APPENDIX C

Geotechnical Evaluation

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soil PACIFIC INC.
Geotechnical and Environmental Services

Project No. A-9899-24
September 19, 2024

WMC, LLC
234 Victoria Place,
Costa Mesa, California

SUBJECT: Soil and Foundation Evaluation Report
Proposed Multi-tenant Building Complex
220, 222, and 234 Victoria Place, Costa Mesa, California

Dear Sir;

Pursuant to your authorization, we are pleased to submit our report for the subject project. Our Site evaluation was conducted on October 2024. This evaluation consisted of field exploration, sub-surface soil sampling, laboratory testing, engineering evaluation, and preparation of the following report containing a summary of our conclusions and recommendations.

The opportunity to be of service is appreciated. Should any questions arise pertaining to any portion of this report, please contact this firm in writing for further clarification.

Very truly,

Soil Pacific Inc.

Yones Kabir
President

Hoss Eftekhari
RCE

675 N. Eckhoff, Suite A, Orange, CA 92868 ○ Tel (714) 879-1203 ○ Fax (714) 879-4812

Soil and Foundation Evaluation Report
Proposed Multi-tenant Building Complex
220, 222, and 234 Victoria Place, Costa Mesa, California

Prepared for:

WMC, LLC
236 Victoria Place,
Costa Mesa, California

Prepared by:

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Project No. A-9899-24
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LIMITATIONS

Between exploratory excavations and/or field testing locations, all subsurface deposits, consequent of their anisotropic and heterogeneous characteristics, can and will vary in many important geotechnical properties. The results presented herein are based on the information in part furnished by others and as generated by this firm, and represent our best interpretation of that data benefiting from a combination of our earthwork related construction experience, as well as our overall geotechnical knowledge. Hence, the conclusions and recommendations expressed herein are our professional opinions about pertinent project geotechnical parameters which influence the understood site use; therefore, no other warranty is offered or implied.

All the findings are subject to field modification as more subsurface exposures become available for evaluations. Before providing bids, contractors shall make thorough explorations and findings. Soil Pacific Inc., is not responsible for any financial gains or losses accrued by persons/firms or a third party from this project.

In the event the contents of this report are not clearly understood, due in part to the usage of technical terms or wording, please contact the undersigned in writing for clarification.

SECTION 1.0
PRELIMINARY EVALUATION

1.1 Site Description

The subject site is comprised of several adjacent parcel recognized as 220, 222, and 234 Victoria Place, Costa Mesa, California. The item parcels collectively named as "The Site" is located within the residential and commercial community of the City of Costa Mesa. The parcels are developed as commercial scattered one story building and storage sheds. The site is partially paved and partially covered with thick gravel bed. Neighboring properties are mixed use residential and commercial developed parcels. Current site access is through Victoria Street and injunction with Victoria Street with Newport Boulevard. The site elevation is about 80 feet above the main sea level, with a sheet water flow toward the south/southwest.

Address:	234 VICTORIA ST
APN	419-111-22
City	COSTA MESA
Address	236 VICTORIA ST
Fault Zone	This parcel is NOT WITHIN an Earthquake Fault Zone.
Liquefaction Zone	This parcel is NOT WITHIN a Liquefaction Zone.
Landslide Zone	This parcel is NOT WITHIN a Landslide Zone.

1.2 Planned Land Use

It is understood that the proposed construction will consist of new designed multi-tenant residential buildings with associated paved driveway and parking areas. Entire existing building and sheds will be removed or demolished. The entire site then will be prepared for construction of the planned structures.

1.3 Field Exploration

Subsurface conditions were explored by using 4 inches auger borings to a minimum depth of 10-12 feet below the existing grade. In total eight boring were planed and performed randomly to cover the adjacent parcels subject to redevelopment.

The relatively undisturbed soil samples, consisting of 2½ inch ring samples that were obtained with the hollow stem auger. A reasonable effort was made to restore drill hole sites to their original condition. This included backfilling and tamping of the test borings, and general surface cleanup. It should be noted that as with any backfill, residual consolidation could occur at the test boring locations. The client is cautioned to periodically examine the test boring locations and if necessary, backfill any resulting depressions.

All of the borings were backfilled with the excavated cuttings following logging, and obtaining bulk and relatively undisturbed samples for laboratory testing. The boring locations are shown on Plate A-1-1 and the logs are included in Appendix A.

Based on this evaluation, the site is underlain by a relatively thin top soils/ fill mantel to about 1-2 feet depth. It comprised of fine to medium grained silty sand, sand with some silt. Underlaying materials were mainly silty sand and clayey sand to clayey sand alluvial paralic deposits.

Earth materials encountered within the exploratory borings were classified and logged by the field engineer in accordance with the visual-manual procedures of the Unified Soil Classification System (USCS), ASTM Test Standard D2488.

1.4 Laboratory Testing

1.4.1. Classification

Soils were classified visually according to the Unified Soil Classification System. Moisture content and dry density determinations were made for the samples taken at various depths in the exploratory excavations. Results of moisture-density and dry-density determinations, together with classifications, are shown on the boring logs, Appendix A.

1.4.2 Expansion

An expansion index test was performed on a representative sample in accordance with the California Building Code Standard. A low expansion potential (EI=38) is anticipated for the encountered soils at the surficial soils (0-5 feet).

1.4.3 Direct Shear

Shear strength parameters are determined by means of strain-controlled, double plain, direct shear tests performed in general accordance with ASTM D-3080. Generally, three or more specimens are tested, each under a different normal load, to determine the effects upon shear resistance and displacement, and strength properties such as Mohr strength envelopes. The direct shear test is suited to the relatively rapid determination of consolidated drained strength properties because the drainage paths through the test specimen are short, thereby allowing excess pore pressure to be dissipated more rapidly than with other drained stress tests. The rate of deformation is determined from the time required for the specimen to achieve fifty percent consolidation at given normal stress. The test can be made on all soil materials and undisturbed, remolded or compacted materials. There is, however, a limitation on maximum particle size. Sample displacement during testing may range from 10 to 20 percent of the specimen's original diameter or length.

The shear test results are plotted on the attached shear test diagrams and unless otherwise noted on the shear test diagram, all tests are performed on undisturbed, saturated samples.

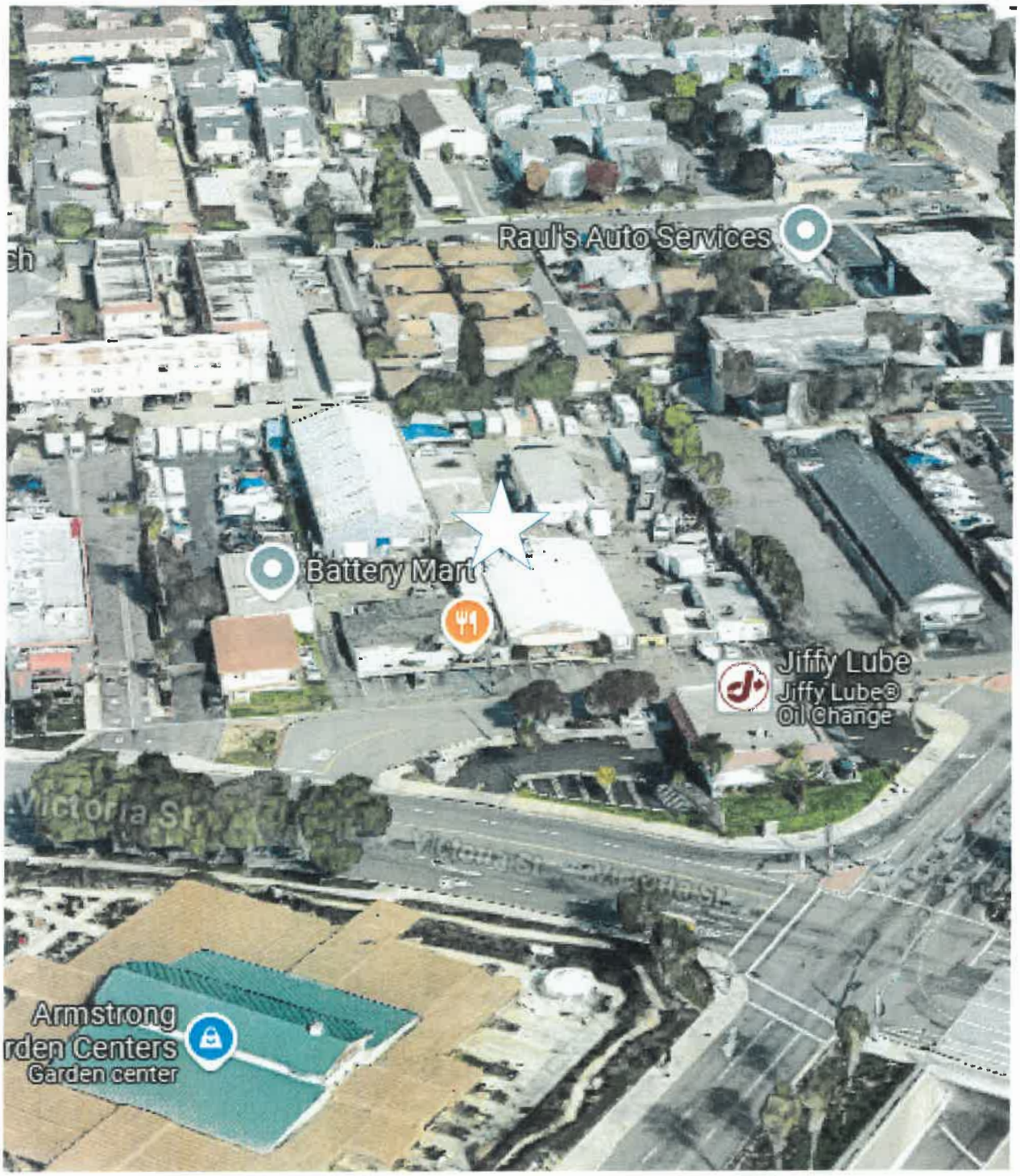


Figure 1: Site Aerial Photo.

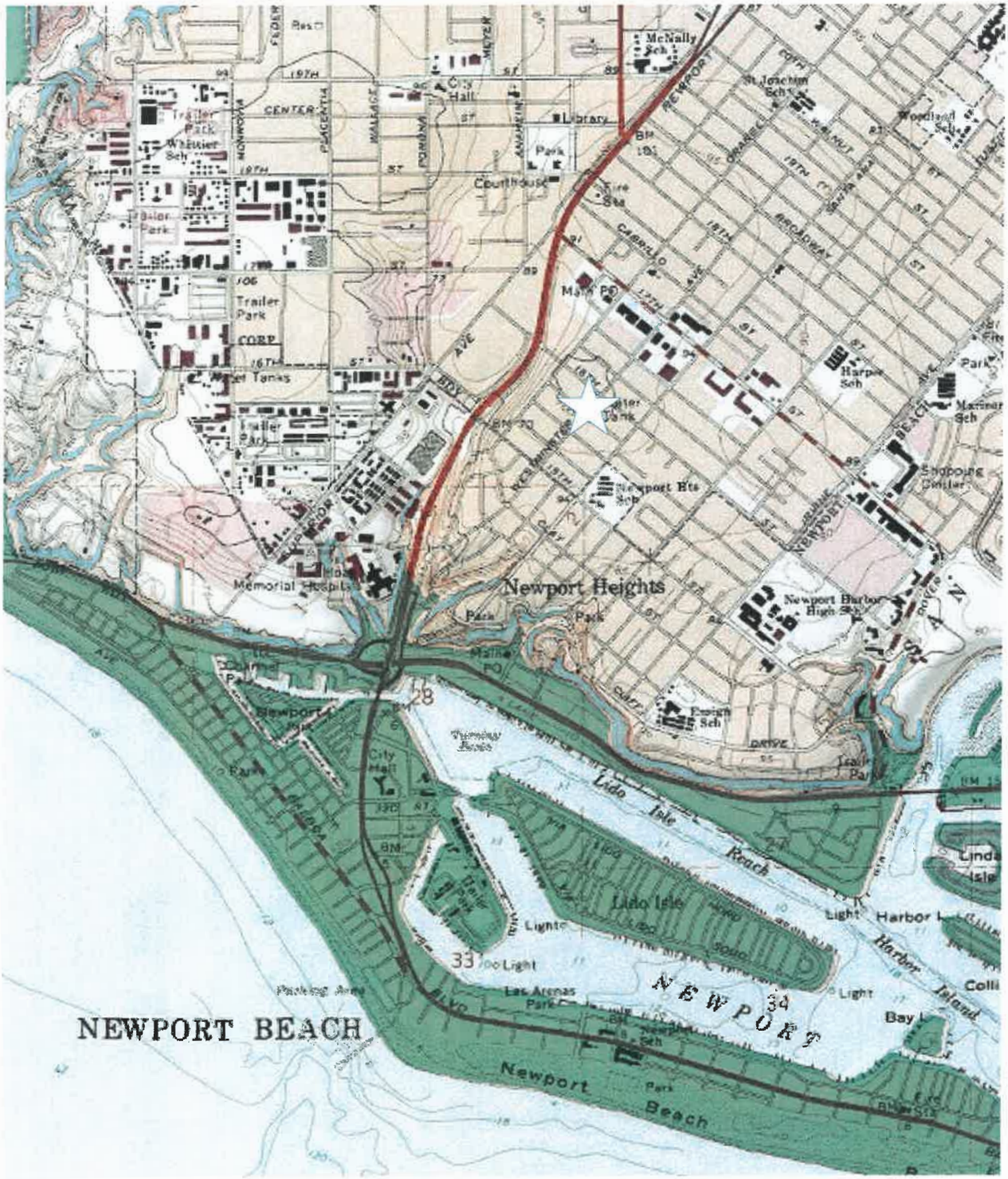


Figure 2: Site Geologic/topographic map by USGS/AAGS.

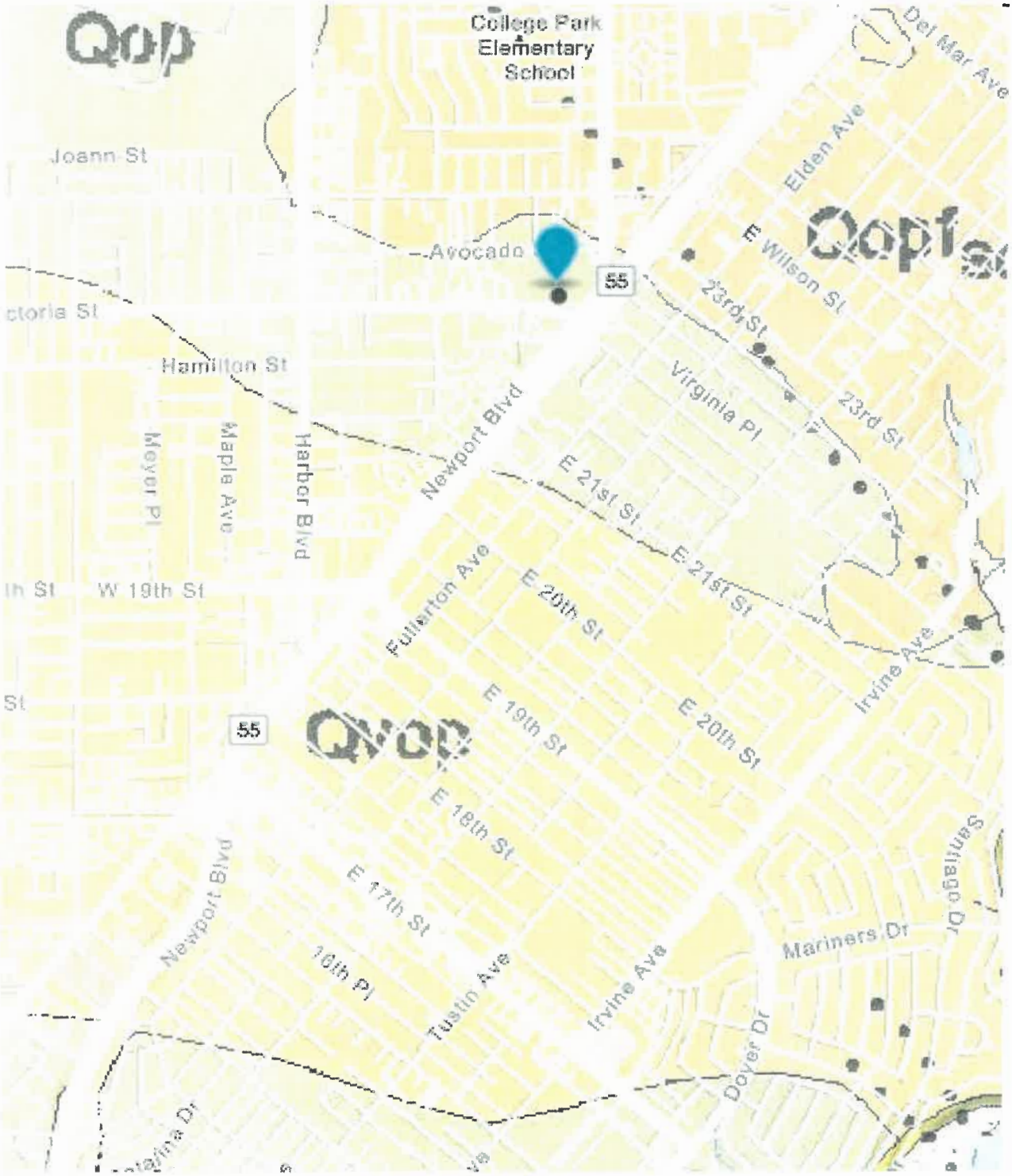


Figure 3: Site Geologic Map. (USGS).

Section 2.0
Conclusions

The proposed construction is considered feasible from a soils engineering standpoint. All earthwork should be performed in accordance with applicable engineering recommendations presented herein or applicable Agency Codes, whichever are the most stringent.

2. 1 Earth Materials

The site is located on an within a south old paralic deposits along the southern flank of the western of Santa Ana Costal Plain. The Coastal Plain lies within the southwest portion of the Los Angeles Basin and consists of semi-consolidated marine and non-marine deposits ranging in age from Miocene to recent. The western boundary of the Coastal Plain, in which the site is located, is referred to as the Tustin Plain. It is bound by the Santa Ana Mountains to the northeast and the San Joaquin Hills to the southeast.

Based on available geologic maps the site is underlain by a thin mantle of estuarine or engineered fill. The shallow soil layer is underlain by Quaternary-age old paralic deposits (Qop) which are described as medium dense to very dense, oxidized, fine to medium grained, moderately to well-cemented sand and silty sand. The old paralic deposits are underlain by massive bedrock of the Monterey Formation (Tm). (reference: Santa Ana 30x60' Geology Quadrangle. Morton).

Fill/ Topsoils

Fill Mantel is relatively thin (0-2 feet). Fill soils consists of light brown, to dark gray fine to medium grained sand /silty sand, moist top soil, underlain by clayey sand/sandy silt and clayey layers. At between 9-12 feet a layer of white to yellowish sandy clay with sea shell fragment was encountered.

Alluvium (Qop)

These deposits are composed of sandy clay and silt, clayey deposits with some sand and silt. The Paralic deposits are moderately dense. The density increases by depth increase.

2.2 Foundations

Proposed detached addition footings will be placed and embedded into prepared certified engineered fill.

2.3 Bearing Materials

Encountered surficial soils are relatively loose to a maximum depth of 2 feet and can not be used as a bearing materials.

2.4 Groundwater

The site is located within the Coastal Plain of Orange County Groundwater Basin (California Department of Water Resources, [CDWR], 2019). Groundwater depth varies within the area and flow direction beneath the subject site is toward the south, southwest. Groundwater during our subsurface exploration program was not encountered.

2.5 CBC Seismic Design Parameters

Earthquake loads on earthen structures and buildings are a function of ground acceleration, which may be determined from the site-specific acceleration response spectrum. To provide the design team with the parameters necessary to construct the site-specific acceleration response spectrum for this project, we used computer application that is available on the United States Geological Survey (USGS) website, https://earthquake.usgs.gov/ws/designmaps/ or https://asce7hazardtool.online.

Based on our review of pertinent CGS maps, no active or potentially active faults are known to traverse the area of the proposed development at the subject site. However, Southern California is seismically active with numerous faults capable of causing ground shaking at the site. The general location of active and potentially active faults within the southern California region can generate ground shaking at the site.

2.6 Chemical Contents

Chemical testing for detection of hydrocarbon or other potential contamination is beyond the scope of this report.

2.7 Liquefaction Study/ Secondary Seismic Hazard Zonation

Based on our review of the published maps (Newport Beach State Hazard 7.5 Min. Quadrangle Map), the subject site is not located within the area having a potential for Liquefaction susceptibility.

Liquefaction occurs when seismically-induced dynamic loading of a saturated sand or silt causes pore water pressures to increase to levels where grain-to-grain contact pressure is significantly decreased and the soil material temporarily behaves as a viscous fluid. Liquefaction can cause settlement of the ground surface, settlement and tilting of engineered structures, flotation of buoyant buried structures and fissuring of the ground surface. A common manifestation of liquefaction is the formation of sand boils (short-lived fountains of soil and water emerges from fissures or vents and leave freshly deposited conical mounds of sand or silt on the ground surface).

Seismicity

Alquist-Priolo Zone: According to the map entitled "State of California Special Studies Zones, Newport Beach Quadrangle," dated July 1, 1986, the site is not situated within an Alquist Priolo Special Studies Zone.

Liquefaction

According to the maps entitled "State of California Seismic Hazard Zones, Newport Beach Quadrangle" the site is not located within a mapped zone for seismic hazard due to liquefaction.

Summary of Findings

Based on our subsurface exploration and laboratory testing, engineering analysis, and our experience with similar sites and developments, the proposed development is feasible from a geotechnical engineering standpoint provided the recommendations contained in this report are implemented into its design and construction.

As mentioned earlier, soils at the site consist of fill soils to a depth of approximately 1 to 2 feet below grade. The fill soils are underlain by stiff to very stiff silts and clays underlain by medium and very dense sand and silty sands. Groundwater was not encountered within our borings to the depth explored.

The onsite fill soils are not considered suitable for the support of the proposed foundations, slabs on grade, and pavement section and should be overexcavated to the firm native soils. The excvated soils shall be recompacted properly to a minimum 90% relative compaction as an acceptable engineered fill.

Section 3.0
Recommendations

Based on our exploration and experience with similar projects, the proposed construction is considered feasible from a soils engineering standpoint providing the following recommendations are made a part of the plans and are implemented during construction.

3.1 Clearing and Site Preparation

Based on the proposed project concept a newly designed building structures are planned. In referencing to the encountered on-site materials, soil removal and recompaction (R&R) should be planned. The following recommendation can be used in preparation of R &R plan by project civil engineer.

1. Upon demolishing the exiting structures, the areas to receive compacted fill should be stripped of all vegetation, construction debris and trashes, non engineered fill, left in place incompetent material up to approved soils (3-3.5 feet). If soft spots are encountered, project soil engineer will evaluate the site conditions and will provide necessary recommendations.

2. The excavated area should be scarified to a minimum of 8 inches, adjusted to optimum moisture content, and reworked to achieve a minimum of 90 percent relative compaction.

3. Compacted fill should extend at least 5 feet beyond all perimeter footings or to a distance equal to the depth of the certified compacted fill, whichever is the greatest and feasible.

4. Compacted fill, consisting of on-site soil shall be placed in lifts not exceeding 6 inches in uncompacted thickness. The excavated onsite materials are considered satisfactory for reuse in the fill if the moisture content is near optimum. All organic material and construction debris should be removed and shall be segregated. Any imported fill should be observed, tested, and approved by the soils engineer prior to use as fill. Rocks larger than 6 inches in diameter should not be used in the fill.

5. The fill should be compacted to at least 90 percent of the maximum dry density for the material. The maximum density should be determined by ASTM Test Designation D 1557-00.

6. Field observation, and compaction testing should be performed by a representative of Soil Pacific Inc. during the grading to assist the contractor in obtaining the required degree of compaction and the proper moisture content. Where compaction is less than required, additional compaction effort should be made with adjustment of the moisture content, as necessary, until a minimum of 90 percent relative compaction is obtained.

7. Subject site is a part of very old development area and may contain old septic tanks and or water wells. These type of old structure amenities must be properly abandoned. In general the liquid part of septic should be removed and the septic well must be backfilled with 2 sack slurry mix or 3/4 inches of single size gravel to-4 feet below grade. The upper portion of any abandoned wells/pits must be filled with the same engineered fill mantel.

3.2 Site Preparation and Excavations

If any unanticipated subsurface improvements (pipe lines, irrigation lines, etc.) are encountered during earthwork construction, this office should be informed and appropriate remedial recommendations would subsequently be provided.

3.3 Stability of Temporary Cuts

The stability of temporary cuts required during removal process depends on many factors, including the slope angle, closeness of the adjacent building foundation or public property traffic, the shearing strength of the underlying materials, and the height of the cut and the length of time the excavation remains open and exposed to equipment vibrations and rainfall. The geotechnical consultant should be present to observe all temporary excavations at the site. The possibility of temporary excavations failing may be minimized by:

1) keeping the time between cutting and filling operations to a minimum;
2) limiting excavation length exposed at any one time; and,
3) shoring prior to cut.

3.4 Foundations

Considering the site specific condition, the following recommendations may be used in preparation of the design and construction of the foundation system.

3.4.1 Bearing Value

Allowable bearing value is 2000 psf. The bearing value may be increased by 1/3 when considering short duration seismic or wind loads.

An allowable frictional resistance of 0.30 may be used for design of concrete foundations poured on approved materials. When frictional and passive resistance are combined to compute the total lateral resistance, no reduction is needed to any of these two components.

3.4.2 Foundation Settlement

Based upon anticipated structural loads, the maximum total settlement for the proposed

foundation is not expected to exceed 1 inch at design load. Differential settlement between adjacent footings and lateral displacement of lateral resisting elements should not exceed 1/2 inch.

3.4.3 Concrete Type

Based on our experience with similar project at the vicinity of the site, Type II concrete can be used in planning and construction.

3.4.4 Slabs-on-grade

If slabs-on-grade is desired to design then it should be a minimum of 5 inches in nominal thickness. Slab areas that are to be carpeted or tiled, or where the intrusion of moisture is objectionable, should be underlain by a moisture barrier consisting of 15-mil Visqueen, properly protected from the puncture by four inches of gravel per Calgreen requirements. The slab should be reinforced by rebars no. 3 at 16 inches on center and shall be tied to the foundation.

3.5 Utility Trench Backfill

Utility trenches backfill should be placed in accordance with Appendix D. It is the owners' and contractors' responsibility to inform subcontractors of these requirements and to notify Soil Pacific when backfill placement is to begin.

3.6 Seismic Design and Construction

Construction should be in conformance with seismic design parameters of the latest edition of California Building Code (C.B.C.) Please refer to the following table for related seismic design parameters.

SS (0.2 sec)	S1 (1.0 sec)	Soil Class	SDS (0.2 sec)	SD1 (1.0 sec)	PGAm	Seismic Design Cat
1.344	.48	D	0.898	-	.64	II

3.7 Retaining Wall Design Recommendations

A retaining wall is not planned or proposed. If a conventional retaining wall is planned to envelop and cover the proposed decking cavity around the planned decking, then the following design criteria may be used.

1) The free standing retaining walls should be designed using at active pressure condition. The minimum equivalent fluid pressure, for lateral soil loads, of 642 pounds per cubic foot may be used for design for onsite non expansive granular soils conditions and level backfill (10:1 to 4:1 or less).

2) An allowable soil bearing pressure of 2000 lbs. per square foot may be used in design for footings embedded to the street level (estimated to be in the order of a minimum of 4 feet deep).

3) A friction coefficient of .30 between concrete and natural or compacted soil and a passive bearing value of 345 lbs. per square foot per foot of depth, up to a maximum of 1000 pounds per square foot at the bottom excavation level may be employed to resist lateral loads. Any wall exceeding 6 feet height should be designed against static and seismic loads.

3.8 Concrete Driveway

1. The subgrade soils for all flatwork should be checked to have a minimum moisture content of 2 percentage points above the optimum moisture content to a depth of at least 18 inches.

2. Local irrigation and drainage should be diverted from all flatwork areas. Area drains and swales should be utilized to reduce the amount of subsurface water intrusion beneath the foundation and flatwork areas.

3. The concrete flatwork should have enough cold joints to prevent cracking. Adequate reinforcement considering the expansion potential is required. A minimum of rebar no. 4 placed at 18 inches on center must be used.

4. Surface and shrinkage cracking of the finished slab may be significantly reduced if a low slump and water-cement ratio are maintained during concrete placement. Excessive water added to concrete prior to placement is likely to cause shrinkage cracking.

5. Construction joints and saw cuts should be designed and implemented by the concrete contractor or design engineer based on the medium expansive soil conditions. Maximum joint spacing should not exceed 8 feet in any direction.

6. Patio or driveway subgrade soil should be compacted to a minimum of 90 percent to a depth of 18 inches. All run-off should be gathered in gutters and conducted off-site in a non-erosive manner. Planters located adjacent to footings should be sealed, and leach water intercepted.

3.9 Patio Slabs and Hardscape

It may be desirable to support new patio slabs and hardscape (patios, steps, walkways, etc.) on the existing surficial soils. These structures are not normally subject to building code requirements for structural support. In order to reduce the potential for distress due to potential settlement, it may be desirable to provide additional subgrade preparation and additional steel and concrete thickness for

the proposed patio slabs and hardscape at the site. We recommend that patio slabs and hardscape be reinforced with a minimum of No.4 rebar spaced a maximum distance of 16 inches on center, each way. The upper 12 inches of existing surficial soils (depending on field conditions) to be used for slab support should be removed and recompacted to 90% of the maximum dry density as determined by ASTM:D-1557. It should be noted that patio slabs/hardscape constructed to the preceding specification may be subject to distress over time. Periodic maintenance or replacement may be necessary.

3.10 Pavement Section Design

To provide support for paving, the subgrade soils should be prepared as recommended in the Earthwork Section of this report. Our pavement recommendations are based on our findings and observations during our field investigation.

The required pavement thicknesses are based on expected wheel loads and the volume of traffic (TI or Traffic Index). Anticipated traffic indices of 4 through 7 have been used to develop pavement recommendations as presented in the tables below.

Asphalt Concrete Pavement

Traffic Usage	**Traffic Index**	**Asphaltic Concrete** inch	**Base Course** inch
Automobile Parking Areas	**4**	**3**	**8**
Automobile Traffic	**5**	**3**	**10**
Truck Traffic	**6**	**4**	**13**
Heaving Truck Traffic	**7**	**4**	**16**

Cement Concrete Pavement

Traffic Usage	**Traffic Index**	**Asphaltic Concrete** inch	**Base Course** inch
Automobile Parking Areas	**4**	**5**	**8**
Automobile Traffic	**5**	**5**	**10**
Truck Traffic	**6**	**7**	**13**
Heaving Truck Traffic	**7**	**7**	**16**

The above design recommendation is subject to perform sub-base grade soils to be compacted to a minimum of 95 percent relative compaction.

3.11 Excavation

Calosha requires that any excavation exceeding 4 feet in vertical cut require shoring or 1:1 trim above the 4 feet vertical cut.

All temporary excavations shall conform to the requirements of CAL-OSHA (Title 8, Division 1, Subchapter 4, Article 6 "Excavations" Sections 1539 to 1547) as well as all specific worker safety requirements as enforced by the local Building Authority. Proposed excavation will require adequate shoring, and maintain drained in an appropriate manner to prevent the continual accumulation of water. All vertical cuts shall be inspected by this office, to verify geologic continuity.

3.12 On-site Infiltration Testing

It is our understanding that in order to control the stormwater flow of the proposed site improvements, stormwater infiltration devices such as dry wells or other similar concepts, are proposed for the subject site. Percolation testing was performed at the site to provide subsurface soil percolation potential and to assist in the design of the infiltration devices.

Percolation testing was performed in several boring shafts having a 10 feet depth throughout the site. Percolation at the site is not feasible. The rate of the percolation is less than the minimum acceptable rate.

3.13 Shrinkage and Subsidence

Volumetric changes in earth quantities will occur when excavated onsite soil materials are replaced as properly compacted fill. We estimate the existing surficial soils may shrink approximately 5 to 10% when removed and replaced as compacted fill. Subsidence due to the processing of excavations exposing competent deposits is anticipated to be negligible. The estimates of shrinkage and subsidence are intended as an aid for project engineers in determining earthwork quantities. However, these estimates should be used with some caution since they are not absolute values.

This value may be included for balancing earthwork quantities based on actual shrinkage and subsidence that occurs during the grading process. The project Civil Engineer should consider that the upper two feet shrinkage may be much higher than 5-10%, while the rate of shrinkage by depth will be lesser.

3.14 Site Drainage

Ponding and saturation of the soils in the vicinity of the proposed foundations should be avoided. To reduce this potential, we recommend that positive drainage be provided for the site, in both improvement and landscaping areas, to carry surface water away from the building foundations and slabs on grade and towards appropriate drop inlets or other surface drainage devices. Site grading

adjacent to structures and foundations should be slopped away a minimum of 5 percent for a minimum distance of 10 feet away from the face of wall. Impervious surfaces within 10 feet of structures should be sloped a minimum of 2 percent away from the building. These grades should be maintained for the life of the structure. We also recommend that roof runoff be connected to a suitable collection and discharge system to avoid surface discharge and potential saturating the soils near foundations. Poor perimeter and surface drainage may result in water migration beneath building foundations, and may result in potential distress to the proposed improvements.

Planter areas adjacent to the building and foundations should be lined to reduce the infiltration of irrigation water beneath the building. Care should also be taken to maintain a leak-free irrigation system.

3.15 Observation and Testing

All grading and earthwork including trench backfill should be performed under the observation and testing of the consulting engineer for proper sub-grade preparation, selection of satisfactory materials, placement and compaction of all structural fill. Sufficient notification prior to stripping and earthwork construction is essential in order that the work will be adequately observed and tested.

Prior to initiation of grading, a meeting should be arranged by the developer and should be attended by representatives of the governmental agencies, contractors, consultants and the developer. Construction should be inspected at the following stages by the Geotechnical Consultant.

It is recommended that representative of **Soil Pacific, Inc.** be present to observe and test during the following stages of construction:

❒ Site grading to confirm proper removal of unsuitable materials and to observe and test the placement of fill.

❒ Inspection of all foundation excavations prior to placement of steel or concrete.

❒ During the placement of retaining wall subdrain and backfill materials.

❒ Inspection of all slab-on-grade areas prior to placement of sand, Visqueen.

❒ After trenches have been properly backfilled and compacted.

❒ When any unusual conditions are encountered.

APPENDIX A

Field Exploration

Log of Sub-surface Exploration

B-1

Std. Pen / Bulk/Bag / Ring	Drive Wt: / Drop:	USCS Letter / Graphic	Laboratory Moisture	Laboratory Dry Reading	Elev. (feet)	C/S N	Description of Earth Materials
		SM					Fill- Gray to dark brown gravelly grained silty snad with some clay.
			14.3	110.9			
		SC	13.8	114.0			Qof- Dark brown clayey sand, stiff and relatively dense, interbedded with sandy clayey layers.Old Paralic deposit. Moist to wet.
		SM/ SC	11.3	117.2			At 8 feet, interbedded with silty sand with some gravel.
							End of subsurface exploration 10 feet. No perchedwater was encountered.

Equipment Type: SH 2800 | Boring # B-1

Diameter: 4" | Logged by: D. B. | Date:9/16/24

Depth: 10 feet | G.water: - feet | Backfilled:Y

Log depicts conditions at the time and location drilled.

Soil Pacific Inc.

Geotechnical and Environmental Services

Project Name: 220,222,234 Victoria Blvd., Costa Mesa

Project Number: A-9899-24

Report Date:

Figure:

Log of Sub-surface Exploration

B-2

Std. Pen | Bulk/Bag | Ring | Elev. (feet)

Drive Wt: Drop: | C/S | N

USCS Letter | Graphic

Laboratory: Moisture | Dry Reading

Equipment Type: SH 2800		Boring # B-2
Diameter: 4"	Logged by: Y.K.	Date:9/16/24
Depth: 12 feet	G.water: - feet	Backfilled:Y

Elev. (feet)	Moisture	Dry Reading	USCS	Description of Earth Materials
0	13.4	109.5	SM	Fill- Gray to dark brown gravelly grained silty snad with some clay.
5	13.2	112.8	SC	Qof- Dark brown clayey sand, stiff and relatively dense, interbedded with sandy clayey layers.Old Paralic deposit. Moist to wet.
10			SM/ SC	At 9 feet, interbedded with silty sand with some gravel.
	11.0	118.0		At 11 feet, white to yellowish gray clayey sand with frequent see shell fragments, damp to moist in general.
15				
20				
25				End of subsurface exploration 12 feet. No perchedwater was encountered.
30				
35				
40				

Log depicts conditions at the time and location drilled.

Soil Pacific Inc.

Geotechnical and Environmental Services

Project Name: 220,222,234 Victoria Blvd., Costa Mesa

Project Number: A-9899-24

Report Date:

Figure:

Log of Sub-surface Exploration

B-3

Std. Pen	Drive Wt:	USCS Letter	Equipment Type: SH 2800		Boring # B-3
Bulk/Bag	Drop:	Graphic	Diameter: 4"	Logged by: Y.K.	Date:9/16/24
Ring	C/S	Laboratory	Depth: 10 feet	G.water: - feet	Backfilled:Y
Elev. (feet)	N	Moisture / Dry Reading	**Description of Earth Materials**		

Elev. (feet)	Moisture	Dry Reading		Description of Earth Materials
0			SM	Fill- Gray to dark brown gravelly grained silty snad with some clay.
5	13.0	113.7	SC	Qof- Dark brown clayey sand, stiff and relatively dense, interbedded with sandy clayey layers.Old Paralic deposit. Moist to wet.
10	12.5	116.1	SM/ SC	At 8.5 feet, interbedded with silty sand with some clay. Damp to moist.
15				
20				End of subsurface exploration 10 feet. No perchedwater was encountered.
25				
30				
35				
40				

Log depicts conditions at the time and location drilled.

Soil Pacific Inc.

Geotechnical and Environmental Services

Project Name: 220,222,234 Victoria Blvd., Costa Mesa

Project Number: A-9899-24

Report Date:

Figure:

Log of Sub-surface Exploration

B-4

Std. Pen | Bulk/Bag | Ring | Drive Wt: Drop: | C/S | N | USCS Letter | Graphic | Laboratory | Moisture | Dry Reading | Elev. (feet)

Equipment Type: SH 2800			Boring # B-4
Diameter: 4"	Logged by: Y.K.		Date:9/16/24
Depth: 10 feet	G.water: - feet		Backfilled:Y

Description of Earth Materials

Elev. (feet)	Moisture	Dry Reading	USCS	Description
0			SM	Fill- Gray to dark brown gravelly grained silty snad with some clay.
5	13.0	113.7	SC	Qof- Dark brown clayey sand, stiff and relatively dense, interbedded with sandy clayey layers.Old Paralic deposit. Moist to wet.
10	12.5	116.1	SM/ SC	At 8.5 feet, interbedded with silty sand with some clay. Damp to moist.
15				
20				End of subsurface exploration 10 feet. No perchedwater was encountered.
25				
30				
35				
40				

Log depicts conditions at the time and location drilled.

Soil Pacific Inc.

Geotechnical and Environmental Services

Project Name: 220,222,234 Victoria Blvd., Costa Mesa

Project Number: A-9899-24

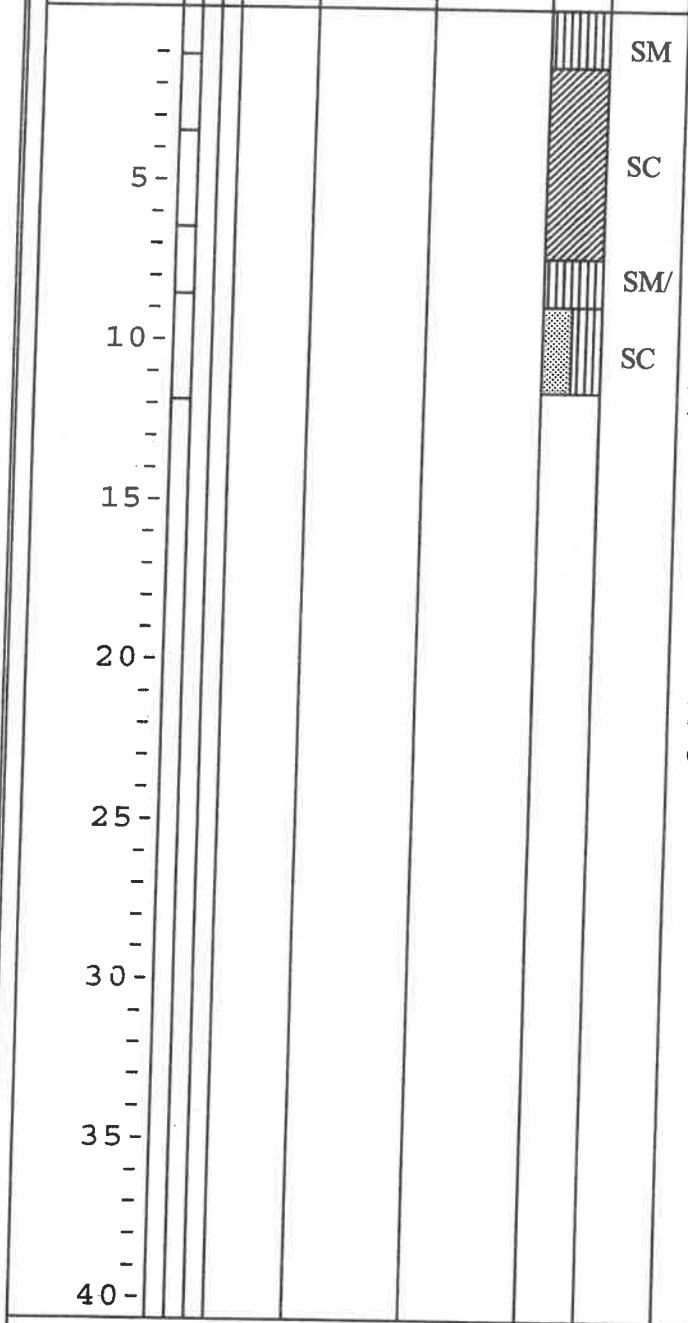
Report Date:

Figure:

Log of Sub-surface Exploration

B-5

Std. Pen	Drive Wt:	USCS Letter	Equipment Type: SH 2800		Boring # B-5
Bulk/Bag	Drop:	Graphic	Diameter: 4"	Logged by: Y.K.	Date:9/16/24
Ring	C/S	Laboratory	Depth: 12 feet	G.water: - feet	Backfilled:Y
Elev. (feet)	N	Moisture / Dry Reading	**Description of Earth Materials**		



Fill- Gray to dark brown gravelly grained silty snad with some clay.

Qof- Dark brown clayey sand, stiff and relatively dense, interbedded with sandy clayey layers.Old Paralic deposit. Moist to wet.

Brown fine to medium garined clayey sand. Damp.

At 10 feet, interbedded with silty sand with some clay. Damp to moist.

End of subsurface exploration 12 feet. No perchedwater was encountered.

Log depicts conditions at the time and location drilled.

Soil Pacific Inc.

Geotechnical and Environmental Services

Project Name: 220,222,234 Victoria Blvd., Costa Mesa

Project Number: A-9899-24

Report Date:

Figure:

Log of Sub-surface Exploration

B-6

Std. Pen
Bulk/Bag
Ring
Elev. (feet)

Drive Wt:
Drop:
C/S
N

USCS Letter
Graphic

Laboratory
Moisture
Dry Reading

Equipment Type: SH 2800		Boring # B-6
Diameter: 4"	Logged by: Y.K.	Date:9/16/24
Depth: 10 feet	G.water: - feet	Backfilled:Y

Description of Earth Materials

Elev. (feet)	USCS	Description
0	SM	Fill- Gray to dark brown gravelly grained silty snad with some clay.
5	SC	Qof- Dark brown clayey sand, stiff and relatively dense, interbedded with sandy clayey layers.Old Paralic deposit. Moist to wet.
10	SM/ SC	Brown fine to medium garined clayey sand, underlain by silty sand with some clay. Damp to moist.
15		
20		End of subsurface exploration 10 feet. No perchedwater was encountered.
25		
30		
35		
40		

Log depicts conditions at the time and location drilled.

Soil Pacific Inc.

Geotechnical and Environmental Services

Project Name: 220,222,234 Victoria Blvd., Costa Mesa

Project Number: A-9899-24

Report Date:

Figure:

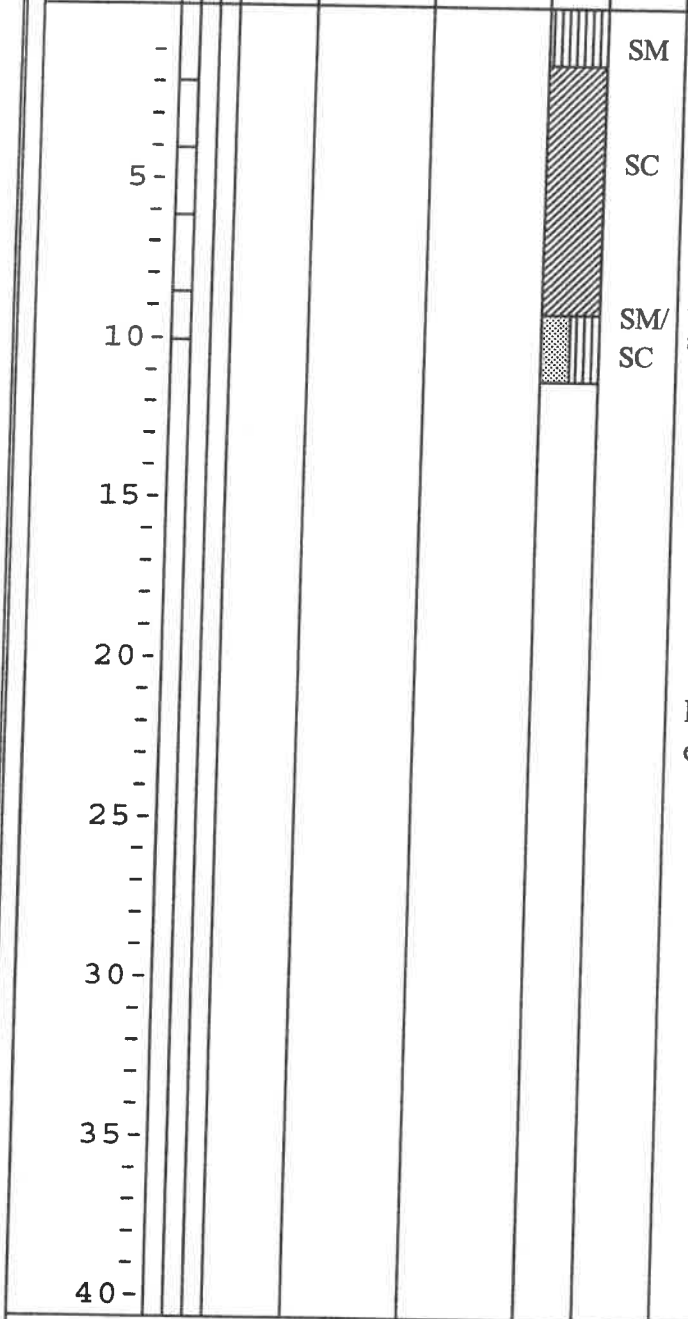
Log of Sub-surface Exploration

B-7

Std. Pen
Bulk/Bag
Ring
Elev. (feet)
Drive Wt:
Drop:
C/S
N
USCS Letter
Graphic
Laboratory
Moisture
Dry Reading

Equipment Type: SH 2800		Boring # B-7
Diameter: 4"	Logged by: Y.K.	Date:9/16/24
Depth: 12 feet	G.water: - feet	Backfilled:Y

Description of Earth Materials



SM — Fill- Gray to dark brown gravelly grained silty snad with some clay.

SC — Qof- Dark brown clayey sand, stiff and relatively dense, interbedded with sandy clayey layers.Old Paralic deposit. Moist to wet.

SM/SC — Brown fine to medium garined clayey sand, underlain by silty sand with some clay. Damp to moist.

End of subsurface exploration 12 feet. No perchedwater was encountered.

Log depicts conditions at the time and location drilled.

Soil Pacific Inc.

Geotechnical and Environmental Services

Project Name: 220,222,234 Victoria Blvd., Costa Mesa

Project Number: A-9899-24

Report Date:

Figure:

Log of Sub-surface Exploration

B-8

Std. Pen | Bulk/Bag | Ring | Elev. (feet)

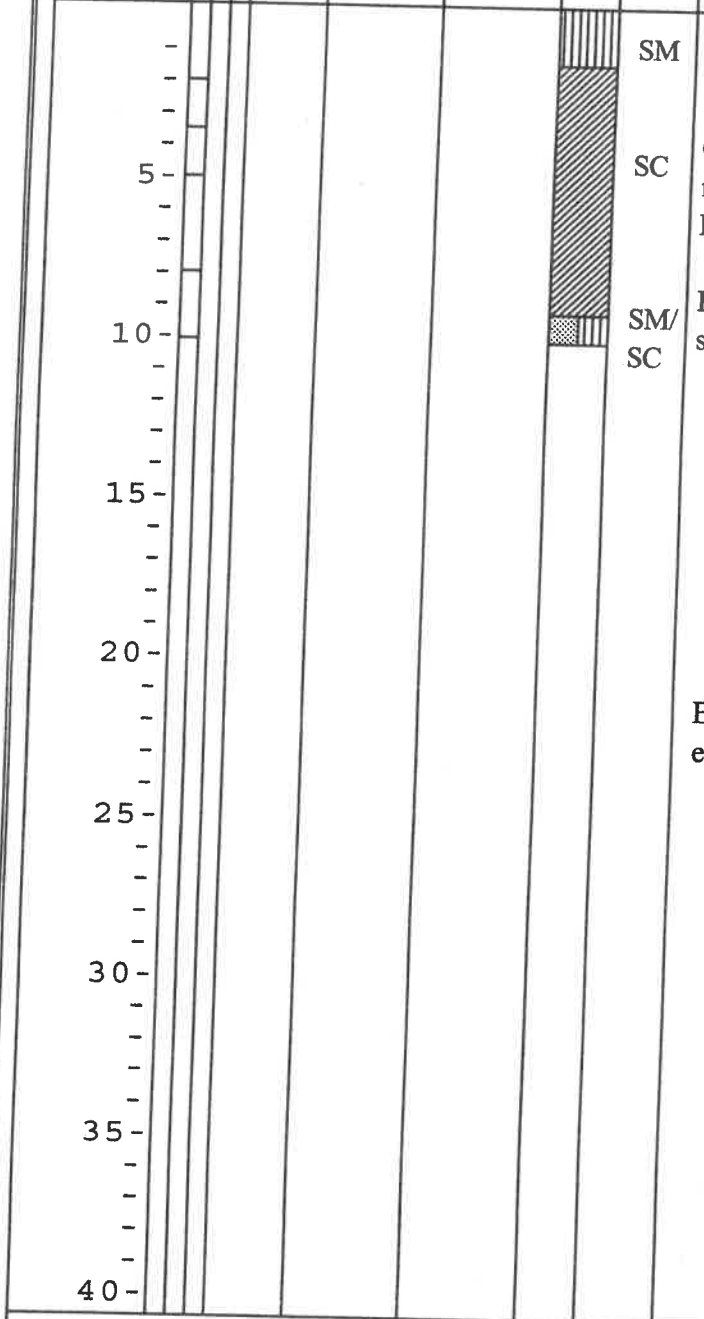
Drive Wt: Drop: | C/S | N

USCS Letter | Graphic

Laboratory: Moisture | Dry Reading

Equipment Type: SH 2800		Boring # B-8
Diameter: 4"	Logged by: Y.K.	Date:9/16/24
Depth: 10 feet	G.water: - feet	Backfilled:Y

Description of Earth Materials



SM — Fill- Gray to dark brown gravelly grained silty snad with some clay.

SC — Qof- Dark brown clayey sand, stiff and relatively dense, interbedded with sandy clayey layers.Old Paralic deposit. Moist to wet.

SM/SC — Brown fine to medium garined clayey sand, underlain by silty sand with some clay. Damp to moist.

End of subsurface exploration 10 feet. No perchedwater was encountered.

Log depicts conditions at the time and location drilled.

Soil Pacific Inc.

Geotechnical and Environmental Services

Project Name: 220,222,234 Victoria Blvd., Costa Mesa

Project Number: A-9899-24

Report Date:

Figure:

APPENDIX B

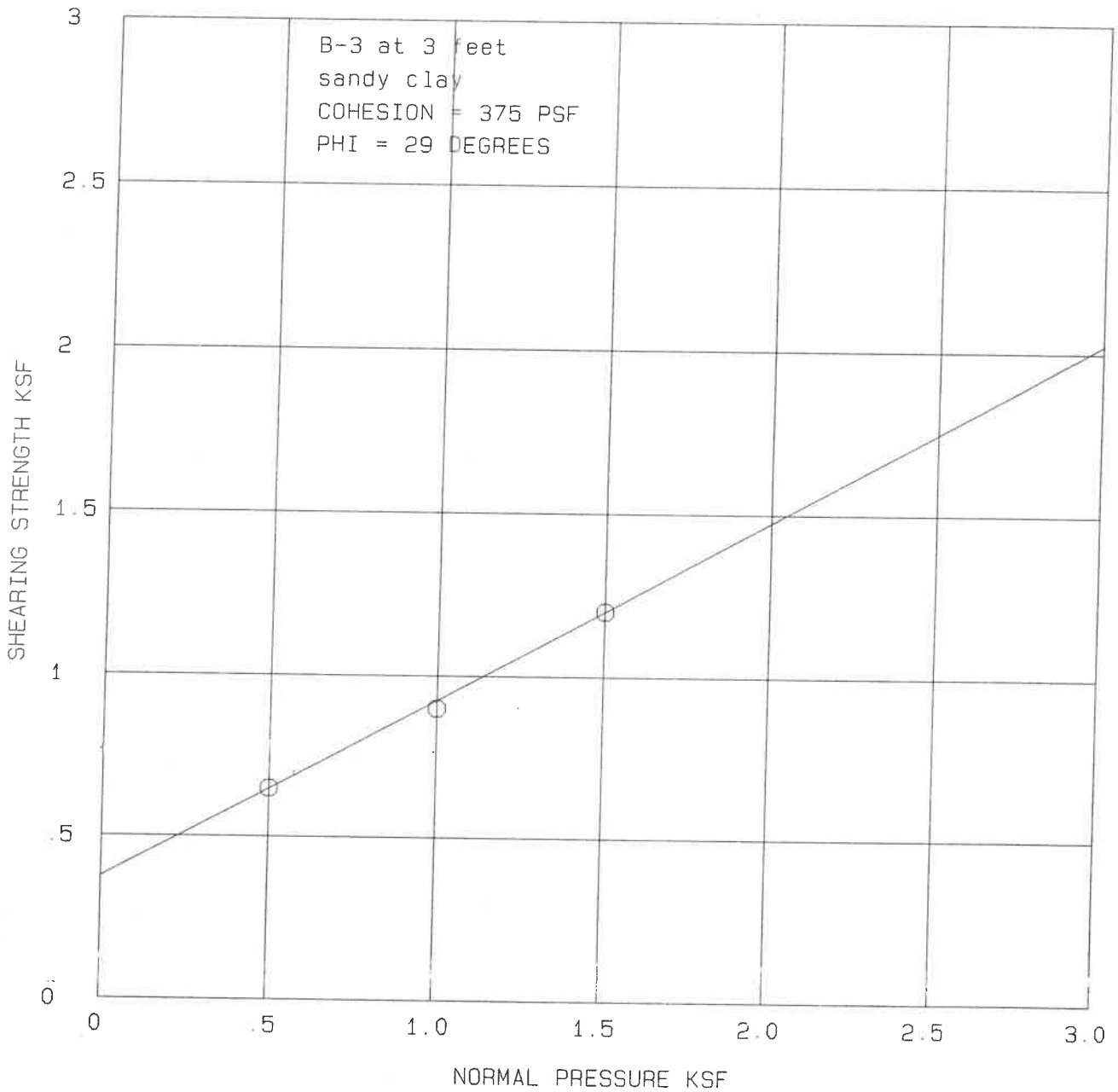
Laboratory

APPENDIX

SHEAR TEST DIAGRAM

J.O. A-9899-24

DATE 9/18/24



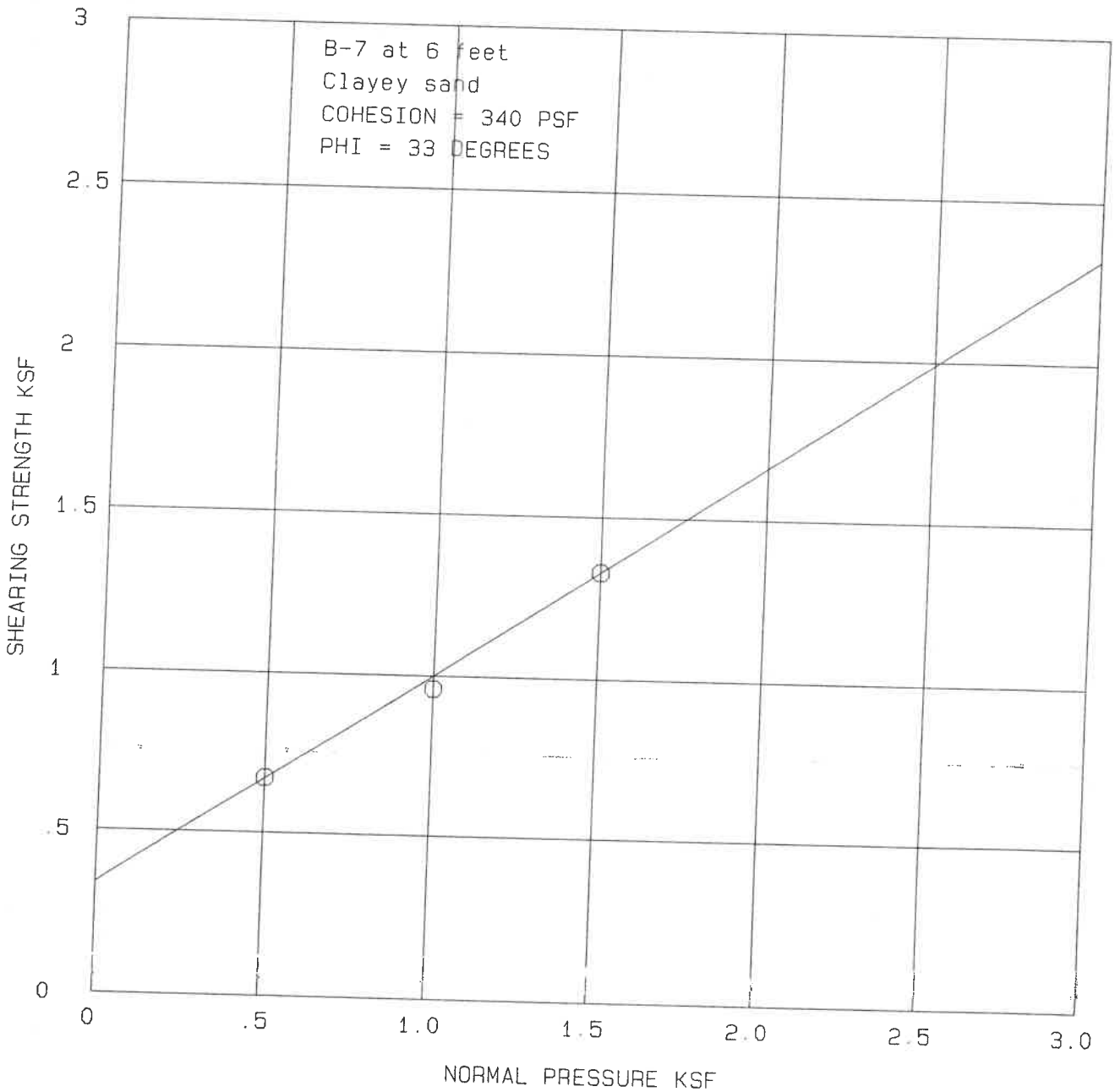
PLATE

APPENDIX

SHEAR TEST DIAGRAM

J.O. A-9899-24

DATE 9/18/24



PLATE

APPENDIX

TEMPORARY BACKCUT STABILITY

J.O. A-9899-24 DATE 9/18/24

COHESION = 375 PSF GAMA = 120 PCF PHI = 29 DEGREES

CUT HEIGHT = 4 FEET

SOIL TYPE = Clayey sand

BACKFILL ASSUMED TO BE LEVEL

PORE PRESSURE NOT CONSIDERED

FORMULA

$$\text{SAFETY FACTOR} = \frac{(C * L) + (GA * AREA * \cos(Z) * \tan(PHI))}{GA * AREA * \sin(Z)} = 3.9$$

$$Z = 45 + (PHI/2)$$

SINCE THE SAFETY FACTOR OF 3.9 IS GREATER THAN THE REQUIRED 1.25, THE TEMPORARY EXCAVATION IS CONSIDERED TO BE STABLE. THIS IS WITH A LEVEL AREA EQUAL TO THE LENGTH OF THE VERTICAL CUT ABOVE THE CUT.

PLATE

APPENDIX

BEARING VALUE ANALYSIS

J.O. A-9899-24

DATE 9/18/24

COHESION = 375 PSF GAMA = 120 PCF PHI = 29 DEGREES

DEPTH OF FOOTING = 2 FEET

BREADTH OF FOOTING = 2 FEET

FOOTING TYPE = SQUARE

BEARING CAPACITY FACTORS

Nc = 27.9 Nq = 16.4 Ng = 15.6

FOOTING COEFFICIENTS

K1 = 1.2 K2 = .4

REFERENCE: TERZAGHI & PECK: 1967: 'SOIL MECHANICS IN ENGINEERING PRACTICE': PAGES 217 TO 225.

FORMULA

ULIMATE BEARING = (K1 * Nc * C) + (K2 * GA * Ng * B) + (Nq * GA * D) = 17983.9

ALLOWABLE BEARING = ULTIMATE BEARING / 3 = 5994.6

THE ALLOWABLE BEARING VALUE SHOULD NOT EXCEED 5994.6 PSF. DESIGN SHOULD CONSIDER EXPANSION INDEX.

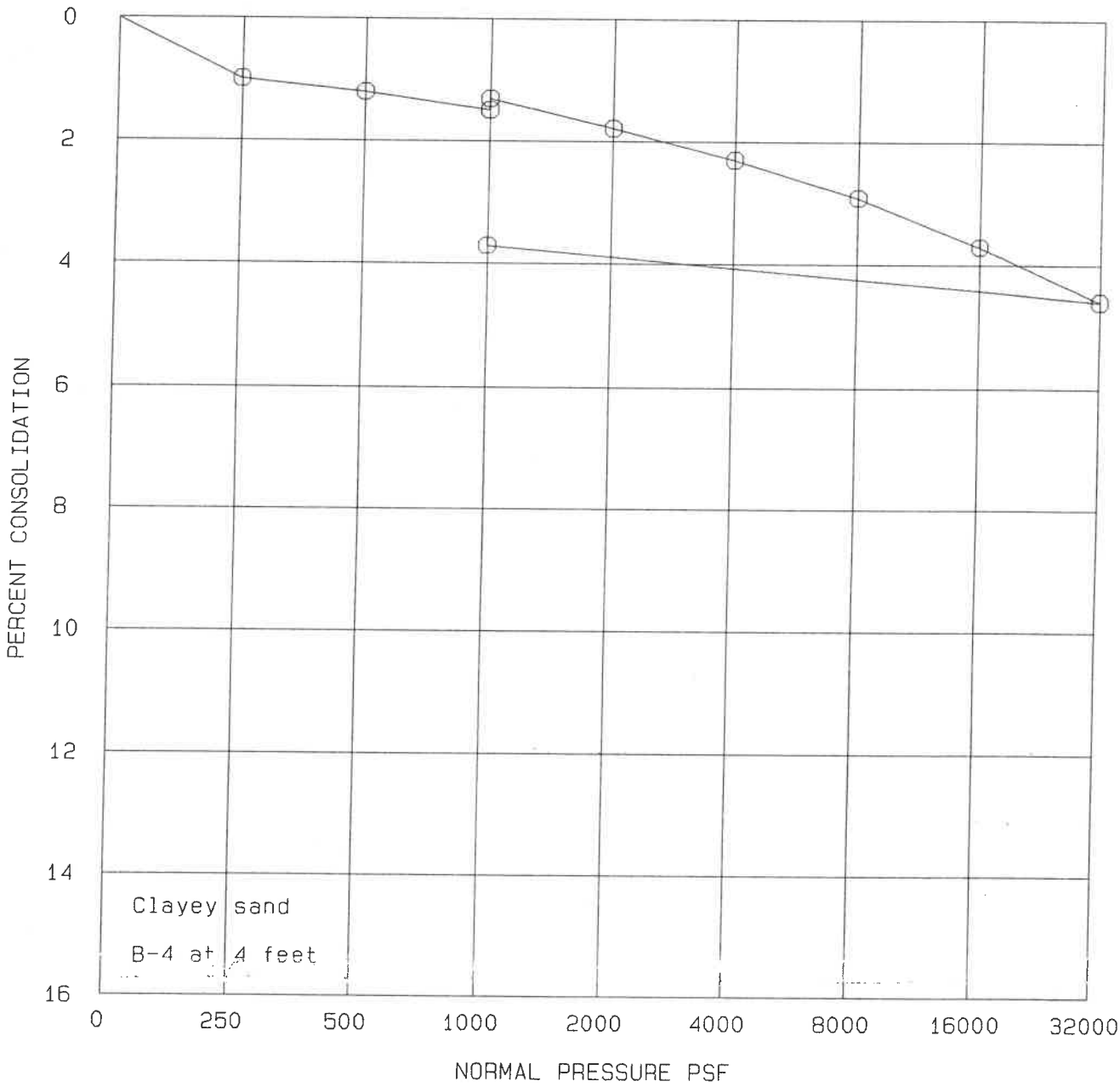
PLATE

SOFTWARE

CONSOLIDATION PRESSURE CURVE

J.O. A-9899-24

DATE 9/18/24



PLATE

APPENDIX

BEARING VALUE ANALYSIS

J.O. A-9899-24

DATE 9/18/24

COHESION = 375 PSF GAMA = 120 PCF PHI = 29 DEGREES

DEPTH OF FOOTING = 2 FEET

BREADTH OF FOOTING = 1.5 FEET

FOOTING TYPE = CONTINUOUS

BEARING CAPACITY FACTORS

Nc = 27.9 Nq = 16.4 Ng = 15.6

FOOTING COEFFICIENTS

K1 = 1 K2 = .5

REFERENCE: TERZAGHI & PECK; 1967; 'SOIL MECHANICS IN ENGINEERING PRACTICE'; PAGES 217 TO 225.

FORMULA

ULIMATE BEARING = (K1 * Nc * C) + (K2 * GA * Ng * B) + (Nq * GA * D) = 15800.6

ALLOWABLE BEARING = ULTIMATE BEARING / 3 = 5266.9

THE ALLOWABLE BEARING VALUE SHOULD NOT EXCEED 5266.9 PSF. DESIGN SHOULD CONSIDER EXPANSION INDEX.

PLATE

Earth Pressure Calculations

Soil Strength Parameters:

$\phi := 29$

$\gamma := 120$

Active :

$$Ka := \tan\left[\left(45 - \frac{\phi}{2}\right) \cdot \left(\frac{\pi}{180}\right)\right]^2$$

Active earth Presure $Ka = 0.347$

$Pa := Ka \cdot \gamma$

slope angle range, degrees

$Pa = 41.637$

		LEVEL BACKFILL BEHIND WALL	$Pa = 41.637$
$Pa18 := Pa \cdot 1.08$	5:1	BACKFILL BEHIND WALL	$Pa18 = 44.968$
$Pa18 := Pa \cdot 1.22$	3:1	BACKFILL BEHIND WALL	$Pa18 = 50.797$
$Pa39 := Pa \cdot 1.48$	2:1	BACKFILL BEHIND WALL	$Pa39 = 61.623$

Passive

$$Kp := \tan\left[\left(45 + \frac{\phi}{2}\right) \cdot \left(\frac{\pi}{180}\right)\right]^2 \qquad Kp = 2.882$$

Pasive Earth Presure

$Pp := Kp \cdot \gamma$

$Pp = 345.847$

Atrest

$$Kat := 1 - \sin\left(\phi \cdot \frac{\pi}{180}\right) \qquad Kat = 0.515$$

$Pat := Kat \cdot \gamma$

$Pat = 61.823$

Seismic lateral earth pressure

Free standing Wall

$\phi := 29 \cdot deg$ angle of internal friction of soil

$\delta := 17 \cdot deg$ angle of friction between soil and wall, (concrete or masonry)

PGAm := .64

h := 10 Height of wall

$$kh := \frac{\left[\left(\frac{2}{3}\right) PGAm\right]}{2}$$

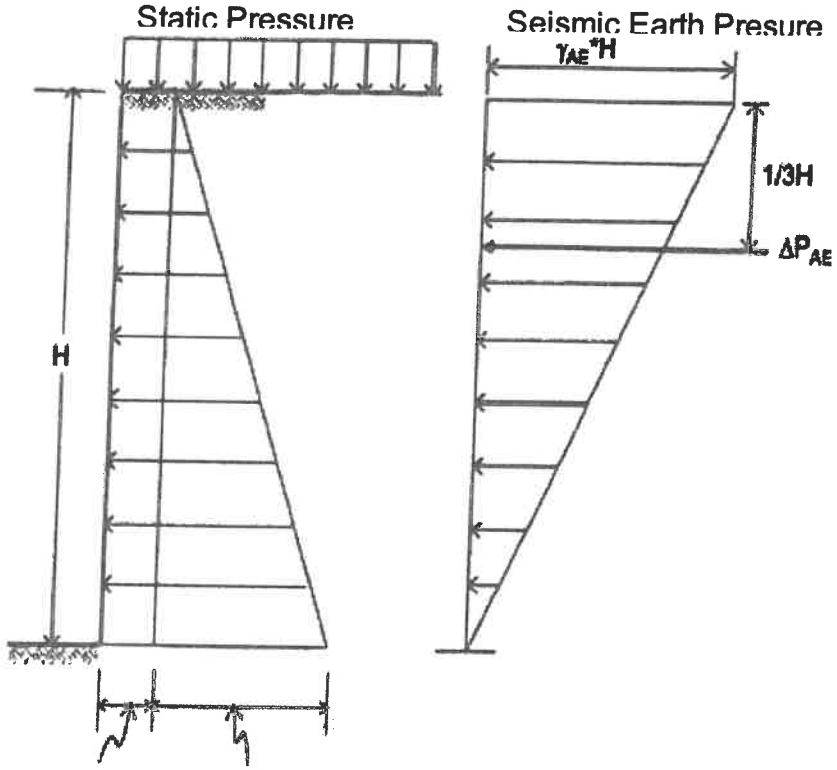
kh = 0.213

$\gamma := 120$ Soil Unit Weight

$$PaE := \frac{3}{8} \cdot \gamma \cdot h^2 \cdot kh$$

PaE = 960 PLF

$$EFPs := 2 \cdot \frac{PaE}{h^2}$$



0.45q EFPxH(psf)

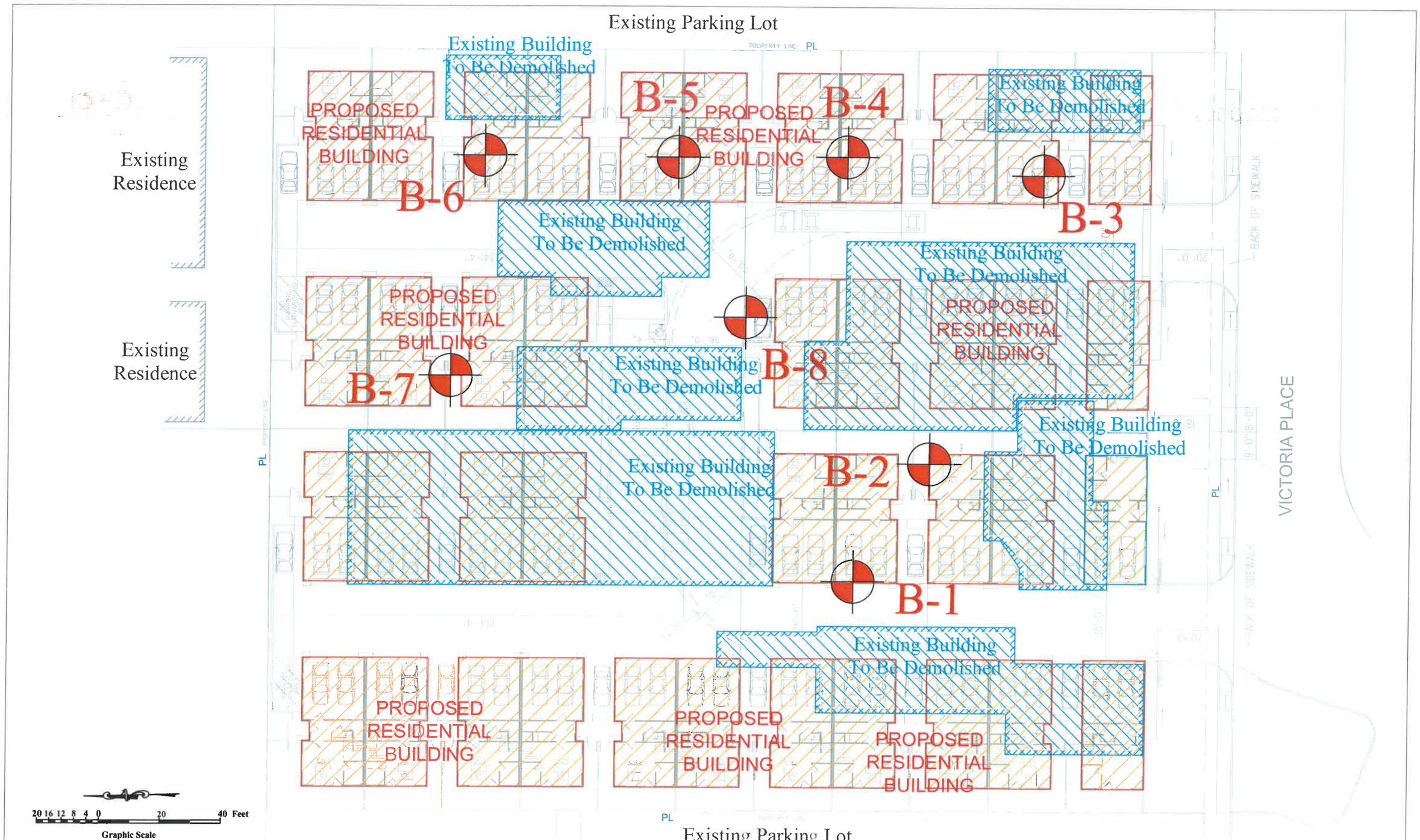
EFPs = 19.2 PCF seismic Lateral Force (retaining wall In excess of 6 feet)

q := 0 Surcharge Load should be added by structural justification

Project No.= A – 9899 – 24

APPENDIX C

References



LEGEND

- Soil Boring Location
- Proposed Building
- Existing Building to Be Demolished

soil PACIFIC Inc.
Geotechnical & Environmental Services
675 N. Eckhoff, Suite # A
Orange, CA 92868

Project Location:
220, 222, 234 & 236
Victoria Place, Costa Mesa, CA

GEOTECHNICAL PLAN

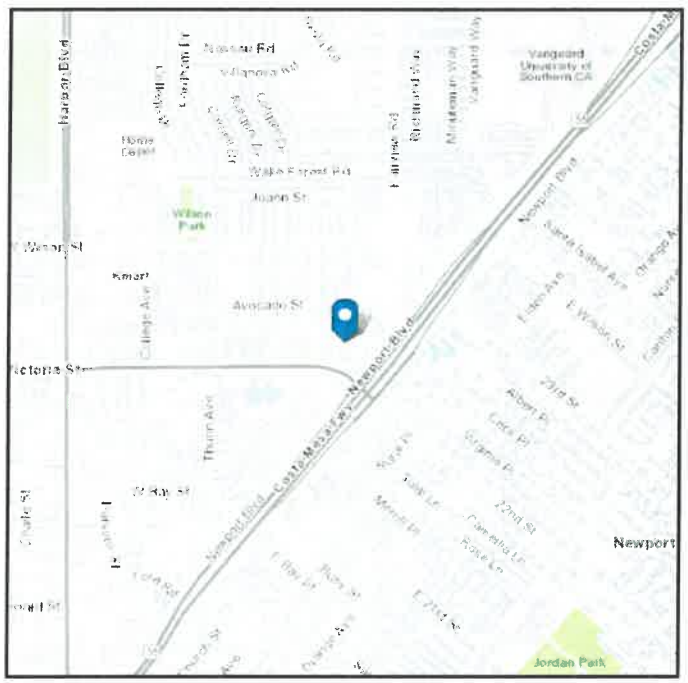
FIGURE-A-1-1	PROJECT NO.:A-9899-24
DATE : 9/19/2024	SCALE: 1"=30'

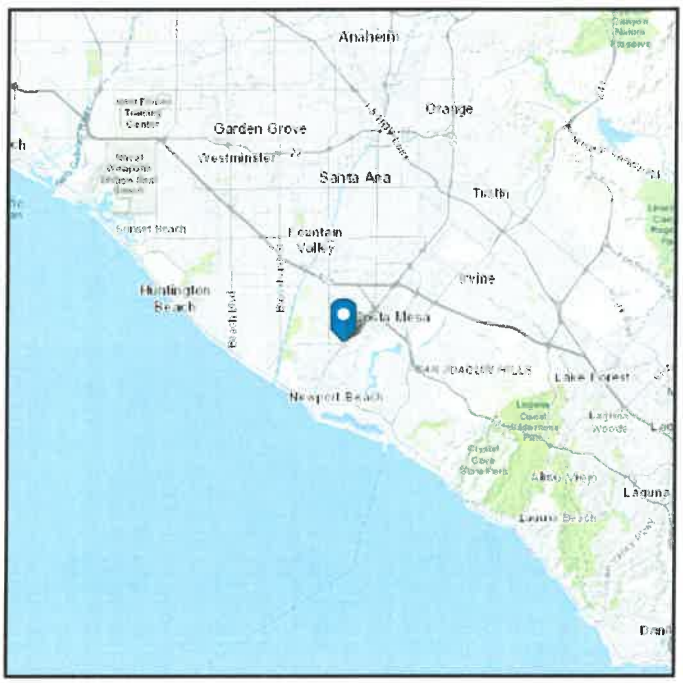
ASCE Hazards Report

Address:
234 Victoria St
Costa Mesa, California
92627

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Stiff Soil

Latitude: 33.65332
Longitude: -117.909244
Elevation: 84.76877108202316 ft (NAVD 88)





ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Seismic

Site Soil Class: D - Stiff Soil

Results:

S_S :	1.344	S_{D1} :	N/A
S_1 :	0.48	T_L :	8
F_a :	1	PGA :	0.582
F_v :	N/A	PGA_M :	0.64
S_{MS} :	1.344	F_{PGA} :	1.1
S_{M1} :	N/A	I_e :	1
S_{DS} :	0.896	C_v :	1.369

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Thu Sep 19 2024

Date Source: USGS Seismic Design Maps

The ASCE Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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APPENDIX D

General Grading Specifications

GENERAL EARTHWORK AND GRADING SPECIFICATIONS

1. GENERAL INTENT

These specifications present general procedures and requirements for grading and earthwork as shown on the approved grading plans, including preparation of areas to be filled, placement of fill, installation of subdrains, and excavations. The recommendations contained in the geotechnical report are a part of the earthwork and grading specifications and shall supersede the provisions contained hereinafter in the case of conflict. Evaluations performed by the consultant during the course of grading may result in new recommendations of the geotechnical report.

2.EARTHWORK OBSERVATION AND TESTING

Prior to the commencement of grading, a qualified geotechnical consultant (soils engineer and engineering geologist, and their representatives) shall be employed for the purpose of observing earthwork and testing the fills for conformance with the recommendations of the geotechnical report and these specifications. It will be necessary that the consultant provide adequate testing and observation so that he may determine that the work was accomplished as specified. It shall be the responsibility of the contractor to assist the consultant and keep him apprised of work schedules and changes so that he may schedule his personnel accordingly.

It shall be the sole responsibility of the contractor to provide adequate equipment and methods to accomplish the work in accordance with applicable grading codes or agency ordinances, these specifications and the approved grading plans. If in the opinion of the consultant, unsatisfactory conditions, such as questionable soil, poor moisture condition, inadequate compaction, adverse weather, etc., are resulting in a quality of work less than required in these specifications, the consultant will be empowered to reject the work and recommend that construction be topped until the conditions are rectified. Maximum dry density tests used to determine the degree of compaction will be performed in accordance with the American Society of Testing and Materials tests method ASTM D 1557-00.

3.0 PREPARATION OF AREAS TO BE FILLED

3.1 Clearing and Grubbing: All brush, vegetation and debris shall be removed or piled and otherwise disposed of.

3.2 Processing: The existing ground which is determined to be satisfactory for support of fill shall be scarified to a minimum depth of 6 inches. Existing ground which is not satisfactory shall be overexcavated as specified in the following section. Scarification shall continue until the soils are broken down and free of large clay lumps or clods and until the working surface is reasonably uniform and free of uneven features which would inhibit uniform compaction.

3.3 Overexcavation: Soft, dry, spongy, highly fractured or otherwise unsuitable ground, extending to such a depth that the surface processing cannot adequately improve the condition, shall be overexcavated down to firm ground, approved by the consultant.

3.4 Moisture Conditioning: Overexcavated and processed soils shall be watered, dried-back, blended, and/or mixed, as required to attain a uniform moisture content near optimum.

3.5 Recompaction: Overexcavated and processed soils which have been properly mixed and moisture- conditioned shall be recompacted to a minimum relative compaction of 90 percent.

3.6 Benching: Where fills are to be placed on ground with slopes steeper than 5: 1 (horizontal to vertical units), the ground shall be stepped or benched. The lowest bench shall be a minimum of 15 feet wide, shall be at least 2 feet deep, shall expose firm material, and shall be approved by the consultant. Other benches shall be excavated in firm material for a minimum width of 4 feet. Ground sloping flatter than 5 : 1 shall be benched or otherwise overexcavated when considered necessary by the consultant.

3.7 Approval: All areas to receive fill, including processed areas, removal areas and toe-of-fill benches shall be approved by the consultant prior to fill placement.

4.0 FILL MATERIAL

4.1 General: Material to be placed as fill shall be free of organic matter and other deleterious substances, and shall be approved by the consultant. Soils of poor gradation, expansion, or strength characteristics shall be placed in areas designated by consultant or shall be mixed with other soils to serve as satisfactory fill material.

4.2 Oversize: Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 12 inches, shall not be buried or placed in fills, unless the location, materials, and disposal methods are specifically approved by the consultant. Oversize disposal operations shall be such that nesting of oversize material does not occur, and such that the oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 feet vertically of finish grade or within the range of future utilities or underground construction, unless specifically approved by the consultant.

4.3 Import: If importing of fill material is required for grading, the import material shall meet the requirements of Section 4. 1.

5.0 FILL PLACEMENT AND COMPACTION

5.1 Fill Lifts: Approved fill material shall be placed in areas prepared to receive fill in near-horizontal layers not exceeding 6 inches in compacted thickness. The consultant may approve thicker lifts if testing indicates the grading procedures are such that adequate compaction is being achieved with lifts of greater thickness. Each layer shall be spread evenly and shall be thoroughly mixed during spreading to attain uniformity of material and moisture in each layer.

5.2 Fill Moisture: Fill layers at a moisture content less than optimum shall be watered and mixed, and wet fill layers shall be aerated by scarification or shall be blended with drier material. Moisture-conditioning and mixing of fill layers shall continue until the fill material is at a uniform moisture content or near optimum.

5.3 Compaction of Fill: After each layer has been evenly spread, moisture conditioned, and mixed, it shall be uniformly compacted to not less than 90 percent of maximum dry density. Compaction equipment shall be adequately sized and shall be either specifically designed for soil compaction or of proven reliability, to efficiently achieve the specified degree of compaction.

5.4 Fill Slopes: Compaction of slopes shall be accomplished, in addition to normal compacting procedures, by backfilling of slopes with sheepsfoot rollers at frequent increments of 2 to 3 feet in fill elevation gain, or by other methods producing satisfactory results. At the completion of grading, the relative compaction of the slope out to the slope face shall be at least 90 percent.

5.5 Compaction Testing: Field tests to check the fill moisture and degree of compaction will be performed by the consultant. The location and frequency of tests shall be at the consultant's discretion. In general, the tests will be taken at an interval not exceeding 2 feet in vertical rise and/or 1,000 cubic yards of embankment.

6.0 SUBDRAIN INSTALLATION

Subdrain systems, if required, shall be installed in approved ground to conform to the approximate alignment and details shown on the plans or herein. The subdrain location or materials shall not be changed or modified without the approval of the consultant. The consultant, however, may recommend and upon approval, direct changes in subdrain line, grade or material. All subdrains should be surveyed for line and grade after installation, and sufficient time shall be allowed for the surveys, prior to commencement of filling over the subdrains.

7.0 EXCAVATION

Excavation and cut slopes will be examined during grading. If directed by the consultant, further excavation or overexcavation and refilling of cut areas shall be performed, and/or remedial grading of cut slopes shall be performed. Where fill-over-cut slopes are to be graded, unless otherwise approved, the cut portion of the slope shall made and approved by the consultant prior to placement of materials for construction of the fill portion of the slope.

8.0 TRENCH BACKFILLS

8.1 Supervision: Trench excavations for the utility pipes shall be backfilled under engineering supervision.

8.2 Pipe Zone: After the utility pipe has been laid, the space under and around the pipe shall be backfilled with clean sand or approved granular soil to a depth of at least one foot over the top of the pipe. The sand backfill shall be uniformly jetted into place before the controlled backfill is placed over the sand.

8.3 Fill Placement:'The onsite materials, or other soils approved by the engineer, shall be watered and mixed as necessary prior to placement in lifts over the sand backfill.

8.4 Compaction: The controlled backfill shall be compacted to at least 90 percent of the maximum laboratory density as determined by the ASTM compaction method described above.

8.5 Observation and 'Testing: Field density tests and inspection of the backfill procedures shall be made by the soil engineer during backfilling to see that the proper moisture content and uniform compaction is being maintained. The contractor shall provide test holes and exploratory pits as required by the soil engineer to enable sampling and testing.