw sewage into the water and onto the beach and low-lying areas to the east of the beachfront. Stripped of any protection, as the Ordinance requires, this sewer line is vulnerable not only to storms, but unusually high tides and wave action generally.

F. Also, all houses between 18th and 19th Streets were
29 built under City of Del Mar permits excepting front-yard setback requirements. Instead, there is a substantial setback line to the rear of the lots to allow greater visibility of traffic entering and exiting Ocean Front. The Ordinance's frontage setback requirement squeezes these property owners, both landward and seaward, and creates a conflict with public safety on Ocean Front. This environmental impact must be addressed.

G. The EIR notes property owners may choose not to rebuild shore protections after removing nonconforming structures. (EIR, page 49.) The impact of this is not disclosed. Nor are the reasons why property owners would embrace such a daunting choice.

30

- One factor, however, is clear: The Ordinance's inflexible restrictions may make properly engineered shore protections impracticable.

Property owners whose residences and buildings are located at or near the SPA line may be better served by fortifying foundations and building fronts and paving over side and backyards to prevent erosion, rather than constructing a vertical wall which totally eliminates seaward views.

28. The existing sewer line serves the beachfront owners that it abuts. If relocation of the line is necessary it can be accommodated behind a wall located at the 5-foot line, or if needed, relocation to Ocean Front Boulevard is feasible. Resolution of the sewer relocation issue is not considered to raise significant environmental issues.

29. The setbacks established by the BPI, individually and in conjunction with setbacks from Ocean Front Boulevard, as defined by the City's zoning ordinance, permit reasonable use of all lots. Existing structures landward of the SPA line which were legally constructed qualify for non-conforming rights status and need not be removed unless the main structure is damaged, destroyed or the owner chooses to substantially remodel as addressed in the BPI Guidelines and the City Code. It is not expected that any owner will be unduly "squeezed" as postulated in the comment.

30. The potential impacts associated with areas where protective structures are not rebuilt are described on page 49 of the EIR. As stated, these impacts include instability of adjacent structures as a result of sand erosion and flooding caused by waves. The requirement to build a seawall and/or the design of the wall are not addressed by the BPI and as such as are not analyzed in the EIR. Where gaps in the walls occur, applicants whose property is adjacent to an unprotected property would be required to provide flank protection to mitigate for potential erosion and flooding impacts. Each property owner has an obligation to maintain their property in a condition so that it does not cause damage to neighboring properties.

Minimally, the choice not to build protective structures

- will affect flooding in low-lying areas and
- will challenge the stability of existing or newly built protective structures.

For example, given the beach profile between 17th and 19th Streets, high water would not only reach beachfront properties, but also Ocean Front, Coast Boulevard, and beyond. These impacts cannot be dismissed without detailed review and planned mitigation.

H. Finally, the unmitigated environmental impacts mentioned above will substantially reduce beachfront
31 property values throughout the City of Del Mar. This will necessarily lead to diminished real property tax assessments. The City of Del Mar already boasts one of the highest tax rates in San Diego County and lacks a good industrial or commercial tax base. The loss of residential tax base fostered by the Ordinance will impact <u>all</u> <u>property</u> <u>owners</u> within the City of Del Mar.

32 I. As the SPA line traverses the Denye's property it inexplicably jogs to the southwest. This angle in the wall will necessarily create a "cup" area subject to increased sand erosion and scouring by high water. Further, this placement requires that natural bluff lands and sandberms <u>west</u> of the SPA line would have to be removed in order to conform new construction to Ordinance requirements. Neither impact is mentioned in the EIR, although both are easily remedied by a more reasoned placement of the SPA line.

VI. The EIR fails to identify cumulative impacts from foreseeable <u>projects</u>.

An environmental impact report must outline the cumulative impacts of closely related past, present and
33 reasonably foreseeable future projects. (<u>Whitman v. Bd. of Supervisors</u> (1985) 176 Cal.App.3d 421, 428.)

Here, the EIR consistently states the City of Del Mar Local Coastal Program (to be completed in 1989) and the construction guidelines imposed by the City of Del Mar's Design Review Ordinance will affect the project. Whether these intimately related projects augment or impair environmental impacts must be investigated and revealed. This EIR is precisely the vehicle for this study.

31. This is an economic issue, not an environmental impact. It is not analyzed by the EIR in accordance with CEQA Guidelines Section 15131.

32. See response #20 regarding the location of the SPA line. The specific impacts associated with any proposed seawall solutions for this property will be reviewed during the permit application process when the City will conduct further environmental review. Such detailed review cannot be incorporated into a program level EIR. Moreover, the fact that the SPA line jogs does not require the location of the wall to move in a corresponding fashion. The property owner retains the right to design the wall as he or she deems best within the maximum constraints of the BPI.

33. The requirements for Design Review are to review the design criteria of the wall (color, texture, material, etc.). The engineering review must ensure the structural suitability of the wall. The impacts resulting from Design Review are anticipated to reduce, not aggravate environmental impacts. The same is true of the City's LCP which will include the BPI.

VII. The EIR has overlooked the most compelling and prudent environmental alternative.

CEQA commands consideration of reasonable project alternatives. California courts have held that

> [a]lthough EIR's are not required to be perfect or to discuss project alternatives beyond what is realistically possible . . ., an EIR must produce information sufficient to permit a reasonable choice of alternatives so far as environmental aspects are concerned. (San Bernardino Valley Audubon Society, Inc. v. County of San Bernardino (1984) 155 Cal.App.3d 738, 750; emphasis added.)

34

Apparently attempting to demonstrate nothing is better, the EIR summarily rejects three alternatives. This information gap is unacceptable. More to the point, the entire EIR, and in particular all mitigation statements, point directly to an environmental alternative which was not mentioned:

- Siting protective structures, on a block-by-block basis, as far landward as practicable given the economic, engineering and geotechnical considerations involved in adequately protecting beachfront properties.

That the strict language of the ordinance prohibits such an alternative is no ground for not considering its ameliorative affect on the environment.

CONCLUSION

If all projects looked as well in the "real world" as they do "on paper," there would be no need for environmental assessment. CEQA recognizes the impossibility of this premise. Conversely, it is not the province of an environmental impact report to make the on-paper project look better in the real world than it actually does.

Unfortunately, this EIR has gone too far to support the project, at the cost of not disclosing environmental degradation.
35 The environmental harms identified in these comments demand further attention, empirical study, and planned mitigation. As drafted, the EIR is wholly inadequate and unquestionably outside the CEQA mandate.

34. The Program EIR does not identify any significant and unmitigable impacts. CEQA states that the discussion of alternatives shall focus on alternatives capable of eliminating any significant impacts; therefore, the alternative referenced in the letter does not require evaluation. In any event, the alternative suggested is consistents with the BPI and not precluded thereby.

35. The EIR provides an impartial analysis of the potential environmental impacts of implementing the BPI. At the program level of analysis it is difficult to present the specific level of impacts as would be implied by the comment. Such detailed analysis will occur during the application process as needed to address any issues that arise. See response #2.

GOEBEL SHENSA & BEALE
A PARTNERSHIP INCLUDING A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW

LOUIS E. GOEBEL, A.P.C.
CHERYL SHENSA
MEAGAN J. BEALE

JAMES A. CAPUTO
RICHARD M. RENKIN

MCCLINTOCK PLAZA SUITE 5000
202 KETTNER BOULEVARD
SAN DIEGO, CALIFORNIA 92101
619 338-2611

May 25, 1989

City of Del Mar
Department of Planning
and Community Development
1050 Camino Del Mar
Del Mar, CA 92014

Attn: Mr. James D. Sandoval, Planning Director

Re: Draft Environmental Impact Report regarding Beach Preservation Initiative Ordinance

Ladies and Gentlemen:

This firm represents the following City of Del Mar beachfront property owners:

- Mary L. Glanz
- Eugene B. Fletcher, Inc.
- Carolyn F. Benson
- Barbara A. Fletcher
- Lawrence B. Fletcher
- Steven G. Fletcher, Inc.
- C. Vernon Hawk
- Willis H. Fletcher Company
- Ferdinand T. Fletcher

These persons and entities, collectively referred to as "the Fletcher Group," own lots 11 through 15, inclusive, in Block 113 of Del Mar resubdivision No. 2. These properties lie just north of 18th Street and fall within the Section 2 study area, as designated by the April 1989 Draft Environmental Impact Report (EIR).

By this letter and attachments, we submit the following comments to the EIR for your review and response.

Very truly yours,

GOEBEL, SHENSA & BEALE

By: Louis E. Goebel
Louis E. Goebel

LEG/JAC/mf
cc: P&D Technologies, Inc.
401 West A Street, Ste. 2500
San Diego, CA 92101

THE FLETCHER GROUP'S COMMENTS TO

THE DRAFT ENVIRONMENTAL IMPACT REPORT (EIR)

I. The EIR's characterization of existing protective structures is erroneous and unwarranted.

36 Throughout, the EIR characterizes existing protective structures as "encroachments." (See, e.g., EIR, pp. 8, 9, 15, 22, 23.) This characterization presumes these structures are not properly and lawfully sited. However, this question is not resolved and is currently in litigation. (See, Denyes, et al. v. City of Del Mar, San Diego Superior Court Case No. N41775; Glanz, et al. v. City of Del Mar, San Diego Superior Court Case No. N41774; Lang v. City of Del Mar, San Diego Superior Court Case No. N31478.) Indeed, the Fletcher Group constructed their present seawall on various claims of right going back more than 50 years.

The EIR's characterization is not fact, but is instead a speculative legal conclusion beyond the drafters' statutory authority to make. This error is easily remedied by identifying "encroachments" as existing structures or protective devices.

II. There is no support for the EIR's statement regarding placement of the Shoreline Protection Area (SPA) line.

At page 7, the EIR states:

37 The easterly boundary of the SPA zone is the SPA line which was also established by the Ordinance. The location of the line is based on numerous factors including existing seawalls, location consistency with existing seawalls, and property boundaries.

Yet, nowhere do

- The Beach Overlay Zone Ordinance ("Ordinance") (Chapter 30.50; appendix B to the EIR);
- The Implementation Guidelines for the Beach Preservation Initiative (Appendix B to the EIR); and

36. See response #19.

37. See response #20.

- The Official Supplemental to the Sample Ballot regarding Measure D

identify any factors determining the ultimate placement of the SPA line. These documents constitute the people's official pronouncement on the Ordinance. Thus, there is simply no legislative support for the EIR's statement.

III. As drafted, the EIR is insufficiently detailed and unjustifiably incomplete.

The California Environmental Quality Act (CEQA) mandates that the EIR must function as an informational tool to analyze significant environmental impacts and to disclose possible remedies. (Pub. Res. Code, §21202.1; Cal. Code Reg., tit. 14, §15362.) An EIR "should be prepared with the sufficient degree of analysis to provide decisionmakers with information which enables them to make a decision which intelligently takes account of environmental consequences." (Citizens of Goleta Valley v. Bd. of Sup'rs. (1988) 197 Cal.App.3d, 1167, 1176.)

In essence, the EIR serves "as an environmental 'alarm bell' whose purpose is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return." (Citizens for Qual. Growth v. The City of Mt. Shasta (1988) 198 Cal.App.3d 433, 439.) Unsupported assertions and undocumented technical conclusions have no place in such a report. (Whitman v. Board of Supervisors (1979) 88 Cal.App.3d 397, 411.)

These legal guidelines are every report's target, yet this EIR consistently misses the mark. The specific flaws listed below provide apt examples of the EIR's deficiencies. One shortcoming is so pervasive, it must be specially noted.

38 A. The Ordinance purports to balance public shoreline access with protection of private property. (Ordinance, §30.50.010.) Yet, the EIR addresses the adequacy of the SPA restrictions on private property protections in only one sentence:

> Generally, the limits of the SPA line and zone will provide an adequate area to construct shoreline protection devices, if required, and provide an adequate recreational beach area. (EIR, p. 24.)

38. See response #22.

This statement is made without technical authority and ignores engineering reviews readily available to the City of Del Mar.

In 1983 R. M. Noble and Associates conducted a preliminary engineering study of beach and river protection devices for the City of Del Mar ("Noble Report"). This report, which is attached as Exhibit A and incorporated in its entirety by this reference, is apparently referenced only once in the EIR, and then not by name. (See, EIR, p. 10.)

The EIR's conclusionary statement and omitted reference to the Noble Report are astonishing in light of the report's finding that protective structures are optimally located 25 to 30 feet seaward of existing residences and commercial property. (Exhibit A, pp. 15-16, 28.)

- By placing the SPA line at or near the faces of existing structures and barring vertical protective structures 5 feet seaward of that line, the Ordinance all but assures the inadequacy of new "protective" construction.

The City of Del Mar has already recognized this point in its 1984 Response to comments to the Noble Report:

> A seawall located on the property line would maximize public use of the beach and minimize effects on beach erosion. This alternative would not provide adequate protection to all of the structures. Damage from splash and overtopping waves would be most severe under this alternative because little room would be provided for overtopping waves and splash to dissipate before reaching the structures. (Response 30.)

This conflict with the Ordinance's stated purpose cannot be brushed aside with a single, unsupported assertion.

39 B. The EIR's lack of specificity and technical detail is made more critical by the fact it is a program

39. See response #23.

environmental impact report. Such a report allows the City of Del Mar to review simultaneously a number of activities now and to avoid further environmental assessment later by deeming subsequent activities as being within the scope of the original report. (Cal. Code Regs., tit. 14, §15168.) If this EIR is to serve "double duty" as a report of present and future impacts, a thorough and detailed analysis is paramount. (Cal. Code Regs., tit. 14, §15168(c)(5).) If it is not, this limitation should be plainly stated.

Nor is it a satisfactory response that this EIR only reaches a zoning ordinance and not construction-related activities. (Cal. Code Regs., tit. 14, §15146(b).) The Ordinance requires demolishing old and constructing new protective devices within specific tolerances and boundaries. The scope of this demolition and construction is readily notable and reasonably foreseeable. As such, it too must be addressed in detail.

III. The EIR omits or mischaracterizes specific and significant environmental impacts.

As drafted, the EIR inadequately addresses the following impacts, each of which requires further investigation, analysis and planned mitigation:

40 A. The EIR decries existing protective structures as a psychological barrier, reducing visual attractiveness and creating the impression of private ownership. (See, e.g., EIR, p. 13.) But, there is no scientific or empirical data stated to support this position.

Ironically, the report finds new seawalls constructed on the SPA line would be "hardly noticeable, if at all," and that jogs in newly constructed walls would not be considered "visually unpleasant or adverse, as this would serve to break up the monotony of a long, continuous straight line of walls." (EIR, page 32.) Based on the EIR, it would appear that seawalls are not visually unpleasant, as long as they are located at or eastward of the SPA line. Such a conclusion tests the credibility of this report.

41 B. The visual impact of new vertical seawalls is not properly analyzed. As the Noble Report states and the City of Del Mar recognized in its July 1987 Environmental Impact Report Supplement, the closer vertical seawalls are located to a building face, the

40. See response #24.

41. See response #25.

higher the crest elevation has to be raised to provide adequate protection. When seawalls are placed at or near a building's face, as is the case in much of Section 2, existing seaward views would be lost. The EIR cursorily notes this consequence at page 32, but again does so without any empirical estimate of harm, even though this data is readily available. (See, e.g., Environmental Impact Report Supplement, July 1987, pp. 15; identifying numbers of properties affected by various setback distances.)

The EIR does not, however, address the visual impact of landward views from the beach. The specter of 13 to 15 foot concrete or wooden monoliths rising directly from the beach cannot be said to be "hardly noticeable." Indeed, visual impact can only be accurately measured by assessing the difference between the existing beachfront and post-construction and demolition conditions.

42 C. Between 18th and 19th Streets, the public are assured lateral access to the beach by a dedicated public walkway commonly known as Lot 22.

Dedicated public access to this area has been a settled question for almost 40 years. (See, Exhibit B, Judgment in Crabtree, et al. v. Good, et al., Case No. 166161, recorded on March 14, 1952, at Book 44004, p. 79 of the Official Records of the County of San Diego.) The Ordinance permits rip-rap protections to intrude into and usurp this settled public way. This is not solely a legal matter; it is an Ordinance-endorsed private encroachment into a dedicated public access way. As such, its impact must be addressed.

43 D. Similarly, a concrete public sidewalk traverses most of the properties between 18th and 19th Streets. This walkway affords greater access to handicapped and elderly beach users, and has survived the ravages of the ocean because of the existing westward and lateral protections. Demolition of these structures, as the Ordinance requires, will leave this public walkway unprotected. This exposure, as evidenced in the northern part of Section 2, will all but assure its eventual destruction.

44 E. Public health concerns have gone unreported. For example, a sewer line serving homes between 18th and 19th street occupies the westerly five feet of Lot 22. This line is presently protected by existing seaward and lateral structures. The need for this protection was

42. See response #26.

43. See response #27.

44. See response #28.

evidenced in 1983 when storm-driven waves breached seawalls destroying approximately 125 feet of the sewer line and spreading raw sewage into the water and onto the beach and low-lying areas to the east of the beachfront. Stripped of any protection, as the Ordinance requires, this sewer line is vulnerable not only to storms, but unusually high tides and wave action generally.

45 F. Also, all houses between 18th and 19th Streets were built under City of Del Mar permits excepting front-yard setback requirements. Instead, there is a substantial setback line to the rear of the lots to allow greater visibility of traffic entering and exiting Ocean Front. The Ordinance's frontage setback requirement squeezes these property owners, both landward and seaward, and creates a conflict with public safety on Ocean Front. This environmental impact must be addressed.

46 G. The EIR notes property owners may choose <u>not</u> to rebuild shore protections after removing nonconforming structures. (EIR, page 49.) The impact of this is not disclosed. Nor are the reasons why property owners would embrace such a daunting choice.

- One factor, however, is clear: The Ordinance's inflexible restrictions may make properly engineered shore protections impracticable.

Property owners whose residences and buildings are located at or near the SPA line may be better served by fortifying foundations and building fronts and paving over side and backyards to prevent erosion, rather than constructing a vertical wall which totally eliminates seaward views.

Minimally, the choice not to build protective structures

- will affect flooding in low-lying areas and

- will challenge the stability of existing or newly built protective structures.

For example, given the beach profile between 17th and 19th Streets, high water would not only reach beachfront properties, but also Ocean Front, Coast Boulevard, and beyond. These impacts cannot be dismissed without detailed review and planned

45. See response #29.

46. See response #30.

mitigation.

47 H. Finally, the unmitigated environmental impacts mentioned above will substantially reduce beachfront property values throughout the City of Del Mar. This will necessarily lead to diminished real property tax assessments. The City of Del Mar already boasts one of the highest tax rates in San Diego County and lacks a good industrial or commercial tax base. The loss of residential tax base fostered by the Ordinance will impact all property owners within the City of Del Mar.

V. The EIR fails to identify cumulative impacts from foreseeable projects.

48 An environmental impact report must outline the cumulative impacts of closely related past, present and reasonably foreseeable future projects. (Whitman v. Bd. of Supervisors (1985) 176 Cal.App.3d 421, 428.)

Here, the EIR consistently states the City of Del Mar Local Coastal Program (to be completed in 1989) and the construction guidelines imposed by the City of Del Mar's Design Review Ordinance will affect the project. Whether these intimately related projects augment or impair environmental impacts must be investigated and revealed. This EIR is precisely the vehicle for this study.

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49 [a]lthough EIR's are not required to be perfect or to discuss project alternatives beyond what is realistically possible . . ., an EIR must produce information sufficient to permit a reasonable choice of alternatives so far as environmental aspects are concerned. (San Bernardino Valley Audubon Society, Inc. v. County of San Bernardino (1984) 155 Cal.App.3d 738, 750; emphasis added.)

Apparently attempting to demonstrate nothing is better, the EIR summarily rejects three alternatives. This information gap is unacceptable. More to the point, the entire EIR, and in particular all mitigation statements, point directly to an environmental alternative which was not mentioned:

47. See response #31.

48. See response #33.

49. See response #34.

- Siting protective structures, on a block-by-block basis, as far landward as practicable given the economic, engineering and geotechnical considerations involved in adequately protecting beachfront properties.

That the strict language of the ordinance prohibits such an alternative is no ground for not considering its ameliorative affect on the environment.

CONCLUSION

If all projects looked as well in the "real world" as they do "on paper," there would be no need for environmental assessment. CEQA recognizes the impossibility of this premise. Conversely, it is not the province of an environmental impact report to make the on-paper project look better in the real world than it actually does.

Unfortunately, this EIR has gone too far to support the project, at the cost of not disclosing environmental degradation. 50 The environmental harms identified in these comments demand further attention, empirical study, and planned mitigation. As drafted, the EIR is wholly inadequate and unquestionably outside the CEQA mandate.

50. See response #35.

Report
Preliminary Engineering Study
Beach and River Protective Devices
For the City of Del Mar

R.M. NOBLE & ASSOCIATES Job No. 22-02
Malibu, California
July 22, 1983

EXHIBIT A

TABLE OF CONTENTS

	PAGE
INTRODUCTION	1
SCOPE	2
SITE CONDITIONS	3
DESIGN CRITERIA	11
SHORE PROTECTION STRUCTURES	19
Alternative Protective Structures	19
Construction Materials	21
Preliminary Design	23
SHORE PROTECTION RIGHT-OF-WAY	27
SHORE PROTECTION IMPACTS	30
Degree of Protection	30
Beach Front Erosion	31
Aesthetics	32
Construction Right-of-Way	34
Public Access	36
Long-Term Stability and Maintenance	37
COSTS	37
Existing Protective Structures	42
Existing Installations	44

LIST OF FIGURES

1 Site Area, Del Mar, California

2 Photographs of Del Mar Beach

3 Photographs of Del Mar Beach

4 Photographs of Del Mar Beach

5 Photographs of Del Mar Beach

6 Beach Profiles

7 Wave Runup Values For Selected Shore Protection Structures

8 Shore Protection, Anchored Vertical Wall, Timber Piles With Timber Planks

9 Shore Protection, Cantilever Vertical Wall, Concrete Piles With Timber Planks

10 Shore Protection, Cantilever Vertical Wall, Concrete Piles With Concrete Panels

11 Shore Protection, Anchored Vertical Wall, Concrete Piles With Concrete Wall

12 Shore Protection, Cantilever Vertical Wall, Concrete Sheet Piles

13 Shore Protection, Stone Revetment

14 Vertical Wall Shore Protection

15 Stone Revetment Shore Protection

16 Shore Protection Examples

17 Shore Protection Examples

18 Shore Protection Examples

19 Shore Protection Examples

R. M. Noble & Associates
CONSULTING ENGINEERS

July 22, 1983

City of Del Mar
1050 Camino del Mar
Del Mar, California 92014

Attention: Mr. Bob Nelson
City Manager

Gentlemen:

Report
Preliminary Engineering Study
Beach and River Protective Devices
Del Mar, California
For the City of Del Mar

INTRODUCTION

This report presents our findings and recommendations for the preliminary engineering study of beach and river protection devices at Del Mar, California. The purpose of this study was to select a protective device which will provide protection from storm waves, high tides and river flooding for the public and private structures built on properties fronting on the beach and on San Dieguito River between 15th Street and the Camino del Mar Bridge. This protective device is to have minimum impact on the public's enjoyment of the beach and river, and benefit the beach-using public, if posssible.

All elevations in this report are in feet, and refer to either National Geodetic Vertical Datum (NGVD), formerly Sea Level Datum - 1929 (SLD) or Mean Lower Low Water Datum (MLLW). In the site area the MLLW datum is approximately 2.57 feet lower than NGVD. A difference of 2.6 feet between these two datums was used in this study. Therefore an elevation of +10 feet NGVD is equivalent to +12.6 feet MLLW.

SCOPE

The scope of this study is described in the City's RFP of April 26, 1983, which is summarized as follows:

- Prepare a list of alternative protective structures to discuss with the City Manager for approval of alternatives to be included in the study.
- The study area extends westerly from the Camino del Mar bridge along the San Dieguito River bank to the ocean, and southerly along the ocean to the extension of 15th Street as shown in Figure 1.
- Review data to determine hazards presented by high tides, storm waves, river flooding and their simultaneous occurrence.
- Prepare preliminary designs on four alternative protective structures.
- Determine right-of-ways required for construction of the alternative protective structures.
- Prepare a statement of impacts for each alternative structure.
- Determine cost estimates for design, construction and

construction inspection for each alternative structure, and where possible, provide a simplified cost-benefit ratio.

- Consider the incorporation of existing protective structures with preliminary design concepts of proposed alternative structures, where practical.
- Identify an existing installation for each alternative structure proposed.
- Complete work and submit reports within 45 days of contract award.
- Attend a City staff meeting and attend a public meeting of the City Council to present the results of the report.

SITE CONDITIONS

Various reports, data records and maps pertaining to the hydrographic, oceanographic, meteorological, hydrological and geological conditions at Del Mar were obtained and reviewed. Several of these reviewed documents are listed in the reference section of this report.

Del Mar is located at the southern end of the Oceanside littoral cell which extends from Dana Point to La Jolla. The Del Mar beach sand levels and width are constantly changing as a result of the wave activity and the supply of sand to its beaches. The onshore-offshore and longshore transport of sand is mainly governed by the seasonally changing wave energy and its direction. The net littoral drift is reported to be from north to south along this stretch of coastline, however, there are reversals due to the varying wave climate. A net annual sediment transport rate of 215,000 cubic yards to the south has been reported for the Del Mar area.

The natural supply of sand to this coastline is mainly by the sediment transport of rivers and streams, and the erosion of the unprotected coastal terraces. This natural sand replenishment has been reduced through the construction of flood control and irrigation district dams, river sand mining operations, coastal revetments and harbor entrance protective structures. The construction, and expansion of harbors, their maintenance dredging, and the dredging or excavation of lagoons, rivers and offshore areas has helped to renourish beaches on an intermittent basis. However, beach sand is permanently lost directly offshore with a large volume of sand lost to the La Jolla submarine canyon. Therefore, on a long-term basis it becomes increasingly difficult to renourish lost beach sands.

Del Mar beach is westerly facing and consists of fine to medium grained sand. Offshore contours are fairly uniform and parallel to the shoreline. To the north and at the southerly boundary of the beach area included in this study lies narrow sandy beaches backed by high, near vertical, wave cut eroding cliffs. At the northern boundary of the study area, prior to the wave cut cliffs is a sandy bar area across the mouth of the San Dieguito River. The area included in this study consists of sandy beaches of Pleistocene sediments backed by low active dunes, which are backed by the San Dieguito River flood plain. Houses, apartments and restaurants constructed along the dune backshore area are subject to damage during high tide and wave conditions. The beach area which has been fairly wide in the past is presently a narrow beach along the southern portion with essentially no beach along the northern portion.

A 70 inch diameter Longard Tube approximately 200 meters in length was installed in January 1981, between 27th and 29th Streets to stabilize beach erosion in this area. A majority of the shoreline included in this study has existing seawalls fronting the shorefront buildings. These seawalls consist of wood and concrete vertical walls, and stone revetments, or a combination of the above. Their design, age of construction, present condition and size vary considerably.

Figures 2 through 5 show representative photographs taken on the afternoon of June 13, 1983 along the study area from south to north. Figure 2 - photograph A, is looking north from the extension of 15th Street. This area shows exposed cobbles and beach bedrock, and is backed by a low, eroding bluff. A reef exists offshore of this area. Figure 2 - photograph B, is looking at Jake's and Poseidon's restaurants and the main life guard tower at 17th Street. This area shows many exposed beach cobbles and is backed by large stone riprap. Figure 3 - photograph A, is the 19th Street area showing a sandy beach with stone and a concrete seawall protection, while photograph B is th

20th-21st Street area showing a mixture of stone and sand berm for protection. Figure 4 - photograph A, is the 22nd-23rd Street area showing a sandy beach backed by vertical timber walls with some stone while photograph B is the 24th-25th Street area showing the beach backed by stone, earth and vertical timber walls. North of 25th Street their is insufficient beach sands to provide a beach area. Figure 5 - photograph A, is looking north from 26th Street showing stone and vertical wall protection with essentially no beach. Photograph B, is looking south showing the San Dieguito River entrance from the Camino del Mar bridge to the ocean with the back shoreline area lined with a stone revetment.

The Del Mar beach is exposed to winter and summer swells generatd by Pacific Ocean storms as well as locally generated seas. However, the offshore Santa Barbara Channel Islands significantly reduce the wave energy that reaches the shoreline from incoming deepwater waves for several approach directions. Northern hemisphere swell approaches Del Mar, primarily during the months between November and April, from a westerly direction between Santa Barbara-Santa Catalina Islands and San Nicolas-San Clemente Islands. Wave periods typically range between 12 to 18 seconds.

Local winds generate steep, short period waves generally from the northwest, however locally generated waves including those generated by diurnal sea breezes can occur from all offshore directions throughout the year. Fetch lengths for the generation of these waves are limited within the Channel Islands and are therefore smaller in height and shorter in period.

Southern hemisphere swell approaches Del Mar from the south through the southwest primarily during the months of May through October. These waves are usually of low height and long period. On rare occasions large waves generated by Eastern Northern Pacific tropical cyclones can approach southern California from the south through southwest directions.

Deepwater wave statistics have been developed through three independent wave hindcast studies for selected stations offshore of California. Nearshore waves have been measured to the north at Oceanside and to the south at La Jolla. A limited amount of visual wave observations have been recorded at Del Mar as part of the Scripps Institution of Oceanography beach profile program. Also, a wave gage array has recently been installed offshore of 25th Street in approximately 30 feet of water.

Tsunami waves generated by seismic activity along the Aleutian-Alaskan and Peru-Chile trenches can propagate to southern California. However, a review of tide gages located at Los Angeles and La Jolla during past tsunami events indicate that tsunami flooding is not significant in the Del Mar area when compared to storm wave events.

Tides at Del Mar are semidiurnal with a diurnal inequality. Tide data is shown below for the nearby subordinate tide station at La Jolla which should be representative for Del Mar tides. These tide planes are based on recorded water levels off the Scripps Institution of Oceanography pier.

Highest tide observed— (January 29, 1983)	7.8 feet MLLW
Mean higher high water	5.2 feet MLLW
Mean high water	4.5 feet MLLW
Mean tide level	2.7 feet MLLW
Mean low water	0.9 feet MLLW
Mean lower low water	0.0 feet MLLW
Lowest tide observed (December 17, 1933)	-2.6 feet MLLW

The predicted high astronomical tide for January 29, 1983 at La Jolla was 6.8 feet MLLW, therefore the measured tide of 7.8 feet included 1.0 foot in water level increase due to storm surge or pressure and wind affects. During intense storm activity along the southern California coast an increase in water levels of 1.0 foot due to storm surge is realistic.

Very limited subsoil data is available within the Del Mar study area. At the southern boundary in the vicinity of 15th Street's extension to the shoreline, a rocky reef area extends offshore. The beach area which is backed by a vertical bluff is presently covered with cobbles. Beach bedrock is exposed in this area. However, the remainder of the study area appears to be mainly sand. Soil reports were available for four properties within the study area. Two of these reports include results for soil borings from 15 to 45 feet below the building lot grade. Soil conditions encountered were sands with gravel. The other two reports include results for shallow boring which also show sand conditions.

For this study sandy soils are assumed to exist to the lower depth of proposed structures. This assumption will require verification for proposed vertical wall protective structures through a soil boring program. Also of significance is the thickness and location of any cobble areas. During times of eroded beach profiles, cobbles are exposed in portions of the study area.

A large sand berm has closed off the ocean mouth of the San Dieguito River flood plain during the past years, except during times of high river flooding such as occurred in 1980 and 1983. When severe coastal flooding from high tides and wave action occur during times of intense precipitation caused flood flows passing through the San Dieguito River, the river entrance area is subjected to severe erosion. The combination of high velocity flood currents scouring the river entrance channel to the ocean, and the steep storm waves eroding the shoreline area is of special concern in the study area from the Camino del Mar bridge to the ocean. This area has been revetted with stone as seen in photograph B on Figure 5. The corner house also has a vertical seawall directly behind the shown rock revetment.

Scripps Institution of Oceanography has performed measurements of the Del Mar Beach between the San Dieguito River and 15th Street since early 1974. Since early 1981, this survey program was expanded to include additional beach profiles due to the Longard Tube installation between 27th and 29th Streets. These beach profiles show the seasonal fluctuation of sand levels along the beach face as well as the severe beach erosion which occurred during the winter storms of 1977-8 and 1982-3. These storms which combined intense rainfall, high tides and large waves resulted in rapid shoreline erosion with significant damage to shoreline structures. Beach widths have changed as much as 200 to 300 feet from extreme low to high conditions.

Offshore profiles taken by Scripps show no offshore bar formation for Range 5 (north bank of San Dieguito River) and a small bar formation for Range 1 (south bank of San Dieguito River). However, for Range 2 (25th Street) a significant offshore bar has formed since their December 1982 survey. Their April 28, 1983 profile is reported to show a large sand bar formation at approximately 250 to 275 meters offshore from their baseline. Their Range 3 (20th Street) shows a comparable bar to Range 2, however, it apparently is not as well defined. No sand bar is shown for Range 4 (15th Street).

Prior to 1980, the San Dieguito River mouth was closed for many years resulting in the creation of a large sand berm. During the February 1980 storm, this sand deposit was flushed out and moved to the south. Relatively mild wave conditions existed over the next two years resulting in a fairly wide beach area. Presently, there is a very narrow or nonexistent beach area from about 25th Street north to the south bank of the San Dieguito

River, while the beach area increases in width south of about 25th Street. It appears that the river mouth sand that was moved offshore plus the sand from 25th Street and north which was pulled offshore, has moved southerly where significant offshore bar formations presently exist, and where the beach area has started to rebuild. It would appear that relatively small amounts of sand have been transported from the north during recent months.

The Flood Insurance Rate Map, to become effective August 15, 1983, presents 100 year flood elevations varying between +6 feet to +9 feet NGVD for the Del Mar site area. The 100 year tsunami runup elevation given in the Type 16 Flood Insurance Study for Del Mar is +5.9 feet NGVD. Flood elevations presented on the County of San Diego, Flood Area Map, Sheet 294-1683 for the San Deiguito River 100 year flood give values ranging from +8.0 feet at the ocean mouth to +9.6 feet NGVD at the Camino del Mar bridge. These values were calculated by use of an erodable bed model and a 100 year peak flow of 46,000 cubic feet per second. The Federal Emergency Management Agency is requesting that these values be recalculated for a rigid bed model.

DESIGN CRITERIA

Oceanographic and hydraulic design criteria was selected based on the above discussed information. This design criteria was then used in the preliminary design of shore protection structures considered in this study. Design criteria consists of water levels, wave conditions, wave runup elevations, beach scour depths, river elevations and velocities, and soil data.

Components of the design stillwater level are astronomical tide, storm surge (pressure and wind setup) and wave setup. An astronomical tide of +6.9 feet MLLW was selected for Del Mar. This was based on tides recorded at the National Ocean Survey, NOAA, San Diego tide gage and adjusted for the subordinate La Jolla station. This tide would represent an approximate 10 percent exceedance tide. Added to this tide was 1.0 foot for storm surge affects which results in a tide level of +7.9 feet MLLW. The highest recorded tide at San Diego was +8.3 feet MLLW which occurred on January 27, 1983. This value when adjusted for La Jolla is +7.5 feet MLLW. The tide gage located at the La Jolla Scripps pier recorded values of +7.4, +7.5 and +7.8 feet MLLW on January 27, 28 and 29, 1983, respectively.

During periods of heavy storm wave activity an additional local inshore increase in stillwater will result from wave setup. This occurs when intense breaking wave action superelevates the stillwater level before the mass onshore transport of water is allowed to return seaward. When using typical high breaking waves conditions and bottom slopes at Del Mar, a wave setup on the order of one to two feet is calculated. A wave setup value of 1.5 feet is used in this study.

Nearshore beach profiles obtained from Scripps Institution of Oceanography were replotted to MLLW datum for Ranges 1 through 4 (south bank of San Dieguito River south to 15th Street). These profiles were for the period from May 1980 through May 1983. The highest and lowest nearshore profiles for each of these ranges have been plotted and shown in Figure 6. The maximum vertical change in elevation within forty to fifty feet of the baseline is about 10 feet for Range 2. However, vertical changes of 12 to 15 feet were reported as observed during the 1982-83 winter storm events. This is possible since these reported values were in front of vertical walls which could experience deeper local erosion. Design waves breaking in the area of proposed shore protection structures were selected based on the above information.

Even though storm wave heights in excess of 15 feet can approach the Del Mar shoreline, these waves will break before reaching the shoreline. When considering an eroded low beach profile and an overall stillwater level between +8.0 and +9.4 feet NGVD, a breaking wave height on the order of 8 feet could break on a shore protection structure approximately 30 feet seaward of the baseline. For design purposes a breaking wave height of 8.0 feet with a range in wave periods from 6.0 to 14.0 seconds was selected.

Wave runup was calculated for three types of shore protection structures which would be located approximately 30 feet seaward of the baseline. Runup procedures and curves presented in the U.S. Corps of Engineers, "Shore Protection

Manual" were used. The three structures considered were a smooth vertical wall, a smooth recurved wall of the Galveston, Texas type and a stone revetment with a slope of 1.5 horizontal:1.0 vertical. These structures were assumed to extend to at least the elevation of calculated runup. If they were lower in elevation, wave overtopping would result, however the runup elevations would be lower than indicated. All runup elevations were based on a breaking wave height of 8.0 feet and its equivalent deepwater wave height, and were calculated for a range in wave period of 6 to 14 seconds.

Wave runup values above the stillwater level are shown in Figure 7. These values are only estimates to indicate an approximate runup level and a relative comparison between structures. Also, shown are wave runup elevations when using the design stillwater elevation of +9.4 feet MLLW, which is equivalent to +6.8 feet NGVD. Figure 7 indicates that for lower wave periods the vertical wall results in much higher runup, with the recurved wall resulting in the lowest runup. As the wave period increases, wave runup increases for the revetment and recurved wall as it decreases for the vertical wall. At a wave period of 14 seconds the three structures have approximately the same runup. Data used in calculating wave runup for the recurved wall were inappropriate above a 12 second wave period, and in actuality the curve shown in Figure 7 would probably start to level off after a wave period of 12 seconds instead of continuing to increase as shown. Also, the curves shown for the vertical wall and the revetment would tend to level off after a 14 second wave period.

A recurved concrete seawall of the Galveston type is not being recommended at Del Mar since it would be too large in size. However, based on the runup results, a curved pile cap will be recommended for vertical wall structures as well as stone toe protection. Otherwise, wave runup could potentially be as high as 16.5 feet above the stillwater level or to an elevation of +23.3 feet NGVD. For a stone revetment the runup would be approximately 12 feet above the stillwater level or to an elevation of +18.8 feet NGVD. It is assumed that a vertical wall, with a properly designed curved pile cap and stone toe protection, will have wave runup approximating that of the stone revetment.

It is recommended that shore protection structures located about 30 feet seaward of the baseline be constructed to a crest elevation of +16.0 feet NGVD. This would result in some wave overtopping during extreme storm events. However, with the baseline assumed at the front face of the buildings a 30 feet corridor should adequately handle the expected wave overtopping.

Review of the boundary survey map, provided by the City of Del Mar, shows shoreline property first floor elevations varying from about +12 feet to +15 feet NGVD. Therefore, in most cases a shore protection crest elevation of +16 feet NGVD should not drastically interfere with coastal views. Review of the reproduced aerial photograph maps show that in most cases a shore protection structure located 30 feet seaward of the building face would place it in the toe area of the existing stone.

A design toe elevation for proposed shore protection structures is based on a review of the maximum measured scoured beach profiles, locally observed scour levels fronting the existing shore protection structures, storm and flood design parameters, site soil conditions, experience with the performance of other coastal structures, and engineering judgement. A review of the low beach profiles shown in Figure 6 show a low beach elevation on the order of +3 feet to +5 feet MLLW in the area of 30 to 60 feet seaward of the baseline. Scour depths directly in front of vertical seawalls could have reached an elevation as low as zero feet MLLW based on reported changes in sand level. This value is not unrealistic when compared to maximum scoured beach profiles along southern California beaches. An elevation of 0.0 feet MLLW is equivalent to -2.6 feet NGVD. A design toe elevation of -4.0 feet NGVD has been selected for proposed shore protection structures. Proposed vertical wall systems will have piling below this elevation to insure structural stability. The design toe elevation of -4.0 feet NGVD is to prevent scouring and loss of material beneath and behind the proposed wall systems.

The design crest elevation of +16 feet NGVD and toe elevation of -4 feet NGVD is considered adequate for the shoreline area fronting the San Dieguito River entrance between the ocean and the Camino del Mar bridge. The County of San Diego presently shows a 100 year river flood elevation of +8.0 feet NGVD at the ocean entrance, increasing to +9.6 feet at the bridge. These elevations were based on the use of an erodible bed model in the flood analysis. During this flood, river velocities are estimated to be on the order of 10 feet per second in the ocean entrance area. The Federal Emergency Management Agency (FEMA), is requiring that a flood analysis be performed using a fixed bed model, which could raise the above river elevations.

The design crest elevation of +16 feet NGVD is based on an ocean stillwater elevation of +6.8 feet NGVD and the wave runup from a breaking wave height of eight feet. The flood analysis did not consider ocean tide levels to this height, which if it had, could result in some increase in river levels along this stretch. The river ocean entrance area during times of high river flooding, high ocean tides and storm wave action is a dynamically changing area with the movement of beach sands, transport of river sands, breaking wave patterns, river waters meeting ocean waters and the resulting current patterns. Wave heights of eight feet would probably be breaking across a changing river sand berm area and smaller waves would rebreak in the shoreline area. For this preliminary engineering study, a protective structure crest elevation of +16 feet NGVD is considered appropriate. This elevation could be increased at the corner property fronting both the ocean and river entrance. However, this should be decided based on information available during the final design phase.

The San Dieguito Lagoon Resource Enhancement Program recommends an excavated river channel depth to -4.0 feet NGVD to keep the river entrance continuously open. The protective structure toe elevation of -4.0 feet NGVD recommended along the ocean fronting shoreline could require deepening along the river entrance shoreline. It would depend on the actual location and details of river channel improvements in relation to the property shoreline area. Actual toe elevation requirements should be verified during the final design phase.

Preliminary design of proposed shore protection structures have been based on typical soil properties for the beach sands that exist at Del Mar. A sandy soil condition was assumed for the entire depth of proposed structures. If competent bedrock conditions were encountered this could reduce required pile lengths and affect construction techniques. Also, it is essential to identify elevations and thicknesses of buried cobble layers as this will affect the type of wall suitable for site conditions, construction techniques and construction costs. Therefore, a detailed soil boring program and report is recommended at the initiation of the final engineering design phase. This program could be minimized if a stone revetment is selected as the shore protection structure.

Design criteria used in this study are summarized below:

- stillwater elevation (including 1.5 feet wave setup) of +6.8 feet NGVD (+9.4 feet MLLW)
- breaking wave height at shoreline of 8.0 feet (wave period range of 6 to 14 seconds)
- shore protection structure crest elevation of +16 feet NGVD
- shore protection structure toe elevation of -4 feet NGVD
- shore protection pile bottom elevations are individually designed as shown per structure
- soil boring program and report required.

SHORE PROTECTION STRUCTURES

Coastal shore protection structures are typically constructed of stone, timber, concrete, steel or some composite of these materials. These structures consist of revetments, retaining walls, gravity walls, anchored walls, cantilever walls, alongshore parallel structures, offshore parallel structures or groins. There are endless design combinations of structural members, construction materials and design configurations making up these structures. There are also many examples of structural failures as well as successful structural performances.

Alternative Protective Structures

At the initiation of this study a meeting was held with the City Manager of Del Mar to review our list of alternative protective structures. Four alternative structures were to be selected from this list for inclusion into this preliminary engineering study. The City's objective is to select an alternative design that will provide the highest degree of protection with the least adverse impact and is cost effective. The initial list included several concepts of cantilever, anchored and double rowed pile supported vertical wall systems; stone and pile supported concrete revetments included with low retaining walls, and composite revetment/vertical wall systems; two lines of protective structures with a perched beach between structures using combinations of revetments, vertical walls and retaining walls; and such structures as groins and offshore breakwaters.

Four structures were selected from this list which we voluntarily increased to six. These six shore protection structures considered in this study are the following:

- an anchored vertical wall with timber piling and planks
- a cantilever vertical wall with concrete piling and timber planks
- a cantilever vertical wall with concrete piling and panels
- an anchored vertical wall with concrete piling and panels
- a cantilever vertical wall of concrete sheet piles
- a stone revetment.

Also, a couple of other structures were considered further but were eventually deleted and are therefore not included in this study. Four of these structures were a vertical wall with steel H-piling and timber planks, a vertical steel sheet pile wall, a stepped concrete revetment support by piles, and a stone revetment with a curved concrete wave deflector supported by piles. These structures were deleted due to cost, construction or material concerns. The latter two structures were not cost effective when compared to other structures. The former two structures are feasible, however, steel would require concrete coating or other form of protection above the point of maximum scour depth and the driving of H-piles is critical to insure proper alignment for the placement of planks.

A shore protection scheme using two lines of protective structures with a perched beach between them was deleted for several reasons. A combination of structures required to insure adequate protection to shoreline buildings is not cost effective and could result in adverse nearshore current conditions to swimmers. It could also cause access and safety concerns across the outer structure during various tide and sand level stages, and require maintenance to maintain the perched beach and outer structure.

Offshore structures including groins were considered less desirable than revetments and vertical walls in providing adequate protection to the shoreline buildings. They were therefore deleted in this study.

Construction Materials

Construction materials have been considered for their structural properties, durability in a coastal environment, ease of installation and cost. Wood is the oldest waterfront construction material for piles and lagging. However, wood must be protected from fungi, bacteria, insects and marine organisms by proper treating with an oil base preservative. Wood piles and lagging can easily be damaged by abrasion from floating deris. Wood planking (lagging) can also easily be destroyed by wave action if the backfill behind the wall is missing. Wood piles can be driven, jetted or dropped into predrilled holes, depending on site soil conditions. Properly treated, they are expected to last 20 to 30 years with normal maintenance. Wood lagging is expected to last no longer than 20 years before requiring replacement.

Properly engineered and installed concrete walls are expected to last 50 plus years with minimum annual maintenance. Concrete walls are very durable to weathering and are resistant to abrasion. The major concern with concrete walls is the corrosion of reinforcing steel, if exposed. Coated reinforcing steel can be used to diminish this concern. It is desirable to construct concrete walls with precast units in the water zones. Concrete piling can be formed with a steel H-pile tip or be fitted with a steel tip for driving or jetting of piles, if dictated by site soil conditions. Piles either jetted or dropped in predrilled holes will minimize damage.

Steel H-piles and steel sheet piling have been used for years in waterfront application since they have excellent strength and mechanical properties. However, they are highly susceptible to chemical and galvanic deterioration. They can experience rapid corrosion through oxidation and rust, especially in the wet-dry tidal area and at the sandline. Therefore, steel walls require protective coating or cathodic protection, and annual maintenance. A high-strength, low-alloy steel of ASTM designation A690 will provide greater resistance to corrosion than standard steels. Steel piles can be driven or jetted in place. A steel wall is expected to have a life span on the order of 20 plus years.

Stone is used in many coastal applications. A proper engineered and installed revetment of good quality stone can be very successful as a shore protection structure, and has lower costs compared to vertical walls. It is important to use sound, hard, durable stone of high specific gravity. Construction of a stone revetment is less involved as compared to the construction of a vertical wall system. Stone revetments should have long life spans but can require some maintenance due to settlement and stone dislodgement.

Preliminary Design

A preliminary design has been performed for each of the identified six alternative shore protection structures. Design criteria discussed in this report was used in these preliminary designs. The site's subsoil conditions require verification before final design of vertical walls. Also, any design details would be specified during the final design phase.

Figure 8 shows the design of an anchored vertical wall constructed with timber piles and timber planks. A timber wall constructed of 4x12 inch treated timber lagging to a depth of -4 feet NGVD is shown. This wall is supported by 12 inch diameter - 44 feet long treated Class A timber piles spaced 4 feet on center. Lateral support of this wall system is provided by tie rods placed 10 feet on center attached to the wall by a treated timber whaler using two 4x16 inch timbers. The tie rods are anchored to concrete deadman anchors placed 20 feet on center and located approximately 50 feet behind the wall. A timber wave deflector is recommended at the top of wall to help in reducing wave runup. A stone toe section is recommended as shown in front of the wall to help in reducing both wave runup and excessive scour along the wall face. A gravel filter and filter cloth is recommended directly behind the face with weep holes constructed through the wall face. This is to reduce the hydrostatic pressure directly behind the wall, and decrease the potential for the piping of backfill materials.

The deadman anchor system shown in Figure 8 would place the wall approximately 55 feet seaward of the building line so the deadmen could be located in front of the buildings. It is our opinion that this distance encroaches too far onto the beach and would aggravate beach rebuilding during times of low beach profiles. There are alternative anchor systems that could be considered if this shore protection plan was selected. The wall could be located approximately 30 feet seaward of the building line and soil anchors could be slant drilled approximately 60 feet in length, 10 feet on center and 20 to 30 degrees from the horizontal. This would place them beneath the buildings. A third alternative would be to place the shown anchor system between houses and supplement this system with soil anchors where required. A fourth alternative would consist of concrete pile anchors located about 15 feet behind the wall as shown for the anchored concrete wall in Figure 11.

Figure 9 shows a cantilever vertical wall constructed with concrete piles and timber planks. This wall is constructed with 4x12 inch treated timbers to elevation -4 feet NGVD (as was the previously discussed wall) and is supported by 20 inch square, 36 feet long precast, prestressed concrete piles at 10 feet on center. A curved concrete pile cap would be formed and poured-in-place. This curved cap would help in reducing extreme wave runup. Stone toe protection, gravel filter, filter cloth and weep holes would be constructed as shown and discussed previously.

A cantilever vertical wall constructed of concrete piles with concrete panels is shown in Figure 10. This wall consists of 12 inch precast concrete panels to elevation -4 feet NGVD supported by 20 inch square, 36 feet long precast, prestressed concrete piles at 10 feet on center. The curved concrete pile cap, toe stone, gravel filter, filter cloth and weep holes are the same as previously shown and discussed.

An achored vertical wall constructed of concrete piles and concrete panels is shown in Figure 11. This wall is constructed with 12 inch precast concrete panels to elevation -4 feet NGVD supported by 18 inch square, 30 feet long precast, prestressed piles at 10 feet on center. These piles are supported by anchor piles through a tie rod system as shown in Figure 11. The anchor piles are 18 inch square, 26 feet long precast, prestressed piles at 20 feet on center. The concrete pile cap, stone toe protection and gravel filter system are shown as previously discussed.

Figure 12 shows a cantilever vertical wall constructed with concrete sheet piles. This system consist of 12 inch x 48 inch x 40 feet long precast concrete sheet piles. A concrete pile cap stone toe protection and gravel filter system are shown as previously discussed.

A stone revetment is shown in Figure 13. This revetment is shown constructed to a slope of 1.5 horizontal to 1.0 vertical It has an armor zone consisting of two layers of 1.5 to 3 ton stone, a secondary zone of two layers of 200 to 400 pound stone and a 6 to 12 inch layer of 5 to 20 pound stone against a filte cloth. The toe depth is shown to elevation -4 feet NGVD.

The wall panels or lagging shown for the above-discussed vertical walls can be designed and constructed in several manners. They are shown on the landward side of the pilings instead of the seaward side or between the piles. Also, timber wall lagging is shown running horizontal versus running vertical which eliminates whalers. Details of connecting wall panels or lagging to the piling, and joint connections of wall panels would be selected during the final design phase.

For site subsoil conditions consisting of sands, piles would more than likely be jetted in place or predrilled and dropped in place. Driving of piles in non-cohesive soils such as sands would probably result in damaged piles before reaching required pile depths. Drilling would require drill mud and more than likely casing to keep holes from caving in during drilling. Jetting of piles would be the desirable technique for pile installation. If there was difficulty in obtaining the required pile depth due to dense sands, composite concrete piles with steel tips could be designed so that the steel portion would be jetted through the denser sands. However, cobble layers could pose problems to the jetting of either piles.

The timber pile wall shown in Figure 8 could prove too difficult for the jetting of timber piles to the required depth. The concrete sheet pile wall shown in Figure 12 or a steel sheet pile wall could also pose problems for installation. These concerns and the actual pile design of a pile supported wall would be addressed during the final design phase after review of a soils report and its recommendations.

SHORE PROTECTION RIGHT-OF-WAY

It is recommended that shore protection structures be located on a line approximately 25 to 30 feet seaward of the outer building faces. Seaward of this point would result in reduced preservation of the beach area for public use, and would also result in a steeper beach profile which can accelerate erosion of the beach face. Shore protection structures could be located closer to the building face, however this would decrease protection to the shoreline buildings during extreme storm events unless the shore protection crest elevation was raised above the recommended +16 feet NGVD. Construction of protective structures would also be more difficult resulting in increased construction costs.

The above recommendation of 30 feet seaward of the building line would place the vertical face of wall structures approximately along the "line 10 feet west of seaward boundary of existing sewer easement" between Jake's Restaurant and 21st Street, and just inside of the "sand berm - sand bag line" between 21st Street and San Dieguito River's south bank as shown on the property map titled, "Ordinance No. I, Exhibit 'A', Protection Lines". For shore protection along the bluff area south of Jake's Restaurant, the protective structure is recommended along the toe of bluff. The location of shore protection along the river bank between the Camino del Mar bridge and the ocean entrance would have to be determined after detailed examination of the existing shore protection and the planned improvements for the San Dieguito Lagoon Resource Enhancement Program.

Right-of-ways required for cantilever wall systems consist of a few feet for the wall and piling, running parallel to the shoreline at the proposed wall location. The top of pile cap would be at the recommended crest elevation of +16 feet NGVD. Buried below grade level would be the proposed gravel filter system as shown on the design drawings. In addition, the recommended toe stone would require a bottom width of about 14 feet, however, only about 9 feet of this would be exposed at the shown low beach profile and none of this toe stone would be exposed for mid-beach profiles and higher. Anchored wall systems would require below grade right-of-ways as shown and discussed in the Preliminary Design section of this report.

For a stone revetment it is recommended that its outer crest point be located between 20 and 30 feet seaward from the building face line, and preferably no closer than 25 feet. It is shown in Figure 13 at 30 feet. As designed, the revetment requires a total horizontal right-of-way of about 40 feet along the shoreline. During an extreme low beach profile about 35 horizontal feet is exposed, while during a high beach profile about 20 feet is exposed. Since a revetment uses up more horizontal beach front than a vertical wall structure it would have to be located closer to the building face to preserve as much beach area as the vertical wall structures. This, in turn, could reduce its degree of protection unless it were raised in height.

Right-of-ways will also be required for structure returns due to wall discontinuities for vehicle access to the beach or for any other reason. These returns are required to prevent flanking during storm conditions. Also, pedestrian beach access by steps over shore structures could require some right-of-way. Construction of right-of-way requirements are discussed in the following section of this report.

SHORE PROTECTION IMPACTS

Shore protection impacts discussed include estimated protection provided by the structure, affect on beach erosion, aesthetics, construction right-of-way, public access, and long-term stability and maintenance of the structure. The vertical wall structures discussed in this report will usually have similar impacts, therefore they will be discussed as one in those cases.

Degree of Protection

The best natural protection is a wide sandy beach. However, when storm conditions reduce the beach front, shoreline protection is usually required in some form. The recommended design and location of structures in this report should provide a high degree of protection to the shorefront buildings during extreme storm events, such as occurred in the winter of 1982-3. During such an event it is possible that water could overtop the shore protection structures by three to five feet for short durations. This should not be in the form of continuous sheet flow, but would result in water directly behind the wall. For the recommended location of structures and the limited times of overtopping occurrence the shoreline buildings should be satisfactorily protected, however there should be an adequate drainage system to handle this water.

Since the stone revetment is a rubble, porous structure it should result in less wave overtopping than the recommended vertical wall structures. It is essential that the vertical wall structures include a curved pile cap and sufficient toe stone; otherwise they could allow higher wave overtopping unless they were raised in crest elevation.

Beach Front Erosion

Properly designed vertical walls and revetments will stop erosion landward of their location, however they will not stop offshore erosion. A sloping rubble revetment will result in less frontal beach erosion than vertical walls. The permeable stone revetment will help to dissipate wave energy while the impermeable vertical wall will reflect wave energy resulting in more frontal beach erosion. These structures should have little impact on adjacent shorelines when located as recommended. The recommended toe stone shown for the vertical wall system should help to reduce frontal beach erosion for the lower beach profile conditions.

None of the recommended structures will help to maintain or re-establish the beach area. However, a sloped stone revetment can accumulate beach sands in its toe area due to its dissipation of wave energy. It is important to maintain a beach area in front of these structures through natural or artificial beach nourishment. Both the revetment and the vertical walls could have a negative impact on the frontal beach erosion at the far north end of the site where presently no beach area exists. However, they should have minimum impact when located as recommended for the areas which have some beach front over the tidal range, except during severe storm conditions when their primary purpose is to provide protection from flood damage. When the revetment and the vertical walls are located at the same location along the shoreline the revetment should have less adverse impact on frontal beach erosion than the recommended vertical wall structures.

Aesthetics

The vertical walls discussed in this report will have the same visual impact in terms of location, height and exposed surface area, except the timber wall if it were located further seaward as shown in Figure 8. However, these structures will have varied aesthetic impact depending on an individual's perspective. Piling will either be exposed on the wall's exterior face or hidden behind its face. Timber walls would have piles 4 feet on center, while concrete piles would be 10 feet on center. The exposed wall's face would be concrete ~~or~~ timber planking. The concrete face could be painted a selected color if desired. During high beach profiles only the pile cap would be exposed. During mid to high beach profiles the stone toe protection would not be exposed while some stone would appear during low beach profiles.

Figure 14 shows a one point perspective of a recommended vertical wall system during a low and high beach profile. The water level is shown at mean tide, while first floor elevations of homes are shown at around +13 to +14 feet NGVD. The beach width increases by about 200 feet between the low and high profiles during a mean tide level. Views from beach front homes across the protective structures would depend on the location point of viewing but these can be visualized from the perspective in Figure 14. If an individual was sitting in a chair near a beach front window looking toward the water and their eye level was four feet above a floor elevation of +13.5 feet, then they would not see the beach. They would see the ocean at approximately 400 feet away during a mean tide level. If that individual was standing, he would see the beach about 150 feet away during a high profile, and the ocean about 250 feet away during a low profile.

An individual sitting on the beach would only see the exposed pile cap during a high beach profile. During an extreme low beach profile there would be little beach area at mean tide level. However, about five vertical feet of stone would be exposed with 9 feet of wall above this stone.

The stone revetment would look massive in size compared to the vertical walls, and it would take up much more space in beach area except at an extreme high beach profile. During a high beach profile a majority of the stone revetment is buried. Figure 15 shows a one point perspective of the stone revetment during low and high beach profiles. Visual views across the structure from beach front homes would be the same as described for the vertical walls. An individual sitting on the beach would see approximately 25 feet of surface length during a low beach profile and about 8 feet of length during a high beach profile.

Construction Right-of-Way

Construction right-of-way includes the area required by the contractor during the construction of shore protection structures. There will be construction differences between the described vertical wall systems, however, the construction sequence and length of construction area required will be similar. Anchored wall systems could require additional lateral area depending on the anchor system, and would require an additional construction sequence for anchor and tie rod construction. As an example, the projected construction sequence for a cantilever concrete vertical wall is as follows:

1. Remove existing stone seaward of new wall area.
2. Drive piles continuously across the site area. This operation will require about 200 feet of beach length moving at the rate of approximately 200 feet per week.
3. Excavate sand, set precast concrete panel wall, pour concrete joints and partially backfill.
4. Install gravel wall drain, backfill behind wall to pile cap and install toe stone, concurrently.
5. Form and pour pile cap, strip forms and complete backfill.

Construction steps 3 through 5 will require approximately 1,000 to 1,500 feet of beach front with each operation requiring about 200 feet and moving at a rate of about 200 feet per week. Construction time in front of any residence is expected to be one week for pile driving followed by seven weeks for wall construction.

The contractor will require approximately 40,000 to 80,000 square feet of land for a construction yard. He will also require three beach access areas that move with the construction sequence. The vertical wall construction would require about two months for mobilization and 12 months for wall construction.

Construction of the stone revetment would require about 1,000 feet of moving beach front area. This operation would consist of the following sequence:

1. Move existing stone from first 200 feet of beach front to a storage area. Thereafter, move existing stone to new revetment if it can be reused. This stone could also be moved seaward to provide protection from the tide and waves.
2. Excavate sand and grade revetment slope.
3. Install filter cloth.
4. Install small stone to armor stone layers in lower half of revetment.
5. Install small stone to armor stone layers in remainder of revetment.

This entire operation should move at the rate of about 250 feet per week. Construction time in front of any residence should be about 3 weeks. The stone revetment construction would require about one month for mobilization and 7 to 8 months for construction. This protection scheme would be the easiest from a construction standpoint, while the two anchored vertical walls would be the hardest. The difference between the three cantilever vertical wall systems would depend on site soil conditions.

Public Access

Steps across the protective structures to the beach should be required at each street intersection for public access. Steps would be constructed within the stone revetment face, while steps should lead parallel to the vertical wall's face. A minimum of two streets should be opened for vehicle access to the beach.

Access along the water's edge would be less for the stone revetment when its crest is located at the location of a vertical seawall. It would result in approximately 10 feet less of horizontal beach usage when compared to a vertical wall with toe stone during low and mid beach profiles. During a high beach profile it would result in about 5 feet less of horizontal beach. This distance could be offset some if the revetment were moved five feet landward.

Long-Term Stability and Maintenance

The two cantilever concrete vertical walls shown in Figures 10 and 12 should have the longest life with a minimum of annual maintenance. They can have an expected life of 50 years. A properly designed stone revetment of good quality stone should have a life pushing 50 years. However, it could require more annual maintenance due to some settlement and replacement of dislodged or damaged stone. The anchored concrete vertical wall should also have a long life span, however, if maintenance is required to its anchor-tie rod system, it could be costly.

The timber planking for the cantilever wall with concrete piles shown in Figure 9 has an estimated life of 20 years, therefore its long-term stability is affected unless proper maintenance and plank replacement is performed. The all timber anchored wall shown in Figure 8 has the lowest long-term stability and highest maintenance. Its timber piles have an estimated life of 20 to 30 years while its timber planking has an estimated 20 year life. Also, if the anchor system requires maintenance, it is difficult to reach.

COSTS

Preliminary construction cost estimates are based on the information and assumptions discussed in this report. They assume that shore protection is constructed during one continuous operation. If the project was done in noncontinuous stages, then higher costs could result from demobilization and remobilization of equipment. Also, wherever the protective structure is not continuous, there would be additional lineal footage wall costs for required wall return sections. The site area measures slightly over 6,100 feet in shoreline length. Total construction costs are presented for a shoreline length of 6,300 lineal feet to account for vehicle beach accesses.

Preliminary costs are presented below for construction, engineering design and construction services. Engineering design includes a soils report while construction services include field inspection, field engineering and construction administration. Construction costs are presented as first costs and allow for some contingencies. Costs shown for engineering design and construction services are best estimates.

ANCHORED TIMBER WALL (FIGURE 8)

Construction Camp	$ 37/L.F
Anchor and Wall	780/L.F
Stone and Excavation	160/L.F.
Unit Construction Cost:	977/L.F.
Construction Cost (@ 6,300 L.F.):	$6.16 million
Engineering Design:	300,000
Construction Services:	180,000

CANTILEVER WALL-CONCRETE PILES/TIMBER PLANKS (FIGURE 9)

Construction Camp	$ 37/L.F.
Wall	503
Pile Cap	214
Stone and Excavation	160
Unit Construction Cost	$ 914/L.F.
Construction Cost (@6,300 L.F.):	$5.76 million
Engineering Design:	300,000
Construction Services:	180,000

CANTILEVER CONCRETE WALL (FIGURE 10)

Construction Camp	$ 37/L.F.
Wall	693
Pile Cap	214
Stone and Excavation	160
Unit Construction Cost	$1,104/L.F.
Construction Cost (@ 6,300 L.F.):	$6.96 million
Engineering Design:	300,000
Construction Services:	180,000

ANCHORED CONCRETE WALL (FIGURE 11)

Construction Camp	$ 37/L.F.
Anchor and Wall	1,016
Pile Cap	214
Stone and Excavation	160
Unit Construction Cost	$1,427/L.F.

Construction Cost (@ 6,300 L.F.):	$ 8.99 million
Engineering Design:	300,000
Construction Services:	180,000

CANTILEVER CONCRETE SHEET PILE WALL (FIGURE 12)

Construction Camp	$ 37/L.F.
Wall	541
Pile Cap	214
Stone and Excavation	160
Unit Construction Cost	$ 952/L.F.

Construction Cost (@ 6,300 L.F.):	$6.00 million
Engineering Design:	300,000
Construction Services:	180,000

STONE REVETMENT (FIGURE 13)

Construction Camp	$ 37/L.F.
Stone and Filter	500
Excavation	100
Unit Construction Cost	$ 637/L.F.

Construction Cost (@ 6,300 L.F.):	$4.01 million
Engineering Design:	180,000
Construction Services:	110,000

A simplified benefit-cost ratio was developed for the six alternative designs. This ratio is only for the relative comparison of each alternative design. Therefore, the actual numbers developed could change drastically depending on the assumptions made. The following assumptions were made for this comparison:

- 50 year life of structure
- Tax exempt bonds sold at 10% interest over 20 years to finance the project

- Present worth for a 50 year annual maintenance cost of 1% of the first cost of protective structure
- An additional present worth cost of $166/L.F. to replace timber piling and timber lagging at 20 years and at 40 years for the anchored timber wall (Figure 8)
- An additional present worth cost of $85/L.F. to replace timber lagging at 20 years and at 40 years for the cantilever concrete pile wall with timber lagging (Figure 9)
- There was no consideration given to the negative impact of the protective structure on the beach
- The benefit was arbitrarily assumed so that each protection alternative would save on the average a repair and maintenance cost to shore front buildings and land of $400/L.F. each five years.

Based on the above assumptions, the following benefit-cost ratios were calculated:

1. Anchored timber wall B/C = 0.5
2. Cantilever Concrete pile wall with timber planks B/C = 0.6
3. Cantilever Concrete wall B/C = 0.6
4. Anchored Concrete wall B/C = 0.4
5. Cantilever Concrete sheet pile wall B/C = 0.6
6. Stone Revetment B/C = 1.0.

These shore protection alternatives were also compared by rating their relative impact for those impacts discussed within this report. The ratings assigned were judgemental in many cases and could be rated differently by other raters. A point system of one to six was used with one for the best performance and six for the worst performance. Ratings selected for the six shore protection alternatives (listed by number as described above for benefit-cost ratios) are as follows:

Shore Protection Alternative	1	2	3	4	5	6
Cost	4	2	5	6	3	1
Aesthetics	5	4	2	3	1	6
Ease of Construction	6	3	2	4	5	1
Protection Provided	2	2	2	2	2	1
Beach Erosion	2	2	2	2	2	1
Structure R-of-W	4	1	1	2	1	6
Construction R-of-W	4	2	2	3	2	1
Public Access	1	1	1	1	1	3
Stability/Maintenance	6	4	1	2	1	3
B/C	3	2	2	4	2	1
TOTAL	37	23	20	29	20	24

From the above comparison the cantilever concrete sheet pile wall and the cantilever concrete pile wall with panels rate the most favorable. A soils report would dictate if a sheet pile wall was feasible for construction in the site area. Dense sands with cobble layers would probably rule out a concrete sheet pile wall.

EXISTING PROTECTIVE STRUCTURES

The use of any existing shore protection structures will depend on the shore protection alternative selected, its planned location relative to the shore front buildings and the design, location and condition of existing structures. However, some general comments can be made concerning existing structures. It could be advantageous to use a good portion of the existing shoreline stone revetment. However, this stone would not be left in-place as it now exists, except for possibly one area which will be discussed.

First, the stone could be moved seaward to help act as a construction berm from tide and wave action during construction. Second, it could possibly be reused in either the stone toe sections for the vertical wall alternatives or in the stone revetment. If this stone were moved in one operation from its existing location directly to its new location it could cost approximately one-half the cost of new stone in-place. However, if it were moved in two operations, then the costs would be similar. Therefore, if it was picked up and moved directly to a revetment structure, the revetment costs shown in this report could be reduced by whatever percentage of stone was useable. One potential area for its direct reuse is the shoreline bluff area south of Jake's Restaurant. This shoreline area is suitable for a stone revetment structure acting as bluff toe protection in an area covered with cobbles and exposed beach bedrock.

The stone revetment along the site's northern boundary between the Camino del Mar bridge to the ocean and for a short distance to the south could be incorporated within a new shore protection structure. This area has not been closely inspected.

However, it has a fairly large stone revetment fronting vertical walls of unknown design. This area also is very exposed to storm damage due to its existing low offshore beach profile and to its proximity to the highly active river entrance area during storm conditions. An offshore retaining wall has been proposed by others in this location. This could be helpful and should be considered in shore protection planning along with means to insure a returning beach front for the ocean front in this area.

Most of the existing vertical walls within the study area are probably not suitable for incorporation into the recommended vertical walls described in this report. These walls could remain in-place, for the most part, if new structures were enough seaward of existing structures for construction operations. The affect of new vertical walls presently being constructed between 24th and 26th Streets and planned for other shoreline areas is unknown, as we are unaware of their details.

EXISTING INSTALLATIONS

Some existing California shore protection structures which performed fairly well as protective structures during the winter storms of 1982-83, and which are similar to the proposed structures in this report are identified below. Figure 16 shows a photograph of a pile supported concrete vertical wall with an angled pile cap. This structure is located in southern Solana Beach, a short distance to the site's north. The second photograph shows a steel H-pile wall with timber planks and a curved concrete pile cap which is located at Rio del Mar in Santa Cruz County, California. This type of structure was the seventh alternative before being deleted from this study. It is shown for its curved concrete pile cap as recommended in this report. A cantilever concrete sheet pile system is not shown, however the Coronado Cay development in Coronado, California has several thousand lineal feet of bulkhead constructed with concrete sheet piles.

Figure 17 shows a timber pile wall with timber lagging and wave deflector. This figure also shows a concrete pile wall with timber lagging. Both these structures are fronting homes in Malibu, California. The homes shown in these photographs are vulnerable to severe storms since the walls are located close to the buildings face and the walls are not excessively high. Two other timber walls in Malibu where the walls are offset from the building face are shown in Figure 19.

Figure 18 shows stone revetments located at San Malo, southern Oceanside, and at Seadrift in Stinson Beach, northern California. The San Malo structure was constructed about 10 years ago, and even though it is on the low side during extreme storms, flood damage was reported for only two homes during the 1982-3 winter storms. The stone revetment at Seadrift has just recently been constructed since these homes were under severe storm attack during the 1982-3 winter storms.

* * *

It has been a pleasure to prepare this report for you. We look forward to meeting with you to discuss any comments concerning this report, and in continuing to work with the City of Del Mar on this project.

Very truly yours,

R.M. NOBLE & ASSOCIATES

Ronald M. Noble

RMN/cld

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Map of property boundaries for ocean front lots, "Ordinance No. 1, Exhibit 'A', Protection Lines".

Reproduced aerial photograph maps of the City of Del Mar beachfront, March 1, 1983.

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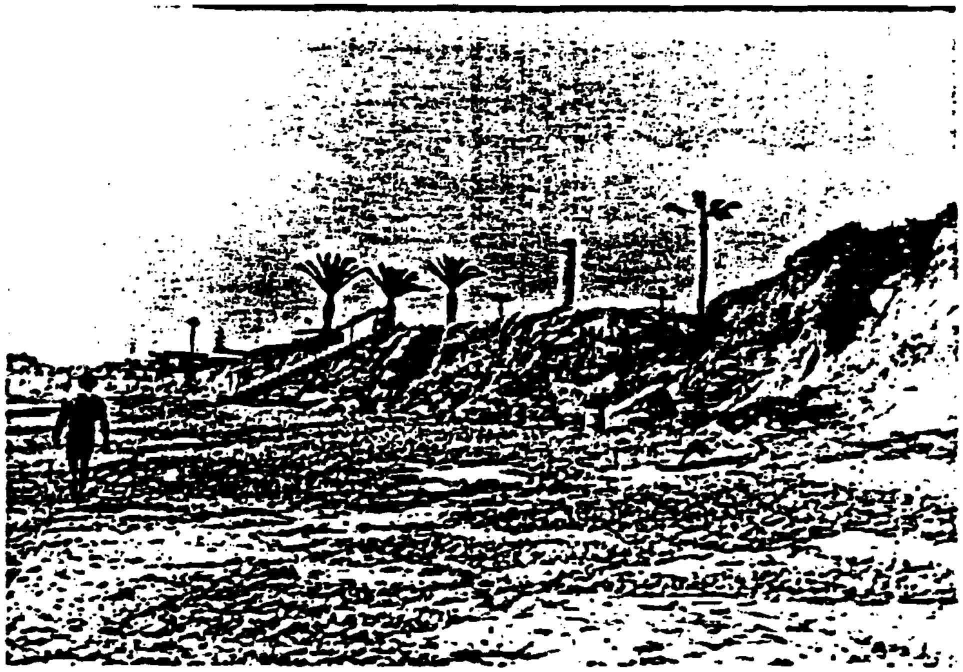
SITE AREA
DEL MAR, CALIFORNIA

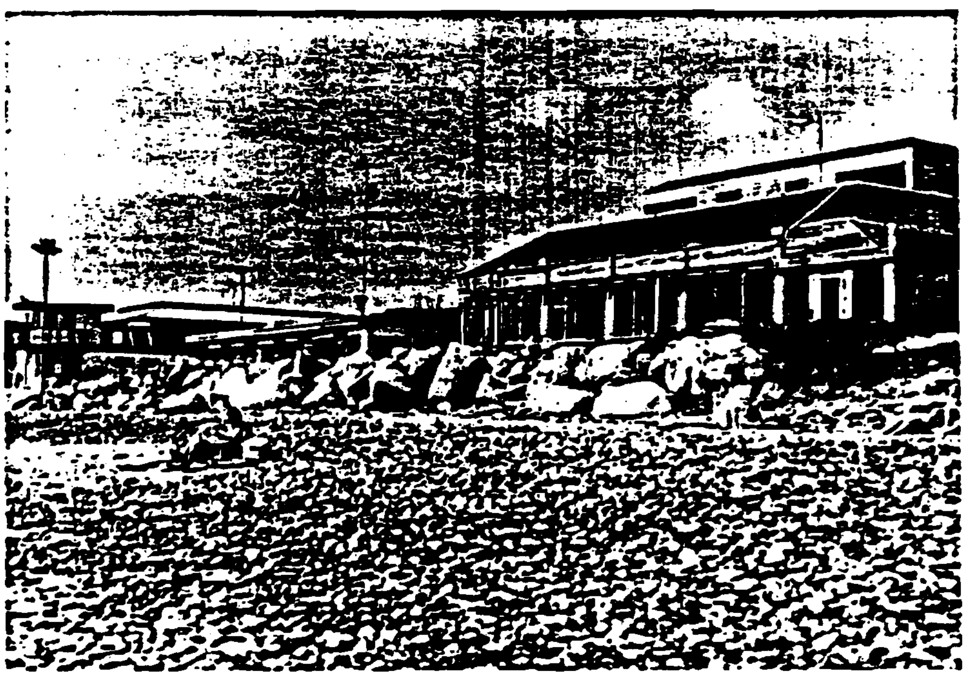
SCALE
0 400 800 1200 FEET

R. M. Noble & Assoc.
CONSULTING ENGINEERS

FIGURE 1



A. LOOKING NORTH FROM 15th STREET EXTENSION

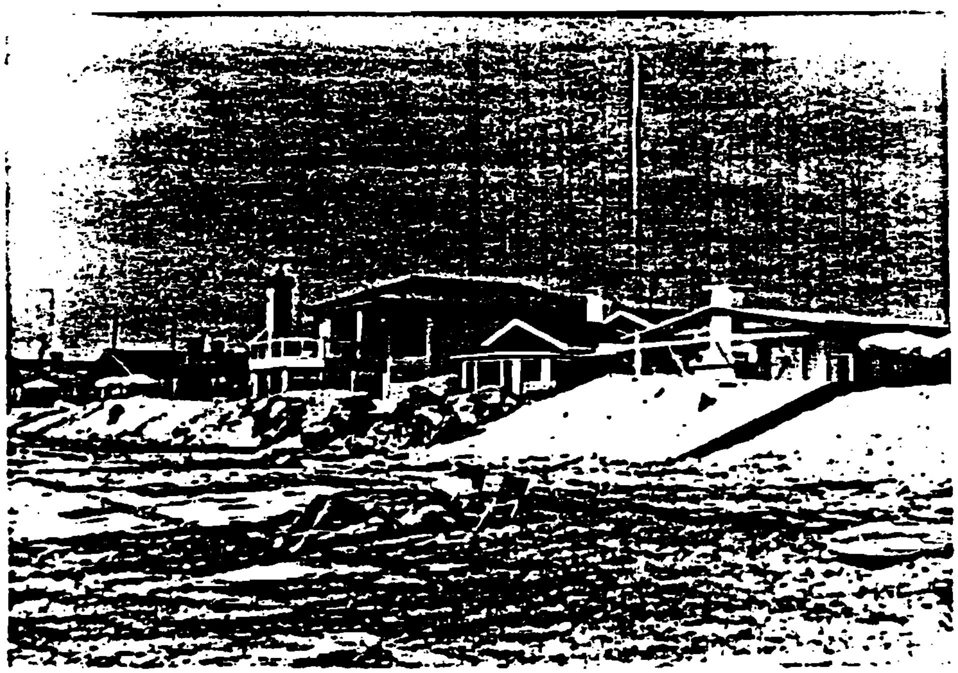


B. JAKES AND POSEIDON RESTAURANTS

PHOTOGRAPHS OF DEL MAR BEACH
(6/13/83)

R. M. Noble & Associa
CONSULTING ENGINEERS

A. 18th TO 19th STREETS



B. 20th TO 21st STREETS

PHOTOGRAPHS OF DEL MAR BEACH
(6/13/83)

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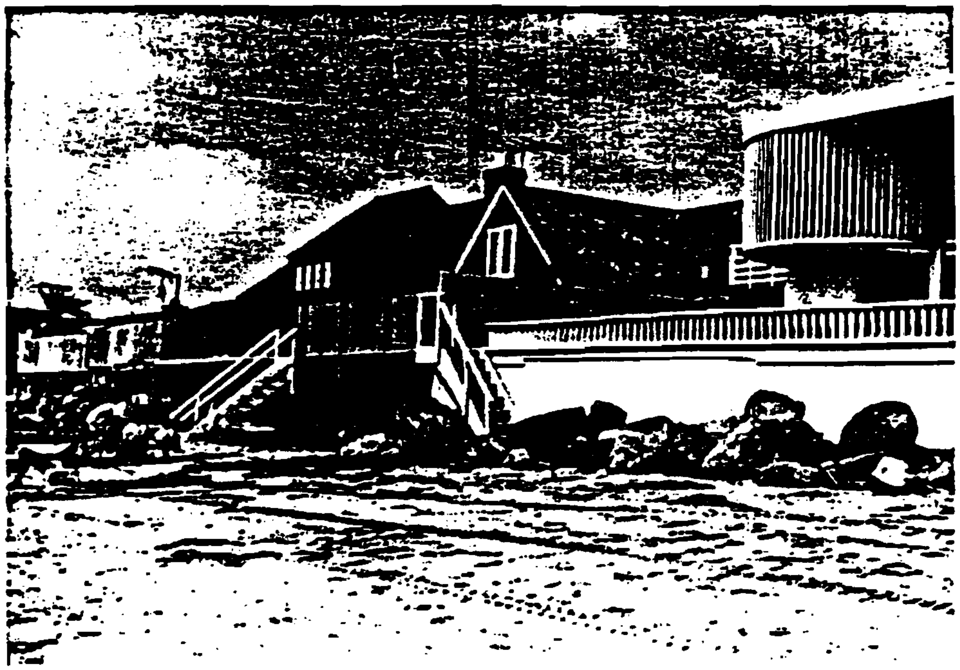

A. 22nd TO 23rd STREETS

B. 23rd STREET LOOKING NORTH

PHOTOGRAPHS OF DEL MAR BEACH
(6/13/83)

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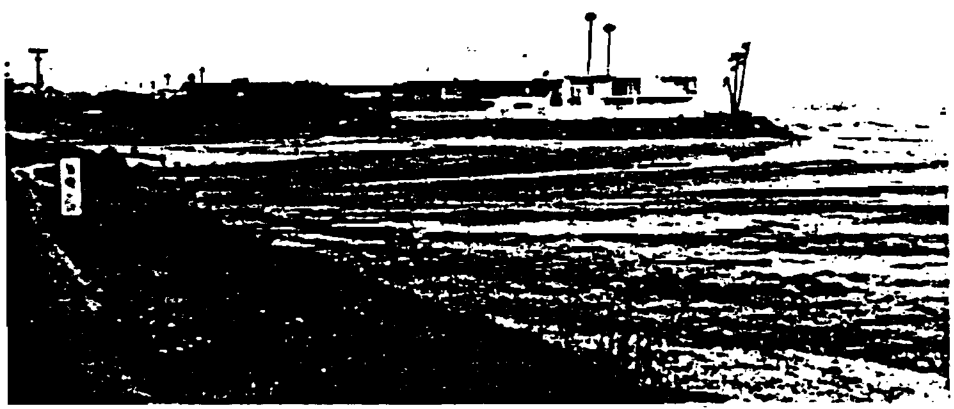
CONSULTING ENGINEERS

FIGURE 4

A. 26th STREET LOOKING NORTH



B. SAN DIEGUITO RIVER ENTRANCE LOOKING SOUTH

PHOTOGRAPHS OF DEL MAR BEACH
(6/13/83)

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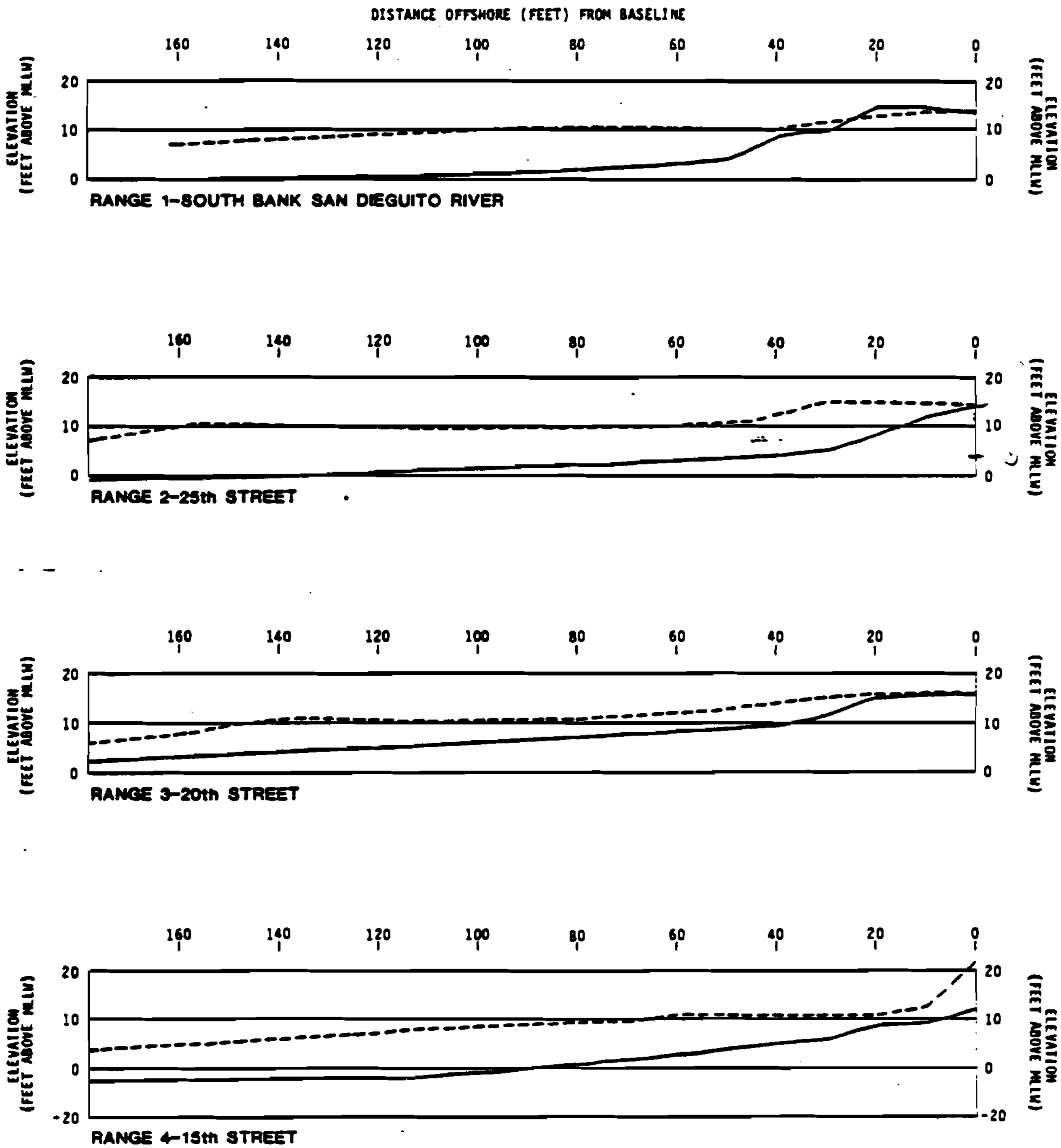

BEACH PROFILES
HIGH(----) AND LOW(——)
DURING MAY 1980 TO MAY 1983
DEL MAR, CALIFORNIA

NOTE: BEACH PROFILES PLOTTED FROM SCRIPPS INSTITUTION OF OCEANOGRAPHY DATA.

R. M. Noble & Associates
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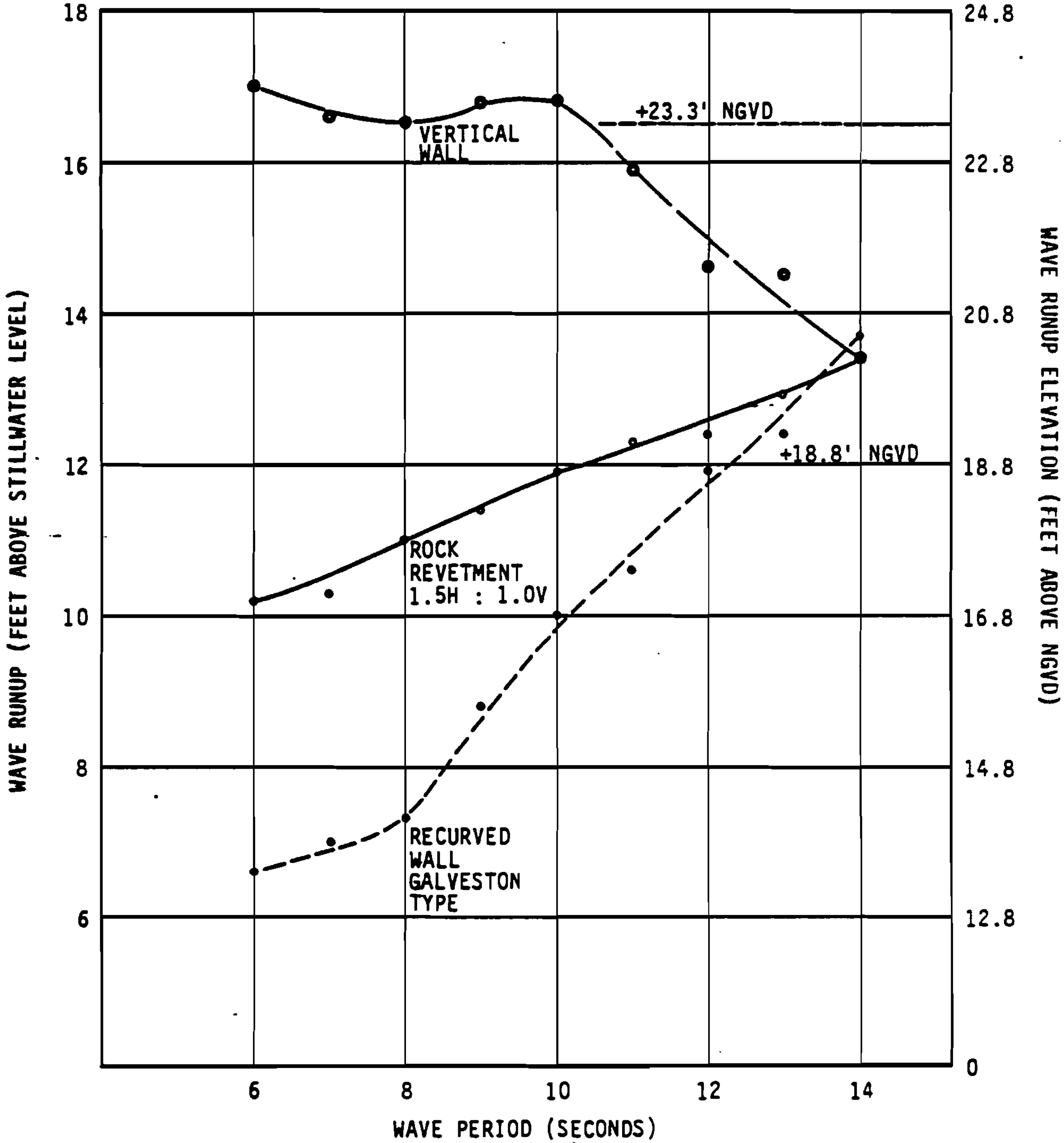
FIGURE 6



WAVE RUNUP VALUES FOR SELECTED SHORE PROTECTION STRUCTURES

DESIGN CONDITIONS:

BREAKING WAVE HEIGHT, H_b = 8.0'

STILLWATER LEVEL, SWL = +6.8' NGVD (+9.4' MLLW)

DATUM: NATIONAL GEODETIC VERTICAL DATUM (NGVD)

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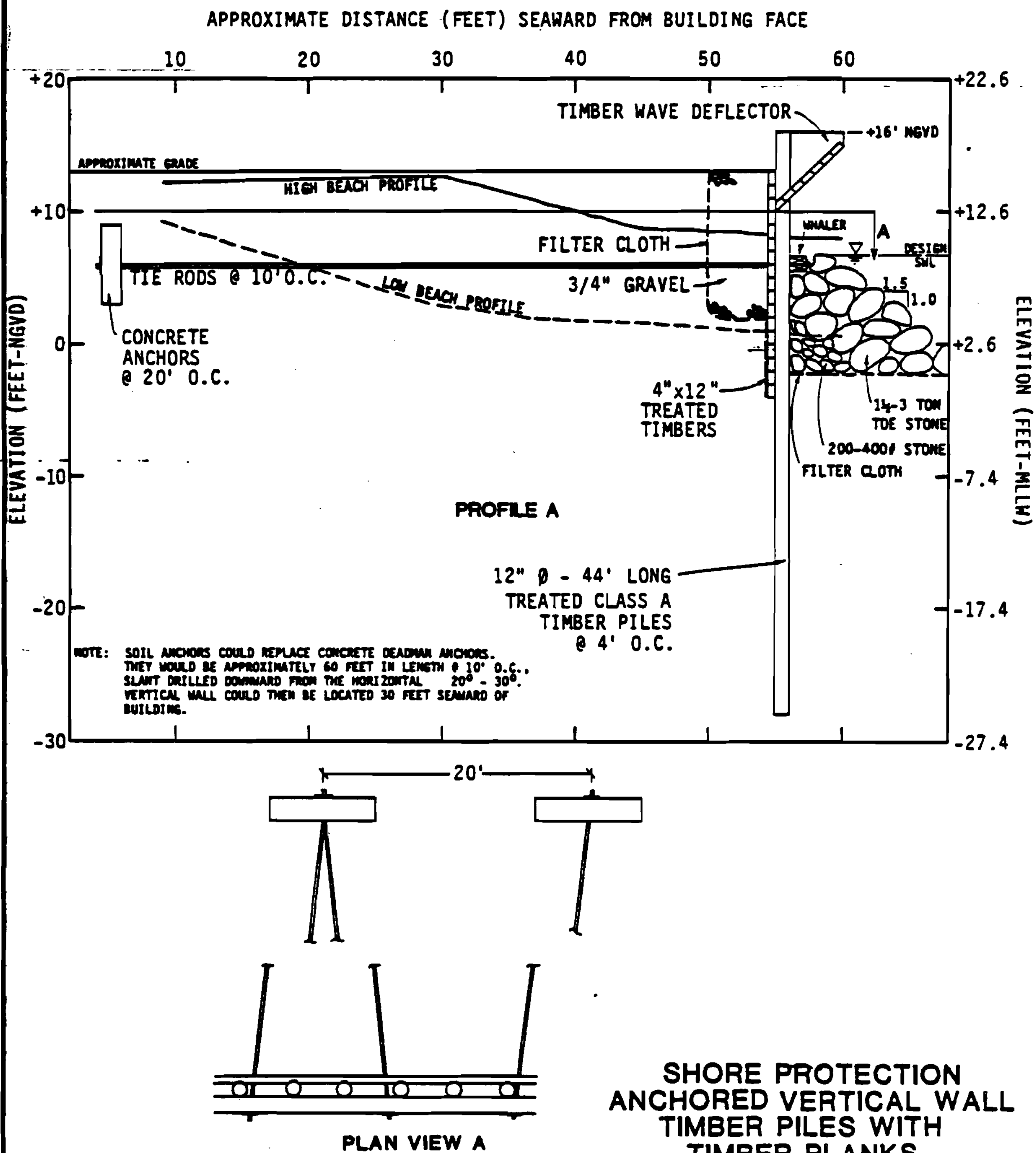
FIGURE 7



SHORE PROTECTION ANCHORED VERTICAL WALL TIMBER PILES WITH TIMBER PLANKS

DATUM: MEAN LOWER LOW WATER (MLLW)
NATIONAL GEODETIC VERTICAL DATUM (NGVD)

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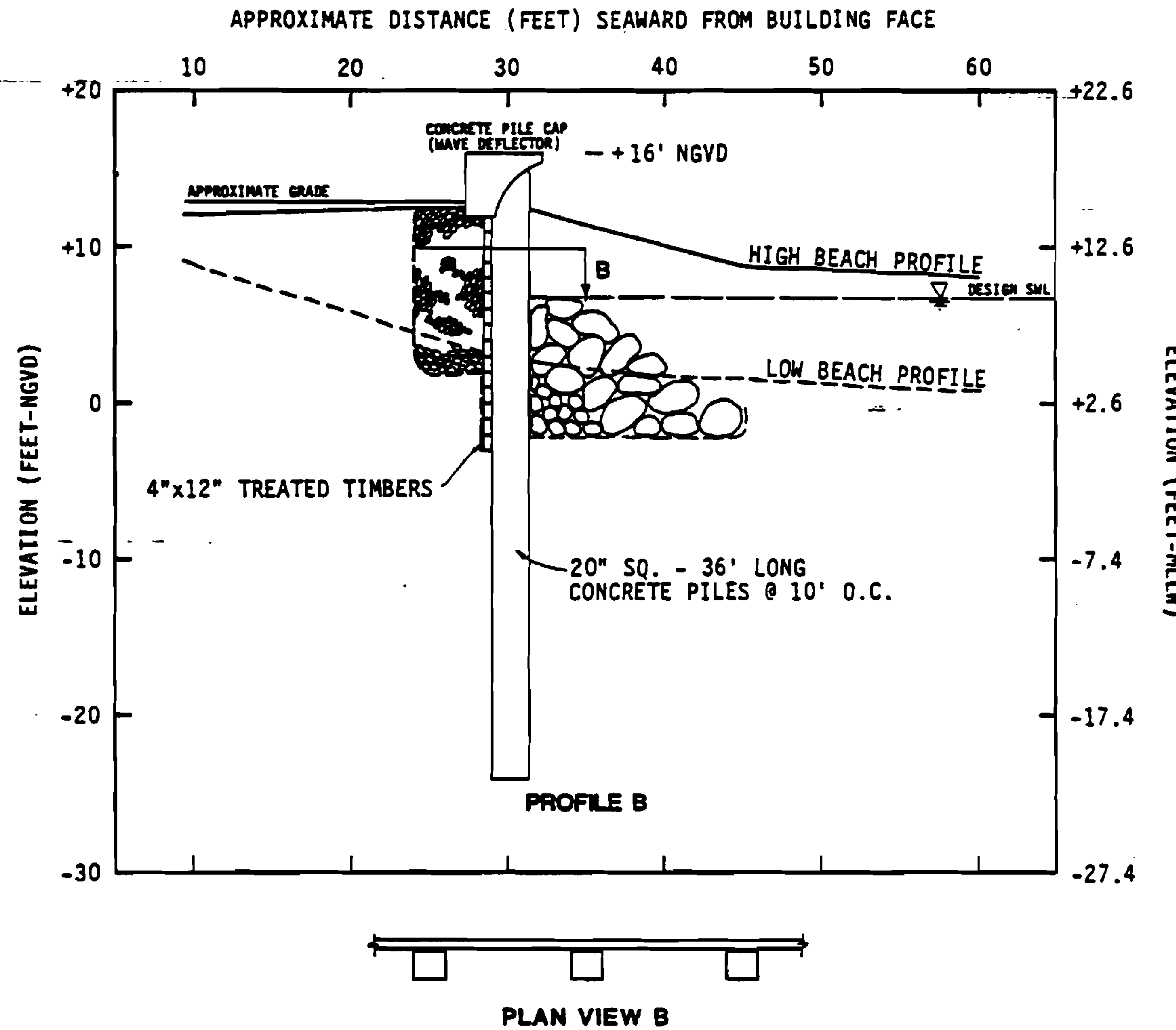
FIGURE 8



SHORE PROTECTION
CANTILEVER VERTICAL WALL
CONCRETE PILES WITH TIMBER PLANKS

DATUM: MEAN LOWER LOW WATER (MLLW)
NATIONAL GEODETIC VERTICAL DATUM (NGVD)

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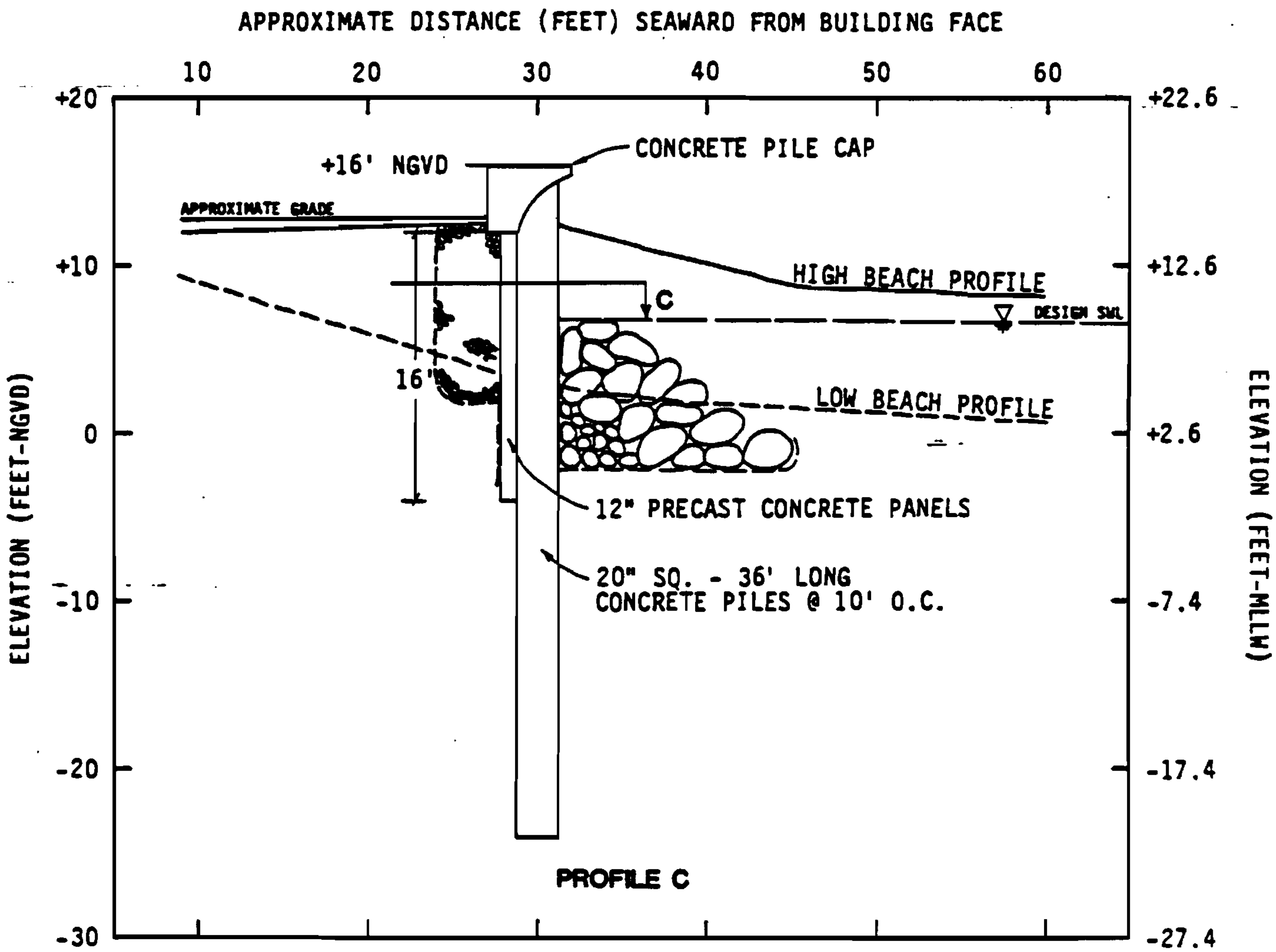
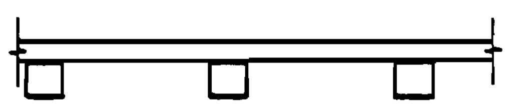
FIGURE 9





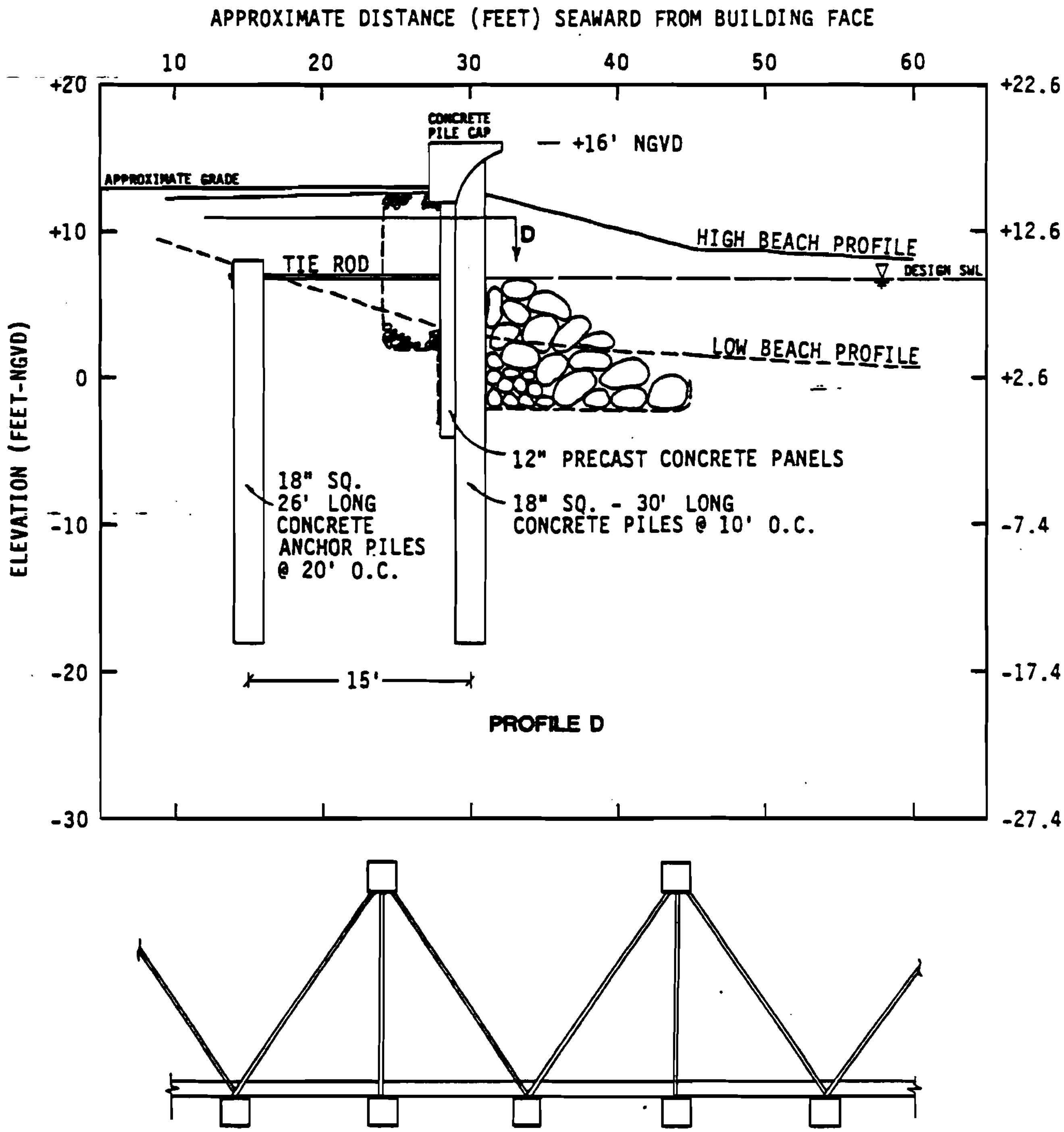
PLAN VIEW C

SHORE PROTECTION
CANTILEVER VERTICAL WALL
CONCRETE PILES WITH CONCRETE PANELS

DATUM: MEAN LOWER LOW WATER (MLLW)
NATIONAL GEODETIC VERTICAL DATUM (NGVD)

R. M. Noble & Associates
CONSULTING ENGINEERS

FIGURE 10



PROFILE D

PLAN VIEW D

SHORE PROTECTION
ANCHORED VERTICAL WALL
CONCRETE PILES WITH CONCRETE WALL

DATUM: MEAN LOWER LOW WATER (MLLW)
NATIONAL GEODETIC VERTICAL DATUM (NGVD)

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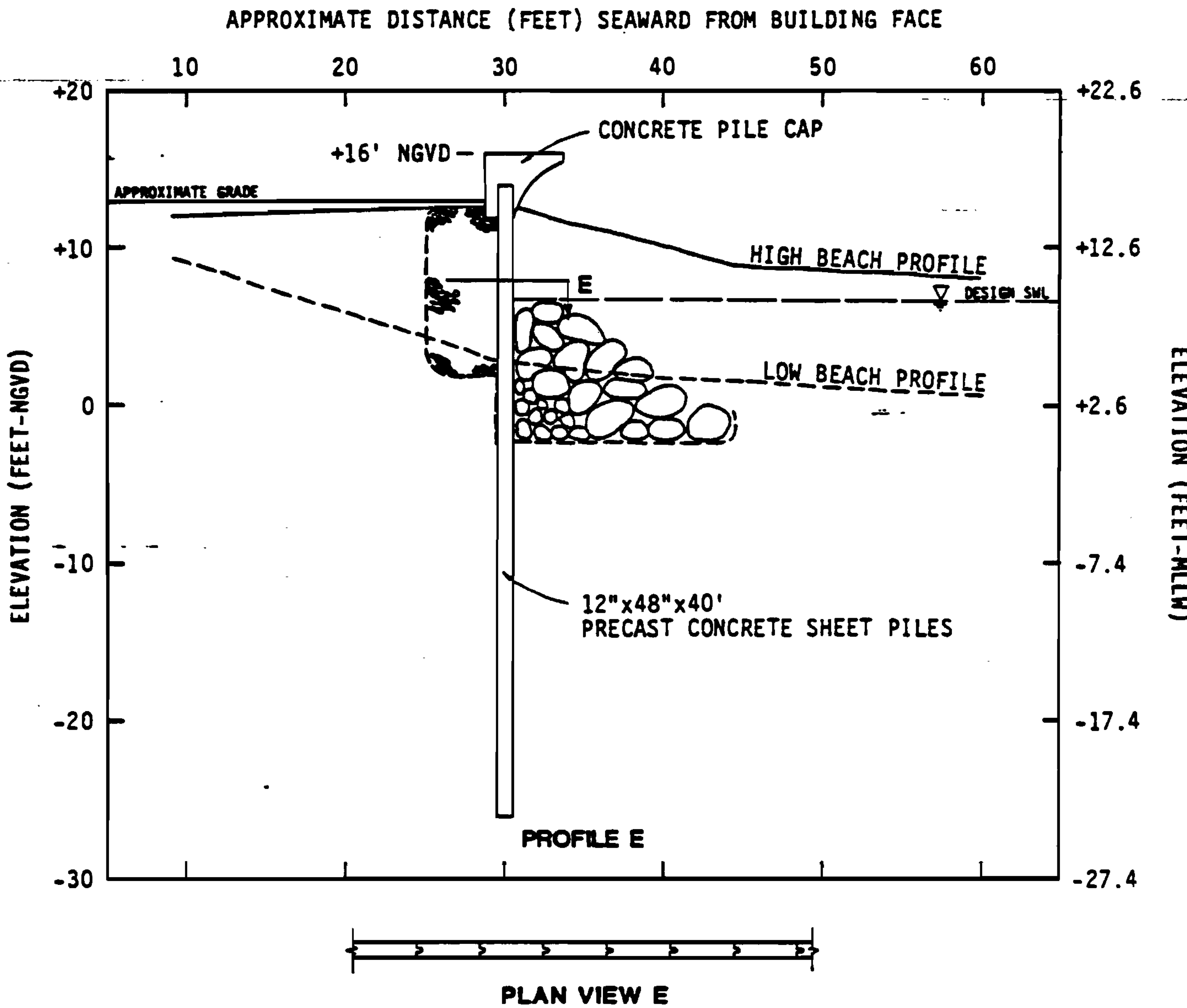
CONSULTING ENGINEERS

FIGURE 11



SHORE PROTECTION
CANTILEVER VERTICAL WALL
CONCRETE SHEET PILES

DATUM: MEAN LOWER LOW WATER (MLLW)
NATIONAL GEODETIC VERTICAL DATUM (NGVD)

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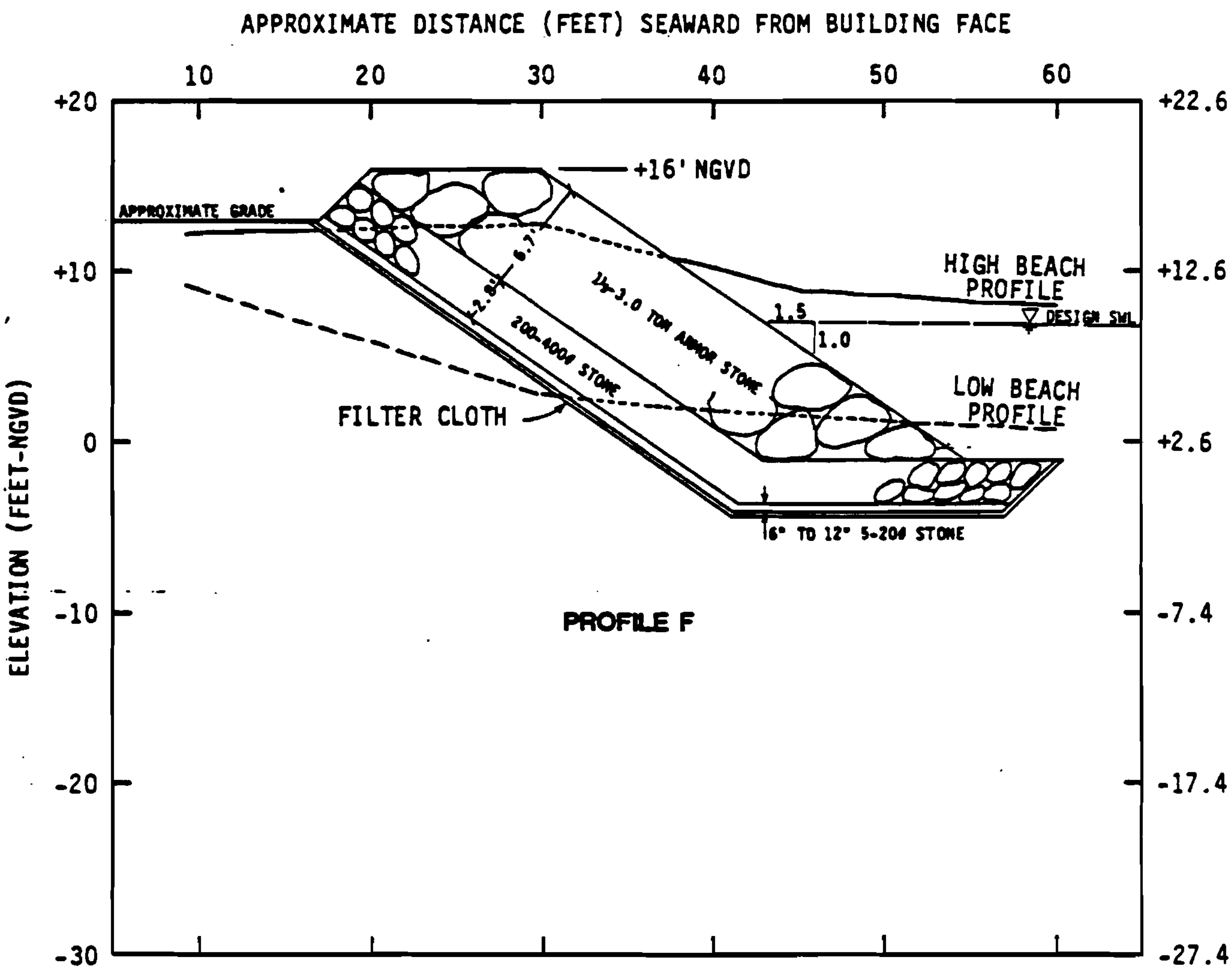
FIGURE 12



SHORE PROTECTION STONE REVETMENT

DATUM: MEAN LOWER LOW WATER (MLLW)
NATIONAL GEODETIC VERTICAL DATUM (NGVD)

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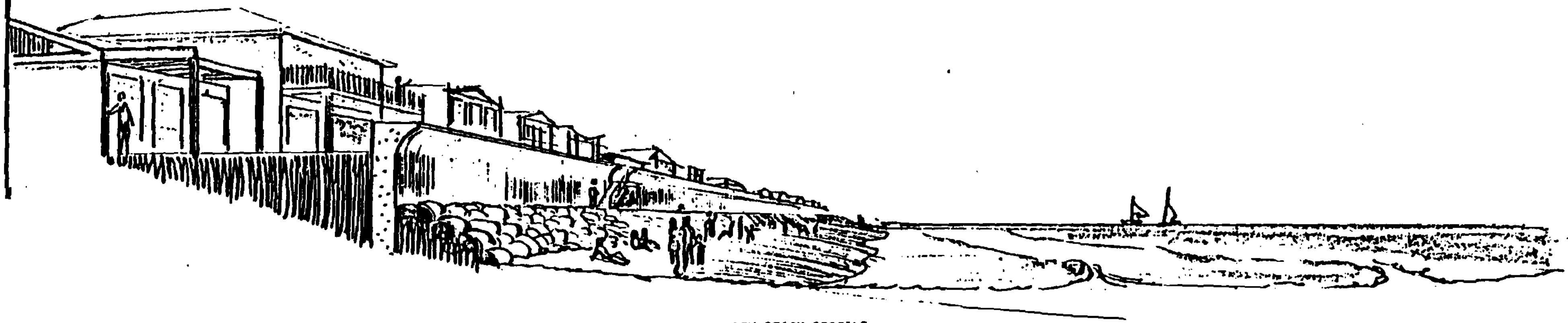
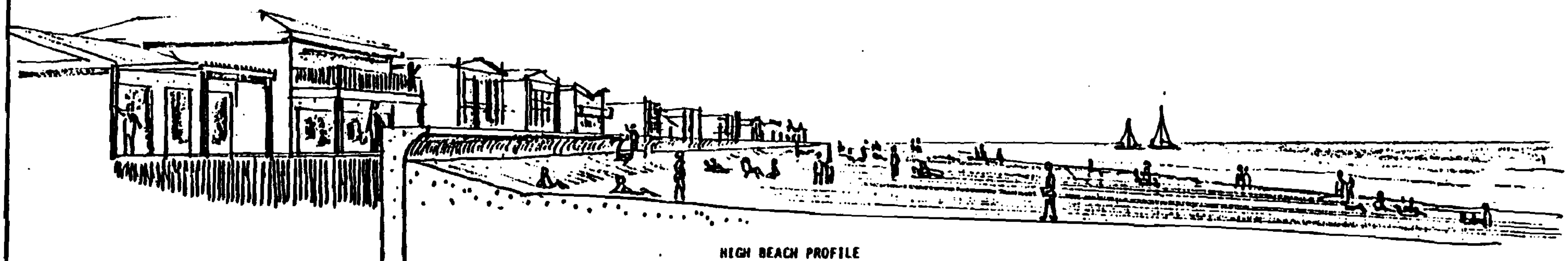
CONSULTING ENGINEERS

FIGURE 13



LOW BEACH PROFILE



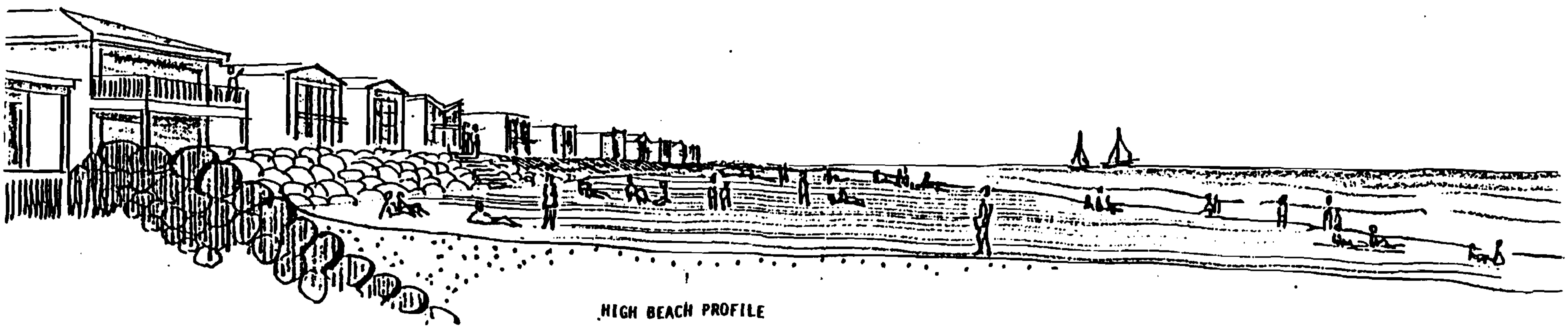
HIGH BEACH PROFILE

VERTICAL WALL
SHORE PROTECTION

R. M. Noble & Associates
CONSULTING ENGINEERS

FIGURE 14

LOW BEACH PROFILE

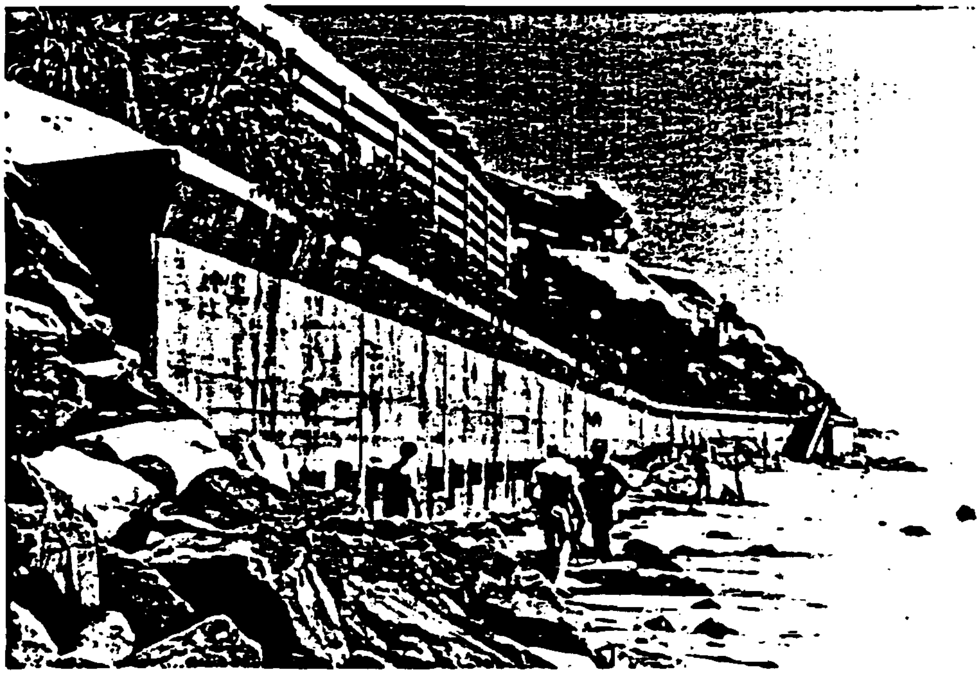


HIGH BEACH PROFILE

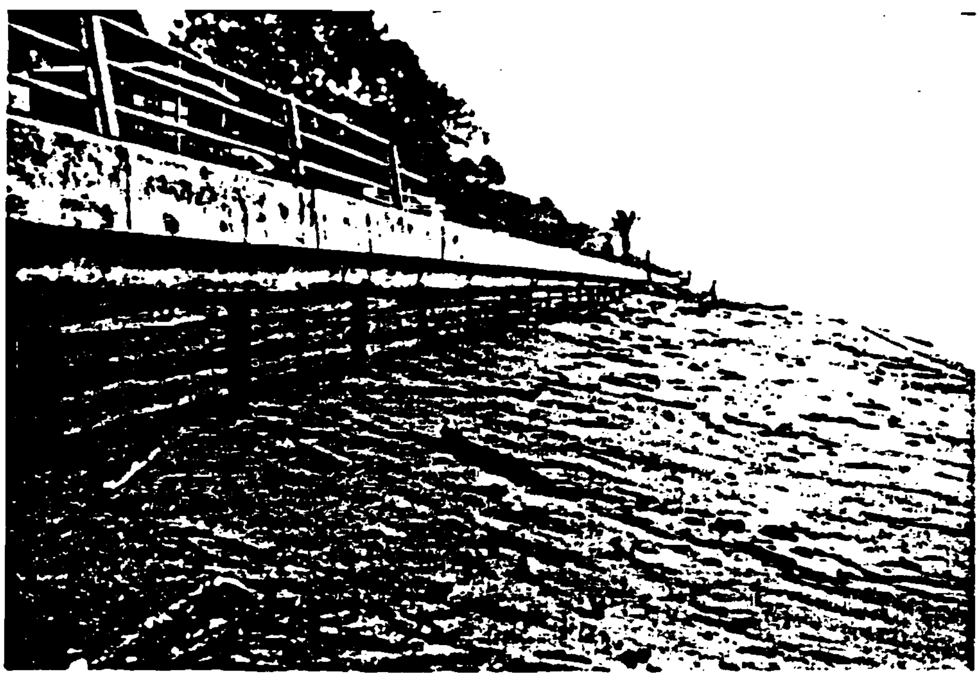
STONE REVETMENT
SHORE PROTECTION

R. M. Noble & Associates
CONSULTING ENGINEERS

FIGURE 15



A. CONCRETE VERTICAL WALL, SOLANA BEACH

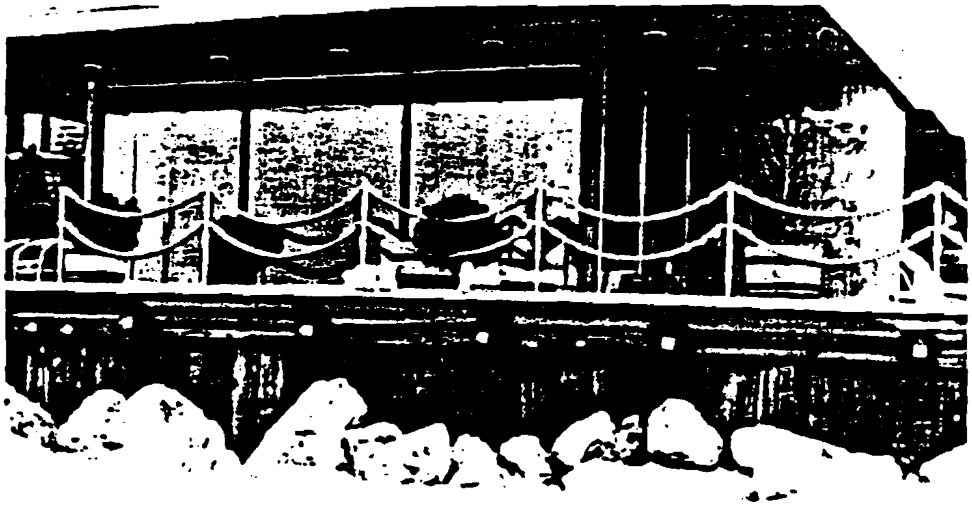


B. STEEL H-PILES WITH TIMBER LAGGING AND CURVED CONCRETE CAP, RIO DEL MAR, SANTA CRUZ COUNTY

SHORE PROTECTION EXAMPLES

R. M. Noble & Associates
CONSULTING ENGINEERS

FIGURE 16



A. TIMBER PILES WITH TIMBER LAGGING, MALIBU

B. CONCRETE PILES WITH TIMBER LAGGING, MALIBU

SHORE PROTECTION EXAMPLES

R. M. Noble & Associate
CONSULTING ENGINEERS

FIGURE 1?

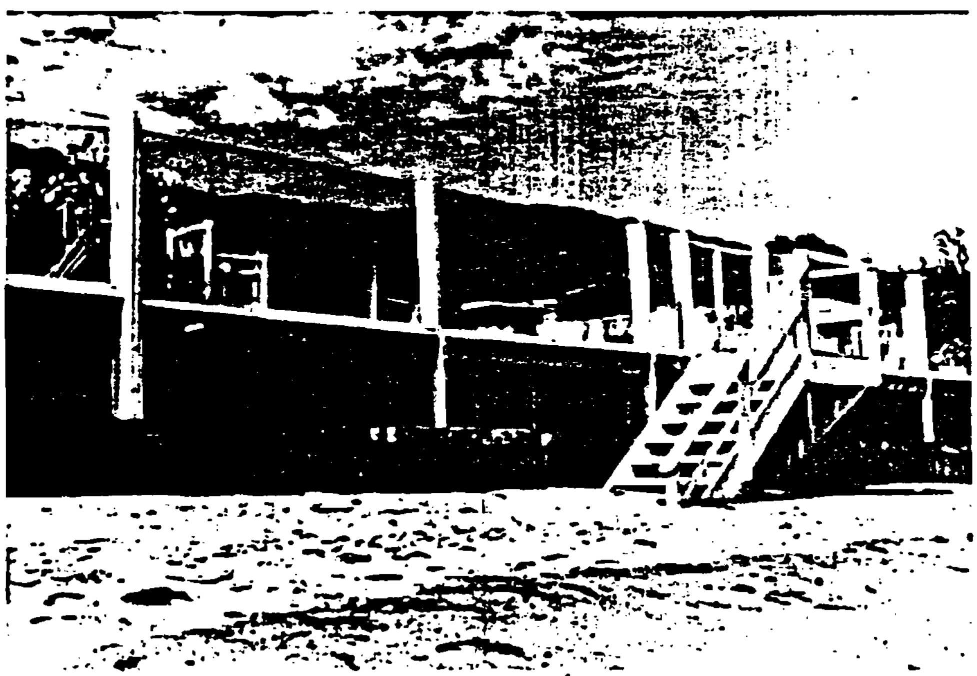
A. STONE REVETMENT, SEADRIFT AT STINSON BEACH

B. STONE REVETMENT, SAN MALO BEACH AT OCEANSIDE

SHORE PROTECTION EXAMPLES

R. M. Noble & Associates
CONSULTING ENGINEERS

A. TIMBER PILES WITH TIMBER LAGGING, MALIBU



B. TIMBER WALL WITH WHALER, MALIBU

SHORE PROTECTION EXAMPLES

BROOKS CRABTREE
and
MILLER, HIGGS AND FLETCHER
ATTORNEYS AT LAW
SUITE 726 BANK OF AMERICA BUILDING
SAN DIEGO 1, CALIFORNIA
FRANKLIN 0134

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BOOK 4404 PAGE 79

Attorneys for Plaintiffs

IN THE SUPERIOR COURT OF THE STATE OF CALIFORNIA,
IN AND FOR THE COUNTY OF SAN DIEGO

GENEVIEVE N. CRABTREE, et al.,
Plaintiffs,
-vs-
VIOLA F. GOOD, et al.,
Defendants.

No. 166161

JUDGMENT

The above entitled cause coming on duly and regularly for trial on the 18th day of December, 1951, before the Court sitting without a jury, BROOKS CRABTREE, ESQ. and MILLER, HIGGS, FLETCHER & MACK, by FERDINAND T. FLETCHER, appearing as counsel for plaintiffs, and JAMES B. ABBEY appearing as counsel for defendants VIOLA F. GOOD, LORENS H. GOOD and GENEVRA McNALLY GOOD; and evidence, both oral and documentary having been introduced, and both sides having rested on December 20, 1951, and the Court having heard the arguments of the respective counsel and Findings of Fact and Conclusions of Law having been waived by written Stipulation of the parties by their respective counsel, and the Court having formally rendered its decision in the matter and thereafter the parties by their respective counsel having entered into a written Stipulation that judgment may be entered in accordance with said Stipulation;

EXHIBIT B

1114

NOW, THEREFORE, by reason of the premises, IT IS ORDERED ADJUDGED AND DECREED AS FOLLOWS:

1. That the plaintiffs, GENEVIEVE N. CRABTREE; PRISCILLA ALLEN, formerly PRISCILLA REYNOLDS; RUTH LOCK, formerly RUTH REYNOLDS; ED FLETCHER COMPANY, a California corporation, formerly GROSSMONT PARK CO., a California corporation; and R. E. WERLICH and JULIA WERLICH, husband and wife, and each of them, together with the general public, are the owners of and entitled to the possession of an easement for sidewalk purposes over and across the following described real property:

> The East 7½ feet of the Northerly 70 feet of Lot 22 in Block 112 of Del Mar Resubdivision No. 2, according to Map thereof No. 1277, filed in the office of the County Recorder of San Diego County August 3, 1910

as part of a continuous way extending to the north through Block 113 of said Del Mar Resubdivision No. 2 and extending to the south through the remaining portions of Block 112 of said Del Mar Resubdivision No. 2 to improvements placed on real property to the south thereof, including but not limited to a bath house, pier and railroad station, and that the defendants, VIOLA F. GOOD, LORENS H. GOOD, GENEVRA McNALLY GOOD and each of them, be and they are hereby forever enjoined and debarred from asserting any claim whatever in and to said above described real property adverse to the right, privilege and easement for sidewalk purposes of the plaintiffs and each of them and the general public.

2. That the defendants above named and each of them be and they are hereby perpetually and forever enjoined and restrained from obstructing any portion of the above described real property, or from in any way hindering plaintiffs or each of them and the general public from the use thereof for sidewalk purposes.

3. That said defendants and each of them above named are hereby ordered and directed to remove that portion of their

MILLER, HIGGS, FLETCHER AND MACK
ATTORNEYS AT LAW
728 BANK OF AMERICA BUILDING
SAN DIEGO 1, CALIFORNIA
FRANKLIN 0134

porch which extends over a portion of the easement above described.

4. That the defendants above named and each of them are hereby ordered to replace at their own expense the concrete sidewalk heretofore existing on the southerly 55 feet of the above described real property, said sidewalk to be of comparable construction to the existing sidewalk to the north and south of the above described real property.

5. That the defendants above named and each of them shall comply with and perform the orders set forth in paragraphs 3 and 4 above within 30 days from the date of entry of the judgment herein.

6. That the plaintiffs have judgment for their costs against the defendants and each of them in the sum of $ 32.00.

Done in Open Court this 3rd day of March, 1952.

C. M. MONROE
Judge of the Superior Court

Entered in Judgment Book No. 152 at Page 232 on March 4th, 1952.

The foregoing instrument is a full, true and correct copy of the original on file in this office.

Attest MAR 13 1952 19__

R. H. SEXTON, County Clerk and Clerk of the Superior Court of the State of California, in and for the County of San Diego.

By [signature] Deputy

INDEXED

DOCUMENT NO.____
RECORDED AT REQUEST OF

MAR 14 1952
____ Minutes Past ____
BOOK 4404 PAGE 79
OFFICIAL RECORDS
San Diego County, California
EDGER E. MOWE, County Recorder

INDEXED

MS. MacNAUGHTON'S COMMENTS TO THE DRAFT ENVIRONMENTAL IMPACT REPORT (EIR)

I. **The EIR's characterization of existing protective structures is erroneous and unwarranted.**

Throughout, the EIR characterizes existing protective
51 structures as "encroachments." (See, e.g., EIR, pp. 8, 9, 15, 22, 23.) This characterization presumes these structures are not properly and lawfully sited. However, this question is not resolved and is currently in litigation. (See, Denyes, et al. v. City of Del Mar, San Diego Superior Court Case No. N41775; Glanz, et al. v. City of Del Mar, San Diego Superior Court Case No. N41774; Lang v. City of Del Mar, San Diego Superior Court Case No. N31478.) Indeed, MacNaughton's predecessors constructed their present seawall on various claims of right going back more than 50 years.

The EIR's characterization is not fact, but is instead a speculative legal conclusion beyond the drafters' statutory authority to make. This error is easily remedied by identifying "encroachments" as existing structures or protective devices.

See response #19.

52. See response #20.

II. **There is no support for the EIR's statement regarding placement of the Shoreline Protection Area (SPA) line.**

At page 7, the EIR states:

> The easterly boundary of the SPA zone is the
> 52 SPA line which was also established by the Ordinance. The location of the line is based on numerous factors including existing seawalls, location consistency with existing seawalls, and property boundaries.

Yet, nowhere do

- The Beach Overlay Zone Ordinance ("Ordinance") (Chapter 30.50; appendix B to the EIR);
- The Implementation Guidelines for the Beach Preservation Initiative (Appendix B to the EIR); and

- The Official Supplemental to the Sample Ballot regarding Measure D

identify <u>any factors</u> determining the ultimate placement of the SPA line. These documents constitute the people's <u>official pronouncement</u> on the Ordinance. Thus, there is simply no legislative support for the EIR's statement.

III. As drafted, the EIR is insufficiently detailed and <u>unjustifiably incomplete</u>.

The California Environmental Quality Act (CEQA) mandates that the EIR must function as an <u>informational tool</u> to analyze significant environmental impacts and to disclose possible remedies. (Pub. Res. Code, §21202.1; Cal. Code Reg., tit. 14, §15362.) An EIR "should be prepared with the sufficient degree of analysis to provide decisionmakers with information which enables them to make a decision which intelligently takes account of environmental consequences." (<u>Citizens of Goleta Valley v. Bd. of Sup'rs</u>. (1988) 197 Cal.App.3d, 1167, 1176.)

In essence, the EIR serves "as an environmental 'alarm bell' whose purpose is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return." (<u>Citizens for Qual. Growth v. The City of Mt. Shasta</u> (1988) 198 Cal.App.3d 433, 439.) Unsupported assertions and undocumented technical conclusions have no place in such a report. (<u>Whitman v. Board of Supervisors</u> (1979) 88 Cal.App.3d 397, 411.)

These legal guidelines are every report's target, yet this EIR consistently misses the mark. The specific flaws listed below provide apt examples of the EIR's deficiencies. One shortcoming is so pervasive, it must be specially noted.

53 A. The Ordinance purports to balance public shoreline access with protection of private property. (Ordinance, §30.50.010.) Yet, the EIR addresses the <u>adequacy</u> of the SPA restrictions on private property protections in <u>only one sentence</u>:

> Generally, the limits of the SPA line and zone will provide an adequate area to construct shoreline protection devices, if required, and provide an adequate recreational beach area. (EIR, p. 24.)

53. See response #22.

This statement is made without technical authority and ignores engineering reviews readily available to the City of Del Mar.

In 1983 R. M. Noble and Associates conducted a preliminary engineering study of beach and river protection devices for the City of Del Mar ("Noble Report"). This report, which is attached as Exhibit A to the Fletcher Group's Comments and incorporated in its entirety by this reference, is apparently referenced only once in the EIR, and then not by name. (See, EIR, p. 10.)

The EIR's conclusionary statement and omitted reference to the Noble Report are astonishing in light of the report's finding that protective structures are optimally located 25 to 30 feet seaward of existing residences and commercial property. (Exhibit A, pp. 15-16, 28.)

- By placing the SPA line at or near the faces of existing structures and barring vertical protective structures 5 feet seaward of that line, the Ordinance all but assures the inadequacy of new "protective" construction.

The City of Del Mar has already recognized this point in its 1984 Response to comments to the Noble Report:

> A seawall located on the property line would maximize public use of the beach and minimize effects on beach erosion. This alternative would not provide adequate protection to all of the structures. Damage from splash and overtopping waves would be most severe under this alternative because little room would be provided for overtopping waves and splash to dissipate before reaching the structures. (Response 30.)

This conflict with the Ordinance's stated purpose cannot be brushed aside with a single, unsupported assertion.

54 B. The EIR's lack of specificity and technical detail

54. See response #23.

is made more critical by the fact it is a program environmental impact report. Such a report allows the City of Del Mar to review simultaneously a number of activities now and to avoid further environmental assessment later by deeming subsequent activities as being within the scope of the original report. (Cal. Code Regs., tit. 14, §15168.) If this EIR is to serve "double duty" as a report of present and future impacts, a thorough and detailed analysis is paramount. (Cal. Code Regs., tit. 14, §15168(c)(5).) If it is not, this limitation should be plainly stated.

Nor is it a satisfactory response that this EIR only reaches a zoning ordinance and not construction-related activities. (Cal. Code Regs., tit. 14, §15146(b).) The Ordinance requires demolishing old and constructing new protective devices within specific tolerances and boundaries. The scope of this demolition and construction is readily notable and reasonably foreseeable. As such, it too must be addressed in detail.

III. The EIR omits or mischaracterizes specific and significant environmental impacts.

As drafted, the EIR inadequately addresses the following impacts, each of which requires further investigation, analysis and planned mitigation:

55 A. The EIR decries existing protective structures as a psychological barrier, reducing visual attractiveness and creating the impression of private ownership. (See, e.g., EIR, p. 13.) But, there is no scientific or empirical data stated to support this position.

Ironically, the report finds new seawalls constructed on the SPA line would be "hardly noticeable, if at all," and that jogs in newly constructed walls would not be considered "visually unpleasant or adverse, as this would serve to break up the monotony of a long, continuous straight line of walls." (EIR, page 32.) Based on the EIR, it would appear that seawalls are not visually unpleasant, as long as they are located at or eastward of the SPA line. Such a conclusion tests the credibility of this report.

56 B. The visual impact of new vertical seawalls is not properly analyzed. As the Noble Report states and the City of Del Mar recognized in its July 1987 Environmental Impact Report Supplement, the closer

55. See response #24.

56. See response #25.

vertical seawalls are located to a building face, the higher the crest elevation has to be raised to provide adequate protection. When seawalls are placed at or near a building's face, as is the case in much of Section 2, existing seaward views would be lost. The EIR cursorily notes this consequence at page 32, but again does so without any empirical estimate of harm, even though this data is readily available. (See, e.g., Environmental Impact Report Supplement, July 1987, pp. 15; identifying numbers of properties affected by various setback distances.)

The EIR does not, however, address the visual impact of landward views from the beach. The specter of 13 to 15 foot concrete or wooden monoliths rising directly from the beach cannot be said to be "hardly noticeable." Indeed, visual impact can only be accurately measured by assessing the difference between the existing beachfront and post-construction and demolition conditions.

57 C. Between 18th and 19th Streets, the public are assured lateral access to the beach by a dedicated public walkway commonly known as Lot 22.

Dedicated public access to this area has been a settled question for almost 40 years. (See, Exhibit B to the Fletcher Group's Comments. The Ordinance permits rip-rap protections to intrude into and usurp this settled public way. This is not solely a legal matter; it is an Ordinance-endorsed private encroachment into a dedicated public access way. As such, its impact must be addressed.

58 D. Similarly, a concrete public sidewalk traverses most of the properties between 18th and 19th Streets. This walkway affords greater access to handicapped and elderly beach users, and has survived the ravages of the ocean because of the existing westward and lateral protections. Demolition of these structures, as the Ordinance requires, will leave this public walkway unprotected. This exposure, as evidenced in the northern part of Section 2, will all but assure its eventual destruction.

59 E. Public health concerns have gone unreported. For example, a sewer line serving homes between 18th and 19th street occupies the westerly five feet of Lot 22. This line is presently protected by existing seaward and

57. See response #26.

58. See response #27.

59. See response #28.

lateral structures. The need for this protection was evidenced in 1983 when storm-driven waves breached seawalls destroying approximately 125 feet of the sewer line and spreading raw sewage into the water and onto the beach and low-lying areas to the east of the beachfront. Stripped of any protection, as the Ordinance requires, this sewer line is vulnerable not only to storms, but unusually high tides and wave action generally.

60 F. Also, all houses between 18th and 19th Streets were built under City of Del Mar permits excepting front-yard setback requirements. Instead, there is a substantial setback line to the rear of the lots to allow greater visibility of traffic entering and exiting Ocean Front. The Ordinance's frontage setback requirement squeezes these property owners, both landward and seaward, and creates a conflict with public safety on Ocean Front. This environmental impact must be addressed.

61 G. The EIR notes property owners may choose <u>not</u> to rebuild shore protections after removing nonconforming structures. (EIR, page 49.) The impact of this is not disclosed. Nor are the reasons why property owners would embrace such a daunting choice.

- One factor, however, is clear: The Ordinance's inflexible restrictions may make properly engineered shore protections impracticable.

Property owners whose residences and buildings are located at or near the SPA line may be better served by fortifying foundations and building fronts and paving over side and backyards to prevent erosion, rather than constructing a vertical wall which totally eliminates seaward views.

Minimally, the choice not to build protective structures

- will affect flooding in low-lying areas and
- will challenge the stability of existing or newly built protective structures.

For example, given the beach profile between 17th and 19th Streets, high water would not only reach beachfront properties, but also Ocean Front, Coast Boulevard, and beyond. These impacts cannot be

60. See response #29.

61. See response #30.

dismissed without detailed review and planned mitigation.

62 H. Finally, the unmitigated environmental impacts mentioned above will substantially reduce beachfront property values throughout the City of Del Mar. This will necessarily lead to diminished real property tax assessments. The City of Del Mar already boasts one of the highest tax rates in San Diego County and lacks a good industrial or commercial tax base. The loss of residential tax base fostered by the Ordinance will impact all property owners within the City of Del Mar.

V. The EIR fails to identify cumulative impacts from foreseeable projects.

63 An environmental impact report must outline the cumulative impacts of closely related past, present and reasonably foreseeable future projects. (Whitman v. Bd. of Supervisors (1985) 176 Cal.App.3d 421, 428.)

Here, the EIR consistently states the City of Del Mar Local Coastal Program (to be completed in 1989) and the construction guidelines imposed by the City of Del Mar's Design Review Ordinance will affect the project. Whether these intimately related projects augment or impair environmental impacts must be investigated and revealed. This EIR is precisely the vehicle for this study.

VI. The EIR has overlooked the most compelling and prudent environmental alternative.

64 CEQA commands consideration of reasonable project alternatives. California courts have held that

> [a]lthough EIR's are not required to be perfect or to discuss project alternatives beyond what is realistically possible . . ., an EIR must produce information sufficient to permit a reasonable choice of alternatives so far as environmental aspects are concerned. (San Bernardino Valley Audubon Society, Inc. v. County of San Bernardino (1984) 155 Cal.App.3d 738, 750; emphasis added.)

Apparently attempting to demonstrate nothing is better, the EIR summarily rejects three alternatives. This information gap is unacceptable. More to the point, the entire EIR, and in particular all mitigation statements, point directly to an environmental alternative which was not mentioned:

62. See response #31.

63. See response #33.

64. See response #34.

- Siting protective structures, on a block-by-block basis, as far landward as practicable given the economic, engineering and geotechnical considerations involved in adeq_ately protecting beachfront properties.

That the strict language of the ordinance <u>prohibits</u> such an alternative is no ground for not considering its ameliorative affect on the environment.

CONCLUSION

If all projects looked as well in the "real world" as they do "on paper," there would be no need for environmental assessment. CEQA recognizes the impossibility of this premise. Conversely, it is not the province of an environmental impact report to make the on-paper project <u>look better</u> in the real world than it actually does.

65 Unfortunately, this EIR has gone too far to support the project, at the cost of not disclosing environmental degradation. The environmental harms identified in these comments demand further attention, empirical study, and planned mitigation. As drafted, the EIR is wholly inadequate and unquestionably outside the CEQA mandate.

65. See response #35.

State of California The Resources Agency of California

Memorandum

Date : April 27, 1989

To : Bonnie S. Porter
State Historian II
Environmental Review Section

From : Department of Parks and Recreation
Southern Region Headquarters

Subject: City of Del Mar's Beach Preservation
Initiative Program EIR #88092819

66 Staff of Southern Region has evaluated the referenced document which could allow impacts to occur to Torrey Pines State Reserve and State Beach. These impacts are addressed as "possibilities" only, because the EIR provides no quantitative data from which to evaluate qua[illegible]tative changes.

67 Our concerns focus on possible reduction of beach sand supply and increased erosion of State Park lands adjacent to the City's BPI zone.

68 Carried to its allowable development, the Beach Protective Initiation (BPI) permits a continuous seawall/riprap structure along the City of Del Mar's 2.9 mile coastline (Figura 3 and 4 in the EIR). It is clear that Sections 1 and 2 (2,600 ft. and 8,700 ft. respectively) are imminently predisposed to the construction/reconstruction of shoreline protective structures. Section 3 (3,700 ft.) is comprised of bluffs which would not be immediately subject to protective structure construction, as the Shoreline Protective Area (SPA) line is inland of the toe of the bluffs.

69 The EIR addresses coastal processes (existing conditions, proposed solutions, potential impacts, and recommended mitigations) and concludes that acceptable mitigations can be implemented. We believe the EIR does not fully address project impacts on sand depletion. A continuous series of "block-by-block" structures and flank protection reduces the amount of upper beach sand storage available to the littoral cell. Combined with the historical net loss of shoreline in the Del Mar area (Table 2 in the EIR), the implication is that this area and the downcoast State Beach will be subject to accelerated shoreline erosion. Once the Del Mar shoreline stabilizes at the SPA line, the "sand-hungry" littoral cell will begin to seek sediments from unprotected shorelines such as the city bluffs (if left unprotected) and State Beach. The long-term impact will be to accelerate losses of scenic coastal bluffs and beaches.

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66. It is not anticipated that protective structures will be proposed for the ocean bluffs south of Seagrove Park. In the event that the railroad would make such a proposal to protect the railroad right-of-way, careful review would occur and appropriate mitigation would be required.

67. The BPI does not necessarily require the construction of seawalls but does require the removal of existing non-complying structures. If new seawalls are constructed they will be located landward of their existing location(s) (i.e., either at, or east of the SPA line). It is anticipated that this would provide a wider sandy beach area which would in turn provide more material to downcoast beaches. Existing riprap located along the coastal bluffs may remain with the issuance of a Shoreline Protection Permit.

68. Section 2 (8,700 feet) is the only section which would be expected to have a continuous seawall. Figure 4 has been corrected to reflect the line between Section 1 and 2 at the south side of the San Dieguito River. See responses #66 and #67.

69. See response #67. Presently, the coastal bluffs and beaches are subject to erosion and thus are supplying sand to adjacent beaches. As stated in response #67, it is anticipated that implementation of the BPI will result in providing more material to downcoast beaches than is currently being provided. Existing protective devices located seaward of the SPA line will be removed and any new structures will be built at the SPA line or east of it. Long-term impacts to coastal bluffs are not anticipated as an indirect impact of the project.

Bonnie S. Porter
Page 2
April 27, 1989

70 Losses of State Beach and coastal bluffs at Torrey Pines State Beach and Reserve would create significant and unmitigated impacts on public access, recreation, visual aesthetics and biotic resources. The EIR does not adequately address these concerns.

70. See response #69.

Please contact Bill Tippets at ATSS 631-7250 if you require additional input from Southern Region.

Kenneth B. Jones, Regional Director
Southern Region

Attachment

cc: W. Tait

TABLE OF CONTENTS

		Page
	EXECUTIVE SUMMARY	S-1
1.0	INTRODUCTION	
2.0	PROJECT DESCRIPTION	3
	2.1 Location	3
	2.2 Project Description and Objectives	3
	2.3 Background	8
	2.4 Project Setting	15
3.0	ENVIRONMENTAL ANALYSIS	22
	3.1 Public Access/Beach Encroachment	22
	3.2 Visual Quality	26
	3.3 Coastal Processes	34
	3.4 Construction Impacts	55
4.0	ALTERNATIVES	
5.0	CUMULATIVE IMPACTS	65
6.0	RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY.	66
7.0	ANY SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED	67
8.0	SOURCES	68
	8.1 References	68
	8.2 Persons Contacted	69
	8.3 Preparers	69

APPENDICES

A. Notice of Preparation and Comments
B. Beach Preservation Initiative and Guidelines
C. City of Del Mar Shoreline Protection Permit

LIST OF FIGURES

		Page
1.	Regional Map	4
2.	Vicinity Map	5
3.	City of Del Mar SPA Line Locations	16
4.	General Characteristis of Del Mar Beachfront and SPA Line Location	17
5.	Generalized Wave Exposure for Del Mar	35
6.	Maximum and Minimum Significant Wave Heights	38
7.	Location Map for Oceanside Littoral Cell	39
8.	Schematic Diagram of Storm Wave Attack on Beach and Dune	41
9.	Beach Foreshore Sand Volume Changes at 25th Street, Del Mar	43
10.	Del Mar Shoreline Position Extremes	44
11.	Beach Profiles - Del Mar	45
12.	Typical Flank Protection	48

LIST OF PHOTOGRAPHS

A.	Looking North from South Side of San Dieguito River Channel	27
B.	Looking Northeast from Beach	28
C.	Looking East from Beach	28
D.	Looking South from East End of Beach	29
E.	Looking East from Beach	29
F.	Looking South from Beach	30
G.	Looking Southeast from East End of Beach	30

LIST OF TABLES

1.	Tide Data for Del Mar, California	34
2.	Shoreline Change Rates	46

EXECUTIVE SUMMARY

This document is a Program Environmental Impact Report (EIR) which addresses the implementation of the City of Del Mar's Beach Preservation Initiative (BPI) Ordinance. The BPI Ordinance establishes a Shoreline Protection Area zone (SPA zone) seaward of a designated north/south Shoreline Protection Area line (SPA line) which is comparable to a setback line. The BPI regulates new development within the SPA zone and provides for the abatement (removal) of existing non-complying structures located within the SPA zone.

The project area includes the oceanfront in the City of Del Mar from the northern city limits of Solana Beach to the southern city limits at Torrey Pines State Reserve, a distance of approximately 2.9 miles. At both the northern and southern ends of Del Mar the sandy beach intersects high, near-vertical cliffs. Of the approximate 2,700 residences in the City, 90 are situated on the beachfront (not including the residences located on the bluffs).

PROJECT BACKGROUND AND DESCRIPTION

Over the past several decades, a series of private seawalls, patios and the like have been constructed by property owners to protect residences and provide usable patio and walkway areas. During the 1970's, temporary sand berms were created to provide additional protection; sandbags and riprap have also been utilized by individual property owners. Much of this development encroaches into public lands. In 1982, a Longard tube was installed by the City of Del Mar on an experimental basis to provide protection to a portion of the beach in the SPA area. The Longard tube and other protective devices were destroyed during the severe winter storms of 1983.

In April of 1988 the voters of the City of Del Mar approved Measure D, also known as the BPI Ordinance. The purpose of the BPI Ordinance is to regulate the uses of the beach area including the protection of public access to and along the shoreline and protection of private property. The Ordinance and its Guidelines outline the permit application procedures for any development and/or construction of protective structures within the SPA zone and contains regulations for the issuance of permits. Any development on or west of the SPA line requires the approval of a Shoreline Protection Permit.

The removal of existing non-complying development is also addressed in the Ordinance. The City has completed a preliminary identification of all privately owned, non-complying structures within the SPA zone. These structures must be immediately removed unless a Shoreline Protection Permit is obtained. This permit allows for the temporary maintenance of these structures and calculation of an amortization period.

ENVIRONMENTAL ANALYSIS

Public Access/Beach Encroachment

Impacts: Protective structures, whether they be vertical seawalls or riprap, could potentially pose direct obstacles to public beach access both laterally (parallel along the beach) and vertically (from the east). Generally, vertical public access would be maintained at the existing accessways (street ends) by means of openings in the protective structures or by stairways over the walls, therefore no adverse impacts are expected. Lateral access may be reduced somewhat with the placement of riprap, but this encroachment is not considered excessive when viewed in conjunction with the design parameters of the BPI. Also, given the need to protect the structural integrity of private development and the engineering, economic and geotechnical requirements for the use of riprap; the adverse impacts are considered to be reasonable and below a level of significance.

Mitigation: Because no significant adverse impact to public access or beach encroachment would occur from implementation of the Ordinance, no mitigiation measures are required.

Visual Quality

Impacts: Since the street ends within Section 2 currently have some type of protective device which blocks most beach views from the inland streets, construction of protective structures and/or relocation of existing structures would produce no substanative visual change from the existing condition. The existing visitas from the bluff tops would not be adversely affected by implementation of the Ordinance. Views from the beach toward the east would not change significantly since beach walls and riprap are currently in place, and the addition or relocation of walls would be hardly noticeable. Ocean views from some of the residences located directly on the beach could be affected if seawalls with higher elevations block the first floor views. The Ordinance does not directly regulate the design or height of seawalls, however the Guidelines implementing the Ordinance state that the City Code would apply, and would include enforcement of the Design Review Ordinance. Thus, each proposed wall would be subject to evaluation by the City Design Review Board.

Mitigation Measures: No significant visual impacts would occur and no mitigiation measures are necessary. Project-inherent design mitigation is embodied within the Ordinance itself, which requires consistency with the City Code, including the Design Review Ordinance.

Coastal Processes

Impacts: The BPI requires that existing non-complying shore protection structures be removed. Relocated and/or new structures must be placed at the SPA line; within 5 feet west of the SPA line (for vertical walls if no other environmentally feasible location exists); within 20 feet west of the SPA line (for riprap); or east of the SPA line. The potential for offsets in seawall alignments can cause a localized concentration of wave energy resulting in a greater potential for sand erosion and structural damage. In certain cases, relocating an existing wall to the SPA line may create greater offsets than presently exist unless all walls within a given block are relocated simultaneously. A continuous wall located as far landward as possible and aligned parallel to the shoreline will have the least impacts and provide the widest beach area. Several non-continuous structures at varying alignments and offsets would have significant impacts on the shoreline.

Potentially significant impacts could also occur if the wall is constructed too close to the primary structure because of waves overtopping the walls and the effects of pile-driving construction equipment. Waves breaking at the toe of the structure have the potential to cause scour at the toe, resulting in instability of the structure and potentially significant impacts to residential structures. Improper location of the wall and inadequate design can result in overtopping of the structure by waves and a substantial amount of wave runup. This action can result in needless damage to primary structures.

Mitigation Measures: A series of measures are available to minimize impact associated with a series of offset wall structures to below a level of significance. The City would encourage the construction of walls on a block-by-block basis. Offsets would be discouraged and where offsets do occur, the City would require the applicant to provide flank protection. In addition, the City would develop a schedule with the property owners to coordinate the timing and location of wall reconstruction and/or construction.

Several features should be incorporated into the design of the protective structure to minimize the impacts of overtopping waves. These include recurved faces, pile caps, splash aprons and use of large armor stone to dissipate wave energy. To reduce the potential for scour at the toe of walls a toe apron stone with filter cloth should be provided. To establish the need for shore protection of the sea cliffs, a geotechnical analysis should be completed to evaluate the formation and collapse of sea caves and the need for protective devices.

Construction Impacts

Impacts: Removal of non-complying revetment and construction of new walls would involve the use of heavy contruction equipment. Areas which would be affected include the local streets, the portion of the beach used to access the site and the demolition site itself. These are short-term impacts which would vary by site. The level of disturbance to residents and beach users would be reduced if walls are build on a residential block-by-block basis.

Mitigation Measures: Implementation of mitigation measures would reduce the impacts from construction of shoreline protective structures to below a level of significance. Construction hours would be consistent with the City Noise Ordinance. The beach would be restored at the end of each work week, and equipment would be removed from the beach at the end of each workday. Construction would not occur west of the permitted shoreline protective devices between Memorial Day and Labor Day (except for emergencies). The City would develop a schedule with private property owners for the timing of wall construction so that construction could occur on a block-by-block basis. During the construction period, use of public parking areas for construction purposes would be minimized.

1.0 INTRODUCTION

This document is a Program Environmental Impact Report (EIR) which addresses the City of Del Mar's Beach Preservation Initiative Ordinance (BPI) and its implementing Guidelines. The Ordinance regulates new development on the ocean front and provides for the abatement of existing non-complying structures located on the beachfront in the City of Del Mar.

This EIR has been prepared in accordance with the criteria, standards, and procedures of the California Environmental Quality Act (CEQA) (Public Resources Code Sections 21000 et. seq.), the State CEQA Guidelines (Cal. Admin. Code Sections 15000 et. seq.) and the City of Del Mar's Procedures for EIRs.

The purpose of this EIR is to provide an accurate and concise informational document which analyzes the environmental consequences of implementation of the Ordinance which would result in the removal of existing non-complying structures and the construction and maintenance of new shoreline protection structures. It has been determined by the City of Del Mar that a Program EIR is necessary to address the potential impacts that may result from the implementation of the Ordinance and its guidelines, including future discretionary actions such as issuance of a Shoreline Protection Permit. According to Section 15168 of CEQA "A program EIR is an EIR which may be prepared on a series of actions that can be characterized as one large project...".

The potential impacts that will occur with implementation of the Ordinance and its Guidelines are analyzed in this EIR and mitigation measures to reduce or eliminate impacts are recommended. The specific environmental issues which are potentially significant include: (1) Public Access/Beach Encroachment, (2) Visual Resources, (3) Coastal Processes, and (4) Construction-related impacts. The Ordinance sets forth an abatement procedure (which includes an amortization period) for removal of existing structures within the project area which are determined to be non-complying. The issues surrounding the calculation of the amortization term are economic, and are not analyzed or discussed in the EIR. In accordance with CEQA (Section 15131) "economic or social effects of a project shall not be treated as significant effects in the environment. The focus of the analysis shall be on the physical change." However, impacts associated with the removal of non-conforming protective structures are addressed where appropriate.

The City of Del Mar issued a Notice of Preparation (NOP) for this EIR in October, 1988. The NOP, and comments received during the 30 day NOP review period, are located in Appendix A. Issues identified by these comments are also incorporated into the EIR, as appropriate.

The lead agency for this project is the City of Del Mar. CEQA defines the lead agency as "the public agency which has the principal responsibility for carrying out or approving a project." The environmental consultant responsible for the preparation of this report is P&D Technologies, Inc. of San Diego, California. Preparers of and contributors to this report are listed in Section 8.0.

This report is a Draft EIR. Upon completion of the public review period and the receipt of public comments, the Final EIR will be prepared, which will include this Draft with any necessary revisions, and the responses to all comments.

2.0 PROJECT DESCRIPTION

2.1 LOCATION

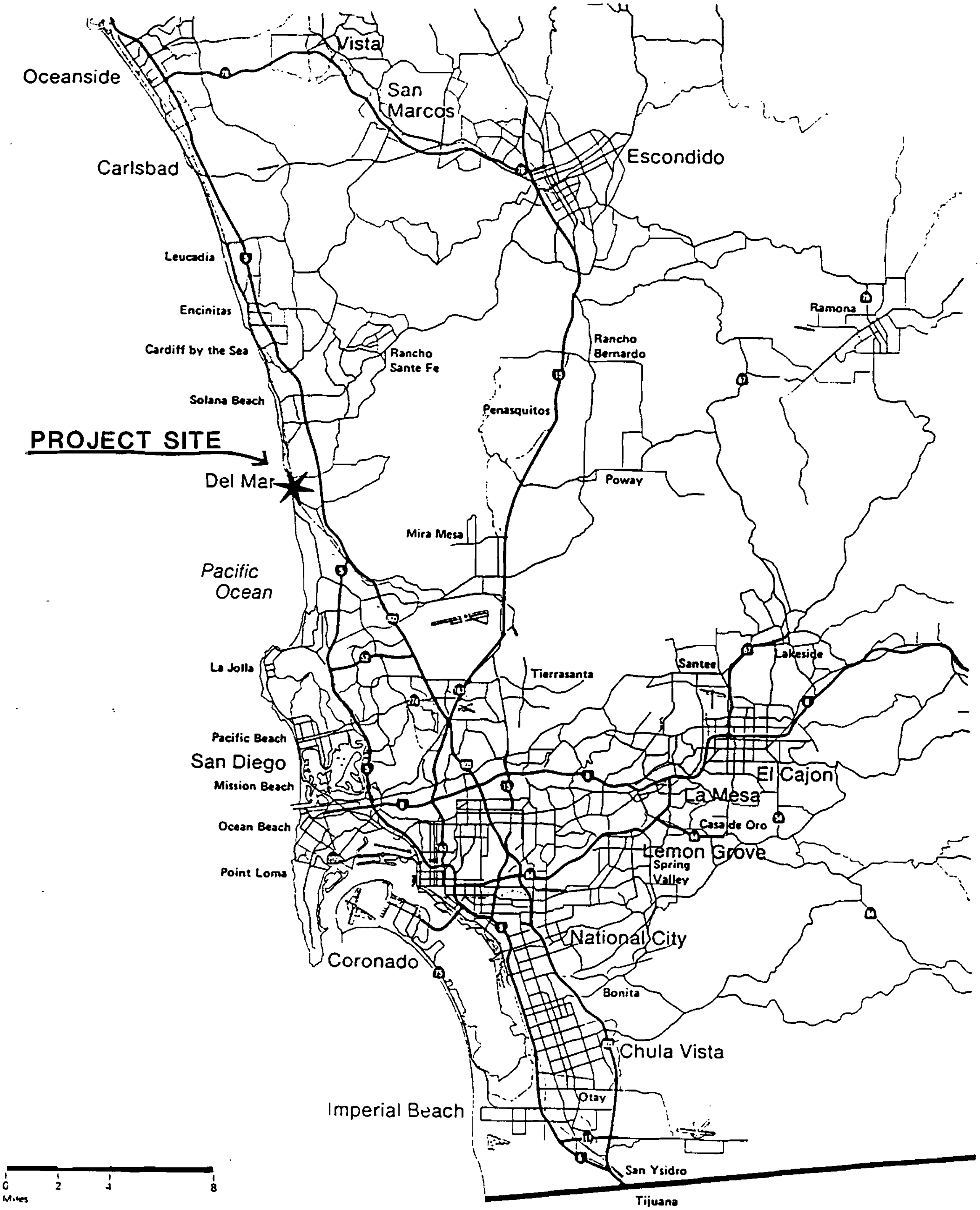
The regional project site location is shown on Figure 1. The project area includes the oceanfront in the City of Del Mar from the northern City limits at Solana Beach to the southern City limits at Torrey Pines State Reserve, a distance of approximately 2.9 miles. The City of Del Mar is located in San Diego County, primarily along the coast, approximately twenty miles north of downtown San Diego. Del Mar is largely a residential community with a population of approximately 5,000 persons. Of the approximate 2,700 residences in the City, 90 are situated on the beachfront. Additionally, residences are located on the bluffs along the northernmost and southernmost extensions of the oceanfront.

2.2 PROJECT DESCRIPTION AND OBJECTIVES

Purpose

In April of 1988, the voters of the City of Del Mar approved Measure D, also known as the Beach Preservation Initiative Ordinance (BPI Ordinance). The BPI Ordinance supplements and supersedes the City's regulations which allowed protective structures to be constructed by permit on sandy beach areas to provide interim protection for beachfront buildings threatened by wave and tidal action. The purpose of the BPI Ordinance is to regulate the uses of the Del Mar beach area; this includes the protection of public access to and along the shoreline, and provides for the protection of private property. The BPI Ordinance establishes a Shoreline Protection Area zone (SPA zone) seaward of a designated north/south Shoreline Protection Area line (SPA line) which is comparable to a set-back line. The SPA line was established to facilitate in the regulation of construction of all structures within the SPA zone. Figure 2 shows the general location of the SPA zone within the City.

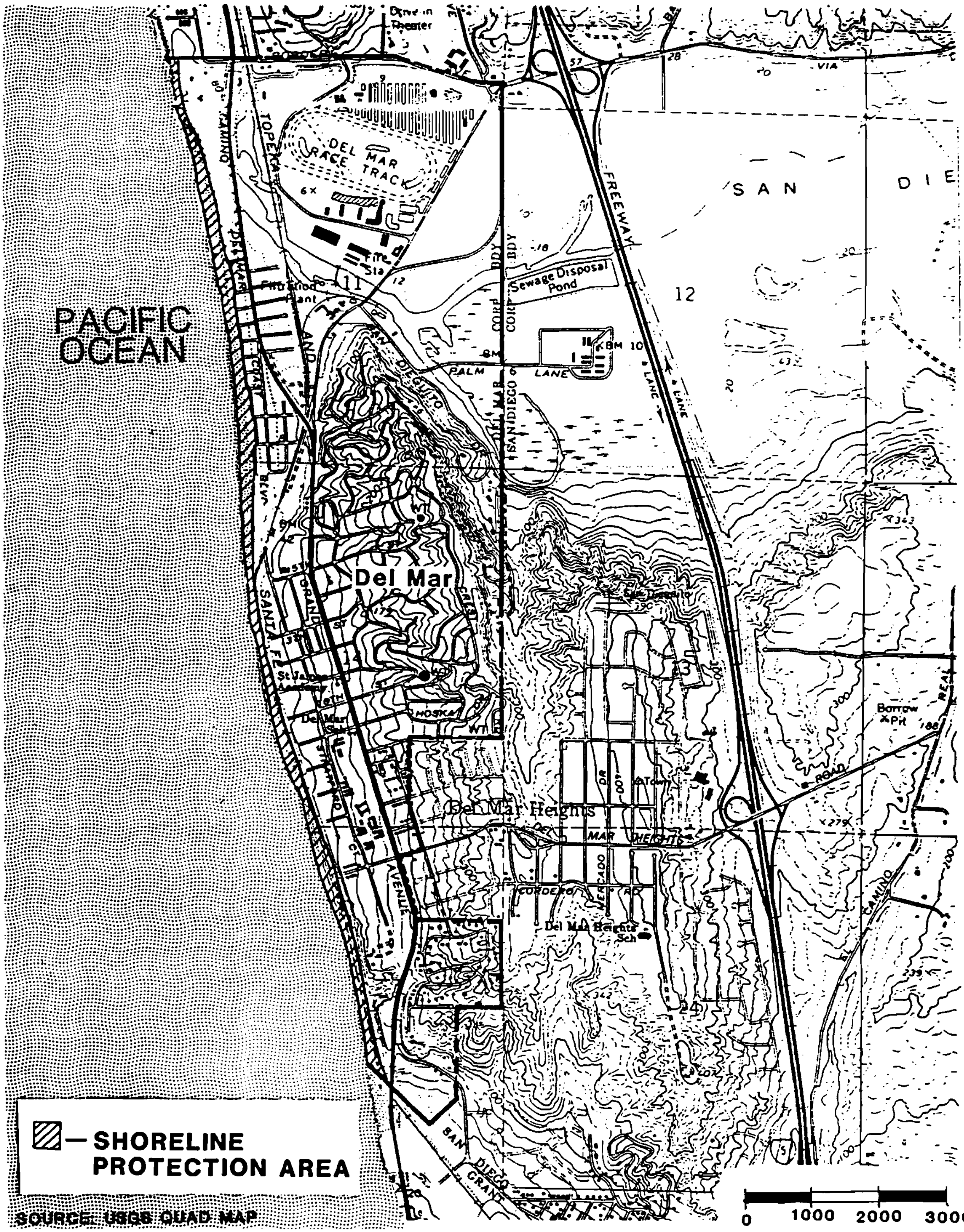
The BPI Ordinance, and the adopted Guidelines are hereby incorporated by reference, and included in their entirety in Appendix B. The Ordinance outlines the



SOURCE: SANDAG

REGIONAL MAP

Figure 1



VICINTY MAP

Figure 2

permit application procedure for any development and/or construction of protective structures within the SPA zone and contains the regulations for the issuance of permits. Any development on the SPA line or west of it requires the approval of a Shoreline Protection Permit (Appendix C) and in some cases a user fee to be determined by the City Council (Chapter 30.50.080 City Zoning Ordinance). The construction of a protective structure located within the SPA zone may be authorized by the issuance of this permit if the City Council makes a number of findings (following notice and public hearing). These findings are described in full in Chapter 30.50.060 of the City of Del Mar Zoning Ordinance and are summarized below.

The proposed protective structure:

- Is required to protect existing structures when designed to mitigate adverse impacts to local shoreline sand supply; and will minimize risks to life and property;
- Will assure structural integrity and neither create nor contribute significantly to erosion, geologic instability, nor substantially alter natural landforms along bluffs and cliffs;
- Is in conformance with the Local Coastal Program (when certified) and Chapter 3 of the Coastal Act;
- Has material and design which are consistent with good engineering practices;
- Will have the seaward face of a wall (vertical or otherwise) located within the SPA zone only if there is no other feasible location but in no event more than five feet westward of the SPA line;
- Will, if there is a riprap element, have the riprap extending no more than 20 feet westward from the SPA line and a westward slope beginning no higher than a 5.7 foot elevation at the SPA line, decreasing in height at a minimum slope of 1.5:1.

The use (and removal) of emergency reinforcement is also addressed by the BPI Ordinance. The removal of existing noncomplying development is also addressed by the Ordinance. Privately owned noncomplying structures have been preliminarily identified by the City and these structures are to be removed immediately unless a Shoreline Protection Permit has been obtained. A Shoreline Protection Permit allows for the maintainance of these structures and the calculation of an amortization period. The amortization period is calculated as follows: for every $5,000.00 of initial construction costs on each individual lot; the non-complying development may remain for one year following its initial construction, not to exceed ten years. The City Council will determine how the amortization provisions will apply to a particular case following notice and hearing. The issue of amortization, which is of an economic nature, is not addressed by the EIR because it is not required under CEQA (Guidelines Section 15131).

Project Characteristics

The principal feature of the BPI Ordinance is the establishment of the SPA zone. The BPI Ordinance limits development within this SPA zone to private and public shoreline protective structures which would provide protection to inland property. As described above, the construction or maintenance of development in this SPA zone would require the approval of a Shoreline Protection Permit by the City Council. Under the Ordinance, only permitted protective structures may be located within the SPA zone. All existing non-conforming private development must be abated. An amortization period for abatement of non-conforming development may be granted by the City of Del Mar with a Shoreline Protection Permit.

The easterly boundary of the SPA zone is the SPA line which was also established by the Ordinance. The location of the line is based on numerous factors including existing seawalls, location consistency with existing seawalls, and property boundaries. It should be kept in mind that this EIR does not analyze the line location, but rather potential environmental impacts from implementation of the Ordinance including the removal of non-conforming protective structures and the construction and maintenance of new protective structures. The location of the line is not intended to alter ownership.

The BPI also has provisions for emergency reinforcement. Where property inland from a protective structure is being immediately threatened by flooding or wave damage, a shoreline protection permittee may temporarily increase the height and bulk of the protective structure. The permittee is required to remove the temporary protection from the SPA area within 15 days from the end of the emergency condition. It should be noted that emergency reinforcement would also be subject to requirements contained in the Coastal Act.

2.3 BACKGROUND

History of Beachfront Protection

Development in Del Mar which is potentially affected by wave or flood damage is limited to property along the beachfront, thus the private protective structure projects to date have been limited to beachfront areas. Existing primary structures on the top of the bluffs, significantly above and east of the shore, do not lie within the SPA zone.

Since the 1920's, the beachfront property has been developed with approximately 90 single family homes, two restaurants and four lifeguard stations located at an elevation slightly above the beach. A series of public streets terminates at the beachfront between 17th and 29th Streets, providing public access to the beach. Some of the beachfront properties are directly exposed to ocean wave damage and flooding during severe winter storms. Over the years, a series of private seawalls, patios and the like have been constructed by property owners to protect structures and to provide usable patio and walkway areas. Much of this development encroaches into public lands under the jursidiction of both the City of Del Mar and the Coastal Commission. During the 1970's, temporary sand berms were created to provide additional protection; sand bags and riprap have also been utilized by individual property owners. In 1982, a Longard tube was installed by the City of Del Mar on an experimental basis to provide protection to a portion of the beach and individual properties in the northern portion of the study area. The Longard tube and many other protective devices were destroyed during the severe winter storms of 1983.

Much sand was carried away from the shoreline during the storms in 1983 and much riprap was placed on the beach by private owners in an effort to protect their property. Damage to beachfront property and to property near the beach resulted from waves overtopping existing shoreline protection devices and from flooding at the street-ends. The added riprap and other encroachments have diminished public access to the beach. For a variety of reasons, including protection of private property, individual encroachment within public land continued after 1983 with and without the necessary permits for both temporary as well as permanent structures. These encroachments include patios, fences, private stairways, landscaping, riprap, seawalls, sand bags and in one instance, a portion of a residence.

Del Mar has historically been subject to beach encroachments. From 1910 to 1922, the 15-foot public sidewalk and alley running seaward of the private lots was dedicated. A 7½ foot concrete walk was constructed in the right-of-way from 15th to 25th, but it fell into disrepair. Portions of this walk are still visible today. In 1938, land west of the sidewalk and alley was deeded to the Del Mar Civic Association, prior to community incorporation, for use as beach lands for Del Mar residents. The lack of enforcement against ensuing encroachments over the years, and the failure to maintain the sidewalk, raised questions about the public's rights in this area. Past litigation (Crabtree v. Good) confirmed that public rights could not be extinguished by "prescription, adverse possession or reliance on permits." Similarly, the California Coastal Comission maintains that the public interest and right to access to Del Mar beaches are clearly mandated by state policy. The Commission cites the historical use of the beach for public recreation and indications in recent regional planning studies for increased recreational use in the future.

Numerous cases have come before the Coastal Commission regarding this issue, but one case in particular demonstrates the Commission's stance. In November, 1983, several property owners between 24th and 26th streets applied to retain a wood seawall, 480 linear feet in length, erected under emergency permit in July 1983. Recently, following extended litigation (Carrie, et al v. California Coastal Commission) the Coastal Commission, in consideration of the policies described above, approved as a compromise that the applicants be given the option of removing the existing seawall (located 15 feet seaward of the property line) or moving it 5 feet west of the SPA line. The Commission also required that the owners pay a user fee in conformance with the BPI Ordinance, remove all riprap and other encroachments except for a limited amount of toe stone (no more than 12 feet from the seaward face of the wall) and required the restoration of public access at street ends. While the maximum height of riprap allowed under the BPI is 5.7 feet National Geodedic Vertical Datum (NGVD) at the SPA line, in this case the Commission allowed a maximum height of no more than 3 feet Mean Lower Low Water (MLLW) or 0.43 feet NGVD. Undoubtedly, the Commission's action in this case set an important precedent that encroachments beyond the five foot line are not acceptable and that riprap be no higher than 0.43 NGVD. This precedent has importance not only to private beachfront owners but to the City as well which must obtain certification from the Commission of a Local Coastal Program (LCP) addressing this issue.

In an effort to determine the most effective approach to protecting the public's right to access and use public beach land and at the same time, to protect beach properties from storm waves, high tides and river flooding at the least impact, the City of Del Mar commissioned an engineering study of beach and river protective devices. This study, conducted in 1983, addressed six alternative types of protective devices which might be used on the beach, their construction techniques, and their costs. In 1984, the potential environmental impacts of these alternatives were analyzed. Since that time the City of Del Mar has proceeded with development of a comprehensive beachfront plan. The California Coastal Act calls for all municipalities to prepare an LCP to address coastal development and access. Del Mar is presently in the process of preparing an LCP and expects that it will be completed in 1989.

In 1986, an Environmental Impact Report was prepared for the Del Mar Beach Overlay Zone Ordinance (BOZO), and in 1987 a Supplement to this EIR was prepared. It should be noted that the 1987 Supplemental EIR was never certified. Both EIRs addressed the impacts of implementation of the zone and the accompanying ordinance which regulated development within the zone. The BOZO was not enacted, but was apparently used as the basis for the current BPI Ordinance.

In April, 1988, the citizens of Del Mar passed Measure D, The Beach Preservation Initiative (BPI) which identifies the location of the Shoreline Protection Area. The implementation of the BPI Ordinance which has been incorporated into the City's zoning code (Chapter 30.50 - Beach Overlay Zone) is being analyzed by this EIR.

Coastal Policies

The California Coastal Act of 1976 and subsequent amendments contain several policies relating to shoreline protective devices in terms of the physical effects of such devices and the rights of private owners and the general public. The Coastal Commission's major concerns in shoreline protection issues are the minimization of seaward encroachment, and the protection of public rights, prescriptive and otherwise. These concerns apply directly to the Del Mar beachfront, where numerous private seawalls have been constructed with and without permits from the City of Del Mar and the Coastal Commission. The City's intention in adopting the BPI Ordinance was to bring existing and proposed development westward of the SPA line in conformance with the Coastal Act. The requirements of Chapter 3 of the Coastal Act, which contain the Act's major policy criteria, are expressly incorporated by reference into the BPI as criteria for judging a shoreline protection permit application under the BPI. Some of these Chapter 3 requirements are summarized below.

Shoreline Protection: Section 30235 of the Coastal Act permits shoreline protective devices (such as revetments, seawalls, breakwaters, etc.) when required to protect existing structures or public beaches in danger of erosion. Under the BPI ordinance, issuance of a Shoreline Protection Permit for construction of a protective structure is authorized only if the City Council finds that it is "required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion" (Chapter 30.50.060.A). The BPI Ordinance is in conformance with Section 30235 which specifically allows the use of protective devices for these purposes.

Section 30253 states that new development shall "minimize risks to life and property in areas of high geologic, flood and firehazard" as long as development "neither create(s) nor contribute(s) significantly to erosion, geologic instability or destruction of the site or in any way require(s) the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs".

Chapter 30.50.060.C of the BPI ordinance states these same stipulations. While the Coastal Commission recognizes the right of private owners to protect their property, the Commission's primary mandate is to protect beaches and encourage their recreational use by the public. This mandate is twofold: physical protection of the shoreline and protection of public access to the beach.

The Coastal Commission maintains that shoreline protective devices frequently have adverse effects which are inconsistent with the intent of Section 30253. Seawalls will protect the upland environment but may actually increase beach erosion. These adverse effects occur because seawalls force waves striking the wall downward, causing the waves to scour sand at the foot of the wall. At the same time, the seawall restricts the shoreline profile from adjusting to winter wave action because material that was formerly drawn by the waves to an offshore sand bar is either deposited behind the wall or replaced by it. Thus the incoming force of winter waves is no longer restrained by the natural "breakwater" created by the presence of an offshore sand bar. The increased wave action reduces critical sand supplies. Although these phenomena can adversely affect natural shoreline processes, in the evaluation of specific projects, the Coastal Commission weighs the potentially negative impacts against the property owner's need for protection.

To minimize the adverse effects of shoreline alteration, permits for protective devices are often conditioned with specific design or locational restrictions. Individual property owners are also required to accept risk, liability and maintenance responsibility for the physical integrity of the protective structures. The City's approach under the BPI is similar.

Public Access: In addition to the effect of seawalls on natural processes, the Coastal Commission is concerned with the effect of shoreline alteration on public access and recreational use. The purpose of the BPI Ordinance is "to protect public access to and along the shoreline, while promoting public safety, health and welfare, and providing for the protection of private property". Seawalls are noted to have direct physical impacts and indirect psychological effects on public access. The BPI Ordinance is in conformance with the public access and public recreation policies of Chapter 3 of the Coastal Act.

The public has ownership rights seaward of the mean high water line and has rights by prescription or otherwise landward of this line. Tidal cycles will, of course, cause this mark to fluctuate seasonally and annually. The BPI Ordinance stipulates that protective structures must be "designed to eliminate or mitigate adverse impacts to local shoreline sand supply" (Chapter 30.50.060.A). Where the sediment supply has been reduced through natural phenomena, the mean high water mark, and thus the area of public ownership, is altered. This affects public interests in four ways. First, the change in the shoreline profile may alter the area of public ownership. A beach that is forced to rest at a steeper angle (either temporarily or permanently) than under natural conditions reduces the horizontal area available to public access between the low and high tides. Second, the obstruction of sand bar material and resultant high energy waves may result in a progressive loss of sand far off-shore, again reducing the size of the public beach. Third, seawalls may cause cumulative regional effects by increasing erosion on adjacent public beaches. Finally, seawalls interfere directly with public access by creating physical obstacles to pedestrian movement.

In addition to direct physical restriction, continuous seawalls can create a psychological barrier by reducing the visual attractiveness of the beach or by creating the impression of private ownership. Thus, Coastal Commission policy strives to minimize encroachment onto the beach while providing privacy and protection to the resident.

The following State statutes regulate public access and recreational opportunities in the coastal environment.

- California Constitution-Article X, Section 4 prohibits individuals, partnerships or corporations from excluding the right of way to water required for any public purpose.
- California Coastal Act-Section 30210 implements Article X by requiring maximum public access, "conspicuously posted, . . . for all the people consistent with public safety needs and the need to protect public rights, rights of property owners, and natural resource areas from overuse."
  - Section 30211 states that "Development shall not interfere with the public's right of access to the sea where acquired through use or

legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation."

- Section 30212 states public access shall be provided in new development from the nearest public roadway except where "(1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources, (2) adequate access exists nearby, or (3) agriculture would be adversely affected." (New development excludes replacement of structures or repair or maintenance activities.)
- Section 30214 states that implementation of public access must take into account regulation of time, place and manner of public access in respect to topographic conditions, protection of privacy of adjacent property owners and provision of litter collection. The section further states that "It is the intent of the Legislature that the public access policies of this article be carried out in a reasonable manner that considers the equities and that balances the rights of the individual property owner with the public's constitutional right of access pursuant to Section 4 of Article X of the California Constitution. Nothing in this section or any amendment thereto shall be construed as a limitation on the rights guaranteed to the public under Section 4 of Article X of the California Constitution."

The Coastal Commission's policy for the Del Mar shorefront is clearly summarized in a staff report (Case No. 6-84-30):

> "With regard to the permitted alignment of the seawall and any associated toe stone foundation, the Commission finds, . . . that the placement of more private structures or seawalls adjacent to public beaches has the potential of creating use conflicts between private residents and the beach-going public. The results of new private use encroachment into the sandy beach can create situations in which landowners intimidate the public and seek to prevent them from using public areas because of disputes over where the exact boundary between private and public ownership is located. The placement of such structures on public land directly precludes the public physically and may diminish the visual attractiveness of a coastal segment in a psychological

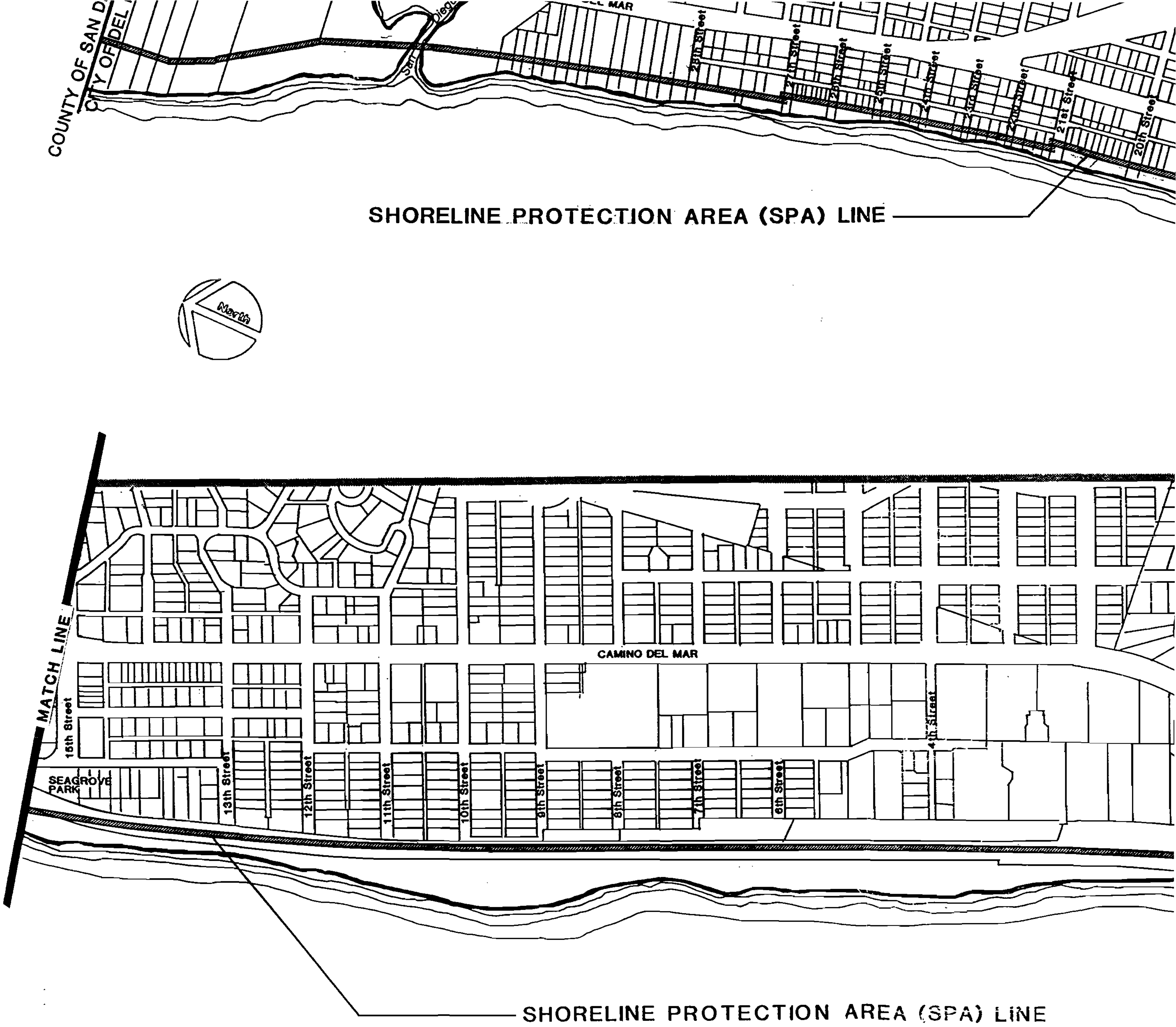
way. Lastly, the construction of such shoreline protective devices lower on the beach again increases its impact on natural shoreline processes (p. 17)".

2.4 PROJECT SETTING

The Del Mar beachfront extends approximately 2.9 miles in length and is situated near the southern end of the Oceanside Littoral Cell, which extends from Dana Point south to La Jolla. At both the northern and southern ends of Del Mar, the sandy beach intersects high, near-vertical cliffs. The San Dieguito River flows into the sea in the northern part of the project area, forming a 1600-foot wide rivermouth as it intersects the beach. The location of the SPA line along the length of the beachfront is illustrated in Figure 3. Most development of the Del Mar beachfront occurs in the low-lying area south of the San Dieguito River mouth to approximately 15th Street.

In order to properly analyze the study area and the proposed project, the area has been divided into three sections (Figure 4). This division was necessary because of the differences in each section with regard to the following factors: the extent of private encroachments into the public beach; the amount of public access and public use of the beachfront; the natural beach and coastal bluff features; hazard protection and beach erosion; and the need for beachfront protection. The three sections of the study area are described below.

Section 1: This northern-most section extends approximately 2600 feet (one-half mile) from the north city limits of Del Mar to the south shore of the San Dieguito River channel. The sea cliffs north of the rivermouth rise approximately 75 feet from the beach. The SPA line, located on the bluff top roughly parallel to the cliffs, ranges from approximately 20 feet to 80 feet east of the top edge of the cliff. Residential development in this portion is located at the top of the bluffs. The house closest to the bluffs is located 70 feet east of the cliff edge and although this property does not require protection at the present time, it ma, require protection in the future. The North Bluff Preserve, a 7-acre park is located on the top of the bluffs at the northwest edge of the San Dieguito rivermouth. The preserve is the location of a significant archaeological site. Crossing the rivermouth, at approximately 375 feet inland from the shoreline is the


COUNTY OF SAN D
CITY OF DEL
DEL MAR
28th Street
27th Street
26th Street
25th Street
24th Street
23rd Street
22nd Street
21st Street
20th Street
SHORELINE PROTECTION AREA (SPA) LINE
North
MATCH LINE
CAMINO DEL MAR
15th Street
SEAGROVE PARK
13th Street
12th Street
11th Street
10th Street
9th Street
8th Street
7th Street
6th Street
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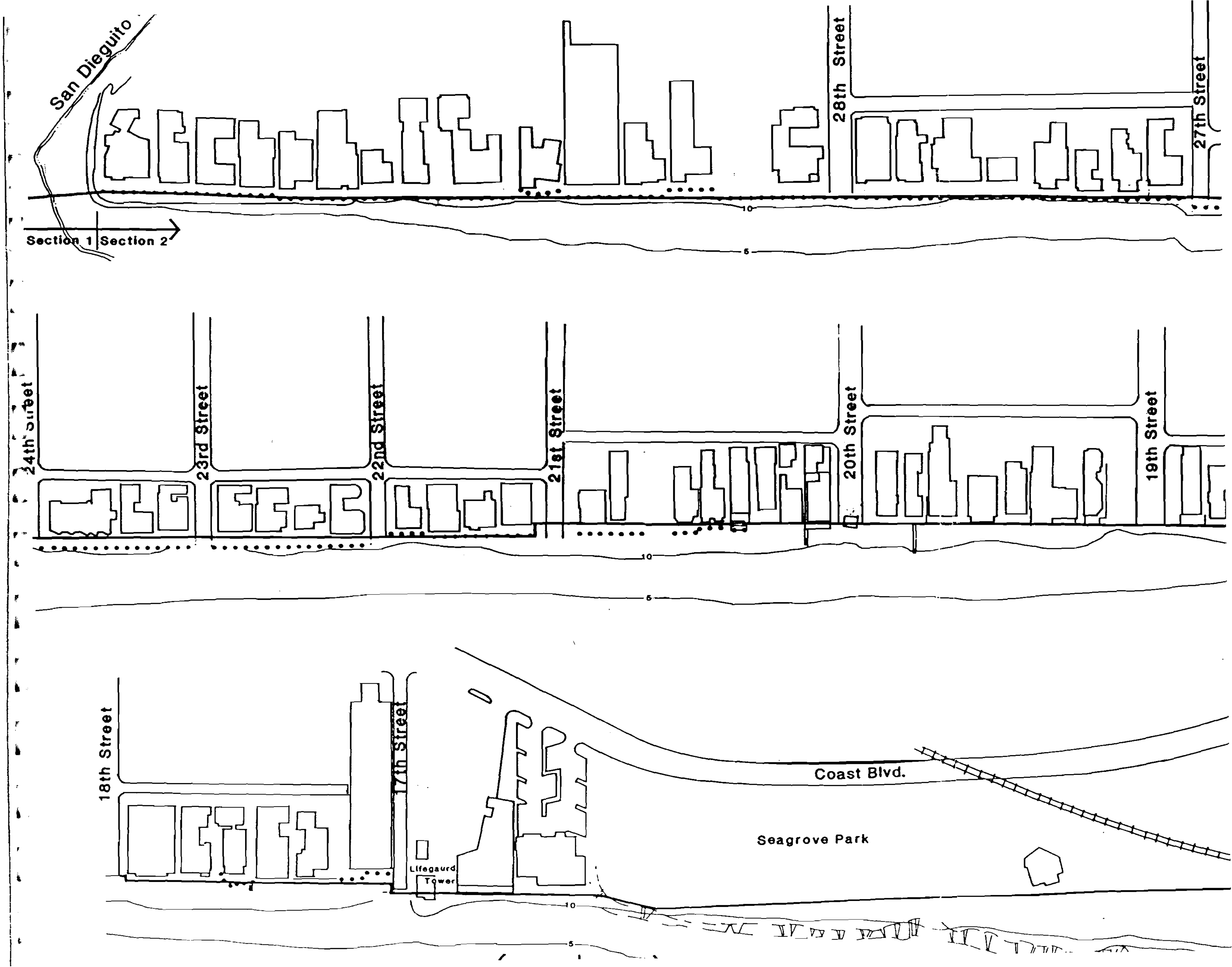
SHORELINE PROTECTION AREA (SPA) LINE


San Dieguito
28th Street
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Section 1
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24th Street
23rd Street
22nd Street
21st Street
20th Street
19th Street
10
5
18th Street
17th Street
Coast Blvd.
Seagrove Park
Lifegaurd
Tower
10
5

Camino Del Mar Bridge. Natural bluffs descend from the peninsula to the bridge on the north side of the rivermouth. The south side of the rivermouth at the beachfront is lined with residential development and a rock revetment for beach and riverfront protection. The sandy beach is quite narrow in this section along the cliffs. Access is available from contiguous beach areas to the north and south of the cliffs. There is occasional beach access via dirt paths through the river bottom on each side of the river mouth.

Section 2: This section is approximately 8,700 feet long and includes the northerly properties from the south side of the San Dieguito River to the north end of Seagrove Park. The SPA line in Section 2 generally follows existing walls, or property line boundaries, or is intended to form practical links between walls or landmarks which are offset. Several residences within this section have shoreline protection structures, patios, walkways, and private stairs which extend west of the SPA line. The beach is quite narrow during the winter and during high tides; the water sometimes reaches the existing riprap, especially north of 29th Street. The properties north of 29th Street have ownerships of record which extend westerly to the mean high tide line. These properties are generally well protected by vertical seawalls, with extensive riprap protection seaward of the vertical walls. The existing protective devices apparently provide adequate protection during storm, high tide and river flood conditions.

The block between 29th and 27th streets is protected by a series of individually constructed vertical seawalls, with 5 to 15 feet of stone toe protection along all but one property. The vertical walls are constructed at or near the westerly property line, and the rock protection extends westerly onto the beach. Public access is available at the 29th and 27th Street-ends; however, access is hindered at certain times of the year by the 3-foot seawall and rock revetment extending westerly toward the sea. Portable stairs are utilized during the summer to provide access over the wall and rock at 27th and 29th streets.

The properties between 27th Street and 240 feet south of 17th Street were subdivided in the 1920's and have a more complicated legal status and development history than other portions of the study area. At the time of development, strips of property of varying widths were dedicated and recorded as public property west

of the property lines. Between 27th and 25th streets, a 20-foot wide "Alley" was dedicated on the westerly side of the private lots (between the lots and the beach). Between 25th and 21st streets, a 15-foot wide "Public Sidewalk" was dedicated between the private lots and the beach. Between 21st and 17th streets, a 15-foot wide "Lot 22" was recorded between other private lots and the beach. A 7.5-foot wide sidewalk for public and private use was constructed in this area by the original subdivider from 25th to 15th street, connecting the beachfront with downtown Del Mar, the railroad station and the hotel. Most of the sidewalk was destroyed in 1927 and 1983, and only small portions of the sidewalk remain. The "Alley", "Public Sidewalk" and "Lot 22" are properties in which the public has rights, however, the exact legal status of these properties has not been adjudicated, except as to the property covered by the Crabtree v. Goode litigation.

Numerous private improvements including patios, seawalls, stairs and/or landscaping have been located within the "Alley", "Public Sidewalk" and "Lot 22" since the original subdivision of these properties between 27th and 17th streets. The beach is widest in this area also and waves generally do not reach existing protective structures except during storm conditions.

North of 22nd Street, seawalls of varying materials are located along a line running approximately 15 feet west of the SPA line, with exposed rock protection currently extending from approximately 5 feet to 22 feet west of the walls. Private improvements have been completed within the SPA area. South of 22nd Street, short spans of sea walls are interspersed with low rock revetment protection and/or sand berming. Here, private improvements within the SPA area are fewer and occur mainly on the block between 21st and 20th streets including one residence located immediately south of 21st Street which is slightly over the SPA line. Between 22nd and 21st streets, the SPA line generally follows the line of existing seawalls. Riprap extends up to 22 feet west of the line. In the block between 21st-20th streets, existing seawalls in the north half of the block are located approximately 15 feet west of the line; while seawalls in the south half of the block are located on the SPA line. Exposed riprap within this block extends to a maximum of 25 feet west of the existing walls. In the block between 20th to 19th streets there are short spans of exposed riprap, currently extending to a maximum of 37 feet west of the line, and there are no existing seawalls within this block.

Between 19th to 18th Streets, most of the residences have existing seawalls generally located 28 feet west of the line, with the exception of one residence with a wall extending 40 feet west of the line and exposed riprap extending an additional 5 feet west of the wall. The block between 18th and 17th streets is characterized as having riprap only, with the exception of one property with a seawall, currently extending approximately 5 feet west of the line. At the north side of the 17th Street right-of-way, the SPA line extends approximately 7 feet seaward, and then south for 270 feet in a line which slices through the west face of the lifeguard tower. This line is almost concurrent with the western edge of the Poseidon Restaurant. Exposed riprap for both the Poseidon and Jake's restaurants currently extends approximately 11 feet west of the line.

Public access to Del Mar's beach is provided at 17th Street, and to a lesser extent at 25th and 20th streets where the other enclosed lifeguard towers are located. Public access is also available at all the other street-ends within this section by means of walk-outs or built-in stairs. The southernmost restaurant (Jake's) operates under a conditional use permit which requires north-south public access across the south lot. The other restaurant (Poseidon) has executed an agreement to provide lateral public access upon request of the City.

Section 3: The most southerly, 3700-foot portion of the project area extends from the north boundary of Seagrove Park to the southern limits of the City of Del Mar. Two short spans of wood seawalls are the only protection within this section of the SPA zone. The coastal bluffs range in height here from 10 feet near the restaurant to 60 feet at the city's southern limit. Seagrove Park is located at the top of the bluffs. In the northernmost part of Section 3, the SPA line follows a slightly diagonal line from the rim of the bluff, south to the railroad tracks. From the 15th Street-end, but west of Seagrove Park, the SPA line follows the center of the railroad tracks south to the City boundary. The bluffs rise steeply in this section to the railroad right-of-way and then rise steeply again on the east side of the railroad right-of-way to the top of the bluffs. Residential development occurs on the westerly edge at the top of the bluffs from Seagrove Park south to Carmel Valley Road. A concrete stormwater culvert is located west of the property lines at the top of the bluffs.

Beach access within this section is provided by two "day ramps" down the bluff face near the intersection of Coast Boulevard with the railroad track. No other designated access is available from this point south to the City boundary, although there are several well-used narrow, steep dirt paths which provide access, such as at 11th and 8th streets. These paths are not maintained by the City.

3.0 ENVIRONMENTAL ANALYSIS

3.1 PUBLIC ACCESS/BEACH ENCROACHMENT

Existing Conditions

Considerable demand presently exists for recreational use of Del Mar's beach, and future population growth projections within the region indicate a significantly greater demand for such use in the future. Given the current plans for development of land to the east of the City, the beach area in Del Mar is projected to experience significant increases in recreational activity. In general, however, lack of available parking serves to limit the accessibility of the beach. Additionally, private encroachments onto public beach land and severe beach erosion have reduced the amount of beach available for public recreation.

As described in the Project Description, private encroachments occur along the east side of the beach, typically covering a width of approximately a few inches to over 20 feet. Access is presently available at certain street ends, which are shown on Figure 3.

Public access and beach encroachments for each section of the study area are described below.

Section 1: This northernmost section presently receives a limited amount of year-round public use; however, during the peak season the beach can become crowded. This area is a popular year-round surfing beach and is Del Mar's only designated "dog beach". No major pedestrian access is provided within Section 1. Public access is available to the north in Solana Beach by means of permanent concrete stairs that extend from the top of the bluff to the beach; a few on-street public parking spaces are provided at the top of the bluff for public beach use. Other access to this section is obtained via Camino Del Mar. Access is gained by parking along the street and utilizing narrow dirt paths located on the north and south sides of the river mouth. The City of Del Mar does maintain an asphalt path for the North Bluff Preserve park that runs between the river and the bluff top.

Section 2: The northern portion of Section 2 presently receives a limited amount of public use, because the sandy beach is narrow here. Pedestrian access onto the beach is provided at the street-ends of both 29th and 27th streets and from Camino del Mar along the south of the river, although access at these points is hindered by existing protective devices. A 3-foot wall extends across both of these street-ends, located along the same line as the protective devices for adjacent private properties. A rock revetment extends approximately 5 to 8 feet west of the wall. Eight to twelve parking spaces are available near the 29th Street access point; no parking is available at 27th Street. Other limited parking is available at certain locations on the streets in the surrounding area. Portable stairs are available for use at 25th, 27th and 29th streets during the summer season to provide access over the wall and rock toe at these locations. Existing rock revetments do extend farther than the allowable maximum 15-foot horizontal depth for some of the properties within this section.

Farther south is the central, most heavily used portion of the entire study area because the majority of public beach facilities, improved lifeguard towers, restaurants and a snack stand are located in this area. Available parking and a wider beach area are two other factors contributing to the high public use of this section. Existing protective devices at the street-ends include:

- o Seawall with rock revetment: 26th and 25th streets
- o Rock revetment only: 24th, 20th, 18th and 17th streets
- o Sand berm only: 23rd through 21st Streets, 19th street.

Major pedestrian access points are located at the street-ends of 25th, 20th, and 17th streets. Minor public access is available at all the other street-ends within this section by means of built-in stairs or walk-outs. Handicap parking is available at 17th and 20th streets, limited parking is available on the area streets (there are approximately 15 metered parking spaces at the "tower"), and a large public parking lot is located adjacent to the train station (across the street from the two restaurants). Vehicular access is currently provided at 24th, 20th and 17th streets. All of the developed beachfront lots in this area with the exception of one residential lot and the two restaurants, have encroached onto public beach land by the placement of protective devices. In some instances, encroachment also includes the addition of fences, patios, private stairs, and/or landscaping for private use. The two restaurant properties located south of 17th Street include ownership to the mean high tide line. The Poseidon Restaurant adjacent to 17th Street is in the process of entering into an agreement with the City to provide lateral public access upon request of the City. The southernmost restaurant, Jake's, operates under a conditional use permit which requires provision for north-south public access across the lot.

Section 3: Section 3 also receives a large amount of public use. It is recognized as a surfing area by the Del Mar lifeguard department. The beach along this section is narrow and contains exposed rock in many areas. Pedestrian access onto the beach is available at two "day ramps" in Seagrove Park (one near the center of the Park and the other next to Jake's Restaurant). Narrow, steep dirt paths descend down the near-vertical cliff face at several locations within this section, particularly at 11th and 8th Streets and receive heavy use by surfers; however, these paths are not safely navigable by the general public and their use is discouraged by posted warning signs. Limited parking is available at some street ends and on the streets.

Impacts

The BPI Ordinance allows a maximum of 5 feet encroachment of a vertical wall west of the SPA line if "there is no other feasible location for effectively protecting a principal structure; there is no feasible, less damaging alternative; and feasible mitigation measures have been provided to minimize any adverse environmental effects." Also, if there is a riprap element, the riprap cannot extend more than 20 feet westward of the SPA line (i.e., 15 feet west of the maximum 5-foot encroachment).

The intent of the creation of the SPA line and zone was to minimize beach encroachments while allowing protection of beachfront residences. Thus, development or maintenance of protective structures within the stated distance limits would result in encroachments no greater than 20 feet seaward from the SPA line. Generally, the limits of the SPA line and zone will provide an adequate area to construct shore protection structures, if required, and provide an adequate recreational beach area. This assumes that the beach is maintained at or near its existing width and condition.

Wave reflection from a shore protection structure can increase the seaward transport of sediment. When storm waves occur frequently, sand is transported seaward and before it all can return to build the beach back, another storm removes it again. The result is that when the distance between the structure and the waterline is small, the beach in front of the structure is statistically narrower, over time, than it would be if the structure did not exist. The width of the beach gradually returns to its pre-storm condition as the frequency of storm waves decrease. The farther seaward a shore protection structure is located, the greater the impacts and the longer time required to restore the width of usable beach.

Protective structures, whether they be vertical seawalls or riprap, potentially pose direct obstacles to the public to access the beach both laterally (parallel along the beach) and vertically (from the east). The BPI Ordinance allows private property owners to construct and/or maintain seawalls and riprap within the SPA zone limits subject to issuance of a shoreline protection permit. Issuance of this permit requires that the City Council make a number of findings including a finding that the proposed protective structure is in conformance with the public access and public recreation policies of Chapter 3 of the Coastal Act. Except for streets which are perpendicular to and terminate at the beach, the residences along the beachfront generally provide no vertical public access to the beach. Thus, development or maintenance of a seawall and accompanying riprap directly in front (west) of these residences within the SPA zone would not impact vertical public access to the beach. Public access would be maintained at the existing accessways (street ends) by means of either openings in the protective structures, or by stairways over the walls.

Lateral access could be reduced if the riprap element of the proposed structures extends the maximum of 20 feet westward from the SPA line. This encroachment distance is not considered excessive when viewed in conjunction with Section 30.50.060-I.2 of the BPI which states that the riprap will have a westward slope beginning no higher than 5.7 feet NGVD or 0.43 feet MLLW at the SPA line, and will decrease in height at a minimum slope of 1.5:1. Also, consideration must be given to the need to protect the structural integrity of private development; and the engineering, economic and geotechnical requirements for using up to 20 feet for the riprap element of these protective structures (in some cases). The potentially adverse impacts of riprap are considered to be reasonable and below a level of significance.

Mitigation Measures

Provided that the BPI is implemented the way it is designed, no significant impact to public access or beach encroachment would occur from implementation of the project and no mitigation measures are required, provided that access is maintained at the street ends and other existing access points. Adherence to the BPI ordinance ensures that excessive beach encroachment would not occur, and, if protective structures are built at the street ends, the City would ensure that public access is provided and maintained The riprap element of structures would be covered by sand, thus reducing potential impacts described above. This would be included as a condition of approval of each Shoreline Protection Permit.

3.2 VISUAL QUALITY

Existing Conditions

The Del Mar oceanfront is generally characterized by steep bluffs in the northern and southern portions of the study area (Sections 1 and 3 shown on Figure 4), and by flat topography in the central portion (Section 2). Each section is described in more detail below.

Section 1: Natural coastal cliffs characterize this section of the shoreline. Views laterally along the beach north of the San Dieguito River are bordered by near-vertical cliffs. The only development within this section is located at the top of the 75-foot cliffs, north of the North Bluff Preserve. A panoramic vista point is located at the top western edge of the North Bluff Preserve, offering views westward to the sea and south along the coastline. A view corridor exists along Camino Del Mar, looking west across the river mouth and offering an unobstructed view of the shoreline and ocean. Residential developments located on top of the cliffs have unobstructed views to the west. Photograph A shows the view of this area from the beach on the south side of the river mouth.

Section 2: Due to the flat nature of the topography adjacent to the beach, and the residential development in this area, no prominent vista points are available to the public looking west. However, view opportunities do exist at those street ends which access the beach, if the viewer stands directly at or on the protective structures. Residences located on the beachfront have unobstructed views to the west over most existing protective devices, except for some residences where protective structures may block the line of vision from the first floors.

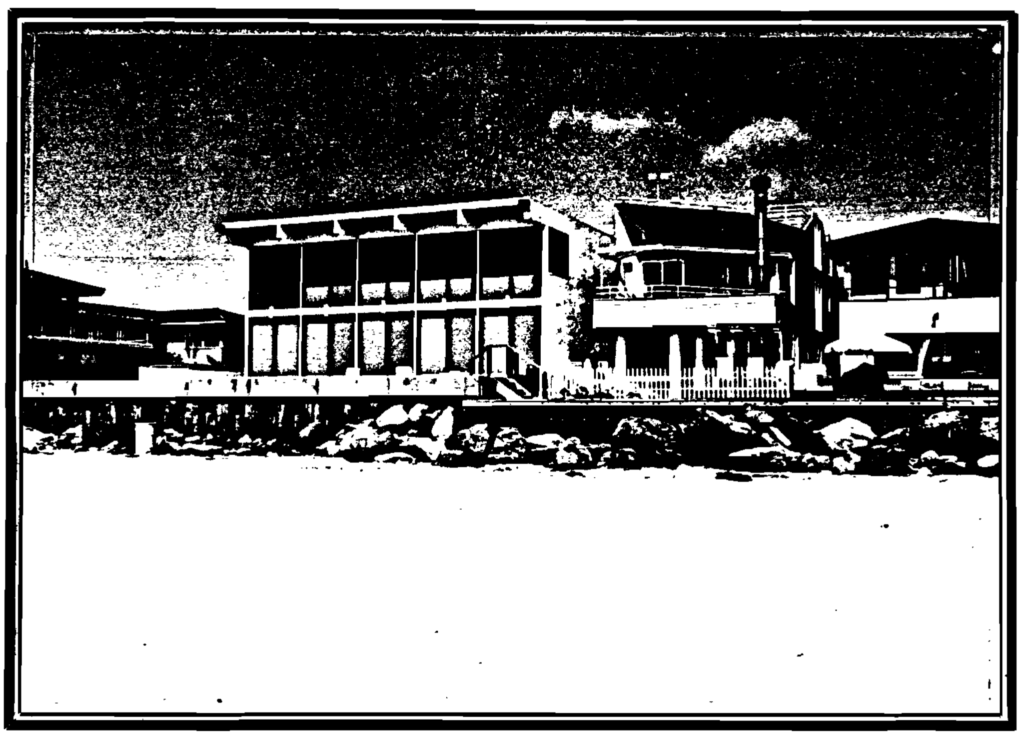
A view corridor extends laterally along the shoreline with the ocean to the west and the beachfront residences to the east. Existing protective structures, including walls, riprap and sand berms are located along portions of the residential fronts on the east. These structures vary in design, size, height and material, as demonstrated in Photographs B through F.

Photograph A: Looking north from the south side of the San Dieguito River channel (Section 1)

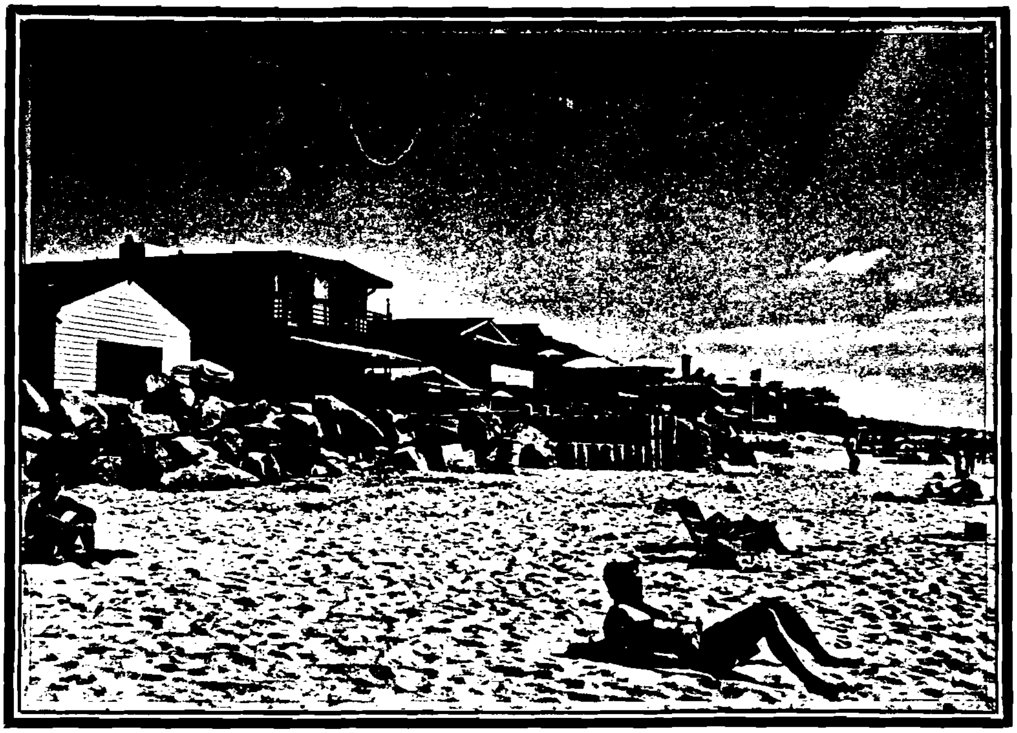
Photograph B: Looking northeast from beach (Section 2)

Photograph C: Looking east from beach (Section 2)

Photograph D: Looking south from east end of beach (Section 2)

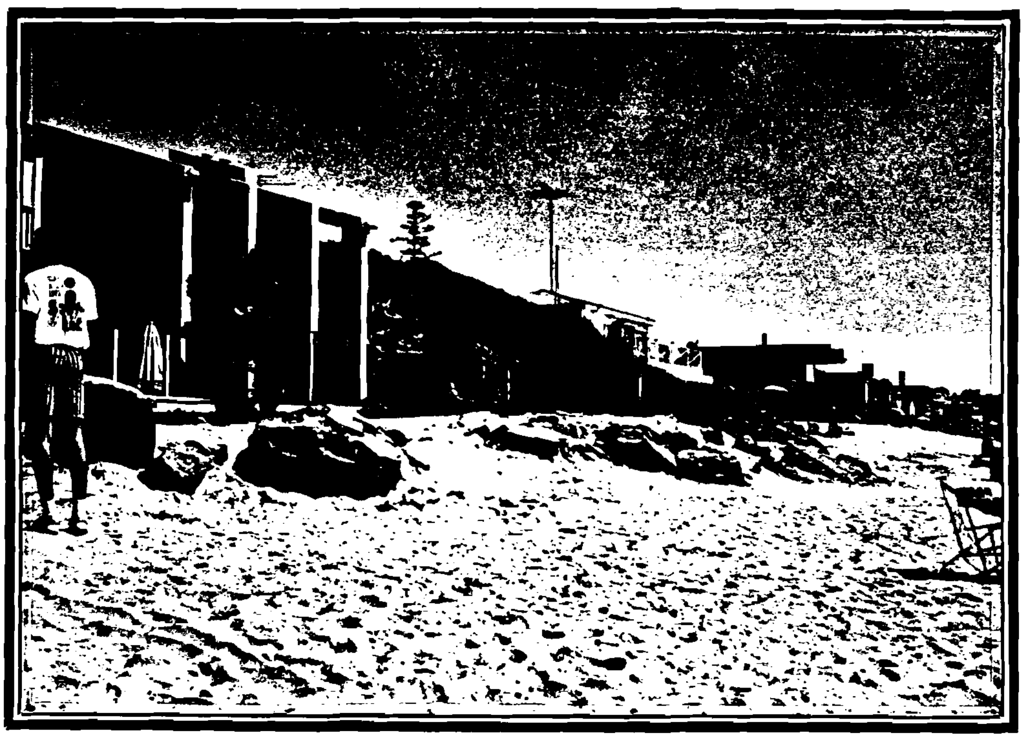


Photograph E: Looking east from beach (Section 2)



Photograph F: Looking south from beach (Section 2)

Some of the beachfront residences do not have walls as protective structures. An example of this is shown on Photograph G.



Photograph G: Looking southeast from east end of beach (Section 2)

Section 3: The section between Seagrove Park and the City's southern boundary is characterized by natural coastal cliffs. There are four vista points in this section: Seagrove Park; the Ahmonson property west of the railroad tracks between 8th and 11th Streets; and the cliff edge at the 7th Street terminus; and Bardacos/Garro Canyon and the City boundary at the south end of the beach area. Benches are provided for the public at two of these locations for more leisurely viewing. The lateral view from the beach along the shoreline is characterized by the steep natural cliffs on the east side. Residential structures line the bluff, east of the railroad track. Each of the street-ends within this section offers a distance view of the ocean. Hiking paths are utilized along the top of the outer bluff, along the railroad right-of-way and along the culvert at the upper bluff, all offering views to the west, north and south.

California Coastal Act: The Act provides for the protection of scenic and visual qualities of coastal areas, specifically in Section 30251. This section states that "Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas,... to be visually compatible with the character surrounding areas...." The Coastal Act (Section 30600) requires that in addition to other permits required by local, regional or state agencies, development in the coastal zone is required to have a coastal development permit.

Each jurisdiction in the coastal zone is required by the Coastal Act (Section 30500) to prepare a Local Coastal Program (LCP) which would regulate, among other things, development within that jurisdiction's portions of the coastal zone. The City of Del Mar is expected to have its LCP completed during 1989.

Impacts

Implementation of the BPI is not expected to result in adverse visual impacts within Section 1 which consists of the sea cliffs north of the San Dieguito River. Likewise, Section 3 which extends from Seagrove Park to the southern City limit, would not be adversely impacted as a result of the BPI. Both of these areas presently have some riprap at the toe of the slope, implementation of the BPI will result in the removal of non-conforming riprap. Visually, this would be a positive impact.

Since all the street-ends within Section 2 presently have some type of protective device which blocks most beach views from the inland streets, development of protective structures and/or removal of existing structures in front of residences would produce no substantive change from existing conditions at the street-ends. Also, existing vistas from the bluff tops will not be affected as a result of the project. Views from the beach and from the water to the east would be improved by the removal of the various non-complying protective structures and associated riprap.

Ocean views from some of the residences located directly on the beach could be potentially affected as a result of future development or abatement and redevelopment of protective structures. The residences affected would be those that are near the SPA line and at or near the same elevation. These residences could construct seawalls with a higher crest elevation to provide sufficient protection to their property. The resulting seawalls with higher elevations potentially could block the first floor views.

Views from the beach toward the east would not change significantly in the long term, except that more protective structures are likely to be built, and some existing structures could be relocated. The relocation distance could be from five feet to approximately 40 feet toward the east (including rip rap). Because walls and rip rap presently exist, and in many cases exist in connecting lines, the addition of new walls to a continuous line of walls would be hardly noticeable, if at all. Walls may jog in and out a few feet, corresponding with the SPA line (or 5-foot allowable westerly encroachment), or from existing protective structures which are maintained in their current configuration. This is not considered to be visually unpleasant or adverse, as this would serve to break up the monotonony of a long, continuous straight line of walls. Additionally, the greater size of beach area created by relocation would be, at the most, minimally noticeable, since it would be a small percentage of the adjacent beach.

Concern may arise regarding height or design of the structures, and the aesthetic relationship to adjacent structures and the area in general. The BPI Ordinance does not directly regulate height or design, however, the Guidelines implementing the Ordinance state that the City Code would apply, and that would include enforcement of the Design Review Ordinance. Thus, each proposed wall would be subject to evaluation by the City's Design Review Board, which is considered to constitute a positive impact as more uniformity and/or acceptable design might result than with no control at all. It is not expected that excessive height would be an issue, because of the corresponding preclusion of views from the residences.

In conclusion, no significant visual impacts would occur from future development of protective structures along the SPA line, or within 5 feet of the SPA line to the west. This statement considers the riprap associated with walls which can extend no more than 20 feet westward from the SPA line. In accordance with the BPI, the height and slope of the riprap shall be no higher than a 5.7 foot elevation National Geodedic Vertical Datum (NGVD) at the SPA line, decreasing in height at a minimum slope of 1.5:1. It should be noted however, that in the Barrie et. al. and California Coastal Commission litigation, the Coastal Commission required that the riprap element of the project extend no more than 12 feet from the seaward face of the seawall and that the vertical height be no higher than 3 feet Mean Lower Low Water (MLLW) or 0.43 feet NGVD with a maximum slope of 1.5:1. Since the BPI's 5.7 foot NGVD elevation is a maximum, it is possible that City Council will require riprap to be at a lower elevation.

Mitigation Measures

No significant visual impacts would occur, thus, no mitigation measures are necessary. Project-inherent design mitigation is embodied within the Ordinance itself, which requires consistency with the City Code, including the Design Review Ordinance.

3.3 COASTAL PROCESSES

Existing Conditions

Tides and Water Levels

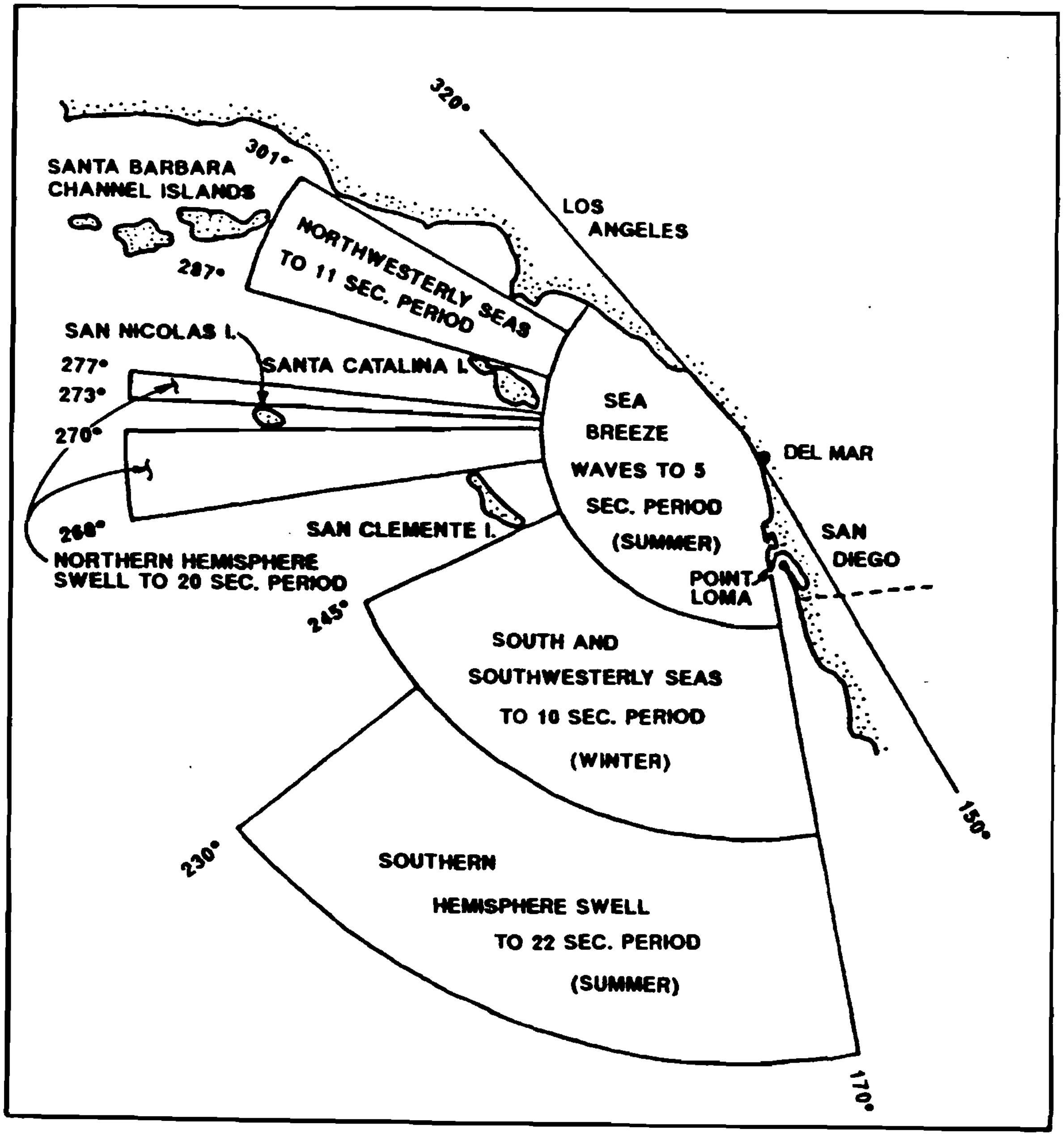
Tide data for Del Mar are presented in Table 1. The elevations are referenced to both MLLW and NGVD; MLLW is 2.57 feet below NGVD. Mean Lower Low Water will be used for the reference datum in this report. Tabulated values for Del Mar were compiled by applying an astronomical tidal correction factor to the tides at San Diego Bay. Water levels at the location of the shoreline protection structures may be exceeded due to wave runup and wave setup.

Table 1
TIDE DATA FOR DEL MAR, CALIFORNIA

	MLLW Datum	NGVD Datum
Extreme high tide (Jan. 28, 1983)	7.77 feet	5.20 feet
Mean higher high water (MHHW)	5.20 feet	2.63 feet
Mean high water (MHW)	4.50 feet	1.93 feet
National Geodetic Vertical Datum (NGVD)	2.57 feet	0.00 feet
Mean low water (MLW)	0.90 feet	-1.67 feet
Mean lower low water (MLLW)	0.00 feet	-2.57 feet
Extreme low tide	-2.60 feet	-5.17 feet

Wave Characteristics

Deepwater Wave Conditions: The waves at Del Mar can be divided into four primary categories according to origin: extratropical swell, southern hemisphere swell, seas generated by local winds, and seas and swell generated by Eastern North Pacific tropical cyclones. Wave exposure for Del Mar is shown in Figure 5.



GENERALIZED WAVE EXPOSURE FOR DEL MAR

SOURCE: MOFFATT & NICHOL, ENGINEERS

Figure 5

Extratropical swell, generated by storms in the North Pacific, approaches Del Mar from the west through narrow corridors between Santa Catalina Island, San Nicolas Island and San Clemente Island. This swell occurs primarily during the months of November through April. These waves generally represent the most frequent severe waves at Del Mar, although typically deepwater significant wave heights rarely exceed 10 feet, with wave periods ranging from 12 to 18 seconds. Extreme extratropical storms can generate deepwater waves up to 30 feet with wave periods in excess of 20 seconds.

Del Mar is exposed to southern hemisphere swell through a wide corridor from the south to southwest. Most of this swell arrives during the months of May through October. Because of the great decay distances, these waves have low heights and long periods. Typical southern hemisphere swell rarely exceeds 4 feet in height in deep water; however, with periods of up to 22 seconds, these waves can break at about twice this height.

Steep, short-period waves are generated by local winds and are predominantly from the northwest, although they can occur from all offshore directions throughout the year. Wave heights are usually between two and five feet with an average period of 7 seconds. Pre- and post-frontal winds associated with extratropical storms can generate seas from the northwest and south to southwest up to 17 feet high with wave periods of 12 seconds.

Eastern North Pacific tropical cyclones of hurricane intensity have the potential of generating some of the largest waves at Del Mar. These waves approach from the south to the southwest from May through November; however, a hurricane track along a path that would produce large waves at the project site seldom occurs. The tropical storm of September 1939, with a recurrence interval that could be greater than 100 to 200 years, produced waves from the southwest with an estimated significant breaking-wave height of 24 feet.

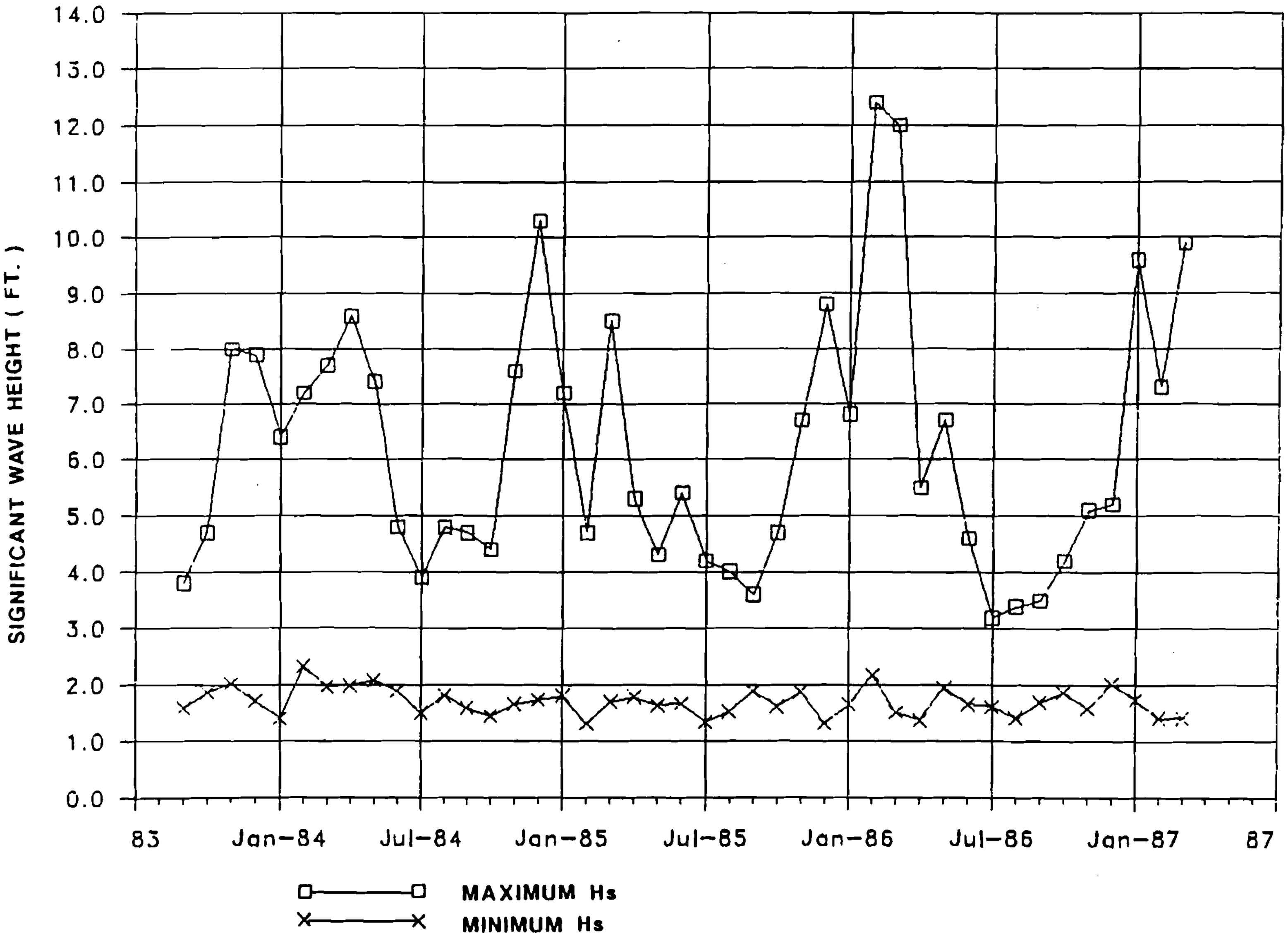
Nearshore Wave Conditions: Deepwater waves are altered by the proximity of offshore islands, refraction, diffraction and shoaling as they propagate toward Del Mar. As the waves approach the beach, the water depth will limit the wave height. This means that the larger deepwater waves will break offshore and the height of the nearshore waves in shallow water varies directly with water depth, which is a function of beach profile and tide elevation.

In September 1983, a wave gage-array was installed in 35 feet of water, approximately 2,400 feet offshore at 15th Street in Del Mar. The gage was installed by the State of California and U.S. Army Corps of Engineers as part of the California Coastal Data Information Program. A graphical distribution of the maximum and minimum significant wave heights recorded by the gage for each month of operation (from September 1983 to March 1987) is shown in Figure 6. The highest significant wave height recorded during this period of record was 12.4 feet, with a predominant wave period of 16 to 18 seconds on February 16, 1986. These wave characteristics are only representative of the wave conditions at the gage location and are not necessarily representative of design wave conditions for coastal structures.

Coastal Processes and Shoreline History

The Del Mar beach is located near the south end of the Oceanside Littoral Cell as shown in Figure 7. The cell extends from Dana Point south to Point La Jolla. Primary sources of sand in the Oceanside Littoral Cell is from erosion of coastal terraces and from beachfills. Sediment discharges from the San Juan Creek, Santa Margarita River and San Luis Rey River and erosion of sea cliffs constitute the remaining sources of sand in the cell. Longshore transport of sand in the Oceanside Cell is predominantly from north to south where it ultimately settles into the La Jolla Submarine Canyon.

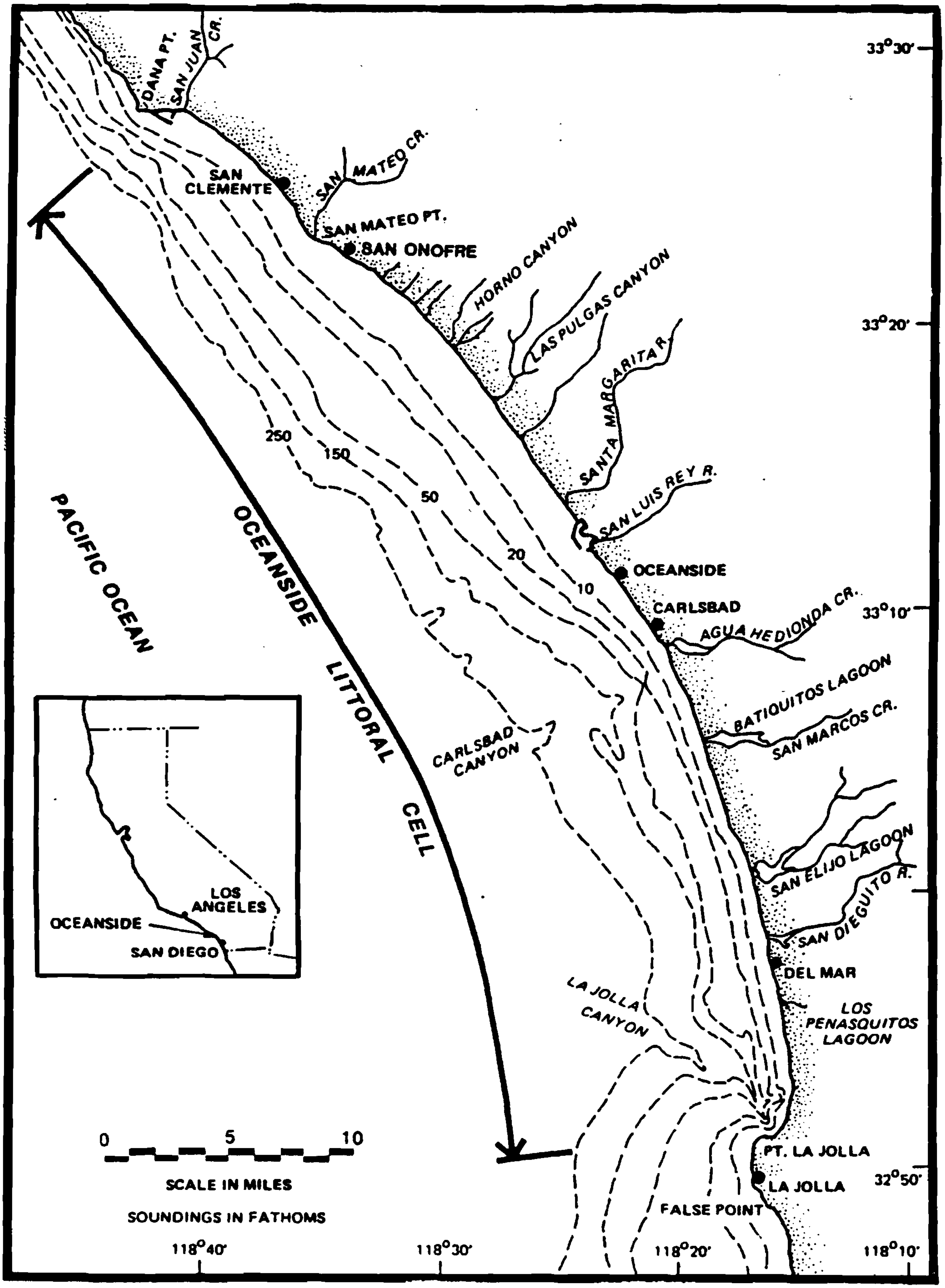
Sea Cliff Erosion: Research conducted by Scripps Institution of Oceanography indicates that the vertical cliffs along the north and south sections of Del Mar's coast have been slowly retreating. Wave-caused erosion steepens the sea cliff slope and controls the sea cliff retreat rate. Above the zone of wave action, the slope is subsequently reduced by surface water runoff, rockfalls, burrowing animals and human activity. The cliffs in the southern section of the project area may be particularly susceptible to this type of erosion. The property above the southern cliffs is more highly developed than in the north part of the City and the hillside topography is characterized by a steeper slope down to the cliff edge. Water



SOURCE: CALIFORNIA COASTAL DATA INFORMATION PROGRAM
WAVE GAGE LOCATED 2400 FEET OFFSHORE OF 15 TH STREET
d = -35 FT. MLLW.
PERIOD OF RECORD: SEPT. 1983 - MARCH 1987
DEL MAR, CALIFORNIA

MAXIMUM AND MINIMUM SIGNIFICANT WAVE HEIGHTS

Figure 6



LOCATION MAP FOR OCEANSIDE LITTORAL CELL

(FROM U.S. ARMY CORPS OF ENGINEERS, 1987

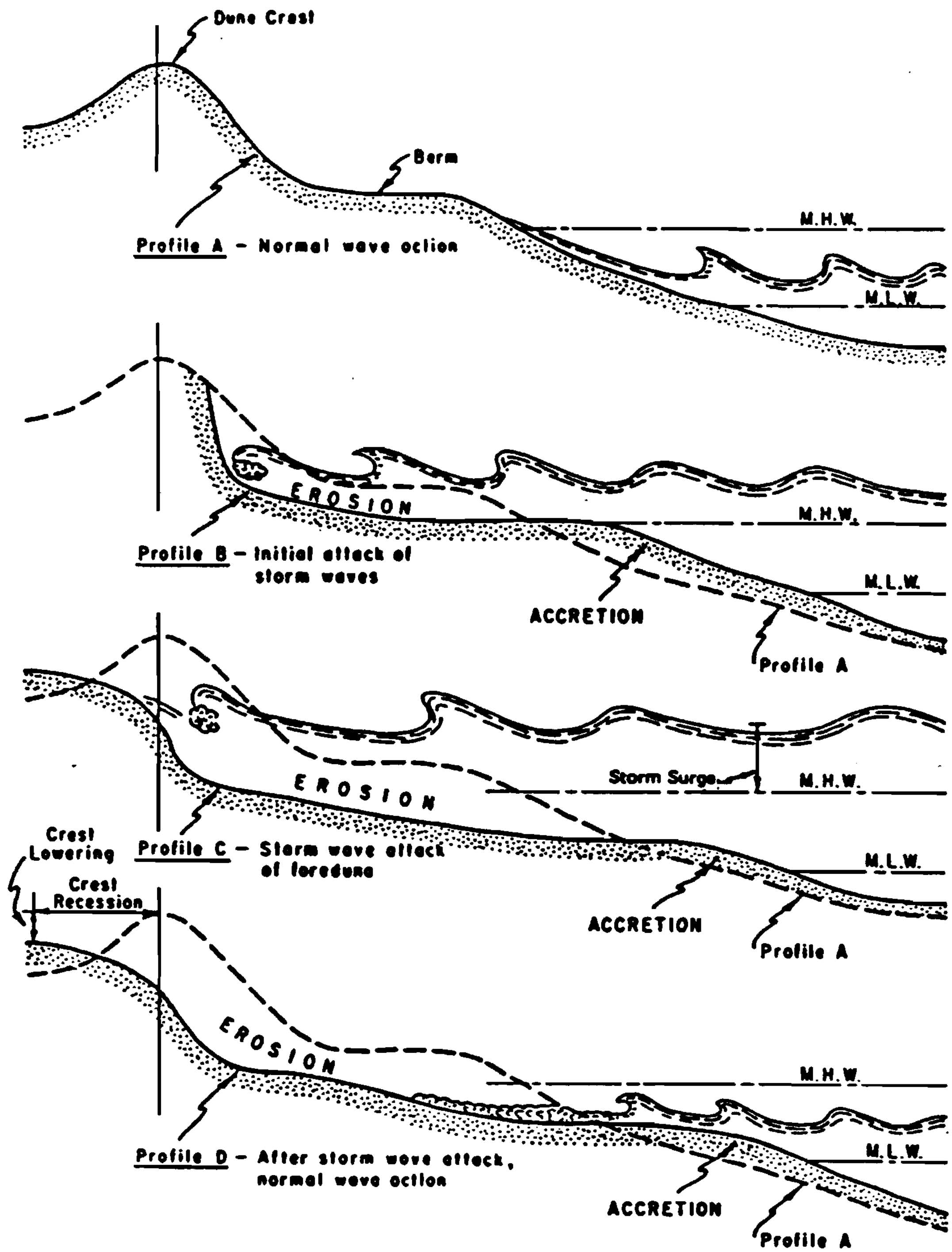
Figure 7

runoff from the streets and properties located on the hillside flows westward to the cliff face. In the 1940's the City of Del Mar constructed a concrete drainage culvert west of the street-ends and property lines to channel the water runoff into the City's drainage system, thereby greatly reducing water runoff over the cliff face.

Another potential cause of the cliff erosion is the increased groundwater flow from the coastal hillsides, west to the cliff faces. This is thought to have caused tensional fractures along the top, parallel to the cliff face, which ultimately result in cliff failure. Water can be seen seeping from the cliff faces at varying elevations below the bluff top. The groundwater table began rising in the area in 1973, commensurate with urbanization. This rise has been attributed to watering of lawns and the introduction of non-native vegetation to the region. This over-watering in coastal areas is thought to have three important effects which may contribute to landslides and blockfalls: (1) a slow but steady rise in the water table; (2) added weight to the cliff materials; and (3) increased pressure in the soil pores.

Historic Shoreline Movement: The storms which occured during the 1982-83 winter caused severe erosion of the Del Mar coastline. Aerial photographs indicate that the beach retreated at least 80 to 100 feet. However, the beach returned to its prestorm condition within two years after the storm, as also evidenced from aerial photographs. The January 1988 storm was also considered a severe event, but the beach erosion was not as extensive as the 1982-83 erosion. Unlike the 1982-83 storms, the water level was not exceptionally high during the peak of the storm waves and this may account for the lesser amount of coastal damage.

Shoreline movement maps published by the National Oceanic and Atmospheric Administration, National Ocean Service (NOS), aerial photographs, and U.S. Army Corps of Engineers surveys were evaluated to determine the fluctuations of the shoreline and the shoreline change rates at Del Mar. The shoreline positions shown on the maps, photographs, and surveys are the shorelines that existed at the moment the survey was made; it may be at any position within its fluctuating range. Fluctuations of shoreline positions are usually seasonal changes occurring between winter and summer. Winter storms typically cause sand to move offshore resulting in shoreline retreat as shown in Figure 8. During post-storm periods,



SCHEMATIC DIAGRAM OF STORM WAVE ATTACK ON BEACH AND DUNE

(FROM U.S. ARMY CORPS OF ENGINEERS, 1984)

Figure 8

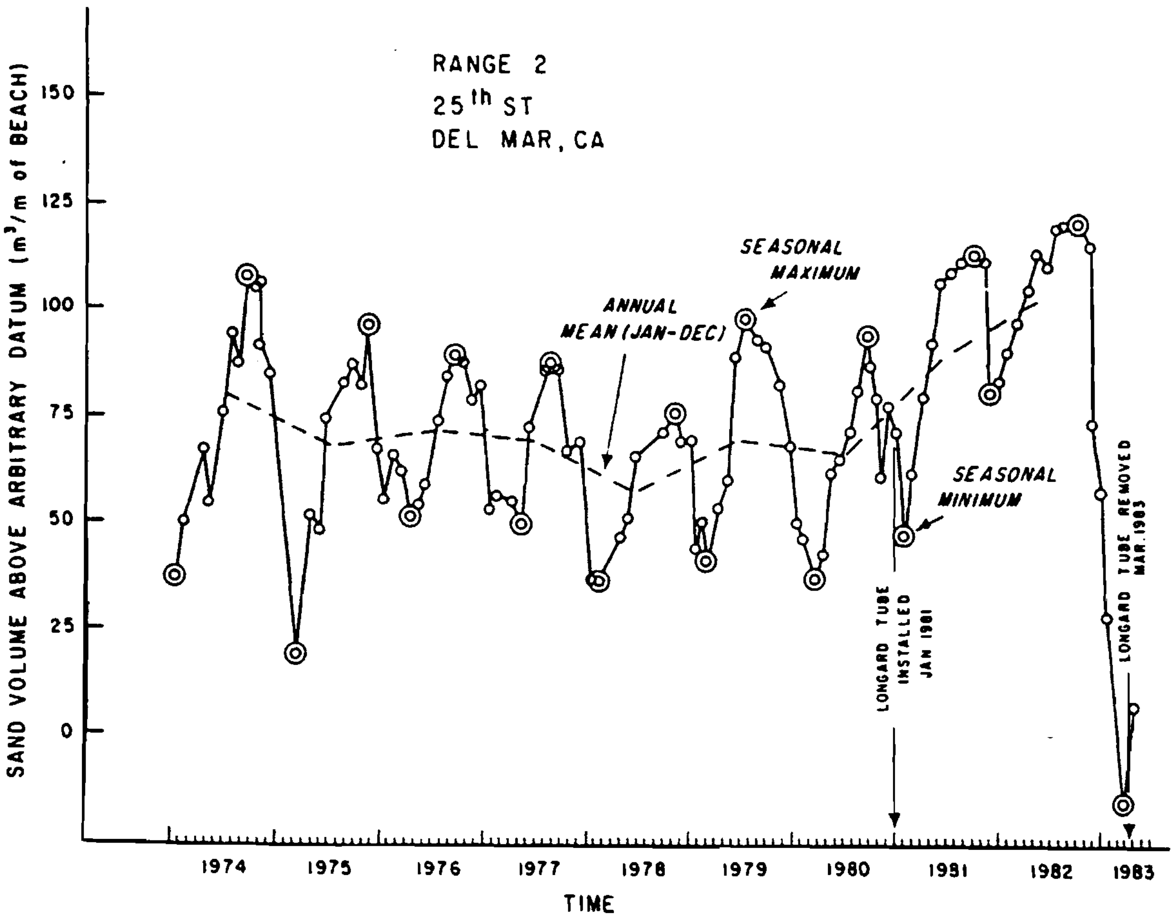
usually spring and summer when wave heights are lower and periods are longer, the sand typically moves onshore again and the shoreline advances seaward. Fluctuations in shoreline positions may also occur due to variability in longshore sediment transport. These fluctuations can occur over a longer period of time. The seasonal fluctuations are usually greater than the long-term fluctuations. This is illustrated in Figure 9, which shows the beach foreshore sand volume changes at Del Mar for available survey data between 1974 and 1983 at 25th Street. Comparison of the annual differences with the seasonal differences reveals that the seasonal differences are greater.

Shoreline positions maps obtained from aerial photographs were analyzed to determine shoreline positions and fluctuations at the project site. These shoreline movement maps were developed using a photographic transfer instrument to superimpose the aerial photograph image of fixed reference features and the wetted bound shoreline position on a base map. The wetted bound is the boundary line between sand saturated at the time of high tide and drier sand landward of that limit. The wetted bound does not vary appreciably over a tidal cycle and has been determined to approximate the mean high water shoreline.

The extreme shoreline positions at the project site from available aerial photographs between May 1954 and January 1988 are shown in Figure 10. The beach has fluctuated 50 to 150 feet during this period. Since 1954, the available aerial photography data indicates that the beach was the narrowest in February 1983, after the January 1983 storm. Data immediately after a second, and equally as severe storm which occurred in March 1983 were not available.

Shoreline Change Rates: The aerial photographs were combined with NOS maps and U.S. Army Corps of Engineers surveys to obtain shoreline change rates. Table 2 presents shoreline change rates for Del Mar based on measurements made every 1,000 feet along the coast between 1954 and 1988. A negative quantity indicates a retreat of the shoreline while a positive quantity indicates an advance. From these data it has been determined that the Del Mar beach eroded at an average rate of approximately 1 foot per year between 1954 and 1988.

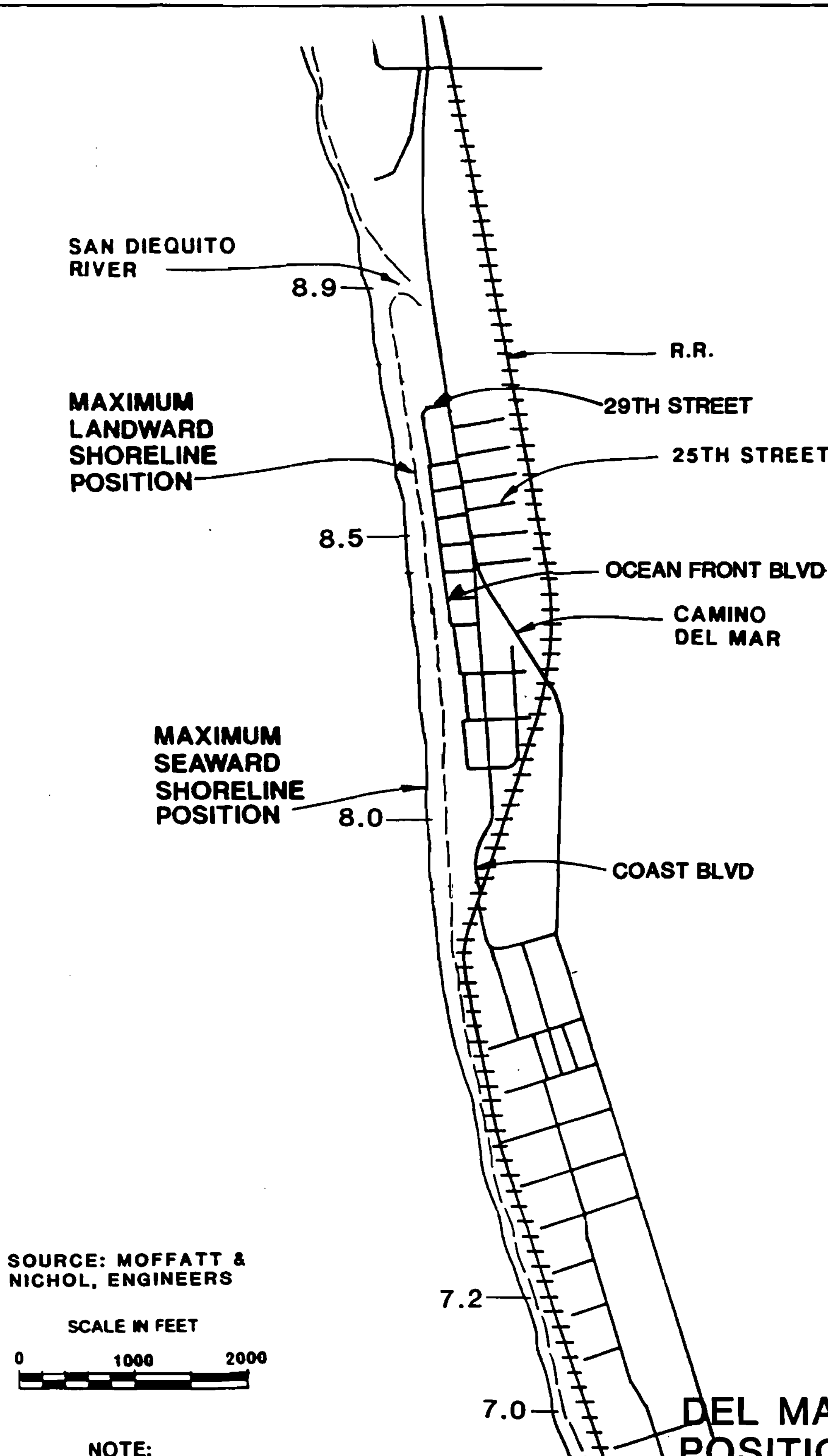
Figure 11 shows the beach profile extremes from available survey data at Del Mar from October 1983 to September 1987.



BEACH FORESHORE SAND VOLUME CHANGES AT 25th STREET, DEL MAR

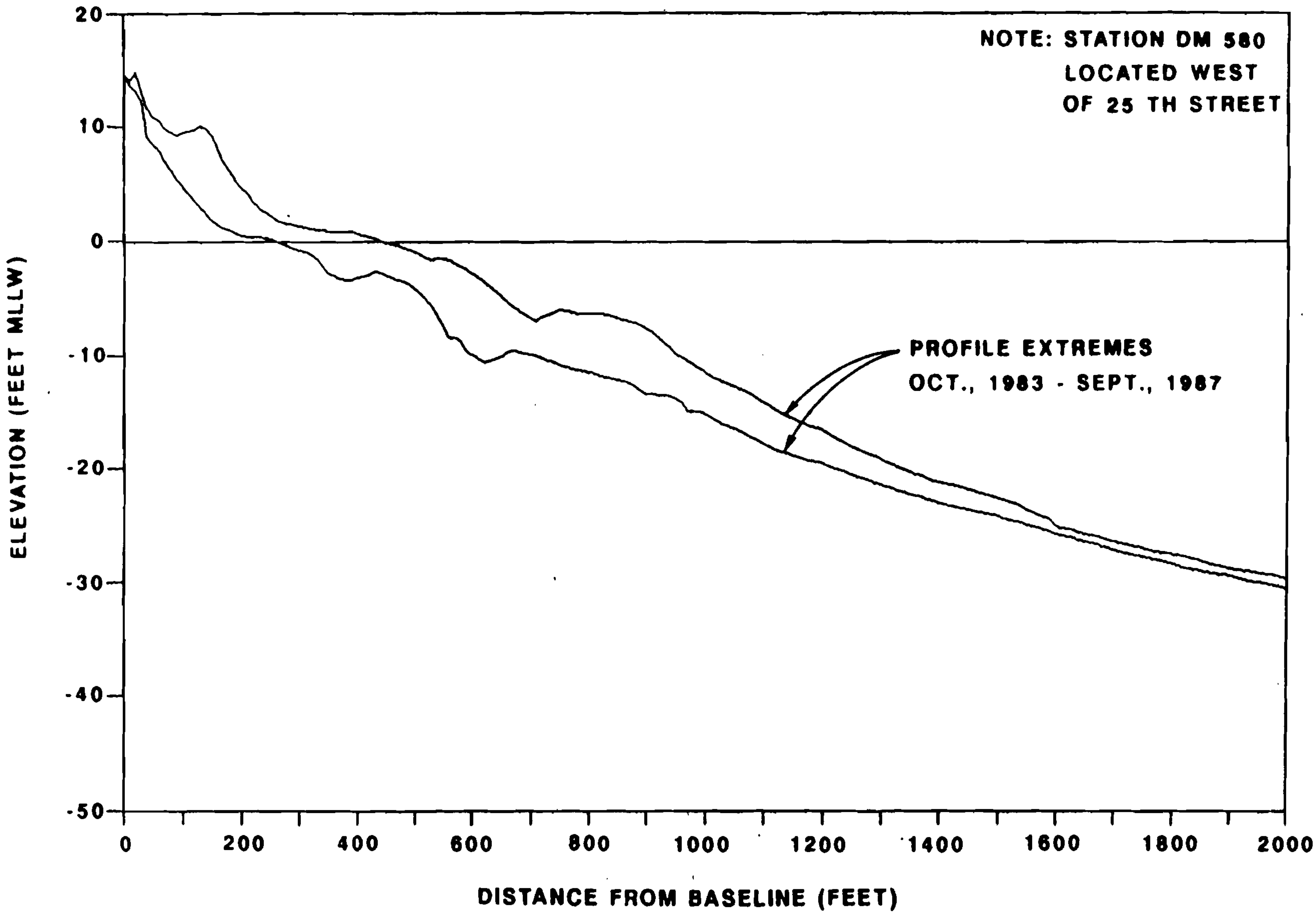
(FROM FLICK AND WALDORF, 1984)

Figure 9



NOTE:
LOCATIONS OF SHORELINE POSITIONS OBTAINED FROM ANALYSIS OF AVAILABLE AERIAL PHOTOGRAPHS (1954 - 1988)
8.0 (TYP) – MILES FROM LA JOLLA POINT; SEE TABLE 3

DEL MAR SHORELINE POSITION EXTREMES (1954 - 1988) Figure 10



STATION DM 580

BEACH PROFILES–DEL MAR

Figure 11

SOURCE: MOFFATT & NICHOL, ENGINEERS

Table 2
SHORELINE CHANGE RATES
1954-1988

Shoreline Interval (Mile)[1]	Shoreline Change Rate
7.00-7.20	-1.3 ft/yr
7.20-8.00	-1.0 ft/yr
8.00-8.50	+0.3 ft/yr
8.50-8.90	-1.7 ft/yr

[1]Miles from La Jolla Point; mile marker locations shown on Figure 10.

Effects of Sea Level Rise: The effect of the projected rise in sea level should be considered in future estimates of shoreline changes. The rate of sea level rise in the San Diego area has historically been approximately 0.007 feet per year between 1906 and 1986 (Hicks and Hickman, 1988). Future estimates of sea level rise rates for the San Diego region range from 0.02 feet per year to 0.07 feet per year. Bruun established a method to predict the effect of a rising sea level on a sandy shoreline. According to Bruun's methodology, the predicted rates of future sea level rise could result in 1.0 to 2.5 feet per year of recession of the beach unless additional fill is placed on the beach (Bruun, 1962).

Impacts

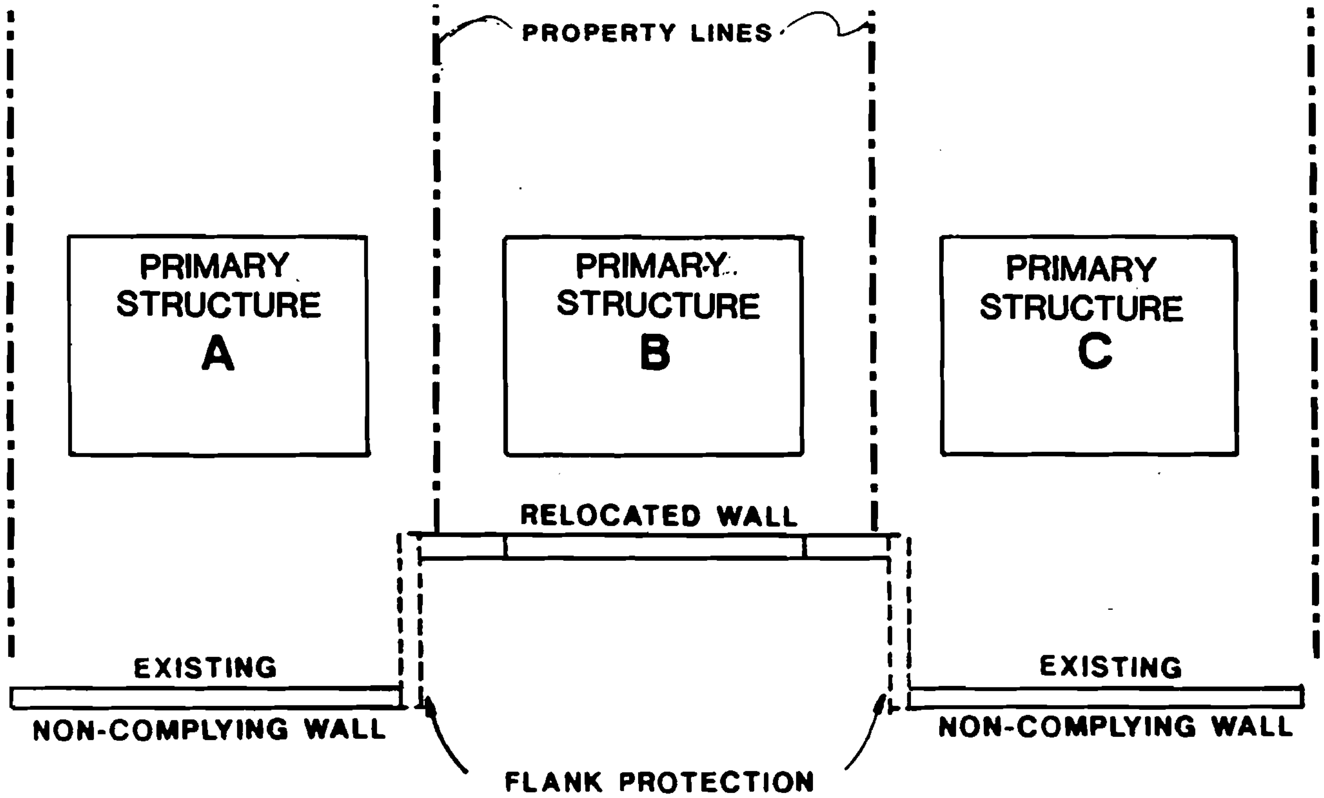
The BPI Ordinance was reviewed in reference to existing or possible future impacts on the shoreline; specifically the impacts of removing existing walls and relocating them to the SPA line; the future construction of protective structures; and the impacts of non-continuous shore protection structures, either existing or future, were all examined.

Removal and Relocation of Existing Walls and Future Construction of New Walls: The BPI Ordinance requires that existing shore protection structures which do not comply with the Ordinance must be removed, Relocated and/or new structures must be placed at the SPA line; within 5 feet west of the SPA line if it is a vertical wall and if no other environmentally feasible location exists; within 20 feet west of the SPA line if a riprap element is used; or east of the SPA line. Thus, there is a potential for numerous offsets in the alignment of the relocated walls. Typically, the higher on the beach profile and the farther landward on the beach the structure is constructed, the less the impacts on the shoreline will be. Offsets in the alignment of walls could cause a localized concentration of wave energy, resulting in higher waves, higher wave forces, higher wave runup, and a greater potential for sand erosion and structural damage. The larger the offset, the greater the potential for significant impacts to occur. In certain cases, relocating an existing wall to the SPA line may create greater offsets than presently exist unless all walls within a given block are relocated at the same time.

Thus, the sequence (or timing) of relocating the existing structures to the SPA line could cause potential impacts. The least amount of impacts would occur if all of the non-complying walls would be relocated to the SPA line at the same time. Furthermore, new shore protection structures (for areas which do not have any protective structures) should be constructed along the same alignment and at the same time as the relocated structures. A continuous wall located as far landward as possible and aligned parallel to the shoreline will have the least impacts on the beach.

It is recognized that the non-complying walls may be relocated at different times and to different locations than the adjacent walls. Existing development on the property and varying soil conditions may constrain the type and location of the relocated wall. Where offsets occur, it is important that protection is provided between the landward and seaward protective structures as illustrated in Figure 12. This protection is referred to as flank protection.

If there is no flank protection, then both of the existing adjacent walls and possibly homes would be subject to structural failure. Erosion would occur on the landward side of the adjacent walls causing the potential for the wall to fail from loss of support. Furthermore, the adjacent properties and existing development would be subject to wave-induced erosion and damage.



TYPICAL FLANK PROTECTION

Figure 12

Presently, there are areas along Del Mar beach that have no existing shore protection structures, such as at street ends. Implementation of the BPI Ordinance will result in the removal of non-complying structures. In some cases these structures may not be reconstructed by the private property owners. This will result in a non-continuous line of shore protective structures. Areas of discontinuity introduce a potential for instability of adjacent structures as a result of sand erosion. Waves and high tides during storm events have the potential to erode large quantities of sand from these unprotected areas and from behind adjacent protective structures. Furthermore, there is a greater potential for flooding caused by waves which run up the beach into the City's streets through the unprotected street ends.

The height of a shore protection structure is a function of the water levels, scour depth, and wave height. However, in many situations, especially for structures protecting residential buildings, the criteria for determining structure height is directly related to the visual impacts. Most people who live along the coast want to maintain their view of the ocean. Thus, the shore protection structure is usually designed to be overtopped by waves and the potential for significant impacts to primary structures would still exist. These impacts decrease the farther landward the primary structure is from the shore protection structure.

In summary, the impacts of the various shoreline protection scenarios are listed below in order from the least to the most impactive; (1) a continuous vertical wall or stone revetment, aligned parallel to the shoreline and constructued as far landward as possible will have the least impacts and provide the widest beach area. If this is not feasible, then (2) a continuous structure with the least amount of offsets with flank protection will minimize the impacts; and (3) non-continuous structures, at varying alignments and offsets would have significant impacts on the shoreline. Potentially significant impacts to residences could also occur if (4) the wall is constructed too close to the primary structure because of waves overtopping the walls and the effects of pile-driving construction equipment (depending on the subterranean conditions at each site).

Wave-Induced Scour: Waves that impinge on a shore protection structure are directed up and down the structure. Waves that are directed down the structure and waves breaking at the toe of the structure have the potential to cause scour at the toe. This wave-induced scour has the potential to undermine the toe causing instability of the structure, and potentially significant impacts to residential structures resulting from a failed shoreline protection structure.

Predicting the level that the beach may scour at the toe of a structure is usually based on observations made during, or more commonly, after storm events. However, observations made after a storm do not necessarily represent the depth of scour due to the rapid rate which sand may return to the beach. Observations made the day after one of the highest storm wave events of record, January 18, 1988, showed the sand level returned at a rate of approximately 4 to 6 feet in one day in front of a vertical steel sheetpile wall at the San Clemente Lifeguard Headquarters. The depth that the beach scours also depends on the location and type of seawall. Deeper scour will occur the farther seaward the structure is located. A more wave reflective-type structure which directs wave energy downward will also cause deeper scour.

Sea Cliff Erosion: Two important and conflicting concerns of sea cliff retreat in the Southern California area are: (1) erosion of the sea cliff threatens valuable real estate on top of the sea cliff and (2) erosion of the sea cliff produces sediment that may benefit the beach. Shore protection structures at the toe of the sea cliff minimize the potential of property loss, but also minimize the contribution of sediment to the littoral zone. The impacts a shore protection structure has on the beach requires an analysis of the sea cliff retreat rate and the rate which coarse eroded sediment is contributed to the beach.

Estimates of average sea cliff retreat rates in the Del Mar area have ranged from an annual 0.17 feet (1925 - 1986 average) between La Jolla and Leucadia (Craig Everts, personal communication) to 3.0 feet per year (Kuhn and Shepard, 1979) at Del Mar. The estimated sea cliff contribution of sediment to the littoral zone between 1954 and 1988 between La Jolla and Leucadia is 22,000 cubic yards per year (Craig Everts, personal communication). These estimates are based on observations and empirical equations. The erosion rate of the upper part of the sea cliff above the wave-induced erosion area is typically not in phase or of the same magnitude as the erosion rate at the toe. Implementation of the BPI will result in the removal of existing non-conforming riprap at the toe of the cliffs which may result in accelerated erosion rates at the toe of the cliffs. While this may result in an incremental increase in the sediment supply, it could adversely impact the stability of the cliffs thus threatening the structural integrity of primary structures located on top of the cliffs.

Other Design Measures: The BPI has a minimum setback distance of 15 feet east of the SPA line for new construction and remodels (when 50 percent of the lot's permitted floor area is involved). It is assumed that appropriate setback distances between existing primary structures and shore protection structures would be established based on the horizontal distance that a wave would runup beyond the crest of the shore protection structure. Although, other design parameters, such as structural requirements, may be the primary factors in establishing this distance. The location of the structure relative to the beach profile is also an important factor in establishing a setback distance. Shore protection structures located farther seaward and lower on the beach profile are subjected to higher waves and water levels and thus the potential for higher wave runup and overtopping.

The setback distance that should be provided between a primary structure and a shore protection structure depends on several design features: wave characteristics and water levels, height of shore protection structure, type of structure, and location of shore protection structure on the beach profile. These features determine the quantity, elevation and frequency of wave overtopping for given design wave conditions. The higher the structure, the lower the potential wave overtopping. Design features of the protective structure also can minimize the horizontal distance that waves could runup beyond the crest. For example, vertical walls with recurved faces would direct wave energy seaward and not landward of the structure. Stone revetments (riprap) typically dissipate some of the wave energy between the voids which would minimize the distance that the wave runs up and beyond the crest elevation.

In conclusion, implementation of the BPI Ordinance could result in potentially significant impacts with regard to shoreline processes. Offsets in the alignment of walls could cause a localized concentration of wave energy, resulting in higher waves, higher wave forces, higher wave runup and greater potential for sand erosion and structural damage. Where offsets in the alignment occur erosion would potentially cause the wall to fail, unless flank protection is provided. Adjacent properties would then be subject to erosion and damage. Also, if some properties are not protected, resulting in a non-continuous line of walls, then similar impacts would occur. A continuous wall located as far landward as possible will have the least impacts on the beach. Other potential impacts include damage to primary structures as a result of waves overtopping the walls, from walls that are undermined as a result of wave-induced scour and from erosion of the toe of the seacliffs. If an appropriate setback distance between the primary structure and the shore protection device is not provided then there is a greater potential for higher wave runup and overtopping.

Mitigation

Removal and Relocation of Existing Walls and Future Construction of New Walls: When existing walls are relocated, or when new walls are constructed, the City would encourage the construction of walls as a part of a continuous line of walls, such as on a block-by-block basis. Due to potential adverse environmental impacts, offsets should be discouraged. This may necessitate changing the required timing or schedule for relocation of existing structures. The City would require that the walls be built in a continuous line on the SPA line, or no further than 5 feet west of the line. The 5-foot allowance would be environmentally preferable to a discontinuous wall with offsets. In the cases where offsets occur, the City would require the applicant to provide flank protection to mitigate potential impacts described above. In addition, the City would develop a schedule with the property owners for the timing and the location of wall reconstruction and/or construction to ensure that the potential for beach erosion and property damage is minimized. These measures would mitigate the impacts to below a level of significance.

Structural features need to be incorporated into the design of the protective structure to minimize the impacts of overtopping waves. For example, on vertical walls a recurved face or pile cap can serve to deflect wave energy seaward. Also, a splash apron can be constructed on the landward side of the wall to prevent overtopped waves from eroding the backfill. On revetments, a wide crest and a splash apron will dissipate some of the wave energy which runs up the slope and overtops the crest. Another design feature to minimize the quantity of wave runup and overtopping on revetments is to provide a high percentage of voids using large armor stone to dissipate the wave energy which runs up the slope.

Another method to reduce potential overtopping wave damage to existing development is to provide temporary, reinforcement over windows. Shutters designed for hurricane-force winds have been successful in preventing wave damage to other structures along the coast. These shutters would not prevent flooding, but would protect the primary structure.

Wave-Induced Scour and Toe Protection: To reduce the potential for scour at the toe of shoreline protection walls, toe protection would be provided. The toe protection also protects the structure from undermining when the beach profile steepens as the beach erodes. Toe protection for vertical walls typically consist of stone and filter cloth placed at the toe of the wall. If toe stone is not included, then the vertical wall would be designed to be stable at the maximum depth of expected toe scour. The practical depth to construct toe protection depends on the site specific conditions, type of wall construction, and economic feasibility. It is also possible to design the face of a wall such that the majority of wave energy is deflected upward.

Toe protection for stone revetments is typically provided as toe apron stone with filter cloth. The toe apron stone will provide two functions: (1) armor the beach in front of the revetment and (2) act as a sacrificial toe. If scour occurs at the toe of the revetment, the sacrificial toe stone will drop but remain to protect the protective structure toe. The above mitigation measures will serve to mitigate the potential wave-induced failure of protective structures and consequent impacts to adjacent structures as well as primary structures.

Sea Cliff Erosion: To protect existing property, shore protection of the sea cliff may be required to stabilize the cliff from previous erosion at the toe. The need for shore protection should be established on a case-by-case basis from a geotechnical analysis of the stability of the sea cliff for existing conditions and future erosion. Formation and collapse of sea caves and their impact on the stability of the sea cliff should also be addressed from a geotechnical perspective.

The structural considerations for shore protection for beachfront residences also apply to protecting sea cliffs. Additionally, the sea cliff shore protection structure should be placed as close as possible against the sea cliff and not against talus (i.e. fallen disintegrated material). Furthermore, reflected wave energy from the shore protection structure should be equivalent to or less than reflected energy from the sea cliff.

Other Design Measures: Setback distances would have to be established on a site specific basis. Typically, the closer the shore protection structure is to the primary structure, the higher the protective structure needs to be to minimize impacts. An analysis of potential wave runup and overtopping effects of the proposed shore protection structures on a site specific basis should be conducted prior to establishing a required setback distance.

If the properties adjacent to a street end construct a shore protection structure, then the structure should either extend across the street end or the adjacent properties should provide adequate flank protection. The flank protection should extend far enough landward such that waves which could runup and into the street end will not cause erosion landward of the adjacent properties' shore protection structures. If the structure is to extend across the street end, then the City would ensure that public access is provided and maintained.

The City of Del Mar has agreed to implement the appropriate measures to mitigate site specific impacts. Such mitigation would be placed as conditions of approval on individual Shoreline Protection Permits. Mitigation measures for impacts related to coastal processes are summarized below:

- To avoid offsets, the City would encourage the construction/reconstruction of walls as part of a continuous line of walls, such as on a residential block-by-block basis.
- In cases where non-continuous walls or offsets occur (including street-ends), the applicant would provide flank protection.
- The City would develop a schedule with property owners for the timing and location of wall construction/reconstruction.

- o The design of the protective structures would include structural features to minimize wave overtopping.
- o Window shutters designed for hurricane-force winds would be used where practical.
- o Toe protection (such as stone and filter cloth) would be provided for vertical walls when possible. Otherwise, the wall would be designed so that the majority of wave energy is deflected upward and/or so that the wall is stable at the maximum depth of expected toe scour.
- o Toe protection for stone revetments (such as toe apron stone with filter cloth) would be provided.
- o A geotechnical analysis of sea cliff stability would be conducted on a site-by-site basis to establish the need for shore protection.
- o Setbacks would be established on a site specific basis depending on the potential wave runup and overtopping effects of the proposed shore protection structure.

3.4 CONSTRUCTION IMPACTS

The following is a general discussion of potential construction activities associated with the Beach Preservation Initiative Ordinance (BPI Ordinance). Specifically, this discussion addresses the type of construction equipment required, the duration of construction, and the area of disturbance.

Type of Structures: The two types of construction activities identified in the BPI Ordinance consist of:

(1) construction of a shore protection structure at an existing unprotected site, and

(2) demolition of existing non-complying shore protection structures and reconstruction of shore protection structures landward to the BPA line.

The general categories of structures which have been considered at Del Mar for shore protection are vertical walls and stone revetments. The construction activities for stone revetments would not vary as significantly as the construction activities for a vertical wall.

There are primarily three types of vertical walls which could be constructed:
(1) gravity walls,
(2) cantilevered walls, and
(3) anchored walls, which are sometimes referred to as tied-back walls.

The determination of which type of vertical wall to construct is typically a function of the existing site and geotechnical conditions. For example, it may not be feasible to construct an anchored wall if there is an existing building located immediately landward of the proposed wall location. Furthermore, a cantilevered wall may not be feasible if the sub-surface conditions consist of an extensive quantity of cobbles or shallow depth of bedrock. Thus, a fully accurate determination of construction activities which may occur, would have to be accomplished on a site specific basis. This discussion provides a general description of the potential construction activities that will occur with implementation of the ordinance.

For both the revetment and vertical wall, it was assumed that construction access for equipment is available at the street ends and that construction would be conducted from the beach. In general, an area near the construction site, either off-site or on the beach, but away from potential tide and wave influences would be necessary for storage of equipment and materials during the construction phase. The size of this storage area may vary from 10,000 square feet to 20,000 square feet, depending on the contractor's construction plan.

Impacts

This section describes the construction impacts associated with removal only, removal and reconstruction and new construction of stone revetments and verticals walls.

STONE REVETMENT

1. Removal of Non-Complying Revetments Only

   o Construction Equipment - Demolition of an existing structure would typically require the use of a front-end loader, a backhoe and rock hauling trucks. The exact numbers and types of equipment may vary depending on the requirements of the site. In some cases, a crane may also be required.

- Construction Duration - An existing revetment could be removed at a rate of approximately 40 to 60 linear feet per day.

- Area of Disturbance - Areas which would be affected during the removal of an existing stone revetment include the local streets which are used for beach access, the portion of the beach used to access the site and the demolition site itself. The size of the area of disturbance at the construction site would range from approximately 40 to 60 linear feet by approximately 75 to 100 feet in width per day or from 3,000 square feet (s.f.) to 6,000 s.f. per day.

2. Removal and Reconstruction of Revetments

- Construction Equipment - The construction equipment that would be required for the removal and reconstruction of revetments would be similar to that listed above for revetment removal only. Use of a crane is more likely in this case depending on the size of stone and the specifications for placing the stone.

- Construction Duration - The duration for demolition of an existing revetment would be within the range listed above (i.e., one day for every 40 to 60 linear feet of revetment). The amount of time required to then construct a new wall would depend on a variety of factors as described below.

  The duration for construction of a stone revetment is a function of the weather, oceanographic conditions, beach conditions, the quantity of material, and the design of the structure. For example, if construction occurs during the winter season when the beach is typically narrow and the tides are high, the contractor will likely have to stop construction during the high tide periods. It is also likely that construction could be affected by storm waves.

Another factor which influences the construction duration, is the design of the revetment. If the revetment design includes a toe apron much below 0 feet MLLW, it typically requires a longer construction period because of the difficulty in excavating sand below the water table and placing material under the water.

Construction of a typical engineered stone revetment without extensive site preparation would average about 25 to 50 linear feet a day. Using 22 working days per month (excluding weekends), approximately 550 to 1100 linear feet of stone revetment could be constructed in one calendar month. Mobilization of equipment and materials may require an additional one to two weeks from Notice to Proceed to the start of construction. If the rock that is removed from the existing non-complying revetment can be incorporated into the new revetment, then the one to two week start-up time for construction to begin may be reducd or eliminated.

- o Area of Disturbance - The areas of disturbance for the removal and reconstruction of revetments would be similar to that listed above for revetment removal only. However, disturbance at the construction site itself would include a larger area which would range from 100 to 200 linear feet by 75 to 100 feet in width per day or from 7,500 to 20,000 s.f. per day.

3. New Construction

- o Construction Equipment - The construction equipment required for new construction would be similar to that listed above for revetment removal only.

- o Construction Duration - The duration of construction would be similar to that described above for reconstruction of a revetment (i.e. 25 to 50 linear feet per day).

- o Area of Disturbance - The area of disturbance would range from 7,500 to 20,000 s.f. per day.

VERTICAL WALLS

1. Removal of Non-Complying Structures Only

   - Construction Equipment - The removal of vertical walls would require the use of many types of equipment including jack hammers, a backhoe, a front end loader, rock hauling trucks and possibly a crane.

   - Construction Duration - An existing vertical wall could be demolished and removed at a rate of approximately 20 to 100 linear feet per day, depending on the type of wall. In general, it would take from one to five days to remove a wall in front of one primary structure. Initial mobilization of equipment may take one to three weeks.

   - Area of Disturbance - In addition to impacts to local roads and beach access routes, there would be the following on-site impacts. The area of disturbance depends on the type of wall, however, it is estimated that approximately 200 to 800 linear feet by 50 to 100 feet in width or 10,000 s.f. to 80,000 s.f. per day.

2. Removal and Reconstruction of Vertical Walls

   - Construction Equipment - The equipment required for the removal of existing structures is listed above. In addition, the equipment which may be required for construction of the types of vertical walls discussed above include: a vibratory pile driving hammer, backhoe, concrete truck and pump, and possibly a drill rig. Toe stone would likely be included in the construction, thus, rock hauling trucks and a front end loader and/or back hoe would also be required. If previously used toe stone can be incorporated into the design of the new wall, fewer truck trips would be required to haul stone to the site.

   - Construction Duration - The existing vertical wall could be removed within approximately the same range of time as new construction. The factors which influence the duration of construction for a stone revetment also apply to construction of a vertical wall. The rate of construction for the types of vertical walls discussed above is directly related to the site specific soil conditions. Typical construction rates range from 20 to 100 linear feet per day. Mobilization of equipment and materials would take one to three weeks.

- <u>Area of Disturbance</u> - The area of disturbances for the removal and reconstruction of walls would be similar to that estimated above for removal of walls only (i.e., access routes and 10,000 s.f. to 80,000 s.f. on-site).

3. <u>New Construction</u>

- <u>Construction Equipment</u> - The construction equipment required for new construction is the same as that listed above for reconstruction of walls.

- <u>Construction Duration</u> - Construction duration for new walls is the same as listed above for reconstruction of walls (i.e., 20 to 100 linear feet per day).

- <u>Area of Disturbance</u> - The area of disturbance for new construction of walls is the same as listed above for reconstruction of walls (i.e., access routes and 10,000 - 80,000 s.f. on-site).

In summary, construction related impacts are short-term impacts which would vary on a site-by-site basis depending on factors such as: type of existing structure, on-site geological conditions, design and materials of proposed new construction, and proximity of access roads. The level of disturbance to residents and beach users would be reduced if walls are built on a residential block-by-block basis as the equipment and materials would be brought to the individual blocks and then removed when construction of the walls within that particular block are complete.

Mitigation

The City has agreed to implement the following mitigation measures which would reduce the impacts from construction of shoreline protective structures to below a level of significance. These measures would be placed as standard conditions of approval on each Shoreline Protecton Permit.

- Construction hours would be consistent with the City Noise Ordinance.

- The beach within the construction zone would be restored at the end of each work week, and equipment would be removed from the beach at the end of each workday.

- Construction would not occur west of the permitted shoreline protective devices between Memorial Day and Labor Day (except for emergencies).

- The City would develop a schedule with private property owners for the timing of wall construction so that construction occurs on a block-by-block basis.

- The City would minimize usurpation of public parking areas during the construction period.

4.0 ALTERNATIVES

CEQA requires a description of a range of "reasonable alternatives to the project, or to the location of the project, which could feasibly attain the basic objectives of the project," and to evaluate the comparative merits of the alternatives. "The discussion of alternatives shall focus on alternatives capable of eliminating any significant adverse environmental effects or reducing them to a level of insignificance, even if these alternatives would impede to some degree the attainment of project objectives, or would be more costly". CEQA also requires analysis of the "no project" or existing conditions alternative. The range of alternatives required in an EIR is governed by "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The key issue is whether the selection and discussion of alternatives fosters informed decision-making and informed public participation. An EIR need not consider an alternative for which the environmental effects cannot be reasonably ascertained and for which implementation is remote and speculative.

Implementation of the BPI Ordinance would not result in significant, unmitigable impacts. The BPI allows for the seaward face of a vertical seawall to extend up to 5 feet westward of the SPA line if there is no other feasible location for effectively protecting a principle structure; there is no feasible, less environmentally damaging alternative; and feasible mitigation measures have been provided to minimize adverse environmental effects. In addition, if there is a riprap element in the proposed structure, the BPI allows for the riprap to extend up to 20 feet westward of the SPA line. Alternatives to the proposed project that were considered but that are not discussed because they were determined to be infeasible include (1) relocation of the SPA line further east of existing location and (2) extension of the seaward encroachment limits further west of existing position. These potential alternatives were rejected as being infeasible because a SPA line located further inland would not allow for an adequate setback distance between primary structures and seawalls. This would result in potentially significant wave-induced impacts and was considered an inappropriate encroachment onto private property. An extension of the seaward encroachment limits further to the west would psychologically and physically inhibit the public from using that portion of the public beach (exceptions include the lots where the property owners own up to the HWL). This is considered a significant impact to public access, sand erosion and visual resources. The above alternatives would result in considerably greater environmental impacts than the proposed project and therefore they were not analyzed in greater detail.

NO PROJECT

The No Project alternative would result in no implementation of the BPI Ordinance requirements. Legally, the City is required to implement the requirements of the new law, thus, this alternative is not legally feasible. Viewing this alternative from an environmental perspective only, this alternative would result in no requirement to immediately remove non-complying structures and no requirement for the construction/reconstruction of walls on the SPA line (unless otherwise required by other City or Coastal Act regulations). It should be noted that without the BPI Ordinance, the City of Del Mar would follow the procedures outlined in Resolution No. 87-121 (Installation of Interim Protective Devices) which establishes a procedure for the installation and removal of interim protective devices. In addition, regulations under Chapter 7 (Development Controls) of the Coastal Act would apply to permitted coastal development.

Under the No Project alternative the following existing environmental impacts are anticipated to remain:

Public Access/Beach Encroachment: Existing beach encroachment of certain shoreline protective structures would remain until other City or Coastal Act regulations are enforced.

Visual Quality: As with the proposed project, visual quality impacts would be minimal.

Coastal Processes: The potential for sand erosion and for structural instability/damage of primary structures and shore protection structures would remain.

Construction Impacts: No construction impacts are anticipated beyond those impacts associated with the placement of interim protection devices as allowed under the existing City and Coastal Commission regulations.

Technically, it is not appropriate to assess the No Project alternative for the entire beachfront, because conditions vary by residence or by block, and the No Project may be, in some cases, environmentally preferable over the project. It is clearly preferable to have a continuous line of structures; the exact placement of the continuous structure(s) is less signficant than ensuring that offsets (without flank protection) do not occur. In some cases, where existing protective structures encroach by numerous feet, implementation of the project would be preferable because the project would mitigate for existing impacts (i.e., encroachment of the public beach and visual impacts). The main point is that the No Project alternative should be considered on a site-by-site (or block-by-block) basis. Under the No Project alternative it is anticipated that existing beach impacts (e.g., encroachment and erosion) would remain and that conflicts associated with these issues would still be unresolved.

5.0 CUMULATIVE IMPACTS

Implementation of the project could result in potentially significant cumulative sand erosion impacts. Impacts could occur from the reconstruction or construction of protective structures at the SPA line (or 5-feet westerly of it) at varying times, resulting in potentially numerous locations along the beachfront where there are discontinuous walls, and walls with offsets and/or no flank protection. The potential sand erosion impact is more severe cumulatively than on a site specific basis, because loss of sand at one area affects the source/supply of sand down the coastline. As the locations affected by sand erosion become more numerous, this impact is likewise increased. This is true for the project area as well as locations north of Del Mar where sand erosion has been of concern.

Mitigation is possible at the project level by minimizing sand erosion through careful planning of the location and/or relocation of protective structures and the timing of construction. The City would develop a program and schedule for reconstruction/new construction to ensure that walls are constructured at one time on a block-by-block basis (including street ends) and some allowances would be made for the location of structures so that offsets are avoided.

6.0 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG TERM PRODUCTIVITY

This section addresses the project's potential to affect the long-term productivity or viability of the project area. The project's intent is to minimize beach encroachment from protective structures, while ensuring that beachfront residences have adequate protection. The long-term viability of the project area relates to the long-term use of the area, which is mostly recreational. The project, by minimizing beach encroachment, assures that the beach would be available for this public use. However, implementation of the project could result in sand erosion impacts, which could affect the width of the usable beach area in the future, negatively affecting usable public recreational area. Implementation of the mitigation measures designed to reduce these impacts would ensure (to the highest degree possible) that the size of the beach would be maintained, preserving the long-term viability of the project area.

7.0 ANY SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED

Potential sand erosion impacts could be mitigated by ensuring development (on a block-by-block basis) of a continuous wall at one time. If mitigation did not occur, then sand erosion would occur at similar rates as what could presently be occurring from areas where discontinuous walls exist.

8.0 SOURCES

8.1 REFERENCES

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8.2 PERSONS CONTACTED

Ms. Sharilyn Saarb, Ms. Debra Lee and Mr. Adam Birnbaum. Staff, California Coastal Commission, meeting, September 21, 1988.

City of Del Mar Homeowners. Attendance at homeowners meeting to discuss project-related issues, September 29, 1988.

City of Del Mar, BPI Ordinance Advisory Committee. Attendance at Advisory Committee meetings, August, September, 1988.

Mr. John M. Powell, City Engineer, City of Del Mar. Meeting, September 15, 1988.

Mr. Dwight Worden, Special Council, City of Del Mar. Meetings on January 31, 1989 and March 14, 1989.

8.3 PREPARERS

P&D staff and consultants contributing to this report include:

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Ms. Mary D. Putnam, Project Manager, P&D Technologies, Inc.

Ms. Mary McGee, Graphics Coordinator, P&D Technologies, Inc.

Mr. Robert Nathan, Project Engineer, Moffatt & Nichol, Engineers.

APPENDIX A

NOTICE OF PREPARATION AND COMMENTS

CITY of DEL MAR

NOTICE OF PREPARATION

TO: Responsible Agencies and interested parties shown on attached list

FROM: City of Del Mar
Department of Planning and Community Development
1050 Camino del Mar
Del Mar, CA 92014

SUBJECT: Notice of Preparation of Draft Environmental Impact Report

The City of Del Mar will be the Lead Agency and will prepare an environmental impact report for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval of the project.

The project description, location, and the probable environmental effects are contained in the attacted materials. A copy of the Initial Study ___ is, X is not, attached.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than ___ 30, X 45 days after receipt of this notice.

Please send your response to James Sandoval, Planning Director at the address shown above. We will need the name of a contact person in your agency.

Project Title: Beach Preservation Initiative Ordinance

Project Applicant: City of Del Mar

Signature James Sandoval   Date Sep. 20, 1988   Title Planning Director

(619) 755-9337

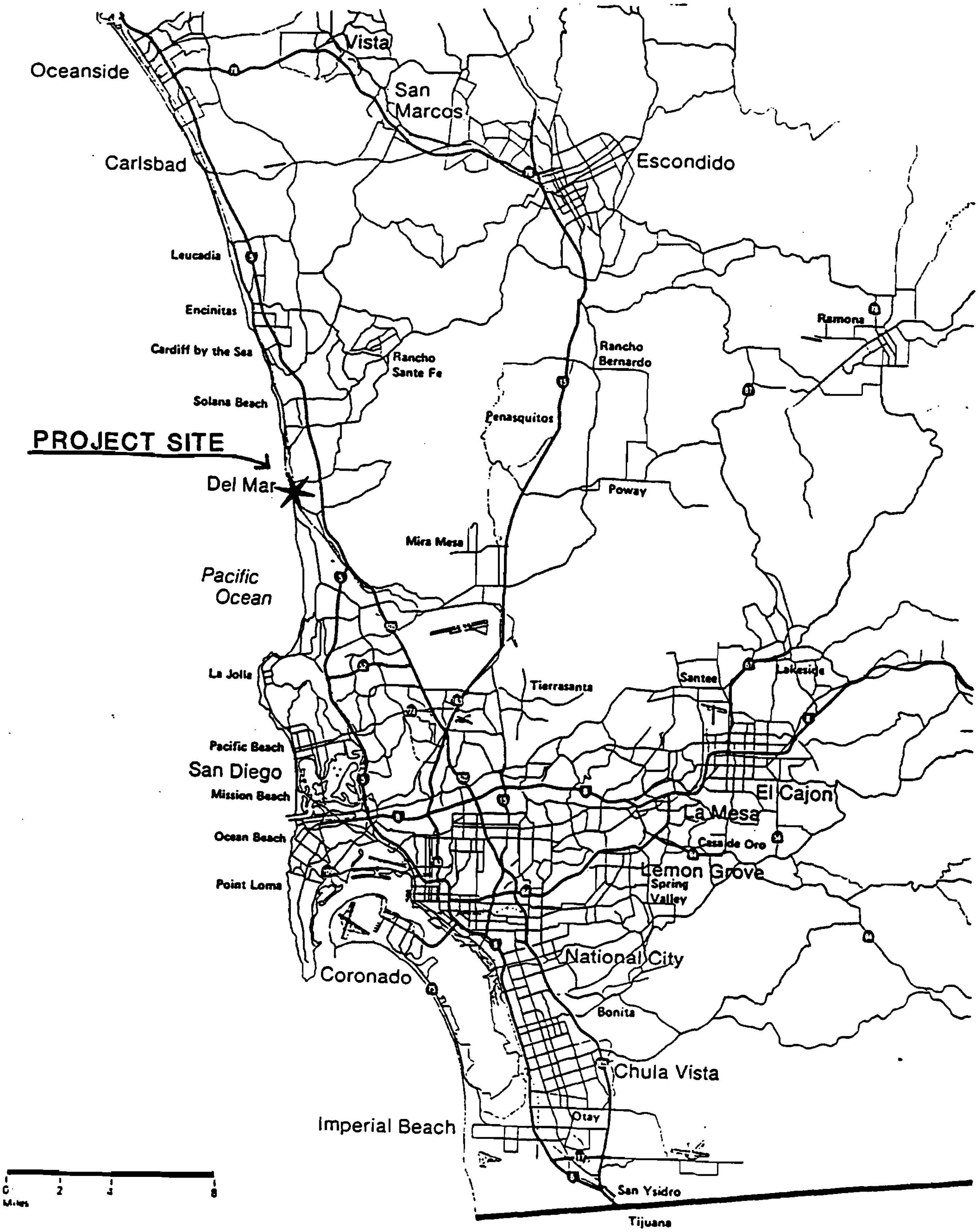
DRAFT
CITY OF DEL MAR
BEACH PRESERVATION INITIATIVE ORDINANCE
NOTICE OF PREPARATION FOR
AN ENVIRONMENTAL IMPACT REPORT

SEPTEMBER 1988

In April of 1988, the voters of the City of Del Mar approved Measure D, also known as the Beach Preservation Initiative Ordinance (BPI Ordinance). The BPI Ordinance will supersede the City's current regulations which allow protective structures to be constructed by permit on sandy beach areas to provide interim protection for beachfront buildings threatened by wave and tidal action. The purpose of the BPI Ordinance is to regulate the uses of the Del Mar beach area; this includes the protection of public access to and along the shoreline and provisions for the protection of private property.

The City of Del Mar is located in San Diego County, along the coast, approximately 20 miles north of downtown San Diego (Figure 1). The City's coast is approximately 2.9 miles in length. The BPI Ordinance project area includes the beachfront and riverfront in the City of Del Mar from the northern City limits at Solana Beach to the southern city limits at Torrey Pines State Reserve. The BPI Ordinance establishes a Shoreline Protection Area zone (SPA zone) seaward of a designated north/south Shoreline Protection Area line (SPA line). The SPA line was established to facilitate in the regulation of construction of all structures within the SPA zone. Figure 2 shows the general location of the SPA zone.

Del Mar has historically been subject to encroachment along the beachfront. Existing development seaward of the SPA includes decks, seawalls and rip-rap. The BPI Ordinance is designed to more clearly define the public and private use areas of the beach and to establish a permit process for any development seaward of the SPA line. The BPI Ordinance also attempts, as much as is feasible, to eliminate the zig-zag seawall pattern now present, and to replace it with walls in one alignment.



SOURCE: SANDAG

FIGURE 1 **REGIONAL MAP**

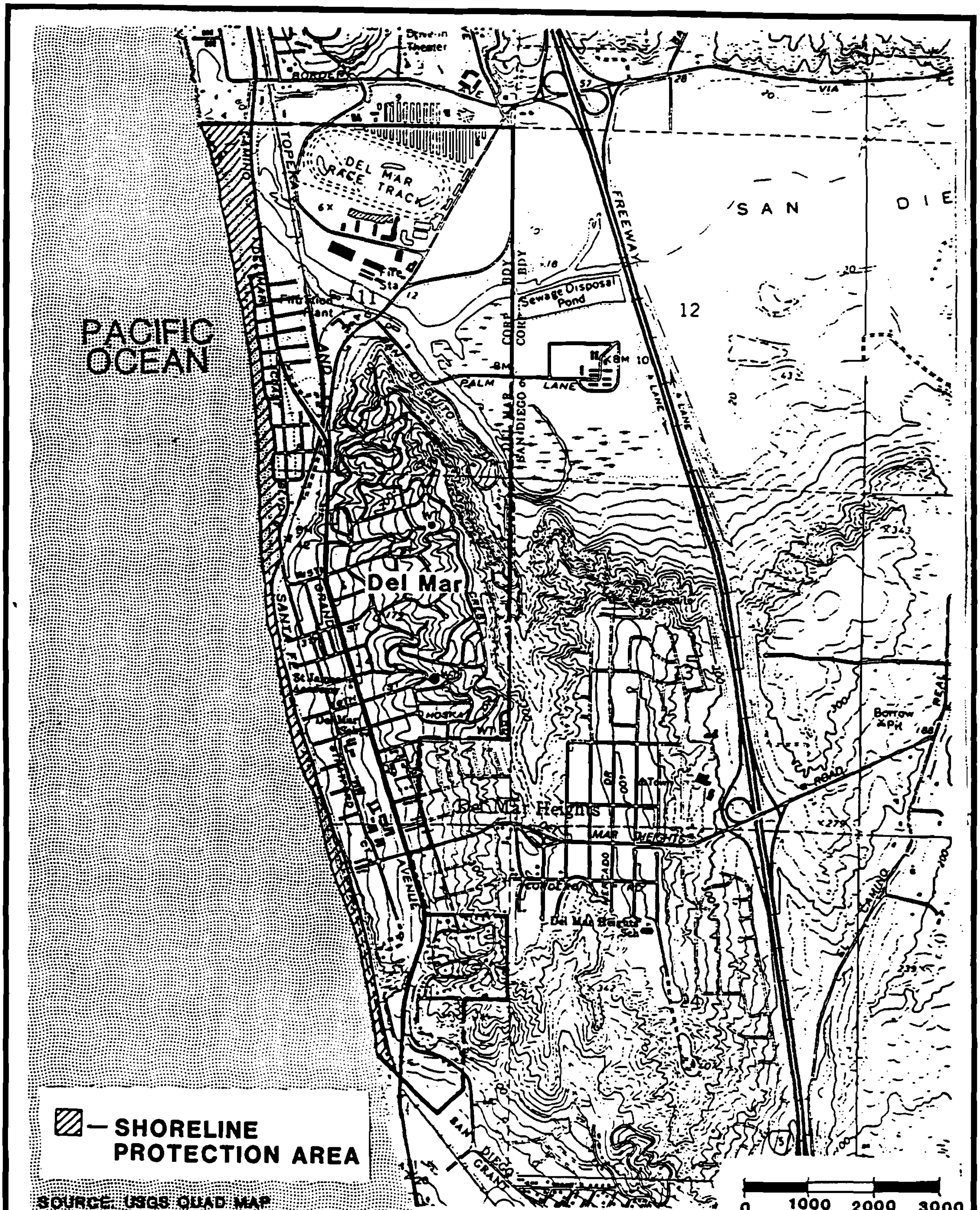


FIGURE 2 BEACH OVERLAY ZONE

The BPI Ordinance outlines the permit application procedure, the regulations for the issuance of permits and provisions for emergency reinforcement of protective structures. In addition, the removal of noncomplying development is addressed by the initiative. Noncomplying developments will be identified and such developments shall be removed in accordance with the designated abatement procedure. A Shoreline Protection Permit may be obtained which establishes an amortization period not to exceed ten years.

It has been determined by the City of Del Mar that a Program Environmental Impact Report (EIR) is necessary to address the potential impacts that may result from the implementation of the initiative and it's guidelines, including future discretionary actions of a variance and/or a permit to build the walls. According to Section 15168 of the California Environmental Quality Act (CEQA) "A program EIR is an EIR which may be prepared on a series of actions that can be characterized as one large project...". The potential impacts of the development that will occur under implementation of the BPI Ordinance will be analyzed, and mitigation measures to reduce or eliminate impacts will be recommended.

There have been two previous EIRs which analyzed the environmental effects of various shoreline protection alternatives within the project area. The information contained in these documents will be incorporated into the Program EIR as much as possible.

In order to address public concerns, alternatives to the proposed project will be analyzed in the same level of detail as the proposed project. The alternatives include: the "No Project" alternative, construction of the walls seaward of the SPA line (to a maximum of 5 feet from the line), and construction of the walls east of the SPA line.

PROBABLE ENVIRONMENTAL EFFECTS

Issues determined by the City to be potentially significant are: public access, beach encroachment, visual impacts, sand erosion, and construction-related impacts. Specific issues to be addressed include an inventory of existing beach encroachments and ensuring public beach access upon completion of the seawalls.

Also addressed will be visual impacts caused by different building materials, riprap, and gaps between properties with and without walls. The erosion potential due to gaps between walls and movement of said walls east or west of property lines will be analyzed by an engineering firm and the information will be incorporated into the EIR. Finally, impacts related to the removal of existing walls and construction of new walls, including large vehicle traffic on the beach, will be addressed. The issues to be analyzed in the EIR are shown on Table 1, Preliminary Contents of the EIR.

TABLE 1

PRELIMINARY CONTENTS OF EIR

1.0 INTRODUCTION

- 1.1 Purpose
- 1.2 Summary of Impacts and Mitigation
- 1.3 Background

2.0 PROJECT DESCRIPTION

3.0 IMPACT ANALYSIS

- 3.1 Public Access/Beach Encroachment
  - 3.1.1 Project Setting
  - 3.1.2 Potential Impact
  - 3.1.3 Analysis of Significance
  - 3.1.4 Mitigation

  (each section will include these sub-sections)
- 3.2 Visual Resources
- 3.3 Sand Erosion/Geotechnical
- 3.4 Construction-Related Impacts

4.0 ALTERNATIVES TO THE PROPOSED ACTION

5.0 ENVIRONMENTAL SUMMARIES

- 5.1 Unavoidable Significant Environmental Affects
- 5.2 Relationship between Local Short Term Use of the Environment and the Maintenance and Enhancement of Long Term Productivity
- 5.3 Irreversible Environmental Changes
- 5.4 Growth Inducing Impacts
- 5.5 Cumulative Impacts

STATE OF CALIFORNIA—OFFICE OF THE GOVERNOR GEORGE DEUKMEJIAN, Governor

OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO, CA 95814

COPY

RECEIVED
OCT 10 1988
P & D TECHNOLOGIES

RECEIVED
OCT - 6 1988
CITY OF DEL MAR
PLANNING DEPARTMENT

DATE: October 3, 1988

TO: Reviewing Agencies

RE: The City of Del Mar's NOP for
Beach Preservation Initiative Ordinance, Del Mar
SCH# 88092819

Attached for your comment is the City of Del Mar's Notice of Preparation of a draft Environmental Impact Report (EIR) for the Beach Preservation Initiative Ordinance, Del Mar project.

Responsible agencies must transmit their concerns and comments on the scope and content of the EIR, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of this notice. We encourage commenting agencies to respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

James Sandoval
City of Del Mar
1050 Camino Del Mar
Del Mar, CA 92014

with a copy to the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the review process, call Keith Lee at 916/445-0613.

Sincerely,

David C. Nunenkamp
Chief
Office of Permit Assistance

Attachments

cc: James Sandoval

SCH: 88092819

S': Sent by lead 'X': Sent by SCH

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HIGGS, FLETCHER & MACK

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FERDINAND T. FLETCHER
OF COUNSEL

October 5, 1988

Planning Department
City of Del Mar
1050 Camino Del Mar
Del Mar, CA 92015

Attention: Mr. James D. Sandoval
Director

Re: Proposed Environmental Impact Report regarding Initiative Beach Ordinance

Gentlemen:

These comments are being prepared on behalf of the owners of Lots 11 to 15, inclusive, Block 113, Del Mar Resub Unit No. 2, lying between the beach and Ocean Front north of 18th Street.

Historically, before the building of Lake Hodges Dam, the Del Mar beach between the San Dieguito River and 17th Street on the south and the hills, later the Santa Fe right of way on the east and 17th Street on the south, was the Del Mar lagoon or Del Mar slough, whichever name you choose, due to periodic overflow of the San Dieguito River over its southern bank. The lowest area of the beach profile, which is and was between 17th Street and 19th Street, was the mouth of the Del Mar lagoon or slough for the overflow of the San Dieguito River and the tidal action of the ocean. In the geotechnical analysis for the construction of our seawall north of 18th Street, borings taken by R. E. Staite Engineering Co. established heavy cobble formation commencing approximately 20' below the surface of the sand. It is my expectation that this cobble condition will exist all along between 17th Street and 19th Street. The geotechnical analysis also dictated a distance of 29' west of the property line, which was the location of the previous wall. This distance of 29' west of the property line and the SPA line proved fortuitous for among other reasons the conclusions reached in the Noble Report. Upon R. E. Staite engineers' recommendations, steel stanchions were used since they can be pile driven well into cobble which then furnish good footing for the steel stanchions without the necessity of using riprap toe at the base. The riprap toe would have furnished good insurance against hydrostatic pressure on the inside of the seawall, but the Coastal Commission would not permit riprap under any circumstances.

If wooden timbers are used, as is contemplated in some of the Noble structures in the area where cobble exists, then a riprap toe is mandatory since a pile driven wooden timber cannot be driven into the cobble, and the hydrostatic pressure exerted on the inside of the seawall without riprap would soon destroy the wall.

At the low elevation existing between 17th and 19th Street, when you experience a 1929 and 1936 or a 1983 convergence of high tide and high wind and low barometric pressure (sea level rises measurably), no seawall or breakwater can be designed to effectively withstand the onslaught and strength of the waves. A seawall/ breakwater can break the force of the flow of the waves, but there will always be an over spill. With an over spill you must have percolating sand behind the wall which can absorb the over spill before water accumulates with the next wave. You must also have engineering devices in the form of buried cement or other type of deadmen attached to the seawall by steel cable or other device to help the seawall withstand the hydrostatic pressure of sea water returning to the ocean under and around the seawall. Without these protective provisions, the Noble seawall is not feasible or suitable for the area between 17th Street and 19th Street.

It is true that if you build a Noble seawall at or within 5' of the SPA line, presently proposed between 18th and 19th Street, you won'd need sand or deadmen behind the seawall because the property line and the SPA line is at the highest beach level, and any over spill will flood into the lower area on both sides of Ocean Front and Coast Boulevard between 17th Street and 21st Street.

Environmentally you are faced with one of two choices between 18th Street and 19th Street. Require the seawall to be built at or near the SPA line as presently proposed, which some of the property owners may or may not be willing to erect at their cost, or put the wall out where the Noble Report says it must be to be effective. If you accept the Noble Report in toto, then you have the environmental subjective perception that the sand behind the wall appears to be private property. Is that perception fair as applied to the property behind the seawall immediately north of 18th Street? The sand behind the seawall abuts 18th Street with no barrier between. Lot 22 is an admitted public walkway, abuts the sand on the east, and in the current year 1987, all during the active summer months with our usual good sand profile you can step across the wall from the beach side. You can lay on it, you can sit on it, you can eat your lunch on it, and you can have large group picnics using the wall and the sand behind it, for all kinds of purposes consistent with the picnic.

I submit that the area between 17th and 19th Street is unique and must be considered on the basis of the facts that are pertinent to their particular case.

I can't close without calling to your attention the testimony at the last public hearing of Mr. Louis Lee, called as an expert witness by the City of Del Mar. Scientists from Scripps Institute of Oceanography recently confirmed Mr. Lee's findings. He testified that "sand erosion" was a misnomer as applied to the Del Mar beach. The Del Mar beach has a very gentle shoreline. In the winter the currents remove the sand from the beach to an area several hundred yards off shore where it remains during the winter and is returned to the beach in the spring. We have a generous replenishment supply of sand from the San Dieguito River. Witness the many acres of sandy recreational area created at the mouth of the San Dieguito River by the relocation of the river channel to the south side.

I am sure it would be conceded without argument that if the seawall were not where it is, the normal fall and winter tides would carry all of the loose sand eastward of the seawall off the beach to its winter resting spot several hundred yards off shore and there would be no sandy beach for sunbathing on warm winter days behind the protection of the seawall. I am also sure that any alleged erosion attributable to the waves hitting the seawall and removing some of the hard sand immediately adjacent to the seawall would be more than offset by the sand which would be removed from the beach during the fall and winter months were the wall not there.

I think it would be appropriate for you to request from the City of Del Mar the substance of Mr. Lee's testimony before the City Council. To me it was very consistent with my own experiences for over sixty years with the beach at Del Mar, and it was very persuasive.

I realize that the substance of these comments is not consistent with the Initiative Ordinance, but it does appear that if there is substance to my remarks, then it would be the responsibility of the Draft Environmental Impact Report to call attention to the environmental inconsistency between the Initiative Ordinance and the damage inherent in the Initiative Ordinance that can't be mitigated.

Respectfully submitted,

Ferdinand Fletcher

Ferdinand T. Fletcher
On behalf of the Owners of
Lots 11 to 15, inclusive,
Block 113, Del Mar Resub Unit No. 2

FTF/nlk

bcc - Diane Richardson
P & D Technologies

STATE OF CALIFORNIA—THE RESOURCES AGENCY

GEORGE DEUKMEJIAN, *Governor*

DEPARTMENT OF FISH AND GAME
Marine Resources Division
330 Golden Shore, Suite 50
Long Beach, California 90802
(213) 590-5117

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CITY OF DEL MAR
PLANNING DEPARTMENT

October 25, 1988

James Sandoval, Planning Director
City of Del Mar
Department of Planning and
Community Development
1050 Camino del Mar
Del Mar, California 92014

Dear Mr. Sandoval:

We have reviewed the Notice of Preparation (SCH 88092819) of a draft Environmental Impact Report (EIR) for the Del Mar Beach Preservation Initiative Ordinance project and recommend that the following information be developed and included in the draft EIR.

A. Description of Environmental Setting. The description should include the present setting and probable future setting with implementation and completion of the proposed projects. Emphasis should be placed on items related to potential effects of the project to fish and wildlife and their habitats. Specific items that should be included in the document to be prepared are:

1. Water Quality. A discussion of nearshore water quality in the project area and the influence of nearby discharges, including the San Dieguito River and other ocean discharges, on existing nearshore water quality.

2. Biological Resources

a. A description of existing biological resources and habitats within and adjacent to the proposed project area. To accomplish this, we recommend a biological survey be undertaken. However, the use of existing biological information, if available and adequate, would be satisfactory. Resources and habitats of concern are:

1) Intertidal and subtidal marine resources which may be impacted or lost as a result of project implementation.

2) A species of concern is the State- and federally-listed endangered California least tern. This species has been known to nest within San Dieguito Lagoon and may forage along the nearshore marine zone within and adjacent to the project area. Potential project impacts to this species and measures to eliminate identified impacts must be included in the document.

B. Impacts. Provide a discussion of impacts of the proposed project on biological resources and their habitats and water quality. An analysis of impacts should also be included in the discussion of project alternatives.

C. Mitigation. Provide an analysis of mitigation/compensation measures which would reduce, eliminate or offset project impacts. This analysis should include a discussion of the level to which impacts would be reduced and the basis for determining the acceptability of identified measures and the degree of offset to mitigate/compensate for project impacts.

D. Alternatives. Describe project alternatives including the no project alternative. Each alternative should include its relationship to the potential significant environmental impacts and the rationale for accepting or rejecting its implementation.

Should you have any questions, please contact Richard Nitsos, Environmental Coordinator for Marine Resources. The phone number is (213) 590-5174.

Sincerely,

for R. A. [signature]

Rolf E. Mall
Program Manager
Southern California Operations

cc: Office of Planning and Research

STATE OF CALIFORNIA

GEORGE DEUKMEJIAN, *Governor*

STATE LANDS COMMISSION

LEO T. McCARTHY, *Lieutenant Governor*
GRAY DAVIS, *Controller*
JESSE R. HUFF, *Director of Finance*

EXECUTIVE OFFICE
1807 - 13th Street
Sacramento, California 95814

CLAIRE T. DEDRICK
Executive Officer

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CITY OF DEL MAR

November 1, 1988

Mr. James Sandoval
Planning Director
City of Del Mar
Department of Planning
and Community Development
1050 Camino del Mar
Del Mar, CA 92014

Dear Mr. Sandoval:

State Lands Commission (SLC) staff has reviewed the Notice of Preparation of a Draft Environmental Impact Report (EIR) for the Beach Preservation Initiative Ordinance and offer the following comments.

Our investigation discloses that, in the area of the San Dieguito River, State-owned sovereign lands are situated within the Shoreline Protection area zone. Additionally, the State Lands Commission has jurisdiction over that area waterward of the ordinary high water mark (last natural mean high tide line). Therefore, any proposed development affecting these areas, by either public or private parties would be subject to the permit requirements of the State Lands Commission. We would, therefore, appreciate being kept advised of any specific developments in these areas.

In as much as the ordinance deals with proposed projects which will involve lands within the coastal zone, and portions of which will include lands that are within the California Coastal Commission's original permit jurisdiction, we assume this is intended as an implementing ordinance of the Local Coastal Program process, and will be subject to the approval of the California Coastal Commission.

At this time we have no specific comments on the proposed ordinance, but agree with the City's determination as to the nature of the environmental analysis required, specifically an EIR. We appreciate the opportunity to comment and look forward to reviewing the draft document.

If you have any questions, please contact Diana Jacobs of our office at (916) 445-5034.

Sincerely,

Dwight E. Sanders

DWIGHT E. SANDERS, Chief
Division of Research
and Planning

DES:maa
cc: Claire T. Dedrick, Executive Officer
Lance Kiley, Chief, Division of Land Management
and Conservation
Diana Jacobs
OPR

DEPARTMENT OF TRANSPORTATION
DISTRICT 11, P.O. BOX 85406, SAN DIEGO 92138-5406

November 2, 1988

11-SD-005
R32.9-R36.3

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CITY OF DEL MAR
PLANNING DEPARTMENT

James Sandoval
Planning Director
City of Del Mar
1050 Camino del Mar
Del Mar, CA 92014

Dear Mr. Sandoval:

Notice of Preparation of a DEIR for the
Beach Preservation Initiative Ordinance,
SCH 88092819

Caltrans District 11 will probably not have a Responsible Agency role in the preparation of this EIR.

Sincerely,

JESUS M. GARCIA
District Director

By

James T Cheshire

JAMES T. CHESHIRE, Chief
Environmental Planning Branch

MO:yg

APPENDIX B

BEACH PRESERVATION INITIATIVE AND GUIDELINES

Chapter 30.50

BEACH OVERLAY ZONE

Adopted as an Initiative on April 12, 1988

30.50.010 Purpose. The Beach Overlay Zone created by this initiative is established to regulate the uses of the Del Mar beach area, a distinct and valuable natural resource, for the benefit of present and future generations. The regulations contained herein shall be administered so as to protect public access to and along the shoreline, while promoting public safety, health and welfare, and providing for the protection of private property.

30.50.020 Zone Boundaries. The boundaries of the Beach Overlay Zone are as described in Exhibit A, incorporated herein by reference.

30.50.030 Permitted Uses. Permitted uses within the Beach Overlay Zone shall be those allowed in the underlying Zone, subject to the regulations contained in the Beach Overlay Zone which shall prevail in the event of conflict with any other provisions of the City Code.

30.50.040 Definitions.

A. "Shoreline Protection Area" shall mean that area which is within the Beach Overlay Zone and is located from south to north along the shoreline of the City being more particularly described as follows: All lands located westerly of the line as described in Exhibit B, incorporated herein by reference.

B. "Development" shall mean the placement or construction of any solid material or structure on land, to include without limitation, any human-directed alteration of the land and the planting, cultivation, or maintenance of any vegetation.

C. "Protective Structure" shall mean any privately or publicly owned development designed to protect property inland from such structure from ocean flooding or wave damage.

30.50.050 Development within the Shoreline Protection Area. No development shall occur within the shoreline area except such privately owned protective structures, publicly owned protective structures and public owned development authorized, constructed and maintained in accordance with the regulations set forth in the City Code.

30.50.060 Authorized Protection Structures. The construction of a protective structure located within the Shoreline Protection Area may be authorized by the issuance of a Shoreline Protection Permit, if the City Council finds following notice and public hearing that the proposed protective structure:

A. Is required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion and when designed to eliminate or mitigate adverse impacts to local shoreline sand supply;

B. Will minimize risks to life and property in areas of flood hazards;

C. Will assure stability and structural integrity and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area, nor in any way substantially alter natural landforms along bluffs and cliffs;

D. Is in conformity with the certified Coastal Program, after certification of the local Coastal Program;

E. Is in conformity with the public access and public recreation policies of Chapter 3 of the Coastal Act;

F. Has material and design which are consistent with good engineering practices;

G. Will, if there is a vertical wall element in the proposed protective structure, have the seaward face of the vertical wall located within the Shoreline Protective Area only if there is no other feasible location for effectively protecting a principle structure; there is no feasible, less environmentally damaging alternative; and feasible mitigation measures have been provided to minimize adverse environmental effects; but in no event have the seaward face of the vertical wall more than five feet westward of the Shoreline Protection Area line;

H. Will, if other than a vertical wall, meet all the conditions of subsection G, above;

I. Will, if there is a riprap element in the proposed structure:

1. Have the riprap extending no more than 20 feet westward from the Shoreline Protection Area line.

2. Have a westward slope beginning no higher than a 5.7 foot elevation (NGVD) at the Shoreline Protection Area line, decreasing in height at a minimum rate of one vertical foot for every one and one-half feet of lateral distance, the riprap extends westerly of the SPA line.

30.50.070 Permit Application Procedure.

A. An application for a Shoreline Protection Permit shall be made to the City Manager on forms provided by the City. The applicant shall pay a fee determined by the City Manager to be sufficient to pay for the costs of notice and the processing of the application for City Council consideration to include prehearing CEQA processing and any consulting costs incurred by the City.

B. The application shall include the full description of the development and the applicant's proposal, together with supporting evidence on each issue raised by the application. Where deemed necessary by the City Manager, the application will include information as prepared by either a registered engineer or a land surveyor and an environmental consultant.

C. Following the required CEQA processing, the City Manager shall cause the application to be set for a noticed administrative hearing before the City Council. The City Manager shall cause to be published, at least ten days before the date set for the administrative hearing, a notice of application. The notice of application shall also be concurrently posted on the site of the subject development and mailed to each person who has filed a written request for such notice, giving their name and mailing address. The notice of application shall contain:

1. A description of the subject development;

2. The purpose of the application;

3. The date and time of the meeting at which the administrative hearing will be conducted.

4. A statement that the hearing will be open to the public and to public discussion.

30.50.080 Issuance Shoreline Protection Permit.

A. It shall be unlawful to construct or maintain a privately owned protective structure or maintain privately owned development within the Shoreline Protection Area without first having obtained a Shoreline Protection Permit from the City Council.

B. The City Council may issue a Shoreline Protection Permit authorizing the following:

1. The construction and maintenance of a privately owned protective structure in accordance with the regulations of this ordinance.

2. The maintenance of a privately owned protective structure or privately owned development constructed prior to and in nonconformance with the Beach Overlay Zone regulations for the duration of the amortization term established for such privately owned protective structure or privately owned development.

3. The private financing, construction and/or maintenance of a publicly owned protective structure authorized by the Beach Overlay Zone regulations.

C. A Shoreline Protection Permit shall:

1. Contain waivers, indemnification and hold harmless provisions as required by the City Council at the time of approval.

2. Contain such conditions as the City Council determines to be necessary to accomplish the purposes of the Beach Overlay Zone.

3. Shall require a reasonable user fee to be determined by the City Council.

4. Be recorded in a manner to bind successors in interest.

<u>30.50.090 Emergency Reinforcement.</u>

A. Where property inland from a protective structure is being immediately threatened by ocean flooding or wave damage, a shoreline protection permittee may temporarily increase the height and bulk of the protective structure. The permittee shall within fifteen days from the end of the emergency condition remove the temporary protection from the Shoreline Protection Area. Said emergency reinforcement shall be subject to other requirements contained in the California Coastal Act.

B. In the event such added temporary protection remains beyond April 15 in any year the City shall remove such added structure within ten days and shall charge the owner the cost of removal, placing a lien on the property for such cost.

30.50.100 Shoreline Protection Area: Removal of Noncomplying Development.

A. Privately owned development within the Shoreline Protection Area constructed before the effective date of and in nonconformity to the Beach Overlay Zone regulations shall be abated immediately by the person or persons who constructed, now use and/or maintain such development; unless a Shoreline Protection Permit has been obtained establishing an amortization period of such development.

B. The following privately owned development within the Shoreline Protection Area shall constitute a public nuisance. In addition to other remedies provided by law, all direct and indirect costs, including legal expenses, incurred by the City of Del Mar in abating such nuisance shall become a lien on the property and a personal obligation of the person or persons who constructed, now use and/or now maintain such development, and shall be a special assessment against said property to be collected as ordinary municipal taxes.

1. Privately owned development which was constructed before the effective date of and in noncompliance with the regulations of the Beach Overlay Zone and thereafter is maintained either without or contrary to the terms of a Shoreline Protection Permit.

2. Privately owned development which is constructed and maintained after the effective date of and in noncompliance with the regulations of the Beach Overlay Zone.

30.50.110 Shoreline Protection Area: Determination of Noncomplying Developments, Amortization Term.

A. The City Manager shall investigate and identify within a period no later than six months following the date of the enactment of this ordinance the existence of any development within the Shoreline Protection Area that is not in compliance with the requirements of the Beach Overlay Zone.

B. The City Manager shall prepare a preliminary recommendation identifying the noncomplying development, and designating an abatement procedure to include an amortization period calculated as follows:

For every $5,000.00 of initial construction costs on each individual lot, the noncomplying development may remain for one year following its initial construction, not to exceed ten years. The City Manager shall determine the initial cost of construction based upon the best information available.

C. The City Manager shall cause a Notice of Preliminary Recommendation to be sent by certified mail, return receipt requested, and by first class postage prepaid mail to the address of record listed in the County Recorder's office, and to such other address of which the City Manager has actual knowledge of the person or persons who constructed, now use, and/or now maintain the privately owned development. In addition, the Notice of Preliminary Recommendation shall be concurrently posted in a conspicuous location at the development site and shall be mailed to persons who have registered their names and addresses with the City indicating an interest in obtaining such notice. Further the notice shall be published in accordance with the provisions of this ordinance at least 15 days prior to the administrative hearing thereon.

<u>30.50.120 Notice of Preliminary Recommendation.</u> The <u>Notice of Preliminary Recommendation shall contain</u> the following:

A. The preliminary recommendation.

B. The date and time of the City Council meeting at which an administrative hearing will be conducted.

C. A statement that the City Council, following the completion of the administrative hearing, will make a final determination of the foregoing matter and may record a Notice of Abatement against the property of persons found to be responsible for removing the development.

D. A statement that the hearing will be open to the public and to public discussion.

<u>30.50.130 Determination of Noncompliance and Abatement</u>.

A. Following the administrative hearing, the City Council shall reach a final determination as to whether the development is noncomplying, whether it constitutes a nuisance and the final determination of an abatement procedure consistent with the terms of this ordinance. The City Council shall base its determination on any information presented during the administrative hearing that may be constitutionally considered.

B. After such final determination the City shall give the notice, provided for in Section 12, C, notifying the noncomplying owner, notifying such persons that they have thirty days from the date of the notice to remove the noncomplying development; that upon a showing of good cause this period may be extended for a longer period but not to exceed ninety days.

C. If the owner of the noncomplying development does not remove it within the required period, the City Council shall direct the City Attorney to take immediate action to abate the nuisance created by the development, including the taking of any necessary legal action to abate the same. The City will recover the expense of such actions as provided in Section 10, B.

30.50.140 New Construction or Reconstruction. No reconstruction or remodeling of a structure when 50% or more of the lot's permitted floor area is involved and no new construction shall be located within 15 feet east of the Shoreline Protection Area line. Patio and landscaping improvements not to exceed six feet in height, and which provide adequate drainage of excess water resulting from storm and/or wave conditions shall be exempt from this section. Said drainage capabilities shall be reviewed and subject to approval of the City Engineer at the time of application.

30.50.150 Shoreline Protection Area: Publicly Owned Development. Within the Shoreline Protection Area, the City Council may authorize the construction and maintenance of lifeguard facilities.

EXHIBIT A

All land lying westerly of a line extending southerly from the northern City boundary along the westerly right-of-way line of Camino del Mar, then turning westerly along the northerly right-of-way line of 29th Street, then turning southerly along the westerly right-of-way line of Ocean Front, then turning easterly along the southerly right-of-way line of 17th Street, then turning southerly along the westerly right-of-way line of Coast Boulevard, and then following southerly along the easterly right-of-way line of the AT&SF Railway to the southern City boundary.

FOLLOWING IS THE DESCRIPTION OF A LINE KNOWN AS THE "SHORELINE PROTECTION LINE" AS IS DEFINED IN THE CITY OF DEL MAR ZONING ORDINANCE, BEACH OVERLAY ZONE, D.M.M.C. CHAPTER 30; SAID LINE EXTENDING FROM THE NORTHERLY CORPORATE BOUNDARY TO THE SOUTHERLY CORPORATE BOUNDARY OF THE CITY OF DEL MAR IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

EGINNING AT THE SOUTHEAST CORNER OF LOT 1 OF MAP 6838, SAID POINT BEING LOCATED ON THE SOUTHERLY EXTENSION OF THE CENTERLINE OF SIERRA AVENUE AND ON THE NORTHERLY CORPORATE BOUNDARY LINE OF THE CITY OF DEL MAR:

1. THENCE WESTERLY ALONG SAID NORTHERLY BOUNDARY LINE NORTH 89 DEGREES 35' 36" WEST, 458.98 FEET (RECORD-NORTH 89 DEGREES 49' 32" EAST) TO THE "TRUE POINT OF BEGINNING;"

2. THENCE LEAVING SAID NORTHERLY CORPORATE BOUNDARY LINE DUE SOUTH A DISTANCE OF 362.08 FEET;

3. THENCE SOUTH 12 DEGREES 58' 16.0" EAST, 182.66 FEET;

4. THENCE SOUTH 54 DEGREES 11' 22.8" EAST, 60.01 FEET;

5. THENCE SOUTH 23 DEGREES 58' 07.5" EAST, 90.00 FEET TO A POINT COINCIDENT WITH THE NORTHEASTERLY CORNER OF THE CITY OF DEL MAR SEA BLUFF PRESERVE;

6. THENCE SOUTHERLY ALONG THE EASTERLY BOUNDARY LINE OF SAID SEA BLUFF PRESERVE, SOUTH 23 DEGREES 58' 07.5" EAST, 428.26 FEET;

7. THENCE LEAVING SAID EASTERLY BOUNDARY LINE OF SAID SEA BLUFF PRESERVE, SOUTH 13 DEGREES 50' 16.1" EAST, 987.41 FEET TO A POINT ON THE EAST FACE OF A SEAWALL AS IT EXISTED ON JANUARY 11, 1986, SAID SEAWALL LOCATED SOUTHERLY OF THE SAN DIEGUITO RIVER;

8. THENCE SOUTHERLY SOUTH 8 DEGREES 26' 48.8" EAST, 273.20 FEET TO A POINT ON THE EASTERLY FACE OF SAID SEAWALL AS IT EXISTED ON JANUARY 11, 1986;

9. THENCE SOUTH 9 DEGREES 04' 07.8 " EAST, 269.57 FEET TO A POINT ON THE EASTERLY FACE OF SAID SEAWALL AS IT EXISTED ON JANUARY 11, 1986;

10. THENCE SOUTH 8 DEGREES 59' 16.2" EAST, 449.91 FEET TO A POINT ON THE EASTERLY FACE OF SAID SEAWALL AS IT EXISTED ON JANUARY 11, 1986; SAID POINT BEING LOCATED ON THE SOUTHERLY RIGHT-OF-WAY LINE OF 29TH STREET AS SHOWN ON RECORD OF SURVEY 679, 9056 & 9551;

11. THENCE WESTERLY ALONG SAID SOUTHERLY RIGHT-OF-WAY LINE OF 29TH STREET, SOUTH 81 DEGREES 01' 01" WEST, 0.89 FEET (RECORD - SOUTH 80 DEGREES 48' WEST);

12. THENCE LEAVING SAID SOUTHERLY RIGHT-OF-WAY LINE OF 29TH STREET, FOLLOWING A LINE PARALLEL TO AND 120.00 FEET WESTERLY OF THE CENTERLINE OF THE ALLEY KNOWN AS OCEANFRONT AS SHOWN ON RECORD OF SURVEY 9551, SOUTH 8 DEGREES 59' 56.2" EAST, 440.00 FEET (RECORD SOUTH 9 DEGREES 10' EAST) TO A POINT LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF 27TH STREET AS SHOWN ON RECORD OF SURVEY 9551;

13. THENCE EASTERLY ALONG SAID NORTHERLY RIGHT-OF-WAY LINE OF 27TH STREET NORTH 81 DEGREES 20' 36.7" EAST, 10.21 FEET (RECORD - SOUTH 80 DEGREES 50' WEST);

14. THENCE LEAVING SAID NORTHERLY RIGHT-OF-WAY LINE OF 27TH STREET AND CONTINUING ALONG A LINE COINCIDENT WITH THE EASTERLY RIGHT-OF-WAY LINE OF A 20.00 FOOT WIDE ALLEY AS SHOWN ON MAP 1737, SOUTH 9 DEGREES 00' 34.3" EAST, 480.02 FEET (RECORD - SOUTH 9 DEGREES 10' EAST) TO A POINT ON THE NORTHERLY RIGHT-OF-WAY LINE OF 25TH STREET, SAID POINT COINCIDENT WITH THE SOUTHWEST CORNER OF LOT 26, MAP 1737;

15. THENCE CONTINUING ALONG THE EASTERLY RIGHT-OF-WAY LINE OF A 15 FOOT WIDE PUBLIC SIDEWALK AS SHOWN ON MAP 1450, SOUTH 9 DEGREES 00' 34.3" EAST, 140 FEET (RECORD - SOUTH 80 DEGREES 50' EAST) TO AN ANGLE POINT, SAID ANGLE POINT BEING THE SOUTHWEST CORNER OF LOT 7, BLOCK 127, MAP 1450;

16. THENCE CONTINUING ALONG THE EASTERLY RIGHT-OF-WAY LINE OF SAID PUBLIC SIDEWALK AS SHOWN ON MAP 1450, SOUTH 7 DEGREES 15' 27.3" EAST, 102.13 FEET (RECORD - SOUTH 7 DEGREES 07' EAST) TO A POINT ON THE NORTHERLY RIGHT-OF-WAY LINE OF 24TH STREET, SAID POINT COINCIDENT W[illegible] THE SOUTHWEST CORNER OF LOT 13, BLOCK 127 OF MAP 1450;

17. THENCE CONTINUING ALONG THE EASTERLY RIGHT-OF-WAY LINE OF SAID 15 FOOT PUBLIC SIDEWALK AS SHOWN ON MAP 1450, SOUTH 6 DEGREES 15' 34.1" EAST, 690.00 FEET (RECORD - SOUTH 6 DEGREES 24' EAST) TO A POINT ON THE NORTHERLY RIGHT-OF-WAY LINE OF 21ST STREET, SAID POINT COINCIDENT WITH THE SOUTHWEST CORNER OF LOT 13, BLOCK 124, MAP 1450;

18. THENCE EASTERLY ALONG THE NORTHERLY RIGHT-OF-WAY LINE OF 21ST STREET, NORTH 83 DEGREES, 39' 25.5" EAST, 20.10 FELT (RECORD - SOUTH 83 DEGREES 36' WEST);

19. THENCE LEAVING SAID NORTHERLY RIGHT-OF-WAY LINE OF 21ST STREET AND CONTINUING SOUTHERLY ALONG THE EASTERLY LINE OF LOT 22 AS SHOWN ON MAP 1277, SOUTH 6 DEGREES 15' 32.2" EAST, 114.20 FEET (RECORD - SOUTH 56 DEGREES 24' FEET EAST) TO AN ANGLE POINT LOCATED ON THE WESTERLY LINE OF LOT 19, BLOCK 115, MAP 1277, A DISTANC THEREON SOUTH 6 DEGREES 15' 32.2" EAST, 19.00 FEET (RECORD - SOUTH 6 DEGREES 24 " EAST) FROM THE NORTHWEST CORNER OF SAID LOT 19;

IMPLEMENTATION GUIDELINES
MEASURE D - BEACH PRESERVATION INITIATIVE
NOVEMBER 14, 1988

GUIDELINES IMPLEMENTING

MEASURE "D"

Guidelines - General Provisions

A. Authority for Guidelines. These guidelines are adopted for Measure D, the Beach Preservation Initiative (BPI) by Resolution No. 88-112 of the City council of the City of Del Mar, November 14, 1988. The City Council may amend these guidelines by resolution after a duly advertised public hearing in accordance with the DMMC.

B. Purpose of Guidelines. The purpose of these guidelines is to implement and interpret Measure D in a manner consistent with the provisions and intent of Measure D. It is further the purpose of these guidelines to establish procedures to facilitate compliance with Measure D in an expeditious, cost-effective manner.

C. Interpretation of Guidelines.

1. Procedure; Fee. It shall be the duty of the Director of Planning to interpret and apply these guidelines. Upon payment of an interpretation fee, any member of the public may request in writing that the Director of Planning render an opinion on the interpretation or application of these guidelines, as it pertains to a particular project, as per Del Mar Municipal Code, Section 30-2.1. A request under this section shall not be grounds for delaying any application process or project, unless otherwise directed by the Director, in which case the delay shall not exceed one week.

2. Binding Effect. Interpretations shall be binding only on the property covered by the request. Where not requested by the affected property owner, written notice of the request for interpretation shall be provided within ten (10) days of the filing of the request to the affected property owner. Where the interpretation might affect more than one property, notice shall be provided to all affected owners.

D. Appeal to Council

The decisions of the City, or Planning Director, made pursuant to the Beach Preservation Initiative, may be appealed in accordance with Chapter 1.12 of the Del Mar Municipal Code.

Section 1. Beach Preservation Initiative: Purpose.

The Beach Overlay Zone created by this initiative is established to regulate the uses of the Del Mar beach area, a distinct and valuable natural resource, for the benefit of present and future generations. The regulations contained herein shall be administered so as to protect public access to and along the shoreline, while promoting public safety, health and welfare, and providing for the protection of private property.

Section 1. Guideline: None needed.

Section 2. Beach Preservation Initiative: Zone Boundaries.

The boundaries of the Beach Overlay Zone are as described in exhibit A, incorporated herein by reference.

Section 2. Guideline:

At the time of submission of an application for a Shore Protection Permit for any new project or existing project when a dispute exists, the property owner shall submit a survey determining the location of the SPA line in relation to the property. This survey shall be prepared by a Registered Civil Engineer or Licensed Land Surveyor. The survey shall be based on the Initiative's legal description and monuments referenced to therein. It is recommended that the property owner contact the City Engineer prior to undertaking any survey. The property owner may request the City to locate the line at the owners expense. Any submitted survey must be found satisfactory to the Director of Planning.

Section 3. Beach Preservation Initiative: Permitted Uses.

Permitted uses within the Beach Overlay Zone shall be those allowed in the underlying Zone, subject to the regulations contained in the Beach Overlay Zone which shall prevail in the event of conflict with any other provisions of the City Code.

Section 3. Guideline:

Those properties which are subject to the provisions of the Beach Preservation Initiative lie within one or more zones. The uses allowed are those which are contained within the text of the City Ordinances for each particular zone.

Section 4. Beach Preservation Initiative: Definitions.

a. "Shoreline Protection Area" shall mean that area which is within the Beach Overlay Zone and is located from south to north along the shoreline of the City being more particularly described as follows: All lands located westerly of the line as described in exhibit B, incorporated herein by reference.

b. "Development" shall mean the placement or construction of any solid material or structure on land, to include without limitation, any human-directed alteration of the land and the planting, cultivation, or maintenance of any vegetation.

c. "Protective Structure" shall mean any privately or publicly owned development designed to protect property inland from such structure from ocean flooding or wave damage.

Section 4. Guideline:

Additional definitions in Guidelines:

Favored Seawall Solution: A vertical seawall within the parameters of the Program EIR and existing or constructed on or east of the SPA line.

Program EIR (as defined by the California Environmental Quality Act): An EIR which may be prepared on a series of actions that can be characterized as one large project and are related either:

(1) Geographically,

(2) As logical parts in the chain of contemplated actions,

(3) In connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program, or

(4) As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways.

Negative Declaration: A written statement by the lead agency describing the reasons that a proposed project, not exempt from CEQA, will not have a significant effect on the environment and therefore does not require the preparation of an EIR.

Section 5. Beach Preservation Initiative: Development within the Shoreline Protection Area.

No development shall occur within the shoreline area except such privately owned protective structures, publicly owned protective structures and publicly owned development authorized, constructed and maintained in accordance with the regulations set forth in the City Code.

Section 5. Guideline:

The development allowed within the Shoreline Protection Area will be governed by City Code, the Beach Preservation Initiative, and the Design Review Ordinance. Any development proposed in this area is subject to the provisions of the California Environmental Quality Act (CEQA) which may require specific conditions to mitigate potential problems. The City will be undertaking preparation of a program EIR. The program EIR will not be a design solution. It is anticipated that individual projects consistent with the Program EIR can be approved with a Negative Declaration. The fees the City must require of the applicant for a Negative Declaration will be significantly lower than that of an individual EIR. CEQA compliance for individual projects other than the favored seawall solution will most likely require individual Environment Impact Reports at property owner's expense.

Section 6. Beach Preservation Initiative: Authorized Protection Structures.

The construction of a protective structure located within the shoreline protection area may be authorized by the issuance of a shoreline protection permit, if the City Council finds following notice and public hearing that the proposed protective structure:

a. Is required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion and when designed to eliminate or mitigate adverse impacts to local shoreline sand supply;

b. Will minimize risks to life and property in areas of flood hazards;

c. Will assure stability and structural integrity and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area, nor in any way substantially alter natural landforms along bluffs and cliffs;

d. Is in conformity with the certified Coastal Program, after certification of the local Coastal Program;

e. Is in conformity with the public access and public recreation policies of Chapter 3 of the Coastal Act;

f. Has material and design which are consistent with good engineering practices;

g. Will, if there is a vertical wall element in the proposed protective structure, have the seaward face of the vertical wall located within the shoreline protective area only if there is no other feasible location for effectively protecting a principle structure; there is no feasible, less environmentally damaging alternative; and feasible mitigation measure have been provided to minimize adverse environmental effects; but in no event have the seaward face of the vertical wall more than five feet westward of the shoreline protection area line;

h. Will, if other than a vertical wall, meet all the conditions of subsection g, above;

i. Will, if there is a riprap element in the proposed structure;

1. Have the riprap extending no more than 20 feet westward from the shoreline protection area line.

2. Have a westward slope beginning no higher than a 5.7 foot elevation (NGVD) at the shoreline protection area line, decreasing in height at a minimum rate of one vertical foot for every one and one-half feet of lateral distance, the riprap extends westerly of the SPA line.

Section 6. Guideline:

The City Council, after a noticed administrative hearing, will, prior to approval of a Shoreline Protection Permit, require compliance with Section 6 of the Beach Preservation Initiative. Section 6 requires the City Council to make findings regarding Subsections "a" through "i". It shall be the burden of the property owner to bring forward evidence to show that the requirements of Section 6 are being met. All protective structures shall be submitted to the Design Review Board as required pursuant to Chapter 23.08 of the Del Mar Municipal Code. Favored seawall solutions shall be given priority for review and scheduling ahead of all other projects through January 1, 1990.

Additional information and review in the form of additional Engineering information and Environmental Review shall be required by the Planning Director or the City Council when deemed necessary to fully evaluate the proposed project. The need for such additional information and review shall be substantially reduced in those cases of a favored seawall solution.

The Shoreline Protection Permit, and other required discretionary permits, may also require approval by other governmental agencies regulating Coastal development.

Feasible location, as used in Section 6G means "capable of being accomplished in a successful manner within a reasonable period of time, taking into account environmental, legal, social, and technological factors."

Section 7. Beach Preservation Initiative: Permit Application Procedure.

a. An application for a shoreline protection permit shall be made to the City Manager on forms provided by the City. The applicant shall pay a fee determined by the City Manager to be sufficient to pay for the costs of notice and the processing of the application for City Council consideration to include prehearing CEQA processing and any consulting costs incurred by the City.

b. The application shall include the full description of the development and the applicant's proposal, together with supporting evidence on each issue raised by the application. Where deemed necessary by the City Manager, the application will include information as prepared by either a registered engineer or a land surveyor and an environmental consultant. The application shall also include a liability waiver that would hold harmless the City of Del Mar which must be signed by the property owner.

c. Following the required CEQA processing, the City Manager shall cause the application to be set for a noticed administrative hearing before the City Council. The City Manager shall cause to be published, at least ten days before the date set for the administrative hearing, a notice of application in the newspaper of local circulation. The notice shall be mailed to all property owners and residents within 300 feet of the subject site. The notice of application shall also be concurrenlty posted on the site of the subject development and mailed to each person who has filed a written request for such notice, giving their name and mailing address. The notice of application shall contain:

1. A description of the subject development;

2. The purpose of the application;

3. The date and time of the meeting at which the administrative hearing will be conducted;

4. A statement that the hearing will be open to the public and to public discussion.

Section 7. Guideline:

The Shoreline Protection application form will be consistent with the Coastal Commissions' Coastal Development Permit form to insure processing uniformity for the applicant.

The City fee charged for permit processing will be set from time to time by the City Council through resolution. The fees are set on a full cost recovery basis.

The applicant may also be required to pay a deposit to offset the costs of environmental review and/or coastal engineering review when said review is required by the Planning Director or City Council.

Section 8. Beach Preservation Initiative: Issuance Shoreline Protection Permit.

a. It shall be unlawful to construct or maintain a privately owned protective structure or maintain privately owned development within the Shoreline Protection Area without first having obtained a Shoreline Protection Permit from the City Council.

b. The City Council may issue a Shoreline Protection Permit authorizing the following:

1. The construction and maintenance of a privately owned protective structure in accordance with the regulations of this ordinance.

2. The maintenance of a privately owned protective structure or privately owned development constructed prior to and in nonconformance with the Beach Overlay Zone regulations for the duration of the amortization term established for such privately owned protective structure or privately owned development.

3. The private financing, construction and/or maintenance of a publicly owned protective structure authorized by the Beach Overlay Zone regulations.

c. A Shoreline Protection Permit shall:

1. Contain waivers, indemnification and hold harmless provisions as required by the City Council at the time of approval.

2. Contain such conditions as the City Council determines to be necessary to accomplish the purposes of the Beach Overlay Zone.

3. Shall require a reasonable user fee to be determined by the City Council.

4. Be recorded in a manner to bind successors in interest.

Section 8. Guideline:

A Shoreline Protection Permit issued by the City Council is required for construction of new private and public protective structures as well as to maintain existing encroaching structures.

The Shoreline Protection Permit will include reasonable conditions imposed by the City Council to protect the health, safety and welfare of the community, to release the City from undue liability, and to ensure a coordinated and effective overall solution to beach and private property preservation.

The City Council will establish from time to time a schedule for reasonable user fees for private use of the property within the Shoreline Protection area.

Any conditions attached to Shoreline Protection Permit, as well as any use agreement, will run with the applicant's adjacent land through a recorded covenant.

Section 9. Beach Preservation Initiative: Emergency Reinforcement.

a. Where property inland from a protective structure is being immediately threatened by ocean flooding or wave damage, a shoreline protection permittee may temporarily increase the height and bulk of the protective structure. The permittee shall within fifteen days from the end of the emergency condition remove the temporary protection from the Shoreline Protection Area. Said emergency reinforcement shall be subject to other requirements contained in the California Coastal Act.

b. In the event such added temporary protection remains beyond April 15 in any year the City shall remove such added structure within ten days and shall charge the owner the cost of removal, placing a lien on the property for such cost.

Section 9. Guideline:

If a temporary increase in the bulk of a lawfully existing protective structure is needed, or the placement of a temporary protective structure is needed, temporary measures may be taken provided that the applicant shall, within 3 days following implementation of the temporary measures, notify the City in writing of the placement of material. Such notice shall be given on the form attached hereto as Exhibit F. The form shall include a liability waiver that would hold harmless the City of Del Mar which must be signed by the property owner. If rip-rap is used as a temporary protective device, it shall extend no more than 32' west of the Shoreline Protection Area line. Any rip-rap which extends more than 20' west of the Shoreline Protection Line shall be removed after 15 days of placement or face financial penalty. The amount of the standard penalty will be determined by the City Council based upon the recommendation of the City Attorney. All such temporary measures shall be removed by April 15th of each year.

A temporary protective structure may be maintained on a one time basis only, for a period of one year beyond the April 15th deadline, providing the following two conditions are met:

1. The temporary encroachment extends no more than 20 feet west of the Shoreline Protection Line;

2. An application for a Shoreline Protection Permit has been filed prior to such April 15th and the permit process is, in the opinion of the City Manager, diligently pursued, and if approved, the Shoreline Protection device is constructed within a reasonable time not to exceed one year from approval.

The City Manager, on January 5th of each year, will send notice to all property owners that the temporary encroachments must be removed by April 15th of that year. The notice will also state that if the property owner desires to permanently maintain the temporary structure, a Shoreline Protection Permit shall be filed within 15 days of the placement of the temporary structure or no later than April 15th. In the event that the temporary protective structure addition remains beyond April 15th. the City shall remove it within 10 days and place a lien on the property for the cost of removal, as well as a penalty for the time after April 15th that the temporary protection remains.

Section 10. Beach Preservation Initiative: Shoreline Protection Area: Removal of Noncomplying Development.

a. Privately owned development within the Shoreline Protection Area constructed before the effective date of and in nonconformity to the Beach Overlay Zone regulations shall be abated immediately by the person or persons who constructed, no use and/or maintain such development; unless a Shoreline Protection Permit has been obtained establishing an amortization period of such development.

b. The following privately owned development within the Shoreline Protection Area shall constitute a public nuisance. In addition to other remedies provided by law, all direct and indirect costs, including legal expenses, incurred by the City of Del Mar in abating such nuisance shall become a lien on the property and a personal obligation of the person or persons who constructed, now use and/or now maintain such development, and shall be a special assessment against said property to be collected as ordinary municipal taxes.

1. Privately owned development which was constructed before the effective date of and in noncompliance with the regulations of the Beach Overlay Zone and thereafter is maintained either without or contrary to the terms of a Shoreline Protection Permit.

2. Privately owned development which is constructed and maintained after the effective date of and in noncompliance with the regulations of the Beach Overlay Zone.

Section 10. Guideline:

Any development in the Shore Protection area which did not receive a Shore Protection Permit or is in conflict with any approved Shoreline Protection Permit must be removed. The removal requirement may be delayed if a Shoreline Protection Permit has been applied for and diligently pursued. Abatement, if needed, will be in accordance with Sections 11 and 13 of this Chapter.

Section 11. Beach Preservation Initiative: Shoreline Protection Area: Determination of Noncomplying Developments, Amortization Term.

a. The City Manager shall investigate and identify within a period no later than six months following the date of the enactment of this ordinance the existence of any development within the Shoreline Protection Area that is not in compliance with the requirements of the Beach Overlay Zone.

b. The City Manager shall prepare a preliminary recommendation identifying the noncomplying development, and designating abatement procedure to include an amortization period calculated as follows:

For every $5,000.00 of initial construction costs on each individual lot, the noncomplying development may remain for one year following its initial construction, not to exceed ten years. The City Manager shall determine the initial cost of construction based on the best information available.

c. The City Manager shall cause a Notice of Preliminary Recommendation to be sent by certified mail, return receipt requested, first class postage prepaid mail to the address of record listed in the County Recorder's office, and to such other address of which the Manager has actual knowledge of the person or person who constructed, no use, and/or now maintain the privately owned development. In addition, the Notice of Preliminary Recommendation shall be concurrently posted in a conspicuous location at the development site and shall be mailed to persons who have registered their names and addresses with the City indicating an interest in obtaining such notification. Further the notice shall be published in accordance with the provisions of this ordinance at least 15 days prior to the administrative hearing thereon.

Section 11. Guideline:

The City Manager will notify both the City Council and the individual property owners of structural noncompliance within the Shoreline Protection Area by October 19, 1988.

The initial notice will request information regarding the construction costs/owner estimates of the existing non-complying structure. The property owner will have 30 days to respond to the initial notice.

A second notice (Notice of Preliminary recommendation) will be sent to all property owners with non-complying structures. The second notice shall set the time and date of the administrative hearing. If the property owner disputes the City's determination of encroachment, the property owner shall post a deposit with which the City will hire a Registered Civil Engineer or Licensed Land Surveyor to survey the SPA line and its location in relation to the owners property. If the owner does not pay the City fully for the survey costs, the City may recover the monies expended through a lien on the property or through other means.

The City Manager may delay the administrative hearing if a complete application for a Shoreline Protection Permit has been submitted and dilegently pursued. There shall be no extension granted beyond January 1, 1990.

Section 12. Beach Preservation Initiative: Notice of Preliminary Recommendation. The Notice of Preliminary Recommendation shall contain the following:

a. The preliminary recommendation.

b. The date and time of the City Council meeting at which an administrative hearing will be conducted.

c. A statement that the City Council, following the completion of the administrative hearing, will make a final determination of foregoing matter and may record a Notice of Abatement against the property of persons found to be responsible for removing the development.

d. A statement that the hearing will be open to the public and to public discussion.

Section 12. Guideline:

The City Manager may grant an extension of time for the administrative hearing provided that an application for a Shoreline Protection Permit has been filed and the permit process in the opinion of the City Manager is being diligently pursued, and if approved, the Shoreline Protection device is constructed within a reasonable time not to exceed one year from approval date. There shall, however, be no extensions granted behond January 1, 1990.

Section 13. Beach Preservation Initiative: Determination of Noncompliance and Abatement.

a. Following the administrative hearing, the City Council shall reach a final determination as to whether the development is noncomplying, whether it constitutes a nuisance and the final determination of an abatement procedure consistent with the terms of the ordinance. The City Council shall base its determination on any information presented during the administrative hearing that may be constitutionally considered.

b. After such final determination the City shall give the notice, provided for in Section 12, c, notifying the noncomplying owner, notifying such persons that they have thirty days from the date of the notice to remove the noncomplying development; that upon a showing of good cause this period may be extended for a longer period but not to exceed ninety days.

c. If the owner of the noncomplying development does not remove it within the required period, the City Council shall direct the City Attorney to take immediate action to abate the nuisance created by the development, including the taking of any necessary legal action to abate the same. The City will recover the expense of such actions as provided in Section 10. b.

Section 13. Guideline:

The City Council vests in the City Manager the authority to grant, with good cause, an extension of up to 90 days for removal of noncomplying structures beyond the thirty (30) days from Date of Notice.

If the noncomplying development is not removed the City Council will direct the City Attorney to institute proceedings to abate the nuisance by removal of the structure with the cost to be born by the property owner secured by a lien on the property.

Section 14. Beach Preservation Initiative: New Construction or Reconstruction.

No reconstruction or remodeling of a structure when 50% or more of the lot's permitted floor area is involved and no new construction shall be located within 15 feet east of the Shoreline Protection Area line. Patio and landscaping improvements not to exceed six feet in height, and which provide adequate drainage of excess water resulting from storm and/or wave conditions shall be exempt from this section. Said drainage capabilities shall be reviewed and subject to approval of the City Engineer at the time of application.

Section 14. Guideline:

There shall be no development, which requires a building permit, either new, reconstruction or remodeling, within 15 feet east of the SPA line if any of the following apply: 1) more than 50% of the applicant's lot's permitted floor area is involved in the area being worked; or 2) the value of the overall remodel, reconstruction, or addition exceeds the pre-existing value by 50% or more.

Patio and landscape improvements which the Planning Director finds may have drainage impacts will be reviewed by the City Engineer and, if necessary, by the City's landscape consultant, both at the property owner's expense.

Section 15. Beach Preservation Initiative: Shoreline Protection Area: Publicly Owned Development.

Within the Shoreline Protection Area, the City Council may authorize the construction and maintenance of lifeguard facilities.

Section 15. Guideline: None needed.

SHORELINE PROTECTION

application

FOR DEPARTMENT USE ONLY
SPP-____-____
Date Submitted____________
Fee: Planning $________ Engineering $________
ED#____________
Receipt #____________
By____________
Related Cases____________
Other Required Reviews____________

PLEASE FILL IN COMPLETELY

Applicant____________

Address____________

____

Phone____________

Signature____________

Applicant's Representative____________

Address____________

____

Phone____________

Signature____________

Property Owner____________
(If other than applicant)

Address____________

____

Phone____________

Signature____________
(Authorizing Applicant to Submit Application)

Property Information

Site Address____________

Assessor's Parcel Number(s)____________

____

Lot Size (sq. ft.)____________

Existing Land Use____________

Zoning____________

Overlay Zone____________

General Plan Designation____________

Brief Description of Project: ____________

____

____

____

____

b. Will minimize risks to life and property in areas of flood hazards;

c. Will assure stability and structural integrity and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area, nor in an way substantially alter natural landforms along bluffs and cliffs;

d. Is in conformity with the certified Coastal Program, after certification of the local Coastal Program;

e. Is in conformity with the public access and public recreation policies of Chapter 3 of the Coastal Act;

f. Has material and design which are consistent with good engineering practices;

g. Will, if there is a vertical wall element in the proposed protective structure, have the seaward face of the vertical wall located within the shoreline protective area only if there is no other feasible location for effectively protecting a principle structure; there is no feasible, less environmentally damaging alternative; and feasible mitigation measure have been provided to minimize adverse environmental effects; but in no event have the seaward face of the vertical wall more than five feet westward of the shoreline protection area line;

h. Will, if other than a vertical wall, meet all the conditions of subsection g, above;

i. Will, if there is a riprap element in the proposed structure;

   1. Have the riprap extending no more than 20 feet westward from the shoreline protection area line.

   2. Have a westward slope beginning no higher than a 5.7 foot elevation (NGVD) at the shoreline protection area line, decreasing in height at a minimum rate of one vertical foot for every one and one-half feet of lateral distance, the riprap extends westerly of the SPA line.

If the Shoreline Protection permit is approved, any required conditions will be recorded in such a manner to bind successors in interest.

<u>Step 6 - Expiration</u>

If substantial construction has not been completed in reliance upon a granted Shoreline Protection Permit within one (1) year, the permit will expire.

14) A 300' radius map drawn on assessor's parcel maps and spliced together (when necessary), showing the radius measured from the exterior boundaries of the subject property.

15) A typewritten property owner's list keyed to correspond with the radius map, containing the names, addresses, and assessor's parcel number (including the applicant and/or owner). The list will be Xerox copied from an addressed label sheet.

16) Stamped business-size envelopes with typed address labels and City of Del Mar return address. (See city handout for further explanation of #'s 10, 11, and 12).

Step 3 - Environmental Review

After the application is submitted to the Planning Department, the site plans will be sent to the appropriate public agencies involved in the project, for their review and comment. After the completion of an Environmental Initial Study, an environmental determination will be made on the project. If no significant environmental impacts are anticipated, a Negative Declaration will be prepared. If it is determined that the project will have a significant environmental impact, an EIR will be prepared (at the applicant's expense) and circulated for public review and comment.

Step 4 - Design Review

The Design Review Board will hold an administrative hearing. The applicant or his agent must attend. Applicant or his agent should obtain a copy of the Staff Report from the Planning Department prior to the hearing date. The Design Review Board will either recommend the Shoreline Protection Permit for approval, approval with conditions, or denial.

Step 5 - City Council Hearing

The City Council will hold a public hearing. The applicant or his agent must attend. Applicant or his agent should obtain a copy of the Staff Report from the Planning Department prior to the hearing date. The City Council will either approve the Shoreline Protection Permit as submitted, approve with conditions, or deny. If the City Council authorizes the issuance of a Shoreline Protection Permit, the authorization will be based on findings that the proposed protective structure:

a. Is required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion and when designed to eliminate or mitigate adverse impacts to local shoreline sand supply;

5) Engineering drawings and specifications showing a typical section and plan view of the protection structure. If it is an existing structure, the plans should be signed and stamped by a registered civil/structural engineer and indicated as "record" drawings if they reflect what was constructed. The plans should clearly show the proposed or existing methods of providing flank protection or structurally tieing-in with the shore protection structure on the adjacent properties.

6) A report addressing the oceanographic design criteria, specific to the site including water levels, wave conditions, wave runup elevation, and beach erosion depths. The report should be prepared by a registered engineer experienced in coastal analysis and design.

7) A soils engineering report based upon field exploration and testing, and specific to the project being proposed, should be prepared. This report should include the depth and extent of cobbles and/or bedrock.

8) All plans to be collated into sets. One set of plans to be reduced to 8 1/2" x 11".

9) Photographs, from beach, of location of proposed (or existing) protective device.

10) The applicant acknowledges that the applicant assumes full liability for any damages which may result to the benefitted property, nearby private or public properties or persons as a result of the installation of the proposed Shoreline Protective device, and shall <u>provide proof of liability insurance in the amount of not less than $100,000, naming the City as co-insured and providing 30 days notice of termination/cancellation to the City from the carrier</u>.

11) Applicant agrees to indemnify and hold the City of Del Mar harmless from all claims arising out of the activity of the permittee, the issuance of this permit and permittee's Shoreline Protective device.

12) Applicant on behalf of the applicant, applicant's successors, assigns and heirs, waives all claims against the City of Del Mar, known and unknown, future and present, arising out of the subject matter of this permit, and permittee's Shoreline Protective device.

13) The applicant expressly acknowledges that the City of Del Mar has mad no warranty or representation that any approved application or designs will afford adequate protection to the applicant's property or to adjacent property.

PROCESS

Step 1 - Pre-application Conference

In order to process your application most effectively, a pre-application conference with a member of the Planning staff is highly recommended. The applicant and/or applicant's representative should bring in any information available on the site/structure in question, including but not limited to, plans or sketches.

Step 2 - Filing of Application

Favored seawall applications will be given first priority over all other applications. A favored seawall is a vertical seawall within the parameters of the EIR and constructed on or east of the SPA line.

Applications must be filed between 1:00 p.m. and 4:00 p.m. Each application will be reviewed for completeness at the counter by the Planning Technician. Accepted applications shall contain all information listed below. Incomplete submittals will not be accepted. The following items must be submitted at this time:

1) Completed and signed application form
2) Current Preliminary Title Report and Grant Deed
3) Application fee (see Fee Schedule)
4) Eight (8) copies of site plan with (24" x 36" folded to 8 1/2" x 11") containing the following information:
   - scale and north arrow (north at top of page)
   - name and address of applicant, engineer and/or architect, etc.
   - date
   - all easements
   - building(s) location
   - survey by a Registered Civil Engineer or Licensed Land Surveyor showing the property line, Shore Protection Line and all structures east and west of the Line.
   - location and amount of existing/proposed rip rap
   - dimensions of offsets between proposed protective structure and protective structures on properties to north and south
   - dimensioned location of point of vehicular egress
   - dimensioned distances between buildings and protective structure
   - height of all major points of structure
   - location, height, and materials of protective structure
   - location of all buildings within 100 feet of subject properties
   - a vicinity map showing major cross streets
   - a summary table indicating the following information:
     - site acreage
     - existing zone and land use
     - total area of proposed Shoreline Protective structure
     - landscaping
     - North arrow

CITY of DEL MAR SHORELINE PROTECTION PERMIT

an applicant's guide to procedures

PURPOSE

The Beach Overlay Zone was created by Initiative D passed by the voters of Del Mar in April, 1988. The Beach Overlay Zone is established to regulate the uses of the Del Mar Beach area, a district and valuable natural resource, for the benefit of present and future generations. The regulations of the Initiative shall be administered to protect public access to and along the Shoreline, while promoting public safety, health and welfare and providing for the protection of public property.

The Initiative was designed to regulate development both existing and proposed on or west of the Shore Protection Area Line as described in the Initiative. Any development on the SPA line or west requires the approval of a Shoreline Protection Permit.

APPENDIX C
CITY OF DEL MAR SHORELINE PROTECTION PERMIT

1. Are there any existing structures on property? ( )Yes ( )No
Explain____
____
____
____

2. Proposed protective structure height.

a) Maximum height of protective structure______________
b) Average height of protective structure______________

3. Will any existing protective structure be demolished? ( )Yes ( )No

4. Estimated cost of protective structure ______________

5. Estimated cost of proposed protective structure __________

6. Any previous applications? ( )Yes ( )No

Number______________
Date Issued______________
Coastal Commission Application______________
Number______________
Date Issued______________

7. Amount of lot coverage ______________

8. Is any grading proposed? ( )Yes ( )No If yes, complete the following:

a) amount of cut______________________________cu.yds.
b) amount of fill______________________________cu.yds.
c) maximum height of fill slope___________________cu.yds.
d) maximum height of cut slope___________________cu.yds.
e) amount of import or export___________________cu.yds.
f) location of borrow or disposal site___________________

Grading and drainage plans must be included with this application. In certain areas, an engineering geology report must also be included.

9. Will the development extend onto or adjoin any beach, tidelands, submerged lands or public trust lands? ( )Yes ( )No

For projects on State-owned lands, additional information may be required. Consult the staff representative in the Planning Division.

10. Is the proposed development in or near:

a) A 100-year flood plain ( )Yes ( )No (hydrologic mapping may be required)

11. Is the proposed development visible from:

a) any park, beach, or recreation area ( )Yes ( )No

12. Does the site contain any:

a) historic resources ( )Yes ( )No

b) archaeological resources ( )Yes ( )No

c) paleontological resources ( )Yes ( )No

If yes to any of the above, please explain on an attached sheet.

13. Would the project in any way alter or divert a stream bed or drainage course? ( )Yes ( )No

If yes, please describe on a separate sheet of paper.

14. Explain how the protective structure is required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion and when designed to eliminate or mitigate adverse impacts to local shoreline sand supply:

____
____
____
____

15. Explain how the protective structure will minimize risks to life and property in areas of flood hazards:

____
____
____
____

16. Explain how the proposed Shoreline Protective device will assure stability and structural integrity and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area, nor in an way substantially alter natural landforms along bluffs and cliffs:

____
____
____
____

17. Explain how the proposed Shoreline Protection structure is in conformity with the public access and public recreation policies of Chapter 3 of the Coastal Act:

____
____
____
____

18. Explain how the proposed Shoreline Protection structure's material and design are consistent with good engineering practices.

MITIGATION, MONITORING AND REPORTING PROGRAM

CITY OF DEL MAR

BEACH PRESERVATION INITIATIVE ORDINANCE

Prepared for:

City of Del Mar
1050 Camino del Mar
Del Mar, CA 92014

Prepared by:

P&D Technologies, Inc.
401 West "A" Street
Suite 2500
San Diego, CA 92101

August 1989

TABLE OF CONTENTS

I. INTRODUCTION

II. PROJECT DESCRIPTION/BACKGROUND

III. PROCEDURE FOR IMPLEMENTATION OF PROGRAM

IV. THE BPI ORDINANCE MITIGATION AND MONITORING PROGRAM

I. INTRODUCTION

On January 1, 1989, Assembly Bill 3180 (Cortese) was enacted. AB 3180 requires that public agencies "adopt a reporting and monitoring program for changes to the project which it has adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment". The purpose of the law is to establish a reporting or monitoring program to assure implementation of recommended mitigation measures.

This Mitigation Monitoring Program for the Del Mar Beach Preservation Initiative (BPI) Ordinance has been developed in compliance with AB 3180 and will assist the City of Del Mar in mitigation monitoring and reporting. It presents all mitigation required in the Final EIR and outlines the procedures which must be followed to ensure that the mitigation measures are implemented. It also ensures that documentation or reporting of compliance with the mitigation program occurs.

II. PROJECT DESCRIPTION/BACKGROUND

The City of Del Mar's BPI Ordinance establishes a Shoreline Protection Area Zone (SPA zone) seaward of a designated north/south Shoreline Protection Area line (SPA line) which is comparable to a setback line. The BPI regulates new development within the SPA zone and provides for the abatement (removal) of existing non-complying structures located within the SPA zone. The project area includes the City of Del Mar's 2.9 mile oceanfront.

The City of Del Mar prepared an Environmental Impact Report (EIR) for the project which identified potentially significant environmental impacts associated with implementation of the project. The EIR incorporated measures to reduce impacts to below a level of significance. These mitigation measures form the basis for this mitigation monitoring and reporting program.

III. PROCEDURE FOR IMPLEMENTATION OF PROGRAM

The mitigation measures presented in this program have been developed to avoid or reduce to below a level of significance the potentially significant environmental impacts associated with implementation of the BPI. Monitoring will occur at various stages during project implementation. The table presented in Section IV will form the basis for implementation of the monitoring program. Copies of the table will be kept on file at the City of Del Mar Planning Department. The table will be updated as appropriate.

IV. DEL MAR BPI ORDINANCE MITIGATION AND MONITORING PROGRAM

Mit/ Cond. No.	EIR Page Ref.	Mitigation Measure/Condition of Approval	Verification: Monitoring and Reporting Process	Time Frame	Responsible Party	VERIFICATION OF COMPLIANCE Initials	Date	Remarks
		PUBLIC ACCESS/BEACH ENCROACHMENT						
1.	P. 26	Ensure that public access is provided and maintained at the street ends.	Application Review	Project Approval	Planning Department/ Applicant			
2.	P. 26	Riprap element of structures will be covered by sand.	Plan Check	During Construction	Applicant			
		COASTAL PROCESSES						
3.	P. 54	Encourage the construction/reconstruction of walls as part of a continuous line of walls, such as on a block-by-block basis.	Application Review	Prior to Project Approval	Planning Department/ Applicant			
4.	P. 54	City to discourage offset in wall alignment.	Application Review	Prior to Project Approval	City Staff/ Council			
5.	P. 54	Provide flank protection in cases where non-continuous walls or offsets occur (including street ends).	Plan Check	Prior to Project Approval	Applicant			
6.	P. 54	City to develop a schedule with property owners for the timing and location of wall construction/ reconstruction.	Application Review	Prior to Project Approval	Planning Department			
7.	P. 55	Design protective structures to include structural features to minimize wave overtopping.	Plan Check	Prior to Project Approval	City's Department			
8.	P. 55	Use of window shutters designed for hurricane-force winds where practical.	Application Review	Prior to Project Approval	Planning Department			

IV. DEL MAR BPI ORDINANCE MITIGATION AND MONITORING PROGRAM

Mit/ Cond. No.	EIR Page Ref.	Mitigation Measure/Condition of Approval	Verification: Monitoring and Reporting Process	Time Frame	Responsible Party	VERIFICATION OF COMPLIANCE Initials	Date	Remarks
		COASTAL PROCESSES (continued)						
9.	P. 55	Provide toe protection (such as stone and filter cloth) for vertical walls when possible. If not possible, then design wall so that the majority of wave energy is deflected upward and/ or so that the wall is stable at the maximum depth of expected toe scour.	Plan Check	Prior to Project Approval	City's Coastal Engineer			
10.	P. 55	Provide toe protection for stone revetments (such as toe apron stone with filter cloth).	Plan Check	Prior to Project Approval	City's Coastal Engineer			
11.	P. 55	Conduct a geotechnical analysis of sea cliff stability on a site-by-site basis to establish the need for shore protection	During or prior to Application Review	Prior to Project Approval	Applicant/ Contracting Environmental Consultant			
12.	P. 55	Setbacks from the SPA line should be established on a site specific basis depending on the potential wave runup and overtopping effects of the proposed shore protection structure. (In no case will the setback be more than 5 feet west of the SPA line.)	Plan Check	Prior to Project Approval	Planning Staff/ City's Coastal Engineer			
		CONSTRUCTION IMPACTS						
13.	P. 61	Construction hours would be consistent with the City Noise Ordinance.	Field Inspection	During Construction	City Staff			
14.	P. 61	The beach within the construction zone would be restored at the end of each work week, and equipment would be removed from the beach at the end of each workday.	Field Inspection	During Construction	Lifeguard Department/ Planning Department			

IV. DEL MAR BPI ORDINANCE MITIGATION AND MONITORING PROGRAM

Mit/ Cond. No.	EIR Page Ref.	Mitigation Measure/Condition of Approval	Verification: Monitoring and Reporting Process	Time Frame	Responsible Party	VERIFICATION OF COMPLIANCE Initials	Date	Remarks
		CONSTRUCTION IMPACTS (continued)						
15.	P. 61	Construction would not occur west of the permitted shoreline protective devices between Memorial Day and Labor Day (except for emergencies).	Field Inspection	Ongoing	Applicant/ City			
16.	P. 61	The City will develop a schedule with private property owners for the timing of wall construction so that construction occurs on a block-by-block basis.	Application Review	Prior to Project Approval	Planning Department			
17.	P. 61	The City will ensure use of public parking areas is minimized during the construction period.	Field Inspection	During Construction	City Staff/ Lifeguard Department			

ATTACHMENT 2

Coastal and Geotechnical Engineering Report
prepared by ENGEO Incorporated (February 2025)

SEAWALL AND RIPRAP REMOVAL AND CONSTRUCTION OF NEW SEAWALL LANDWARD OF CITY OF DEL MAR SPA LINE
2936 CAMINO DEL MAR
DEL MAR, CALIFORNIA

COASTAL AND GEOTECHNICAL ENGINEERING REPORT

SUBMITTED TO
Ocean Investments, LLC
2936 Camino Del Mar
Del Mar, CA 92014

PREPARED BY
ENGEO Incorporated

February 19, 2025

PROJECT NO.
26084.000.001

ENGEO
Expect Excellence

GEOTECHNICAL
ENVIRONMENTAL
WATER RESOURCES
CONSTRUCTION SERVICES
COASTAL/MARINE GEOTECHNICS

Project No.
26084.000.001

February 19, 2025

Ocean Investments, LLC
2936 Camino Del Mar
Del Mar, CA 92014

Subject: Seawall and Riprap Removal and Construction of New Seawall
Landward of City of Del Mar SPA Line
2936 Camino Del Mar, Del Mar, California

COASTAL AND GEOTECHNICAL ENGINEERING REPORT

Dear Ocean Investments:

We prepared this Coastal and Geotechnical Engineering Report for requirements of your Coastal Development Permit application package. Our study was performed to address the coastal environment affecting your property at 2936 Camino Del Mar, including wave environment, coastal hazards, and the effects of future sea level rise within the lifetime of the project.

This report summarizes our field observations and our findings pertaining to the general coastal processes in the area. A discussion of alternatives to, and design criteria for, the seawall are also provided.

This report also addresses geotechnical considerations for new seawall design and the impact of tsunamis and considers the influence of sea level rise research summarized by the Ocean Protection Council (2024), which resulted in the California Coastal Commission's 2024 update of its 2018 Sea Level Rise Guidance document.

We appreciate the opportunity to be of service. If you have any questions or comments regarding this report, please call and we will be glad to discuss them with you.

Sincerely,

ENGEO Incorporated

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TABLE OF CONTENTS

LETTER OF TRANSMITTAL

1.0 INTRODUCTION 1

2.0 GENERAL SITE CONDITIONS 1

2.1 SITE DESCRIPTION 1
2.2 TOPOGRAPHY AND BATHYMETRY 2
2.3 GEOLOGIC SETTING 2

3.0 GEOLOGIC HAZARDS EVALUATION 2

3.1 FAULTING AND SEISMICITY 2
3.2 GROUND SURFACE RUPTURE 3
3.3 LIQUEFACTION 3
3.4 LANDSLIDES 3
3.5 TSUNAMIS 3
3.6 COASTAL HAZARDS 3

4.0 COASTAL ENVIRONMENT 4

4.1 WATER LEVELS 4
4.2 WAVE CONDITIONS 5
4.3 SHORT-TERM SEA LEVEL CHANGE 6
4.4 TIDES 6
4.5 EL NIÑO EVENTS 6
4.6 RELATIVE SEA LEVEL RISE 6

5.0 DESIGN CONSIDERATIONS 7

5.1 DESIGN MEAN SEA LEVEL RISE SCENARIO 7
5.2 DESIGN STILLWATER 9
5.3 DESIGN WAVE HEIGHT 10
5.4 WAVE RUNUP AND OVERTOPPING ANALYSIS 11
5.5 WALL DESIGN 13
5.6 CANTILEVERED VS. TIED-BACK VERTICAL SEAWALLS 13

6.0 CANTILEVERED SHEET PILE DESIGN 14

7.0 SHEET PILE INSTALLATION CHARACTERISTICS 15

8.0 ALTERNATIVES ANALYSIS 15

8.1 CANTILEVERED SHEET-PILE SEAWALL – CURRENTLY PROPOSED PROJECT 15
8.2 SECANT PILE WALL 16
8.3 ROCK RIPRAP REVETMENT 16
8.4 “SOFT” PROTECTION 16
8.5 RETREAT 16
8.6 NO PROJECT = NO MAINTENANCE 16

9.0 LIMITATIONS 17

SELECTED REFERENCES

FIGURES

APPENDIX A –CALCULATIONS

1.0 INTRODUCTION

At your request, we performed a coastal study and geotechnical evaluation of the proposed removal of the non-compliant seawall and riprap and its replacement with a City of Del Mar SPA-compliant seawall along the western side of the property located at 2936 Camino Del Mar in Del Mar, California. The primary purpose of our study is to understand the coastal environment affecting the subject beachfront property and address coastal design consideration as it relates to new seawall design and construction. In addition, we also discuss current threats and risks with existing structures, which illustrate the need for the subject improvements.

For our use, we reviewed the following reports.

1. Preliminary Geotechnical Investigation, 2936 Camino Del Mar, Del Mar, California prepared by UES dated January 29, 2025. Project No. 4830.2400025.
2. Construction Drawings for the 2936 Camino Del Mar Seawall prepared by ENGEO Incorporated dated December 23, 2024.

2.0 GENERAL SITE CONDITIONS

2.1 SITE DESCRIPTION

The project site is located at 2936 Camino Del Mar in Del Mar, California (Figure 1). The two-story residential structure is bounded by existing residential structures to the north and south, Camino Del Mar to the east, and by an existing seawall and revetment to the west.

EXHIBIT 2.1-1: 2936 Camino Del Mar (looking east from beach)

The existing seawall to the west of the site is a reinforced concrete structure (shown above in Exhibit 2.1-1), with a top-of-wall elevation of approximately Elevation 16 feet (NAVD 88). Additionally, to the west of site, an existing riprap revetment can be observed in Exhibit 2.1-1, which consists of ¼-ton to 4-ton rocks. The proposed improvements are planned to consist of demolition of the existing concrete seawall, removal of the riprap, and replacement with steel sheet piles with an architectural treatment along the exposed section. The proposed seawall is planned to have to have a top-of-wall of Elevation 17 feet (NAVD 88) and a tip of Elevation -22 feet (NAVD 88) and be located completely landward of the City SPA line.

2.2 TOPOGRAPHY AND BATHYMETRY

The project area is generally flat and contains a westerly seawall and rock revetment. Beach profile data has been surveyed for the Del Mar beach area by personnel from Scripps Institution of Oceanography since early 1974. Data collected at Range 3 (20th Street) and Range 4 (15th Street) have indicated maximum seasonal variations in beach sand elevations within the active beach area ranging from 5 to 10 feet. Our review of bathymetric charts showing the sea floor topography off the coastline in the vicinity of the site indicates a relatively uniform foreshore slope of 1 in 60, extending to several miles offshore.

2.3 GEOLOGIC SETTING

The study area is located within the low-lying lands southerly of the present mouth of the San Dieguito River. Based on our review of the Geologic Map of the San Diego 30’x60’ Quadrangle (Kennedy & Tan, 2008), we understand that the surficial geologic units underlying the site include Qop, “old paralic deposits undivided (late to middle Pleistocene)” (Figure 3). These deposits generally consist of medium dense to dense, poorly graded, fine to medium sand with occasional gravel and shell fragments. The presence of these relatively deep alluvial and nearshore sandy deposits suggests that the San Dieguito River mouth at one time discharged into the ocean across the area when sea level was lower.

The active sand beach is subject to seasonal onshore and offshore movement. In winter, heavy surf moves sand from an onshore berm and deposits it along offshore bars, resulting in lower beach elevations. Summer swell moves sand back onshore, again building up the beach. Severe storms in the late 1970s and early 1980s necessitated the placement of the existing sheet-pile wall and riprap to protect the residential structures in the area.

The study area is underlain at depth by the Eocene-age (approximately 50 million year old) Delmar Formation. This formation is exposed along the coastal bluff just north of the San Dieguito River, and likely exists below approximately Elevation -100 to -120 feet in the site vicinity.

3.0 GEOLOGIC HAZARDS EVALUATION

3.1 FAULTING AND SEISMICITY

Our review of geologic maps and literature indicates that there are no known active or potentially active faults near or projecting toward the subject property. The site is, however, located in a seismically active region of Southern California that is subject to significant hazards from moderate to large earthquakes. Ground shaking could affect the site in the event of an earthquake on any of the active fault zones located in, or offshore of, Southern California.

The nearest known active faults are within the Newport-Inglewood (offshore) fault zone located approximately 3.5 miles west of the site. Other active fault zones within about 30 miles of the site, which could generate ground shaking at the site, are the San Joaquin Hills, Oceanside, and Palos Verdes fault zones. A Fault and Seismicity Map is provided as Figure 4.

3.2 GROUND SURFACE RUPTURE

The project site area is not mapped as being located within an Alquist-Priolo fault zone. The potential for ground surface rupture at the site is considered negligible since no known faults cross the site.

3.3 LIQUEFACTION

The potential for liquefaction or seismically induced ground settlement due to an earthquake is considered moderate to high within the near-surface overburden soil above the relatively dense older Eocene-age deposits due to the grain-size characteristics of the sandy soil and the presence of near-surface groundwater at the site.

3.4 LANDSLIDES

Our review of geologic maps and literature indicates that the site is not mapped as being underlain by active or potential landslides, nor was any evidence of landsliding observed during our site observations.

3.5 TSUNAMIS

An online “Tsunami Inundation Map for Emergency Planning (Del Mar Quadrangle), San Diego County, California” was prepared jointly by the California Emergency Management Agency, California Geological Survey, and the University of Southern California (California Emergency Management Agency, 2009). The Tsunami Inundation Map and information are presented in Figure 5. The Tsunami Inundation Map indicates an inundation area throughout the low-lying areas of Del Mar and the San Dieguito River mouth. While exact inundation elevations are not available through the University of Southern California Tsunami Research Center, tsunami inundation elevations can be approximated by comparing topographic map elevations along the tsunami inundation limits. Using this method, we approximate that the estimated inundation elevation is on the order of about Elevation 11 feet (NGVD 29), inundating the site.

3.6 COASTAL HAZARDS

As discussed in Section 5.4 – Wave Runup and Overtopping Analysis, for most any storm condition, including the 1982-83 El Niño storms, significant overtopping of the seawall occurs. Moreover, with 3.1 feet of sea level rise (SLR), the maximum runup is approximately Elevation 20 feet above the top of the seawall, with the horizontal jet from overtopping waves having a velocity of over 10 feet per second, with sufficient velocity to injure people in front of the buildings and wave forces that will also damage the seaward portions of the property improvements. Any structures should be a minimum of 30 feet from overtopping waves to reduce the damaging effects of these overtopping waves.

4.0 COASTAL ENVIRONMENT

Along this portion of coastline, protection from storm surf has previously been provided mainly by the active beach, with the beach berm providing a secondary line of defense prior to storms overwashing the berm and flooding the low-lying lands adjacent to, and easterly of, Camino Del Mar. As a result of the continuing loss of beach sand (primarily due to conflicting interests allowing the construction of dams and mining of mineral aggregates on the coastal rivers), more stress has been placed on the beach berm from more frequent wave attack and from the public desiring more recreational beach area. The ultimate selection of the approved Shoreline Protection Area (SPA) line is a reaffirmation of this fact.

In evaluating the wave climate, which controls coastal erosion, considerable hindcast data is available to provide an indication of future trends and, hence, design criteria for design of coastal structures. Wave energy approaching the Southern California coastline has been relatively benign during the first 80 years of the 20th century (Seymour, et al., 1984). Extreme deep-water wave episodes exceeding 6 meters were reported on only eight occasions during the period 1900 to 1979, while the period from February 1980 through February 1984 experienced a total of ten storm events with deep-water waves exceeding 6 meters. It should be noted that the storm of January 17, 1987, produced the highest measured deep-water waves of record approaching the Southern California coast since deployment of deep-water wave gauges by Scripps Institution of Oceanography, further corroborating a more energetic wave environment.

Continued coastal erosion, in part accelerated by more energetic wave activity during the last 40 years, has subjected the site vicinity to a progressively more severe wave environment than that experienced during the preceding 50+ years, suggesting more frequent severe winters and the likelihood for more severe coastal storm damage during the design life of the proposed structure.

4.1 WATER LEVELS

Past water elevations are based on tide gauge data from La Jolla, which has been collected by the National Oceanic and Atmospheric Administration (NOAA) since 1924. These data are applicable to the San Diego County region open-ocean coastline. The tidal and geodetic reference relationships at La Jolla (the closest station with historical data) are provided below in Table 4.1-1.

TABLE 4.1-1: Tidal Datums (Station 9410230, 1983 to 2001 Tidal Epoch)

DESCRIPTION	DATUM	ELEVATION (feet MLLW)	ELEVATION (feet NGVD 29)	ELEVATION (feet NAVD 88)
Highest Observed Tide (11/25/2015)	Max Tide	7.81	5.25	7.62
Highest Astronomical Tide	HAT	7.20	4.64	7.01
Mean Higher-High Water	MHHW	5.32	2.17	5.13
Mean High Water	MHW	4.60	2.04	4.41
Mean Tide Level	MTL	2.75	0.19	2.56
Mean Sea Level	MSL	2.73	0.17	2.54
Mean Diurnal Tide Level	DTL	2.66	0.10	2.47
NGVD 29	NGVD 29	2.56	0.00	2.37
Mean Low Water	MLW	0.90	-1.66	0.71
North American Vertical Datum of 1988	NAVD 88	0.19	-2.37	0.00
Mean Lower-Low Water	MLLW	0.00	-2.56	-0.19

DESCRIPTION	DATUM	ELEVATION (feet MLLW)	ELEVATION (feet NGVD 29)	ELEVATION (feet NAVD 88)
Lowest Astronomical Tide	LAT	-2.01	-4.44	-2.20
Lowest Observed Tide (12/17/1933)	Min Tide	-2.87	-5.43	-3.06
Station Datum	STND	-4.37	-6.93	-4.56
Great Diurnal Range	GT	5.33	5.33	5.33
Mean Range of Tide	MN	3.69	3.69	3.69

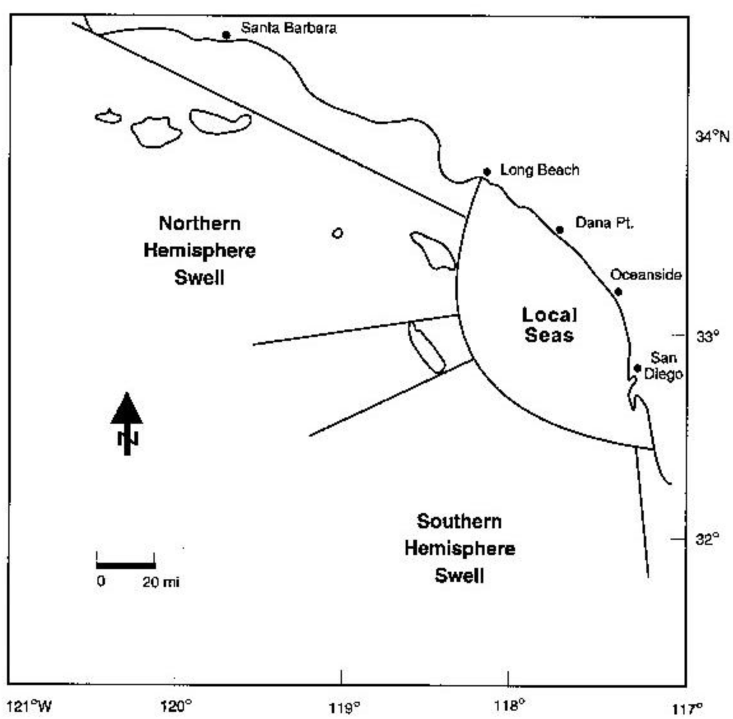
(*Source: NOAA 2023*)

Tide gauges measure total water level outside the breaker zone, which includes contributions from the tide, as well as storm surges and other factors that raise sea level over the short and long term, including the effects of El Niño.

4.2 WAVE CONDITIONS

A factor that influences coastal erosion is the wave environment. Waves provide most of the energy input that drives shoreline processes along the California coast. As illustrated in Exhibit 4.2-1, incoming waves along the Southern California coast fall into three main categories: (1) longer period northern hemisphere swell, (2) longer period southern hemisphere swell, and (3) short-period locally generated seas. Northern hemisphere swell from the North Pacific Ocean dominates the winter wave conditions off California, while southern hemisphere swell is more dominant in the summer. Short-period seas are produced by storms sweeping through the area. Offshore islands, shallow banks, submarine canyons, and the generally complex bathymetry off the Southern California coast greatly complicate the wave climate at the coast.

EXHIBIT 4.2-1: Map Showing Generalized Wave Exposure for Southern California



Coastline orientation and the islands and offshore banks greatly influence swells propagating toward shore by partially sheltering Southern California, especially from northern hemisphere swell. Exhibit 4.2-1 shows the approximate directions from which incoming swells are blocked by the islands. The coastline at the subject property faces southwest and is occasionally exposed to southern hemisphere swell. Because of the complicated effects of bathymetry and island shadowing, the wave height at the shoreline is sensitive to relatively small changes in the incoming direction of the deep ocean waves.

4.3 SHORT-TERM SEA LEVEL CHANGE

The effect of waves on the coast is highly dependent on the sea level during the wave episode. Large waves at low sea level cause limited erosion, since they break well offshore. When episodes of large waves combine with short-term high sea level from tides and other factors, rapid retreat may occur along vulnerable coastlines.

4.4 TIDES

Tides are caused by the gravitational pull of astronomical bodies, primarily the moon and sun, on the Earth. Tides along the Southern California coast have a semi-diurnal inequality. On an annual average basis, the mean high tide line is at approximately Elevation 4 feet (NAVD 88), with the highest observed tide recorded in the year 2005 during an El Niño year at an Elevation 7.62 feet (NAVD 88), which was recorded at the La Jolla station gauge.

4.5 EL NIÑO EVENTS

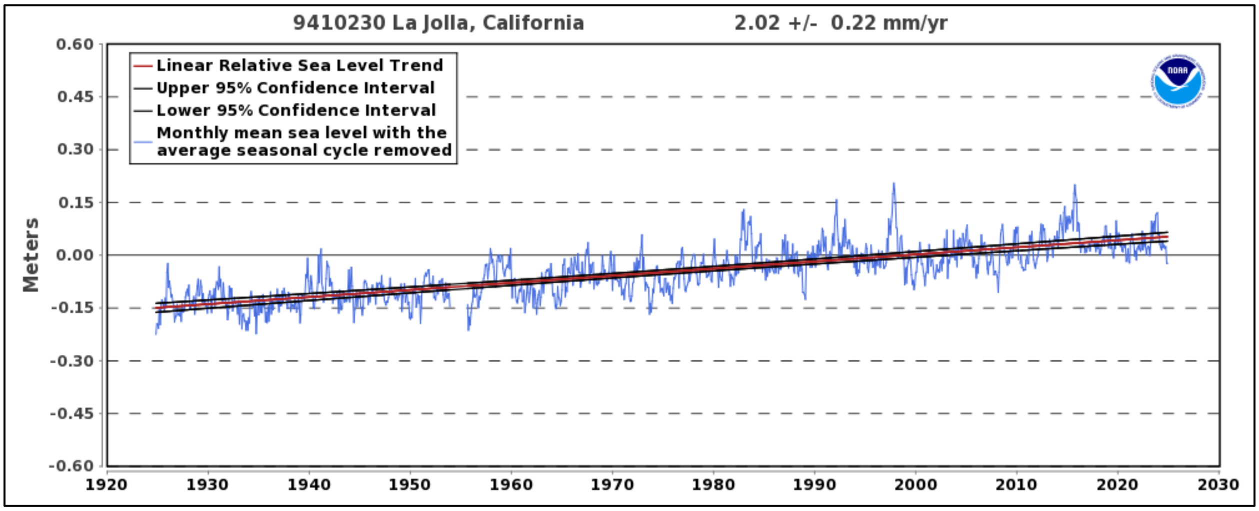
Large-scale warming periods in the Pacific Ocean occur episodically and are related to the El Niño phenomenon. These meteorological events are characterized by low atmospheric pressures and persistent onshore winds. During these events, average sea levels in Southern California can rise up to 0.5 foot above normal. Tidal data indicates that seven episodes have occurred since 1905. These events occurred in 1914, 1930 through 1931, 1941, 1957 through 1959, 1982 through 1983, 1997 through 1998, and 2015 through 2016. Mild El Niño-type conditions were also reported in 1988 and 1992. Further analysis suggests that these events have an average return period of 14 years, with 0.2-foot tidal departures lasting for 2 to 3 years. The added probability of experiencing more severe winter storms during El Niño periods increases the likelihood of coincident storm waves and higher storm surge.

4.6 RELATIVE SEA LEVEL RISE

Sea level rise (SLR) is not the same everywhere around the world. Because of local differences in tectonic uplift, subsidence caused by oil, gas, and groundwater extraction, and saltwater intrusion, the land itself is moving vertically. The difference between the local land motion and global rise of sea level gives the relative SLR that will determine the magnitude of local SLR impacts. Vertical land motion in some studies would identify this relative rate from local tide gauges.

Past and possible future changes in mean sea level (MSL) are of interest in design and planning for coastal cities, as well as for engineering activities on the coast. Exhibit 4.6-1 shows the relative sea level trend observed at the La Jolla tide gauge from 1924 to 2024. These data are routinely tabulated by the NOAA as part of their national tide gaging program (Flick *et al.*, 2003).

EXHIBIT 4.6-1: NOAA's Relative SLR Trend at La Jolla Tide Gauge



The relative sea level trend is 2.02 millimeters/year (mm/year) with a 95 percent confidence interval of +/- 0.22 mm/yr based on monthly MSL data from 1924 to 2024, which is equivalent to a change of 0.66 foot in 100 years.

5.0 DESIGN CONSIDERATIONS

5.1 DESIGN MEAN SEA LEVEL RISE SCENARIO

The California Coastal Commission recognizes the Ocean Protection Council's (OPC) State of California Sea Level Rise Guidance 2024 Update as the current best available science on SLR projections for California. The new OPC guidance details five mean sea level rise (MSLR) projections for 14 tide gauges along the California coast. The considered global MSLR scenarios include the following.

- Low (0.9 foot of MSLR by 2100)
- Intermediate-Low (1.6 feet of MSLR by 2100)
- Intermediate (3.1 feet of MSLR by 2100)
- Intermediate-High (4.8 feet of MSLR by 2100)
- High (6.6 feet of MSLR by 2100)

OPC (2024) presents results for each tide gauge location in a series of tables that specify several time sequences of global mean sea level (GMSL) from 2020 through 2150. The MSLR projections use the year 2000 as the base year, and project MSLR in specified future years relative to MSL in 2000. The OPC (2024) MSL elevation projections for La Jolla from 2020 through 2150 are provided in Table 5.1-1 below.

TABLE 5.1-1: Projected Sea Level Rise (in feet) for La Jolla

YEAR	LOW	INTERMEDIATE -LOW	INTERMEDIATE	INTERMEDIATE -HIGH	HIGH
2020	0.2	0.2	0.3	0.3	0.3
2030	0.3	0.4	0.4	0.4	0.5
2040	0.4	0.5	0.6	0.7	0.8
2050	0.5	0.7	0.8	1.0	1.3
2060	0.6	0.8	1.1	1.6	2.0
2070	0.7	1.0	1.4	2.3	3.0
2080	0.8	1.2	1.8	3.1	4.1
2090	0.9	1.4	2.4	3.9	5.3
2100	0.9	1.6	3.1	4.8	6.6
2110	1.0	1.8	3.8	5.7	7.9
2120	1.1	2.0	4.4	6.4	9.0
2130	1.2	2.2	4.9	7.1	9.9
2140	1.2	2.4	5.5	7.6	10.9
2150	1.3	2.6	6.0	8.2	11.8

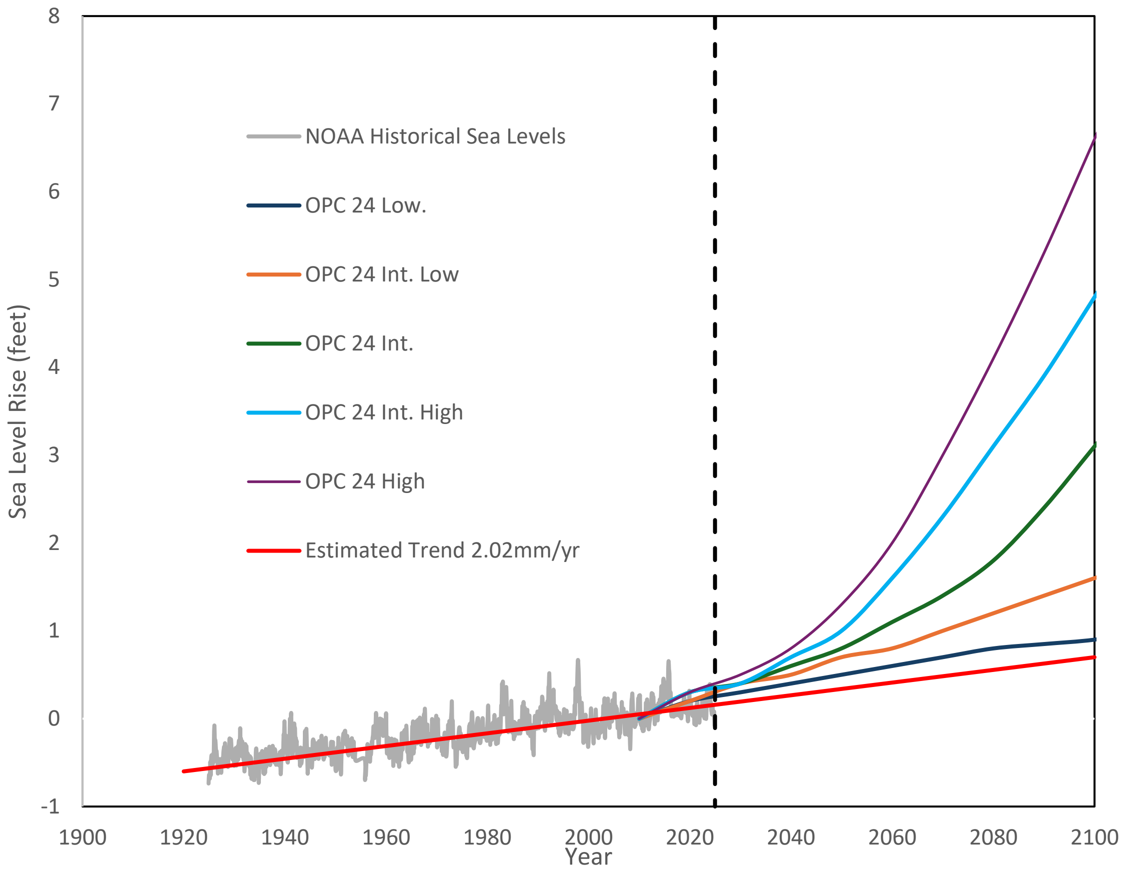
Source: Ocean Protection Council, 2024
Median values of Sea Level Scenarios, in feet, for each decade from 2020 to 2150, with a baseline of 2000. All median scenario values incorporate the local estimate of vertical land motion.

Five different global MSLR scenarios are presented for each of the 14 NOAA tide gauge locations along the California coast. These scenarios incorporate the local estimate of vertical land motion into the relative SLR projection. For this project location, the Intermediate SLR scenario projects 3.1 feet of SLR, with a 5 percent probability of exceedance by the year 2100. The Intermediate-High SLR scenario projects 4.8 feet of SLR, with a 0.1 percent probability of exceedance by the year 2100. Accordingly, we have included the 1982-83 El Niño storm season, which is considered to be the 100-year design level event without SLR, along with these two SLR scenarios in our evaluation to define the design wave environment.

In addition to the Ocean Protection Council's (OPC) 2024 guidance document, the California Coastal Commission (CCC) updated its Sea Level Policy Guidance document with a Science Update dated November 13, 2024. This 2024 document updates the CCC's 2018 document with additional findings, conclusions, and recommendations, and incorporates much of the 2024 OPC State of California Sea Level Rise 2024 Update.

To provide additional perspective for the design MSLR scenario, we have reproduced as Exhibit 5.1-1, the CCC's five suggested scenarios through the year 2100 from the CCC's 2024 Sea Level Rise Policy Guidance Document, ranging from the lowest at 0.9 foot, to the highest at 6.6 feet. On Exhibit 5.1-1, we have also plotted NOAA's 100-year record of SLR for La Jolla (Exhibit 4.6-1) at the relatively uniform rate of 2.02 mm/year, which from 2000 through 2024 has resulted in 4.8 centimeters (cm) of SLR in the past 24 years, which is relatively similar to the CCC's 2024 lowest MSLR scenario.

EXHIBIT 5.1-1: Modified California Coastal Commission Sea Level Rise Policy Guidance Document, Adopted November 13, 2024



The real significance of the various MSLR scenarios is the design breaking wave height and the overtopping and damage to the existing structure. We have analyzed the 1982-83 El Niño storms considered to be the 100-year design event without SLR, along with the 3.1 and 4.8-foot SLR scenarios recommended by the OPC and have included these in our wave height and wave runup and overtopping calculations.

5.2 DESIGN STILLWATER

The maximum design stillwater level (SWL) is critical to any wave analyses, as it determines the wave energy that can be propagated into the shoreline, eventually impacting and overtopping structures. It is the deep-water wave height superimposed upon the extreme SWL that defines the joint probability of the design storm condition, creating the largest wave forces on structures, along with the maximum runup and overtopping volume. In addition to tidal fluctuation, water levels at the shoreline are influenced by storm surge, wave setup, and surf beat. These influences, combined with the astronomical high tide, allow offshore storm waves to run up the elevated back beach and impact coastal structures. For the Del Mar area, excluding SLR, the likely maximum 100-year design SWL would be on the order of 7.62 feet (NAVD 88), not including wave runup. To account for SLR, we have used the criteria provided in Table 5.1-1, evaluating two different SLR scenarios of 3.1 and 4.8 feet by the year 2100. We have also evaluated the 100-year design storm in the absence of SLR, assumed to be the 1982-83 El Niño storm season.

5.3 DESIGN WAVE HEIGHT

Selection of a design wave requires consideration of such factors as the maximum anticipated deep-water wave height and the wave period that can be expected to occur over the life of the structure. As large deep-water waves approach a coastline, friction on the rising sea floor eventually causes the wave to collapse or break. This wave-breaking depth is equal to about 1.3 times the wave height. During periods of extreme high tides, and in the absence of the protective back beach, small swells (possibly 3 to 5 feet in height) may actually maintain most of their wave energy and break directly on the coast. During periods of heavy storms, deep-water waves, tens of feet high, break quite a distance offshore, reform as small waves, and eventually impart a portion of their original wave energy onto the coastal bluff.

Wave conditions at the site depend critically on the water level and corresponding beach elevation at the base of the bluff. Consequently, a design SWL or a range of SWLs must be established in determining wave forces on coastal bluffs.

The foreshore slope also affects the height of a particular design wave approaching the coast. For a given beach, a steeper foreshore slope allows a larger wave to break closer to shore.

We used a contemporary design SWL of 7.62 feet (NAVD 88) determined from Table 4.1-1 above), which is the highest observed tide reported. We then added 2.02 mm/year from 2001 through 2025 to account for the contemporary rate of SLR from the year 2001 (the latest NOAA tidal epoch). This results in an additional design water level of 0.16 feet for a design stillwater of Elevation 7.78 feet (NAVD 88).

Our evaluation of the maximum design wave for the seawall is based on criteria set forth in the U.S. Army Corps of Engineers Shore Protection Manual (1984 Edition). For purposes of computing the maximum wave height, we have also considered a design scour elevation in front of the structure of +2.37 and -1.63 feet (NAVD 88) (0 feet and -4 feet NAVD 29), which is discussed in further detail in Section 5.4, and a foreshore slope of 1 to 60. The three design SWLs were selected as described below.

- Case 1 represents the 100-year storm event with an estimated design SWL of 8.28 feet with a design scour of Elevation 2.37 feet (NAVD 88).
- Case 2 represents the Intermediate SLR scenario, which has an expected exceedance probability of 5 percent and a design SWL of 11.38 feet in the year 2100. In addition, this case assumes a design scour of Elevation 2.37 feet (NAVD 88).
- Case 3 represents the Intermediate-High SLR scenario, which has an expected exceedance probability of 0.1 percent and a design SWL of 13.08 feet in the year 2100. In addition, this case assumes a design scour of Elevation 2.37 feet (NAVD 88).

Additionally, Cases 4 to 6 are the same conditions as noted in Cases 1 to 3, with the exception of a higher design scour of Elevation -1.63 feet (NAVD 88). All of the above cases also assume an El Niño temporary SLR of 0.5 foot.

The maximum wave height (tabulated below) that can reach the structure occurs during the period when the maximum depth of standing water exists in front of the structure, which includes both the maximum SWL combined with the maximum scour at the base of the structure. The maximum water depths at the base of the structure, d_s, for the three design scenarios considered are tabulated below. We have also assumed a wave period of 18 seconds. The resultant maximum breaking wave height occurs when a specific deep-water wave is allowed to shoal and break directly upon the structure. Using the design criteria set forth in the Army Corps of Engineers Shore Protection Manual, the design breaking wave height, H_b, is slightly less than d_s, also tabulated below.

TABLE 5.3-1: Design SLR and SWL for Wave Height Analysis

DESIGN LOADING CONDITION	ASSUMED MSLR (feet)	EL NIÑO TEMPORARY SLR (feet)	DESIGN SWL (feet, NAVD 88)	DESIGN SCOUR ELEVATION (feet, NAVD88)	ds (feet)	Hb, ft
Case 1	0	0.5	8.28	2.37	7.32	7.0
Case 2	3.1	0.5	11.38	2.37	10.88	10.3
Case 3	4.8	0.5	13.08	2.37	12.79	12.0
Case 4	0	0.5	8.28	-1.63	11.90	11.3
Case 5	3.1	0.5	11.38	-1.63	15.40	14.5
Case 6	4.8	0.5	13.08	-1.63	17.30	16.3

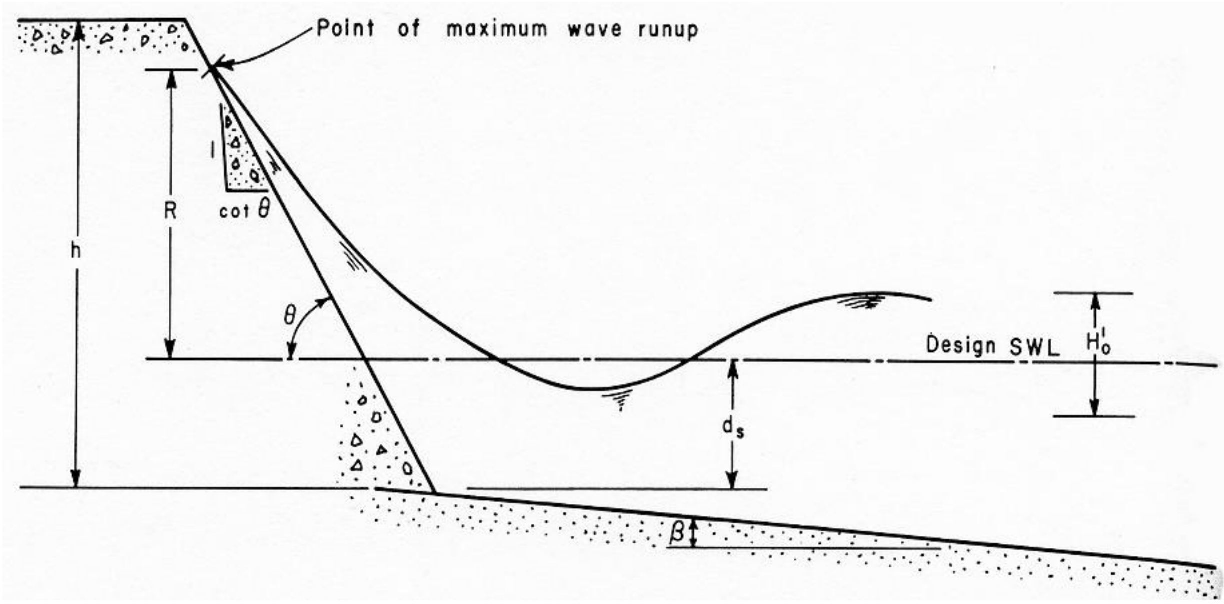
5.4 WAVE RUNUP AND OVERTOPPING ANALYSIS

Wave runup is defined as the rush of water up a beach or coastal structure that is caused by, or associated with, breaking waves. The maximum runup is the highest vertical elevation that the runup will reach above the SWL. If the maximum runup is higher than the top of a coastal structure, the excess represents overtopping. Runup elevation depends on the incident wave characteristics, the beach profile, including profile elevation, and other factors. Most wave runup and overtopping analyses are based upon equations and nomographs provided in the U.S. Army Corps of Engineers Shore Protection Manual (SPM, USACE, 1984), the Internet-based Coastal Engineering Manual (Part VI-Chapter 5, 2022), and the more recent Handbook of Coastal and Ocean Engineering by Kim (2010).

Previous studies of the coastal processes in the site vicinity is provided in the July 22, 1983, "Preliminary Engineering Study, Beach and River Protective Devices, for the City of Del Mar," report prepared by R.M. Noble and Associates. From their study, a design scour of Elevation -4 feet (NGVD 29) (-1.63 feet NAVD 88) was considered.

The following definition sketch for both wave runup and overtopping, reproduced from the 1984 SPM, graphically illustrates the point of maximum wave runup for a particular design condition.

EXHIBIT 5.4-1: Definition Sketch: Wave Runup and Overtopping



It should also be clear from the sketch that any wave runup exceeding the height of the structure then represents overtopping.

We evaluated both the maximum height of runup and volume of overtopping based on the 2010 Handbook of Coastal and Ocean Engineering (Kim, 2010) for the six design scenarios assumed above. We also assumed a wave period of 18 seconds assuming storms out of the west, which results in the maximum design wave runup elevations and calculated overtopping volumes, as tabulated below. Summary calculations are also provided in Appendix A.

TABLE 5.4-1: Design Wave Runup Results

DESIGN CONDITION	ASSUMED SLR in 2100 (feet)	DESIGN SWL (feet, NAVD 88)	ds (feet)	WAVE RUNUP HEIGHT (feet)	MAXIMUM DESIGN WAVE RUNUP ELEVATION (feet)	OVERTOPPING VOLUME (liters/second per m)
Case 1	0	8.28	7.32	11.3	21.0	16
Case 2	3.1	11.38	10.88	16.8	30.0	588
Case 3	4.8	13.08	12.79	19.5	34.7	1844
Case 4	0	8.28	11.90	18.4	28.6	244
Case 5	3.1	11.38	15.40	23.5	37.3	1795
Case 6	4.8	13.08	17.30	26.4	42.1	3960

In selecting both the design wave height and the anticipated design wave runup and overtopping, the controlling criteria is the design maximum SWL combined with scoured Elevation 0 feet or -4 feet (NGVD 29) (2.37 feet to -1.63 feet NAVD88). Ultimately, the design SLR sets the design criteria, with OPC 2024, and hence the CCC, recommending that all designs consider the intermediate risk aversion scenario of 3.1 feet of SLR by the year 2100 with a corresponding probability of exceedance of 5 percent.

5.5 WALL DESIGN

The existing seawall has a crown elevation around Elevation 16 feet (NAVD 88). All cases have a maximum design wave runup elevation in excess of the top of the existing seawall, resulting in overtopping for all cases. Even in the absence of any SLR, severe storms may result in scour of the soil supporting the wall foundation to an approximately Elevation -1.63 feet (NAVD 88), which corresponds to a previously established scour elevation as discussed above. Based on the likely overtopping from the above scenarios, the owner should expect future wave runup hazards with the planned top of wall of Elevation 17 feet (NAVD 88).

5.6 CANTILEVERED VS. TIED-BACK VERTICAL SEAWALLS

As indicated in the 1983 Noble report, a vertical seawall is generally the configuration of coastal protection preferred by most regulatory agencies. Additionally, a vertical seawall is usually less disruptive and occupies only a fraction of the space taken up by a stone revetment. Vertical seawalls incorporating a properly designed wave deflector substantially reduce the wave runup and overtopping more typically encountered with stone revetments.

Vertical seawalls may be designed as either cantilevered or tied-back structures. Wall loads increase roughly with the square of the unsupported height, and cantilevered walls are typically limited to unsupported wall heights on the order of 15 feet.

Vertical sheet-pile walls are loaded by the active earth pressure (including any surcharge loads) behind the wall. Resistance to overturning is developed through deflection in the wall, which mobilizes the reaction of the soil into which the wall is embedded. The resisting pressure applied by the soil to a sheet-pile wall depends upon the relative stiffness of the pile and soil, as well as the depth of embedment.

If sufficient embedment is not available, overturning forces must then be resisted by a tied-back system utilizing tie rods attached to concrete anchors some distance behind the wall. Schematic designs were provided for both cantilevered and tied-back vertical seawalls in the 1983 Noble report. Both options were provided in the report because relatively dense formational deposits exist at shallow depths along portions of the Del Mar coastline, eliminating the use of cantilevered walls in these areas. Cantilevered vertical walls are usually less expensive than tied-back walls, are easier to construct, and are generally less susceptible to a potential failure. One disadvantage, however, is the post-construction deflections that occur after the beach has been scoured down to the design scour level, allowing the wall to rotate outward; a necessary requisite to mobilize the strength of the soil fronting the wall.

Actual wall deflection is a function of the active earth pressure loading the wall, and is very sensitive to the differential water level on both sides of the wall. An important consideration then becomes the effect of severe wave overtopping during a major storm that may tend to saturate the wall backfill, with a worst-case condition being total hydrostatic pressures developing within the backfill behind the wall. In considering this worst-case design scenario, one must address the water surface elevation in front of the wall, and ultimately the differential in water surface elevations in front of and behind the wall. The most severe wave overtopping will occur during the highest tides, thereby reducing the differential water level on both sides of the wall. The worst-case design scenario would be to assume full hydrostatic conditions behind the wall and a water surface of Elevation -1.63 feet (NAVD 88) in front of the wall (equal to the design scour depth). This worst-case condition is highly unlikely, however, in view of the fact that severe wave overtopping can only occur during tidal highs when significant storm waves can actually reach and break upon the structure.

Considering the type of seawalls used both north and south of the subject property, in addition to the advantages mentioned above, it is our opinion that a cantilevered vertical sheet-pile wall is still the most desirable type of seawall for the subject site.

6.0 CANTILEVERED SHEET PILE DESIGN

Vertical seawalls are loaded by the active earth pressure (including any surcharge loads) behind the wall. Resistance to overturning of cantilevered vertical seawalls is developed through deflection in the seawall, which mobilizes the reaction of the soil into which the sheet-pile wall is embedded. The resisting pressure applied by the soil to a pile depends upon the relative stiffness of the pile and soil, as well as depth of embedment.

Failure of a laterally loaded pile takes place either when the maximum bending moment in the loaded pile reaches the ultimate or yield resistance of the pile section, or when the lateral earth pressures reach the ultimate lateral resistance of the soil along the total length of the pile. For purposes of definition, failure of piles with relatively “short embedment” takes place when the pile rotates as a unit with respect to a point located close to its toe. Failures of piles with relatively “long embedment” occur when the maximum bending moment applied to the pile exceeds the yield resistance of the pile section and a plastic hinge forms at the section of maximum bending moment. Investigators have suggested that piles be grouped relative to their dimensionless depth of embedment, L/T, where:

L = embedment length of the pile in feet, and

$$T = \left(\frac{EI}{f}\right)^{\frac{1}{5}} \text{ (divided by 12 to convert inches to feet)}$$

The quantity EI is the stiffness of the pile section, and f (coefficient of variation of soil modulus) for the on-site soil would be on the order of 8 pounds per cubic inch (pci). The actual modulus value is approximately 32 pci (however, this value must be reduced by a factor of 4 to account for the case of full bridging of isolated piles resulting from the continuous wall). Short piles are generally defined as L/T being less than 2.0, and long piles are generally defined as L/T being larger than 4.0. Thus, minimum pile embedment was selected based on an L/T equal to 4.0 to develop the full moment capacity and minimum deflection of the pile.

Design loading conditions were based on active earth pressures and a combination of hydrostatic pressures evaluating three separate loading conditions. The beach sand fronting the wall appear to have an average relative density of approximately 75 percent, and a porosity on the order of 40 percent. Thus, active wall pressures for an unsaturated backfill, assuming all pore space is essentially filled with water but not saturated (a condition that may exist after considerable wave overtopping), would be approximately 37 pounds per cubic foot (pcf). Active wall pressures for buoyant soil would be approximately 18 pcf, and active wall pressures for a saturated backfill subjected to full hydrostatic conditions would be approximately 82 pcf (64 pcf [weight of sea water] + 18 pcf).

In order to determine the structural requirements for the proposed sheet-pile wall, we have evaluated the soil-induced moment, shear, and deflection of a vertical wall using the elastic theory approach developed by Matlock and Reese (1962). Calculations are also provided in Appendix A.

We have selected a PZ-35 Grade 50 steel sheet pile having a minimum yield stress of 50,000 psi. A corresponding minimum required tip elevation for the PZ-35 would be Elevation -22 feet (NAVD 88).

It should be noted, post-storm wall deflections can be fairly significant, resulting in ground surface settlements immediately behind the wall approaching that of the horizontal wall deflection. If it is desired to minimize future post-storm wall deflections, the steel sheet-pile wall can be pre-loaded or pre-deflected by excavating down as deep as practical in front of the wall, allowing the wall to deflect and the soil behind the wall to settle into the deflected wall shape.

7.0 SHEET PILE INSTALLATION CHARACTERISTICS

Sheet piles are generally installed through the use of an impact hammer, by vibratory techniques, or by hydraulically jetting piles down to design tip elevation (jetting of piles still requires dynamic driving for the last several feet to redensify soil loosened by the jetting process). Displacement piles, as proposed in the 1983 Noble report, will likely be difficult to drive to the depths indicated in that report, or as recommended herein. Hydraulic jetting requires a water source and may result in some lost ground, which may adversely affect the adjacent improvements to the east. Vibratory techniques are most effective when using a non-displacement pile, such as a steel sheet pile. Steel sheet piles are economical and facilitate installation, minimizing disruptive construction activities on the beach.

It should be noted that any of the installation techniques described above will meet refusal on any existing riprap left in place. The contractor should be aware of the presence of existing riprap extending to an undetermined depth along the sheet pile alignment, which will require removal prior to sheet pile installation.

Regardless of installation technique, some vibration-induced damage may occur in nearby structures. It is important to realize that installation of a conventional sheet-pile wall in close proximity to existing structures will likely cause damage, with the intensity of damage becoming progressively more severe with proximity to the structure. When utilizing the United States Bureau of Mines Damage Criteria, and anticipated human response criteria as presented by John Wiss (1981), it is reasonable to conclude that the installation of conventional sheet-pile walls will cause damage to structures within 12 feet of the alignment and; for structures within 4 feet of the alignment, severe damage should be anticipated.

8.0 ALTERNATIVES ANALYSIS

An analysis of alternatives to the currently proposed project was completed. The proposed project consists of the construction of a new cantilevered sheet-pile wall to perform as a coastal protection structure. The following alternatives were considered.

8.1 CANTILEVERED SHEET-PILE SEAWALL – CURRENTLY PROPOSED PROJECT

A new sheet-pile wall would consist of vibratory-installed steel sheet piles with a concrete cap. To comply with City guidelines, the front face of the seawall provides a visual marker to indicate fairly significant beach erosion and for visual consistency. This compliant seawall would have a top-of-wall of Elevation 17.0 feet, with the seaward edge of the proposed concrete cap located behind the City's SPA line. As part of this project, the existing seawall and all riprap rock fronting the current seawall would be removed. The new seawall would be entirely landward of the City's SPA line.

8.2 SECANT PILE WALL

A secant pile wall is formed by constructing overlapping concrete piles. A benefit of the secant pile wall is that the concrete wall is more resistant to corrosion and can be placed along most any alignment, and thus easily constructed behind the SPA line. This alternative would have no impact on the amount of usable beach, similar to the cantilevered sheet-pile wall alternative.

8.3 ROCK RIPRAP REVETMENT

As with seawalls, rock riprap is a conventional structural measure for mitigating marine erosion. Although arguably having some value as an alternative for stabilization, it has a variety of negative environmental impacts, including visual aesthetics and encroachment into the active beach face. Additionally, this alternative, as with the existing conditions, would extend the revetment beyond the SPA line, requiring the property owners to obtain a Coastal Development Permit from the California Coastal Commission, and incur the additional expense of a significant mitigation fee.

8.4 "SOFT" PROTECTION

"Soft" protection might include sand replenishment, dune creation, and native plantings on the beach in front of the westerly facing beach property. These alternatives would provide habitat to wildlife, would add sand to the beach, and would appear more natural. "Soft" protection alternatives were rejected for multiple reasons. The property owners own only the narrow strip of land where the seawall exists. This strip would not provide enough area to implement any "soft" form of protection. Such projects would have to be implemented on a broader community-wide basis for the beach in front of the properties. "Soft" protection would require large amounts of manpower, large volumes of sand, and continuous monitoring and maintenance, making it an extremely burdensome undertaking for a private entity. Note that SANDAG performs irregular sand replenishment projects on this beach, which we understand the property owners fully support, but these sand replenishment projects do not eliminate the need for shore protection in the event of an extreme high tide or storm surge. Dunes and vegetation did not exist naturally on this beach before development, suggesting that they might be difficult to establish and maintain artificially. Furthermore, dunes and vegetation would negatively impact the recreational value of the heavily used beach. More importantly, "soft" protection strategies are not likely to provide sufficient protection against flooding of the existing structure at 2936 Camino Del Mar.

8.5 RETREAT

A retreat alternative would mean removing the existing house and relocating it inland some undetermined distance. A retreat option is not feasible because sufficient area is not available on the property to relocate the structure and, in any event, because the entire project site is at a low elevation, merely relocating the protective structure would not eliminate the threat of inundation to the entire area, public streets, surrounding homes, and adjacent properties.

8.6 NO PROJECT = NO MAINTENANCE

Although this alternative may be considered, it is our opinion that it is not an acceptable option. Failure of the existing seawall, partially or in its entirety, would not only expose the existing residential structure to inundation and damage from marine flooding, but the failure would also present an unacceptable public health and safety hazard to both the beach-going public and the low elevation properties east of Camino Del Mar, all of which would experience flooding as occurred during the 1983 storms. Additionally, retaining the existing non-compliant seawall and riprap seaward of the SPA line would not advance the goals and objectives of the SPA to remove encroachments and enhance public access to and along the shoreline and beach.

9.0 LIMITATIONS

Coastal engineering and the earth sciences are characterized by uncertainty. Professional judgments represented herein are based partly on our evaluation of the technical information gathered, partly on our understanding of the proposed construction, and partly on our general experience. Our engineering work and judgments rendered meet the current professional standards and there is no warranty, express or implied. There are risks of earth movement and property damage inherent in buildings on or with earth materials. We are unable to eliminate all risks; therefore, we are unable to guarantee or warrant the results of our services.

This report is based upon field and other conditions discovered at the time of report preparation. We developed this report with limited subsurface exploration data. We assumed that the subsurface exploration data are representative of the actual subsurface conditions in the vicinity of the project location. If unexpected conditions are encountered, ENGEO must be notified immediately to review these conditions and provide additional and/or modified recommendations, as necessary.

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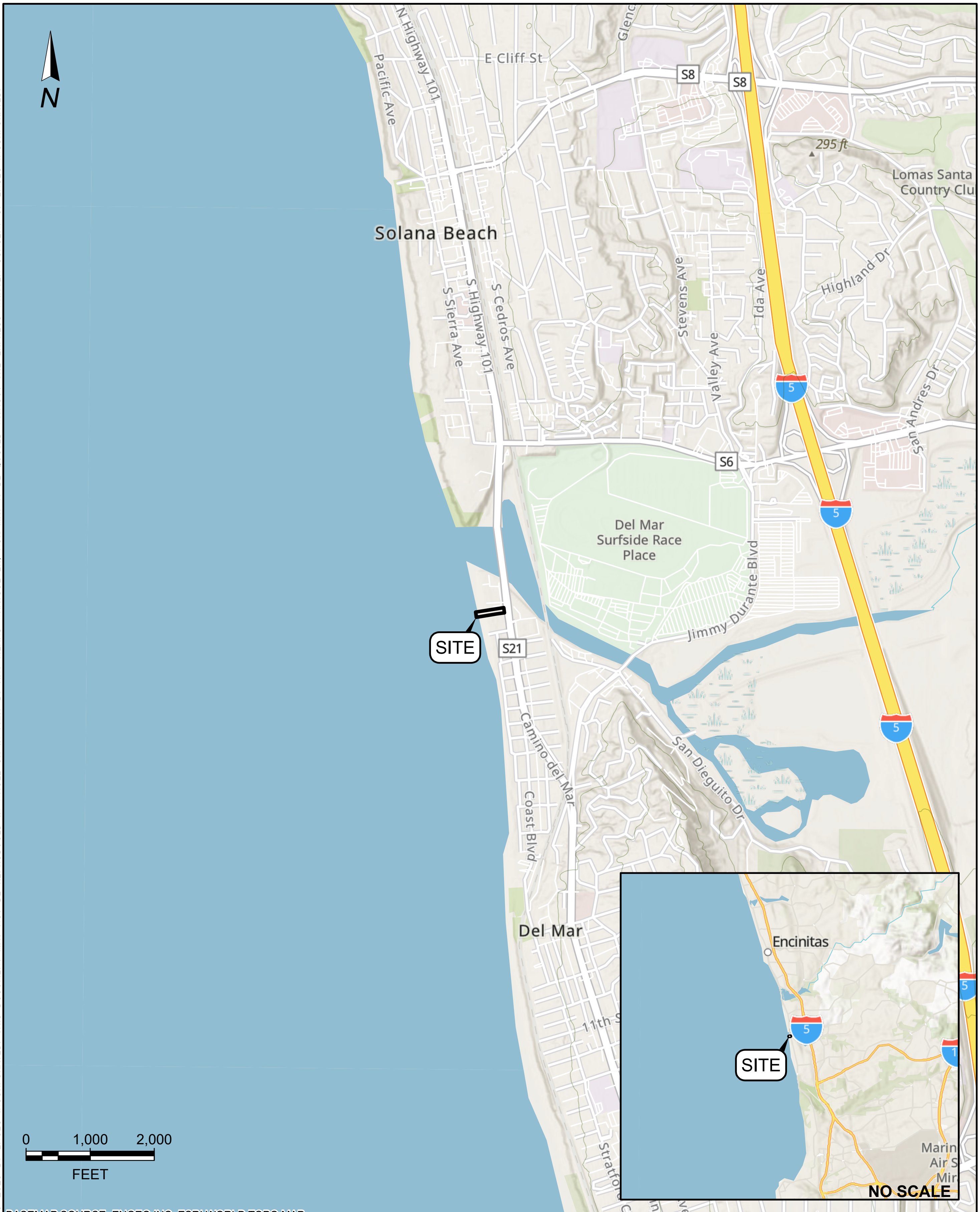
FIGURES

FIGURE 1: Vicinity Map
FIGURE 2: Site Plan
FIGURE 3: Geologic Map
FIGURE 4: Fault and Seismicity Map
FIGURE 5: Tsunami Inundation Map



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VICINITY MAP
2936 CAMINO DEL MAR
DEL MAR, CALIFORNIA

PROJECT NO. : 26084.000.001		FIGURE NO. 1
SCALE: AS SHOWN		
DRAWN BY: NWC	CHECKED BY: TJS	

ORIGINAL FIGURE PRINTED IN COLOR

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LAYOUT: 01. VICINITY 8.5 X 11 PORTRAIT USER: NCLOUGH

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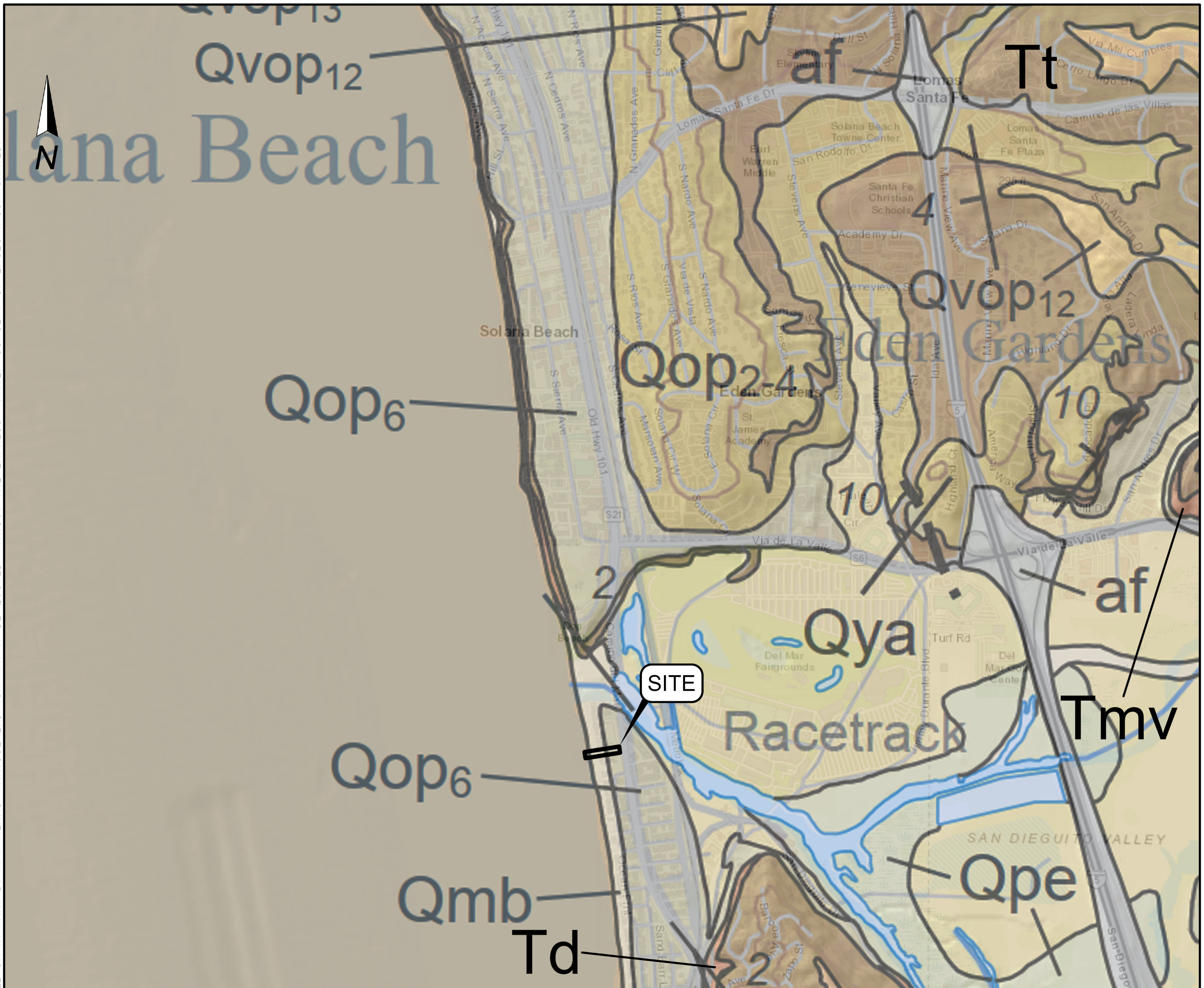
GOOGLE EARTH SITE PHOTO
2936 CAMINO DEL MAR
DEL MAR, CALIFORNIA

PROJECT NO.: 26084.000.001	FIGURE NO. 2
SCALE: AS SHOWN	
DRAWN BY: RF	CHECKED BY: TS

ORIGINAL FIGURE PRINTED IN COLOR



EXPLANATION

af	Artificial Fill (Late Holocene)
Qmb	Marine Beach Deposits (Late Holocene)
Qpe	Paralic Estuarine Deposits (Late Holocene)
Qya	Young Alluvial Flood-Plain Deposits (Holocene and Late Pleistocene)
Qop_6	Old Paralic Deposits, Undivided, Unit 6 (Late to Middle Pleistocene)
Qop_{2-4}	Old Paralic Deposits, Undivided, Units 2-4(Late to Middle Pleistocene)
$Qvop_{12}$	Very Old Paralic Deposits, Undivided, Unit 12 (Middle to Early Pleistocene)
$Qvop_{10}$	Very Old Paralic Deposits, Undivided, Unit 10 (Middle to Early Pleistocene)
Tmv	Mission Valley Formation (Middle Eocene)
Tt	Torrey Sandstone (Middle Eocene)
Td	Delmar formation (Middle Eocene)

Contact - Contact Between Geologic Units; Dotted Where Concealed

Fault - Solid Where Accurately Located; Dashed Where Approximately Located; Dotted Where Concealed

70 Strike and Dip of Beds - Inclined

0 1,000 2,000
FEET

BASEMAP SOURCE: ESRI TOPO MAP; AND, KENNEDY AND TAN, 2008

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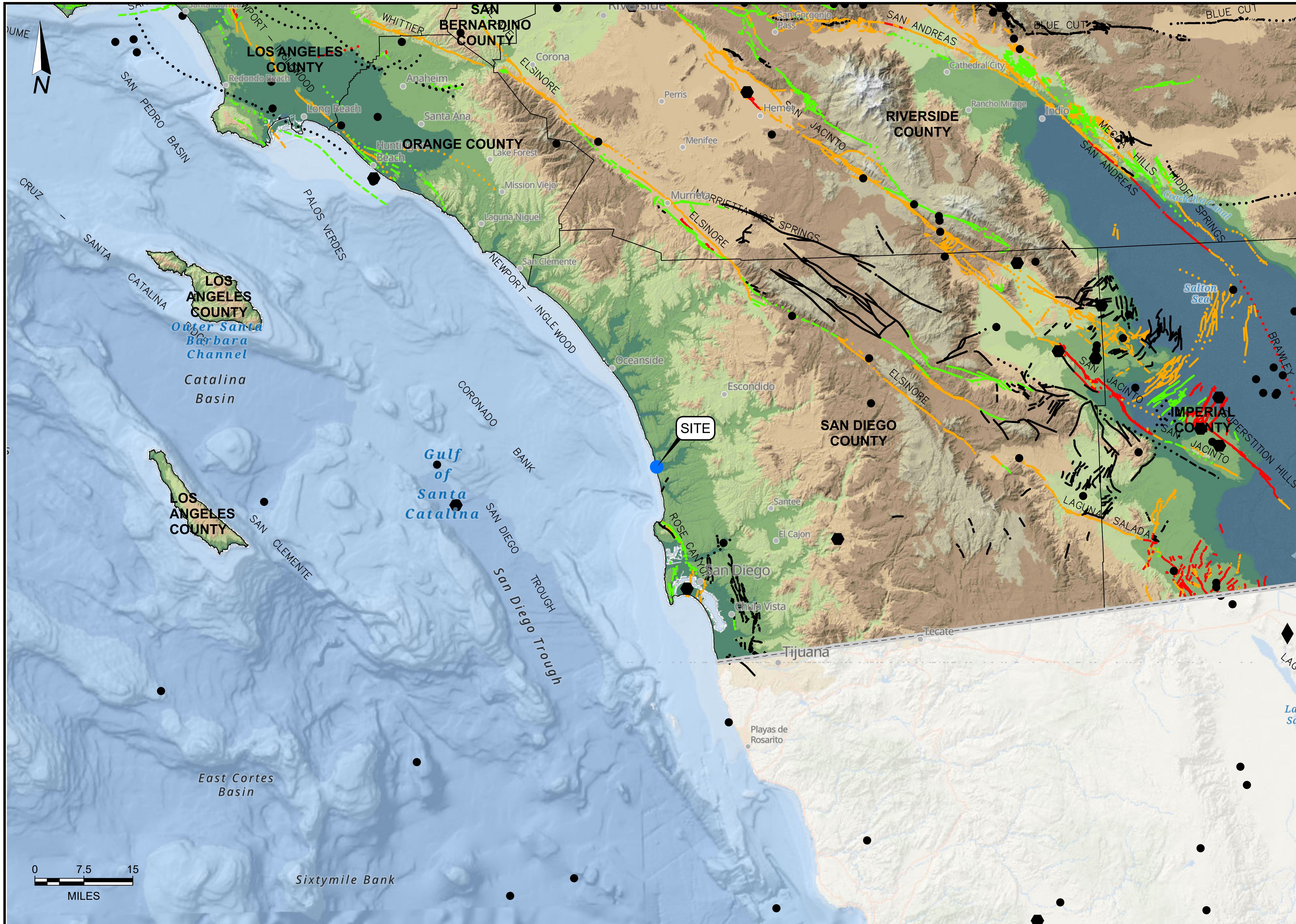
GEOLOGIC MAP
2936 CAMINO DEL MAR
DEL MAR, CALIFORNIA

PROJECT NO.: 26084.000.001
SCALE: AS SHOWN
DRAWN BY: NWC
CHECKED BY: TJS
FIGURE NO. 3



EXPLANATION

HISTORIC EARTHQUAKE EPICENTERS

- Magnitude 5-6
- Magnitude 6-7
- Magnitude 7+
- Historic Blind Thrust Fault Zone

QUATERNARY FAULTS 2020

Based on time of most recent surface deformation

- Historical (<150 Years), Well Constrained Location
- Historical (<150 Years), Moderately Constrained Location
- Historical (<150 Years), Inferred Location
- Latest Quaternary (<15,000 Years), Well Constrained Location
- Latest Quaternary (<15,000 Years), Moderately Constrained Location
- Latest Quaternary (<15,000 Years), Inferred Location
- Late Quaternary (<130,000 Years), Well Constrained Location
- Late Quaternary (<130,000 Years), Moderately Constrained Location
- Late Quaternary (<130,000 Years), Inferred Location
- Middle And Late Quaternary (<750,000 Years), Well Constrained Location
- Middle And Late Quaternary (<750,000 Years), Moderately Constrained Location
- Middle And Late Quaternary (<750,000 Years), Inferred Location
- Undifferentiated Quaternary(<1.6 Million Years), Well Constrained Location
- Undifferentiated Quaternary(<1.6 Million Years), Moderately Constrained Location
- Undifferentiated Quaternary(<1.6 Million Years), Inferred Location
- Class B (Various Age), Well Constrained Location
- Class B (Various Age), Moderately Constrained Location
- Class B (Various Age), Inferred Location

BASE MAP SOURCE: SANGIS, CALIFORNIA STATE PARKS, ESRI, TOMTOM, GARMIN, SAFEGRAPH, FAO, METI/NASA, USGS, BUREAU OF LAND MANAGEMENT, EPA, NPS, USFWS, ESRI, GEBCO, GARMIN, NATURALVUE
COLOR HILLSHADE IMAGE BASED ON THE NATIONAL ELEVATION DATA SET (NED) AT 30 METER RESOLUTION
U.S.G.S. QUATERNARY FAULT DATABASE, 2020
C.G.S. HISTORIC EARTHQUAKE DATABASE

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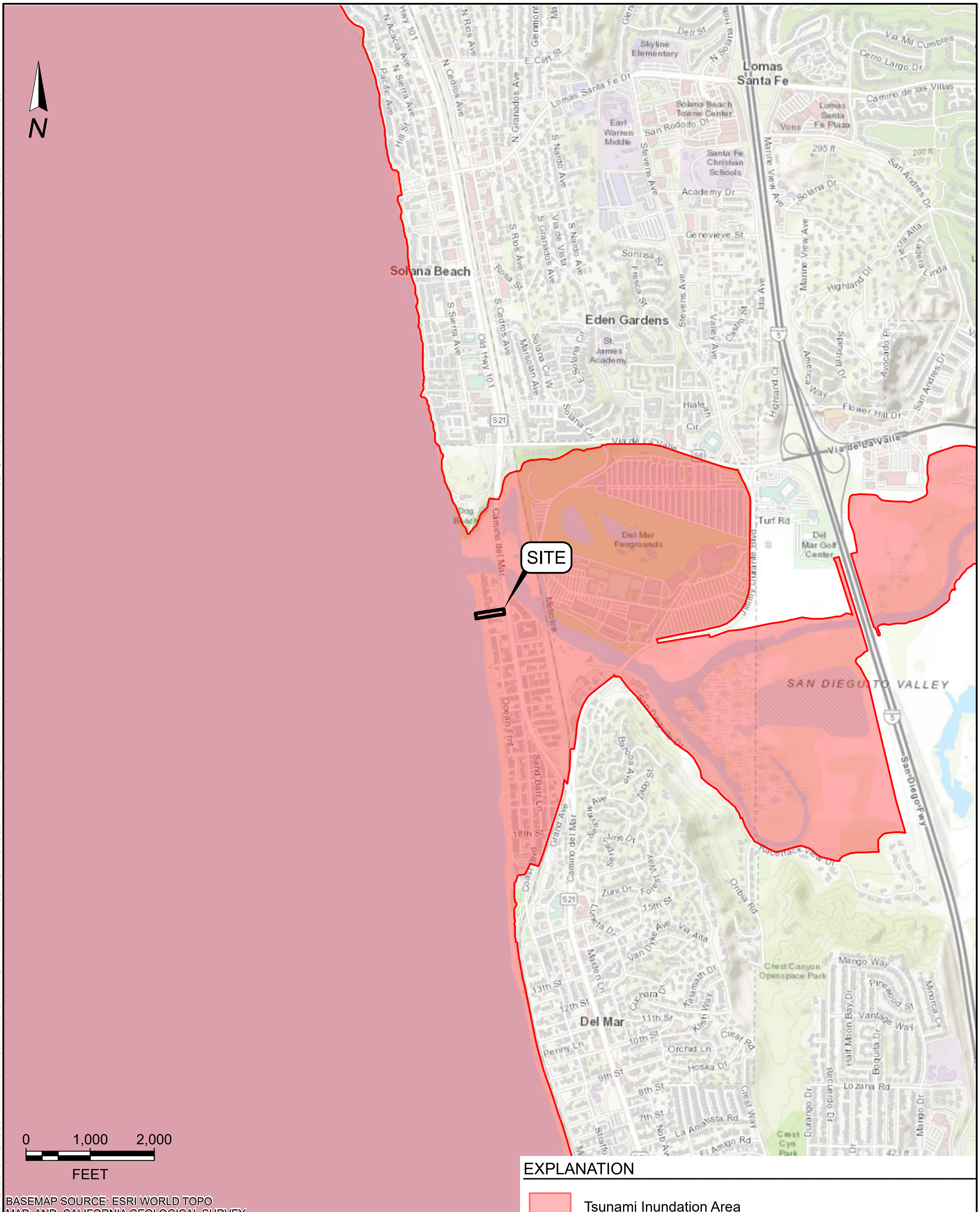
FAULT AND SEISMICITY MAP
2936 CAMINO DEL MAR
DEL MAR, CALIFORNIA

PROJECT NO.:	26084.000.001
SCALE:	AS SHOWN
DRAWN BY: NWC	CHECKED BY: TJS
FIGURE NO.	4



EXPLANATION

Tsunami Inundation Area

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TSUNAMI INUNDATION MAP

2936 CAMINO DEL MAR

DEL MAR, CALIFORNIA

PROJECT NO. :	26084.000.001
SCALE:	AS SHOWN
DRAWN BY: NWC	CHECKED BY: TJS
FIGURE NO.	5

PATH: G:\DRAFTING\PROJECTS_26000 TO 27999\26084\26084000001\GEX\26084000001 – GEX.APRX
LAYOUT: 05. TSUNAMI INUNDATION MAP USER: NCLOUGH

ORIGINAL FIGURE PRINTED IN COLOR

APPENDIX A

CALCULATIONS

								Runup and Overtopping Analysis based on Kim (2010)									
Condition	**Crest Elev. ft (NAVD88)**	**SWL (NAVD88)**	**MWL (NAVD88)**	**Design Scour, ft**	**d_s (ft)**	**Wset (ft)**	**T (s)**	**d_s/gT^2**	**H_b/d_s**	**H_b (ft)**	**Wset/ Hb**	**Rc (ft)**	**Runup, ft Eq. 15-1**	**R* (NAVD88)**	**q (cfs/ft)**	**q (gpm/ft)**	**q (liters/s per m)**
Case 1 - 2024 storms w/out SLR, scoured to el 0 ft	17	8.28	9.69	2.37	7.32	0.91	18	0.0007	0.95	7.0	0.13	7.31	11.30	20.99	0.17	77.7	16.1
Case 2 - w/2.8 ft SLR, scoured to el 0 ft	17	11.38	13.25	2.37	10.88	1.37	18	0.0010	0.95	10.3	0.13	3.75	16.80	30.05	6.33	2843.0	588.4
Case 3 - w/4.5 ft SLR, scoured to el 0 ft	17	13.08	15.16	2.37	12.79	1.58	18	0.0012	0.94	12.0	0.13	1.84	19.54	34.70	19.85	8911.1	1,844.4
Case 4 - Case 1 w/Top of wall el 22 ft	17	8.28	10.27	-1.63	11.90	1.49	18	0.0011	0.95	11.3	0.13	6.73	18.37	28.64	2.63	1178.5	243.9
Case 5 - Case 2 w/Top of wall el 22 ft	17	11.38	13.77	-1.63	15.40	1.89	18	0.0015	0.94	14.5	0.13	3.23	23.53	37.30	19.32	8670.4	1,794.6
Case 6 - Case 3 w/Top of wall el 22 ft	17	13.08	15.67	-1.63	17.30	2.09	18	0.0017	0.94	16.3	0.13	1.33	26.43	42.10	42.63	19133.6	3,960.3

MWL = SWL + wave setup + El Nino temp slr
R* = R + MWL
Top of wall elev = 17 ft, NAVD88

Shoreline Protection Manual

H_b/d_s from SPM Fig 7-4 assuming 60:1 offshore slope

Wave Setup, Wset

Wset - f(Hb, Hb/gT^2, m)...............eq 3-75, fig 3-50 of SPM, 2984

Hb =	16.30	ft
T =	18	sec
Hb/gT^2 =	0.0015624	
Wset/Hb =	0.128	from fig 3-50
Wset =	2.09	ft

This is a trial & error solution. Assume a Wset (H5), use the calculated Hb (D22), which solves for Wset (D26). Compare this with the assumed Wset and change the assumed to make both the same.

El Nino temp slr = 0.5 ft

Wave Runup from Kim (2010)

$R_{u\%} = H_b*1.65*\gamma_b*\gamma_f*\gamma_\beta*\xi m\text{-}1,0$ ....Eq 15.1

where:

γ_b =	1
γ_f =	0.5
γ_β =	1
ξm-1,0 =	1.97

Wave Overtopping from Kim (2010)

$q = (g*H_b\text{^}3)\text{^}0.5*(0.067/\tan\alpha)*\gamma_b*\xi m\text{-}1,0*\exp(-4.3(Rc/\xi m\text{-}1,0*H_b*\gamma_b*\gamma_f*\gamma_\beta*\gamma_v)$ ......Eq 15.7

where: γ_v = 1

ENGEO

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ATTACHMENT 3

Preliminary Geotechnical Investigation
prepared by UES (January 2025)

PRELIMINARY GEOTECHNICAL INVESTIGATION
2936 CAMINO DEL MAR
DEL MAR, CALIFORNIA

Prepared for:

Ocean Investments, LLC
2936 Camino Del Mar
Del Mar, CA 92014

Prepared By:

UES
1441 Montiel Road, Suite 115
Escondido, California 92026

January 29, 2025
Project No. A24165.00270

TABLE OF CONTENTS

1.0 INTRODUCTION AND SCOPE OF SERVICES 1
1.1 Introduction 1
1.2 Scope of Services 1
2.0 SITE DESCRIPTION 1
3.0 FIELD INVESTIGATION AND LABORATORY TESTING 2
3.1 Field Investigation 2
3.2 Laboratory Testing 2
4.0 GEOLOGY 3
4.1 General Setting 3
4.2 Geologic Conditions 3
4.2.1 Quaternary Undocumented Fill 4
4.2.2 Quaternary Marine Beach Deposits 4
4.3 Groundwater Conditions 4
4.4 Geologic Hazards 5
4.4.1 Surface Fault Rupture 5
4.4.2 Local and Regional Faulting 6
4.4.3 Liquefaction and Seismic Settlement Evaluation 7
4.4.4 Tsunamis and Seiche Evaluation 9
4.4.5 Flooding and Dam Inundation 10
4.4.6 Landsliding 10
4.4.7 Compressible and Expansive Soils 10
4.4.8 Corrosive Soils 11
5.0 CONCLUSIONS AND RECOMMENDATIONS 12
5.1 General 12
5.2 Site Preparation 12
5.3 Site Excavation 12
5.4 Fill Placement and Compaction 13
5.5 Fill Materials 13
5.6 Seismic Design Criteria 14
5.7 Drainage 15
5.8 Plan Review 15
6.0 LIMITATIONS OF INVESTIGATION 16

FIGURES

FIGURE 1 SITE LOCATION MAP
FIGURE 2 GEOLOGIC/ EXPLORATION LOCATION MAP
FIGURE 2A GEOLOGIC CROSS SECTION A-A'
FIGURE 3 REGIONAL GEOLOGIC MAP
FIGURE 4 REGIONAL FAULT AND SEISMICITY MAP
FIGURE 5 SEISMIC HAZARD ZONE MAP

APPENDICES

APPENDIX A	REFERENCES
APPENDIX B	FIELD EXPLORATION METHODS AND LOGS
APPENDIX C	LABORATORY METHODS AND RESULTS
APPENDIX D	STANDARD GRADING SPECIFICATIONS
APPENDIX E	LIQUEFACTION EVALUATION

1.0 INTRODUCTION AND SCOPE OF SERVICES

1.1 Introduction

This report presents the results of the geotechnical investigation performed by Universal Professional Solutions Inc. (UES) and provides preliminary conclusions and recommendations for removal of rip-rap and replacement setback-compliant seawall at 2936 Camino Del Mar in Del Mar, California. The investigation was performed in general accordance with the terms of UES proposal 4830.0124.00005 dated January 23, 2024.

1.2 Scope of Services

The scope of services provided included:

- Review of readily available geologic and geotechnical reports.
- Coordination of Underground Service Alert (USA) utility mark-out and location.
- Exploration of subsurface conditions utilizing a truck-mounted drill rig, and manually advanced augers.
- Laboratory testing of selected soil samples.
- Description of site geology and evaluation of potential geologic hazards.
- Engineering and geologic analysis.
- Preparation of this geotechnical investigation report.

2.0 SITE DESCRIPTION

The project site is located at 2936 Camino Del Mar in Del Mar, California (Figure 1). The improvement area is bound by public right-of-way and Camino Del Mar to the east, the beach of the Pacific Ocean to the west, and residential properties to the north and south. The site has relatively level topography with approximate elevations ranging from 11 to 14 feet above mean sea level (msl) and currently supports a non-compliant seawall, rip-rap, a single-story residence, swimming pool, concrete drive areas, utilities, and landscaping.

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3.0 FIELD INVESTIGATION AND LABORATORY TESTING

3.1 Field Investigation

UES conducted the field investigation on May 16, 2024, which included visual reconnaissance and the excavation of four exploratory borings within the site . The borings were advanced to a maximum depth of approximately 51.5 feet below ground surface (bgs). Bulk samples were collected from the cuttings, and relatively undisturbed samples were collected by driving Standard Penetration Test (SPT) and Modified California (CAL) samplers. Prior to advancing borings, concrete surfaces were cored utilizing a 10-inch-diameter core drill bit. Exploratory borings B-1 and B-2 were advanced with a CME-95 truck-mounted drill rig equipped with eight-inch-diameter, hollow-stem augers. Exploratory borings HAB-1 and HAB-2 were advanced with a three-inch manually operated hand auger.

The soils were logged in the field by a UES Geologist and were visually classified in general accordance with the Unified Soil Classification System. The field descriptions have been modified, where appropriate, to reflect laboratory test results. The boring logs, including descriptions of the soils encountered, are included in Appendix B. The approximate locations of the explorations are presented on Figure 2.

3.2 Laboratory Testing

Laboratory tests were conducted on selected soil samples for classification purposes, and to evaluate physical properties and engineering characteristics. Samples were laboratory tested in accordance with applicable ASTM and California Test Methods (CTM). Laboratory tests included:

- In-situ Moisture Content and Dry Density Tests (ASTM D2216 and D2937)
- Classification (ASTM D2487)
- Expansion Index (D4829)

- Particle-Size Distribution Analysis (ASTM D6913)
- Laboratory Compaction Characteristics - Modified Proctor (ASTM D1557)
- Corrosivity Test Series, including Sulfate Content, Chloride Content, pH-value, and Resistivity (CTM 417, 422, and 532/643).

Test descriptions and laboratory results for the selected soils are included in Appendix C.

4.0 GEOLOGY

4.1 General Setting

Del Mar is located in San Diego County within the Peninsular Ranges physiographic province, an area characterized by northwest-trending mountain ranges, intervening valleys, and predominantly northwest-trending regional faults. The San Diego Region can be further subdivided into the coastal plain area, a central mountain–valley area, and the eastern mountain valley area. The project site is located in the coastal plain area. The coastal plain sub-province ranges in elevation from approximately sea level to 1,200 feet above mean sea level (msl) and is characterized by Cretaceous and Tertiary sedimentary deposits that onlap an eroded basement surface consisting of Jurassic and Cretaceous crystalline rocks that have been repeatedly eroded and infilled and by alluvial processes throughout the Quaternary Period in response to regional uplift. This has resulted in a geomorphic landscape of uplifted alluvial and marine terraces that are dissected by alluvial drainages.

4.2 Geologic Conditions

Regional geologic mapping by Kennedy and Tan (2008) shows the regional geologic near-surface units to be Quaternary Marine Beach Deposits and Quaternary Old Paralics (Figure 3). Based on our site reconnaissance and subsurface explorations, the project area is mantled by Undocumented Fill underlain by Quaternary Marine Beach Deposits. Descriptions of the encountered geologic units are presented below.

4.2.1 Quaternary Undocumented Fill

Quaternary Undocumented Fill was encountered at the surface in all borings and extended to depths ranging from approximately two- to four- feet below ground surface (bgs). This material generally consists of loose, slightly moist, red brown to dark brown, silty, fine- to medium-grained sand with trace gravel. Isolated areas with deeper fill may be encountered during grading and excavations.

4.2.2 Quaternary Marine Beach Deposits

Quaternary Marine Beach deposits (beach deposits) were observed beneath the fill and extended to the maximum explored depth of approximately 51.5 feet bgs. These soils were loose near the surface and become increasingly dense with depth. The Marine Beach Deposits generally consist of slightly moist to saturated, gray and dark gray, fine- to medium-grained sand and gravel with varying amounts of silt, rounded cobbles and abundant shell fragments.

4.3 Groundwater Conditions

Groundwater was encountered in borings B-1 and B-2 at depths varying from 10 to 11 feet bgs. Groundwater conditions are anticipated to vary and are likely influenced by oceanic tides. Groundwater may also fluctuate following periods of sustained precipitation or irrigation. Based on specific localized area of construction, groundwater may impact shallow construction activities and may be encountered during site grading and excavation.

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4.4 Geologic Hazards

Geologic hazards that were considered to have potential impacts to site development were evaluated based on field observations, literature review, and laboratory test results. It appears that geologic hazards at the site are primarily limited to those caused by coastal flooding, tsunami, and by shaking from earthquake-generated ground motions. The following paragraphs discuss the geologic hazards considered and their potential risk to the site.

4.4.1 Surface Fault Rupture

In accordance with the Alquist-Priolo Earthquake Fault Zoning Act, (ACT), the State of California established Earthquake Fault Zones around known active faults. The purpose of the ACT is to regulate the development of structures intended for human occupancy near active fault traces in order to mitigate hazards associated with surface fault rupture. According to the California Geological Survey (Special Publication 42, Revised 2018), a fault that has had surface displacement within the last 11,700 years is defined as a Holocene-active fault and is either already zoned or is pending zonation in accordance with the ACT. There are several other definitions of fault activity that are used to regulate dams, power plants, and other critical facilities, and some agencies designate faults that are documented as older than Holocene (last 11,700 years) and younger than late Quaternary (1.6 million years) as potentially active faults that are subject to local jurisdictional regulations.

Based on reconnaissance and review of referenced literature, the site is not located within a State designated Earthquake Fault Zone, no known active fault traces underlie or project toward the site, and no known potentially active fault traces project toward the site.

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4.4.2 Local and Regional Faulting

The United States Geological Survey (USGS), with support of State Geological Surveys, and reviewed published work by various researchers, have developed a Quaternary Fault and Fold Database of faults and associated folds that are believed to be sources of earthquakes with magnitudes greater than 6.0 that have occurred during the Quaternary (the past 1.6 million years). The faults and folds within the database have been categorized into four Classes (Class A-D) based on the level of evidence confirming that a Quaternary fault is of tectonic origin and whether the structure is exposed for mapping or inferred from fault related deformational features. Class A faults have been mapped and categorized based on age of documented activity ranging from Historical faults (activity within last 150 years), Latest Quaternary faults (activity within last 15,000 years), Late Quaternary (activity within last 130,000 years), to Middle to late Quaternary (activity within last 1.6 million years). The Class A faults are considered to have the highest potential to generate earthquakes and/or surface rupture, and the earthquake and surface rupture potential generally increases from oldest to youngest. The evidence for Quaternary deformation and/or tectonic activity progressively decreases for Class B and Class C faults. When geologic evidence indicates that a fault is not of tectonic origin it is considered to be a Class D structure. Such evidence includes features such as joints, fractures, landslides, or erosional and fluvial scarps that resemble fault scarps, but demonstrate a non-tectonic origin.

The nearest known Class A fault is the Newport-Inglewood-Rose Canyon fault zone, which is approximately 2.7 miles west of the site. The attached Figure 4 shows regional faults and seismicity with respect to the site.

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4.4.3 Liquefaction and Seismic Settlement Evaluation

Liquefaction occurs when saturated fine-grained sands or silts lose their physical strengths during earthquake-induced shaking and behave like a liquid. This is due to loss of point-to-point grain contact and transfer of normal stress to the pore water. Liquefaction potential varies with water level, soil type, material gradation, relative density, and probable intensity and duration of ground shaking. Seismic settlement can occur with or without liquefaction; it results from densification of loose soils. The site is located within a potentially liquefiable zone, and a quantitative evaluation of liquefaction and seismic settlement was performed as summarized herein.

Input parameters for the liquefaction evaluation were based on the Maximum Considered Earthquake (MCE, 2% probability of exceedance with a 50-year period). A code-based acceleration value (PGA_M) was obtained in accordance with ASCE 7-16 Equation 11.8-1. In order to quantify site liquefaction susceptibility, the computer program Geologismiki LiqSVs 2.2.1.8 was utilized. The following data were also utilized used for the analysis:

- Based on direct measurement during the recent subsurface exploration, groundwater was encountered at 10 feet bgs. Given the available information based on recently performed geotechnical explorations, a historic high groundwater depth at 5 feet bgs was used for the liquefaction analysis presented in Appendix E.
- As indicated, the PGA_M value (0.61g) obtained using ASCE 7-16 Section 11.8.3 was used for the liquefaction evaluation.
- Based on the area tectonic framework and probable seismic hazard deaggregation for PGA (USGS Unified Hazard Tool), the modal contributing earthquake magnitude of 6.99 was used for the analysis.

In addition to inputting the above-mentioned parameters into Geologismiki LiqSVs 2.2.1.8, the fine-grained soils were evaluated for their liquefaction potential in accordance with Bray and

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Sancio (2006) methodology. Previously accepted practice for liquefaction susceptibility confirmation of fine-grained soils was based on the Chinese criteria and procedures delineated in DMG Special Publication 117. These commonly used evaluation procedures assumed that soils with a clay content (particle size <0.005 mm) greater than 15% were considered to be non-liquefiable. More recent research, summarized by Bray and Sancio (2006), indicates that silty and clayey soils containing more than 15% clay-size particles may also be susceptible to liquefaction. Therefore, plasticity indices and water content/liquid limit ratios are considered to be more suitable as liquefaction susceptibility criteria and were used for the analysis. Specifically, soils with a plasticity index greater than 12 are generally less susceptible to liquefaction and soils with a water content/liquid limit ratio less than 0.8 are not likely to liquefy. Site soils were considered granular and evaluated for fines percentages.

Liquefaction evaluation was performed for Boring, B-2 based on the PGA_m, magnitude, and groundwater levels previously provided in addition to the susceptibility criteria noted above. No subsurface soils exhibited Plasticity Index values or characteristics to exclude them in the potentially liquefiable soils according to Bray and Sancio (2006). A summary of the criteria is provided below.

The results of the liquefaction evaluation indicate that total potential ground deformation and dynamic settlement at the site are anticipated to be on the order of 13 inches based on SPT methods, which are anticipated to generally be conservative.

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Surface effects associated with liquefaction-related settlement can consist of sand boils, soil strength loss, and associated phenomena. In general, the potential for surface manifestations is related to the continuity and thickness of liquefiable layers compared to depth of overlying non-liquefiable material (Ishihara, 1985). Based on the depth and distribution of the potential liquefiable layers, surface effects may not be entirely precluded in localized areas where liquefiable soils are within approximately 10 to 15 feet of the proposed surface elevations Because of the relatively flat site topography, the potential hazard associated with lateral spreading is considered low.

Due to the nature of likely improvements, mitigation of the regional liquefaction and/or seismic settlement potential is generally not anticipated to be warranted or required. The liquefaction evaluation and results are provided in Appendix E.

4.4.4 Tsunamis and Seiche Evaluation

According to McCulloch (1985), the potential in the San Diego County coastal area for “100-year” and “500-year” tsunami waves is approximately five and eight feet, or less. This indicates that there is a considerable probability of a tsunami reaching the site based on elevation of the area and location on the beach of the Pacific Ocean. The site is located in a tsunami design zone with potential tsunami inundation up to 4.5 feet based on the ASCE Tsunami Hazard Tool (online at https://asce7tsunami.online) In addition, the potential for oscillatory waves (seiches) to affect the site should be considered based on the distance to the San Dieguito River lagoon located less than 400 feet east of the site. Design considerations should be made based on local regulations regarding the potential for flooding at the site.

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4.4.5 Flooding and Dam Inundation

Based on Federal Emergency Management Agency mapping (FEMA 2012), the site improvement areas are located within Special Flood Hazard Areas Zone VE and AE and determined to be inside of the 0.2% annual chance floodplain. Therefore, hazard rising groundwater due to flooding may impact static design parameters presented herein. A detailed interactive map provided by the FEMA Flood Map Service Center can be found at the following link: https://msc.fema.gov/portal/home.

4.4.6 Landsliding

According to the Seismic Hazards Zones map and the regional geologic map compiled by Tan and Giffen Landslide Hazard Maps (1995), no landslides are mapped in the project area, and landslides were not encountered during the recent field exploration at the minimally sloped project site. Based on the investigation findings, landsliding is not considered to be a significant geologic hazard at the subject site.

4.4.7 Compressible and Expansive Soils

The loose upper portions of the Undocumented Fill and Marine Beach Deposits are considered to be potentially compressible. As recommended herein, these soils should be overexcavated, moisture conditioned, and recompacted beneath surface improvement areas if proposed

Based on laboratory results and the fine- to medium-grained nature of the subgrade materials, near surface soils at the site are anticipated to exhibit low expansion potential (Expansion Index of 50 or less). The expansion potential of exposed clayey soils, if encountered, should be evaluated.

4.4.8 Corrosive Soils

Testing of representative site soils was performed to evaluate the potential corrosive effects of site soil on concrete foundations and buried metallic utilities. Soil environments detrimental to concrete generally have elevated levels of soluble sulfates and/or pH levels less than 5.5. According to the American Concrete Institute (ACI) Table 318 4.3.1, specific guidelines have been provided for concrete where concentrations of soluble sulfate (SO_4) in soil exceed 0.10 percent by weight. These guidelines include low water: cement ratios, increased compressive strength, and specific cement type requirements. A minimum resistivity value less than approximately 5,000 ohm-cm and/or soluble chloride levels in excess of 200 ppm generally indicate a corrosive environment for buried metallic utilities and untreated conduits.

Based on laboratory test results, near-surface soils at the site generally present a negligible corrosion potential for Portland cement concrete. Based on chloride and resistivity testing, It is also interpreted that the site soils will have a low corrosive potential to buried metallic improvements. However, it would likely be prudent for buried utilities to utilize plastic piping and/or conduits, where feasible, especially due to the general marine environment. However, UES does not practice corrosion engineering. Therefore, if corrosion of improvements is of more significant concern, a qualified corrosion engineer could be consulted.

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5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 General

UES concludes that the removal of rip-rap and proposed setback compliant seawall are feasible from a geotechnical standpoint, provided the recommendations in this report are incorporated into the design and construction of the project. These recommendations should either be evaluated as appropriate as ENGEO's structural design information and loads become available, and/or updated based on conditions exposed during excavation and grading at the site.

5.2 Site Preparation

Prior to grading or excavation, the improvement area should be cleared of any existing building materials or improvements that are not to remain, as well as debris and deleterious materials. Objectionable materials, such as construction debris and vegetation, not suitable for structural backfill should be properly disposed of offsite.

A geotechnical representative from UES should observe the exposed bottom of excavations prior to placement of the replacement setback-compliant seawall. If localized areas of loose or unsuitable materials are encountered at the base of overexcavations, deeper excavation may be recommended, subject to ENGEO's site-specifics recommendations.

5.3 Site Excavation

Generally, shallow excavation of site materials may be accomplished with heavy-duty construction equipment under normal conditions. However, excavations within the fill, Marine Beach Deposits, and other unconsolidated soils could encounter zones that are sensitive to caving and/or erosion and may not effectively remain standing vertical or near-vertical, even at shallow or minor heights and for short periods of time. Local dense to very dense materials could also be encountered, though they are not generally anticipated at the relatively shallow excavation depths anticipated. Deep structural installations do have the potential to encounter very dense or hard materials, as well as buried objects that could impede excavation.

5.4 Fill Placement and Compaction

Following recommended removals of loose or disturbed soils, areas to receive fills should be scarified a minimum of eight inches, moisture conditioned and properly compacted. Fill and backfill should be compacted to a minimum relative compaction of 90 percent (95 percent for upper 12" of subgrade beneath pavements and all aggregate base) at a minimum two percent above optimum moisture (three percent above for clayey soils) as evaluated by ASTM D 1557. The optimum lift thickness for fill soil will depend on the type of compaction equipment used. Generally, backfill should be placed in uniform, horizontal lifts not exceeding eight inches in loose thickness. Fill placement and compaction should be conducted in conformance with local ordinances.

5.5 Fill Materials

Although this report is not intended to address environmental conditions at the subject site, it is anticipated that imported soils will be screened, sampled, and tested in accordance with the Department of Toxic Substances Control's suggested guidelines for clean imported fill soils.

Actual field conditions and soil type designations must be verified by a "competent person" while excavations exist, according to Cal-OSHA regulations. In addition, the above sloping recommendations do not allow for surcharge loading at the top of slopes by vehicular traffic, equipment, or materials. Appropriate surcharge setbacks must be maintained from the top of all unshored slopes.

5.6 Seismic Design Criteria

The seismic ground motion values listed in the table below were derived in accordance with the ASCE 7-16 Standard that is incorporated into the 2019 California Building Code. This was accomplished by establishing the Site Class based on the soil properties at the site and calculating site coefficients and parameters using the using the SEAOC-OSHPD U.S. Seismic Design Maps application. Seismic ground motion values are based on the approximate site coordinates of 32.97298790° latitude and -117.26953310° longitude and the understanding that the fundamental period of proposed structure is no greater than 0.5 seconds. These values are intended for the design of structures to resist the effects of

TABLE 5.6
SEISMIC GROUND MOTION VALUES (CODE-BASED)
2019 CBC AND ASCE 7-16

PARAMETER	VALUE	2019 CBC/ASCE 7-16 REFERENCE
Site Class	D	ASCE 16, Chapter 20
Mapped Spectral Response Acceleration Parameter, S_S	1.239	Figure 1613.2.1 (1)
Mapped Spectral Response Acceleration Parameter, S_1	0.439	Figure 1613.2.1 (2)
Seismic Coefficient, F_a	1.004	Table 1613.2.3 (1)
Seismic Coefficient, F_v	null -See Section 11.4.8	Table 1613.2.3 (2)
MCE Spectral Response Acceleration Parameter, S_{MS}	1.245	Section 1613.2.3
MCE Spectral Response Acceleration Parameter, S_{M1}	null -See Section 11.4.8	Section 1613.2.3

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Design Spectral Response Acceleration, Parameter S_{DS}	0.83	Section 1613.2.5(1)
Design Spectral Response Acceleration, Parameter S_{D1}	null -See Section 11.4.8	Section 1613.2.5 (2)
Peak Ground Acceleration PGA_M	0.614	ASCE 16, Section 11.8.3

5.7 Drainage

Surface runoff should be collected and directed away from improvements by means of appropriate erosion-reducing devices, and positive drainage should be established around proposed improvements. Positive drainage should be directed away from improvements and slope areas at a minimum gradient of two percent for a distance of at least five feet. In order to minimize moisture accumulation within subgrade areas, the project civil engineer should evaluate the on-site drainage and make necessary provisions to keep surface water from affecting the site.

Generally, UES recommends against allowing water to infiltrate building pads or adjacent to slopes and improvements. However, it is understood that some agencies are encouraging the use of storm-water cleansing devices. Therefore, if storm water cleansing devices must be used, it is generally recommended that they be underlain by an impervious barrier and that the infiltrate be collected via subsurface piping and discharged off site. If infiltration must occur, water should infiltrate as far away from structural improvements as feasible. Additionally, any reconstructed slopes descending from infiltration basins should be equipped with subdrains to collect and discharge accumulated subsurface water.

5.8 Plan Review

UES should be authorized to review the proposed setback-compliant replacement seawall design prior to commencement of earthwork or construction to identify potential conflicts with the intent of the geotechnical recommendations.

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Recommendations provided in this report are based on the understanding and assumption that UES will provide the observation and testing services for the project. All earthwork should be observed and tested to verify that grading activities have been performed according to the recommendations contained within this report.

6.0 LIMITATIONS OF INVESTIGATION

The field evaluation, laboratory testing, and geotechnical analysis presented in this report have been conducted according to current engineering practice and the standard of care exercised by reputable geotechnical consultants performing similar tasks in this area. No other warranty, expressed or implied, is made regarding the conclusions, recommendations and opinions expressed in this report. Variations may exist and conditions not observed or described in this report may be encountered during construction. The recommendations presented herein have been developed in order to reduce the potential adverse effects of soil settlement. However, even with the design and construction precautions provided, some post-construction movement and associated distress may occur.

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 are 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.

UES's conclusions and recommendations are based on an analysis of the observed conditions. If conditions different from those described in this report are encountered, this office should be notified and additional recommendations, if required, will be provided.

The opportunity to be of service on this project is appreciated. If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Respectfully,
UNIVERSAL PROFESSIONAL SOLUTIONS INC. (UES)

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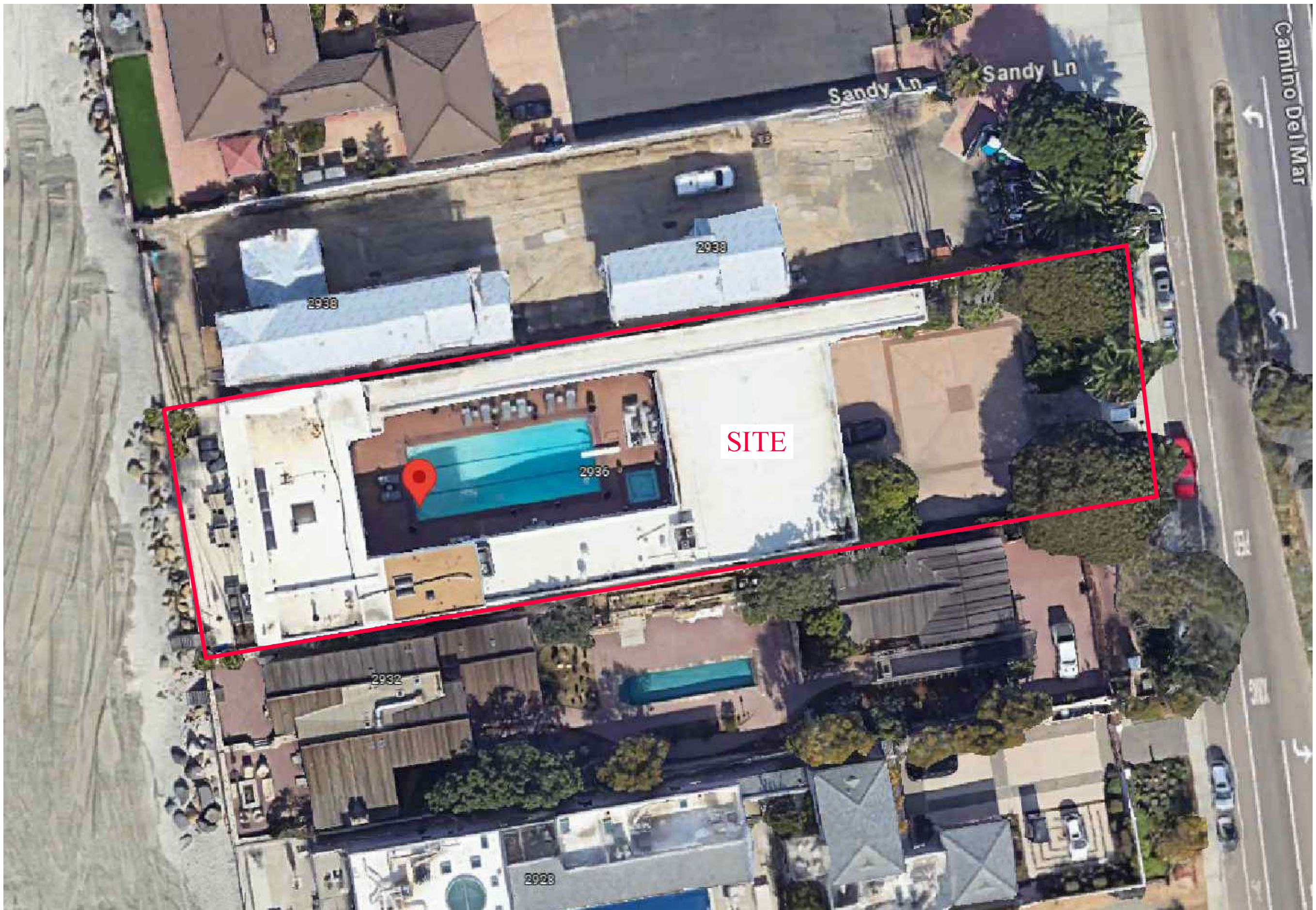
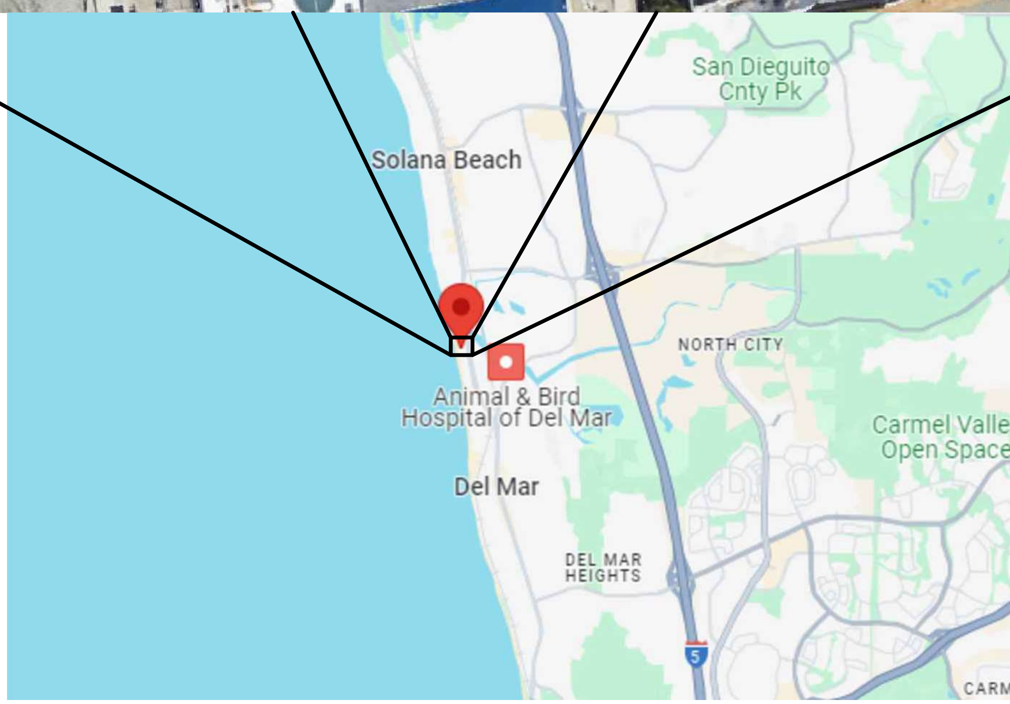
ML/DAK/JFL/DTM:amc





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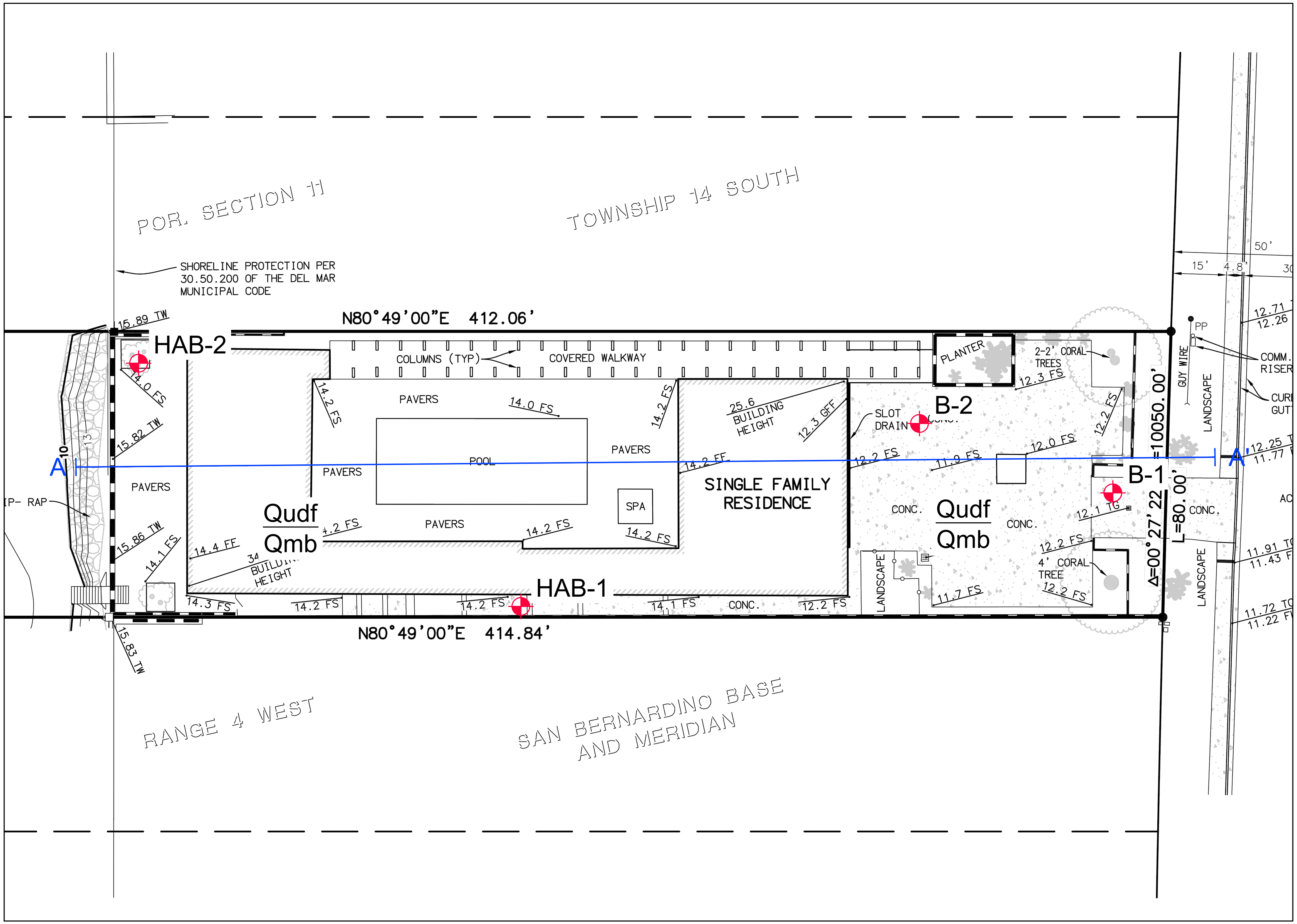
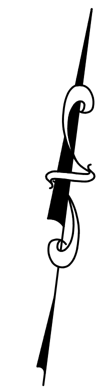
SITE LOCATION MAP 2936 CAMINO DEL MAR DEL MAR, CALIFORNIA	SCALE: AS SHOWN	DATE: 6/2024
	UES JOB NO.: 4830.2400025	FIGURE: 1





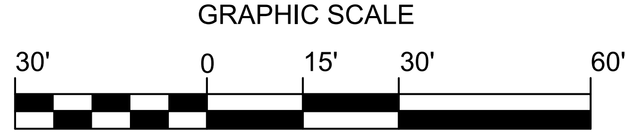
EXPLANATION

B-2 APPROXIMATE BORING LOCATION

HAB-2 APPROXIMATE HAND-AUGER BORING LOCATION

Qudf / Qmb QUATERNARY UNDOCUMENTED FILL OVERLYING QUATERNARY MARINE BEACH DEPOSITS

CROSS SECTION A-A'



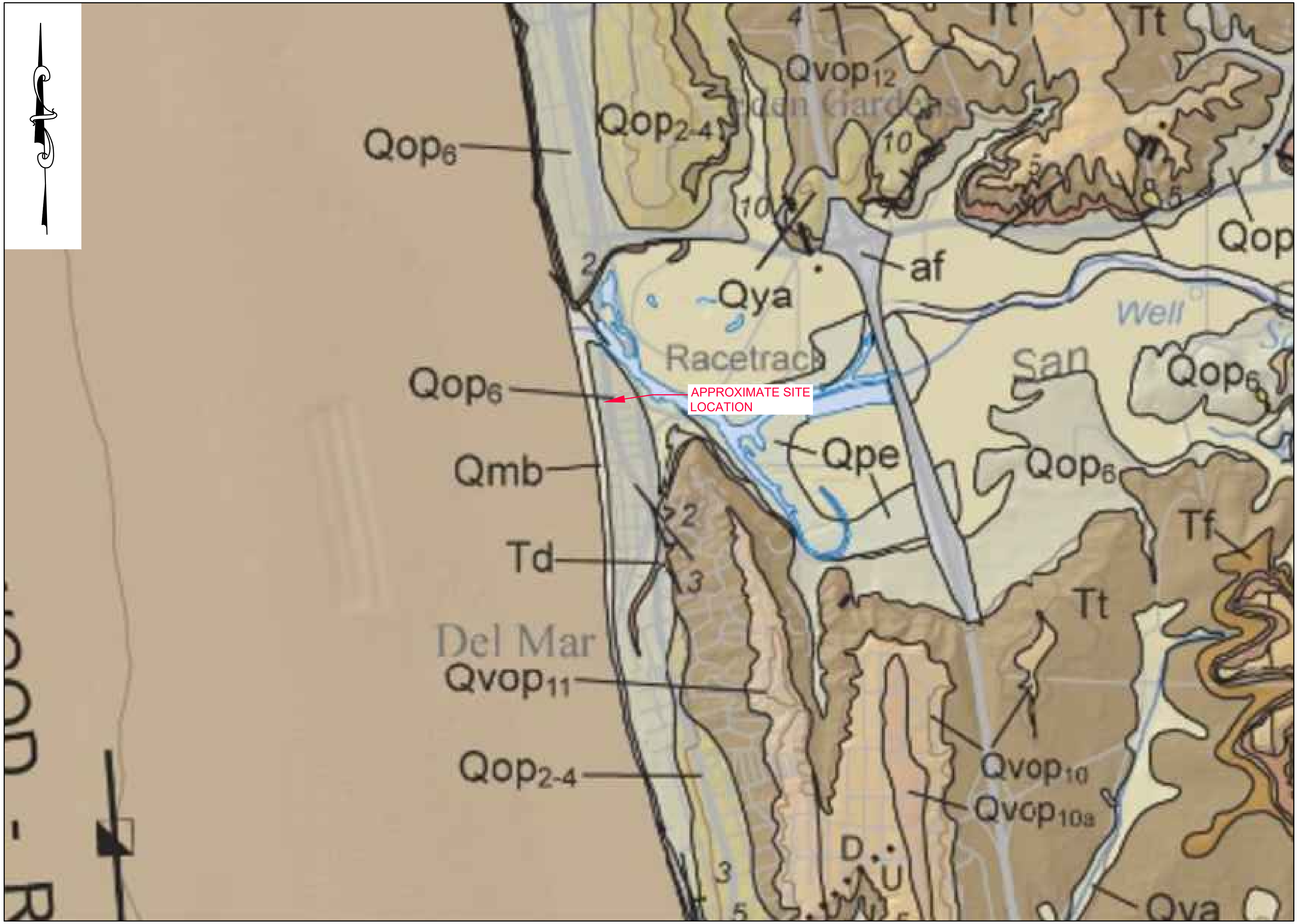
S:\Projects\4830 (GEO)\4830.2400025.0000 (2936 Camino Del Mar- Geo)\DWG\Figure 2 (Geologic & Exploration Location Map).dwg

UES

GEOTECHNICAL/EXPLORATION LOCATION MAP

2936 CAMINO DEL MAR
DEL MAR, CALIFORNIA

UES JOB NO:	4830.2400025
SCALE:	1" = 30'
DATE: 6/2024	FIGURE: 2



EXPLANATION

af QUATERNARY ARTIFICIAL FILL

Qmb QUATERNARY MARINE BEACH DEPOSITS

Qya QUATERNARY YOUNG ALLUVIAL FLOOD-PLAIN DEPOSITS

Qop QUATERNARY OLD PARALIC DEPOSITS

Qvop QUATERNARY VERY OLD PARALIC DEPOSITS

Qpe QUATERNARY PARALIC ESTUARINE DEPOSITS

Td TERTIARY DELMAR FORMATION

Tf TERTIARY FRIARS FORMATION

Tt TERTIARY TORREY SANDSTONE

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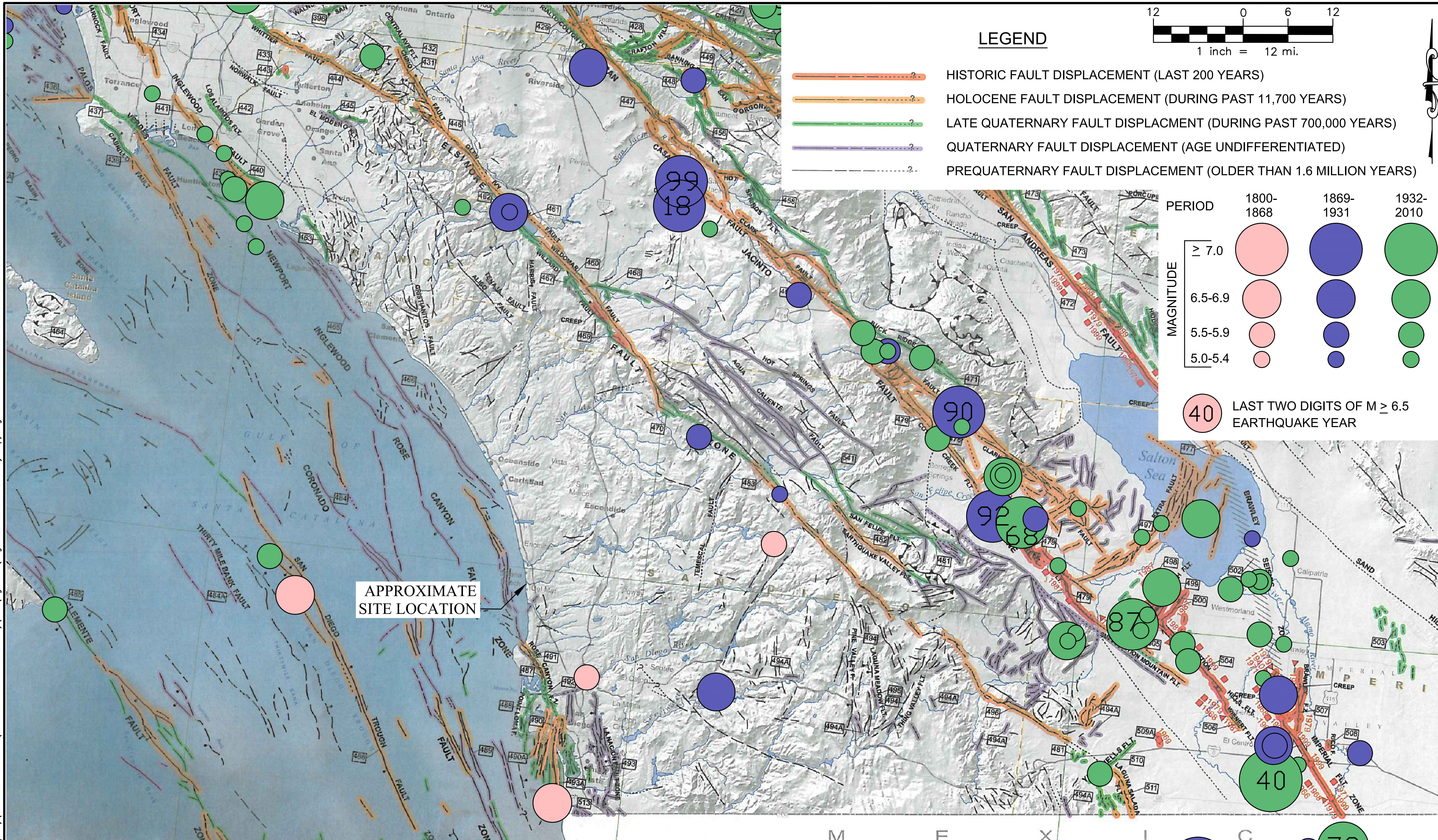
GEOLOGIC MAP
2936 CAMINO DEL MAR
DEL MAR, CALIFORNIA

UES JOB NO: 4830.2400025	
SCALE: NOT SHOWN	
DATE: 6/2024	FIGURE: 3

S:\Projects\4830 (GEO)\4830.2400025.0000 (2936 Camino Del Mar- Geo)\DWG\Figure 3 (Regional Geologic Map).dwg



NOTES: FAULT ACTIVITY MAP OF CALIFORNIA, 2010, CALIFORNIA GEOLOGIC DATA MAP SERIES MAP NO. 6;
EPICENTERS OF AND AREAS DAMAGED BY M≥ 5 CALIFORNIA EARTHQUAKES, 1800–1999 ADAPTED AFTER TOPPOZADA, BRANUM, PETERSEN, HALLSTORM, CRAMER, AND REICHLE, 2000, CDMG MAP SHEET 49
REFERENCE FOR ADDITIONAL EXPLANATION; MODIFIED WITH CISN AND USGS SEISMIC MAPS

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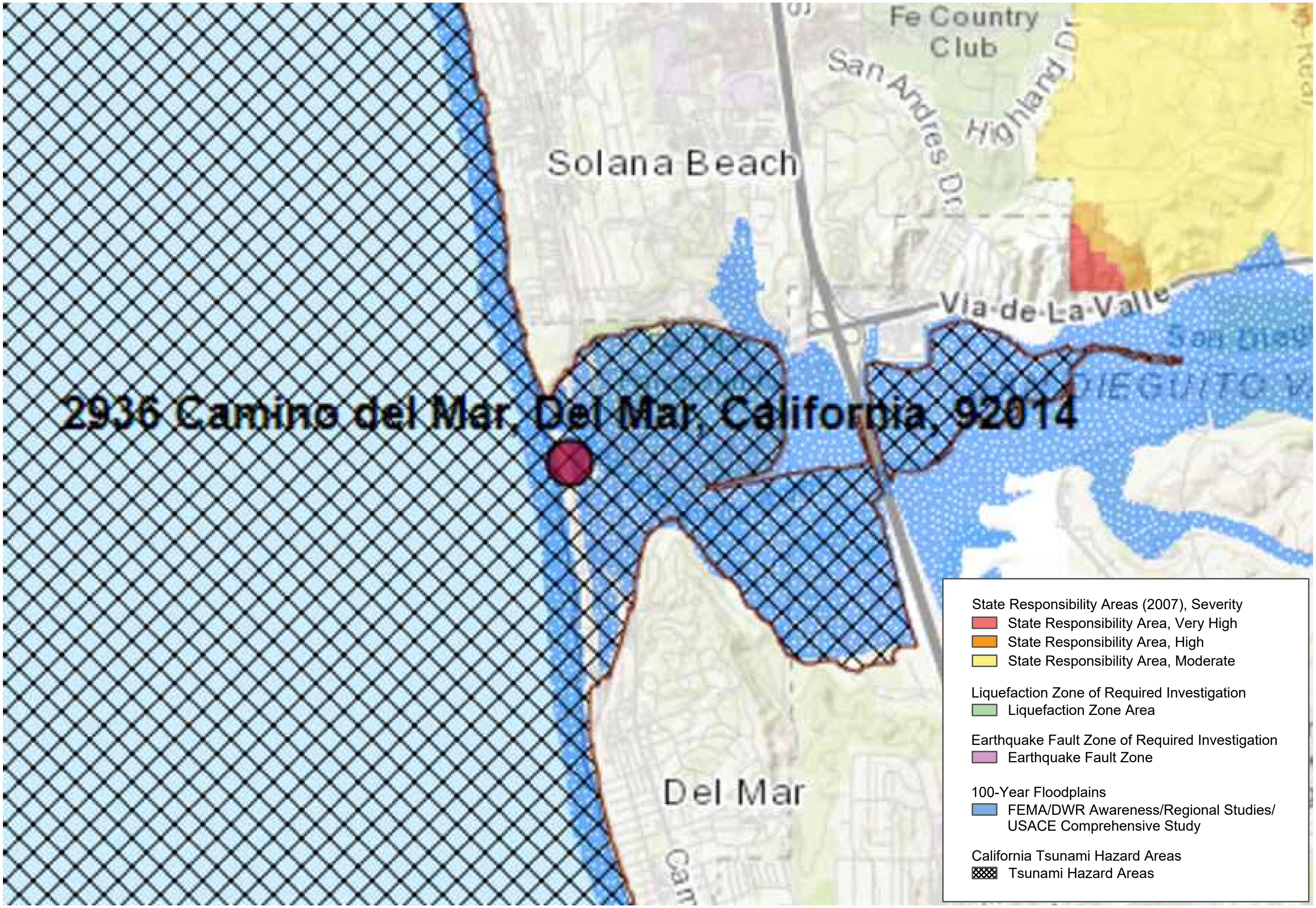
REGIONAL FAULT AND SEISMICITY MAP

2936 CAMINO DEL MAR
DEL MAR, CALIFORNIA

UES JOB NO:	4830.2400025
SCALE:	1 inch = 12 miles
DATE:	6/2024
FIGURE:	4

S:\Projects\4830 (GEO)\4830.2400025.0000 (2936 Camino Del Mar- Geo)\DWG\Figure 4 (Regional Fault & Seismicity Map).dwg

S:\Projects\4830 (GEO)\4830.2400025.0000 (2936 Camino Del Mar- Geo)\DWG\Figure 5 (Seismic Hazard Zone Map).dwg



https://myhazards.caloes.ca.gov/

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SEISMIC HAZARD ZONE MAP

2936 CAMINO DEL MAR
DEL MAR, CALIFORNIA

UES JOB NO: 4830.2400025	
SCALE: No Scale	
DATE: 6/2024	FIGURE: 5

APPENDIX A

REFERENCES

REFERENCES

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APPENDIX B

EXPLORATION LOGS

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DEFINITION OF TERMS

PRIMARY DIVISIONS			SYMBOLS	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS < 5% FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES LITTLE OR NO FINES
			GP	POORLY GRADED GRAVELS OR GRAVEL SAND MIXTURES, LITTLE OF NO FINES
		GRAVELS WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, NON-PLASTIC FINES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, PLASTIC FINES
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS < 5% FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXTURES, NON-PLASTIC FINES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES, PLASTIC FINES
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50		ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, SLIGHTLY PLASTIC CLAYEY SILTS
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY, SANDY, SILTS OR LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTY CLAYS
HIGHLY ORGANIC SOILS			PT	PEAT AND OTHER HIGHLY ORGANIC SOILS

GRAIN SIZES

BOULDERS	COBBLES	GRAVEL		SAND			SILTS AND CLAYS
		COARSE	FINE	COARSE	MEDIUM	FINE	

12" 3" 3/4" 4 10 40 200

CLEAR SQUARE SIEVE OPENING — U.S. STANDARD SIEVE SIZE

ADDITIONAL TESTS

(OTHER THAN TEST PIT AND BORING LOG COLUMN HEADINGS)

MAX- Maximum Dry Density
GS- Grain Size Distribution
SE- Sand Equivalent
EI- Expansion Index
CHM- Sulfate and Chloride Content , pH, Resistivity
COR - Corrosivity
SD- Sample Disturbed

PM- Permeability
SG- Specific Gravity
HA- Hydrometer Analysis
AL- Atterberg Limits
RV- R-Value
CN- Consolidation
CP- Collapse Potential
HC- Hydrocollapse
REM- Remolded

PP- Pocket Penetrometer
WA- Wash Analysis
DS- Direct Shear
UC- Unconfined Compression
MD- Moisture/Density
M- Moisture
SC- Swell Compression
OI- Organic Impurities

FIGURE: BL1

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PROJECT:	DRILLER:	SHEET: of
UES JOB NO:	DRILL METHOD:	DRILLING DATE:
LOGGED BY:	SAMPLE METHOD:	ELEVATION:

BORING LEGEND

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0								Block or Chunk Sample	
								Bulk Sample	
5									
								Standard Penetration Test	
10								Modified Split-Barrel Drive Sampler (Cal Sampler)	
								Thin Walled Army Corp. of Engineers Sample	
15								Groundwater Table	
								Soil Type or Classification Change	
20								? ? ? ? ? ? ? Formation Change [(Approximate boundaries queried (?)]	
25						"SM"		Quotes are placed around classifications where the soils exist in situ as bedrock	

FIGURE:	BL2

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PROJECT:	2936 Camino Del Mar Geo	DRILLER:	Baja Exploration	SHEET:	1 of 1
CTE JOB NO:	4830.2400025.0000	DRILL METHOD:	CME-95 Hollow Stem Auger 8"	DRILLING DATE:	5/16/2024
LOGGED BY:	ML	SAMPLE METHOD:	BULK, SPT, RING	ELEVATION:	12 FEET MSL

BORING: B-1

Depth (Feet)	Bulk Sample	Driven Type	Blows/6"	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0								CONCRETE = 5.5"	
	X					SM		**Quaternary Undocumented Fill (Qudf):** Loose, slightly moist, silty, red brown, fine- to medium grained SAND.	
						SM		**Quaternary Marine Beach Deposits (Qmb):** Loose, slightly moist, gray, silty, fine- to medium-grained SAND with abundant round cobbles and gravel.	
5		Ring	6 7 10	82.4	10.7			Becomes gray brown with round cobbles and gravel.	MD
10		SPT	8 4 6					▼ Becomes medium dense, saturated.	
								Becomes light gray with abundant rounded cobbles and gravel, shell fragmer	
								Becomes medium dense, wet, dark gray, silty, fine- to medium-grained SAND with rounded gravel and shell fragments.	
15		SPT	7 10 10						
		Ring	10 11 11						
20								Excavation terminated at 20.0 ft bgs Groundwater encountered at 11.0 ft bgs Boring backfilled on 5/16/2024	
25									

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PROJECT:	2936 Camino Del Mar Geo	DRILLER:	Baja Exploration	SHEET:	1 of 3
CTE JOB NO:	4830.2400025.0000	DRILL METHOD:	CME-95 Hollow Stem Auger 8"	DRILLING DATE:	5/16/2024
LOGGED BY:	ML	SAMPLE METHOD:	BULK, SPT, RING	ELEVATION:	12 FEET MSL

BORING: B-2

Depth (Feet)	Bulk Sample	Driven Type	Blows/6"	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
								CONCRETE = 5.5"	
0						SM		**Quaternary Undocumented Fill (Qudf):** Loose, slightly moist, silty, red brown, fine- to medium grained SAND.	
	X					SM		**Quaternary Marine Beach Deposits (Qmb):** Loose, slightly moist, gray, silty fine- to medium-grained SAND.	CHEM MAX EI
5		SPT	4 4 6			SP		Becomes medium dense, poorly graded, fine- to medium-grained SAND.	GS
								Becomes moist, dark gray, fine- to medium-grained SAND with trace rounded gravel and shell fragments.	
10		RING	2 2 3	99.4 96.0	26.2 26.2			Becomes loose and saturated.	MD MD
						GP		Becomes medium dense, wet, dark gray, fine- to coarse sandy GRAVEL with shell fragments.	
15		RING	10 10 14						1st ring material lost. GS
						SP		Becomes medium dense, poorly graded, fine- to medium-grained SAND.	
20		SPT	7 7 10		15.4				MS
25									

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PROJECT:	2936 Camino Del Mar Geo	DRILLER:	Baja Exploration	SHEET:	2 of 3
CTE JOB NO:	4830.2400025.0000	DRILL METHOD:	CME-95 Hollow Stem Auger 8"	DRILLING DATE:	5/16/2024
LOGGED BY:	ML	SAMPLE METHOD:	BULK, SPT, RING	ELEVATION:	12 FEET MSL

BORING: B-2

Depth (Feet)	Bulk Sample	Driven Type	Blows/6"	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
25			6 8 14			SP-SM		**<u>Quaternary Marine Beach Deposits (Qmb)</u>:** Medium dense, wet, dark gray, poorly graded fine- to medium-grained SAND with silt; trace rounded gravel and shell fragments.	GS
3			6 9 9		20.0				MS
35			6 15 21					Becomes dense.	No recovery
40			8 18 30						GS
45			7 16 17						
								Becomes poorly graded SAND with trace silt.	
50									

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PROJECT:	2936 Camino Del Mar Geo	DRILLER:	Baja Exploration	SHEET:	3 of 3
CTE JOB NO:	4830.2400025.0000	DRILL METHOD:	CME-95 Hollow Stem Auger 8"	DRILLING DATE:	5/16/2024
LOGGED BY:	ML	SAMPLE METHOD:	BULK, SPT, RING	ELEVATION:	12 FEET MSL

BORING: B-2

Depth (Feet)	Bulk Sample	Driven Type	Blows/6"	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
5			10 17 19		19.7		SP	**Quaternary Marine Beach Deposits (Qmb):** Dense, wet, dark gray, poorly graded SAND with trace silt.	MS GS
								Excavation terminated at 51.5 ft bgs Groundwater encountered at 10.0 ft bgs Boring backfilled on 5/16/2024	
55									
60									
65									
70									
75									

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PROJECT:	2936 Camino Del Mar Geo	DRILLER:	UES (Michael Levenson)	SHEET:	1 of 1
CTE JOB NO:	4830.2400025.0000	DRILL METHOD:	Manual Hand Auger 3"	DRILLING DATE:	5/16/2024
LOGGED BY:	ML	SAMPLE METHOD:	Hand Sample	ELEVATION:	15 FEET MSL

BORING: HAB-1

Depth (Feet)	Bulk Sample	Driven Type	Blows/6"	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
								CONCRETE = 3.0"	
0	X					SM		**Quaternary Undocumented Fill (Qudf):** Loose, slightly moist, silty, red brown, fine- to medium grained SAND with trace trace fine rounded gravel.	
	X					SM		**Quaternary Marine Beach Deposits (Qmb):** Loose, slightly moist, dark gray and tan, silty, fine- to medium-grained SAND with trace fine rounded gravel.	
								Becomes lighter gray.	
5								Refusal on cobble.	
								Excavation terminated at 6.0 ft bgs (practical refusal) No groundwater encountered Boring backfilled on 5/16/2024	
10									
15									
20									
25									

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PROJECT:	2936 Camino Del Mar Geo	DRILLER:	UES (Michael Levenson)	SHEET:	1 of 1
CTE JOB NO:	4830.2400025.0000	DRILL METHOD:	Manual Hand Auger 3"	DRILLING DATE:	5/16/2024
LOGGED BY:	ML	SAMPLE METHOD:	None	ELEVATION:	15 FEET MSL

BORING: HAB-2

Depth (Feet)	Bulk Sample	Driven Type	Blows/6"	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0						SM		**Quaternary Undocumented Fill (Qudf):** Loose, slightly moist, silty, dark brown, fine- to medium-grained SAND with roots.	
								Excavation terminated at 1.3 ft bgs (Bottom of concrete planter box) No goundwater encountered. Boring backfilled on 5/16/2024	
5									
10									
15									
20									
25									

APPENDIX C

LABORATORY METHODS AND RESULTS

LABORATORY TEST METHODS

Laboratory tests were performed on selected soil samples to evaluate their engineering properties. Tests were performed following test methods of the American Society for Testing and Materials, or other accepted standards. The following presents a brief description of the various test methods used. Laboratory results are presented in the following section of this Appendix.

In-situ Moisture Content and Dry Density Tests (ASTM D2216 and D2937)

The in-situ moisture content and dry density of selected samples obtained during the subsurface investigations were evaluated in general accordance with the latest versions of the ASTM D2216 and D2937 test methods. The methods involve obtaining the moist weight of the sample and then drying the sample to obtain its dry weight. The moisture content is calculated by taking the difference between the wet and dry weights, dividing it by the dry weight of the sample and expressing the result as a percentage. The dry weight and the measured volume of the tested sample are then used to calculate the samples dry density. The results of the in-situ moisture content and dry density tests are presented in the following section of this appendix and on the logs of the exploratory excavations presented in Appendix B.

Classification (ASTM D2487)

Earth materials encountered were visually and texturally classified in accordance with the Unified Soil Classification System (USCS/ASTM D2487) and ASTM D2488. Material classifications are indicated on the logs of the exploratory borings presented in Appendix B.

Particle-size Distribution Tests (ASTM D6913)

Particle-size distribution (gradation) testing was performed on selected samples of the materials encountered in general accordance with the latest version of the ASTM D6913 test method. The test results were utilized in evaluating the soil classifications in accordance with the Unified Soil Classification System and to evaluate the geotechnical engineering characteristics of the tested material. The test results are plotted on grain-size distribution graphs and are presented in the following section of this appendix.

Expansion Index Test (ASTM D4829)

Expansion index testing was performed on selected samples of the earth materials encountered in general accordance with the ASTM D4829 test method. The test determines the expansion potential of the materials encountered. The test results are presented in the following section of this appendix.

Laboratory Compaction Characteristics Test (ASTM D1557)

Laboratory compaction characteristics testing was performed on selected samples of the earth materials encountered in general accordance with the ASTM D1557 test method. The test establishes the laboratory maximum dry density and optimum moisture content of the tested materials and are also used to aid in evaluating the strength characteristics of the materials.

Soil Corrosivity Tests

The water-soluble sulfate and chloride content, the resistivity, and pH of selected samples were performed by a third-party laboratory in general accordance with California Test Methods. The tests results are useful in the assessment of the degree of corrosivity of the earth materials encountered with regard to concrete and normal grade steel.

MOISTURE CONTENT
(ASTM D2216)

Sample Location / Depth (feet)	Moisture Content (percent)
B-2 @ 20 – 21.5	15.4
B-2 @ 30 – 31.5	20.0
B-2 @ 50 – 51.5	19.7

IN SITU DRY DENSITY & MOISTURE CONTENT
(ASTM D2937 and D2216)

Sample Location / Depth (feet)	Moisture Content (percent)	Dry Density (pounds per cubic foot)
B-1 @ 6 – 6.5	10.7	82.4
B-2 @ 11 – 11.5	26.2	99.4
B-2 @ 11 – 11.5	26.2	96.0

EXPANSION INDEX
(ASTM D4829)

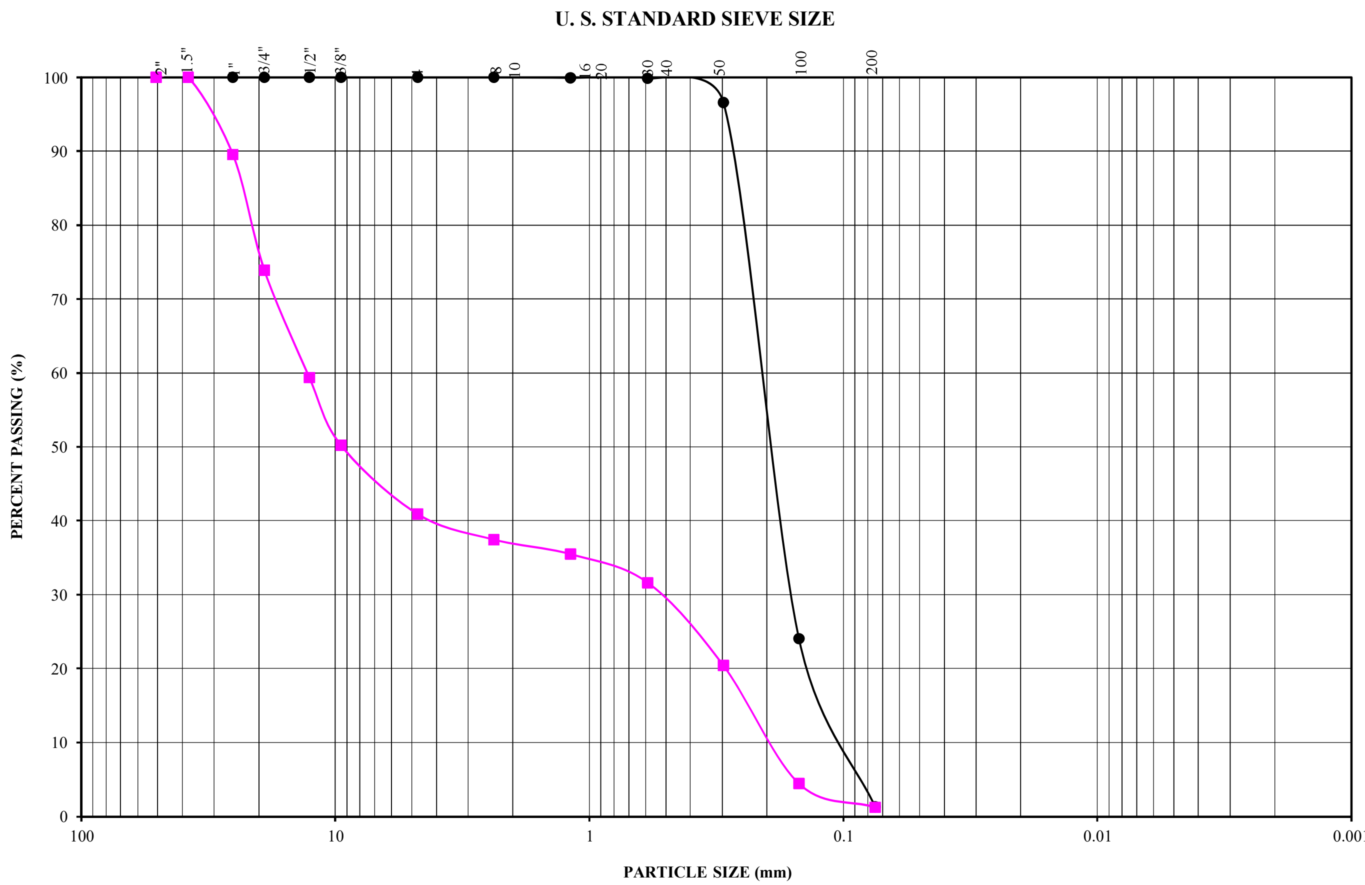
Sample Location / Depth (feet)	Expansion Index	Expansion Potential
B-2 @ 2.5 – 5	10	VERY LOW

LABORATORY COMPACTION CHARACTERISTICS
(ASTM D1557)

Sample Location / Depth (feet)	Maximum Dry Density (pounds per cubic foot)	Optimum Moisture (percent)
B-2 @ 2.5 – 5	104.0	6.1

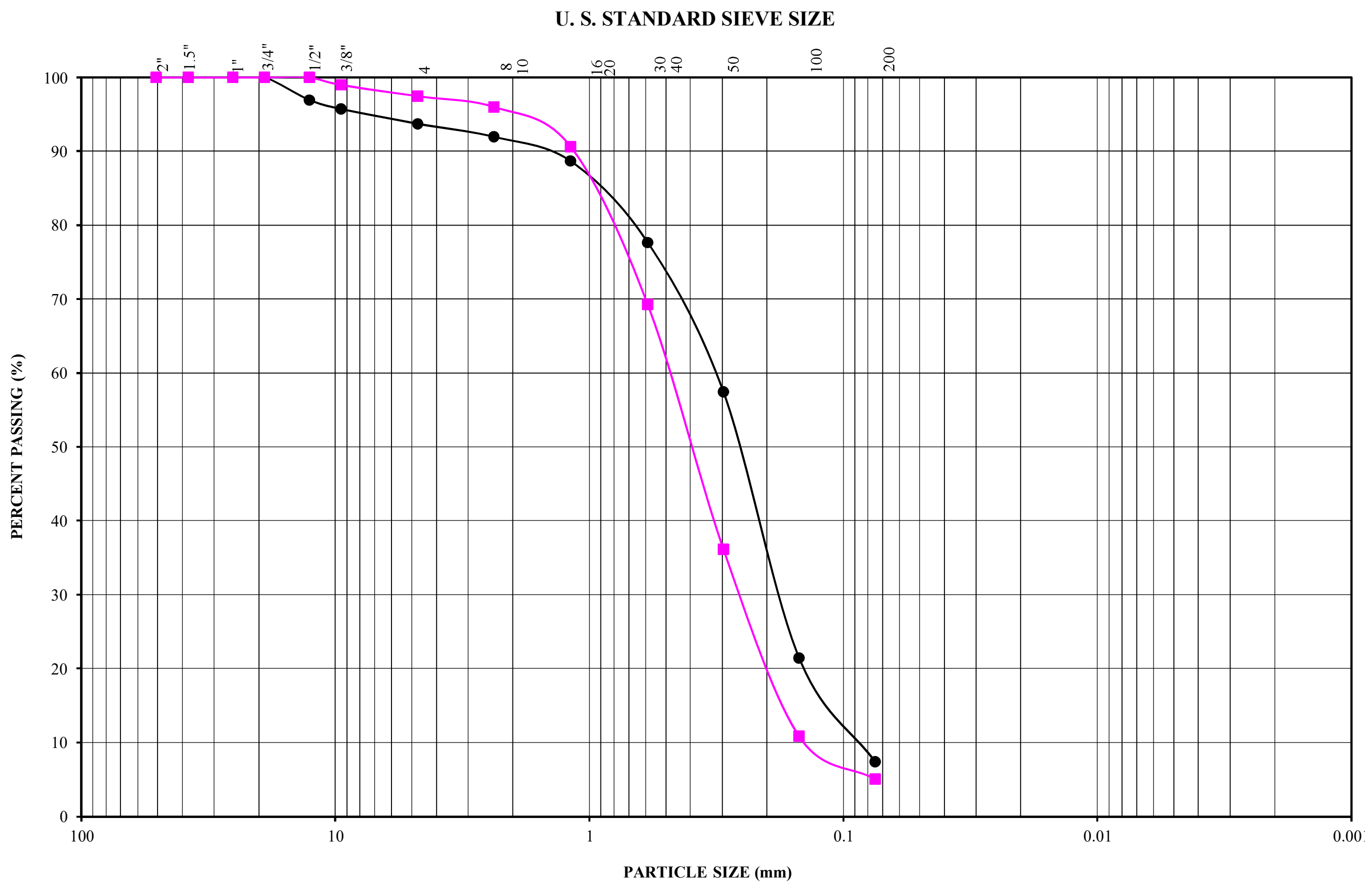
CORROSIVITY
(CTM 417, CTM 422 and CTM 643)

Sample Location / Depth (feet)	Material Type (USCS)	pH	Minimum Resistivity (Ohm-cm)	Water Soluble Sulfates (ppm)	Water Soluble Chlorides (ppm)
B-2 @ 2.5 – 5	Sandy Clay (SC)	9.79	14,400	28.2	3.6



PARTICLE SIZE ANALYSIS

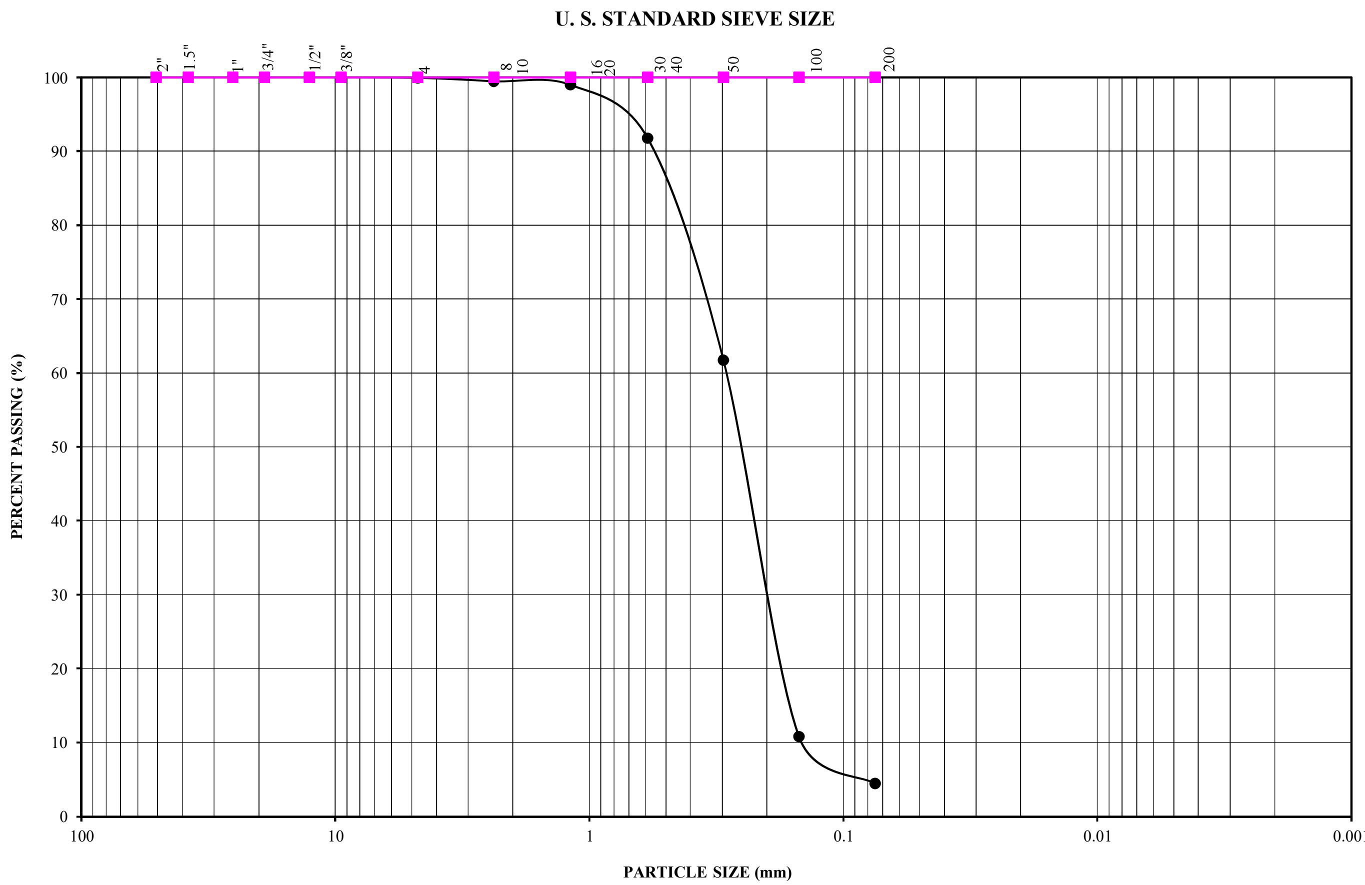
Sample Designation	Sample Depth (feet)	Symbol	Liquid Limit (%)	Plasticity Index	Classification
B-2	5-6.5	●	-	-	SP
B-2	15-16.5	■	-	-	GP
UES JOB NUMBER:		4830.2400025		FIGURE:	C-1



PARTICLE SIZE ANALYSIS

UES™

Sample Designation	Sample Depth (feet)	Symbol	Liquid Limit (%)	Plasticity Index	Classification
B-2	25-26.5	●	-	-	SP-SM
B-2	40-41.5	■	-	-	SP-SM
UES JOB NUMBER:		4830.2400025		FIGURE:	C-2



PARTICLE SIZE ANALYSIS

Sample Designation	Sample Depth (feet)	Symbol	Liquid Limit (%)	Plasticity Index	Classification
B-2	50-51.5	●	-	-	SP
-	-	■	-	-	-
UES JOB NUMBER:		4830.2400025		FIGURE:	C-3

LABORATORY COMPACTION OF SOIL (MOD.)

ASTM D 1557

Project Name:	2936 Camino Del Mar Geo	**Tested By :**	B.S.	**Date:**	5/20/24
Project Number:	4830.2400025.0000	**Calculated By :**	B.S.	**Date:**	5/20/24
Lab Number:	35841	**Sampled By:**	M.L.	**Date:**	5/16/24
Sample Location:	B-2	**Depth (ft.)**	2.5'-5'		
Sample Description:	Grey (SM)				

Moisture Added (ml)	50	100	0	150	
TEST NO.	1	2	3	4	
Wt. Comp. Soil + Mold (g)	3651	3663	3571	3598	
Wt. of Mold (g)	1995	1995	1995	1995	
Net Wt. of Soil (g)	1656	1668	1576	1603	
Wet Wt. of Soil + Cont. (g)	200.0	200.0	200.0	200.0	
Dry Wt. of Soil + Cont. (g)	189.5	186.0	193.0	182.5	
Wt. of Container (g)	0.0	0.0	0.0	0.0	
Moisture Content (%)	5.5	7.5	3.6	9.6	
Wet Density (pcf)	109.6	110.4	104.3	106.1	
Dry Density (pcf)	103.9	102.7	100.7	96.9	

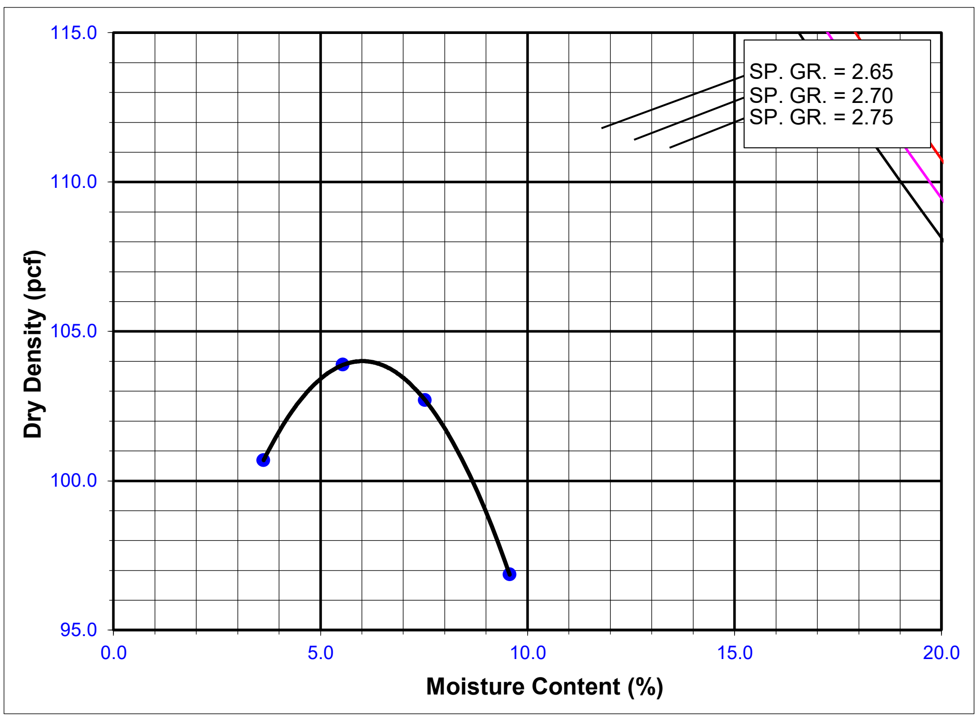
Preparation Method:	Dry	X
	Moist	
	Mechanical Rammer	X
	Manual Rammer	
Hammer Weight:	10.0 lb.	
Drop:	18 in.	
Mold Volume (ft.^{3}):	0.03330	

PROCEDURE USED

X **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if No.4 retained =/< 25%

Procedure B
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if 3/8" retained =/< 25%

Procedure C
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
May be used if 3/4" retained =/< 30%



OVERSIZE FRACTION

Total Sample Weight (g): 19963

Weight Retained (g)		Percent Retained
	Plus 3/4"	
	Plus 3/8"	
25	Plus #4	0.1

Maximum Dry Density (pcf)	**104.0**
Optimum Moisture Content (%)	**6.1**

Rock Correction Applied per ASTM D 4718

Maximum Dry Density (pcf)	**N/A**
Optimum Moisture Content (%)	**N/A**

APPENDIX D

STANDARD SPECIFICATIONS FOR GRADING

Section 1 - General

Construction Testing & Engineering, Inc. presents the following standard recommendations for grading and other associated operations on construction projects. These guidelines should be considered a portion of the project specifications. Recommendations contained in the body of the previously presented soils report shall supersede the recommendations and or requirements as specified herein. The project geotechnical consultant shall interpret disputes arising out of interpretation of the recommendations contained in the soils report or specifications contained herein.

Section 2 - Responsibilities of Project Personnel

The geotechnical consultant should provide observation and testing services sufficient to general conformance with project specifications and standard grading practices. The geotechnical consultant should report any deviations to the client or his authorized representative.

The Client should be chiefly responsible for all aspects of the project. He or his authorized representative has the responsibility of reviewing the findings and recommendations of the geotechnical consultant. He shall authorize or cause to have authorized the Contractor and/or other consultants to perform work and/or provide services. During grading the Client or his authorized representative should remain on-site or should remain reasonably accessible to all concerned parties in order to make decisions necessary to maintain the flow of the project.

The Contractor is responsible for the safety of the project and satisfactory completion of all grading and other associated operations on construction projects, including, but not limited to, earth work in accordance with the project plans, specifications and controlling agency requirements.

Section 3 - Preconstruction Meeting

A preconstruction site meeting should be arranged by the owner and/or client and should include the grading contractor, design engineer, geotechnical consultant, owner's representative and representatives of the appropriate governing authorities.

Section 4 - Site Preparation

The client or contractor should obtain the required approvals from the controlling authorities for the project prior, during and/or after demolition, site preparation and removals, etc. The appropriate approvals should be obtained prior to proceeding with grading operations.

Clearing and grubbing should consist of the removal of vegetation such as brush, grass, woods, stumps, trees, root of trees and otherwise deleterious natural materials from the areas to be graded. Clearing and grubbing should extend to the outside of all proposed excavation and fill areas.

Demolition should include removal of buildings, structures, foundations, reservoirs, utilities (including underground pipelines, septic tanks, leach fields, seepage pits, cisterns, mining shafts, tunnels, etc.) and other man-made surface and subsurface improvements from the areas to be graded. Demolition of utilities should include proper capping and/or rerouting pipelines at the project perimeter and cutoff and capping of wells in accordance with the requirements of the governing authorities and the recommendations of the geotechnical consultant at the time of demolition.

Trees, plants or man-made improvements not planned to be removed or demolished should be protected by the contractor from damage or injury.

Debris generated during clearing, grubbing and/or demolition operations should be wasted from areas to be graded and disposed off-site. Clearing, grubbing and demolition operations should be performed under the observation of the geotechnical consultant.

Section 5 - Site Protection

Protection of the site during the period of grading should be the responsibility of the contractor. Unless other provisions are made in writing and agreed upon among the concerned parties, completion of a portion of the project should not be considered to preclude that portion or adjacent areas from the requirements for site protection until such time as the entire project is complete as identified by the geotechnical consultant, the client and the regulating agencies.

Precautions should be taken during the performance of site clearing, excavations and grading to protect the work site from flooding, ponding or inundation by poor or improper surface drainage. Temporary provisions should be made during the rainy season to adequately direct surface drainage away from and off the work site. Where low areas cannot be avoided, pumps should be kept on hand to continually remove water during periods of rainfall.

Rain related damage should be considered to include, but may not be limited to, erosion, silting, saturation, swelling, structural distress and other adverse conditions as determined by the geotechnical consultant. Soil adversely affected should be classified as unsuitable materials and should be subject to overexcavation and replacement with compacted fill or other remedial grading as recommended by the geotechnical consultant.

The contractor should be responsible for the stability of all temporary excavations. Recommendations by the geotechnical consultant pertaining to temporary excavations (e.g., backcuts) are made in consideration of stability of the completed project and, therefore, should not be considered to preclude the responsibilities of the contractor. Recommendations by the geotechnical consultant should not be considered to preclude requirements that are more restrictive by the regulating agencies. The contractor should provide during periods of extensive rainfall plastic sheeting to prevent unprotected slopes from becoming saturated and unstable. When deemed appropriate by the geotechnical consultant or governing agencies the contractor shall install checkdams, desilting basins, sand bags or other drainage control measures.

In relatively level areas and/or slope areas, where saturated soil and/or erosion gullies exist to depths of greater than 1.0 foot; they should be overexcavated and replaced as compacted fill in accordance with the applicable specifications. Where affected materials exist to depths of 1.0 foot or less below proposed finished grade, remedial grading by moisture conditioning in-place, followed by thorough recompaction in accordance with the applicable grading guidelines herein may be attempted. If the desired results are not achieved, all affected materials should be overexcavated and replaced as compacted fill in accordance with the slope repair recommendations herein. If field conditions dictate, the geotechnical consultant may recommend other slope repair procedures.

Section 6 - Excavations

6.1 Unsuitable Materials

Materials that are unsuitable should be excavated under observation and recommendations of the geotechnical consultant. Unsuitable materials include, but may not be limited to, dry, loose, soft, wet, organic compressible natural soils and fractured, weathered, soft bedrock and nonengineered or otherwise deleterious fill materials.

Material identified by the geotechnical consultant as unsatisfactory due to its moisture conditions should be overexcavated; moisture conditioned as needed, to a uniform at or above optimum moisture condition before placement as compacted fill.

If during the course of grading adverse geotechnical conditions are exposed which were not anticipated in the preliminary soil report as determined by the geotechnical consultant additional exploration, analysis, and treatment of these problems may be recommended.

6.2 Cut Slopes

Unless otherwise recommended by the geotechnical consultant and approved by the regulating agencies, permanent cut slopes should not be steeper than 2:1 (horizontal: vertical).

The geotechnical consultant should observe cut slope excavation and if these excavations expose loose cohesionless, significantly fractured or otherwise unsuitable material, the materials should be overexcavated and replaced with a compacted stabilization fill. If encountered specific cross section details should be obtained from the Geotechnical Consultant.

When extensive cut slopes are excavated or these cut slopes are made in the direction of the prevailing drainage, a non-erodible diversion swale (brow ditch) should be provided at the top of the slope.

6.3 Pad Areas

All lot pad areas, including side yard terrace containing both cut and fill materials, transitions, located less than 3 feet deep should be overexcavated to a depth of 3 feet and replaced with a uniform compacted fill blanket of 3 feet. Actual depth of overexcavation may vary and should be delineated by the geotechnical consultant during grading, especially where deep or drastic transitions are present.

For pad areas created above cut or natural slopes, positive drainage should be established away from the top-of-slope. This may be accomplished utilizing a berm drainage swale and/or an appropriate pad gradient. A gradient in soil areas away from the top-of-slopes of 2 percent or greater is recommended.

Section 7 - Compacted Fill

All fill materials should have fill quality, placement, conditioning and compaction as specified below or as approved by the geotechnical consultant.

7.1 Fill Material Quality

Excavated on-site or import materials which are acceptable to the geotechnical consultant may be utilized as compacted fill, provided trash, vegetation and other deleterious materials are removed prior to placement. All import materials anticipated for use on-site should be sampled tested and approved prior to and placement is in conformance with the requirements outlined.

Rocks 12 inches in maximum and smaller may be utilized within compacted fill provided sufficient fill material is placed and thoroughly compacted over and around all rock to effectively fill rock voids. The amount of rock should not exceed 40 percent by dry weight passing the 3/4-inch sieve. The geotechnical consultant may vary those requirements as field conditions dictate.

Where rocks greater than 12 inches but less than four feet of maximum dimension are generated during grading, or otherwise desired to be placed within an engineered fill, special handling in accordance with the recommendations below. Rocks greater than four feet should be broken down or disposed off-site.

7.2 Placement of Fill

Prior to placement of fill material, the geotechnical consultant should observe and approve the area to receive fill. After observation and approval, the exposed ground surface should be scarified to a depth of 6 to 8 inches. The scarified material should be conditioned (i.e. moisture added or air dried by continued discing) to achieve a moisture content at or slightly above optimum moisture conditions and compacted to a minimum of 90 percent of the maximum density or as otherwise recommended in the soils report or by appropriate government agencies.

Compacted fill should then be placed in thin horizontal lifts not exceeding eight inches in loose thickness prior to compaction. Each lift should be moisture conditioned as needed, thoroughly blended to achieve a consistent moisture content at or slightly above optimum and thoroughly compacted by mechanical methods to a minimum of 90 percent of laboratory maximum dry density. Each lift should be treated in a like manner until the desired finished grades are achieved.

The contractor should have suitable and sufficient mechanical compaction equipment and watering apparatus on the job site to handle the amount of fill being placed in consideration of moisture retention properties of the materials and weather conditions.

When placing fill in horizontal lifts adjacent to areas sloping steeper than 5:1 (horizontal: vertical), horizontal keys and vertical benches should be excavated into the adjacent slope area. Keying and benching should be sufficient to provide at least six-foot wide benches and a minimum of four feet of vertical bench height within the firm natural ground, firm bedrock or engineered compacted fill. No compacted fill should be placed in an area after keying and benching until the geotechnical consultant has reviewed the area. Material generated by the benching operation should be moved sufficiently away from the bench area to allow for the recommended review of the horizontal bench prior to placement of fill.

Within a single fill area where grading procedures dictate two or more separate fills, temporary slopes (false slopes) may be created. When placing fill adjacent to a false slope, benching should be conducted in the same manner as above described. At least a 3-foot vertical bench should be established within the firm core of adjacent approved compacted fill prior to placement of additional fill. Benching should proceed in at least 3-foot vertical increments until the desired finished grades are achieved.

Prior to placement of additional compacted fill following an overnight or other grading delay, the exposed surface or previously compacted fill should be processed by scarification, moisture conditioning as needed to at or slightly above optimum moisture content, thoroughly blended and recompacted to a minimum of 90 percent of laboratory maximum dry density. Where unsuitable materials exist to depths of greater than one foot, the unsuitable materials should be over-excavated.

Following a period of flooding, rainfall or overwatering by other means, no additional fill should be placed until damage assessments have been made and remedial grading performed as described herein.

Rocks 12 inch in maximum dimension and smaller may be utilized in the compacted fill provided the fill is placed and thoroughly compacted over and around all rock. No oversize material should be used within 3 feet of finished pad grade and within 1 foot of other compacted fill areas. Rocks 12 inches up to four feet maximum dimension should be placed below the upper 10 feet of any fill and should not be closer than 15 feet to any slope face. These recommendations could vary as locations of improvements dictate. Where practical, oversized material should not be placed below areas where structures or deep utilities are proposed. Oversized material should be placed in windrows on a clean, overexcavated or unyielding compacted fill or firm natural ground surface. Select native or imported granular soil (S.E. 30 or higher) should be placed and thoroughly flooded over and around all windrowed rock, such that voids are filled. Windrows of oversized material should be staggered so those successive strata of oversized material are not in the same vertical plane.

It may be possible to dispose of individual larger rock as field conditions dictate and as recommended by the geotechnical consultant at the time of placement.

The contractor should assist the geotechnical consultant and/or his representative by digging test pits for removal determinations and/or for testing compacted fill. The contractor should provide this work at no additional cost to the owner or contractor's client.

Fill should be tested by the geotechnical consultant for compliance with the recommended relative compaction and moisture conditions. Field density testing should conform to ASTM Method of Test D 1556-00, D 2922-04. Tests should be conducted at a minimum of approximately two vertical feet or approximately 1,000 to 2,000 cubic yards of fill placed. Actual test intervals may vary as field conditions dictate. Fill found not to be in conformance with the grading recommendations should be removed or otherwise handled as recommended by the geotechnical consultant.

7.3 Fill Slopes

Unless otherwise recommended by the geotechnical consultant and approved by the regulating agencies, permanent fill slopes should not be steeper than 2:1 (horizontal: vertical).

Except as specifically recommended in these grading guidelines compacted fill slopes should be over-built two to five feet and cut back to grade, exposing the firm, compacted fill inner core. The actual amount of overbuilding may vary as field conditions dictate. If the desired results are not achieved, the existing slopes should be overexcavated and reconstructed under the guidelines of the geotechnical consultant. The degree of overbuilding shall be increased until the desired compacted slope surface condition is achieved. Care should be taken by the contractor to provide thorough mechanical compaction to the outer edge of the overbuilt slope surface.

At the discretion of the geotechnical consultant, slope face compaction may be attempted by conventional construction procedures including backrolling. The procedure must create a firmly compacted material throughout the entire depth of the slope face to the surface of the previously compacted firm fill intercore.

During grading operations, care should be taken to extend compactive effort to the outer edge of the slope. Each lift should extend horizontally to the desired finished slope surface or more as needed to ultimately established desired grades. Grade during construction should not be allowed to roll off at the edge of the slope. It may be helpful to elevate slightly the outer edge of the slope. Slough resulting from the placement of individual lifts should not be allowed to drift down over previous lifts. At intervals not exceeding four feet in vertical slope height or the capability of available equipment, whichever is less, fill slopes should be thoroughly dozer trackrolled.

For pad areas above fill slopes, positive drainage should be established away from the top-of-slope. This may be accomplished using a berm and pad gradient of at least two percent.

Section 8 - Trench Backfill

Utility and/or other excavation of trench backfill should, unless otherwise recommended, be compacted by mechanical means. Unless otherwise recommended, the degree of compaction should be a minimum of 90 percent of the laboratory maximum density.

Within slab areas, but outside the influence of foundations, trenches up to one foot wide and two feet deep may be backfilled with sand and consolidated by jetting, flooding or by mechanical means. If on-site materials are utilized, they should be wheel-rolled, tamped or otherwise compacted to a firm condition. For minor interior trenches, density testing may be deleted or spot testing may be elected if deemed necessary, based on review of backfill operations during construction.

If utility contractors indicate that it is undesirable to use compaction equipment in close proximity to a buried conduit, the contractor may elect the utilization of light weight mechanical compaction equipment and/or shading of the conduit with clean, granular material, which should be thoroughly jetted in-place above the conduit, prior to initiating mechanical compaction procedures. Other methods of utility trench compaction may also be appropriate, upon review of the geotechnical consultant at the time of construction.

In cases where clean granular materials are proposed for use in lieu of native materials or where flooding or jetting is proposed, the procedures should be considered subject to review by the geotechnical consultant. Clean granular backfill and/or bedding are not recommended in slope areas.

Section 9 - Drainage

Where deemed appropriate by the geotechnical consultant, canyon subdrain systems should be installed in accordance with CTE's recommendations during grading.

Typical subdrains for compacted fill buttresses, slope stabilization or sidehill masses, should be installed in accordance with the specifications.

Roof, pad and slope drainage should be directed away from slopes and areas of structures to suitable disposal areas via non-erodible devices (i.e., gutters, downspouts, and concrete swales).

For drainage in extensively landscaped areas near structures, (i.e., within four feet) a minimum of 5 percent gradient away from the structure should be maintained. Pad drainage of at least 2 percent should be maintained over the remainder of the site.

Drainage patterns established at the time of fine grading should be maintained throughout the life of the project. Property owners should be made aware that altering drainage patterns could be detrimental to slope stability and foundation performance.

Section 10 - Slope Maintenance

10.1 - Landscape Plants

To enhance surficial slope stability, slope planting should be accomplished at the completion of grading. Slope planting should consist of deep-rooting vegetation requiring little watering. Plants native to the southern California area and plants relative to native plants are generally desirable. Plants native to other semi-arid and arid areas may also be appropriate. A Landscape Architect should be the best party to consult regarding actual types of plants and planting configuration.

10.2 - Irrigation

Irrigation pipes should be anchored to slope faces, not placed in trenches excavated into slope faces.

Slope irrigation should be minimized. If automatic timing devices are utilized on irrigation systems, provisions should be made for interrupting normal irrigation during periods of rainfall.

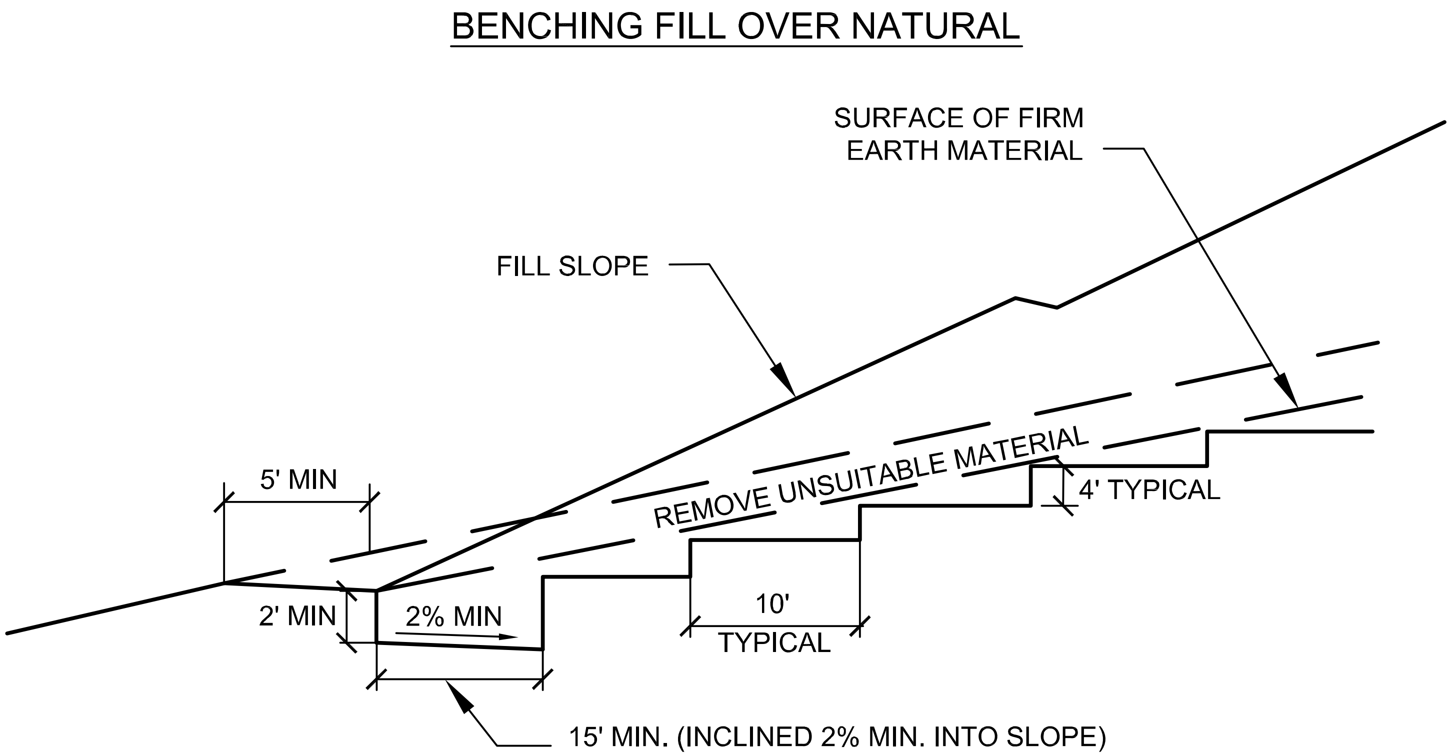
10.3 - Repair

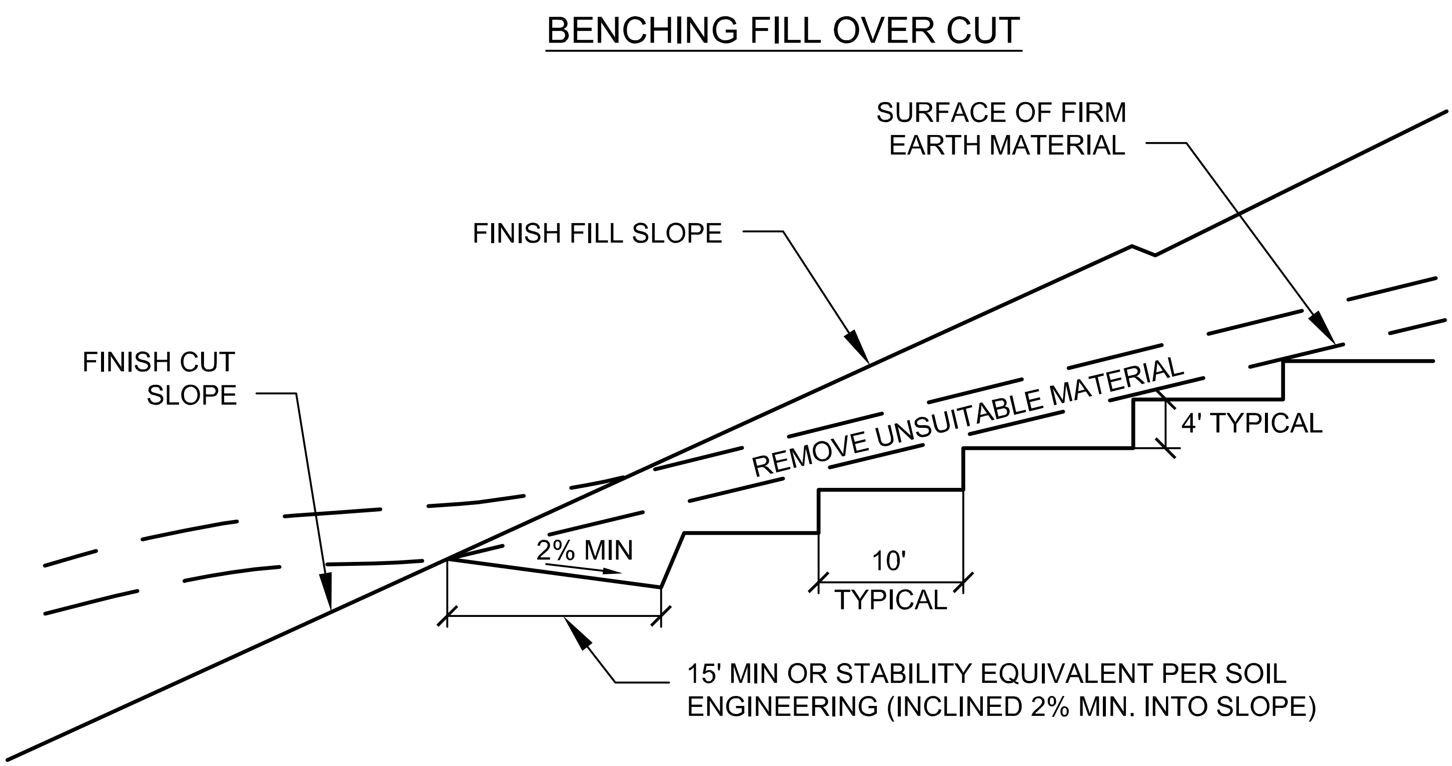
As a precautionary measure, plastic sheeting should be readily available, or kept on hand, to protect all slope areas from saturation by periods of heavy or prolonged rainfall. This measure is strongly recommended, beginning with the period prior to landscape planting.

If slope failures occur, the geotechnical consultant should be contacted for a field review of site conditions and development of recommendations for evaluation and repair.

If slope failures occur as a result of exposure to period of heavy rainfall, the failure areas and currently unaffected areas should be covered with plastic sheeting to protect against additional saturation.

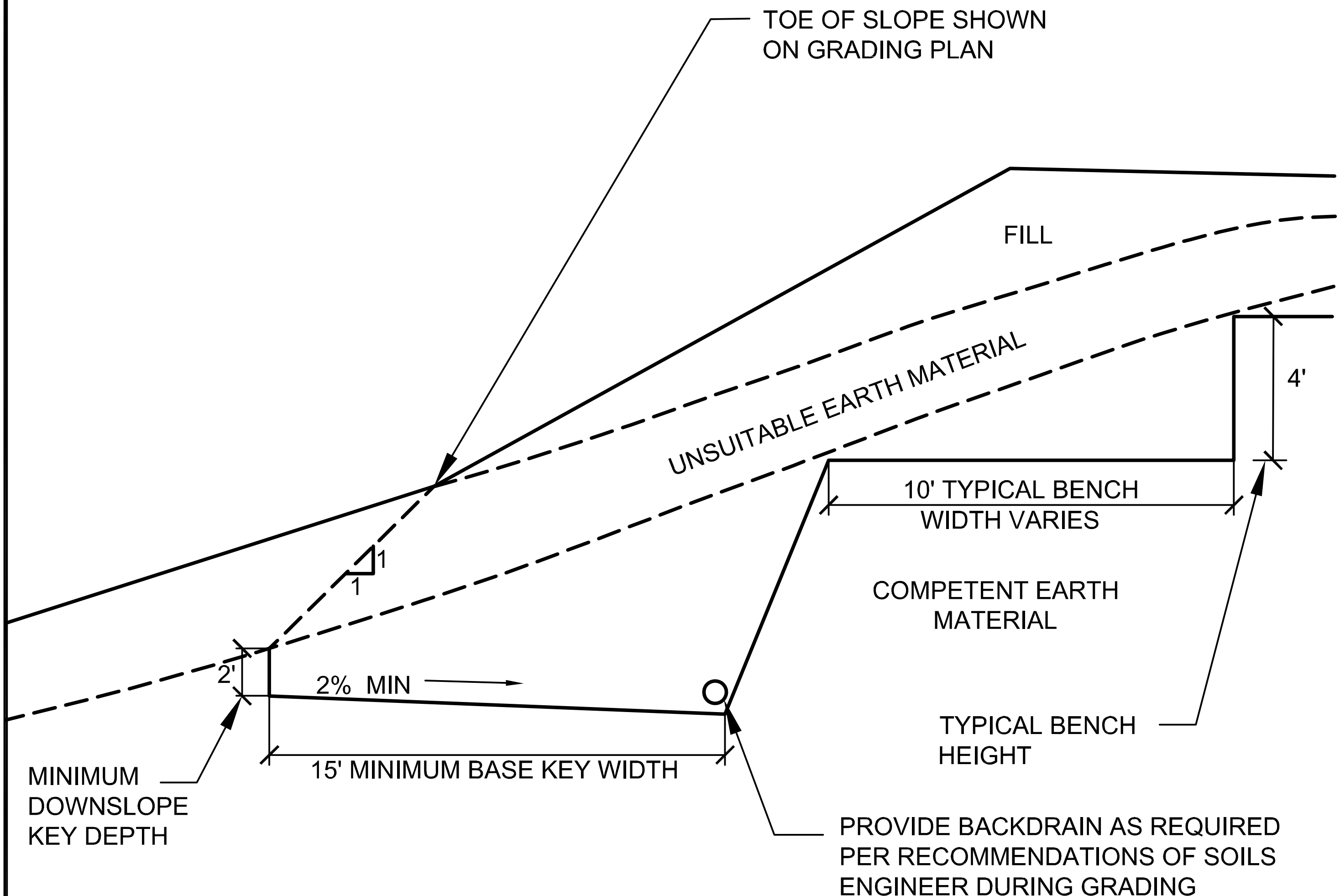
In the accompanying Standard Details, appropriate repair procedures are illustrated for superficial slope failures (i.e., occurring typically within the outer one foot to three feet of a slope face).





NOT TO SCALE

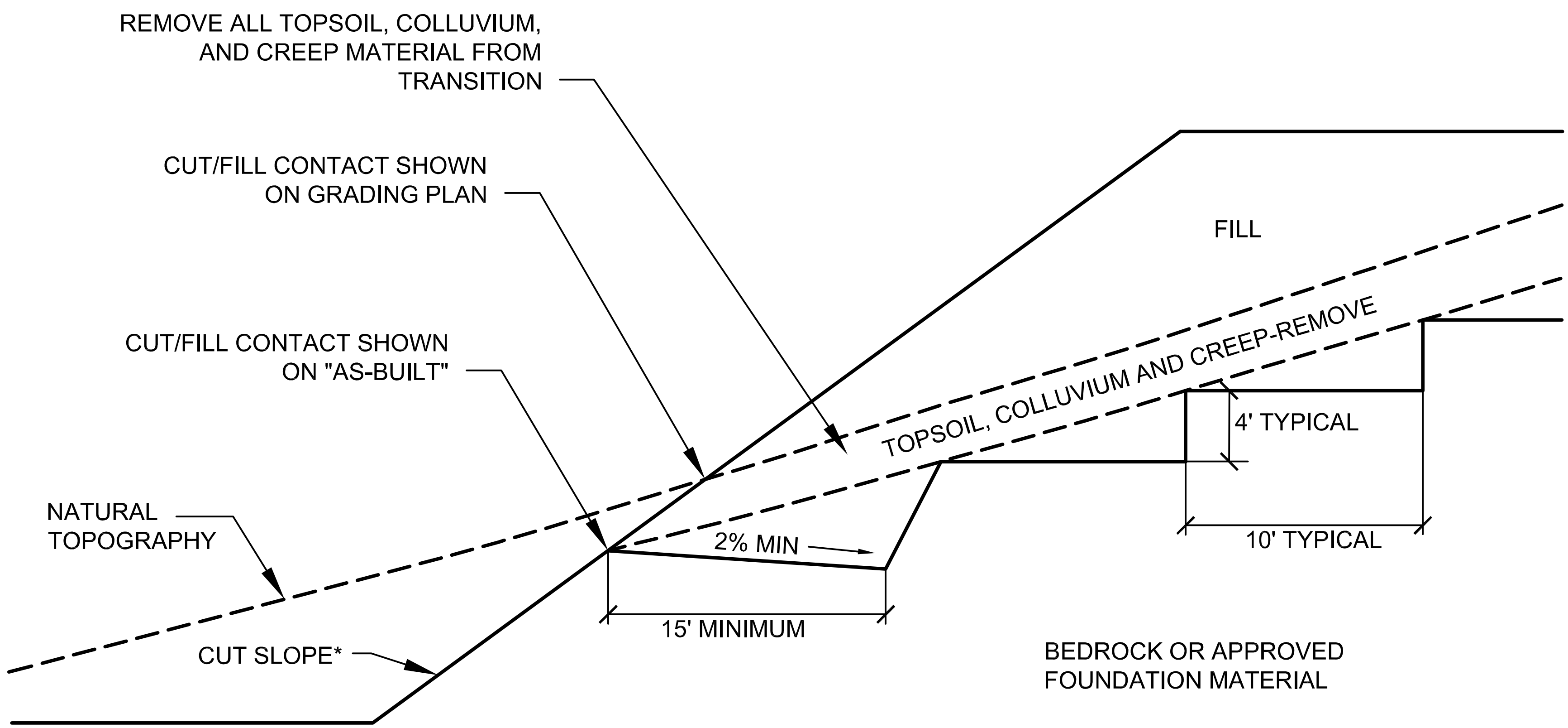
BENCHING FOR COMPACTED FILL DETAIL



WHERE NATURAL SLOPE GRADIENT IS 5:1 OR LESS, BENCHING IS NOT NECESSARY. FILL IS NOT TO BE PLACED ON COMPRESSIBLE OR UNSUITABLE MATERIAL.

NOT TO SCALE

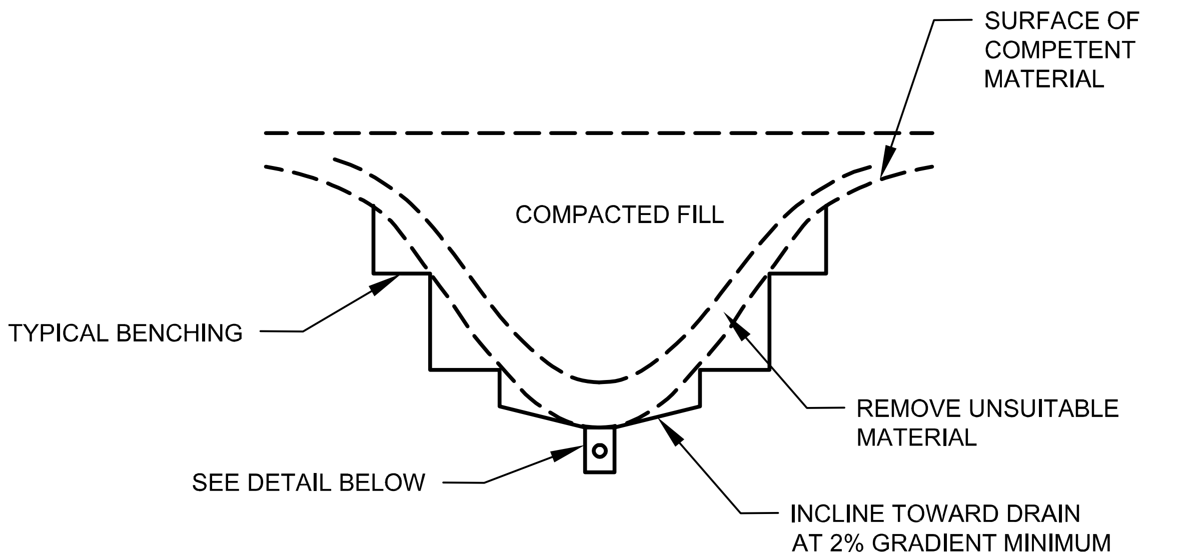
FILL SLOPE ABOVE NATURAL GROUND DETAIL



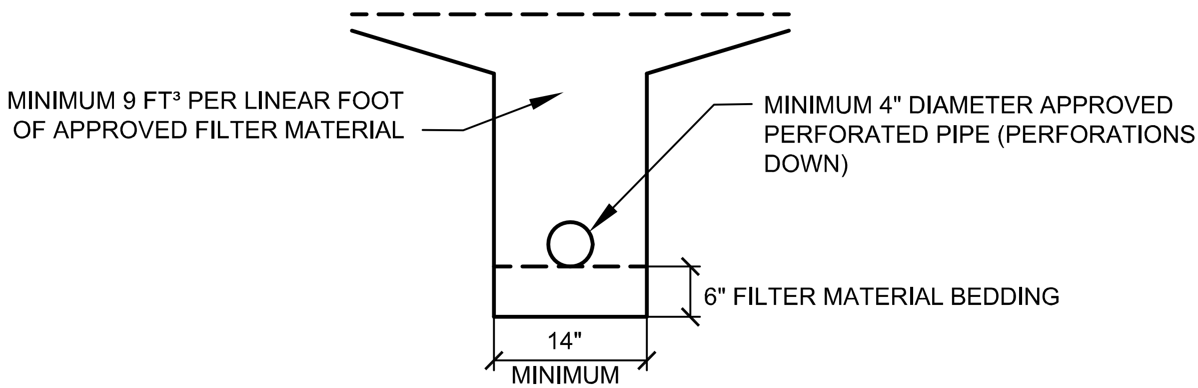
*NOTE: CUT SLOPE PORTION SHOULD BE MADE PRIOR TO PLACEMENT OF FILL

NOT TO SCALE

FILL SLOPE ABOVE CUT SLOPE DETAIL



DETAIL



CALTRANS CLASS 2 PERMEABLE MATERIAL
FILTER MATERIAL TO MEET FOLLOWING
SPECIFICATION OR APPROVED EQUAL:

SIEVE SIZE	PERCENTAGE PASSING
1"	100
¾"	90-100
⅜"	40-100
NO. 4	25-40
NO. 8	18-33
NO. 30	5-15
NO. 50	0-7
NO. 200	0-3

APPROVED PIPE TO BE SCHEDULE 40 POLY-VINYL-CHLORIDE (P.V.C.) OR APPROVED EQUAL. MINIMUM CRUSH STRENGTH 1000 psi

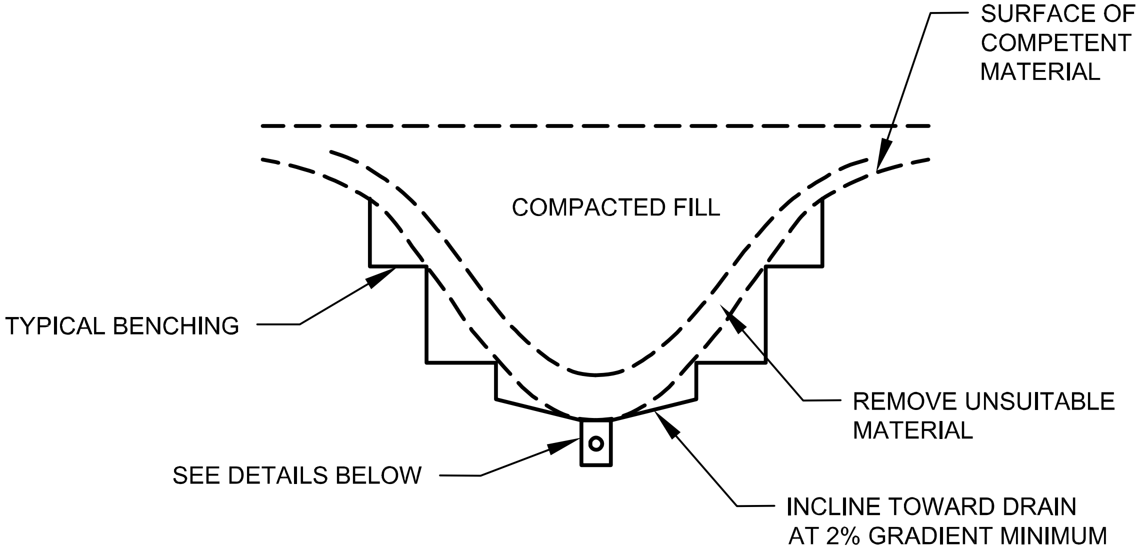
PIPE DIAMETER TO MEET THE FOLLOWING CRITERIA, SUBJECT TO FIELD REVIEW BASED ON ACTUAL GEOTECHNICAL CONDITIONS ENCOUNTERED DURING GRADING

LENGTH OF RUN	PIPE DIAMETER
INITIAL 500'	4"
500' TO 1500'	6"
> 1500'	8"

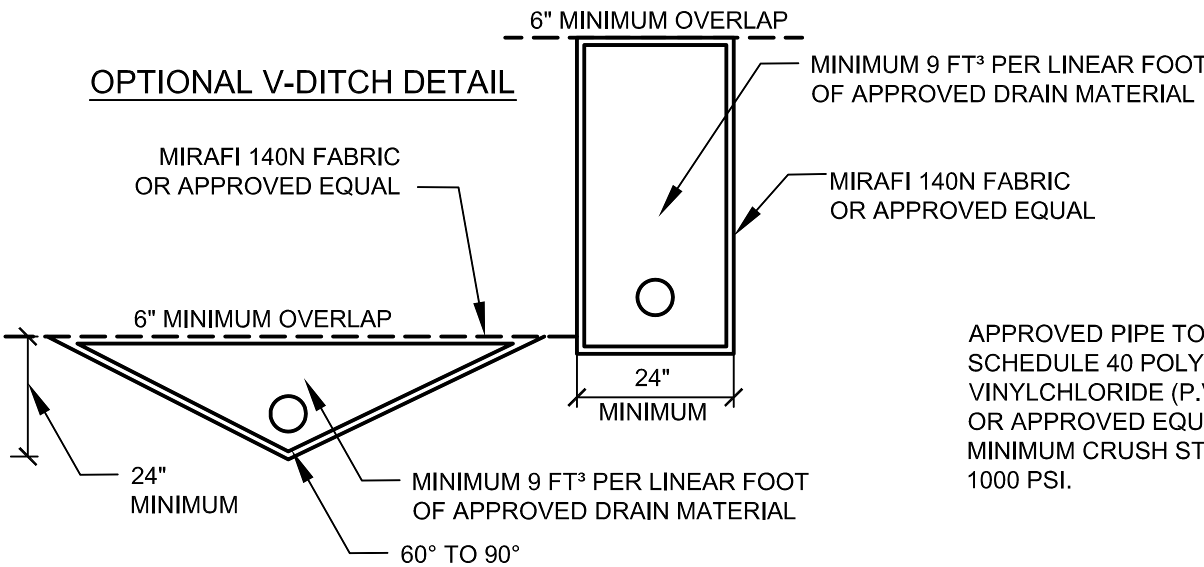
NOT TO SCALE

TYPICAL CANYON SUBDRAIN DETAIL

CANYON SUBDRAIN DETAILS



TRENCH DETAILS



APPROVED PIPE TO BE SCHEDULE 40 POLY-VINYLCHLORIDE (P.V.C.) OR APPROVED EQUAL. MINIMUM CRUSH STRENGTH 1000 PSI.

DRAIN MATERIAL TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUAL:

SIEVE SIZE	PERCENTAGE PASSING
1 ½"	88-100
1"	5-40
¾"	0-17
⅜"	0-7
NO. 200	0-3

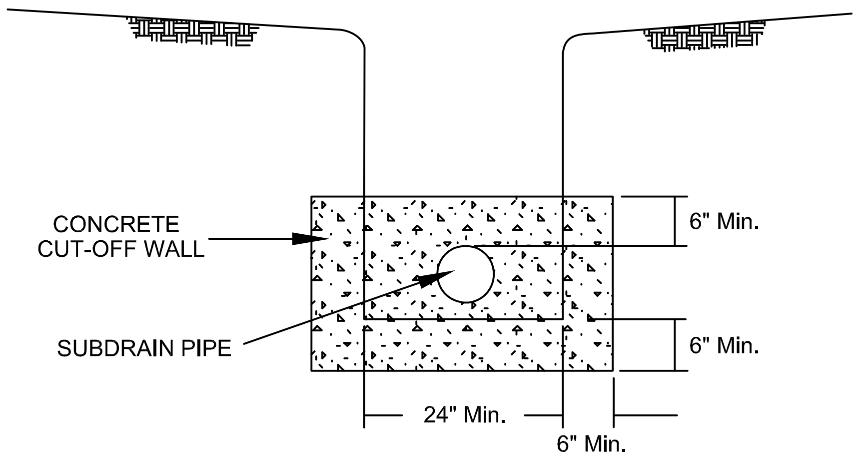
PIPE DIAMETER TO MEET THE FOLLOWING CRITERIA, SUBJECT TO FIELD REVIEW BASED ON ACTUAL GEOTECHNICAL CONDITIONS ENCOUNTERED DURING GRADING

LENGTH OF RUN	PIPE DIAMETER
INITIAL 500'	4"
500' TO 1500'	6"
> 1500'	8"

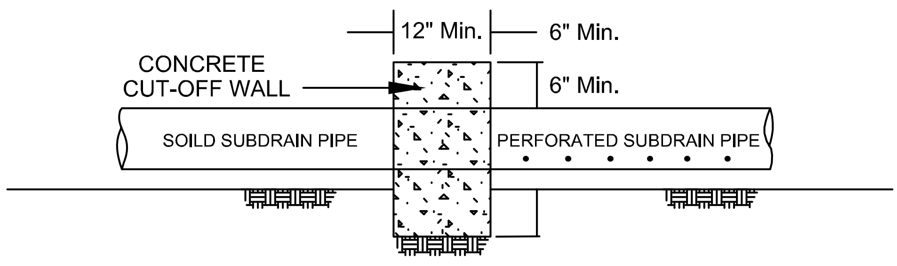
NOT TO SCALE

GEOFABRIC SUBDRAIN

FRONT VIEW

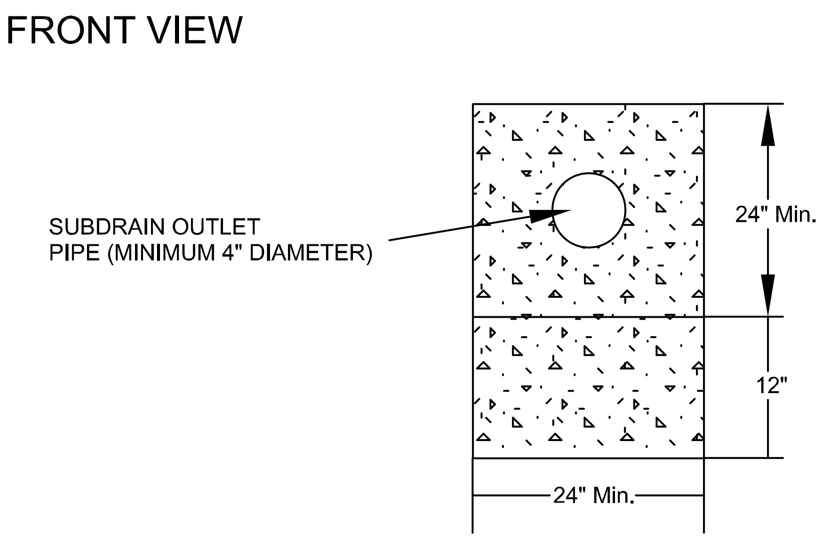


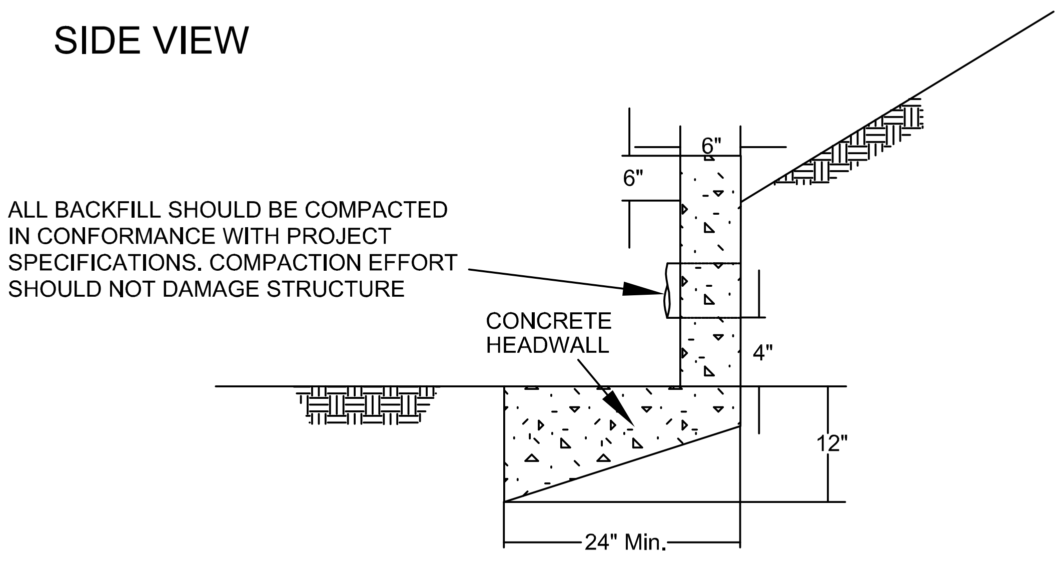
SIDE VIEW



NOT TO SCALE

RECOMMENDED SUBDRAIN CUT-OFF WALL





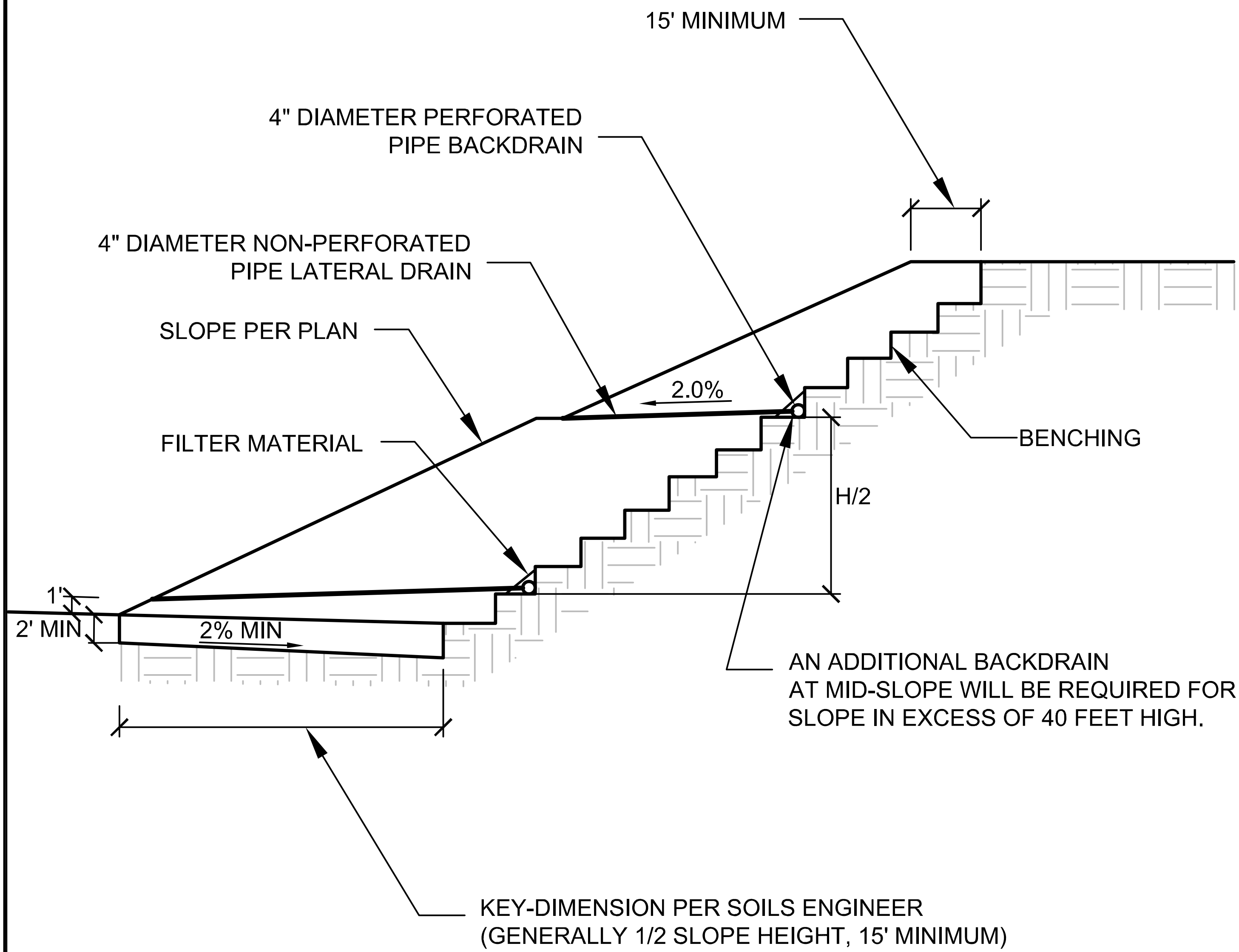
NOTE: HEADWALL SHOULD OUTLET AT TOE OF SLOPE OR INTO CONTROLLED SURFACE DRAINAGE DEVICE

ALL DISCHARGE SHOULD BE CONTROLLED

THIS DETAIL IS A MINIMUM DESIGN AND MAY BE MODIFIED DEPENDING UPON ENCOUNTERED CONDITIONS AND LOCAL REQUIREMENTS

NOT TO SCALE

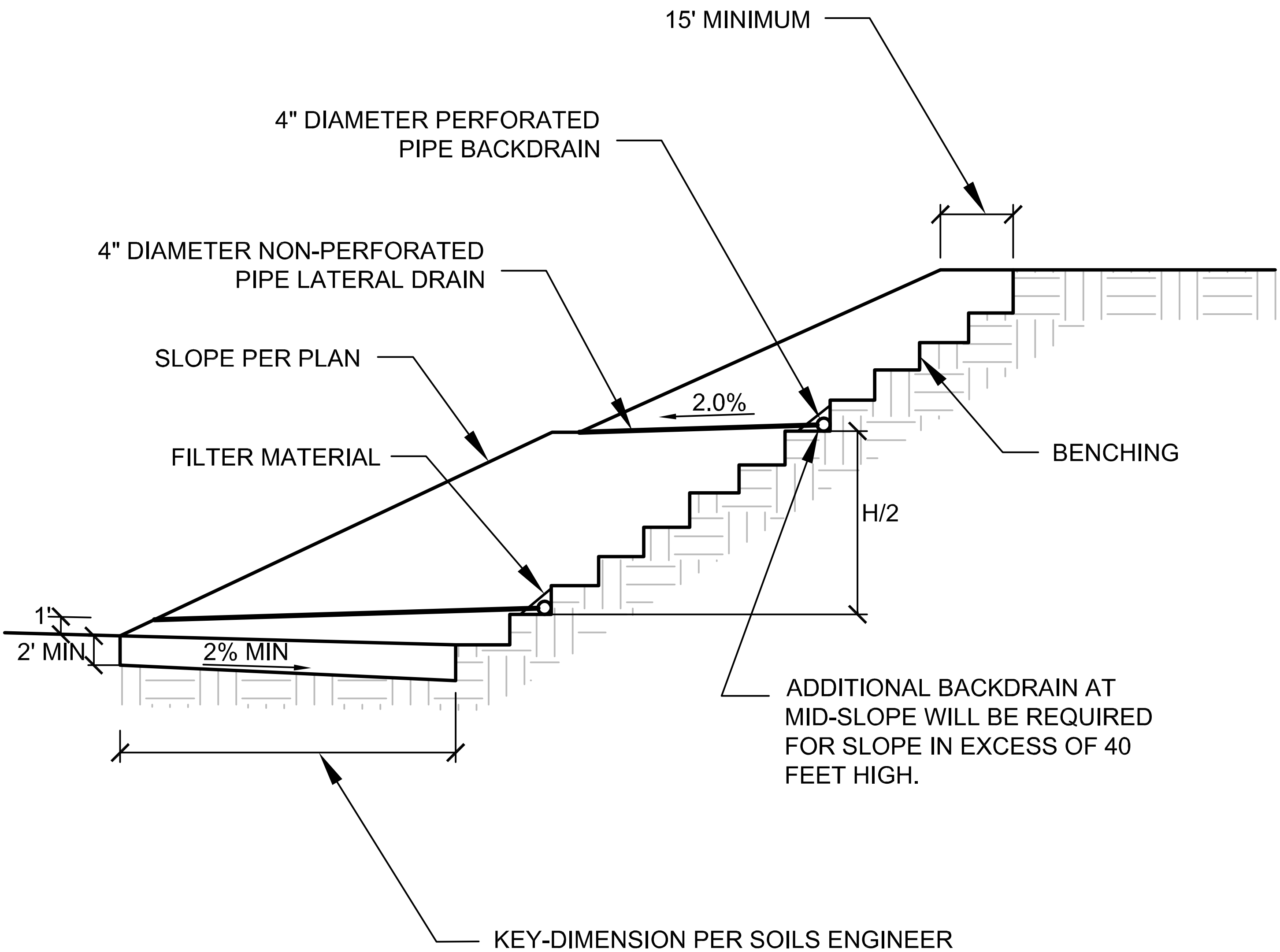
TYPICAL SUBDRAIN OUTLET HEADWALL DETAIL



DIMENSIONS ARE MINIMUM RECOMMENDED

NOT TO SCALE

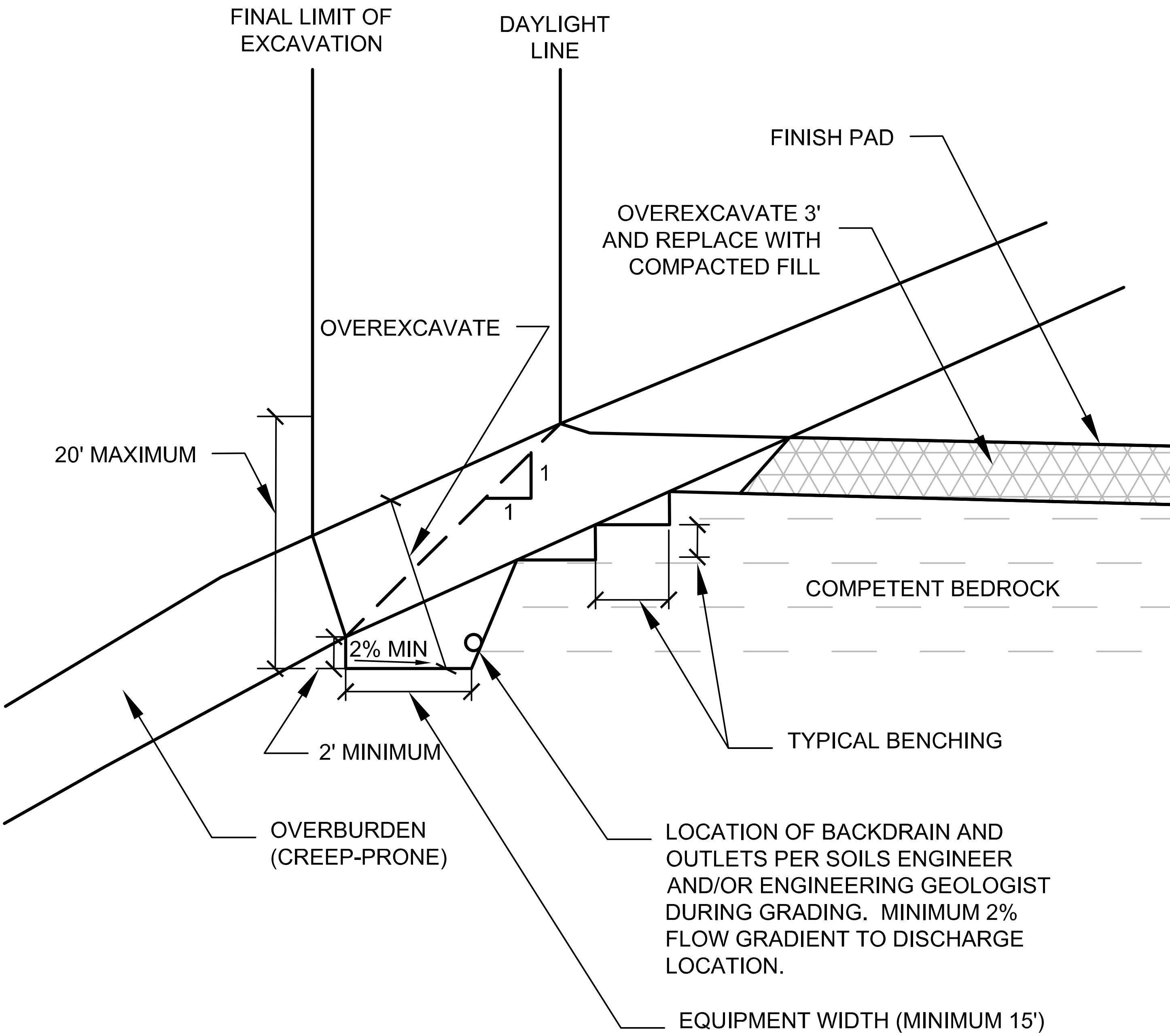
TYPICAL SLOPE STABILIZATION FILL DETAIL



DIMENSIONS ARE MINIMUM RECOMMENDED

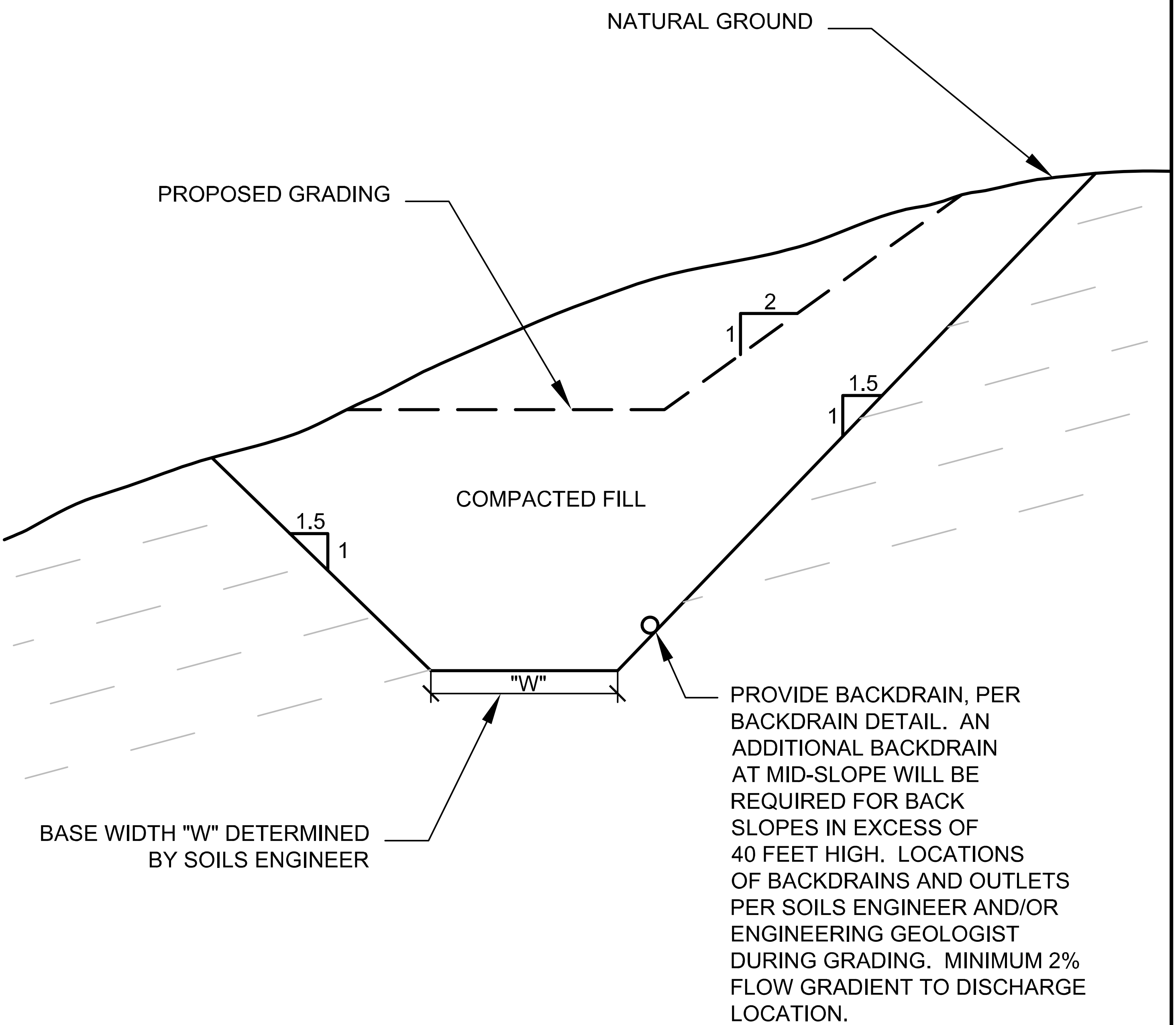
NOT TO SCALE

TYPICAL BUTTRESS FILL DETAIL



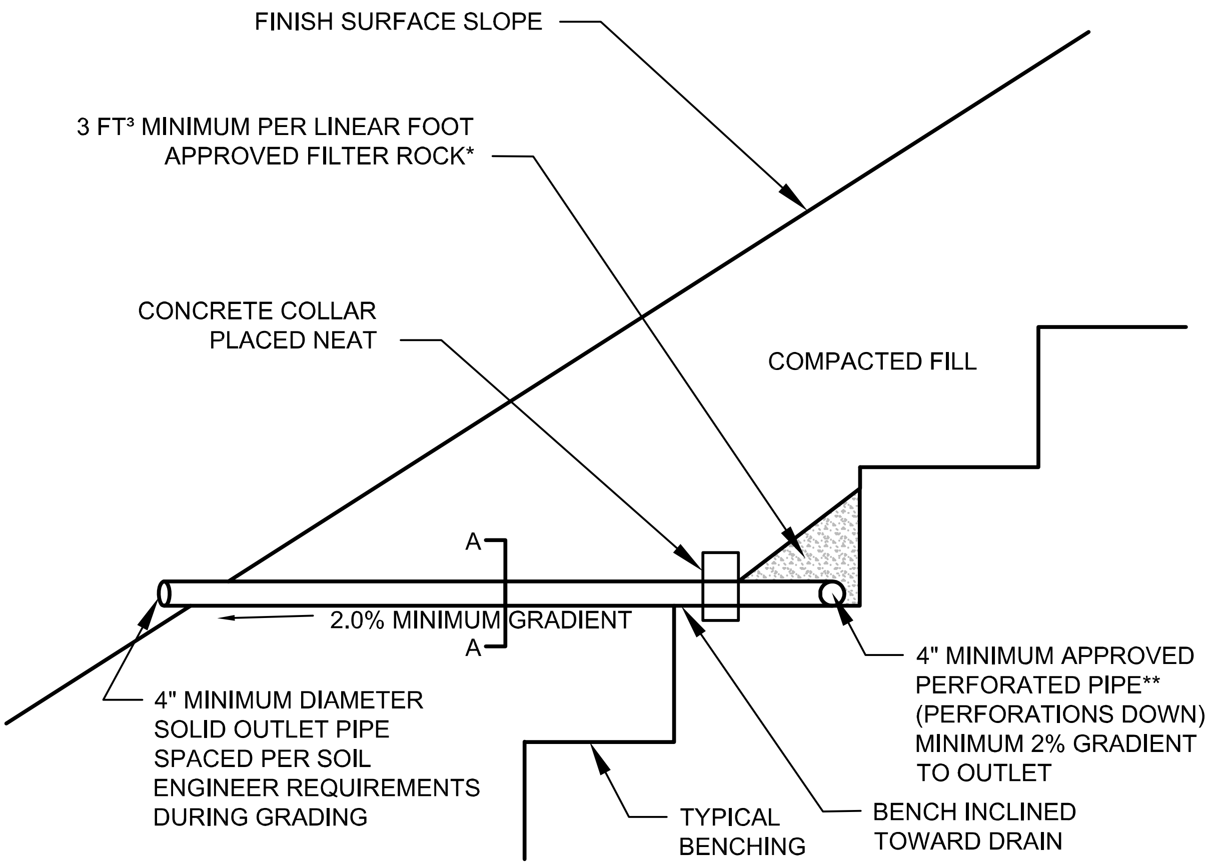
NOT TO SCALE

DAYLIGHT SHEAR KEY DETAIL

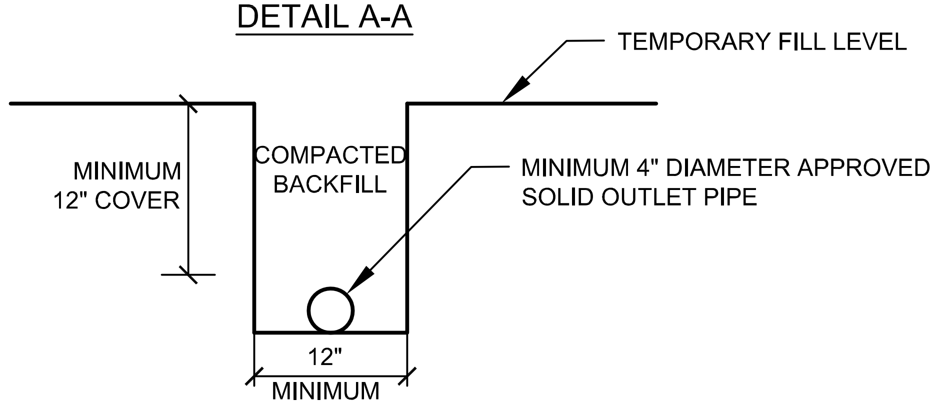


NOT TO SCALE

TYPICAL SHEAR KEY DETAIL



DETAIL A-A



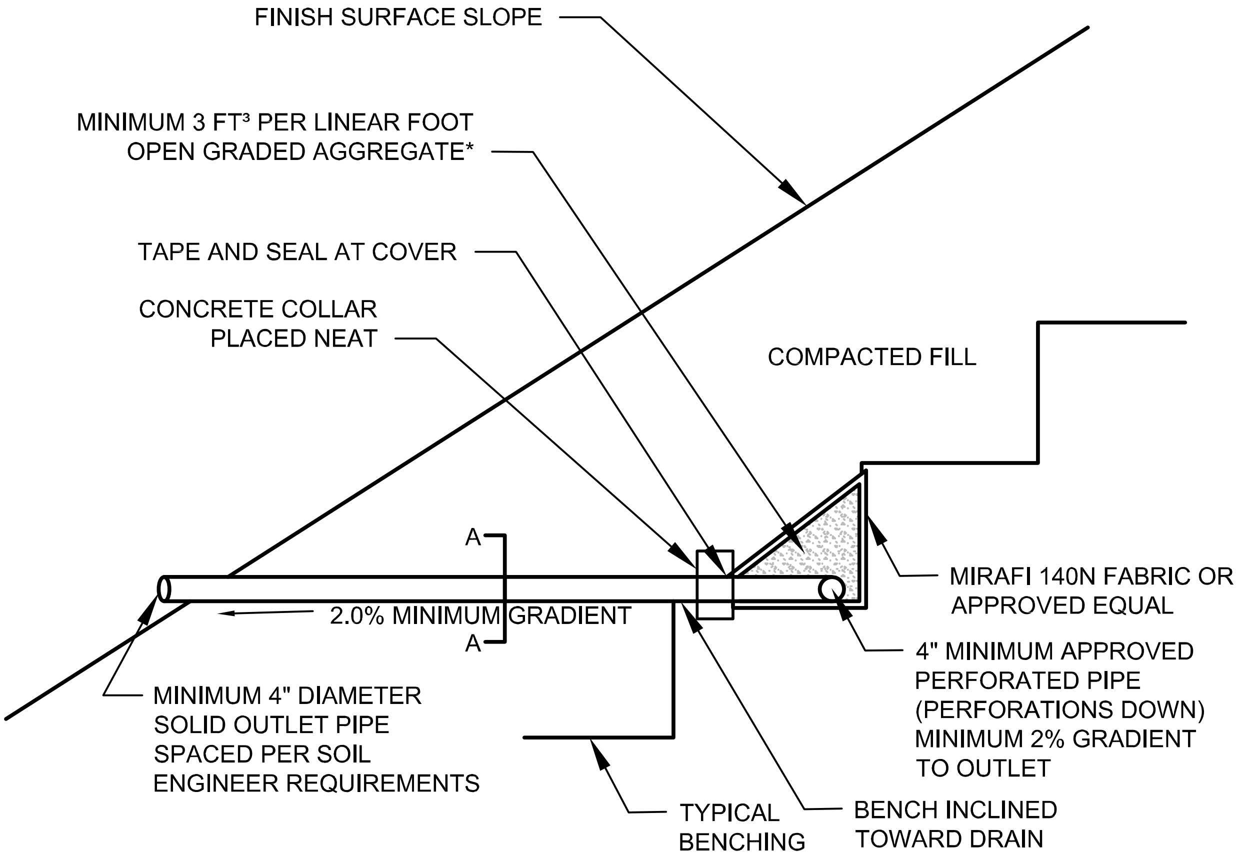
**APPROVED PIPE TYPE:
SCHEDULE 40 POLYVINYL CHLORIDE
(P.V.C.) OR APPROVED EQUAL.
MINIMUM CRUSH STRENGTH 1000 PSI

*FILTER ROCK TO MEET FOLLOWING
SPECIFICATIONS OR APPROVED EQUAL:

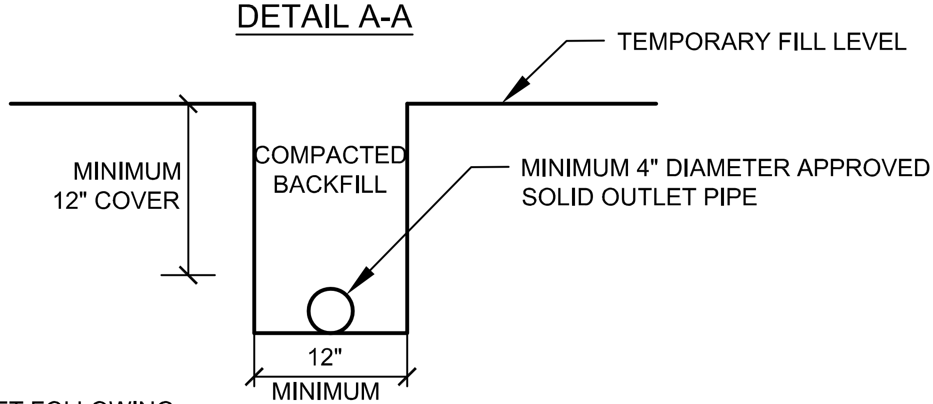
SIEVE SIZE	PERCENTAGE PASSING
1"	100
¾"	90-100
⅜"	40-100
NO. 4	25-40
NO. 30	5-15
NO. 50	0-7
NO. 200	0-3

NOT TO SCALE

TYPICAL BACKDRAIN DETAIL



DETAIL A-A

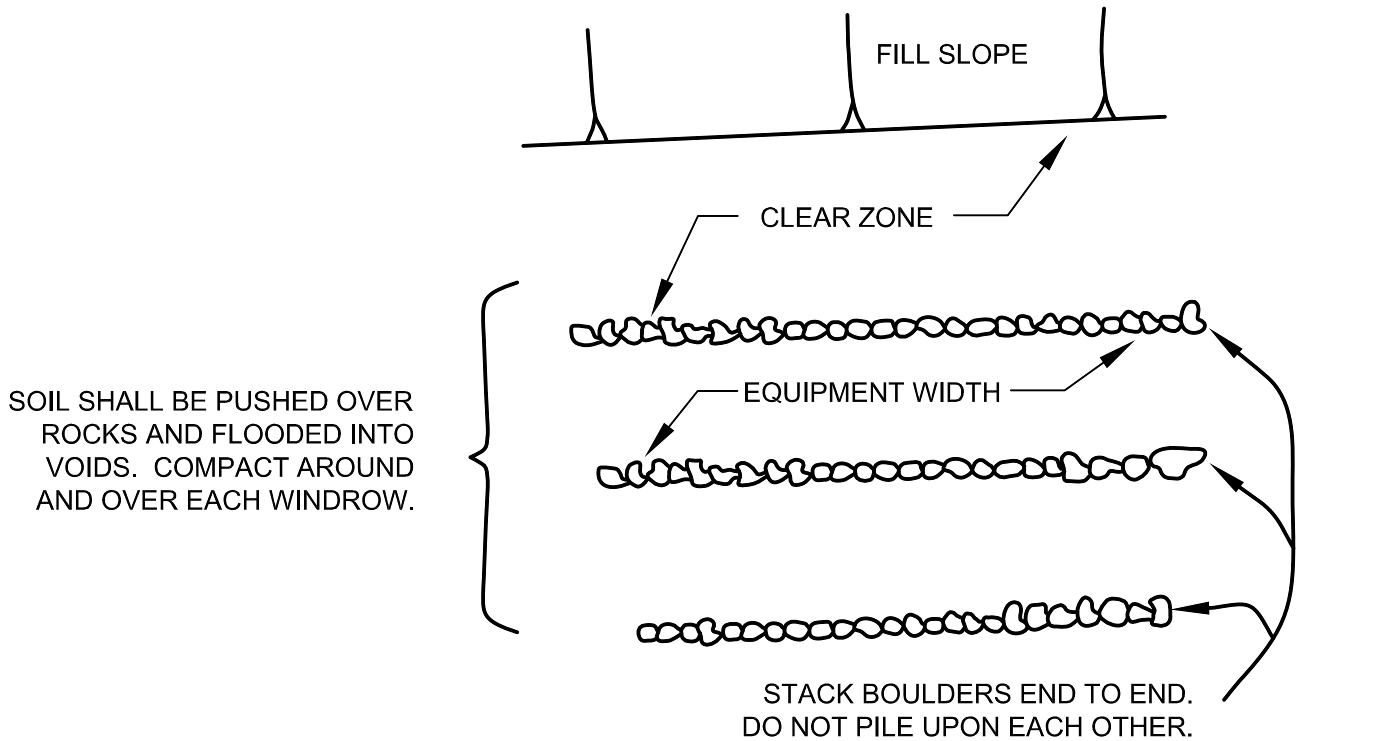


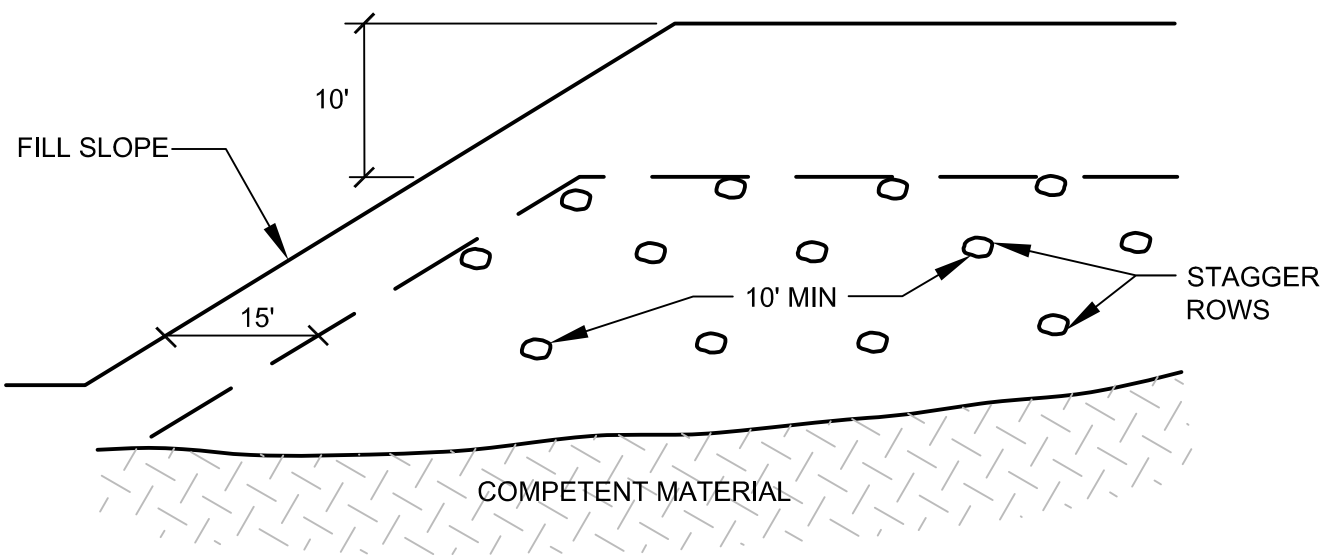
*NOTE: AGGREGATE TO MEET FOLLOWING SPECIFICATIONS OR APPROVED EQUAL:

SIEVE SIZE	PERCENTAGE PASSING
1 ½"	100
1"	5-40
¾"	0-17
⅜"	0-7
NO. 200	0-3

NOT TO SCALE

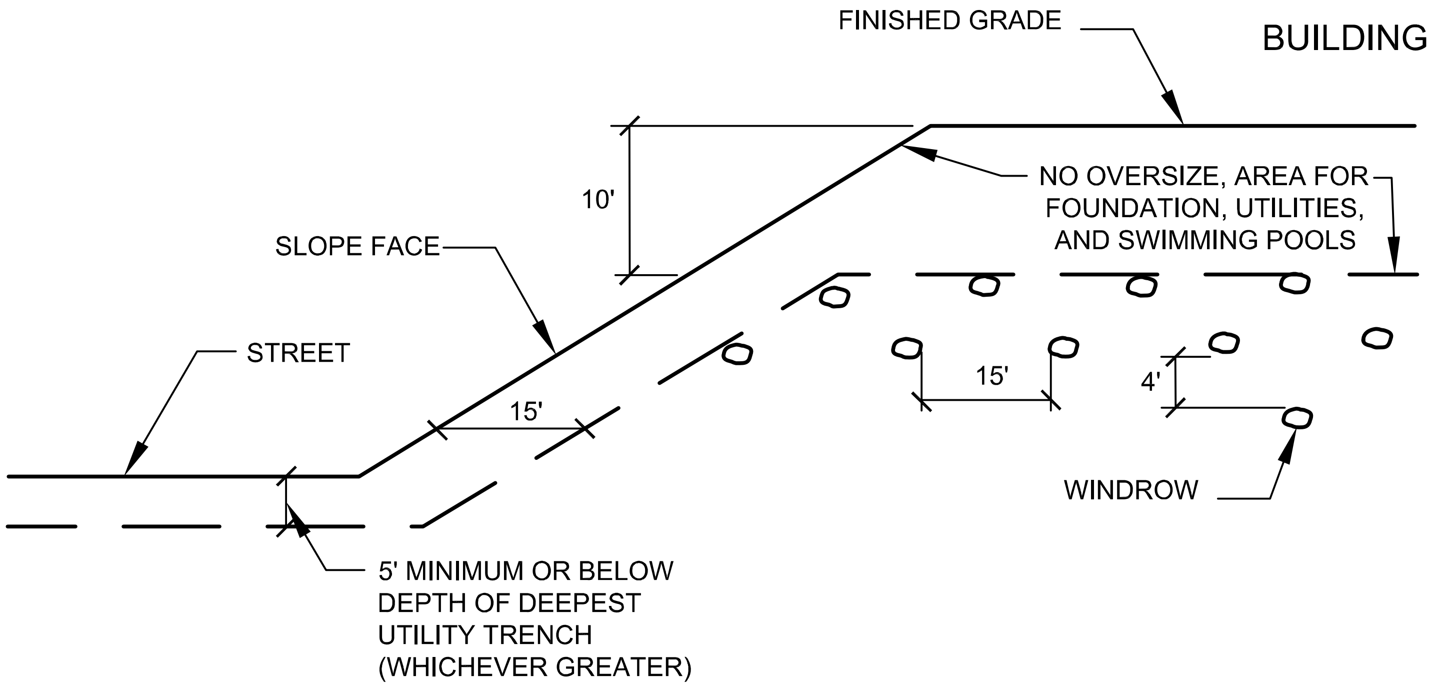
BACKDRAIN DETAIL (GEOFRABIC)



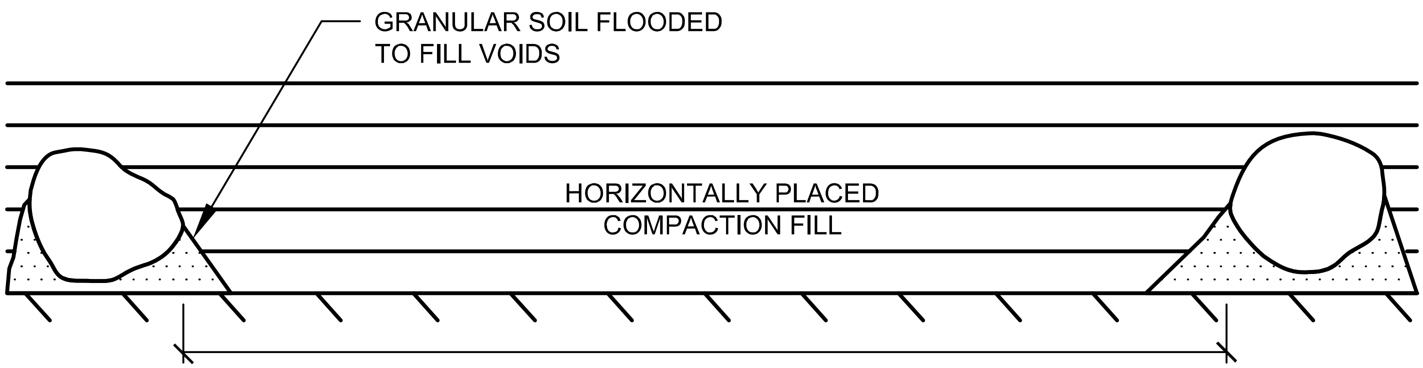


NOT TO SCALE

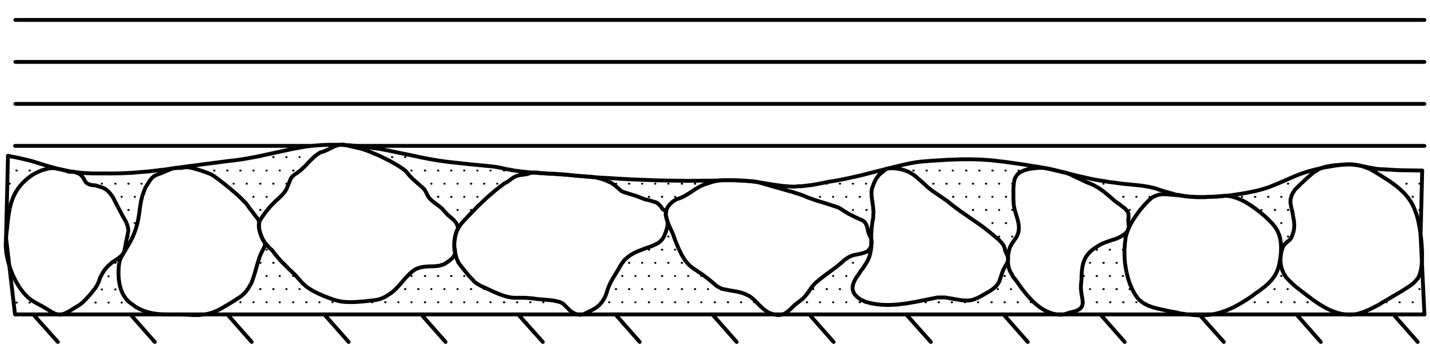
ROCK DISPOSAL DETAIL



TYPICAL WINDROW DETAIL (EDGE VIEW)



PROFILE VIEW

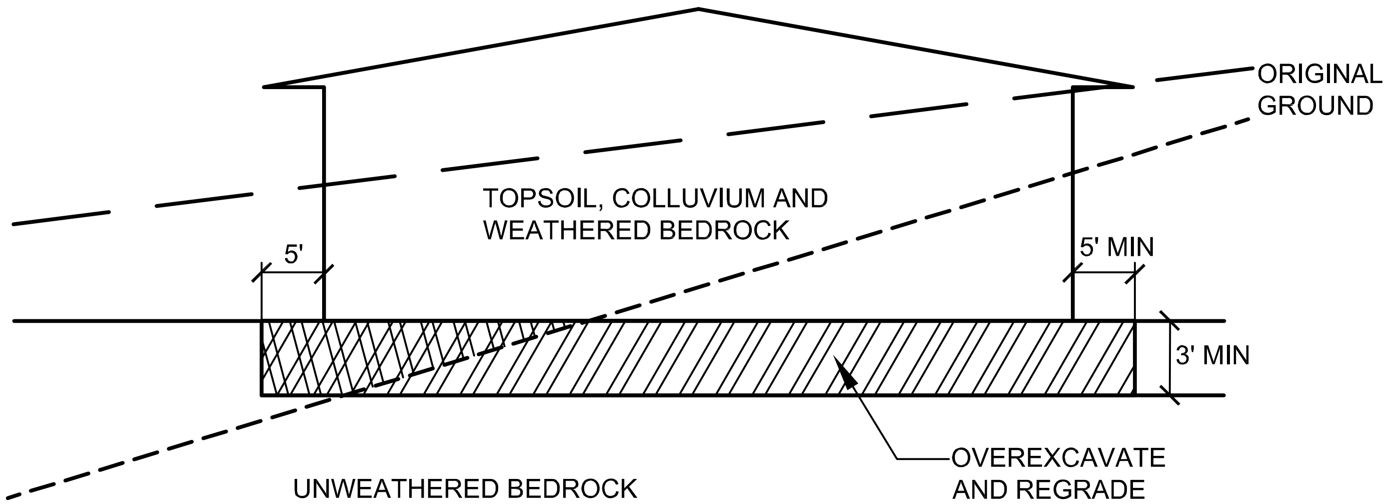


NOT TO SCALE

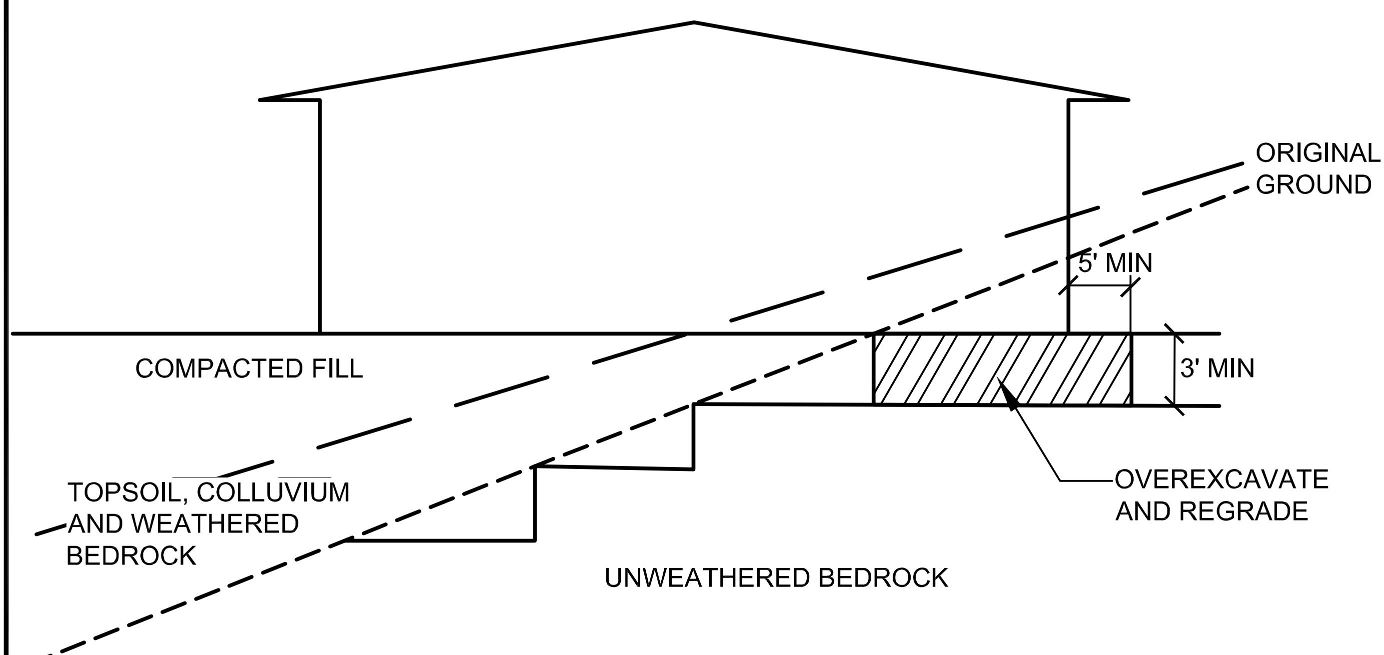
ROCK DISPOSAL DETAIL

GENERAL GRADING RECOMMENDATIONS

CUT LOT



CUT/FILL LOT (TRANSITION)



NOT TO SCALE

TRANSITION LOT DETAIL

<u>APPENDIX E</u>

LIQUEFACTION EVALUATION

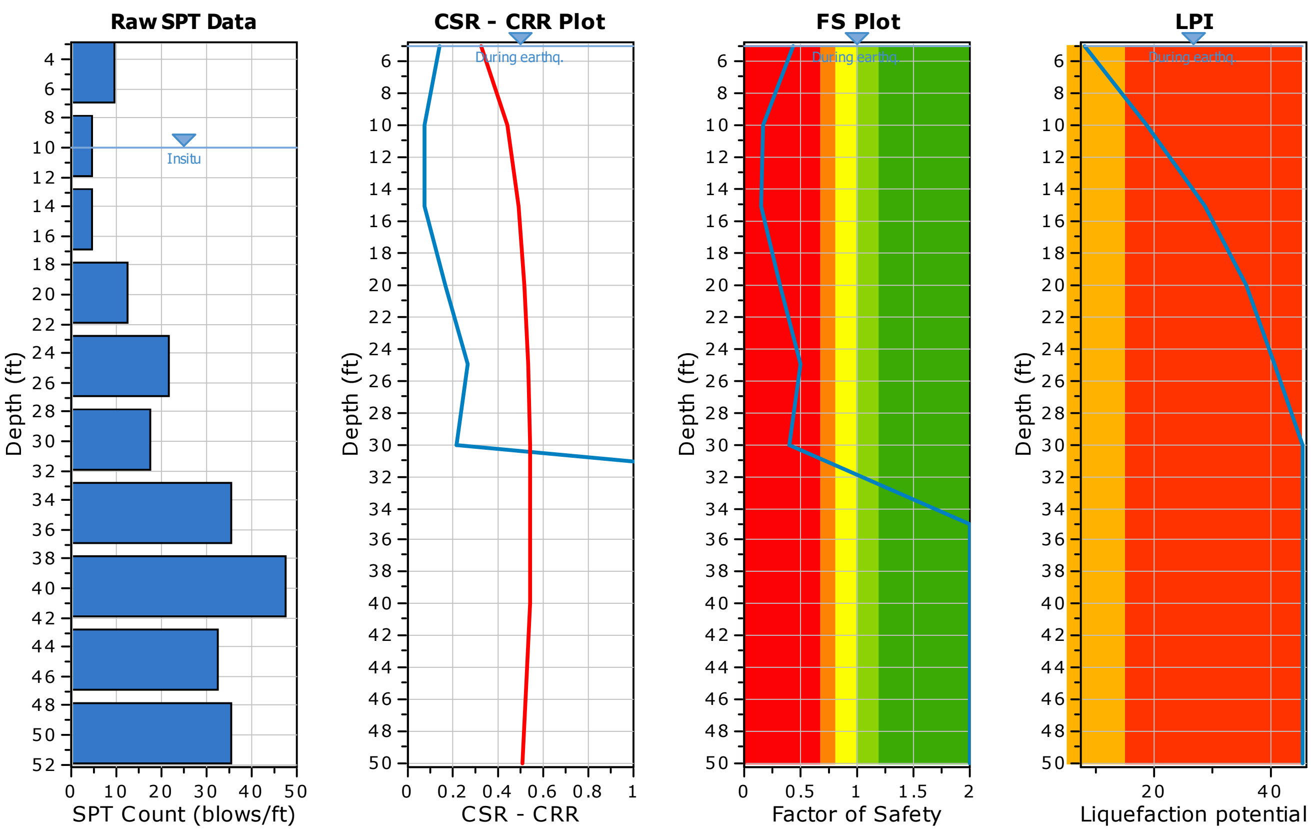
SPT BASED LIQUEFACTION ANALYSIS REPORT

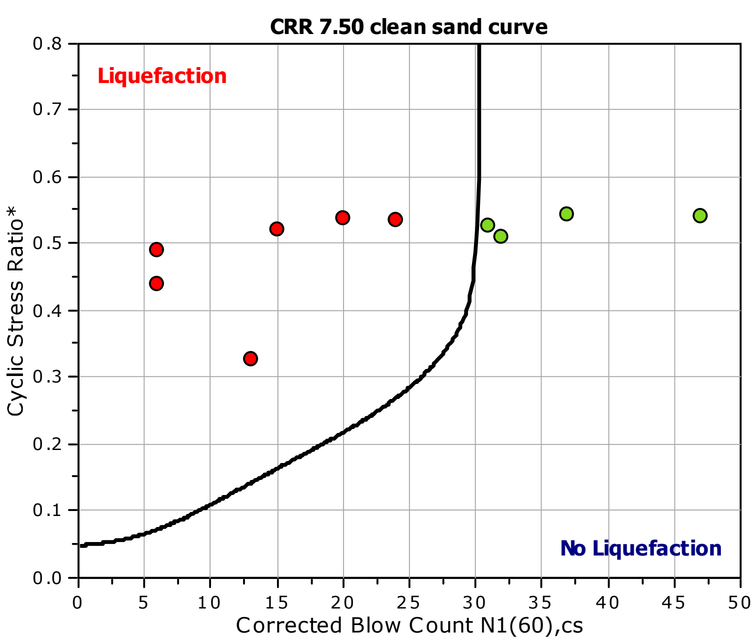
Project title : 2936 Camino Del Mar **SPT Name: Boring B-2**

Location : Del Mar, CA

:: Input parameters and analysis properties ::

Analysis method:	NCEER 1998	G.W.T. (in-situ):	10.00 ft
Fines correction method:	NCEER 1998	G.W.T. (earthq.):	5.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	6.99
Borehole diameter:	200mm	Peak ground acceleration:	0.61 g
Rod length:	5.00 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.00		





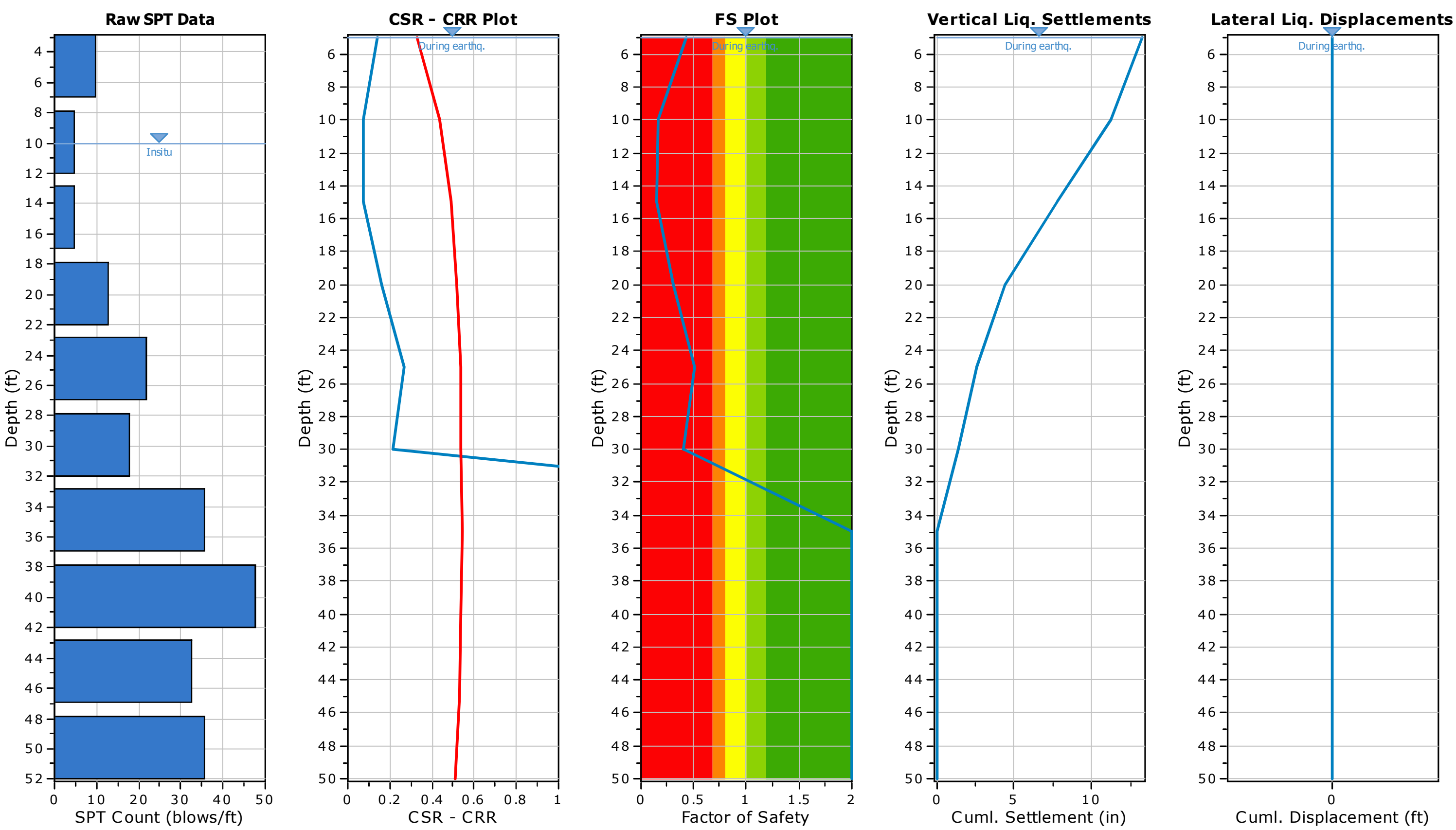
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

:: Overall Liquefaction Assessment Analysis Plots ::



:: Field input data ::

Test Depth (ft)	SPT Field Value (blows)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
5.00	10	1.00	120.00	5.00	Yes
10.00	5	1.00	120.00	5.00	Yes
15.00	5	1.00	120.00	5.00	Yes
20.00	13	1.00	120.00	5.00	Yes
25.00	22	7.00	120.00	5.00	Yes
30.00	18	7.00	120.00	5.00	Yes
35.00	36	7.00	120.00	5.00	Yes
40.00	48	5.00	120.00	5.00	Yes
45.00	33	5.00	120.00	5.00	Yes
50.00	36	5.00	120.00	5.00	Yes

Abbreviations

Depth: Depth at which test was performed (ft)
SPT Field Value: Number of blows per foot
Fines Content: Fines content at test depth (%)
Unit Weight: Unit weight at test depth (pcf)
Infl. Thickness: Thickness of the soil layer to be considered in settlements analysis (ft)
Can Liquefy: User defined switch for excluding/including test depth from the analysis procedure

:: Cyclic Resistance Ratio (CRR) calculation data ::

Depth (ft)	SPT Field Value	Unit Weight (pcf)	σ_v (tsf)	u_o (tsf)	σ'_{vo} (tsf)	C_N	C_E	C_B	C_R	C_S	$(N_1)_{60}$	Fines Content (%)	α	β	$(N_1)_{60cs}$	$CRR_{7.5}$
5.00	10	120.00	0.30	0.00	0.30	1.48	1.00	1.15	0.75	1.00	13	1.00	0.00	1.00	13	0.142
10.00	5	120.00	0.60	0.00	0.60	1.25	1.00	1.15	0.85	1.00	6	1.00	0.00	1.00	6	0.073
15.00	5	120.00	0.90	0.16	0.74	1.16	1.00	1.15	0.95	1.00	6	1.00	0.00	1.00	6	0.073
20.00	13	120.00	1.20	0.31	0.89	1.08	1.00	1.15	0.95	1.00	15	1.00	0.00	1.00	15	0.163
25.00	22	120.00	1.50	0.47	1.03	1.01	1.00	1.15	0.95	1.00	24	7.00	0.12	1.01	24	0.269
30.00	18	120.00	1.80	0.62	1.18	0.95	1.00	1.15	1.00	1.00	20	7.00	0.12	1.01	20	0.218
35.00	36	120.00	2.10	0.78	1.32	0.90	1.00	1.15	1.00	1.00	37	7.00	0.12	1.01	37	4.000
40.00	48	120.00	2.40	0.94	1.46	0.85	1.00	1.15	1.00	1.00	47	5.00	0.00	1.00	47	4.000
45.00	33	120.00	2.70	1.09	1.61	0.81	1.00	1.15	1.00	1.00	31	5.00	0.00	1.00	31	4.000
50.00	36	120.00	3.00	1.25	1.75	0.77	1.00	1.15	1.00	1.00	32	5.00	0.00	1.00	32	4.000

Abbreviations

σ_v: Total stress during SPT test (tsf)
u_o: Water pore pressure during SPT test (tsf)
σ'_{vo}: Effective overburden pressure during SPT test (tsf)
C_N: Overburden corretion factor
C_E: Energy correction factor
C_B: Borehole diameter correction factor
C_R: Rod length correction factor
C_S: Liner correction factor
$N_{1(60)}$: Corrected N_{SPT} to a 60% energy ratio
α, β: Clean sand equivalent clean sand formula coefficients
$N_{1(60)cs}$: Corected $N_{1(60)}$ value for fines content
$CRR_{7.5}$: Cyclic resistance ratio for M=7.5

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS
5.00	120.00	0.30	0.00	0.30	0.99	1.00	0.393	1.20	0.328	1.00	0.328	0.433
10.00	120.00	0.60	0.16	0.44	0.98	1.00	0.525	1.20	0.438	1.00	0.438	0.166

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS
15.00	120.00	0.90	0.31	0.59	0.97	1.00	0.588	1.20	0.491	1.00	0.491	0.148
20.00	120.00	1.20	0.47	0.73	0.96	1.00	0.622	1.20	0.520	1.00	0.520	0.314
25.00	120.00	1.50	0.62	0.88	0.94	1.00	0.640	1.20	0.534	1.00	0.534	0.504
30.00	120.00	1.80	0.78	1.02	0.92	1.00	0.644	1.20	0.538	1.00	0.538	0.404
35.00	120.00	2.10	0.94	1.16	0.89	1.00	0.637	1.20	0.532	0.98	0.543	2.000
40.00	120.00	2.40	1.09	1.31	0.85	1.00	0.619	1.20	0.517	0.96	0.540	2.000
45.00	120.00	2.70	1.25	1.45	0.80	1.00	0.593	1.20	0.495	0.94	0.528	2.000
50.00	120.00	3.00	1.40	1.60	0.75	1.00	0.561	1.20	0.469	0.92	0.509	2.000

Abbreviations

$\sigma_{v,eq}$:	Total overburden pressure at test point, during earthquake (tsf)
$u_{o,eq}$:	Water pressure at test point, during earthquake (tsf)
$\sigma'_{vo,eq}$:	Effective overburden pressure, during earthquake (tsf)
r_d :	Nonlinear shear mass factor
α:	Improvement factor due to stone columns
CSR :	Cyclic Stress Ratio (adjusted for improvement)
MSF :	Magnitude Scaling Factor
$CSR_{eq,M=7.5}$:	CSR adjusted for M=7.5
K_{sigma}:	Effective overburden stress factor
CSR^*:	CSR fully adjusted (user FS applied)***
FS:	Calculated factor of safety against soil liquefaction

*** User FS: 1.00

:: Liquefaction potential according to Iwasaki ::

Depth (ft)	FS	F	wz	Thickness (ft)	I_L
5.00	0.433	0.57	9.24	5.00	7.99
10.00	0.166	0.83	8.48	5.00	10.77
15.00	0.148	0.85	7.71	5.00	10.01
20.00	0.314	0.69	6.95	5.00	7.26
25.00	0.504	0.50	6.19	5.00	4.68
30.00	0.404	0.60	5.43	5.00	4.93
35.00	2.000	0.00	4.67	5.00	0.00
40.00	2.000	0.00	3.90	5.00	0.00
45.00	2.000	0.00	3.14	5.00	0.00
50.00	2.000	0.00	2.38	5.00	0.00

Overall potential I_L : 45.64

I_L = 0.00 - No liquefaction
I_L between 0.00 and 5 - Liquefaction not probable
I_L between 5 and 15 - Liquefaction probable
I_L > 15 - Liquefaction certain

:: Vertical settlements estimation for saturated sands ::

Depth (ft)	D_{50} (in)	q_c/N	e_v weight factor	e_v (%)	Δh (ft)	s (in)
5.00	0.00	5.00	1.00	3.33	5.00	1.996
10.00	0.00	5.00	1.00	5.80	5.00	3.480
15.00	0.00	5.00	1.00	5.80	5.00	3.480
20.00	0.00	5.00	1.00	2.96	5.00	1.775
25.00	0.00	5.00	1.00	2.01	5.00	1.207

:: Vertical settlements estimation for saturated sands ::

Depth (ft)	D_{50} (in)	q_c/N	e_v weight factor	e_v (%)	Δh (ft)	s (in)
30.00	0.00	5.00	1.00	2.34	5.00	1.402
35.00	0.00	5.00	1.00	0.00	5.00	0.000
40.00	0.00	5.00	1.00	0.00	5.00	0.000
45.00	0.00	5.00	1.00	0.00	5.00	0.000
50.00	0.00	5.00	1.00	0.00	5.00	0.000

Cumulative settlements: 13.340

Abbreviations

D_{50}: Median grain size (in)
q_c/N: Ratio of cone resistance to SPT
e_v: Post liquefaction volumetric strain (%)
Δh: Thickness of soil layer to be considered (ft)
s: Estimated settlement (in)

:: Lateral displacements estimation for saturated sands ::

Depth (ft)	$(N_1)_{60}$	D_r (%)	γ_{max} (%)	d_z (ft)	LDI	LD (ft)
5.00	13	50.48	34.10	5.00	0.000	0.00
10.00	6	34.29	51.20	5.00	0.000	0.00
15.00	6	34.29	51.20	5.00	0.000	0.00
20.00	15	54.22	34.10	5.00	0.000	0.00
25.00	24	68.59	14.50	5.00	0.000	0.00
30.00	20	62.61	22.70	5.00	0.000	0.00
35.00	37	85.16	0.00	5.00	0.000	0.00
40.00	47	100.00	0.00	5.00	0.000	0.00
45.00	31	77.95	0.00	5.00	0.000	0.00
50.00	32	79.20	0.00	5.00	0.000	0.00

Cumulative lateral displacements: 0.00

Abbreviations

D_r: Relative density (%)
γ_{max}: Maximum amplitude of cyclic shear strain (%)
d_z: Soil layer thickness (ft)
LDI: Lateral displacement index (ft)
LD: Actual estimated displacement (ft)

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