ENGEO
Expect Excellence

Project No.
19026.000.001

April 15, 2022

Mr. Dustin Saldivar
Bellingham Marine Industries, Inc.
8810 Sparling Lane
Dixon, CA 95620

Subject: Dana Point Marina Rehabilitation Project
Dana Point, California

RESPONSE TO OCPW REVIEW COMMENTS

Dear Mr. Saldivar:

We are pleased to present the following letter responding to comments received by Orange County Public Works (OCPW). For our use we were provided OCPW comments pages 23 to 33 (not dated).

Comment No. 3.001
Geotechnical consultant must review the Dock Plans submitted to the County that will be utilized during construction of the project and provide additional recommendations as necessary. The approved dock plans and applicable details must be reviewed and signed/stamped by the geotechnical engineer and engineering geologist prior to permit issuance. 2nd Submittal Review Comment: This comment will be marked as "Satisfied" upon confirmation of plan check completion/approval and geotechnical signed/stamped approved plans.

ENGEO Response to Comment 3.001
See revised drawings. ENGEO reviewed the drawings and sealed sheet PE1.

Comment No. 3.006
Geotechnical consultant must provide comment/discussion on project demo operations of existing docks/piles and provide additional geotechnical recommendations as necessary. Specifically, are the existing piles to be removed and if so, what impact may that have on the proposed pile installation and performance. 2nd Submittal Review Comment: As previously requested, please provide additional comment/discussion on project demo operations of existing docks/piles and provide additional geotechnical recommendations as necessary. Specifically, are the existing piles to be removed and if so, what impact may that have on the proposed pile installation and performance. If existing piles can't be removed, how will possible conflicts between new and existing piles be revolved. Please refer to and reference currently submitted project demo permit/plans (DMO22-0032) as part of response. Additional geotechnical recommendations should be provided as necessary.

ENGEO Response to Comment 3.006
Supplemental plan showing proposed piles and abandoned piles has been attached for reference. ENGEO provided a consideration with reference to pile abandonment Section 3.2.3. If piles to be abandoned in place have a distance less than 1 foot as discussed in Section 3.2.3, pull testing should be performed on the subject pile to confirm lateral performance during construction.

Comment No. 3.009

Geotechnical consultant must provide comment/discussion and geotechnical conclusion on site specific tsunami impact on the proposed dock piles. Additional geotechnical recommendations for design and construction of the proposed dock piles must be provided as necessary. 2nd Submittal Review Comment: As previously requested, please provide comment/discussion and geotechnical conclusion on site specific tsunami impact on the proposed dock piles. Additional geotechnical recommendations for design and construction of the proposed dock piles must be provided as necessary.

ENGEO Response to Comment 3.009

Per 2019 CBC 1615.1, only risk category III and IV buildings shall be designed per Chapter 6 of ASCE 7. The docks in the marina are risk category I. The store building, which will be a deferred submittal, will be risk category II. Neither will be subject to Chapter 6 of ASCE 7. ENGEO is not aware of county, city, or state requirements for guide pile elements to be designed for tsunami loading.

Comment No. 3.010

Geotechnical consultant must provide comment/discussion and geotechnical conclusion on site specific wave impact on the proposed dock piles. Additional geotechnical recommendations for design and construction of the proposed dock piles must be provided as necessary. 2nd Submittal Review Comment: As previously requested, please provide comment/discussion and geotechnical conclusion on site specific wave impact on the proposed dock piles. Additional geotechnical recommendations for design and construction of the proposed dock piles must be provided as necessary.

ENGEO Response to Comment 3.010

ENGEO has provided lateral pile analysis and maximum loading in Tables 3.2.2-2 to 3.2.2-4. Provided loading is less than the maximum lateral load provided in Tables 3.2.2-2 to 3.2.2-4, it is our opinion the piles can withstand intended design loads which consider wave loading within the marina.

Comment No. 3.011

Geotechnical consultant must provide comment/discussion and geotechnical conclusion on site specific flow sand velocity impact on the proposed dock piles. Additional geotechnical recommendations for design and construction of the proposed dock piles must be provided as necessary. 2nd Submittal Review Comment: The geotechnical report (ENGEO, 2/23/22) included with the 2nd submittal document package references a 3-foot thick sand section utilized in the pile design model (Section 3.2.2 / Page 7). Provide additional comment/discussion to confirm the basis for limiting the "sand" to only 3 feet when the exploratory boring logs indicate the observed "sand" section varied in thickness from approximately 2 feet to 10 feet in Borings B-1 through B-3. Please also comment if thicker sections of "sand" were analyzed, and if so what impact the additional analysis had on the design. Provide additional geotechnical recommendations as necessary.

ENGEO Response to Comment 3.011

ENGEO has attached an updated site plan and geologic cross sections for reference.

Comment No. 3.016
Geotechnical consultant must provide comment/discussion and geotechnical conclusion on site specific settlement values for design and construction of the proposed dock piles. Additional geotechnical recommendations should be provided as necessary. 2nd Submittal Review Comment: The geotechnical report (ENGEO, 2/23/22) included with the 2nd submittal document package provides conclusions/recommendations for the anticipated magnitude of remaining vertical settlement for design/construction of different aspects of the subject project (including landside improvements). However the report only addresses TOTAL vertical settlement. Please provide additional comment/discussion and geotechnical conclusion on site specific differential settlement values for design and construction of the proposed project. Additional geotechnical recommendations should be provided as necessary.

ENGEO Response to Comment 3.016
ENGEO provided total vertical settlement associated with the Gangway Landing in Section 3.1. It is our opinion differential settlement will be low due to uniform load transfer. For conservative analysis, the structural engineer may consider half the total settlement across the structural footing for differential settlement. For guide pile elements for floating docks, it is our opinion vertical loading will not be applied therefore no settlement is anticipated.

Comment No. 3.019
Provide updated/additional geotechnical cross-section(s) as necessary based on your review of the currently submitted project plans and your responses the review comments contained herein. At a minimum, cross-section(s) should extend beyond property lines/limits of permit as necessary to accurately depict site conditions that may impact the proposed grading and construction. Cross section/ exhibit/detail should indicate the proposed site grading/improvements, as graded site conditions/existing improvements, anticipated subsurface conditions (e.g. geologic contacts/structure, existing improvement foundations, etc.), slope setback requirements and the geotechnical remedial grading, temporary excavation (including shoring or specialized excavation method as necessary), slope setback and foundation recommendations from your submitted report(s). 2nd Submittal Review Comment: The geotechnical report (ENGEO, 2/23/22) included in the 2nd submittal document package did not address this review comment. As previously requested, please provide geotechnical cross sections applicable to the proposed scope of work per the subject permit.

ENGEO Response to Comment 3.019
ENGEO has attached an updated site plan and geologic cross sections for reference.

Comment No. 3.020
Provide updated plot plan/map to indicate the location of any new cross sections/ exhibits/details prepared in response to the review comments contained herein. 2nd Submittal Review Comment: The geotechnical report (ENGEO, 2/23/22) included in the 2nd submittal document package did not address this review comment. As previously requested, please provide updated plot plan/map as necessary to indicate the location of any new cross-sections/exhibits/details prepared in response to the review comments contained herein.

ENGEO Response to Comment 3.020
ENGEO has attached an updated site plan and geologic cross sections for reference.

Comment No. 3.021
Update Exhibit 3.2.2-1 from the submitted ENGEO report dated 2/23/22 to label bedrock contact/bedrock unit and 3-foot thick overlying sand unit. Provide additional geotechnical recommendations as necessary.

ENGEO Response to Comment 3.021
ENGEO has attached an updated site plan and geologic cross sections for reference.

Comment No. 3.022
Update Exhibit 3.2.2-1 from the submitted ENGEO report dated 2/23/22 to label sand movement force (w/magnitude). Provide additional geotechnical recommendations as necessary.

ENGEO Response to Comment 3.021
High flows for sand movement not anticipated within marina bays.

Comment No. 3.023
Update Exhibit 3.2.2-1 from the submitted ENGEO report dated 2/23/22 to label wave load (w/magnitude). Provide additional geotechnical recommendations as necessary.

ENGEO Response to Comment 3.023
ENGEO has provided lateral pile analysis and maximum loading in Tables 3.2.2-2 to 3.2.2-4. Provided loading is less than the maximum lateral load provided in Tables 3.2.2-2 to 3.2.2-4, it is our opinion the piles can withstand intended design loads which consider wave loading within the marina.

Comment No. 3.024
Update Exhibit 3.2.2-1 from the submitted ENGEO report dated 2/23/22 to indicate typical location of existing piles to be removed (or abandoned in place if applicable) with respects to the proposed new piles. Provide additional geotechnical recommendations as necessary.

ENGEO Response to Comment 3.024
Supplemental plan showing proposed piles and abandoned piles has been attached for reference. ENGEO provided a consideration with reference to pile abandonment Section 3.2.3. If piles to be abandoned in place have a distance less than 1 foot as discussed in Section 3.2.3, pull testing should be performed on the subject pile to confirm lateral performance during construction.

Comment No. 3.025
Provide additional comment/discussion to define "Point of Load Application" as indicated on Exhibit 3.2.2-1 from the submitted ENGEO report dated 2/23/22.Clarify load combination and impact load. Updated Exhibit 3.2.2-1 with applicable information (location/load combination).Provide additional recommendations as necessary.

ENGEO Response to Comment 3.025
Point of Load Application is the applied lateral force in our L-Pile analysis and is provided to us by BMI as worst case loading. Pile loading and structural analysis is performed by BMI's structural engineer and EOR Craig Funston S.E. Pile demand is compared to the pile capacity in the submitted structural calculations prepared by BMI.

Comment No. 3.026
Per the submitted geotechnical report prepared by ENGEO dated 2/23/22, the deflection for the proposed piles has been calculated to vary from approximately 8.75inches to 13.75 inches. Please provide additional comment/discussion on the anticipated deflection, including anticipated pile/dock performance and if reported deflection is maximum or combined. Please also update Exhibit3.2.2-1 from the submitted ENGEO report dated 2/23/22 to label/clarify location of deflection. Provide additional geotechnical recommendations as necessary.

ENGEO Response to Comment 3.026
ENGEO has provided lateral pile analysis and maximum loading in Tables 3.2.2-2 to 3.2.2-4. Provided loading is less than the maximum lateral load provided in Tables 3.2.2-2 to 3.2.2-4, it is our opinion the piles can withstand intended design loads and anticipated deflection. Maximum deflection is anticipated at the point of applied loading.

If you have any questions or comments regarding this letter, please call.

Sincerely,

ENGEO Incorporated

REGISTERED PROFESSIONAL ENGINEER
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Attachments: Figure 1 – Site Plan
Figure 2 – Cross Sections A-A' and B-B'
Figure 3 – Historic Photograph
New and Existing Pile Map

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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OC Development Services
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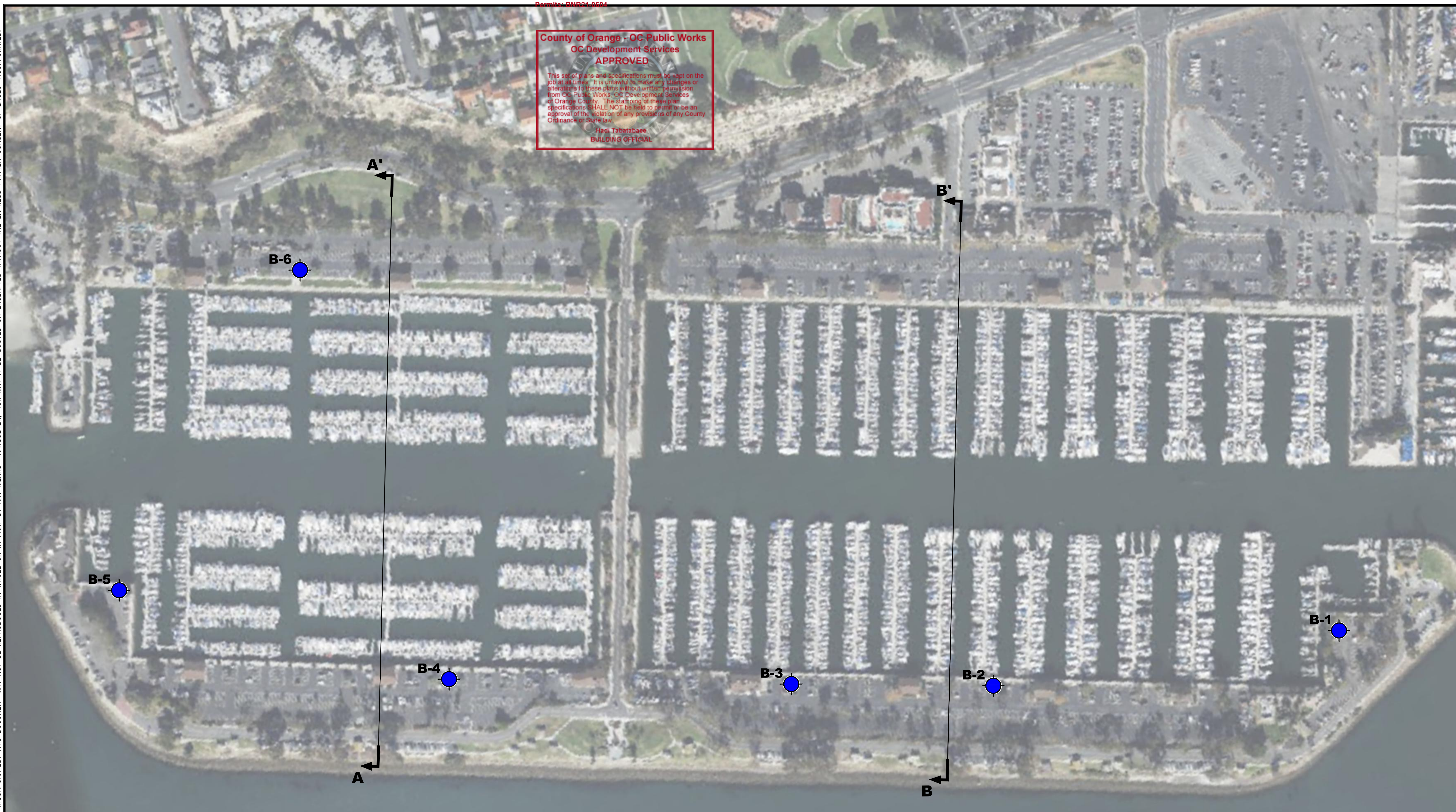
Hadi Tabatabaee
BUILDING OFFICIAL



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FEET

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

B-6 BORING (TERRACOSTA, 2018)

B B' CROSS SECTION

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SITEPLAN DANA POINT DANA POINT, CALIFORNIA	PROJECT NO.: 19026.000.001		FIGURE NO. 1
	SCALE: AS SHOWN		
	DRAWN BY: CC	CHECKED BY: JJT	

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ORIGINAL FIGURE PRINTED IN COLOR

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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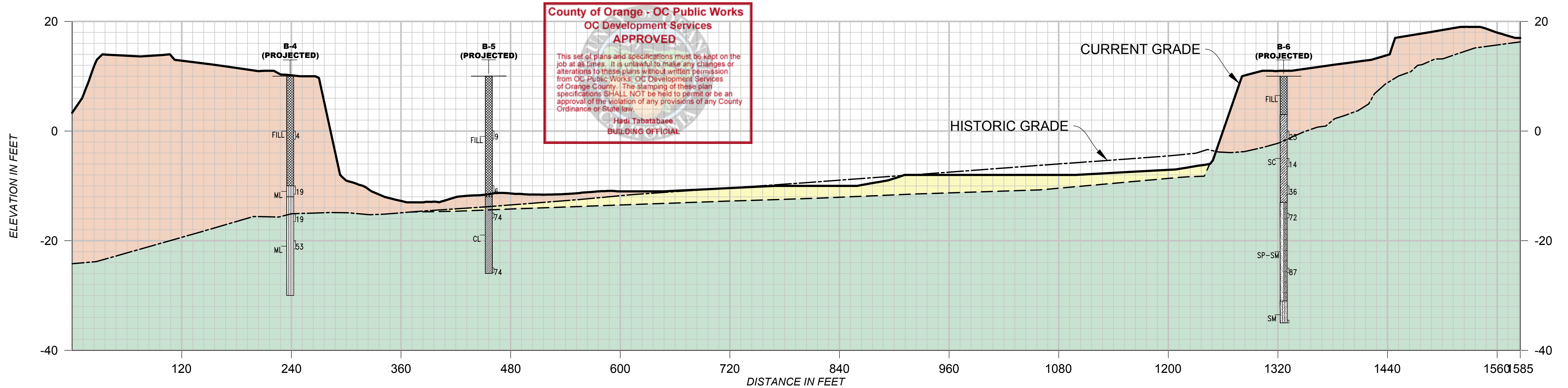
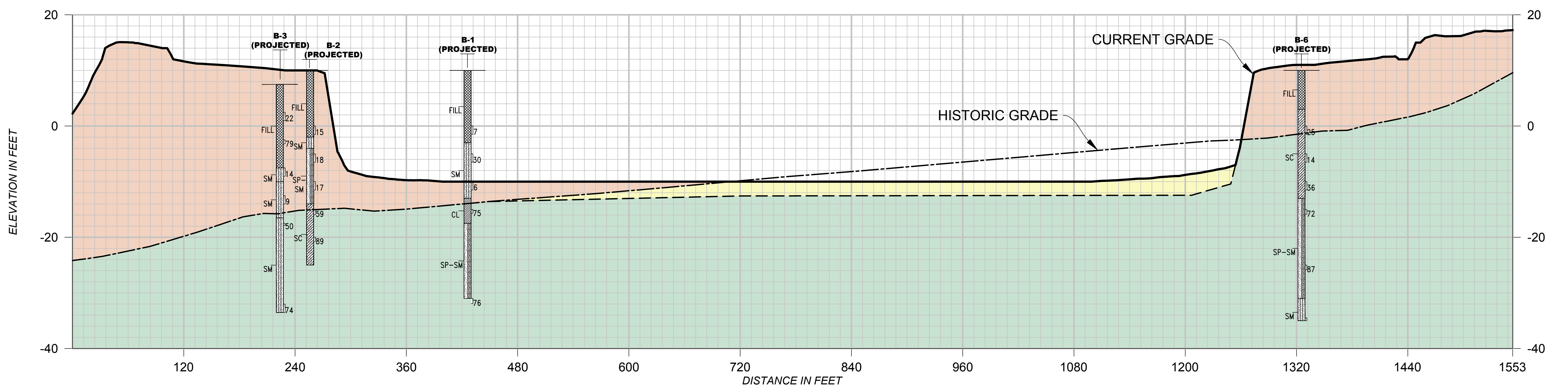


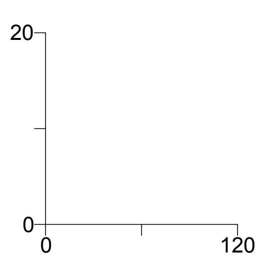
SECTION A-A'

1"=120' Vertical 1"=20' Horizontal



SECTION B-B'

1"=120' Vertical 1"=20' Horizontal



EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

B-6 (PROJECTED) BORING (TERRACOSTA, 2018)

ARTIFICAL FILL

NEAR SHORE/WEATHERED CAPISTRANO FORMATION

CAPISTRANO FORMATION

NOTE: BORINGS ARE PROJECTED AND ARE CONSIDERED APPROXIMATE

ENGEO Expect Excellence	CROSS SECTIONS A-A' AND B-B' DANA POINT DANA POINT, CALIFORNIA	PROJECT NO.: 19026.000.001 SCALE: AS SHOWN DRAWN BY: CC / CHECKED BY: JJT	FIGURE NO. 2

ORIGINAL FIGURE PRINTED IN COLOR

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1971 PHOTOGRAPH OF CONSTRUCTION. LIMITED EXCAVATION ACTIVITIES PERFORMED ACROSS MAJORITY OF SITE AS ILLISTRATED IN CROSS SECTIONS A AND B AND SHOWN IN PHOTOGRAPH.

ENGEO Expect Excellence	HISTORIC PHOTOGRAPH - JULY 1971 DANA POINT DANA POINT, CALIFORNIA	PROJECT NO.: 19026.000.001		FIGURE NO. 3
		SCALE: AS SHOWN		
		DRAWN BY: CC	CHECKED BY: JJT	

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Building&Safety: Ryan Rose 6/9/2022
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Hadi Tabatabaee
BUILDING OFFICIAL

DANA POINT MARINA REHABILITATION PROJECT

DANA POINT, CALIFORNIA

GEOTECHNICAL REPORT

SUBMITTED TO:
Mr. Dustin Saldivar
Bellingham Marine Industries, Inc.
8810 Sparling Lane
Dixon, CA 95620

PREPARED BY:
ENGEO Incorporated

February 23, 2022

PROJECT NO.
19026.000.001

ENGEO
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Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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Hadi Tabatabaee
BUILDING OFFICIAL

Project No.
19026.000.001

February 23, 2022

Mr. Dustin Saldivar
Bellingham Marine Industries, Inc.
8810 Sparling Lane
Dixon, CA 95620

Subject: Dana Point Marina Rehabilitation Project
Dana Point, California

GEOTECHNICAL REPORT

Dear Mr. Saldivar**:**

ENGEO prepared this geotechnical report for the Dana Point Marina Rehabilitation project in Dana Point, California. We reviewed existing geotechnical exploration information performed by TerraCosta (an ENGEO company) to characterize the subsurface conditions at the site to provide the enclosed geotechnical recommendations for design.

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

REGISTERED PROFESSIONAL ENGINEER
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ts/jjt/dt

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1.0 INTRODUCTION

1.1 PROJECT LOCATION AND DESCRIPTION

This report presents the results of exploration and analysis performed by ENGEO and TerraCosta Consulting Group (an ENGEO company) in support of improvements at the Dana Point Marina in Dana Point, California. The Dana Point Marina is located along the west side of Dana Point Harbor Drive in Dana Point, California. The marina is bordered to the north by the Ocean Institute and by Parking and Harbor Drive to the east. Documents provided by you for our use are listed below.

1. Building Plan Check Comments for Dana Point Harbor Revitalization prepared by Orange County Public Works.

2. Site Plan with New and Existing Pile Locations prepared by Bellingham Marine Industries.

3. Geotechnical Review of Deep Soil Mixing Submittal prepared by GMU dated May 27, 2021.

4. Geotechnical Investigation Report prepared by GMU dated May 27, 2021.

Additional geotechnical information reviewed for this report includes the Guide Pile Design Criteria Report prepared by TerraCosta Consulting Group dated August 15, 2019, and Supplemental L-Pile analysis prepared by ENGEO on July 15, 2021.

Based on our discussion with you and review of the information provided, we understand the proposed project is part of the rehabilitation of the existing approximately 50-year-old marina facilities and infrastructure. Improvements will include seawall repairs, gangway and approach pier replacement, and reconfiguration and replacement of the existing floating docks throughout the marina. We understand the existing docks and guide piles will be replaced with a new dock system, including new open steel pipe guide piles. In addition, we understand landward improvements included in the renovation provided consist of minor re-paving at handicap parking stalls and concrete hardscape along boardwalk walkways.

1.2 EXISTING GEOTECHNICAL DOCUMENTS

As mentioned above, multiple geotechnical studies have been performed for various improvements at the Dana Point Marina. Two geotechnical reports prepared by GMU were provided for reference which include an overall geotechnical investigation report pertaining to landward improvements including new retail, restaurants and existing structure renovations, and review of ground improvements on the landward portion of the Dana Point Marina project. For use in preparation of this report, we rely on the Guide Pile Design Criteria report prepared by TerraCosta Consulting and supplemental L-Pile analysis prepared by ENGEO.

1.3 SITE BACKGROUND

As noted in TCG, 2019, the area selected for the marina was naturally protected by the Dana Point Headland, creating a shallow anchorage west of San Juan Creek. To the southeast of the headland, a series of jetties was constructed to enclose the area further and protect it from westerly and southerly swells as shown in Exhibit 1.3-1 below. In addition, the TCG report notes the U.S. Army Corps of Engineers, originally designed and constructed the Dana Point Harbor in the late 1960s.

EXHIBIT 1.3-1: 1953 Aerial

EXHIBIT 1.3-2: 1968 Aerial

Research performed by TCG, 2019 indicates that the harbor was developed initially by constructing the island and a series of cofferdams to enclose the marina basins. Dewatering of the basin allowed construction to move forward in the dry, excavating the basins to an average elevation of -10 feet MLLW. As we understand, because of the hard excavation characteristics of the soil/bedrock, the northwest basin was excavated to an elevation of -8 feet MLLW. Based on our understanding of the site, we anticipate dredging of the marina removed loose and/or soft deposits such that foundation materials consist of consolidated marine deposits and siltstones consistent with the Capistrano Formation.

1.4 SUBSURFACE EXPLORATION

In 2019, TerraCosta (TCG) performed six geotechnical explorations on January 22 and January 23, 2019. In addition, TCG retained the services of a geophysical contractor to perform four refraction microtremor (ReMi) surveys to develop a shear-wave velocity profile down to a depth of approximately 100 feet at the locations shown on Figure 2.

Borings performed by TCG utilized 6-inch-diameter hollow-stem methods to a maximum depth of approximately 46 feet below existing grade. TCG retrieved disturbed soil samples at various intervals in the boring using a 2-inch O.D. standard penetration test split-spoon sampler. TCG obtained the blow counts recorded by dropping a 140-pound hammer with a 30-inch free fall drop. Blows were recorded for 6 inches of penetration, the blows recorded on the boring logs represent the accumulated number of blows required to drive the last 1 foot of penetration; the blow counts have not been converted using any correction factors. When sampler driving was difficult, the recorded penetration was recorded as inches per hammer blows.

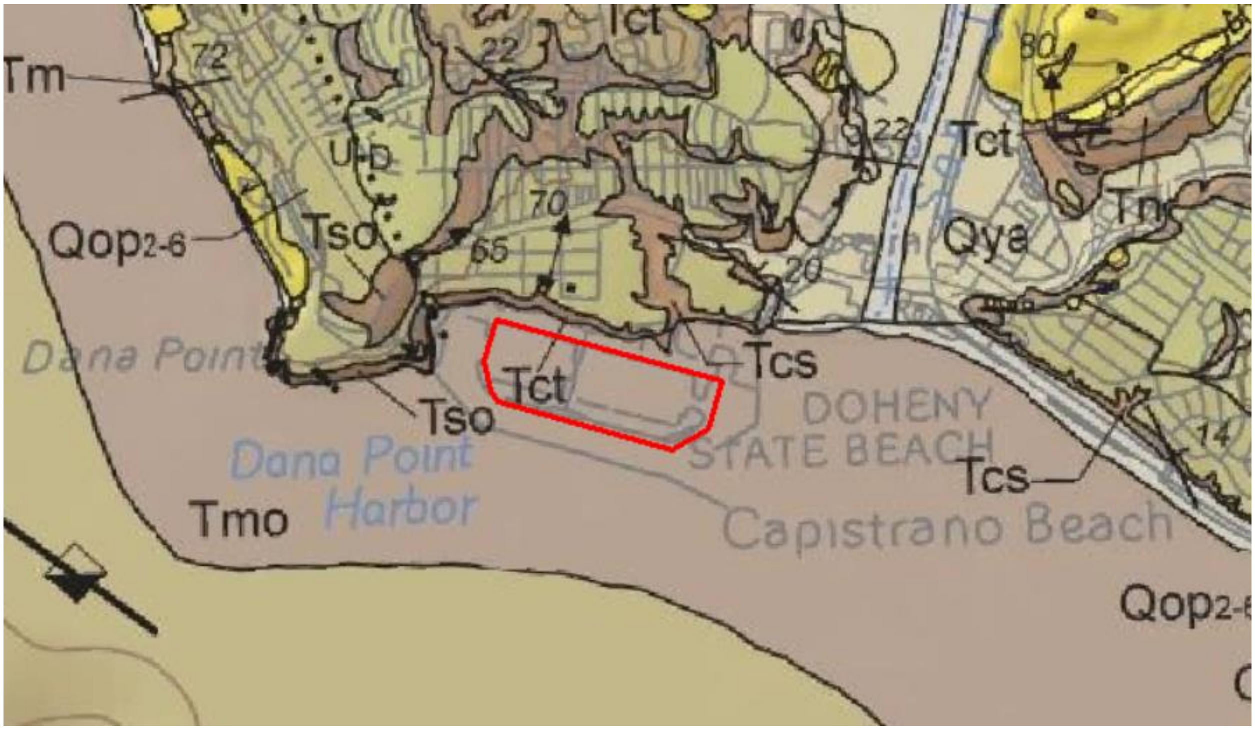
Report logs are provided in Appendix A. The logs depict subsurface conditions at the exploration locations on the date of exploration; however, subsurface conditions may vary with time. Representative samples were collected, sealed in plastic containers to preserve moisture content, and taken to the laboratory for grain-size and plasticity testing. Results of the laboratory tests are presented in Appendix B. A copy of the ReMi survey completed by Southwest Geophysics is provided in Appendix C

1.5 GEOLOGY AND SEISMICITY

1.5.1 Site Geology

We reviewed the Geologic Map of the Oceanside Quadrangle prepared by Kennedy 2007. Based on our review of the geologic map, we understand surficial geologic units underlying the site include Tmo, undivided sedimentary rocks in the offshore region.

EXHIBIT 1.5.1-1: Geologic Mapping by Kennedy 2007



According to TCG 2019, artificial fills, beach sands, alluvial deposits, and recent bay deposits, all underlain by older Quaternary to Miocene-aged formational bedrock units are present in the areas surrounding the marina. These surficial deposits were encountered in explorations performed by TCG (located on artificial fills associated with the harbor construction in the late 1960s). These materials should be anticipated landward of the harbor and in construction of gangway approach platforms and other ancillary improvements on the land side of the marina.

TCG, 2019 notes the primary formational unit that will be encountered during pile driving for the new marina is the late Miocene to early Pliocene-age Capistrano Formation. The Capistrano Formation is of marine origin and primarily consists of interbedded siltstones, sandstone, and localized conglomerates. The siltstone was encountered in generally all of the borings across the site, with limited amounts of sandstone encountered in borings across the northern edge of the marina. In addition, Remi surveys performed across the site also indicate shear wave velocities of 1200 to 2500 ft/s for Capistrano formation.

1.5.2 Site Seismicity

Moderate to large earthquakes have historically occurred in the region and many earthquakes of low magnitude occur every year. Figure 4, Regional Faulting and Seismicity, shows the approximate locations of nearby faults and significant earthquakes recorded within the region. We utilized the USGS Unified Hazard Tool to understand contributing active faults to the seismic hazard at the Dana Point Marina. At the peak ground acceleration (PGA) for 2,475-year return period, the Newport-Inglewood Fault system is the primary contributor to the design earthquake scenario. The estimated distance of the design event is approximately 2.2 miles from the site with a possible moment magnitude of approximately 7.3. To understand other active faults in the vicinity of the Dana Point Marina, we utilizing the USGS Quaternary Faults Database and present a list nearby active faults and distances below.

TABLE 1.5.2-1: Active Faults

FAULT NAME	DISTANCE (miles)	DIRECTION
Newport-Inglewood	2.2	Southwest
San Mateo	9.5	South
Pelican Hill	12.5	Northwest
San Joaquin Hills	12.8	North
Palos Verde	21	Southwest
Elsinore	28	Northeast

The State of California has prepared maps designating zones for special studies that contain these active earthquake faults. No known active faults cross the property and the site is not located within an Earthquake Fault Special Study Zone;

1.6 GROUNDWATER CONDITIONS

According to TCG, 2019, static or perched groundwater was not encountered in any subsurface explorations performed in their study. Based on our review of the GMU, 2021, report, we understand groundwater was encountered at approximately 5 to 16 feet below the ground surface to the landward, or southeast, of the Dana Point Marina. Based on proximity to the Pacific Ocean, it is our opinion groundwater is tidally influenced and should be assumed to be approximately consistent or equal in elevation to sea level.

1.7 SUBSURFACE SOIL

Based on our review of borings performed by TCG in 2019, we understand artificial fill soil was encountered within the upper 5 to 20 feet of all explorations performed within the existing parking lot. Fill soil generally consisted of loose to medium-dense clayey sand and soft to stiff sandy clay. Below artificial fill soil, TCG encountered near shore deposits to approximately 15 to 25 feet depth for Boring B-1 to B-3 consisting of medium-dense clayey sand with varying amounts of fines and sand. Below artificial fill soil and near shore deposits, TCG encountered Capistrano formation consisting of weathered clayey siltstones to the total depth explored.

In general boring explorations performed by TCG were specifically performed to identify consistency of foundations soil likely to be encountered for new pile elements. Based on our understanding of the site history and review of geotechnical borings, we anticipate pile foundations to be embedded within 3 feet of medium dense to dense granular stratum and moreover into competent siltstone bedrock of the Capistrano Formation.

2.0 CONCLUSIONS

From a geotechnical engineering viewpoint, in our opinion, the proposed project may be designed as planned, provided the geotechnical recommendations in this report are properly incorporated into the design plans and specifications.

2.1 SEISMIC HAZARDS

Potential seismic hazards resulting from a nearby moderate to major earthquake can generally be classified as primary and secondary. The primary effect is ground rupture, also called surface faulting. The common secondary seismic hazards include ground shaking, liquefaction, and lateral spread. The following sections present a discussion of these hazards as they apply to the site.

2.1.1 Ground Rupture

Since there are no known active faults crossing the property and the site is not located within an Earthquake Fault Special Study Zone, it is our opinion that ground rupture is unlikely at the subject property.

2.1.2 Ground Shaking

An earthquake of moderate to high magnitude generated within region could cause considerable ground shaking at the site, similar to that which has occurred in the past. To mitigate the shaking effects, structures should be designed using sound engineering judgment and the 2019 California Building Code (CBC) requirements.

2.1.3 Liquefaction

Soil liquefaction results from loss of strength during cyclic loading, such as imposed by earthquakes. The soil type considered most susceptible to liquefaction is clean, loose, saturated, and uniformly graded, fine-grained sand.

In general, artificial fills encountered in the borings are considered to be potentially liquefiable. As noted in Section 1.0, geotechnical explorations performed by TerraCosta were not performed to evaluate the liquefaction potential of artificial fills in the vicinity of the floating dock improvements. Since this geotechnical report was performed specifically in support of pile elements for floating docks, liquefaction analysis was not performed. Since historical dredging within the marina in the 1960s was performed into the underlying Capistrano bedrock formation, we believe proposed piles will be embedded within non-liquefiable bedrock stratum.

2.1.4 Lateral Spreading

Lateral spreading is a failure within a nearly horizontal soil zone (possibly due to liquefaction) that causes the overlying soil mass to move toward a free face or down a gentle slope. It is our opinion the potential for lateral spreading for artificial fills landward of the floating docks may be moderate. However, for proposed piles located within the previously dredged marina, it is our opinion the potential for lateral spread damage to dock piles to be low.

2.2 SLOPE STABILITY

Based on the improvements consisting of renovation to existing docks and construction of new pile foundations for new dock construction, static and seismic slope stability was not performed.

2.3 SOIL CORROSION POTENTIAL

Based on the presence of water, we recommend a chloride class of C2, which indicates 'concrete exposed to moisture and an external source of chlorides from deicing chemicals, salt, brackish water, seawater, or spray from these sources' exposure. In addition, we anticipate bedrock materials consist of clayey siltstone bedrock to be potentially corrosive with electrical resistivity in range of 500 to 2000 ohms-cm. Based on discussions with you, we understand additional corrosion measures include plastic sleeves will be placed on proposed piles.

2.4 2019 CBC SEISMIC DESIGN PARAMETERS

The 2019 CBC utilizes design criteria set forth in the 2010 ASCE 7 Standard. Based on the subsurface conditions encountered, we characterized the site as Site Class C in accordance with the 2019 CBC. We provide the 2019 CBC seismic design parameters in Table 2.4-1 below, which include design spectral response acceleration parameters based on the mapped Risk-Targeted Maximum Considered Earthquake (MCER) spectral response acceleration parameters.

TABLE 2-4-1: 2019 CBC Seismic Design Parameters, Latitude: 33.459913 **Longitude:** -117.699604

PARAMETER	VALUE
Site Class	C
Mapped MCE_R Spectral Response Acceleration at Short Periods, S_S (g)	1.28
Mapped MCE_R Spectral Response Acceleration at 1-second Period, S_1 (g)	0.459
Site Coefficient, F_A	1.2
Site Coefficient, F_V	1.5
MCE_R Spectral Response Acceleration at Short Periods, S_{MS} (g)	1.536
MCE_R Spectral Response Acceleration at 1-second Period, S_{M1} (g)	0.689
Design Spectral Response Acceleration at Short Periods, S_{DS} (g)	1.024
Design Spectral Response Acceleration at 1-second Period, S_{D1} (g)	0.459
Mapped MCE Geometric Mean (MCE_G) Peak Ground Acceleration, PGA (g)	0.563
Site Coefficient, F_{PGA}	1.2
MCE_G Peak Ground Acceleration adjusted for Site Class effects, PGA_M (g)	0.675
Long-period transition-period, T_L	8 sec

If proposed floating docks are subjected to seismic loading, the above parameters should be used for seismic design.

3.0 FOUNDATION RECOMMENDATIONS

3.1 GANGWAY LANDING

Based on discussions with you, we understand new access gangways will be attached to the existing seawall similar to the existing gangways at the Dana Point Marina. We understand at one location the proposed gangway includes a new concrete cantilever slab above the existing bulkhead seawall. We understand the proposed slab is anticipated to load the existing seawall with a load of approximately 4 kips per linear foot. Based on the size of the retaining wall footing of approximately 6 feet, we anticipate a pressure of approximately 670 psf of new load to be added vertically to the existing wall. Based on preliminary analysis, we estimate static settlements to be approximately less than 1 inch with the addition of 670 psf of new load.

3.2 PILE FOUNDATION DESIGN

As discussed above, we anticipate primary lateral and vertical support to be derived from competent siltstone bedrock of the Capistrano Formation. Based on these conditions, we recommend pile foundations consist of open pipe piles based on drivability. Provided recommendations and embedment depths are achieved, it is our opinion the proposed improvements may be constructed as planned with no supplemental ground improvement required.

3.2.1 Vertical Pile Capacity

We anticipate pile foundations to be embedded within competent siltstone bedrock of the Capistrano Formation. For compression or tensile loading (uplift or buoyancy) calculations, we recommend an allowable vertical capacity of 500 psf within siltstone bedrock. The uplift capacity should be taken as 0.75 of the vertical capacity. The allowable capacity is calculated using a factor of safety of 2. Since proposed dock piles are primarily for lateral pile support, we do not anticipate significant vertical or uplift loading. As such, we anticipate negligible vertical settlement or movement of dock piles.

3.2.2 Lateral Pile Analysis

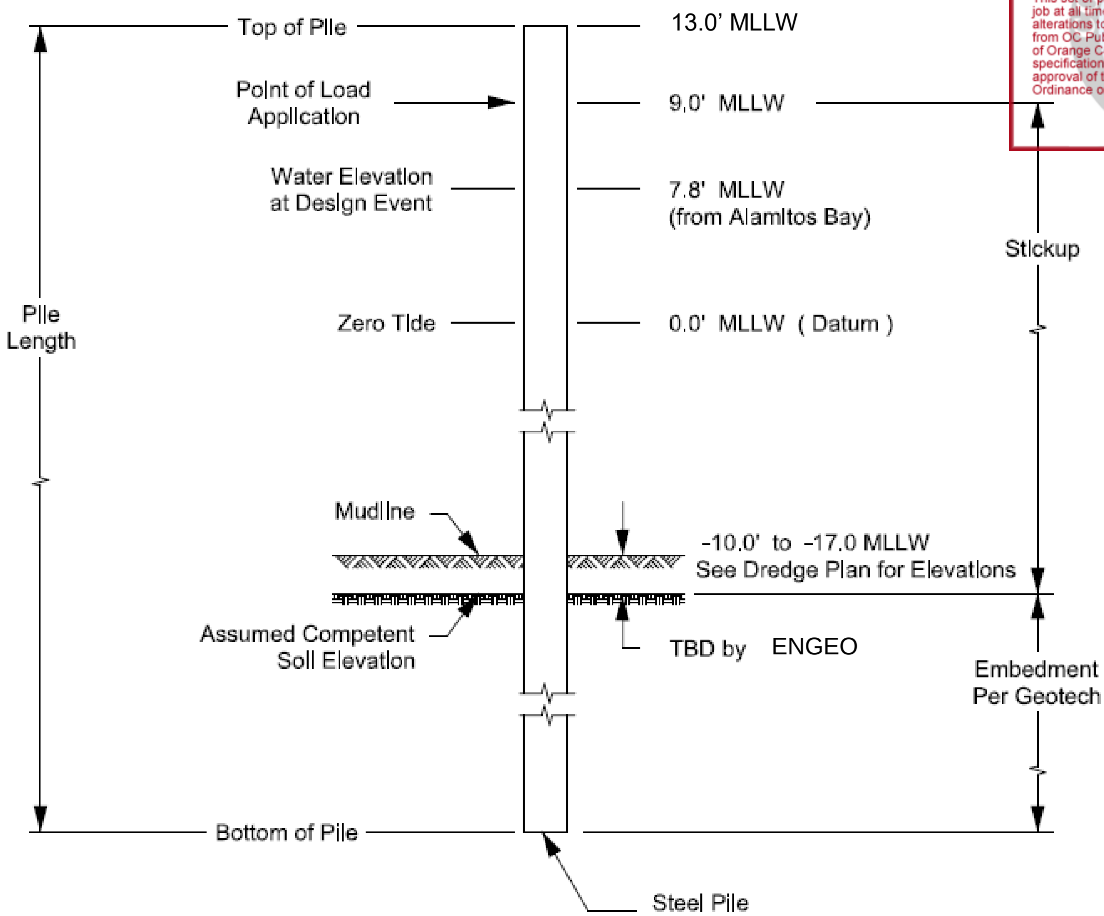
In accordance with the referenced document, we modeled the subsurface conditions with 3 feet of sand underlain by hard clay to rock-like conditions to the total depth of the model. L-Pile parameters used in our analysis are provided in Table 3.2.2-1 below.

TABLE 3.2.2-1: Soil Condition Parameters

SOIL TYPE	THICKNESS (feet)	UNIT WEIGHT (pcf)	COHESION (psf)	FRICTION ANGLE (∅)	LATERAL REACTION MODULUS (pci)	STRAIN FACTOR
Sand (Reese)	3	55	--	34	60	--
Stiff Clay (No Free Water)	78	60	4000	--	--	0.004

We reviewed the elevation view for typical Marina piles shown in Exhibit 3.2.2-1. Multiple mudline conditions were evaluated to account for varying thickness of the mudline deposits and depth across the site from elevation -10 to -17 feet (MLLW).

EXHIBIT 3.2.2-1: Elevation View of Typical Marina Pile



Based on Exhibit 3.2.2-1, we understand the elevation of the applied lateral loading is at elevation 9 feet (MLLW). Based on our discussions with you and review of the Request of Geotechnical Design Information prepared by Bellingham Marine Industries dated February 8, 2019, we understand pile design is controlled by the maximum pile moment of 213 ft-kips. Results of our L-Pile analysis are shown in Table 3.2.2-2 below.

TABLE 3.2.2-2: L-Pile Results for 12.75-Inch Steel Pipe Pile

BOTTOM OF MUDLINE (feet)	PILE STICKUP (feet)	PILE EMBEDMENT (feet)	TOTAL PILE LENGTH (feet)	MAXIMUM LATERAL LOAD(kips)	DEFLECTION (Inches)	PILE TIP ELEVATION (feet)	MAXIMUM MOMENT (ft-kip)
-10	19	17	36	9.76	8.75	-27	213
-13	22	15	37	8.60	10.75	-28	213
-15	24	13	37	7.99	12.5	-28	213
-17	26	13	39	7.41	13.75	-30	213

TABLE 3.2.2-3: L-Pile Results for 14-Inch Steel Pipe Pile (Prepared by TCG, 2019)

BOTTOM OF MUDLINE (feet)	PILE STICKUP (feet)	PILE EMBEDMENT (feet)	TOTAL PILE LENGTH (feet)	MAXIMUM LATERAL LOAD(kips)	DEFLECTION (Inches)	PILE TIP ELEVATION (feet)	MAXIMUM MOMENT (ft-kip)
-10	19	18	37	11	10	-28	259
-13	22	15	37	11	10	-28	259
-15	24	13	37	10.4	11.4	-28	259
-17	26	13	39	9.4	12.5	-30	259

TABLE 3.2.2-4: L-Pile Results for 18-Inch Steel Pipe Pile (Prepared by TCG, 2019)

BOTTOM OF MUDLINE (feet)	PILE STICKUP (feet)	PILE EMBEDMENT (feet)	TOTAL PILE LENGTH (feet)	MAXIMUM LATERAL LOAD(kips)	DEFLECTION (Inches)	PILE TIP ELEVATION (feet)	MAXIMUM MOMENT (ft-kip)
-10	19	18	37	19	9	-28	434
-13	22	15	37	19	9	-28	434
-15	24	13	37	17.6	10.2	-28	434
-17	26	13	39	16.4	11.4	-30	434

It should be noted the provided moment capacity was not factored and assumed to include bending capacity reduction from corrosion. Shear capacity of the pile was set to 100 kips to avoid shear from controlling the design. Moment of inertia of the pile is assumed to be 361.5 in^4 with a total area of the pile at 19.2 in^2. Steel pipe pile modulus of elasticity is assumed to be 29,000,000 psi.

3.2.3 Lateral Capacity Reduction

We understand proposed dock piles will be located adjacent to abandoned/demolished existing piles. Provided approximately 1 foot of clearance from an existing pile location is provided, it is our opinion lateral or vertical pile support will not be significantly reduced.

3.3 CONSTRUCTION CONSIDERATIONS

TCG, 2019 notes new piles are proposed for the Dana Point floating docks. These piles are primarily laterally loaded piles with negligible axial load requirements. As such, the key construction requirement for these piles is to drive the piles to their design specified tip elevations. The new piles are to be located within the main harbor area where the existing floating docks are located.

We understand that Bellingham drove piles for guide piles near the travel lift area of the marina, where they encountered hard driving conditions such that some piles mushroomed at the top during driving. As a result, we understand that pile design and driving operations were modified and some piles driven using stingers and/or driving shoes.

It is interesting to note that the existing piles in the marina appear to be a combination of both steel pipe piles and concrete piles. However, a review of the as-built drawings suggests that the concrete piles observed in the western basin required steel stingers to be able to drive the piles to desired tip.

We anticipate that pile operations will likely be on-water, with piles located and installed from a barge using a pile driving hammer. While we anticipate that most piles can be installed using the pile driving hammer, it is possible that approximately 5 to 10 percent of the piles may require pre-drilling or jetting at the pile location prior to driving.

4.0 EARTHWORK RECOMMENDATIONS

The following earthwork recommendations are provided in support of the landward improvements discussed in Section 1.0.

The relative compaction and optimum moisture content of soil, rock, and aggregate base referred to in this report are based on the most recent ASTM D1557 test method. Compacted soil is not acceptable if it is unstable. It should exhibit only minimal flexing or pumping, as observed by an ENGEO representative. As used in this report, the term “moisture condition” refers to adjusting the moisture content of the soil by either drying if too wet or adding water if too dry. We define “structural areas” in this report as any area sensitive to settlement of compacted soil. These areas include, but are not limited to building pads, sidewalks, pavement areas, and retaining walls.

4.1.1 Grading in Structural Areas

Subgrade compaction should be performed prior to fill placement, following cutting operations, and in areas left at grade as follows.

1. Scarify to a depth of at least 8 inches.

2. Moisture condition soil to at least 2 percentage points above the optimum moisture content.

3. Compact the subgrade to at least 90 percent relative compaction. Compact the upper 6 inches of finish pavement subgrade to at least 95 percent relative compaction prior to aggregate base placement. Fill deeper than 10 feet should be compacted to a minimum of 95 percent relative compaction.

After the subgrade soil has been compacted, place and compact acceptable fill as follows.

1. Spread fill in loose lifts that do not exceed 8 inches.

2. Moisture condition lifts to at least 2 percentage points above the optimum moisture content.

3. Compact fill to a minimum of 90 percent relative compaction; Compact the upper 6 inches of fill in pavement areas to 95 percent relative compaction prior to aggregate base placement. Fill deeper than 10 feet should be compacted to a minimum of 95 percent relative compaction.

4.1.1.1 Pavement Aggregate Base

Pavement base materials should meet Crushed Aggregate Base (CAB) or Crushed Miscellaneous Base (CMB) specifications in accordance with 2019 Greenbook standards, and should be compacted to at least 95 percent relative compaction (ASTM D1557). Moisture condition aggregate base to or slightly above the optimum moisture content prior to compaction.

5.0 PAVEMENT RECOMMENDATIONS

Based on the soil encountered in the explorations, an R-value of 10 was deemed to be appropriate for preliminary pavement design. Using estimated traffic indices for various pavement loading requirements, the following recommended pavement sections were developed using Topic 633 of the Caltrans Highway Design Manual (including the asphalt factor of safety), presented in the table below.

TABLE 5.0-1: Recommended Asphalt Concrete Pavement Sections

TRAFFIC INDEX	SECTION	
	ASPHALT CONCRETE (AC) (INCHES)	CLASS 2 AGGREGATE BASE (CAB) (INCHES)
5	3	8½
6	3½	10½
7	4	13
8	5	15
9	5½	17½
10	6½	19½

The Civil Engineer should determine the appropriate traffic indexes based on the estimated traffic loads and frequencies. Representative bulk samples of subgrade soil should be obtained during construction to allow confirmation R-value testing for the design.

Based on our review of the Civil Plans prepared by Tait, we understand boardwalk walkways are planned to consist of 4 inches of concrete over compacted subgrade. For higher performance of walkways we suggest placement of approximately 4 inches of aggregate base to support concrete pavements.

6.0 LIMITATIONS AND UNIFORMITY OF CONDITIONS

This report presents geotechnical recommendations for design of the improvements discussed in Section 1.0 for the Dana Point Marina Rehabilitation Project. If changes occur in the nature or design of the project, we should be allowed to review this report and provide additional recommendations, if any. It is the responsibility of the owner to transmit the information and recommendations of this report to the appropriate organizations or people involved in design of the project, including but not limited to developers, owners, buyers, architects, engineers, and designers. The conclusions and recommendations contained in this report are solely professional opinions and are valid for a period of no more than 2 years from the date of report issuance.

We strived to perform our professional services in accordance with generally accepted geotechnical engineering principles and practices currently employed in the area; no warranty is provided, express or implied. There are risks of earth movement and property damages inherent in building 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 existing subsurface exploration data is representative of the actual subsurface conditions across the site. Considering possible underground variability of soil, rock, stockpiled material, and groundwater, additional costs may be required to complete the project. We recommend that the owner establish a contingency fund to cover such costs. If unexpected conditions are encountered, ENGEO must be notified immediately to review these conditions and provide additional and/or modified recommendations, as necessary.

This document must not be subject to unauthorized reuse, that is, reusing without written authorization of ENGEO. Such authorization is essential because it requires ENGEO to evaluate the document's applicability given new circumstances, not the least of which is passage of time.

Actual field or other conditions will necessitate clarifications, adjustments, modifications or other changes to ENGEO's documents. Therefore, ENGEO must be engaged to prepare the necessary clarifications, adjustments, modifications or other changes before construction activities commence or further activity proceeds. If ENGEO's scope of services does not include on-site construction observation, or if other persons or entities are retained to provide such services, ENGEO cannot be held responsible for any or all claims arising from or resulting from the performance of such services by other persons or entities, and from any or all claims arising from or resulting from clarifications, adjustments, modifications, discrepancies or other changes necessary to reflect changed field or other conditions.

We determined the lines designating the interface between layers on the exploration logs using visual observations. The transition between the materials may be abrupt or gradual. The exploration logs contain information concerning samples recovered, indications of the presence of various materials such as clay, sand, silt, rock, existing fill, etc., and observations of groundwater encountered. The field logs also contain our interpretation of the subsurface conditions between sample locations. Therefore, the logs contain both factual and interpretative information. Our recommendations are based on the contents of the final logs, which represent our interpretation of the field logs.

7.0 LIST OF SELECTED REFERENCES

Federal Highway Administration (FHWA). (2016). Design and Construction of Driven Pile Foundations; Publication No. FHWA NHI-16-009.

California Building Code. (2019). California Building Standards Commission, http://www.bsc.ca.gov/codes.aspx.

Kennedy (2007); Geologic Map of the Oceanside 30'x60' Quadrangle, California; California Department of Conservation Geological Survey.

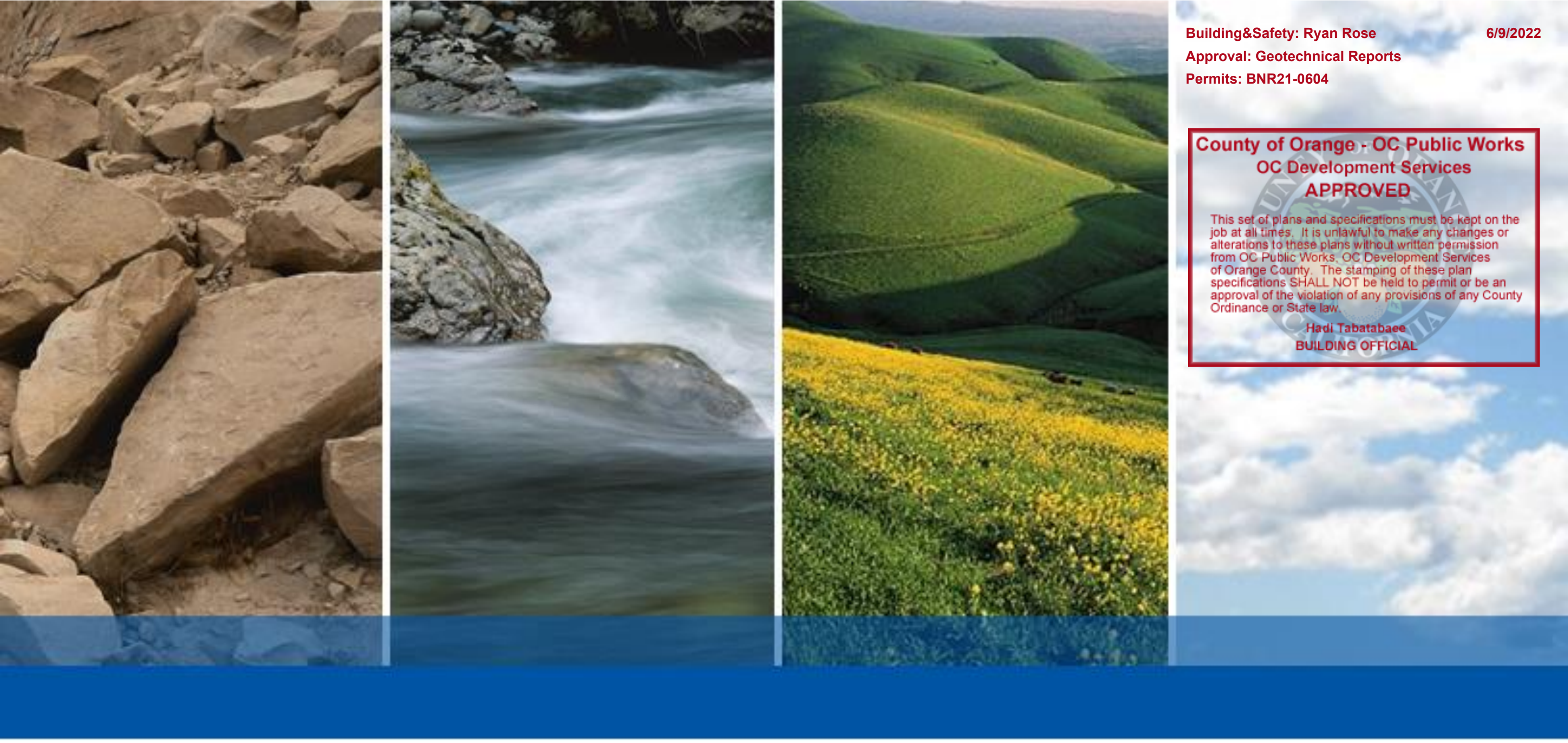
ENGEO (2021); Supplemental L-Pile Analysis; Dana Point Marina Rehabilitation Project; Dana Point, California; Project No. 19026.000.001; July 15, 2021.

TerraCosta Consulting Group (2019); Guide Pile Design Criteria ;Dana Point Marina Rehabilitation Project; Dana Point, California; Project No. 2975; August 15, 2019.

GMU (2021); Geotechnical Review of AGI Deep Soil Mixing; Dana Point Harbor Revitalization – Commercial Component, City of Dana Point, County of Orange, California; Project No. 17-206-02; May 27, 2021.

GMU (2021); Geotechnical Investigation Report- Volumes 1 to 2 Building 1 to 12; Dana Point Harbor Revitalization – Commercial Component, City of Dana Point, County of Orange, California; Project No. 17-206-02; May 27, 2021.

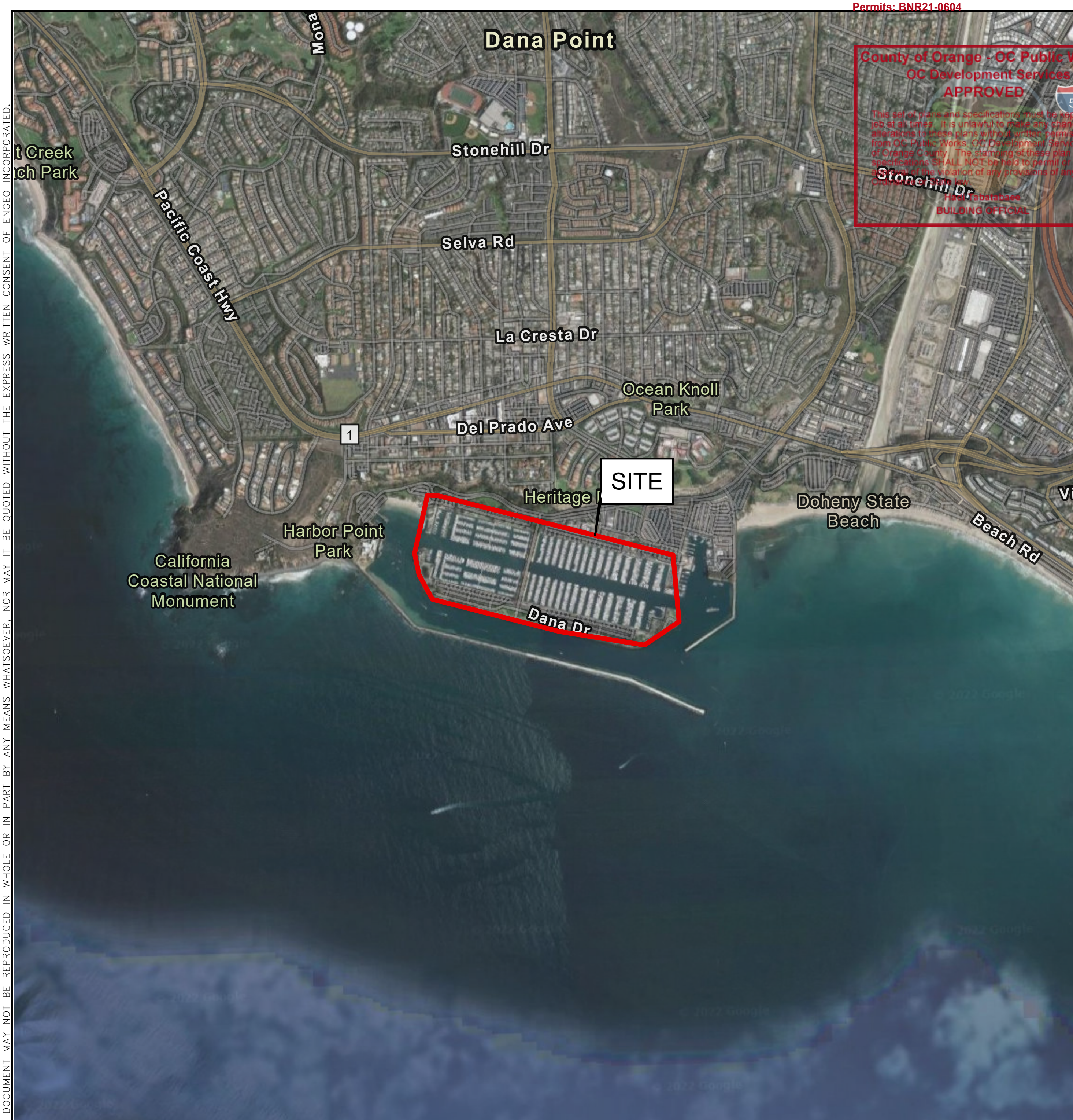
Tait (2022); West Cove ADA Improvement Plans; Dana Point Harbor, City of Dana Point, County of Orange, State of California, Sheets 1 to 5, Project No. ME0381; February 16, 2022.



FIGURES

FIGURE 1: Vicinity Map
FIGURE 2: Site Plan
FIGURE 3: Seismic Hazard Map
FIGURE 4: Regional Faulting and Seismicity

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604



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BASEMAP SOURCE: GOOGLE EARTH MAPPING SERVICE 2021

ENGEO
Expect Excellence

VICINITY MAP
DANA POINT MARINA
DANA POINT, CALIFORNIA

PROJECT NO.: 19026.000.001	FIGURE NO. 1
SCALE: AS SHOWN	
DRAWN BY: QRL	CHECKED BY: JT

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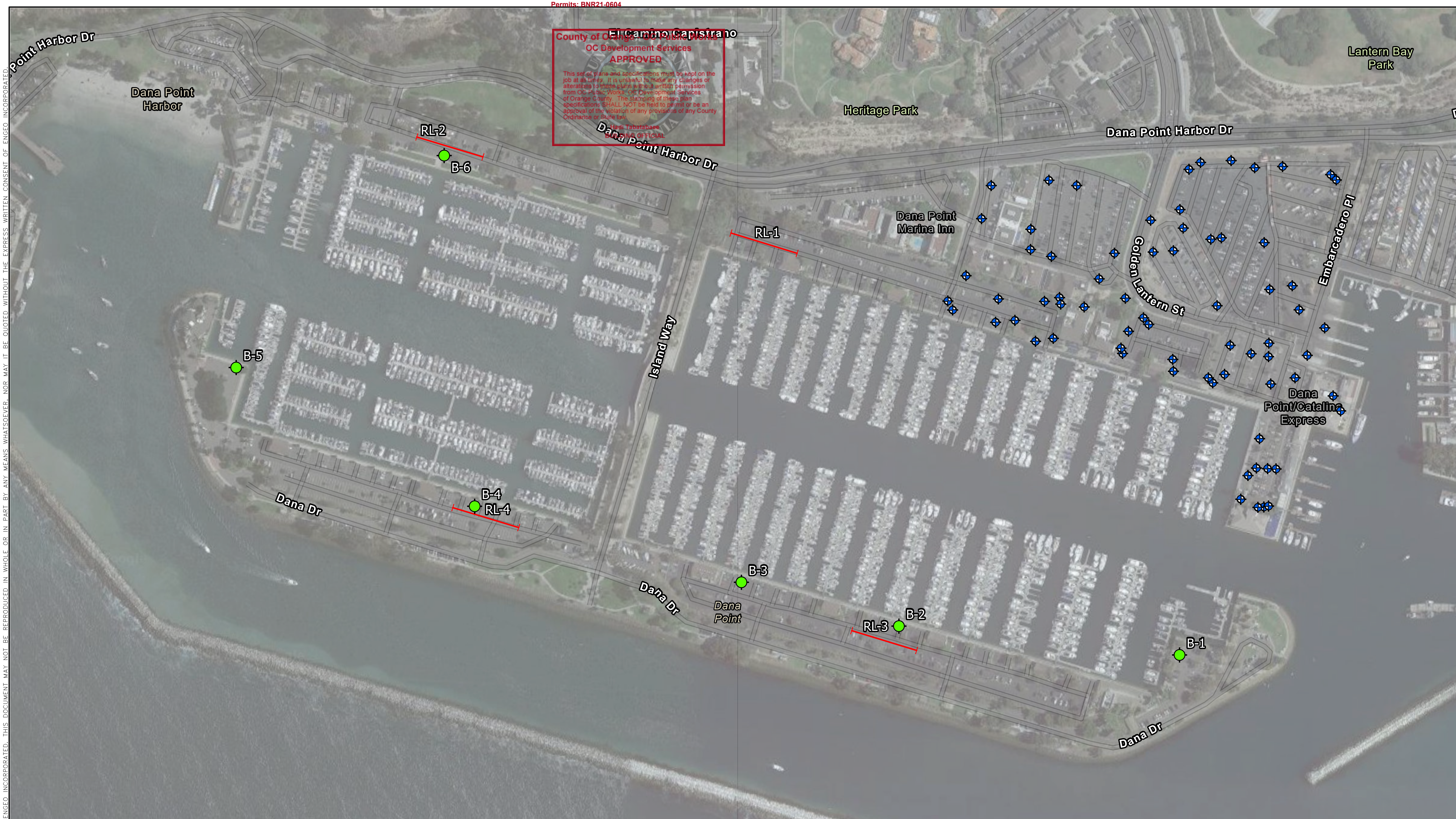
LAYOUT: VICINITY USER: QLIANG

ORIGINAL FIGURE PRINTED IN COLOR

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604



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EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- SOIL BORING (TERRACOSTA, 2018)
- SOUTHWEST GEOPHYSICS REMI LINE (230 FT) (TERRACOSTA, 2018)
- PREVIOUS EXPLORATION (GMU, 2021)

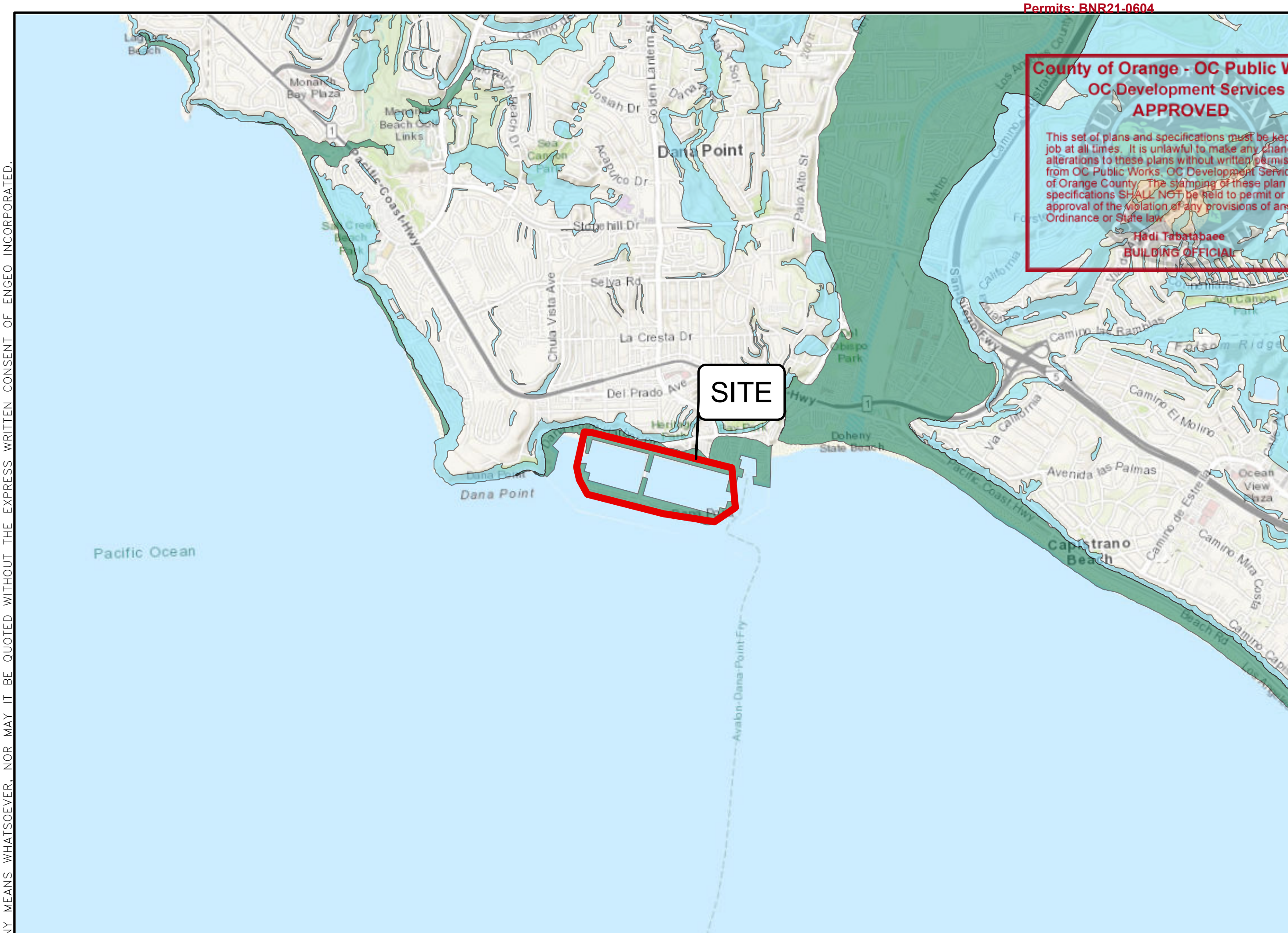
BASEMAP SOURCE: GHOOGLE MAPPING SERVICE 2021

ENGEO Expect Excellence	SITE PLAN DANA POINT MARINA DANA POINT, CALIFORNIA	PROJECT NO. : 19026.000.001 SCALE: AS SHOWN DRAWN BY: QRL CHECKED BY: JT	FIGURE NO. 2

PATH: G:\DRAFTING\PROJECTS_18000 TO 19999\19026\19026000001\GEOTECH\GEX\DANA POINT MARINA.APRX
LAYOUT: SITE PLAN USER: QLIANG

ORIGINAL FIGURE PRINTED IN COLOR

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604



County of Orange - OC Public Works
OC Development Services
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Hadi Tabatabaee
BUILDING OFFICIAL

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

EARTHQUAKE-INDUCED LANDSLIDE ZONES
AREAS WHERE THE PREVIOUS OCCURRENCE OF LANDSLIDE MOVEMENT, OR LOCAL TOPOGRAPHIC, GEOLOGICAL, GEOTECHNICAL AND SUBSURFACE WATER CONDITIONS INDICATE A POTENTIAL FOR PERMANENT GROUND DISPLACEMENTS SUCH THAT MITIGATION AS DEFINED IN PUBLIC RESOURCES CODE SECTION 2693(C) WOULD BE REQUIRED.

LIQUEFACTION ZONE
AREAS WHERE THE HISTORICAL OCCURRENCE OF LIQUEFACTION, OR LOCAL GEOLOGICAL, GEOTECHNICAL AND GROUND WATER CONDITIONS INDICATE A POTENTIAL L FOR PERMANENT GROUND DISPLACEMENTS SUCH THAT MITIGATION AS DEFINED IN PUBLIC RESOURCES CODE SECTION 2693(C) WOULD BE REQUIRED

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FEET

BASEMAP SOURCE: ESRI MAPPING SERVICE
CALIFORNIA DEPARTMENT OF CONSERVATION, CALIFORNIA GEOLOGICAL SURVEY

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SEISMIC HAZARDS ZONE MAP
DANA POINT MARINA
DANA POINT, CALIFORNIA

PROJECT NO. : 19026.000.001		FIGURE NO. 3
SCALE: AS SHOWN		
DRAWN BY: QRL	CHECKED BY: JT	

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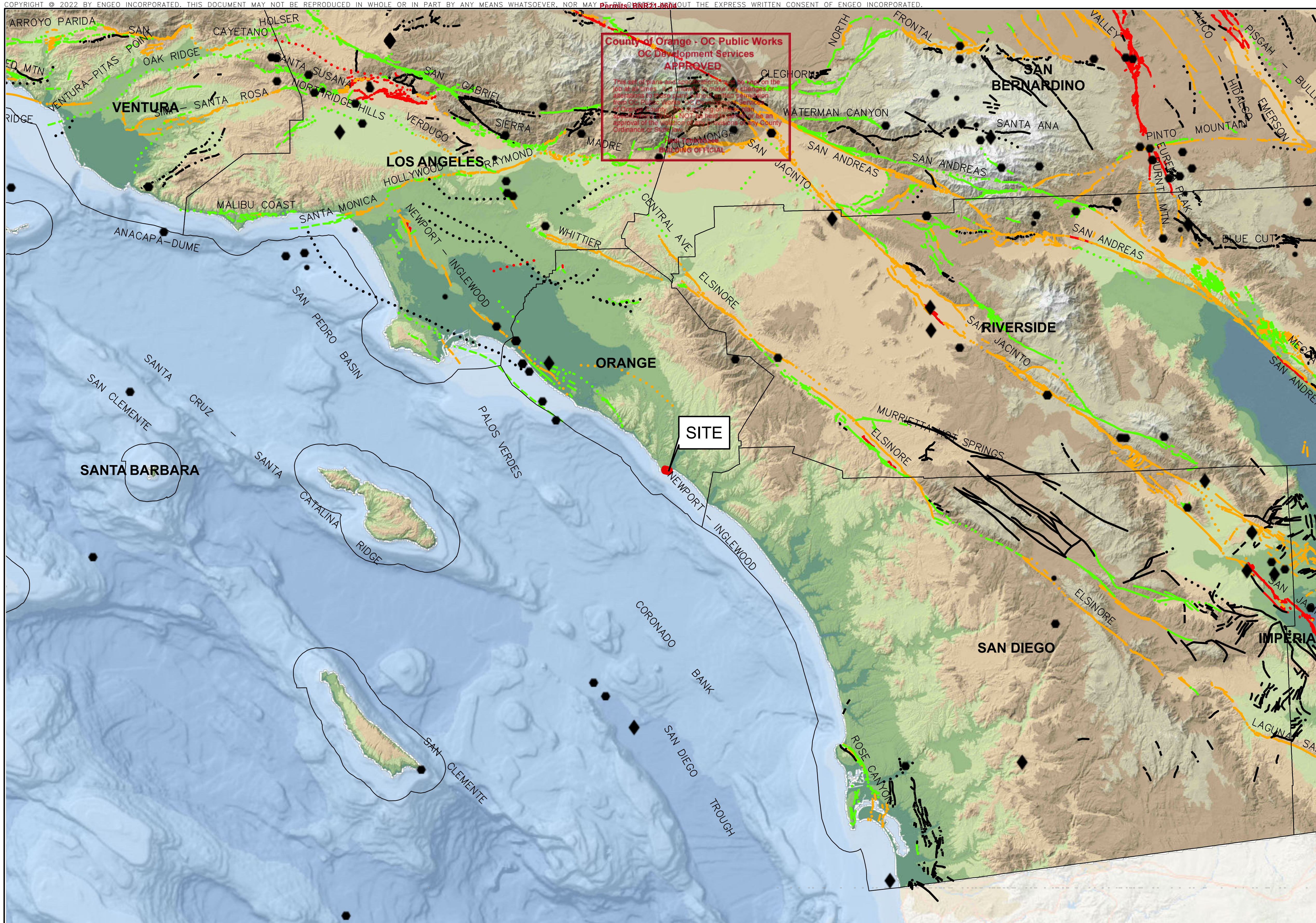
LAYOUT: SEISMIC HAZARD USER: QLIANG
ORIGINAL FIGURE PRINTED IN COLOR

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: GRD21-0...



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Miles

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

EARTHQUAKE

- MAGNITUDE 7+
- MAGNITUDE 6-7
- MAGNITUDE 5-6

QUATERNARY FAULTS

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
- 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
- GREAT VALLEY FAULT ZONE

BASE MAP SOURCE
ESRI, GEBCO, DELORME, NATURALVUE
COLOR HILLSHADE IMAGE BASED ON THE NATIONAL ELEVATION DATA SET (NED) AT 30 METER RESOLUTION
U.S.G.S. QUATERNARY FAULT DATABASE, 2018
U.S.G.S. HISTORIC EARTHQUAKE DATABASE (1800-PRESENT)

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REGIONAL FAULTING AND SEISMICITY
DANA POINT MARINA
DANA POINT, CALIFORNIA

PROJECT NO. : 19026.000.001	FIGURE NO. 4
SCALE: AS SHOWN	
DRAWN BY: QRL	CHECKED BY: JT

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LAYOUT: FAULT&SEISMICITY USER: QLIANG

ORIGINAL FIGURE PRINTED IN COLOR

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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Hadi Tabatabaee
BUILDING OFFICIAL

APPENDIX A

EXPLORATION LOGS

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	LEGEND

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/22/2019	1/23/2019	1 of 2

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GROUND WATER (ft)
Marl M5	6"	40	10.0	▼ 2.0 / *8.0*

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
5	5								
10	0								
		PB							
		S							
15	-5								

KEY TO EXCAVATION LOGS

▼ WATER TABLE MEASURED AT TIME OF DRILLING

OTHER TESTS

CC	Confined Compression	ppm	parts per million of VOCs*
CL	Chloride Content	R	Resistivity
CS	Consolidation	RV	R-Value
DS	Direct Shear	SA	Sieve Analysis
EI	Expansion Index	SE	Sand Equivalent
GS	Grain Size Analysis	SF	Sulfate
LC	Laboratory Compaction	SG	Specific Gravity
pH	Hydrogen Ion	SW	Swell
PI	Plasticity Index		

PENETRATION RESISTANCE (BLOWS/ft)

Number of blows required to advance the sampler 1 foot.

California Sampler blow counts can be converted to equivalent SPT blow counts by using an end-area conversion factor of 0.67 when using a 140-pound hammer and a 30-inch drop.

SAMPLE TYPE

PB ("Plastic Bag") - a disturbed, but representative sample obtained from a specific depth interval placed in a large plastic bag.

S ("SPT") - a.k.a. Standard Penetration Test, an 18-inch-long, 2-inch O.D., 1-3/8-inch I.D. drive sampler.

(CONTINUED)

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FIGURE B-1 a

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	LEGEND

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/22/2019	1/23/2019	2 of 2

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GROUND WATER (ft)
Marl M5	6"	40	10.0	2.0 / *8.0*

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
25	-15								
30	-20								
35	-25								

KEY TO EXCAVATION LOGS

(CONTINUED)

NOTES ON FIELD INVESTIGATION

Borings were advanced using a truck-mounted Marl M5 drill rig with a 6-inch hollow-stem auger.

Standard Penetration Tests (SPT) were used to obtain soil samples. The SPT were driven into the soil at the bottom of the borings with a 140-pound hammer falling 30 inches. When the samplers were withdrawn from the boring, the samples were removed, visually classified, sealed in plastic containers, and taken to the laboratory for detailed inspection.

Free groundwater was encountered in the borings at the time of drilling as noted on the boring logs.

Classifications are based upon the Unified Soil Classification System and include color, moisture, and consistency. Field descriptions have been modified to reflect results of laboratory inspection where deemed appropriate. At the completion of drilling, all borings were sealed per state and local standards.

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FIGURE B-1 b

LOG OF TEST BORING

PROJECT NAME	Dana Point Harbor Revitatilzation
PROJECT NUMBER	2975
BORING	B-1
SITE LOCATION	Dana Point
START	1/22/2019
FINISH	1/22/2019
SHEET NO.	1 of 3
DRILLING COMPANY	Pacific Drilling
DRILLING METHOD	Hollow Stem Auger
LOGGED BY	G. Spaulding
CHECKED BY	
DRILLING EQUIPMENT	Marl M5
BORING DIA. (in)	6"
TOTAL DEPTH (ft)	41
GROUND ELEV (ft)	10.0
DEPTH/*ELEV.* GROUND WATER (ft)	n/a
SAMPLING METHOD	SPT
NOTES	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
0	10								2" - 3" AC / 4" - 6" Class II Base
									FILL **CLAYEY SAND(SC) TO SANDY CLAY (CL)**, damp, medium dense, olive to olive-gray
		PB	1						
5	5								
									- Becomes moist
10	0								
		S	2	7					
									NEAR SHORE DEPOSITS **SILTY TO CLAYEY SAND (SC-SM)**, wet, medium dense, olive gray
15	-5								
		S	3	30					- Sampler on rock, poor recovery
									- Becomes sandier

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FIGURE B-2 a

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	B-1

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/22/2019	1/22/2019	2 of 3

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/ELEV. GROUND WATER (ft)
Marl M5	6"	41	10.0	▼ n/a

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		S	4	6					
									CAPISTRANO FORMATION **SILT TO CLAYEY SILT (ML) & FINE SANDY CLAY (CL)**, damp, hard, dark gray, interbedded w/ cemented zones
25	-15								
		S	5	79/8"			GS PI		
									- Hard drilling cemented zone
									CLAYEY SILT (ML) TO SAND (SP-SM), moist to wet, very dense, gray to dark gray, interbedded, w/ occasional concretions and cemented zones
30	-20								
35	-25								

TCG_METRIC_LOG(3) 2975.GPJ GDCLOGMT.GDT 8/14/19

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FIGURE B-2 b

LOG OF TEST BORING

PROJECT NAME: Dana Point Harbor Revitatilzation			PROJECT NUMBER: 2975	BORING: B-1	
SITE LOCATION: Dana Point		START: 1/22/2019	FINISH: 1/22/2019	SHEET NO.: 3 of 3	
DRILLING COMPANY: Pacific Drilling	DRILLING METHOD: Hollow Stem Auger		LOGGED BY: G. Spaulding	CHECKED BY:	
DRILLING EQUIPMENT: Marl M5	BORING DIA. (in): 6"	TOTAL DEPTH (ft): 41	GROUND ELEV (ft): 10.0	DEPTH/*ELEV.* GROUND WATER (ft): ⊻ n/a	
SAMPLING METHOD: SPT	NOTES:				

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		S	6	76/11"					
									Botton of hole @ 41 feet. No free groundwater encountered at time of drilling.
45	-35								
50	-40								
55	-45								

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FIGURE B-2 c

LOG OF TEST BORING

PROJECT NAME: Dana Point Harbor Revitatilzation	PROJECT NUMBER: 2975	BORING: B-2	
SITE LOCATION: Dana Point	START: 1/22/2019	FINISH: 1/22/2019	SHEET NO.: 1 of 2
DRILLING COMPANY: Pacific Drilling	DRILLING METHOD: Hollow Stem Auger	LOGGED BY: G. Spaulding	CHECKED BY:
DRILLING EQUIPMENT: Marl M5	BORING DIA. (in): 6"	TOTAL DEPTH (ft): 35	GROUND ELEV (ft): 10.0
DEPTH/ELEV. GROUND WATER (ft): n/a	SAMPLING METHOD: SPT	NOTES:	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
									2" - 3" AC
									FILL **CLAYEY SAND (SC) & SANDY CLAY (CL)**, damp to moist, medium dense, olive to olive-gray, interbedded
5	5								- Becomes clayier
10	0	S	1	15					
									NEAR SHORE DEPOSITS **SILTY TO CLAYEY SAND (SC/SM)**, becomes olive-gray to gray
									CAPISTRANO FORMATION **SILTY SAND (SP-SM)**, moist, medium dense, yellow to yellow-brown, w/ occasional gravels
15	-5	S	2	17					

TCG_METRIC_LOG(3) 2975.GPJ GDCLOGMT.GDT 8/14/19

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	B-2

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/22/2019	1/22/2019	2 of 2

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/ELEV. GROUND WATER (ft)
Marl M5	6"	35	10.0	n/a

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		SPT	3	17			GS		**SILTY SAND (SM)**, moist to wet, medium dense, olive-gray, w/ occasional gravels
									- Harder drilling
									- Gravels
									SILT (ML) & FINE SAND (SC), moist, very dense, dark gray, interbedded, occasional cemented zones
25	-15	SPT	4	59/11"			GS PI		
30	-20								- Becomes Silty Sand (SM)
		SPT	5	89/9"			GS		
									- Very hard drilling
35	-25								
									Practical refusal @ 35 feet. No free groundwater encountered at time of drilling.

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FIGURE B-3 b

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING	
Dana Point Harbor Revitatilzation	2975	B-3	

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/22/2019	1/22/2019	1 of 3

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/ELEV. GROUND WATER (ft)
Marl M5	6"	41	7.5	n/a

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
									2" - 3" AC
									FILL **SILTY TO CLAYEY SAND (SM/SC)**, damp, medium dense, olive
	5								
									FILL **SILT (ML)**, damp, medium dense, gray, w/ siltstone chunks
5		S	1	22					
	0								
10		S	2	79/8"					- Large piece of cemented siltstone (moved hole 4')
	-5								
15		S	3	14					RECENT NEAR SHORE DEPOSITS **SILTY TO CLAYEY SAND (SM/SC)**, damp to moist, medium dense, gray
	-10								
									WEATHERED CAPISTRANO FORMATION **SAND TO SILTY FINE SAND (SM)**, moist, loose to medium dense, mottled yellow-brown to light olive-gray, w/ occasional gravel

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FIGURE B-4 a

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	B-3

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/22/2019	1/22/2019	2 of 3

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/ELEV. GROUND WATER (ft)
Marl M5	6"	41	7.5	n/a

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		S	4	9			GS PI		- Becomes Clayey Sand (SC)
	-15								
25		S	5	50/4"			GS		CAPISTRANO FORMATION **SAND TO SILTY FINE SAND (SM)**, damp, very dense, olive-gray to gray, interbedded, w/ occasional gravels - Cemented - Hard drilling - Interbedded siltstone (ML) & sandstone (SM)
	-20								
30									- Very hard drilling
	-25								
									- Cemented zone 34' to 35'
35									
									- Cemented zone 37' to 39'
	-30								

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FIGURE B-4 b

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	B-3

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/22/2019	1/22/2019	3 of 3

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/ELEV. GROUND WATER (ft)
Marl M5	6"	41	7.5	n/a

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		S	6	74					
	-35								Bottom of hole @ 41 feet. No free groundwater encountered at time of drilling.
45									
	-40								
50									
	-45								
55									
	-50								

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FIGURE B-4 c

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	B-4

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/23/2019	1/23/2019	1 of 2

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/ELEV. GROUND WATER (ft)
Marl M5	6"	40	10.0	⊻ n/a

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
									2" - 3" AC / 3" Class II
									FILL **CLAYEY SAND (SC) & SANDY CLAY (CL)**, damp, medium stiff, olive-gray, mix
5	5								- Becomes mostly olive Sandy Clay (CL)
10	0								
		S	1	4					
15	-5								

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FIGURE B-5 a

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange OC Public Works
OC Development Services
APPROVED
This set of plans and specifications must be kept on the job site until completion of the project. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works/OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law.
Hadi Tabatabaee
BUILDING OFFICIAL

LOG OF TEST BORING

PROJECT NAME: Dana Point Harbor Revitatilzation	PROJECT NUMBER: 2975	BORING: B-4	
SITE LOCATION: Dana Point	START: 1/23/2019	FINISH: 1/23/2019	SHEET NO.: 2 of 2
DRILLING COMPANY: Pacific Drilling	DRILLING METHOD: Hollow Stem Auger	LOGGED BY: G. Spaulding	CHECKED BY:
DRILLING EQUIPMENT: Marl M5	BORING DIA. (in): 6"	TOTAL DEPTH (ft): 40	GROUND ELEV (ft): 10.0
DEPTH/ELEV. GROUND WATER (ft): n/a	SAMPLING METHOD: SPT	NOTES:	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		S	2	19					WEATHERED CAPISTRANO FORMATION **SAND (SP-SM) & SILT (ML)**, damp, medium dense, olive and dark gray, interbedded
									CAPISTRANO FORMATION **SAND (SP-SM) & SILT (ML)**, damp, medium dense to dense, olive and dark gray, interbedded w. occasional cemented zones - Harder drilling cemented zone
25	-15	S	3	19			GS		
									- Harder drilling cemented zone
30	-20								- Becomes Silty Sand (SM)
		S	4	53			GS		
									- Harder drilling
35	-25								- Cemented zone
									- Hard drilling
									Bottom of hole @ 40 feet sanding in. No free groundwater encountered at time of drilling.

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FIGURE B-5 b

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	B-5

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/23/2019	1/23/2019	1 of 2

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GROUND WATER (ft)
Marl M5	6"	36	10.0	▼ n/a

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
0	10								2" - 3" AC
									FILL **SANDY CLAY (CL) & CLAYEY SAND (SC)**, damp, loose to medium dense, dark gray and olive, w/ occasional gravels
5	5								
10	0	S	1	9					- Becomes moist to wet
15	-5								

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FIGURE B-6 a

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange OC Public Works
OC Development Services
APPROVED
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Hadi Tabatabaee
BUILDING OFFICIAL

LOG OF TEST BORING

PROJECT NAME: Dana Point Harbor Revitatilzation
PROJECT NUMBER: 2975
BORING: B-5
SITE LOCATION: Dana Point
START: 1/23/2019
FINISH: 1/23/2019
SHEET NO.: 2 of 2
DRILLING COMPANY: Pacific Drilling
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: G. Spaulding
CHECKED BY:
DRILLING EQUIPMENT: Marl M5
BORING DIA. (in): 6"
TOTAL DEPTH (ft): 36
GROUND ELEV (ft): 10.0
DEPTH/*ELEV.* GROUND WATER (ft): n/a
SAMPLING METHOD: SPT
NOTES:

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		S	2	6			GS PI		
									CAPISTRANO FORMATION **SILT (ML) & FINE SANDY CLAY (CL)**, damp, very dense, dark gray, interbedded, w/ occasional cemented zones
25	-15								
		S	3	74/10"			GS PI		- Becomes Silty Sand (SM)
									- Very hard drilling
30	-20								
									- Cemented zone
35	-25								
		S	4	72/10"					
									Practical refusal @ 36 feet. No free groundwater encountered at time of drilling.

TCG_METRIC_LOG(3) 2975.GPJ GDCLOGMT.GDT 8/14/19

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FIGURE B-6 b

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	B-6

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/23/2019	1/23/2019	1 of 3

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GROUND WATER (ft)
Marl M5	6"	46	10.0	▼ n/a_

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
0	10								2" - 3" AC / 3" Class II Base
									FILL **CLAYEY SAND (SC) & SANDY CLAY (CL)**, moist, soft to medium stiff, olive & gray, mix
5	5								
									WEATHERED CAPISTRANO FORMATION **CLAYEY SAND (SC)**, moist, medium dense, light olive w/ yellow-brown iron oxide staining
10	0								
		S	1	25					
									- Gravels
15	-5								- Rock in tip of sampler, poor recovery
		S	2	14					

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FIGURE B-7 a

LOG OF TEST BORING

PROJECT NAME	Dana Point Harbor Revitatilzation
PROJECT NUMBER	2975
BORING	B-6
SITE LOCATION	Dana Point
START	1/23/2019
FINISH	1/23/2019
SHEET NO.	2 of 3
DRILLING COMPANY	Pacific Drilling
DRILLING METHOD	Hollow Stem Auger
LOGGED BY	G. Spaulding
CHECKED BY	
DRILLING EQUIPMENT	Marl M5
BORING DIA. (in)	6"
TOTAL DEPTH (ft)	46
GROUND ELEV (ft)	10.0
DEPTH/*ELEV.* GROUND WATER (ft)	▼ n/a
SAMPLING METHOD	SPT
NOTES	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		S	3	36					- Poor recovery
									CAPISTRANO FORMATION **SILTY SAND TO SAND (SP-SM)**, moist, very dense, light olive-gray w/ yellow iron oxide staining, interbedded
25	-15								
		S	4	72			GS		
									- Hard drilling
30	-20								
35	-25								
		S	5	87/10"					- w/ occasional dark gray clay chunks
									- Very hard drilling

TerraCosta Consulting Group
TerraCosta Consulting Group, Inc.
3890 Murphy Canyon Road, Suite 200
San Diego, California 92123

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

FIGURE B-7 b

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	B-6

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/23/2019	1/23/2019	3 of 3

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GROUND WATER (ft)
Marl M5	6"	46	10.0	⊻ n/a_

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
									- Hard drilling **SAND (SM)**, moist, very dense, gray
45	-35								
		S	6	71			GS		
									Bottom of hole @ 46 feet. No free groundwater encountered at time of drilling.
50	-40								
55	-45								

TCG_METRIC_LOG(3) 2975.GPJ GDCLOGMT.GDT 8/14/19

TerraCosta Consulting Group

TerraCosta Consulting Group, Inc.
3890 Murphy Canyon Road, Suite 200
San Diego, California 92123

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FIGURE B-7 c

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SOUTHWEST GEOPHYSICS LLC
YOUR SUBSURFACE SOLUTION

February 6, 2019
Project No. 119031

Mr. Gregory A. Spaulding
TerraCosta Consulting Group, Inc.
3890 Murphy Canyon Road, #200
San Diego, CA 92123

Subject: Geophysical Evaluation
Dana Point Harbor
Dana Point, California

Dear Mr. Spaulding:

In accordance with your authorization, we have performed geophysical survey services pertaining to the Dana Point Harbor project located in Dana Point, California (Figure 1). The purpose of our survey was to develop Shear-wave velocity profiles to be used for design and construction at the site. Our services were performed on January 23, 2019. This report presents the survey methodology, equipment used, analysis, and findings from our study.

Our scope of services included the performance of four refraction microtremor (ReMi) profiles (RL-1 through RL-4) at preselected areas of the project site (see Figures 2 and 3). The ReMi technique uses recorded surface waves (specifically Rayleigh waves) that are contained in background noise to develop a Shear-wave velocity profile of the study area down to a depth, in this case, of approximately 100 feet. The depth of exploration is dependent on the length of the line and the frequency content of the background noise. The results of the ReMi method are displayed as a one-dimensional sounding which represents the average condition across the length of the line. The ReMi method does not require an increase of material velocity with depth; therefore, low velocity zones (velocity inversions) are detectable with ReMi.

Our ReMi survey included the use of a 24-channel Geometrics Geode seismograph and 24 4.5-Hz vertical component geophones. The geophones were spaced 10 feet apart for a total line length of 230 feet. Fifteen records, each 32 seconds long, were recorded and then downloaded to a computer. The data were later processed using SeisOpt® ReMi™ software (© Optim LLC, 2005), which uses the refraction microtremor method (Louie, 2001). The program generates phase-velocity dispersion curves for each record and provides an interactive dispersion modeling tool where the users determine the best fitting model. The result is a one-dimensional shear-wave velocity model of the site with roughly 85 to 95 percent accuracy. Figure 3 depicts the general site conditions in the survey area.

Figures 4a through 4d present the results from our survey. Based on our analysis of the collected data, the average characteristic site Shear-wave velocity down to a depth of 100 feet is 1,399 feet per second (ft/s) for RL-1, 1,352 ft/s for RL-2, 1,381 ft/s for RL-3, and 1,118 ft/s for RL-4 (CBC, 2016). These values correspond to site classifications of **C** for RL-1 through RL-3 and **D** for RL-4. The results also indicate a substantial, abrupt, increase in velocity at an approximate depth of 22 feet and 25 feet at locations RL-1 through RL-3, and RL-4 respectively. It should be noted the ReMi results represent the average condition across the length of the line.

The field evaluation and geophysical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by consultants performing similar tasks in the project area. No warranty, express or implied, is made regarding the conclusions and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be present. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface surveying will be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Southwest Geophysics should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document. This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

We appreciate the opportunity to be of service on this project. Should you have any questions related to this report, please contact the undersigned at your convenience.

Sincerely,

SOUTHWEST GEOPHYSICS, LLC

Aaron T. Puente
Project Geophysicist

Hans van de Vrugt, C.E.G., P.Gp.
Principal Geologist/Geophysicist

REGISTERED GEOPHYSICIST
Hans van de Vrugt
No 1012
Exp. 2/29/20
STATE OF CALIFORNIA

ATP/HV/hv

Attachments: Figure 1 – Site Location Map
Figure 2 – Seismic Line Location Map
Figure 3 – Site Photographs
Figure 4a – ReMi Results, RL-1
Figure 4b – ReMi Results, RL-2
Figure 4c – ReMi Results, RL-3
Figure 4d – ReMi Results, RL-4

Distribution: Addressee (electronic)

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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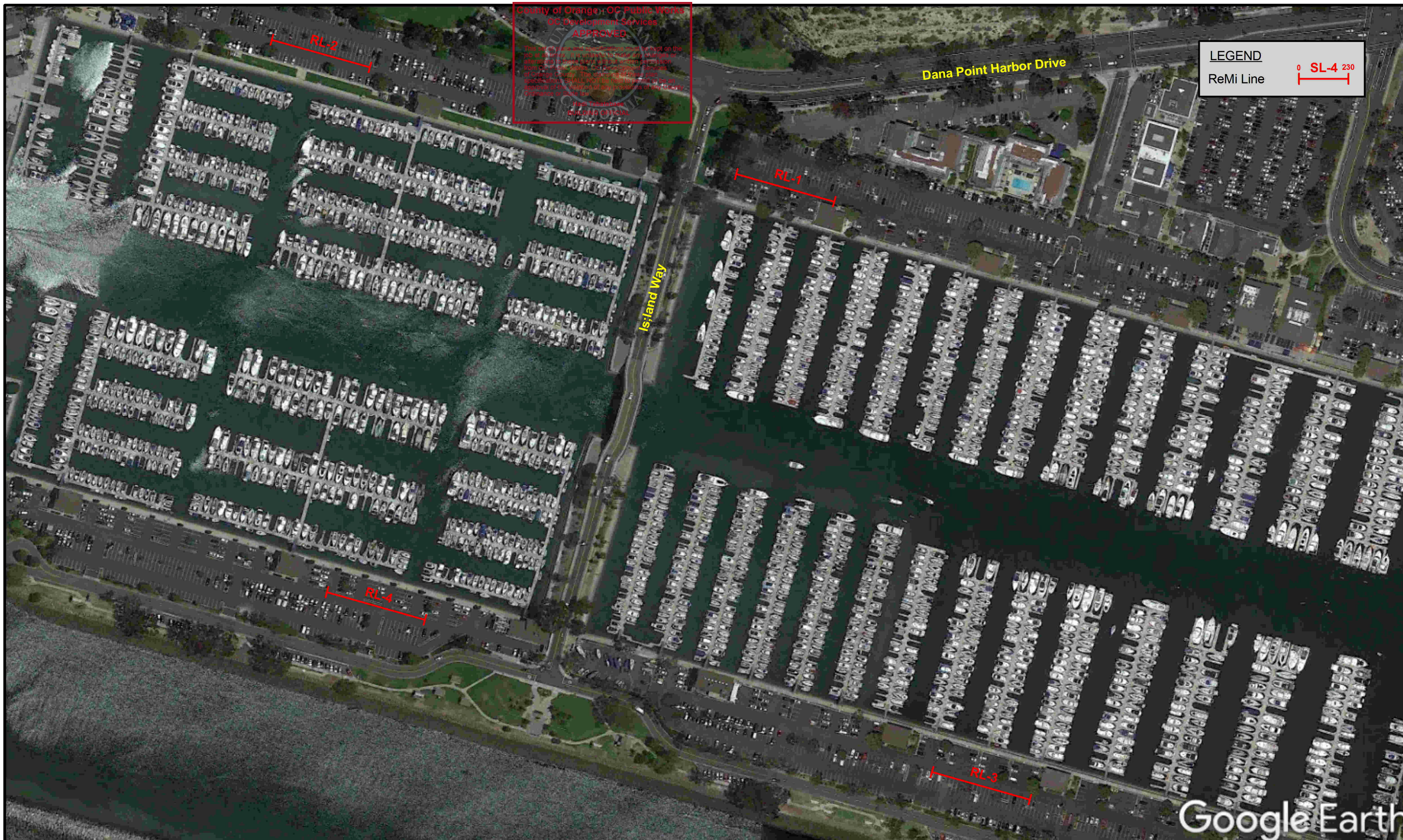
SITE LOCATION MAP	N	Dana Point Harbor Dana Point, California Project No.: 119031 Date: 01/19	SOUTHWEST GEOPHYSICS Figure 1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604



SEISMIC LINE LOCATION MAP	N	Dana Point Harbor Dana Point, California Project No.: 119031 Date: 02/19	SOUTHWEST GEOPHYSICS Figure 2	0 200 400 **approximate scale in feet**

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SITE PHOTOGRAPHS	Dana Point Harbor Dana Point, California Project No.: 119031 — Date: 02/19	SouthWest Geophysics LLC Figure 3

Building&Safety: Ryan Rose 6/9/2022
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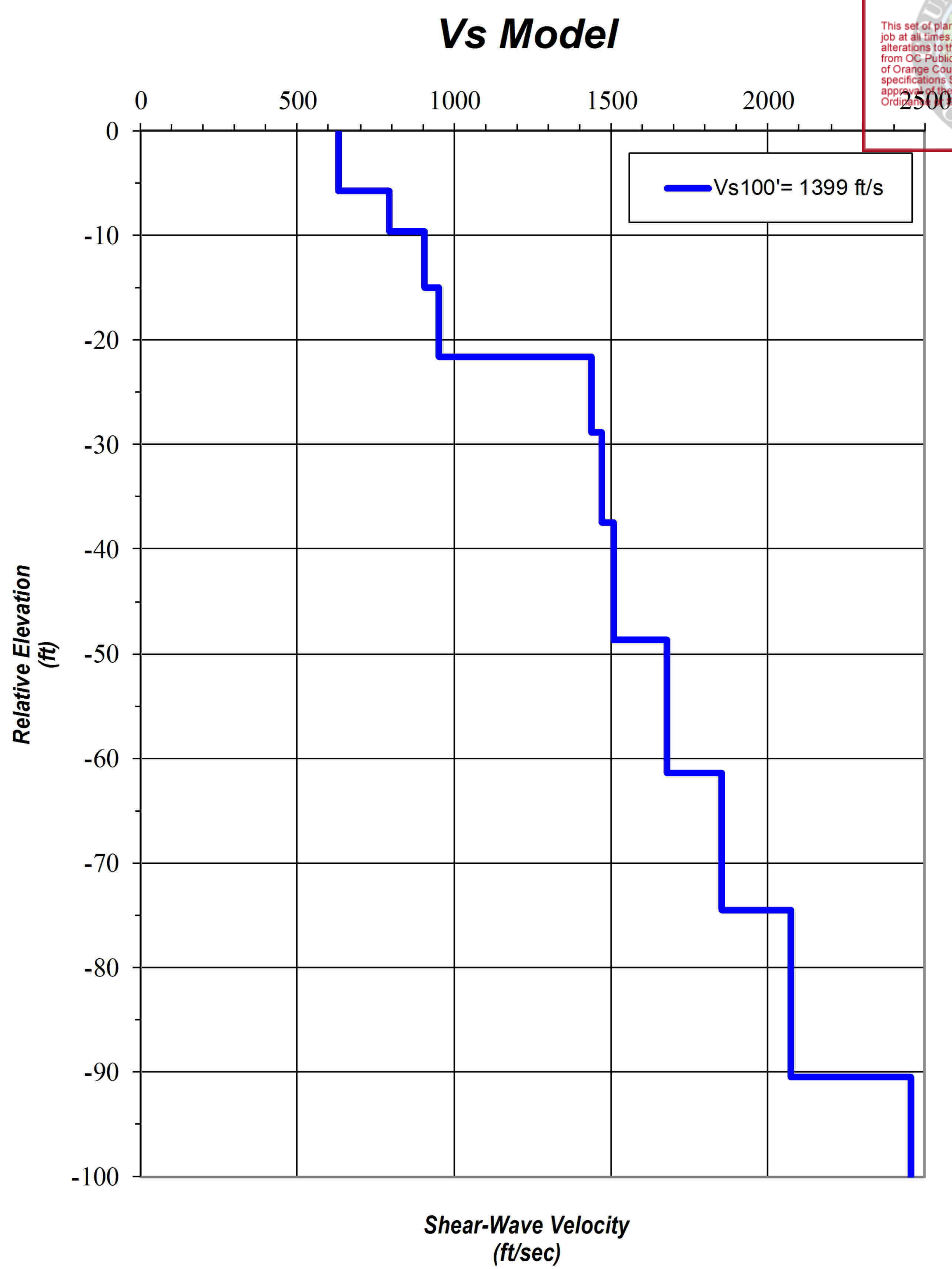


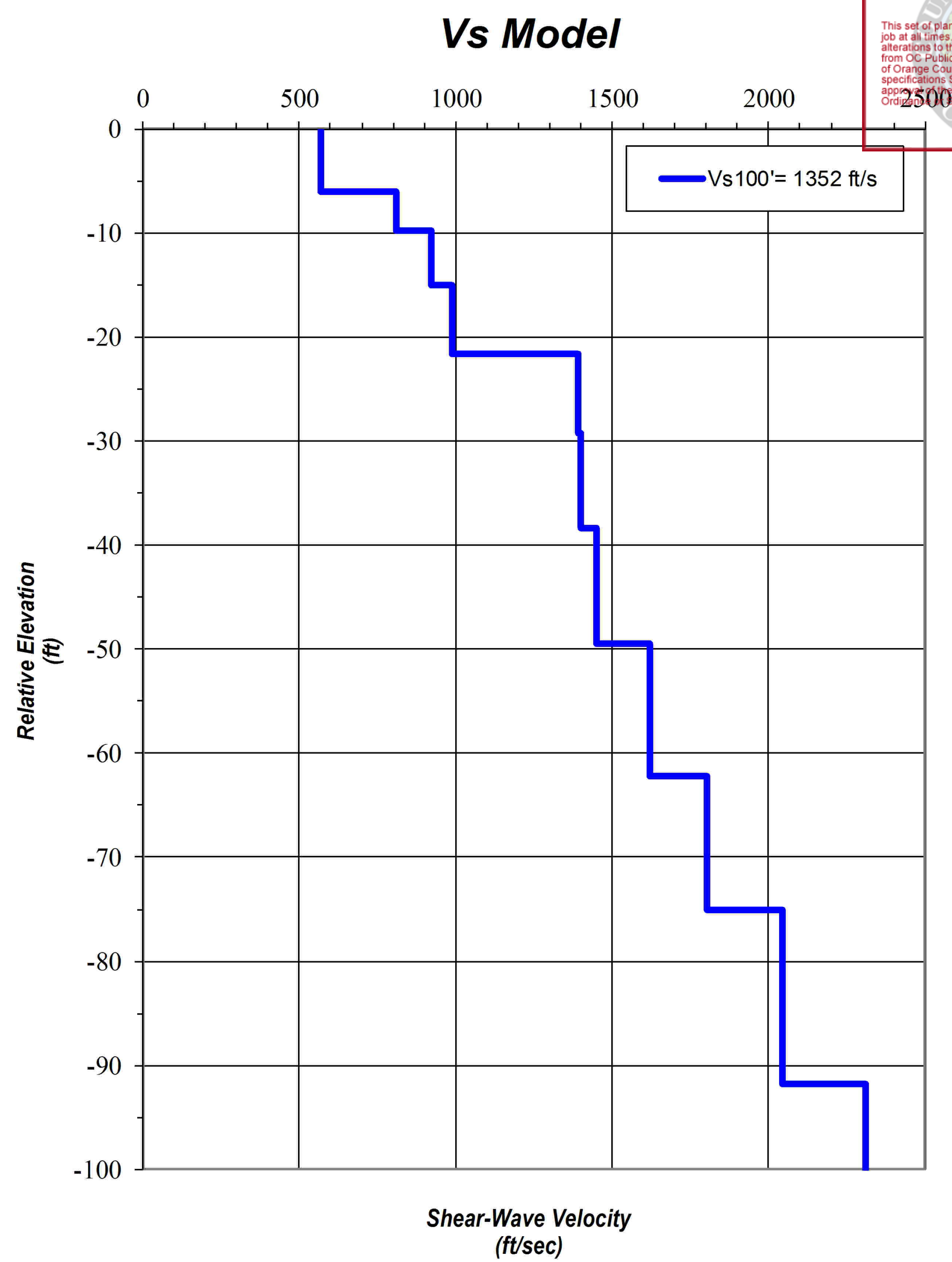
ReMi RESULTS
RL-1

Dana Point Harbor
Dana Point, California

Project No.: 119031 | Date: 02/19

SOUTHWEST GEOPHYSICS LLC

Figure 4a



ReMi RESULTS RL-2	Dana Point Harbor Dana Point, California		SOUTHWEST GEOPHYSICS LLC Figure 4b
	Project No.: 119031	Date: 02/19	

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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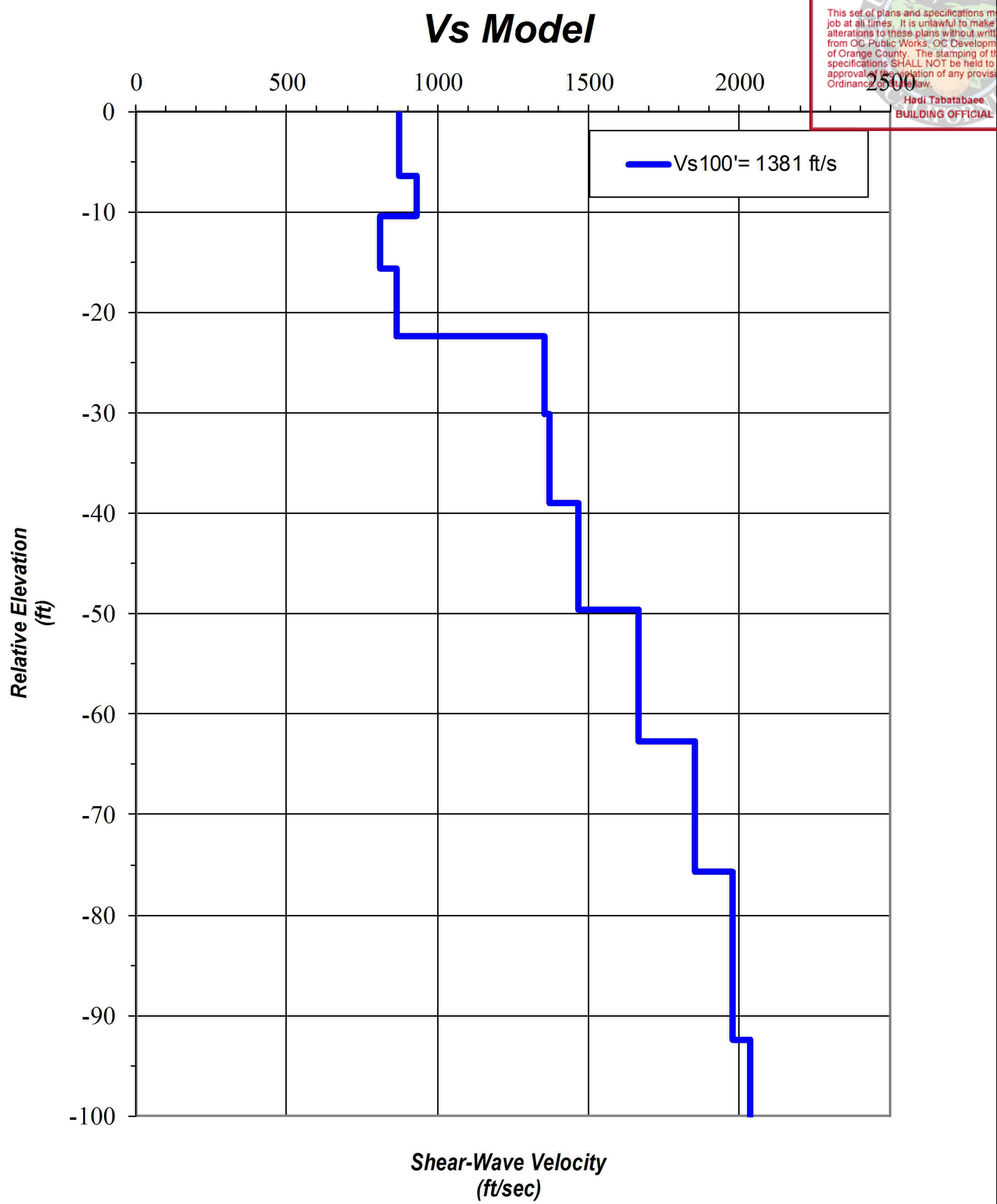
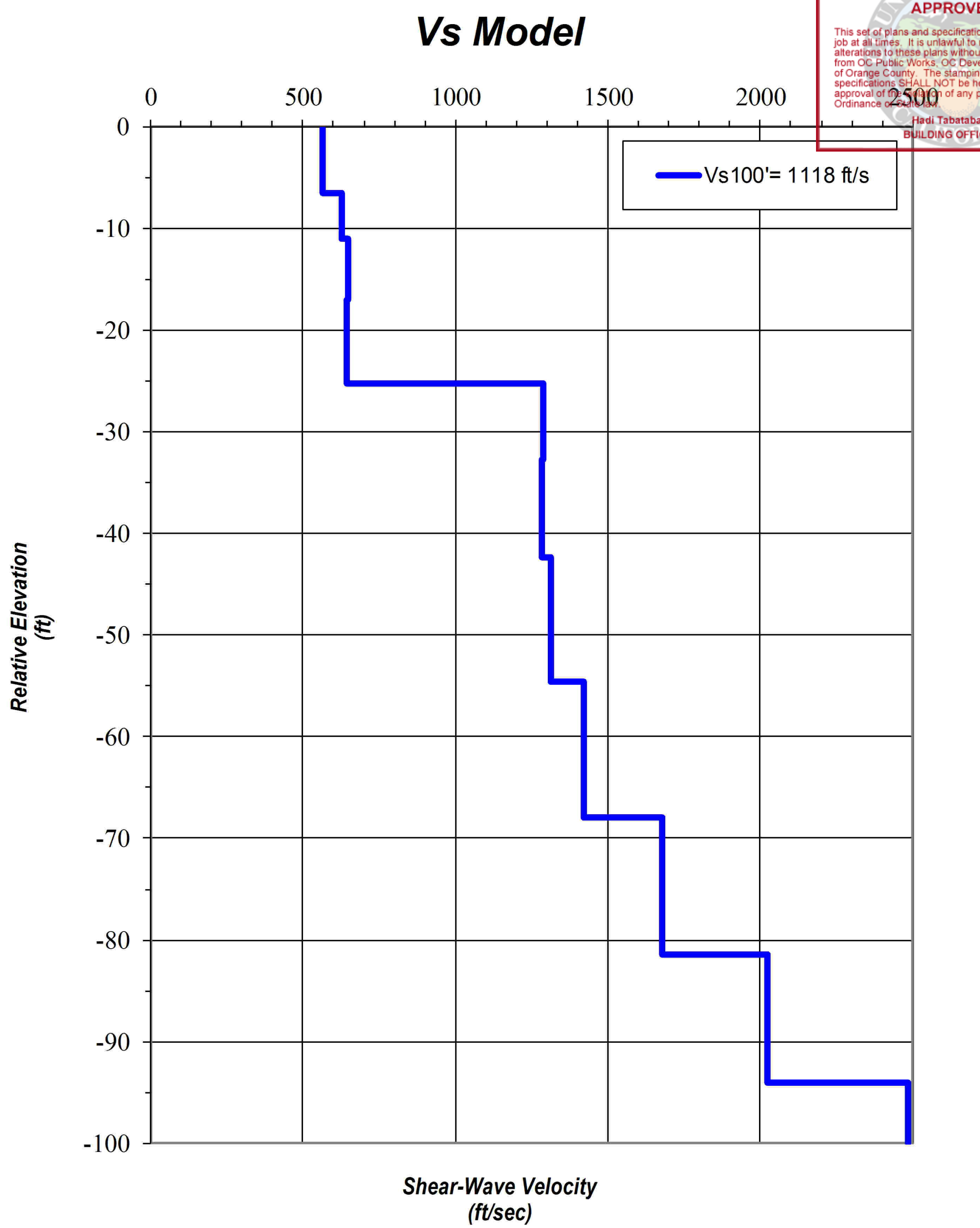


ReMi RESULTS RL-3	Dana Point Harbor Dana Point, California		SOUTHWEST GEOPHYSICS LLC Figure 4c
	Project No.: 119031	Date: 02/19	



ReMi RESULTS RL-4	Dana Point Harbor Dana Point, California		SOUTHWEST GEOPHYSICS LLC Figure 4d
	Project No.: 119031	Date: 02/19	

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APPENDIX B

LABORATORY TEST DATA

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Approval: Geotechnical Reports
~~Permits: BNR21-0604~~

Particle Size Distribution Report

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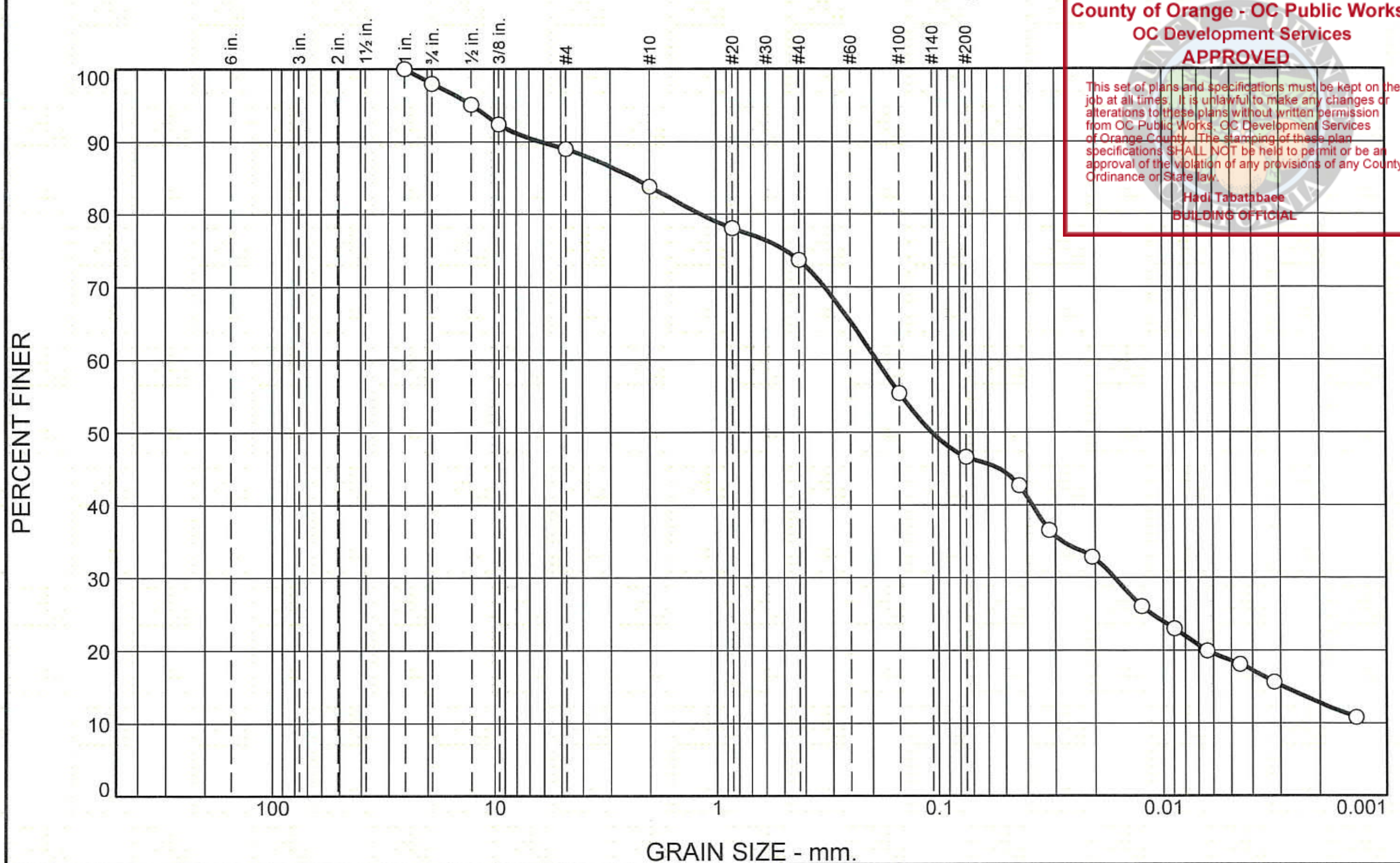

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.0	9.0	5.2	10.1	27.1	33.8	12.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
0.75"	98.0		
0.5"	95.1		
0.375"	92.4		
#4	89.0		
#10	83.8		
#20	78.1		
#40	73.7		
#100	55.4		
#200	46.6		

* (no specification provided)

Material Description

Clayey Sand, SC (#32282)

Atterberg Limits

PL= 25.4 LL= 43.7 PI= 18.3

Coefficients

D_{90}= 6.1846 D_{85}= 2.3697 D_{60}= 0.1911
D_{50}= 0.1066 D_{30}= 0.0164 D_{15}= 0.0029
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-7-6(6)

Remarks

Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.

Sample Number: B1-5 **Depth:** 25'

Date: 2/20/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: M. Gibson **Checked By:** L. Collins

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25' **Sample Number:** B1-5
Material Description: Clayey Sand, SC (#32282)
Date: 2/20/19 **PL:** 25.4 **LL:** 43.7 **PI:** 18.3
USCS Classification: SC **AASHTO Classification:** A-7-6(6)
Testing Remarks: Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.
Tested by: M. Gibson **Checked by:** L. Collins

Sieve Test Data

Sieve Opening Size	Percent Finer
1"	100.0
0.75"	98.0
0.5"	95.1
0.375"	92.4
#4	89.0
#10	83.8
#20	78.1
#40	73.7
#100	55.4
#200	46.6

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 83.8
Weight of hydrometer sample =70.33
Hygroscopic moisture correction:
Moist weight and tare = 78.74
Dry weight and tare = 77.14
Tare weight = 26.27
Hygroscopic moisture = 3.1%
Table of composite correction values:

Temp., deg. C:	19.1	20.3	20.9	21.3	22.6
Comp. corr.:	-3.5	-3.0	-2.8	-2.8	-2.5

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - .164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.7	38.0	34.8	0.0137	38.0	10.1	0.0434	42.7
2.00	19.7	33.0	29.8	0.0137	33.0	10.9	0.0319	36.6
5.00	19.7	30.0	26.8	0.0137	30.0	11.4	0.0207	32.9
15.00	19.6	24.5	21.2	0.0137	24.5	12.3	0.0124	26.1
30.00	19.6	22.0	18.7	0.0137	22.0	12.7	0.0089	23.0
60.00	19.7	19.5	16.3	0.0137	19.5	13.1	0.0064	20.0
120.00	19.7	18.0	14.8	0.0137	18.0	13.3	0.0046	18.1
250.00	19.7	16.0	12.8	0.0137	16.0	13.7	0.0032	15.7
1440.00	19.8	12.0	8.8	0.0137	12.0	14.3	0.0014	10.8

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	2.0	9.0	11.0	5.2	10.1	27.1	42.4	33.8	12.8	46.6

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0029	0.0064	0.0164	0.0379	0.1066	0.1911	1.1726	2.3697	6.1846	12.5588

Fineness Modulus
1.55

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0004

LIQUID AND PLASTIC LIMITS TEST REPORT

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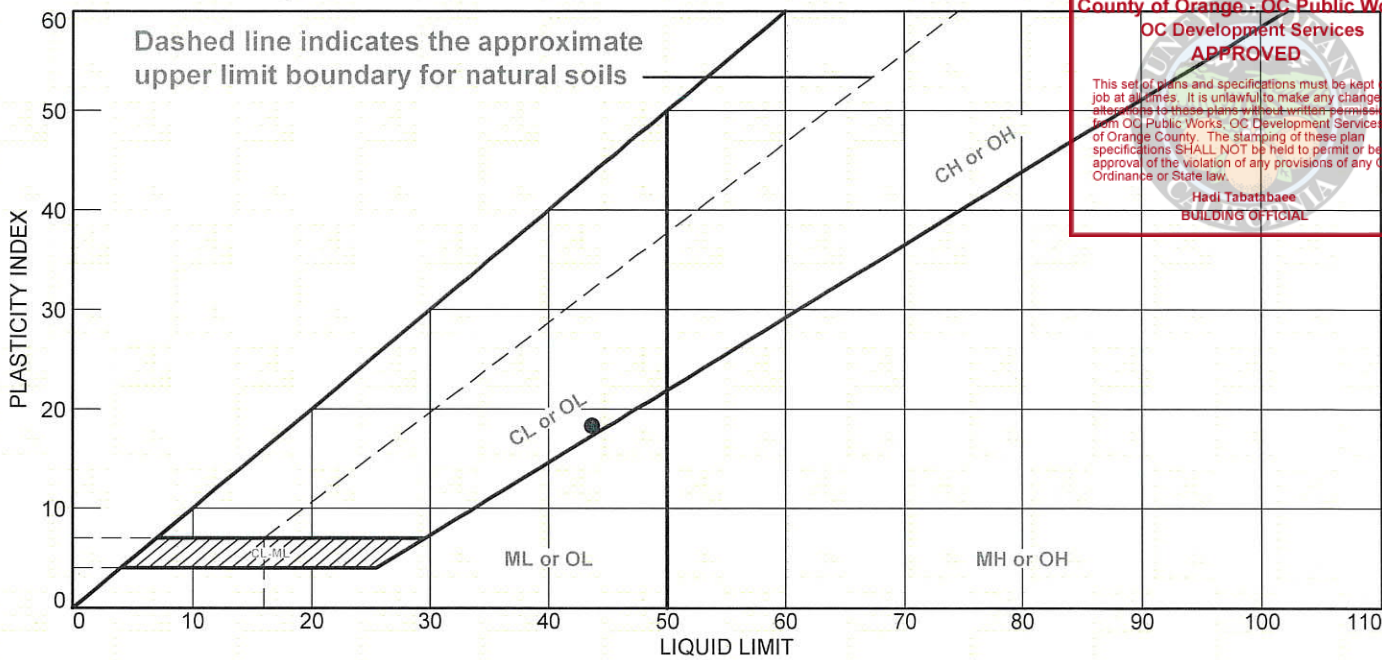
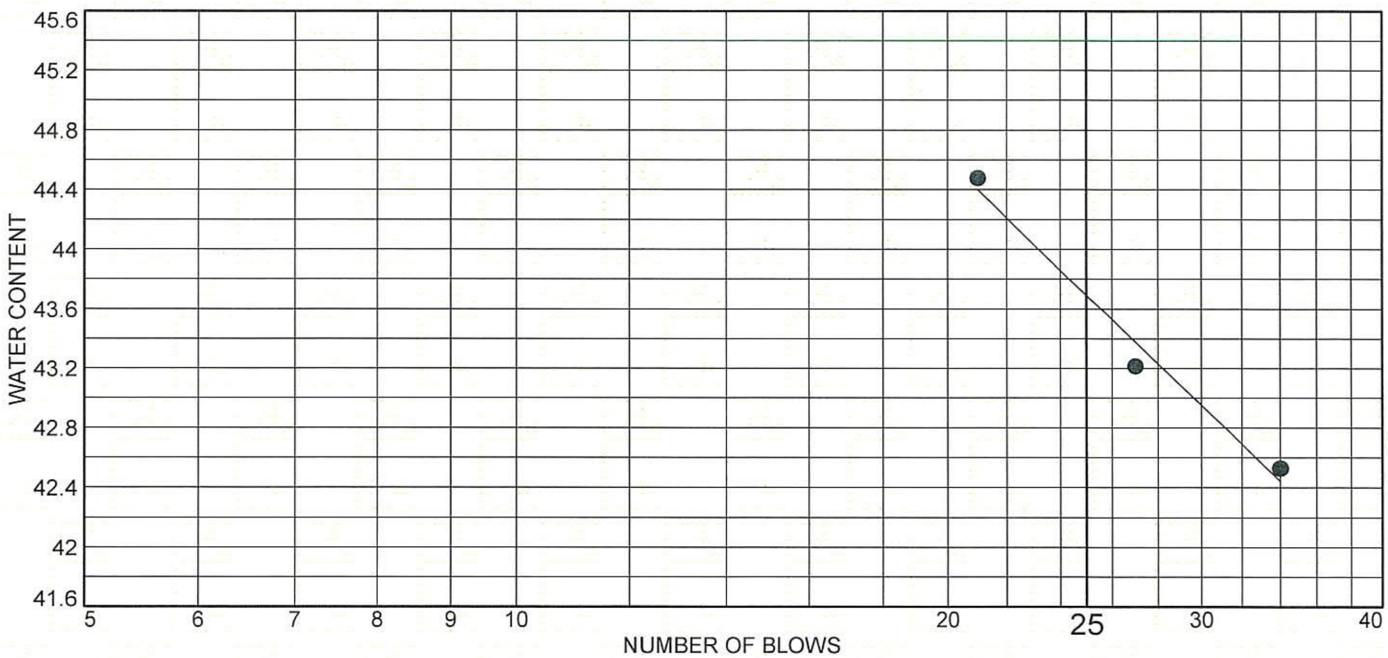




	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Clayey Sand, SC (#32282)	43.7	25.4	18.3	73.7	46.6	SC

Project No. 5015190002.02 **Client:** TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration

Sample Number: B1-5 **Depth:** 25'

Remarks:

amec

Figure

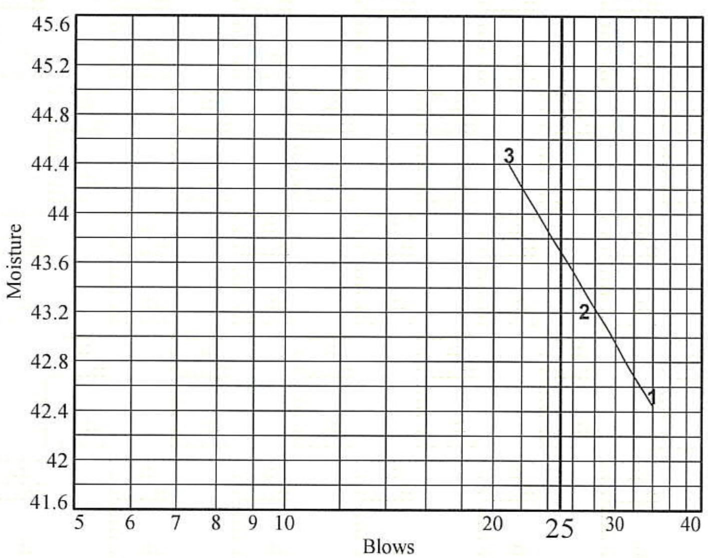
Tested By: M. Gibson **Checked By:** L. Collins

LIQUID AND PLASTIC LIMIT TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25' **Sample Number:** B1-5
Material Description: Clayey Sand, SC (#32282)
%<#40: 73.7 **%<#200:** 46.6 **USCS:** SC **AASHTO:** A-7-6(6)
Tested by: M. Gibson **Checked by:** L. Collins

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	24.29	26.02	24.17			
Dry+Tare	21.33	22.58	21.15			
Tare	14.37	14.62	14.36			
# Blows	34	27	21			
Moisture	42.5	43.2	44.5			

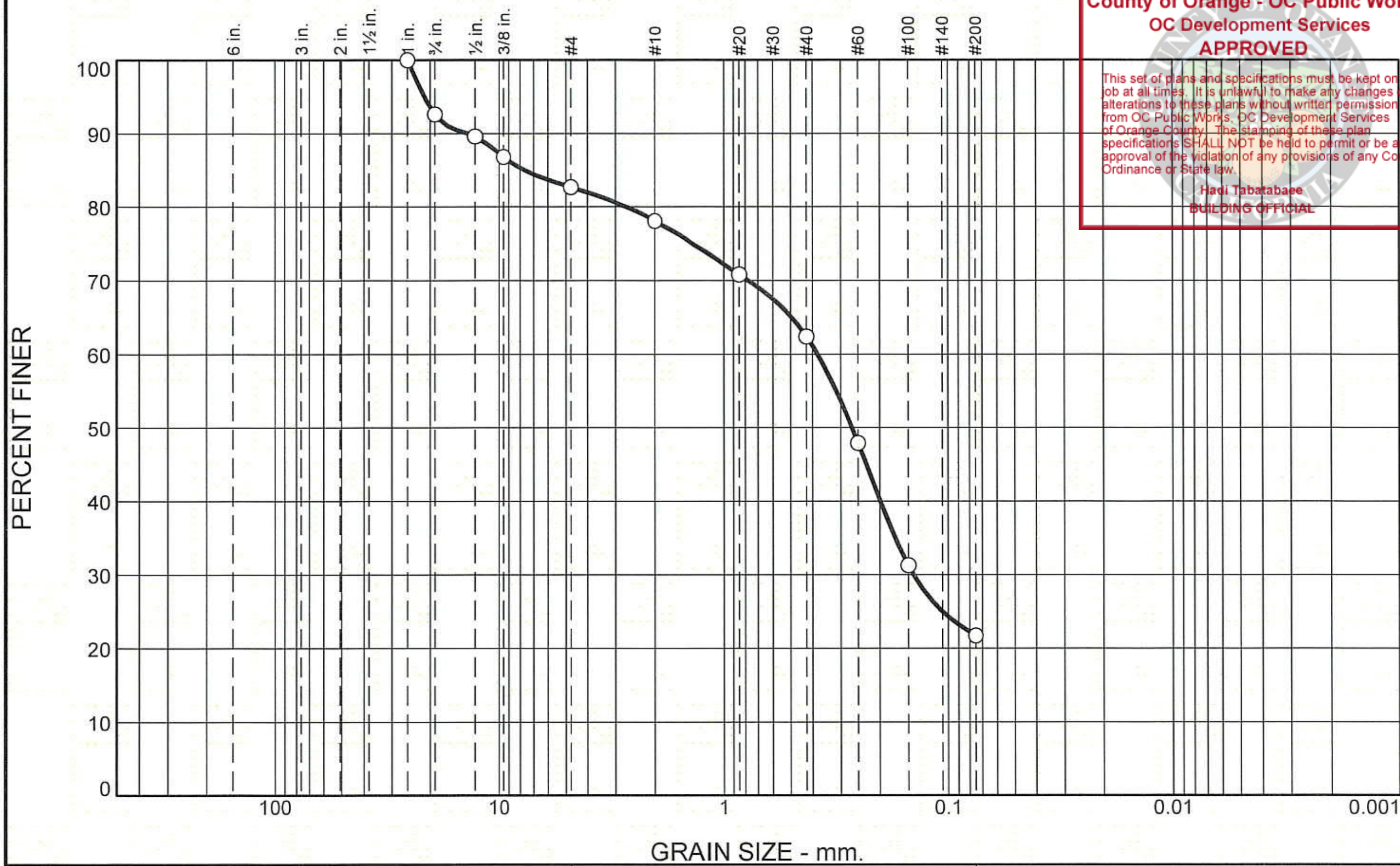


Liquid Limit= 43.7
Plastic Limit= 25.4
Plasticity Index= 18.3

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	27.68	27.51			
Dry+Tare	26.35	26.19			
Tare	21.11	21.01			
Moisture	25.4	25.5			

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	7.4	9.9	4.6	15.7	40.7	21.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
0.75"	92.6		
0.5"	89.6		
0.375"	86.8		
#4	82.7		
#10	78.1		
#20	70.8		
#40	62.4		
#60	47.9		
#100	31.3		
#200	21.7		

* (no specification provided)

Material Description

Silty Sand w/ Gravel, SM (#32283)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 13.6520 D_{85}= 7.6417 D_{60}= 0.3801
D_{50}= 0.2664 D_{30}= 0.1421 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Sample Number: B2-3 **Depth:** 20'

Date: 02/12/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: L. Collins **Checked By:** M. Farr

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 20'
Sample Number: B2-3
Material Description: Silty Sand w/ Gravel, SM (#32283)
Date: 02/12/19
USCS Classification: SM
Tested by: L. Collins
Checked by: M. Farr

Sieve Test Data

Sieve Opening Size	Percent Finer
1"	100.0
0.75"	92.6
0.5"	89.6
0.375"	86.8
#4	82.7
#10	78.1
#20	70.8
#40	62.4
#60	47.9
#100	31.3
#200	21.7

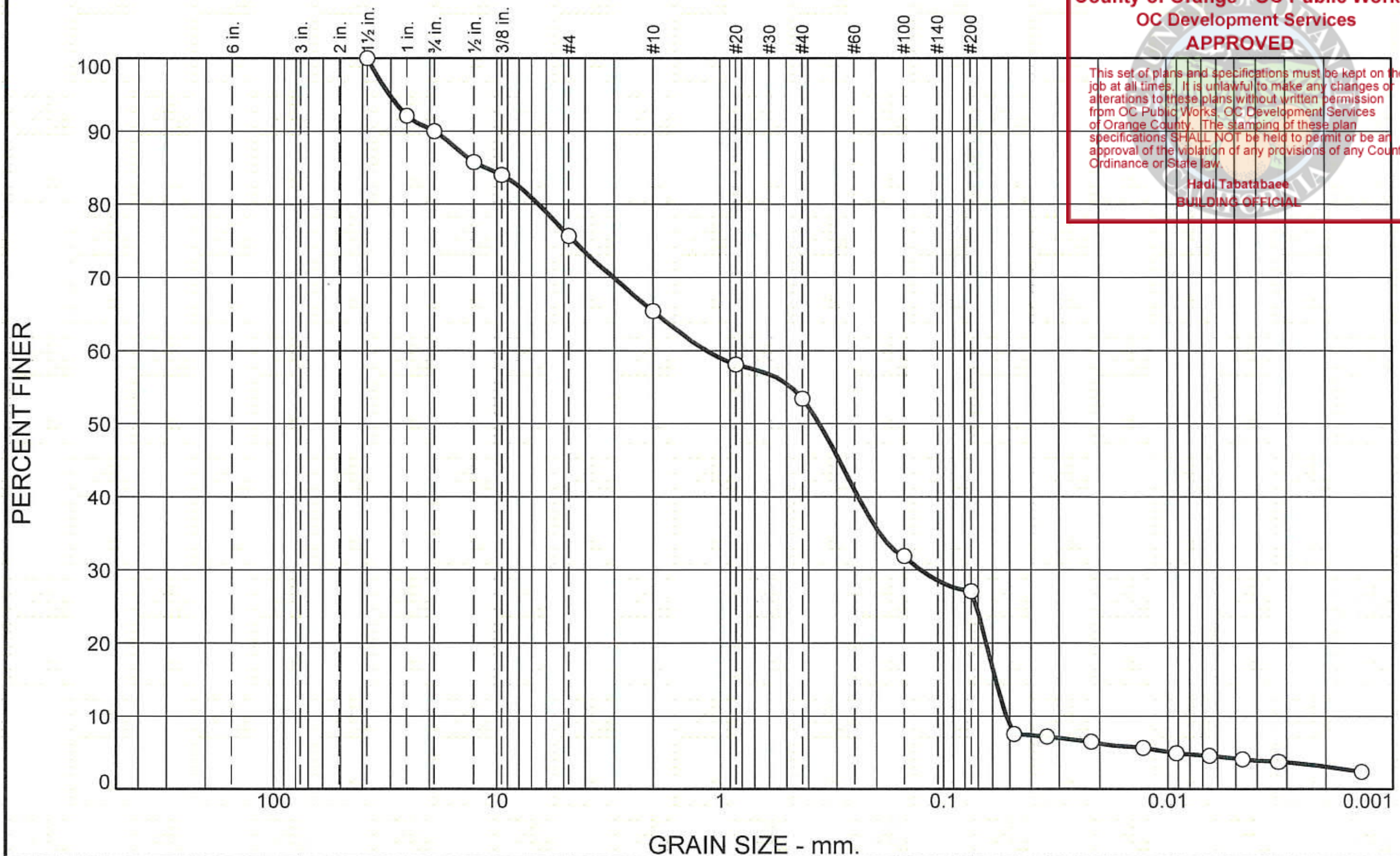
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	7.4	9.9	17.3	4.6	15.7	40.7	61.0			21.7

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.1421	0.1989	0.2664	0.3801	2.6913	7.6417	13.6520	21.3081

Fineness Modulus
2.32

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	10.0	14.3	10.3	12.0	26.3	24.0	3.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5"	100.0		
1"	92.1		
0.75"	90.0		
0.5"	85.8		
0.375"	84.0		
#4	75.7		
#10	65.4		
#20	58.1		
#40	53.4		
#100	31.9		
#200	27.1		

* (no specification provided)

Material Description

Clayey Sand w/ Gravel, SC (#32284)

Atterberg Limits

PL= 19.6 LL= 36.5 PI= 16.9

Coefficients

D_{90}= 19.0500 D_{85}= 11.2887 D_{60}= 1.1497
D_{50}= 0.3579 D_{30}= 0.1263 D_{15}= 0.0581
D_{10}= 0.0519 C_u= 22.15 C_c= 0.27

Classification

USCS= SC AASHTO= A-2-6(1)

Remarks

Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.

Sample Number: B2-4 **Depth:** 25'

Date: 1/23/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: M. Gibson **Checked By:** L. Collins

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25' **Sample Number:** B2-4
Material Description: Clayey Sand w/ Gravel, SC (#32284)
Date: 1/23/19 **PL:** 19.6 **LL:** 36.5 **PI:** 16.9
USCS Classification: SC **AASHTO Classification:** A-2-6(1)
Testing Remarks: Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.
Tested by: M. Gibson **Checked by:** L. Collins

Sieve Test Data

Sieve Opening Size	Percent Finer
1.5"	100.0
1"	92.1
0.75"	90.0
0.5"	85.8
0.375"	84.0
#4	75.7
#10	65.4
#20	58.1
#40	53.4
#100	31.9
#200	27.1

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 65.4
Weight of hydrometer sample =194.09
Hygroscopic moisture correction:
Moist weight and tare = 83.21
Dry weight and tare = 81.57
Tare weight = 25.85
Hygroscopic moisture = 2.9%
Table of composite correction values:

Temp., deg. C:	19.1	20.3	20.9	21.3	22.6
Comp. corr.:	-3.5	-3.0	-2.8	-2.8	-2.5

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - .164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.6	25.0	21.7	0.0137	25.0	12.2	0.0479	7.5
2.00	19.6	24.0	20.7	0.0137	24.0	12.4	0.0341	7.2
5.00	19.6	22.0	18.7	0.0137	22.0	12.7	0.0218	6.5
15.00	19.6	19.5	16.2	0.0137	19.5	13.1	0.0128	5.6
30.00	19.6	17.5	14.2	0.0137	17.5	13.4	0.0092	4.9
60.00	19.6	16.5	13.2	0.0137	16.5	13.6	0.0065	4.6
120.00	19.7	15.0	11.8	0.0137	15.0	13.8	0.0047	4.1
250.00	19.8	14.0	10.8	0.0137	14.0	14.0	0.0032	3.7
1440.00	19.9	10.0	6.8	0.0137	10.0	14.7	0.0014	2.4

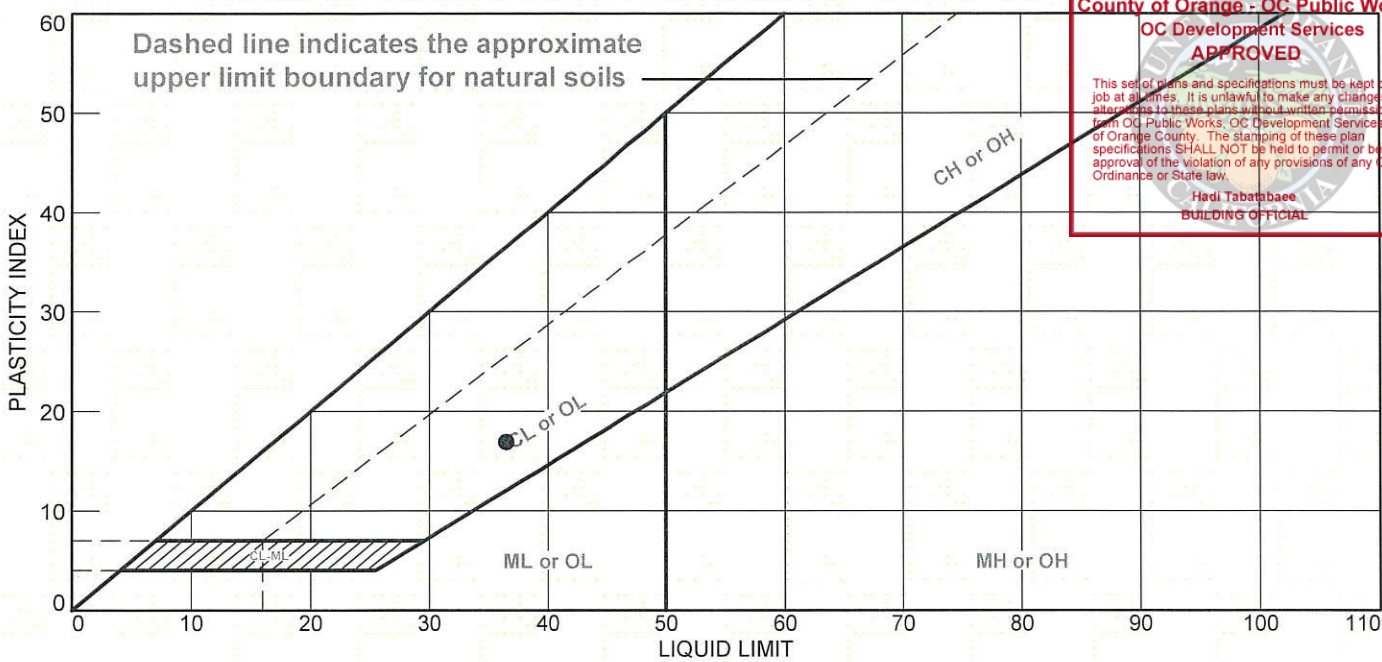
Fractional Components

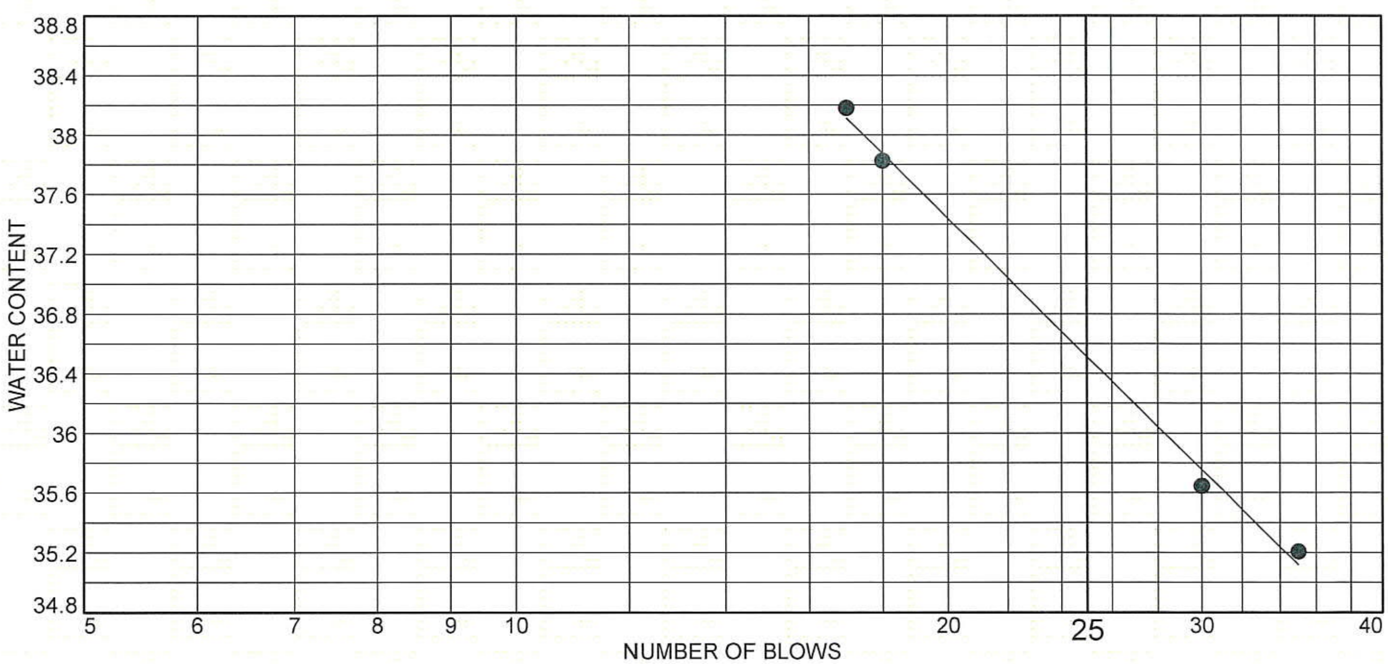
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	10.0	14.3	24.3	10.3	12.0	26.3	48.6	24.0	3.1	27.1

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0096	0.0519	0.0581	0.0641	0.1263	0.2415	0.3579	1.1497	6.5105	11.2887	19.0500	30.4481

Fineness Modulus	C_u	C_c
2.89	22.15	0.27

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Clayey Sand w/ Gravel, SC (#32284)	36.5	19.6	16.9	53.4	27.1	SC

Project No. 5015190002.02 **Client:** TerraCosta Consulting Group, Inc.

Project: #2975 Dana Point Harbor Restoration

Sample Number: B2-4 **Depth:** 25'

Remarks:

amec

Figure

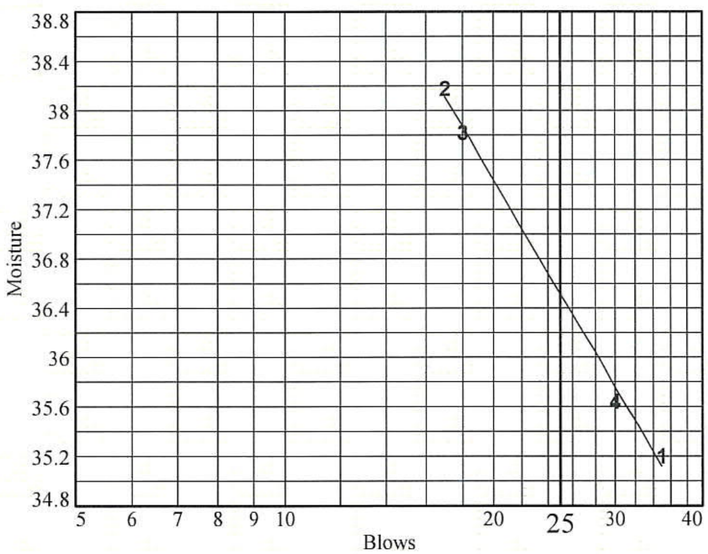
Tested By: M. Gibson **Checked By:** L. Collins

LIQUID AND PLASTIC LIMIT TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25' **Sample Number:** B2-4
Material Description: Clayey Sand w/ Gravel, SC (#32284)
%<#40: 53.4 **%<#200:** 27.1 **USCS:** SC **AASHTO:** A-2-6(1)
Tested by: M. Gibson **Checked by:** L. Collins

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	26.34	25.86	26.00	24.34		
Dry+Tare	23.27	22.71	22.8	21.72		
Tare	14.55	14.46	14.34	14.37		
# Blows	35	17	18	30		
Moisture	35.2	38.2	37.8	35.6		



Liquid Limit= 36.5
Plastic Limit= 19.6
Plasticity Index= 16.9

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	21.61	24.73			
Dry+Tare	20.54	23.68			
Tare	15.17	18.22			
Moisture	19.9	19.2			

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
~~Permits: BNR21-0604~~

County of Orange - OC Public Works
OC Development Services
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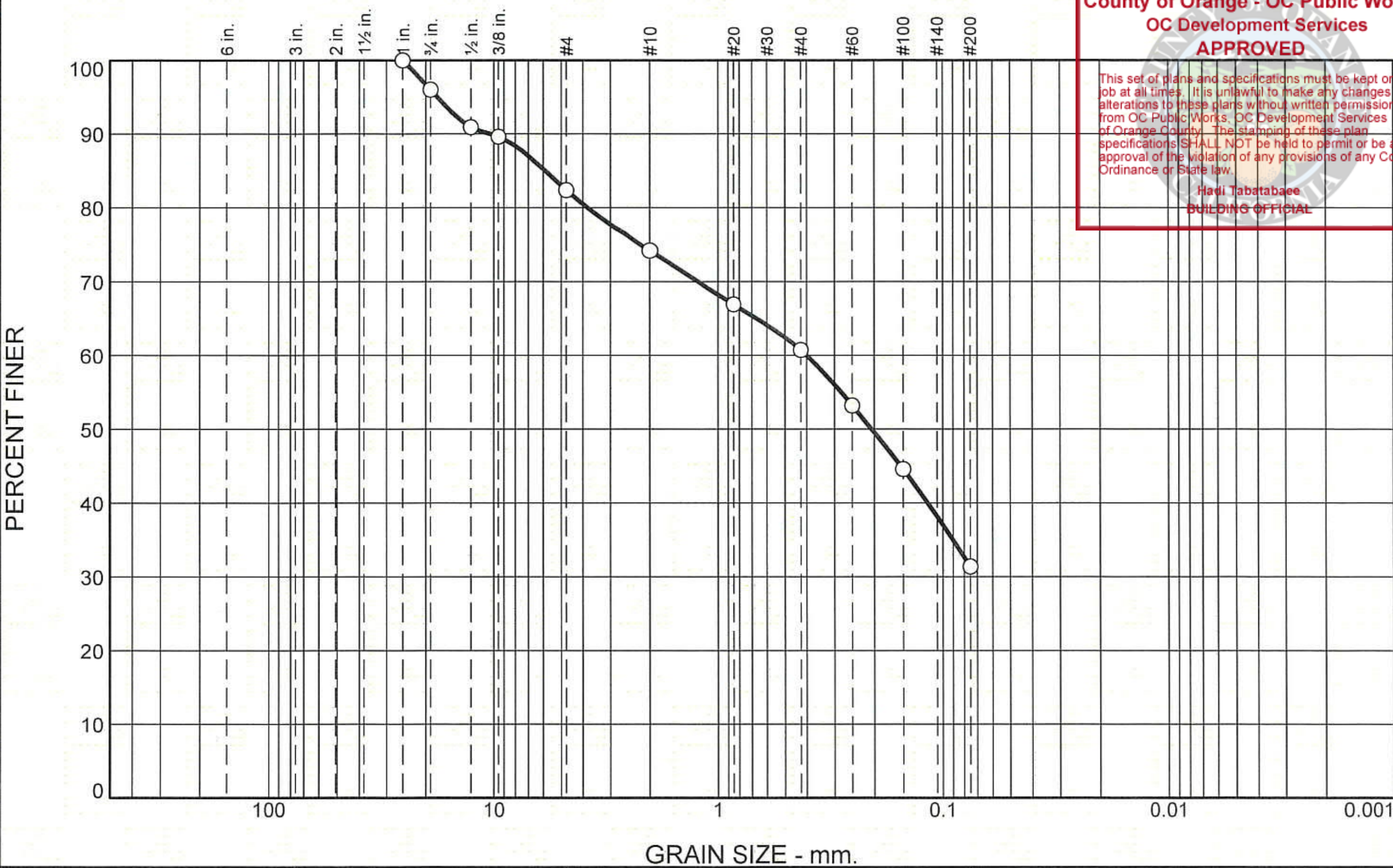
Hadi Tabatabaee
BUILDING OFFICIAL

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.0	13.6	8.2	13.5	29.3	31.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
0.75"	96.0		
0.5"	90.9		
0.375"	89.6		
#4	82.4		
#10	74.2		
#20	66.9		
#40	60.7		
#60	53.2		
#100	44.6		
#200	31.4		

* (no specification provided)

Material Description

Silty Sand, SM (#32285)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 10.4928 D_{85}= 5.8899 D_{60}= 0.4008
D_{50}= 0.2052 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Sample Number: B2-5 **Depth:** 30'

Date: 2/12/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: L. Collins **Checked By:** M. Farr

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 30'
Sample Number: B2-5
Material Description: Silty Sand, SM (#32285)
Date: 2/12/19
USCS Classification: SM
Tested by: L. Collins
Checked by: M. Farr

Sieve Test Data

Sieve Opening Size	Percent Finer
1"	100.0
0.75"	96.0
0.5"	90.9
0.375"	89.6
#4	82.4
#10	74.2
#20	66.9
#40	60.7
#60	53.2
#100	44.6
#200	31.4

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	4.0	13.6	17.6	8.2	13.5	29.3	51.0			31.4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
					0.1169	0.2052	0.4008	3.8061	5.8899	10.4928	17.7952

Fineness Modulus
2.22

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

Particle Size Distribution Report

County of Orange - OC Public Works
OC Development Services
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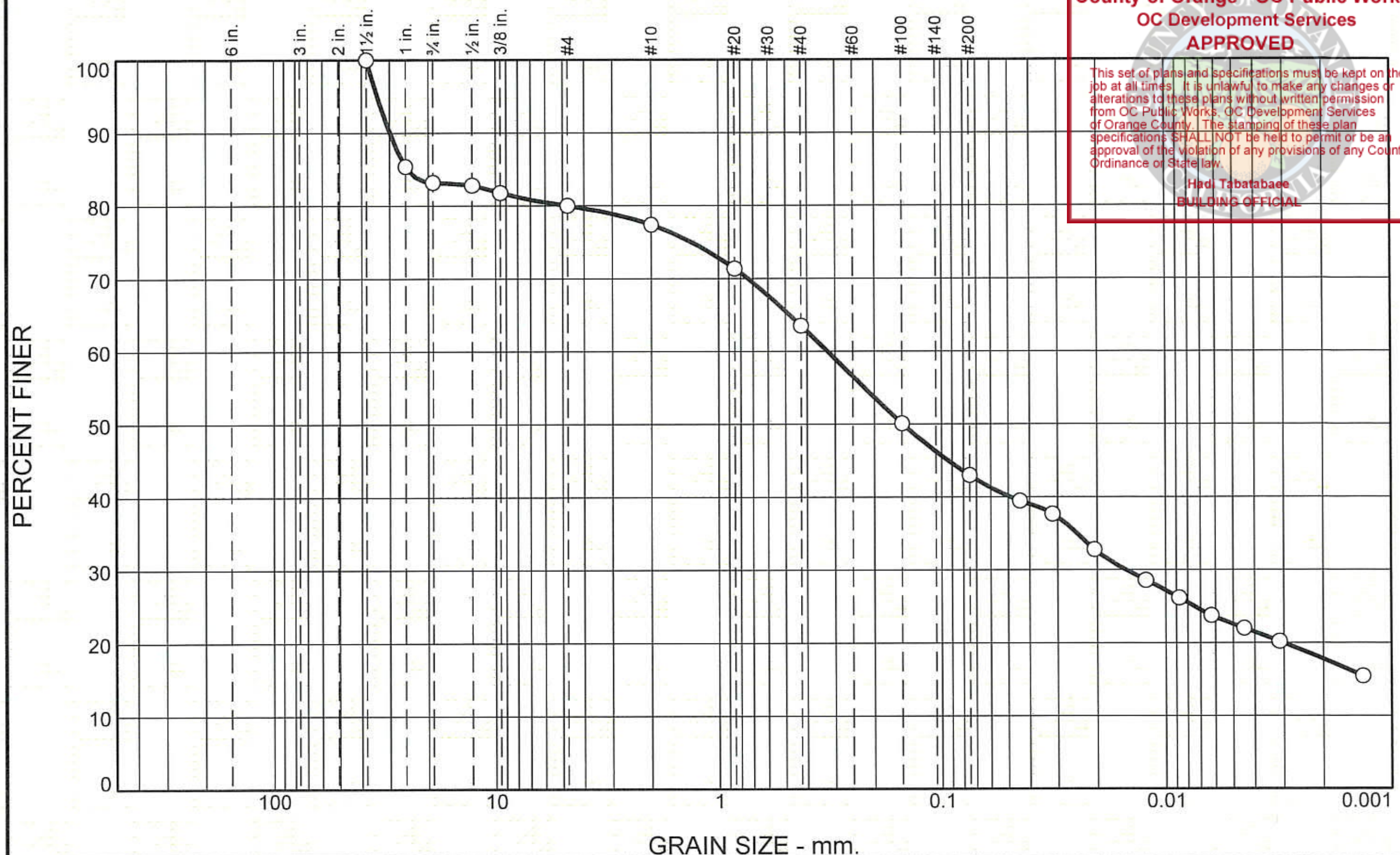


% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	16.8	3.2	2.6	13.9	20.5	25.2	17.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5"	100.0		
1"	85.4		
0.75"	83.2		
0.5"	82.8		
0.375"	81.8		
#4	80.0		
#10	77.4		
#20	71.4		
#40	63.5		
#100	50.1		
#200	43.0		

* (no specification provided)

Material Description

Clayey Sand, SC (#32286)

Atterberg Limits

PL= 18.3 LL= 40.4 PI= 22.1

Coefficients

D_{90}= 29.9015 D_{85}= 24.8523 D_{60}= 0.3245
D_{50}= 0.1487 D_{30}= 0.0149 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-6(5)

Remarks

Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.

Sample Number: B3-4 **Depth:** 20'

Date: 1/23/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: M. Gibson **Checked By:** L. Collins

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 20' **Sample Number:** B3-4
Material Description: Clayey Sand, SC (#32286)
Date: 1/23/19 **PL:** 18.3 **LL:** 40.4 **PI:** 22.1
USCS Classification: SC **AASHTO Classification:** A-6(5)
Testing Remarks: Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.
Tested by: M. Gibson **Checked by:** L. Collins

Sieve Test Data

Sieve Opening Size	Percent Finer
1.5"	100.0
1"	85.4
0.75"	83.2
0.5"	82.8
0.375"	81.8
#4	80.0
#10	77.4
#20	71.4
#40	63.5
#100	50.1
#200	43.0

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 77.4
Weight of hydrometer sample =66.01
Hygroscopic moisture correction:
Moist weight and tare = 76.75
Dry weight and tare = 75.30
Tare weight = 25.42
Hygroscopic moisture = 2.9%
Table of composite correction values:

Temp., deg. C:	19.1	20.3	20.9	21.3	22.6
Comp. corr.:	-3.5	-3.0	-2.8	-2.8	-2.5

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - .164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.6	36.0	32.7	0.0137	36.0	10.4	0.0442	39.5
2.00	19.6	34.5	31.2	0.0137	34.5	10.6	0.0316	37.7
5.00	19.6	30.5	27.2	0.0137	30.5	11.3	0.0206	32.8
15.00	19.6	27.0	23.7	0.0137	27.0	11.9	0.0122	28.6
30.00	19.6	25.0	21.7	0.0137	25.0	12.2	0.0087	26.2
60.00	19.6	23.0	19.7	0.0137	23.0	12.5	0.0063	23.8
120.00	19.7	21.5	18.3	0.0137	21.5	12.8	0.0045	22.0
250.00	19.7	20.0	16.8	0.0137	20.0	13.0	0.0031	20.2
1440.00	19.8	16.0	12.8	0.0137	16.0	13.7	0.0013	15.4

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

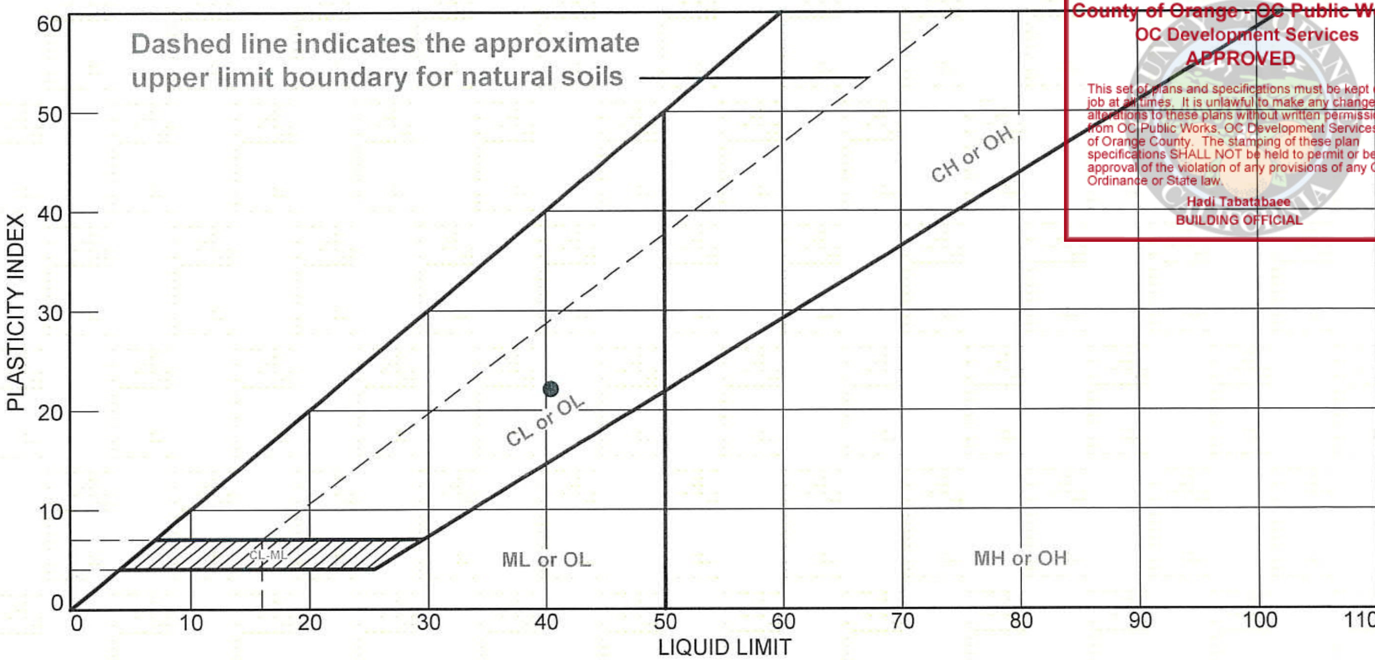
Fractional Components

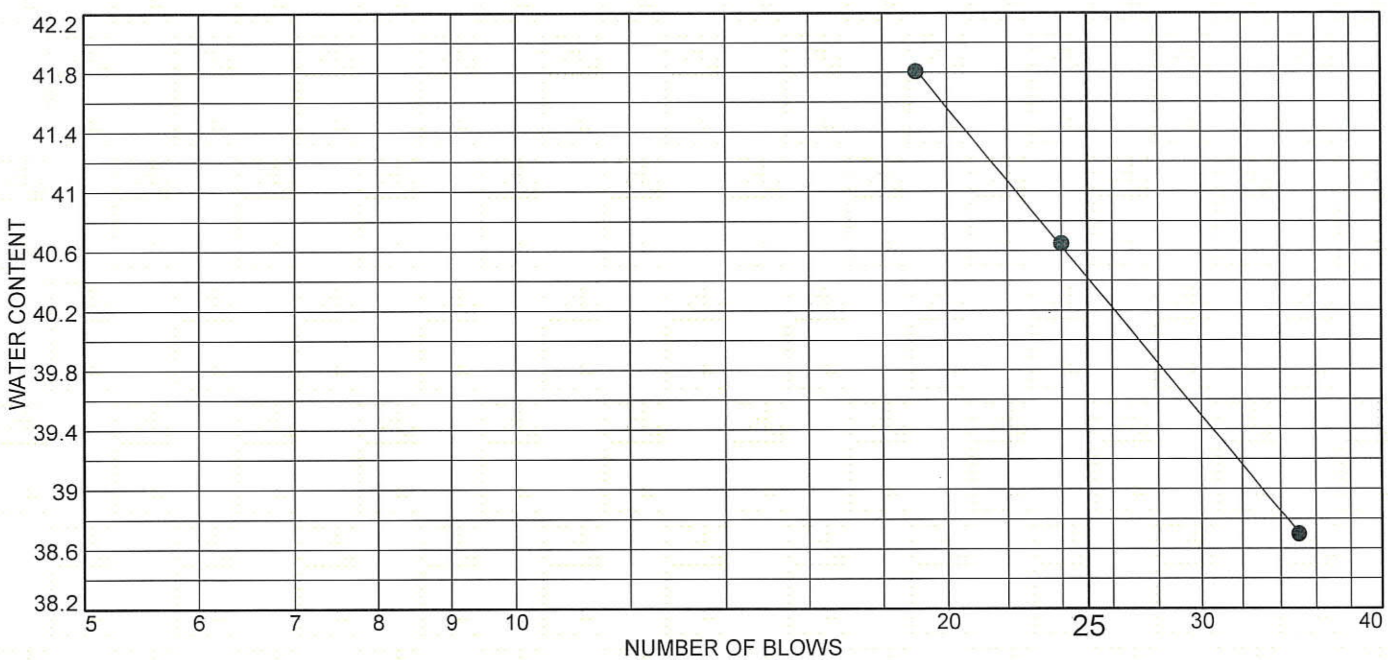
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	16.8	3.2	20.0	2.6	13.9	20.5	37.0	25.2	17.8	43.0

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0030	0.0149	0.0491	0.1487	0.3245	4.7500	24.8523	29.9015	33.9663

Fineness Modulus
2.26

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Clayey Sand, SC (#32286)	40.4	18.3	22.1	63.5	43.0	SC

Project No. 5015190002.02 **Client:** TerraCosta Consulting Group, Inc.

Project: #2975 Dana Point Harbor Restoration

Sample Number: B3-4 **Depth:** 20'

Remarks:

amec

Figure

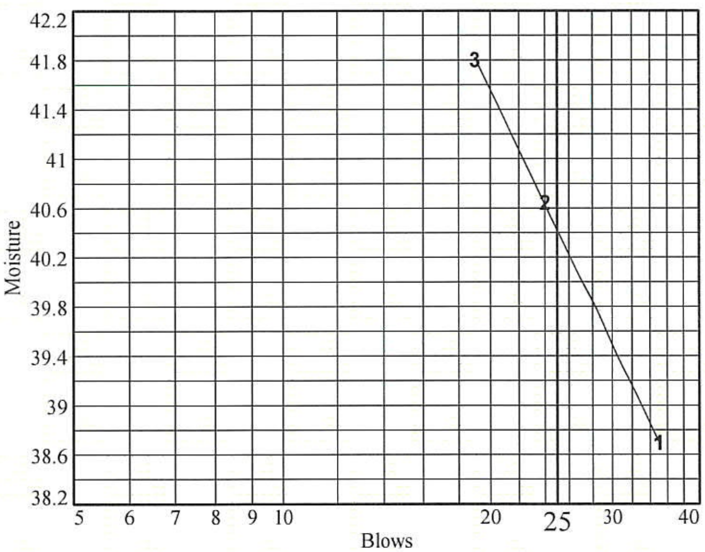
Tested By: M. Gibson **Checked By:** L. Collins

LIQUID AND PLASTIC LIMIT TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 20' **Sample Number:** B3-4
Material Description: Clayey Sand, SC (#32286)
%<#40: 63.5 **%<#200:** 43.0 **USCS:** SC **AASHTO:** A-6(5)
Tested by: M. Gibson **Checked by:** L. Collins

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	25.70	25.71	27.04			
Dry+Tare	22.55	22.45	23.29			
Tare	14.41	14.43	14.32			
# Blows	35	24	19			
Moisture	38.7	40.6	41.8			

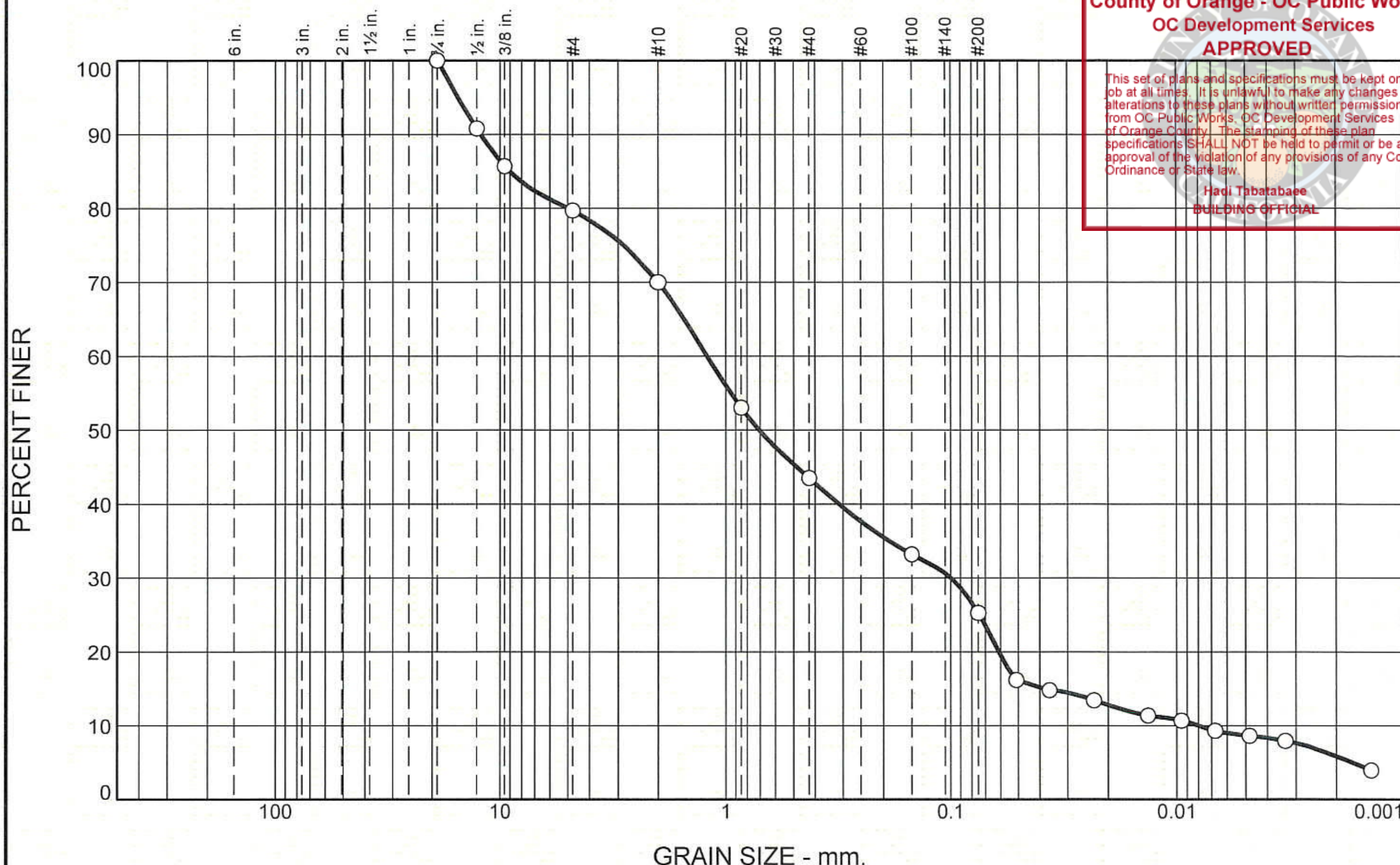


Liquid Limit= 40.4
Plastic Limit= 18.3
Plasticity Index= 22.1

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	25.69	27.31			
Dry+Tare	24.44	26.37			
Tare	17.77	21.09			
Moisture	18.7	17.8			

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	20.3	9.7	26.5	18.2	19.5	5.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75"	100.0		
0.5"	90.8		
0.375"	85.7		
#4	79.7		
#10	70.0		
#20	53.0		
#40	43.5		
#100	33.2		
#200	25.3		

* (no specification provided)

Material Description

Silty Sand w/ Gravel, SM (#32287)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 12.2079 D_{85}= 9.0481 D_{60}= 1.2115
D_{50}= 0.7066 D_{30}= 0.0998 D_{15}= 0.0381
D_{10}= 0.0080 C_u= 151.05 C_c= 1.02

Classification

USCS= SM AASHTO=

Remarks

Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.

Sample Number: B3-5 **Depth:** 25'

Date: 1/23/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: M. Gibson **Checked By:** L. Collins

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25'
Sample Number: B3-5
Material Description: Silty Sand w/ Gravel, SM (#32287)
Date: 1/23/19
USCS Classification: SM
Testing Remarks: Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.
Tested by: M. Gibson
Checked by: L. Collins

Sieve Test Data

Sieve Opening Size	Percent Finer
0.75"	100.0
0.5"	90.8
0.375"	85.7
#4	79.7
#10	70.0
#20	53.0
#40	43.5
#100	33.2
#200	25.3

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 70.0
Weight of hydrometer sample =51.24
Hygroscopic moisture correction:
- **Moist weight and tare =** 34.28
- **Dry weight and tare =** 34.21
- **Tare weight =** 26.23
- **Hygroscopic moisture =** 0.9%

Table of composite correction values:

Temp., deg. C:	19.1	20.3	20.9	21.3	22.6
Comp. corr.:	-3.5	-3.0	-2.8	-2.8	-2.5

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - .164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.7	15.0	11.8	0.0137	15.0	13.8	0.0509	16.2
2.00	19.7	14.0	10.8	0.0137	14.0	14.0	0.0362	14.8
5.00	19.7	13.0	9.8	0.0137	13.0	14.2	0.0231	13.4
15.00	19.7	11.5	8.3	0.0137	11.5	14.4	0.0134	11.4
30.00	19.7	11.0	7.7	0.0137	11.0	14.5	0.0095	10.7
60.00	19.7	10.0	6.7	0.0137	10.0	14.7	0.0068	9.3
120.00	19.7	9.5	6.2	0.0137	9.5	14.7	0.0048	8.6
250.00	19.7	9.0	5.7	0.0137	9.0	14.8	0.0033	7.9
1440.00	19.9	6.0	2.8	0.0137	6.0	15.3	0.0014	3.9

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	20.3	20.3	9.7	26.5	18.2	54.4	19.5	5.8	25.3

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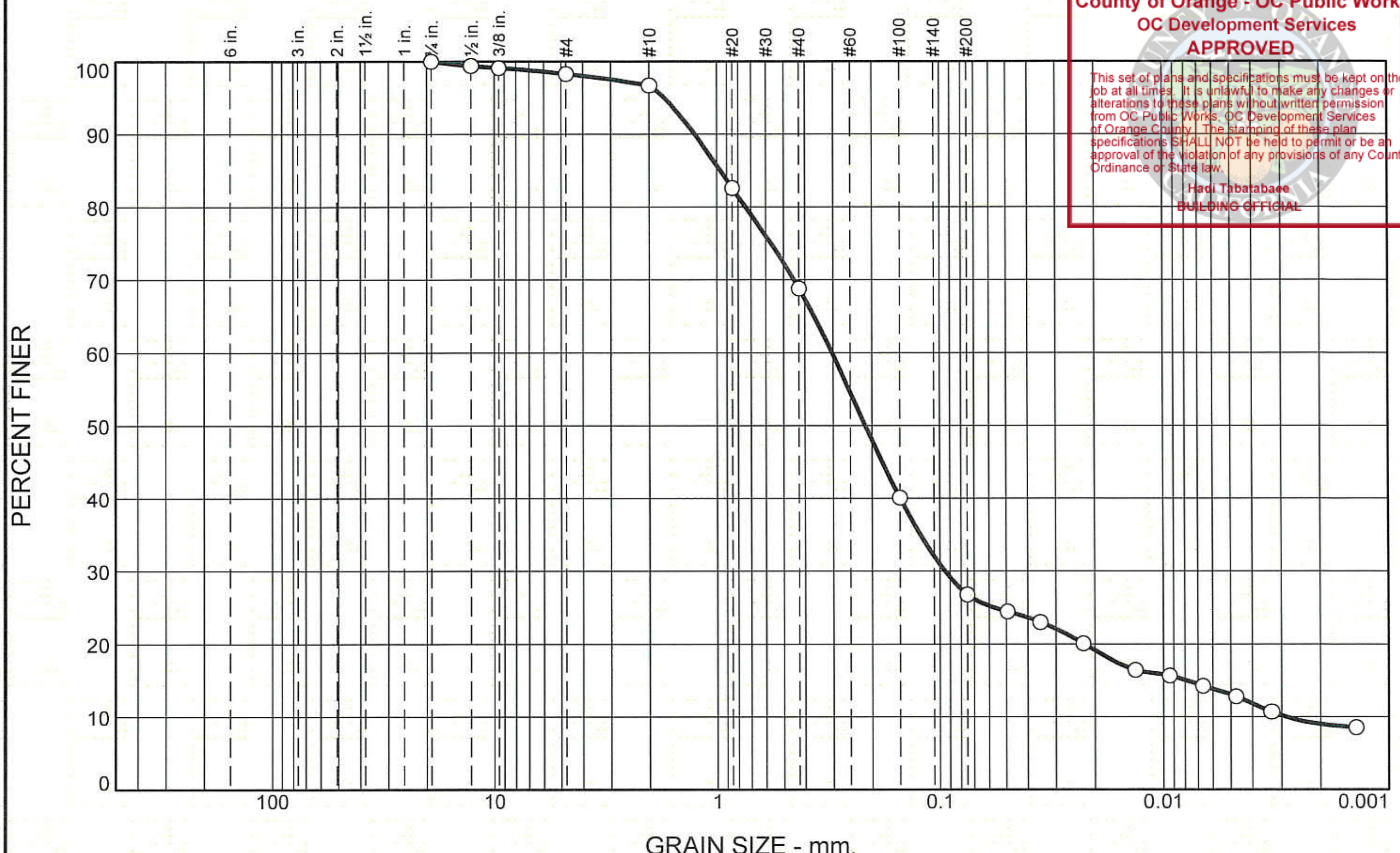
D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0017	0.0080	0.0381	0.0610	0.0998	0.3121	0.7066	1.2115	4.9661	9.0481	12.2079	15.3933

Fineness Modulus	C_u	C_c
2.82	151.05	1.02

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.7	1.6	27.9	42.0	17.8	9.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75"	100.0		
0.5"	99.4		
0.375"	99.1		
#4	98.3		
#10	96.7		
#20	82.6		
#40	68.8		
#100	40.1		
#200	26.8		

* (no specification provided)

Material Description

Silty Sand, SM (#32288)

Atterberg Limits

PL= NP LL= PI=

Coefficients

D_{90}= 1.2527 D_{85}= 0.9627 D_{60}= 0.3031
D_{50}= 0.2141 D_{30}= 0.0949 D_{15}= 0.0079
D_{10}= 0.0029 C_u= 105.62 C_c= 10.35

Classification

USCS= AASHTO=

Remarks

Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.

Sample Number: B4-3 **Depth:** 25'

Date: 2/23/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: J. Iacovera **Checked By:** L. Collins

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25'
Sample Number: B4-3
Material Description: Silty Sand, SM (#32288)
Date: 2/23/19
PL: NP
Testing Remarks: Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.
Tested by: J. Iacovera
Checked by: L. Collins

Sieve Test Data

Sieve Opening Size	Percent Finer
0.75"	100.0
0.5"	99.4
0.375"	99.1
#4	98.3
#10	96.7
#20	82.6
#40	68.8
#100	40.1
#200	26.8

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 96.7
Weight of hydrometer sample =67.5
Hygroscopic moisture correction:
Moist weight and tare = 88.74
Dry weight and tare = 87.46
Tare weight = 25.30
Hygroscopic moisture = 2.1%
Table of composite correction values:

Temp., deg. C:	19.1	20.3	20.9	21.3	22.6
Comp. corr.:	-3.5	-3.0	-2.8	-2.8	-2.5

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - .164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.7	20.0	16.8	0.0137	20.0	13.0	0.0494	24.5
2.00	19.7	19.0	15.8	0.0137	19.0	13.2	0.0352	23.0
5.00	19.7	17.0	13.8	0.0137	17.0	13.5	0.0225	20.1
15.00	19.7	14.5	11.3	0.0137	14.5	13.9	0.0132	16.4
30.00	19.6	14.0	10.7	0.0137	14.0	14.0	0.0094	15.7
60.00	19.7	13.0	9.8	0.0137	13.0	14.2	0.0067	14.3
120.00	19.7	12.0	8.8	0.0137	12.0	14.3	0.0047	12.8
250.00	19.8	10.5	7.3	0.0137	10.5	14.6	0.0033	10.7
1440.00	19.9	9.0	5.8	0.0137	9.0	14.8	0.0014	8.5

Fractional Components

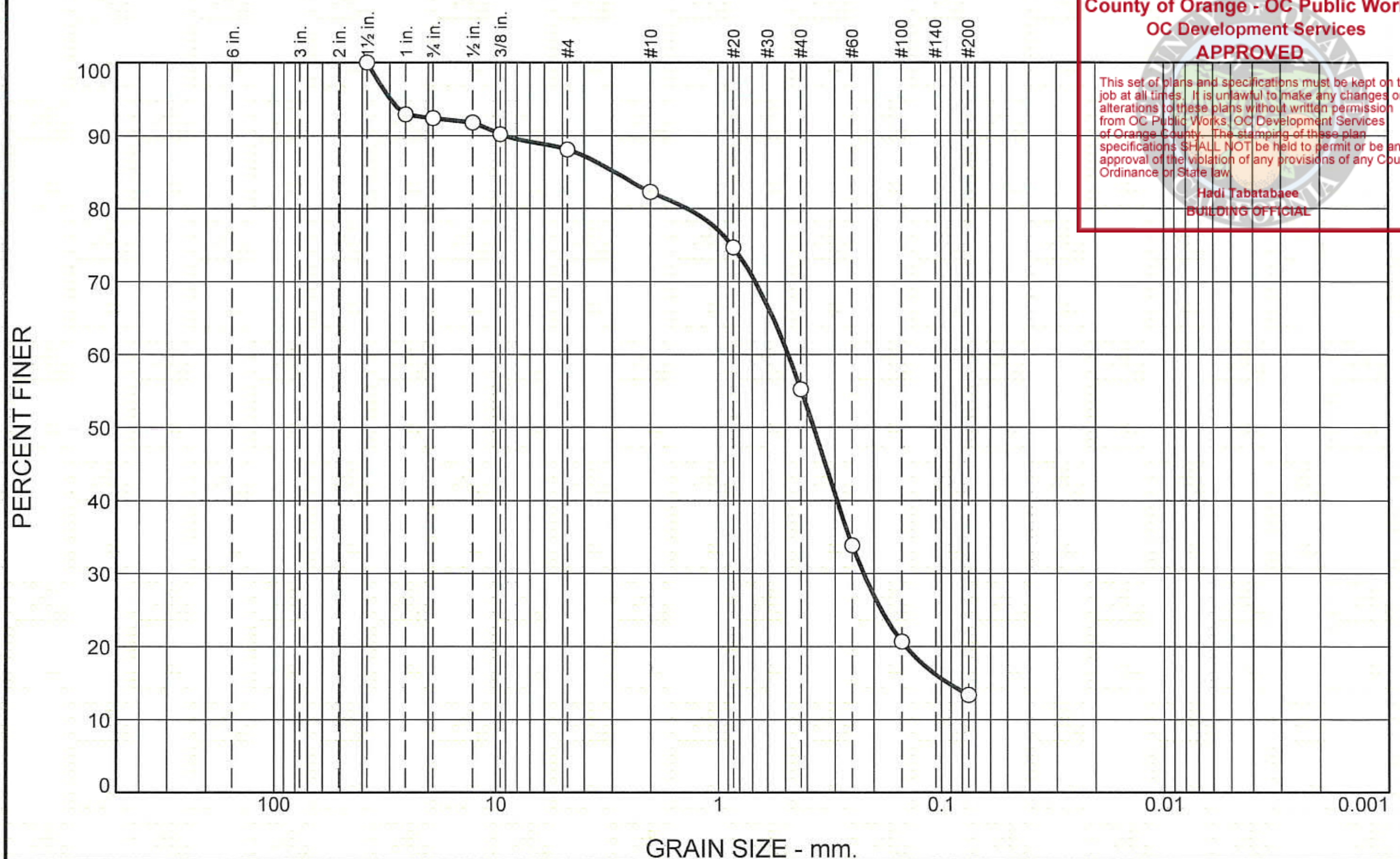
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.7	1.7	1.6	27.9	42.0	71.5	17.8	9.0	26.8

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0029	0.0079	0.0222	0.0949	0.1494	0.2141	0.3031	0.7401	0.9627	1.2527	1.7161

Fineness Modulus	C_u	C_c
1.41	105.62	10.35

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
~~Permits: BNR21-0604~~

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	7.6	4.3	5.8	27.1	41.8	13.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5"	100.0		
1"	92.9		
0.75"	92.4		
0.5"	91.8		
0.375"	90.2		
#4	88.1		
#10	82.3		
#20	74.7		
#40	55.2		
#60	33.9		
#100	20.7		
#200	13.4		

* (no specification provided)

Material Description

Silty Sand, SM (#32289)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 9.1294 D_{85}= 2.9091 D_{60}= 0.4843
D_{50}= 0.3734 D_{30}= 0.2221 D_{15}= 0.0929
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Sample Number: B4-4 **Depth:** 30'

Date: 2/12/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration

Project No: 5015190002.02 **Figure**

Tested By: L. Collins **Checked By:** M. Farr

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 30' **Sample Number:** B4-4
Material Description: Silty Sand, SM (#32289)
Date: 2/12/19
USCS Classification: SM
Tested by: L. Collins **Checked by:** M. Farr

Sieve Test Data

Sieve Opening Size	Percent Finer
1.5"	100.0
1"	92.9
0.75"	92.4
0.5"	91.8
0.375"	90.2
#4	88.1
#10	82.3
#20	74.7
#40	55.2
#60	33.9
#100	20.7
#200	13.4

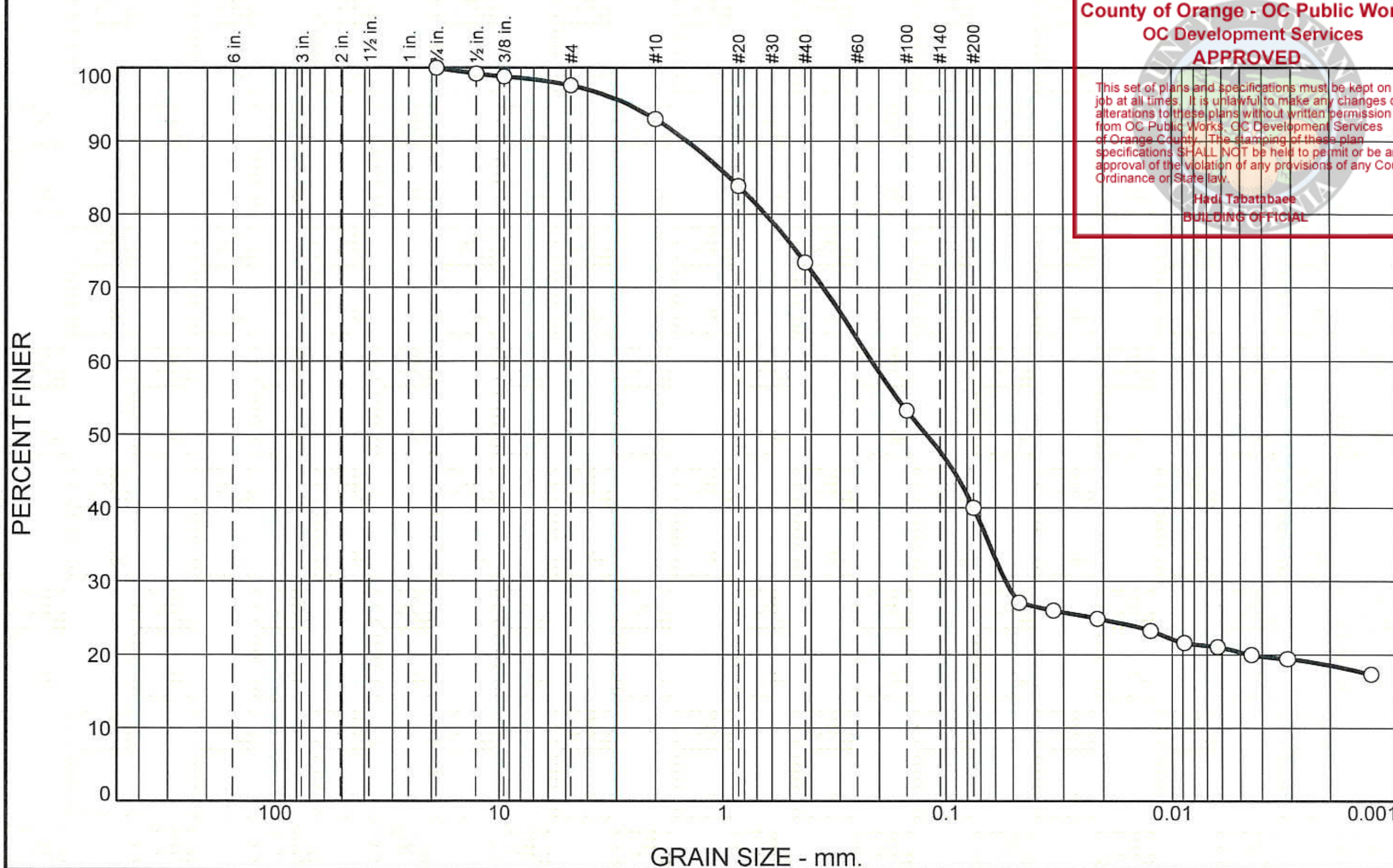
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	7.6	4.3	11.9	5.8	27.1	41.8	74.7			13.4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0929	0.1438	0.2221	0.2934	0.3734	0.4843	1.3674	2.9091	9.1294	29.8650

Fineness Modulus
2.39

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.4	4.6	19.6	33.4	21.4	18.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75"	100.0		
0.5"	99.2		
0.375"	98.8		
#4	97.6		
#10	93.0		
#20	83.9		
#40	73.4		
#100	53.3		
#200	40.0		

* (no specification provided)

Material Description

Clayey Sand, SC (#32290)

Atterberg Limits

PL= 15.8 LL= 36.5 PI= 20.7

Coefficients

D_{90}= 1.4386 D_{85}= 0.9268 D_{60}= 0.2155
D_{50}= 0.1220 D_{30}= 0.0539 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-6(3)

Remarks

Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.

Sample Number: B5-2 **Depth:** 20'

Date: 2/23/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration

Project No: 5015190002.02 **Figure**

Tested By: J. Iacovera **Checked By:** L. Collins

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 20' **Sample Number:** B5-2
Material Description: Clayey Sand, SC (#32290)
Date: 2/23/19 **PL:** 15.8 **LL:** 36.5 **PI:** 20.7
USCS Classification: SC **AASHTO Classification:** A-6(3)
Testing Remarks: Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.
Tested by: J. Iacovera **Checked by:** L. Collins

Sieve Test Data

Sieve Opening Size	Percent Finer
0.75"	100.0
0.5"	99.2
0.375"	98.8
#4	97.6
#10	93.0
#20	83.9
#40	73.4
#100	53.3
#200	40.0

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 93.0
Weight of hydrometer sample =87.04
Hygroscopic moisture correction:
Moist weight and tare = 84.70
Dry weight and tare = 83.27
Tare weight = 25.38
Hygroscopic moisture = 2.5%
Table of composite correction values:

Temp., deg. C:	19.1	20.3	20.9	21.3	22.6
Comp. corr.:	-3.5	-3.0	-2.8	-2.8	-2.5

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - .164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.7	28.0	24.8	0.0137	28.0	11.7	0.0469	27.1
2.00	19.7	27.0	23.8	0.0137	27.0	11.9	0.0334	26.0
5.00	19.7	26.0	22.8	0.0137	26.0	12.0	0.0212	24.9
15.00	19.7	24.5	21.3	0.0137	24.5	12.3	0.0124	23.3
30.00	19.7	23.0	19.8	0.0137	23.0	12.5	0.0088	21.6
60.00	19.7	22.5	19.3	0.0137	22.5	12.6	0.0063	21.1
120.00	19.7	21.5	18.3	0.0137	21.5	12.8	0.0045	20.0
250.00	19.7	21.0	17.8	0.0137	21.0	12.9	0.0031	19.4
1440.00	19.9	19.0	15.8	0.0137	19.0	13.2	0.0013	17.3

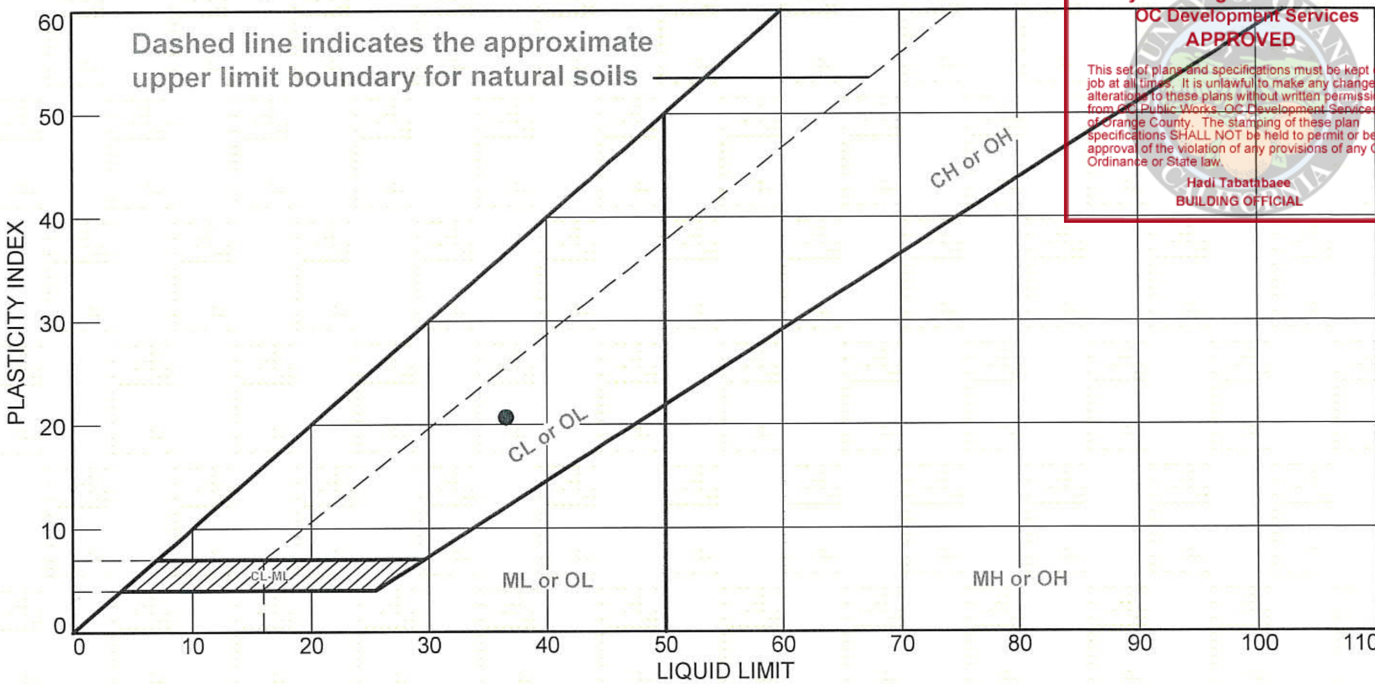
Fractional Components

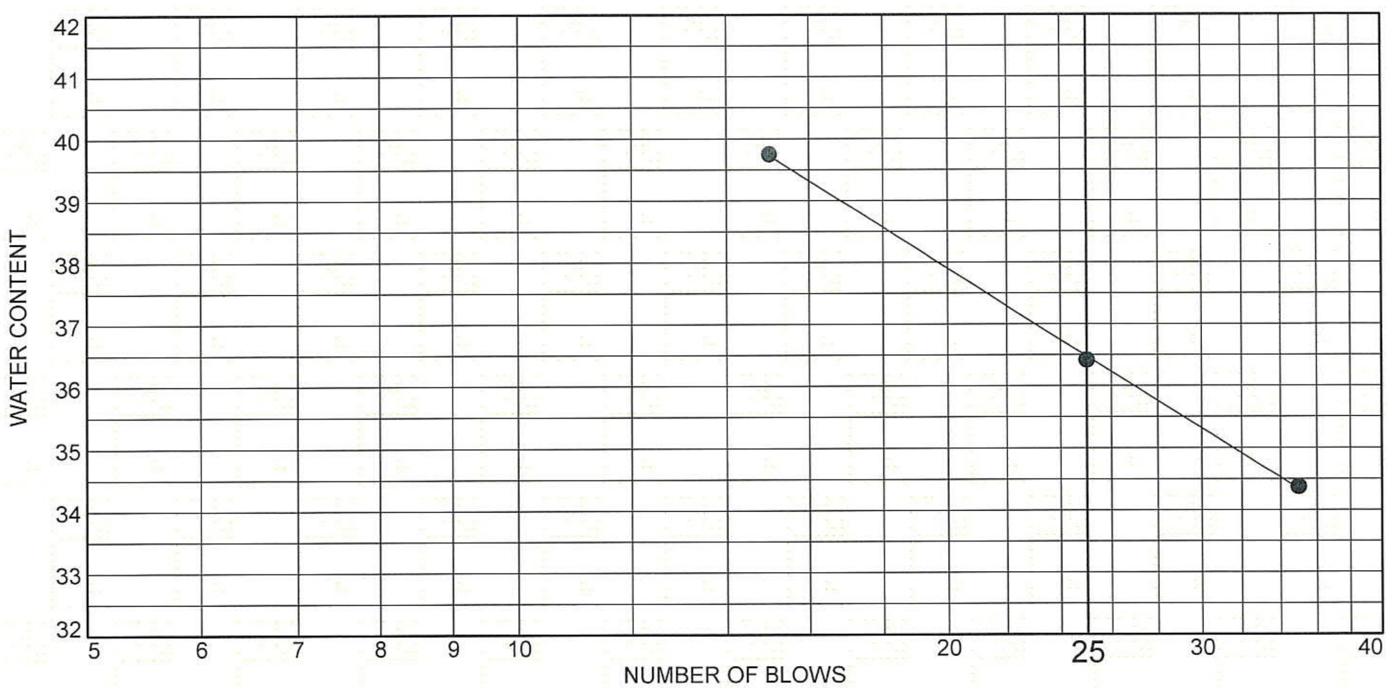
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.4	2.4	4.6	19.6	33.4	57.6	21.4	18.6	40.0

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0045	0.0539	0.0750	0.1220	0.2155	0.6393	0.9268	1.4386	2.6520

Fineness Modulus
1.22

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Clayey Sand, SC (#32290)	36.5	15.8	20.7	73.4	40.0	SC

Project No. 5015190002.02 **Client:** TerraCosta Consulting Group, Inc.

Project: #2975 Dana Point Harbor Restoration

Sample Number: B5-2 **Depth:** 20'

Remarks:

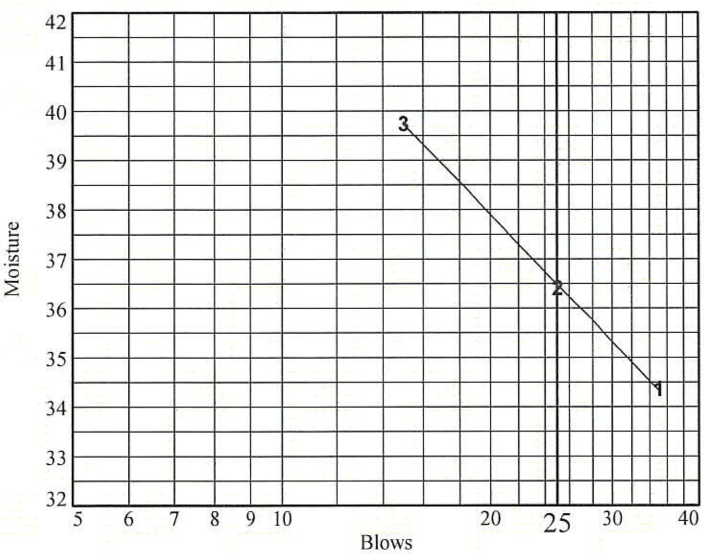
Figure

LIQUID AND PLASTIC LIMIT TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 20' **Sample Number:** B5-2
Material Description: Clayey Sand, SC (#32290)
%<#40: 73.4 **%<#200:** 40.0 **USCS:** SC **AASHTO:** A-6(3)

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	25.58	24.67	26.80			
Dry+Tare	22.72	21.72	23.27			
Tare	14.40	13.62	14.39			
# Blows	35	25	15			
Moisture	34.4	36.4	39.8			



Liquid Limit= 36.5
Plastic Limit= 15.8
Plasticity Index= 20.7

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	27.83	29.4			
Dry+Tare	26.92	28.27			
Tare	21.05	21.29			
Moisture	15.5	16.2			

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
~~Permits: BNR21-0604~~

County of Orange - OC Public Works
OC Development Services
APPROVED
This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works, OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law.
Hadi Tabatabaee
BUILDING OFFICIAL

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	9.9	2.6	19.6	23.6	30.5	13.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75"	100.0		
0.5"	95.8		
0.375"	93.2		
#4	90.1		
#10	87.5		
#20	77.4		
#40	67.9		
#100	53.8		
#200	44.3		

* (no specification provided)

Material Description

Silty Sand, SM (#32291)

Atterberg Limits

PL= 34.6 LL= 51.9 PI= 17.3

Coefficients

D_{90}= 4.5015 D_{85}= 1.5221 D_{60}= 0.2336
D_{50}= 0.1164 D_{30}= 0.0162 D_{15}= 0.0025
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-7-5(4)

Remarks

Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.

Sample Number: B5-3 **Depth:** 25'

Date: 2/23/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: J. Iacovera **Checked By:** L. Collins

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25' **Sample Number:** B5-3
Material Description: Silty Sand, SM (#32291)
Date: 2/23/19 **PL:** 34.6 **LL:** 51.9 **PI:** 17.3
USCS Classification: SM **AASHTO Classification:** A-7-5(4)
Testing Remarks: Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.
Tested by: J. Iacovera **Checked by:** L. Collins

Sieve Test Data

Sieve Opening Size	Percent Finer
0.75"	100.0
0.5"	95.8
0.375"	93.2
#4	90.1
#10	87.5
#20	77.4
#40	67.9
#100	53.8
#200	44.3

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 87.5
Weight of hydrometer sample =67.27
Hygroscopic moisture correction:
- **Moist weight and tare =** 81.99
- **Dry weight and tare =** 79.87
- **Tare weight =** 26.37
- **Hygroscopic moisture =** 4.0%

Table of composite correction values:

Temp., deg. C:	19.1	20.3	20.9	21.3	22.6
Comp. corr.:	-3.5	-3.0	-2.8	-2.8	-2.5

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - .164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.6	33.0	29.7	0.0137	33.0	10.9	0.0452	40.2
2.00	19.6	30.5	27.2	0.0137	30.5	11.3	0.0326	36.8
5.00	19.6	27.0	23.7	0.0137	27.0	11.9	0.0211	32.1
15.00	19.6	24.0	20.7	0.0137	24.0	12.4	0.0124	28.0
31.00	19.6	21.5	18.2	0.0137	21.5	12.8	0.0088	24.6
60.00	19.7	19.5	16.3	0.0137	19.5	13.1	0.0064	22.0
120.00	19.7	17.5	14.3	0.0137	17.5	13.4	0.0046	19.3
250.00	19.7	15.5	12.3	0.0137	15.5	13.8	0.0032	16.6
1440.00	19.9	12.0	8.8	0.0137	12.0	14.3	0.0014	11.9

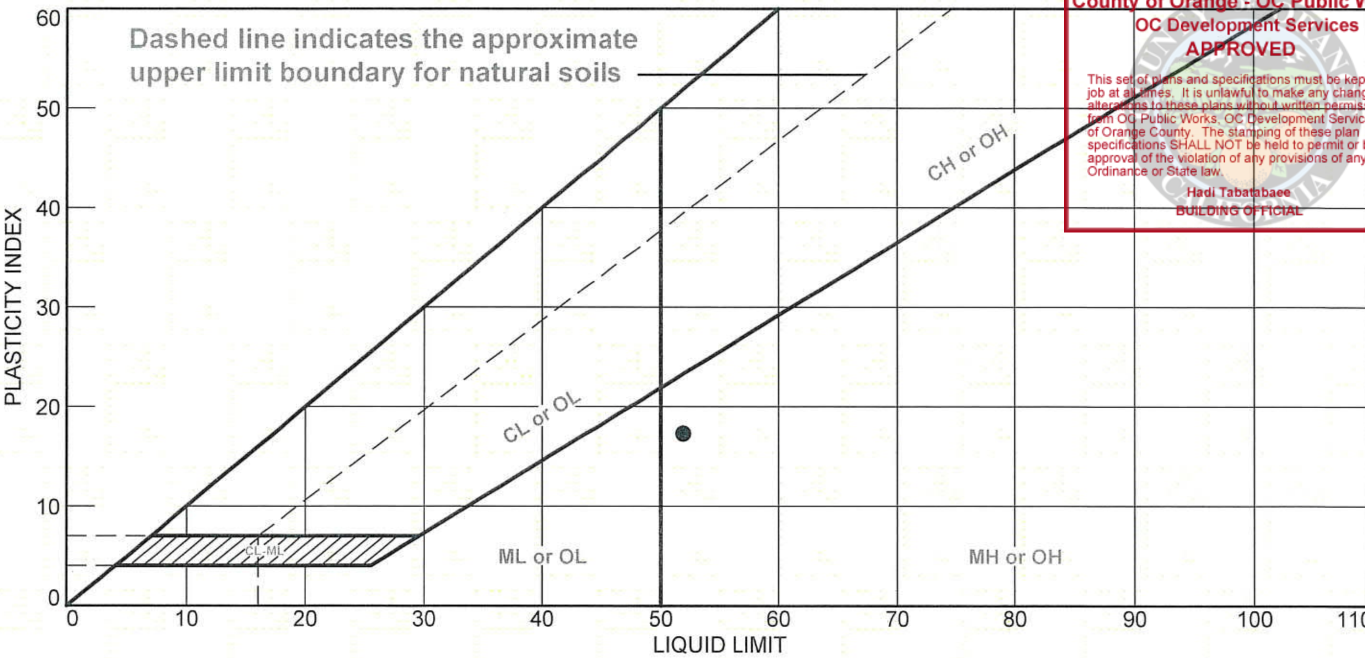
Fractional Components

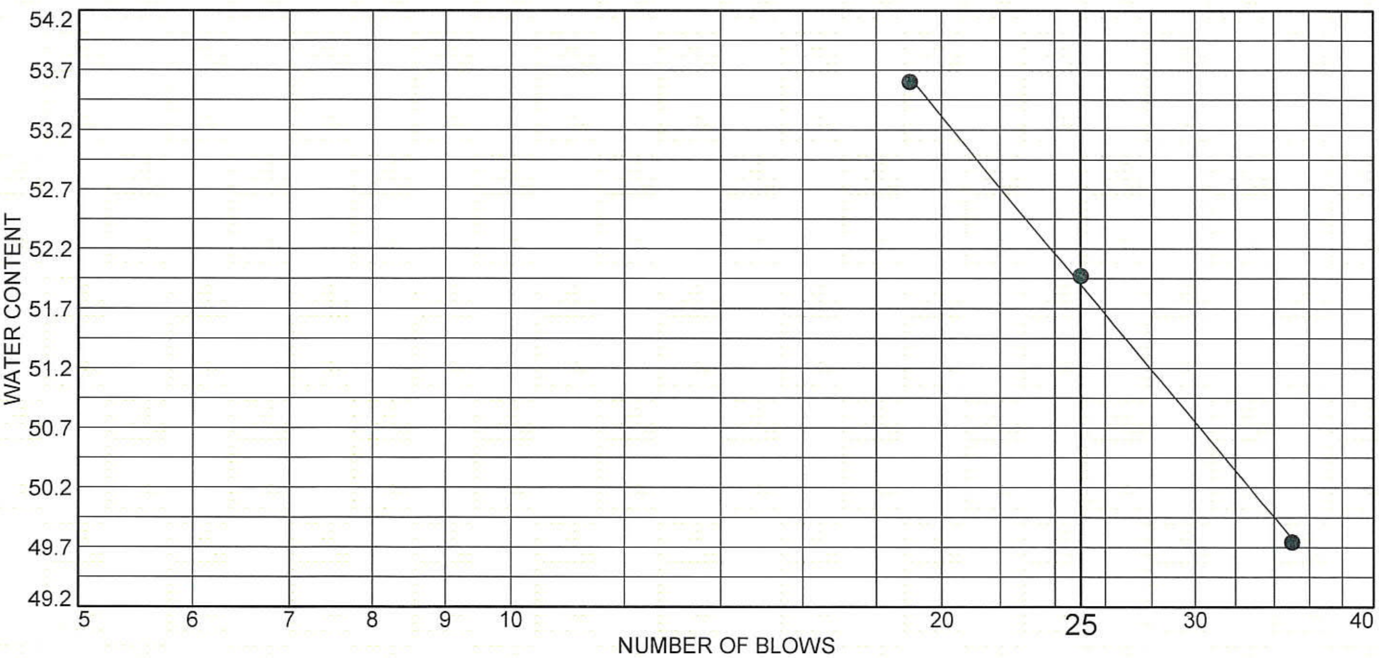
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	9.9	9.9	2.6	19.6	23.6	45.8	30.5	13.8	44.3

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0025	0.0050	0.0162	0.0444	0.1164	0.2336	1.0241	1.5221	4.5015	11.6995

Fineness Modulus
1.57

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Sand, SM (#32291)	51.9	34.6	17.3	67.9	44.3	SM

Project No. 5015190002.02 **Client:** TerraCosta Consulting Group, Inc.

Project: #2975 Dana Point Harbor Restoration

Sample Number: B5-3 **Depth:** 25'

Remarks:

amec

Figure

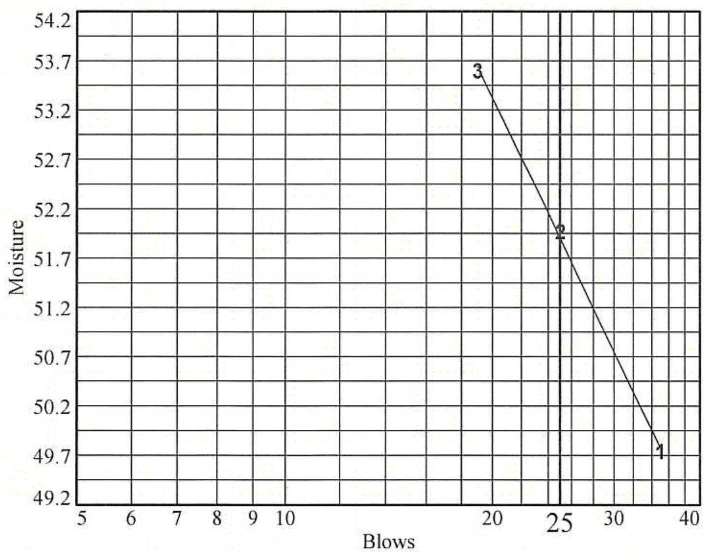
Tested By: M. Gibson **Checked By:** L. Collins

LIQUID AND PLASTIC LIMIT TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25' **Sample Number:** B5-3
Material Description: Silty Sand, SM (#32291)
%<#40: 67.9 **%<#200:** 44.3 **USCS:** SM **AASHTO:** A-7-5(4)
Tested by: M. Gibson **Checked by:** L. Collins

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	22.69	25.23	25.15			
Dry+Tare	18.81	21.54	21.43			
Tare	11.01	14.44	14.49			
# Blows	35	25	19			
Moisture	49.7	52.0	53.6			



Liquid Limit= 51.9
Plastic Limit= 34.6
Plasticity Index= 17.3

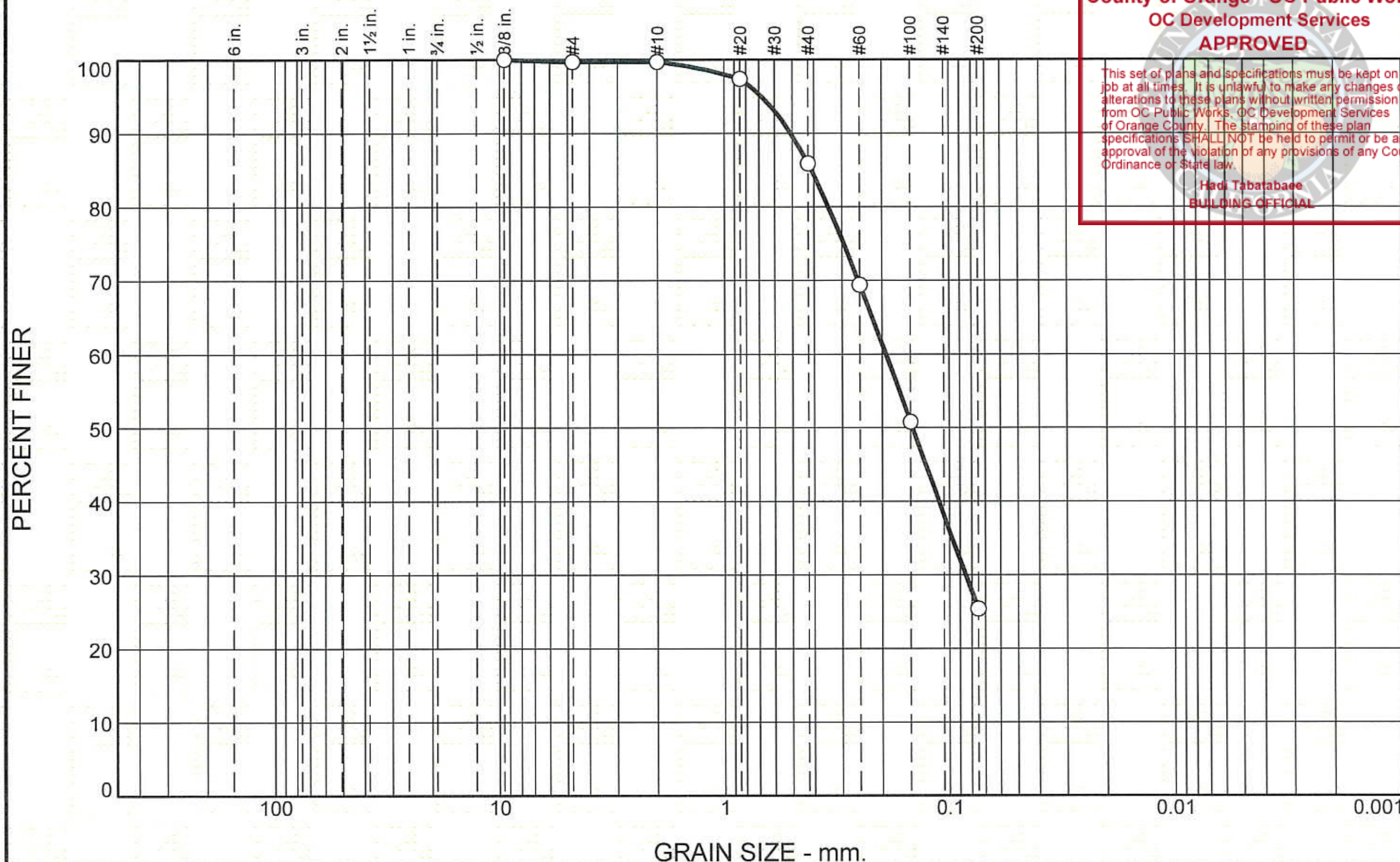
Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	24.03	21.83			
Dry+Tare	21.69	20.10			
Tare	15.10	14.97			
Moisture	35.5	33.7			

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
APPROVED
This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works, OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law.
Hadi Tabatabaee
BUILDING OFFICIAL

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.0	13.8	60.5	25.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375"	100.0		
#4	99.7		
#10	99.7		
#20	97.4		
#40	85.9		
#60	69.4		
#100	50.8		
#200	25.4		

* (no specification provided)

Material Description

Silty Sand, SM (#32292)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.5080 D_{85}= 0.4105 D_{60}= 0.1925
D_{50}= 0.1468 D_{30}= 0.0851 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Sample Number: B6-4 **Depth:** 25'

Date: 2/12/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: L. Collins **Checked By:** M. Farr

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25' **Sample Number:** B6-4
Material Description: Silty Sand, SM (#32292)
Date: 2/12/19
USCS Classification: SM
Tested by: L. Collins **Checked by:** M. Farr

Sieve Test Data

Sieve Opening Size	Percent Finer
0.375"	100.0
#4	99.7
#10	99.7
#20	97.4
#40	85.9
#60	69.4
#100	50.8
#200	25.4

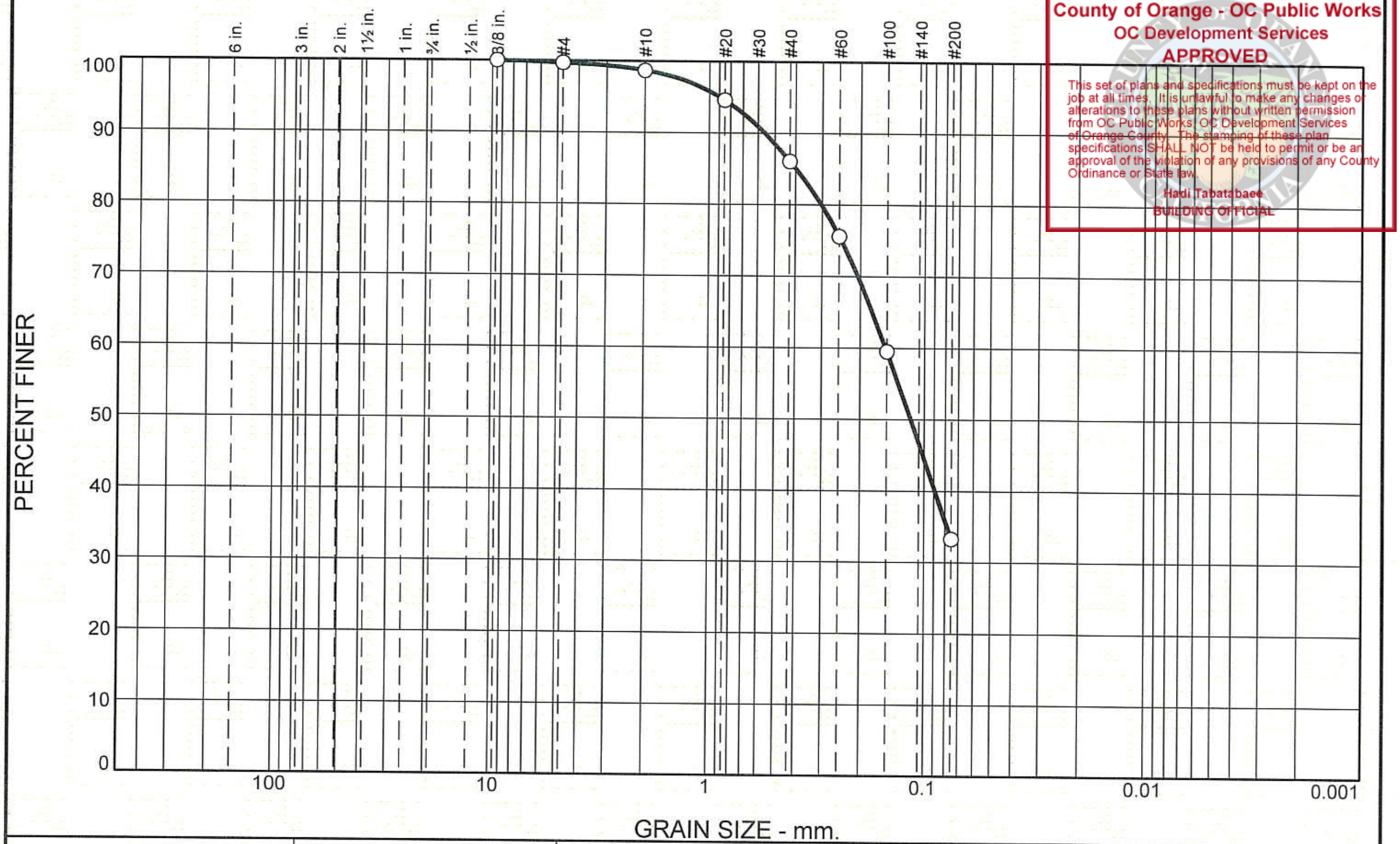
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.3	0.3	0.0	13.8	60.5	74.3			25.4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0851	0.1118	0.1468	0.1925	0.3444	0.4105	0.5080	0.6825

Fineness Modulus
0.83

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	1.0	12.6	52.8	33.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375"	100.0		
#4	99.7		
#10	98.7		
#20	94.6		
#40	86.1		
#60	75.6		
#100	59.5		
#200	33.3		

* (no specification provided)

Material Description

Silty Sand, SM (#32293)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.5572 D_{85}= 0.3967 D_{60}= 0.1521
D_{50}= 0.1158 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Sample Number: B6-5 **Depth:** 35'

Date: 2/12/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: L. Collins **Checked By:** M. Farr

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 35'
Sample Number: B6-5
Material Description: Silty Sand, SM (#32293)
Date: 2/12/19
USCS Classification: SM
Tested by: L. Collins
Checked by: M. Farr

Sieve Test Data

Sieve Opening Size	Percent Finer
0.375"	100.0
#4	99.7
#10	98.7
#20	94.6
#40	86.1
#60	75.6
#100	59.5
#200	33.3

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.3	0.3	1.0	12.6	52.8	66.4			33.3

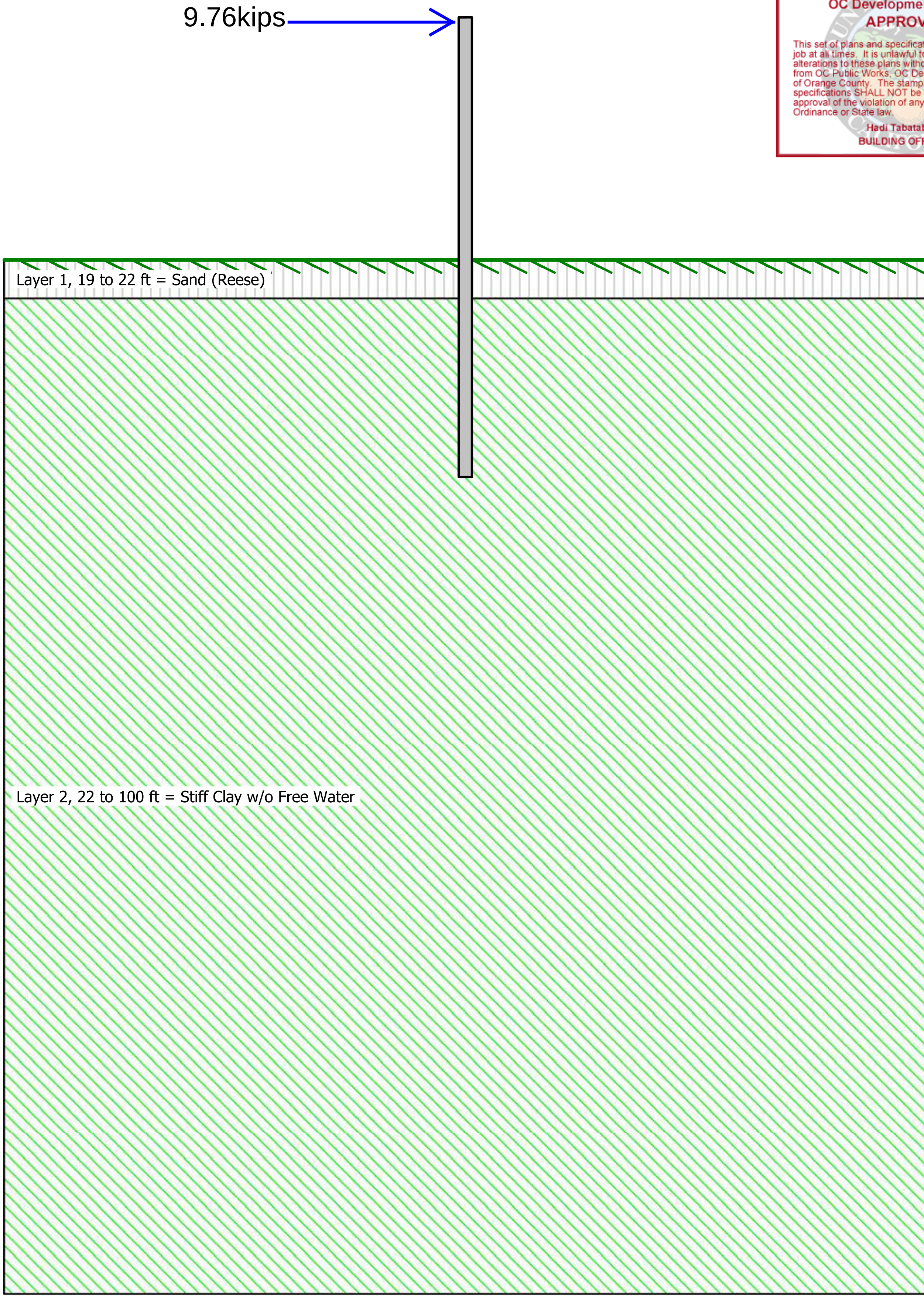
D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
					0.0891	0.1158	0.1521	0.3022	0.3967	0.5572	0.8920

Fineness Modulus
0.74

APPENDIX C

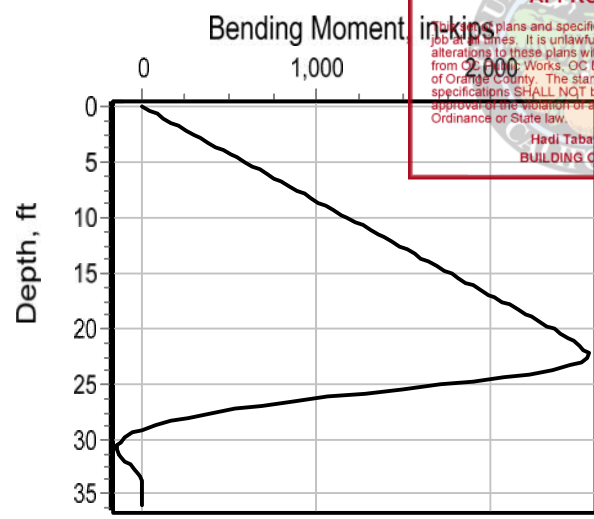
ANALYSIS RESULTS

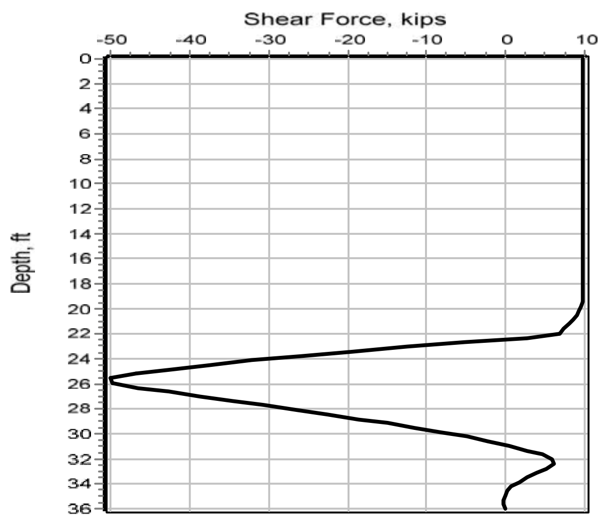
Soil Profile for Mudline at -10 feet MLLW

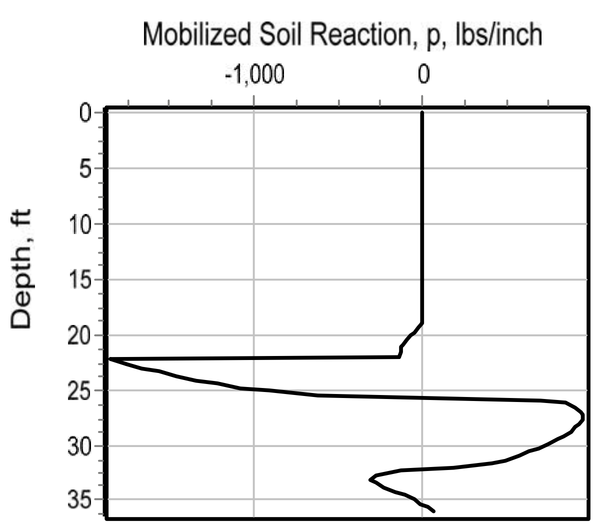


LPile 2015.8.07, © 2015 by Ensoft, Inc.

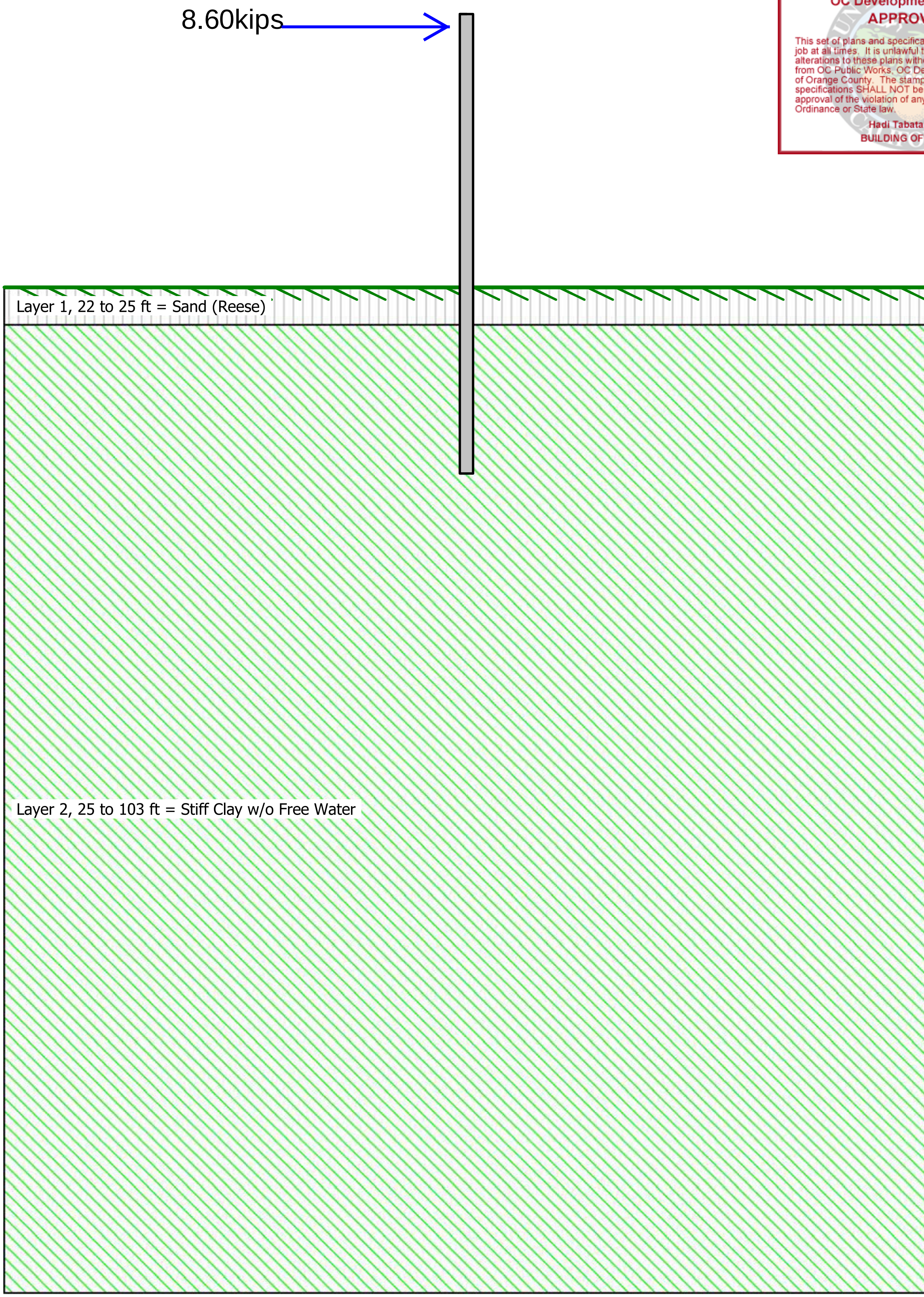
Pile Results for Mudline at -10 feet MLLW



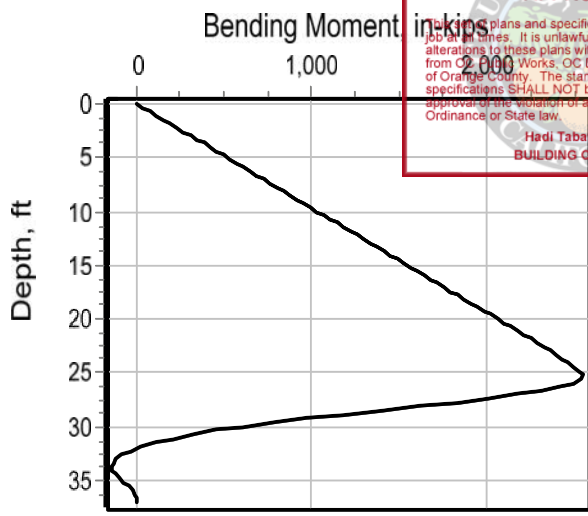


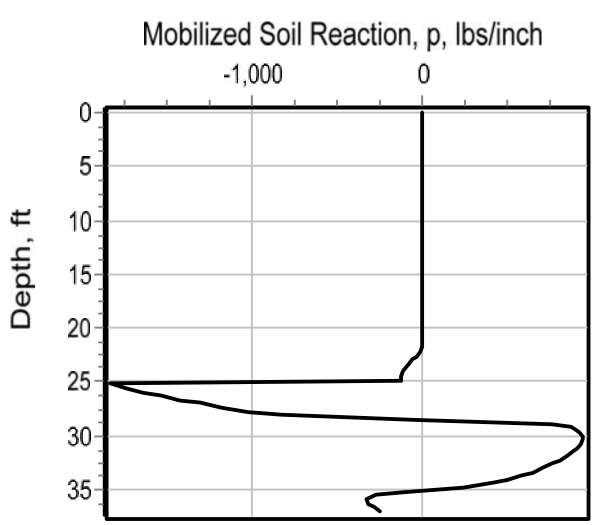


Soil Profile for Mudline at -13 feet MLLW

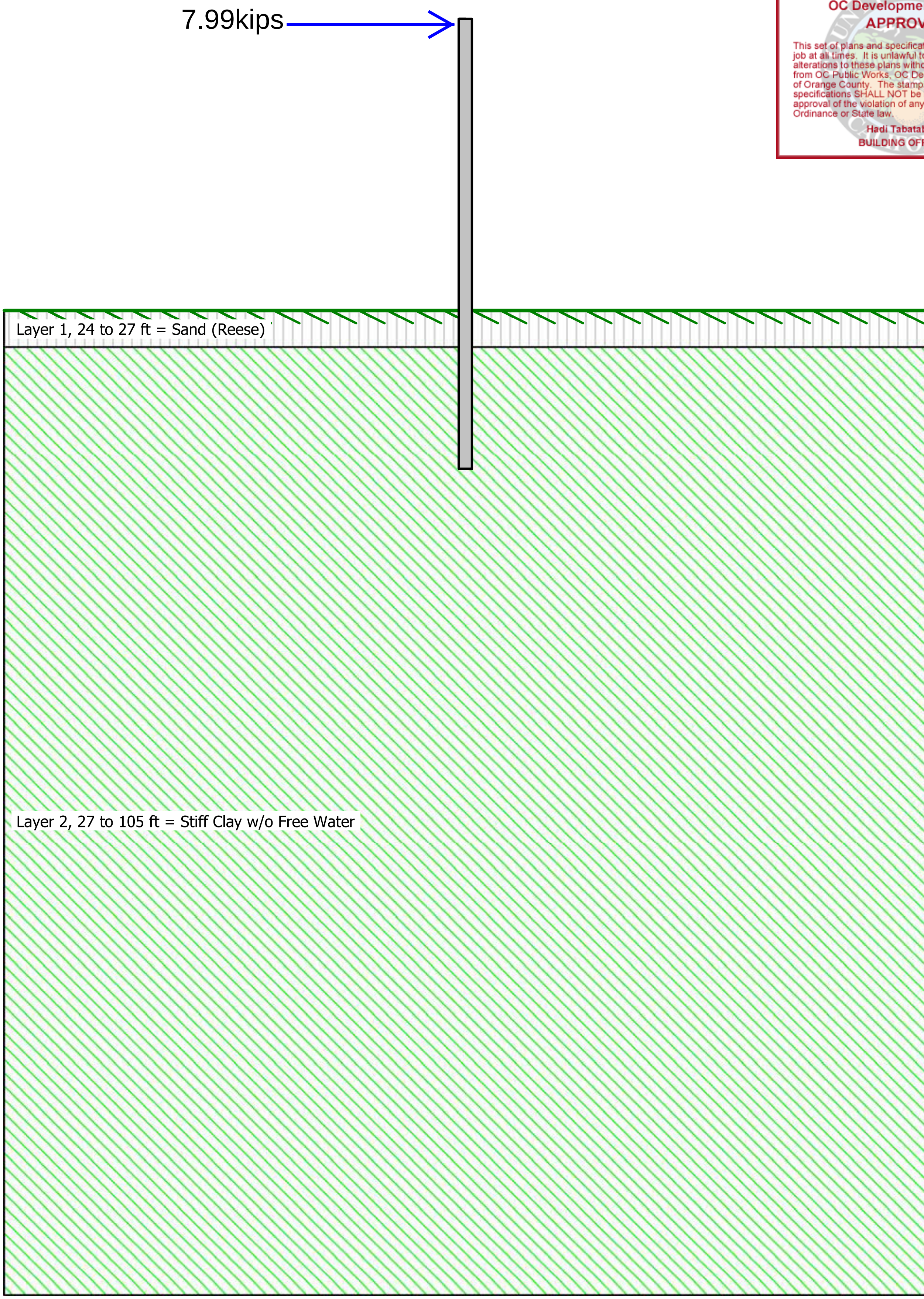


Pile Results for Mudline at -13 feet MLLW

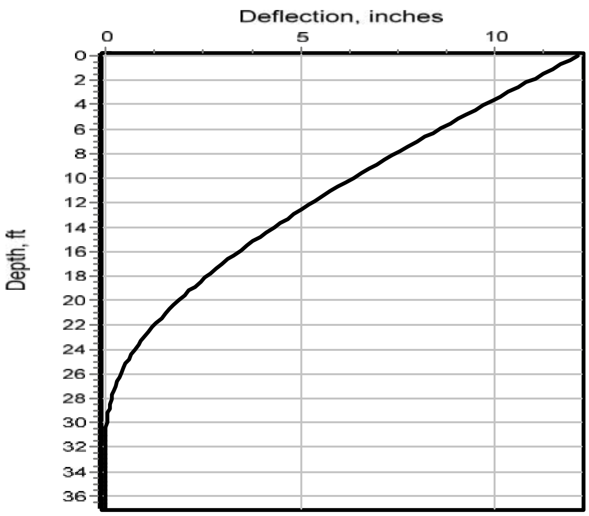


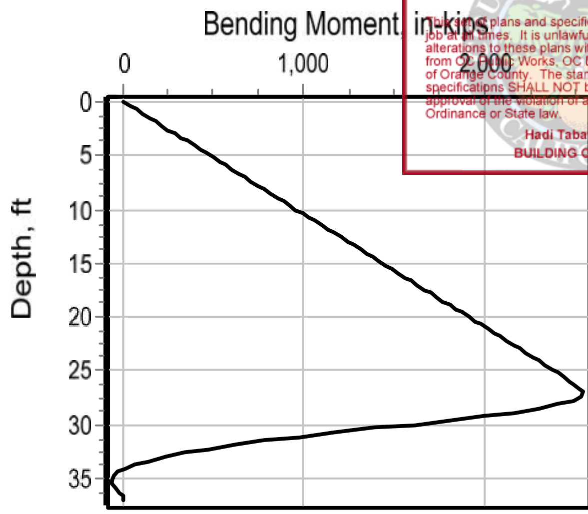


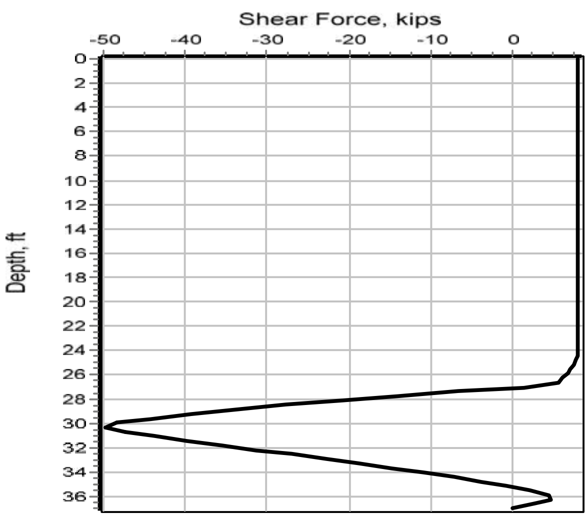
Soil Profile for Mudline at -15 feet MLLW

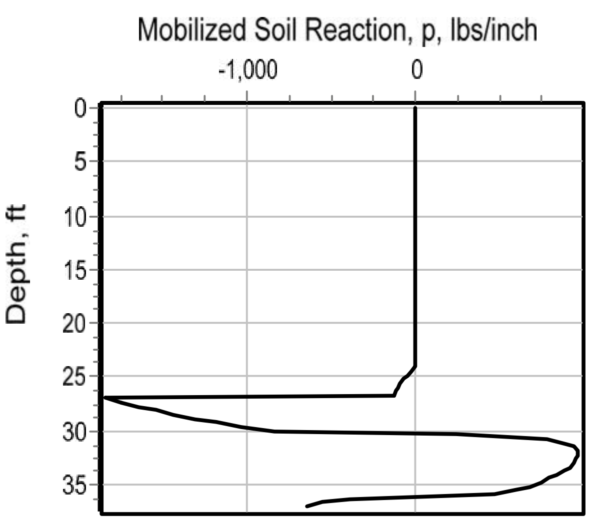


Pile Results for Mudline at -15 feet MLLW

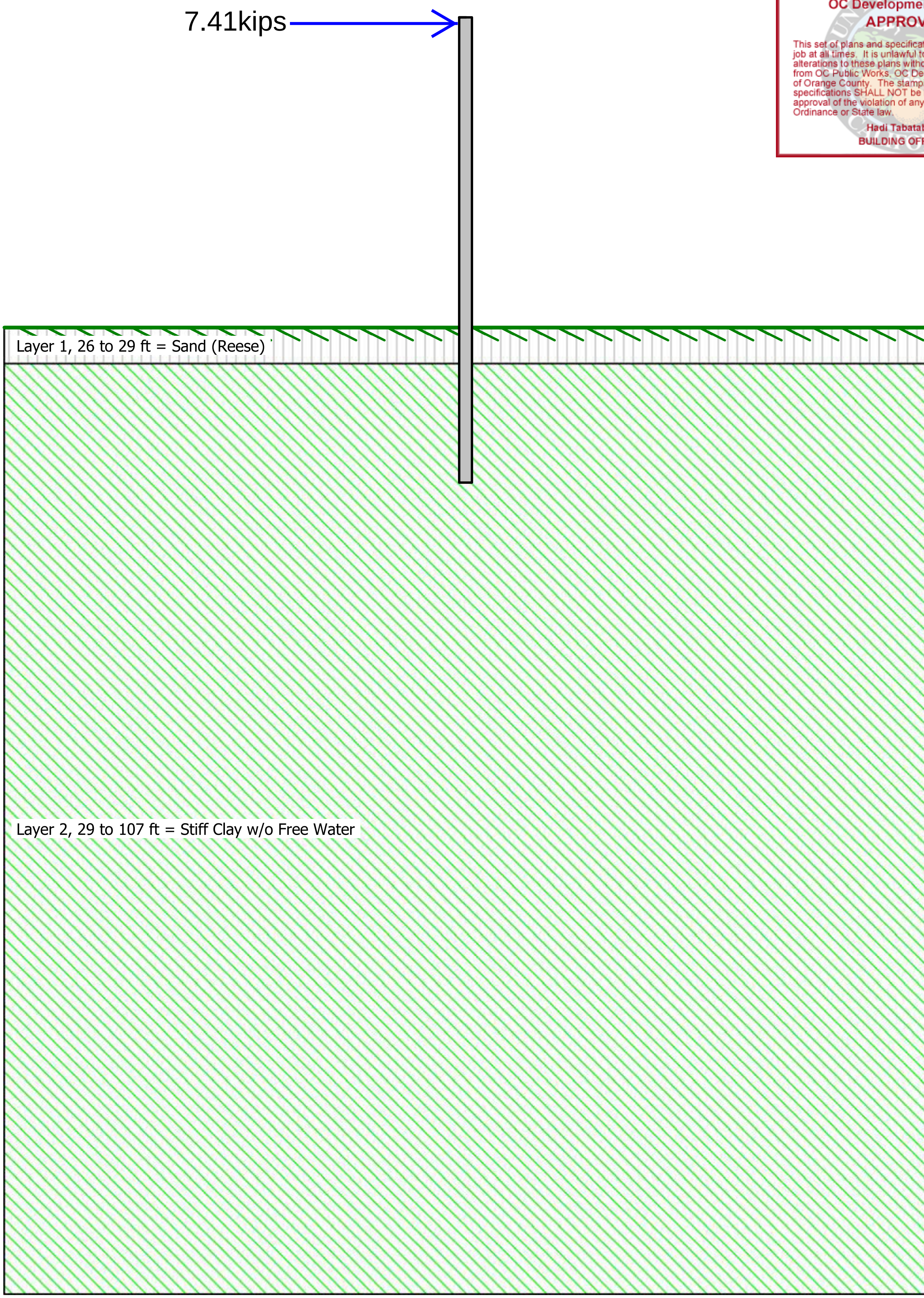






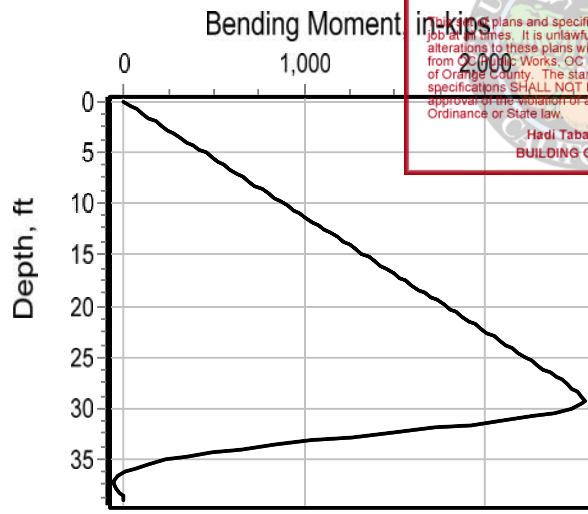


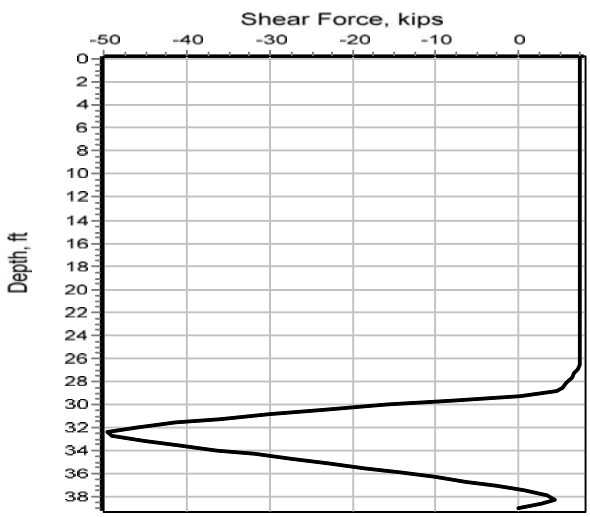
Soil Profile for Mudline at -17 feet MLLW

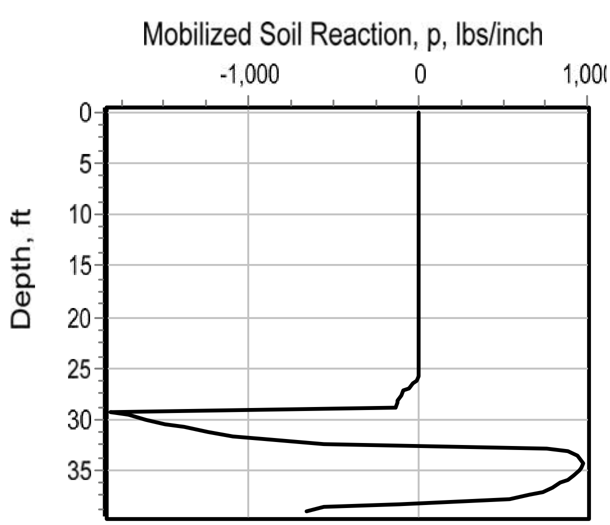


LPile 2015.8.07, © 2015 by Ensoft, Inc.

Pile Results for Mudline at -17 feet MLLW







```
================================================================================

                 LPile for Windows, Version 2015-08.007

              Analysis of Individual Piles and Drilled Shafts
             Subjected to Lateral Loading Using the p-y Method
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--------------------------------------------------------------------------------
                             Files Used for Analysis
--------------------------------------------------------------------------------

Path to file locations:
\Active Projects\_Promo\P2021\P2021001661 Dana Point Marina\wp\

Name of input data file:
danapt_n10ml.lp8d

Name of output report file:
danapt_n10ml.lp8o

Name of plot output file:
danapt_n10ml.lp8p

Name of runtime message file:
danapt_n10ml.lp8r


--------------------------------------------------------------------------------
                            Date and Time of Analysis
--------------------------------------------------------------------------------

               Date:  February 18, 2022          Time:   9:03:33
```

```
--------------------------------------------------------------------------------
                              Problem Title
--------------------------------------------------------------------------------

Project Name:


Job Number:


Client:


Engineer:


Description:



--------------------------------------------------------------------------------
                         Program Options and Settings
--------------------------------------------------------------------------------

Computational Options:
 - Use unfactored loads in computations (conventional analysis)
Engineering Units Used for Data Input and Computations:
 - US Customary System Units (pounds, feet, inches)

Analysis Control Options:
 - Maximum number of iterations allowed                =          750
 - Deflection tolerance for convergence                =   1.0000E-03 in
 - Maximum allowable deflection                        =     100.0000 in
 - Number of pile increments                           =          100

Loading Type and Number of Cycles of Loading:
 - Static loading specified

 - Use of p-y modification factors for p-y curves not selected
 - No distributed lateral loads are entered
 - Loading by lateral soil movements acting on pile not selected
```

```
 - Input of shear resistance at the pile tip not selected
 - Computation of pile-head foundation stiffness matrix not selected
 - Push-over analysis of pile not selected
 - Buckling analysis of pile not selected

Output Options:
 - Output files use decimal points to denote decimal symbols.
 - Values of pile-head deflection, bending moment, shear force, and
   soil reaction are printed for full length of pile.
 - Printing Increment (nodal spacing of output points) = 1
 - No p-y curves to be computed and reported for user-specified depths
 - Print using wide report formats



--------------------------------------------------------------------------------
                     Pile Structural Properties and Geometry
--------------------------------------------------------------------------------

Number of pile sections defined                            =           1
Total length of pile                                       =      36.000 ft
Depth of ground surface below top of pile                  =     19.0000 ft

Pile diameters used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over
the length of the pile. A summary of values of pile diameter vs. depth follows.

            Depth Below           Pile
Point        Pile Head          Diameter
 No.           feet              inches
-----      -------------      -------------
  1            0.000            12.7500
  2           36.000            12.7500


Input Structural Properties for Pile Sections:
----------------------------------------------

Pile Section No. 1:

   Section 1 is an elastic pile with a specified moment capacity
   Cross-sectional Shape                                   =    Circular Pipe
   Length of section                                       =     36.000000 ft
   Width of top of section                                 =     12.750000 in
   Width of bottom of section                              =     12.750000 in
   Wall Thickness at Top                                   =      0.500000 in
   Wall Thickness at Bottom                                =      0.500000 in
   Top Area                                                =     19.242255 sq. in
   Bottom Area                                             =     19.242255 sq. in
```

```
   Moment of Inertia at Top                               =   361.543932 in^4
   Moment of Inertia at Bottom                            =   361.543932 in^4
   Elastic Modulus                                        =    29000000. psi
   Plastic Moment Capacity at Top                         =     2556000. in-lb
   Plastic Moment Capacity at Bottom                      =     2556000. in-lb
   Top Elastic Bending Stiffness                          =   1.0485E+10 lbs-in^2
   Bot Elastic Bending Stiffness                          =   1.0485E+10 lbs-in^2
   Shear Capacity at top of section                       =      100000. lbs
   Shear Capacity at bottom of section                    =      100000. lbs
```

Ground Slope and Pile Batter Angles

```
Ground Slope Angle                                        =        0.000 degrees
                                                          =        0.000 radians

Pile Batter Angle                                         =        0.000 degrees
                                                          =        0.000 radians
```

Soil and Rock Layering Information

The soil profile is modelled using 2 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974

```
   Distance from top of pile to top of layer              =    19.000000 ft
   Distance from top of pile to bottom of layer           =    22.000000 ft
   Effective unit weight at top of layer                  =    55.000000 pcf
   Effective unit weight at bottom of layer               =    55.000000 pcf
   Friction angle at top of layer                         =    34.000000 deg.
   Friction angle at bottom of layer                      =    34.000000 deg.
   Subgrade k at top of layer                             =    60.000000 pci
   Subgrade k at bottom of layer                          =    60.000000 pci
```

Layer 2 is stiff clay without free water

```
   Distance from top of pile to top of layer              =    22.000000 ft
   Distance from top of pile to bottom of layer           =   100.000000 ft
   Effective unit weight at top of layer                  =    60.000000 pcf
   Effective unit weight at bottom of layer               =    60.000000 pcf
   Undrained cohesion at top of layer                     =        4000. psf
   Undrained cohesion at bottom of layer                  =        4000. psf
   Epsilon-50 at top of layer                             =     0.004000
```

Epsilon-50 at bottom of layer = 0.004000

(Depth of the lowest soil layer extends 64.000 ft below the pile tip)

Summary of Input Soil Properties

Layer Num.	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Undrained Cohesion psf	Angle of Friction deg.	E50 or krm	kpy pci
1	Sand	19.0000	55.0000	--	34.0000	--	60.0000
	(Reese, et al.)	22.0000	55.0000	--	34.0000	--	60.0000
2	Stiff Clay	22.0000	60.0000	4000.	--	0.00400	--
	w/o Free Water	100.0000	60.0000	4000.	--	0.00400	--

Static Loading Type

Static loading criteria were used when computing p-y curves for all analyses.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load No.	Load Type	Condition 1	Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length
1	1	V = 9755. lbs	M = 0.0000 in-lbs	0.0000000	No

V = shear force applied normal to pile axis
M = bending moment applied to pile head
y = lateral deflection normal to pile axis
S = pile slope relative to original pile batter angle
R = rotational stiffness applied to pile head
Values of top y vs. pile lengths can be computed only for load types with specified shear loading (Load Types 1, 2, and 3).
Thrust force is assumed to be acting axially for all pile batter angles.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

---

Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Moment-curvature properties were derived from elastic-plastic section properties

---

Layering Correction Equivalent Depths of Soil & Rock Layers

Layer No.	Top of Layer Below Pile Head ft	Equivalent Top Depth Below Grnd Surf ft	Same Layer Type As Layer Above	Layer is Rock or is Below Rock Layer	F0 Integral for Layer lbs	F1 Integral for Layer lbs
1	19.0000	0.00	N.A.	No	0.00	3268.
2	22.0000	22.0000	No	No	3268.	N.A.

Notes: The F0 integral of Layer n+1 equals the sum of the F0 and F1 integrals for Layer n. Layering correction equivalent depths are computed only for soil types with both shallow-depth and deep-depth expressions for peak lateral load transfer. These soil types are soft and stiff clays, non-liquefied sands, and cemented c-phi soil.

Computed Values of Pile Loading and Deflection for Lateral Loading for Load Case Number 1

Pile-head conditions are Shear and Moment (Loading Type 1)

Shear force at pile head = 9755.0 lbs
Applied moment at pile head = 0.0 in-lbs
Axial thrust load on pile head = 0.0 lbs

Depth X feet	Deflect. y inches	Bending Moment in-lbs	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness in-lb^2	Soil Res. p lb/inch	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	8.9268	2.99E-05	9755.	-0.04360	5.28E-07	1.05E+10	0.00	0.00	0.00
0.3600	8.7384	42142.	9755.	-0.04359	743.0707	1.05E+10	0.00	0.00	0.00
0.7200	8.5502	84283.	9755.	-0.04356	1486.	1.05E+10	0.00	0.00	0.00
1.0800	8.3620	126425.	9755.	-0.04352	2229.	1.05E+10	0.00	0.00	0.00
1.4400	8.1742	168566.	9755.	-0.04346	2972.	1.05E+10	0.00	0.00	0.00
1.8000	7.9866	210708.	9755.	-0.04338	3715.	1.05E+10	0.00	0.00	0.00
2.1600	7.7994	252850.	9755.	-0.04328	4458.	1.05E+10	0.00	0.00	0.00
2.5200	7.6126	294991.	9755.	-0.04317	5201.	1.05E+10	0.00	0.00	0.00
2.8800	7.4264	337133.	9755.	-0.04304	5945.	1.05E+10	0.00	0.00	0.00
3.2400	7.2407	379274.	9755.	-0.04289	6688.	1.05E+10	0.00	0.00	0.00
3.6000	7.0558	421416.	9755.	-0.04273	7431.	1.05E+10	0.00	0.00	0.00
3.9600	6.8716	463558.	9755.	-0.04255	8174.	1.05E+10	0.00	0.00	0.00
4.3200	6.6882	505699.	9755.	-0.04235	8917.	1.05E+10	0.00	0.00	0.00
4.6800	6.5057	547841.	9755.	-0.04213	9660.	1.05E+10	0.00	0.00	0.00
5.0400	6.3242	589982.	9755.	-0.04189	10403.	1.05E+10	0.00	0.00	0.00
5.4000	6.1437	632124.	9755.	-0.04164	11146.	1.05E+10	0.00	0.00	0.00
5.7600	5.9644	674266.	9755.	-0.04137	11889.	1.05E+10	0.00	0.00	0.00
6.1200	5.7863	716407.	9755.	-0.04109	12632.	1.05E+10			

0.00	0.00	0.00				
6.4800	5.6094	758549.	9755.	-0.04078	13375.	1.05E+10
0.00	0.00	0.00				
6.8400	5.4339	800690.	9755.	-0.04046	14118.	1.05E+10
0.00	0.00	0.00				
7.2000	5.2598	842832.	9755.	-0.04012	14861.	1.05E+10
0.00	0.00	0.00				
7.5600	5.0872	884974.	9755.	-0.03977	15604.	1.05E+10
0.00	0.00	0.00				
7.9200	4.9162	927115.	9755.	-0.03939	16348.	1.05E+10
0.00	0.00	0.00				
8.2800	4.7469	969257.	9755.	-0.03900	17091.	1.05E+10
0.00	0.00	0.00				
8.6400	4.5792	1011398.	9755.	-0.03860	17834.	1.05E+10
0.00	0.00	0.00				
9.0000	4.4134	1053540.	9755.	-0.03817	18577.	1.05E+10
0.00	0.00	0.00				
9.3600	4.2494	1095682.	9755.	-0.03773	19320.	1.05E+10
0.00	0.00	0.00				
9.7200	4.0874	1137823.	9755.	-0.03727	20063.	1.05E+10
0.00	0.00	0.00				
10.0800	3.9275	1179965.	9755.	-0.03679	20806.	1.05E+10
0.00	0.00	0.00				
10.4400	3.7696	1222106.	9755.	-0.03629	21549.	1.05E+10
0.00	0.00	0.00				
10.8000	3.6139	1264248.	9755.	-0.03578	22292.	1.05E+10
0.00	0.00	0.00				
11.1600	3.4604	1306390.	9755.	-0.03525	23035.	1.05E+10
0.00	0.00	0.00				
11.5200	3.3093	1348531.	9755.	-0.03471	23778.	1.05E+10
0.00	0.00	0.00				
11.8800	3.1605	1390673.	9755.	-0.03414	24521.	1.05E+10
0.00	0.00	0.00				
12.2400	3.0143	1432814.	9755.	-0.03356	25264.	1.05E+10
0.00	0.00	0.00				
12.6000	2.8706	1474956.	9755.	-0.03296	26007.	1.05E+10
0.00	0.00	0.00				
12.9600	2.7295	1517098.	9755.	-0.03234	26751.	1.05E+10
0.00	0.00	0.00				
13.3200	2.5911	1559239.	9755.	-0.03171	27494.	1.05E+10
0.00	0.00	0.00				
13.6800	2.4555	1601381.	9755.	-0.03106	28237.	1.05E+10
0.00	0.00	0.00				
14.0400	2.3228	1643522.	9755.	-0.03039	28980.	1.05E+10
0.00	0.00	0.00				
14.4000	2.1929	1685664.	9755.	-0.02971	29723.	1.05E+10
0.00	0.00	0.00				
14.7600	2.0661	1727806.	9755.	-0.02900	30466.	1.05E+10
0.00	0.00	0.00				
15.1200	1.9424	1769947.	9755.	-0.02828	31209.	1.05E+10
0.00	0.00	0.00				

15.4800	1.8218	1812089.	9755.	-0.02754	31952.	1.05E+10	0.00	0.00	0.00
15.8400	1.7044	1854230.	9755.	-0.02679	32695.	1.05E+10	0.00	0.00	0.00
16.2000	1.5903	1896372.	9755.	-0.02602	33438.	1.05E+10	0.00	0.00	0.00
16.5600	1.4796	1938514.	9755.	-0.02523	34181.	1.05E+10	0.00	0.00	0.00
16.9200	1.3724	1980655.	9755.	-0.02442	34924.	1.05E+10	0.00	0.00	0.00
17.2800	1.2686	2022797.	9755.	-0.02359	35667.	1.05E+10	0.00	0.00	0.00
17.6400	1.1685	2064938.	9755.	-0.02275	36410.	1.05E+10	0.00	0.00	0.00
18.0000	1.0721	2107080.	9755.	-0.02189	37154.	1.05E+10	0.00	0.00	0.00
18.3600	0.9794	2149222.	9755.	-0.02101	37897.	1.05E+10	0.00	0.00	0.00
18.7200	0.8905	2191363.	9755.	-0.02012	38640.	1.05E+10	0.00	0.00	0.00
19.0800	0.8055	2233505.	9747.	-0.01921	39383.	1.05E+10	-3.7437	20.0770	0.00
19.4400	0.7245	2275577.	9687.	-0.01828	40125.	1.05E+10	-23.8497	142.2026	0.00
19.8000	0.6476	2317203.	9533.	-0.01733	40859.	1.05E+10	-47.3768	316.0452	0.00
20.1600	0.5748	2357946.	9276.	-0.01637	41577.	1.05E+10	-71.9486	540.7699	0.00
20.5200	0.5061	2397345.	8914.	-0.01539	42272.	1.05E+10	-95.6898	816.7218	0.00
20.8800	0.4418	2434959.	8460.	-0.01440	42935.	1.05E+10	-114.2443	1117.	0.00
21.2400	0.3818	2470441.	7943.	-0.01339	43561.	1.05E+10	-125.0050	1415.	0.00
21.6000	0.3261	2503590.	7391.	-0.01236	44145.	1.05E+10	-130.6695	1731.	0.00
21.9600	0.2750	2534301.	6819.	-0.01132	44687.	1.05E+10	-134.0843	2107.	0.00
22.3200	0.2283	2562509.	2547.	-0.01025	45184.	1.00E+10	-1844.	34889.	0.00
22.6800	0.1864	2556305.	-5222.	-0.00917	45075.	1.05E+10	-1753.	40619.	0.00
23.0400	0.1491	2517390.	-12589.	-0.00812	44388.	1.05E+10	-1658.	48032.	0.00
23.4000	0.1162	2447539.	-19534.	-0.00710	43157.	1.05E+10	-1558.	57895.	0.00
23.7600	0.08773	2348619.	-26034.	-0.00611	41413.	1.05E+10	-1452.	71497.	0.00
24.1200	0.06341	2222601.	-32063.	-0.00517	39190.	1.05E+10	-1339.	91213.	0.00
24.4800	0.04305	2071596.	-37580.	-0.00429	36528.	1.05E+10			

-1216.	121974.	0.00				
24.8400	0.02638	1897906.	-42529.	-0.00347	33465.	1.05E+10
-1076.	176184.	0.00				
25.2000	0.01308	1704142.	-46804.	-0.00273	30049.	1.05E+10
-903.2989	298358.	0.00				
25.5600	0.00282	1493519.	-50091.	-0.00207	26335.	1.05E+10
-618.3016	948667.	0.00				
25.9200	-0.00479	1271358.	-49916.	-0.00150	22417.	1.05E+10
699.2590	630714.	0.00				
26.2800	-0.01013	1062246.	-46580.	-0.00102	18730.	1.05E+10
844.9435	360274.	0.00				
26.6400	-0.01358	868903.	-42791.	-6.20E-04	15321.	1.05E+10
909.6304	289303.	0.00				
27.0000	-0.01549	692536.	-38795.	-2.98E-04	12211.	1.05E+10
940.1687	262241.	0.00				
27.3600	-0.01616	533715.	-34711.	-4.56E-05	9411.	1.05E+10
950.3179	254047.	0.00				
27.7200	-0.01588	392629.	-30615.	1.45E-04	6923.	1.05E+10
946.2736	257392.	0.00				
28.0800	-0.01491	269203.	-26559.	2.82E-04	4747.	1.05E+10
931.4191	269954.	0.00				
28.4400	-0.01345	163159.	-22586.	3.71E-04	2877.	1.05E+10
907.8171	291597.	0.00				
28.8000	-0.01170	74057.	-18731.	4.20E-04	1306.	1.05E+10
876.8098	323663.	0.00				
29.1600	-0.00982	1319.	-15025.	4.35E-04	23.2593	1.05E+10
839.2989	369043.	0.00				
29.5200	-0.00794	-55756.	-11493.	4.24E-04	983.1277	1.05E+10
795.8855	432792.	0.00				
29.8800	-0.00616	-97978.	-8160.	3.92E-04	1728.	1.05E+10
746.9361	523567.	0.00				
30.2400	-0.00456	-126260.	-5051.	3.46E-04	2226.	1.05E+10
692.5956	656695.	0.00				
30.6000	-0.00317	-141617.	-2188.	2.91E-04	2497.	1.05E+10
632.7382	861184.	0.00				
30.9600	-0.00204	-145165.	402.9051	2.32E-04	2560.	1.05E+10
566.7951	1197936.	0.00				
31.3200	-0.00117	-138136.	2693.	1.73E-04	2436.	1.05E+10
493.2233	1817551.	0.00				
31.6800	-5.47E-04	-121901.	4638.	1.20E-04	2149.	1.05E+10
407.5055	3221224.	0.00				
32.0400	-1.38E-04	-98062.	5911.	7.44E-05	1729.	1.05E+10
181.9857	5709805.	0.00				
32.4000	9.66E-05	-70827.	6029.	3.96E-05	1249.	1.05E+10
-127.6554	5709805.	0.00				
32.7600	2.05E-04	-45974.	5168.	1.56E-05	810.6407	1.05E+10
-270.6702	5709805.	0.00				
33.1200	2.31E-04	-26172.	3924.	7.13E-07	461.4818	1.05E+10
-305.5279	5709805.	0.00				
33.4800	2.11E-04	-12072.	2662.	-7.17E-06	212.8626	1.05E+10
-278.8138	5709805.	0.00				

```
   33.8400   1.69E-04     -3175.       1576.  -1.03E-05    55.9923   1.05E+10
-223.6992   5709805.       0.00
   34.2000   1.22E-04      1546.   745.0003  -1.06E-05    27.2656   1.05E+10
-161.1140   5709805.       0.00
   34.5600   7.73E-05      3261.   176.3142  -9.65E-06    57.5060   1.05E+10
-102.1666   5709805.       0.00
   34.9200   3.85E-05      3070.  -154.2919  -8.35E-06    54.1265   1.05E+10
-50.8918   5709805.       0.00
   35.2800   5.17E-06      1928.  -278.9896  -7.32E-06    34.0001   1.05E+10
-6.8386   5709805.       0.00
   35.6400  -2.47E-05   659.1947  -223.1762  -6.79E-06    11.6234   1.05E+10
32.6782   5709805.       0.00
   36.0000  -5.34E-05       0.00       0.00  -6.65E-06       0.00   1.05E+10
70.6441   2854902.       0.00
```

* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

```
Output Summary for Load Case No. 1:

Pile-head deflection              =     8.92675169 inches
Computed slope at pile head       =    -0.04359613 radians
Maximum bending moment            =       2562509. inch-lbs
Maximum shear force               =        -50091. lbs
Depth of maximum bending moment   =    22.32000000 feet below pile head
Depth of maximum shear force      =    25.56000000 feet below pile head
Number of iterations              =             21
Number of zero deflection points  =              3
```

Summary of Pile-head Responses for Conventional Analyses

```
Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs
Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians
Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.
Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs
Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians


Load Load                Load                  Axial    Pile-head  Pile-head  Max
Shear Max Moment
Case Type   Pile-head    Type     Pile-head   Loading  Deflection  Rotation    in
```

```
Pile    in Pile
 No.  1      Load 1       2         Load 2       lbs      inches       radians    lbs
     in-lbs
---- ----- ---------- ---------- ---------- ---------- ---------- ---------- ----------
---------- ----------
  1  V, lb      9755.  M, in-lb        0.00       0.00     8.9268    -0.04360
-50091.   2562509.


Maximum pile-head deflection = 8.9267516946 inches
Maximum pile-head rotation   = -0.0435961265 radians = -2.497874 deg.

This analysis ended normally
```

===

LPile for Windows, Version 2015-08.007

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

===

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Files Used for Analysis

Path to file locations:
\Active Projects_Promo\P2021\P2021001661 Dana Point Marina\wp\

Name of input data file:
danapt_n13ml.lp8d

Name of output report file:
danapt_n13ml.lp8o

Name of plot output file:
danapt_n13ml.lp8p

Name of runtime message file:
danapt_n13ml.lp8r

Date and Time of Analysis

Date: February 18, 2022 Time: 9:01:20

Problem Title

Project Name:

Job Number:

Client:

Engineer:

Description:

Program Options and Settings

Computational Options:
- Use unfactored loads in computations (conventional analysis)

Engineering Units Used for Data Input and Computations:
- US Customary System Units (pounds, feet, inches)

Analysis Control Options:

- Maximum number of iterations allowed	=	500
- Deflection tolerance for convergence	=	1.0000E-05 in
- Maximum allowable deflection	=	100.0000 in
- Number of pile increments	=	100

Loading Type and Number of Cycles of Loading:
- Static loading specified

- Use of p-y modification factors for p-y curves not selected
- No distributed lateral loads are entered
- Loading by lateral soil movements acting on pile not selected

- Input of shear resistance at the pile tip not selected
- Computation of pile-head foundation stiffness matrix not selected
- Push-over analysis of pile not selected
- Buckling analysis of pile not selected

Output Options:
- Output files use decimal points to denote decimal symbols.
- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (nodal spacing of output points) = 1
- No p-y curves to be computed and reported for user-specified depths
- Print using wide report formats

Pile Structural Properties and Geometry

```
Number of pile sections defined                          =           1
Total length of pile                                     =      37.000 ft
Depth of ground surface below top of pile                =     22.0000 ft
```

Pile diameters used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over the length of the pile. A summary of values of pile diameter vs. depth follows.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
1	0.000	12.7500
2	37.000	12.7500

Input Structural Properties for Pile Sections:

Pile Section No. 1:

```
   Section 1 is an elastic pile with a specified moment capacity
   Cross-sectional Shape                                 =   Circular Pipe
   Length of section                                     =    37.000000 ft
   Width of top of section                               =    12.750000 in
   Width of bottom of section                            =    12.750000 in
   Wall Thickness at Top                                 =     0.500000 in
   Wall Thickness at Bottom                              =     0.500000 in
   Top Area                                              =    19.242255 sq. in
   Bottom Area                                           =    19.242255 sq. in
```

Moment of Inertia at Top	=	361.543932 in^4
Moment of Inertia at Bottom	=	361.543932 in^4
Elastic Modulus	=	29000000. psi
Plastic Moment Capacity at Top	=	2556000. in-lb
Plastic Moment Capacity at Bottom	=	2556000. in-lb
Top Elastic Bending Stiffness	=	1.0485E+10 lbs-in^2
Bot Elastic Bending Stiffness	=	1.0485E+10 lbs-in^2
Shear Capacity at top of section	=	100000. lbs
Shear Capacity at bottom of section	=	100000. lbs

Ground Slope and Pile Batter Angles

Ground Slope Angle	=	0.000 degrees
	=	0.000 radians
Pile Batter Angle	=	0.000 degrees
	=	0.000 radians

Soil and Rock Layering Information

The soil profile is modelled using 2 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	22.000000 ft
Distance from top of pile to bottom of layer	=	25.000000 ft
Effective unit weight at top of layer	=	55.000000 pcf
Effective unit weight at bottom of layer	=	55.000000 pcf
Friction angle at top of layer	=	34.000000 deg.
Friction angle at bottom of layer	=	34.000000 deg.
Subgrade k at top of layer	=	60.000000 pci
Subgrade k at bottom of layer	=	60.000000 pci

Layer 2 is stiff clay without free water

Distance from top of pile to top of layer	=	25.000000 ft
Distance from top of pile to bottom of layer	=	103.000000 ft
Effective unit weight at top of layer	=	60.000000 pcf
Effective unit weight at bottom of layer	=	60.000000 pcf
Undrained cohesion at top of layer	=	4000. psf
Undrained cohesion at bottom of layer	=	4000. psf
Epsilon-50 at top of layer	=	0.004000

```
   Epsilon-50 at bottom of layer                          =     0.004000

 (Depth of the lowest soil layer extends 66.000 ft below the pile tip)
```

Summary of Input Soil Properties

Layer Num.	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Undrained Cohesion psf	Angle of Friction deg.	E50 or krm	kpy pci
1	Sand	22.0000	55.0000	--	34.0000	--	60.0000
	(Reese, et al.)	25.0000	55.0000	--	34.0000	--	60.0000
2	Stiff Clay	25.0000	60.0000	4000.	--	0.00400	--
	w/o Free Water	103.0000	60.0000	4000.	--	0.00400	--

Static Loading Type

Static loading criteria were used when computing p-y curves for all analyses.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load No.	Load Type	Condition 1	Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length
1	1	V = 8600. lbs	M = 0.0000 in-lbs	0.0000000	No

V = shear force applied normal to pile axis
M = bending moment applied to pile head
y = lateral deflection normal to pile axis
S = pile slope relative to original pile batter angle
R = rotational stiffness applied to pile head
Values of top y vs. pile lengths can be computed only for load types with specified shear loading (Load Types 1, 2, and 3).
Thrust force is assumed to be acting axially for all pile batter angles.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

---

Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Moment-curvature properties were derived from elastic-plastic section properties

---

Layering Correction Equivalent Depths of Soil & Rock Layers

Layer No.	Top of Layer Below Pile Head ft	Equivalent Top Depth Below Grnd Surf ft	Same Layer Type As Layer Above	Layer is Rock or is Below Rock Layer	F0 Integral for Layer lbs	F1 Integral for Layer lbs
1	22.0000	0.00	N.A.	No	0.00	3268.
2	25.0000	25.0000	No	No	3268.	N.A.

Notes: The F0 integral of Layer n+1 equals the sum of the F0 and F1 integrals for Layer n. Layering correction equivalent depths are computed only for soil types with both shallow-depth and deep-depth expressions for peak lateral load transfer. These soil types are soft and stiff clays, non-liquefied sands, and cemented c-phi soil.

Computed Values of Pile Loading and Deflection for Lateral Loading for Load Case Number 1

Pile-head conditions are Shear and Moment (Loading Type 1)

```
Shear force at pile head                       =        8600.0 lbs
Applied moment at pile head                    =           0.0 in-lbs
Axial thrust load on pile head                 =           0.0 lbs
```

Depth X feet	Deflect. y inches	Bending Moment in-lbs	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness in-lb^2	Soil Res. p lb/inch	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	10.7745	-2.36E-05	8600.	-0.04741	4.16E-07	1.05E+10	0.00	0.00	0.00
0.3700	10.5640	38184.	8600.	-0.04740	673.2875	1.05E+10	0.00	0.00	0.00
0.7400	10.3536	76368.	8600.	-0.04737	1347.	1.05E+10	0.00	0.00	0.00
1.1100	10.1434	114552.	8600.	-0.04733	2020.	1.05E+10	0.00	0.00	0.00
1.4800	9.9333	152736.	8600.	-0.04728	2693.	1.05E+10	0.00	0.00	0.00
1.8500	9.7235	190920.	8600.	-0.04720	3366.	1.05E+10	0.00	0.00	0.00
2.2200	9.5141	229104.	8600.	-0.04712	4040.	1.05E+10	0.00	0.00	0.00
2.5900	9.3051	267288.	8600.	-0.04701	4713.	1.05E+10	0.00	0.00	0.00
2.9600	9.0967	305472.	8600.	-0.04689	5386.	1.05E+10	0.00	0.00	0.00
3.3300	8.8888	343656.	8600.	-0.04675	6060.	1.05E+10	0.00	0.00	0.00
3.7000	8.6815	381840.	8600.	-0.04660	6733.	1.05E+10	0.00	0.00	0.00
4.0700	8.4750	420024.	8600.	-0.04643	7406.	1.05E+10	0.00	0.00	0.00
4.4400	8.2692	458208.	8600.	-0.04624	8079.	1.05E+10	0.00	0.00	0.00
4.8100	8.0643	496392.	8600.	-0.04604	8753.	1.05E+10	0.00	0.00	0.00
5.1800	7.8604	534576.	8600.	-0.04582	9426.	1.05E+10	0.00	0.00	0.00
5.5500	7.6574	572760.	8600.	-0.04559	10099.	1.05E+10	0.00	0.00	0.00
5.9200	7.4556	610944.	8600.	-0.04534	10773.	1.05E+10	0.00	0.00	0.00
6.2900	7.2548	649128.	8600.	-0.04507	11446.	1.05E+10			

0.00	0.00	0.00				
6.6600	7.0553	687312.	8600.	-0.04479	12119.	1.05E+10
0.00	0.00	0.00				
7.0300	6.8571	725496.	8600.	-0.04449	12792.	1.05E+10
0.00	0.00	0.00				
7.4000	6.6603	763680.	8600.	-0.04417	13466.	1.05E+10
0.00	0.00	0.00				
7.7700	6.4649	801864.	8600.	-0.04384	14139.	1.05E+10
0.00	0.00	0.00				
8.1400	6.2710	840048.	8600.	-0.04349	14812.	1.05E+10
0.00	0.00	0.00				
8.5100	6.0786	878232.	8600.	-0.04313	15486.	1.05E+10
0.00	0.00	0.00				
8.8800	5.8880	916416.	8600.	-0.04275	16159.	1.05E+10
0.00	0.00	0.00				
9.2500	5.6990	954600.	8600.	-0.04235	16832.	1.05E+10
0.00	0.00	0.00				
9.6200	5.5119	992784.	8600.	-0.04194	17505.	1.05E+10
0.00	0.00	0.00				
9.9900	5.3266	1030968.	8600.	-0.04151	18179.	1.05E+10
0.00	0.00	0.00				
10.3600	5.1432	1069152.	8600.	-0.04107	18852.	1.05E+10
0.00	0.00	0.00				
10.7300	4.9619	1107336.	8600.	-0.04061	19525.	1.05E+10
0.00	0.00	0.00				
11.1000	4.7826	1145520.	8600.	-0.04013	20199.	1.05E+10
0.00	0.00	0.00				
11.4700	4.6055	1183704.	8600.	-0.03964	20872.	1.05E+10
0.00	0.00	0.00				
11.8400	4.4306	1221888.	8600.	-0.03913	21545.	1.05E+10
0.00	0.00	0.00				
12.2100	4.2581	1260072.	8600.	-0.03860	22218.	1.05E+10
0.00	0.00	0.00				
12.5800	4.0879	1298256.	8600.	-0.03806	22892.	1.05E+10
0.00	0.00	0.00				
12.9500	3.9201	1336440.	8600.	-0.03750	23565.	1.05E+10
0.00	0.00	0.00				
13.3200	3.7548	1374624.	8600.	-0.03693	24238.	1.05E+10
0.00	0.00	0.00				
13.6900	3.5922	1412808.	8600.	-0.03634	24912.	1.05E+10
0.00	0.00	0.00				
14.0600	3.4321	1450992.	8600.	-0.03573	25585.	1.05E+10
0.00	0.00	0.00				
14.4300	3.2749	1489176.	8600.	-0.03511	26258.	1.05E+10
0.00	0.00	0.00				
14.8000	3.1204	1527360.	8600.	-0.03447	26931.	1.05E+10
0.00	0.00	0.00				
15.1700	2.9687	1565544.	8600.	-0.03382	27605.	1.05E+10
0.00	0.00	0.00				
15.5400	2.8201	1603728.	8600.	-0.03315	28278.	1.05E+10
0.00	0.00	0.00				

15.9100	2.6744	1641912.	8600.	-0.03246	28951.	1.05E+10	0.00	0.00	0.00
16.2800	2.5318	1680096.	8600.	-0.03175	29625.	1.05E+10	0.00	0.00	0.00
16.6500	2.3924	1718280.	8600.	-0.03104	30298.	1.05E+10	0.00	0.00	0.00
17.0200	2.2563	1756464.	8600.	-0.03030	30971.	1.05E+10	0.00	0.00	0.00
17.3900	2.1234	1794648.	8600.	-0.02955	31645.	1.05E+10	0.00	0.00	0.00
17.7600	1.9939	1832832.	8600.	-0.02878	32318.	1.05E+10	0.00	0.00	0.00
18.1300	1.8678	1871016.	8600.	-0.02800	32991.	1.05E+10	0.00	0.00	0.00
18.5000	1.7453	1909200.	8600.	-0.02719	33664.	1.05E+10	0.00	0.00	0.00
18.8700	1.6263	1947384.	8600.	-0.02638	34338.	1.05E+10	0.00	0.00	0.00
19.2400	1.5110	1985568.	8600.	-0.02555	35011.	1.05E+10	0.00	0.00	0.00
19.6100	1.3995	2023752.	8600.	-0.02470	35684.	1.05E+10	0.00	0.00	0.00
19.9800	1.2917	2061936.	8600.	-0.02383	36358.	1.05E+10	0.00	0.00	0.00
20.3500	1.1879	2100120.	8600.	-0.02295	37031.	1.05E+10	0.00	0.00	0.00
20.7200	1.0879	2138304.	8600.	-0.02205	37704.	1.05E+10	0.00	0.00	0.00
21.0900	0.9920	2176488.	8600.	-0.02114	38377.	1.05E+10	0.00	0.00	0.00
21.4600	0.9002	2214672.	8600.	-0.02021	39051.	1.05E+10	0.00	0.00	0.00
21.8300	0.8126	2252856.	8600.	-0.01926	39724.	1.05E+10	0.00	0.00	0.00
22.2000	0.7292	2291040.	8578.	-0.01830	40397.	1.05E+10	-9.8982	60.2725	0.00
22.5700	0.6501	2329029.	8485.	-0.01732	41067.	1.05E+10	-32.0966	219.2263	0.00
22.9400	0.5753	2366385.	8287.	-0.01633	41726.	1.05E+10	-56.8907	439.0445	0.00
23.3100	0.5051	2402620.	7979.	-0.01532	42365.	1.05E+10	-82.0799	721.5788	0.00
23.6800	0.4393	2437236.	7571.	-0.01429	42975.	1.05E+10	-101.6461	1027.	0.00
24.0500	0.3781	2469849.	7090.	-0.01326	43550.	1.05E+10	-114.9755	1350.	0.00
24.4200	0.3216	2500195.	6561.	-0.01220	44085.	1.05E+10	-123.3345	1703.	0.00
24.7900	0.2698	2528110.	6005.	-0.01114	44577.	1.05E+10	-127.2723	2095.	0.00
25.1600	0.2227	2553516.	1655.	-0.01006	45025.	1.05E+10			

-1832.	36532.	0.00				
25.5300	0.1804	2542803.	-6272.	-0.00898	44837.	1.05E+10
-1738.	42781.	0.00				
25.9000	0.1429	2497824.	-13771.	-0.00792	44043.	1.05E+10
-1640.	50950.	0.00				
26.2700	0.1101	2420517.	-20822.	-0.00687	42680.	1.05E+10
-1536.	61955.	0.00				
26.6400	0.08186	2312924.	-27400.	-0.00587	40783.	1.05E+10
-1427.	77382.	0.00				
27.0100	0.05796	2177206.	-33472.	-0.00492	38390.	1.05E+10
-1309.	100254.	0.00				
27.3800	0.03815	2015691.	-38994.	-0.00403	35542.	1.05E+10
-1179.	137183.	0.00				
27.7500	0.02213	1830938.	-43895.	-0.00322	32284.	1.05E+10
-1029.	206358.	0.00				
28.1200	0.00956	1625905.	-48030.	-0.00249	28669.	1.05E+10
-834.0202	387287.	0.00				
28.4900	4.52E-05	1404430.	-50014.	-0.00185	24764.	1.05E+10
-59.7690	5868411.	0.00				
28.8600	-0.00683	1181776.	-48445.	-0.00130	20838.	1.05E+10
766.7605	498418.	0.00				
29.2300	-0.01148	974239.	-44804.	-8.42E-04	17178.	1.05E+10
873.1163	337565.	0.00				
29.6000	-0.01431	783914.	-40818.	-4.70E-04	13823.	1.05E+10
922.4183	286281.	0.00				
29.9700	-0.01565	611772.	-36676.	-1.74E-04	10787.	1.05E+10
943.4204	267586.	0.00				
30.3400	-0.01585	458230.	-32481.	5.25E-05	8080.	1.05E+10
946.3874	265079.	0.00				
30.7100	-0.01519	323343.	-28301.	2.18E-04	5701.	1.05E+10
936.3218	273723.	0.00				
31.0800	-0.01392	206915.	-24189.	3.30E-04	3648.	1.05E+10
916.0758	292279.	0.00				
31.4500	-0.01226	108547.	-20185.	3.97E-04	1914.	1.05E+10
887.4301	321512.	0.00				
31.8200	-0.01039	27672.	-16324.	4.26E-04	487.9367	1.05E+10
851.5549	363889.	0.00				
32.1900	-0.00847	-36415.	-12638.	4.24E-04	642.0933	1.05E+10
809.2293	424036.	0.00				
32.5600	-0.00662	-84549.	-9152.	3.98E-04	1491.	1.05E+10
760.9477	509995.	0.00				
32.9300	-0.00494	-117682.	-5893.	3.56E-04	2075.	1.05E+10
706.9577	636015.	0.00				
33.3000	-0.00347	-136879.	-2887.	3.02E-04	2414.	1.05E+10
647.2319	828879.	0.00				
33.6700	-0.00226	-143316.	-159.3098	2.42E-04	2527.	1.05E+10
581.3248	1144057.	0.00				
34.0400	-0.00131	-138294.	2259.	1.83E-04	2438.	1.05E+10
507.9198	1715426.	0.00				
34.4100	-6.33E-04	-123258.	4326.	1.27E-04	2173.	1.05E+10
423.1636	2967129.	0.00				

```
   34.7800  -1.84E-04    -99881.      5804.   8.01E-05      1761.   1.05E+10
242.6060   5868411.       0.00
   35.1500   7.83E-05    -71720.      6113.   4.38E-05      1265.   1.05E+10
-103.5108   5868411.       0.00
   35.5200   2.05E-04    -45600.      5280.   1.90E-05   804.0596   1.05E+10
-271.3956   5868411.       0.00
   35.8900   2.47E-04    -24831.      3954.   4.04E-06   437.8360   1.05E+10
-325.9586   5868411.       0.00
   36.2600   2.41E-04    -10487.      2523.  -3.44E-06   184.9170   1.05E+10
-318.8143   5868411.       0.00
   36.6300   2.16E-04     -2428.      1181.  -6.17E-06    42.8192   1.05E+10
-285.6083   5868411.       0.00
   37.0000   1.86E-04      0.00       0.00  -6.69E-06       0.00   1.05E+10
-246.3674   2934205.       0.00
```

* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 1:

```
Pile-head deflection             =    10.77453533 inches
Computed slope at pile head      =    -0.04740707 radians
Maximum bending moment           =       2553516. inch-lbs
Maximum shear force              =        -50014. lbs
Depth of maximum bending moment  =    25.16000000 feet below pile head
Depth of maximum shear force     =    28.49000000 feet below pile head
Number of iterations             =             23
Number of zero deflection points =              2
```

Summary of Pile-head Responses for Conventional Analyses

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs
Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians
Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.
Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs
Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

```
Load Load                Load                 Axial    Pile-head  Pile-head  Max
Shear Max Moment
Case Type   Pile-head    Type     Pile-head   Loading  Deflection Rotation    in
```

```
Pile    in Pile
 No.  1      Load 1       2         Load 2       lbs      inches      radians    lbs
     in-lbs
---- ----- ---------- ---------- ---------- ---------- ---------- ---------- ----------
---------- ----------
  1  V, lb      8600.  M, in-lb       0.00       0.00    10.7745    -0.04741
-50014.   2553516.


Maximum pile-head deflection = 10.7745353251 inches
Maximum pile-head rotation   = -0.0474070746 radians = -2.716225 deg.

This analysis ended normally
```

===

LPile for Windows, Version 2015-08.007

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

===

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Files Used for Analysis

Path to file locations:
\Active Projects_Promo\P2021\P2021001661 Dana Point Marina\wp\

Name of input data file:
danapt_n15ml.lp8d

Name of output report file:
danapt_n15ml.lp8o

Name of plot output file:
danapt_n15ml.lp8p

Name of runtime message file:
danapt_n15ml.lp8r

Date and Time of Analysis

Date: February 18, 2022 Time: 8:59:53

Problem Title

Project Name:

Job Number:

Client:

Engineer:

Description:

Program Options and Settings

Computational Options:
- Use unfactored loads in computations (conventional analysis)

Engineering Units Used for Data Input and Computations:
- US Customary System Units (pounds, feet, inches)

Analysis Control Options:

- Maximum number of iterations allowed	=	500
- Deflection tolerance for convergence	=	1.0000E-05 in
- Maximum allowable deflection	=	100.0000 in
- Number of pile increments	=	100

Loading Type and Number of Cycles of Loading:
- Static loading specified

- Use of p-y modification factors for p-y curves not selected
- No distributed lateral loads are entered
- Loading by lateral soil movements acting on pile not selected

```
 - Input of shear resistance at the pile tip not selected
 - Computation of pile-head foundation stiffness matrix not selected
 - Push-over analysis of pile not selected
 - Buckling analysis of pile not selected

Output Options:
 - Output files use decimal points to denote decimal symbols.
 - Values of pile-head deflection, bending moment, shear force, and
   soil reaction are printed for full length of pile.
 - Printing Increment (nodal spacing of output points) = 1
 - No p-y curves to be computed and reported for user-specified depths
 - Print using wide report formats




--------------------------------------------------------------------------------
                     Pile Structural Properties and Geometry
--------------------------------------------------------------------------------

Number of pile sections defined                              =           1
Total length of pile                                         =      37.000 ft
Depth of ground surface below top of pile                    =     24.0000 ft

Pile diameters used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over
the length of the pile. A summary of values of pile diameter vs. depth follows.

            Depth Below           Pile
Point        Pile Head          Diameter
 No.           feet              inches
-----      -------------     -------------
  1            0.000            12.7500
  2           37.000            12.7500


Input Structural Properties for Pile Sections:
----------------------------------------------

Pile Section No. 1:

   Section 1 is an elastic pile with a specified moment capacity
   Cross-sectional Shape                                     =   Circular Pipe
   Length of section                                         =    37.000000 ft
   Width of top of section                                   =    12.750000 in
   Width of bottom of section                                =    12.750000 in
   Wall Thickness at Top                                     =     0.500000 in
   Wall Thickness at Bottom                                  =     0.500000 in
   Top Area                                                  =    19.242255 sq. in
   Bottom Area                                               =    19.242255 sq. in
```

```
   Moment of Inertia at Top                           =   361.543932 in^4
   Moment of Inertia at Bottom                        =   361.543932 in^4
   Elastic Modulus                                    =    29000000. psi
   Plastic Moment Capacity at Top                     =     2556000. in-lb
   Plastic Moment Capacity at Bottom                  =     2556000. in-lb
   Top Elastic Bending Stiffness                      =   1.0485E+10 lbs-in^2
   Bot Elastic Bending Stiffness                      =   1.0485E+10 lbs-in^2
   Shear Capacity at top of section                   =      100000. lbs
   Shear Capacity at bottom of section                =      100000. lbs



--------------------------------------------------------------------------------
                       Ground Slope and Pile Batter Angles
--------------------------------------------------------------------------------

Ground Slope Angle                                    =        0.000 degrees
                                                      =        0.000 radians

Pile Batter Angle                                     =        0.000 degrees
                                                      =        0.000 radians



--------------------------------------------------------------------------------
                       Soil and Rock Layering Information
--------------------------------------------------------------------------------

The soil profile is modelled using 2 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974

   Distance from top of pile to top of layer          =    24.000000 ft
   Distance from top of pile to bottom of layer       =    27.000000 ft
   Effective unit weight at top of layer              =    55.000000 pcf
   Effective unit weight at bottom of layer           =    55.000000 pcf
   Friction angle at top of layer                     =    34.000000 deg.
   Friction angle at bottom of layer                  =    34.000000 deg.
   Subgrade k at top of layer                         =    60.000000 pci
   Subgrade k at bottom of layer                      =    60.000000 pci


Layer 2 is stiff clay without free water

   Distance from top of pile to top of layer          =    27.000000 ft
   Distance from top of pile to bottom of layer       =   105.000000 ft
   Effective unit weight at top of layer              =    60.000000 pcf
   Effective unit weight at bottom of layer           =    60.000000 pcf
   Undrained cohesion at top of layer                 =        4000. psf
   Undrained cohesion at bottom of layer              =        4000. psf
   Epsilon-50 at top of layer                         =     0.004000
```

```
   Epsilon-50 at bottom of layer                          =     0.004000

 (Depth of the lowest soil layer extends 68.000 ft below the pile tip)


--------------------------------------------------------------------------------
                        Summary of Input Soil Properties
--------------------------------------------------------------------------------

Layer         Soil Type          Layer      Effective    Undrained    Angle of
 E50
Layer           Name             Depth       Unit Wt.    Cohesion     Friction
 or            kpy
 Num.    (p-y Curve Type)         ft           pcf          psf          deg.
 krm           pci
-----   -------------------   ----------   ----------   ----------   ----------
----------   ----------
  1             Sand          24.0000      55.0000         --        34.0000
 --           60.0000
         (Reese, et al.)      27.0000      55.0000         --        34.0000
 --           60.0000
  2          Stiff Clay       27.0000      60.0000        4000.        --
0.00400        --
         w/o Free Water      105.0000      60.0000        4000.        --
0.00400        --


--------------------------------------------------------------------------------
                               Static Loading Type
--------------------------------------------------------------------------------

Static loading criteria were used when computing p-y curves for all analyses.



--------------------------------------------------------------------------------
                Pile-head Loading and Pile-head Fixity Conditions
--------------------------------------------------------------------------------

Number of loads specified = 1

Load    Load        Condition                Condition             Axial Thrust
Compute Top y
 No.    Type            1                        2                  Force, lbs
vs. Pile Length
-----   ----   --------------------   ----------------------   ----------------
---------------
   1     1     V =        7990. lbs   M =       0.0000 in-lbs         0.0000000
    No
```

V = shear force applied normal to pile axis
M = bending moment applied to pile head
y = lateral deflection normal to pile axis
S = pile slope relative to original pile batter angle
R = rotational stiffness applied to pile head
Values of top y vs. pile lengths can be computed only for load types with specified shear loading (Load Types 1, 2, and 3).
Thrust force is assumed to be acting axially for all pile batter angles.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

---

Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Moment-curvature properties were derived from elastic-plastic section properties

---

Layering Correction Equivalent Depths of Soil & Rock Layers

Layer No.	Top of Layer Below Pile Head ft	Equivalent Top Depth Below Grnd Surf ft	Same Layer Type As Layer Above	Layer is Rock or is Below Rock Layer	F0 Integral for Layer lbs	F1 Integral for Layer lbs
1	24.0000	0.00	N.A.	No	0.00	3268.
2	27.0000	27.0000	No	No	3268.	N.A.

Notes: The F0 integral of Layer n+1 equals the sum of the F0 and F1 integrals for Layer n. Layering correction equivalent depths are computed only for soil types with both shallow-depth and deep-depth expressions for peak lateral load transfer. These soil types are soft and stiff clays, non-liquefied sands, and cemented c-phi soil.

Computed Values of Pile Loading and Deflection for Lateral Loading for Load Case Number 1

Pile-head conditions are Shear and Moment (Loading Type 1)

Shear force at pile head = 7990.0 lbs
Applied moment at pile head = 0.0 in-lbs
Axial thrust load on pile head = 0.0 lbs

Depth X feet	Deflect. y inches	Bending Moment in-lbs	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness in-lb^2	Soil Res. p lb/inch	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	12.1258	1.32E-05	7990.	-0.05006	2.33E-07	1.05E+10	0.00	0.00	0.00
0.3700	11.9035	35476.	7990.	-0.05006	625.5310	1.05E+10	0.00	0.00	0.00
0.7400	11.6813	70951.	7990.	-0.05003	1251.	1.05E+10	0.00	0.00	0.00
1.1100	11.4592	106427.	7990.	-0.05000	1877.	1.05E+10	0.00	0.00	0.00
1.4800	11.2374	141902.	7990.	-0.04994	2502.	1.05E+10	0.00	0.00	0.00
1.8500	11.0158	177378.	7990.	-0.04988	3128.	1.05E+10	0.00	0.00	0.00
2.2200	10.7945	212854.	7990.	-0.04979	3753.	1.05E+10	0.00	0.00	0.00
2.5900	10.5736	248329.	7990.	-0.04970	4379.	1.05E+10	0.00	0.00	0.00
2.9600	10.3532	283805.	7990.	-0.04958	5004.	1.05E+10	0.00	0.00	0.00
3.3300	10.1333	319280.	7990.	-0.04945	5630.	1.05E+10	0.00	0.00	0.00
3.7000	9.9140	354756.	7990.	-0.04931	6255.	1.05E+10	0.00	0.00	0.00
4.0700	9.6954	390232.	7990.	-0.04915	6881.	1.05E+10	0.00	0.00	0.00
4.4400	9.4775	425707.	7990.	-0.04898	7506.	1.05E+10	0.00	0.00	0.00
4.8100	9.2605	461183.	7990.	-0.04879	8132.	1.05E+10	0.00	0.00	0.00
5.1800	9.0442	496658.	7990.	-0.04859	8757.	1.05E+10	0.00	0.00	0.00
5.5500	8.8290	532134.	7990.	-0.04837	9383.	1.05E+10	0.00	0.00	0.00
5.9200	8.6147	567610.	7990.	-0.04814	10008.	1.05E+10	0.00	0.00	0.00
6.2900	8.4015	603085.	7990.	-0.04789	10634.	1.05E+10			

0.00	0.00	0.00				
6.6600	8.1894	638561.	7990.	-0.04763	11260.	1.05E+10
0.00	0.00	0.00				
7.0300	7.9785	674036.	7990.	-0.04735	11885.	1.05E+10
0.00	0.00	0.00				
7.4000	7.7689	709512.	7990.	-0.04706	12511.	1.05E+10
0.00	0.00	0.00				
7.7700	7.5607	744988.	7990.	-0.04675	13136.	1.05E+10
0.00	0.00	0.00				
8.1400	7.3538	780463.	7990.	-0.04643	13762.	1.05E+10
0.00	0.00	0.00				
8.5100	7.1484	815939.	7990.	-0.04609	14387.	1.05E+10
0.00	0.00	0.00				
8.8800	6.9445	851414.	7990.	-0.04574	15013.	1.05E+10
0.00	0.00	0.00				
9.2500	6.7422	886890.	7990.	-0.04537	15638.	1.05E+10
0.00	0.00	0.00				
9.6200	6.5416	922366.	7990.	-0.04499	16264.	1.05E+10
0.00	0.00	0.00				
9.9900	6.3428	957841.	7990.	-0.04459	16889.	1.05E+10
0.00	0.00	0.00				
10.3600	6.1457	993317.	7990.	-0.04417	17515.	1.05E+10
0.00	0.00	0.00				
10.7300	5.9505	1028792.	7990.	-0.04375	18140.	1.05E+10
0.00	0.00	0.00				
11.1000	5.7572	1064268.	7990.	-0.04330	18766.	1.05E+10
0.00	0.00	0.00				
11.4700	5.5660	1099744.	7990.	-0.04284	19391.	1.05E+10
0.00	0.00	0.00				
11.8400	5.3768	1135219.	7990.	-0.04237	20017.	1.05E+10
0.00	0.00	0.00				
12.2100	5.1897	1170695.	7990.	-0.04188	20643.	1.05E+10
0.00	0.00	0.00				
12.5800	5.0049	1206170.	7990.	-0.04138	21268.	1.05E+10
0.00	0.00	0.00				
12.9500	4.8223	1241646.	7990.	-0.04086	21894.	1.05E+10
0.00	0.00	0.00				
13.3200	4.6420	1277122.	7990.	-0.04033	22519.	1.05E+10
0.00	0.00	0.00				
13.6900	4.4641	1312597.	7990.	-0.03978	23145.	1.05E+10
0.00	0.00	0.00				
14.0600	4.2888	1348073.	7990.	-0.03922	23770.	1.05E+10
0.00	0.00	0.00				
14.4300	4.1159	1383548.	7990.	-0.03864	24396.	1.05E+10
0.00	0.00	0.00				
14.8000	3.9456	1419024.	7990.	-0.03804	25021.	1.05E+10
0.00	0.00	0.00				
15.1700	3.7781	1454500.	7990.	-0.03744	25647.	1.05E+10
0.00	0.00	0.00				
15.5400	3.6132	1489975.	7990.	-0.03681	26272.	1.05E+10
0.00	0.00	0.00				

15.9100	3.4512	1525451.	7990.	-0.03617	26898.	1.05E+10
0.00	0.00	0.00				
16.2800	3.2920	1560926.	7990.	-0.03552	27523.	1.05E+10
0.00	0.00	0.00				
16.6500	3.1357	1596402.	7990.	-0.03485	28149.	1.05E+10
0.00	0.00	0.00				
17.0200	2.9825	1631878.	7990.	-0.03417	28774.	1.05E+10
0.00	0.00	0.00				
17.3900	2.8323	1667353.	7990.	-0.03347	29400.	1.05E+10
0.00	0.00	0.00				
17.7600	2.6853	1702829.	7990.	-0.03276	30025.	1.05E+10
0.00	0.00	0.00				
18.1300	2.5414	1738304.	7990.	-0.03203	30651.	1.05E+10
0.00	0.00	0.00				
18.5000	2.4009	1773780.	7990.	-0.03128	31277.	1.05E+10
0.00	0.00	0.00				
18.8700	2.2636	1809256.	7990.	-0.03053	31902.	1.05E+10
0.00	0.00	0.00				
19.2400	2.1298	1844731.	7990.	-0.02975	32528.	1.05E+10
0.00	0.00	0.00				
19.6100	1.9994	1880207.	7990.	-0.02896	33153.	1.05E+10
0.00	0.00	0.00				
19.9800	1.8726	1915682.	7990.	-0.02816	33779.	1.05E+10
0.00	0.00	0.00				
20.3500	1.7494	1951158.	7990.	-0.02734	34404.	1.05E+10
0.00	0.00	0.00				
20.7200	1.6298	1986634.	7990.	-0.02651	35030.	1.05E+10
0.00	0.00	0.00				
21.0900	1.5140	2022109.	7990.	-0.02566	35655.	1.05E+10
0.00	0.00	0.00				
21.4600	1.4020	2057585.	7990.	-0.02479	36281.	1.05E+10
0.00	0.00	0.00				
21.8300	1.2938	2093060.	7990.	-0.02392	36906.	1.05E+10
0.00	0.00	0.00				
22.2000	1.1896	2128536.	7990.	-0.02302	37532.	1.05E+10
0.00	0.00	0.00				
22.5700	1.0894	2164012.	7990.	-0.02211	38157.	1.05E+10
0.00	0.00	0.00				
22.9400	0.9932	2199487.	7990.	-0.02119	38783.	1.05E+10
0.00	0.00	0.00				
23.3100	0.9012	2234963.	7990.	-0.02025	39408.	1.05E+10
0.00	0.00	0.00				
23.6800	0.8134	2270438.	7990.	-0.01930	40034.	1.05E+10
0.00	0.00	0.00				
24.0500	0.7299	2305914.	7985.	-0.01833	40660.	1.05E+10
-2.3036	14.0137	0.00				
24.4200	0.6507	2341344.	7930.	-0.01734	41284.	1.05E+10
-22.6113	154.2958	0.00				
24.7900	0.5759	2376329.	7776.	-0.01634	41901.	1.05E+10
-46.6897	359.9886	0.00				
25.1600	0.5055	2410393.	7512.	-0.01533	42502.	1.05E+10

-71.9324	631.7808	0.00				
25.5300	0.4397	2443039.	7147.	-0.01430	43077.	1.05E+10
-92.4305	933.3013	0.00				
25.9000	0.3785	2473862.	6704.	-0.01326	43621.	1.05E+10
-107.2603	1258.	0.00				
26.2700	0.3220	2502572.	6206.	-0.01221	44127.	1.05E+10
-117.1197	1615.	0.00				
26.6400	0.2701	2528972.	5676.	-0.01114	44593.	1.05E+10
-121.8445	2003.	0.00				
27.0100	0.2230	2552971.	1336.	-0.01007	45016.	1.05E+10
-1833.	36492.	0.00				
27.3800	0.1807	2540838.	-6593.	-0.00899	44802.	1.05E+10
-1739.	42727.	0.00				
27.7500	0.1432	2494424.	-14096.	-0.00792	43983.	1.05E+10
-1641.	50875.	0.00				
28.1200	0.1104	2415666.	-21151.	-0.00688	42595.	1.05E+10
-1537.	61850.	0.00				
28.4900	0.08207	2306605.	-27733.	-0.00588	40672.	1.05E+10
-1428.	77234.	0.00				
28.8600	0.05811	2169401.	-33809.	-0.00494	38252.	1.05E+10
-1310.	100051.	0.00				
29.2300	0.03824	2006382.	-39334.	-0.00405	35378.	1.05E+10
-1179.	136940.	0.00				
29.6000	0.02214	1820112.	-44237.	-0.00324	32094.	1.05E+10
-1029.	206315.	0.00				
29.9700	0.00946	1613560.	-48368.	-0.00251	28451.	1.05E+10
-831.8693	390305.	0.00				
30.3400	-1.81E-04	1390608.	-49683.	-0.00188	24520.	1.05E+10
239.1686	5868411.	0.00				
30.7100	-0.00721	1172372.	-47427.	-0.00133	20672.	1.05E+10
777.2084	478589.	0.00				
31.0800	-0.01204	969457.	-43740.	-8.81E-04	17094.	1.05E+10
883.4155	325900.	0.00				
31.4500	-0.01504	783958.	-39706.	-5.10E-04	13823.	1.05E+10
933.9992	275768.	0.00				
31.8200	-0.01657	616871.	-35508.	-2.14E-04	10877.	1.05E+10
956.8794	256459.	0.00				
32.1900	-0.01693	468647.	-31248.	1.62E-05	8264.	1.05E+10
962.1610	252264.	0.00				
32.5600	-0.01642	339391.	-26992.	1.87E-04	5984.	1.05E+10
954.8005	258149.	0.00				
32.9300	-0.01527	228958.	-22791.	3.08E-04	4037.	1.05E+10
937.6220	272609.	0.00				
33.3000	-0.01369	137008.	-18684.	3.85E-04	2416.	1.05E+10
912.3558	295903.	0.00				
33.6700	-0.01185	63045.	-14705.	4.28E-04	1112.	1.05E+10
880.0540	329716.	0.00				
34.0400	-0.00989	6430.	-10883.	4.42E-04	113.3837	1.05E+10
841.2362	377530.	0.00				
34.4100	-0.00792	-33600.	-7249.	4.36E-04	592.4672	1.05E+10
795.8480	445934.	0.00				

```
   34.7800   -0.00602    -57942.     -3833.   4.17E-04      1022.   1.05E+10
742.9728    548192.       0.00
   35.1500   -0.00422    -67637.  -674.0387   3.91E-04      1193.   1.05E+10
679.9708    715387.       0.00
   35.5200   -0.00255    -63928.      2167.   3.63E-04      1127.   1.05E+10
599.6243   1044071.       0.00
   35.8900  -1.00E-03    -48397.      4552.   3.39E-04   853.3757   1.05E+10
474.8843   2108670.       0.00
   36.2600   4.59E-04    -23505.      4742.   3.24E-04   414.4615   1.05E+10
-389.2653   3764367.       0.00
   36.6300    0.00187     -6287.      2647.   3.17E-04   110.8577   1.05E+10
-554.4990   1313768.       0.00
   37.0000    0.00328      0.00       0.00    3.16E-04       0.00   1.05E+10
-637.8385    432102.       0.00
```

* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 1:

```
Pile-head deflection              =    12.12581990 inches
Computed slope at pile head       =    -0.05006314 radians
Maximum bending moment            =       2552971. inch-lbs
Maximum shear force               =        -49683. lbs
Depth of maximum bending moment   =    27.01000000 feet below pile head
Depth of maximum shear force      =    30.34000000 feet below pile head
Number of iterations              =             27
Number of zero deflection points  =              2
```

Summary of Pile-head Responses for Conventional Analyses

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs
Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians
Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.
Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs
Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

```
Load Load                Load                 Axial    Pile-head  Pile-head  Max
Shear Max Moment
Case Type   Pile-head    Type     Pile-head   Loading  Deflection Rotation    in
```

```
Pile    in Pile
 No.  1      Load 1       2         Load 2       lbs      inches      radians     lbs
     in-lbs
---- ----- ---------- ---------- ---------- ---------- ---------- ---------- ----------
---------- ----------
  1  V, lb      7990.  M, in-lb        0.00       0.00    12.1258    -0.05006
-49683.   2552971.
```

```
Maximum pile-head deflection = 12.1258198966 inches
Maximum pile-head rotation   = -0.0500631363 radians = -2.868406 deg.

This analysis ended normally
```

```
===============================================================================

               LPile for Windows, Version 2015-08.007

           Analysis of Individual Piles and Drilled Shafts
          Subjected to Lateral Loading Using the p-y Method
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===============================================================================
```

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```
-------------------------------------------------------------------------------
                         Files Used for Analysis
-------------------------------------------------------------------------------
```

Path to file locations:
\Active Projects_Promo\P2021\P2021001661 Dana Point Marina\wp\

Name of input data file:
danapt_n17ml.lp8d

Name of output report file:
danapt_n17ml.lp8o

Name of plot output file:
danapt_n17ml.lp8p

Name of runtime message file:
danapt_n17ml.lp8r

```
-------------------------------------------------------------------------------
                        Date and Time of Analysis
-------------------------------------------------------------------------------

               Date:  February 18, 2022          Time:   8:59:18
```

```
--------------------------------------------------------------------------------
                              Problem Title
--------------------------------------------------------------------------------

Project Name:


Job Number:


Client:


Engineer:


Description:




--------------------------------------------------------------------------------
                      Program Options and Settings
--------------------------------------------------------------------------------

Computational Options:
 - Use unfactored loads in computations (conventional analysis)
Engineering Units Used for Data Input and Computations:
 - US Customary System Units (pounds, feet, inches)

Analysis Control Options:
 - Maximum number of iterations allowed                =         500
 - Deflection tolerance for convergence                =   1.0000E-05 in
 - Maximum allowable deflection                        =     100.0000 in
 - Number of pile increments                           =         100

Loading Type and Number of Cycles of Loading:
 - Static loading specified

 - Use of p-y modification factors for p-y curves not selected
 - No distributed lateral loads are entered
 - Loading by lateral soil movements acting on pile not selected
```

```
 - Input of shear resistance at the pile tip not selected
 - Computation of pile-head foundation stiffness matrix not selected
 - Push-over analysis of pile not selected
 - Buckling analysis of pile not selected

Output Options:
 - Output files use decimal points to denote decimal symbols.
 - Values of pile-head deflection, bending moment, shear force, and
   soil reaction are printed for full length of pile.
 - Printing Increment (nodal spacing of output points) = 1
 - No p-y curves to be computed and reported for user-specified depths
 - Print using wide report formats



--------------------------------------------------------------------------------
                     Pile Structural Properties and Geometry
--------------------------------------------------------------------------------

Number of pile sections defined                              =            1
Total length of pile                                         =       39.000 ft
Depth of ground surface below top of pile                    =      26.0000 ft

Pile diameters used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over
the length of the pile. A summary of values of pile diameter vs. depth follows.

            Depth Below          Pile
Point        Pile Head         Diameter
 No.           feet             inches
-----      -------------     -------------
  1            0.000           12.7500
  2           39.000           12.7500


Input Structural Properties for Pile Sections:
----------------------------------------------

Pile Section No. 1:

   Section 1 is an elastic pile with a specified moment capacity
   Cross-sectional Shape                                     =   Circular Pipe
   Length of section                                         =    39.000000 ft
   Width of top of section                                   =    12.750000 in
   Width of bottom of section                                =    12.750000 in
   Wall Thickness at Top                                     =     0.500000 in
   Wall Thickness at Bottom                                  =     0.500000 in
   Top Area                                                  =    19.242255 sq. in
   Bottom Area                                               =    19.242255 sq. in
```

Moment of Inertia at Top	=	361.543932 in^4
Moment of Inertia at Bottom	=	361.543932 in^4
Elastic Modulus	=	29000000. psi
Plastic Moment Capacity at Top	=	2556000. in-lb
Plastic Moment Capacity at Bottom	=	2556000. in-lb
Top Elastic Bending Stiffness	=	1.0485E+10 lbs-in^2
Bot Elastic Bending Stiffness	=	1.0485E+10 lbs-in^2
Shear Capacity at top of section	=	100000. lbs
Shear Capacity at bottom of section	=	100000. lbs

Ground Slope and Pile Batter Angles

Ground Slope Angle	=	0.000 degrees
	=	0.000 radians
Pile Batter Angle	=	0.000 degrees
	=	0.000 radians

Soil and Rock Layering Information

The soil profile is modelled using 2 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	26.000000 ft
Distance from top of pile to bottom of layer	=	29.000000 ft
Effective unit weight at top of layer	=	55.000000 pcf
Effective unit weight at bottom of layer	=	55.000000 pcf
Friction angle at top of layer	=	34.000000 deg.
Friction angle at bottom of layer	=	34.000000 deg.
Subgrade k at top of layer	=	60.000000 pci
Subgrade k at bottom of layer	=	60.000000 pci

Layer 2 is stiff clay without free water

Distance from top of pile to top of layer	=	29.000000 ft
Distance from top of pile to bottom of layer	=	107.000000 ft
Effective unit weight at top of layer	=	60.000000 pcf
Effective unit weight at bottom of layer	=	60.000000 pcf
Undrained cohesion at top of layer	=	4000. psf
Undrained cohesion at bottom of layer	=	4000. psf
Epsilon-50 at top of layer	=	0.004000

```
   Epsilon-50 at bottom of layer                              =     0.004000

 (Depth of the lowest soil layer extends 68.000 ft below the pile tip)


--------------------------------------------------------------------------------
                        Summary of Input Soil Properties
--------------------------------------------------------------------------------

Layer         Soil Type           Layer      Effective    Undrained     Angle of
 E50
Layer           Name              Depth       Unit Wt.    Cohesion      Friction
 or            kpy
 Num.     (p-y Curve Type)         ft           pcf          psf           deg.
 krm           pci
-----   -------------------   ----------   ----------   ----------   ----------
----------   ----------
  1             Sand             26.0000      55.0000        --          34.0000
 --           60.0000
          (Reese, et al.)        29.0000      55.0000        --          34.0000
 --           60.0000
  2          Stiff Clay          29.0000      60.0000       4000.        --
0.00400        --
          w/o Free Water        107.0000      60.0000       4000.        --
0.00400        --


--------------------------------------------------------------------------------
                               Static Loading Type
--------------------------------------------------------------------------------

Static loading criteria were used when computing p-y curves for all analyses.



--------------------------------------------------------------------------------
                Pile-head Loading and Pile-head Fixity Conditions
--------------------------------------------------------------------------------

Number of loads specified = 1

Load    Load         Condition                Condition               Axial Thrust
Compute Top y
 No.    Type             1                        2                     Force, lbs
vs. Pile Length
-----   ----   --------------------   -----------------------   ----------------
---------------
   1     1     V =         7410. lbs   M =        0.0000 in-lbs         0.0000000
    No
```

V = shear force applied normal to pile axis
M = bending moment applied to pile head
y = lateral deflection normal to pile axis
S = pile slope relative to original pile batter angle
R = rotational stiffness applied to pile head
Values of top y vs. pile lengths can be computed only for load types with specified shear loading (Load Types 1, 2, and 3).
Thrust force is assumed to be acting axially for all pile batter angles.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

---

Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Moment-curvature properties were derived from elastic-plastic section properties

---

Layering Correction Equivalent Depths of Soil & Rock Layers

Layer No.	Top of Layer Below Pile Head ft	Equivalent Top Depth Below Grnd Surf ft	Same Layer Type As Layer Above	Layer is Rock or is Below Rock Layer	F0 Integral for Layer lbs	F1 Integral for Layer lbs
1	26.0000	0.00	N.A.	No	0.00	3268.
2	29.0000	29.0000	No	No	3268.	N.A.

Notes: The F0 integral of Layer n+1 equals the sum of the F0 and F1 integrals for Layer n. Layering correction equivalent depths are computed only for soil types with both shallow-depth and deep-depth expressions for peak lateral load transfer. These soil types are soft and stiff clays, non-liquefied sands, and cemented c-phi soil.

Computed Values of Pile Loading and Deflection for Lateral Loading for Load Case Number 1

Pile-head conditions are Shear and Moment (Loading Type 1)

Shear force at pile head = 7410.0 lbs
Applied moment at pile head = 0.0 in-lbs
Axial thrust load on pile head = 0.0 lbs

Depth X feet	Deflect. y inches	Bending Moment in-lbs	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness in-lb^2	Soil Res. p lb/inch	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	13.8612	1.62E-05	7410.	-0.05339	2.85E-07	1.05E+10	0.00	0.00	0.00
0.3900	13.6114	34679.	7410.	-0.05338	611.4813	1.05E+10	0.00	0.00	0.00
0.7800	13.3616	69358.	7410.	-0.05336	1223.	1.05E+10	0.00	0.00	0.00
1.1700	13.1120	104036.	7410.	-0.05332	1834.	1.05E+10	0.00	0.00	0.00
1.5600	12.8625	138715.	7410.	-0.05326	2446.	1.05E+10	0.00	0.00	0.00
1.9500	12.6134	173394.	7410.	-0.05320	3057.	1.05E+10	0.00	0.00	0.00
2.3400	12.3646	208073.	7410.	-0.05311	3669.	1.05E+10	0.00	0.00	0.00
2.7300	12.1163	242752.	7410.	-0.05301	4280.	1.05E+10	0.00	0.00	0.00
3.1200	11.8685	277430.	7410.	-0.05289	4892.	1.05E+10	0.00	0.00	0.00
3.5100	11.6212	312109.	7410.	-0.05276	5503.	1.05E+10	0.00	0.00	0.00
3.9000	11.3746	346788.	7410.	-0.05261	6115.	1.05E+10	0.00	0.00	0.00
4.2900	11.1287	381467.	7410.	-0.05245	6726.	1.05E+10	0.00	0.00	0.00
4.6800	10.8837	416146.	7410.	-0.05227	7338.	1.05E+10	0.00	0.00	0.00
5.0700	10.6394	450824.	7410.	-0.05208	7949.	1.05E+10	0.00	0.00	0.00
5.4600	10.3962	485503.	7410.	-0.05187	8561.	1.05E+10	0.00	0.00	0.00
5.8500	10.1539	520182.	7410.	-0.05165	9172.	1.05E+10	0.00	0.00	0.00
6.2400	9.9128	554861.	7410.	-0.05141	9784.	1.05E+10	0.00	0.00	0.00
6.6300	9.6728	589540.	7410.	-0.05115	10395.	1.05E+10			

0.00	0.00	0.00				
7.0200	9.4340	624218.	7410.	-0.05088	11007.	1.05E+10
0.00	0.00	0.00				
7.4100	9.1965	658897.	7410.	-0.05059	11618.	1.05E+10
0.00	0.00	0.00				
7.8000	8.9604	693576.	7410.	-0.05029	12230.	1.05E+10
0.00	0.00	0.00				
8.1900	8.7258	728255.	7410.	-0.04998	12841.	1.05E+10
0.00	0.00	0.00				
8.5800	8.4926	762934.	7410.	-0.04964	13453.	1.05E+10
0.00	0.00	0.00				
8.9700	8.2611	797612.	7410.	-0.04929	14064.	1.05E+10
0.00	0.00	0.00				
9.3600	8.0312	832291.	7410.	-0.04893	14676.	1.05E+10
0.00	0.00	0.00				
9.7500	7.8031	866970.	7410.	-0.04855	15287.	1.05E+10
0.00	0.00	0.00				
10.1400	7.5768	901649.	7410.	-0.04816	15899.	1.05E+10
0.00	0.00	0.00				
10.5300	7.3524	936328.	7410.	-0.04775	16510.	1.05E+10
0.00	0.00	0.00				
10.9200	7.1299	971006.	7410.	-0.04732	17121.	1.05E+10
0.00	0.00	0.00				
11.3100	6.9095	1005685.	7410.	-0.04688	17733.	1.05E+10
0.00	0.00	0.00				
11.7000	6.6911	1040364.	7410.	-0.04642	18344.	1.05E+10
0.00	0.00	0.00				
12.0900	6.4749	1075043.	7410.	-0.04595	18956.	1.05E+10
0.00	0.00	0.00				
12.4800	6.2610	1109722.	7410.	-0.04546	19567.	1.05E+10
0.00	0.00	0.00				
12.8700	6.0494	1144400.	7410.	-0.04496	20179.	1.05E+10
0.00	0.00	0.00				
13.2600	5.8402	1179079.	7410.	-0.04444	20790.	1.05E+10
0.00	0.00	0.00				
13.6500	5.6334	1213758.	7410.	-0.04391	21402.	1.05E+10
0.00	0.00	0.00				
14.0400	5.4292	1248437.	7410.	-0.04336	22013.	1.05E+10
0.00	0.00	0.00				
14.4300	5.2276	1283116.	7410.	-0.04279	22625.	1.05E+10
0.00	0.00	0.00				
14.8200	5.0287	1317794.	7410.	-0.04221	23236.	1.05E+10
0.00	0.00	0.00				
15.2100	4.8325	1352473.	7410.	-0.04162	23848.	1.05E+10
0.00	0.00	0.00				
15.6000	4.6391	1387152.	7410.	-0.04101	24459.	1.05E+10
0.00	0.00	0.00				
15.9900	4.4487	1421831.	7410.	-0.04038	25071.	1.05E+10
0.00	0.00	0.00				
16.3800	4.2612	1456510.	7410.	-0.03974	25682.	1.05E+10
0.00	0.00	0.00				

16.7700	4.0767	1491188.	7410.	-0.03908	26294.	1.05E+10
0.00	0.00	0.00				
17.1600	3.8954	1525867.	7410.	-0.03840	26905.	1.05E+10
0.00	0.00	0.00				
17.5500	3.7173	1560546.	7410.	-0.03772	27517.	1.05E+10
0.00	0.00	0.00				
17.9400	3.5424	1595225.	7410.	-0.03701	28128.	1.05E+10
0.00	0.00	0.00				
18.3300	3.3708	1629904.	7410.	-0.03629	28740.	1.05E+10
0.00	0.00	0.00				
18.7200	3.2027	1664582.	7410.	-0.03556	29351.	1.05E+10
0.00	0.00	0.00				
19.1100	3.0380	1699261.	7410.	-0.03481	29963.	1.05E+10
0.00	0.00	0.00				
19.5000	2.8769	1733940.	7410.	-0.03404	30574.	1.05E+10
0.00	0.00	0.00				
19.8900	2.7194	1768619.	7410.	-0.03326	31186.	1.05E+10
0.00	0.00	0.00				
20.2800	2.5656	1803298.	7410.	-0.03246	31797.	1.05E+10
0.00	0.00	0.00				
20.6700	2.4156	1837976.	7410.	-0.03165	32409.	1.05E+10
0.00	0.00	0.00				
21.0600	2.2694	1872655.	7410.	-0.03082	33020.	1.05E+10
0.00	0.00	0.00				
21.4500	2.1271	1907334.	7410.	-0.02998	33631.	1.05E+10
0.00	0.00	0.00				
21.8400	1.9888	1942013.	7410.	-0.02912	34243.	1.05E+10
0.00	0.00	0.00				
22.2300	1.8546	1976692.	7410.	-0.02824	34854.	1.05E+10
0.00	0.00	0.00				
22.6200	1.7245	2011370.	7410.	-0.02735	35466.	1.05E+10
0.00	0.00	0.00				
23.0100	1.5986	2046049.	7410.	-0.02645	36077.	1.05E+10
0.00	0.00	0.00				
23.4000	1.4769	2080728.	7410.	-0.02553	36689.	1.05E+10
0.00	0.00	0.00				
23.7900	1.3596	2115407.	7410.	-0.02459	37300.	1.05E+10
0.00	0.00	0.00				
24.1800	1.2468	2150086.	7410.	-0.02364	37912.	1.05E+10
0.00	0.00	0.00				
24.5700	1.1384	2184764.	7410.	-0.02267	38523.	1.05E+10
0.00	0.00	0.00				
24.9600	1.0346	2219443.	7410.	-0.02169	39135.	1.05E+10
0.00	0.00	0.00				
25.3500	0.9354	2254122.	7410.	-0.02069	39746.	1.05E+10
0.00	0.00	0.00				
25.7400	0.8409	2288801.	7410.	-0.01967	40358.	1.05E+10
0.00	0.00	0.00				
26.1300	0.7513	2323480.	7395.	-0.01865	40969.	1.05E+10
-6.2324	38.8258	0.00				
26.5200	0.6664	2358022.	7313.	-0.01760	41578.	1.05E+10

-28.8854	202.8516	0.00				
26.9100	0.5865	2391932.	7117.	-0.01654	42176.	1.05E+10
-54.8449	437.6309	0.00				
27.3000	0.5116	2424640.	6798.	-0.01547	42753.	1.05E+10
-81.4125	744.7468	0.00				
27.6900	0.4418	2455565.	6368.	-0.01438	43298.	1.05E+10
-102.5558	1086.	0.00				
28.0800	0.3770	2484244.	5856.	-0.01327	43804.	1.05E+10
-116.2947	1444.	0.00				
28.4700	0.3175	2510376.	5292.	-0.01216	44265.	1.05E+10
-124.5692	1836.	0.00				
28.8600	0.2632	2533780.	4700.	-0.01103	44677.	1.05E+10
-128.4075	2283.	0.00				
29.2500	0.2142	2554371.	153.7669	-0.00990	45040.	1.05E+10
-1815.	39639.	0.00				
29.6400	0.1706	2535219.	-8103.	-0.00876	44703.	1.05E+10
-1714.	47027.	0.00				
30.0300	0.1322	2478525.	-15878.	-0.00764	43703.	1.05E+10
-1608.	56926.	0.00				
30.4200	0.09904	2386604.	-23142.	-0.00656	42082.	1.05E+10
-1496.	70701.	0.00				
30.8100	0.07085	2261912.	-29864.	-0.00552	39884.	1.05E+10
-1376.	90897.	0.00				
31.2000	0.04738	2107082.	-35995.	-0.00454	37154.	1.05E+10
-1244.	122917.	0.00				
31.5900	0.02831	1924996.	-41467.	-0.00364	33943.	1.05E+10
-1094.	180860.	0.00				
31.9800	0.01326	1718948.	-46146.	-0.00283	30310.	1.05E+10
-905.2066	319389.	0.00				
32.3700	0.00181	1493073.	-49551.	-0.00211	26327.	1.05E+10
-550.2944	1424424.	0.00				
32.7600	-0.00653	1255146.	-49065.	-0.00150	22132.	1.05E+10
758.0338	543365.	0.00				
33.1500	-0.01224	1033821.	-45216.	-9.90E-04	18229.	1.05E+10
887.1376	339091.	0.00				
33.5400	-0.01580	831927.	-40927.	-5.74E-04	14669.	1.05E+10
945.5390	280083.	0.00				
33.9300	-0.01762	650742.	-36441.	-2.43E-04	11474.	1.05E+10
971.6411	258122.	0.00				
34.3200	-0.01807	490839.	-31879.	1.17E-05	8655.	1.05E+10
977.9021	253201.	0.00				
34.7100	-0.01751	352354.	-27321.	2.00E-04	6213.	1.05E+10
970.1407	259329.	0.00				
35.1000	-0.01620	235117.	-22824.	3.31E-04	4146.	1.05E+10
951.5606	274821.	0.00				
35.4900	-0.01441	138722.	-18435.	4.14E-04	2446.	1.05E+10
924.0473	300108.	0.00				
35.8800	-0.01233	62566.	-14193.	4.59E-04	1103.	1.05E+10
888.6520	337415.	0.00				
36.2700	-0.01011	5874.	-10135.	4.75E-04	103.5662	1.05E+10
845.7165	391458.	0.00				

36.6600	-0.00788	-32296.	-6296.	4.69E-04	569.4636	1.05E+10	794.7112	471770.	0.00
37.0500	-0.00572	-53059.	-2720.	4.50E-04	935.5769	1.05E+10	733.5846	599800.	0.00
37.4400	-0.00367	-57755.	533.1588	4.25E-04	1018.	1.05E+10	656.6606	836243.	0.00
37.8300	-0.00175	-48069.	3346.	4.01E-04	847.5833	1.05E+10	545.2347	1460843.	0.00
38.2200	8.11E-05	-26440.	4371.	3.85E-04	466.2167	1.05E+10	-107.1928	6185622.	0.00
38.6100	0.00185	-7160.	2825.	3.77E-04	126.2479	1.05E+10	-553.3962	1397149.	0.00
39.0000	0.00361	0.00	0.00	3.76E-04	0.00	1.05E+10	-653.7978	423634.	0.00

* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 1:

```
Pile-head deflection             =    13.86123977 inches
Computed slope at pile head      =    -0.05338865 radians
Maximum bending moment           =       2554371. inch-lbs
Maximum shear force              =        -49551. lbs
Depth of maximum bending moment  =    29.25000000 feet below pile head
Depth of maximum shear force     =    32.37000000 feet below pile head
Number of iterations             =             27
Number of zero deflection points =              2
```

Summary of Pile-head Responses for Conventional Analyses

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs
Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians
Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.
Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs
Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

```
Load Load                Load                  Axial    Pile-head  Pile-head  Max
Shear Max Moment
Case Type   Pile-head    Type     Pile-head   Loading  Deflection  Rotation    in
```

```
Pile    in Pile
 No.  1      Load 1       2        Load 2       lbs      inches      radians    lbs
     in-lbs
---- ----- ---------- ---------- ---------- ---------- ---------- ----------
---------- ----------
  1  V, lb      7410.  M, in-lb       0.00       0.00    13.8612   -0.05339
-49551.   2554371.


Maximum pile-head deflection = 13.8612397695 inches
Maximum pile-head rotation   = -0.0533886505 radians = -3.058944 deg.

This analysis ended normally
```

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
APPROVED

This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works, OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law.

Hadi Tabatabaee
BUILDING OFFICIAL

ENGEO
Expect Excellence

TerraCosta Consulting Group

Geotechnical Engineering
Coastal Engineering
Maritime Engineering

Project No. 2975
August 15, 2019

Mr. Eric Noegel
BELLINGHAM MARINE INDUSTRIES, INC.
8810 Sparling Lane
Dixon, California 95620

GUIDE PILE DESIGN CRITERIA
DANA POINT MARINA REHABILITATION PROJECT
DANA POINT, CALIFORNIA

Dear Mr. Noegel:

In accordance with your request, TerraCosta Consulting Group, Inc. (TerraCosta) is pleased to provide guide pile design criteria for the proposed renovation of the Dana Point Harbor Marina Restoration Project located in Dana Point, California (Figure 1). The proposed project is part of the rehabilitation of the existing approximately 50-year-old marina facilities and infrastructure, and will include seawall repairs, gangway and approach pier replacement, and reconfiguration and replacement of the existing floating docks throughout the marina. This limited geotechnical investigation was performed to provide update geotechnical input for the replacement of the guide piles and floating docks, and to provide specific foundation design criteria for the proposed marina remodel as part of the design-build project.

PROJECT DESCRIPTION AND SCOPE OF WORK

As we understand, the existing docks and guide piles will be replaced with a new dock system, including new guide piles. We also understand that the rehabilitation work will likely be performed in phases, on a basin-by-basin basis. Lastly, we understand that various types of guide piles have been and are being considered. More specifically, we were requested to provide specific geotechnical design information for dock design for both concrete and steel piles. A copy of Bellingham's February 8, 2019, request letter is provided in Appendix A. We understand that because of the hard driving conditions, the proposed guide piles are likely to consist of steel pipe piles.

3890 Murphy Canyon Road, Suite 200 ▲ San Diego, California 92123 ▲ (858) 573-6900 *voice* ▲ (858) 573-8900 *fax*
www.terracosta.com

In order to provide the requested information, TerraCosta performed the following scope of work:

1. Reviewed available plans, reports, and our in-house files.
2. Conducted a field investigation consisting of performing four ReMi surveys and drilling, sampling, and logging six soil borings to supplement the data presented in previous studies and investigations.
3. Developed a site model to evaluate the lateral load behavior of the proposed piles.
4. Performed lateral load pile analyses using the computer program, LPILE.
5. Developed recommendations pertaining to the requested geotechnical design information.
6. Prepared this brief findings report.

LITERATURE REVIEW

To aid in our understanding of the project, we reviewed the project schematic drawings, as well as various geotechnical reports and other studies. A summary of the documents reviewed is presented under References at the end of this report.

FIELD INVESTIGATION

Prior to our field investigation, and to aid in our characterization of the subsurface conditions at the site, we reviewed published and unpublished reports, maps, and historical photographs of the site and surrounding area.

Our field investigation and testing program was conducted January 22 and 23, 2019, and included advancing six test borings around the marina ranging in depth from 34 to 46 feet below the existing ground surface at the locations shown on Figure 1. In addition, four refraction microtremor (ReMi) surveys were completed to develop a shear-wave velocity profile down to a depth of approximately 100 feet at the locations shown on Figure 1, to further broaden geotechnical site characterization for use in our studies.

The test borings were advanced using a truck-mounted 6-inch-diameter hollow stem auger drill rig. Once the desired sample depth was reached, a 2-inch outside diameter Standard Penetration Test (SPT) sampler was driven into the soil through the auger at the bottom of the boring. The borings were generally sampled at 5-foot intervals. Samplers were driven using a 140-pound hammer with a 30-inch drop. Blow counts were recorded in 6-inch intervals.

Field logs of the materials encountered in the test borings were prepared based on a visual examination of the materials encountered and the action of the drilling and sampling equipment. A Key to Excavation Logs is presented as Figure B-1 in Appendix B. Final logs of the test borings are presented as Figures B-2 through B-7. Descriptions on the logs are based on the field logs, sample inspection, and the results of laboratory test data.

Representative samples were collected, sealed in plastic containers to preserve moisture content, and taken to the laboratory for grain-size and plasticity testing. Results of the laboratory tests are presented in Appendix C.

A copy of the ReMi survey completed by Southwest Geophysics is provided in Appendix D.

EXISTING CONDITIONS

The County of Orange, in concert with the U.S. Army Corps of Engineers, originally designed and constructed the Dana Point Harbor in the late 1960s. The northern half of the harbor, locally known as the Cove Region, contains mostly commercial property. The southerly half, known as the Island Region, contains a linear park and parking for the marina, as well as some smaller businesses and restaurants. The island is connected by a bridge (Island Way), which separates the harbor into east and west basins. The two basins are, in turn, divided into north and south for four separate quadrants.

Prior to development and construction of the harbor in the 1960s, the area was naturally protected by the Dana Point Headland, creating a shallow anchorage westerly of San Juan Creek. Taking advantage of the headland, a series of jetties was constructed to enclose the area further and protect it from westerly and southerly swells. Our research indicates that the harbor was developed by initially constructing the island and a series of cofferdams to enclose the marina basins. Dewatering of the basin allowed construction to move forward in the dry, excavating the basins to an average elevation to -10 feet MLLW. As we understand, because of the hard excavation characteristics of the soils, the northwest basin was excavated to an elevation of -8 feet MLLW.

Plans showing the construction of the marina are presented in Appendix E. In addition, plans showing the existing guide piles are presented in Appendix F.

GEOLOGIC AND SITE CONDITIONS

The project site is located within the Dana Point Quadrangle at 33.460248 degrees north latitude 117.699313 west longitude, near the mouth of the San Juan Creek Valley.

Surficial Geology

Surficial geologic units underlying the area include artificial fills, beach sands, alluvial deposits, and recent bay deposits, all underlain by older Quaternary to Miocene-aged formational bedrock units. Most of these surficial deposits will likely only be encountered during the construction of the gangway approach platforms and other ancillary improvements on the land side of the marina.

While a number of older geologic units, such as marine and non-marine terrace deposits and the middle Miocene-age San Onofre Breccia and Monterey Formations, are mapped as being exposed within the area, the primary formational unit that will be encountered during pile driving for the new marina is the late Miocene to early Pliocene-age Capistrano Formation. The Capistrano Formation is of marine origin and primarily consists of interbedded siltstones, sandstone, and localized conglomerates. The siltstone is generally dark gray to olive-gray, and poorly to moderately consolidated. The sandstone generally consists of a yellowish-brown to gray, weakly to moderately cemented, massive to poorly bedded sandstone. The siltstone was encountered in generally all of the borings across the site, with limited amounts of sandstone encountered in borings across the northern edge of the marina.

GUIDE PILE DESIGN INFORMATION

Guide Pile Design Input

Both concrete and steel piles have been and are being considered for use as guide piles for the new marina floating docks. In their February 8, 2019, letter (Appendix A), Bellingham requested the following design input for use in their design of the guide pile systems:

1. Ultimate lateral load,
2. Maximum deflection at the point of loading, and
3. Pile tip elevations.

The point of loading for the piles is at elevation 9.0 feet MLLW. The piles under consideration include 16-inch and 20-inch round concrete piles, 24-inch octagonal concrete piles, and 14-inch, 16-inch, and 18-inch steel pipe piles. The mudline elevations for the guide piles range from -10 to -17 feet MLLW.

Site Model

Using the information collected from of our field investigation and data from previous studies, TerraCosta developed a subsurface model for use in lateral load pile analyses. The data show that the formational soils become very competent near elevation -12 to -14 feet MLLW. Using this observation, we developed the following analytical subsurface model consisting of nearshore deposits modeled as sands from the mudline to elevation -13 feet, which were in turn underlain by competent formational materials to depth. The formational material consists primarily of a clayey siltstone. To evaluate the lateral load behavior of this material, we examined the lateral response of the pile using a variety of p-y curve models ranging from sands, stiff clays with and without free water, and weak rock. From this assessment, we selected a p-y curve model corresponding to stiff clay without free water. Table 1 summarizes the LPILE material parameters used in our lateral load analyses of the piles.

Lateral Load Analyses

TerraCosta evaluated the three steel pipe piles and three pre-stressed concrete piles requested by Bellingham. We analyzed three mudline conditions: -10 to -13 feet, -15 feet, and -17 feet. Our results may be interpreted for other mudline conditions. Subsurface conditions indicated that formational materials began at approximate elevation -13 feet, with less competent soils above this elevation.

Our analyses focused on developing recommendations for an ultimate load in kips corresponding to the ultimate moment capacity provided by Bellingham, the deflection at the point of load application of the maximum lateral load assuming elastic behavior of the pile, and the pile tip elevation in MLLW below the mudline.

From our analyses, we noted that the concrete piles will start to behave inelastically near 55 percent of the ultimate load based on the concrete steel reinforcing information provided by Bellingham. As such, assessing the piles as elastic pile materials will underestimate the pile deflection as the piles start to experience yielding of the pile materials.

As part of our analyses, we also evaluated the effects of different soil models and, as such, the results provided in the attached tables are estimates based on the average condition of the various models used, where the actual displacements are anticipated to lie within 10 percent (plus or minus) of our estimates.

The results of our analyses are based on the assumption that all piles will be driven.

Recommendations

Recommended maximum lateral force, pile deflection, and pile tip elevations for the requested concrete piles are presented in Tables 2A, 2B, and 2C, and for the requested steel pipe piles in Tables 3A, 3B, and 3C.

CONSTRUCTION CONSIDERATIONS

As we understand, new piles are proposed for the Dana Point floating docks. These piles are primarily laterally loaded piles with negligible axial load requirements. As such, the key construction requirement for these piles is to drive the piles to their design specified tip elevations. The new piles are to be located within the main harbor area where the existing floating docks are located.

We understand that Bellingham drove piles for guide piles near the travel lift area of the marina, where they encountered hard driving conditions such that some piles mushroomed at the top during driving. As a result, we understand that pile design and driving operations were modified and some piles driven using stingers and/or driving shoes.

It is interesting to note that the existing piles in the marina appear to be a combination of both steel pipe piles and concrete piles. However, a review of the as-built drawings suggests that the concrete piles observed in the western basin required steel stingers to be able to drive the piles to desired tip.

We anticipate that pile operations will likely be on-water, with piles located and installed from a barge using a pile driving hammer. While we anticipate that most piles can be installed using the pile driving hammer, it is possible that approximately 5 to 10 percent of the piles may require pre-drilling or jetting at the pile location prior to driving.

LIMITATIONS

This letter-report presents data collected during our field investigation for the purpose of developing recommendations for the minimum tip elevations required to achieve lateral load pile behavior for the new marina piles. The conclusions and information presented in this report are intended to assist Bellingham in their design of guide piles for the new proposed floating docks. Use of this information for any other intended purpose is not recommended.

This firm does not practice or consult in the field of safety engineering. We do not direct the contractor's operations, and we cannot be responsible for the safety of other than our own personnel on the site. Therefore, the safety of others is the responsibility of the contractor. The contractor should notify the owner if he considers any of the recommended actions presented herein to be unsafe.

CLOSURE

We appreciate the opportunity to work with you on this project. If you have any questions or require additional information, please give us a call.

Very truly yours,

TERRACOSTA CONSULTING GROUP, INC.

Gregory A. Spaulding, Project Geologist	Matthew W. Eckert, Director of Engineering
P.G. 5892, C.E.G. 1863	R.C.E. 45171, R.G.E. 2316

GAS/MWE/jg
Attachments

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TABLE 1

SUMMARY OF LPILE PARAMETERS FOR LATERAL LOAD ANALYSES OF PILES

Material	Depth, feet	Unit Weight, pcf	Friction Angle, deg.	K, pci	Undrained Strength, psf	Strain Factor
Sand	19 to 22	55	34	60	na	na
Stiff clay No free water	22 to 100	60	na	na	4000	0.004

SUMMARY OF LATERAL LOAD RECOMMENDATIONS

TABLE 2A
16-INCH ROUND PRE-STRESSED CONCRETE PILE

Mudline, feet	Max. Lateral Load, kips	Deflection at Point of Load, inches	Pile Tip Elevation, feet	Phi*Mu, kip-feet
-10 to -13	4.8	3.6	-28	105
-15	4.4	4.0	-30	105
-17	4.0	4.4	-31	105

TABLE 2B
20-INCH ROUND PRE-STRESSED CONCRETE PILE

Mudline, feet	Max. Lateral Load, kips	Deflection at Point of Load, inches	Pile Tip Elevation, feet	Phi*Mu, kip-feet
-10 to -13	9.9	3.4	-28	223
-15	9.1	3.9	-30	223
-17	8.4	4.2	-31	223

TABLE 2C
24-INCH OCTAGONAL PRE-STRESSED CONCRETE PILE

Mudline, feet	Max. Lateral Load, kips	Deflection at Point of Load, inches	Pile Tip Elevation, feet	Phi*Mu, kip-feet
-10 to -13	15.2	2.8	-28	346
-15	14.0	3.1	-30	346
-17	13.2	3.5	-31	346

NOTES:

1. Deflection of pile assumes that pile is elastic. Inelastic behavior begins at an approximate lateral load equal to 0.55 times the maximum lateral load.
2. Lateral displacements for loads in excess of 0.55 times the maximum lateral load will exceed those presented in the table above.
3. Phi*Mu is the factored ultimate moment capacity of the pile.
4. Pile Tip Elevation is the minimum required for the pile in question.

SUMMARY OF LATERAL LOAD RECOMMENDATIONS

TABLE 3A
14-INCH STEEL PIPE

Mudline, feet	Max. Lateral Load, kips	Deflection at Point of Load, inches	Pile Tip Elevation, feet	Phi*Mu, kip-feet
-10 to -13	11.0	10.0	-28	259
-15	10.4	11.4	-28	259
-17	9.4	12.5	-30	259

TABLE 3B
16-INCH STEEL PIPE PILE

Mudline, feet	Max. Lateral Load, kips	Deflection at Point of Load, inches	Pile Tip Elevation, feet	Phi*Mu, kip-feet
-10 to -13	15.0	9.7	-28	341
-15	13.8	10.6	-28	341
-17	12.8	12.2	-30	341

TABLE 3C
18-INCH STEEL PIPE PILE

Mudline, feet	Max. Lateral Load, kips	Deflection at Point of Load, inches	Pile Tip Elevation, feet	Phi*Mu, kip-feet
-10 to -13	19.0	9.0	-28	434
-15	17.6	10.2	-28	434
-17	16.4	111.4	-30	434

NOTES:

1. Deflection of pile assumes that pile is elastic until the pile capacity is reached.
2. Phi*Mu is the factored ultimate moment capacity of the pile.
3. Pile Tip Elevation is the minimum required for the pile in question.

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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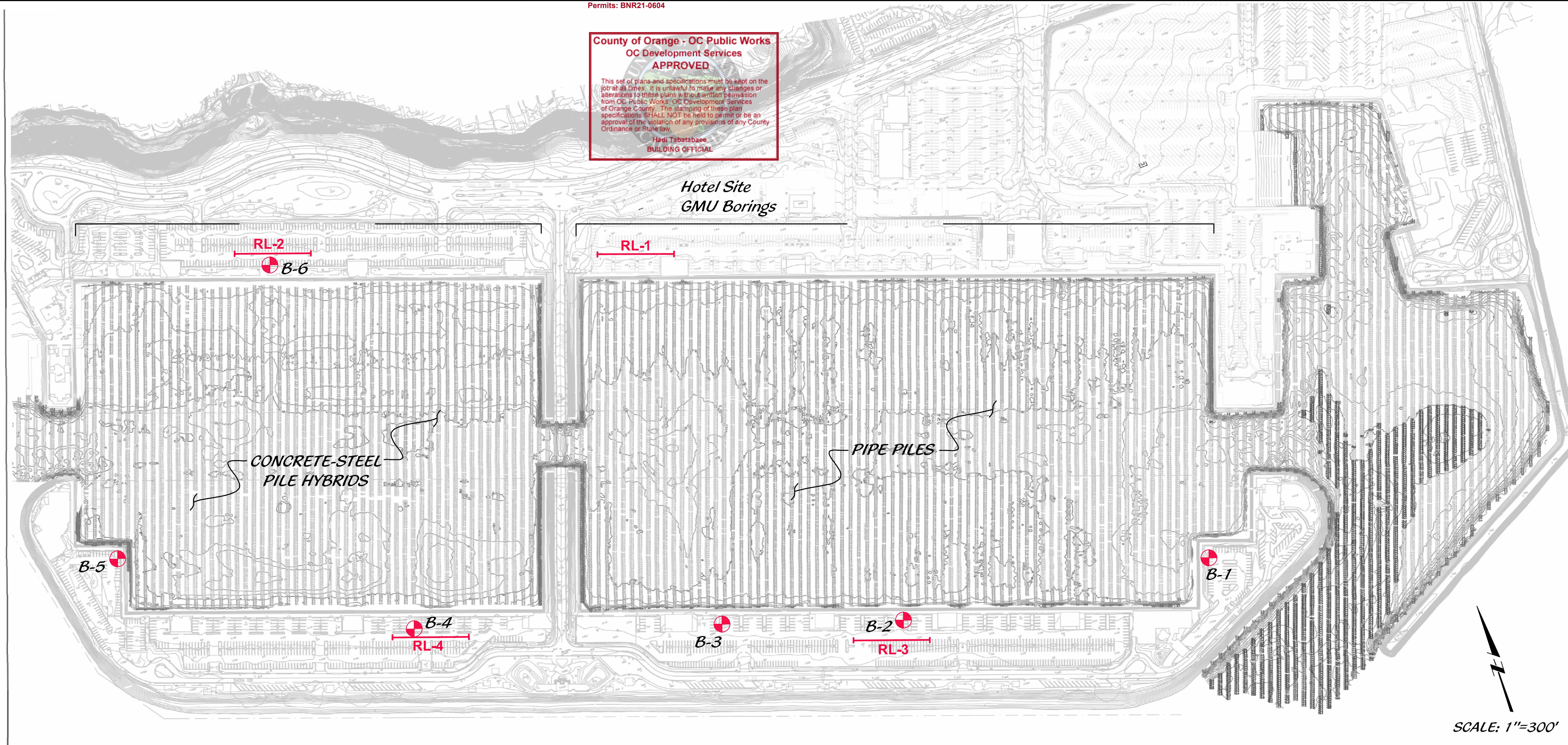
Hadi Tabatabaee
BUILDING OFFICIAL



NO.	DATE	DESCRIPTION	BY	
REVISIONS				

Bellingham MARINE
THE WORLD'S MOST COMPREHENSIVE MARINA BUILDER
Southwest Division
CA License #442499
8810 Sparling Lane
Dixon, CA 95620
TEL: (707) 678-2385
FAX: (707) 678-1760

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PROJECT NUMBER: 7109
ENGINEER / DESIGNER:
PROJECT MANAGER:
CHECKED BY:

DANA POINT HARBOR REVITALIZATION
Dana Point, CA

WATER DEPTHS AND CONTOURS

SCALE: 1" = 140' (Sheet Size 24" x 36")
DRAWN BY: DD
DATE: 11-21-18
SHEET NO.: 1
DRAWING: EL1

LEGEND

B-6 APPROXIMATE LOCATION OF TCG SOIL BORING

RL-4 APPROXIMATE LOCATION OF SOUTHWEST GEOPHYSICS ReMi LINE (230 FEET LONG)

TerraCosta Consulting Group

TERRACOSTA CONSULTING GROUP
ENGINEERS AND GEOLOGISTS
3890 MURPHY CANYON ROAD, SUITE 200
SAN DIEGO, CA 92123 (858) 573-6900

FIGURE NUMBER: 1
PROJECT NAME: DANA POINT MARINA
PROJECT NUMBER: 2975-01

BORING LOCATION MAP

APPENDIX A

LETTER OF REQUEST FROM BELLINGHAM DATED FEBRUARY 8, 2019

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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Hadi Tabatabaee
BUILDING OFFICIAL

Bellingham MARINE®

February 8, 2019

Mr. Eric Noegel
Manager of Project Development, Southwest Division
Bellingham Marine Industries, Inc.
8810 Sparling Lane
Dixon, CA 95620

Project: BMI – Dana Point Marina Job # 7109
Subject: Request for Geotechnical Design Information

Dear Eric,

This letter is provided to identify geotechnical information necessary to perform a structural analysis of the floating dock system.

In general, the docks are restrained against lateral loads by piles embedded in the basin floor; the piles are not subjected to appreciable vertical loading. The dock design requires that adequate pile embedment is provided to fully develop the ultimate moment capacity (ΦM_n) of the piles. The design is typically not deflection limited; however the lateral pile stiffnesses are needed to accurately model the dock system.

Please provide the ultimate lateral load (ΦP_n), the maximum deflection at the point of loading, and the pile tip elevation for the piles shown on the attached elevation drawings.

If you have any questions or concerns, please don't hesitate to contact us.

Sincerely,

Patrick J. Staron, P.E., Ph.D.

Enclosure: Pile Elevation Drawings
Basin Bathymetry
Pile Capacity Calculations

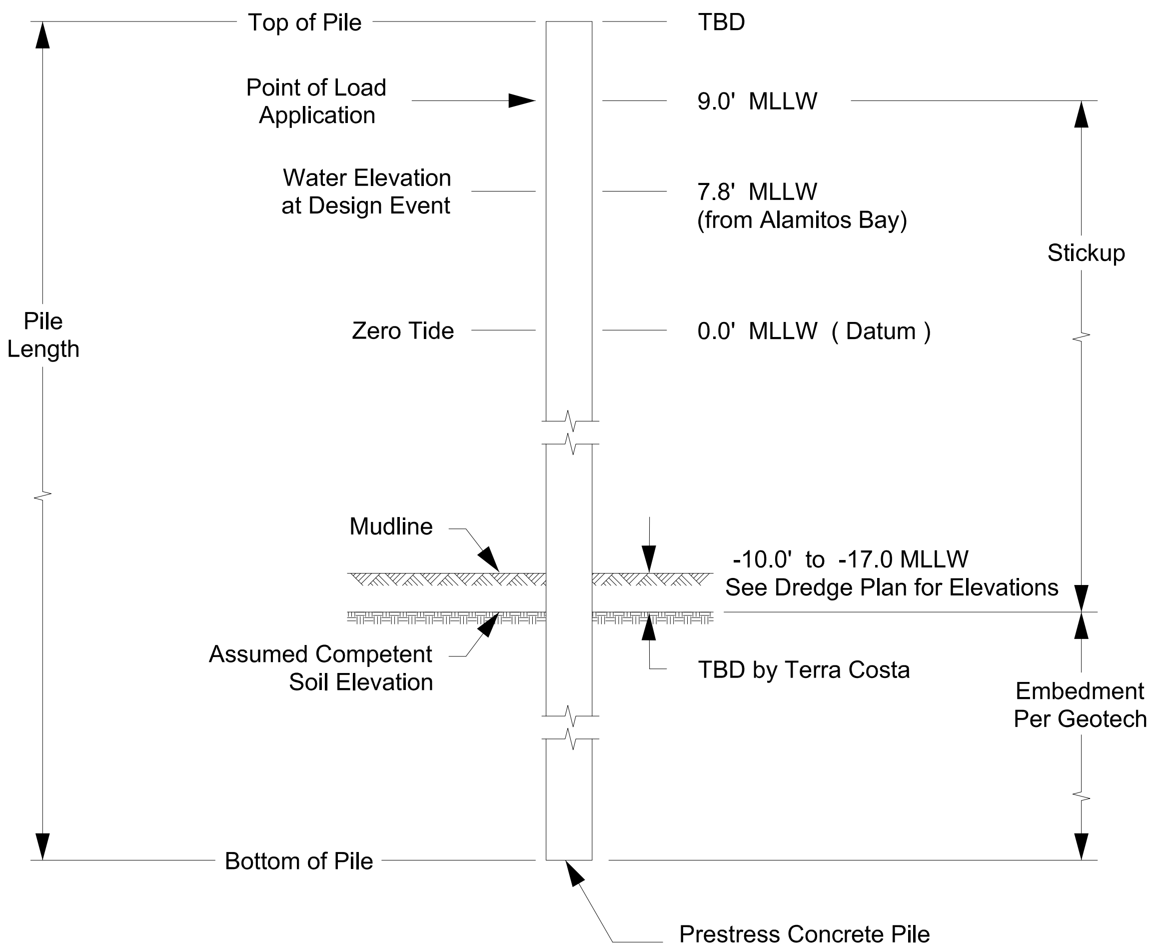
Bellingham Marine Engineering
3825 E. Sunset Dr
Bellingham, Washington 98228
T 360.715.0121

Dana Point Marina - Concrete Piles

PJS 2/8/2019

Pile Diameter (inch)	Ultimate Moment Capacity (ΦM_n) (ft-kips)	Ultimate Lateral Load (ΦP_n) (kips)	Deflection at Max. Lateral Load (inch)	Pile Tip Elevation (ft) (MLLW)
16 rnd.	105			
20 rnd.	223			
24 oct.	346			

Concrete Strength: Min f 'c = 6,000 psi
W4 spiral: 5 turns @ 1" pitch at ends, 3" pitch over top and bottom thirds, 6" pitch over middle third
2.5" clear cover over spiral



ELEVATION VIEW OF TYPICAL MARINA PILE

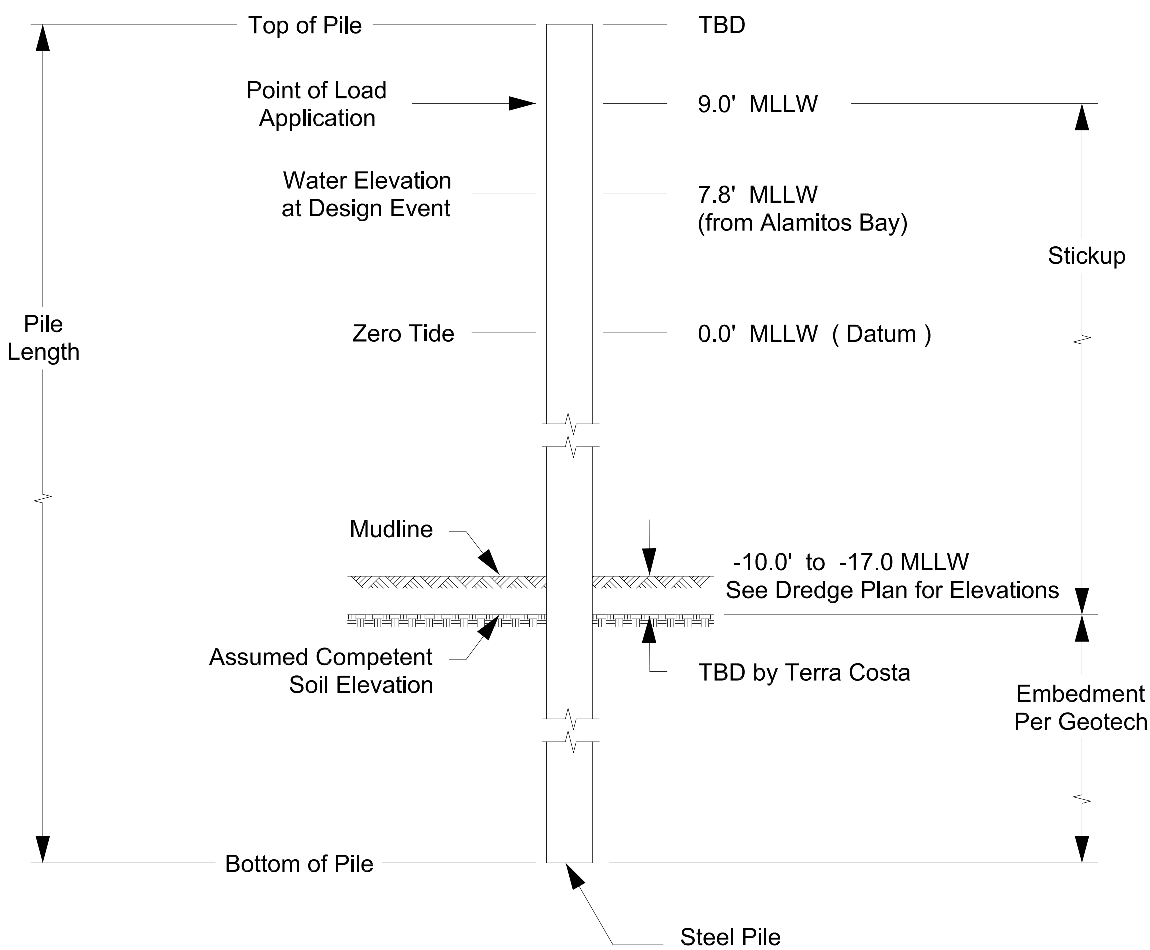
(N.T.S)

Dana Point Marina - Steel Piles

PJS 2/8/2019

Pile Diameter (inch)	Ultimate Moment Capacity (ΦM_n) (ft-kips)	Ultimate Lateral Load (ΦP_n) (kips)	Deflection at Max. Lateral Load (inch)	Pile Tip Elevation (ft) (MLLW)
14	259			
16	341			
18	434			

Fy = 45 ksi; Wall Thickness = 0.5"
Bending capacities reduced to 90% to allow for corrosion

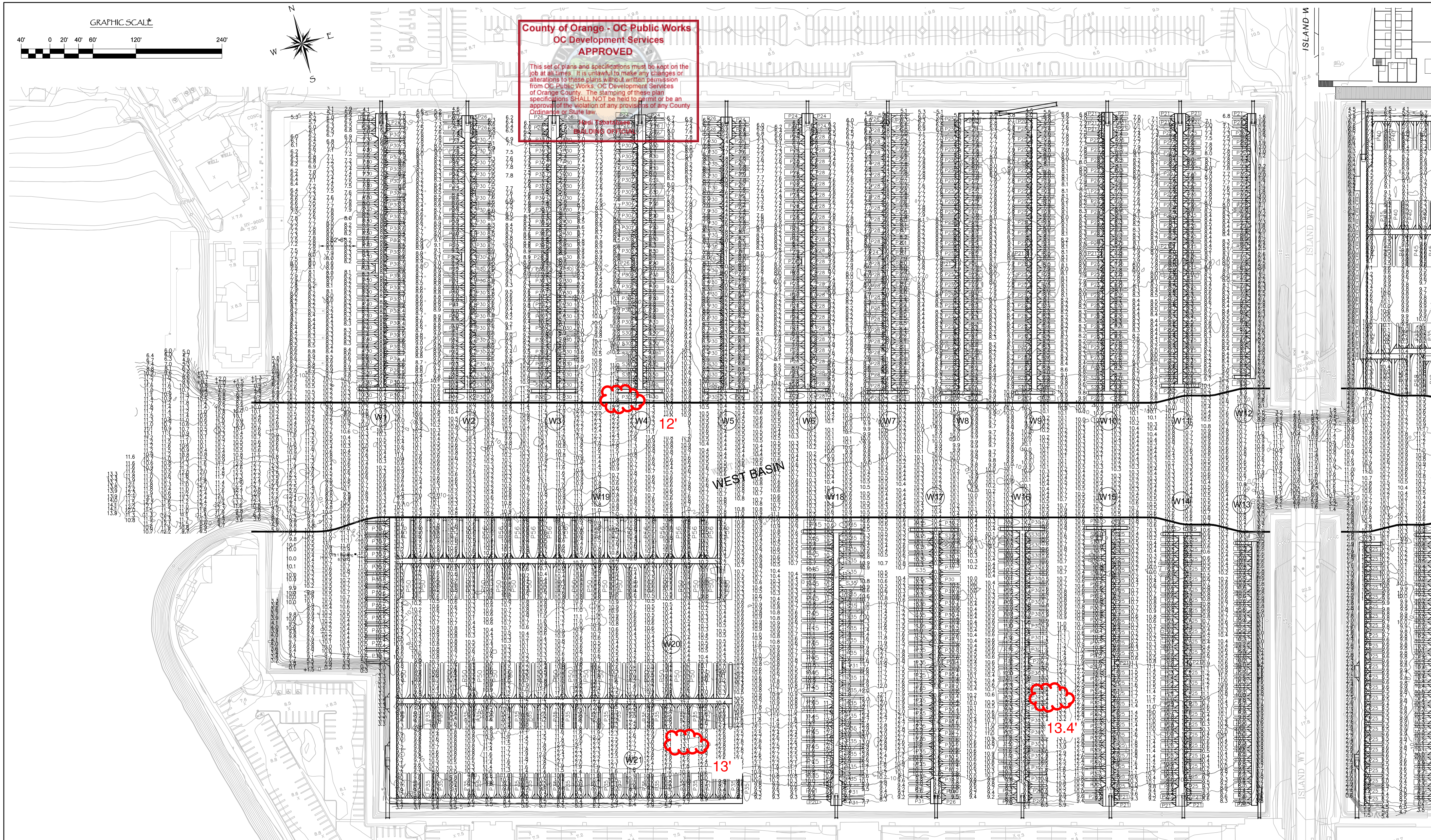


ELEVATION VIEW OF TYPICAL MARINA PILE

(N.T.S)

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

PRELIMINARY - NOT FOR CONSTRUCTION



NO.	DATE	DESCRIPTION	BY
-	-	-	-

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Dixon, CA 95620
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FAX: (707) 678-1760

SITE IMPROVEMENT PLAN

ACCEPTED BY: ______
CITY ENGINEER R.C.E. EXP. DATE

ACCEPTED BY: ______
CITY ENGINEER R.C.E. EXP. DATE

PROJECT NUMBER: 7109
ENGINEER / DESIGNER: -
PROJECT MANAGER: -
CHECKED BY: -

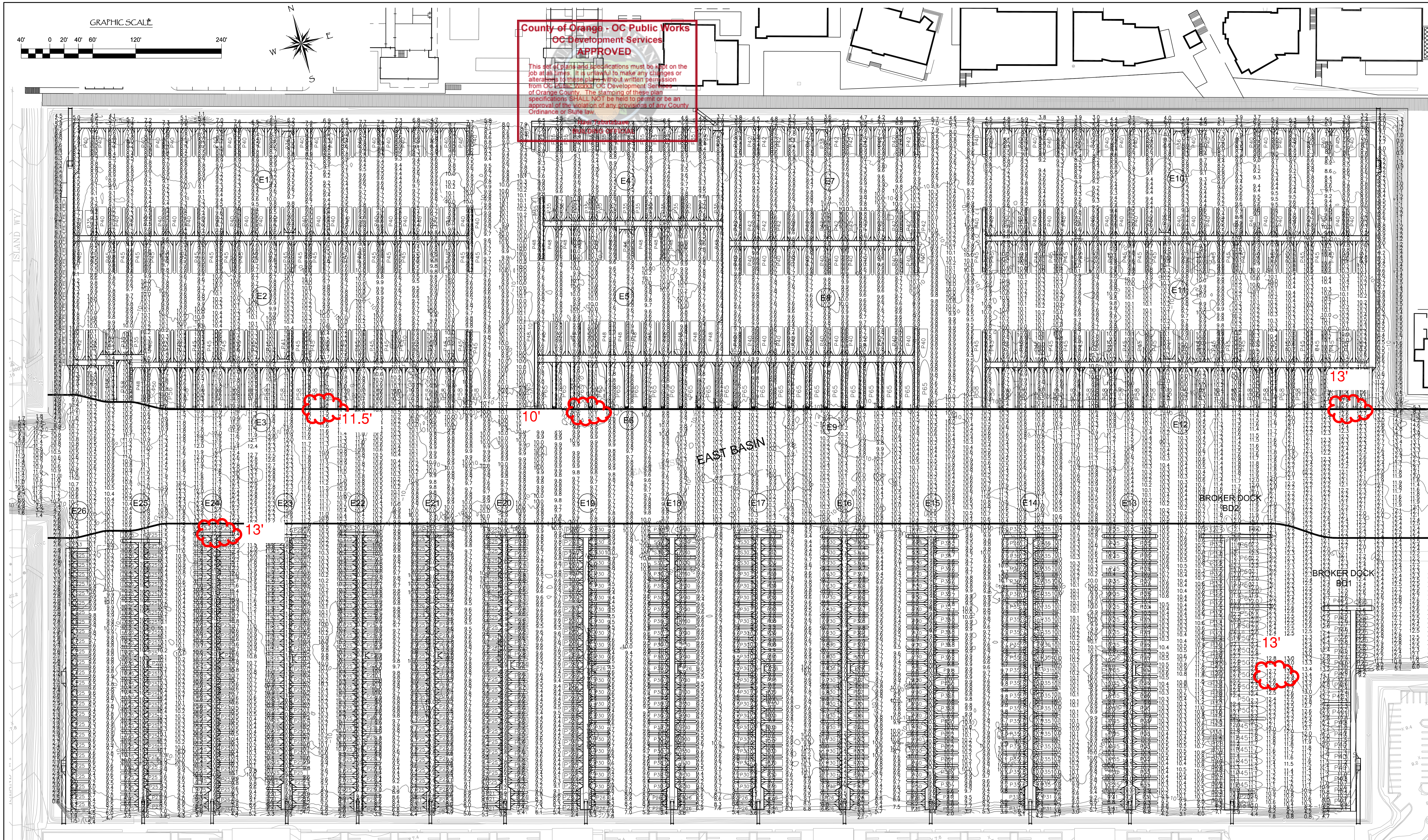
DANA POINT MARINA
Dana Point, CA

NEW PROPOSED WEST BASIN LAYOUT #16
(with WATER DEPTH DATA)

SCALE: 1" = 60' (Sheet Size 24" x 36")
DRAWN BY: DD
DATE: 8-8-18
SHEET NO.: 3.1
DRAWING: WB1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

PRELIMINARY - NOT FOR CONSTRUCTION



NO.	DATE	DESCRIPTION	BY
-	-	-	-

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FAX: (707) 678-1760

SITE IMPROVEMENT PLAN

ACCEPTED BY: ______ CITY ENGINEER R.C.E. EXP. DATE

ACCEPTED BY: ______ CITY ENGINEER R.C.E. EXP. DATE

PROJECT NUMBER: 7109

ENGINEER / DESIGNER: –

PROJECT MANAGER: –

CHECKED BY: –

DANA POINT MARINA

Dana Point, CA

NEW PROPOSED EAST BASIN LAYOUT #16
(with WATER DEPTH DATA)

SCALE: 1" = 60' (Sheet Size 24" x 36")

DRAWN BY: DD

DATE: 8-8-18

SHEET NO.: 4.1

DRAWING: EB1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

PRELIMINARY - NOT FOR CONSTRUCTION

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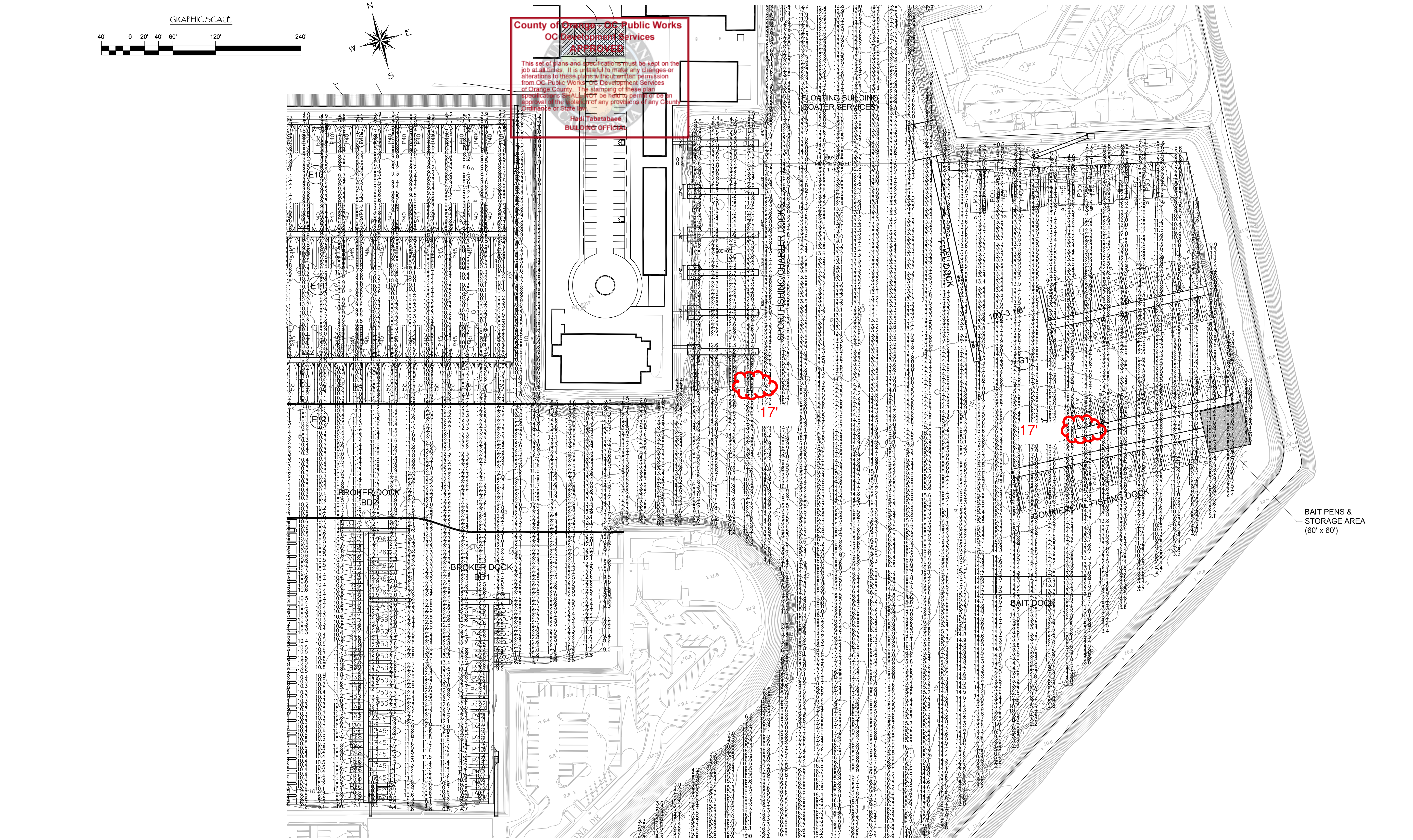
Hadi Tabatabaee
BUILDING OFFICIAL



NO.	DATE	DESCRIPTION	BY
-	-	-	-

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SITE IMPROVEMENT PLAN

ACCEPTED BY:
CITY ENGINEER R.C.E. EXP. DATE

ACCEPTED BY:
CITY ENGINEER R.C.E. EXP. DATE

PROJECT NUMBER: 7109
ENGINEER / DESIGNER: -
PROJECT MANAGER: -
CHECKED BY: -

DANA POINT MARINA

Dana Point, CA

NEW PROPOSED OUTER EAST BASIN LAYOUT #16
(with WATER DEPTH DATA)

SCALE: 1" = 60' (Sheet Size 24" x 36")
DRAWN BY: DD
DATE: 8-8-18
SHEET NO.: 5.1
DRAWING: OB1

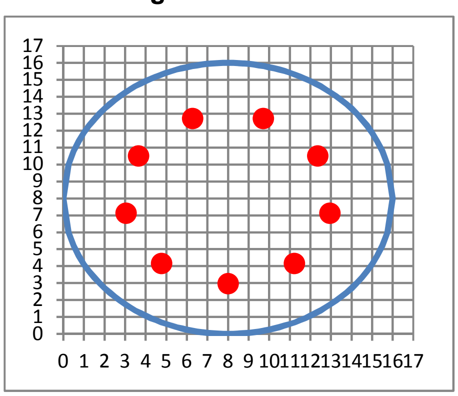
Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

Ultimate Bending Capacity of Prestressed Concrete Pile

round	= pile type
16.00	= pile size [in]
0.00	= chamfer size [in]
1/2" Seven-Wire 270 ksi LRS	= strand type
9	= number of strands
0.00575	= initial strand strain (after losses) [in/in]
0.003	= concrete ultimate strain [in/in]
6	= f'c [ksi]
2.5	= concrete cover [in]
W4	= spiral steel

201.1	= gross area [in^2]
3217	= moment of inertia [in^4]
4415	= concrete E [ksi]
270	= f_{pu} [ksi]
163.7	= f_{se}, initial stress (after losses) [ksi]
1.121	= initial concrete stress (after losses) [ksi]
0.0003	= initial concrete strain (after losses) [in/in]
0.50	= strand diameter [in]
0.153	= area of strand [in]
0.226	= spiral steel diameter [in]
10.05	= diameter of strand layout circle [in]

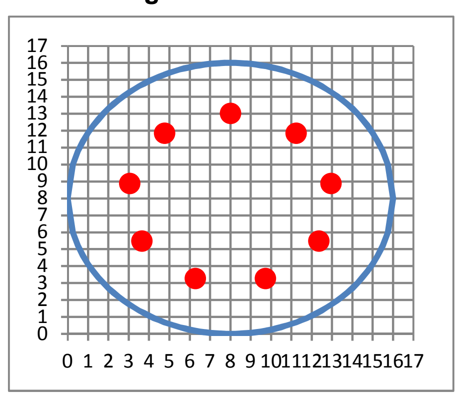
Strand Configuration 1



Pile Capacity

130.0	= Mn [ft-kips]
0.80	= Φ
104.1	= ΦMn [ft-kips]

Strand Configuration 2



Pile Capacity

130.0	= Mn [ft-kips]
0.81	= Φ
105.1	= ΦMn [ft-kips]

105/29 = 3.6 kip

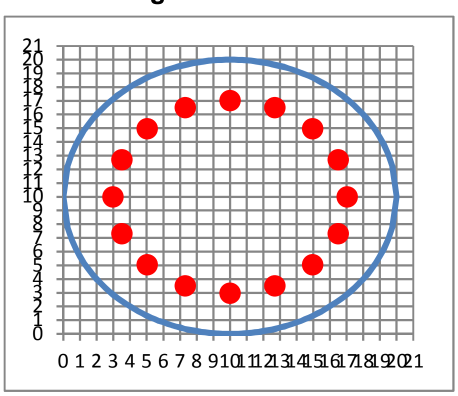
Ultimate Bending Capacity of Prestressed Concrete Pile

round	= pile type
20.00	= pile size [in]
0.00	= chamfer size [in]
1/2" Seven-Wire 270 ksi LRS	= strand type
16	= number of strands
0.00575	= initial strand strain (after losses) [in/in]
0.003	= concrete ultimate strain [in/in]
6	= f'c [ksi]
2.5	= concrete cover [in]
W4	= spiral steel

314.2	= gross area [in^2]
7854	= moment of inertia [in^4]
4415	= concrete E [ksi]
270	= f_{pu} [ksi]
163.7	= f_{se}, initial stress (after losses) [ksi]
1.276	= initial concrete stress (after losses) [ksi]
0.0003	= initial concrete strain (after losses) [in/in]

0.50	= strand diameter [in]
0.153	= area of strand [in]
0.226	= spiral steel diameter [in]
14.05	= diameter of strand layout circle [in]

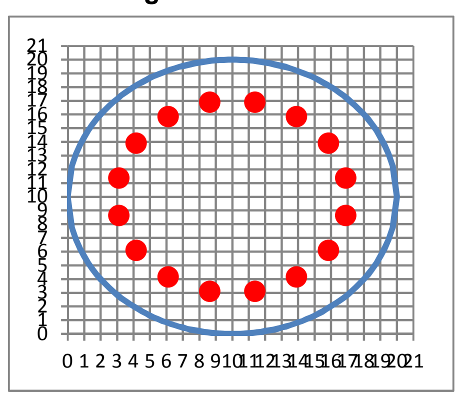
Strand Configuration 1



Pile Capacity

279.4	= Mn [ft-kips]
0.80	= Φ
223.9	= ΦMn [ft-kips]

Strand Configuration 2



Pile Capacity

279.3	= Mn [ft-kips]
0.80	= Φ
223.1	= ΦMn [ft-kips]

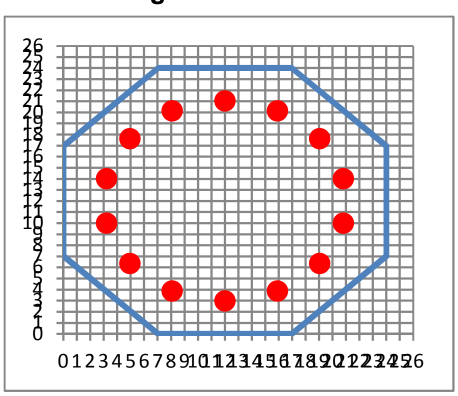
223/29 = 7.6 kip

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

Ultimate Bending Capacity of Prestressed Concrete Pile

octogon	= pile type
24.00	= pile size [in]
0.00	= chamfer size [in]
1/2" Seven-Wire 270 ksi LRS	= strand type
14	= number of strands
0.00575	= initial strand strain (after losses) [in/in]
0.003	= concrete ultimate strain [in/in]
6	= f'c [ksi]
2.5	= concrete cover [in]
W4	= spiral steel
476.9	= gross area [in^2]
18148	= moment of inertia [in^4]
4415	= concrete E [ksi]
270	= f_{pu} [ksi]
163.7	= f_{se}, initial stress (after losses) [ksi]
0.735	= initial concrete stress (after losses) [ksi]
0.0002	= initial concrete strain (after losses) [in/in]
0.50	= strand diameter [in]
0.153	= area of strand [in]
0.226	= spiral steel diameter [in]
18.05	= diameter of strand layout circle [in]

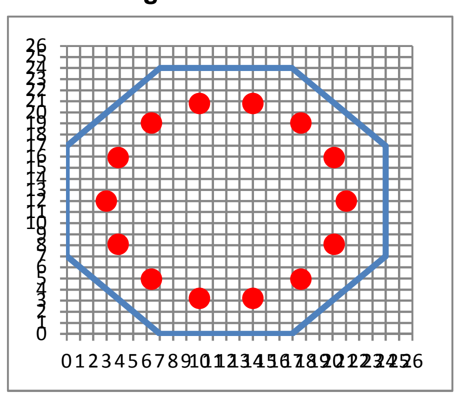
Strand Configuration 1



Pile Capacity

384.7	= Mn [ft-kips]
0.90	= Φ
346.2	= ΦMn [ft-kips]

Strand Configuration 2



Pile Capacity

384.4	= Mn [ft-kips]
0.90	= Φ
345.9	= ΦMn [ft-kips]

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BUILDING OFFICIAL

Steel Pipe Pile Bending Properties

Pile Diameter [in]	Wall Thickness [in]	Yield [ksi]	Area [in^2]	Weight [plf]	I [in^4]	Z [in^3]	ΦM_n [kip-ft]	0.9*ΦMn [kip-ft]	M_n/Ω [kip-ft]	Compact Section [Y/N]
14.0	0.465	45	19.8	67	453.3	85.2	288	259	191.4	Y
16.0	0.465	45	22.7	77	685.2	112.3	379	341	252.1	Y
18.0	0.465	45	25.6	87	985.2	143.0	483	434	321.1	Y

Nominal Wall Thickness [in]	Actual Wall Thickness [in]*
0.500	0.465
0.432	0.402
0.375	0.349
0.312	0.291
0.280	0.260
0.250	0.233

*AISC Steel Construction Manual 14th Edition

Building&Safety: Ryan Rose 6/9/2022
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BUILDING OFFICIAL

APPENDIX B

LOGS OF EXCAVATIONS

TerraCosta Consulting Group

LOG OF TEST BORING

PROJECT NAME: Dana Point Harbor Revitatilzation		PROJECT NUMBER: 2975		BORING: LEGEND	
SITE LOCATION: Dana Point		START: 1/22/2019	FINISH: 1/23/2019	SHEET NO.: 1 of 2	
DRILLING COMPANY: Pacific Drilling	DRILLING METHOD: Hollow Stem Auger		LOGGED BY: G. Spaulding	CHECKED BY:	
DRILLING EQUIPMENT: Marl M5	BORING DIA. (in): 6"	TOTAL DEPTH (ft): 40	GROUND ELEV (ft): 10.0	DEPTH/ELEV. GROUND WATER (ft): ▼ 2.0 / 8.0	
SAMPLING METHOD: SPT	NOTES:				

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
5	5								
10	0								
		PB							
		S							
15	-5								

KEY TO EXCAVATION LOGS

▼ WATER TABLE MEASURED AT TIME OF DRILLING

OTHER TESTS

CC	Confined Compression	ppm	parts per million of VOCs*
CL	Chloride Content	R	Resistivity
CS	Consolidation	RV	R-Value
DS	Direct Shear	SA	Sieve Analysis
EI	Expansion Index	SE	Sand Equivalent
GS	Grain Size Analysis	SF	Sulfate
LC	Laboratory Compaction	SG	Specific Gravity
pH	Hydrogen Ion	SW	Swell
PI	Plasticity Index		

PENETRATION RESISTANCE (BLOWS/ft)

Number of blows required to advance the sampler 1 foot.

California Sampler blow counts can be converted to equivalent SPT blow counts by using an end-area conversion factor of 0.67 when using a 140-pound hammer and a 30-inch drop.

SAMPLE TYPE

PB ("Plastic Bag") - a disturbed, but representative sample obtained from a specific depth interval placed in a large plastic bag.

S ("SPT") - a.k.a. Standard Penetration Test, an 18-inch-long, 2-inch O.D., 1-3/8-inch I.D. drive sampler.

(CONTINUED)

TerraCosta Consulting Group, Inc.
3890 Murphy Canyon Road, Suite 200
San Diego, California 92123

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

FIGURE B-1 a

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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Hadi Tabatabaee
BUILDING OFFICIAL

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	LEGEND

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/22/2019	1/23/2019	2 of 2

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/ELEV. GROUND WATER (ft)
Marl M5	6"	40	10.0	⊻ 2.0 / 8.0

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
25	-15								
30	-20								
35	-25								

KEY TO EXCAVATION LOGS

(CONTINUED)

NOTES ON FIELD INVESTIGATION

Borings were advanced using a truck-mounted Marl M5 drill rig with a 6-inch hollow-stem auger.

Standard Penetration Tests (SPT) were used to obtain soil samples. The SPT were driven into the soil at the bottom of the borings with a 140-pound hammer falling 30 inches. When the samplers were withdrawn from the boring, the samples were removed, visually classified, sealed in plastic containers, and taken to the laboratory for detailed inspection.

Free groundwater was encountered in the borings at the time of drilling as noted on the boring logs.

Classifications are based upon the Unified Soil Classification System and include color, moisture, and consistency. Field descriptions have been modified to reflect results of laboratory inspection where deemed appropriate. At the completion of drilling, all borings were sealed per state and local standards.

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FIGURE B-1 b

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	B-1

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/22/2019	1/22/2019	1 of 3

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GROUND WATER (ft)
Marl M5	6"	41	10.0	n/a

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
									2" - 3" AC / 4" - 6" Class II Base
									FILL **CLAYEY SAND(SC) TO SANDY CLAY (CL)**, damp, medium dense, olive to olive-gray
		PB	1						
5	5								
									- Becomes moist
10	0								
		S	2	7					
									NEAR SHORE DEPOSITS **SILTY TO CLAYEY SAND (SC-SM)**, wet, medium dense, olive gray
15	-5								
		S	3	30					- Sampler on rock, poor recovery
									- Becomes sandier

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FIGURE B-2 a

LOG OF TEST BORING

PROJECT NAME: Dana Point Harbor Revitatilzation	PROJECT NUMBER: 2975	BORING: B-1	
SITE LOCATION: Dana Point	START: 1/22/2019	FINISH: 1/22/2019	SHEET NO.: 2 of 3
DRILLING COMPANY: Pacific Drilling	DRILLING METHOD: Hollow Stem Auger	LOGGED BY: G. Spaulding	CHECKED BY:
DRILLING EQUIPMENT: Marl M5	BORING DIA. (in): 6"	TOTAL DEPTH (ft): 41	GROUND ELEV (ft): 10.0
DEPTH/ELEV. GROUND WATER (ft): ⊻ n/a			
SAMPLING METHOD: SPT	NOTES:		

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		S	4	6					
									CAPISTRANO FORMATION **SILT TO CLAYEY SILT (ML) & FINE SANDY CLAY (CL)**, damp, hard, dark gray, interbedded w/ cemented zones
25	-15								
		S	5	79/8"			GS PI		
									- Hard drilling cemented zone
									CLAYEY SILT (ML) TO SAND (SP-SM), moist to wet, very dense, gray to dark gray, interbedded, w/ occasional concretions and cemented zones
30	-20								
35	-25								

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FIGURE B-2 b

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
APPROVED
This set of plans and specifications must be kept on the job site until completion of the work. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works / OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law.
Hadi Tabatabaee
BUILDING OFFICIAL

LOG OF TEST BORING

PROJECT NAME: Dana Point Harbor Revitatilzation	PROJECT NUMBER: 2975	BORING: B-1	
SITE LOCATION: Dana Point	START: 1/22/2019	FINISH: 1/22/2019	SHEET NO.: 3 of 3
DRILLING COMPANY: Pacific Drilling	DRILLING METHOD: Hollow Stem Auger	LOGGED BY: G. Spaulding	CHECKED BY:
DRILLING EQUIPMENT: Marl M5	BORING DIA. (in): 6"	TOTAL DEPTH (ft): 41	GROUND ELEV (ft): 10.0
DEPTH/*ELEV.* GROUND WATER (ft): n/a			
SAMPLING METHOD: SPT	NOTES:		

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		S	6	76/11"					
									Botton of hole @ 41 feet. No free groundwater encountered at time of drilling.
45	-35								
50	-40								
55	-45								

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FIGURE B-2 c

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	B-2

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/22/2019	1/22/2019	1 of 2

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GROUND WATER (ft)
Marl M5	6"	35	10.0	▼ n/a_

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
									2" - 3" AC
									FILL **CLAYEY SAND (SC) & SANDY CLAY (CL)**, damp to moist, medium dense, olive to olive-gray, interbedded
5	5								- Becomes clayier
10	0								
		S	1	15					
									NEAR SHORE DEPOSITS **SILTY TO CLAYEY SAND (SC/SM)**, becomes olive-gray to gray
									CAPISTRANO FORMATION **SILTY SAND (SP-SM)**, moist, medium dense, yellow to yellow-brown, w/ occasional gravels
15	-5								
		S	2	17					

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FIGURE B-3 a

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	B-2

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/22/2019	1/22/2019	2 of 2

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/ELEV. GROUND WATER (ft)
Marl M5	6"	35	10.0	⊻ n/a

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		S	3	17			GS		**SILTY SAND (SM)**, moist to wet, medium dense, olive-gray, w/ occasional gravels
									- Harder drilling - Gravels
									SILT (ML) & FINE SAND (SC), moist, very dense, dark gray, interbedded, occasional cemented zones
25	-15								
		S	4	59/11"			GS PI		
30	-20								- Becomes Silty Sand (SM)
		S	5	89/9"			GS		
									- Very hard drilling
35	-25								
									Practical refusal @ 35 feet. No free groundwater encountered at time of drilling.

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FIGURE B-3 b

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	B-3

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/22/2019	1/22/2019	1 of 3

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/ELEV. GROUND WATER (ft)
Marl M5	6"	41	7.5	n/a

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
									2" - 3" AC
	5								FILL **SILTY TO CLAYEY SAND (SM/SC)**, damp, medium dense, olive
									FILL **SILT (ML)**, damp, medium dense, gray, w/ siltstone chunks
5		S	1	22					
	0								
10		S	2	79/8"					- Large piece of cemented siltstone (moved hole 4')
	-5								
15		S	3	14					RECENT NEAR SHORE DEPOSITS **SILTY TO CLAYEY SAND (SM/SC)**, damp to moist, medium dense, gray
	-10								WEATHERED CAPISTRANO FORMATION **SAND TO SILTY FINE SAND (SM)**, moist, loose to medium dense, mottled yellow-brown to light olive-gray, w/ occasional gravel

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FIGURE B-4 a

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING	
Dana Point Harbor Revitatilzation	2975	B-3	

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/22/2019	1/22/2019	2 of 3

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/ELEV. GROUND WATER (ft)
Marl M5	6"	41	7.5	n/a

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		S	4	9			GS PI		- Becomes Clayey Sand (SC)
	-15								
									CAPISTRANO FORMATION **SAND TO SILTY FINE SAND (SM)**, damp, very dense, olive-gray to gray, interbedded, w/ occasional gravels
25		S	5	50/4"			GS		- Cemented
									- Hard drilling - Interbedded siltstone (ML) & sandstone (SM)
	-20								
30									- Very hard drilling
	-25								
									- Cemented zone 34' to 35'
35									
									- Cemented zone 37' to 39'
	-30								

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FIGURE B-4 b

LOG OF TEST BORING

PROJECT NAME: Dana Point Harbor Revitatilzation	PROJECT NUMBER: 2975	BORING: B-3		
SITE LOCATION: Dana Point	START: 1/22/2019	FINISH: 1/22/2019	SHEET NO.: 3 of 3	
DRILLING COMPANY: Pacific Drilling	DRILLING METHOD: Hollow Stem Auger	LOGGED BY: G. Spaulding	CHECKED BY:	
DRILLING EQUIPMENT: Marl M5	BORING DIA. (in): 6"	TOTAL DEPTH (ft): 41	GROUND ELEV (ft): 7.5	DEPTH/ELEV. GROUND WATER (ft): n/a
SAMPLING METHOD: SPT	NOTES:			

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		S	6	74					
	-35								Bottom of hole @ 41 feet. No free groundwater encountered at time of drilling.
45									
	-40								
50									
	-45								
55									
	-50								

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FIGURE B-4 c

LOG OF TEST BORING

PROJECT NAME Dana Point Harbor Revitatilzation	**PROJECT NUMBER** 2975	**BORING** B-4	
SITE LOCATION Dana Point	**START** 1/23/2019	**FINISH** 1/23/2019	**SHEET NO.** 1 of 2
DRILLING COMPANY Pacific Drilling	**DRILLING METHOD** Hollow Stem Auger	**LOGGED BY** G. Spaulding	**CHECKED BY**
DRILLING EQUIPMENT Marl M5	**BORING DIA. (in)** 6"	**TOTAL DEPTH (ft)** 40	**GROUND ELEV (ft)** 10.0
DEPTH/*ELEV.* GROUND WATER (ft) ⊻ n/a_			
SAMPLING METHOD SPT	**NOTES**		

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
									2" - 3" AC / 3" Class II
									FILL **CLAYEY SAND (SC) & SANDY CLAY (CL)**, damp, medium stiff, olive-gray, mix
5	5								- Becomes mostly olive Sandy Clay (CL)
10	0								
		S	1	4					
15	-5								

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FIGURE B-5 a

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	B-4

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/23/2019	1/23/2019	2 of 2

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GROUND WATER (ft)
Marl M5	6"	40	10.0	▼ n/a_

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		S	2	19					WEATHERED CAPISTRANO FORMATION **SAND (SP-SM) & SILT (ML)**, damp, medium dense, olive and dark gray, interbedded
									CAPISTRANO FORMATION **SAND (SP-SM) & SILT (ML)**, damp, medium dense to dense, olive and dark gray, interbedded w. occasional cemented zones - Harder drilling cemented zone
25	-15								
		S	3	19			GS		
									- Harder drilling cemented zone
30	-20								- Becomes Silty Sand (SM)
		S	4	53			GS		
									- Harder drilling
35	-25								- Cemented zone
									- Hard drilling
									Bottom of hole @ 40 feet sanding in. No free groundwater encountered at time of drilling.

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FIGURE B-5 b

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	B-5

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/23/2019	1/23/2019	1 of 2

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GROUND WATER (ft)
Marl M5	6"	36	10.0	⊻ n/a_

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
									2" - 3" AC
									FILL **SANDY CLAY (CL) & CLAYEY SAND (SC)**, damp, loose to medium dense, dark gray and olive, w/ occasional gravels
5	5								
10	0								
		S	1	9					- Becomes moist to wet
15	-5								

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FIGURE B-6 a

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	B-5

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/23/2019	1/23/2019	2 of 2

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GROUND WATER (ft)
Marl M5	6"	36	10.0	⊻ n/a

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		S	2	6			GS PI		
									CAPISTRANO FORMATION **SILT (ML) & FINE SANDY CLAY (CL)**, damp, very dense, dark gray, interbedded, w/ occasional cemented zones
25	-15	S	3	74/10"			GS PI		- Becomes Silty Sand (SM)
									- Very hard drilling
30	-20								- Cemented zone
35	-25	S	4	72/10"					
									Practical refusal @ 36 feet. No free groundwater encountered at time of drilling.

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FIGURE B-6 b

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	B-6

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/23/2019	1/23/2019	1 of 3

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GROUND WATER (ft)
Marl M5	6"	46	10.0	⊻ n/a_

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
									2" - 3" AC / 3" Class II Base
									<u>FILL</u> **CLAYEY SAND (SC) & SANDY CLAY (CL)**, moist, soft to medium stiff, olive & gray, mix
5	5								
									<u>WEATHERED CAPISTRANO FORMATION</u> **CLAYEY SAND (SC)**, moist, medium dense, light olive w/ yellow-brown iron oxide staining
10	0								
		S	1	25					
									- Gravels
15	-5								- Rock in tip of sampler, poor recovery
		S	2	14					

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FIGURE B-7 a

LOG OF TEST BORING

PROJECT NAME	PROJECT NUMBER	BORING
Dana Point Harbor Revitatilzation	2975	B-6

SITE LOCATION	START	FINISH	SHEET NO.
Dana Point	1/23/2019	1/23/2019	2 of 3

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Pacific Drilling	Hollow Stem Auger	G. Spaulding	

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/ELEV. GROUND WATER (ft)
Marl M5	6"	46	10.0	▼ n/a

SAMPLING METHOD	NOTES
SPT	

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		S	3	36					- Poor recovery
									CAPISTRANO FORMATION **SILTY SAND TO SAND (SP-SM)**, moist, very dense, light olive-gray w/ yellow iron oxide staining, interbedded
25	-15								
		S	4	72			GS		
									- Hard drilling
30	-20								
35	-25								
		S	5	87/10"					- w/ occasional dark gray clay chunks
									- Very hard drilling

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FIGURE B-7 b

LOG OF TEST BORING

PROJECT NAME: Dana Point Harbor Revitatilzation		PROJECT NUMBER: 2975	BORING: B-6	
SITE LOCATION: Dana Point	START: 1/23/2019	FINISH: 1/23/2019	SHEET NO.: 3 of 3	
DRILLING COMPANY: Pacific Drilling	DRILLING METHOD: Hollow Stem Auger	LOGGED BY: G. Spaulding	CHECKED BY:	
DRILLING EQUIPMENT: Marl M5	BORING DIA. (in): 6"	TOTAL DEPTH (ft): 46	GROUND ELEV (ft): 10.0	DEPTH/*ELEV.* GROUND WATER (ft): n/a_
SAMPLING METHOD: SPT	NOTES:			

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS/ft)	DRY DENSITY (pcf)	MOISTURE (%)	OTHER TESTS	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
									- Hard drilling **SAND (SM)**, moist, very dense, gray
45	-35		6	71			GS		
									Bottom of hole @ 46 feet. No free groundwater encountered at time of drilling.
50	-40								
55	-45								

TCG_METRIC_LOG(3) 2975.GPJ GDCLOGMT.GDT 8/14/19

TerraCosta Consulting Group
TerraCosta Consulting Group, Inc.
3890 Murphy Canyon Road, Suite 200
San Diego, California 92123

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

FIGURE B-7 c

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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OC Development Services
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Hadi Tabatabaee
BUILDING OFFICIAL

APPENDIX C

LABORATORY TEST RESULTS

TerraCosta Consulting Group

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
~~Permits: BNR21-0604~~

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Hadi Tabatabaee
BUILDING OFFICIAL

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.0	9.0	5.2	10.1	27.1	33.8	12.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
0.75"	98.0		
0.5"	95.1		
0.375"	92.4		
#4	89.0		
#10	83.8		
#20	78.1		
#40	73.7		
#100	55.4		
#200	46.6		

* (no specification provided)

Material Description

Clayey Sand, SC (#32282)

Atterberg Limits

PL= 25.4 LL= 43.7 PI= 18.3

Coefficients

D_{90}= 6.1846 D_{85}= 2.3697 D_{60}= 0.1911
D_{50}= 0.1066 D_{30}= 0.0164 D_{15}= 0.0029
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-7-6(6)

Remarks

Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.

Sample Number: B1-5 **Depth:** 25'

Date: 2/20/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: M. Gibson **Checked By:** L. Collins

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25' **Sample Number:** B1-5
Material Description: Clayey Sand, SC (#32282)
Date: 2/20/19 **PL:** 25.4 **LL:** 43.7 **PI:** 18.3
USCS Classification: SC **AASHTO Classification:** A-7-6(6)
Testing Remarks: Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.
Tested by: M. Gibson **Checked by:** L. Collins

Sieve Test Data

Sieve Opening Size	Percent Finer
1"	100.0
0.75"	98.0
0.5"	95.1
0.375"	92.4
#4	89.0
#10	83.8
#20	78.1
#40	73.7
#100	55.4
#200	46.6

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 83.8
Weight of hydrometer sample =70.33
Hygroscopic moisture correction:
- **Moist weight and tare =** 78.74
- **Dry weight and tare =** 77.14
- **Tare weight =** 26.27
- **Hygroscopic moisture =** 3.1%

Table of composite correction values:

Temp., deg. C:	19.1	20.3	20.9	21.3	22.6
Comp. corr.:	-3.5	-3.0	-2.8	-2.8	-2.5

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - .164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.7	38.0	34.8	0.0137	38.0	10.1	0.0434	42.7
2.00	19.7	33.0	29.8	0.0137	33.0	10.9	0.0319	36.6
5.00	19.7	30.0	26.8	0.0137	30.0	11.4	0.0207	32.9
15.00	19.6	24.5	21.2	0.0137	24.5	12.3	0.0124	26.1
30.00	19.6	22.0	18.7	0.0137	22.0	12.7	0.0089	23.0
60.00	19.7	19.5	16.3	0.0137	19.5	13.1	0.0064	20.0
120.00	19.7	18.0	14.8	0.0137	18.0	13.3	0.0046	18.1
250.00	19.7	16.0	12.8	0.0137	16.0	13.7	0.0032	15.7
1440.00	19.8	12.0	8.8	0.0137	12.0	14.3	0.0014	10.8

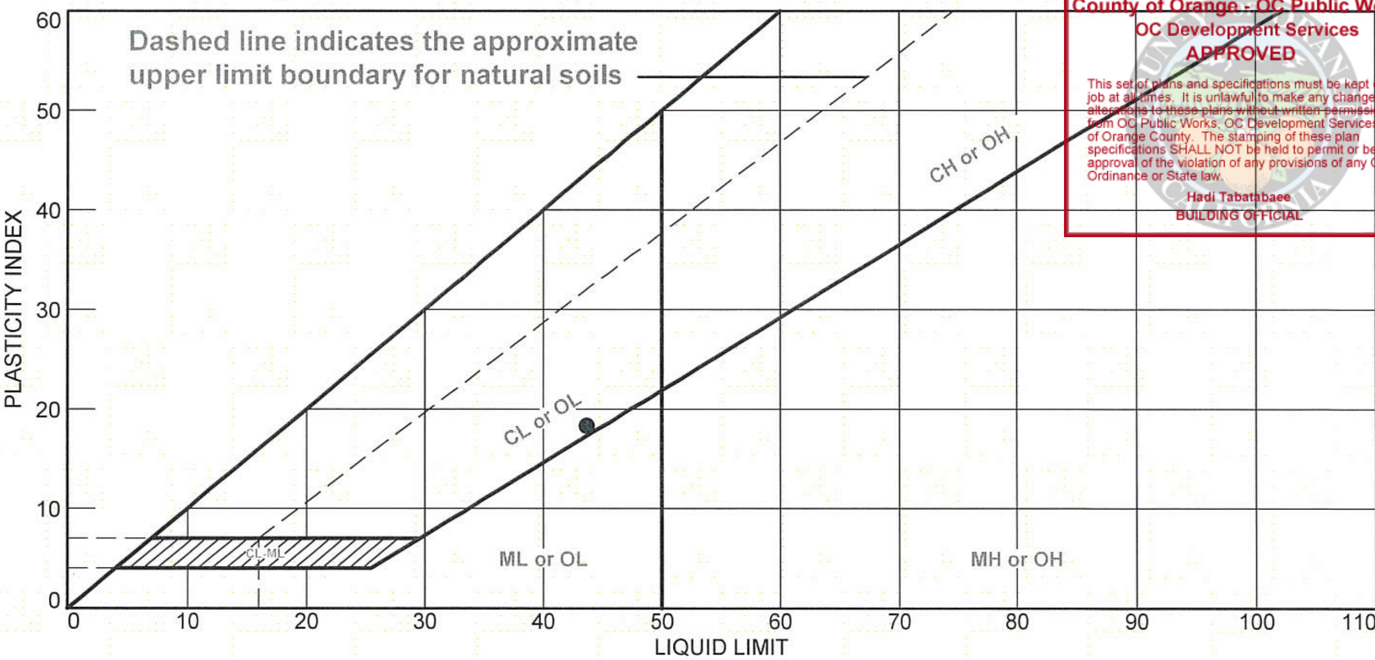
Fractional Components

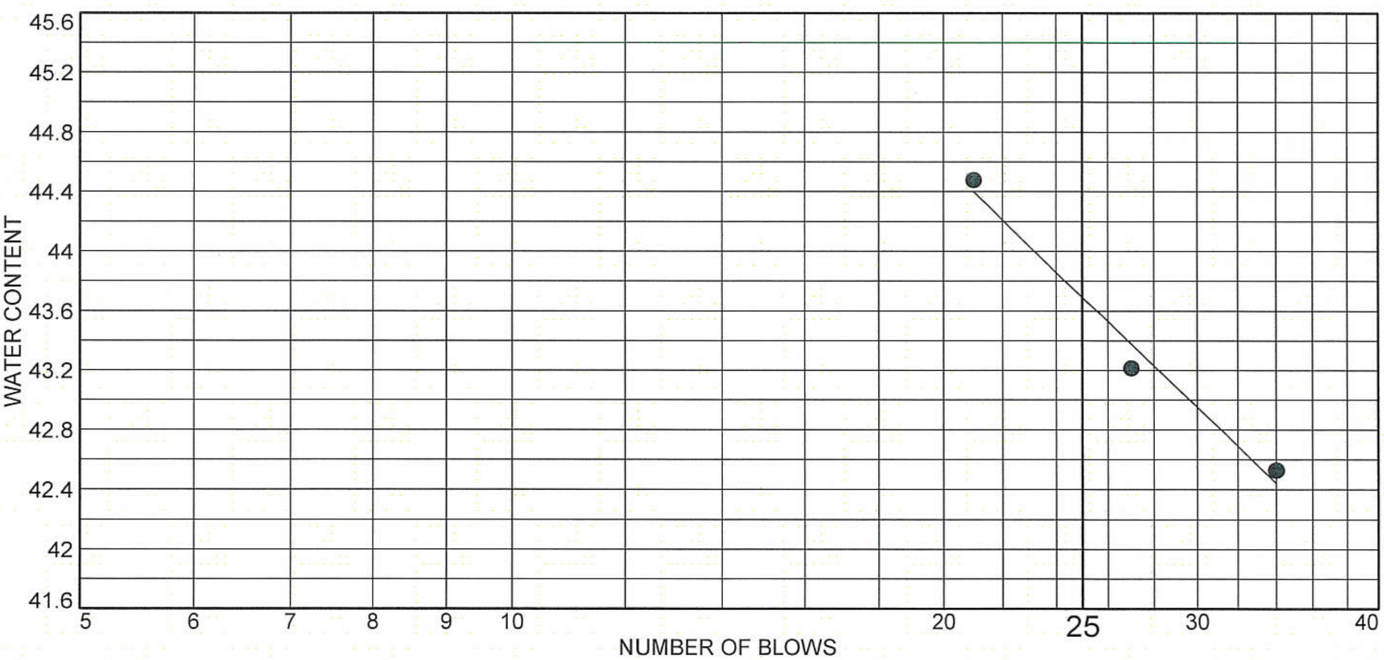
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	2.0	9.0	11.0	5.2	10.1	27.1	42.4	33.8	12.8	46.6

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0029	0.0064	0.0164	0.0379	0.1066	0.1911	1.1726	2.3697	6.1846	12.5588

Fineness Modulus
1.55

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Clayey Sand, SC (#32282)	43.7	25.4	18.3	73.7	46.6	SC

Project No. 5015190002.02 **Client:** TerraCosta Consulting Group, Inc.

Project: #2975 Dana Point Harbor Restoration

Sample Number: B1-5 **Depth:** 25'

Remarks:

amec

Figure

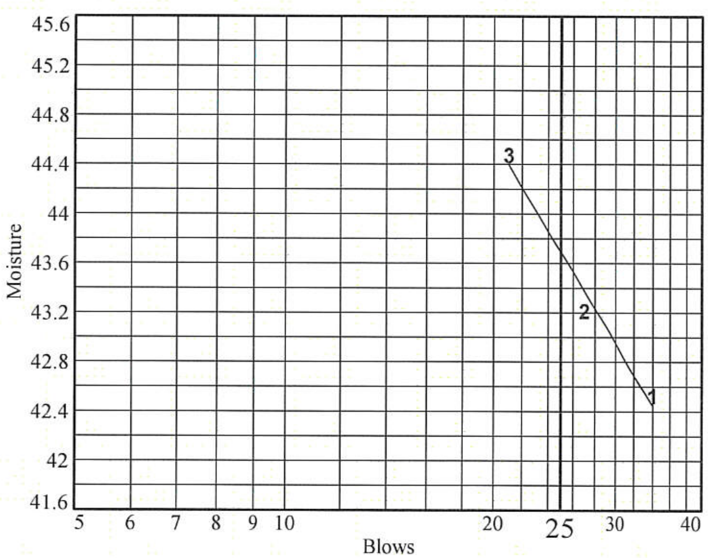
Tested By: M. Gibson **Checked By:** L. Collins

LIQUID AND PLASTIC LIMIT TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25' **Sample Number:** B1-5
Material Description: Clayey Sand, SC (#32282)
%<#40: 73.7 **%<#200:** 46.6 **USCS:** SC **AASHTO:** A-7-6(6)
Tested by: M. Gibson **Checked by:** L. Collins

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	24.29	26.02	24.17			
Dry+Tare	21.33	22.58	21.15			
Tare	14.37	14.62	14.36			
# Blows	34	27	21			
Moisture	42.5	43.2	44.5			



Liquid Limit= 43.7
Plastic Limit= 25.4
Plasticity Index= 18.3

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	27.68	27.51			
Dry+Tare	26.35	26.19			
Tare	21.11	21.01			
Moisture	25.4	25.5			

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	7.4	9.9	4.6	15.7	40.7	21.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
0.75"	92.6		
0.5"	89.6		
0.375"	86.8		
#4	82.7		
#10	78.1		
#20	70.8		
#40	62.4		
#60	47.9		
#100	31.3		
#200	21.7		

* (no specification provided)

Material Description

Silty Sand w/ Gravel, SM (#32283)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 13.6520 D_{85}= 7.6417 D_{60}= 0.3801
D_{50}= 0.2664 D_{30}= 0.1421 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Sample Number: B2-3 **Depth:** 20'

Date: 02/12/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: L. Collins **Checked By:** M. Farr

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 20' **Sample Number:** B2-3
Material Description: Silty Sand w/ Gravel, SM (#32283)
Date: 02/12/19
USCS Classification: SM
Tested by: L. Collins **Checked by:** M. Farr

Sieve Test Data

Sieve Opening Size	Percent Finer
1"	100.0
0.75"	92.6
0.5"	89.6
0.375"	86.8
#4	82.7
#10	78.1
#20	70.8
#40	62.4
#60	47.9
#100	31.3
#200	21.7

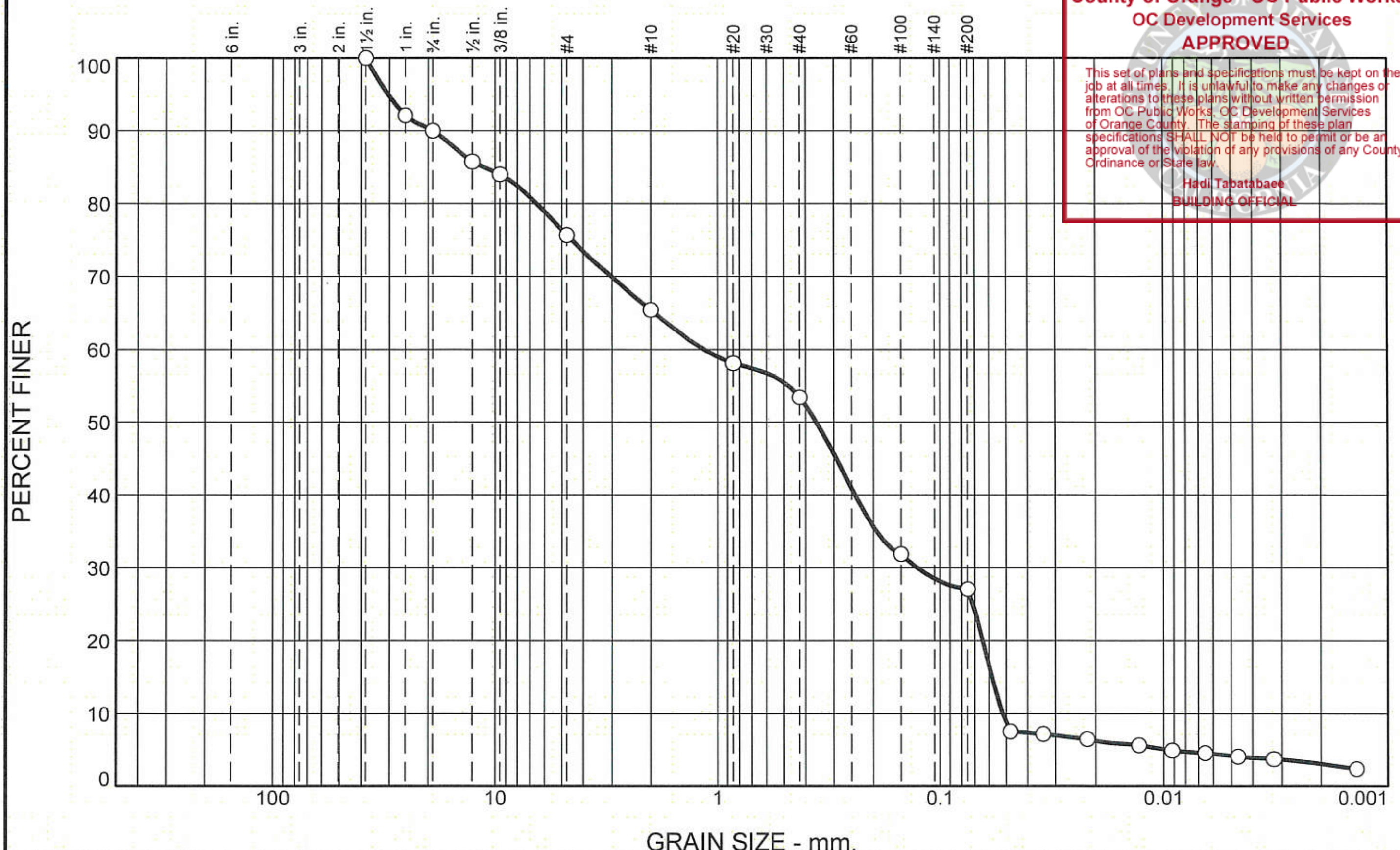
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	7.4	9.9	17.3	4.6	15.7	40.7	61.0			21.7

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.1421	0.1989	0.2664	0.3801	2.6913	7.6417	13.6520	21.3081

Fineness Modulus
2.32

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	10.0	14.3	10.3	12.0	26.3	24.0	3.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5"	100.0		
1"	92.1		
0.75"	90.0		
0.5"	85.8		
0.375"	84.0		
#4	75.7		
#10	65.4		
#20	58.1		
#40	53.4		
#100	31.9		
#200	27.1		

* (no specification provided)

Material Description

Clayey Sand w/ Gravel, SC (#32284)

Atterberg Limits

PL= 19.6 LL= 36.5 PI= 16.9

Coefficients

D_{90}= 19.0500 D_{85}= 11.2887 D_{60}= 1.1497
D_{50}= 0.3579 D_{30}= 0.1263 D_{15}= 0.0581
D_{10}= 0.0519 C_u= 22.15 C_c= 0.27

Classification

USCS= SC AASHTO= A-2-6(1)

Remarks

Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.

Sample Number: B2-4 **Depth:** 25'

Date: 1/23/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: M. Gibson **Checked By:** L. Collins

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25' **Sample Number:** B2-4
Material Description: Clayey Sand w/ Gravel, SC (#32284)
Date: 1/23/19 **PL:** 19.6 **LL:** 36.5 **PI:** 16.9
USCS Classification: SC **AASHTO Classification:** A-2-6(1)
Testing Remarks: Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.
Tested by: M. Gibson **Checked by:** L. Collins

Sieve Test Data

Sieve Opening Size	Percent Finer
1.5"	100.0
1"	92.1
0.75"	90.0
0.5"	85.8
0.375"	84.0
#4	75.7
#10	65.4
#20	58.1
#40	53.4
#100	31.9
#200	27.1

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 65.4
Weight of hydrometer sample =194.09
Hygroscopic moisture correction:
Moist weight and tare = 83.21
Dry weight and tare = 81.57
Tare weight = 25.85
Hygroscopic moisture = 2.9%
Table of composite correction values:

Temp., deg. C:	19.1	20.3	20.9	21.3	22.6
Comp. corr.:	-3.5	-3.0	-2.8	-2.8	-2.5

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - .164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.6	25.0	21.7	0.0137	25.0	12.2	0.0479	7.5
2.00	19.6	24.0	20.7	0.0137	24.0	12.4	0.0341	7.2
5.00	19.6	22.0	18.7	0.0137	22.0	12.7	0.0218	6.5
15.00	19.6	19.5	16.2	0.0137	19.5	13.1	0.0128	5.6
30.00	19.6	17.5	14.2	0.0137	17.5	13.4	0.0092	4.9
60.00	19.6	16.5	13.2	0.0137	16.5	13.6	0.0065	4.6
120.00	19.7	15.0	11.8	0.0137	15.0	13.8	0.0047	4.1
250.00	19.8	14.0	10.8	0.0137	14.0	14.0	0.0032	3.7
1440.00	19.9	10.0	6.8	0.0137	10.0	14.7	0.0014	2.4

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	10.0	14.3	24.3	10.3	12.0	26.3	48.6	24.0	3.1	27.1

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0096	0.0519	0.0581	0.0641	0.1263	0.2415	0.3579	1.1497	6.5105	11.2887	19.0500	30.4481

Fineness Modulus	C_u	C_c
2.89	22.15	0.27

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

LIQUID AND PLASTIC LIMITS TEST REPORT

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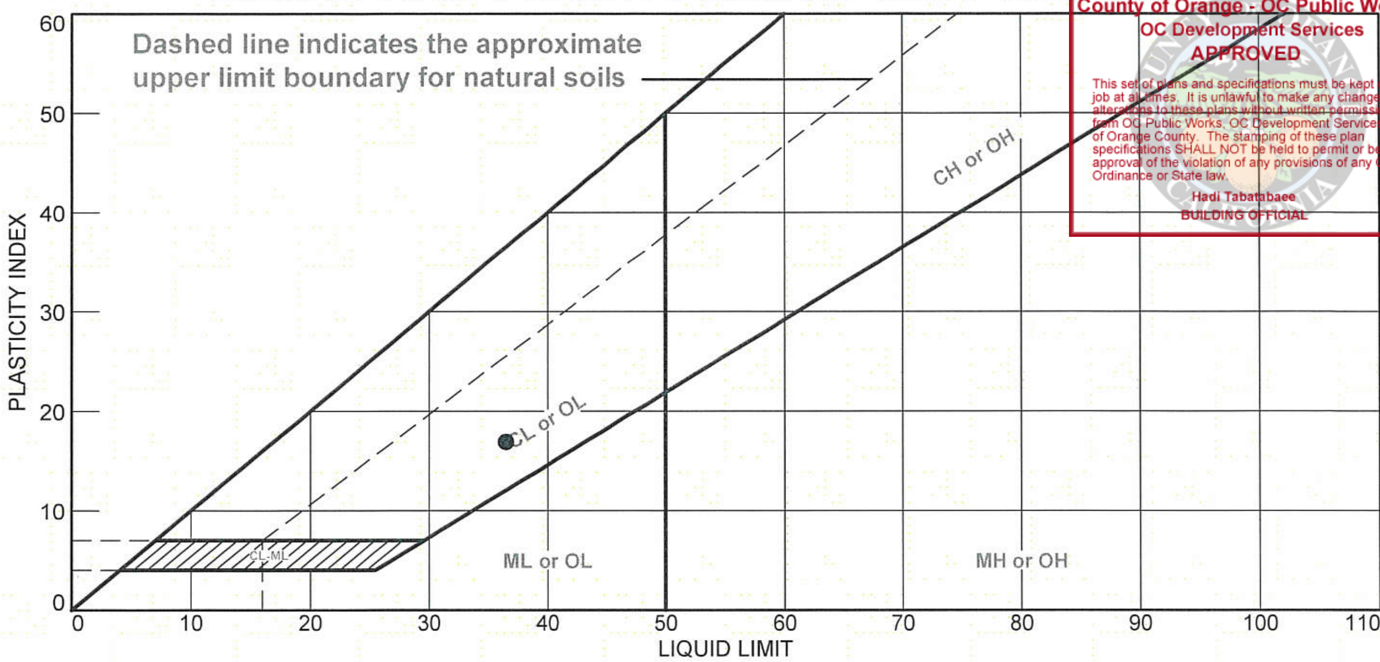


	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Clayey Sand w/ Gravel, SC (#32284)	36.5	19.6	16.9	53.4	27.1	SC

Project No. 5015190002.02 **Client:** TerraCosta Consulting Group, Inc.

Project: #2975 Dana Point Harbor Restoration

Sample Number: B2-4 **Depth:** 25'

Remarks:

amec

Figure

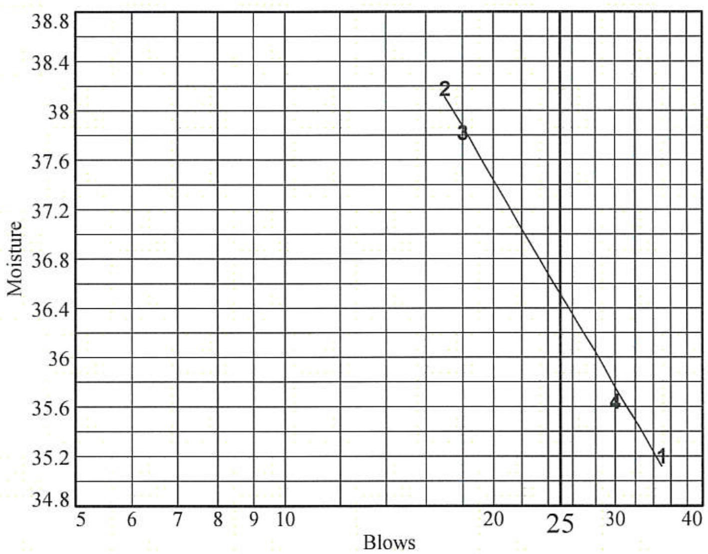
Tested By: M. Gibson **Checked By:** L. Collins

LIQUID AND PLASTIC LIMIT TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25' **Sample Number:** B2-4
Material Description: Clayey Sand w/ Gravel, SC (#32284)
%<#40: 53.4 **%<#200:** 27.1 **USCS:** SC **AASHTO:** A-2-6(1)
Tested by: M. Gibson **Checked by:** L. Collins

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	26.34	25.86	26.00	24.34		
Dry+Tare	23.27	22.71	22.8	21.72		
Tare	14.55	14.46	14.34	14.37		
# Blows	35	17	18	30		
Moisture	35.2	38.2	37.8	35.6		



Liquid Limit= 36.5
Plastic Limit= 19.6
Plasticity Index= 16.9

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	21.61	24.73			
Dry+Tare	20.54	23.68			
Tare	15.17	18.22			
Moisture	19.9	19.2			

Particle Size Distribution Report

County of Orange - OC Public Works
OC Development Services
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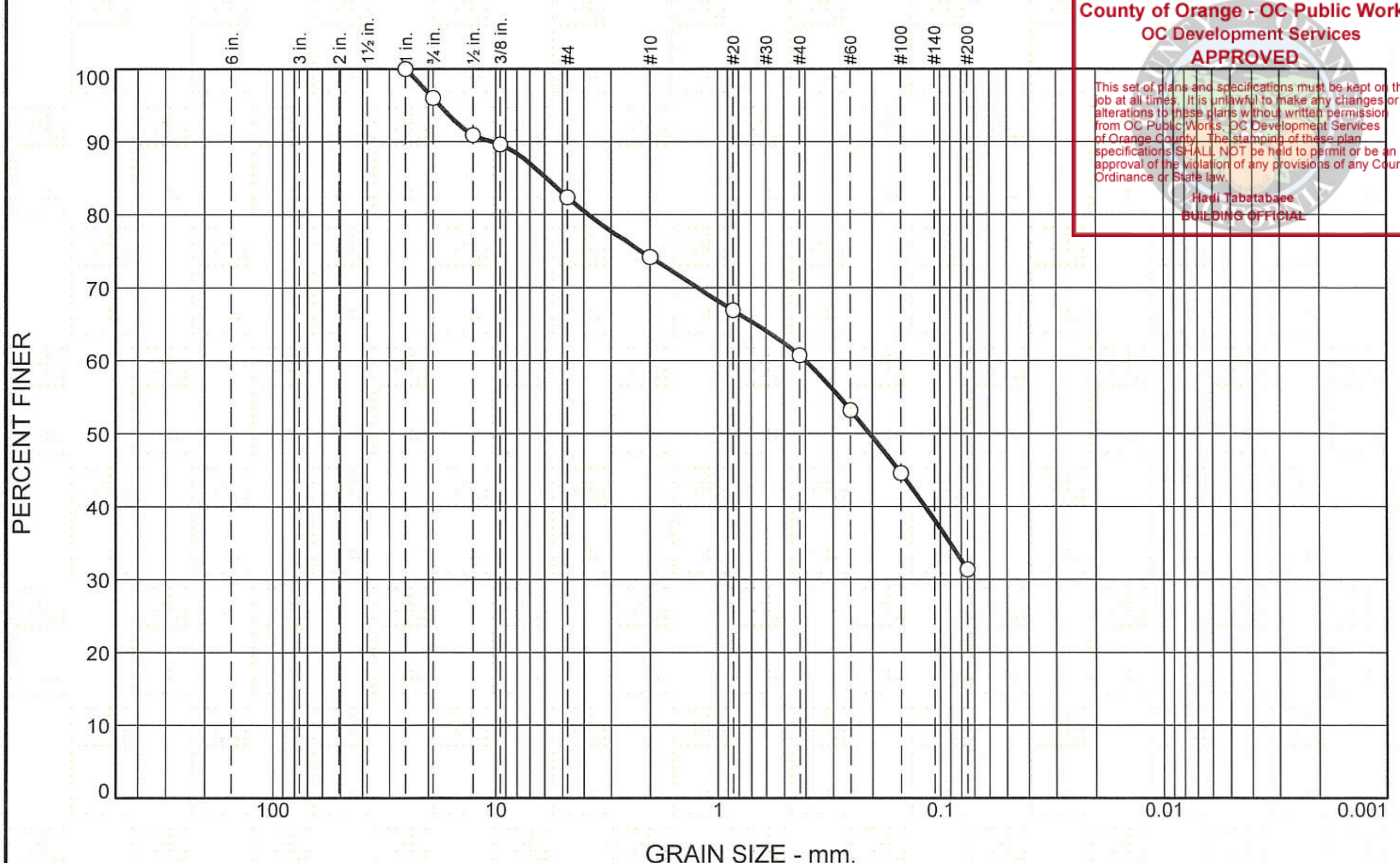


% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.0	13.6	8.2	13.5	29.3	31.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
0.75"	96.0		
0.5"	90.9		
0.375"	89.6		
#4	82.4		
#10	74.2		
#20	66.9		
#40	60.7		
#60	53.2		
#100	44.6		
#200	31.4		

* (no specification provided)

Material Description

Silty Sand, SM (#32285)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 10.4928 D_{85}= 5.8899 D_{60}= 0.4008
D_{50}= 0.2052 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Sample Number: B2-5 **Depth:** 30'

Date: 2/12/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: L. Collins **Checked By:** M. Farr

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 30'
Sample Number: B2-5
Material Description: Silty Sand, SM (#32285)
Date: 2/12/19
USCS Classification: SM
Tested by: L. Collins
Checked by: M. Farr

Sieve Test Data

Sieve Opening Size	Percent Finer
1"	100.0
0.75"	96.0
0.5"	90.9
0.375"	89.6
#4	82.4
#10	74.2
#20	66.9
#40	60.7
#60	53.2
#100	44.6
#200	31.4

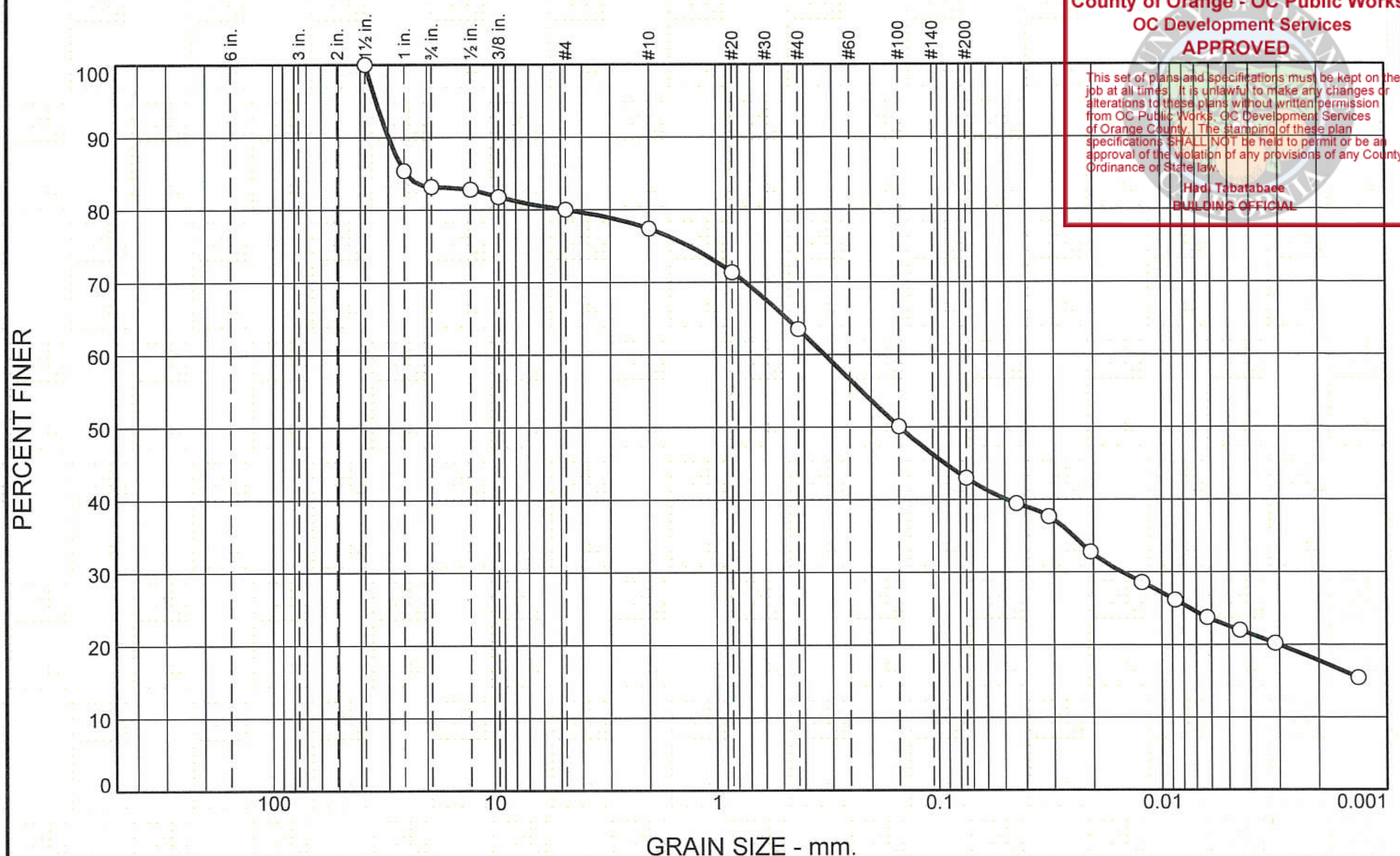
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	4.0	13.6	17.6	8.2	13.5	29.3	51.0			31.4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
					0.1169	0.2052	0.4008	3.8061	5.8899	10.4928	17.7952

Fineness Modulus
2.22

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	16.8	3.2	2.6	13.9	20.5	25.2	17.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5"	100.0		
1"	85.4		
0.75"	83.2		
0.5"	82.8		
0.375"	81.8		
#4	80.0		
#10	77.4		
#20	71.4		
#40	63.5		
#100	50.1		
#200	43.0		

* (no specification provided)

Material Description

Clayey Sand, SC (#32286)

Atterberg Limits

PL= 18.3 LL= 40.4 PI= 22.1

Coefficients

D_{90}= 29.9015 D_{85}= 24.8523 D_{60}= 0.3245
D_{50}= 0.1487 D_{30}= 0.0149 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-6(5)

Remarks

Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.

Sample Number: B3-4 **Depth:** 20'

Date: 1/23/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: M. Gibson **Checked By:** L. Collins

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 20' **Sample Number:** B3-4
Material Description: Clayey Sand, SC (#32286)
Date: 1/23/19 **PL:** 18.3 **LL:** 40.4 **PI:** 22.1
USCS Classification: SC **AASHTO Classification:** A-6(5)
Testing Remarks: Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.
Tested by: M. Gibson **Checked by:** L. Collins

Sieve Test Data

Sieve Opening Size	Percent Finer
1.5"	100.0
1"	85.4
0.75"	83.2
0.5"	82.8
0.375"	81.8
#4	80.0
#10	77.4
#20	71.4
#40	63.5
#100	50.1
#200	43.0

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 77.4
Weight of hydrometer sample =66.01
Hygroscopic moisture correction:
Moist weight and tare = 76.75
Dry weight and tare = 75.30
Tare weight = 25.42
Hygroscopic moisture = 2.9%
Table of composite correction values:

Temp., deg. C:	19.1	20.3	20.9	21.3	22.6
Comp. corr.:	-3.5	-3.0	-2.8	-2.8	-2.5

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - .164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.6	36.0	32.7	0.0137	36.0	10.4	0.0442	39.5
2.00	19.6	34.5	31.2	0.0137	34.5	10.6	0.0316	37.7
5.00	19.6	30.5	27.2	0.0137	30.5	11.3	0.0206	32.8
15.00	19.6	27.0	23.7	0.0137	27.0	11.9	0.0122	28.6
30.00	19.6	25.0	21.7	0.0137	25.0	12.2	0.0087	26.2
60.00	19.6	23.0	19.7	0.0137	23.0	12.5	0.0063	23.8
120.00	19.7	21.5	18.3	0.0137	21.5	12.8	0.0045	22.0
250.00	19.7	20.0	16.8	0.0137	20.0	13.0	0.0031	20.2
1440.00	19.8	16.0	12.8	0.0137	16.0	13.7	0.0013	15.4

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

Fractional Components

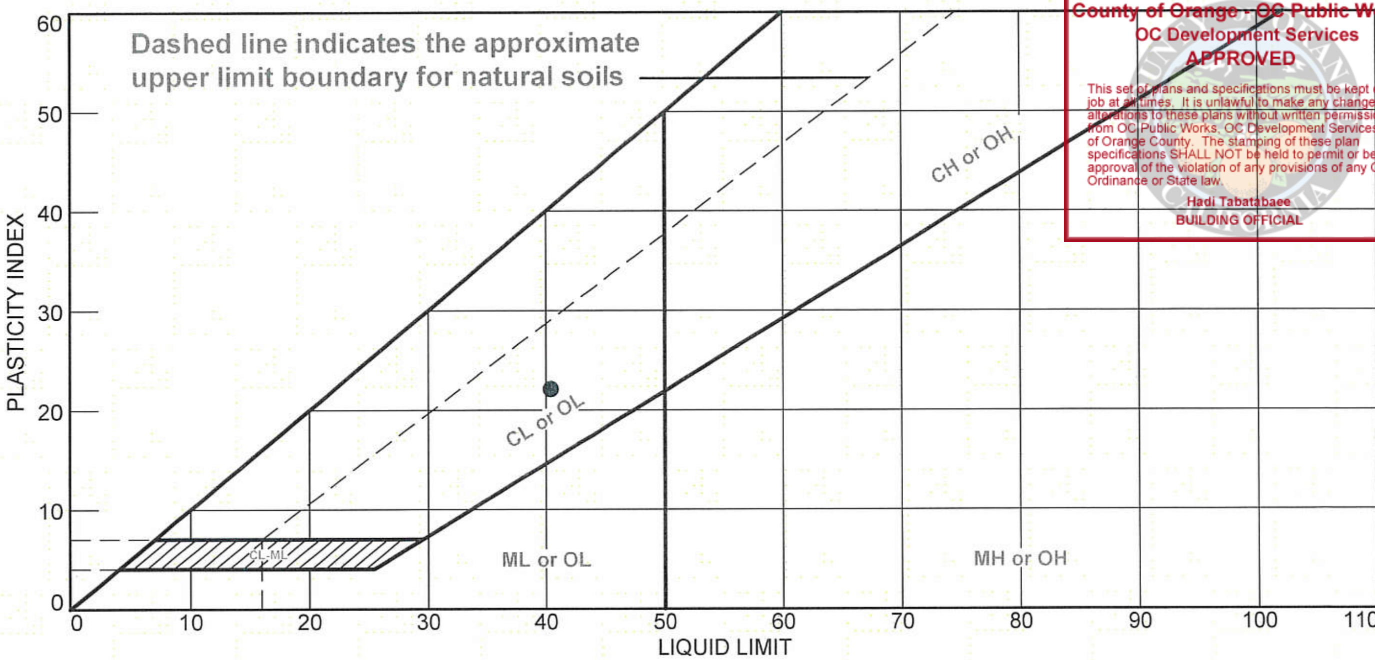
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	16.8	3.2	20.0	2.6	13.9	20.5	37.0	25.2	17.8	43.0

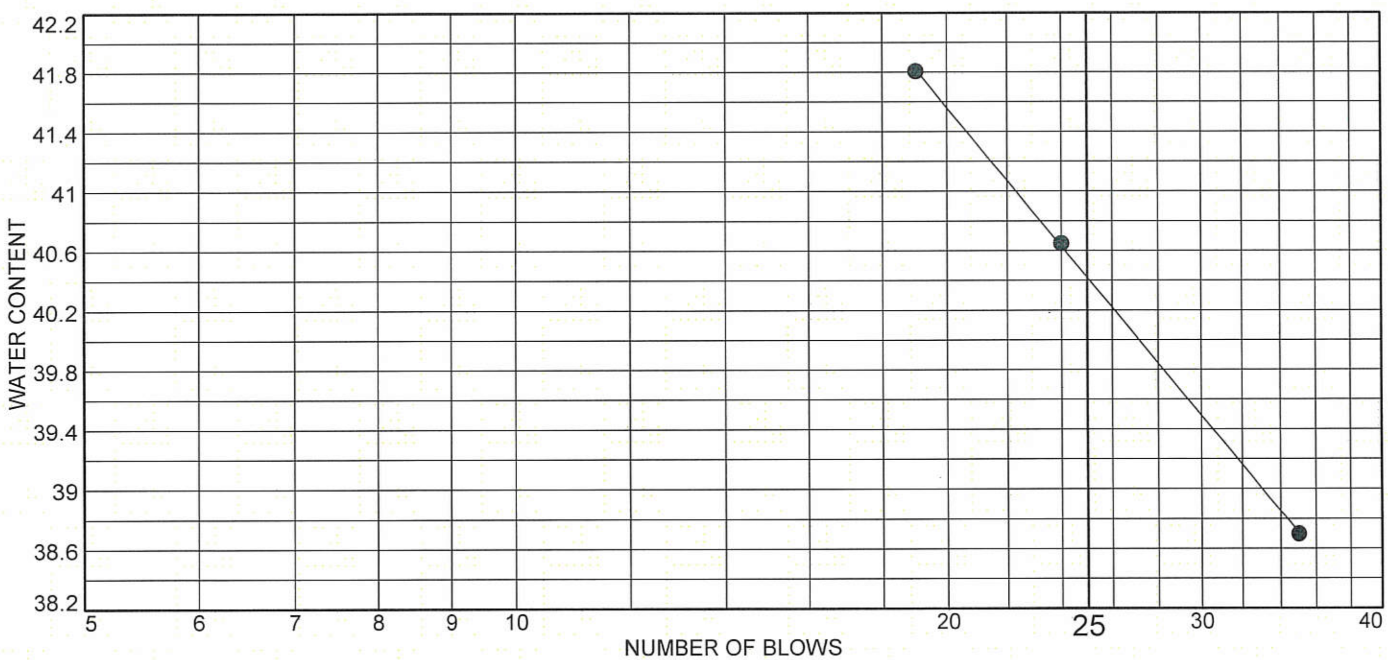
County of Orange - OC Public Works
OC Development Services
APPROVED
This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works, OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law.
Hadi Tabatabaee
BUILDING OFFICIAL

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0030	0.0149	0.0491	0.1487	0.3245	4.7500	24.8523	29.9015	33.9663

Fineness Modulus
2.26

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Clayey Sand, SC (#32286)	40.4	18.3	22.1	63.5	43.0	SC

Project No. 5015190002.02 **Client:** TerraCosta Consulting Group, Inc.

Project: #2975 Dana Point Harbor Restoration

Sample Number: B3-4 **Depth:** 20'

amec

Remarks:

Figure

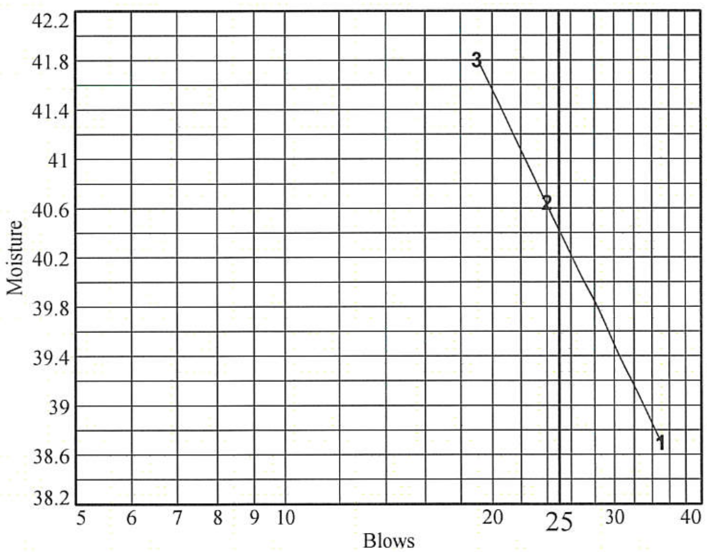
Tested By: M. Gibson **Checked By:** L. Collins

LIQUID AND PLASTIC LIMIT TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 20' **Sample Number:** B3-4
Material Description: Clayey Sand, SC (#32286)
%<#40: 63.5 **%<#200:** 43.0 **USCS:** SC **AASHTO:** A-6(5)
Tested by: M. Gibson **Checked by:** L. Collins

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	25.70	25.71	27.04			
Dry+Tare	22.55	22.45	23.29			
Tare	14.41	14.43	14.32			
# Blows	35	24	19			
Moisture	38.7	40.6	41.8			



Liquid Limit= 40.4
Plastic Limit= 18.3
Plasticity Index= 22.1

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	25.69	27.31			
Dry+Tare	24.44	26.37			
Tare	17.77	21.09			
Moisture	18.7	17.8			

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

Particle Size Distribution Report

County of Orange - OC Public Works
OC Development Services
APPROVED
This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works, OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law.
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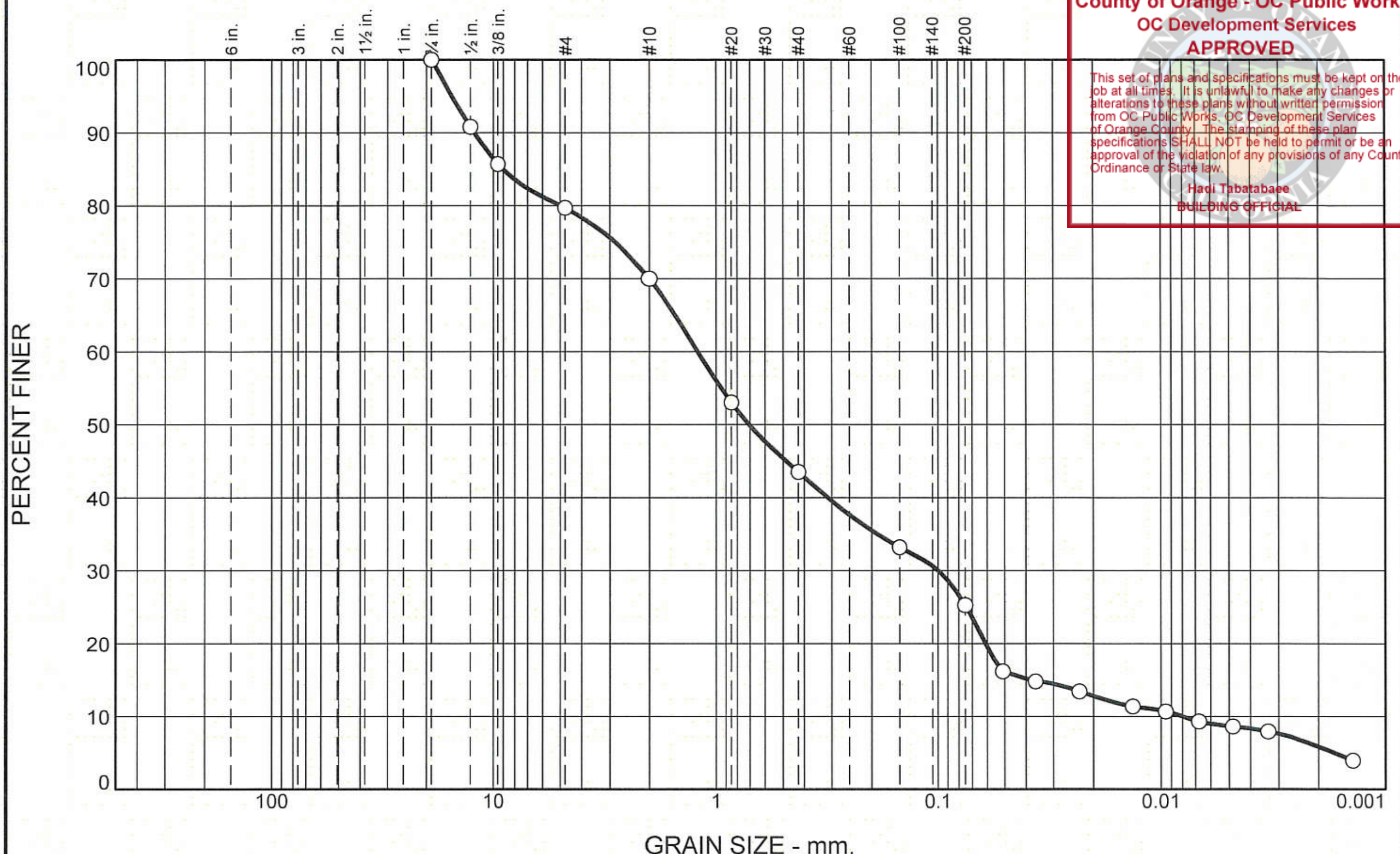


% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	20.3	9.7	26.5	18.2	19.5	5.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75"	100.0		
0.5"	90.8		
0.375"	85.7		
#4	79.7		
#10	70.0		
#20	53.0		
#40	43.5		
#100	33.2		
#200	25.3		

* (no specification provided)

Material Description

Silty Sand w/ Gravel, SM (#32287)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 12.2079 D_{85}= 9.0481 D_{60}= 1.2115
D_{50}= 0.7066 D_{30}= 0.0998 D_{15}= 0.0381
D_{10}= 0.0080 C_u= 151.05 C_c= 1.02

Classification

USCS= SM AASHTO=

Remarks

Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.

Sample Number: B3-5 **Depth:** 25'

Date: 1/23/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: M. Gibson **Checked By:** L. Collins

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25' **Sample Number:** B3-5
Material Description: Silty Sand w/ Gravel, SM (#32287)
Date: 1/23/19
USCS Classification: SM
Testing Remarks: Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.
Tested by: M. Gibson **Checked by:** L. Collins

Sieve Test Data

Sieve Opening Size	Percent Finer
0.75"	100.0
0.5"	90.8
0.375"	85.7
#4	79.7
#10	70.0
#20	53.0
#40	43.5
#100	33.2
#200	25.3

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 70.0
Weight of hydrometer sample =51.24
Hygroscopic moisture correction:
- **Moist weight and tare =** 34.28
- **Dry weight and tare =** 34.21
- **Tare weight =** 26.23
- **Hygroscopic moisture =** 0.9%

Table of composite correction values:

Temp., deg. C:	19.1	20.3	20.9	21.3	22.6
Comp. corr.:	-3.5	-3.0	-2.8	-2.8	-2.5

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - .164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.7	15.0	11.8	0.0137	15.0	13.8	0.0509	16.2
2.00	19.7	14.0	10.8	0.0137	14.0	14.0	0.0362	14.8
5.00	19.7	13.0	9.8	0.0137	13.0	14.2	0.0231	13.4
15.00	19.7	11.5	8.3	0.0137	11.5	14.4	0.0134	11.4
30.00	19.7	11.0	7.7	0.0137	11.0	14.5	0.0095	10.7
60.00	19.7	10.0	6.7	0.0137	10.0	14.7	0.0068	9.3
120.00	19.7	9.5	6.2	0.0137	9.5	14.7	0.0048	8.6
250.00	19.7	9.0	5.7	0.0137	9.0	14.8	0.0033	7.9
1440.00	19.9	6.0	2.8	0.0137	6.0	15.3	0.0014	3.9

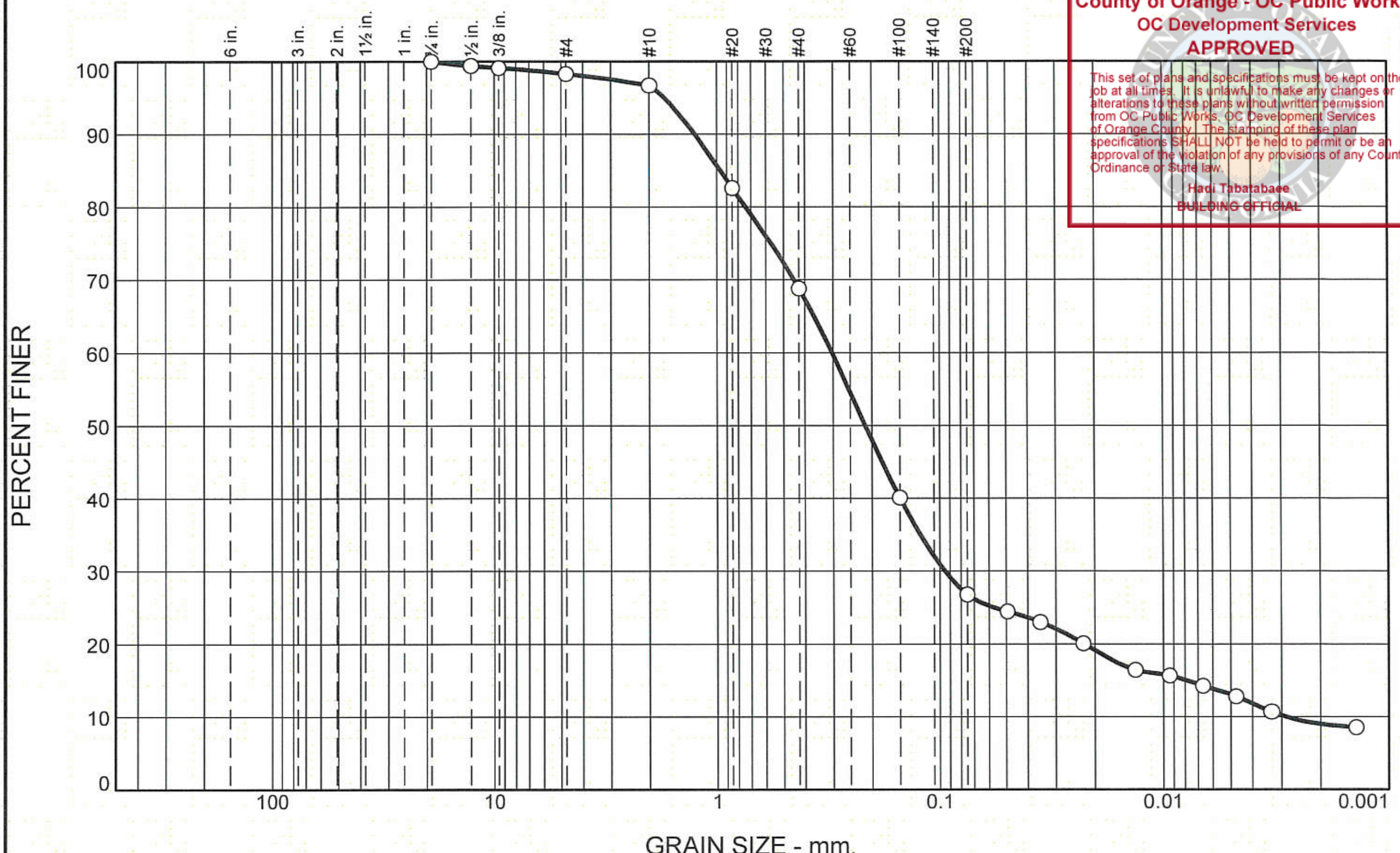
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	20.3	20.3	9.7	26.5	18.2	54.4	19.5	5.8	25.3

D_{5}	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0017	0.0080	0.0381	0.0610	0.0998	0.3121	0.7066	1.2115	4.9661	9.0481	12.2079	15.3933

Fineness Modulus	C_u	C_c
2.82	151.05	1.02

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.7	1.6	27.9	42.0	17.8	9.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75"	100.0		
0.5"	99.4		
0.375"	99.1		
#4	98.3		
#10	96.7		
#20	82.6		
#40	68.8		
#100	40.1		
#200	26.8		

* (no specification provided)

Material Description

Silty Sand, SM (#32288)

Atterberg Limits

PL= NP LL= PI=

Coefficients

D_{90}= 1.2527 D_{85}= 0.9627 D_{60}= 0.3031
D_{50}= 0.2141 D_{30}= 0.0949 D_{15}= 0.0079
D_{10}= 0.0029 C_u= 105.62 C_c= 10.35

Classification

USCS= AASHTO=

Remarks

Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.

Sample Number: B4-3 **Depth:** 25'

Date: 2/23/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: J. Iacovera **Checked By:** L. Collins

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25' **Sample Number:** B4-3
Material Description: Silty Sand, SM (#32288)
Date: 2/23/19 **PL:** NP
Testing Remarks: Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.
Tested by: J. Iacovera **Checked by:** L. Collins

Sieve Test Data

Sieve Opening Size	Percent Finer
0.75"	100.0
0.5"	99.4
0.375"	99.1
#4	98.3
#10	96.7
#20	82.6
#40	68.8
#100	40.1
#200	26.8

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 96.7
Weight of hydrometer sample =67.5
Hygroscopic moisture correction:
Moist weight and tare = 88.74
Dry weight and tare = 87.46
Tare weight = 25.30
Hygroscopic moisture = 2.1%
Table of composite correction values:

Temp., deg. C:	19.1	20.3	20.9	21.3	22.6
Comp. corr.:	-3.5	-3.0	-2.8	-2.8	-2.5

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - .164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.7	20.0	16.8	0.0137	20.0	13.0	0.0494	24.5
2.00	19.7	19.0	15.8	0.0137	19.0	13.2	0.0352	23.0
5.00	19.7	17.0	13.8	0.0137	17.0	13.5	0.0225	20.1
15.00	19.7	14.5	11.3	0.0137	14.5	13.9	0.0132	16.4
30.00	19.6	14.0	10.7	0.0137	14.0	14.0	0.0094	15.7
60.00	19.7	13.0	9.8	0.0137	13.0	14.2	0.0067	14.3
120.00	19.7	12.0	8.8	0.0137	12.0	14.3	0.0047	12.8
250.00	19.8	10.5	7.3	0.0137	10.5	14.6	0.0033	10.7
1440.00	19.9	9.0	5.8	0.0137	9.0	14.8	0.0014	8.5

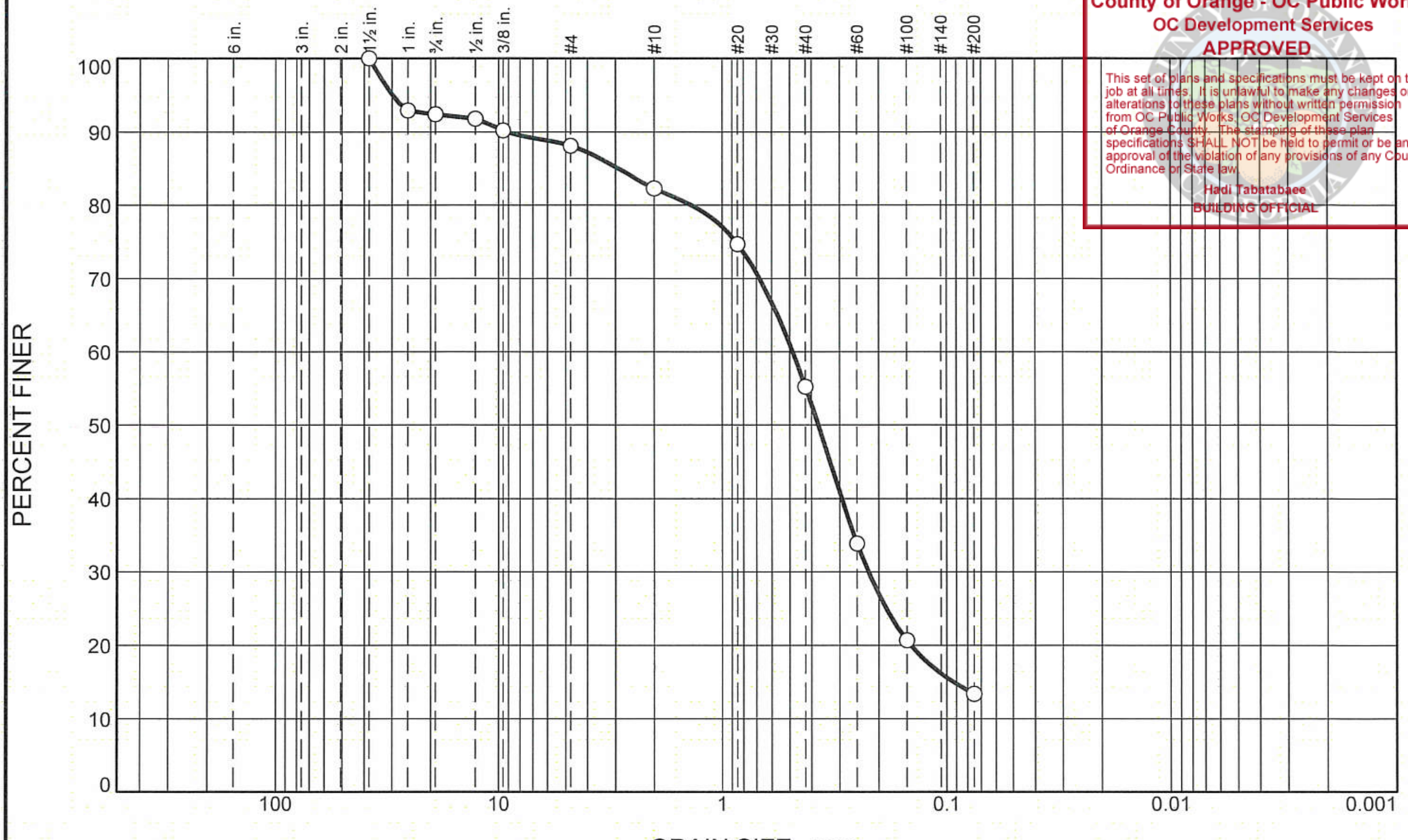
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.7	1.7	1.6	27.9	42.0	71.5	17.8	9.0	26.8

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0029	0.0079	0.0222	0.0949	0.1494	0.2141	0.3031	0.7401	0.9627	1.2527	1.7161

Fineness Modulus	C_u	C_c
1.41	105.62	10.35

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	7.6	4.3	5.8	27.1	41.8	13.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5"	100.0		
1"	92.9		
0.75"	92.4		
0.5"	91.8		
0.375"	90.2		
#4	88.1		
#10	82.3		
#20	74.7		
#40	55.2		
#60	33.9		
#100	20.7		
#200	13.4		

* (no specification provided)

Material Description

Silty Sand, SM (#32289)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 9.1294 D_{85}= 2.9091 D_{60}= 0.4843
D_{50}= 0.3734 D_{30}= 0.2221 D_{15}= 0.0929
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Sample Number: B4-4 **Depth:** 30'

Date: 2/12/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration

Project No: 5015190002.02 **Figure**

Tested By: L. Collins **Checked By:** M. Farr

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 30' **Sample Number:** B4-4
Material Description: Silty Sand, SM (#32289)
Date: 2/12/19
USCS Classification: SM
Tested by: L. Collins **Checked by:** M. Farr

Sieve Test Data

Sieve Opening Size	Percent Finer
1.5"	100.0
1"	92.9
0.75"	92.4
0.5"	91.8
0.375"	90.2
#4	88.1
#10	82.3
#20	74.7
#40	55.2
#60	33.9
#100	20.7
#200	13.4

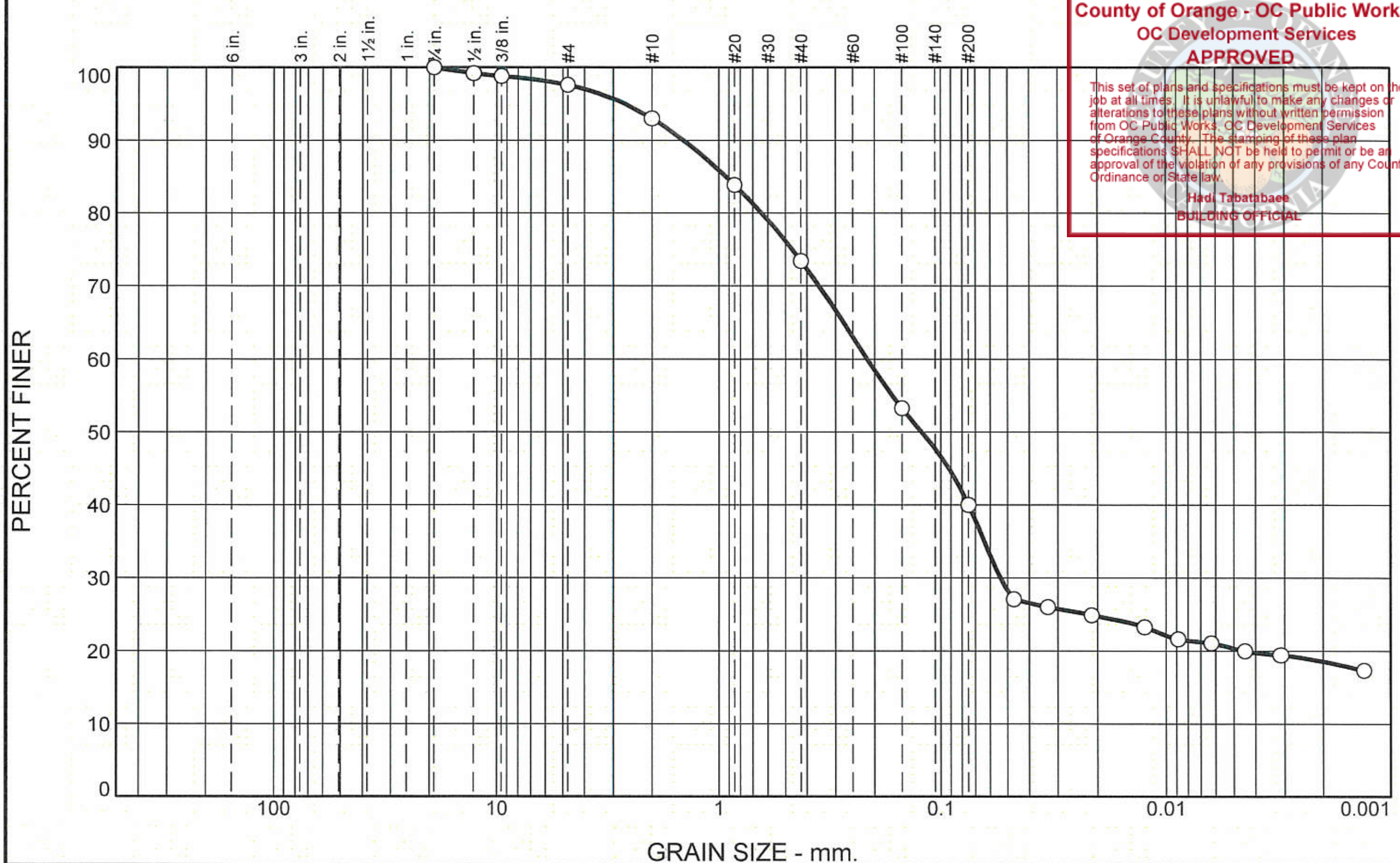
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	7.6	4.3	11.9	5.8	27.1	41.8	74.7			13.4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0929	0.1438	0.2221	0.2934	0.3734	0.4843	1.3674	2.9091	9.1294	29.8650

Fineness Modulus
2.39

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.4	4.6	19.6	33.4	21.4	18.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75"	100.0		
0.5"	99.2		
0.375"	98.8		
#4	97.6		
#10	93.0		
#20	83.9		
#40	73.4		
#100	53.3		
#200	40.0		

* (no specification provided)

Material Description

Clayey Sand, SC (#32290)

Atterberg Limits

PL= 15.8 LL= 36.5 PI= 20.7

Coefficients

D_{90}= 1.4386 D_{85}= 0.9268 D_{60}= 0.2155
D_{50}= 0.1220 D_{30}= 0.0539 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-6(3)

Remarks

Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.

Sample Number: B5-2 **Depth:** 20'

Date: 2/23/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: J. Iacovera **Checked By:** L. Collins

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 20' **Sample Number:** B5-2
Material Description: Clayey Sand, SC (#32290)
Date: 2/23/19 **PL:** 15.8 **LL:** 36.5 **PI:** 20.7
USCS Classification: SC **AASHTO Classification:** A-6(3)
Testing Remarks: Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.
Tested by: J. Iacovera **Checked by:** L. Collins

Sieve Test Data

Sieve Opening Size	Percent Finer
0.75"	100.0
0.5"	99.2
0.375"	98.8
#4	97.6
#10	93.0
#20	83.9
#40	73.4
#100	53.3
#200	40.0

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 93.0
Weight of hydrometer sample =87.04
Hygroscopic moisture correction:
Moist weight and tare = 84.70
Dry weight and tare = 83.27
Tare weight = 25.38
Hygroscopic moisture = 2.5%
Table of composite correction values:

Temp., deg. C:	19.1	20.3	20.9	21.3	22.6
Comp. corr.:	-3.5	-3.0	-2.8	-2.8	-2.5

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - .164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.7	28.0	24.8	0.0137	28.0	11.7	0.0469	27.1
2.00	19.7	27.0	23.8	0.0137	27.0	11.9	0.0334	26.0
5.00	19.7	26.0	22.8	0.0137	26.0	12.0	0.0212	24.9
15.00	19.7	24.5	21.3	0.0137	24.5	12.3	0.0124	23.3
30.00	19.7	23.0	19.8	0.0137	23.0	12.5	0.0088	21.6
60.00	19.7	22.5	19.3	0.0137	22.5	12.6	0.0063	21.1
120.00	19.7	21.5	18.3	0.0137	21.5	12.8	0.0045	20.0
250.00	19.7	21.0	17.8	0.0137	21.0	12.9	0.0031	19.4
1440.00	19.9	19.0	15.8	0.0137	19.0	13.2	0.0013	17.3

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.4	2.4	4.6	19.6	33.4	57.6	21.4	18.6	40.0

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0045	0.0539	0.0750	0.1220	0.2155	0.6393	0.9268	1.4386	2.6520

Fineness Modulus
1.22

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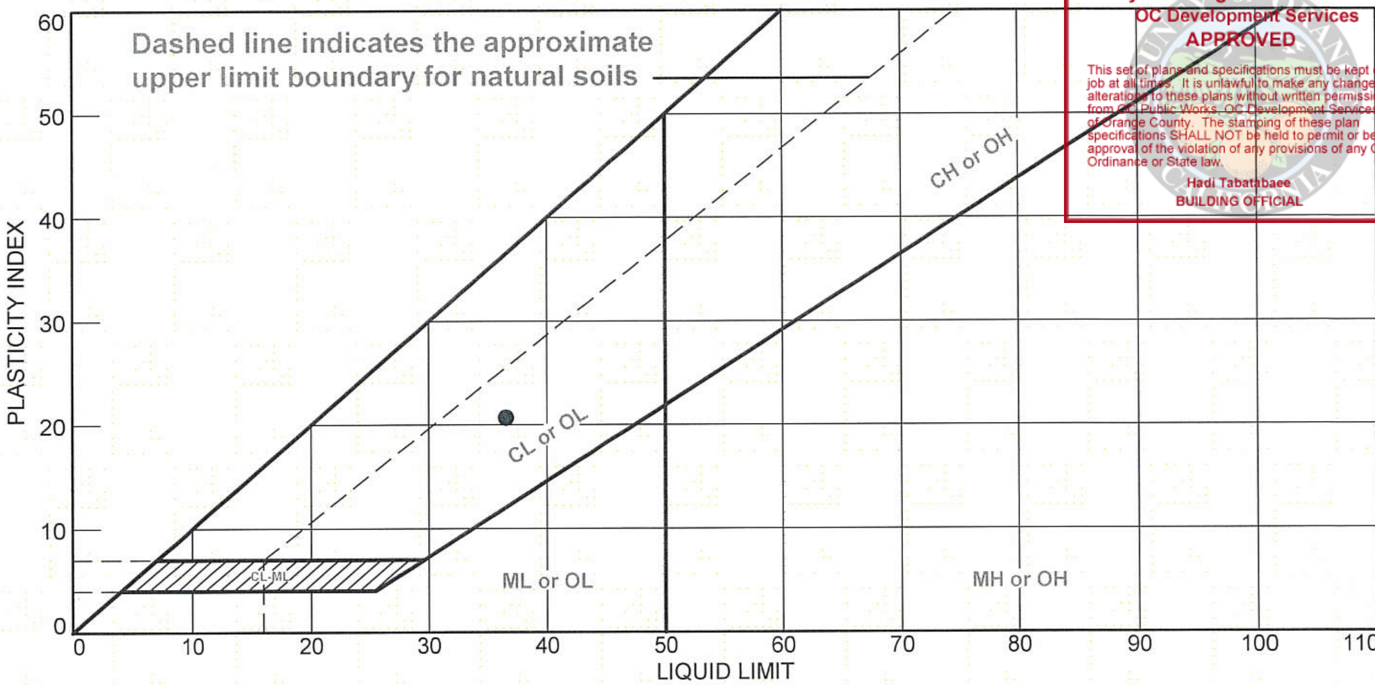
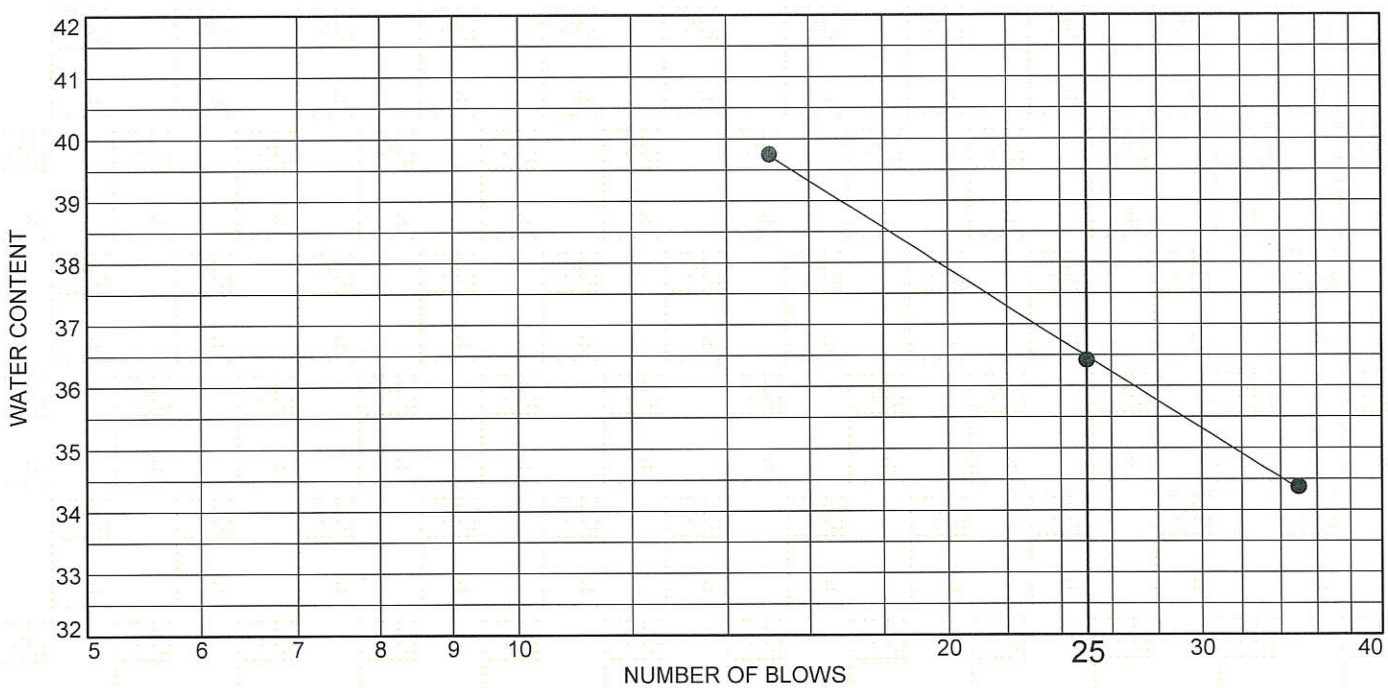
LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Clayey Sand, SC (#32290)	36.5	15.8	20.7	73.4	40.0	SC

Project No. 5015190002.02 **Client:** TerraCosta Consulting Group, Inc.

Project: #2975 Dana Point Harbor Restoration

Sample Number: B5-2 **Depth:** 20'

Remarks:

amec

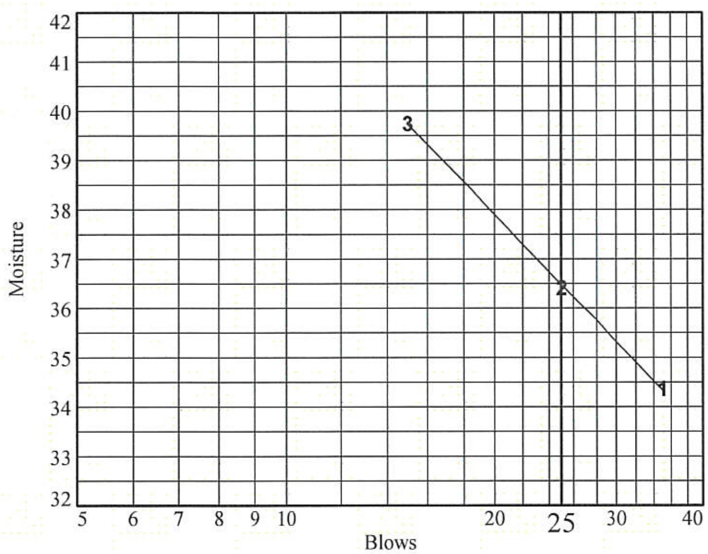
Figure

LIQUID AND PLASTIC LIMIT TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 20' **Sample Number:** B5-2
Material Description: Clayey Sand, SC (#32290)
%<#40: 73.4 **%<#200:** 40.0 **USCS:** SC **AASHTO:** A-6(3)

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	25.58	24.67	26.80			
Dry+Tare	22.72	21.72	23.27			
Tare	14.40	13.62	14.39			
# Blows	35	25	15			
Moisture	34.4	36.4	39.8			



Liquid Limit= 36.5
Plastic Limit= 15.8
Plasticity Index= 20.7

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	27.83	29.4			
Dry+Tare	26.92	28.27			
Tare	21.05	21.29			
Moisture	15.5	16.2			

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
~~Permits: BNR21-0604~~

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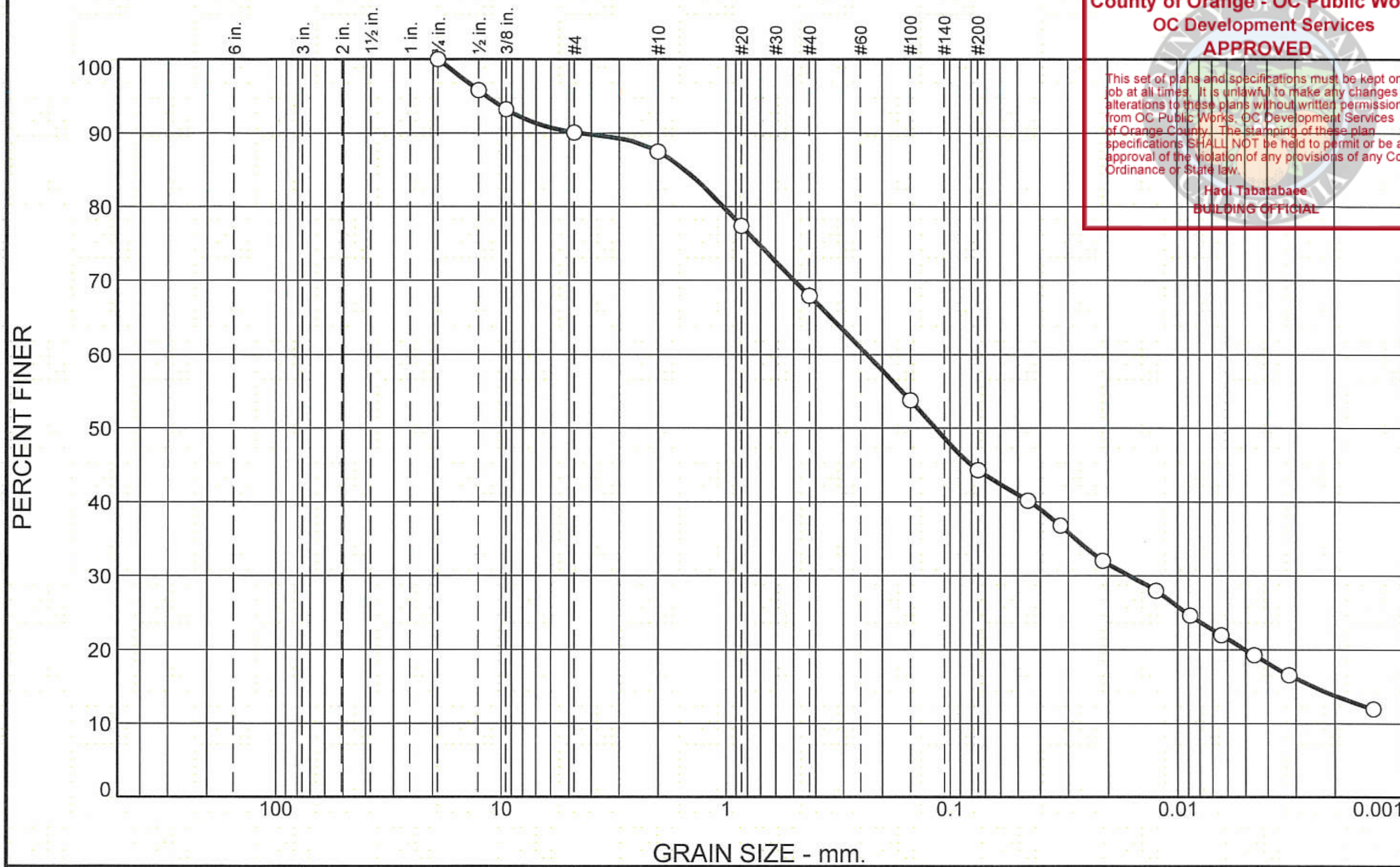
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	9.9	2.6	19.6	23.6	30.5	13.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75"	100.0		
0.5"	95.8		
0.375"	93.2		
#4	90.1		
#10	87.5		
#20	77.4		
#40	67.9		
#100	53.8		
#200	44.3		

* (no specification provided)

Material Description

Silty Sand, SM (#32291)

Atterberg Limits

PL= 34.6 LL= 51.9 PI= 17.3

Coefficients

D_{90}= 4.5015 D_{85}= 1.5221 D_{60}= 0.2336
D_{50}= 0.1164 D_{30}= 0.0162 D_{15}= 0.0025
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-7-5(4)

Remarks

Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.

Sample Number: B5-3 **Depth:** 25'

Date: 2/23/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: J. Iacovera **Checked By:** L. Collins

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25' **Sample Number:** B5-3
Material Description: Silty Sand, SM (#32291)
Date: 2/23/19 **PL:** 34.6 **LL:** 51.9 **PI:** 17.3
USCS Classification: SM **AASHTO Classification:** A-7-5(4)
Testing Remarks: Assumed specific gravity of 2.65 used for hydrometer calculations and soil particles smaller than 0.002mm have been classified as clay.
Tested by: J. Iacovera **Checked by:** L. Collins

Sieve Test Data

Sieve Opening Size	Percent Finer
0.75"	100.0
0.5"	95.8
0.375"	93.2
#4	90.1
#10	87.5
#20	77.4
#40	67.9
#100	53.8
#200	44.3

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 87.5
Weight of hydrometer sample =67.27
Hygroscopic moisture correction:
Moist weight and tare = 81.99
Dry weight and tare = 79.87
Tare weight = 26.37
Hygroscopic moisture = 4.0%
Table of composite correction values:

Temp., deg. C:	19.1	20.3	20.9	21.3	22.6
Comp. corr.:	-3.5	-3.0	-2.8	-2.8	-2.5

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - .164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.6	33.0	29.7	0.0137	33.0	10.9	0.0452	40.2
2.00	19.6	30.5	27.2	0.0137	30.5	11.3	0.0326	36.8
5.00	19.6	27.0	23.7	0.0137	27.0	11.9	0.0211	32.1
15.00	19.6	24.0	20.7	0.0137	24.0	12.4	0.0124	28.0
31.00	19.6	21.5	18.2	0.0137	21.5	12.8	0.0088	24.6
60.00	19.7	19.5	16.3	0.0137	19.5	13.1	0.0064	22.0
120.00	19.7	17.5	14.3	0.0137	17.5	13.4	0.0046	19.3
250.00	19.7	15.5	12.3	0.0137	15.5	13.8	0.0032	16.6
1440.00	19.9	12.0	8.8	0.0137	12.0	14.3	0.0014	11.9

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	9.9	9.9	2.6	19.6	23.6	45.8	30.5	13.8	44.3

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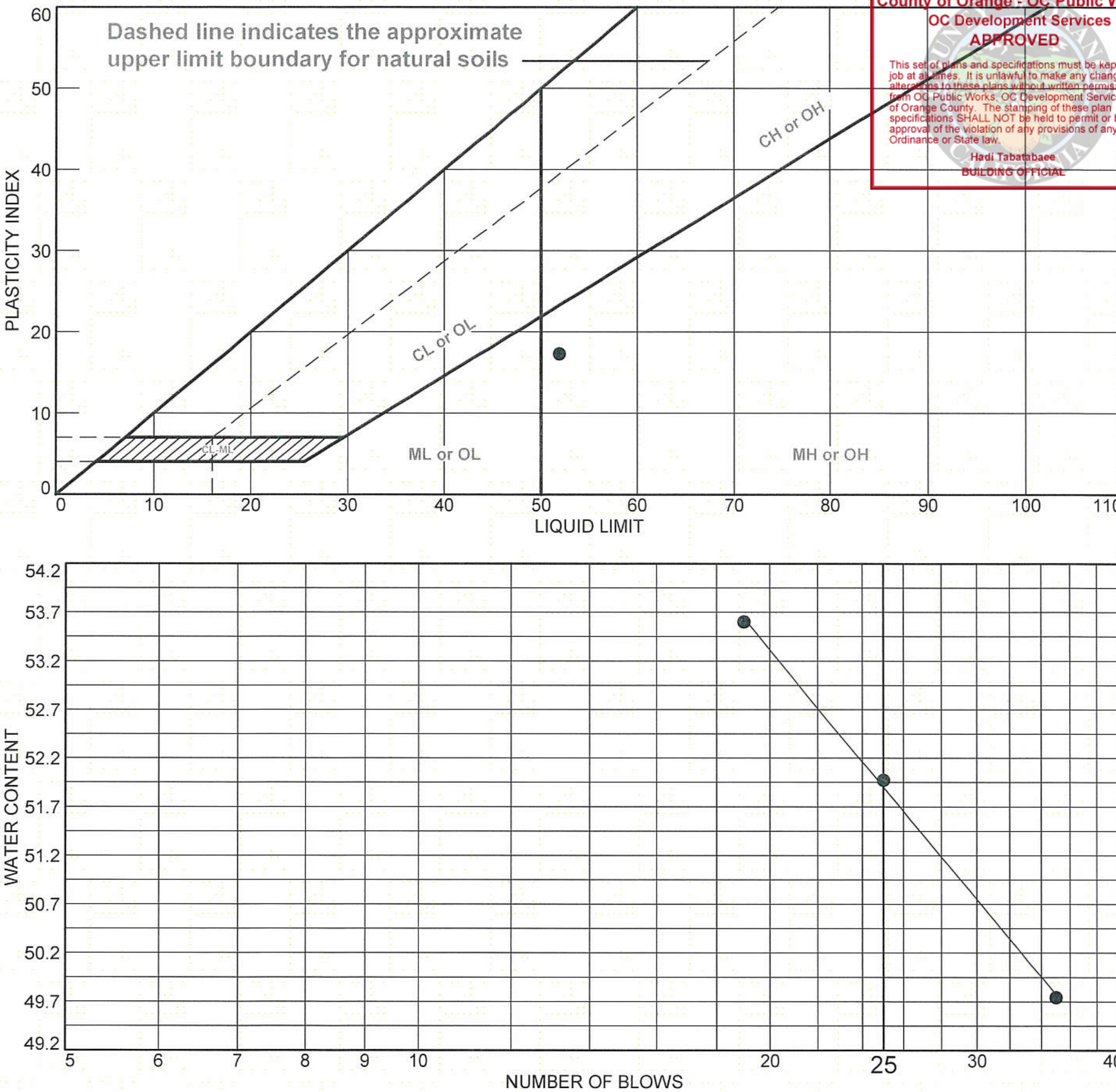
D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0025	0.0050	0.0162	0.0444	0.1164	0.2336	1.0241	1.5221	4.5015	11.6995

Fineness Modulus
1.57

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Sand, SM (#32291)	51.9	34.6	17.3	67.9	44.3	SM

Project No. 5015190002.02 **Client:** TerraCosta Consulting Group, Inc.

Project: #2975 Dana Point Harbor Restoration

Sample Number: B5-3 **Depth:** 25'

Remarks:

amec

Figure

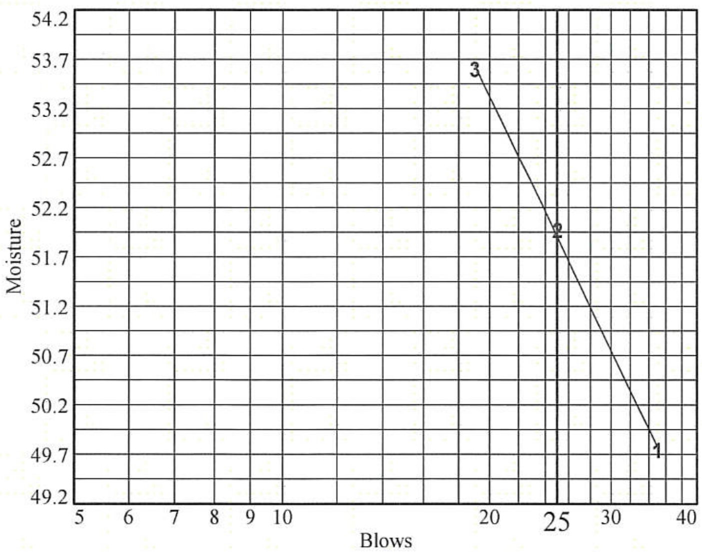
Tested By: M. Gibson **Checked By:** L. Collins

LIQUID AND PLASTIC LIMIT TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25'
Sample Number: B5-3
Material Description: Silty Sand, SM (#32291)
%<#40: 67.9 **%<#200:** 44.3 **USCS:** SM **AASHTO:** A-7-5(4)
Tested by: M. Gibson **Checked by:** L. Collins

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	22.69	25.23	25.15			
Dry+Tare	18.81	21.54	21.43			
Tare	11.01	14.44	14.49			
# Blows	35	25	19			
Moisture	49.7	52.0	53.6			



Liquid Limit= 51.9
Plastic Limit= 34.6
Plasticity Index= 17.3

Plastic Limit Data

Run No.	1	2	3	4
Wet+Tare	24.03	21.83		
Dry+Tare	21.69	20.10		
Tare	15.10	14.97		
Moisture	35.5	33.7		

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

Particle Size Distribution Report

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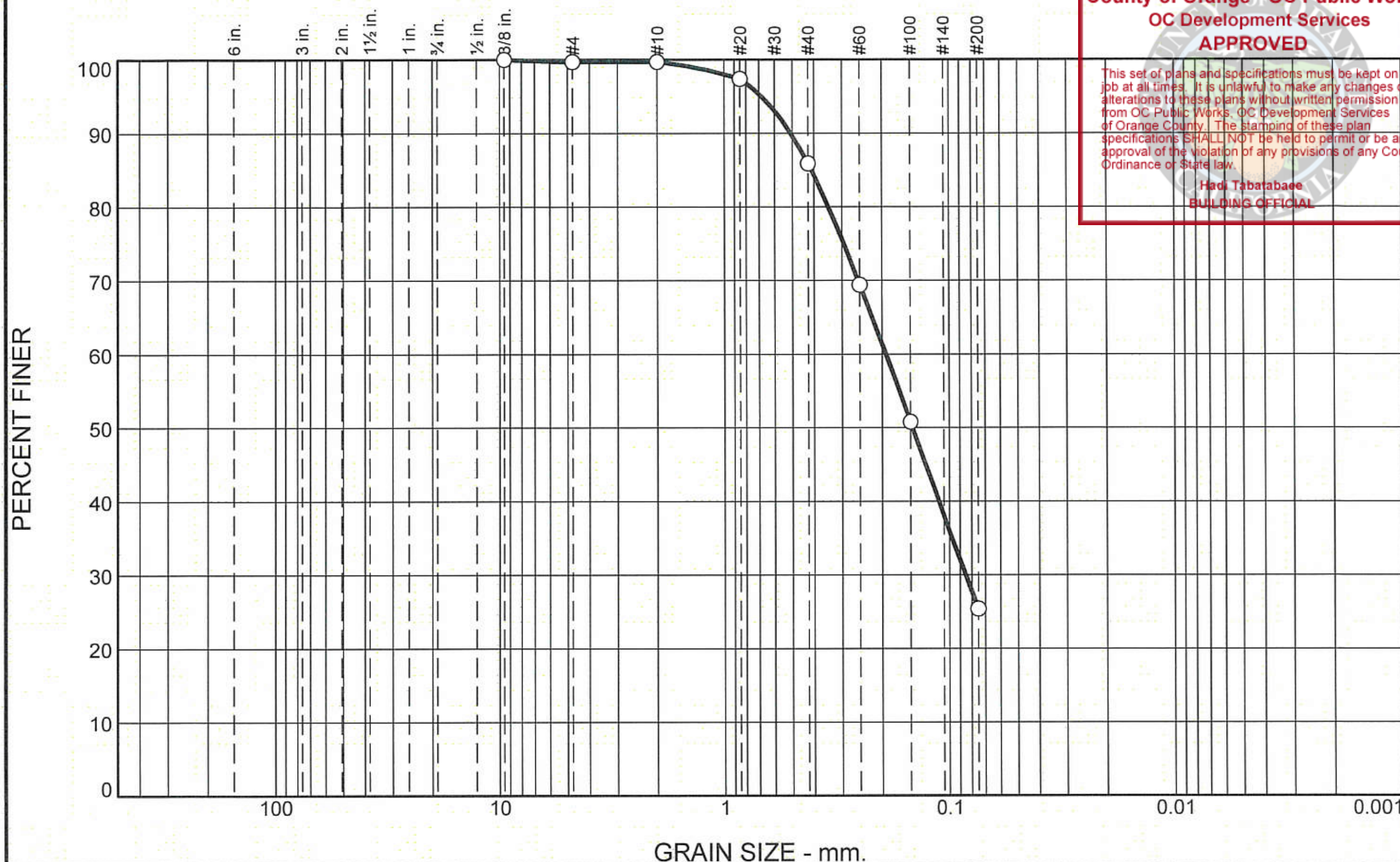

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.0	13.8	60.5	25.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375"	100.0		
#4	99.7		
#10	99.7		
#20	97.4		
#40	85.9		
#60	69.4		
#100	50.8		
#200	25.4		

* (no specification provided)

Material Description

Silty Sand, SM (#32292)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.5080 D_{85}= 0.4105 D_{60}= 0.1925
D_{50}= 0.1468 D_{30}= 0.0851 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Sample Number: B6-4 **Depth:** 25'

Date: 2/12/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration

Project No: 5015190002.02 **Figure**

Tested By: L. Collins **Checked By:** M. Farr

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works 3/6/2019
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GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 25' **Sample Number:** B6-4
Material Description: Silty Sand, SM (#32292)
Date: 2/12/19
USCS Classification: SM
Tested by: L. Collins **Checked by:** M. Farr

Sieve Test Data

Sieve Opening Size	Percent Finer
0.375"	100.0
#4	99.7
#10	99.7
#20	97.4
#40	85.9
#60	69.4
#100	50.8
#200	25.4

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.3	0.3	0.0	13.8	60.5	74.3			25.4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0851	0.1118	0.1468	0.1925	0.3444	0.4105	0.5080	0.6825

Fineness Modulus
0.83

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
~~Permits: BNR21-0004~~

Particle Size Distribution Report

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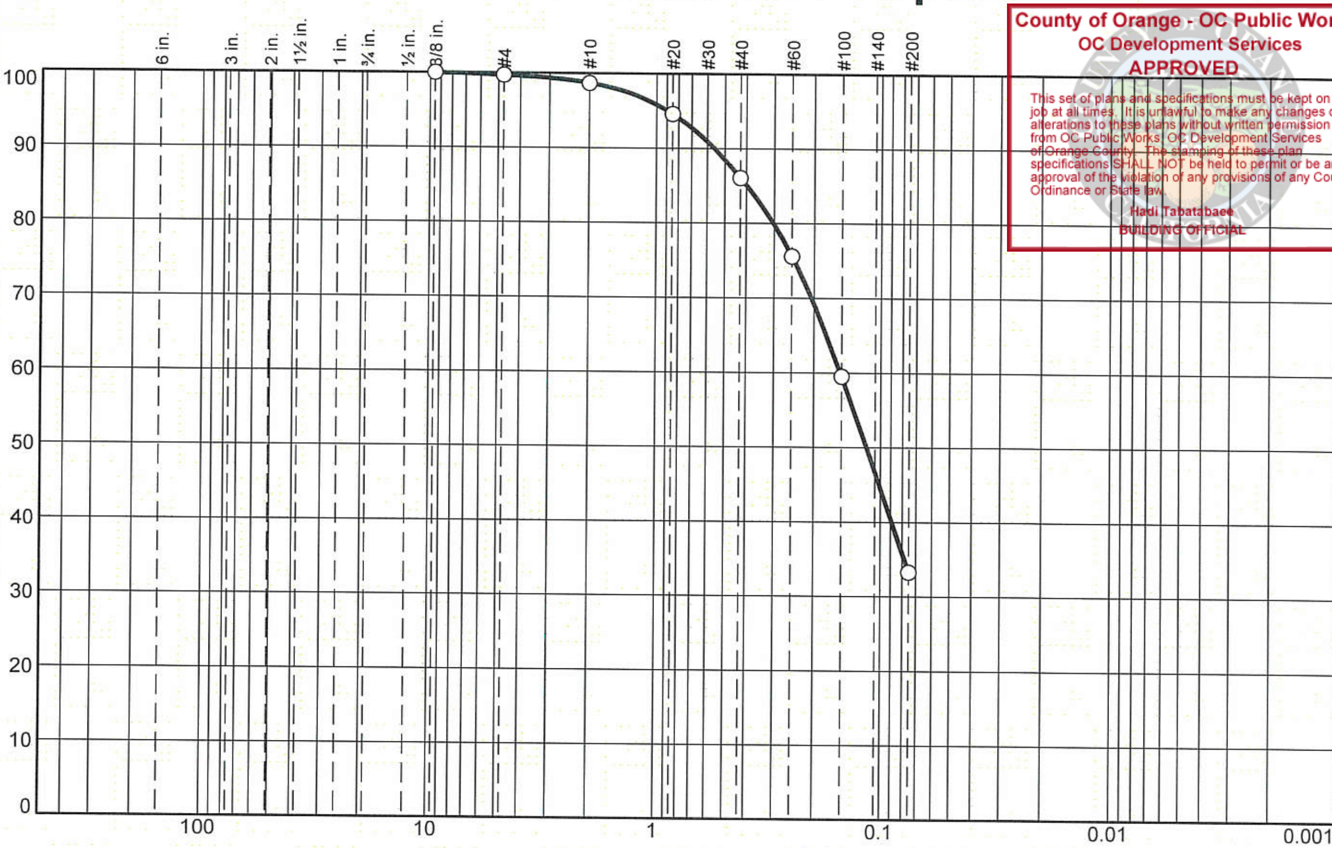

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	1.0	12.6	52.8	33.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375"	100.0		
#4	99.7		
#10	98.7		
#20	94.6		
#40	86.1		
#60	75.6		
#100	59.5		
#200	33.3		

* (no specification provided)

Material Description

Silty Sand, SM (#32293)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.5572 D_{85}= 0.3967 D_{60}= 0.1521
D_{50}= 0.1158 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Sample Number: B6-5 **Depth:** 35'

Date: 2/12/19

amec

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project No: 5015190002.02 **Figure**

Tested By: L. Collins **Checked By:** M. Farr

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TerraCosta Consulting Group, Inc.
Project: #2975 Dana Point Harbor Restoration
Project Number: 5015190002.02
Depth: 35'
Sample Number: B6-5
Material Description: Silty Sand, SM (#32293)
Date: 2/12/19
USCS Classification: SM
Tested by: L. Collins
Checked by: M. Farr

Sieve Test Data

Sieve Opening Size	Percent Finer
0.375"	100.0
#4	99.7
#10	98.7
#20	94.6
#40	86.1
#60	75.6
#100	59.5
#200	33.3

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.3	0.3	1.0	12.6	52.8	66.4			33.3

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
					0.0891	0.1158	0.1521	0.3022	0.3967	0.5572	0.8920

Fineness Modulus
0.74

APPENDIX D

ReMi SURVEY
GEOPHYSICAL EVALUATION
by SOUTHWEST GEOPHYSICS

SOUTHWEST GEOPHYSICS LLC
YOUR SUBSURFACE SOLUTION

February 6, 2019
Project No. 119031

Mr. Gregory A. Spaulding
TerraCosta Consulting Group, Inc.
3890 Murphy Canyon Road, #200
San Diego, CA 92123

Subject: Geophysical Evaluation
Dana Point Harbor
Dana Point, California

Dear Mr. Spaulding:

In accordance with your authorization, we have performed geophysical survey services pertaining to the Dana Point Harbor project located in Dana Point, California (Figure 1). The purpose of our survey was to develop Shear-wave velocity profiles to be used for design and construction at the site. Our services were performed on January 23, 2019. This report presents the survey methodology, equipment used, analysis, and findings from our study.

Our scope of services included the performance of four refraction microtremor (ReMi) profiles (RL-1 through RL-4) at preselected areas of the project site (see Figures 2 and 3). The ReMi technique uses recorded surface waves (specifically Rayleigh waves) that are contained in background noise to develop a Shear-wave velocity profile of the study area down to a depth, in this case, of approximately 100 feet. The depth of exploration is dependent on the length of the line and the frequency content of the background noise. The results of the ReMi method are displayed as a one-dimensional sounding which represents the average condition across the length of the line. The ReMi method does not require an increase of material velocity with depth; therefore, low velocity zones (velocity inversions) are detectable with ReMi.

Our ReMi survey included the use of a 24-channel Geometrics Geode seismograph and 24 4.5-Hz vertical component geophones. The geophones were spaced 10 feet apart for a total line length of 230 feet. Fifteen records, each 32 seconds long, were recorded and then downloaded to a computer. The data were later processed using SeisOpt® ReMi™ software (© Optim LLC, 2005), which uses the refraction microtremor method (Louie, 2001). The program generates phase-velocity dispersion curves for each record and provides an interactive dispersion modeling tool where the users determine the best fitting model. The result is a one-dimensional shear-wave velocity model of the site with roughly 85 to 95 percent accuracy. Figure 3 depicts the general site conditions in the survey area.

Figures 4a through 4d present the results from our survey. Based on our analysis of the collected data, the average characteristic site Shear-wave velocity down to a depth of 100 feet is 1,399 feet per second (ft/s) for RL-1, 1,352 ft/s for RL-2, 1,381 ft/s for RL-3, and 1,118 ft/s for RL-4 (CBC, 2016). These values correspond to site classifications of **C** for RL-1 through RL-3 and **D** for RL-4. The results also indicate a substantial, abrupt, increase in velocity at an approximate depth of 22 feet and 25 feet at locations RL-1 through RL-3, and RL-4 respectively. It should be noted the ReMi results represent the average condition across the length of the line.

The field evaluation and geophysical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by consultants performing similar tasks in the project area. No warranty, express or implied, is made regarding the conclusions and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be present. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface surveying will be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Southwest Geophysics should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document. This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

We appreciate the opportunity to be of service on this project. Should you have any questions related to this report, please contact the undersigned at your convenience.

Sincerely,

SOUTHWEST GEOPHYSICS, LLC

Aaron T. Puente
Project Geophysicist

Hans van de Vrugt, C.E.G., P.Gp.
Principal Geologist/Geophysicist

REGISTERED GEOPHYSICIST
Hans van de Vrugt
No 1012
Exp. 2/29/20
STATE OF CALIFORNIA

ATP/HV/hv

Attachments: Figure 1 – Site Location Map
Figure 2 – Seismic Line Location Map
Figure 3 – Site Photographs
Figure 4a – ReMi Results, RL-1
Figure 4b – ReMi Results, RL-2
Figure 4c – ReMi Results, RL-3
Figure 4d – ReMi Results, RL-4

Distribution: Addressee (electronic)

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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SITE LOCATION MAP

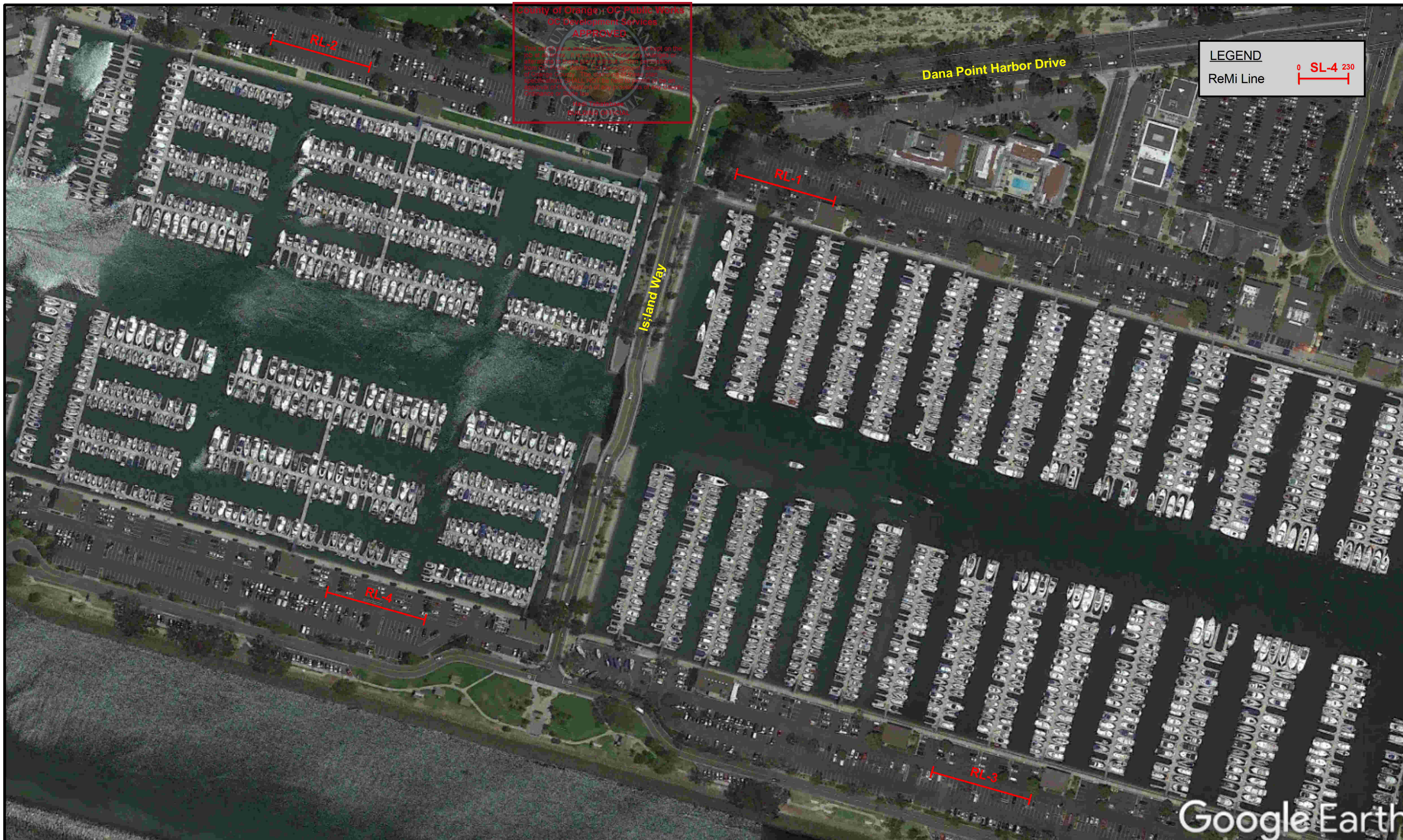
N

Dana Point Harbor
Dana Point, California

Project No.: 119031 | Date: 01/19

SOUTHWEST GEOPHYSICS
Figure 1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

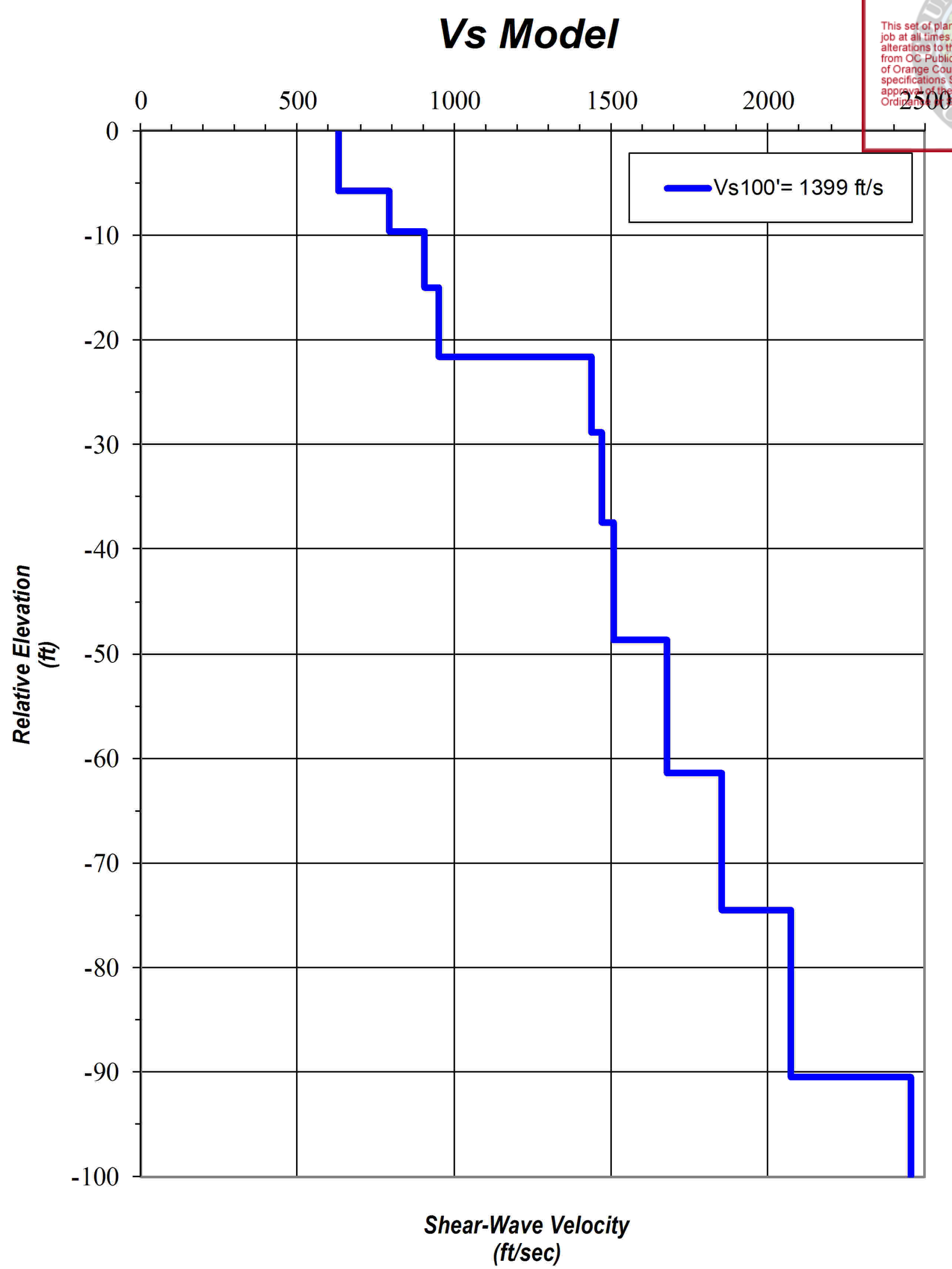


SEISMIC LINE LOCATION MAP	N	Dana Point Harbor Dana Point, California Project No.: 119031 Date: 02/19	SOUTHWEST GEOPHYSICS Figure 2

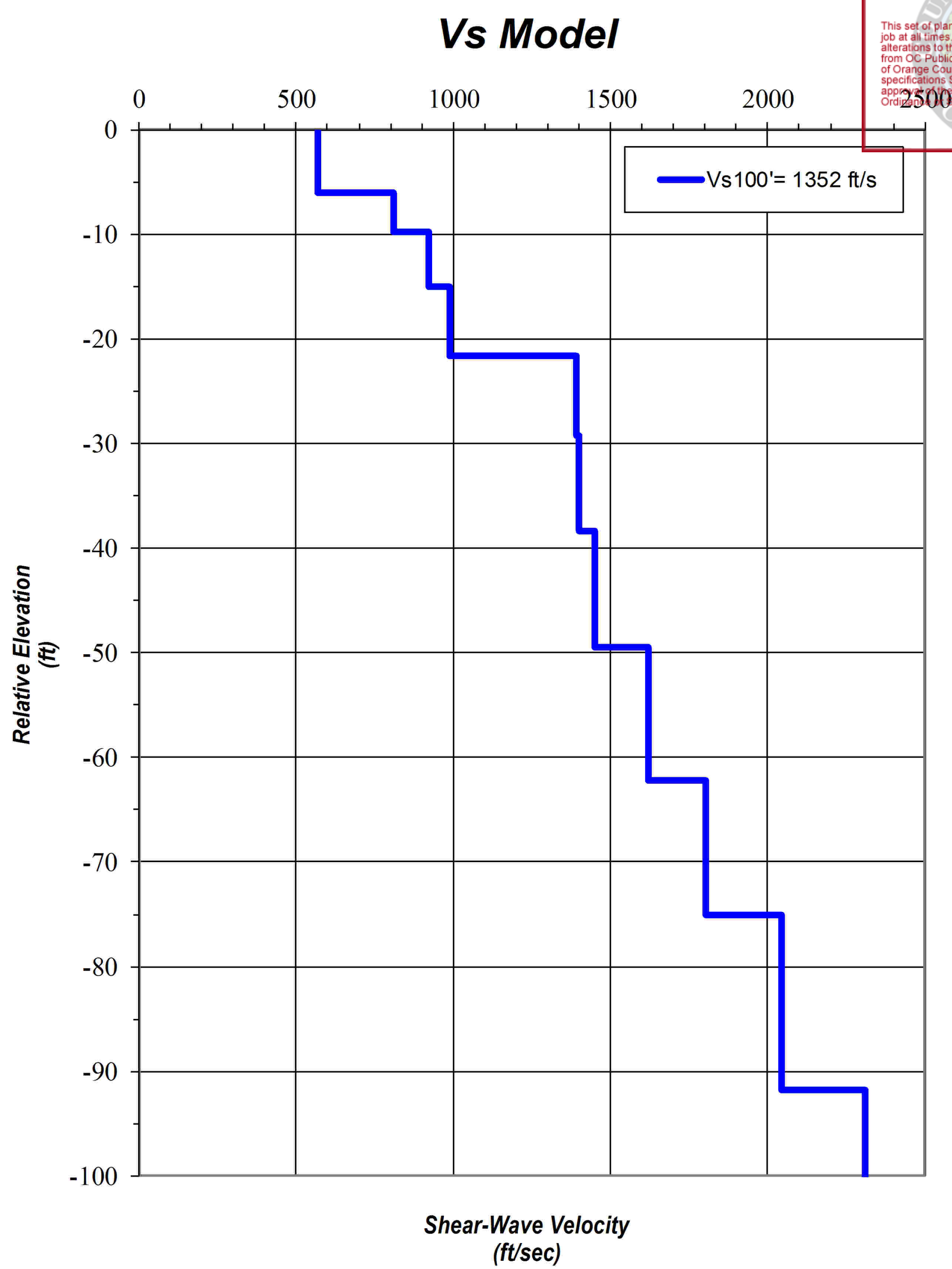
0 200 400
approximate scale in feet

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

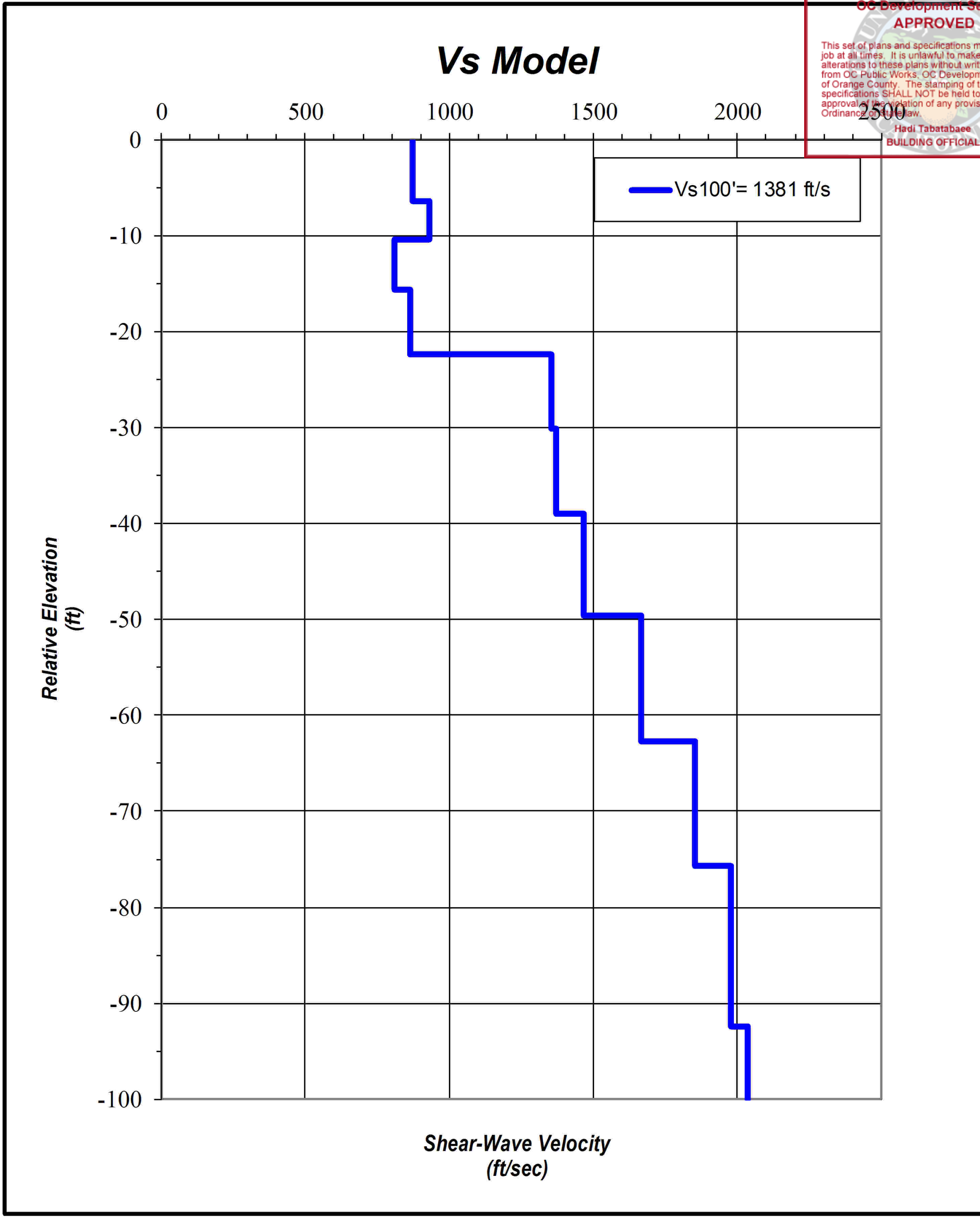
SITE PHOTOGRAPHS	Dana Point Harbor Dana Point, California Project No.: 119031 Date: 02/19	SouthWest Geophysics LLC Figure 3



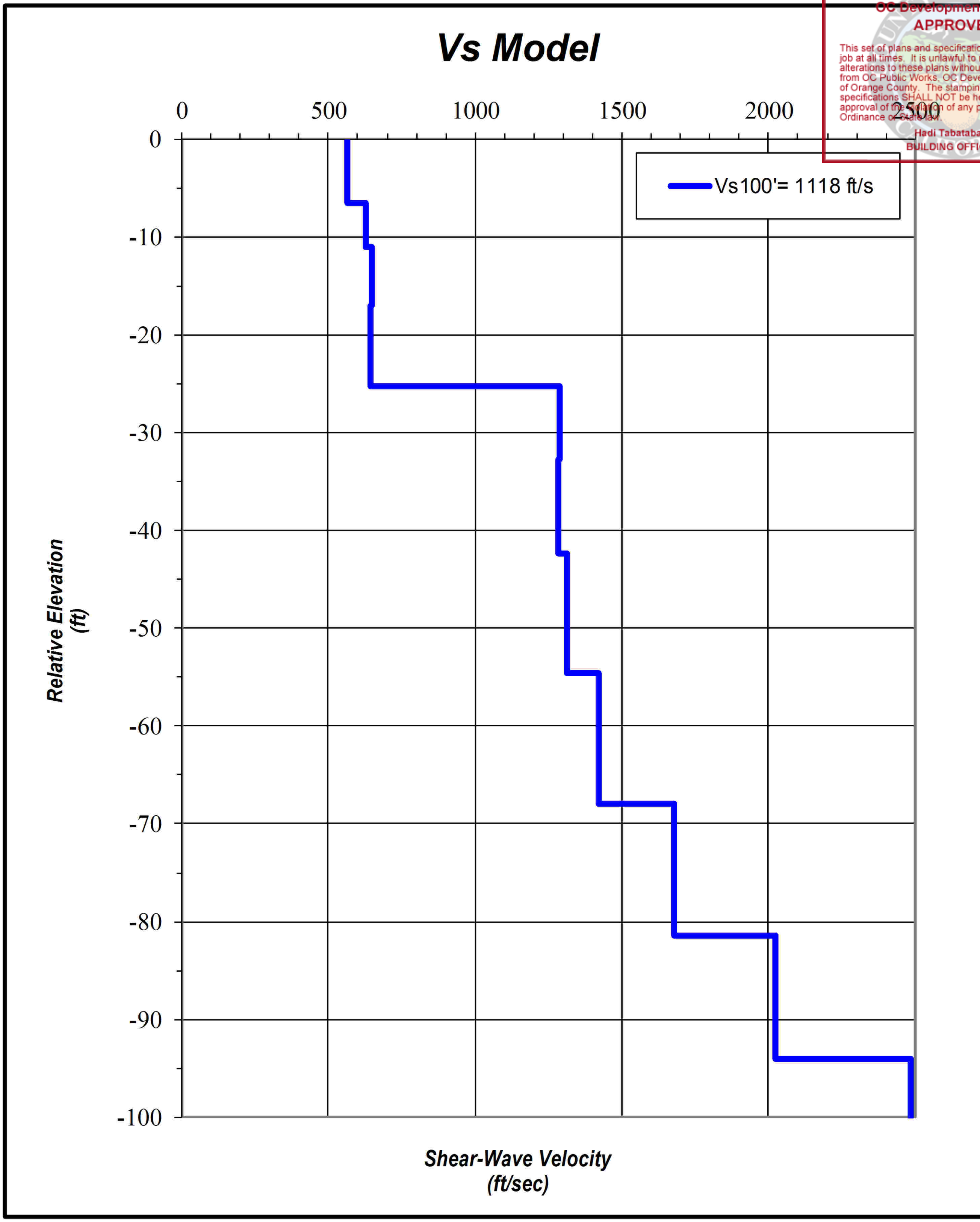
ReMi RESULTS RL-1	Dana Point Harbor Dana Point, California Project No.: 119031 / Date: 02/19	SOUTHWEST GEOPHYSICS LLC Figure 4a



ReMi RESULTS RL-2	Dana Point Harbor Dana Point, California	SOUTHWEST GEOPHYSICS LLC Figure 4b
	Project No.: 119031 / Date: 02/19	



ReMi RESULTS RL-3	Dana Point Harbor Dana Point, California Project No.: 119031 — Date: 02/19	SouthWest Geophysics LLC Figure 4c



ReMi RESULTS RL-4	Dana Point Harbor Dana Point, California	SOUTHWEST GEOPHYSICS LLC Figure 4d
	Project No.: 119031 Date: 02/19	

APPENDIX E

MARINA CONSTRUCTION PLANS

TerraCosta
Consulting Group

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
APPROVED
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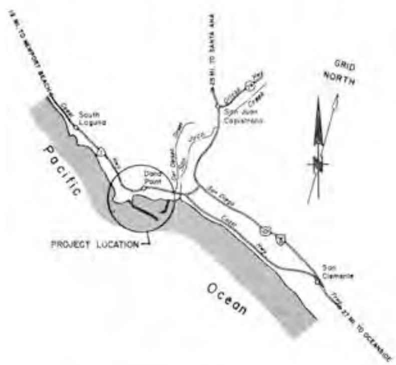
Hadi Tabatabaee
BUILDING OFFICIAL

ORANGE COUNTY HARBOR DISTRICT

DANA POINT HARBOR

DANA POINT, CALIFORNIA

HEAVY CONSTRUCTION



VICINITY MAP

Recommended for Approval by:
Kenneth Sampson
Director of Harbors and Beaches

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA

JOB NO. 1-417
DATE 9-24-68
APPROVED:

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION
TITLE SHEET & VICINITY MAP

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 1 OF 30
D10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
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Hadi Tabatabaee
BUILDING OFFICIAL

INDEX TO DRAWINGS

SHEET NO.	TITLE
1	TITLE SHEET & VICINITY MAP
2	INDEX TO DRAWINGS, LEGEND & GENERAL NOTES
3	INDEX TO FINISHED GRADING PLANS
4	INDEX TO SECTIONS & TRANSITION DETAILS
5	SURVEY CONTROL I
6	SURVEY CONTROL II
7	SURVEY CONTROL III
8	DEWATERING REQUIREMENTS
9	FINISHED GRADING PLAN - AREA IA & AREA IB
10	FINISHED GRADING PLAN - AREA II
11	FINISHED GRADING PLAN - AREA III
12	FINISHED GRADING PLAN - AREA IV
13	FINISHED GRADING PLAN - AREA V
14	FINISHED GRADING PLAN - AREA VI
15	FINISHED GRADING PLAN - AREA VII
16	FINISHED GRADING PLAN - AREA VIII
17	DELETED
17A	FINISHED GRADING PLAN - AREA IX
18	TYPICAL GRADING SECTIONS I
19	TYPICAL GRADING SECTIONS II
20	TYPICAL GRADING SECTIONS III
21	TYPICAL GRADING SECTIONS IV
22	TYPICAL GRADING SECTIONS V
23	TYPICAL REVETMENT SECTIONS
24	REVETMENT TRANSITION DETAILS I
25	REVETMENT TRANSITION DETAILS II
26	REVETMENT TRANSITION DETAILS III

SHEET NO.	TITLE
27	BOAT RAMP - PLAN & SECTIONS
28	BOAT RAMP - DETAILS
29	DEL OBISPO STREET - PROFILES I
30	DEL OBISPO STREET - PROFILES II
31	DRAINAGE PLAN
32	DRAINAGE PROFILES I
33	DRAINAGE PROFILES II
34	DRAINAGE DETAILS I
35	DRAINAGE DETAILS II
36	BRIDGE ARCHITECTURAL PLAN, ELEVATION AND MISCELLANEOUS DETAILS
37	BRIDGE HAND RAIL AND MISCELLANEOUS DETAILS
38	CONCRETE REVETTED SLOPE TYPICAL PLAN ELEVATIONS & DETAILS
39	BRIDGE STRUCTURAL PLAN AND SECTION
40	BRIDGE TYPICAL SECTIONS AND BOX GIRDER DETAILS
41	BRIDGE TYPICAL BENT AND APPROACH STRUCTURE DETAILS
42	QUAY WALL DETAILS
43	RETAINING WALLS - PLANS & ELEVATIONS
44	RETAINING WALLS - DETAILS
45	BRIDGE ELECTRICAL PLAN AND ELEVATION
46	BRIDGE ELECTRICAL MISCELLANEOUS DETAILS
	CAPRON PROPERTY GRADING DRAWINGS
47	CAPRON PROPERTY ROUGH GRADING PLAN
48	CAPRON PROPERTY - PRIORITY OF GRADING
49	CAPRON PROPERTY - TYPICAL SECTIONS
50	CAPRON PROPERTY - DRAINAGE DETAILS
51	PIER MODIFICATION STRUCTURAL & MISCELLANEOUS DETAILS

LEGEND

- BOUNDARY OF HARBOR DISTRICT PROPERTY
- SURVEY CONTROL LINE
- 12 — EXISTING GRADE CONTOUR
- TOP OF SLOPE
- APPROXIMATE NATURAL FORMATION SURFACE
- FLOW LINE
- -15 — DREDGING DEPTH IN FEET (BY OTHERS)
- WORKING POINT
- -10 — REQUIRED BASIN DEPTH IN FEET (MINIMUM) SEE NOTE 6 HEREON

A — SECTION OR DETAIL IDENTIFICATION
4 — SHEET ON WHICH SECTION OR DETAIL IS REFERENCED
2 — DRAWING ON WHICH SECTION OR DETAIL APPEARS

GENERAL NOTES

1. STATIONS INDICATED ON ROAD PLAN AND PROFILE ARE MEASURED ALONG CENTERLINE.
2. THE CONTRACTOR SHALL DEWATER THE CONSTRUCTION AREA AS INDICATED AND SPECIFIED. IT IS IMPERATIVE THAT THE AREA SURROUNDING AND INCLUDING THE BOAT RAMP BE COMPLETED WITHIN 240 DAYS AFTER AWARD OF CONTRACT, AS INDICATED ON SHEET 8 OF THESE DRAWINGS. AT THIS TIME ALL CONSTRUCTION IN THE DESIGNATED AREA SHALL BE COMPLETE AND THE AREA SHALL BE TURNED OVER TO THE ORANGE COUNTY HARBOR DISTRICT, TOGETHER WITH THE SOUTHEASTERLY 50 FEET OF DEL OBISPO STREET FROM PACIFIC COAST HIGHWAY TO STATION 84 + 00
3. THE LOWER LIMITS OF BOTH CONCRETE AND STONE REVETTED SLOPES HAVE BEEN INDICATED HEREIN BASED ON THE INFORMATION AVAILABLE. HOWEVER, BECAUSE THE LIMITS ARE DEPENDENT ON THE DEPTH OF THE NATURAL FORMATION, THE ACTUAL LOCATION OF THE LOWER LIMITS WILL BE FIELD-DETERMINED DURING CONSTRUCTION IN ACCORDANCE WITH THE REQUIREMENTS OF SECTIONS A/23, B/23, C/23, D/23, E/23, C/26 & D/26
4. ALL COORDINATES, GRID LINES, AND BEARINGS SHOWN ON THESE DRAWINGS ARE BASED ON THE HARBOR GRID SYSTEM EXCEPT WHEN OTHERWISE NOTED. THE HARBOR GRID IS BASED UPON THE BEARING OF THE LONGEST SECTION OF THE WEST BREAKWATER, WHICH IS S. 73° 40' E. ON THE LAMBERT SYSTEM, BUT WHICH IS ARBITRARILY TAKEN AS DUE EAST ON THE HARBOR GRID. THE ORIGIN OF THE HARBOR GRID SYSTEM IS SUCH THAT THE NORTHERLY LIMIT OF THE BOAT BASINS IS EXACTLY N. 2000, WHILE THE CENTERLINE OF THE CAUSEWAY AND BRIDGE IS EXACTLY E. 8050. THE ORIGIN OF THE HARBOR GRID, IN TERMS OF LAMBERT COORDINATES, IS N. 474,520.932 AND E. 1,550,090.335.
5. ALL ELEVATIONS HEREIN ARE BASED ON MEAN LOWER LOW WATER (MLLW) DATUM. PROJECT BENCH MARK IS CALIFORNIA STATE LAND COMMISSION MONUMENT B-4061, ELEVATION 15.75, LOCATED ON THE SOUTHWESTERLY SIDE OF THE RAMP ONTO THE EXISTING DANA POINT PIER.
6. THE TERMS "REQUIRED BASIN DEPTH" AND "EXCAVATE TO - 8" (OR - 10 OR - 12), MEAN THAT THE MINIMUM ACCEPTABLE DEPTH IS THE ELEVATION SHOWN. DEEPER AREAS SHALL REMAIN AT NATURAL DEPTH. PINNACLES IN DEEPER AREAS, WHICH PROJECT ABOVE THE REQUIRED MINIMUM, SHALL BE REMOVED TO THE INDICATED DEPTH. OVER EXCAVATION OF NOT MORE THAN ONE FOOT IN WATER AREAS WILL BE PERMITTED.
7. IN AREAS WHERE CONCRETE OR OTHER CONSTRUCTION IS TO BE PLACED ON CUT SURFACES OF NATURAL FORMATION, OVER EXCAVATED AREAS SHALL BE FILLED WITH THE MATERIAL OF WHICH THE OVERLYING CONSTRUCTION IS COMPOSED.
8. UNLESS OTHERWISE INDICATED, THE NORTH ARROWS SHOWN HEREIN REFER TO HARBOR GRID NORTH

ASBUILT

SEP 2 1970

REV.	DESCRIPTION	DATE
A	ADDED 17-A & 51, DELETED 17	9-19-69

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

PLANS PREPARED BY
KK KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213 / 628-3162

JOB NO. 1-417
DATE 9-24-68
APPROVED:

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION
INDEX TO DRAWINGS
LEGEND & GENERAL NOTES

DATE OCTOBER, 1968
SCALE NONE
SHEET 2 OF 51
D10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
APPROVED
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Hadi Tabatabaee
BUILDING OFFICIAL

REV.	DESCRIPTION	DATE
A	REVISED AREA IX	9-19-69

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

PLANS PREPARED BY
KK KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213/629-3182

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

INDEX TO FINISHED GRADING PLANS

JOB NO. 1-417
DATE 9-24-68
APPROVED: [signature]
DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 3 OF 51
D10.5-1

REV	DESCRIPTION	DATE
A	ADDED FILL, WEST END	9-19-69

PLANS PREPARED BY
KK KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213 / 629-3182

JOB NO. 1-417
DATE 9-24-68
APPROVED: Rodney P. Lundin

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION
INDEX TO SECTIONS & TRANSITION DETAILS

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 4 OF 51
D 10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
APPROVED

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Hadi Tabatabaee
BUILDING OFFICIAL

CURVE DATA					
	Δ	R	T	L	REMARKS
Δ_1	44°46'14"	1000'	411.87'	781.39'	℄ DEL OBISPO STREET
Δ_2	04°16'35"	1000'	37.34'	74.64'	"
Δ_3	22°14'09"	500'	98.26'	194.04'	"
Δ_4	51°13'42"	700'	335.60'	625.87'	℄ OUTBOUND RDWY.
Δ_5	06°27'28"	700'	39.49'	78.90'	"

SEE SHEET 6

PLANS PREPARED BY
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ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213/629-3182

JOB NO. 1-417
DATE 9-24-68
APPROVED:

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

SURVEY CONTROL I

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 5 OF 50
D10.5-1

CURVE DATA					
	Δ	R	T	L	REMARKS
Δ_3	22°14'09"	500'	98.26'	194.04'	℄ DEL OBISPO ST.
Δ_6	135°00'00"	125'	301.78'	~~147.26'~~ 294.52	CONTROL LINE
Δ_7	45°00'00"	350'	144.97'	274.89'	" "

PLAN (A/6)
1" = 100'

AS BUILT

PLANS PREPARED BY
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LOS ANGELES CALIFORNIA
213 / 629-3192

JOB NO. 1-417
DATE 9-24-68
APPROVED: [signature]

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION
SURVEY CONTROL II

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 6 OF 50
D10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
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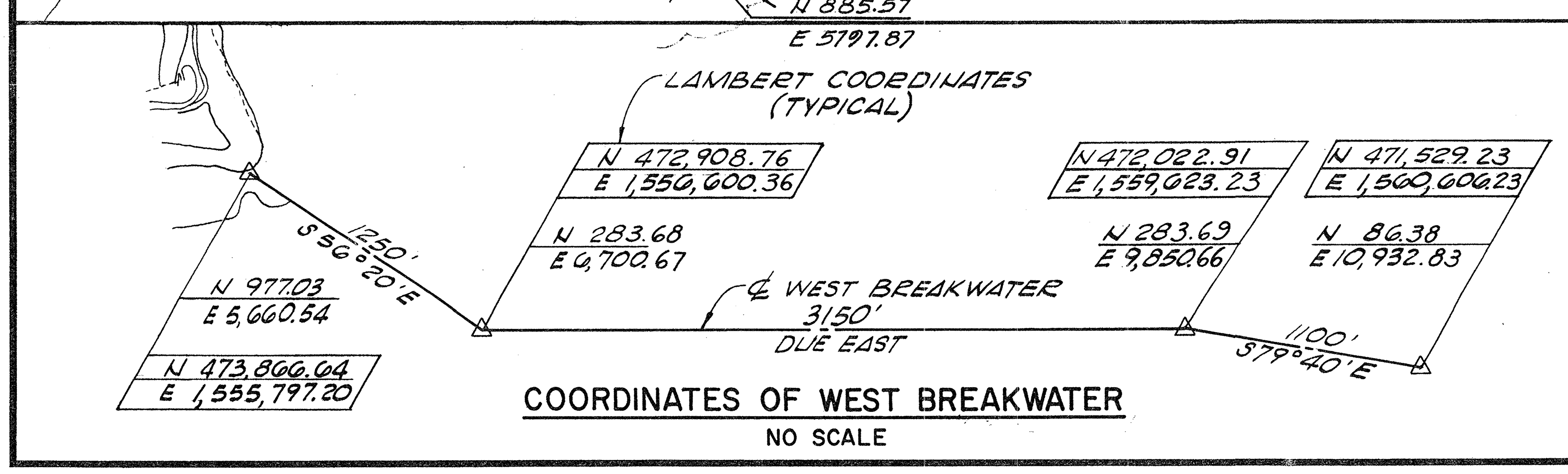
BUILDING OFFICIAL

CURVE DATA

	Δ	R	T	L	REMARKS
Δ_3	22°14'09"	500'	98.26'	194.04'	℄ DEL OBISPO ST.
Δ_8	120°00'00"	125'	216.51'	~~130.90'~~	CONTROL LINE
Δ_9	60°00'00"	350'	202.07'	~~366.52'~~	" "



COORDINATES OF WEST BREAKWATER
NO SCALE

While the information shown is believed to be accurate the Harbors, Beaches and Parks District will not be responsible for omissions, errors or inaccuracies.

PLAN
1" = 100'
A/7

REV.	DESCRIPTION	DATE
A	ADDED FILL WEST END	9-19-69

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213 / 629-3182

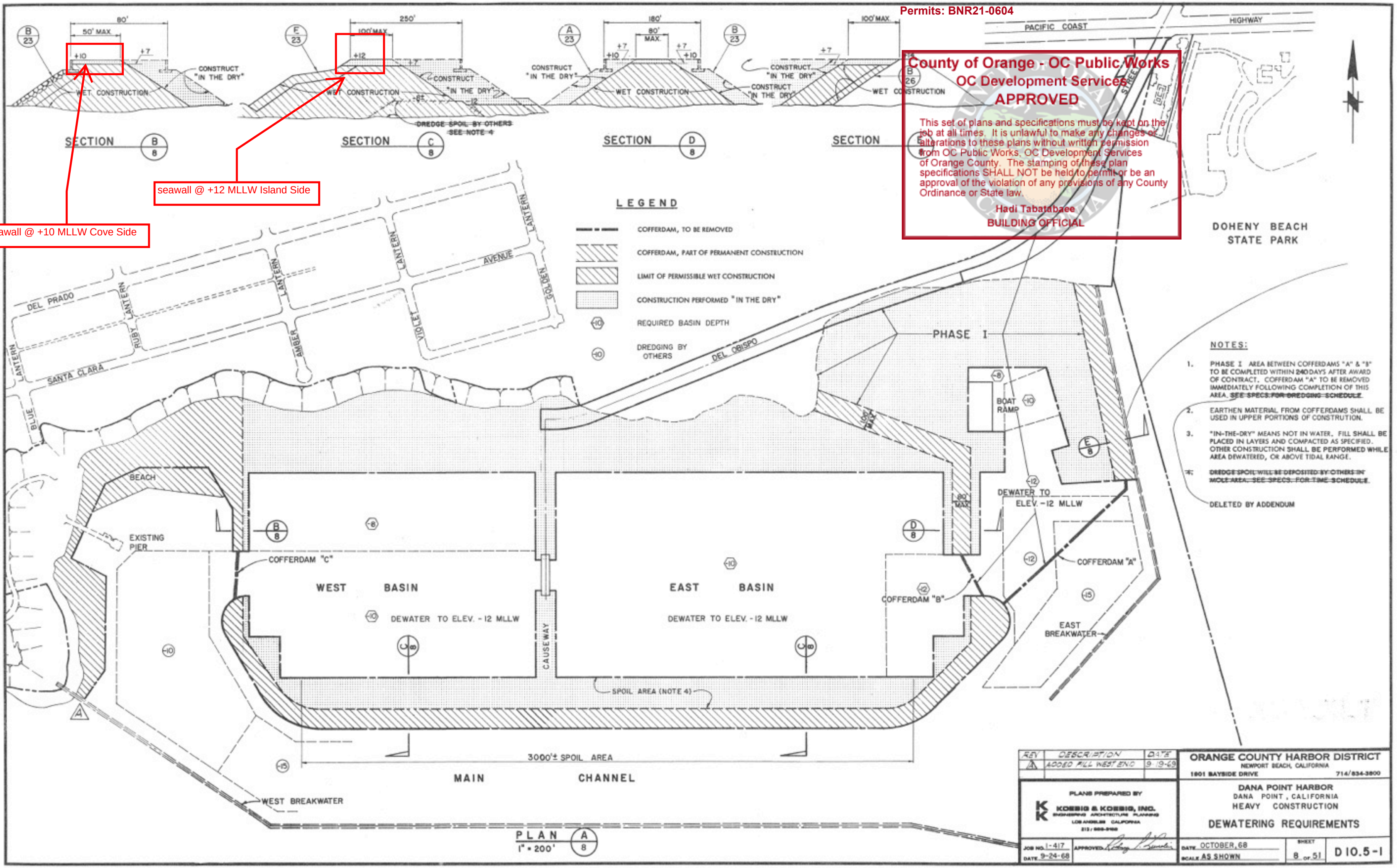
JOB NO. 1-417
DATE 9-24-68
APPROVED:

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

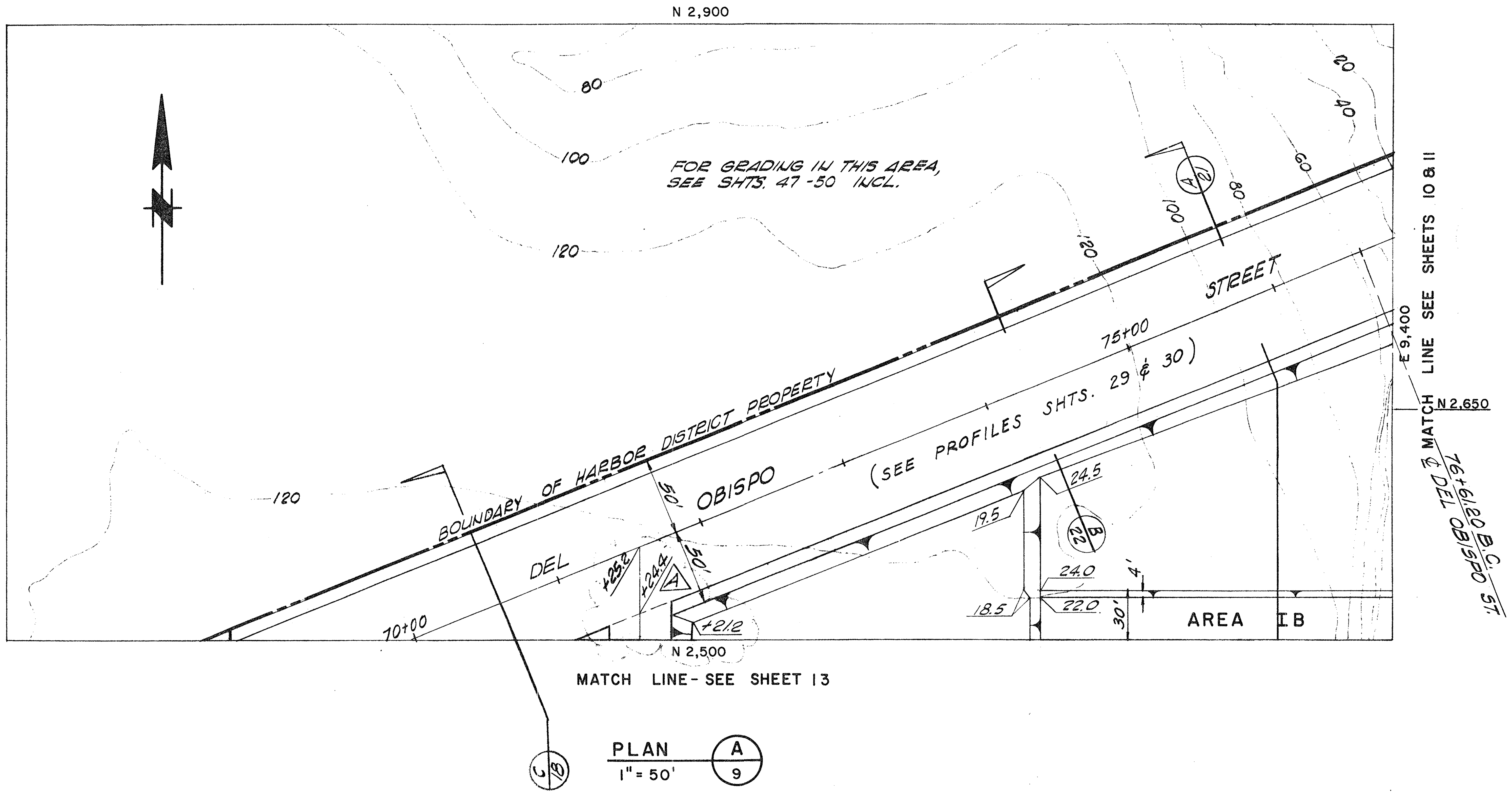
DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION
SURVEY CONTROL III

DATE OCTOBER , 1968
SCALE AS SHOWN
SHEET 7 OF 51
D10.5-1

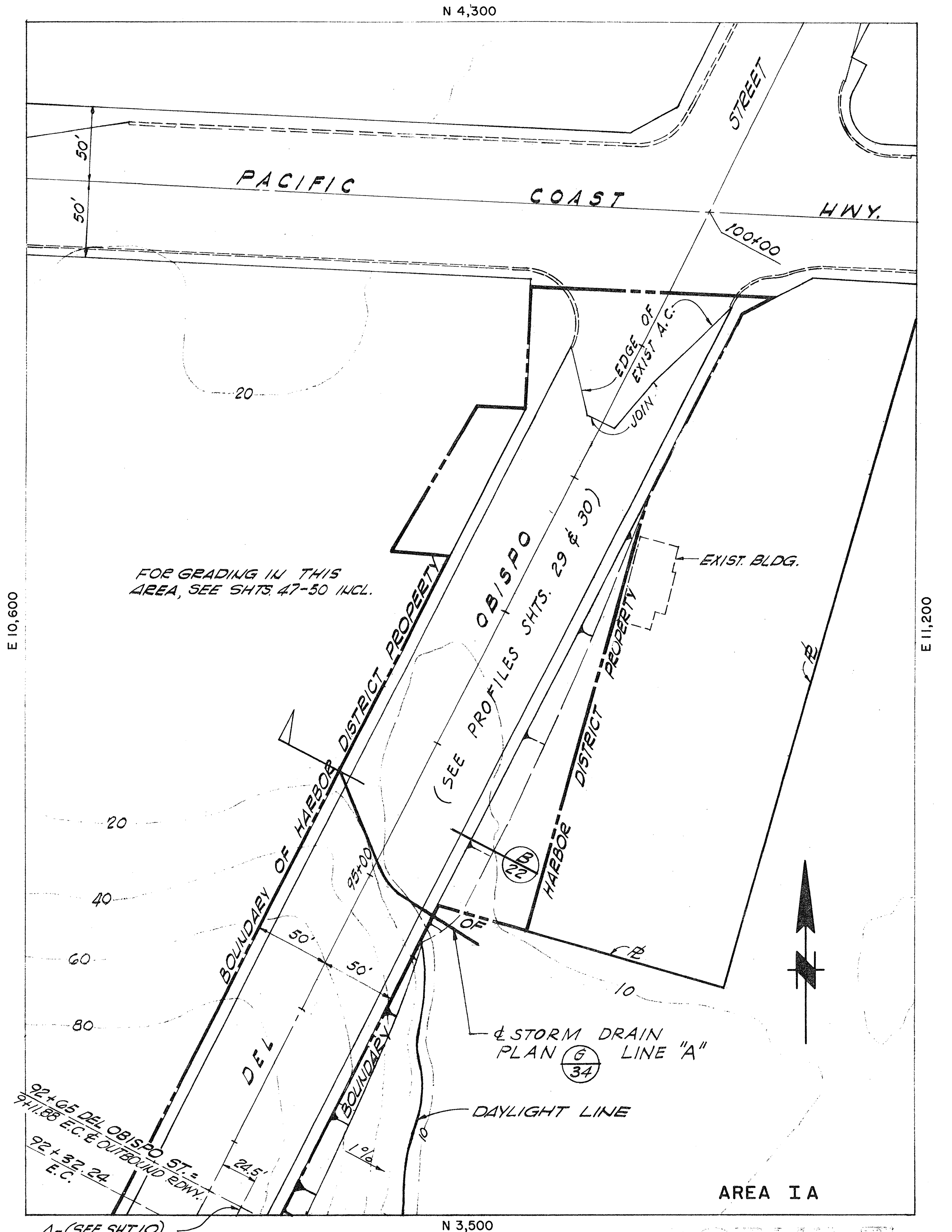
Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604



Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604



PLAN A/9
1" = 50'



PLAN B/9
1" = 50'

REV.	DESCRIPTION	DATE
A	CHANGED GRADES	10-27-69

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213 / 629-3182

JOB NO. 1-417
DATE 9-24-68
APPROVED:

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

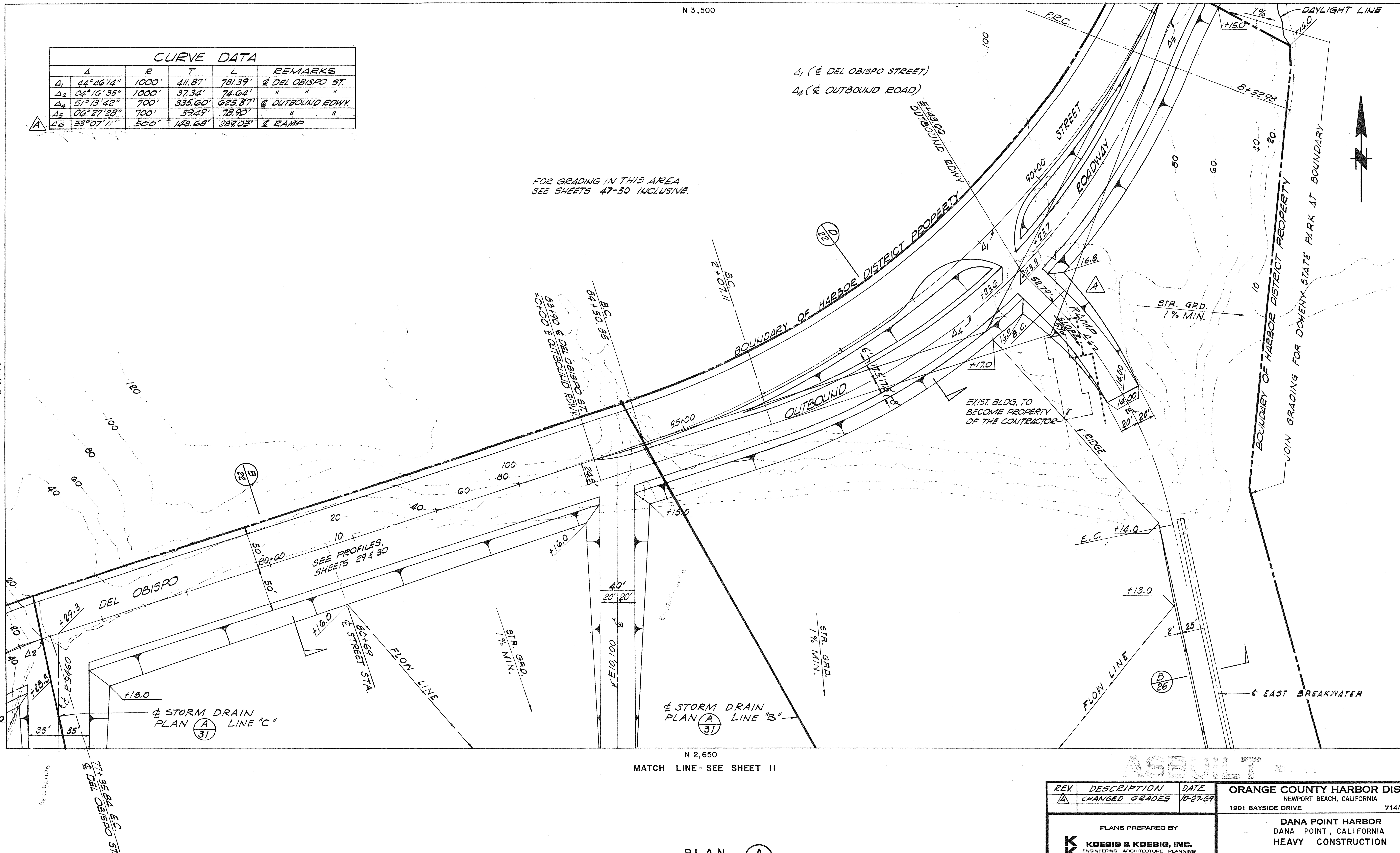
FINISHED GRADING PLAN-AREA IA & AREA IB

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 9 OF 58
D10.5-1

MATCH LINE - SEE SHEET 9

CURVE DATA

Δ		R	T	L	REMARKS
Δ_1	44°46'14"	1000'	411.87'	781.39'	℄ DEL OBISPO ST.
Δ_2	04°16'35"	1000'	37.34'	74.64'	" " "
Δ_4	51°13'42"	700'	335.60'	625.87'	℄ OUTBOUND RDWY.
Δ_5	06°27'28"	700'	39.49'	78.90'	" "
A Δ_6	33°07'11"	500'	148.68'	289.03'	℄ RAMP



MATCH LINE - SEE SHEET 11

ASBUILT

PLAN A/10
1" = 50'

REV.	DESCRIPTION	DATE
A	CHANGED GRADES	10-27-69

PLANS PREPARED BY
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ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213/629-3182

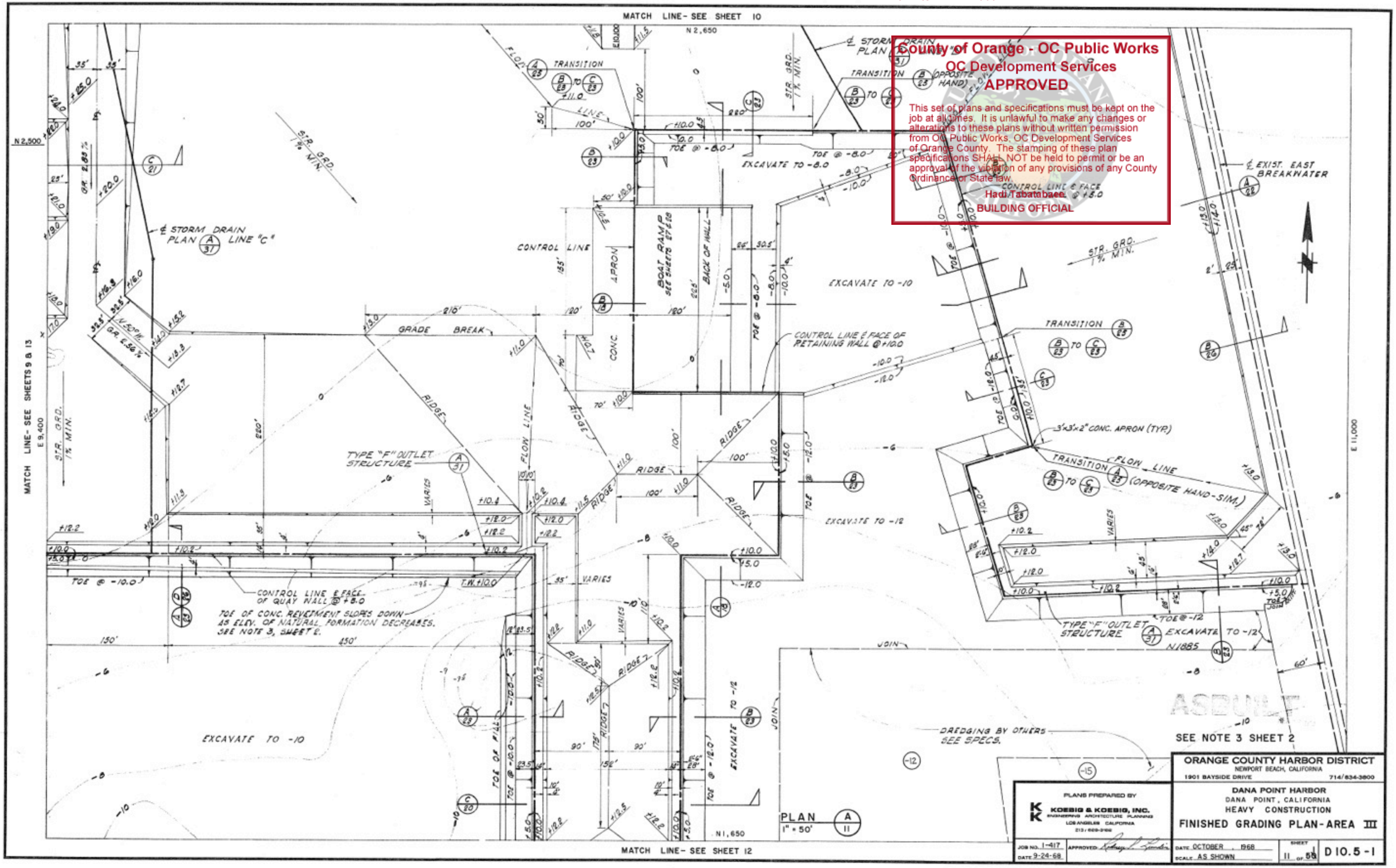
JOB NO. 1-417
DATE 9-24-68
APPROVED: [signature]

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION
FINISHED GRADING PLAN-AREA II

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 10 OF 59
D10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604



CURVE DATA

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Δ_6	135°00'00"	125'	301.78	~~147.26~~ 294.52	CONTROL LINE
Δ_7	45°00'00"	350'	144.97	274.89	" "

REV.	DESCRIPTION	DATE
A	CHANGED GRADES	10-27-69

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

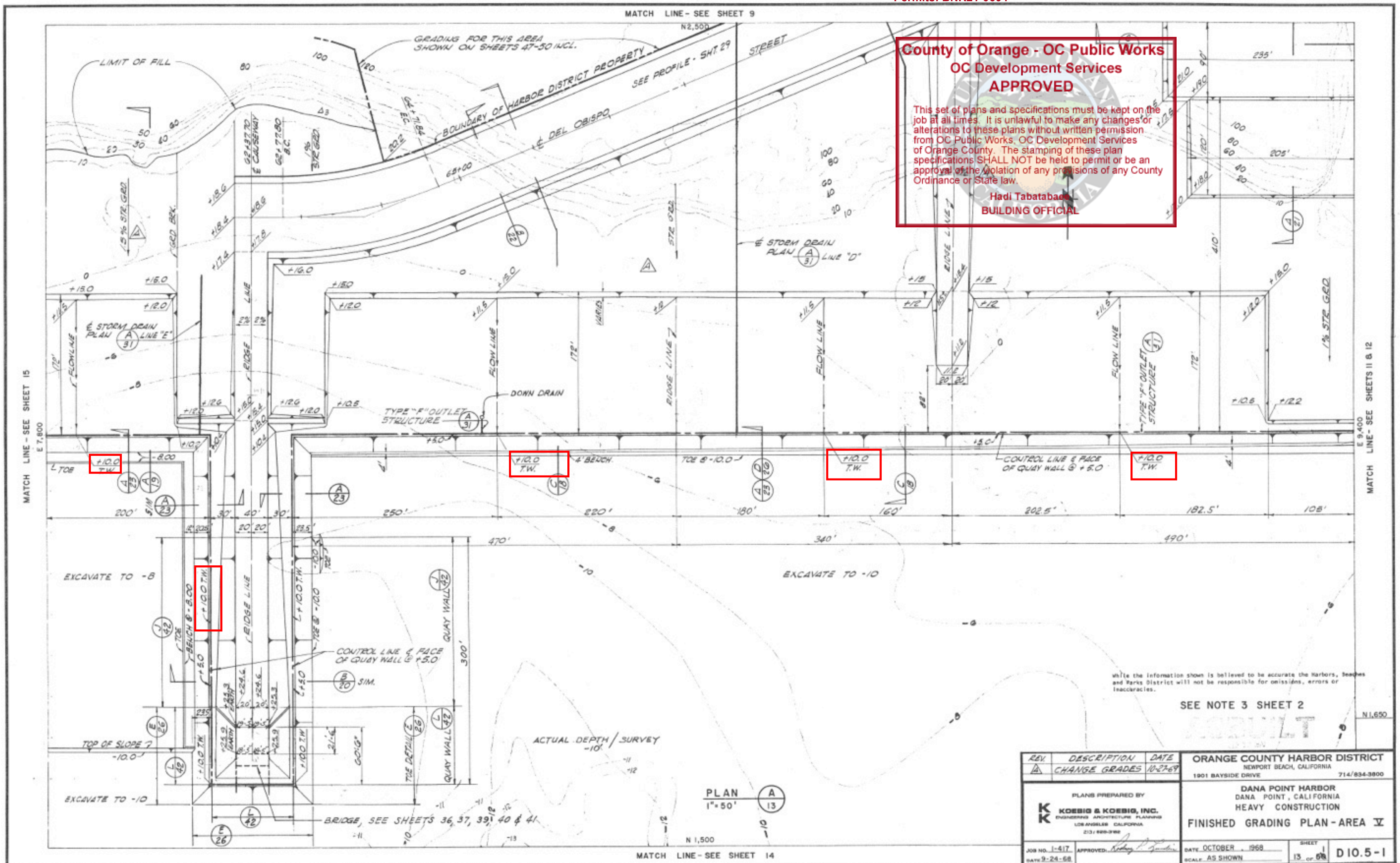
PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213 / 628-3182

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

FINISHED GRADING PLAN-AREA IV

JOB NO. 1-417
DATE 9-24-68
APPROVED: Rodney P. Lundin
DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 12 OF 51
D10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604



Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
APPROVED

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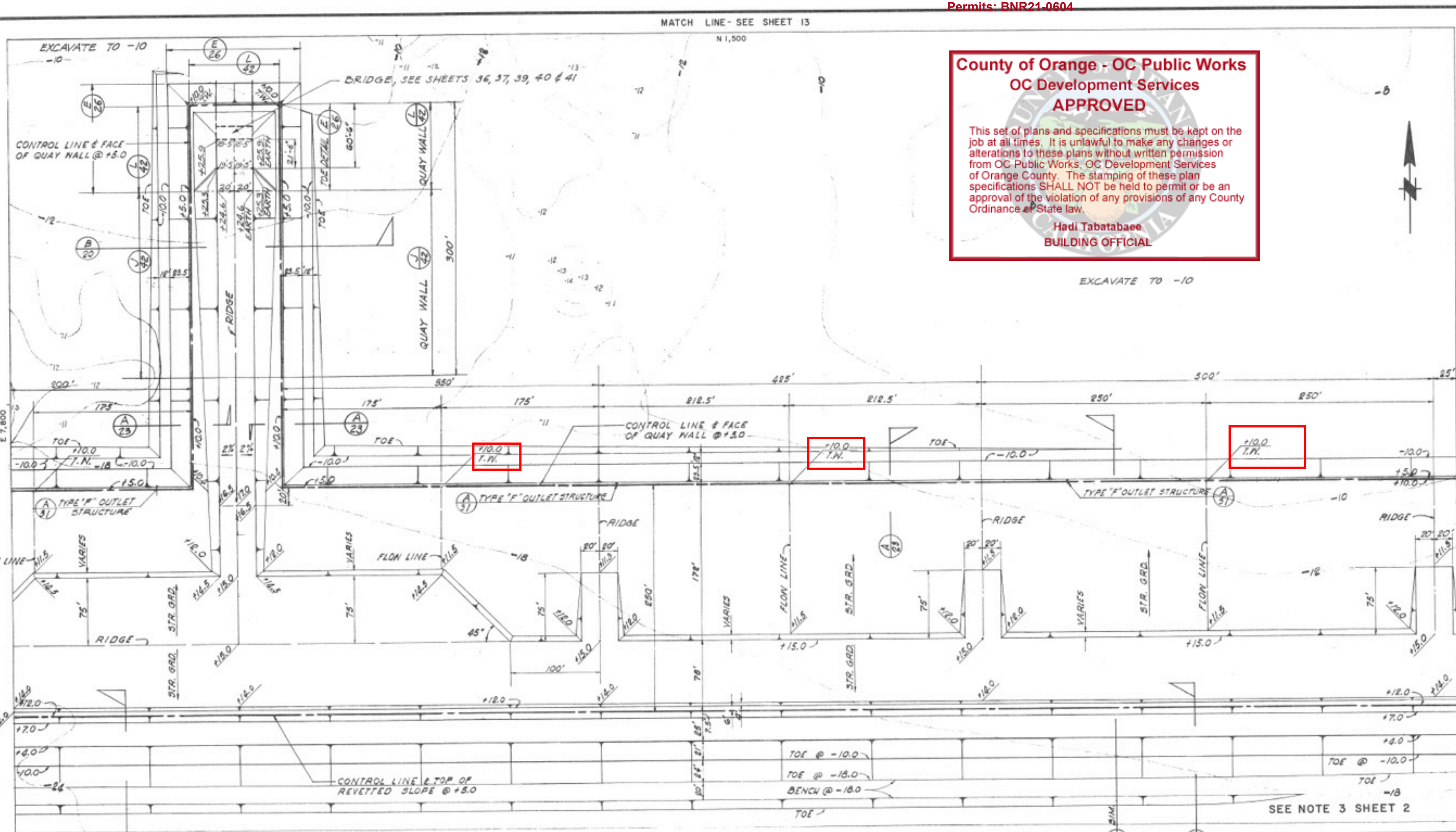
Hadi Tabatabaee
BUILDING OFFICIAL



While the information shown is believed to be accurate the Harbors, Beaches and Parks District will not be responsible for omissions, errors or inaccuracies.

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA

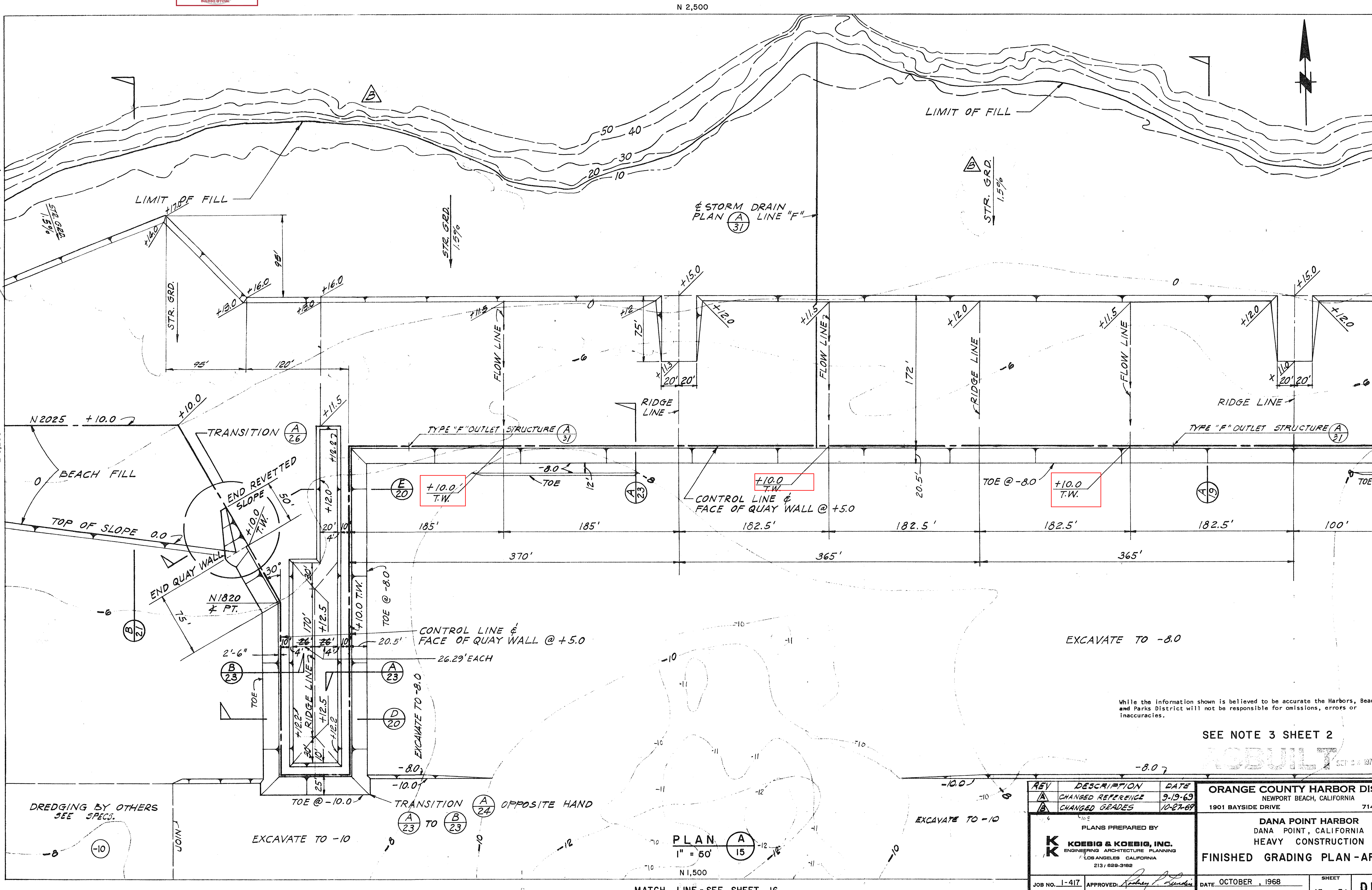
JOB NO. 1-417
DATE 9-24-68

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION
FINISHED GRADING PLAN - AREA VI

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 14 OF 58
D10.5-1

AS BUILT



MATCH LINE - SEE SHEET 17A

MATCH LINE - SEE SHEET 13

MATCH LINE - SEE SHEET 16

While the information shown is believed to be accurate the Harbors, Beaches and Parks District will not be responsible for omissions, errors or inaccuracies.

SEE NOTE 3 SHEET 2

AS BUILT SEP 2 8 1970

REV	DESCRIPTION	DATE
A	CHANGED REFERENCE	9-19-69
B	CHANGED GRADES	10-27-69

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213 / 629-3182

JOB NO. 1-417
DATE 9-24-68
APPROVED: Rodney P. Lundin

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

FINISHED GRADING PLAN - AREA VII

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 15 OF 51
D10.5-1

AS BUILT

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
APPROVED

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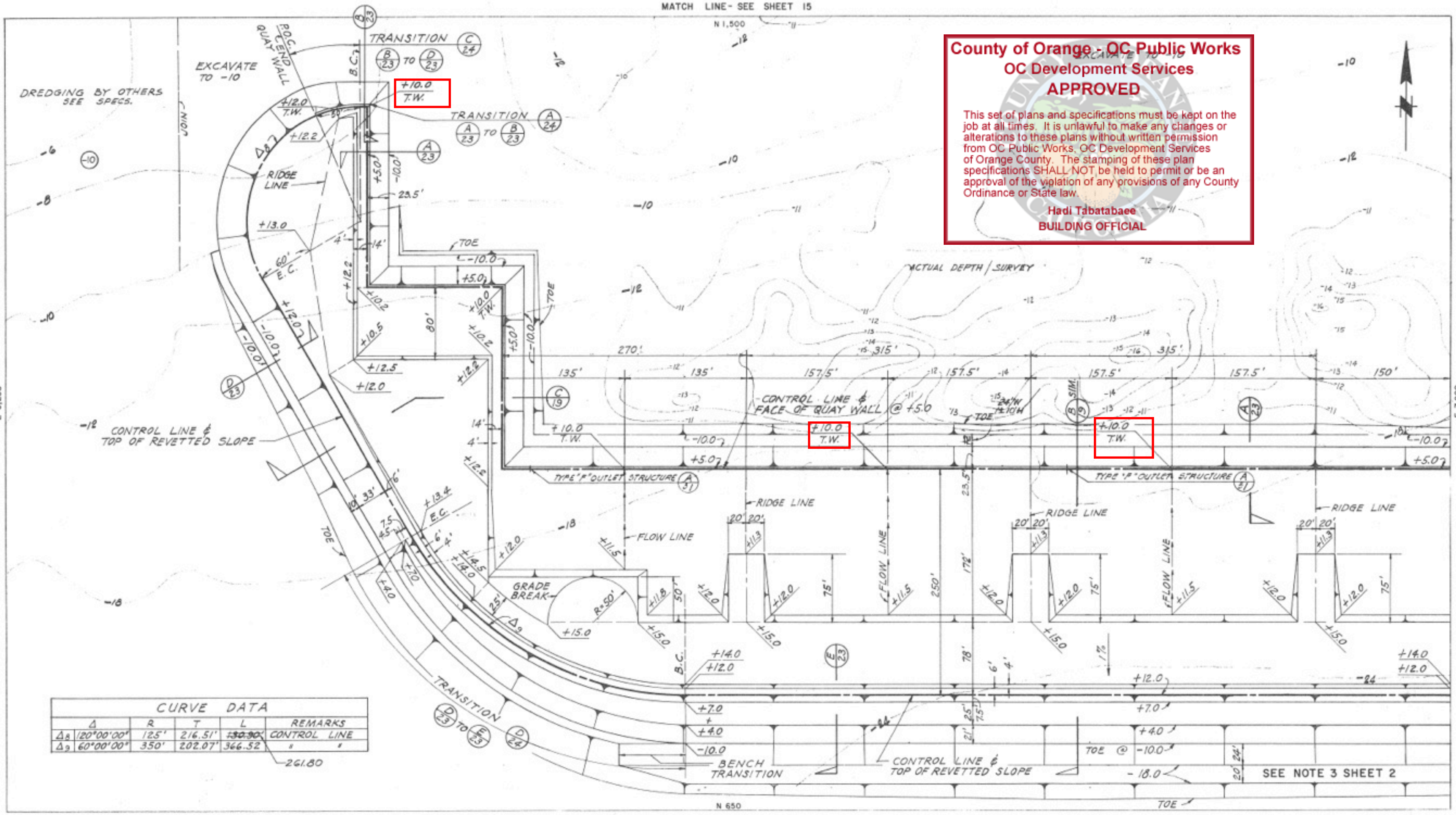
Hadi Tabatabaee
BUILDING OFFICIAL



Δ	R	T	L	REMARKS
Δ_8 120°00'00"	125'	216.51'	~~130.90~~	CONTROL LINE
Δ_9 60°00'00"	350'	202.07'	366.52	" "

CURVE DATA

261.80

PLAN (A/16)
1" = 50'

While the information shown is believed to be accurate the Harbors, Beaches and Parks District will not be responsible for omissions, errors or inaccuracies.

REV.	DESCRIPTION	DATE
A	ADDED MATCH LINE	9-13-68

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA

JOB NO. 1-417 DATE 9-24-68 APPROVED:

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION
FINISHED GRADING PLAN - AREA VIII

DATE OCTOBER, 1968 SCALE AS SHOWN SHEET 16 OF 51 D 10.5-1

AS BUILT

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
APPROVED

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Hadi Tabatabaee
BUILDING OFFICIAL

PLAN A/17-A
1"=50'

REV.	DESCRIPTION	DATE
A	CHANGED GRADES	10-27-69

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213/629-3182

JOB NO. 1-417.10
DATE 9-19-69
APPROVED [signature]

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION
FINISHED GRADING PLAN - AREA IX

DATE SEPTEMBER, 1969
SCALE AS SHOWN
SHEET 17-A OF 51
D 10.5 - 1

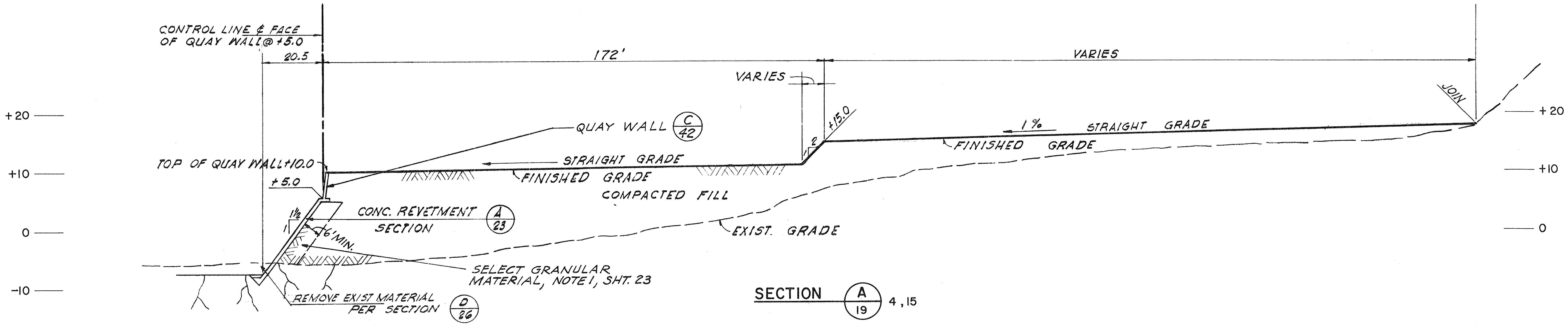
SECTION A/18 4, 11

SECTION B/18 4, 11

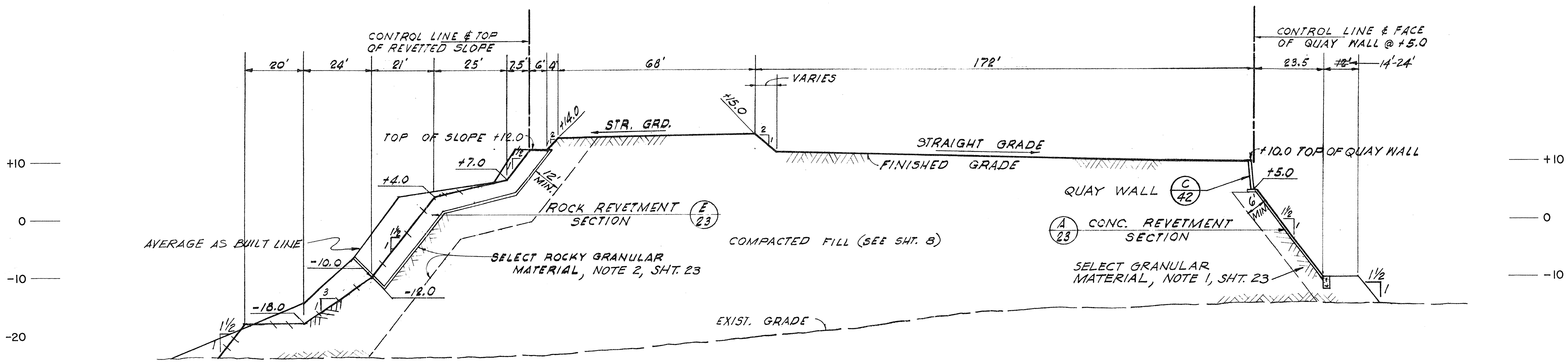
SECTION C/18 4, 13

SCALE: HORIZ. 1" = 20' VERT. 1" = 10'

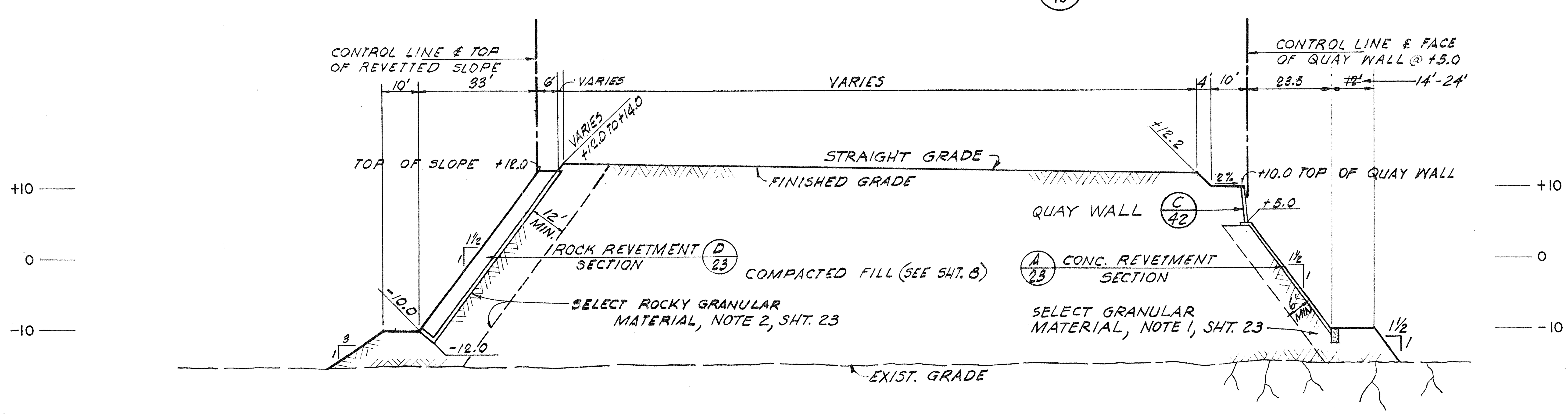
PLANS PREPARED BY KOEBIG & KOEBIG, INC. ENGINEERING ARCHITECTURE PLANNING LOS ANGELES CALIFORNIA 213/629-3182	ORANGE COUNTY HARBOR DISTRICT, NEWPORT BEACH, CALIFORNIA, 1901 BAYSIDE DRIVE 714/834-3800
JOB NO. 1-417 DATE 9-24-68 APPROVED: [signature]	DANA POINT HARBOR, DANA POINT, CALIFORNIA, HEAVY CONSTRUCTION
	TYPICAL GRADING SECTIONS I
	DATE OCTOBER, 1968 SCALE AS SHOWN SHEET 18 OF 59 D10.5-1



SECTION A/19 4, 15



SECTION B/19 4, 12, 14 & 16

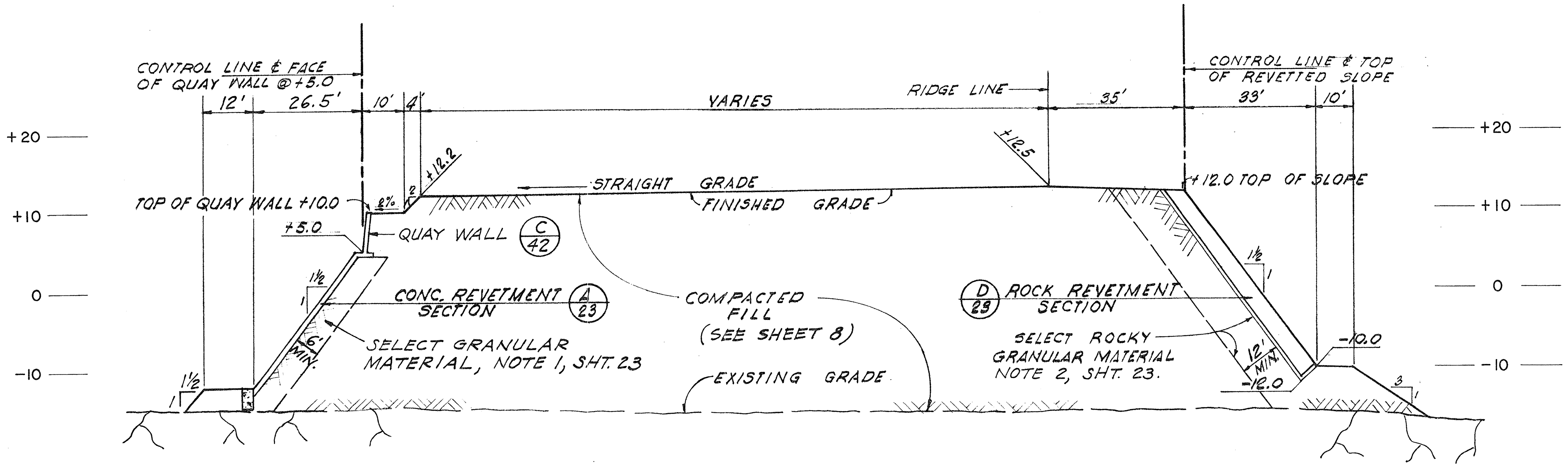


SECTION C/19 4, 16

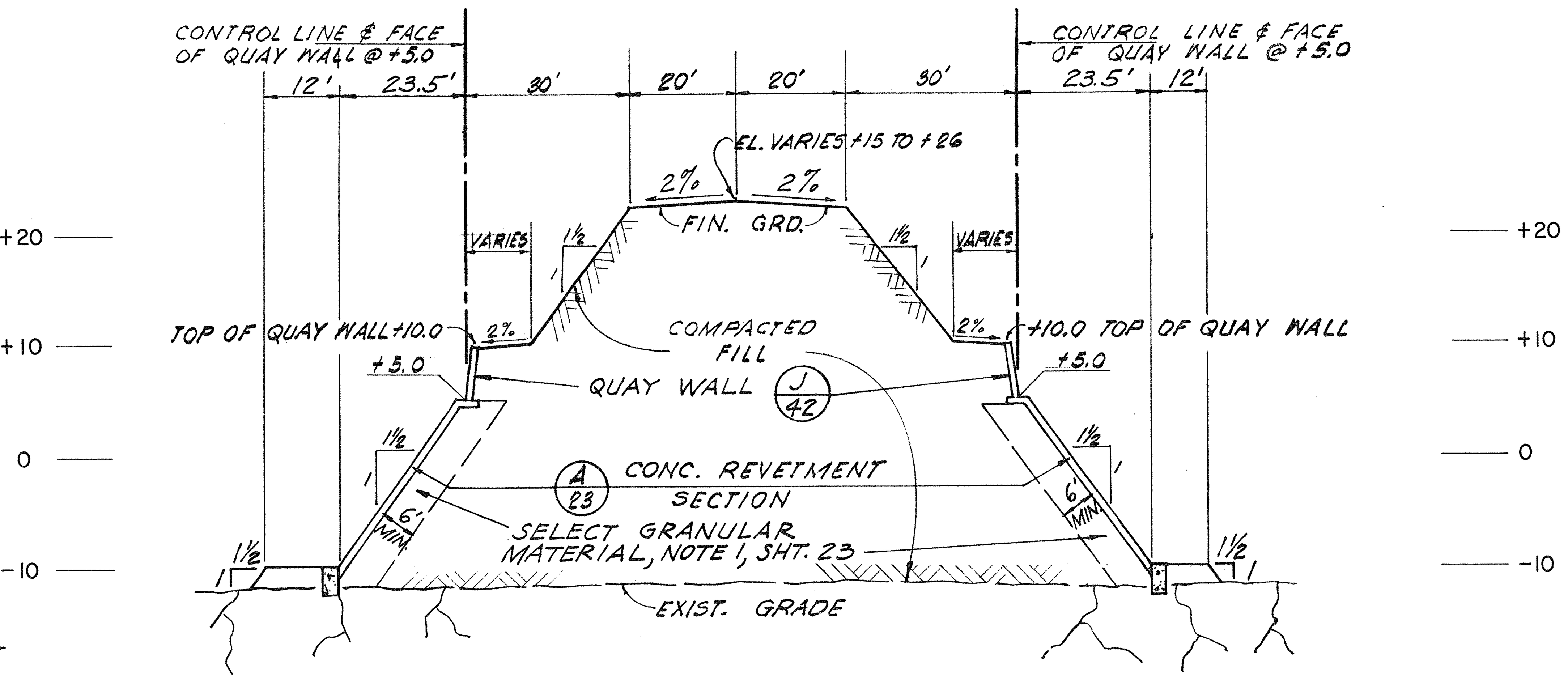
SCALE: HORIZ. 1" = 20'
VERT. 1" = 10'

PLANS PREPARED BY KOEBIG & KOEBIG, INC. ENGINEERING ARCHITECTURE PLANNING LOS ANGELES CALIFORNIA 213/629-3162	ORANGE COUNTY HARBOR DISTRICT NEWPORT BEACH, CALIFORNIA 1901 BAYSIDE DRIVE 714/834-3800
	DANA POINT HARBOR DANA POINT, CALIFORNIA HEAVY CONSTRUCTION
	TYPICAL GRADING SECTIONS II
JOB NO. 1-417 DATE 9-24-68 APPROVED: Rodney P. Lundin	DATE OCTOBER, 1968 SCALE AS SHOWN SHEET 19 OF 50 D10.5-1

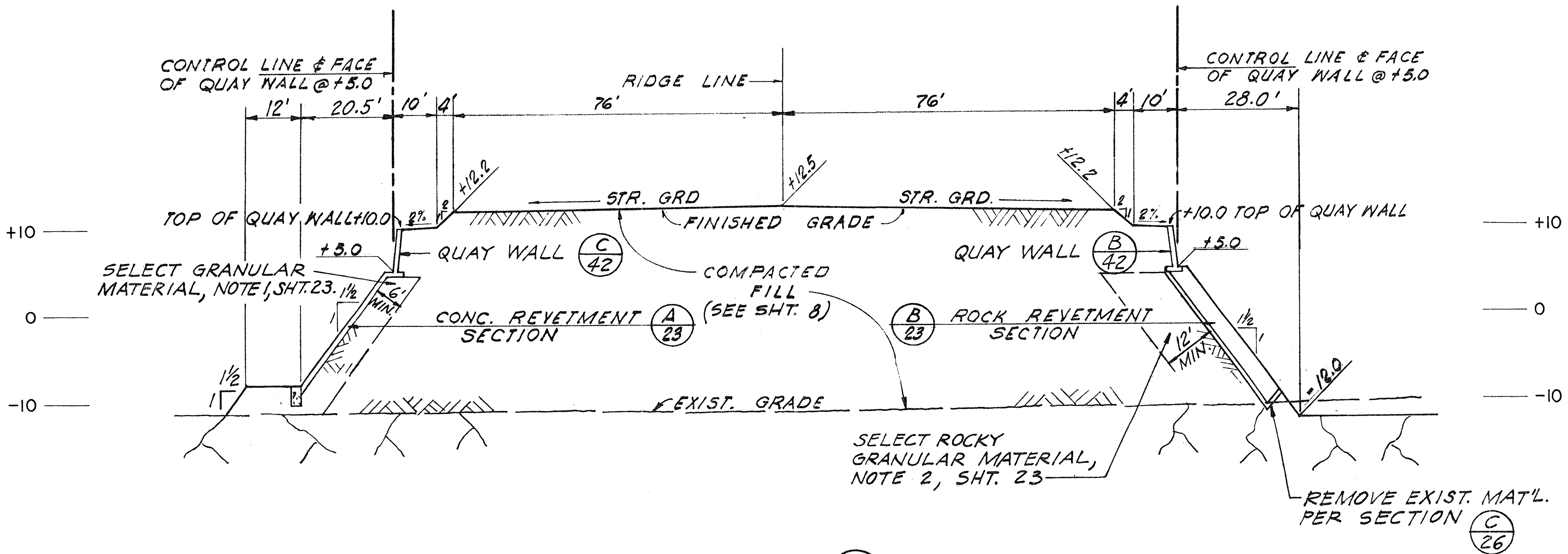
AS BUILT



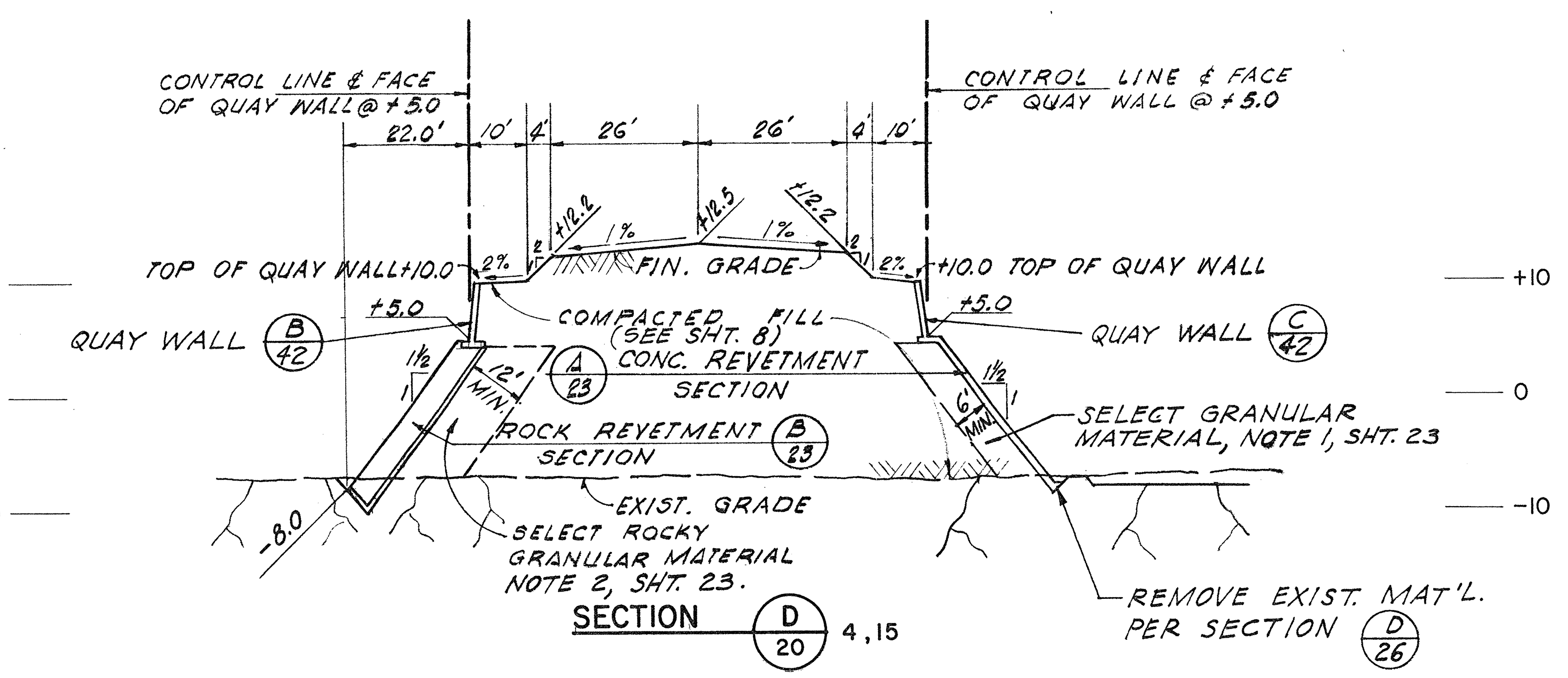
SECTION A/20 4,12



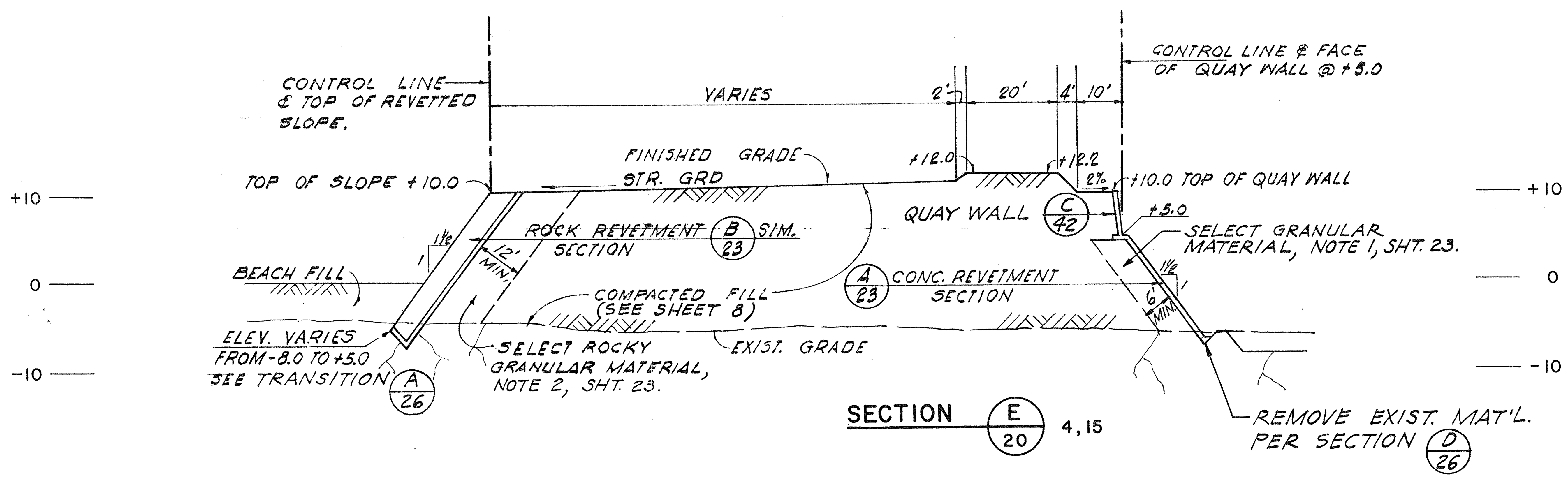
SECTION B/20 4,13,14



SECTION C/20 4,11



SECTION D/20 4,15



SECTION E/20 4,15

SCALE: HORIZ. 1" = 20'
VERT. 1" = 10'

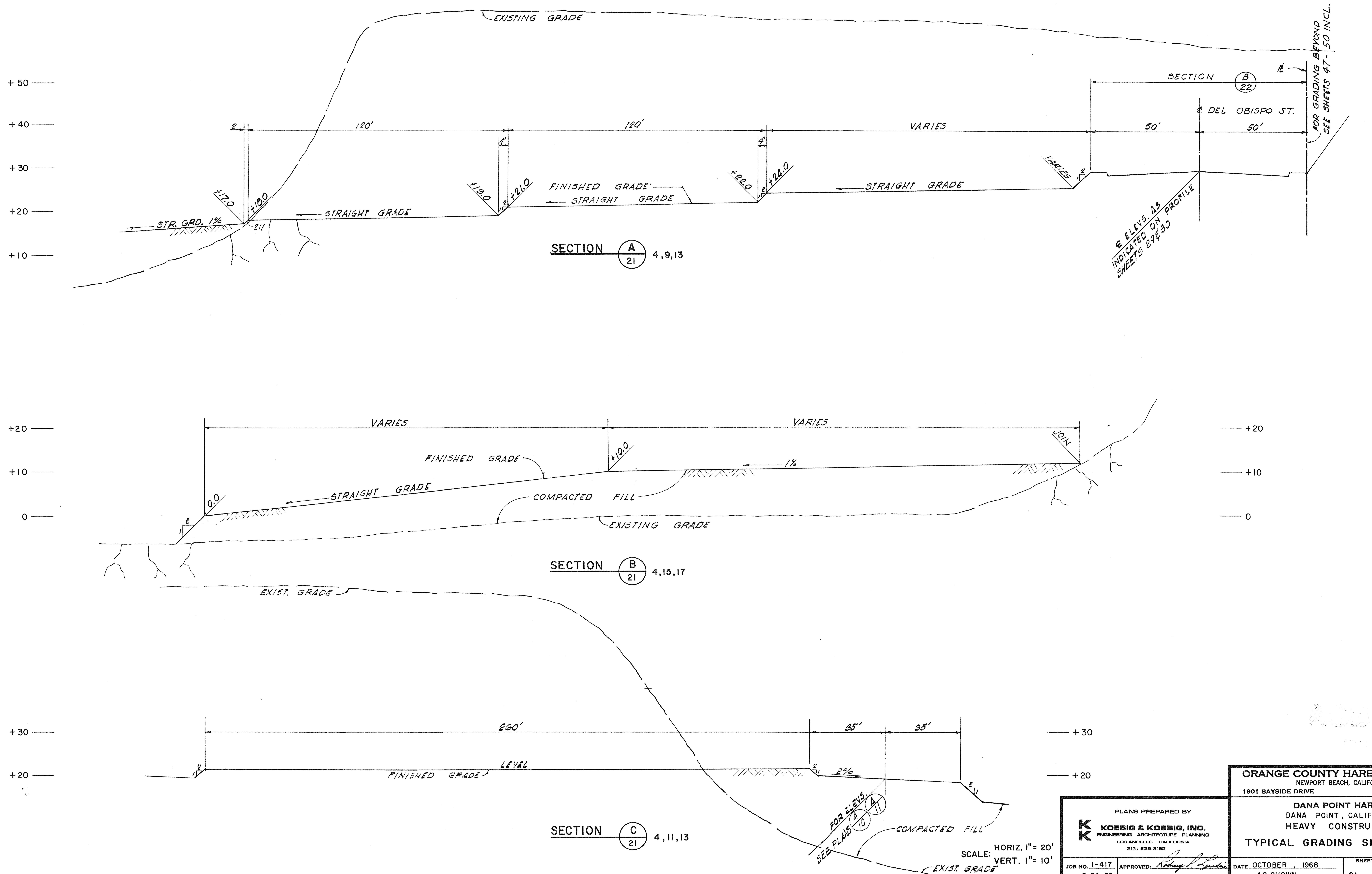
PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213/629-3182

JOB NO. 1-417
DATE 9-24-68
APPROVED:

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION
TYPICAL GRADING SECTIONS III

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 20 OF 50
D 10.5-1



ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213 / 629-3182

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

TYPICAL GRADING SECTIONS IV

JOB NO. 1-417	APPROVED: Rodney P. Lundin	DATE OCTOBER, 1968	SHEET	D10.5-1
DATE 9-24-68		SCALE AS SHOWN	21 OF 51	

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
APPROVED

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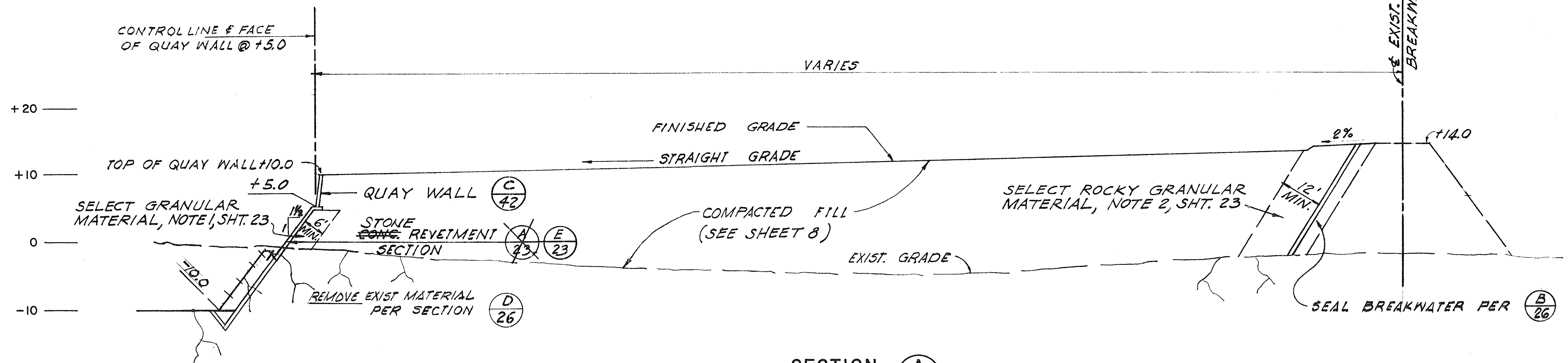
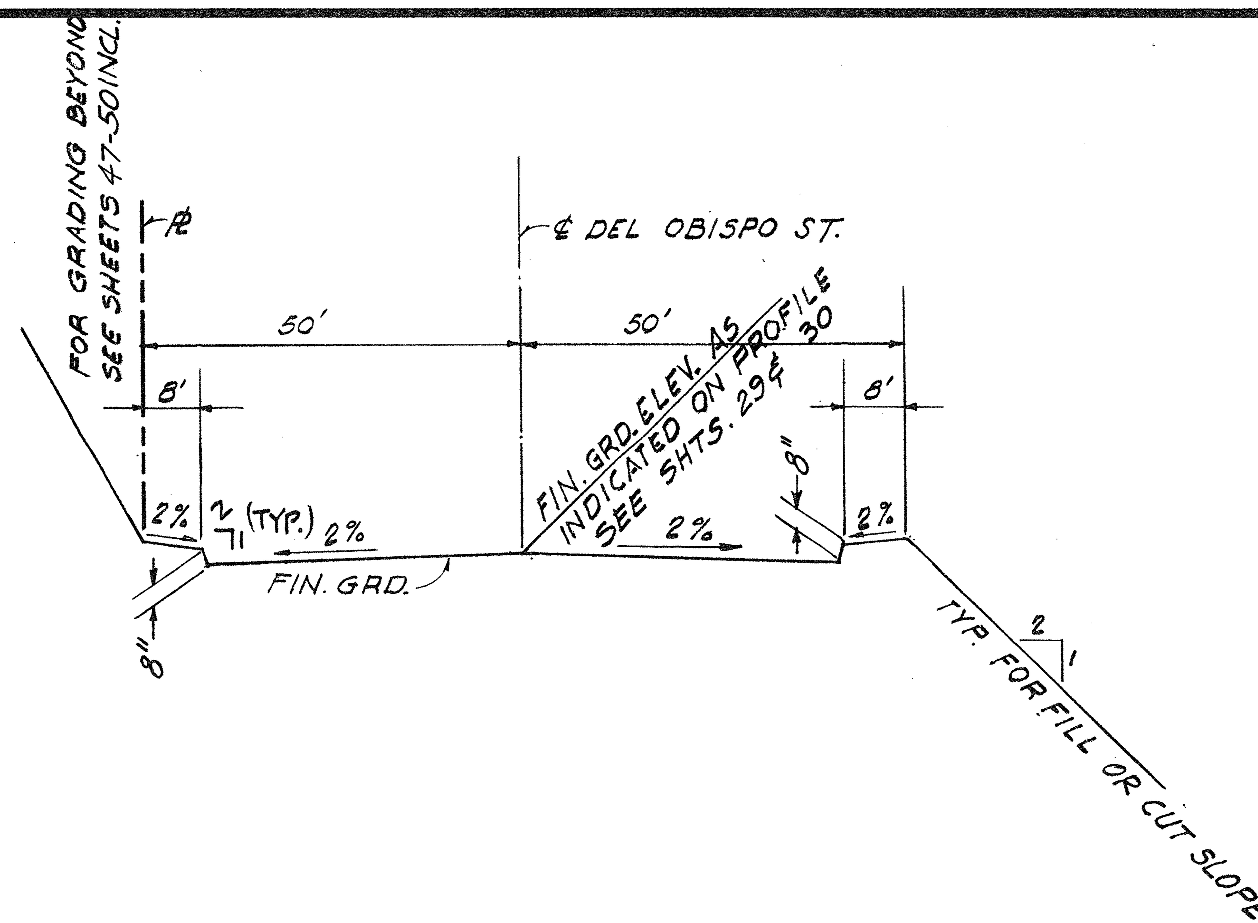
Hadi Tabatabaee
BUILDING OFFICIAL



SECTION A/22 4, 11



SECTION B/22 4, 9, 10, 13

SECTION D/22 4, 10

SEP 2 8 1970

SCALE: HORIZ. 1" = 20'
VERT. 1" = 10'

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213 / 629-3182

JOB NO. 1-417
DATE 9-24-68
APPROVED:

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

TYPICAL GRADING SECTIONS V

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 22 OF 58
D10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
APPROVED

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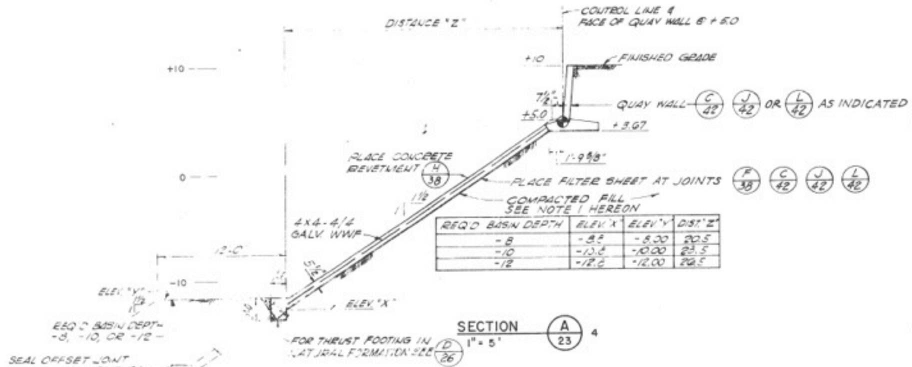
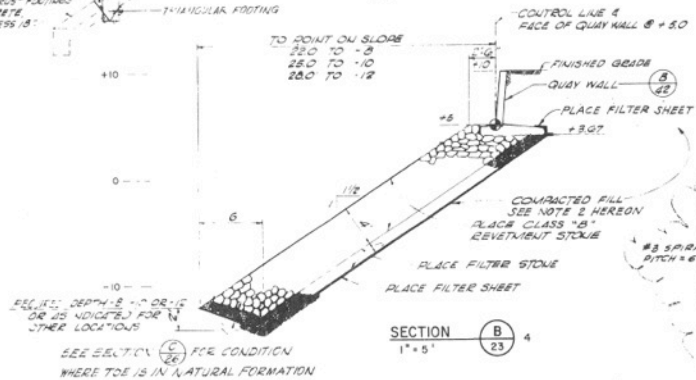
Hadi Tabatabaee
BUILDING OFFICIAL

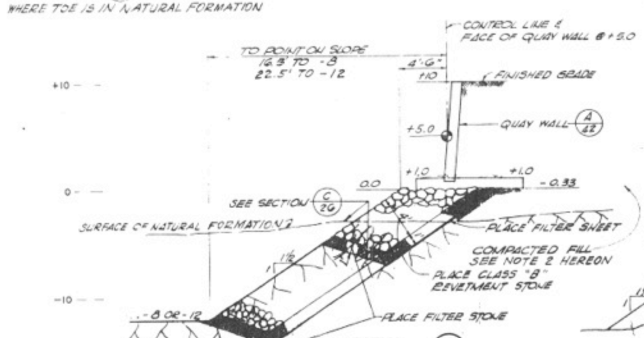


REQ'D BASIN DEPTH	ELEV. "X"	ELEV. "Y"	DIST. "Z"
-8	-8.6	-8.00	20.5
-10	-10.6	-10.00	23.5
-12	-12.6	-12.00	26.5

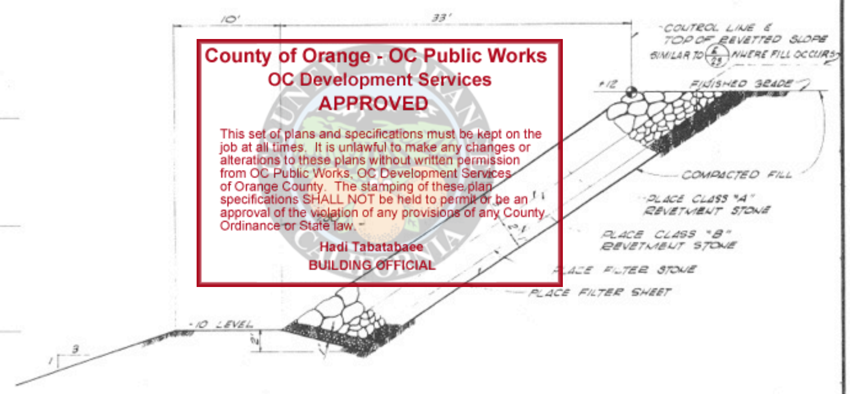
SECTION A/23 4
1" = 5'



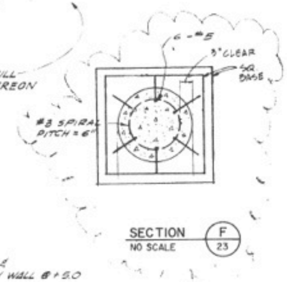
SECTION B/23 4
1" = 5'



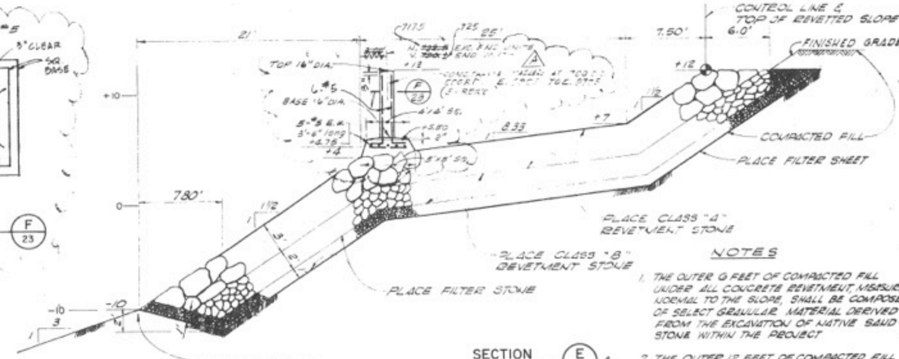
SECTION C/23 4
1" = 5'



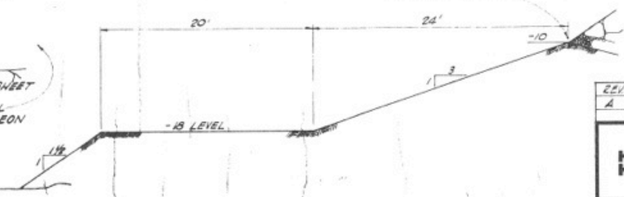
SECTION D/23 4
1" = 5'



SECTION F/23
NO SCALE



SECTION E/23 4
1" = 5'



NOTES

1. THE OUTER 6 FEET OF COMPACTED FILL UNDER ALL CONCRETE REVETMENT, MEASURED NORMAL TO THE SLOPE, SHALL BE COMPOSED OF SELECT GRANULAR MATERIAL DERIVED FROM THE EXCAVATION OF NATIVE SAND-STONE WITHIN THE PROJECT
2. THE OUTER 12 FEET OF COMPACTED FILL UNDER ALL STONE REVETMENT, MEASURED NORMAL TO THE SLOPE, SHALL BE COMPOSED OF SELECT ROCKY, GRANULAR MATERIAL DERIVED FROM THE EXCAVATION OF SUCH MATERIAL WITHIN THE PROJECT.

REV	DESCRIPTION	DATE
A	ADD CONC CHANNEL MARKER	9-15-69

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA

JOB NO. 1-417
DATE 9-24-68
APPROVED

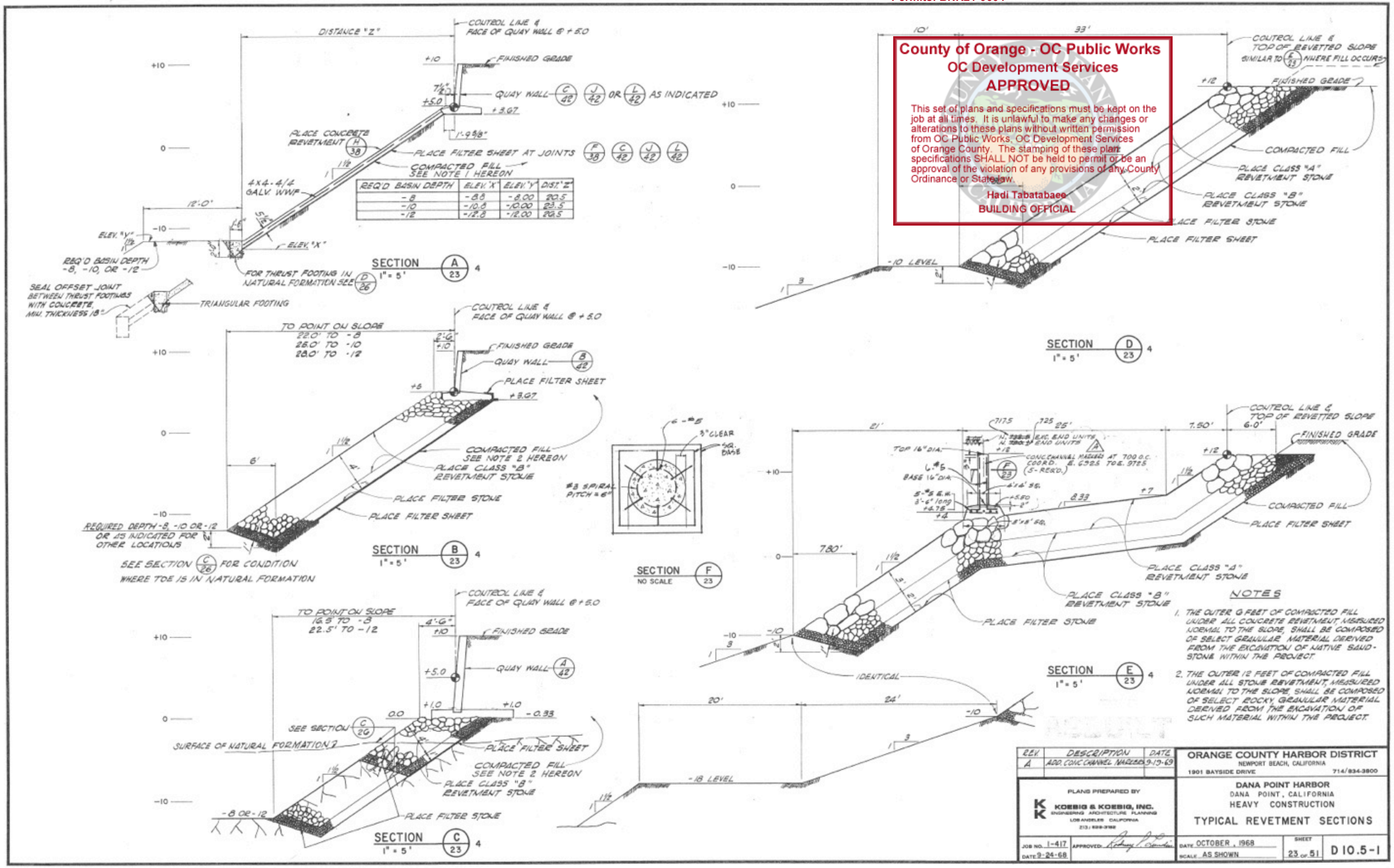
ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

TYPICAL REVETMENT SECTIONS

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 23 OF 51
D 10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604



REQ'D BASIN DEPTH	ELEV. 'X'	ELEV. 'Y'	DIST. 'Z'
-8	-8.8	-8.00	20.5
-10	-10.8	-10.00	23.5
-12	-12.8	-12.00	26.5

County of Orange - OC Public Works
OC Development Services
APPROVED

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Hadi Tabatabaee
BUILDING OFFICIAL

NOTES

1. THE OUTER 6 FEET OF COMPACTED FILL UNDER ALL CONCRETE REVETMENT, MEASURED NORMAL TO THE SLOPE, SHALL BE COMPOSED OF SELECT GRANULAR MATERIAL DERIVED FROM THE EXCAVATION OF NATIVE SAND-STONE WITHIN THE PROJECT.
2. THE OUTER 12 FEET OF COMPACTED FILL UNDER ALL STONE REVETMENT, MEASURED NORMAL TO THE SLOPE, SHALL BE COMPOSED OF SELECT ROCKY, GRANULAR MATERIAL DERIVED FROM THE EXCAVATION OF SUCH MATERIAL WITHIN THE PROJECT.

REV.	DESCRIPTION	DATE
A	ADD. CONC. CHANNEL MARKERS	9-19-69

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA

JOB NO. 1-417 DATE 9-24-68 APPROVED:

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

TYPICAL REVETMENT SECTIONS

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 23 OF 51
D 10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
APPROVED
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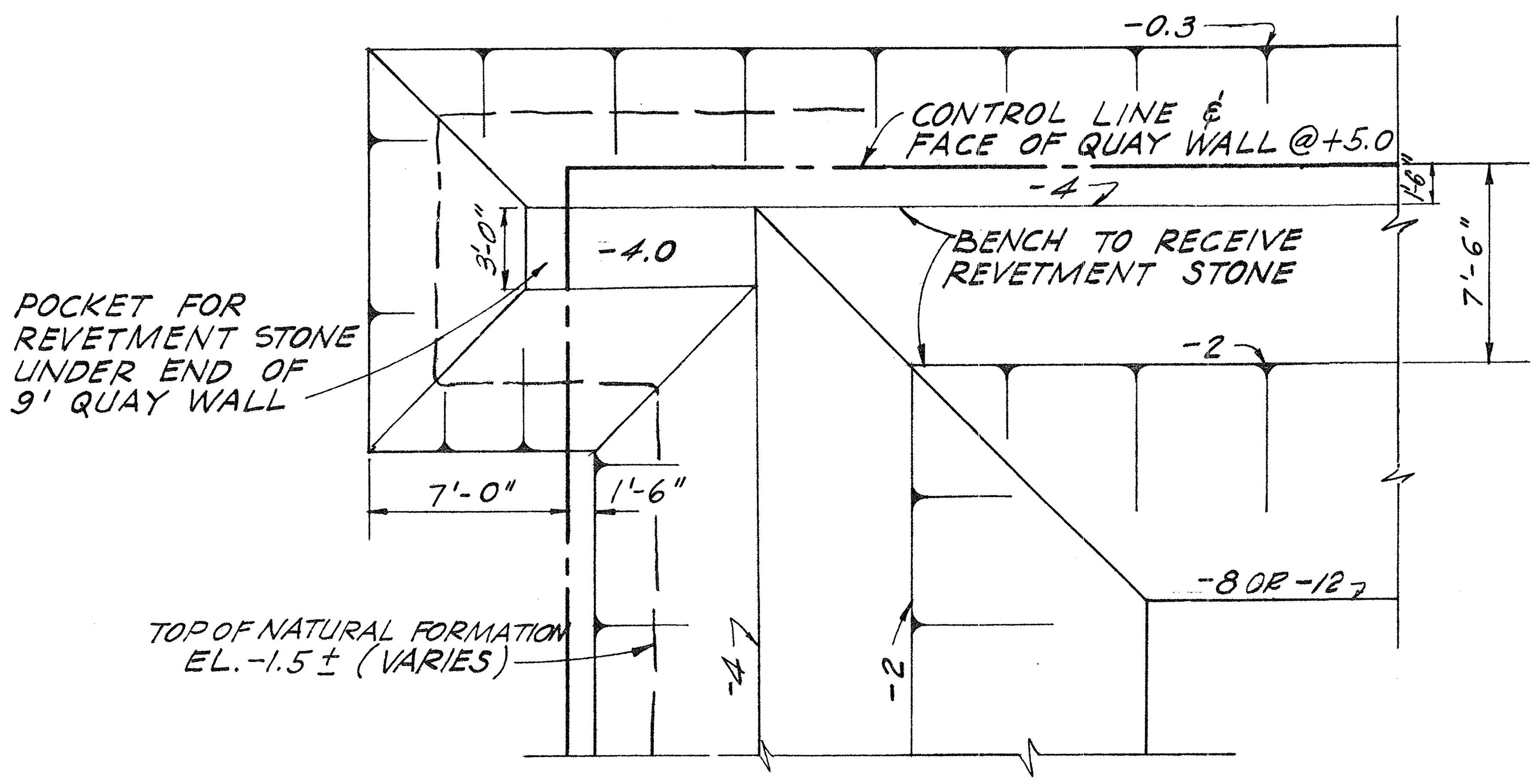
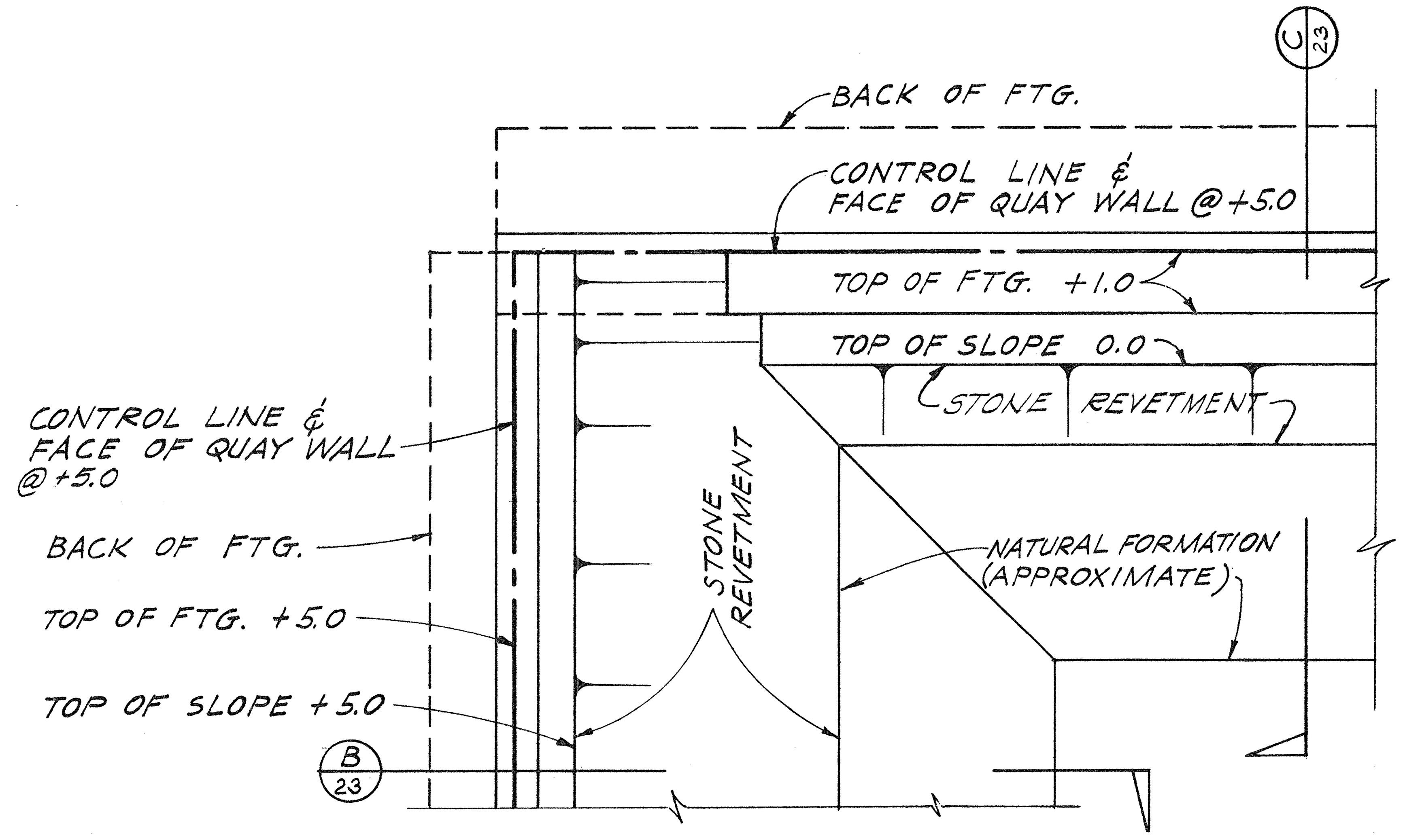
BUILDING OFFICIAL

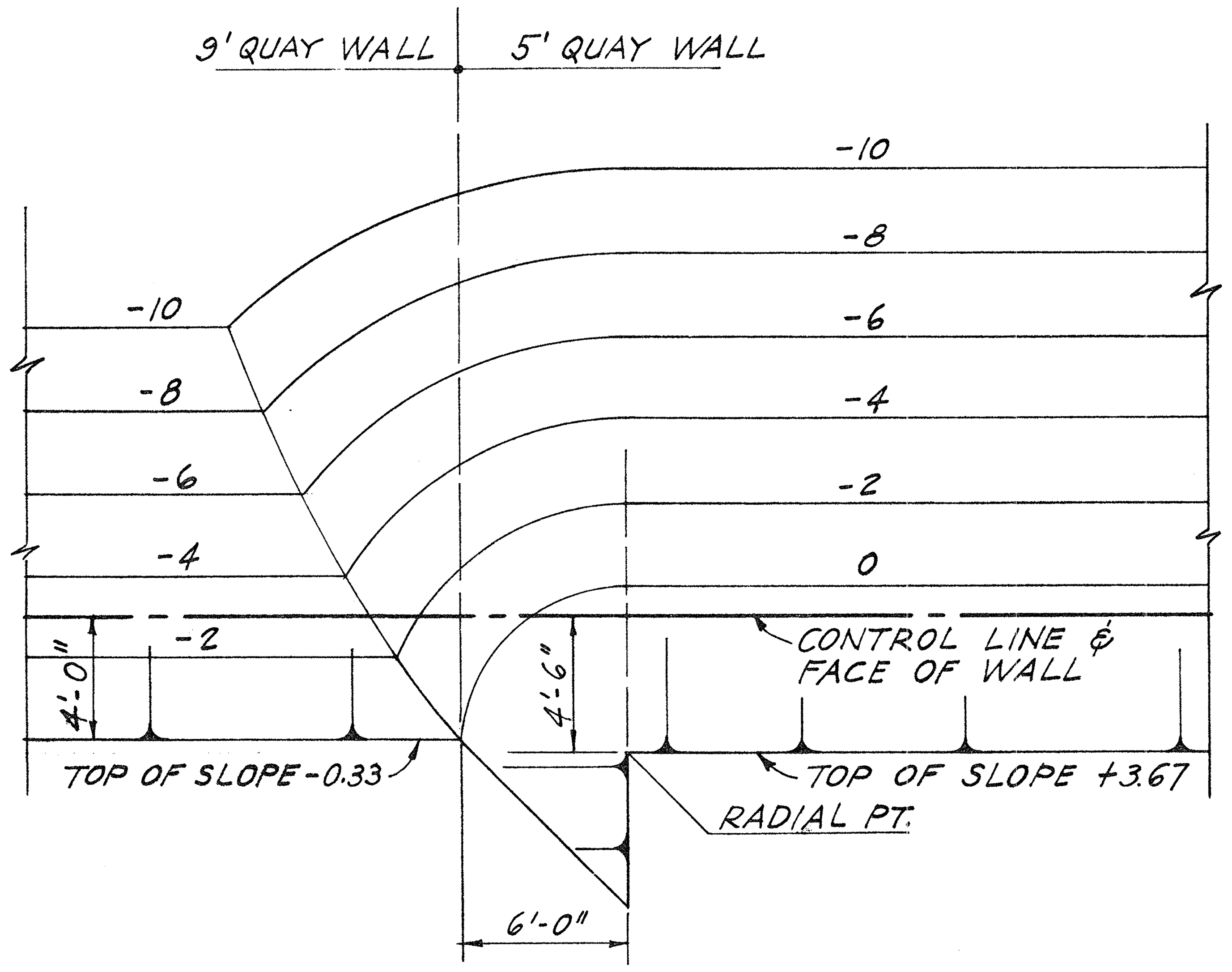


EARTHWORK PLAN A1/25

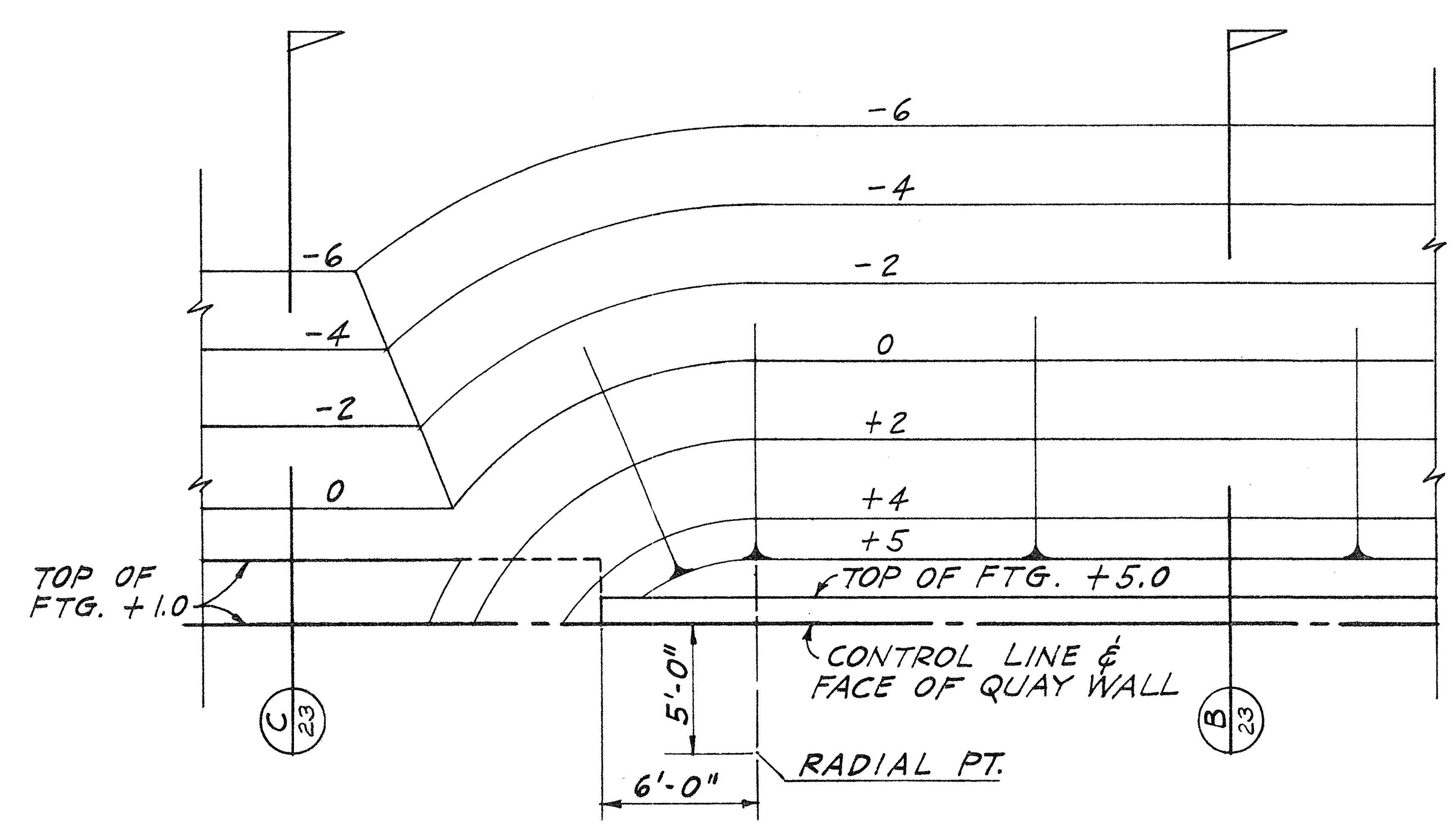


FINISH PLAN A2/25

TRANSITION A/25 4, 11
B/23 TO C/23
1" = 5'



EARTHWORK PLAN B1/25



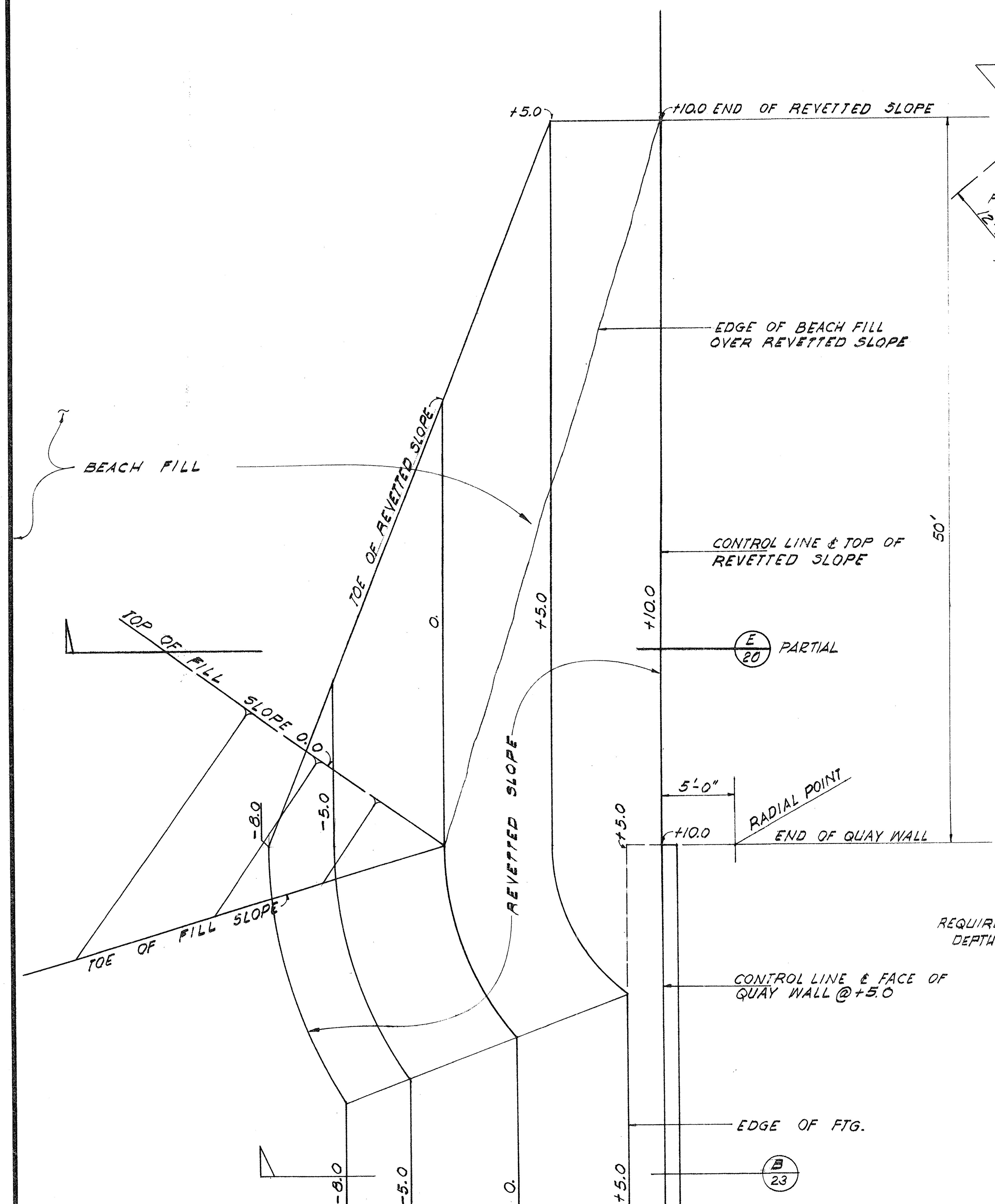
FINISH PLAN B2/25

TRANSITION B/25 4, 11
B/23 TO C/23
1" = 5'

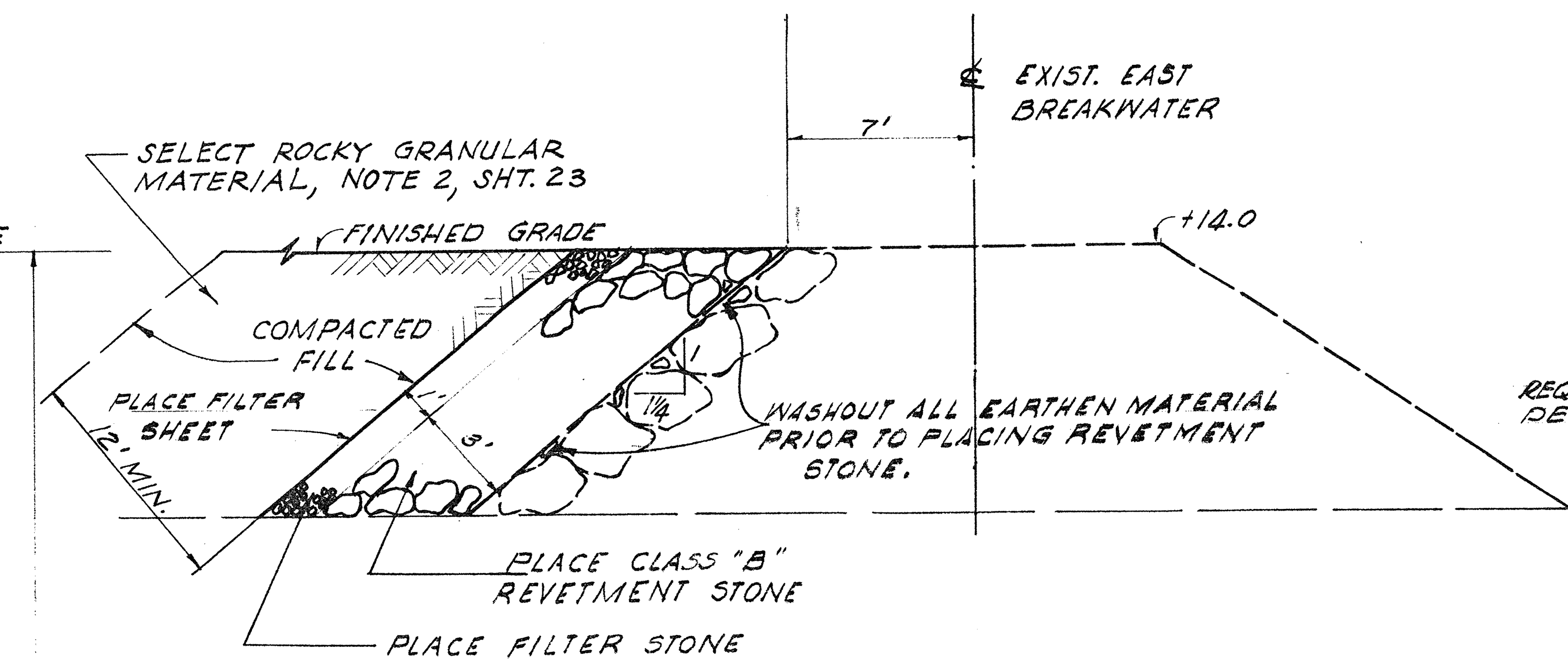
NOTE:
TOE ELEVATION VARIES AT THE VARIOUS LOCATIONS WHERE THESE DETAILS APPLY. CONTINUE EARTHWORK AND FINISH SLOPES DOWN TO PROPER ELEVATIONS FOR BENCH TO RECEIVE REVETMENT STONE AND FOR TOE OF SLOPE.

ASBUILT

PLANS PREPARED BY KOEBIG & KOEBIG, INC. ENGINEERING ARCHITECTURE PLANNING LOS ANGELES CALIFORNIA 213/629-3182	ORANGE COUNTY HARBOR DISTRICT NEWPORT BEACH, CALIFORNIA 1901 BAYSIDE DRIVE 714/834-3800
JOB NO. 1-417 DATE 9-24-68 APPROVED: [signature]	DANA POINT HARBOR DANA POINT, CALIFORNIA HEAVY CONSTRUCTION REVETMENT TRANSITION DETAILS II
	DATE OCTOBER, 1968 SCALE AS SHOWN SHEET 25 OF 50 D 10.5 - 1

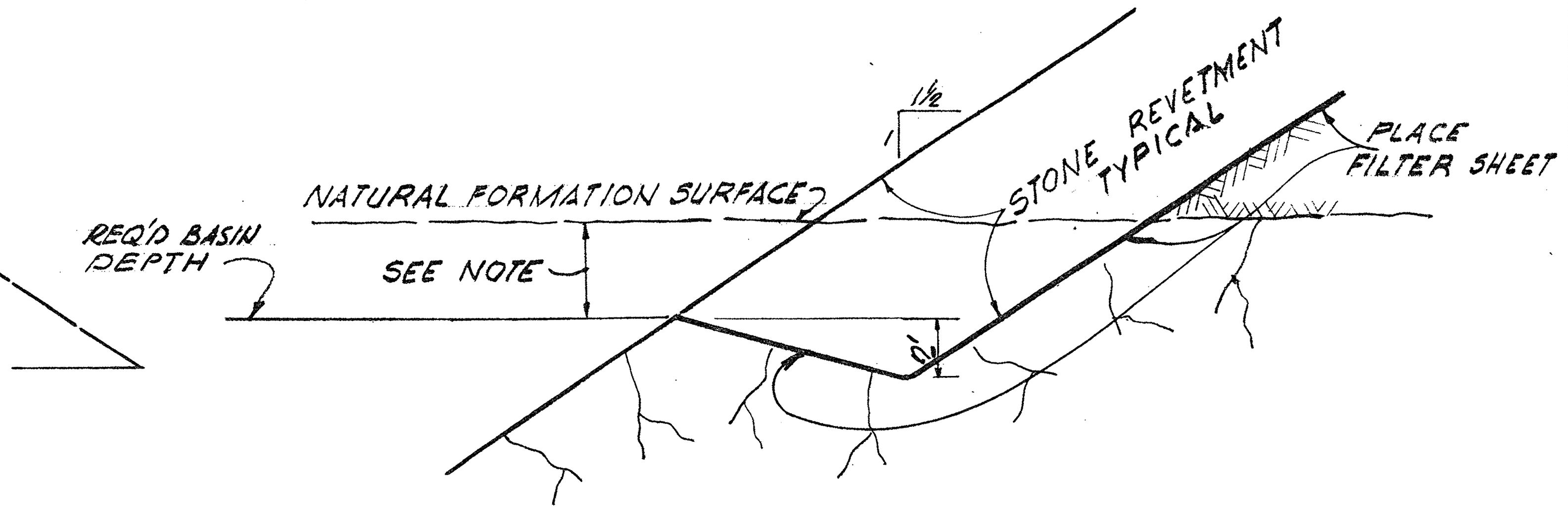


TRANSITION A/26 4,15
1" = 5'



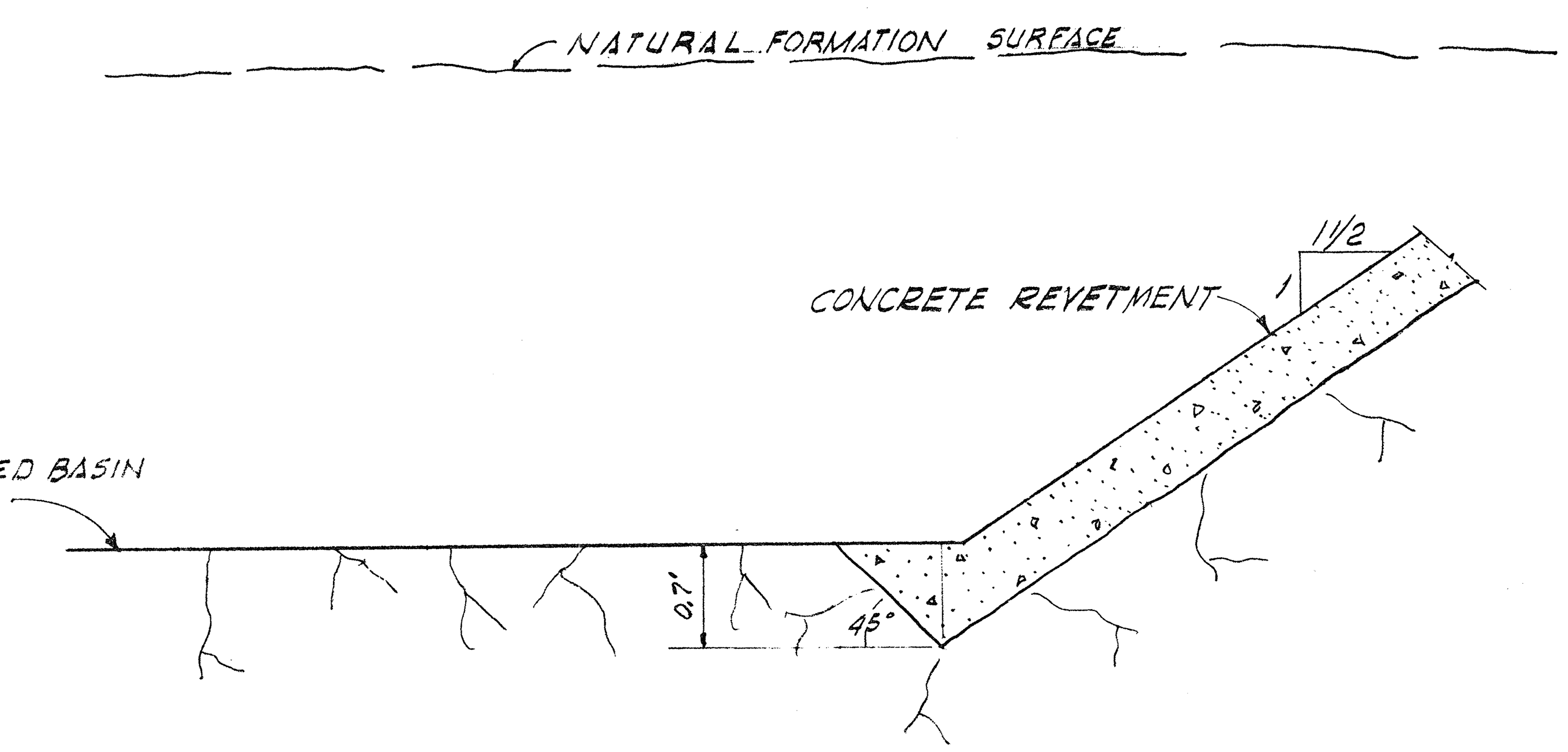
SEALING AT EAST & WEST BREAKWATERS (TYPICAL THROUGHOUT LENGTH OF EARTH FILL)

SECTION B/26 4,8,11
1" = 5'

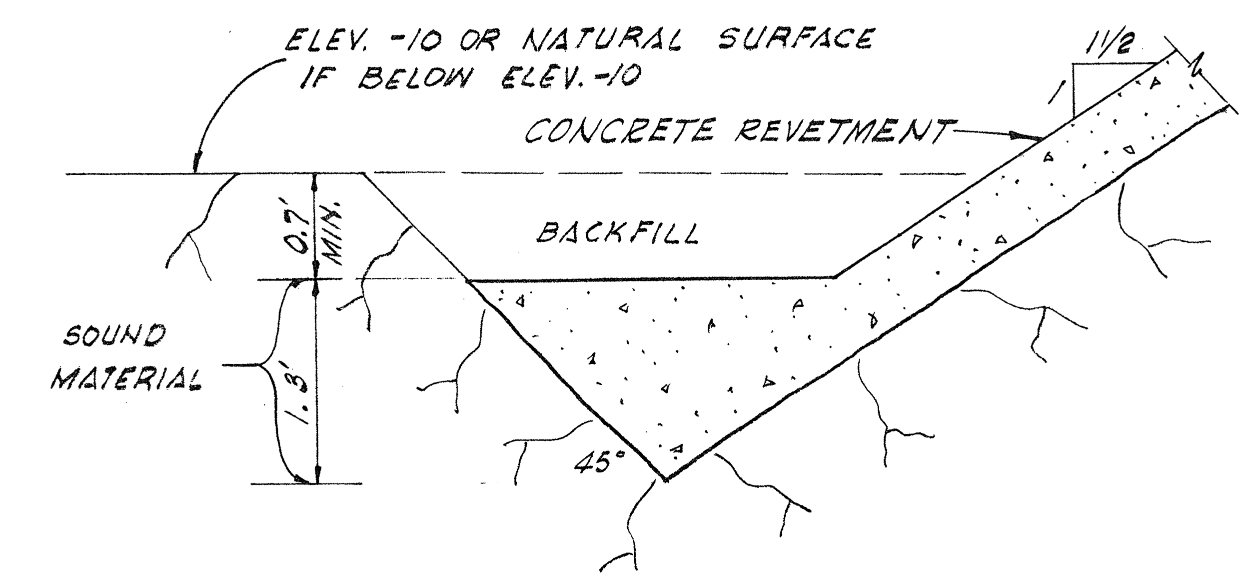


NOTE: REMOVE LOOSE, SOFT, OR WEATHERED MATERIAL AS NEEDED TO OBTAIN REASONABLY SOUND MATERIAL FOR FINISHED SURFACES.

SECTION C/26
1" = 5'



SECTION D/26 23
1" = 1'



TOE DETAIL BELOW BRIDGE ABUTMENTS

SECTION E/26 13, 14
1" = 1'

ASBUILT

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213/629-3182

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

REVETMENT TRANSITION DETAILS III

JOB NO. 1-417
DATE 9-24-68
APPROVED:
DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 26 OF 50
D 10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
APPROVED

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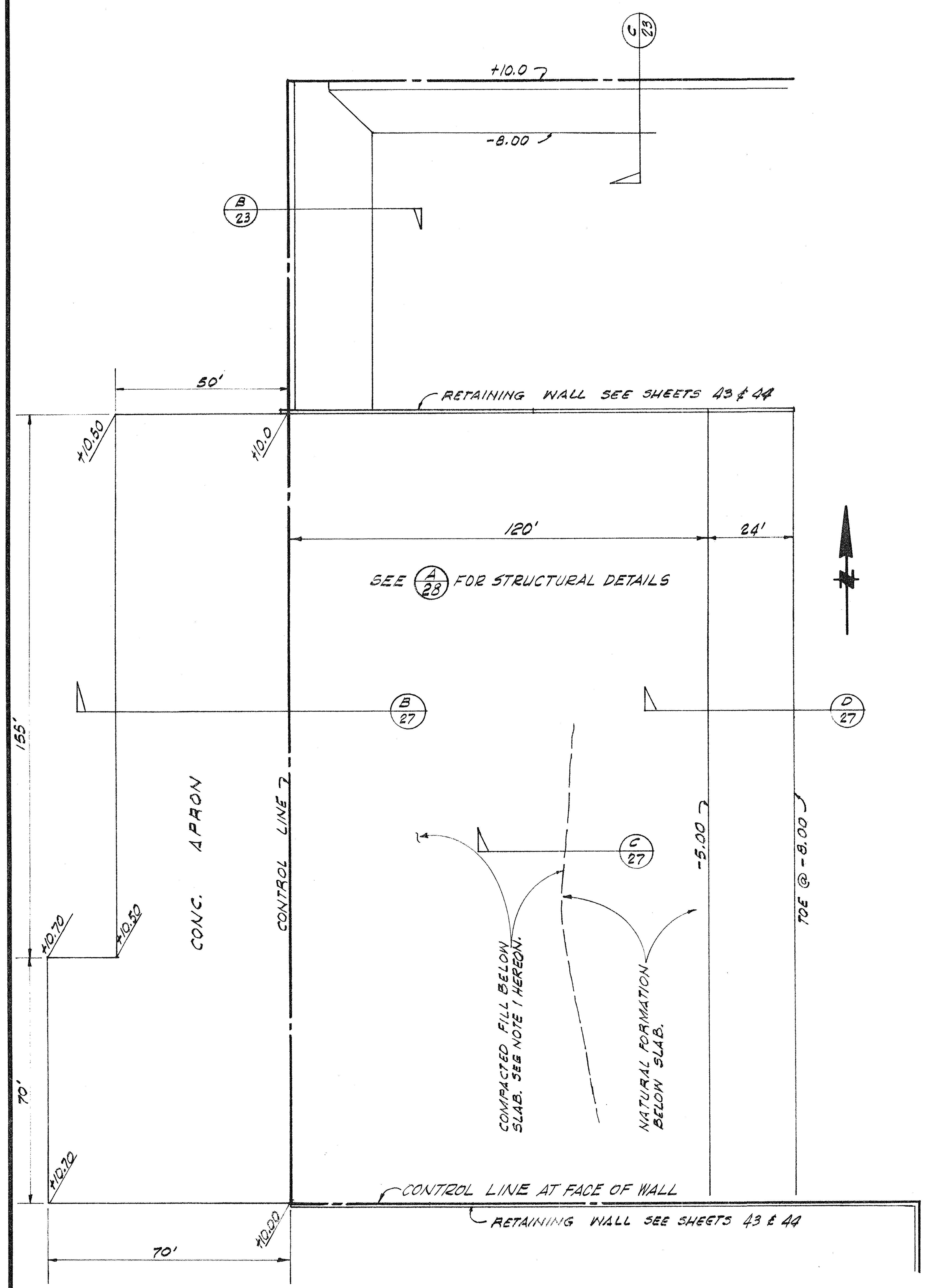
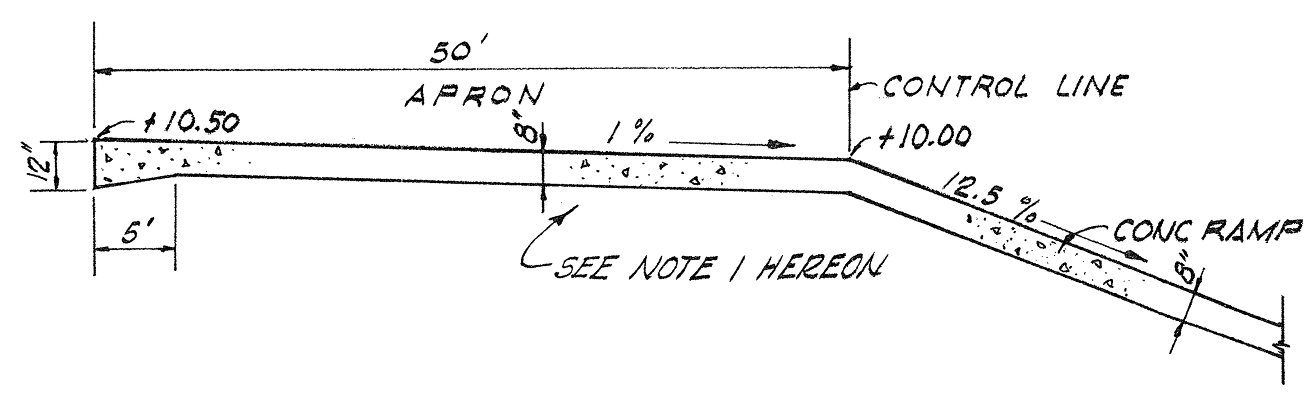
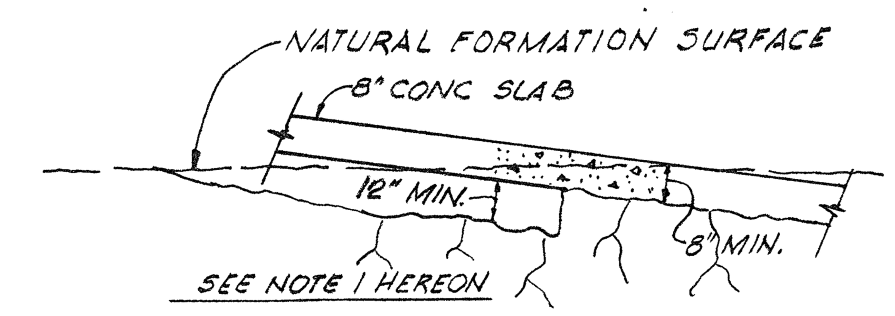
Hadi Tabatabaee
BUILDING OFFICIAL



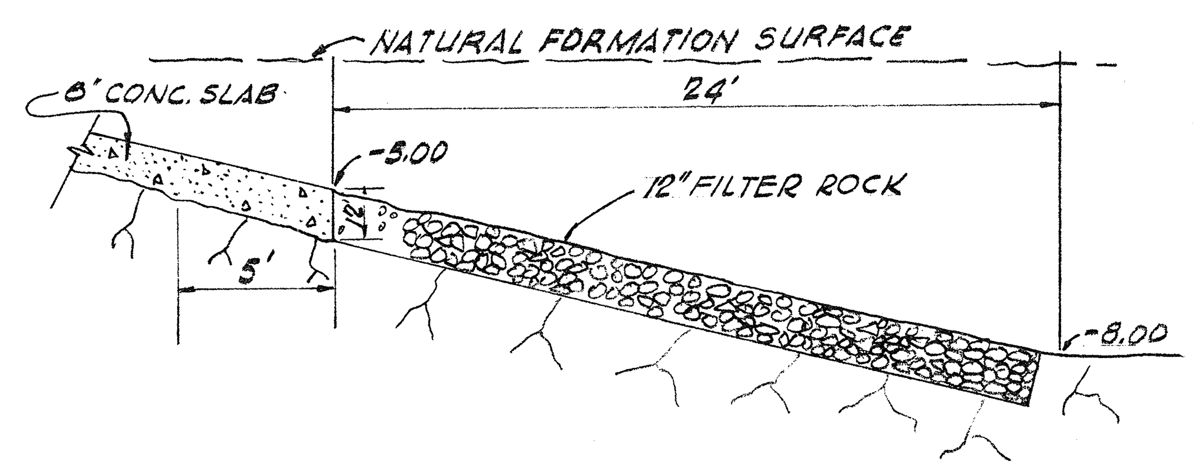
PLAN A/27
1" = 20'



SECTION B/27



SECTION C/27

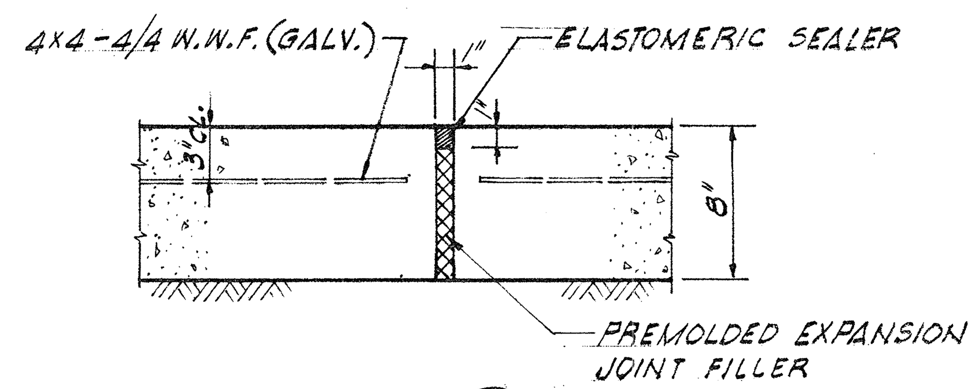


SECTION D/27

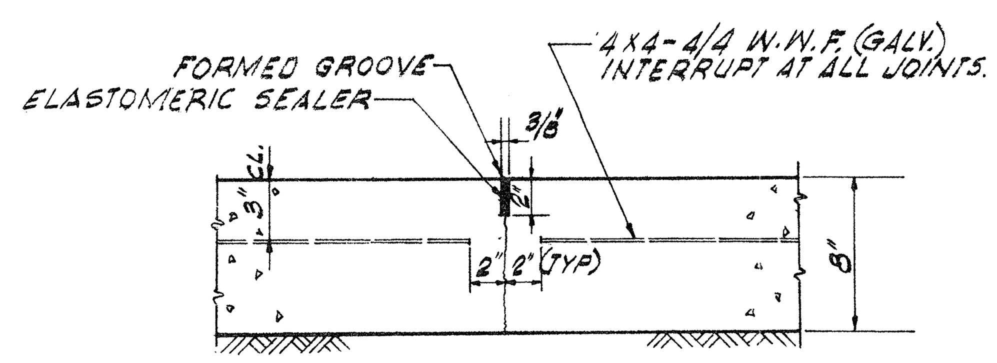
NOTE:
1. PROVIDE A MIN. 12" THICK SUBGRADE LAYER OF GRANULAR FREE DRAINING MATERIAL BETWEEN COMPACTED FILL AND BOTTOM OF 8" CONC. PAVEMENT.

ASBUILT

PLANS PREPARED BY KOEBIG & KOEBIG, INC. ENGINEERING ARCHITECTURE PLANNING LOS ANGELES CALIFORNIA 213 / 629-3182	ORANGE COUNTY HARBOR DISTRICT NEWPORT BEACH, CALIFORNIA 1901 BAYSIDE DRIVE 714/834-3800
	DANA POINT HARBOR DANA POINT, CALIFORNIA HEAVY CONSTRUCTION BOAT RAMP - PLAN & SECTIONS
JOB NO. 1-417 DATE 9-24-68 APPROVED: [signature]	DATE OCTOBER, 1968 SCALE AS SHOWN SHEET 27 OF 50 D10.5-1

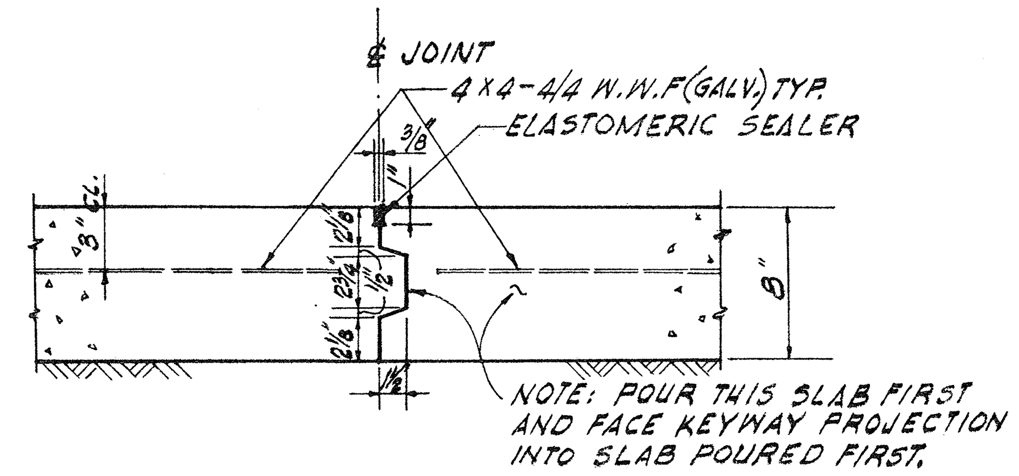


SECTION B/28



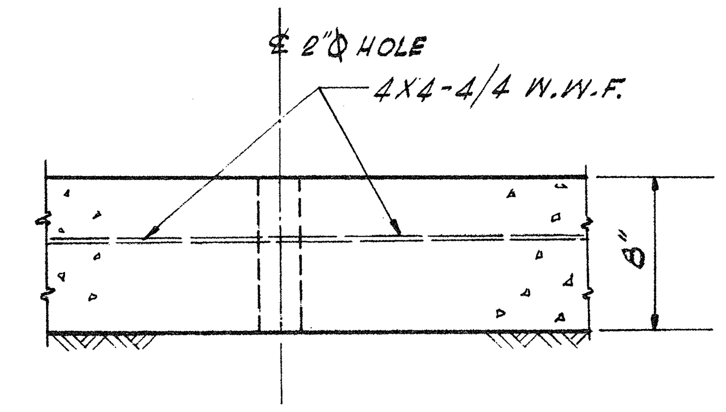
TYPICAL TRANSVERSE DUMMY CONTROL JOINT

SECTION C/28
1 1/2" = 1'-0"



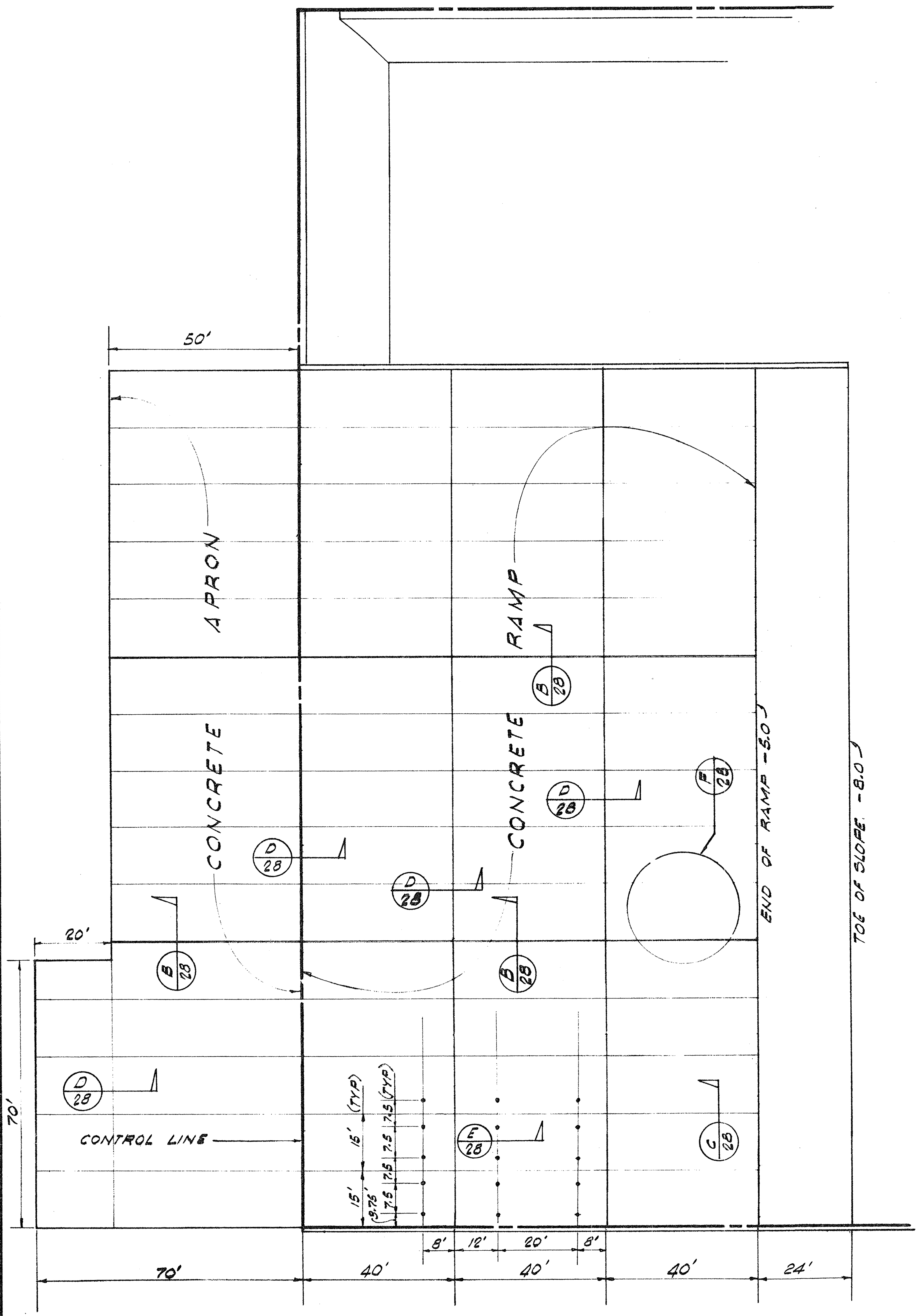
TYPICAL LONGITUDINAL CONSTRUCTION JOINT

SECTION D/28
1 1/2" = 1'-0"

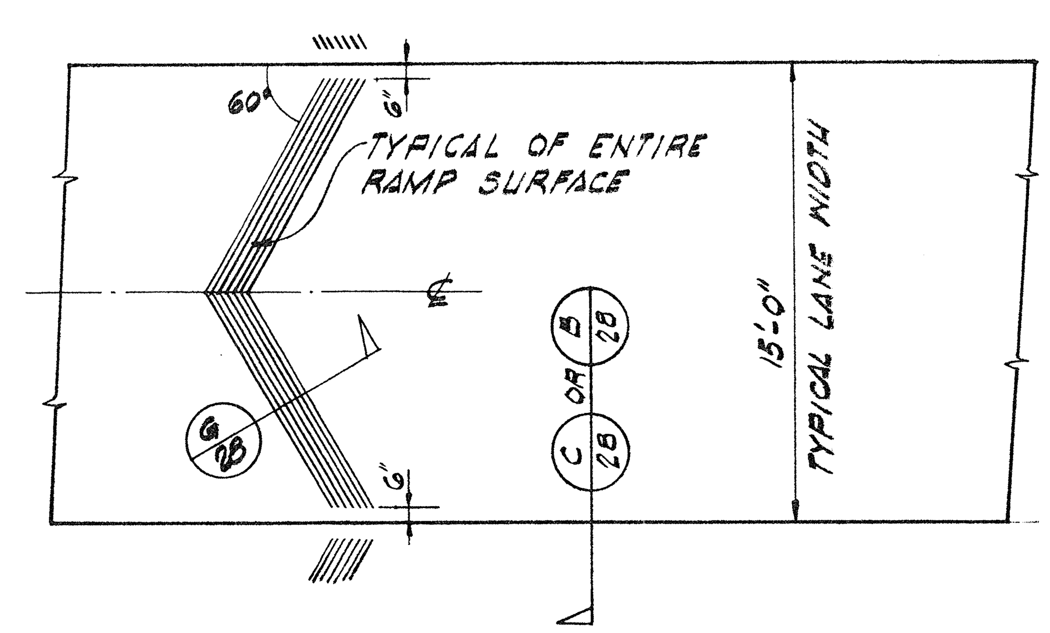


2" Ø WEEP HOLE DETAIL

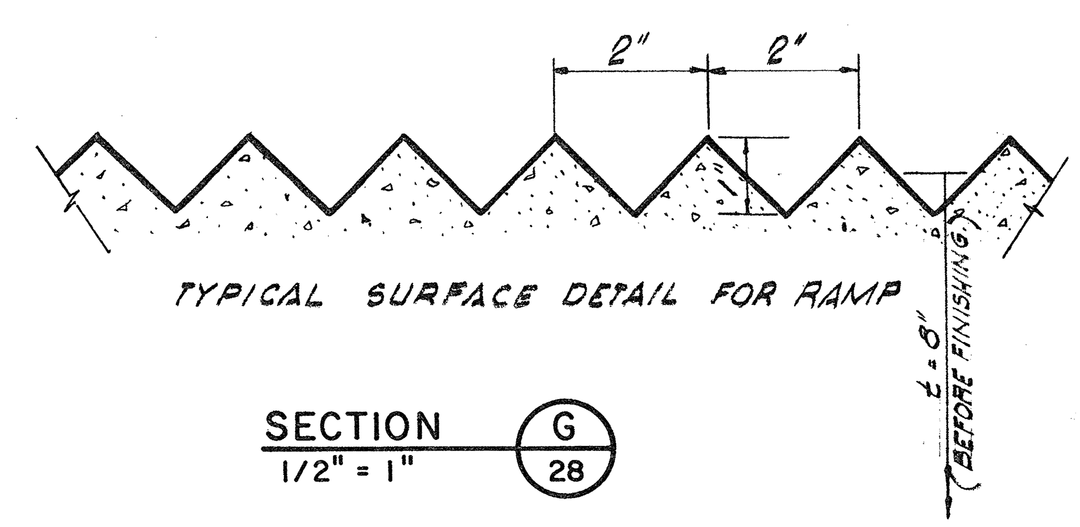
SECTION E/28
1 1/2" = 1'-0"



PLAN A/28
1" = 20'



PLAN F/28
1" = 5'



SECTION G/28
1/2" = 1"

ASBUILT SEP 2 2 1970

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

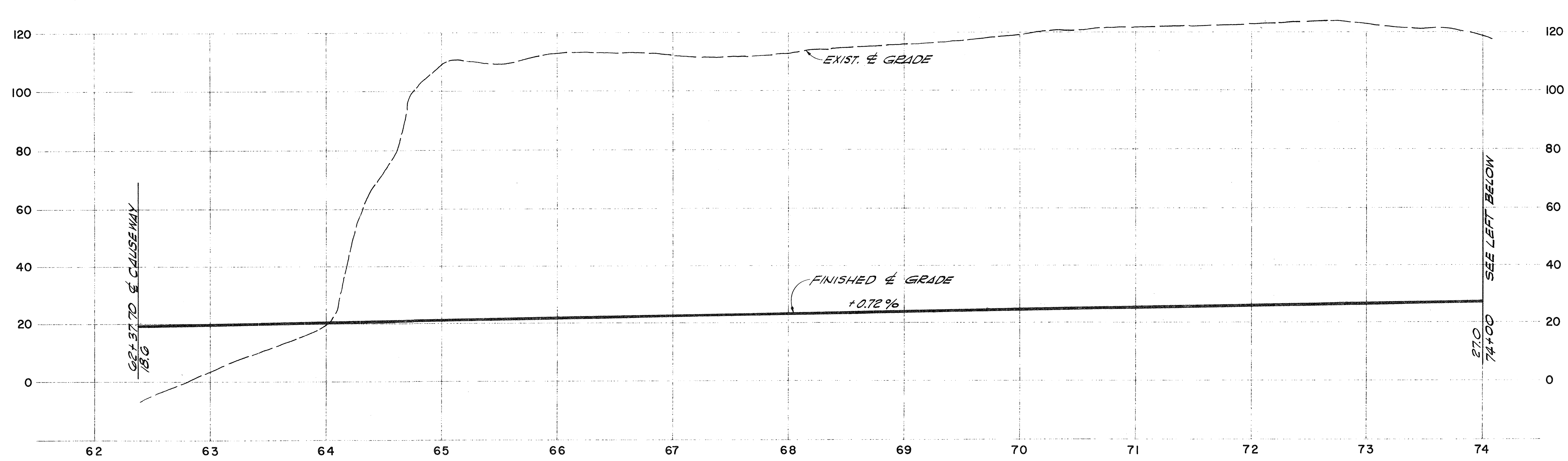
PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213 / 629-3182

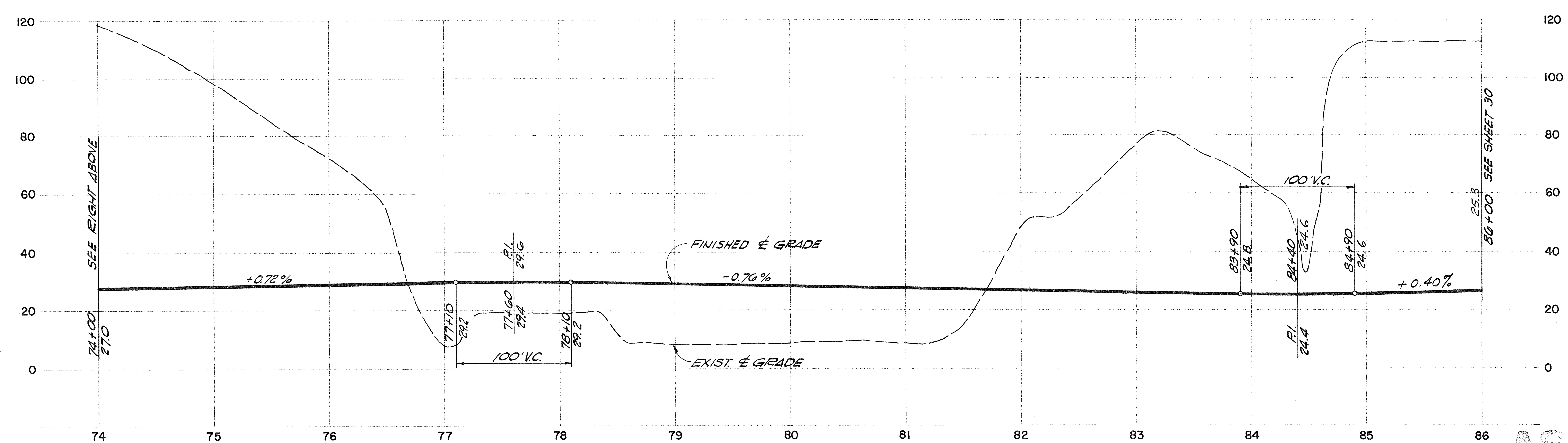
JOB NO. 1-417
DATE 9-24-68
APPROVED:

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

BOAT RAMP - DETAILS

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 28 OF 50
D 10.5-1





ASBUILT

SCALE HORIZ. 1" = 50'
VERT. 1" = 20'

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213 / 629-3182

JOB NO. 1-417
DATE 9-24-68
APPROVED: Rodney P. Lundin

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

DEL OBISPO STREET - PROFILES I

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 29 1 OF 50
D10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
APPROVED
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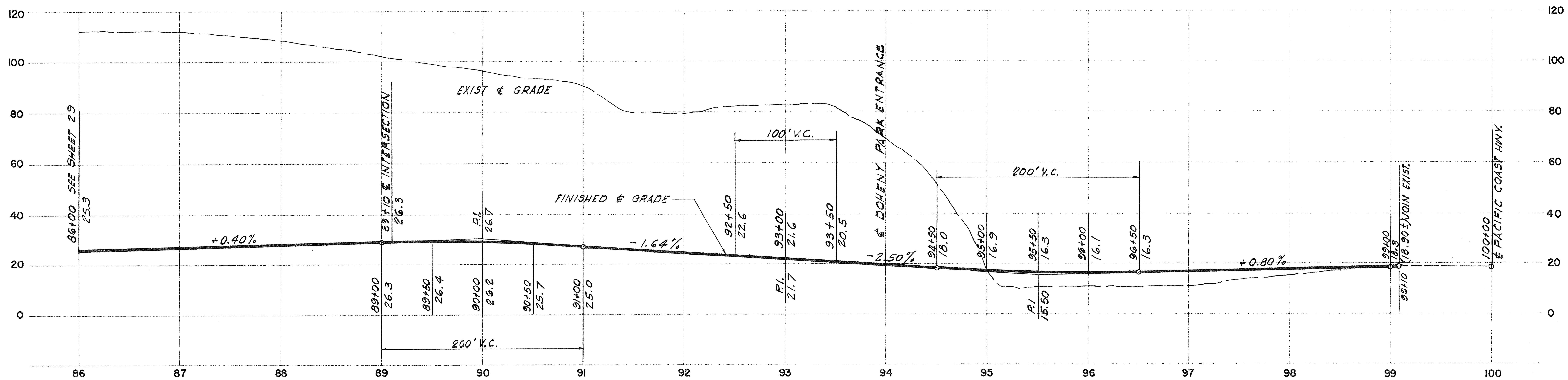
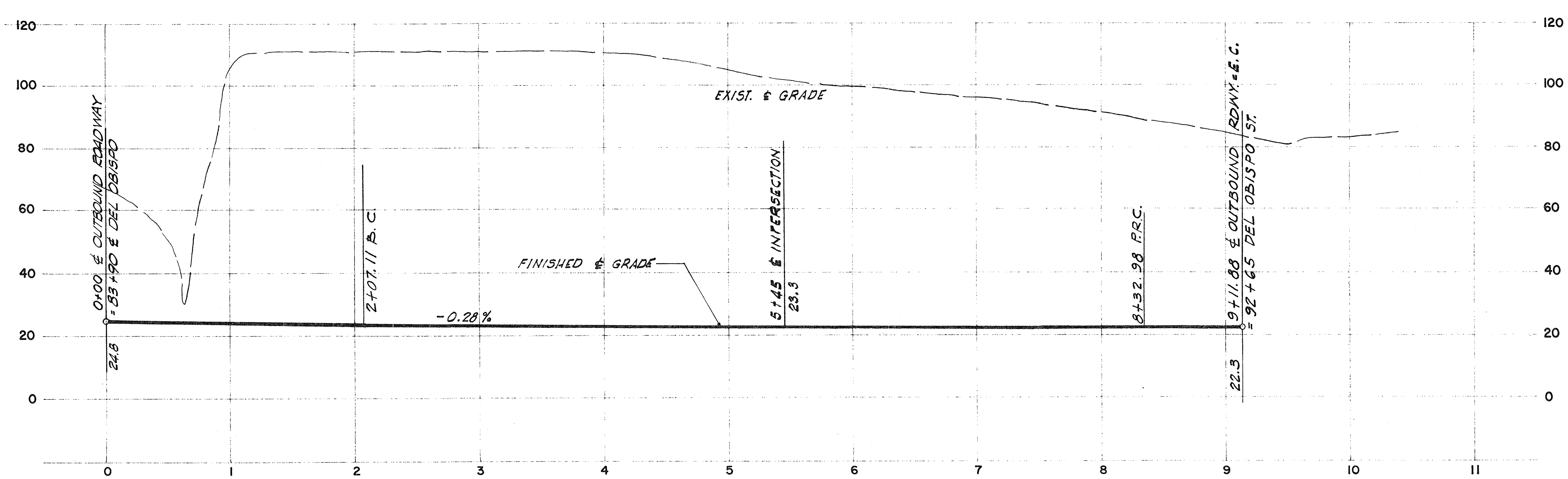
Hadi Tabatabaee
BUILDING OFFICIAL



DEL OBISPO STREET



OUTBOUND ROADWAY

AS BUILT

SCALE: HORIZ. 1"= 50'
VERT. 1"= 20'

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LOS ANGELES CALIFORNIA
213 / 629-3182

JOB NO. 1-417
DATE 9-24-68
APPROVED:

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

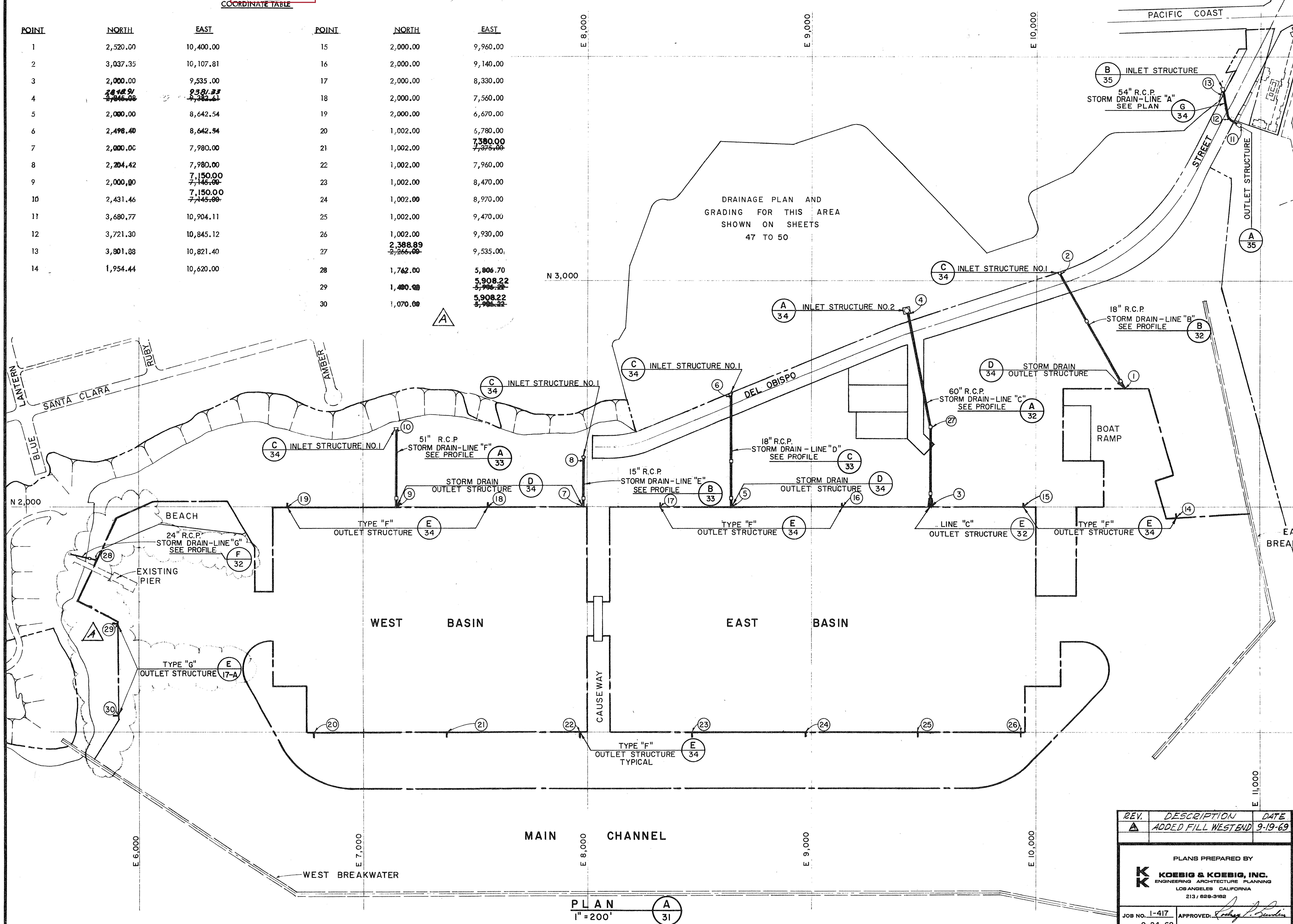
DEL OBISPO STREET - PROFILES II

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 30 OF 50
D10.5-1

COORDINATE TABLE

POINT	NORTH	EAST
1	2,520.00	10,400.00
2	3,037.35	10,107.81
3	2,000.00	9,535.00
4	2848.91 ~~2,846.08~~	9381.33 ~~9,382.61~~
5	2,000.00	8,642.54
6	2,498.40	8,642.54
7	2,000.00	7,980.00
8	2,204.42	7,980.00
9	2,000.00	7,150.00 ~~7,145.00~~
10	2,431.46	7,150.00 ~~7,145.00~~
11	3,680.77	10,904.11
12	3,721.30	10,845.12
13	3,801.88	10,821.40
14	1,954.44	10,620.00

POINT	NORTH	EAST
15	2,000.00	9,960.00
16	2,000.00	9,140.00
17	2,000.00	8,330.00
18	2,000.00	7,560.00
19	2,000.00	6,670.00
20	1,002.00	6,780.00
21	1,002.00	7,380.00 ~~7,375.00~~
22	1,002.00	7,960.00
23	1,002.00	8,470.00
24	1,002.00	8,970.00
25	1,002.00	9,470.00
26	1,002.00	9,930.00
27	2,388.89 ~~2,266.00~~	9,535.00
28	1,762.00	5,806.70
29	1,400.00	5,908.22 ~~5,906.22~~
30	1,070.00	5,908.22 ~~5,906.22~~



LEGEND

(line)	STORM DRAIN
(line with box)	M.H.
(3)	COORDINATE POINT

STORM DRAIN GENERAL NOTES

1. STATIONS SHOWN ON THE STORM DRAIN PLANS ARE ALONG THE CENTERLINE OF CONDUIT OR ON A LINE NORMAL TO THE CENTERLINE OF THE CONDUIT.
2. MANHOLES SHALL BE CONSTRUCTED ACCORDING TO ORANGE COUNTY HIGHWAY DEPARTMENT STANDARD PLAN NOS. 508, 505, 507, AND 510 WHERE THE STORM DRAIN CONDUIT IS 24" OR SMALLER. FOR LARGER SIZE CONDUIT, MANHOLES SHALL BE CONSTRUCTED ACCORDING TO DETAIL.
3. WHERE REINFORCED CONCRETE PIPE HAS A DEFLECTION GREATER THAN 5° USE CONCRETE COLLAR PER DETAIL.

REV.	DESCRIPTION	DATE
A	ADDED FILL WESTEND	9-19-69

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
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LOS ANGELES CALIFORNIA
213/629-3182

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

DRAINAGE PLAN

JOB NO. 1-417
DATE 9-24-68
APPROVED: Rodney P. Lundin
DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 31 OF 51
D 10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
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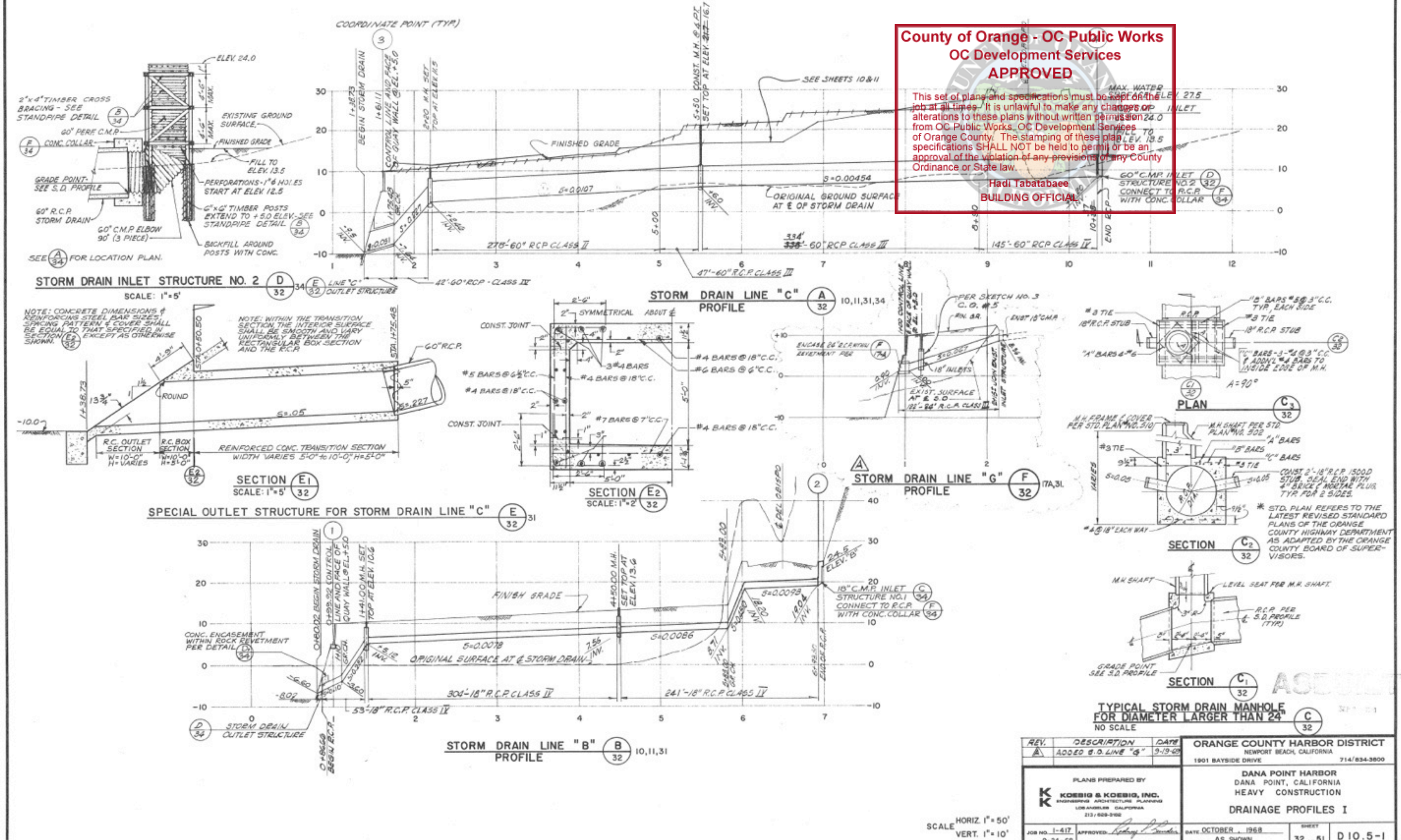
BUILDING OFFICIAL



REV.	DESCRIPTION	DATE
A	ADDED S.D. LINE "G"	9-19-69

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA

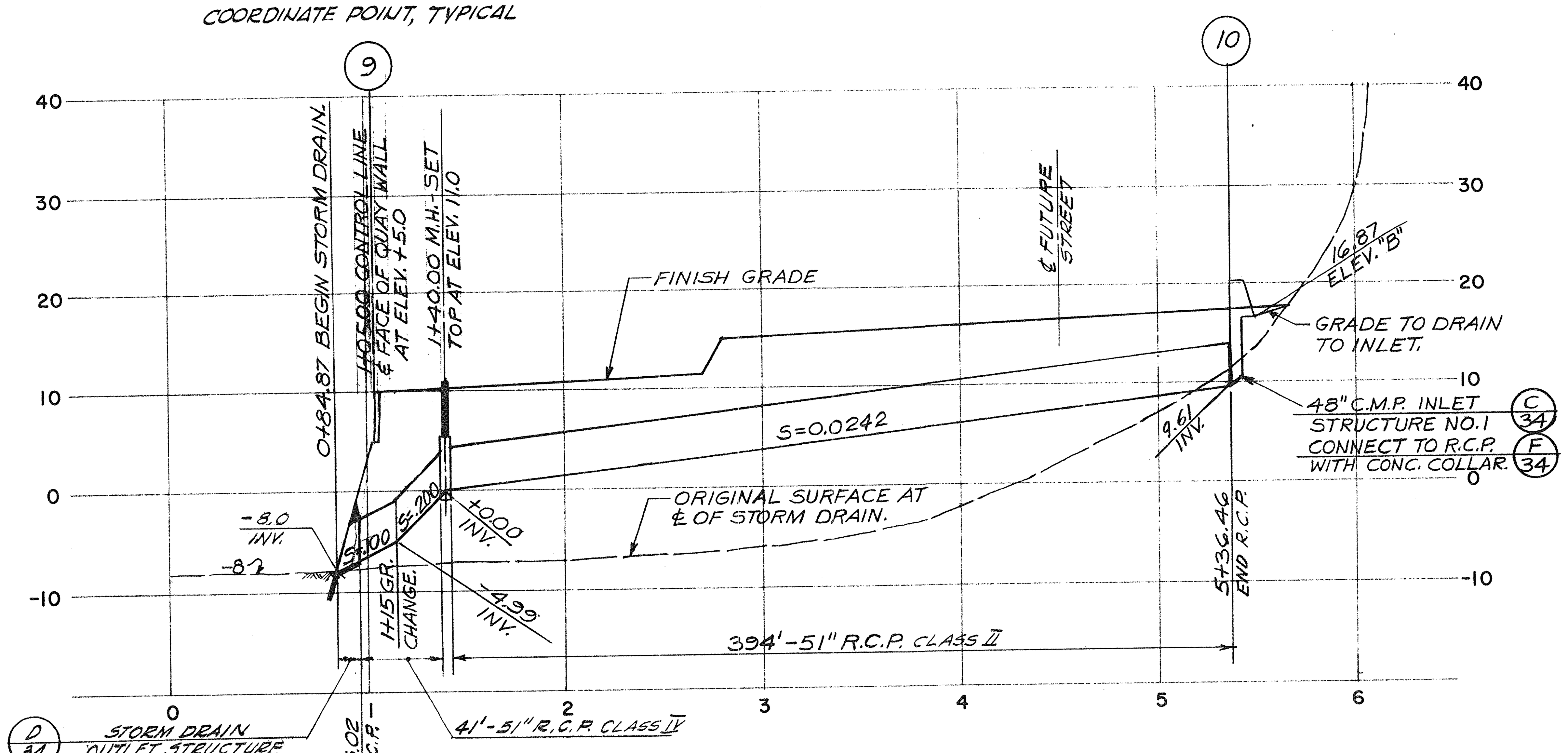
JOB NO. 1-417
DATE 9-24-68
APPROVED:

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

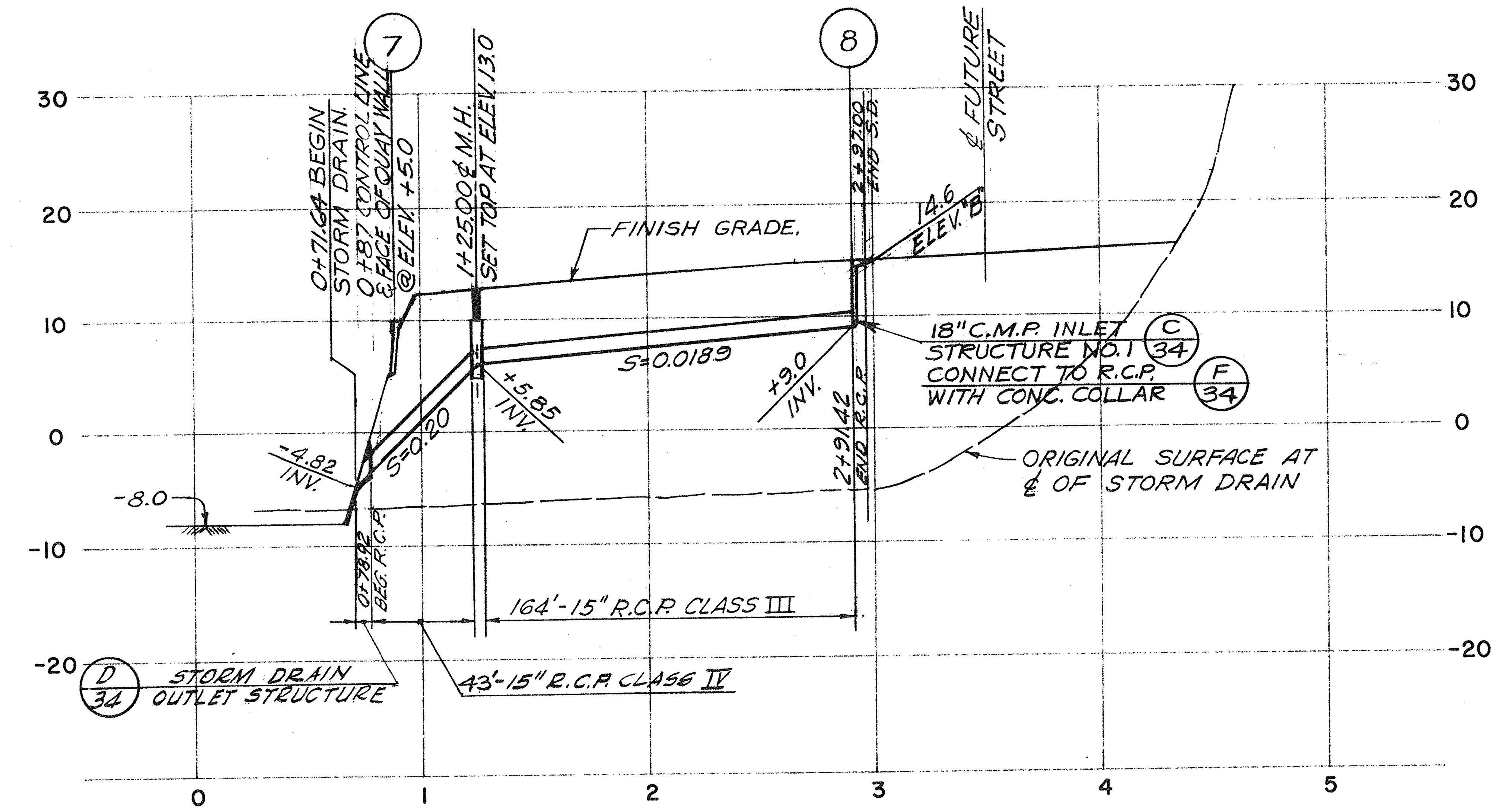
DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

DRAINAGE PROFILES I

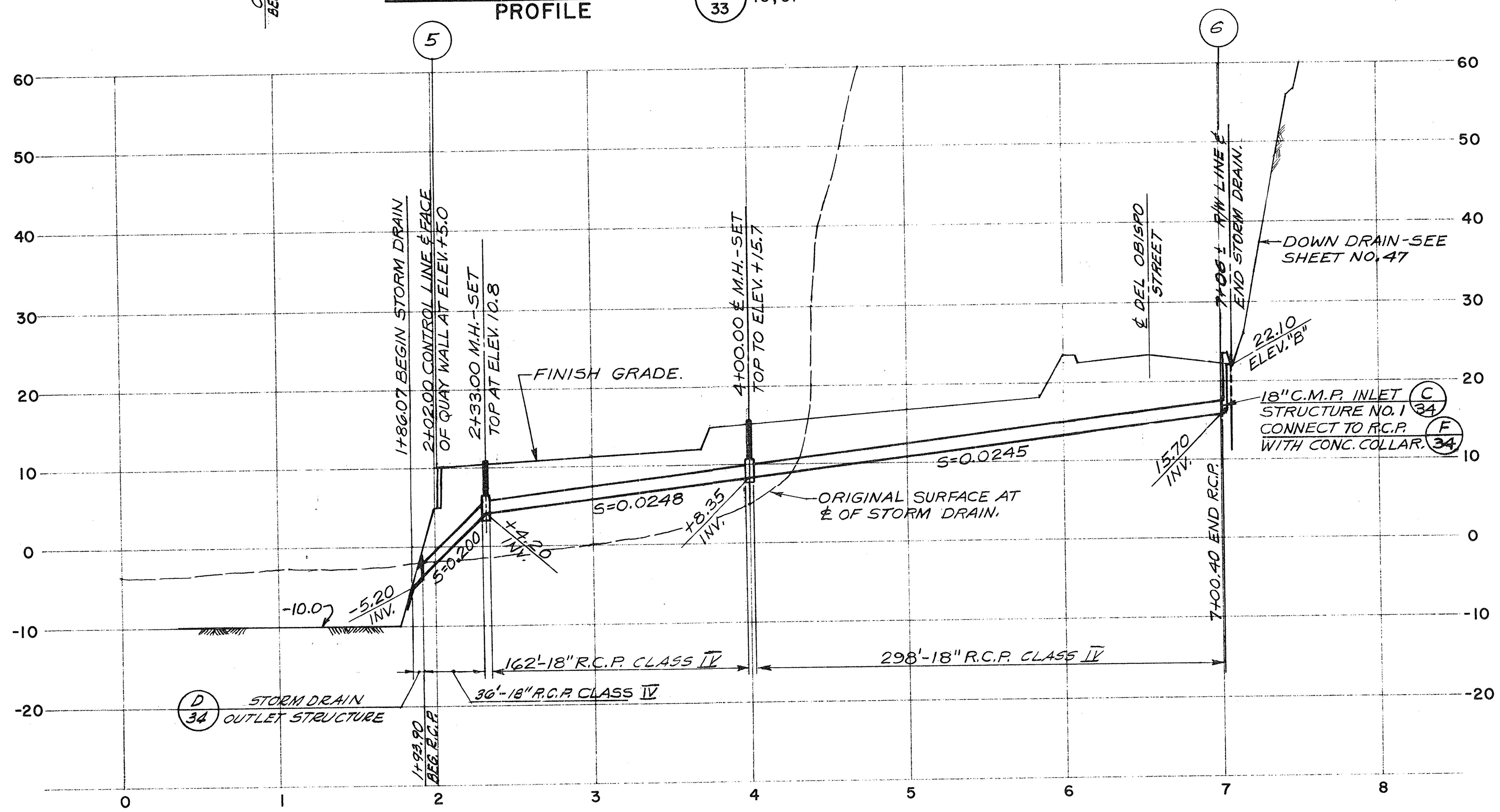
DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 32 OF 51
D 10.5-1



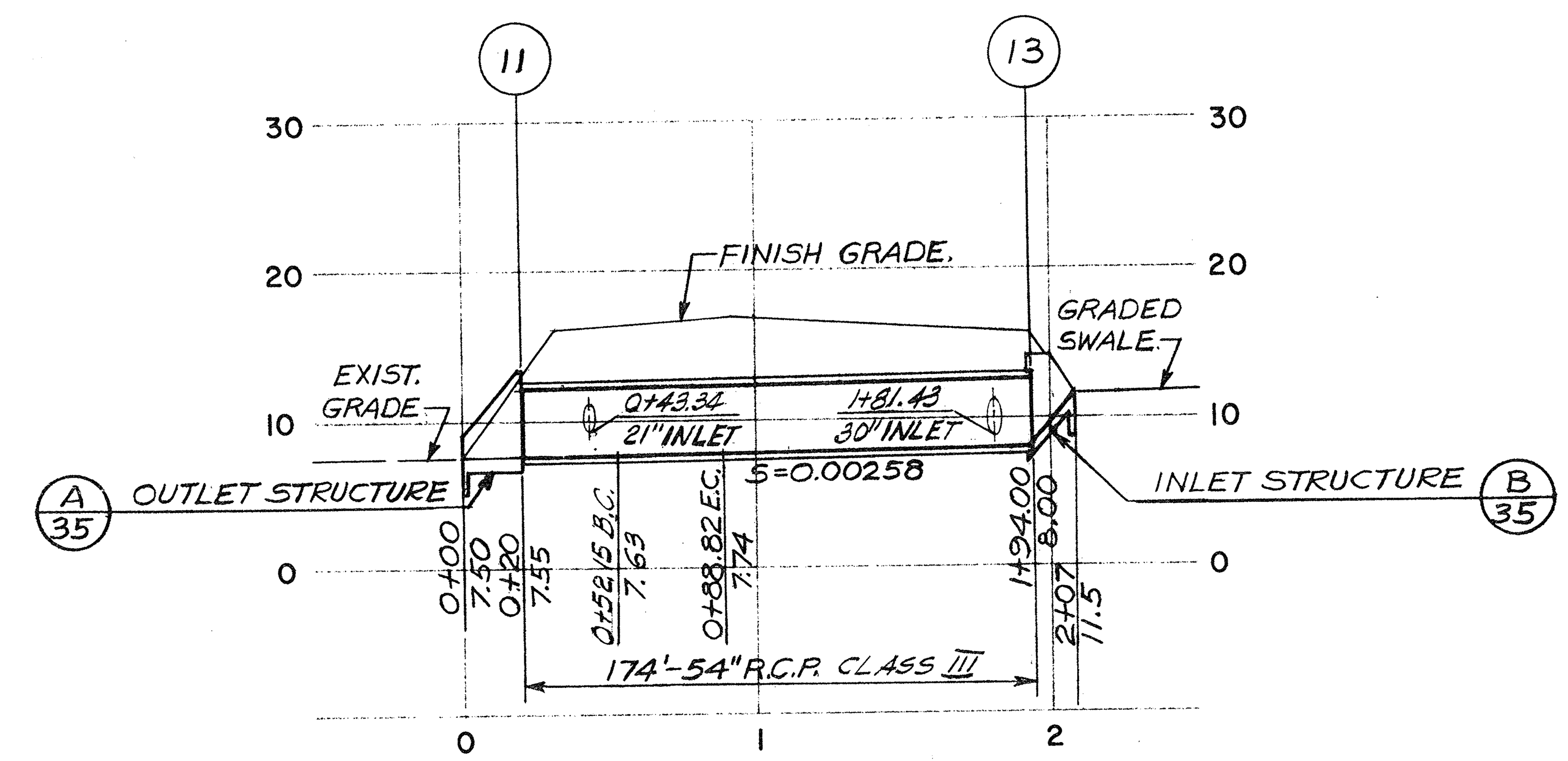
STORM DRAIN LINE "F" PROFILE (A/33) 15,31



STORM DRAIN LINE "E" PROFILE (B/33) 13,31



STORM DRAIN LINE "D" PROFILE (C/33) 9,13,31



STORM DRAIN LINE "A" PROFILE (D/33) 9,31,34

FOR PLAN - SEE (G/34)

SCALE: HORIZ. 1"=50' VERT. 1"=10'

ASBUILT

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213/629-3182

JOB NO. 1-417
DATE 9-24-68
APPROVED: Rodney P. Lundin

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION
DRAINAGE PROFILES II

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 33 OF 50
D 10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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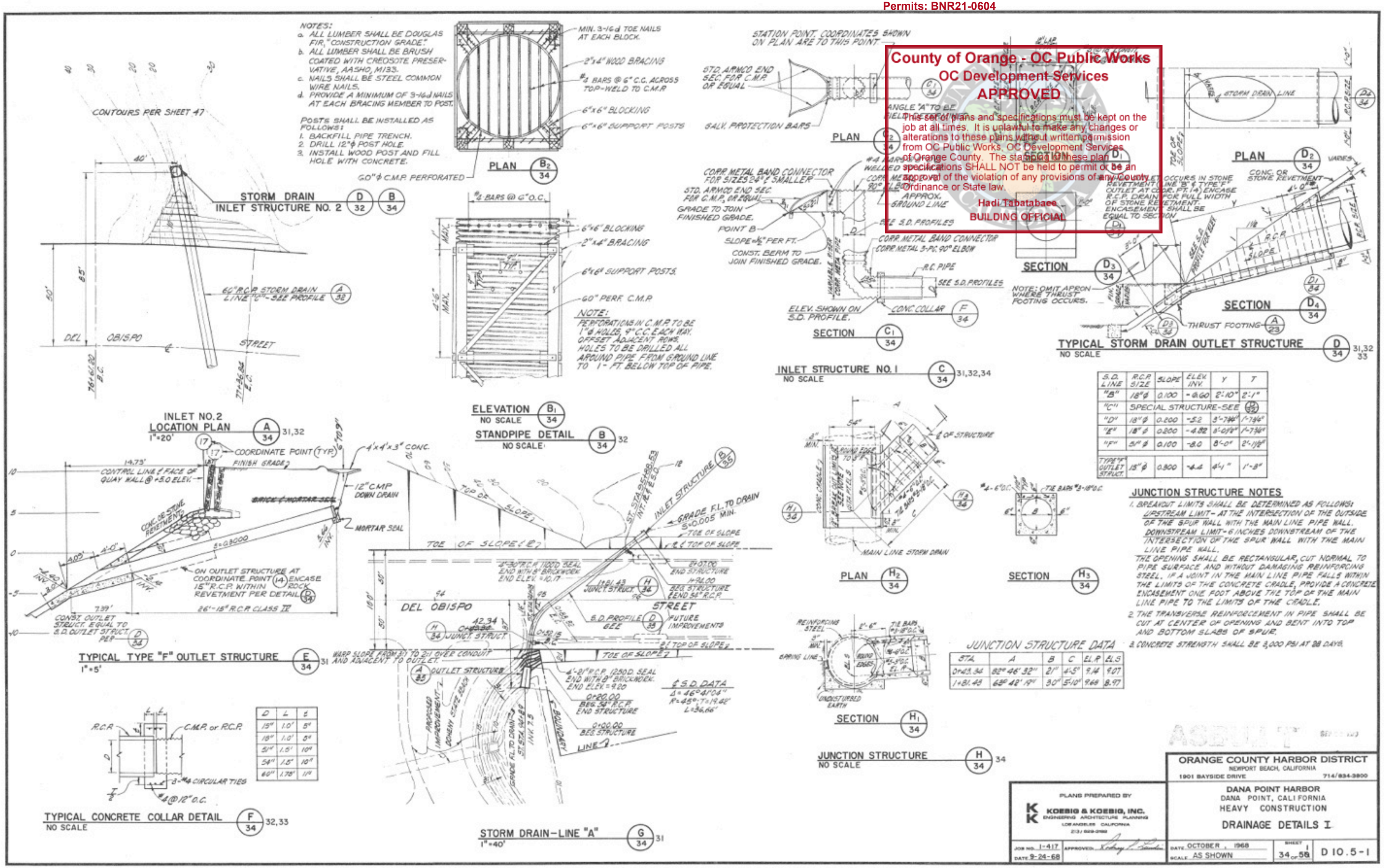

NOTES:
a. ALL LUMBER SHALL BE DOUGLAS FIR, "CONSTRUCTION GRADE."
b. ALL LUMBER SHALL BE BRUSH COATED WITH CREOSOTE PRESERVATIVE, AASHO, M133.
c. NAILS SHALL BE STEEL COMMON WIRE NAILS.
d. PROVIDE A MINIMUM OF 3-16d NAILS AT EACH BRACING MEMBER TO POST.

POSTS SHALL BE INSTALLED AS FOLLOWS:
1. BACKFILL PIPE TRENCH.
2. DRILL 12" ø POST HOLE.
3. INSTALL WOOD POST AND FILL HOLE WITH CONCRETE.

S.D. LINE	R.C.P. SIZE	SLOPE	ELEV. INV.	Y	T
"B"	18" ø	0.100	-0.60	2'-10"	2'-1"
"C"	SPECIAL STRUCTURE-SEE (D/32)				
"D"	18" ø	0.200	-5.2	3'-7¾"	1'-7¾"
"E"	18" ø	0.200	-4.82	3'-0⅛"	1'-7¾"
"F"	51" ø	0.100	-8.0	8'-0"	2'-1½"
TYPE "F" OUTLET STRUCT.	15" ø	0.300	-4.4	4'-1"	1'-8"

JUNCTION STRUCTURE NOTES

1. BREAKOUT LIMITS SHALL BE DETERMINED AS FOLLOWS:
UPSTREAM LIMIT – AT THE INTERSECTION OF THE OUTSIDE OF THE SPUR WALL WITH THE MAIN LINE PIPE WALL.
DOWNSTREAM LIMIT – 6 INCHES DOWNSTREAM OF THE INTERSECTION OF THE SPUR WALL WITH THE MAIN LINE PIPE WALL.
THE OPENING SHALL BE RECTANGULAR, CUT NORMAL TO PIPE SURFACE AND WITHOUT DAMAGING REINFORCING STEEL. IF A JOINT IN THE MAIN LINE PIPE FALLS WITHIN THE LIMITS OF THE CONCRETE CRADLE, PROVIDE A CONCRETE ENCASEMENT ONE FOOT ABOVE THE TOP OF THE MAIN LINE PIPE TO THE LIMITS OF THE CRADLE.
2. THE TRANSVERSE REINFORCEMENT IN PIPE SHALL BE CUT AT CENTER OF OPENING AND BENT INTO TOP AND BOTTOM SLABS OF SPUR.
3. CONCRETE STRENGTH SHALL BE 3,000 PSI AT 28 DAYS.

JUNCTION STRUCTURE DATA

STA.	A	B	C	EL. R	EL. S
0+43.34	82° 46' 32"	21"	4'-5"	9.14	9.07
1+81.43	63° 42' 19"	30"	5'-10"	9.68	8.97

D	L	t
15"	1.0'	5"
18"	1.0'	5"
51"	1.5'	10"
54"	1.5'	10"
60"	1.75'	11"

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PLANS PREPARED BY
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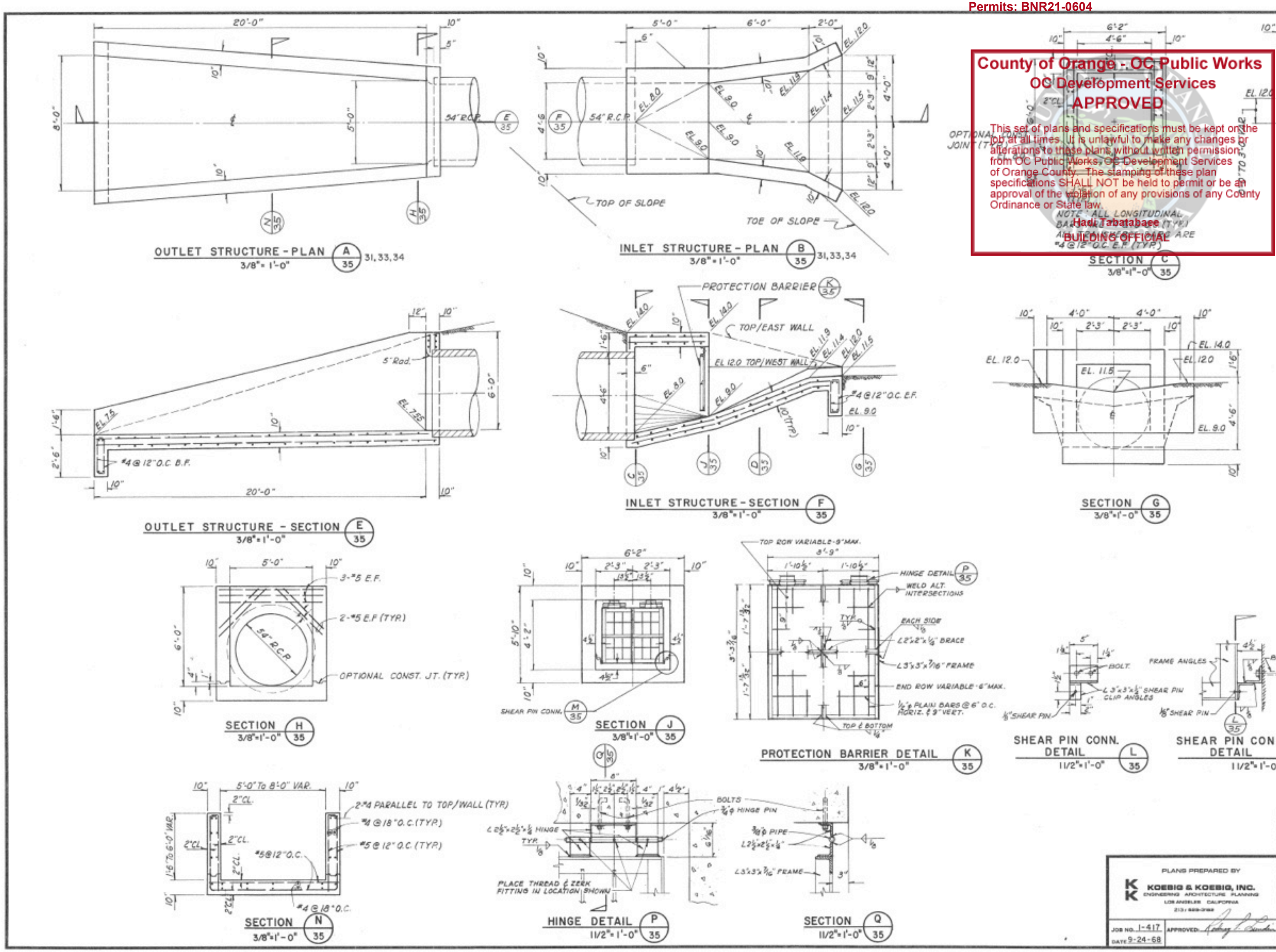
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213/629-2182
JOB NO. 1-417
DATE 9-24-68
APPROVED:

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION
DRAINAGE DETAILS I

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 34 OF 58
D 10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604



County of Orange - OC Public Works
OC Development Services
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PROTECTION BARRIER NOTES

1. ANGLES CONNECTED WITH SHEAR PINS SHALL FIT SNUGLY & TRULY FACE TO FACE.
2. SHEAR PIN HOLES TO BE DRILLED TO PROVIDE A TIGHT FIT WITH SHEAR PINS IN PLACE.
3. SHEAR PINS SHALL BE PEENED ON BOTH ENDS AFTER INSTALLATION.
4. ALL 5/8" φ BOLT HOLES SHALL BE DRILLED ON GAGE LINES OF ANGLES.
5. ALL BOLTS SHALL BE 5/8" φ EMBEDDED A MIN. OF 4" INTO CONCRETE, OR EQUIVALENT EXPANSION BOLTS, FURNISHED WITH HEX NUTS & 5/32" MIN. THK. METAL WASHERS.
6. FRAME, BRACE, & HINGE ANGLES SHALL HAVE THE OUTSTANDING LEGS FACING IN DIRECTION OF FLOW.
7. THREAD ENDS OF HINGE PIN SO THAT NUTS & WASHERS WILL BE FLUSH WITH HINGE ANGLE. DAMAGE THREADS BEYOND NUT FACE USE BOLT STOCK FOR PINS.
8. GALVANIZE ALL FERROUS PARTS AFTER FABRICATION.
9. COVER ALL MOVABLE CONTACT SURFACES WITH A COAT OF WATERPROOF GREASE PRIOR TO INSTALLATION.
10. SHEAR PIN MATERIAL SHALL BE ALUMINUM WIRE, ALLOY 1100, TEMPER O, FED. SPEC. QQ-A-411.

AS BUILT

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA

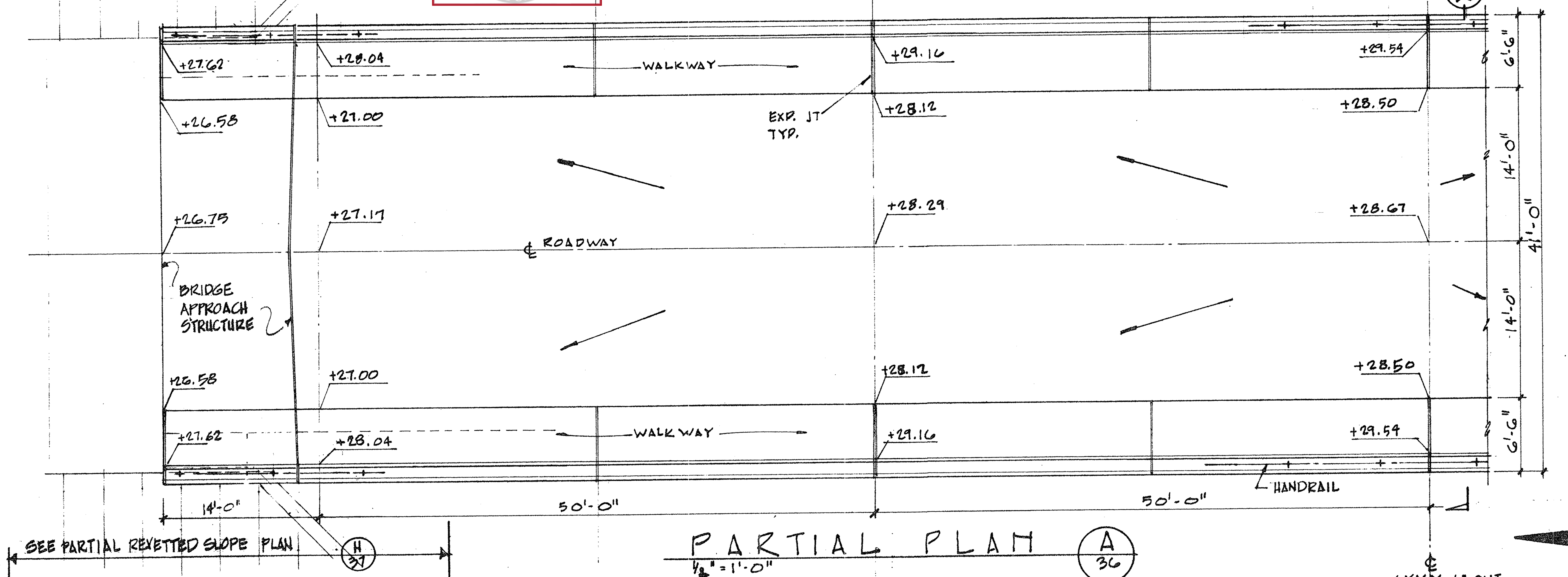
JOB NO. 1-417
DATE 9-24-68
APPROVED:

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

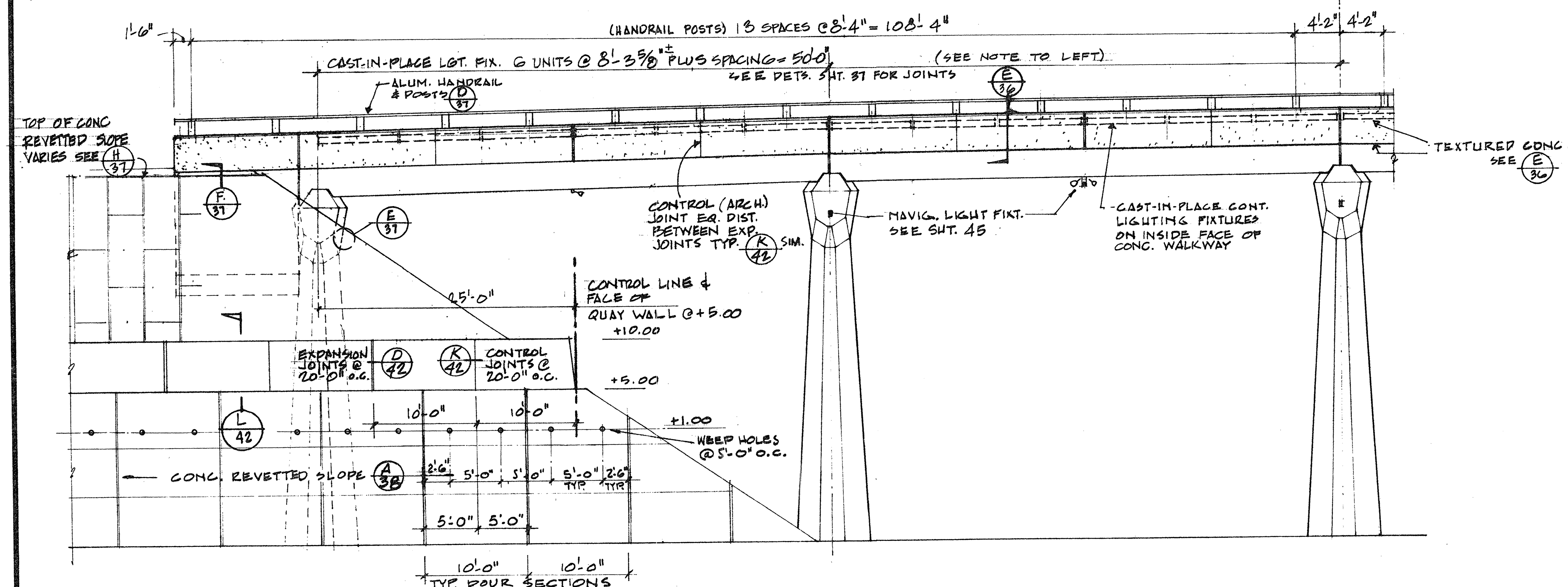
DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

DRAINAGE DETAILS II

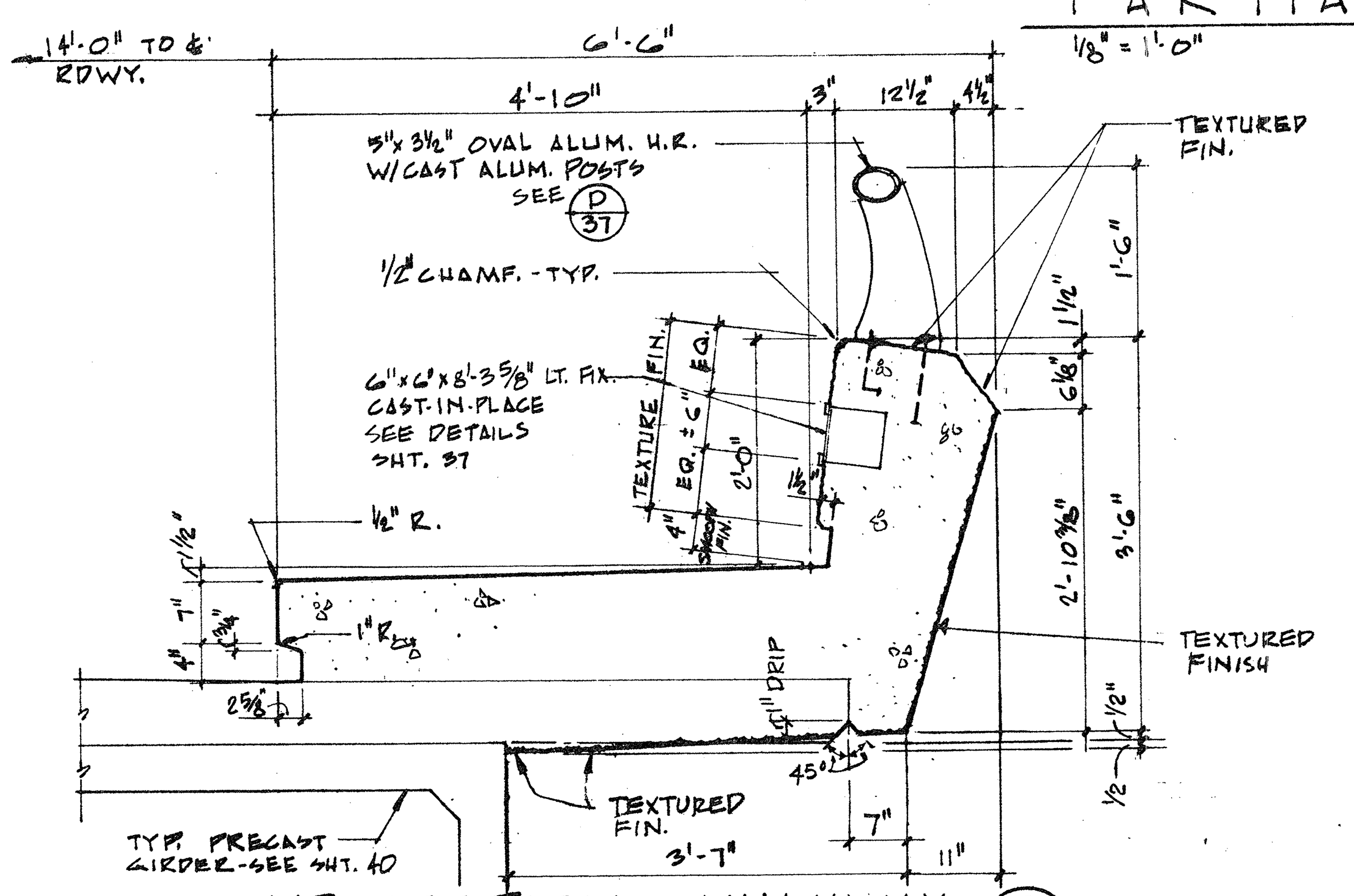
DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 35 OF 50
D 10.5-1



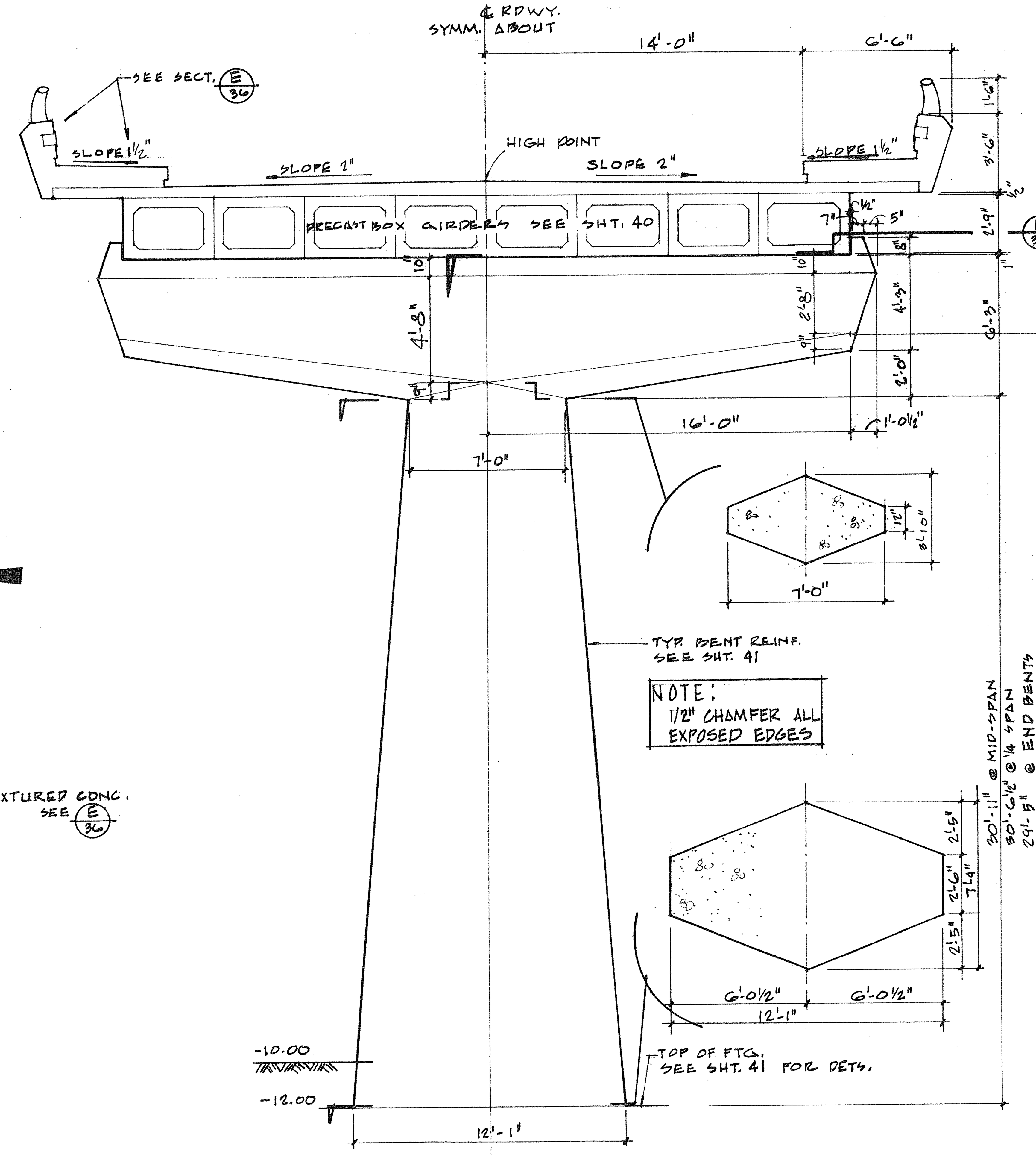
PARTIAL PLAN (A/36)
1/8" = 1'-0"



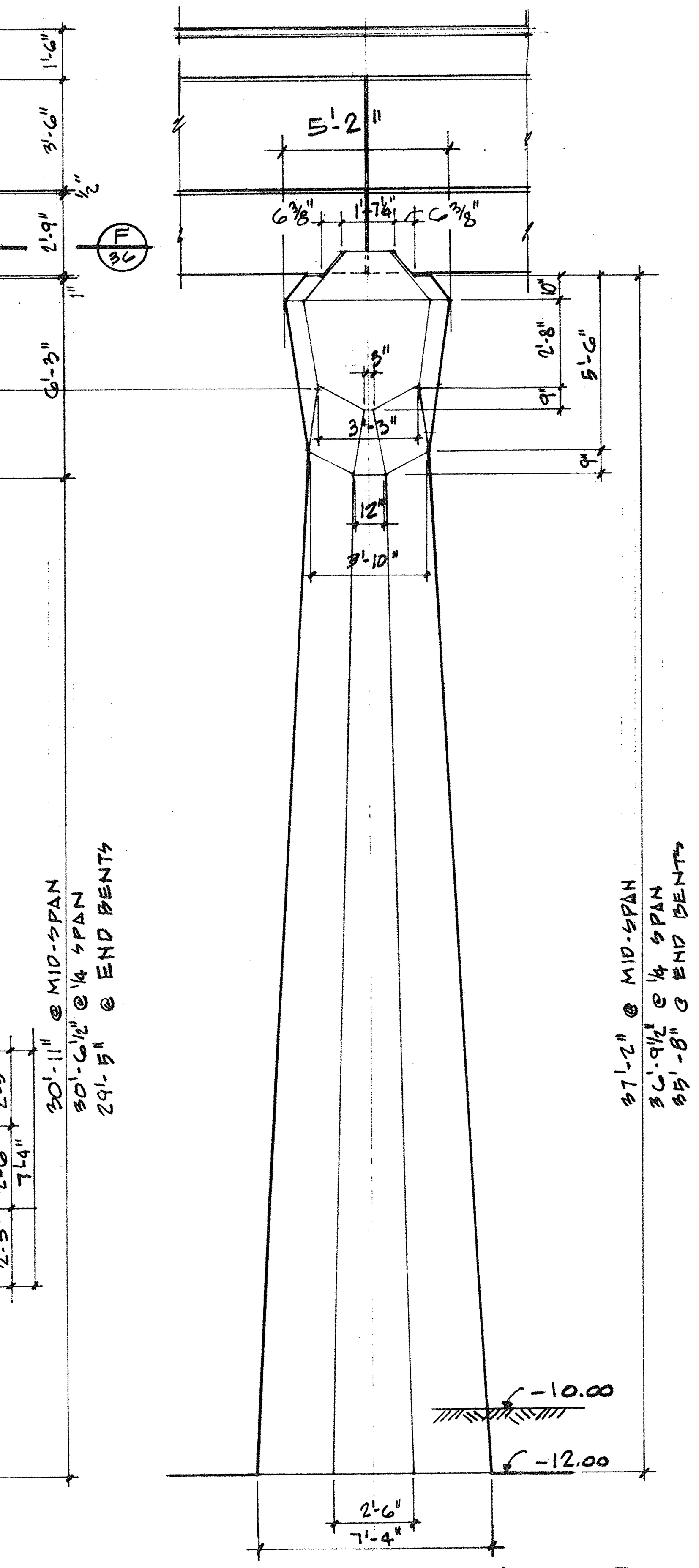
PARTIAL ELEVATION (B/36)
1/8" = 1'-0"



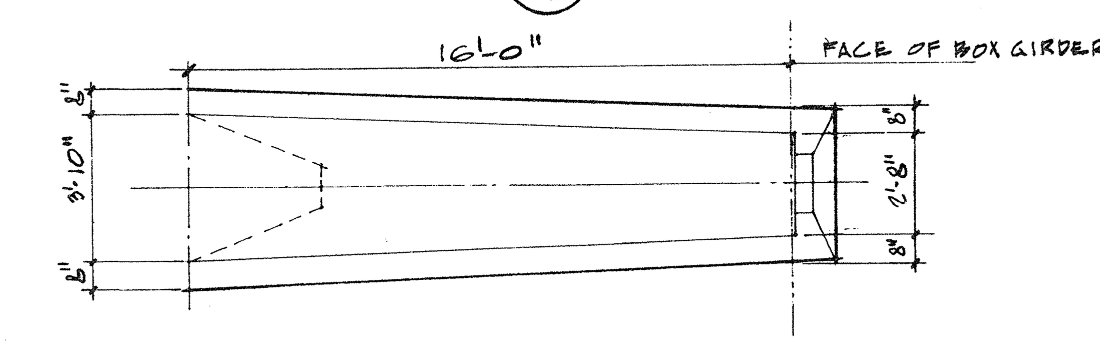
TYP. SECTION @ WALKWAY (E/36)
3/4" = 1'-0"



BENT ELEVATION (C/36)
1/4" = 1'-0"



BENT ELEVATION (D/36)
1/4" = 1'-0"



PLAN (F/36)
1/4" = 1'-0"

ASBUILT

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213/628-3182

JOB NO. 1-417
DATE 9-24-68
APPROVED: [signature]

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION
BRIDGE
ARCHITECTURAL PLAN, ELEVATION AND MISCELLANEOUS DETAILS

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 36 OF 50
D 10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
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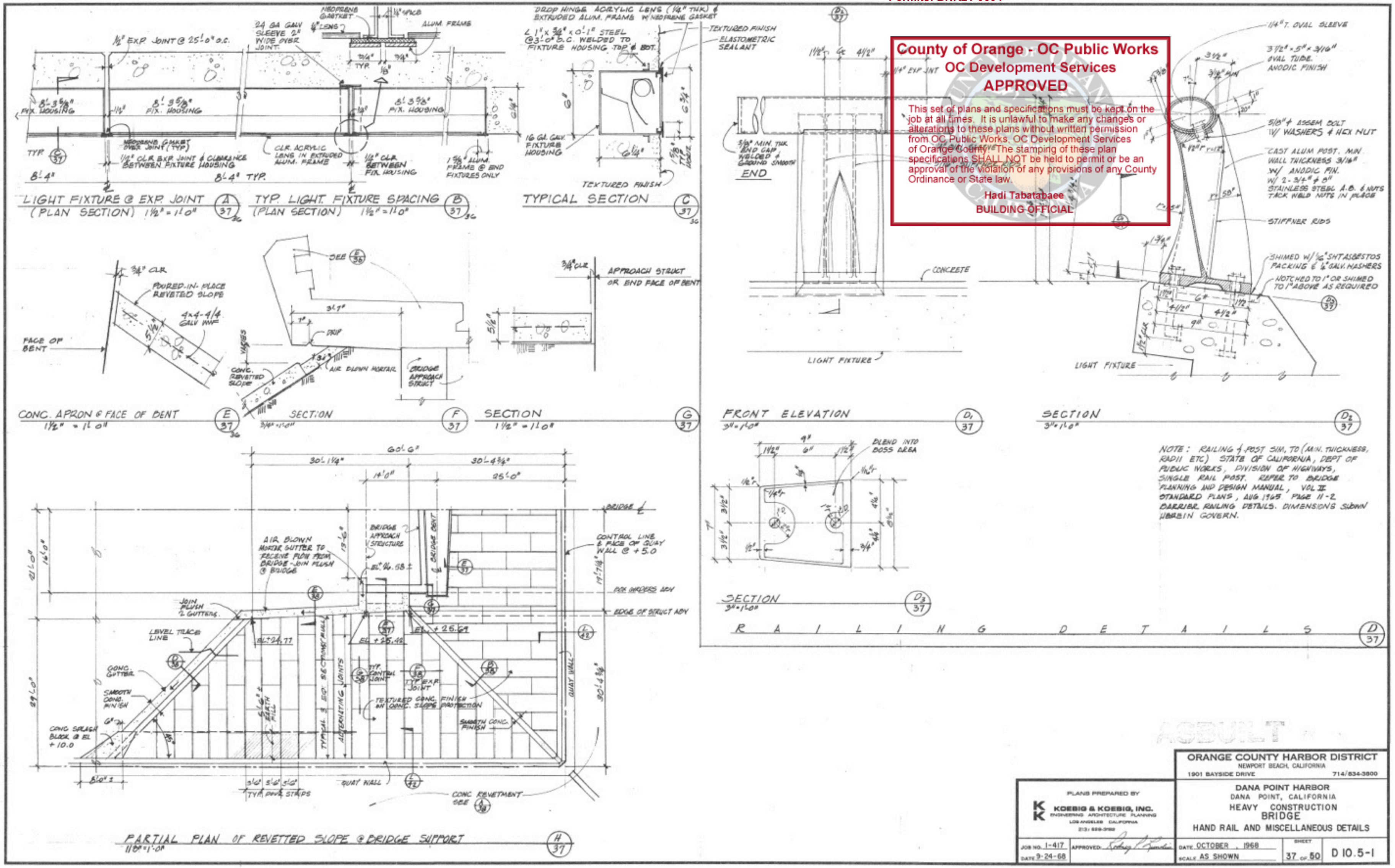
Hadi Tabatabaee
BUILDING OFFICIAL



ORANGE COUNTY HARBOR DISTRICT NEWPORT BEACH, CALIFORNIA 1901 BAYSIDE DRIVE 714/834-3800	
PLANS PREPARED BY KOEBIG & KOEBIG, INC. ENGINEERING ARCHITECTURE PLANNING LOS ANGELES CALIFORNIA	DANA POINT HARBOR DANA POINT, CALIFORNIA HEAVY CONSTRUCTION BRIDGE HAND RAIL AND MISCELLANEOUS DETAILS
JOB NO. 1-417 DATE 9-24-68 APPROVED:	DATE OCTOBER, 1968 SCALE AS SHOWN SHEET 37 OF 50 D 10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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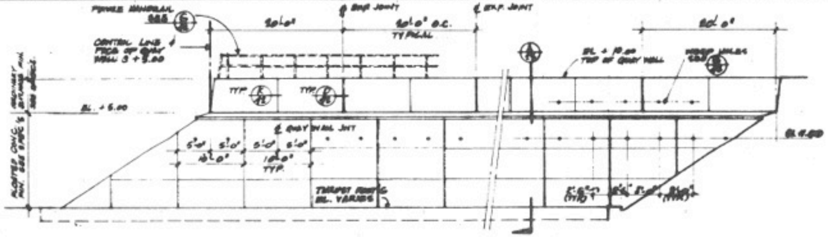
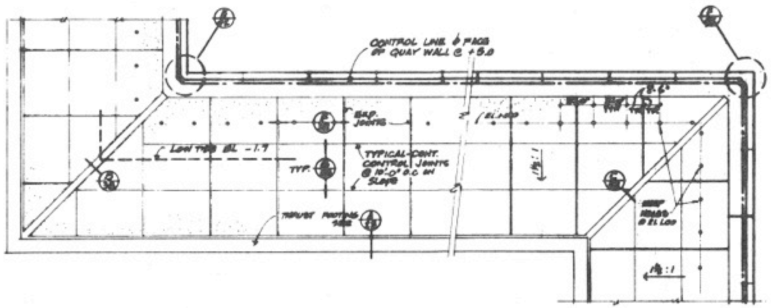
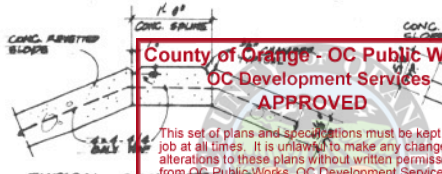


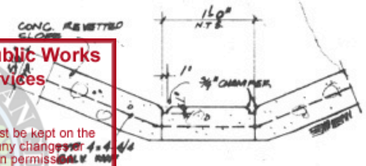
TYP. ELEVATION OF QUAY WALL & CONC. REVETTED SLOPE
1/8" = 1'-0"



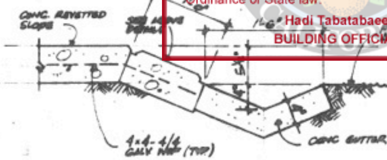
TYP. PLAN OF QUAY WALL & REVETTED SLOPE
1/8" = 1'-0"



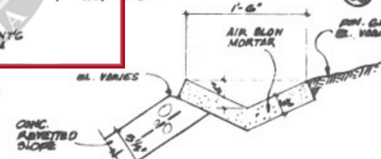
TYPICAL CONCRETE SPLINE OUTSIDE CORNER
1 1/2" = 1'-0"



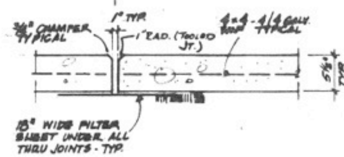
TYPICAL CONCRETE SPLINE INSIDE CORNER
1 1/2" = 1'-0"



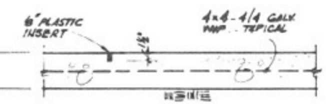
CONC. SPLINE & DRAIN @ BRIDGE
1 1/2" = 1'-0"



TRAP. GUTTER @ BRIDGE & REVETTED SLOPE
1 1/2" = 1'-0"



TYPICAL CONC. REVETTED SLOPE EXPANSION JOINT
1 1/2" = 1'-0"



TYPICAL CONC. REVETTED SLOPE CONTROL JOINT
1 1/2" = 1'-0"

ASBUILT

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
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LOS ANGELES CALIFORNIA

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

CONCRETE REVETTED SLOPE
TYPICAL PLAN ELEVATIONS & DETAILS

JOB NO. 1-417	APPROVED	DATE OCTOBER, 1969	SHEET 38 OF 50
DATE 9-24-68		SCALE AS SHOWN	D 10

PLAN (A/39)
1/8" = 1'-0"
SEE PARTIAL PLAN (A/36)

NOTE: CONCRETE FOOTINGS PLACED AGAINST CUT BANK

SECTION (B/39)
1/8" = 1'-0"

AS BUILT

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213/628-3182

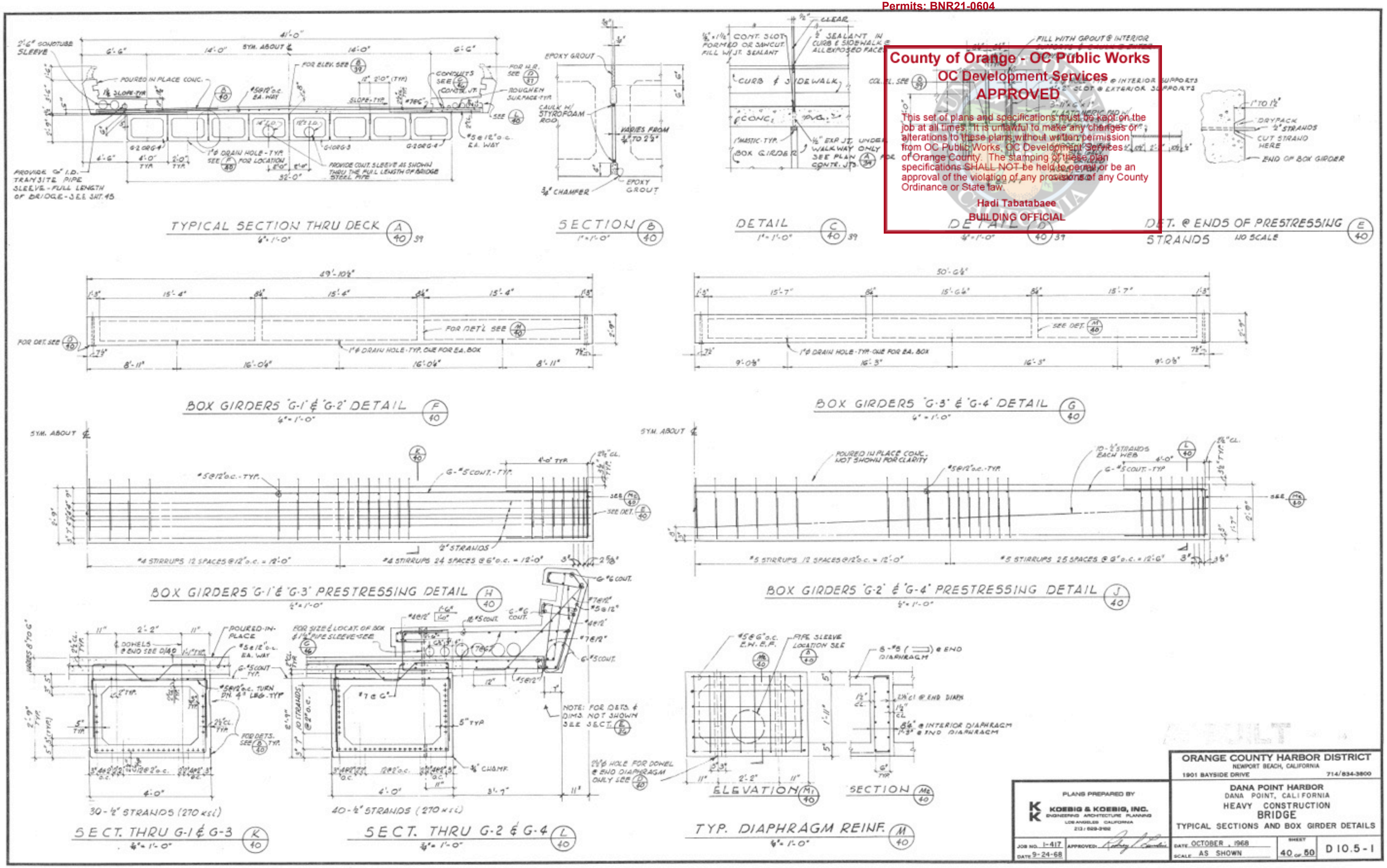
JOB NO. 1-417
DATE 9-24-68
APPROVED: Rodney P. Lundin

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION
BRIDGE
STRUCTURAL PLAN AND SECTION

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 39 OF 50
D 10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604



Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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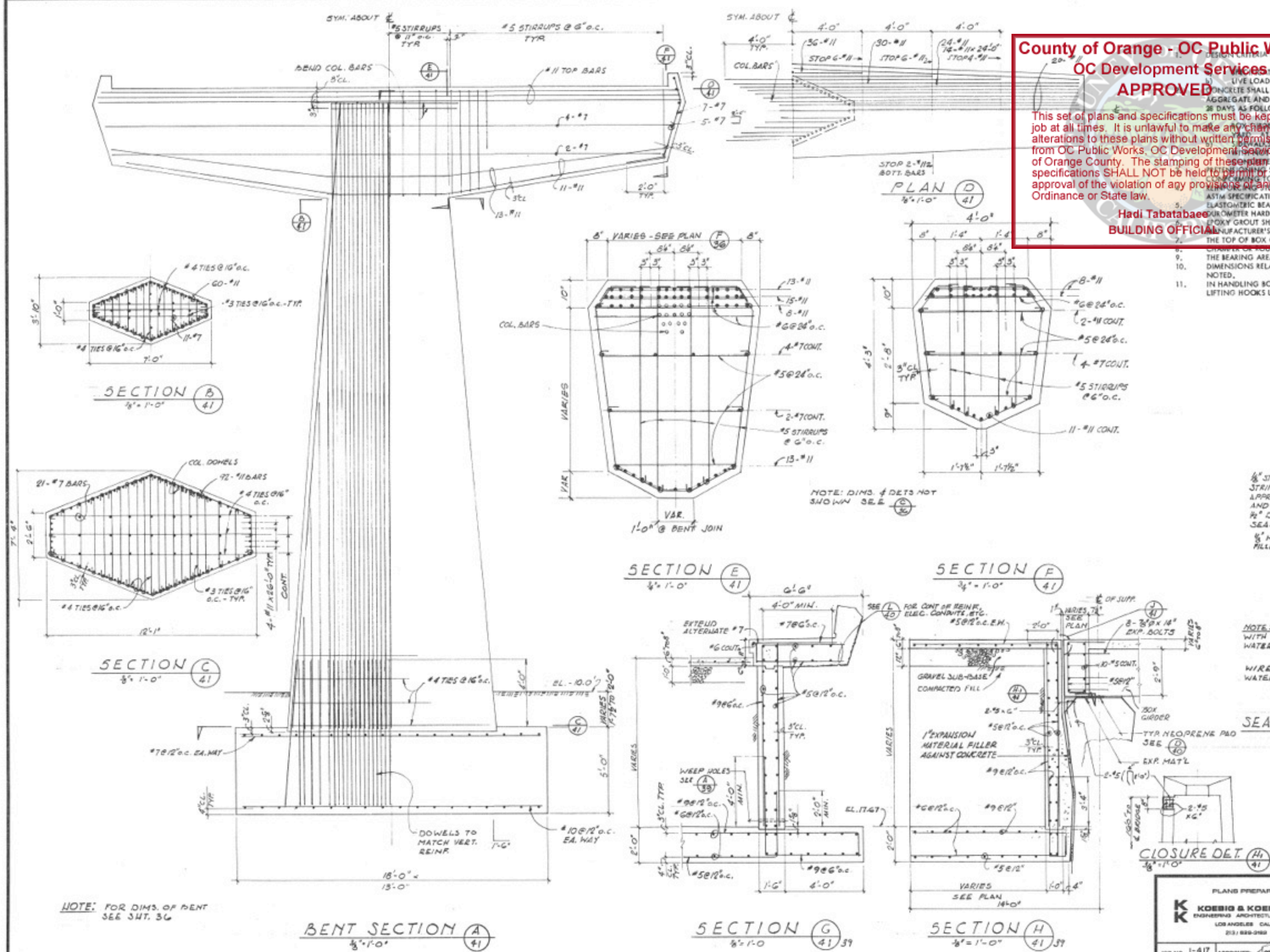
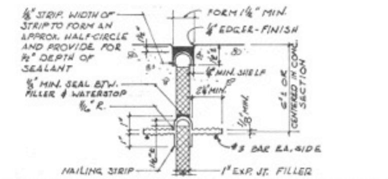
Hadi Tabatabaee
BUILDING OFFICIAL



GENERAL NOTES

1. DESIGN CRITERIA FOR THE PRESTRESSED BOX GIRDERS:
   a) SPECIFICATIONS FOR DESIGN, MATERIAL AND CONSTRUCTION: A.A.S.H.O. 1965
   b) LIVE LOAD: H20 - 44
2. CONCRETE SHALL CONTAIN TYPE II PORTLAND CEMENT WITH 3/4" MAXIMUM SIZE OF AGGREGATE AND MAXIMUM SLUMP OF 3" AND SHALL HAVE A MINIMUM STRENGTH AT 28 DAYS AS FOLLOWS:
   a) BOX GIRDERS f'c = 6000 PSI, WITH NOT LESS THAN 7 1/2 SACKS OF CEMENT PER CUBIC YARD. AT TRANSFER f'ci = 5000 PSI.
   b) SIDEWALKS, PAVEMENTS, BENTS, FOOTINGS AND APPROACH STRUCTURES; f'c = 4500 PSI, WITH NOT LESS THAN 7 SACKS OF CEMENT PER CUBIC YARD. USE PLASTIMENT OR EQUAL [illegible] DENSIFIER AS PER MANUFACTURER'S INSTRUCTIONS.
3. PRETENSIONING STEEL SHALL BE SEVEN-WIRE STRESS RELIEVED STRAND, UNCOATED, 270 KSI CONFORMING TO ASTM A-416 - POST TENSIONING WILL NOT BE PERMITTED.
4. REINFORCING STEEL SHALL BE INTERMEDIATE GRADE DEFORMED BARS IN ACCORDANCE WITH ASTM SPECIFICATIONS A-15 AND A-305.
5. ELASTOMERIC BEARING PADS; AS PER A.A.S.H.O. SPECIFICATION, ARTICLE 1.7.51 - 50 DUROMETER HARDNESS.
6. EPOXY GROUT SHALL BE FURANE EPOCAST 530-2 OR EQUAL AND SHALL BE USED AS PER MANUFACTURER'S RECOMMENDATIONS.
7. THE TOP OF BOX GIRDERS AND FOOTINGS SHALL HAVE WOOD FLOAT ROUGH FINISH.
8. CHAMFER OR ROUND TO 3/4" RADIUS ALL EXPOSED CORNERS UNLESS OTHERWISE NOTED.
9. THE BEARING AREA VARIATION FROM PLANE SURFACE SHALL NOT EXCEED 1/16 INCH.
10. DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS UNLESS OTHERWISE NOTED.
11. IN HANDLING BOX GIRDERS, THEY MUST BE MAINTAINED IN HORIZONTAL POSITION WITH LIFTING HOOKS UPRIGHT AT ALL TIMES AND MUST BE PICKED UP USING THE LIFTING HOOKS.



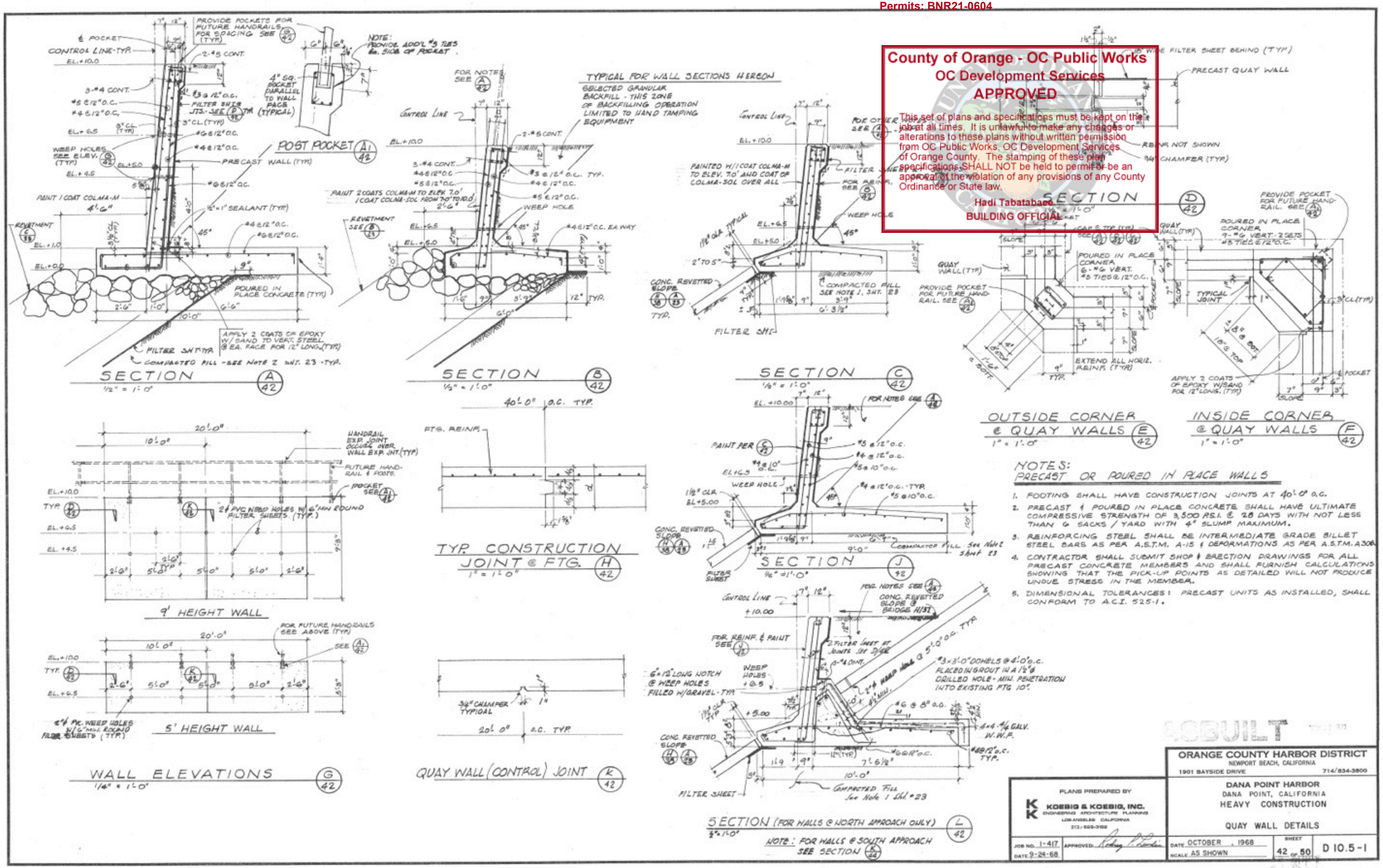
NOTES: 1. WATERSTOP TO HAVE AT LEAST 5 PAIRS OF RAISED RIBS WITH 0.1 SQ.IN. MIN. RIB CROSS-SECT. AREA ON EACH HALF OF WATERSTOP. HT. OF RIBS 3/32" MIN.
2. HOLES WILL BE PERMITTED IN OUTER 1/2" OF WEB FOR WIRES, RINGS, ETC. TIE WEB TO #3 BARS 12" o.c. MAX. TO SUPPORT WATERSTOP IN POSITION DURING CONC. PLACEMENT.

SEALED DECK JOINT DETAIL (J/41)
NO SCALE

AS BUILT

PLANS PREPARED BY KOEBIG & KOEBIG, INC. ENGINEERING ARCHITECTURE PLANNING LOS ANGELES CALIFORNIA 213/ 629-3192	ORANGE COUNTY HARBOR DISTRICT NEWPORT BEACH, CALIFORNIA 1901 BAYSIDE DRIVE 714/834-3800
JOB NO. 1-417 DATE 9-24-68 APPROVED: [signature]	DANA POINT HARBOR DANA POINT, CALIFORNIA HEAVY CONSTRUCTION BRIDGE TYPICAL BENT AND APPROACH STRUCTURE DETAILS
	DATE OCTOBER, 1968 SCALE AS SHOWN SHEET 41 OF 50 D 10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604



Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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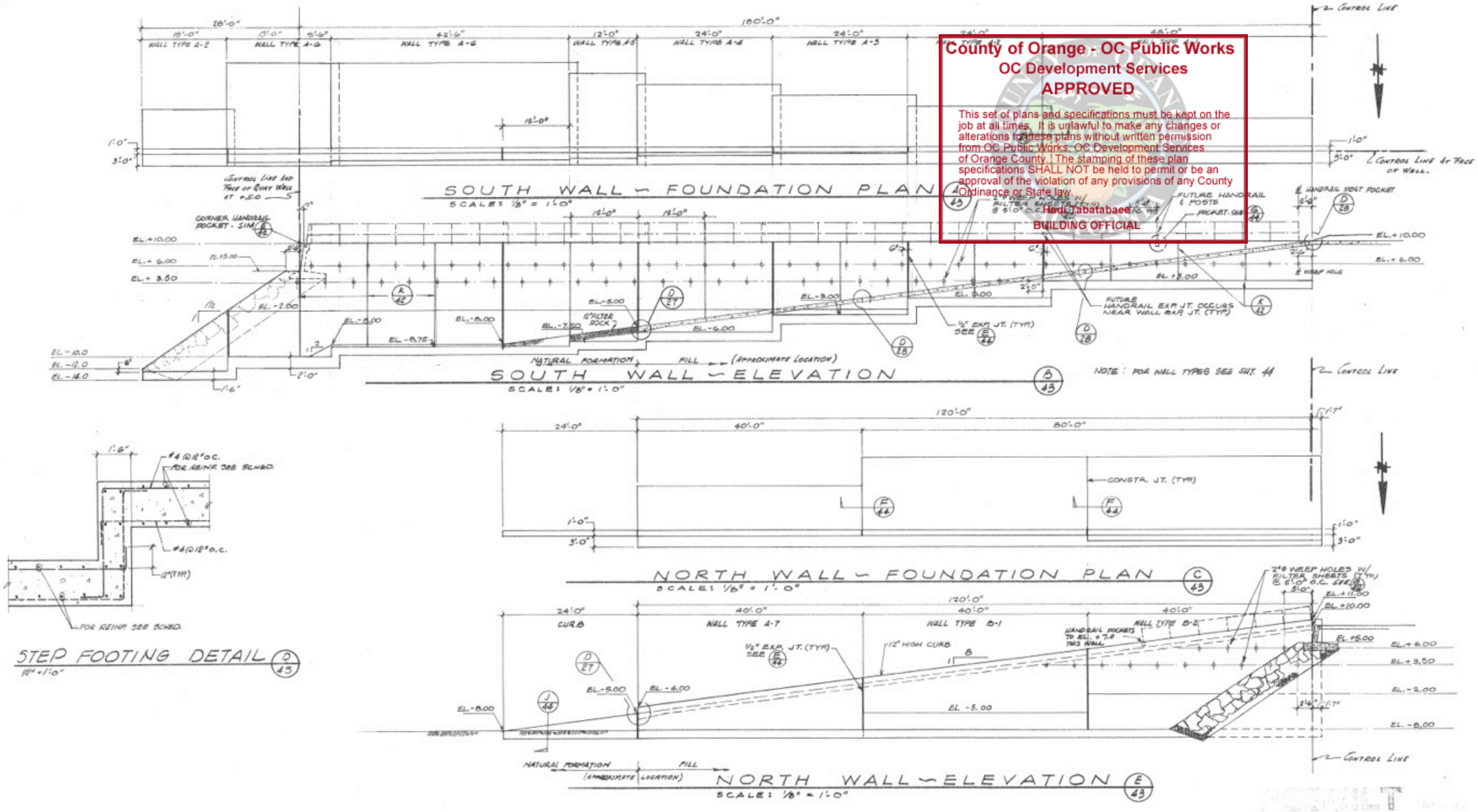

PLANS PREPARED BY KOEBIG & KOEBIG, INC. ENGINEERING ARCHITECTURE PLANNING LOS ANGELES CALIFORNIA	ORANGE COUNTY HARBOR DISTRICT NEWPORT BEACH, CALIFORNIA 1901 BAYSIDE DRIVE 714/834-3800
JOB NO. 1-417 DATE 9-24-68 APPROVED:	DANA POINT HARBOR DANA POINT, CALIFORNIA HEAVY CONSTRUCTION RETAINING WALLS PLANS & ELEVATIONS
	DATE OCTOBER, 1968 SCALE AS SHOWN SHEET 43 OF 50 D10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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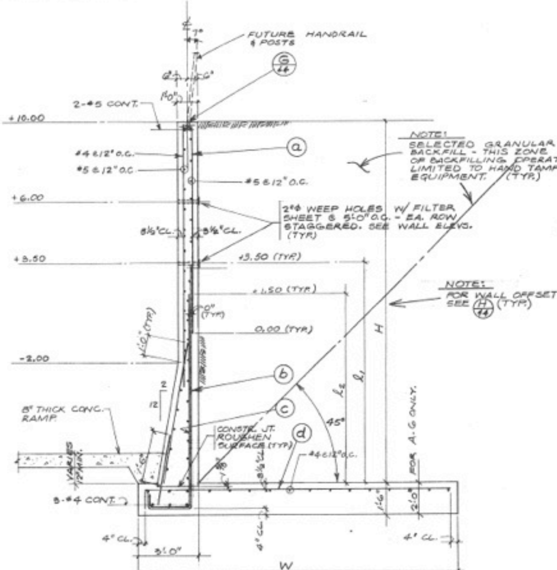
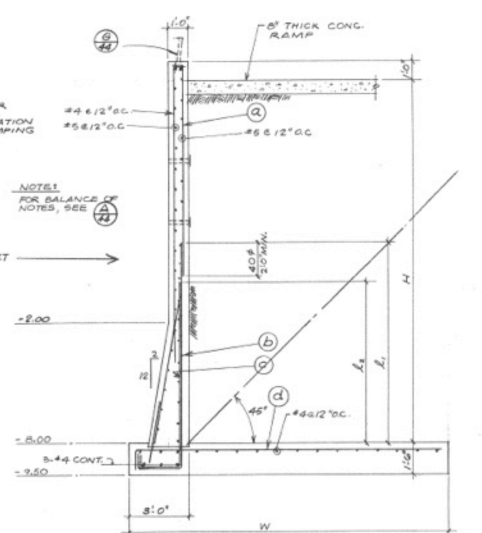
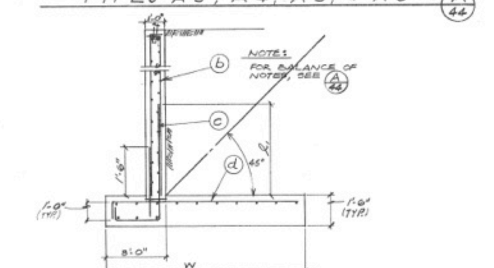


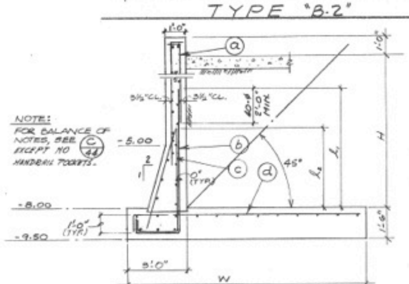
TYPES "A-3", "A-4", "A-5", & "A-6" (A/44)



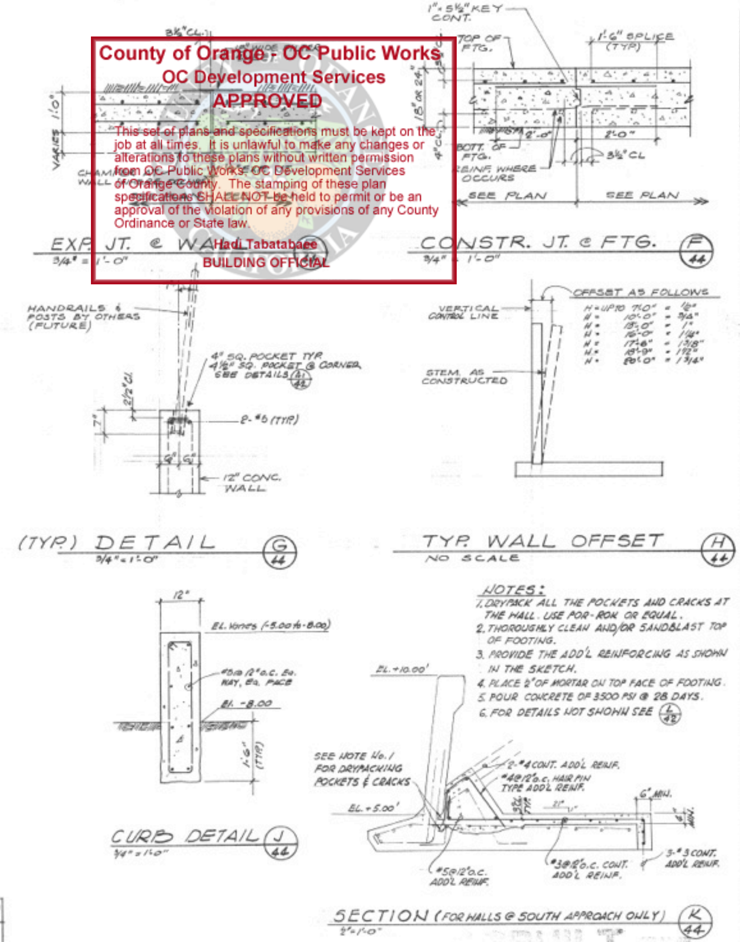
TYPE "B-2" (C/44)



TYPES "A-1", "A-2" & "A-7" (B/44)



TYPE "B-1" (D/44)



EXP. JT. @ WALL (E/44) 3/4" = 1'-0"

CONSTR. JT. @ FTG. (F/44) 3/4" = 1'-0"

(TYP.) DETAIL (G/44) 3/4" = 1'-0"

TYP. WALL OFFSET (H/44) NO SCALE

CURB DETAIL (J/44) 3/4" = 1'-0"

NOTES:
1. DRYPACK ALL THE POCKETS AND CRACKS AT THE WALL. USE POR-ROK OR EQUAL.
2. THOROUGHLY CLEAN AND/OR SANDBLAST TOP OF FOOTING.
3. PROVIDE THE ADD'L REINFORCING AS SHOWN IN THE SKETCH.
4. PLACE 2" OF MORTAR ON TOP FACE OF FOOTING.
5. POUR CONCRETE OF 3500 PSI @ 28 DAYS.
6. FOR DETAILS NOT SHOWN SEE (L/42)

SECTION (FOR WALLS @ SOUTH APPROACH ONLY) (K/44)

SOUTH WALL (ELEV. @ TOP OF WALL - CONSTANT)

TYPE	DIMENSIONS H	DIMENSIONS W	REINFORCING STEEL (a)	(b)	(c)	(d)	LENGTHS ℓ_1	ℓ_2	REMARKS
A-1	7'-0"	7'-6"	—	#6@12	#6@12	#5@12	8'-6"	—	—
A-2	10'-0"	10'-0"	—	#7@12	#7@6	#7@12	8'-6"	—	—
A-3	13'-0"	12'-0"	#7@12	#9@12	#7@12	#10@12	6'-6"	4'-6"	ALTERNATE (b) & (c)
A-4	16'-0"	14'-0"	#7@12	#9@12	#9@12	#9@6	9'-6"	7'-6"	" " "
A-5	18'-0"	16'-0"	#7@12	#9@12	#9@12	#10@6	11'-6"	9'-6"	" " "
A-6	20'-0"	18'-0"	#7@12	#9@12	#9@12	#10@6	13'-6"	11'-6"	" " " FTG. THICKNESS=24"

NORTH WALL (ELEV. @ BOTT. OF FTG. - CONSTANT)

TYPE	DIMENSIONS H	DIMENSIONS W	REINFORCING STEEL (a)	(b)	(c)	(d)	LENGTHS ℓ_1	ℓ_2	REMARKS
A-7	8'-0"	11'-0"	—	#7@12	#7@12	#6@12	—	—	CONC. RAMP SAME AS TYPE "B" DETAILS.
							VARIES	VARIES	
B-1	13'-0"	16'-0"	#7@12"	#9@12"	#7@12"	#7@6"	5.0 to 7.5	3.0 to 5.5	ALTERNATE (b) & (c) BARS
							VARIES	VARIES	
B-2	18'-0"	16'-0"	#7@12"	#9@12"	#9@12"	#11@6"	7.5 to 10.0	5.5 to 8.0	ALTERNATE (b) & (c) BARS

Note: WHERE SPLICES OF DIFFERENT SIZE BARS OCCUR, LAP SHALL BE BASED ON LARGER DIAMETER.

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA

JOB NO. 1-417
DATE 9-24-68
APPROVED:

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION

RETAINING WALLS-DETAILS

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 44 OF 50
D 10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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OC Development Services
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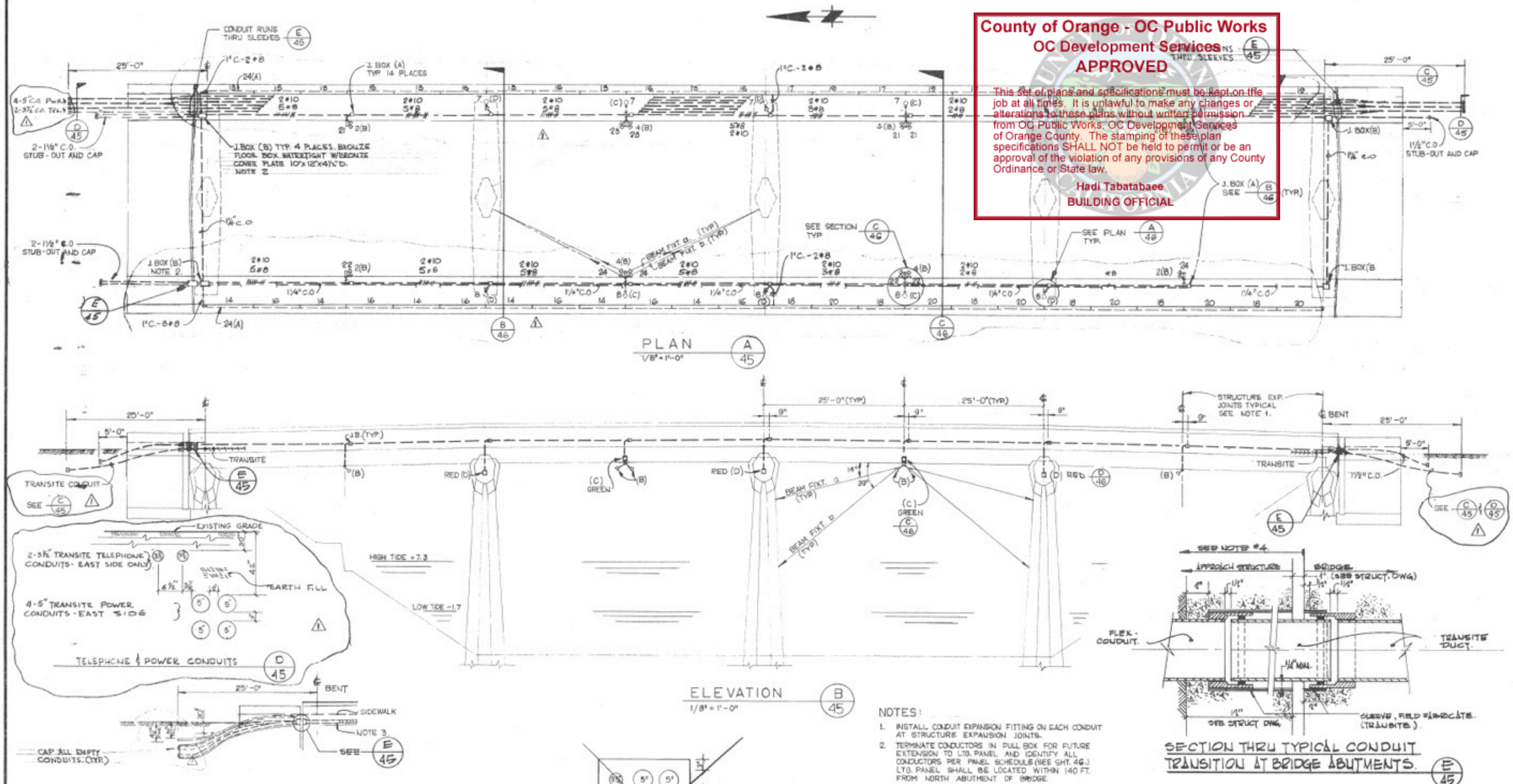

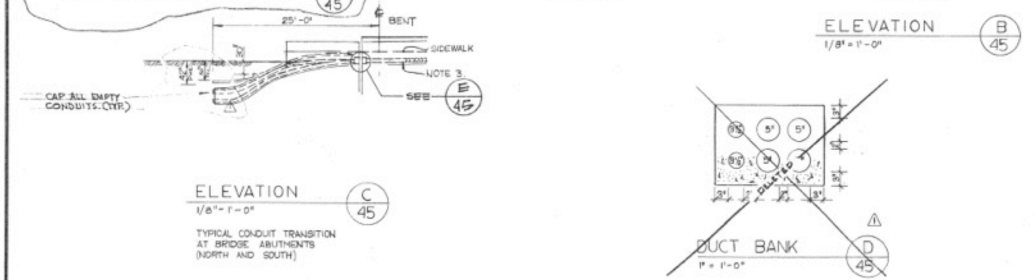

NOTES:

1. INSTALL CONDUIT EXPANSION FITTING ON EACH CONDUIT AT STRUCTURE EXPANSION JOINTS.
2. TERMINATE CONDUCTORS IN PULL BOX FOR FUTURE EXTENSION TO LTG. PANEL AND IDENTIFY ALL CONDUCTORS PER PANEL SCHEDULE (SEE SHT. 46.) LTG. PANEL SHALL BE LOCATED WITHIN 140 FT. FROM NORTH ABUTMENT OF BRIDGE.
3. INSTALL TRANSITE COND. TYPE I IN SIDEWALK AS SHOWN IN A/46
TRANSITION TO DUCT CONFIGURATION BY USING FLEXIBLE CONDUIT (5" & 3½") AS INDICATED IN C/45 TYPICAL FOR BOTH, NORTH AND SOUTH ABUTMENTS.
4. WORK IN AREA INDICATED SHALL BE ACCOMPLISHED AT THE TIME THE APPROACH-STRUCTURE IS CONSTRUCTED.

REV	DESCRIPTION	INIT	DATE
1	BRIDGE LTG. CKT'S	N.K.	2/9/70

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA

JOB NO. 1-417
DATE 9-24-68
APPROVED:

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION
BRIDGE
ELECTRICAL PLAN AND ELEVATION

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 45 OF 50
D 10.5-1

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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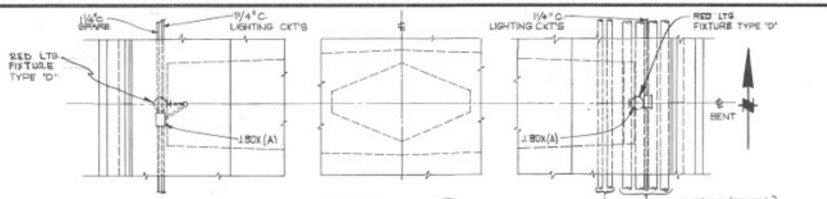
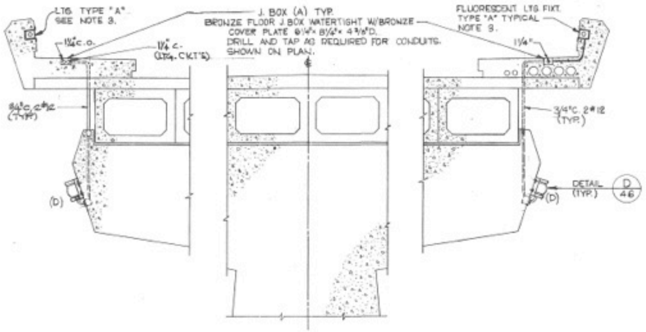
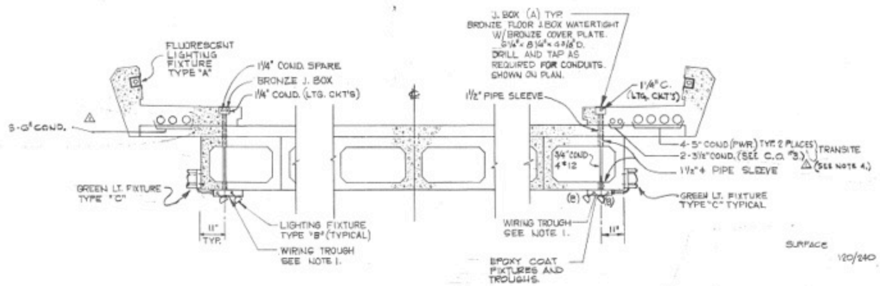


PLAN (A/46)
3/8" = 1'-0"



SECTION (B/46)
3/8" = 1'-0"



SECTION (C/46)
3/8" = 1'-0"

PANEL SCHEDULE "LA" (SEE NOTE 2)

120/240 VOLTS, 1φ, 3 WIRE

CONTACTOR CONTROLLED CKT'S (SPLIT BUS)

CKT. NO.	DESCRIPTION	LTG. FIX.	BREAKER AMPS	BREAKER POLES	WATTS BUS A	WATTS BUS B
1	BRIDGE LTG. EAST	6	20	2	750	[illegible]
2	" " WEST	7	20	2	875	875
3	" " EAST	6	20	2	750	750
4	" " WEST	7	20	2	[illegible]	875
5	" " EAST	6	20	2	[illegible]	[illegible]
6	" " WEST	6	20	2	[illegible]	[illegible]
7	" " EAST	6	20	2	[illegible]	[illegible]
8	" " WEST	6	20	2	[illegible]	[illegible]
9	" " EAST	6	20	2	[illegible]	[illegible]
10	" " WEST	6	20	2	[illegible]	[illegible]
11	FLOOD LTS. EAST	6	20	[illegible]	[illegible]	[illegible]
12	" " WEST	6	20	[illegible]	[illegible]	[illegible]
13	" " EAST	6	20	[illegible]	[illegible]	[illegible]
14	" " WEST	6	20	[illegible]	[illegible]	[illegible]
15	SPARE	-	20	1	500	—
16	SPARE	-	[illegible]	1	500	—
17	RED & GREEN REG. LTS. EAST	5	[illegible]	1	—	500
18	" " " " WEST	5	[illegible]	1	—	[illegible]
19	(1) LTG. CONTACTOR & RELAY		20	1	100	—
20	SPARE		20	1	500	—
21	SPARE		20	1	—	500
22	SPACE					
				TOTAL	10850	10750

CONNECTED LOAD = 21.6 KW
AMPS = 91 AMP.
LCL = 91 x 1.25 = 114 AMP.

INSTALL (1) MECHANICALLY HELD LTG. CONTACTOR, 100 A - 2P. TO CONTROL CKT'S #1 THRU #18. LOCATION OF PANEL AND MEANS OF CONTROLLING LTG. CONTACTOR TO BE DETERMINED LATER. SEE NOTE 2.
INSTALL (1) MECHANICALLY HELD RELAY 25 A. 4 P. (N.O.) TO CONTROL CKT'S 17 & 18. RELAY SHALL BE CONTROLLED BY INDEPENDENT DEVICE; PROVIDE ALSO PUSHBUTTON TO OVERRIDE CONTROLLING DEVICE CONTACTS. (FOR CONTROL OF MECH. HELD RELAY) FOR MANUAL OPERATION AND TESTING.

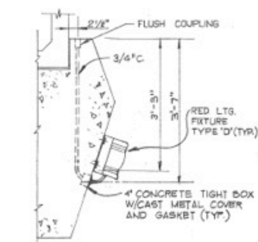
DELETED

FIXTURE SCHEDULE

TYPE	DESCRIPTION	MOUNTING	WATTS	LAMP
A	FLUORESCENT RECESSED W/BRONZE CLEAR ACRYLIC PANEL (SEE SPECIFICATIONS) SIMES # 465TO-R8 WP	RECESSED	250	F96T12 CW
B	FLUORESCENT FLOODLIGHT W/NARROW BEAM LAMP & CAST GLARE SHIELD, BRONZE ANODIC FINISH STONCO # 4600E	SURFACE	200	PAR 46 120 V.
C	INCANDESCENT CAST BRONZE WATERTIGHT WITH 180 DEGREE GREEN FRESNEL LENS, MEDIUM SCREW SOCKET. PERKO 1005.	WALL	100	A/100
D	INCANDESCENT CAST BRONZE WATERTIGHT W/180 DEGREE RED FRESNEL LENS, MEDIUM SCREW SOCKET PERKO 1005	WALL	100	A/100

LEGEND

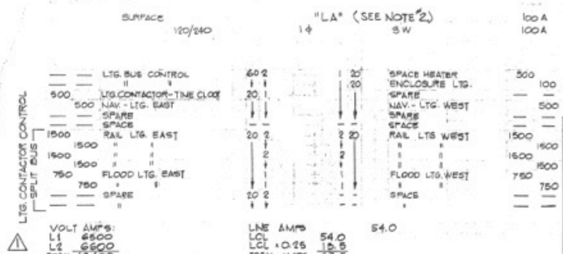
SYMBOL	DESCRIPTION
———	CONDUIT RUN EXPOSED.
— — —	CONDUIT RUN CONCEALED IN CONCRETE, OR BELOW GRADE.
-///-	TIC MARKS INDICATE QUANTITY OF WIRES, SIZE # 12 AWG, CONDUIT FILL PER CODE, UNLESS OTHERWISE NOTED.
-///- #8	TIC MARKS INDICATE QUANTITY OF WIRES, SIZE AS NOTED, CONDUIT FILL PER CODE, UNLESS OTHERWISE NOTED.
▭	FLUORESCENT LIGHTING FIXTURE, MOUNTED AS INDICATED IN THE FIXTURE SCHEDULE.
○	INCANDESCENT LIGHTING FIXTURE, MOUNTED AS INDICATED IN THE FIXTURE SCHEDULE.
D	FLOODLIGHT FIXT., MOUNTING AS INDICATED ON PLANS.
☐ J.B.	JUNCTION BOX.
C.O.	CONDUIT ONLY.
W.P.	WEATHERPROOF



MOUNTING DETAIL (D/46)

NOTES:

1. 2"x 2"x 14"L, WEATHERPROOF, CORROSIONPROOF CAST ALUM. WIRING TROUGH W/ 3/4" MOUNTING HOLE AND 6 - ½" TAPPED HOLES (1 PLUG) COVER AND GASKET. EPOXY FINISH TO MATCH LTG FIXTURE.
2. "SCHEDULE" FOR PANEL "LA" SHOWN IN THIS DWG. IS FOR REFERENCE ONLY. NO PANEL INSTALLATION WILL BE INCLUDED IN THIS CONTRACT.
3. FLUORESCENT LTG. FIXTURES ON BRIDGE RAILING SHOULD BE INSTALLED IN ACCORDANCE WITH DETAILS SHOWN ON ARCHITECTURAL DWG A/37 B/37 C/37
4. TELEPHONE CONDUITS (2-3½") WILL BE ~~FURNISHED AND INSTALLED BY OTHERS~~ PER CHANGE ORDER #3.



REV	DESCRIPTION	INIT.	DATE
1	BRIDGE LTG. CKT'S.	J.K.	2/9/70

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING ARCHITECTURE PLANNING
LOS ANGELES CALIFORNIA
213 / 628-3162

JOB NO. 1-417
DATE 9-24-68
APPROVED:

ORANGE COUNTY HARBOR DISTRICT
NEWPORT BEACH, CALIFORNIA
1901 BAYSIDE DRIVE 714/834-3800

DANA POINT HARBOR
DANA POINT, CALIFORNIA
HEAVY CONSTRUCTION
BRIDGE
ELECTRICAL MISCELLANEOUS DETAILS

DATE OCTOBER, 1968
SCALE AS SHOWN
SHEET 46 OF 50
D 10.5-1

Building&Safety: Ryan Rose 6/9/2022

Approval: Geotechnical Reports

Permits: BNR21-0604

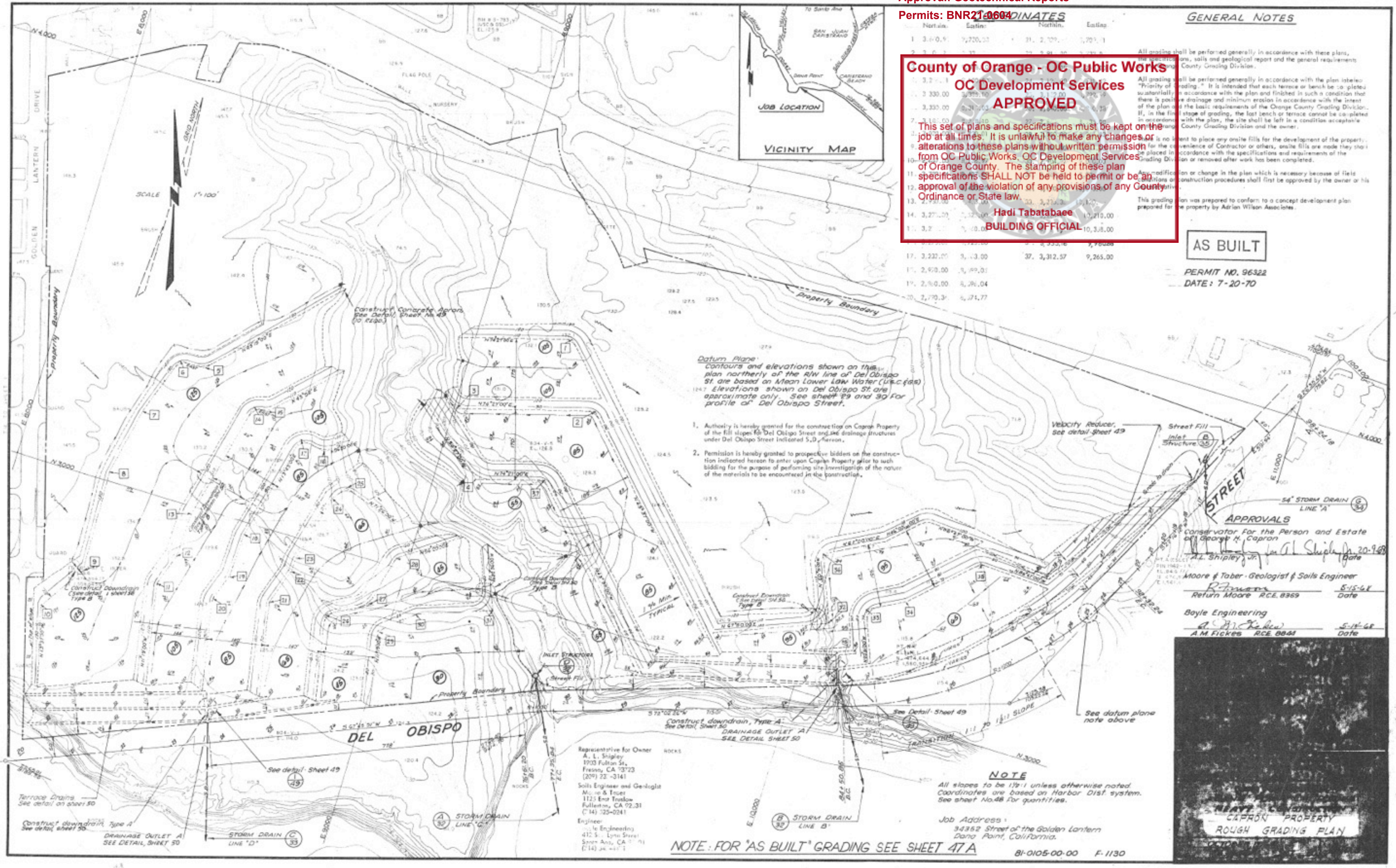
County of Orange - OC Public Works

OC Development Services

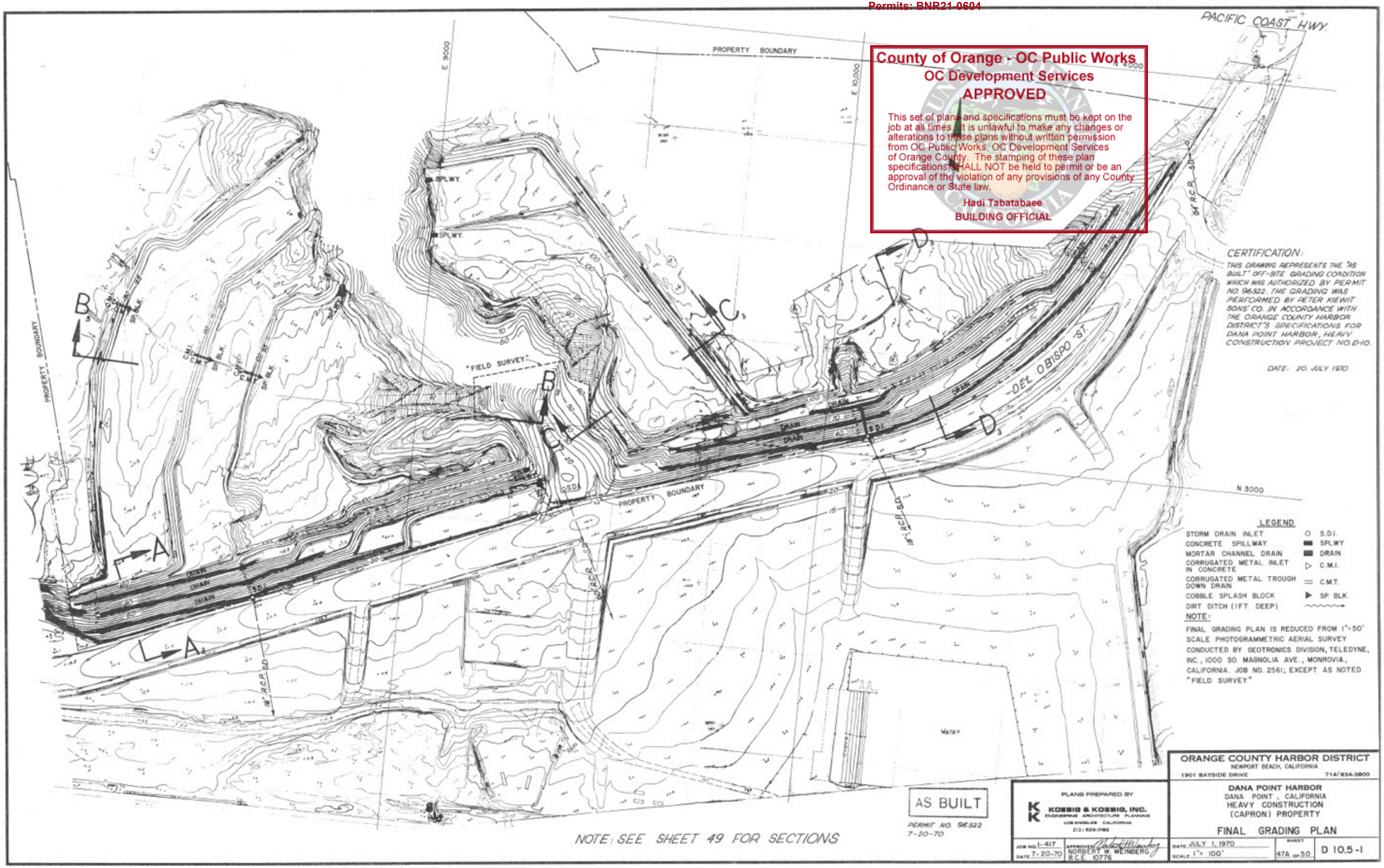
APPROVED

This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works, OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law.

Hadi Tabatabaee
BUILDING OFFICIAL



Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604



Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

EARTH EXCAVATION QUANTITY TABULATION		
AREA Nº	CUBIC YARDAGE	ACCUMULATIVE C.Y.
1	2[illegible],700 CY	CY
2	2[illegible]6,000 —	[illegible]
3	1[illegible]2,700 —	458,700 —
4	1[illegible]4,400 —	611,400 —
5	1[illegible]0,[illegible]	[illegible]
6	106,[illegible]	[illegible]
7	95,[illegible]	[illegible]
8	56,[illegible]	[illegible]
9	91,100 —	1,223,900 —
10	44,700 —	[illegible]
11	[illegible]	[illegible]
12	72,500 —	1,637,000 —
13	6,300 —	1,709,500 —
TOTAL	1,715,800 CY	1,715,800 CY

County of Orange - OC Public Works
OC Development Services
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VOID

Hadi Tabatabaee
BUILDING OFFICIAL

APPROVALS

Conservator for the Person and Estate of George H. Capron

A.L. Shipley, Jr. — 20-9-69 — Date

Moore & Taber · Geologist & Soils Engineer

Return Moore R.C.E. 8369 — 5-15-68 — Date

Boyle Engineering

A.M. Fickes R.C.E. 8844 — 5-14-68 — Date

ASSOCIATES

ORANGE COUNTY

POINT, CAL.

AS BUILT

PERMIT NO. 96322
DATE: 7-20-70

NOTE: SEE SHEET 47A FOR "AS BUILT" GRADING

NOTE:
SEE SHEET 49 FOR SECTIONS

This plan "Priority of Grading" – Sheet 48 – is intended to show in general concept the priority of the areas to be graded and is not intended to show any details of grading. See Sheet 47 for details.

81-0105-00-00 F-1130

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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OC Development Services
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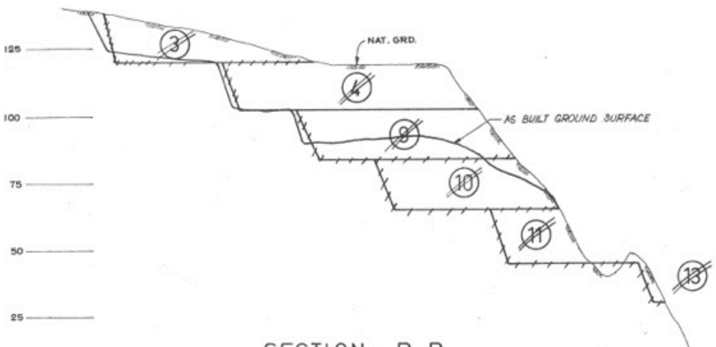
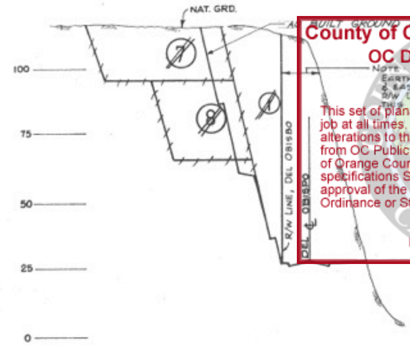
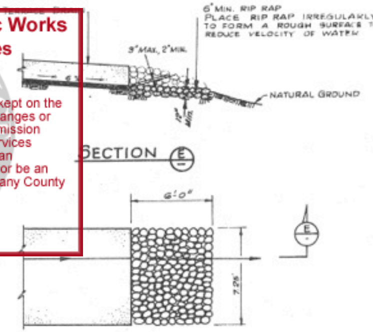
Hadi Tabatabaee
BUILDING OFFICIAL



SECTION B-B
HORIZ: 1" = 100'
VERT: 1" = 20'

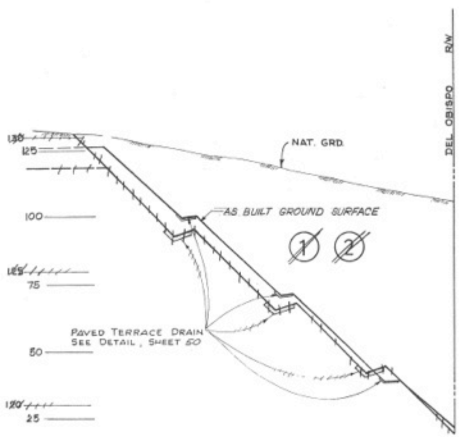


SECTION D-D
HORIZ: 1" = 100'
VERT: 1" = 20'

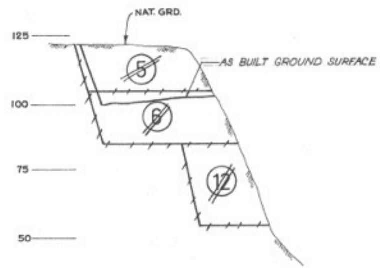


VELOCITY REDUCER
NO SCALE

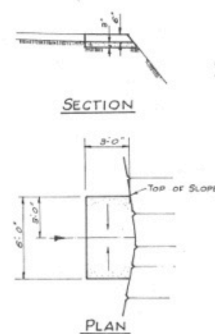
AS BUILT
PERMIT NO. 96322
DATE: 7-20-70



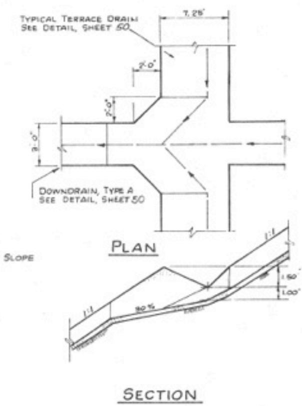
SECTION A-A
HORIZ: 1" = 20'
VERT: 1" = 20'



SECTION C-C
HORIZ: 1" = 100'
VERT: 1" = 20'

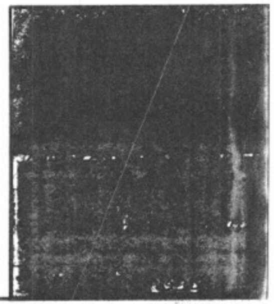


CONCRETE APRON
SCALE 1/4" = 1'-0"



DOWNDRAIN INLET DETAIL (1/49)
NO SCALE

APPROVALS
Conservator for the Person and Estate of George H. Capron
A.L. Shipley, Jr. 20-9-69 Date
Moore & Taber - Geologist & Soils Engineer
Return Moore RCE 6369 5-15-68 Date
Boyle Engineering
A.M. Fickes RCE 8844 5-16-68 Date



81-0105-00-00 F-1130

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604

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OC Development Services
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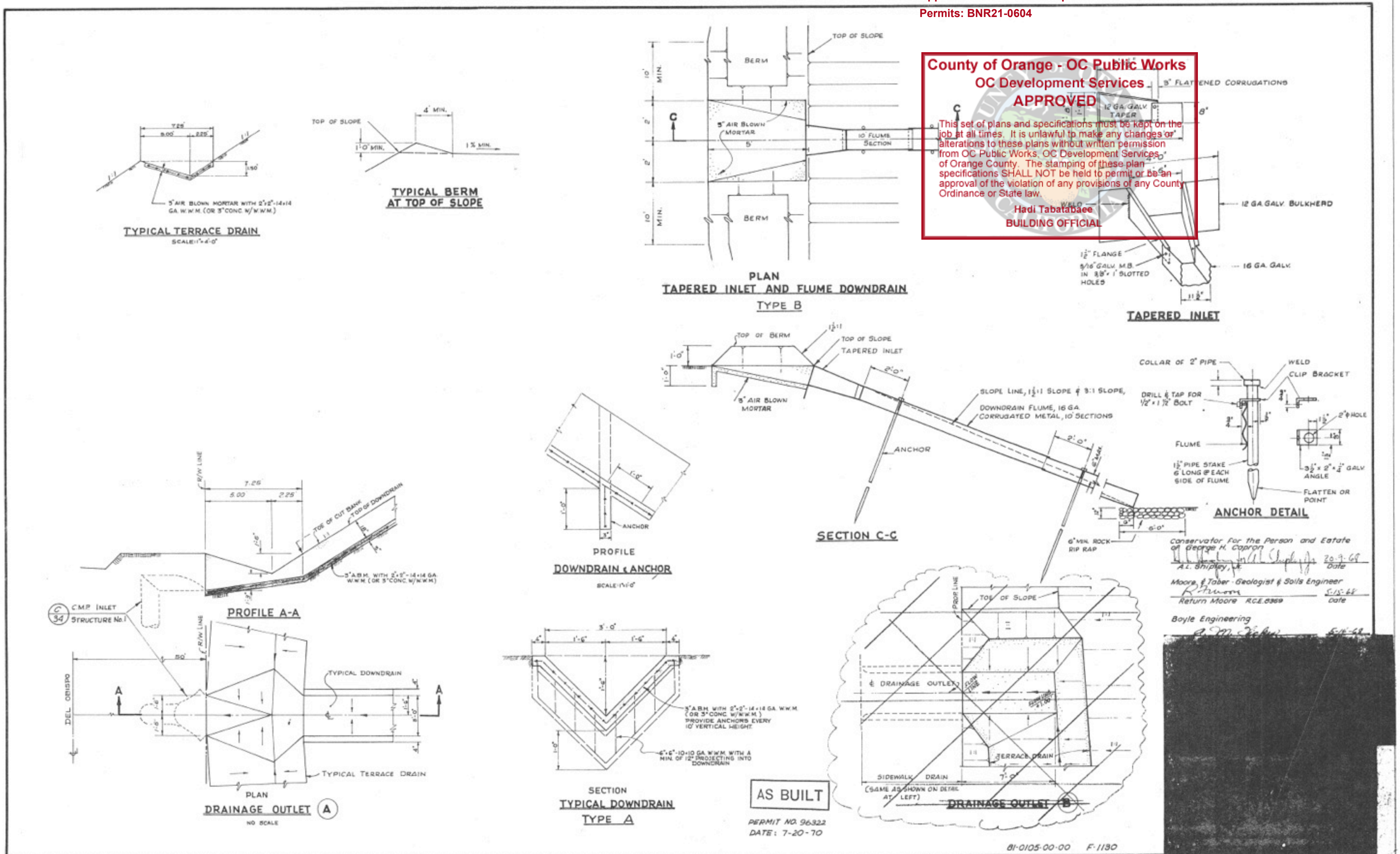
Hadi Tabatabaee
BUILDING OFFICIAL



[redacted]

Building&Safety: Ryan Rose 6/9/2022
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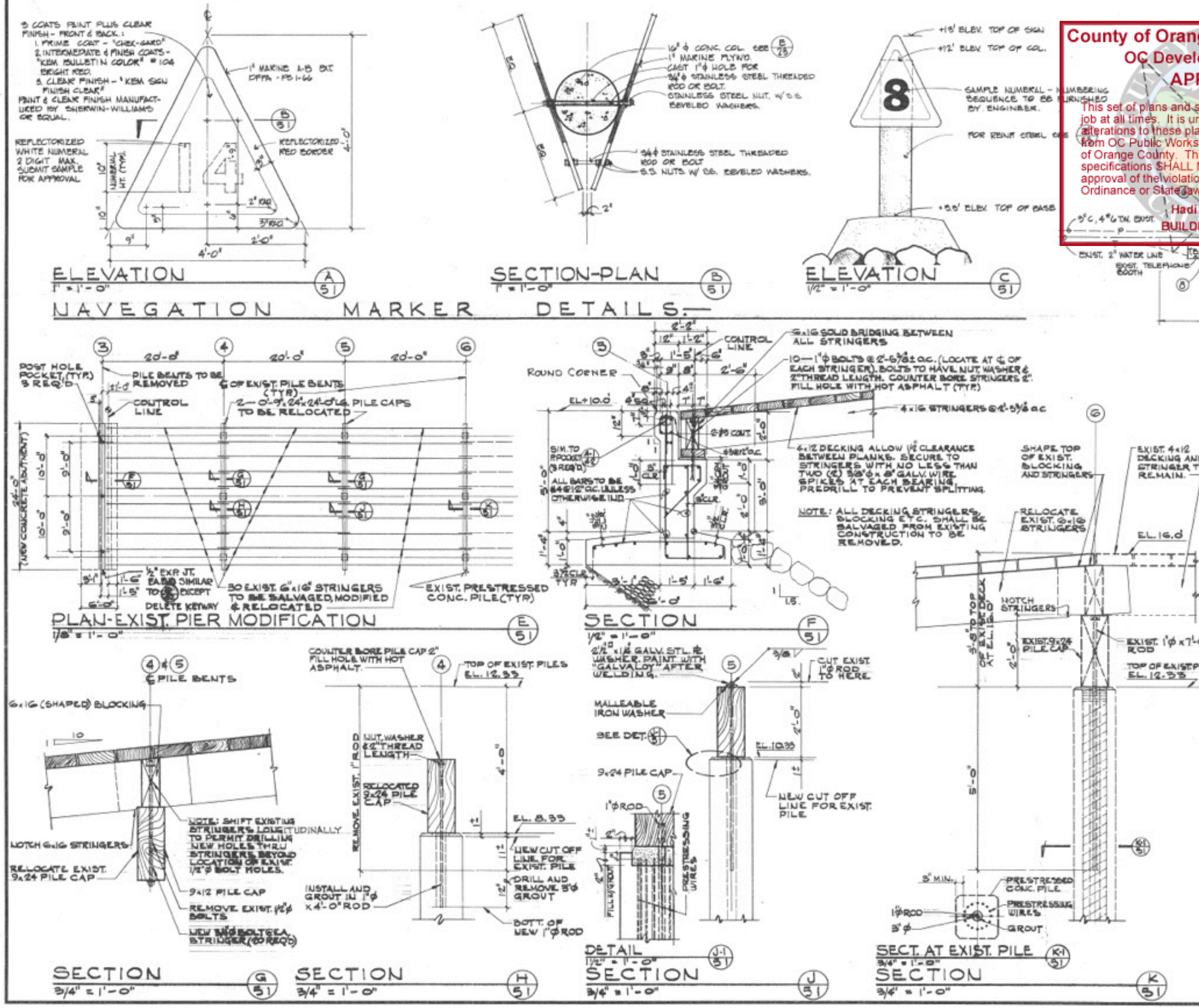
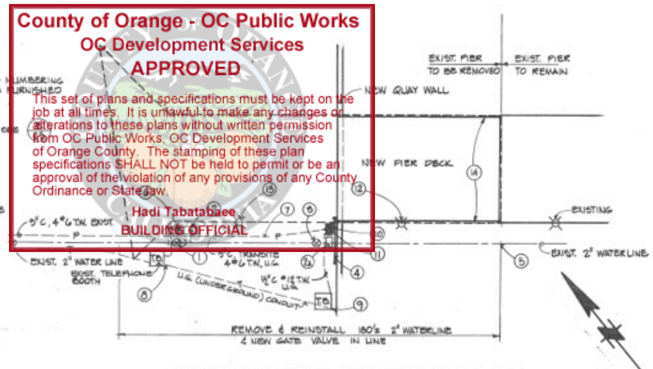




UTILITY RELOCATION PLAN (D/51)

NO SCALE

CONSTRUCTION NOTES

1. REMOVE EXIST. 2" GATE VALVE.
2. RELOCATE EXIST. FIRE HOSE CABINET TO NEW LOCATION. (2A) MOUNT ON RAILING
3. INSTALL NEW GATE VALVE IN REINSTALLED WATER LINE.
4. INSTALL 10' EXIST. RAILING.
5. CONNECT TO EXIST. 2" WATER LINE.
6. RELOCATE PANELBOARD TO NEW LOCATION. (10)
7. EXTEND PRIMARY POWER DUCT & FEEDER TO NEW PANELBOARD LOCATION & CONNECT.
8. REMOVE TELEPHONE CONDUIT STUB-UP AND EXTEND CONDUIT TO TELEPHONE BOOTH NEW LOCATION (9) IN CONFORMANCE WITH THE TELEPHONE COMPANY REQUIREMENTS.
9. TELEPHONE BOOTH - NEW LOCATION.
10. PANELBOARD - NEW LOCATION
11. INSTALL RELOCATED PANELBOARD AND ROUTE CIRCUITS FOR LIGHTING & POWER SIMILAR TO EXISTING.
12. REMOVE LTG. STD. AND REINSTALL AFTER PIER MODIFICATION.
13. REMOVE LTG. STD. AND SALVAGE.
14. REMOVE & REINSTALL HANDRAILING WITHIN LIMITS OF NEW PIER DECK CONSTRUCTION.

GENERAL NOTES

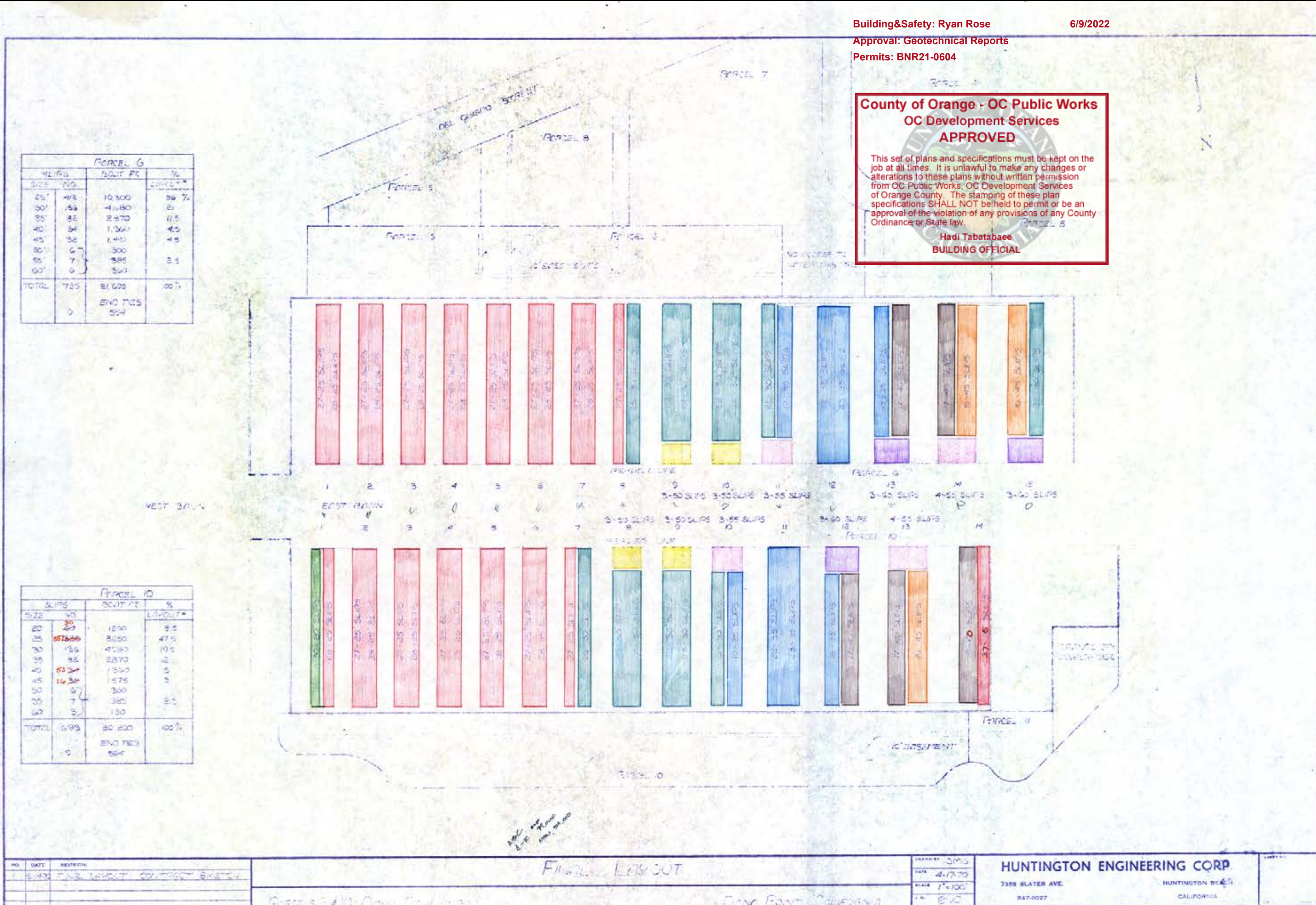
1. WATER LINE INSTALLED WITHIN LAND AREA SHALL HAVE A MIN. COVER OF 36".
2. WATER LINE INSTALLED ON PIER SHALL BE MOUNTED SIMILAR TO EXISTING.
3. LIGHTING POWER, & RECEPTACLES SHALL BE RECONNECTED SIMILAR TO EXISTING.
4. ELECTRICAL MODIFICATION WORK SHALL FOLLOW NATIONAL ELECTRICAL CODE AND LOCAL CODES.
5. ALL ELECTRICAL PERMITS SHALL BE OBTAINED BY THE CONTRACTOR.
6. SPLICES SHALL NOT BE MADE IN CONDUIT RUNS.
7. ALL FRESHLY CUT SURFACES OF DECKING, STRINGERS, ETC. SHALL BE THOROUGHLY BRUSHED WITH TWO COATS OF CREOSOTE.

AS BUILT

PLANS PREPARED BY KOEBIG & KOEBIG, INC. ENGINEERING ARCHITECTURE PLANNING LOS ANGELES CALIFORNIA 213 / 629-3100	ORANGE COUNTY HARBOR DISTRICT NEWPORT BEACH, CALIFORNIA 1901 BAYSIDE DRIVE 714/834-3800
JOB NO. 1-41731 DATE 9-19-69 APPROVED	DANA POINT HARBOR DANA POINT CALIFORNIA HEAVY CONSTRUCTION PIER MODIFICATION STRUCTURAL & MISCELLANEOUS DETAILS
DATE SEPTEMBER, 1969 SCALE AS SHOWN	SHEET 51 OF 51 — D10.5-1

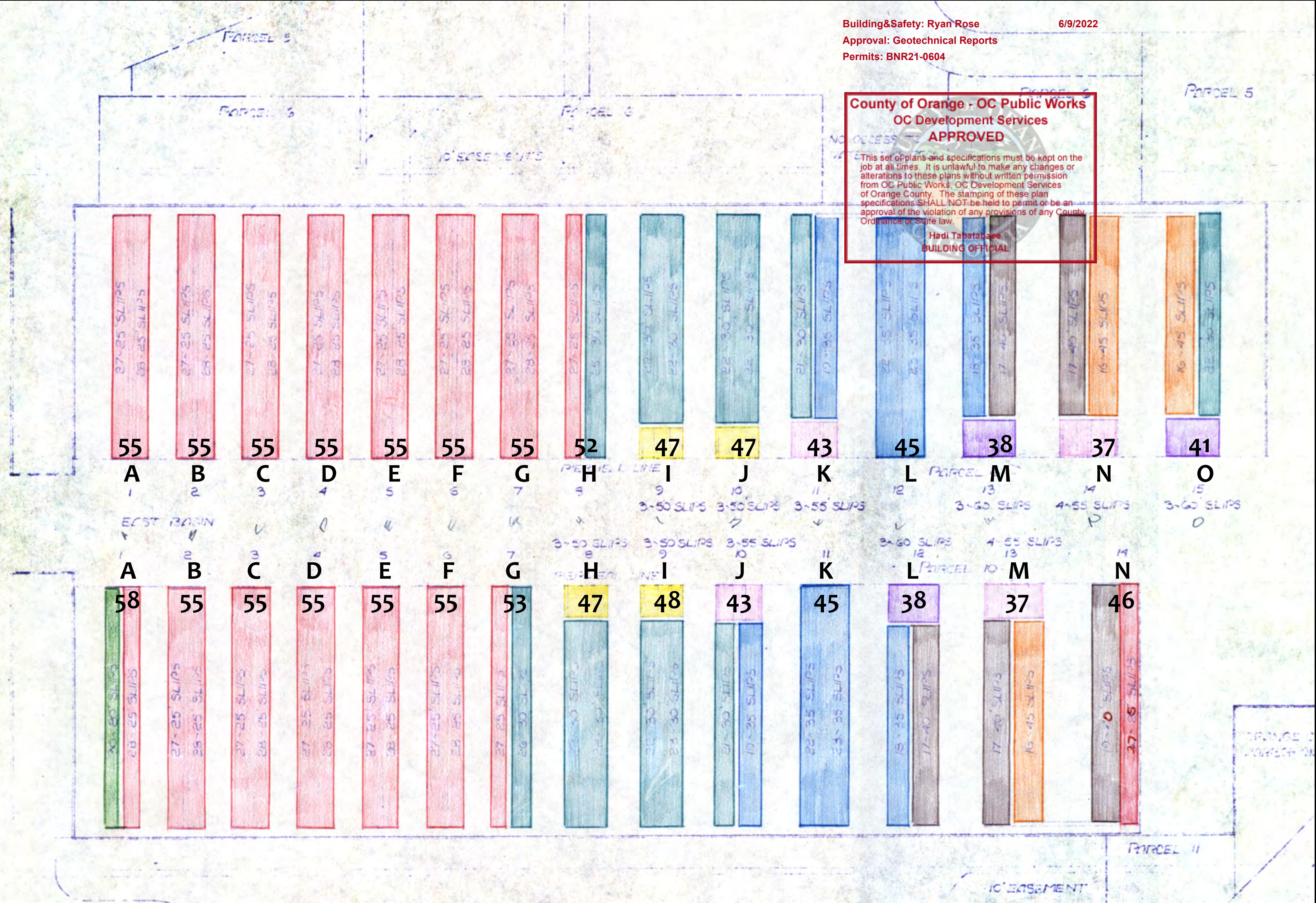
APPENDIX F

EXISTING GUIDE PILES PLANS



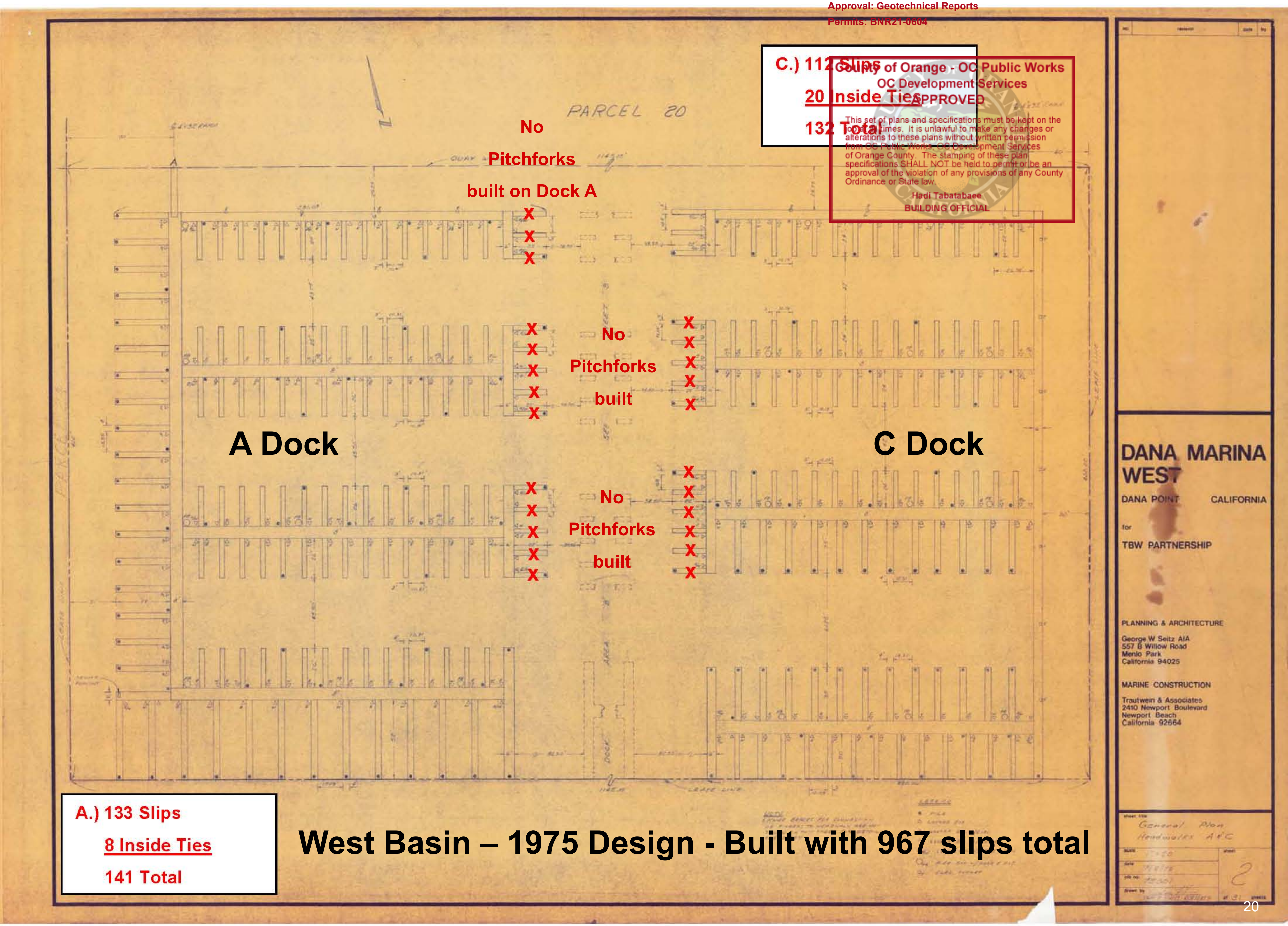
East Basin - 1970 - Original Designed / Built with 1,425 slips

DPH RFQ Resource Documents #3- Original Marina Plans



East Basin - 1970 - Original Designed / Built with 1,425 slips

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604



Building&Safety: Ryan Rose 6/9/2022
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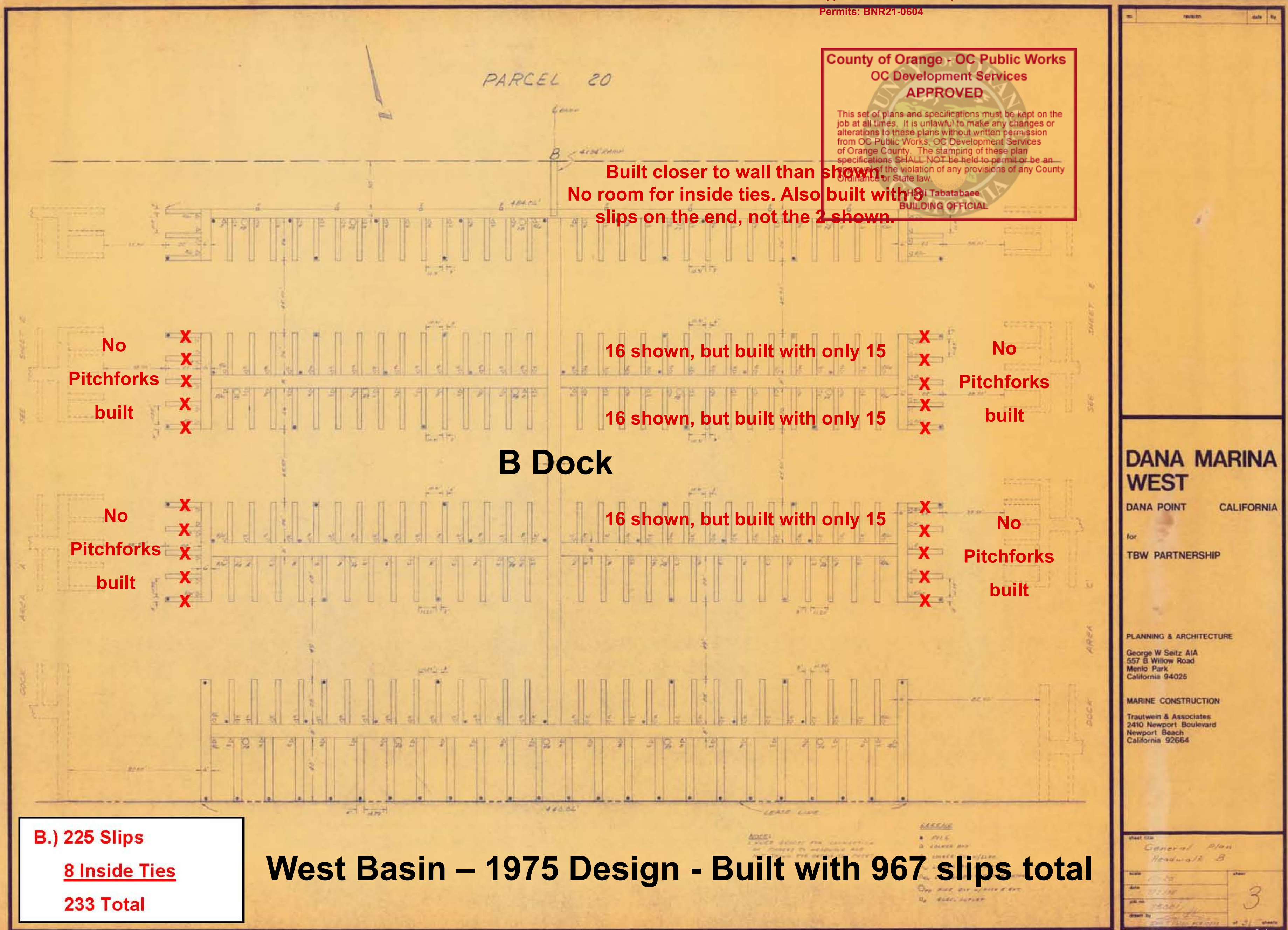


Built closer to wall than shown.
No room for inside ties. Also built with 8 slips on the end, not the 2 shown.

No Pitchforks built

16 shown, but built with only 15

No Pitchforks built

16 shown, but built with only 15

B Dock

No Pitchforks built

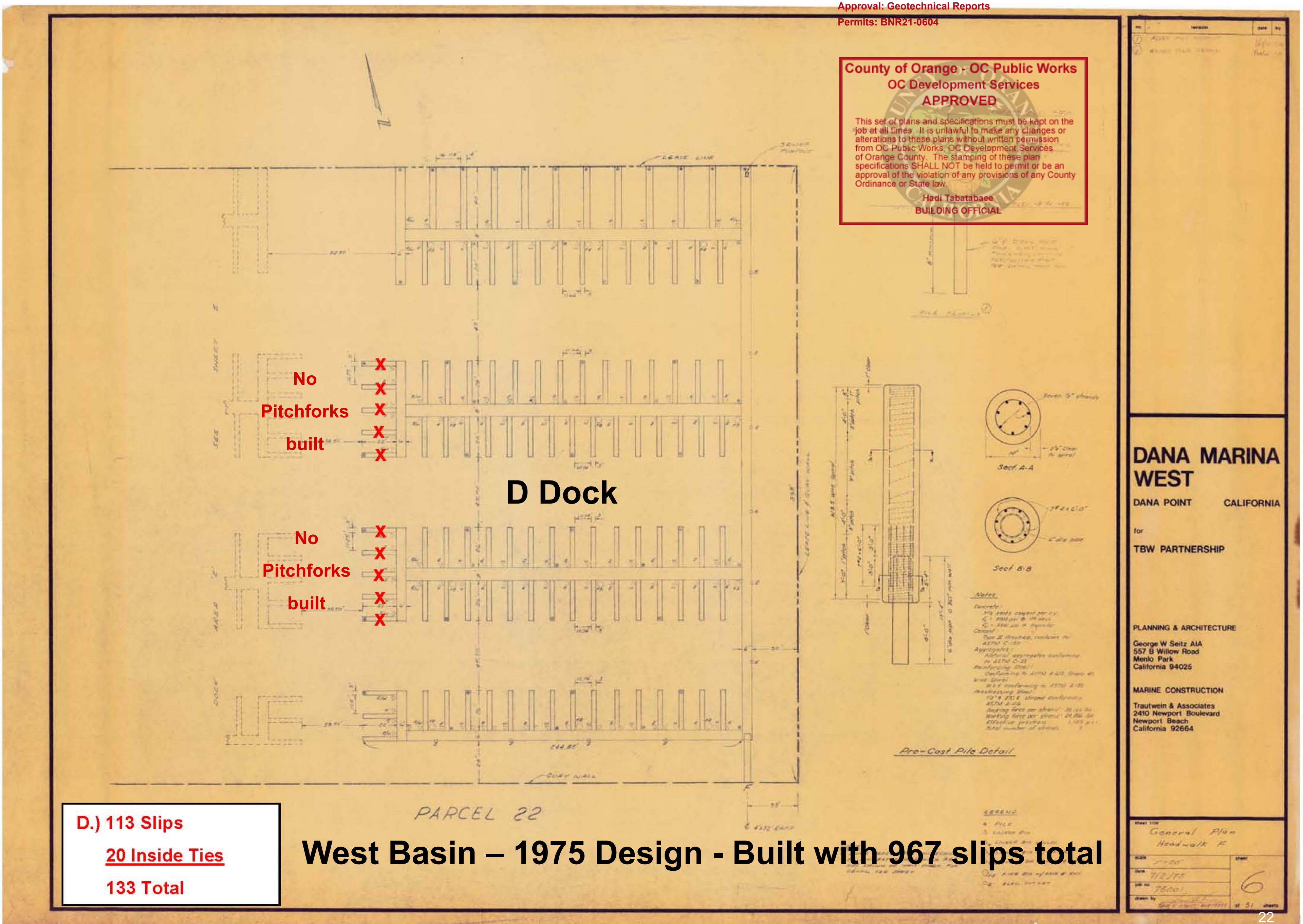
16 shown, but built with only 15

No Pitchforks built

B.) 225 Slips
<u>8 Inside Ties</u>
233 Total

West Basin – 1975 Design - Built with 967 slips total

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604



West Basin – 1975 Design - Built with 967 slips total

Building&Safety: Ryan Rose 6/9/2022
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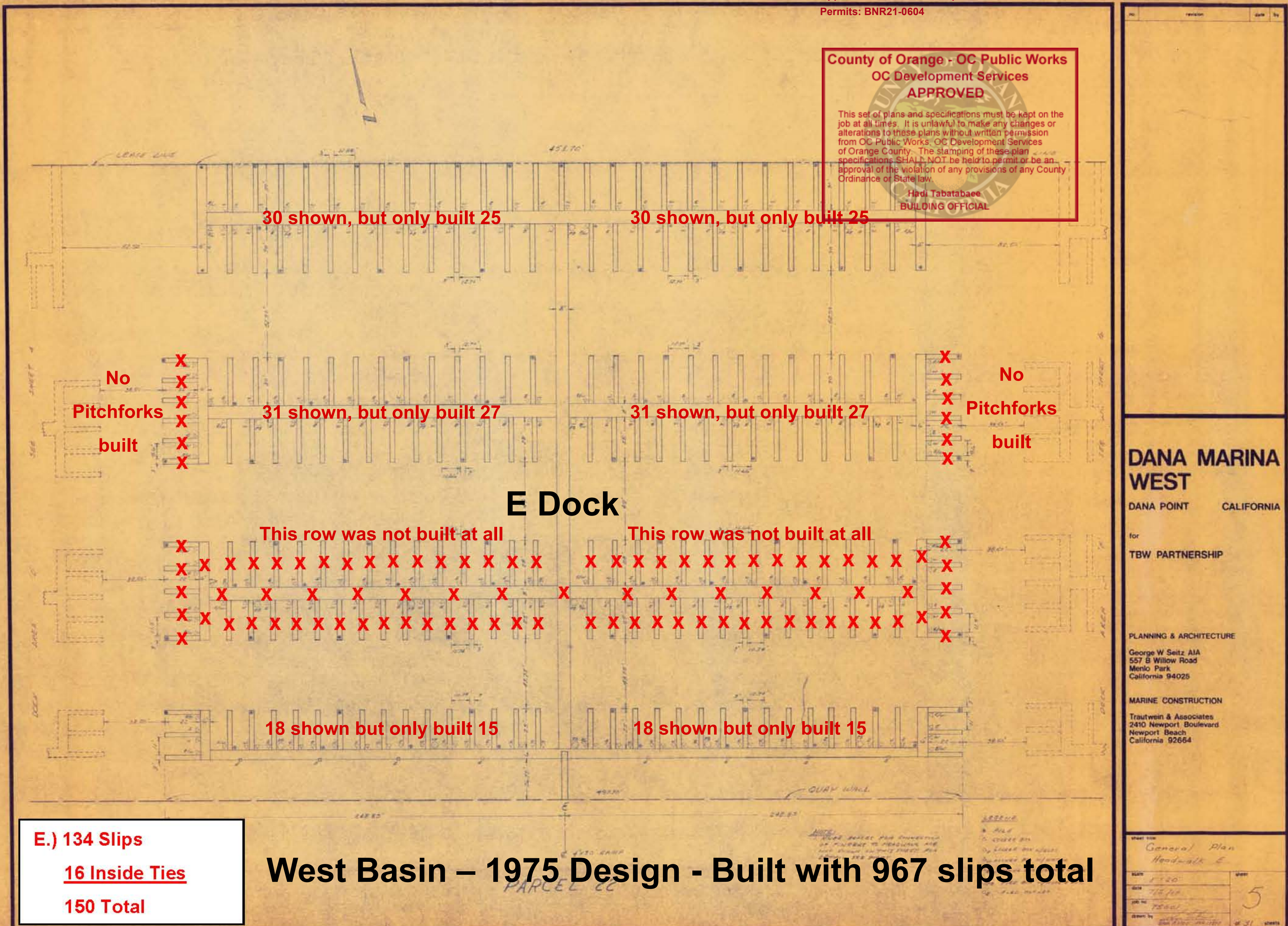

E.) 134 Slips
16 Inside Ties
150 Total

West Basin – 1975 Design - Built with 967 slips total

Building&Safety: Ryan Rose 6/9/2022
Approval: Geotechnical Reports
Permits: BNR21-0604