NMG Geotechnical, Inc.

February 3, 2015

Project No. 14117-01

To: Newport Center Anacapa Associates, LLC
c/o Ridgeway Development Company
2804 Lafayette Avenue
Newport Beach, California 92663

Attention: Mr. Ron Soderling

Subject: Feasibility Report for Proposed Newport Center Condominium Site Development, 150 Newport Center Drive, City of Newport Beach, California

In accordance with your authorization, NMG Geotechnical, Inc. (NMG) has performed a feasibility study for the proposed condominium development at 150 Newport Center, in the City of Newport Beach, California. The primary purpose of our study was to provide a summary of the geologic and geotechnical conditions of the site to identify potential geotechnical issues that might impact the proposed re-development.

The project site is approximately 1.25 acres and is currently an active car wash with surrounding asphalt parking lot. The site is located at the southwest corner of Newport Center Drive and Anacapa Drive (Figure 1). We understand the proposed development will be a condominium complex consisting of three subterranean parking levels with seven-story residential building above the parking structure. We have reviewed a conceptual design package showing the current design scheme, prepared by MVE Partners and received by NMG on January 26, 2015. A recently flown and scribed topographic map was also provided by Fuscoe Engineering. A grading plan has not yet been prepared at this time.

The main geotechnical issues for the proposed subterranean development include:

1) The presence of varying earth units across the site; fill of varying composition, sandy marine terrace deposits, and potentially diatomaceous siltstone and sandstone bedrock.

2) The potential for presence of perched groundwater along the terrace/bedrock contact. This condition has been encountered at sites within the Fashion Island/Newport Center area (but was not reported during prior investigations in the adjacent properties, by NMG and others, as deep as 45.5 feet below ground surface).

3) The potential for presence of saturated soils at the fill/terrace contact. This was encountered across the street during the grading operations for the new restaurants.

4) The potential for presence of weathered/low density bedrock at the terrace/bedrock contact.

Based on our review, we conclude that the subject property is considered suitable for the future proposed development from a geotechnical viewpoint, provided the project is designed and constructed in accordance with the geotechnical considerations and recommendations.

If you have any questions regarding this report, please contact our office. We appreciate the opportunity to provide our services.

Respectfully submitted,

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1.0 INTRODUCTION

1.1 Purpose and Scope of Work

In accordance with your request, NMG Geotechnical, Inc. (NMG) has prepared this feasibility report for the Newport Center Condominium Development, in the City of Newport Beach, California. The primary purpose of our study was to provide a summary of the geologic and geotechnical conditions of the site to identify potential geotechnical issues that might impact the proposed re-development. We have reviewed the conceptual design package prepared by MVE Partners, received by NMG on January 26, 2015. Fuscoe Engineering has also prepared a topographic map of the site portraying the current site conditions that was used as the base map for the Boring/Trench Location Map (Figure 2).

Our scope of work was as follows:

- Acquisition, review and analysis of available geotechnical reports and maps for the subject site and surrounding area. This included a search through the city of Newport Beach archives for the prior geotechnical work performed at and surrounding the site. A list of references is included in Appendix A.
- Review of historic aerial photographs dating back to the late 1930's. A list of the photographs reviewed is included in Appendix A.
- Compilation of laboratory test results by NMG and others from previous geotechnical investigations (Appendix C). Laboratory testing includes in-situ moisture and density, grain-size analysis, consolidation, shear strength, Atterberg limits, maximum density and optimum moisture content, and expansion index.
- Evaluation of faulting and seismicity in accordance with the 2013 California Building Code (CBC).
- Geotechnical review of the compiled data including the geologic and soil conditions. Preliminary engineering evaluation included settlement and liquefaction potential, and remedial grading, preliminary foundation and grading considerations.
- Preparation of illustrations including: a Site and Seismic Hazard Location Map (Figure 1), a Geotechnical Map on Existing Topographic Map (Figure 2), Historic Topographic Map (Figure 3) and a Boring Location Map (Figure 4) which provides a compilation of the boring and trench locations that were excavated at the site and on adjacent sites, from previous geotechnical studies by NMG and others.
- Preparation of this report with our findings, conclusions, and preliminary considerations and recommendations for the proposed condominium site.

1.2 Site Location and Description

The project site is approximately 1-1/4 acres in size and is bordered to the north by Newport Center Drive, to the east by Anacapa Drive, and to the south and west by existing office buildings and asphalt parking lots (Figure 1). The site is essentially flat, gently sloping toward the southwest. Elevations vary from a low of 158.5 feet above mean sea level (msl) in the south-southwest corner to a high elevation of 170.3 feet above msl in the northeast corner. Slopes and retaining walls are located along the northern and eastern perimeter of the site, ascending up to Newport Center Drive and Anacapa Drive, varying in height from 2 to 8 feet. Drainage at the site sheet flows towards the south-southwest. Currently, there is an active car wash/service building in the center of the property, with asphalt paved parking lots surrounding the building.

1.3 Site History and Prior Investigations

Based on review of historic aerial photographs dating back to the late 1930s, the prior use for the subject site was for agricultural (ranching) activities through the mid-1960's when The Irvine Company graded and developed the surrounding Fashion Island/Newport Center area. By 1972, the subject site was in its current state, Fashion Island was built, and the majority of the adjacent streets were constructed or being graded. The adjacent office buildings to the west, and theatre to the east, within the 100 and 300 blocks of Newport Center Drive, were being constructed between 1972 and 1975. By 1992, the subject site and adjacent buildings are essentially in their current state.

The aerial photos suggest the site was originally graded in the mid-1960s with the Fashion Island grading; however, we have not been able to find a report for this grading. Subsequently, in the early 1970s the subject site was re-graded to the existing conditions and the car wash was constructed. The latter grading was relatively minor to create a level pad; we have not been able to find a copy of this report either.

Historically the subject site was a generally flat area located on a marine terrace/old wave-cut platform with elevations ranging from 140 feet above msl along the southwestern portion to an elevation of 160 feet above msl along the northeastern portion (Figure 3). A stream-cut draw trending northeast lies to the west of the subject site and can be seen in early United States Geological Survey (USGS) Topographic maps (USGS, 1949, 1950 and 1951) and on aerial photographs from 1939. This canyon was in-filled with artificial fill during early grading activities and was documented during prior investigations (W.A. Wahler, 1970 and G.A. Nicoll, 1972). Documentation of the early grading mentioned in these reports was not found during our search through the city of Newport Beach files.

Prior geotechnical investigations were performed by W.A. Wahler & Associates (1970) at the subject site prior to development of the car wash (Figures 2 and 4). This investigation included excavation of 5 exploratory test pits (trenches) across the subject site and collection of bulk and in-situ soil samples. Test pits were excavated up to 14 feet deep and encountered fill material and native soil. Fill material generally ranged in thickness from 9 to 14+ feet. In the western portion of the property the fill extended below a depth of 14 feet, native soil was not encountered.

Numerous geotechnical investigations have been performed by NMG and others within the vicinity of the subject site (Figure 4). NMG performed a geotechnical exploration for two restaurant pads north of the subject site, on the north side of Newport Center Drive (NMG, 2012a and 2012b). The exploration included excavation of five hollow-stem auger borings and laboratory testing to determine the engineering characteristics of the on-site soils. In 1972, G.A. Nicoll performed a geotechnical investigation for the adjacent six office buildings, southwest of the subject site, which included excavation of 17 bucket-auger borings and laboratory testing. Moore & Taber performed a geotechnical investigation in 1975 for the bank building to the west, which included excavation of three bucket auger borings. Two geotechnical investigations were performed for expansion of the existing Edwards Theatre to the east of the site by Soils International (1988) and R.T. Frankian (1994) which included excavation of two and three hollow-stem auger borings, respectively.

The data from the prior investigations by NMG and others were reviewed for our study. Boring and trench logs are included in Appendix B and laboratory testing data are included in Appendix C.

1.4 Proposed Development

The proposed condominium development will consist of a large, three-story subterranean parking garage with an overlying seven-story residential condominium buildings above the parking garage. We understand there is a planned pool area on the seventh level of the planned building.

The lowest garage level will be at an elevation of 136 feet above mean sea level (msl) and nearly spans the footprint of the proposed condominium structure. This level is anticipated to overlie native soils and require excavations, up to 31 feet deep. The other garage levels and the residential building overlie this garage level. Entrance to the parking garage will be from the south of the building to the upper garage level.

2.0 GEOTECHNICAL FINDINGS

2.1 Geologic Setting

The site is located on the Newport Mesa, approximately ¾-mile inland from the ocean. The mesa highland is covered with coastal terrace deposits and is located at the southwestern end of the San Joaquin Hills. Mapping by the State (CDMG, 1981) indicates the site is underlain by Quaternary-age marine terrace deposits which overlie Miocene-age sedimentary bedrock of the Monterey Formation.

The Fashion Island/Newport Center area exhibits a configuration that is characteristic of a series of distinguishable elevated terraces and wave-cut platforms. The area has undergone regional uplift since deposition of the marine terrace deposits onto the ancient wave cut benches. These deposits were subsequently uplifted with the oldest deposits exposed along the higher, northern portion of the center and the lower/younger deposits located along the southern portion of the center. The subject site is located on the second elevated terrace deposit, mapped as Qtm2 by the State (Tan, 1976).

2.2 Earth Units

Our evaluation of the onsite data indicates that the site is underlain by marine terrace deposits and bedrock of the Monterey Formation. Existing artificial fill overlies these native deposits and was found to be 9 to 14+ feet thick at the subject site. These units are described below, in the order of youngest to oldest.

Artificial Fill (Af): Based on review of the prior geotechnical report at the site (W.A. Wahler, 1970), there is between 9 to 14+ feet of existing artificial fill across the site. The bottom of the existing fill was not encountered in their test pits excavated in the western portion of the site. The fill materials were found to consist of brown to dark brown and reddish brown sand, silty sand, and clayey sand that was generally damp to moist and medium dense. Gray to dark gray clay and sandy clays were also encountered and were found to be damp to moist and stiff to very stiff. Undisturbed samples of the artificial fill were collected during the investigation. In-situ dry densities for sandy fill material ranged from 108.8 pounds-per-cubic-foot (pcf) to 127.8 pcf with moisture contents ranging from 6.9 to 16.0 percent. In-situ dry densities for clayey fill material ranged from 86.3 pcf to 134.3 pcf with moisture contents ranging from 13.2 to 30.4 percent.

It appears little to no remedial removals were performed during the original grading at the subject site. The materials below the fill, at the top of the native marine terrace deposits, were described by W.A. Wahler as dark brown silty sand with undisturbed grass. It is anticipated that the existing fill and the terrace materials will be removed under the proposed building with the subterranean excavation.

Marine Terrace Deposit (Qtm): Quaternary-age marine terrace deposits underlie the existing artificial fill and overlie the Monterey Formation bedrock. These deposits consist primarily of yellowish brown, dark brown, reddish brown and grayish brown clean fine to medium sands with local zones of silty and/or clayey fine to medium sands. The terrace deposits were encountered in two of the five test pits excavated by W.A. Wahler. The terrace material was found to be damp and medium dense. The basal portions of these deposits often contain rounded cobbles, fragments of the underlying bedrock, and sometimes shells. It is not known whether the terrace deposits underlie the fill in the southern portion of the site.

Monterey Formation (Tm): Bedrock of the Miocene-age Monterey Formation underlies the marine terrace deposits and generally consists of olive gray interbedded fine sandstone, siltstone and claystone. Bedding thickness varies from thin to laminated with localized thin beds of cemented siltstone (or shale, up to ½ inch thick). The bedrock underlying the wave cut bench near the contact is typically found to be highly weathered. Bedrock was not encountered during the geotechnical investigations at the subject site by W.A. Wahler. The marine terrace/bedrock contact at the site is estimated to be at elevations of 145 to 155 feet above msl, based on boring data by NMG (2012a and 2012b) and G.A. Nicoll (1972). Some of the siltstone within the Monterey Formation has been found to be diatomaceous and was encountered during a geotechnical exploration for the nearby Edwards Cinema to the east of the subject site (Soils International, 1988). The diatomaceous bedrock was generally medium stiff to very stiff, with low dry densities (67 to 87 pcf) and high moisture content (27 to 36 percent). The bedrock encountered to the north by NMG consisted of interbedded light gray to yellow brown sandstone and olive gray siltstone. The dry densities varied from 91.5 to 112 pcf and the moisture contents varied from 7.5 to 24.8 percent.

2.3 Geotechnical Conditions

The following includes a summary of the subsurface geotechnical conditions based on the laboratory test results performed on in-situ and bulk samples from previous investigations (Appendix C). The majority of these tests are from offsite investigations, but the results are summarized below.

Prior laboratory testing by W.A. Whaler for the onsite fill included:

- Field resistivity tests, indicating the corrosivity of the soils to metals, found the fill to have resistivity of 1435 ohm-cm (severe) to 2200 ohm-cm (moderate);
- pH was tested to be 6.8 (slightly acidic);
- Dry densities of 86.3 to 127.8 pcf and moisture contents of 6.9 to 30.4 percent;
- USCS classification of mostly SP, SW, SM, with some SW, SC, CL and CH; and
- Shear strength test indicating an angle of internal friction of 35 degrees and cohesion of 0.75 ksf.

Test results by NMG (2012a and 2012b) north of Newport Center Drive, included very low to low expansion potential in the fill with negligible sulfate potential. USCS classifications were mostly SM and SP, with some SC. The angle of internal friction of the fill varied from 29 to 31 degrees with 0 to 350 psf cohesion. Maximum densities ranged from 125 to 128.5 psf with optimum moistures ranging from 8.5 to 9.5 percent. The upper weathered portion of the terrace deposit was generally found to be more compressible than the fill.

As previously discussed, the composition of the bedrock underlying the site could vary between sandstone, siltstone, and diatomaceous siltstone. Since we believe the building will be founded in bedrock, our proposed investigation is intended to drill to deeper depths to determine the conditions of the bedrock underlying the site.

2.4 Regional Faulting, Seismicity, and Seismic Hazards

Regional Faults: The site is not located within a fault-rupture hazard zone as defined by the Alquist-Priolo Special Studies Zones Act (Hart and Bryant, 2007) and no evidence of active faulting was found during our background study or during our prior work at Fashion Island. Also, based on mapping by the State (Jennings, 2010), there are no active faults mapped at the site.

Using the USGS Deaggregation computer program (USGS, 2013a) and the site coordinates of 33.612 degrees north latitude and -117.875 degrees west longitude, the closest major active faults to the site are the Newport-Inglewood Fault located 2.5 miles (4.1 km) to the south of the site and the San Joaquin Hills Thrust Fault located 3.4 miles (5.4 km) north of the site.

Seismicity: Properties in southern California are subject to seismic hazards of varying degrees depending upon the proximity, degree of activity, and capability of nearby faults. These hazards can be primary (i.e., directly related to the energy release of an earthquake such as surface rupture and ground shaking) or secondary (i.e., related to the effect of earthquake energy on the physical world, which can cause phenomena such as liquefaction and ground lurching). Since there are no active faults at the site, the potential for primary ground rupture is considered very low. The primary seismic hazard for this site is ground shaking due to a future earthquake on one of the major regional active faults.

The maximum moment magnitude for the Controlling Fault is 6.97, which would be generated from the San Joaquin Hills Thrust Fault.

Secondary Seismic Hazards: The site is not located in an area classified by the State as having soils that are potentially liquefiable or in a area mapped as susceptible to seismically induced landslides, based on the Seismic Hazard Maps (CDMG, 1998a and 1998b, Figure 1).

The potential for secondary seismic hazards, such as tsunami and seiche are considered very low to nil, as the site is located away from the ocean at an elevation of over 140 feet above mean sea level (msl) and outside of mapped tsunami inundation zones (CGS, 2009). The site is not located adjacent to a confined body of water; therefore, the potential for seismic hazard of a seiche (an oscillation of a body of water in an enclosed basin) is considered very low to nil.

2.5 Groundwater

The groundwater table and/or seepage were not encountered during the previous investigation by W.A. Wahler or during the investigations for the adjacent office buildings to a depth of 45 feet below ground surface. These studies were done in the 1970s prior to development at the site.

NMG also did not encounter groundwater in borings drilled to the north of the site to depths of up to 41 feet in 2012.

Perched groundwater seepage and wet soils have been found along the terrace-bedrock contact at many sites in and around Newport Center. Only wet conditions were found near this contact in the borings by NMG in 2012. The perched groundwater and/or wet soils are interpreted to be the result of infiltration and return-flow of irrigation water and rainwater into up-gradient sandy terrace deposits which becomes perched on the relatively less permeable bedrock. The water then travels laterally down gradient along the contact and down through fractures in the bedrock and through the sandstone beds, where present.

During grading to the north of the site, wet soils were encountered along the fill-terrace contact during grading observed by NMG. This material required utilization of excavators. Perched groundwater has also been found to extend into the weathered/fractured bedrock below the contact at nearby sites.

2.6 Settlement and Foundation Considerations

The site is underlain by three earth units including 1) marine terrace deposits which are primarily sandy, 2) sandstone and siltstone of the Monterey formation at depth, and 3) compacted fill near surface. Based on our preliminary background investigation, the lowest garage floor, Level 3, will be founded on bedrock. Garage Levels 1 and 2 will be entirely overlying Level 3.

The amount of settlement expected will depend upon the type of foundation(s) selected. Our preliminary settlement analyses for this study indicate the total consolidation (static) settlement may be on the order of 1½ -inches for column loads of up to 1,000 kips and allowable bearing capacity of 4,000 psf. The differential settlement is expected to be on the order of ¾ -inch over a 30-foot span

2.7 Temporary Slope Stability

Temporary cut slopes for this project will expose varying earth materials and potential seepage. The excavation for construction of building and perimeter retaining walls will be up to 31 feet high. These excavations will be close to the property line along the south and west sides and 15 feet from the adjacent road right-of-ways along the north and east sides of the building.

These temporary slopes for the garage will expose up to 20 feet of bedrock, with an estimated 2 to 8 feet of terrace deposits and up to 14+ feet of artificial fill. There may be local seepage and wet sands within the fill/terrace and terrace/bedrock contacts. Locally, these slopes could slough or potentially slump along the contact. The bedding orientation in the bedrock is not known at this time. As a result, we are recommending at least two bucket auger borings at the site that will extend to at least 20 feet below the proposed subgrade. These borings will be downhole logged to determine the geologic structure in the bedrock.

The onsite fill and terrace sands have a high potential for erosion (during rainy periods or uncontrolled runoff). These deposits are considered subject to gross instability in vertical excavations. Therefore, temporary shoring with lagging will need to be designed for the site. NMG will provide shoring design recommendations after the future onsite investigation. It will also be important that the excavations be mapped by an engineering geologist during excavation.

3.0 CONCLUSION AND PRELIMINARY RECOMMENDATIONS

3.1 General Conclusion and Recommendation

Based on our preliminary due diligence study, the site is geotechnically suitable for the proposed development. The most significant geotechnical constraint at the site is the presence of varying earth units and potential for perched groundwater. Geologic hazards related to regional earthquake potential (seismic shaking) are not any greater than at other comparable sites in the vicinity. The site is not located in a seismic hazard zone for potential liquefaction or seismically induced landslides.

We recommend that a site specific geotechnical investigation be performed at the site to better assess the site conditions and provide recommendations for design, grading and construction. The proposed investigation will include drilling, sampling and downhole logging of two bucket auger borings, and drilling, sampling and logging of three hollow stem borings. In addition to the following recommendations, General Earthwork and Grading Specifications are provided in Appendix E.

3.2 Grading Recommendations

Prior to grading, the site should be cleared of heavy vegetation and deleterious materials (including asphalt pavement, concrete and existing utility pipelines to be removed) and disposed of offsite. The proposed excavation to construct the subterranean parking structure is anticipated to remove weathered fill and near-surface soils in the vicinity of the building. The bottom level of parking is planned to cover the majority of the site, so there would be little removals around the building; the extended flatwork on grade around the building is anticipated to be placed on compacted backfill materials.

There are varying soil types anticipated to be exposed in the building excavation. The subgrade for Level 3 is anticipated to expose bedrock. The composition of the bedrock may have differing expansion potential. If such condition is observed during the site investigation and/or grading operations, the subgrade soils may need to be overexcavated to a depth of 3 to 5 feet below subgrade and replaced with uniform, low expansion potential soils (i.e., the sandy fill and sandy terrace deposits). Onsite soil materials with the exception of highly expansive clays are considered suitable as fill materials below the building slabs and footings. The soils should be mixed to provide a uniform blend of material; sands and clays. Placement of soils with dissimilar expansion potential should be avoided.

The overexcavation bottom (if any) should be scarified a minimum of 6 inches, moisture-conditioned as needed, and compacted in place prior to placement of fill materials. Fill materials should be placed in maximum 8-inch-thick lifts, moisture-conditioned, and compacted to a minimum of 90 percent relative compaction in accordance with ASTM Test Method D1557.

3.3 Temporary Excavations

As previously discussed, the excavations around the building will vary in depth up to 31 feet along the majority of the site perimeter. If overexcavation of the subgrade soils is needed, the heights of these temporary excavations will be greater. These slopes will expose varying earth units and possibly adverse bedding and/or groundwater seepage. There are also utility trenches around the building that might have differing soil types used as backfill, including bedding and shading sands. These materials, when exposed, are considered Type C soils per Cal/OSHA regulations and should be excavated at 1.5H:1V or flatter, with no vertical excavation. Due to the depth of the excavation, it is anticipated that temporary shoring with lagging will be needed. In addition, due to the height of the shoring, it is likely that tie backs may be recommended by the shoring designer. Permission would be needed from the adjacent property owners to use these temporary tie-backs. Alternatively, shoring could be designed with rackers and braces; as cantilever shoring with deeper caissons; or other methods.

Excavations located adjacent to existing structures (roadways and utilities) should be reviewed periodically by the geotechnical consultant to evaluate the potential for failure. If evidence of instability (such as ground cracks or failures) is observed, then recommendations for additional shoring or other appropriate measures will be provided.

3.4 Building Foundations

The type of building foundations for the site will depend on the anticipated column loads for the structure and the potential compressibility of the supporting soil/bedrock materials. For preliminary design of shallow foundations, a net allowable bearing capacity of 1,800 psf may be assumed for a 12-inch-wide footing embedded 12 inches below the lowest adjacent grade. The allowable bearing pressure may be increased by 500 psf for every additional foot of embedment and by 200 psf for every additional foot of width to a maximum of 4,000 psf. The allowable bearing pressure may be increased by one-third for wind and seismic loading. We recommend that strip and isolated footings have a minimum embedment depth of 24 inches. For lateral resistance against sliding, a friction coefficient of 0.35 may be used at the soil-foundation interface. In addition, for large foundations and mat type slabs (if any), the subgrade modulus of reaction may be assumed to be 75 pci.

The foundations and slab-on-grade should be designed for a total and differential settlement presented below.

3.5 Settlement

The amount of settlement expected will depend upon the type of foundation(s) selected and the type and extent of the soil improvements. Our preliminary settlement analysis is based on the proposed excavations and remedial grading anticipated at the site, the assumed column loads of up to 1,000-kips for the proposed structure and allowable bearing capacity of 4,000 psf. The total and differential settlement for the proposed improvements at the site is expected to be on the order of 1½ - inches and ¾ - inch over a 30-foot span, respectively. For loads significantly greater than 1,000-kips, or for smaller differential settlement requirements, alternative foundations, such as deep foundations or mat slabs and foundations may be required.

3.6 Seismic Design Guidelines

The seismic design criteria based on the 2013 California Building Code (CBC) is presented in the following table:

Selected Seismic Design Parameters from 2013 CBC/ASCE 7-10	*Seismic Design Values*	*Reference*
Latitude	33.612 North	
Longitude	117.875 West	
Nearest Seismic Source	Newport-Inglewood Fault	USGS 2013a
Distance to Nearest Seismic Source	2.5 Miles (4.1 km)	USGS 2013a
Site Class per Table 20.3-1 of ASCE 7-10	D	USGS, 2013b
Spectral Acceleration for Short Periods (Ss)	1.681 g	USGS, 2013b
Spectral Accelerations for 1-Second Periods (S1)	0.615 g	USGS, 2013b
Site Coefficient F_a, Table 11.4-1 of ASCE 7-10	1.0	USGS, 2013b
Site Coefficient F_v, Table 11.4-2 of ASCE 7-10	1.5	USGS, 2013b
Design Spectral Response Acceleration at Short Periods (S_{DS}) from Equation 11.4-3 of ASCE 7-10	1.120 g	USGS, 2013b
Design Spectral Response Acceleration at 1-Second Period (S_{D1}) from Equation 11.4-4 of ASCE 7-10	0.615 g	USGS, 2013b
Peak Ground Acceleration (MCE_R) Corrected for Site Class Effects from Equation 11.8-1 of ASCE 7-10	0.685 g	USGS, 2013b
Seismic Design Category, Section 11.6 of ASCE 7-10	D	USGS, 2013b

3.7 Expansion Potential

Based on laboratory testing, the expansion potential of onsite soils is anticipated to generally range from "Very Low" to "Medium" within the terrace and existing fill materials. Soils with "High" expansion are likely to be encountered in the siltstone/claystone of the Monterey Bedrock. Additional laboratory testing should be performed during the recommended geotechnical investigation to determine the expansion potential of the bedrock and also following completion of grading operations around the building to determine the expansion potential of the near-surface soils.

3.8 Cement Type for Construction

Laboratory test results indicate that the soluble sulfate content of current subgrade soils are generally in the negligible range. Additional laboratory testing should be performed during the recommended geotechnical investigation and following completion of grading operations to determine the soluble sulfate content to be used for design of concrete in contact with the soil in compliance with Table 4.3.1 of ACI-318.

3.9 Surface Drainage and Irrigation

Inadequate control of run-off water, heavy irrigation after development of the site, or regional groundwater level changes may result in shallow groundwater conditions where previously none existed. Maintaining adequate surface drainage, proper disposal of run-off water, and control of irrigation will help reduce the potential for future moisture-related problems and differential movements from soil heave/settlement.

Surface drainage should be carefully taken into consideration during grading, landscaping, and building construction. Positive surface drainage should be provided to direct surface water away from structures and slopes and toward the street or suitable drainage devices. Ponding of water adjacent to the structures should not be allowed. Buildings should have roof gutter systems and the run-off should be directed to parking lot/street gutters by area drain pipes or by sheet flow over paved areas. Paved areas should be provided with adequate drainage devices, gradients, and curbing to prevent run-off flowing from paved areas onto adjacent unpaved areas.

Foundation performance is also dependent upon maintaining adequate surface drainage away from structures. The minimum gradient within 5 feet of the building will depend upon surface landscaping. In general, we suggest that unpaved lawn and landscape areas have a minimum gradient of 2 percent away from structures. Consideration should be given to concrete flatwork construction adjacent to the building.

Construction of planter areas immediately adjacent to structures should be avoided if possible. If planter boxes are constructed adjacent to or near buildings, the planters should be provided with controls to prevent excessive penetration of the irrigation water into the foundation and flatwork subgrades. Provisions should be made to drain excess irrigation water from the planters without saturating the subgrade below or adjacent to the planters. Raised planter boxes may be drained with weepholes. Deep planters (such as palm tree planters) should be drained with below-ground, water-tight drainage lines connected to a suitable outlet. Moisture barriers should also be considered.

It is also important to maintain a consistent level of soil moisture, not allowing the subgrade soils to become overly dry or overly wet. Properly designed landscaping and irrigation systems can help in that regard.

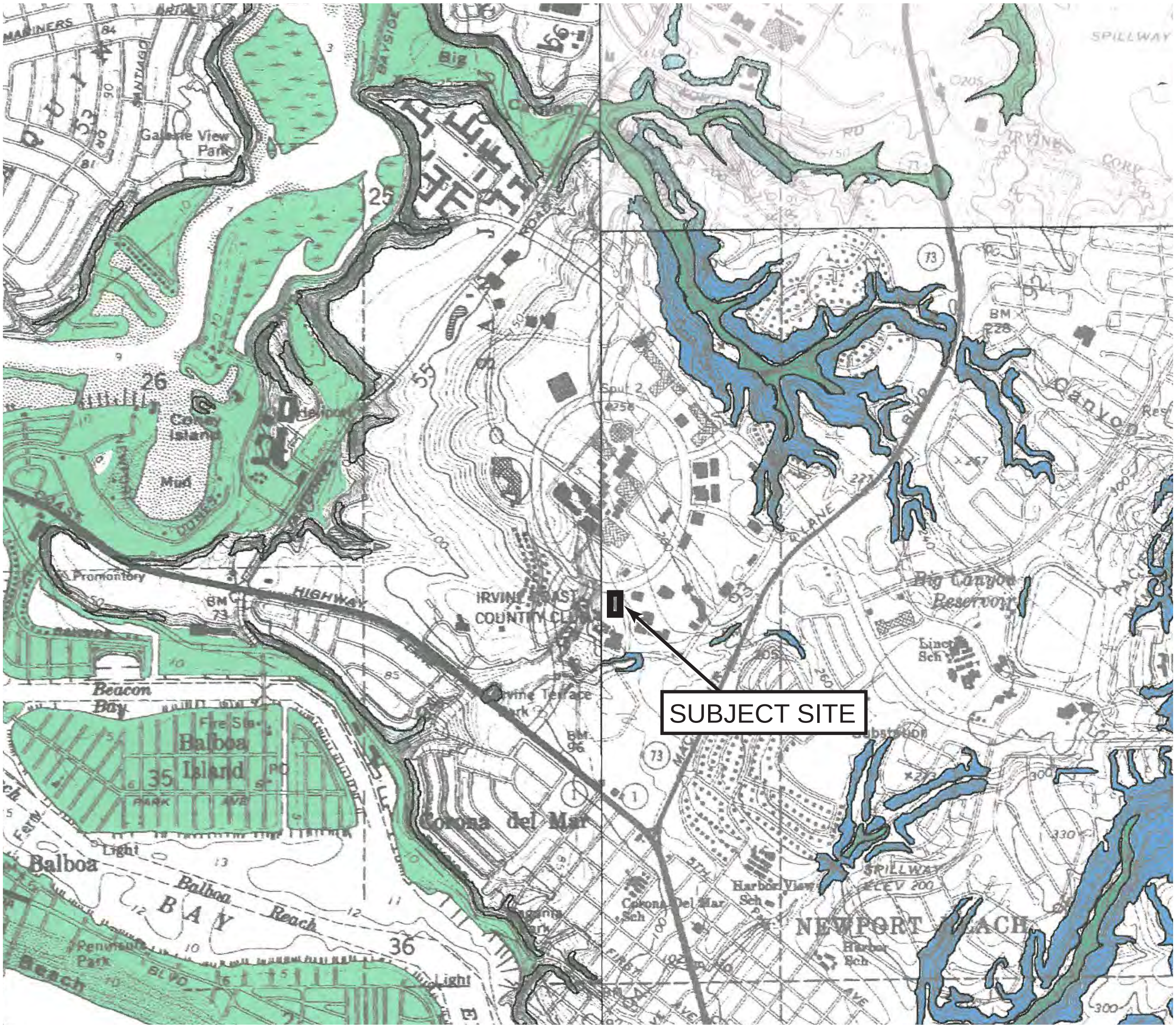
3.10 Geotechnical Investigation and Review of Future Plans

Once a grading plan becomes available, it should be reviewed by the geotechnical consultant. Additional geotechnical investigation is recommended and additional analysis will be necessary for building foundation design in relation to potential settlements and for shoring design for the subterranean structure. The geotechnical consultant will need to work closely with the structural engineer and project team during design. Once the building/grading plan is available, the final geotechnical recommendations for remedial grading and structural design will be provided. A geotechnical grading plan review report should be submitted to the city of Newport Beach for their review and approval prior to issuance of a grading and construction permit.

3.11 Geotechnical Observation and Testing During Grading and Construction

Geotechnical observation and testing should be performed by the geotechnical consultant during the following phases of grading and construction:

- During site preparation and clearing;
- During earthwork operations, including remedial removals and fill placement;
- Upon completion of any excavation for buildings or retaining walls prior to pouring concrete;
- During slab and pavement subgrade preparation (including presoaking), prior to pouring of concrete;
- During and after installation of subdrains for retaining walls and building subgrade;
- During placement of backfill for utility trenches and retaining walls; and
- When any unusual soil conditions are encountered.



Liquefaction

Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslides

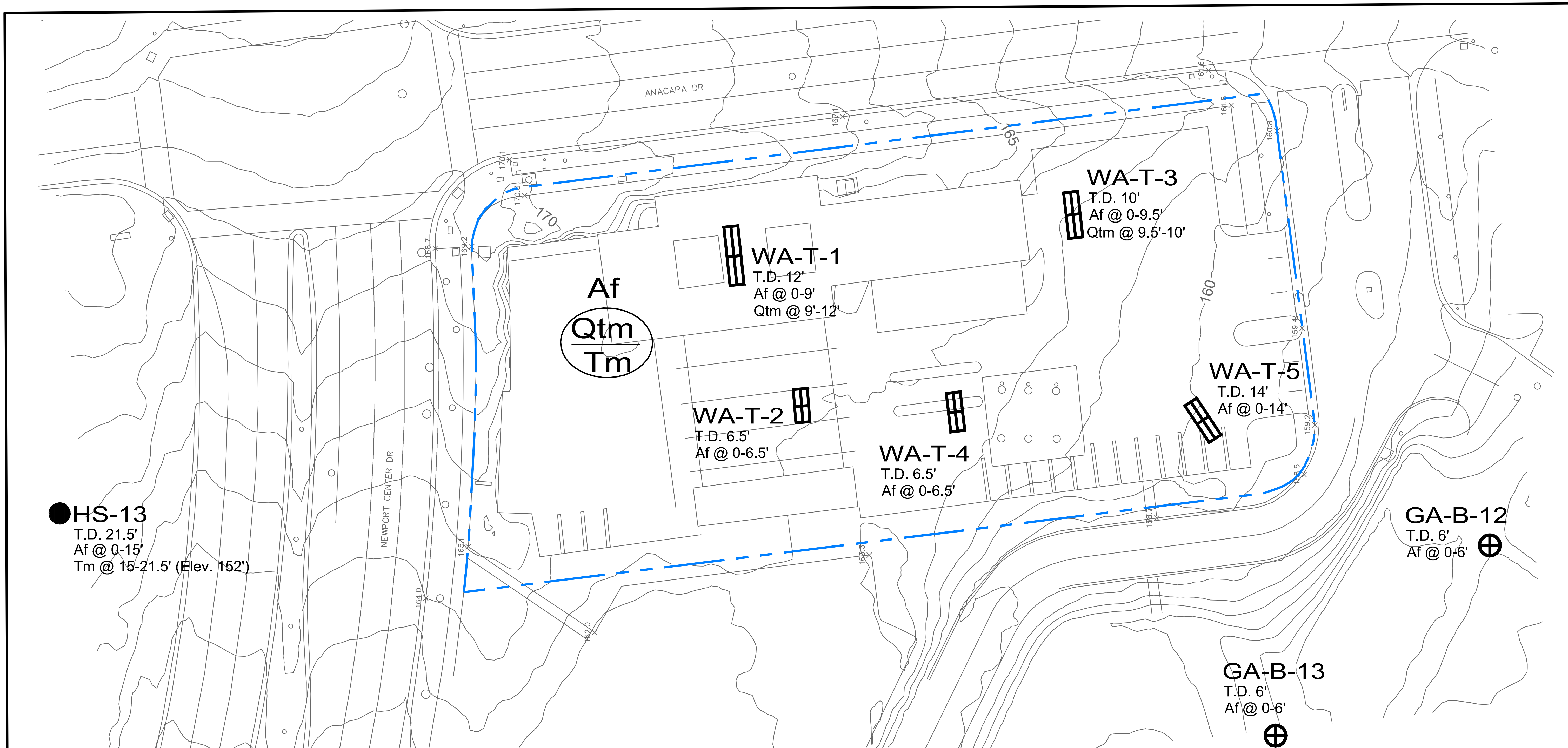
Areas where previous occurance of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

SITE LOCATION AND SEISMIC HAZARDS MAP

BASE: DIVISION OF MINES AND GEOLOGY SEISMIC HAZARDS MAPS, LAGUNA BEACH, NEWPORT BEACH AND TUSTIN QUADRANGLES
Dated: April 15, 1998 and January 17, 2001

N

NEWPORT CENTER CONDOMINIUMS 150 NEWPORT CENTER DRIVE CITY OF NEWPORT BEACH, CALIFORNIA	Project Number: 14117-01 Project Name: NCAA / 150 NCD Date: 2-3-15 Figure No. 1	NMG Geotechnical, Inc.



LEGEND

SYMBOLS - LOCATIONS ARE APPROXIMATE, QUERIED WHERE UNCERTAIN

● HS-13 T.D. 21.5' Af @ 0-15' Tm @ 15-21.5' (Elev. 152')	HOLLOW-STEM AUGER BORING BY NMG GEOTECHNICAL, INC., SHOWING TOTAL DEPTH AND DEPTH TO EARTH UNITS
⊕ GA-B-13 T.D. 6' Af @ 0-6'	BUCKET AUGER BORING BY G.A. NICOLL, SHOWING TOTAL DEPTH AND DEPTH TO EARTH UNITS
WA-T-5 T.D. 14' Af @ 0-14'	TEST PIT BY W.A. WAHLER SHOWING TOTAL DEPTH AND DEPTH TO EARTH UNITS

EARTH UNITS - CIRCLED WHERE BURIED

Af	ARTIFICIAL FILL
Qtm	TERRACE DEPOSIT
Tm	MONTEREY FORMATION
— — —	PROPERTY BOUNDARY

GRAPHIC SCALE

40 0 20 40 80

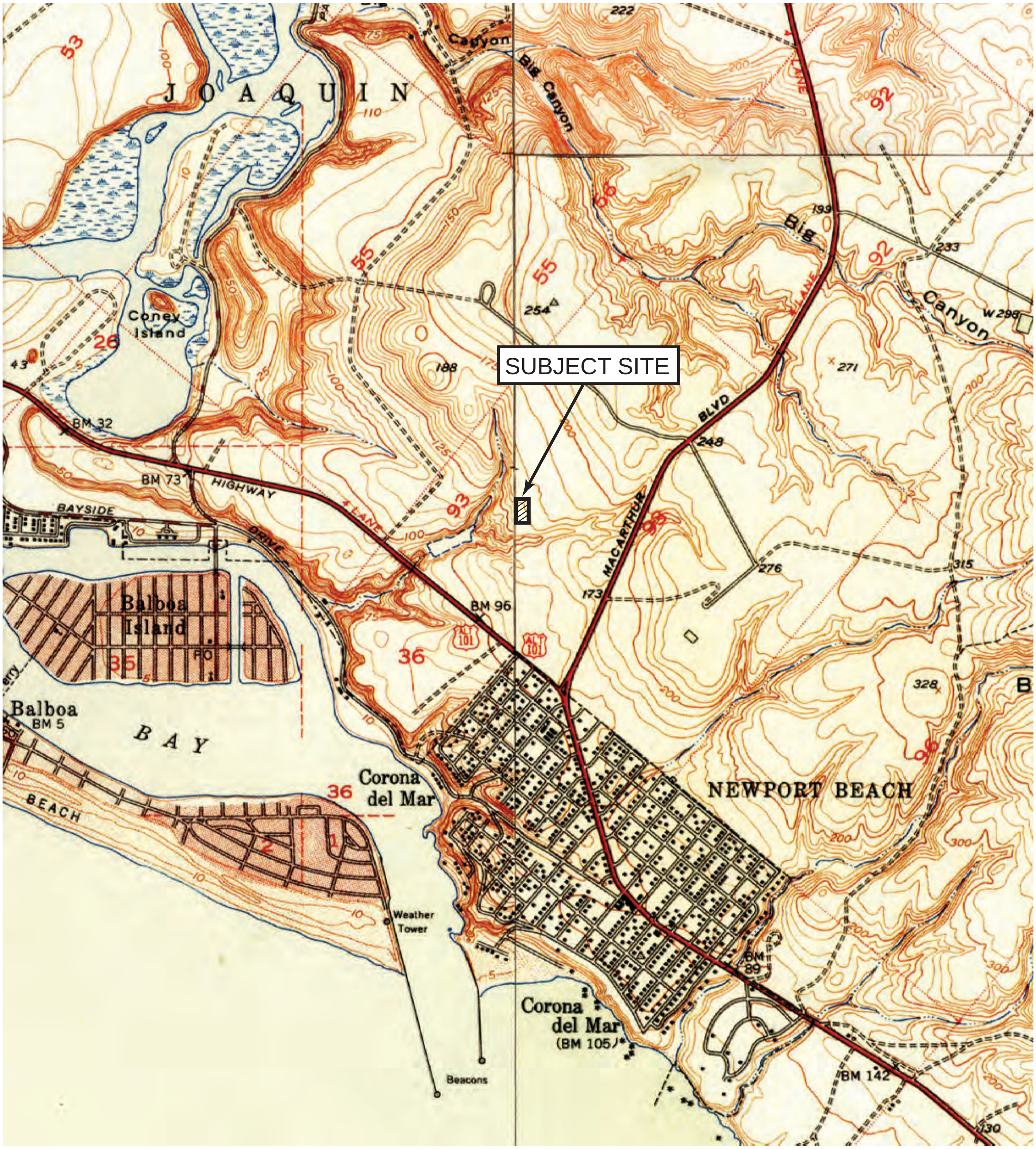
(IN FEET)
1 inch = 40 ft.

FIGURE 2

GEOTECHNICAL MAP
NEWPORT CENTER CONDOMINIUMS
150 NEWPORT CENTER DRIVE
CITY OF NEWPORT BEACH, CALIFORNIA

Project No.: 14117-01
Project Name: NCAA / 150 NCD
Date: 2-3-15
Scale: 1" = 40'

NMG
Geotechnical, Inc.



SITE LOCATION AND TOPOGRAPHIC MAP

BASE: USGS TOPOGRAPHIC MAPS,
LAGUNA BEACH, NEWPORT BEACH AND TUSTIN QUADRANGLES
Dated: 1949 Through 1951

N

NEWPORT CENTER CONDOMINIUMS
150 NEWPORT CENTER DRIVE
CITY OF NEWPORT BEACH, CALIFORNIA

Project Number: 14117-01

Project Name: NCAA / 150 NCD

Date: 2-3-15

Figure No. 3

NMG
Geotechnical, Inc.

Boring Location Map

Newport Center Condominiums
Newport Beach, California

Figure 4

Project Name: NCAA/150 Newport Center Drive
Project No.: 14117-01

APPENDIX A

APPENDIX A
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APPENDIX A

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AERIAL PHOTOGRAPHS REVEIWED

Date	*Photograph*	*Source*
10-14-1939	5925-112	Continental Aerial Photo
11-18-1952	AXK-1K-43	Continental Aerial Photo
1-13-75	157 7-23	Continental Aerial Photo
1-20-1992	C85-13-20	Continental Aerial Photo

APPENDIX B

TEST PITS BY

W.A. WAHLER & ASSOCIATES
(1970)

FOR EXISTING CARWASH

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

PRIMARY DIVISIONS				GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIALS IS LARGER THAN #200 SIEVE SIEZE	GRAVELS	MORE THAN HALF OF COARSE FRACTION IS LARGER THAN #4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.
				GP	POORLY GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.
			GRAVEL WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURE. NON-PLASTIC FINES.
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES. PLASTIC FINES.
	SANDS	MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN #4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES.
				SP	POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES.
			SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXTURES. NON-PLASTIC FINES.
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES. PLASTIC FINES.
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN #200 SIEVE SIZE	SILTS & CLAYS		LIQUID LIMIT IS LESS THAN 50	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY.
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS.
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY.
	SILTS & CLAYS		LIQUID LIMIT IS GREATER THAN 50	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS.
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS.
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS.
	HIGHLY ORGANIC SOILS			PT	PEAT AND OTHER HIGHLY ORGANIC SOILS.

DEFINITION OF TERMS

GRAIN SIZES

U.S. STANDARD SERIES SIEVE: 200, 50, 16, 4 — CLEAR SQUARE SIEVE OPENINGS: 3/4", 3", 8"

SILTS & CLAYS DISTINGUISHED ON BASIS OF PLASTICITY	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

MOISTURE CONDITION (INCREASING MOISTURE ——→)

DRY — SLIGHTLY DAMP — DAMP (PL) — MOIST — VERY MOIST — WET (SATURATED) (LL)

CONSISTENCY

CLAYS & SILTS	BLOWS/FOOT*	STRENGTH ‡
Very Soft	0 – 2	0 – 1/4
Soft	2 – 4	1/4 – 1/2
Firm	4 – 8	1/2 – 1
Stiff	8 – 16	1 – 2
Very Stiff	16 – 32	2 – 4
Hard	Over 32	Over 4

RELATIVE DENSITY

SANDS & GRAVELS	BLOWS/FOOT*
Very Loose	0 – 4
Loose	4 – 10
Medium Dense	10 – 30
Dense	30 – 50
Very Dense	Over 50

* Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split spoon (ASTM D-1586).

‡ Unconfined compressive strength in tons/sq ft. Read from a pocket penetrometer.

SOIL MECHANICS and FOUNDATION ENGINEERS Inc. PALO ALTO • NEWPORT BEACH • CALIF.	NEWPORT CENTER CAR WASH NEWPORT BEACH, CALIFORNIA	KEY FOR SOIL EXPLORATION LOGS		
		PROJECT NO.	DATE	DRAWING NO.
		0461	JAN. 1970	--

LOGS OF BACKHOE PITS

TEST PIT NO.	DEPTH	DESCRIPTION	SAMPLE TYPE* AND DEPTH
1	0-4.5	FILL: SAND (SP & SW), Clayey SAND (SW-SC), and CLAY (CL) in horizontal layers 2" to 6" thick. Brown, damp, medium dense, and firm. Sparse scattered hard SHALE gravel and cobbles.	U @ 2"
	4.5-9	FILL: SAND (SP) with a few Clayey SAND (SP-SC) layers. Layers horizontal, 1" to 8" thick. Brown, slightly damp, medium dense.	U @ 4.5' U @ 6' B @ 8'
	9-10	Silty SAND (SM) and Sandy CLAY (CL), dark brown, slightly damp, stiff and medium dense. Original ground surface at 9.0 feet.	U @ 9'
	10-12	CLAY (CL), dark brown, slightly damp, very stiff.	
2	0-6.5	FILL: SAND (SP) and Clayey SAND (SC) in horizontal layers 2" to 8" thick. Red-brown, slightly damp to damp, medium dense. Sparse scattered gravel of hard SHALE.	B @ 3"-1'
3	0-5	FILL: SAND (SP) and Clayey SAND (SP-SC, SC) in horizontal layers 2" to 6" thick. Red-brown, slightly damp, medium dense.	U @ 1.5' U @ 3.5'
	5-9.5	FILL: SAND (SP) with minor Clayey SAND (SP-SC) in horizontal layers 1" to 6" thick. Red-brown, slightly damp, medium dense.	U @ 5' U @ 7.5' U @ 9'
	9.5-10	MARINE TERRACE: Silty SAND (SM), dark brown, slightly damp, medium dense. Original ground surface with undisturbed grass at 9.5 feet.	

LOGS OF BACKHOE PITS

TEST PIT NO.	DEPTH	DESCRIPTION	SAMPLE TYPE* AND DEPTH
4	0-4	FILL: SAND (SP) and Clayey SAND (SP-SC) in horizontal layers 2" to 8" thick. Red-brown, slightly damp, medium dense.	
	4-5	FILL: CLAY (CL) with scattered hard SHALE gravel and cobbles. Greenish-gray, slightly damp to damp, firm.	U @ 4.5'
	5-6.5	FILL: SAND (SP) and Clayey SAND (SP-SC) in horizontal layers 1" to 6" thick. Red-brown, slightly damp, medium dense.	
5	0-7.5	FILL: SAND (SP), Clayey SAND (SP-SC), and Sandy CLAY (CL) in horizontal layers 4" to 6" thick. Red-brown and gray, damp, medium dense and firm.	B @ 1'-4'
	7.5-10.5	FILL: SAND (SW), homogenous, slightly damp, moist at 10.0', medium dense.	
	10.5-11.5	FILL: Silty SAND (SM), dark gray, damp to moist, medium dense.	U @ 11'
	11.5-13	FILL: Sandy CLAY (CH) and Clayey SAND (SC), dark gray, moist to damp, medium dense and firm.	B @ 13'
	13-14	FILL: SAND (SP), red-brown, slightly damp, medium dense.	U @ 14'

NOTES: 1. No caving.
2. Groundwater not encountered.
3. All pits backfilled.
*4. U = undisturbed sample; B = bulk sample.

BORING LOGS BY NMG

FOR PADS B & C AT FASHION ISLAND (2012a & b)

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	*GRAVEL AND GRAVELLY SOILS* MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	*CLEAN GRAVELS* (LITTLE OR NO FINES)	GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	*CLEAN SANDS* (LITTLE OR NO FINES)	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	SM	SILTY SANDS, SAND - SILT MIXTURES
			SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	*SILTS AND CLAYS*	LIQUID LIMIT LESS THAN 50	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Dual symbols are used to indicate gravels or sand with 5-12% fines and soils with fines classifying as CL-ML. Symbols separated by a slash indicate borderline soil classifications.

Sampler and Symbol Descriptions

- Modified California sample (63.5 mm diameter)
- Standard Penetration Test
- Undisturbed pushed tube sample
- Large bulk sample
- Small bulk sample
- Approximate depth of perched water or groundwater

Note: Number of blows required to advance driven sample 300 mm (or length noted) is recorded; blow count recorded for seating interval (initial 150 mm of drive) is indicated by an asterisk.

Laboratory and Field Test Abbreviations

MD	Laboratory compaction test
CN	Laboratory consolidation test
DS	Laboratory direct shear test
AL	Atterberg limits
SE	Sand Equivalent
GS	Grain Size Analysis (Sieve and/or Hydro.)
RV	R-Value
CC	Chemical Testing incl. Soluble Sulfate
EI	Expansion Index
UU	Unconsolidated Shear Strength

GENERAL NOTES

1. Station location is indicated with offset to right (R) or left (L) of centerline (CL).
2. Soil classifications are based on the Unified Soil System and include color, moisture, and relative density or consistency. Field descriptions have been modified to reflect results of laboratory tests where deemed appropriate. Bedrock descriptions are based on visua classification and include rock type, moisture, color, grain size, strength, and weathering.
3. Descriptions on these boring logs apply only at the specific boring locations and at the time the borings were made. They are not warranted to be representative of subsurface conditions at other locations or times.

KEY TO LOG OF BORING

Fashion Island/Eastside
Newport Beach, California
PROJECT NO. 08034-01

NMG Geotechnical, Inc.

Report: HOLLOW STEM; Project: P:\2008\08034-01\GINT\08034-01.GPJ; Data Template: NMGNOV98.GDT; Printed: 2/27/12

Date(s) Drilled	6/2/08	Logged By	PA
Drilling Company	2R Drilling	Drill Bit Size/Type	8"
Drill Rig Type	CME-75	Hammer Data	140lbs/ 30" drop
Sampling Method(s)	Bulk, Modified California		
Approximate Groundwater Depth:	Groundwater Not Encountered		
Comments			

HS- 1

Sheet 1 of 2

Total Depth Drilled (ft)	41.0
Approximate Ground Surface Elevation (ft)	171.5

Elevation (ft)	Depth (ft)	Samples: Type	Samples: Number	Samples: Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	0						@ 0' Asphalt, 4" thick over 6" base.			
170						SM	**Artificial Fill (Af)**			
			B-1 D-1	13			@ 2.5' Strong brown slightly silty SAND, locally slightly clayey, moist, medium dense, massive, slightly to moderatly friable, no visable roots/ pores.	10.5	109.6	Bag B-1 (0-5')
	5		D-2	5			@ 5' Strong brown slightly silty SAND, wet, loose, moderatly friable, massive, non-cemented.	8.5	108.3	
			D-3	12		SC	@ 7.5' Brown to olive brown clayey SAND, wet, medium dense, root hairs/ pores, MnO/ FeO stining.	14.6	119.2	
	10		D-4	25		SC/ ML	@ 10' Olive clayey fine SAND with abundant siltstone clasts, moist, medium dense, MnO/ FeO staining, slightly plastic.	15.6	113.6	
160										
	15		D-5	20		SM	**Terrace, Marine (Qtm)** @ 15' Brownish yellow and light olive SAND, moist, medium dense, heavy FeO staining, color banding, micaceous.	12.2	98.3	
	20		D-6	70/11.5"		SM	**Monterey Formation (Tm)** @ 20' Light olive gray silty SANDSTONE, moist, dense, heavy FeO staining, MnO lined fractures/ bedding.	19.4	97.7	
150										
	25		D-7	79/11"			@ 25' Light gray silty SANDSTONE, slightly moist, dense, locally FeO stained, micaceous.	6.3	105.2	
	30									

LOG OF BORING

Fashion Island/ Eastside
Fashion Island Retail Center
PROJECT NO. 08034-01

NMG

Elevation (ft)	Depth (ft)	SAMPLES Type	Number	Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	30	■	D-8	79			@ 30' Light brownish gray silty SANDSTONE, moist, dense, micaceous, massive, FeO staining.	9.1	104.7	
140										
	35	■	D-9	50/3"			@ 35' Light olive gray silty SANDSTONE, slightly moist, dense, micaceous, MnO/ FeO staining.	8.1	94.2	
	40	■	D-10	78/11"		ML/ SM	@ 41' Strong brown and olive gray sandy SILTSTONE and silty SANDSTONE, moist, locally laminated, FeO/ MnO stained bedding surfaces, micaceous, gypsum along fractures.	22.7	96.8	
130							Notes: Total Depth: 41 ft. Groundwater Not Encountered. Backfilled With Cuttings. Asphalt Patched.			
	45									
	50									
120										
	55									
	60									
110										
	65									

LOG OF BORING
Fashion Island/ Eastside
Fashion Island Retail Center

PROJECT NO. 08034-01

NMG

Date(s) Drilled	6/3/08	Logged By	PA
Drilling Company	2R Drilling	Drill Bit Size/Type	8"
Drill Rig Type	CME-75	Hammer Data	140lbs/ 30" drop
Sampling Method(s)	Bulk, Modified California		
Approximate Groundwater Depth:	Groundwater Not Encountered		
Comments			

HS-3

Sheet 1 of 1

Total Depth Drilled (ft)	26.0
Approximate Ground Surface Elevation (ft)	182.5

Elevation (ft)	Depth (ft)	Samples: Type	Samples: Number	Samples: Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	0						@ 0' Asphalt, 4", over 4.5" base.			
						SM	**Artificial Fill (Af)**			
180			B-1					8.6	113.0	Bag B-1 (0-5')
			D-2	40		SM/ SC	@ 2.5' Upper: Brownish yellow silty SAND, moist, medium dense, micaceous. Tip: Very dark gray silty SAND, moist, dense, wood fragments, roots, micaceous.	6.0	118.9	AL, GS, MD, EI, CC, CN, DS
	5		D-3	23			@ 5' Dark brown slightly clayey SAND, moist, medium dense, mica, roots, MnO staining, slightly plastic, pores/ rootholes.	12.1	122.6	
							Terrace, Marine (Qtm)			
			D-4	50/5"		SM	@ 7.5' Olive brown silty SAND, moist, dense, -Disturbed Sample-.	12.0	109.7	
	10		D-5	72/9.5"			@ 10' Brown silty SAND, moist to very moist, dense, micaceous, FeO staining, non-friable.	12.3	110.0	
170										
	15		D-6	32		SM	**Monterey Formation (Tm)** @ 15' Pale olive fine SANDSTONE, moist, medium dense, micaceous, locally heavy FeO staining, lightly cemented.	9.3	102.7	
	20		D-7	32			@ 20' Olive silty fine to medium coarse SANDSTONE with graded beds, very moist, medium dense, scattered small pebbles, FeO/ MnO/ jarosite staining, micaceous, lightly cemented.	14.6	110.4	
160										
	25		D-8	32		ML	@ 25' Light olive gray SILTSTONE, moist, medium dense, heavy FeO/ MnO staining, micaceous, moderately fractured.	24.6	95.3	
							Notes: Total Depth: 26 ft. Groundwater Not Encountered. Backfilled With Cuttings. Asphalt Patched.			
	30									

LOG OF BORING

Fashion Island/ Eastside
Fashion Island Retail Center
PROJECT NO. 08034-01

NMG

Date(s) Drilled	6/2/08	Logged By	PA
Drilling Company	2R Drilling	Drill Bit Size/Type	8"
Drill Rig Type	CME-75	Hammer Data	140lbs/ 30" drop
Sampling Method(s)	Bulk, Modified California		
Approximate Groundwater Depth:	Groundwater Not Encountered	Total Depth Drilled (ft)	26.0
Comments		Approximate Ground Surface Elevation (ft)	178.0

HS-4

Elevation (ft)	Depth (ft)	Samples: Type	Samples: Number	Samples: Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	0						@ 0' Asphalt, 4", over 4" base.			
						SP/ SM	**Artificial Fill (Af)**			
			D-1	37			@ 2.5' Strong brown slightly silty SAND, medium dense, very moist, slightly micaceous.	7.9	114.0	
	5		D-2	40			@ 5' Brown slightly silty SAND, medium dense, very moist, slightly friable, no visible roots/ pores.	9.0	117.6	
170			D-3	6		SM	@ 7.5' Dark brown silty SAND, loose, saturated, root hairs, pores, slightly friable.	16.2	115.0	
	10		D-4	6		SM	**Terrace, Marine (Qtm)** @ 10' Yellowish brown slightly clayey fine to medium coarse SAND, loose, very moist, pores, root hairs.	16.1	112.1	
	15		D-5	38			@ 15' Light olive brown silty SAND, medium dense, moist, micaceous, non-friable, occasional root holes.	12.5	116.2	
160										
	20		D-6	51		ML	**Monterey Formation (Tm)** @ 20' Light olive gray slightly clayey SILTSTONE with trace sand, moist, dense, FeO/ MnO staining along joints/ bedding, micaceous.	24.8	91.5	
	25		D-7	32		SM	@ 25' Yellow to pale yellow SANDSTONE, moist, medium dense, micaceous, massive, non-friable.	7.5	102.8	
150							Notes: Total Depth: 26 ft. Groundwater Not Encountered. Backfilled With Cuttings. Asphalt Patched.			
	30									

LOG OF BORING

Fashion Island/ Eastside
Fashion Island Retail Center
PROJECT NO. 08034-01

NMG

Report: HOLLOW STEM; Project: P:\2008\08034-01\GINT\08034-01.GPJ; Data Template: NMGNOV98.GDT; Printed: 1/26/15

Date(s) Drilled	6/22/12	Logged By	PA
Drilling Company	2R Drilling	Drill Bit Size/Type	8"
Drill Rig Type	CME-75 Track Rig	Hammer Data	140lbs @ 30" Drop
Sampling Method(s)	Bulk, Modified California		
Approximate Groundwater Depth:	Groundwater Not Encountered	Total Depth Drilled (ft)	21.5
Comments		Approximate Ground Surface Elevation (ft)	175.0

HS-12

Sheet 1 of 1

Elevation (ft)	Depth (ft)	SAMPLES Type	Number	Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	0	Bulk				SM	**Artificial Fill (Af)** Surface: Turf			
		Bulk	B-1							
			D-1	32			@ 2.5' Reddish brown silty SAND, moist, medium dense, massive, well-sorted.	8.2	115.6	B-1 @ 0-5' MD, GS, EI, CC
170	5		D-2	28			@ 5' Reddish brown silty SAND, moist, medium dense, massive, well-sorted.	8.2	107.9	DS
			D-3	11		CL	**Weathered Marine Terrace (Qtm)** @ 7.5' Pale gray to reddish brown silty sandy CLAY, moist, medium stiff, root hairs, pores.	22.8	105.9	CN
	10		D-4	44		CL	**Marine Terrace (Qtm)** @ 10' Pale olive sandy CLAY, moist, stiff, massive, FeO staining, locally sandy.	14.5	119.1	
160	15		D-5	39		ML	**Monterey Formation (Tm)** @15' Pale gray SILTSTONE, damp, medium dense, local sandstone, heavy FeO staining.	28.2	90.5	
	20		D-6	44			@ 20' Pale gray clayey SILTSTONE, moist, stiff, FeO staining, thinly laminated, scattered sandstone beds.	15.0	98.5	
150	25						Notes: Total Depth 21.5 Feet. No Groundwater Encountered. Backfilled with Cuttings and Tamped.			
	30									

LOG OF BORING

Fashion Island/Eastside
Newport Beach, California
PROJECT NO. 08034-01

NMG

Report: HOLLOW STEM; Project: P:\2008\08034-01\GINT\08034-01.GPJ; Data Template: NMGNOV98.GDT; Printed: 1/26/15

Date(s) Drilled	6/22/12	Logged By	PA
Drilling Company	2R Drilling	Drill Bit Size/Type	8"
Drill Rig Type	CME-75 Track Rig	Hammer Data	140lbs @ 30" Drop
Sampling Method(s)	Bulk, Modified California		
Approximate Groundwater Depth:	Groundwater Not Encountered		
Comments			

HS-13

Sheet 1 of 1

Total Depth Drilled (ft)	21.5
Approximate Ground Surface Elevation (ft)	167.0

Elevation (ft)	Depth (ft)	SAMPLES Type	Number	Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	0					SM	**Artificial Fill (Af)** Surface: 4" AC over 6" AB.			
			B-1							
			D-1	29			@ 2.5' Reddish brown silty SAND, moist, medium dense, massive, slightly mottled.	12.2	118.0	DS B-1 @ 0-5' MD, EI, CC, GS, AL
	5		D-2	38			@ 5' Reddish brown silty SAND, moist, medium dense, massive, well-sorted, uniform.	10.1	126.2	
160										
			D-3	21			@ 7.5' Reddish brown silty SAND, moist, medium dense, massive, well-sorted, bedrock fragments in upper rings.	16.5	111.6	CN
	10		D-4	34			@ 10' Reddish brown silty SAND, moist, medium dense, massive, well-sorted.	12.1	120.6	
			D-5	17			@ 12.5' Reddish brown silty SAND, saturated, medium dense, massive.	14.6	113.2	
	15		D-6	30		ML-CL	**Monterey Formation (Tm)** @ 15' Olive gray clayey SILTSTONE, moist, stiff, massive, weathered.	22.8	98.2	
150										
	20		D-7	50/5"		SM	@ 20' Very pale gray silty fine-grained SANDSTONE, damp, very dense, massive, FeO staining.	11.4	112.2	
							Notes: Total Depth 21.5 Feet. No Groundwater Encountered. Backfilled with Cuttings and Tamped.			
	25									
140										
	30									

LOG OF BORING

Fashion Island/Eastside
Newport Beach, California
PROJECT NO. 08034-01

NMG

BORING LOGS BY

G.A. NICOLL & ASSOCIATES
(1972)

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)	CLEAN GRAVELS (Little or no fines)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amt. of fines)	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size)	CLEAN SANDS (Little or no fines)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amt. of fines)	SM	Silty sands, sand-silt mixtures.
			SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS (More than 50% of material is SMALLER than No. 200 sieve size)	SILTS AND CLAYS (Liquid limit LESS than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

PARTICLE SIZE LIMITS

SILT OR CLAY	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

NO. 200 — NO. 40 — NO. 10 — NO. 4 — ¾ in. — 3 in. — (12 in.)

U. S. STANDARD SIEVE SIZE

PLATE A

UNIFIED SOIL CLASSIFICATION SYSTEM

Reference:
The Unified Soil Classification System, Corps of Engineers, U.S. Army Technical Memorandum No. 3-357, Vol. 1, March, 1953. (Revised April, 1960)

G. A. NICOLL & ASSOCIATES
EARTH SCIENCE CONSULTANTS

DRILL RIG: Bucket Auger	HOLE ELEV.: 152 feet	LOGGED BY: GAN
GROUNDWATER DEPTH: None	HOLE DIA.: 24 inch	DATE: Nov. 3, 1972

blows / foot	sampler: bulk	sampler: split spoon	sampler: tube	moisture (%)	dry density (pcf)	depth (feet)	soil symbol	soil type	DESCRIPTION AND REMARKS
								CL	FILL - BROWN TO GREY SILTY CLAY, MOIST, FIRM
7		X		21.0	96.0				
								SC	- TAN CLAYEY FINE SAND, MOIST, MEDIUM DENSE
10		X		8.1	128.0	5		SM	- REDDISH BROWN SILTY FINE SAND, MOIST, MEDIUM DENSE
								SM	- TAN SILTY SAND, FINE, MOIST, MEDIUM DENSE
								SM	TERRACE DEPOSITS
15		X		8.1	115.9	10			- BROWN TO REDDISH BROWN SILTY SAND, MOIST, DENSE
								GM	- WITH COBBLES TO 8 INCHES

NOTES:
1) GROUND WATER ABSENT
2) NO CAVING
3) HOLE BACKFILLED
4) TOTAL DEPTH 14 FEET
5) DRIVING WEIGHT FOR SAMPLES IS 1500 POUND KELLY BAR
6) Boring stopped due to cobbles

G. A. NICOLL & ASSOCIATES	Block 100 Newport Center The Irvine Company	DRILLHOLE LOG			HOLE NO.
		Project no. 1010	date Nov. 1972	sheet 1 of 1	B-1

DRILL RIG: Bucket Auger		**HOLE ELEV.:** 150 feet	**LOGGED BY:** GAN
GROUNDWATER DEPTH: None		**HOLE DIA.:** 24 inch	**DATE:** Nov. 3, 1972

blows / foot	sampler: bulk	sampler: split spoon	sampler: tube	moisture (%)	dry density (pcf)	depth (feet)	soil symbol	soil type	DESCRIPTION AND REMARKS
								SM	FILL – TAN SANDY SILT WITH SHALE FRAGMENTS, MOIST
									– BROWN SILTY SAND
6		X		12.6	115.2				– TAN SANDY SILT
									– BROWN SILTY FINE SAND
6		X		17.6	100.5	5			
								CL	– GREY CLAY WITH SHALE FRAGMENTS
								SM	– TAN TO REDDISH BROWN SILTY SAND, MOIST,
14		X		8.7	116.0	10			DENSE
								SM	– GREY SILTY SAND, MOIST DENSE
21		X		10.8	121.0	15		SM	SOIL – GREY SILTY SAND, MOIST, DENSE
									TERRACE DEPOSITS
								SM	– TAN SILTY SAND AND SAND, MOIST, VERY DENSE
17		X		7.7	124.5	20			– SAME BUT GREY
16		X		8.5	124.1	25			– BECOMES REDDISH BROWN
									– WITH GRAVEL OF SILICEOUS SHALE FRAGMENTS
						30		–	BEDROCK – MONTEREY FORMATION
									– GREY SHALE AND TAN SANDSTONE, INTERBEDDED, BEDS 1/4 inch to paper-thin THICKNESS. CONTACT: N45W, 15°SW; BEDDING: N35W, 45SW
						35			

NOTES:

1) TOTAL DEPTH 36 FEET
2) NO CAVING
3) HOLE BACKFILLED
4) DRIVING WEIGHT FOR SAMPLER IS 1500 POUND KELLY BAR

G. A. NICOLL & ASSOCIATES	Block 100, Newport Center, The Irvine Company	DRILL HOLE LOG			HOLE NO.
		project no.	date	sheet	
		1010	Nov. 1972	1 of 1	B-2

DRILL RIG: Bucket Auger | HOLE ELEV.: 150 feet | LOGGED BY: GAN

GROUNDWATER DEPTH: None | HOLE DIA.: 24 inch | DATE: Nov. 3, 1972

blows/foot	sampler: bulk	sampler: split spoon	sampler: tube	moisture (%)	dry density (pcf)	depth (feet)	soil symbol	soil type	DESCRIPTION AND REMARKS
						0		SM	FILL – TAN SILTY SAND, DRY, LOOSE
11		X		10.0	113.2			SM	– TAN SILTY SAND, MOIST, MEDIUM DENSE
6		X		13.1	110.7	5			
									– LOCAL LENSES OF REDDISH BROWN SILTY SAND OR POCKETS OF GREY CLAY
11		X		13.2	104.8	10			
						15			
						20		SM	SOIL – GREY SILTY SAND, MOIST, DENSE
								SM	TERRACE DEPOSITS – GREY SILTY SAND, MOIST, DENSE

NOTES:

1) TOTAL DEPTH 24 FEET
2) NO CAVING
3) HOLE BACKFILLED
4) DRIVING WEIGHT FOR SAMPLER IS 1500 POUND KELLY BAR

G. A. NICOLL & ASSOCIATES

Block 100
Newport Center
The Irvine Company

DRILLHOLE LOG

Project no.	date	sheet	HOLE NO.
1010	Nov. 1972	1 of 1	B-3

DRILL RIG: Bucket Auger		HOLE ELEV.: 153 feet	LOGGED BY: GAN
GROUNDWATER DEPTH: None		HOLE DIA.: 24 inch	DATE: Nov. 3, 1972

blows/foot	sampler: bulk	sampler: split spoon	sampler: tube	moisture (%)	dry density (pcf)	depth (feet)	soil symbol	soil type	DESCRIPTION AND REMARKS
								SM	FILL – TAN SILTY SAND, DRY, LOOSE
5		X		10.8	110.0			SM	– REDDISH BROWN SILTY SAND MOIST, MEDIUM DENSE – LOCALLY TAN
10		X		16.5	105.3	5		CL	– GREY AND BROWN CLAY, SOME SHALE FRAGMENTS AND SAND, MOIST, HARD
17		X		10.8	94.3	10		SM	– GREY TO REDDISH BROWN SILTY SAND, MOIST, DENSE
						15			– OCCASIONAL CLAY LAYER OR SHALE FRAGMENTS
						20			
								SM	SOIL – GREY SILTY SAND, MOIST, DENSE
						25		SM	TERRACE DEPOSITS – REDDISH BROWN SILTY SAND, MOIST, VERY DENSE

NOTES:
1) TOTAL DEPTH 26 FEET
2) NO CAVING
3) HOLE BACKFILLED
4) DRIVING WEIGHT FOR SAMPLER IS 1500 POUND KELLY BAR

G. A. NICOLL & ASSOCIATES	Block 100 Newport Center The Irvine Company	DRILLHOLE LOG			HOLE NO.
		project no.	date	sheet	
		1010	Nov. 1972	1 of 1	B-4

DRILL RIG: Bucket Auger | **HOLE ELEV.:** 152 feet | **LOGGED BY:** GAN

GROUNDWATER DEPTH: None | **HOLE DIA.:** 24 inch | **DATE:** Nov. 3, 1972

blows/foot	sampler: bulk	sampler: split spoon	sampler: tube	moisture (%)	dry density (pcf)	depth (feet)	soil type	DESCRIPTION AND REMARKS
							SM	FILL - TAN SILTY SAND, DRY, LOOSE
							SM	- TAN SILTY SAND, MOIST, MEDIUM DENSE
8		X		15.9	105.1		CL	- GREY CLAY, SHALE FRAGMENTS, SAND LENSES
12		X		12.9	125.2	5	SM	- REDDISH BROWN AND TAN SILTY SAND
17		X		9.7	105.9	10		- WITH GREY CLAY LAYERS
						15		
						20		
						25		
						30		
							GP	- COBBLES WITH DARK GREY SILTY SAND
						35	—	BEDROCK - MONTEREY FORMATION SHALE WITH INTERBEDS OF SANDSTONE. CONTACT [illegible] BEDDING: N84W, 24SW

NOTES:

1) TOTAL DEPTH 38 FEET
2) NO CAVING
3) HOLE BACKFILLED
4) DRIVING WEIGHT FOR SAMPLER - 1500 POUND KELLY BAR

G. A. NICOLL & ASSOCIATES

Block 100
Newport Center
The Irvine Company

DRILLHOLE LOG

Project no.	date	sheet	HOLE NO.
1010	Nov. 1972	1 of 1	B-5

DRILL RIG: Bucket Auger | **HOLE ELEV.:** 153 feet | **LOGGED BY:** GAN

GROUNDWATER DEPTH: None | **HOLE DIA.:** 24 inch | **DATE:** Nov. 3, 1972

blows/foot	sampler: bulk	sampler: split spoon	sampler: tube	moisture (%)	dry density (pcf)	depth (feet)	soil type	DESCRIPTION AND REMARKS
						0	SM	FILL – TAN SILTY SAND, DRY, LOOSE
8		X		7.9	116.9		SM	– BROWN SILTY SAND, MOIST, MEDIUM DENSE
								– LOCAL REDDISH BROWN CLAYEY SAND, SCATTERED GRAVEL
12		X		10.8	109.7	5		
						10		
11		X		10.6	113.0			
						15		
						20		
							CL	– BLACK CLAY, MOIST, STIFF
							SM	– REDDISH BROWN SILTY SAND, MOIST, MEDIUM DENSE
						25		
							SM	– DARK GREY SILTY SAND, MOIST, MEDIUM DENSE, ROOTS.
						30		– BECOMES GREEN AND GREY
						35		
							SM	– REDDISH BROWN SILTY SAND, SOME GREY CLAY AND SHALE FRAGMENTS
						40		
							–	BEDROCK – MONTEREY FORMATION SHALE AND SANDSTONE
						45		

NOTES: 1) TOTAL DEPTH 45½ FT. 2) NO CAVING 3) HOLE BACKFILLED 4) SAMPLE DRIVING WEIGHT IS 1500 POUND KELLY BAR

G. A. NICOLL & ASSOCIATES	Block 100 Newport Center The Irvine Company	DRILLHOLE LOG			HOLE NO.
		Project no.	date	sheet	
		1010	Nov. 1972	1 of 1	B-6

DRILL RIG: Bucket Auger | **HOLE ELEV.:** 150 feet | **LOGGED BY:** GAN

GROUNDWATER DEPTH: None | **HOLE DIA.:** 24 inch | **DATE:** Nov. 3, 1972

blows/foot	sampler: bulk	sampler: split spoon	sampler: tube	moisture (%)	dry density (pcf)	depth (feet)	soil type	DESCRIPTION AND REMARKS
							SM	FILL – TAN SILTY SAND, DRY, LOOSE
								– BECOMES BROWN, MOIST, MEDIUM DENSE
2		X		9.6	104.3			
6		X		10.0	107.3	5		
								– LOCALLY REDDISH BROWN
						10		
						15		
5		X		15.1	109.3	20		
						25		
						30		
							GM	– COBBLES
						35	—	BEDROCK – MONTEREY FORMATION SHALE, SOME SANDSTONE

NOTES:

1) TOTAL DEPTH 36 FEET
2) NO CAVING
3) HOLE BACKFILLED
4) SAMPLE DRIVING WEIGHT 1500 POUND KELLY BAR

G. A. NICOLL & ASSOCIATES

Block 100
Newport Center
The Irvine Company

DRILLHOLE LOG

Project no.	date	sheet	HOLE NO.
1010	Nov. 1972	1 of 1	B-7

DRILL RIG: Bucket Auger		HOLE ELEV.: 146 feet	LOGGED BY: GAN
GROUNDWATER DEPTH: None		HOLE DIA.: 24 inch	DATE: Nov. 3, 1972

blows/foot	sampler: bulk	sampler: split spoon	sampler: tube	moisture (%)	dry density (pcf)	depth (feet)	soil symbol	soil type	DESCRIPTION AND REMARKS
								SM	FILL – TAN SILTY SAND, DRY, LOOSE – BECOMES BROWN TO REDDISH BROWN, MOIST, MEDIUM DENSE
4		X		18.5	97.3				
8		X		13.4	104.2	5			
									– LENS OF GREY CLAY
						10			
6		X		14.5	113.1	15			
						20			
						25			
									– GREY SILTY SAND
						30			– REDDISH BROWN SILTY SAND
						35			
									– WITH COBBLES
								–	BEDROCK – MONTEREY FORMATION SHALE AND SANDSTONE
						40			

NOTES:
1) TOTAL DEPTH 40 FEET
2) NO CAVING
3) HOLE BACKFILLED
4) SAMPLER DRIVING WEIGHT IS 1500 POUND KELLY BAR

G. A. NICOLL & ASSOCIATES	Block 100 Newport Center The Irvine Company	DRILLHOLE LOG			HOLE NO.
		Project no.	date	sheet	
		1010	Nov. 1972	1 of 1	B-8

DRILL RIG: Bucket Auger	HOLE ELEV.: 147	LOGGED BY: CAN
GROUNDWATER DEPTH: None	HOLE DIA.: 24 inch	DATE: Nov. 4, 1972

blows/foot	sampler: bulk	sampler: split spoon	sampler: tube	moisture (%)	dry density (pcf)	depth (feet)	soil symbol	soil type	DESCRIPTION AND REMARKS
								SM	FILL - TAN SILTY SAND, DRY, LOOSE REDDISH BROWN SILTY SAND MOIST, MEDIUM DENSE
4		X		8.0	105.5				
10		X		24.0	96.9	5			
								CL	- GREY SANDY CLAY, MOIST, STIFF
								SM	- REDDISH BROWN SILTY SAND, MOIST, MEDIUM DENSE
20		X		9.9	105.8	10			
						15			
						20			
								CL	
						25		SM	
						30			
								CL	- GREY CLAY WITH SHALE FRAGMENTS
								—	BEDROCK - MONTEREY FORMATION SHALE & SANDSTONE

NOTES:

1) TOTAL DEPTH 39 FEET
2) NO CAVING
3) HOLE BACKFILLED
4) DRIVING WEIGHT FOR SAMPLER: 1500 POUND KELLY BAR

G. A. NICOLL & ASSOCIATES	Block 100 Newport Center The Irvine Company	DRILLHOLE LOG			HOLE NO.
		Project no. 1010	date Nov. 1972	sheet 1 of 1	B-9

DRILL RIG: Bucket Auger	HOLE ELEV.: 147 feet	LOGGED BY: GAN
GROUNDWATER DEPTH: None	HOLE DIA.: 24 inch	DATE: Nov. 4, 1972

blows/foot	sampler: bulk	sampler: split spoon	sampler: tube	moisture (%)	dry density (pcf)	depth (feet)	soil symbol	soil type	DESCRIPTION AND REMARKS
								SM	FILL — BROWN AND REDDISH BROWN SILTY FINE SAND, MOIST, MEDIUM DENSE
		X		21.7	97.1				
		X		22.8	98.8	5			— LAYERS OF GREY AND BROWN SILTY CLAY
		X		15.2	112.9	10			— TAN SILTY FINE SAND
						15			— REDDISH BROWN SILTY FINE SAND
						20			

NOTES:
1) TOTAL DEPTH 20 FEET
2) NO CAVING
3) HOLE BACKFILLED
4) SAMPLER DRIVING WEIGHT IS 1500 POUND KELLY BAR

G. A. NICOLL & ASSOCIATES	Block 100 Newport Center The Irvine Company	DRILLHOLE LOG			HOLE NO.
		project no.	date	sheet	
		1010	Nov. 1972	1 of 1	B-10

DRILL RIG: Bucket Auger | **HOLE ELEV.:** 142 feet | **LOGGED BY:** GAN

GROUNDWATER DEPTH: None | **HOLE DIA.:** 24 inch | **DATE:** Nov. 4, 1972

blows/foot	sampler: bulk	sampler: split spoon	sampler: tube	moisture (%)	dry density (pcf)	depth (feet)	soil type	DESCRIPTION AND REMARKS
							SM	FILL — BROWN SILTY SAND, DRY, LOOSE — MOIST BELOW 1 FOOT
6		X		11.6	100.6			
4		X		20.1	100.0	5		
							CL	— GREY SILTY CLAY
							SM	— REDDISH BROWN SILTY SAND WITH SOME GREY CLAY
10		X		17.3	106.7	10		
							CL	— DARK GREY SILTY CLAY, SOME ROOTS, GRAVEL
						15		
							SM	— REDDISH BROWN SILTY SAND, MOIST, MEDIUM DENSE — BECOMES GREY WITH SOME ORGANICS
8		X		8.8	127.7	20		
							SM	— REDDISH BROWN SILTY SAND
						25		

NOTES:
1) TOTAL DEPTH 25 FEET
2) NO CAVING
3) HOLE BACKFILLED
4) SAMPLER DRIVEN BY 1500 POUND KELLY

G. A. NICOLL & ASSOCIATES

Block 100
Newport Center
The Irvine Company

DRILLHOLE LOG

Project no.	date	sheet	HOLE NO.
1010	Nov. 1972	1 of 1	B-11

DRILL RIG: Bucket Auger	HOLE ELEV.: 154 feet	LOGGED BY: GAN
GROUNDWATER DEPTH: None	HOLE DIA.: 24 inch	DATE: Nov. 4, 1972

blows/foot	sampler: bulk	sampler: split spoon	sampler: tube	moisture (%)	dry density (pcf)	depth (feet)	soil symbol	soil type	DESCRIPTION AND REMARKS
								SM	FILL - REDDISH BROWN SILTY SAND, DRY, LOOSE
									- MOIST AND MEDIUM DENSE
8		X		11.4	109.2				
								CL SM	- SOME GREY SILTY CLAY LAYERS
6		X		25.5	96.2	5			

NOTES:
1) TOTAL DEPTH 6 FEET
2) NO CAVING
3) HOLE BACKFILLED
4) DRIVING WEIGHT FOR SAMPLER - 1500 POUND KELLY BAR

G. A. NICOLL & ASSOCIATES	Block 100 Newport Center The Irvine Company	DRILLHOLE LOG			HOLE NO.
		Project no.	date	sheet	
		1010	Nov. 1972	1 of 1	B-12

DRILL RIG: Bucket Auger	HOLE ELEV.: 154 feet	LOGGED BY: GAN
GROUNDWATER DEPTH: None	HOLE DIA.: 24 inch	DATE: Nov. 4, 1972

blows/foot	sampler: bulk	sampler: split spoon	sampler: tube	moisture (%)	dry density (pcf)	depth (feet)	soil symbol	soil type	DESCRIPTION AND REMARKS
								SM	FILL – TAN SILTY SAND, DRY, LOOSE
8		☒		9.7	117.5				– BECOMES MOIST, MEDIUM DENSE
6		☒		26.8	94.8	5		CL	– WITH GREY SILTY CLAY LAYERS

NOTES:
1) TOTAL DEPTH 6 FEET
2) NO CAVING
3) HOLE BACKFILLED
4) SAMPLER DRIVING WEIGHT IS 1500 POUND KELLY BAR

G. A. NICOLL & ASSOCIATES	Block 100 Newport Center The Irvine Company	DRILLHOLE LOG			HOLE NO.
		Project no.	date	sheet	
		1010	Nov. 1972	1 of 1	B-13

DRILL RIG: Bucket Auger	HOLE ELEV.: 161 feet	LOGGED BY: GAN
GROUNDWATER DEPTH: None	HOLE DIA.: 24 inch	DATE: Nov. 4, 1972

blows/foot	sampler: bulk	sampler: split spoon	sampler: tube	moisture (%)	dry density (pcf)	depth (feet)	soil symbol	soil type	DESCRIPTION AND REMARKS
						0		SM	FILL - TAN SILTY SAND, DRY, LOOSE
2		X		7.9	106.1				- MOIST, LOOSE
						5			
									- BECOMES MEDIUM DENSE
14		X		8.2	109.2	10			

NOTES:
1) TOTAL DEPTH 10 FEET
2) NO CAVING
3) HOLE BACKFILLED
4) SAMPLER DRIVEN BY 1500 POUND KELLY BAR

G. A. NICOLL & ASSOCIATES	Block 100 Newport Center The Irvine Company	DRILLHOLE LOG			HOLE NO.
		Project no.	date	sheet	
		1010	Nov. 1972	1 of 1	B-14

DRILL RIG: Bucket Auger | **HOLE ELEV.:** 145 feet | **LOGGED BY:** GAN
GROUNDWATER DEPTH: None | **HOLE DIA.:** 24 inch | **DATE:** Nov. 4, 1972

blows/foot	sampler: bulk	sampler: split spoon	sampler: tube	moisture (%)	dry density (pcf)	depth (feet)	soil symbol	soil type	DESCRIPTION AND REMARKS
								SM	FILL – SILTY SAND, DRY, LOOSE
									– MOIST, MEDIUM DENSE
									– LOCAL CLAYEY SILT
16		X		16.5	109.8	5			

NOTES:
1) TOTAL DEPTH 6 FEET
2) NO CAVING
3) HOLE BACKFILLED
4) DRIVING WEIGHT FOR SAMPLER – 1500 POUND KELLY BAR

G. A. NICOLL & ASSOCIATES	Block 100 Newport Center The Irvine Company	DRILLHOLE LOG			HOLE NO.
		Project no.	date	sheet	
		1010	Nov. 1972	1 of 1	B-15

DRILL RIG: Bucket Auger	HOLE ELEV.: 122 feet	LOGGED BY: GAN
GROUNDWATER DEPTH: None	HOLE DIA.: 24 inch	DATE: Nov. 4, 1972

blows/foot	sampler: bulk	sampler: split spoon	sampler: tube	moisture (%)	dry density (pcf)	depth (feet)	soil symbol	soil type	DESCRIPTION AND REMARKS
								SM	FILL — TAN SILTY SAND, DRY, LOOSE
									— MOIST, MEDIUM DENSE
8		X		10.2	110.7				
									— LOCAL REDDISH BROWN SANDY CLAY
						5			

NOTES:
1) TOTAL DEPTH 5 FEET
2) NO CAVING
3) HOLE BACKFILLED
4) SAMPLE DRIVING WEIGHT — 1500 POUND KELLY BAR

G. A. NICOLL & ASSOCIATES	Block 100 Newport Center The Irvine Company	DRILLHOLE LOG			HOLE NO.
		Project no.	date	sheet	
		1010	Nov. 1972	1 of 1	B-16

DRILL RIG: Bucket Auger | **HOLE ELEV.:** 142 feet | **LOGGED BY:** GAN

GROUNDWATER DEPTH: None | **HOLE DIA.:** 24 inch | **DATE:** Nov. 4, 1972

blows/foot	sampler: bulk	sampler: split spoon	sampler: tube	moisture (%)	dry density (pcf)	depth (feet)	soil symbol	soil type	DESCRIPTION AND REMARKS
								SM	FILL – TAN SILTY SAND, DRY, LOOSE
									– MOIST, MEDIUM DENSE
								CL	– GRAY CLAY, MOIST, STIFF
20		X		7.1	109.2	5		SM	– REDDISH BROWN SILTY SAND MOIST, DENSE
								SM	– TAN SILTY SAND, MOIST, DENSE
								SM	– GREY SILTY SAND, MOIST, DENSE
						10		SM	– REDDISH BROWN SILTY SAND, MOIST, DENSE

NOTES:
1) TOTAL DEPTH 10 FEET
2) NO CAVING
3) HOLE BACKFILLED
4) SAMPLER DRIVING WEIGHT=1500 POUND KELLY BAR

G. A. NICOLL & ASSOCIATES

Block 100
Newport Center
The Irvine Company

DRILLHOLE LOG

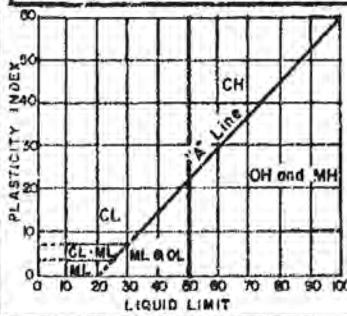
Project no.	date	sheet	HOLE NO.
1010	Nov. 1972	1 of 1	B-17

BORING LOGS BY

MOORE & TABER
(1975)

UNIFIED SOIL CLASSIFICATION

Pt	OH	CH	MH	OL	CL	ML	SC	SM	SP	SW	GC	GM	GP	GW
Highly organic soils	Silts and clays Liquid limit greater than 50			Silts and clays Liquid limit less than 50			Sands with fines >12% fines		Clean sands <5% fines		Gravels with fines >12% fines		Clean gravels <5% fines	
							Sands - more than 50% of coarse fraction is smaller than Nº 4 sieve.				Gravels - more than 50% of coarse fraction is larger than Nº 4 sieve.			
Fine grained soils (More than 50% is smaller than Nº 200 sieve)							Coarse grained soils (More than 50% is larger than Nº 200 sieve)							



LABORATORY CLASSIFICATION CRITERIA

GW and SW - $C_u = \frac{D_{60}}{D_{10}}$ greater than 4 for GW & 6 for SW; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 & 3.

GP and SP - Clean gravel or sand not meeting requirements for GW and SW.

GM and SM - Atterberg limits below "A" line or P.I. less than 4.

GC and SC - Atterberg limits above "A" line with P.I. greater than 7.

Fines (silt or clay)	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel	Cobbles	Boulders
Sieve sizes	200	40	10	4	3/4"	3"	12"

Classification of earth materials shown on this sheet is based on field inspection and should not be construed to imply laboratory analysis unless so stated.

MATERIAL SYMBOLS

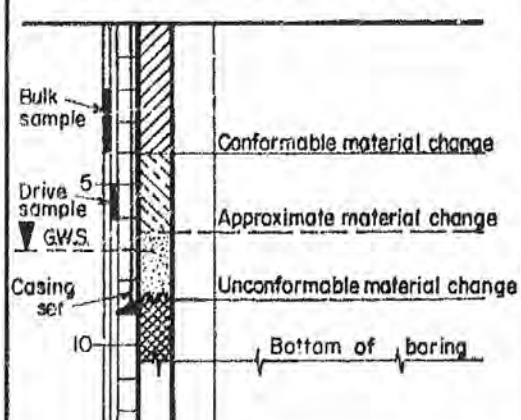
- Gravel
- Sand
- Silt
- Clay
- Sandy clay or clayey sand
- Sandy silt or silty sand
- Silty clay or clayey silt
- Peat or organic matter
- Fill material
- Shale
- Sandstone
- Limestone
- Metamorphic rock
- Igneous rock

CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

Nº of blows	Granular	Cohesive
0 - 5	Very loose	Very soft
6 - 10	Loose	Soft
11 - 20	Semicompact	Stiff
21 - 35	Compact	Very stiff
36 - 70	Dense	Hard
>70	Very dense	Very hard

LEGEND OF BORING



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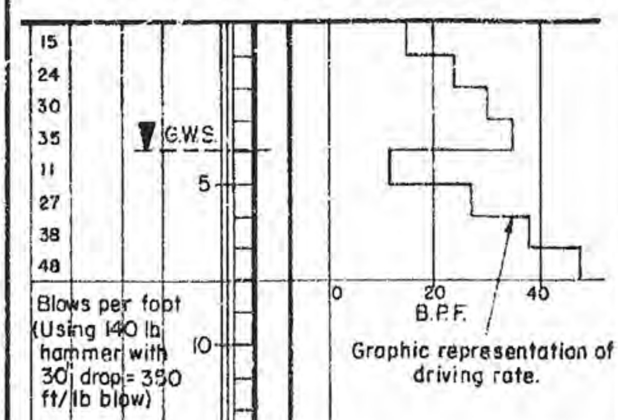


MOORE & TA[illegible]R CONSULTING ENGINEERS AND GEOLOGISTS

TEST BORING LOG

TYPE 18" Bucket Auger

ELEVATION ~101*

BORING 1

STRIKE / DIP	RELATIVE COMPACTION	DRY DENSITY (LBS/CU.FT.)	MOISTURE (%)	BLOWS/FOOT	SAMPLE SIZE (INCHES)	SAMPLE Nº	DEPTH IN FEET
		114	5.6	10	2.5	1	
					Bag	2	
		96	11.1	5	2.5	3	5
		111	10.4	10	2.5	4	10
		111	11.9	10	2.5	5	15
		114	8.8	6	2.5	6	20
		118	7.4	25	2.5	7	25

UNIFIED SOIL CLASS.	DESCRIPTION
SC	Red-brown fine to medium CLAYEY SAND - FILL
SC	Yellow-brown fine CLAYEY SAND - FILL
SM	Light brown fine SILTY SAND - FILL
CL	Greenish SILTY CLAY - FILL
SM	Red-brown fine to medium SILTY SAND
SC	Red-brown fine to medium CLAYEY SAND - FILL
SM	Light brown fine SILTY SAND - FILL
SM	Dark brown SILTY SAND
SM	Red-brown fine SILTY SAND

NOTES

1. No caving
2. No water seepage encountered

* Elevations based on assumed elevation of 100 at top of curb, Newport Center Drive East.

LOGGED BY WMC

DATE 1/14/75

TEST BORING LOG

TYPE: 18" Bucket Auger | ELEVATION ≈100.5 | BORING 2

STRIKE / DIP	RELATIVE COMPACTION	DRY DENSITY (LBS/CU FT)	MOISTURE (%)	BLOWS/FOOT	SAMPLE SIZE (INCHES)	SAMPLE No	DEPTH IN FEET
		91	26.9	11	2.5	1	
							5
		106	11.7	5	2.5	2	
							10
		108	8.3	8	2.5	3	
							15
		109	13.5	8	2.5	4	
		109	5.9	6	2.5	5	20
							25
		109	5.4	5	2.5	6	
		114	7.2	15	2.5	7	30

UNIFIED SOIL CLASS.	DESCRIPTION
SC	Red-brown fine CLAYEY SAND - FILL
SM	Red-brown fine SILTY SAND - FILL
CL	Greenish SILTY CLAY
SM	Red-brown fine SILTY SAND
CL	Red-brown & Greenish SILTY CLAY - FILL
SM	Red-brown fine SILTY SAND - FILL
SM	Red-brown fine SILTY SAND - FILL
SM	Gray-brown fine to medium SILTY SAND & red-brown CLAYEY SAND - FILL
SM	Brown fine SILTY SAND ... changing to red-brown
SC	Mottled red-brown and gray CLAYEY SAND

NOTES

1. No caving
2. No water seepage encountered

LOGGED BY WMC | DATE 1/14/75

MOORE & TABER CONSULTING ENGINEERS AND GEOLOGISTS

TEST BORING LOG

TYPE 18" Bucket Auger | ELEVATION ~100.0 | BORING 1

Strike / Dip	Relative Compaction	Dry Density (lbs/cu.ft)	Moisture (%)	Blows/Foot	Sample Size (inches)	Sample No.	Depth in Feet
		88	23.8	6	2.5	1	
					Bag	2	5
		84	38.1	4	2.5	3	
		116	12.5	4	2.5	4	10
		123	7.5	5	2.5	5	15
		113	5.3	10	2.5	6	20
		101	3.1	18	2.5	7	25

Unified Soil Class	Description
SC	Red-brown fine CLAYEY SAND - FILL
SC	Yellow-brown fine CLAYEY SAND with SHALE - FILL
SM	Red-brown fine SILTY SAND
SC	Gray-brown mottled CLAYEY SAND
ML	Gray-brown SANDY SILT
SM	Red-brown fine SILTY SAND ... some fine CLAYEY SAND layers - FILL
SC	Red-brown fine to medium CLAYEY SAND
SM	Mottled gray and brown fine to coarse SILTY SANDS - FILL
SM	Brown fine SILTY SAND ... changing to red-brown
SP	Light brown fine SAND

NOTES

1. No caving
2. No water seepage encountered

LOGGED BY WMC | DATE 1/14/75

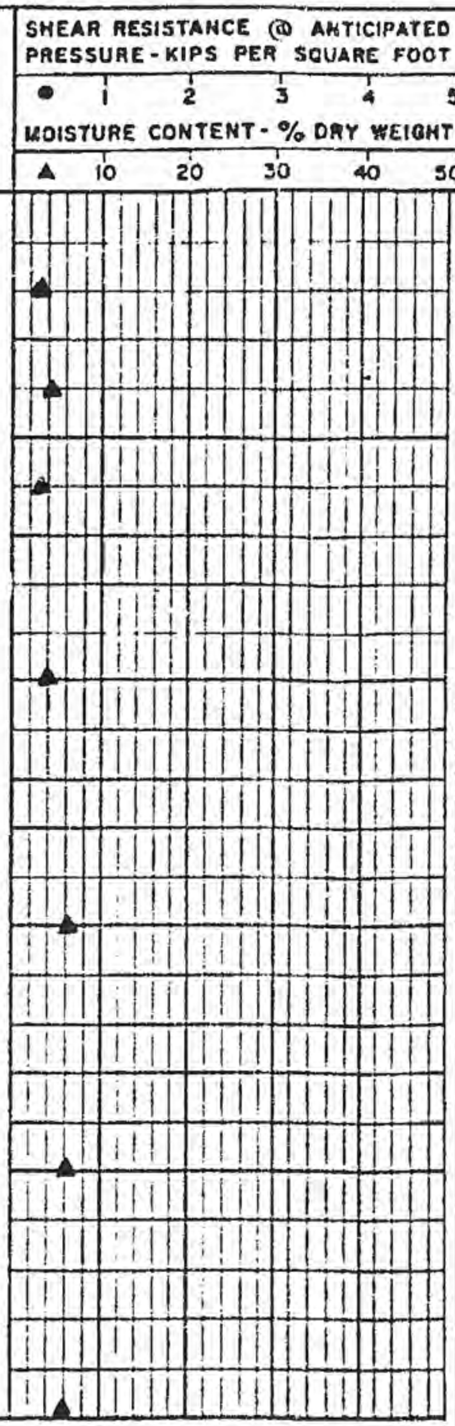
BORING LOGS BY

SOILS INTERNATIONAL
(1988)

LOG OF BORING Nº 1

DATE DRILLED 3-25-88	DRILLING EQUIPMENT 8" Hollowstem
DRIVING WEIGHT 140 pounds - 30" drop	SURFACE ELEVATION

Depth in Feet	Blows per foot	SOILS CLASSIFICATION	COLOR	MOISTURE	CONSISTENCY	DRY UNIT WEIGHT LB. PER CU. FT.
		SAND, fine to medium poorly cemented	Brown	Slight Dry	Mod. Loose	
	14					104
	16	Very fine to fine	Lt. Brown			102
5						
	18					111
10	24	Fine to medium	Orange Brown			101
15	75					99
20	20	Fine			Mod. Comp.	99
25	63					91



Edwards Theatre
300 Newport Center Drive
Newport Beach, Calif.

PROJECT No.	S-1093-F
PLATE	B

SOILS INTERNATIONAL
CONSULTING FOUNDATION ENGINEERS & ENGINEERING GEOLOGISTS

LOG OF BORING Nº 1 continued . . .

DATE DRILLED 3-25-88 | DRILLING EQUIPMENT 8" Hollowstem

DRIVING WEIGHT 140 pounds - 30" drop | SURFACE ELEVATION

Depth in Feet	Samples	Blows per foot	SOILS CLASSIFICATION	COLOR	MOISTURE	CONSISTENCY	DRY UNIT WEIGHT LB. PER CU. FT.	SHEAR RESISTANCE @ ANTICIPATED PRESSURE - KIPS PER SQUARE FOOT ● 1 2 3 4 5 / MOISTURE CONTENT - % DRY WEIGHT ▲ 10 20 30 40 50
			Sand, fine to medium		Sl. Moist	Mod. Comp.		
			Siltstone		Moist	Comp.		
30	●	29					87	▲ (approx. 22)
			Sandstone with siltstone fragments					
35	●	20					67	▲ (approx. 36)
			End of Boring @ 35 feet No caving No groundwater					
40								
45								
50								

● Core Sample

○ Bulk Sample

Edwards Theatre
300 Newport Center Drive
Newport Beach, CAlif.

PROJECT No. S-1093-F

PLATE C

SOILS INTERNATIONAL
CONSULTING FOUNDATION ENGINEERS & ENGINEERING GEOLOGISTS

LOG OF BORING № 2

DATE DRILLED 3-25-88 | DRILLING EQUIPMENT 8" Hollowstem

DRIVING WEIGHT 140 pounds - 30" drop | SURFACE ELEVATION

Depth in Feet	Samples	Blows per foot	SOILS CLASSIFICATION	COLOR	MOISTURE	CONSISTENCY	DRY UNIT WEIGHT LB. PER CU. FT.	MOISTURE CONTENT - % DRY WEIGHT
			FILL Sand, fine clean	Lt Brown to Brown	Sl Dry	Mod Loose		
	●	67	Fine to medium clean				108	▲
	●	73					120	▲
5								
	●	23					106	▲
10	●	79					107	▲
			Fine, clean	Orange Brown		Mod. Comp.		
15	●	33					99	▲
20	●	71					99	▲
25	●	31					90	▲

SHEAR RESISTANCE @ ANTICIPATED PRESSURE - KIPS PER SQUARE FOOT: ● 1 2 3 4 5

MOISTURE CONTENT - % DRY WEIGHT: ▲ 10 20 30 40 50

Edwards Theatre
300 Newport Center Drive
Newport Beach, Calif.

PROJECT No. S-1093-F

PLATE D

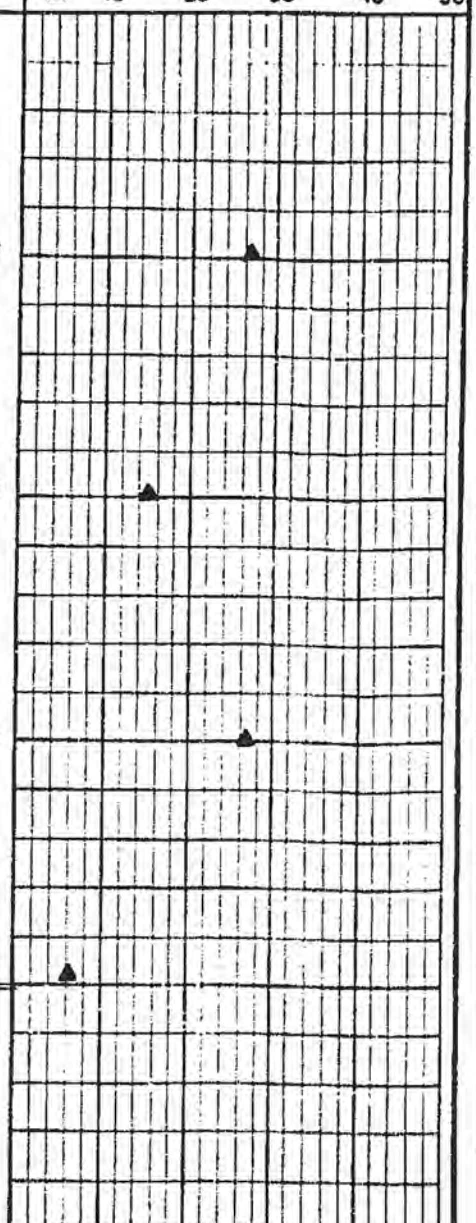
SOILS INTERNATIONAL
CONSULTING FOUNDATION ENGINEERS & ENGINEERING GEOLOGISTS

LOG OF BORING Nº 2 continued. . .

DATE DRILLED 3-25-88	DRILLING EQUIPMENT 8" Hollowstem
DRIVING WEIGHT 140 pounds - 30" Drop	SURFACE ELEVATION

Depth in Feet	Samples	Blows per foot	SOILS CLASSIFICATION	COLOR	MOISTURE	CONSISTENCY	DRY UNIT WEIGHT LB. PER CU. FT.
			SAND, fine to medium	Orange Brown	Sl. Moist	Mod. Comp.	
			Siltstone/sandstone	Tan	Moist	Comp.	
30	●	36					77
35	●	52					93
40	●	79					82
			Sandstone lense of siltstone	Grey Tan			
45	●	95					95
			End of Boring @ 45' No caving No groundwater				
50							

SHEAR RESISTANCE @ ANTICIPATED PRESSURE - KIPS PER SQUARE FOOT
● 1 2 3 4 5
MOISTURE CONTENT - % DRY WEIGHT
▲ 10 20 30 40 50



Edwards Theatre
300 Newport Center Drive
Newport Beach, Calif.

PROJECT No.	S-1093-F
PLATE	E

SOILS INTERNATIONAL
CONSULTING FOUNDATION ENGINEERS & ENGINEERING GEOLOGISTS

BORING LOGS BY

R.T. FRANKIAN & ASSOCIATES
(1994)

LOG OF BORINGS 94-029-A BORING NUMBER 1

CLIENT ____________ JOB NO. ____________

Sample Depth	Blows Per Foot	Moisture Content (%)	Dry Unit Weight Lbs. Per Cu. Ft.	Depth In Feet		ELEVATION· 69½± DESCRIPTION Surface Conditions: Asphalt 6" thick - no base
				0	SM	SAND: Tan-brown, silty, fine to medium moist, dense to very dense
1½	5	11	120			mottled tan-brown and medium brown
3	8	11	113		Ss	SANDSTONE: Mottled rust-brown-gray, fine sandstone, moist, hard
				5		
6	10	9	109			
10	6	23	92	10		mottled rust-brown-olive-gray with olive-gray shale bedrock, root fragment
						mottled rust-brown-white, and olive-gray, fine sandstone with olive-gray siltstone bedding, moist, firm to medium hard
14	7	28	87			
				15		grades olive-buff colored fine sandstone, less moist
						lenses of very hard hsale
				20		End of boring at 20 feet No water - no caving

R.T. FRANKIAN & ASSOCIATES
Theoretical and Applied Earth Mechanics

LOG OF BORINGS 94-029-A BORING NUMBER 2

CLIENT ________ JOB NO. ________

ELEVATION: 72½±

DESCRIPTION

Surface Conditions: Asphalt 7" thick - no base

Sample Depth	Blows Per Foot	Moisture Content (%)	Dry Unit Weight Lbs. Per Cu. Ft.	Depth In Feet		Description
				0		SAND: Tan-brown silty fine sand, damp to moist, dense to very dense
2	9/ 10"	9	118			
4	10	5	110		Ss	SANDSTONE: Mottled tan-brown to dark-brown, fine, damp to moist, hard to very hard
				5		
7	12	6	112			grades tan to medium brown sandstone, damp to moist, very hard
						grades olive-gray, moist
10½	6	26	92	10		olive to light green fine sandstone
					S_i	SILTSTONE: Mottled rust-brown and gray siltstone, moist, very firm
				15		
16	12/ 7"	3	107		Ss	SANDSTONE: Buff-gray fine sandstone, damp, very hard
						occasional layers of hard shale bedding
20	10/ 8"	26	87	20		
						End of boring at 20 feet No water - no caving

CLIENT ______ JOB NO. ______

LOG OF BORINGS 94-029-A BORING NUMBER 3

ELEVATION: 76±

DESCRIPTION

Surface Conditions: Concrete 5" thick (+/-) reinforced

Sample Depth	Blows Per Foot	Moisture Content (%)	Dry Unit Weight Lbs. Per Cu. Ft.	Depth In Feet		Description
				0	Af	FILL: Gray silty clay, moist to very moist grades red-brown almoost clean sand, very moist, loose
2	Push &Tap	15	112			
						grades dark olive-brown to black slightly silty sand with lenses of olive colored silty clay, very moist, loose
				5		
8	6	11	114		SM	SAND: Mottled light brown, medium brown, and rust brown, silty, fine, moist, dense to very dense
				10		
11	10	10	114		S_s	SANDSTONE: Mottled rust-brown and gray, fine sandstone, moist, very hard
						occasional lense of silty clay
15	12	7	107	15		mottled rust-brown, olive, tan colored fine sandstone, moist
						occasional lense of hard shale
20	15	26	93	20		

APPENDIX C

LABORATORY TEST RESULTS BY

W.A. WAHLER
(1970)

FOR EXISTING CARWASH SITE

TABLE A-1

FIELD RESISTIVITY TEST RESULTS

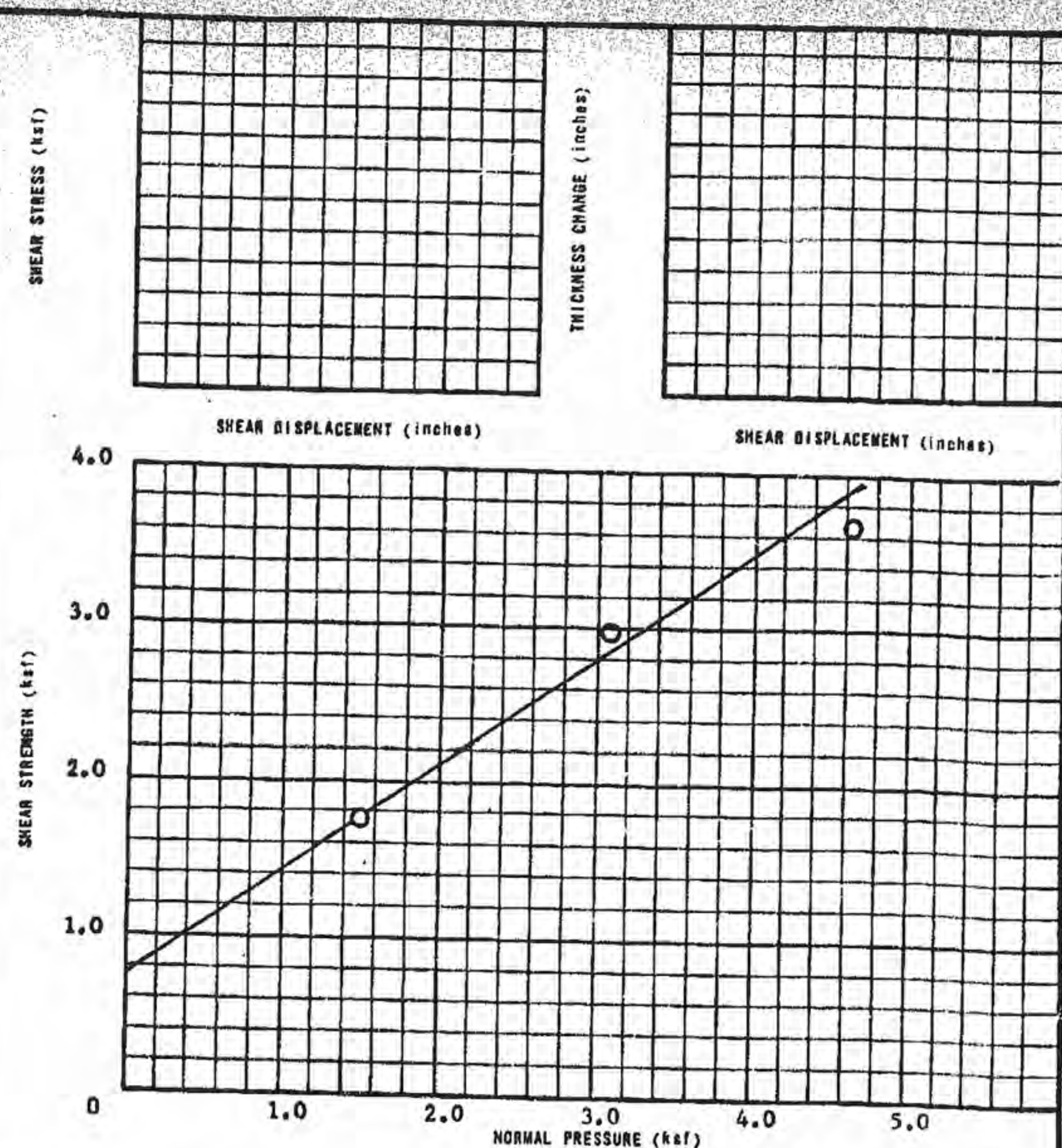
Alignment No.	Test Depth	Soil Classification	Resistivity (ohm-cm)	Corrosivity	Service Life
1	2.5'	Clayey SAND	1435	Severe	10-15
	4.5'	Clayey SAND	1700	Moderate	15-20
	9.0'	SAND	2552	Moderate	15-20
2	2.5'	Clayey SAND	1558	Moderate	15-20
	4.5'	Clayey SAND	1530	Moderate	15-20
	9.0'	SAND	2200	Moderate	15-20
3	10.0'	SAND	1495	Moderate to Severe	12-20
	11.5'	Sandy CLAY	1632	Moderate	15-20

NOTE: pH's were determined for samples from depths of 1', 4.5', 11', 13', and 14'. The pH of each sample was 6.8.

TABLE B-1

DETERMINATION OF NATURAL WATER CONTENT, DRY DENSITY, AND pH

Pit No.	Depth (Ft.)	Sample Description	Unified Soil Classification	Natural Water Content (%)	Natural Dry Density (pcf)	pH
1	0.25	SAND	SP	6.9	112.1	-
	4.5	Clayey SAND	SW-SC	9.1	119.2	6.8
	6	Silty SAND	SP-SM	7.1	108.8	-
	8	Silty SAND	SM	9.7	-	-
	9	Sandy CLAY	CL	13.2	134.3	-
3	1.5	Clayey SAND	SC	16.0	109.8	-
	3.5	Clayey SAND	SP-SC	9.0	119.3	-
4	4.5	Sandy CLAY	CL	30.4	86.3	-
5	1-4	Sandy CLAY	SC	-	-	6.8
	11	Silty SAND	SM	7.2	127.8	6.8
	13	Sandy CLAY	CH	-	-	6.8
	14	SAND	SP	7.1	116.8	6.8



HOLE NO. 1
DEPTH (ft) 4.5
SAMPLE DESCRIPTION Light Brown Clayey SAND
TEST DESIGNATION Q Sat
RATE OF STRAIN .025 in/min.

SPECIMEN NUMBER	1	2	3	
NORMAL PRESSURE (ksf)	1.56	3.09	4.63	
SHEAR STRENGTH (ksf)	1.75	2.99	3.65	
INITIAL WATER CONTENT (%)	9.1	9.1	9.1	
FINAL WATER CONTENT (%)	15.6	14.3	13.4	
DRY DENSITY (pcf)	119.2	119.2	119.2	

NOTE: $\phi = 35^{\circ}$ C = 0.75 ksf

611-2 Rev. 2/69

SOIL MECHANICS and FOUNDATION ENGINEERS Inc.	NEWPORT CENTER CAR WASH NEWPORT BEACH, CALIFORNIA	DIRECT SHEAR TEST		
	PALO ALTO • NEWPORT BEACH • CALIF.	PROJECT NO. 0461	DATE JAN. 1970	DRAWING NO. FIGURE B-1

LABORATORY TEST RESULTS BY

NMG
(2012a & b)

FOR PADS B & C AT FASHION ISLAND

Sample	*Compacted Moisture (%)*	*Compacted Dry Density (pcf)*	*Final Moisture (%)*	*Volumetric Swell (%)*	*Expansion Index[1] Value/Method*		*Expansive Classification[2]*	*Soluble Sulfate (%)*	*Sulfate Exposure[3]*
HS-3 B-1 0-5'	8.6	114.8	13.1	2.8	28	B	Low	.05	Negligible
HS-12 B-1 0-5'	7.5	113.4	12.3	0	0	B	Very Low	0.05	Negligible
HS-13 B-1 0-5'	10.6	112.1	15.7	0.2	5	B	Very Low	0.05	Negligible

Test Method:

ASTM D4829 / UBC Standard 18-2

HACH SF-1 (Turbidimetric)

Notes:

1. Expansion Index (EI) method of determination:
   [A] E.I. determined by adjusting water content to achieve a 50 ±1% degree of saturation
   [B] E.I. calculated based on measured saturation within the range of 40% and 60%
2. 1997 UBC Table 18-1-B *(Classification of Expansive Soil)*
3. 1997 UBC Table 19-A-4 *(Requirement for Concrete Exposed to Sulfate-Containing Solutions)*

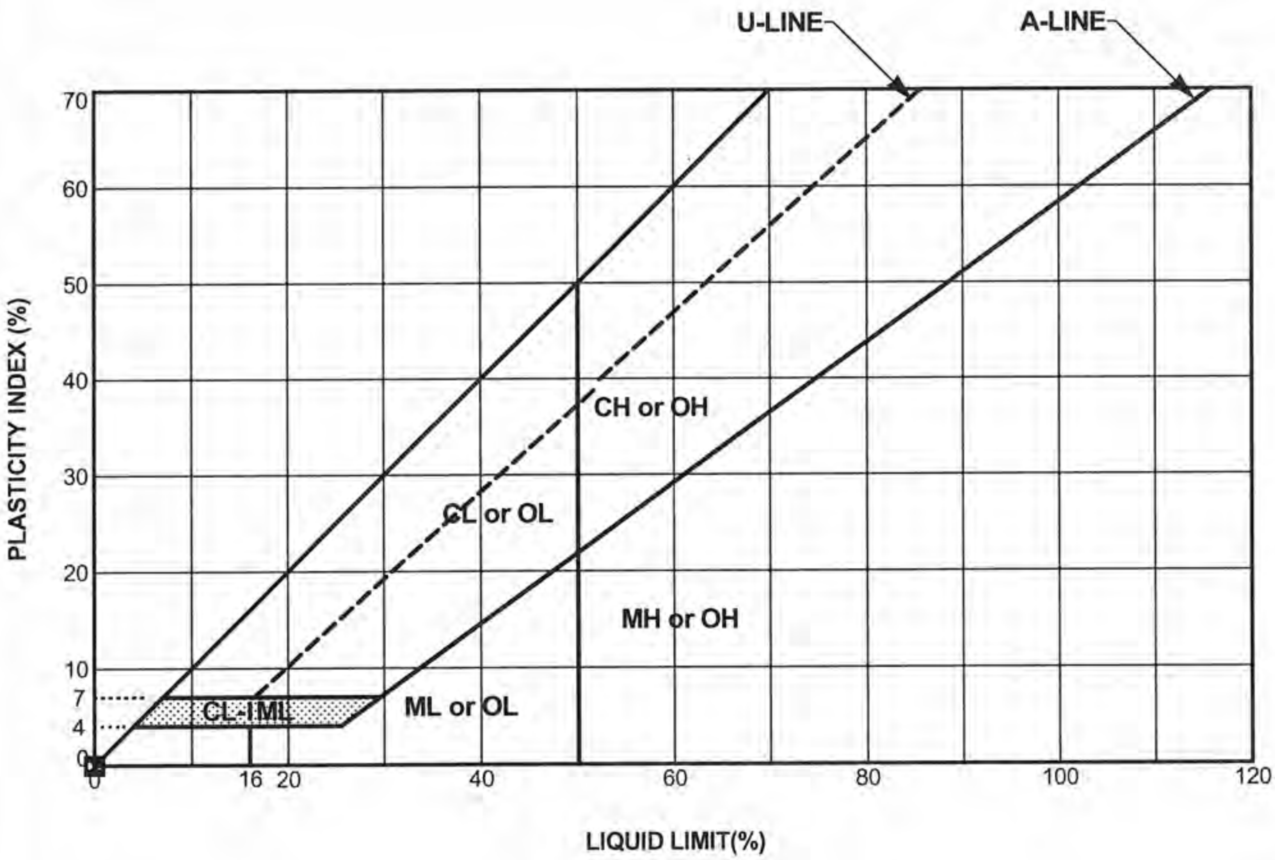
Expansion Index and Soluble Sulfate Test Results

(FRM001 Rev.5)

Project No. 08034-01 and -03

Project Name: FI Eastside

NMG

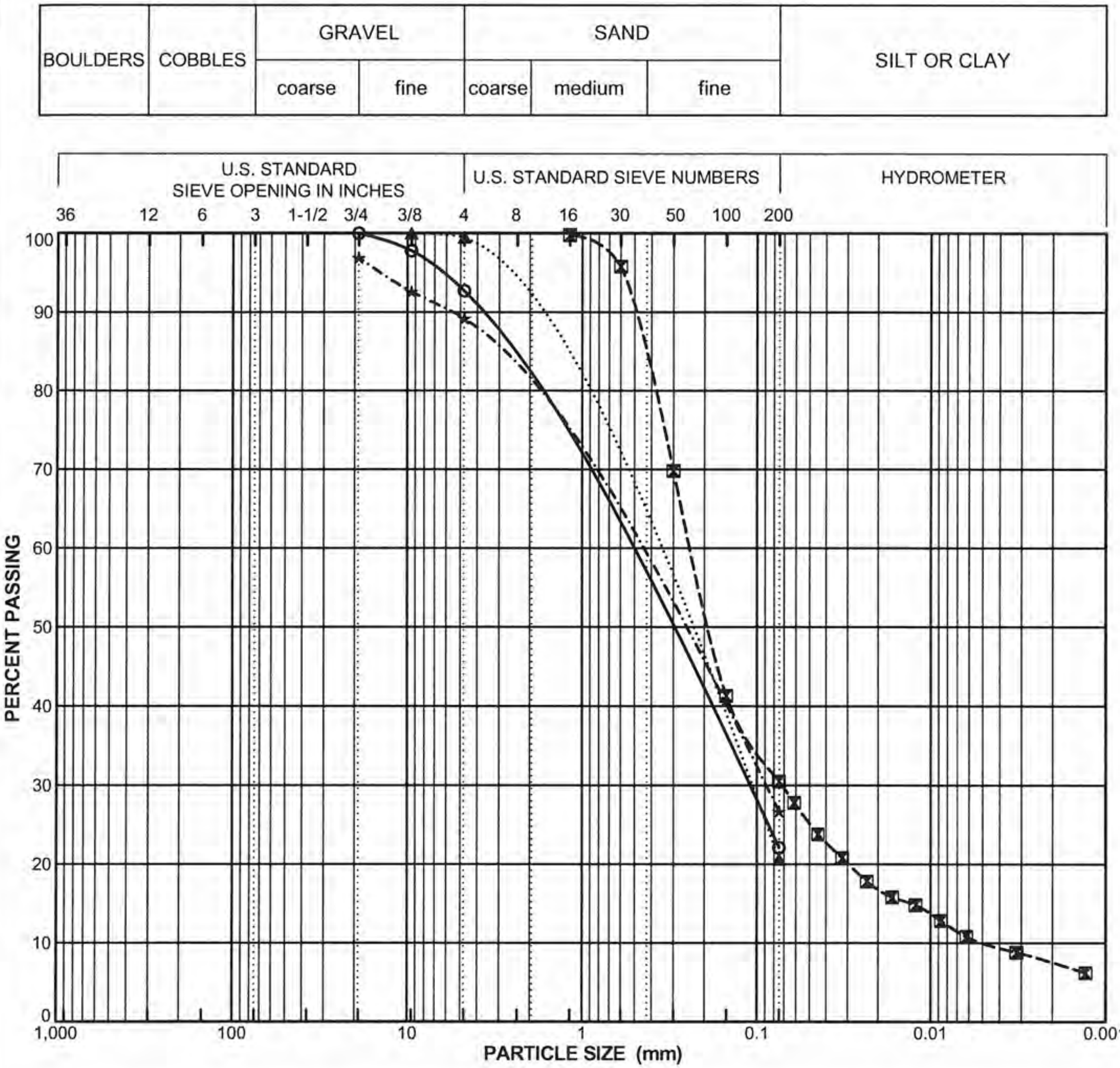


Symbol	Boring Number	Depth (feet)	Sample Number	Passing No. 200 Sieve (%)	LL	PI	USCS	Description
○	HS- 3	2.0	B-1	31	NP	NP	SM	(Af) Dark Brown Silty SAND
⊠	HS-13	2.0	B-1	27	NP	NP	SM	(Af) Brown Silty SAND

PLASTICITY CHART

Fashion Island/Eastside
Newport Beach, California
PROJECT NO. 08034-01

NMG Geotechnical, Inc.

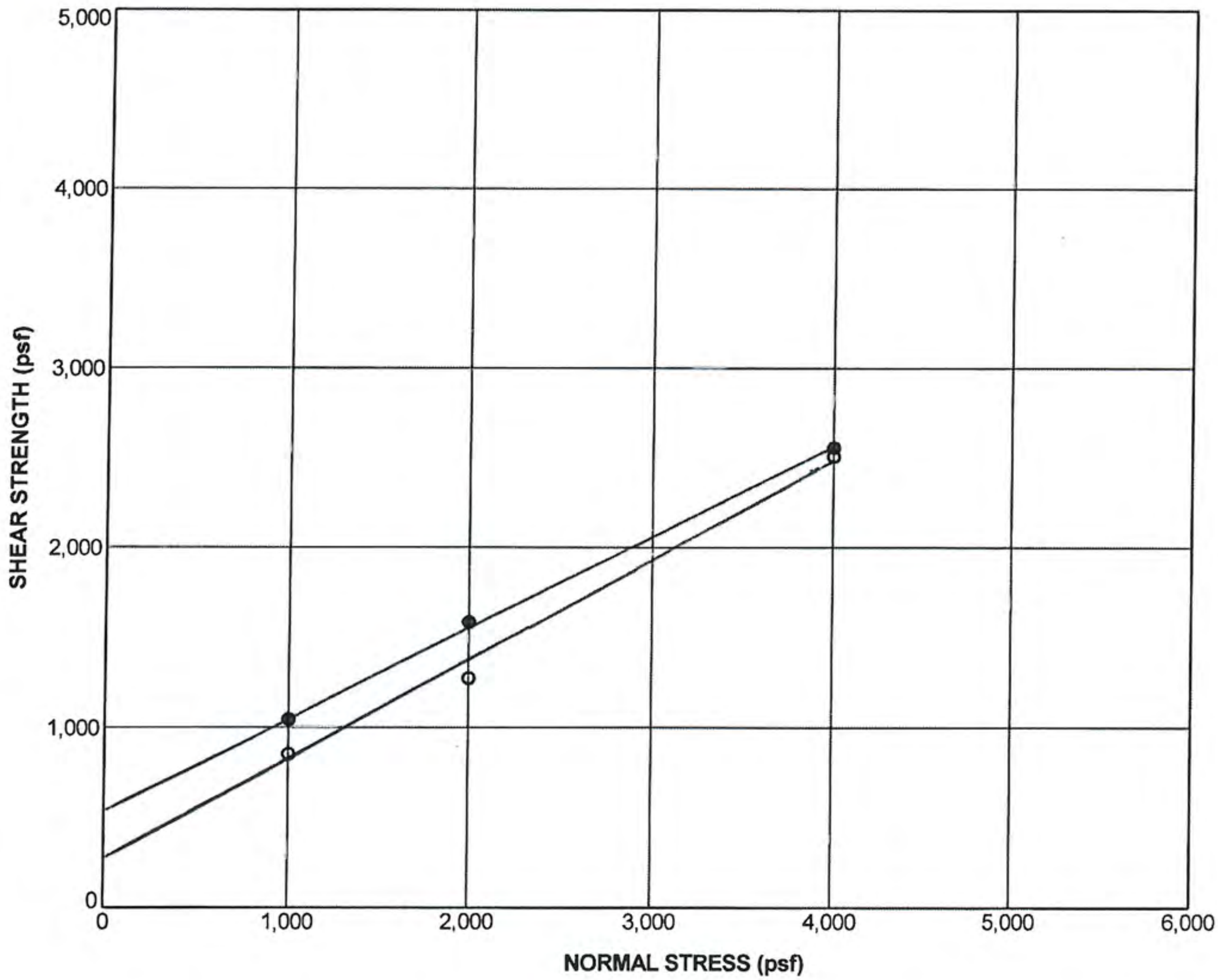


Symbol	Boring Number	Sample Number	Depth (feet)	Field Moisture (%)	LL	PI	Activity PI/-2μ	C_u	C_c	Passing No. 200 Sieve (%)	Passing 2μ (%)	USCS
O	HS- 1	B-1	2.0							22		SP
⊠	HS- 3	B-1	2.0	9	NP	NP				31	7	SM
▲	HS-12	B-1	2.0							21		SM
★	HS-13	B-1	2.0		NP	NP				27		SM

PARTICLE SIZE DISTRIBUTION

Fashion Island/Eastside
Newport Beach, California
PROJECT NO. 08034-01

NMG Geotechnical, Inc.



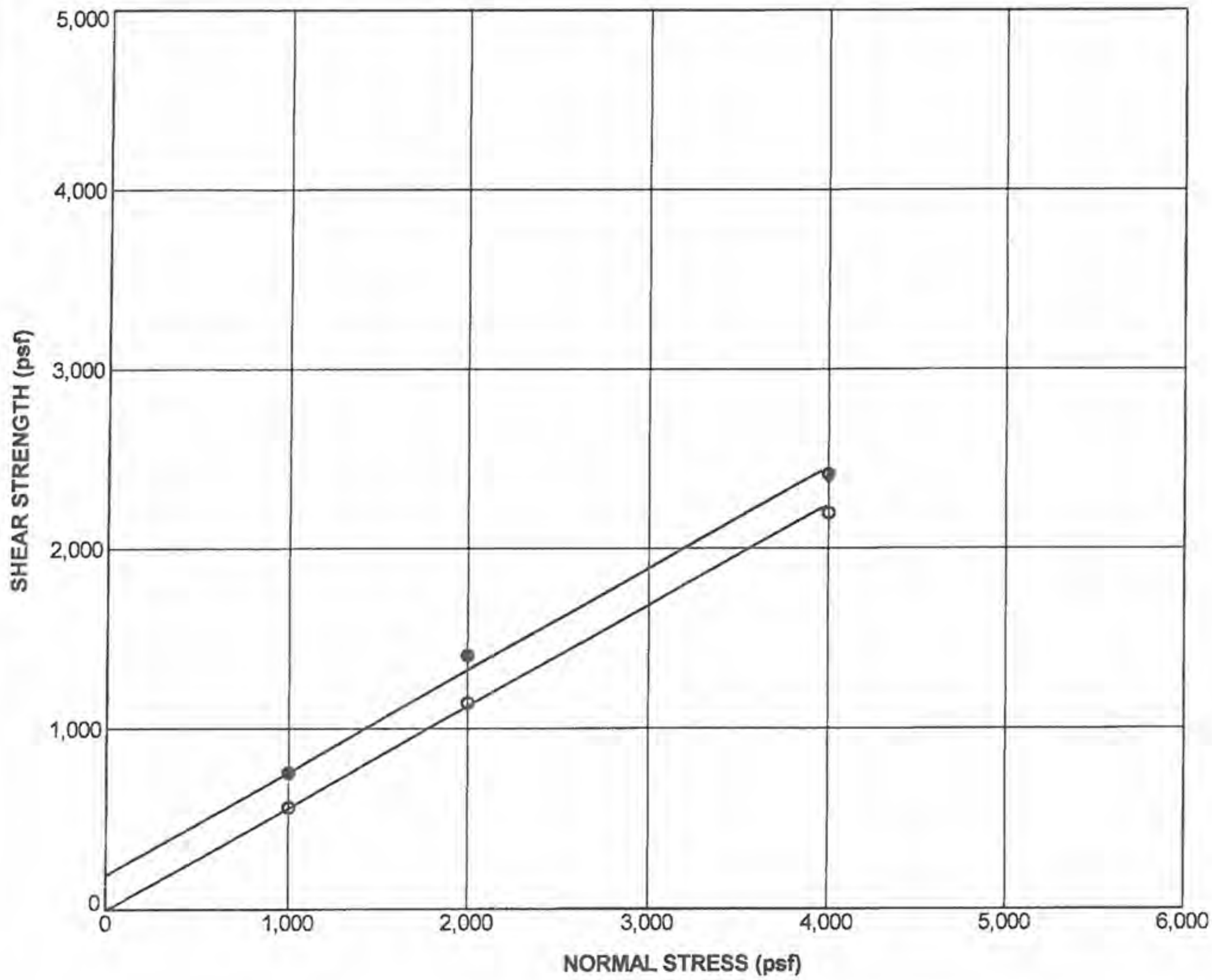
Boring No. HS-3		Sample No. B-1		Depth: 2.0 ft	
Sample Description:	(Af) Dark Brown Silty SAND				
Liquid Limit:	NP	Plasticity Index:	NP	Percent Passing No. 200 Sieve:	31
Moisture Content (%):	16.4	Dry Density (pcf):	112.7	Degree of Saturation (%):	93
Sample Type:	Remolded to 90% RC	Rate of Shear (in./min.):	0.05		

SHEAR STRENGTH PARAMETERS		
Parameter	Peak ●	Ultimate ○
Cohesion (psf)	500	250
Friction Angle (degrees)	27	29.0

DIRECT SHEAR TEST RESULTS

Fashion Island/ Eastside
Fashion Island Retail Center
PROJECT NO. 08034-01

NMG Geotechnical, Inc.



Boring No. HS-12	**Sample No. D-2**	**Depth: 5.0 ft**
Sample Description: (Af) Brown Clayey SAND		
Liquid Limit:	**Plasticity Index:**	**Percent Passing No. 200 Sieve:**
Moisture Content (%): 20.6	**Dry Density (pcf):** 105.0	**Degree of Saturation (%):** 95
Sample Type: Undisturbed	**Rate of Shear (in./min.):** 0.05	

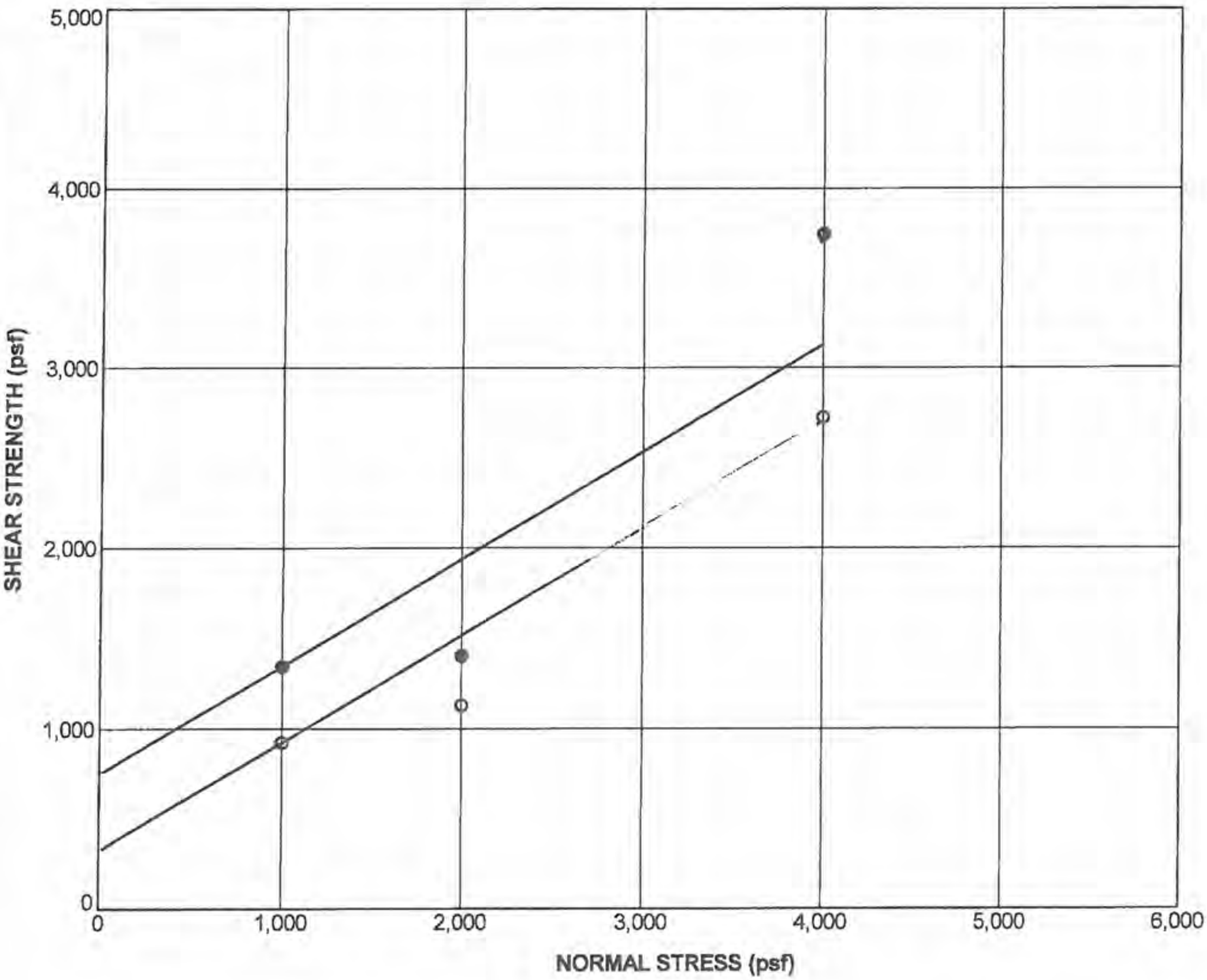
SHEAR STRENGTH PARAMETERS

Parameter	Peak ●	Ultimate ○
Cohesion (psf)	200	0
Friction Angle (degrees)	30	30.0

DIRECT SHEAR TEST RESULTS

Fashion Island/Eastside
Newport Beach, California
PROJECT NO. 08034-01

NMG Geotechnical, Inc.



Boring No. HS-13	**Sample No. D-1**	**Depth: 2.5 ft**
Sample Description: (Af) Brown Silty SAND		
Liquid Limit:	**Plasticity Index:**	**Percent Passing No. 200 Sieve:**
Moisture Content (%): 15.5	**Dry Density (pcf):** 114.5	**Degree of Saturation (%):** 92
Sample Type: Undisturbed	**Rate of Shear (in./min.):** 0.05	

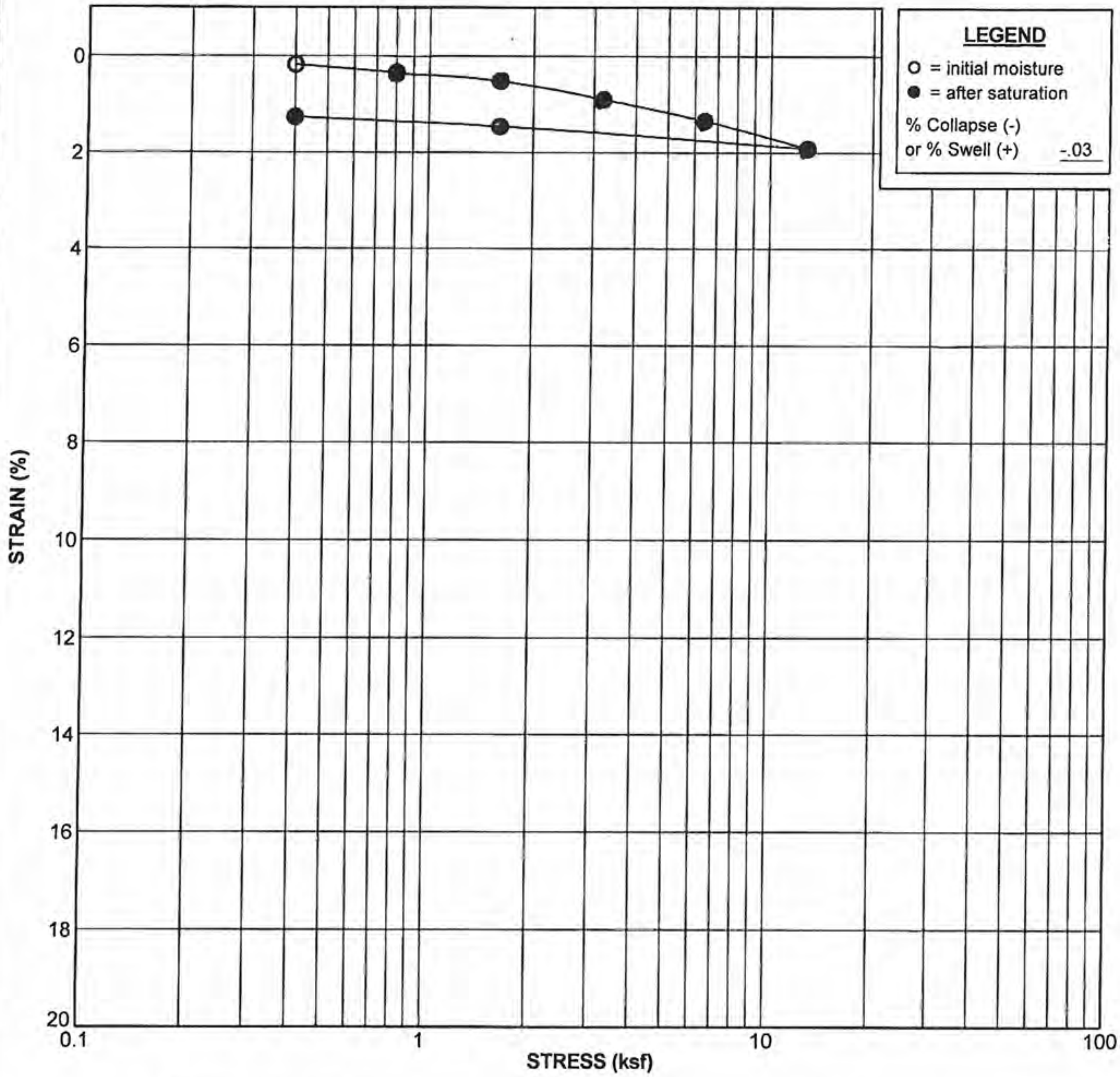
SHEAR STRENGTH PARAMETERS

Parameter	Peak ●	Ultimate ○
Cohesion (psf)	750	350
Friction Angle (degrees)	31	31.0

DIRECT SHEAR TEST RESULTS

Fashion Island/Eastside
Newport Beach, California
PROJECT NO. 08034-01

NMG Geotechnical, Inc.



Boring No. HS-3	Sample No. B-1	Depth: 2.0 ft
Sample Description: (Af) Dark Brown Silty SAND (Remolded to 90%RC)		
Liquid Limit: NP	**Plasticity Index:** NP	**Percent Passing No. 200 Sieve:** 31

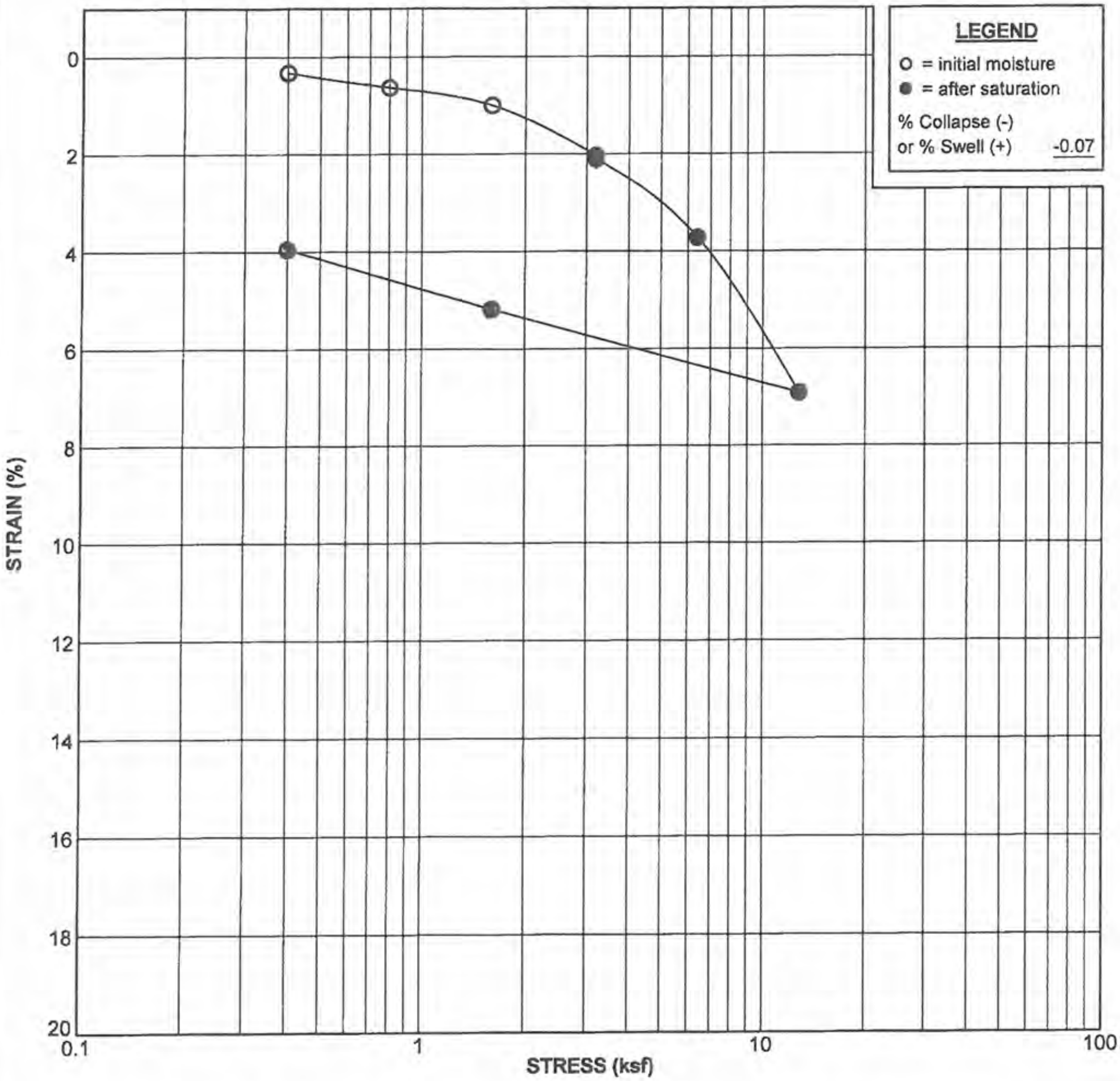
Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	8.6	113.0	49.2	0.463
Final	15.4	114.4	91.6	0.445

CONSOLIDATION TEST RESULTS

Fashion Island/ Eastside
Fashion Island Retail Center
PROJECT NO. 08034-01

NMG Geotechnical, Inc.

Template: NMCONS; Prj ID: 08034-01.GPJ; Printed: 2/27/12



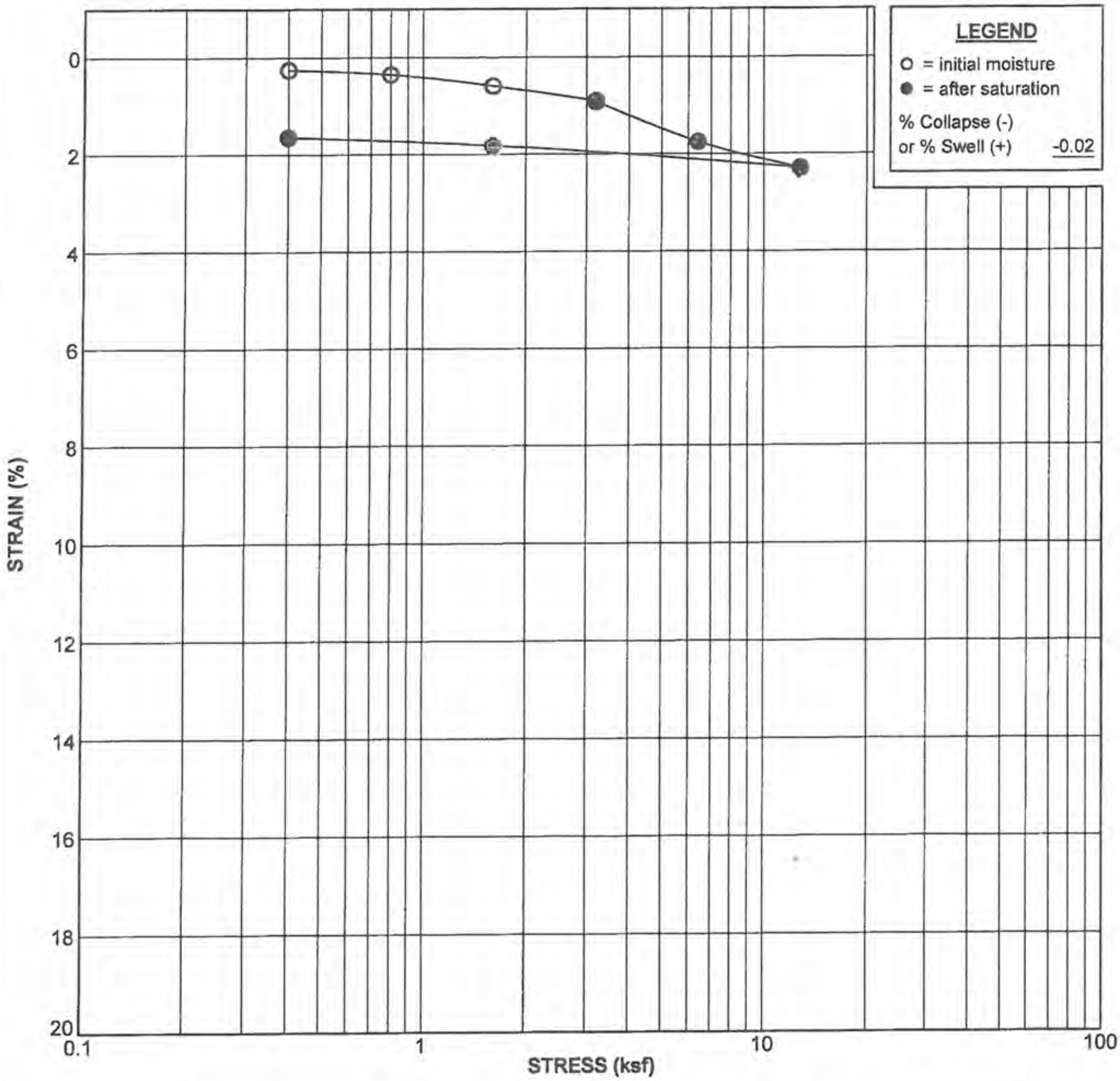
Boring No. HS-12	Sample No. D-3	Depth: 7.5 ft
Sample Description:	(Qal) Pale Gray to Reddish Brown Silty Sandy CLAY	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	22.0	102.3	94.6	0.616
Final	22.2	106.4	106.2	0.554

CONSOLIDATION TEST RESULTS

Fashion Island/Eastside
Newport Beach, California
PROJECT NO. 08034-01

NMG Geotechnical, Inc.



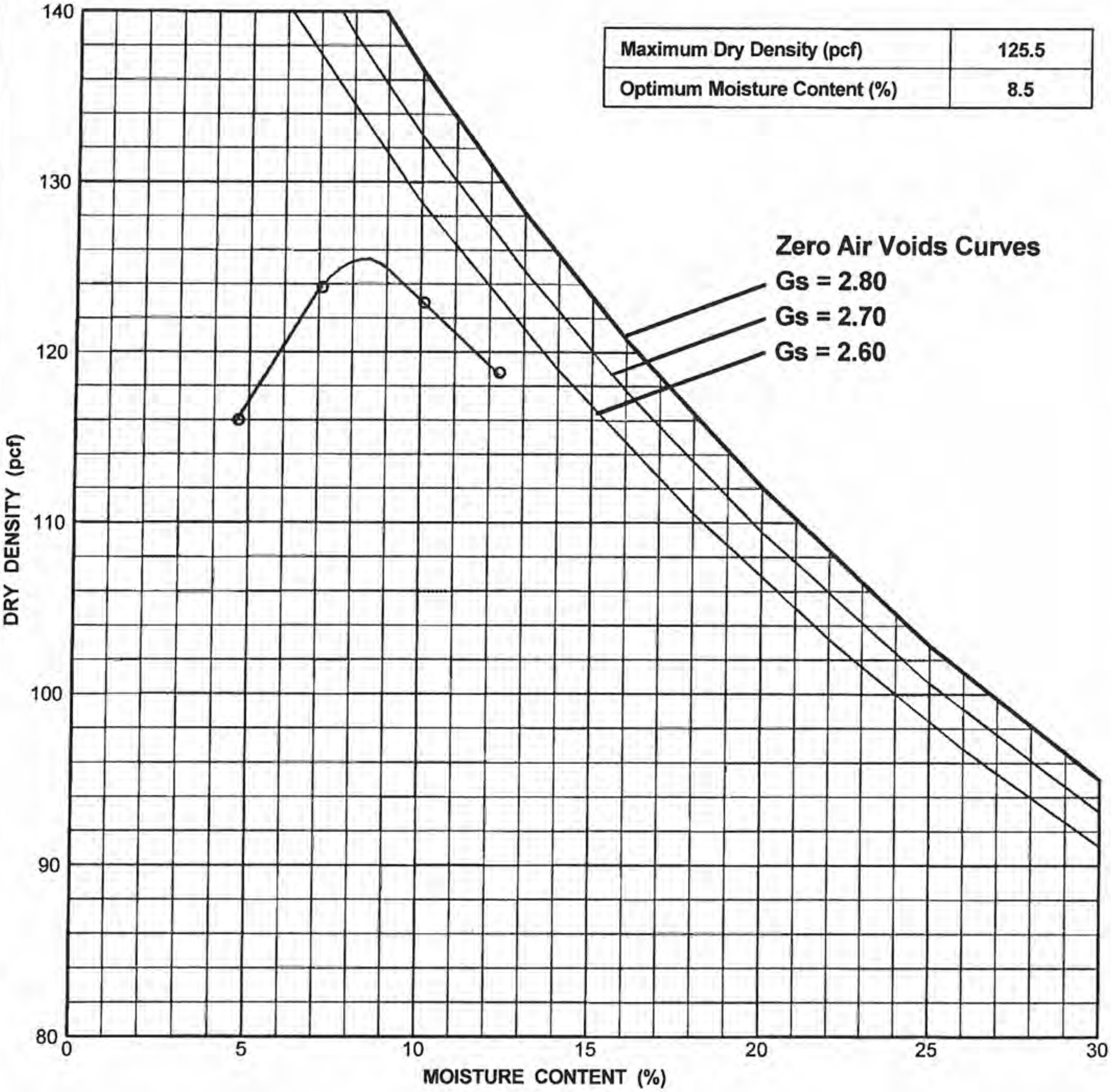
Boring No. HS-13	Sample No. D-3	Depth: 7.5 ft
Sample Description:	(Af) Reddish Brown Silty SAND	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	9.9	113.2	56.9	0.461
Final	13.1	115.1	79.5	0.437

CONSOLIDATION TEST RESULTS

Fashion Island/Eastside
Newport Beach, California
PROJECT NO. 08034-01

NMG Geotechnical, Inc.



Maximum Dry Density (pcf)	125.5
Optimum Moisture Content (%)	8.5

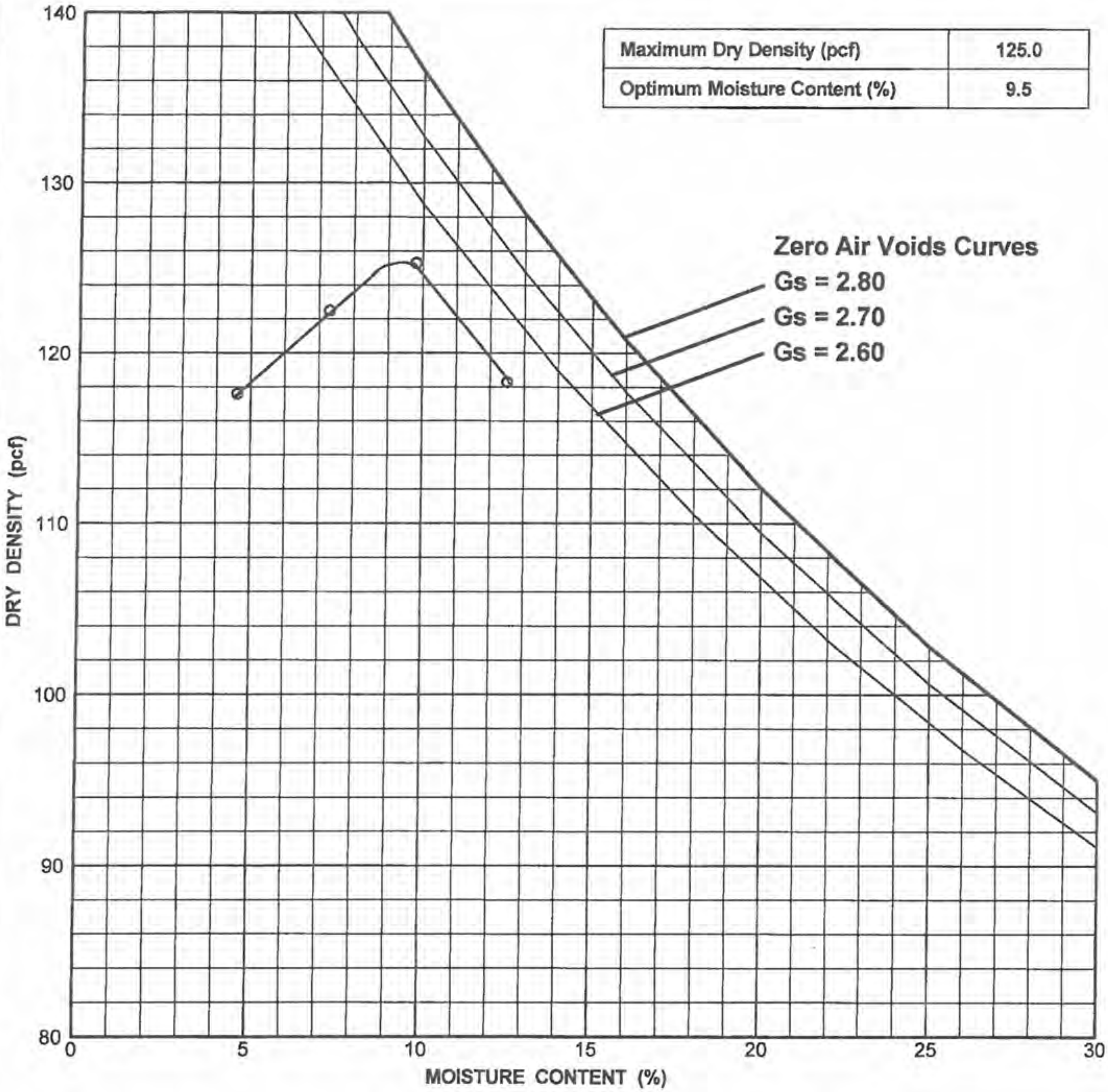
Boring No. HS-3		**Sample No. B-1**		**Depth: 2.0 ft**	
Sample Description:	(Af) Dark Brown Silty SAND				
Liquid Limit:	NP	**Plasticity Index:**	NP	**Percent Passing No. 200 Sieve:**	31
Comments:	1557A				

COMPACTION TEST RESULTS

Fashion Island/ Eastside
Fashion Island Retail Center
PROJECT NO. 08034-01

NMG Geotechnical, Inc.

Maximum Dry Density (pcf)	125.0
Optimum Moisture Content (%)	9.5

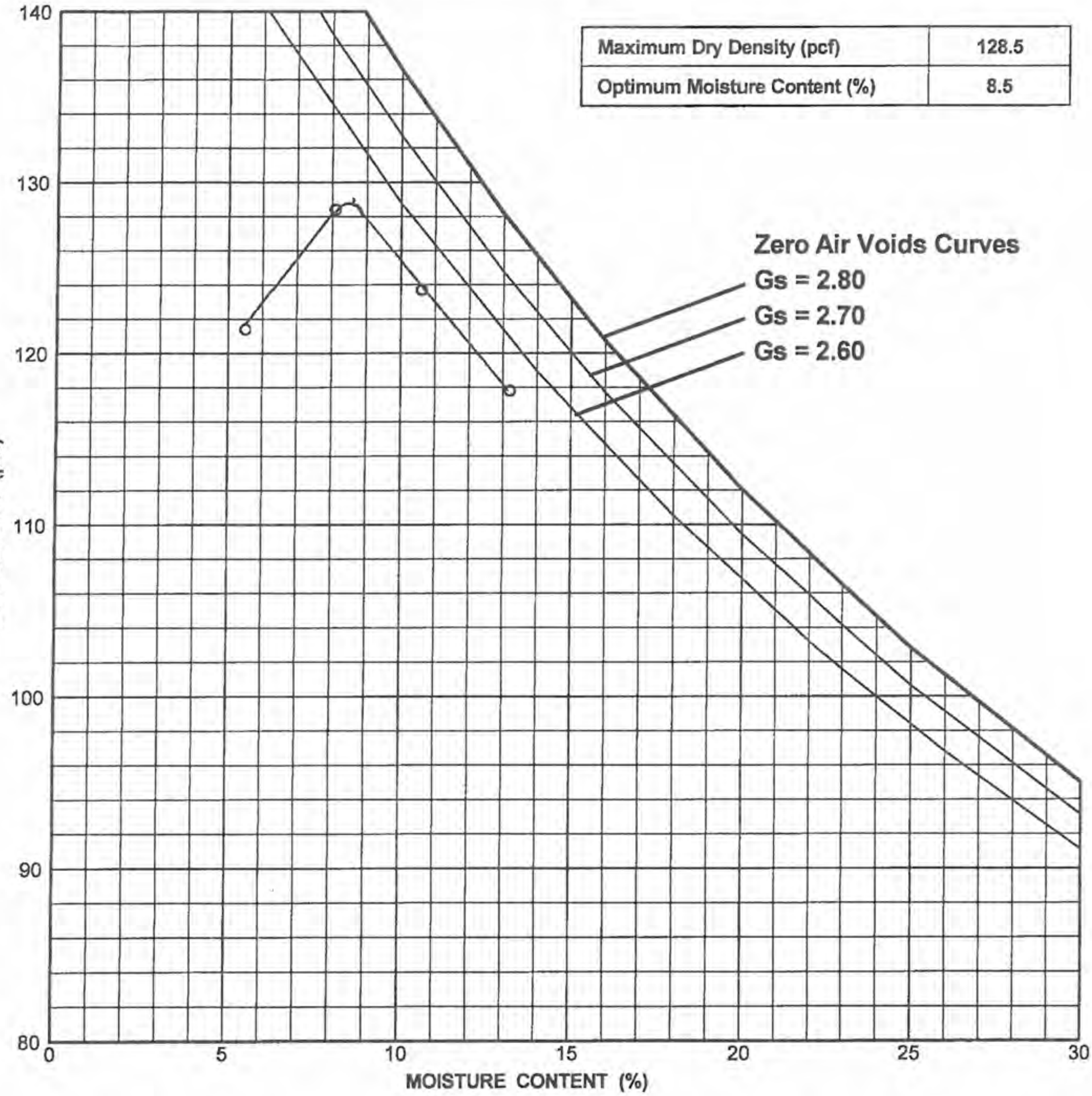


Boring No. HS-12	**Sample No. B-1**	**Depth: 2.0 ft**
Sample Description: (Af) Reddish Brown Silty SAND		
Liquid Limit:	**Plasticity Index:**	**Percent Passing No. 200 Sieve:** 21
Comments: 1557A		

COMPACTION TEST RESULTS

Fashion Island/Eastside
Newport Beach, California
PROJECT NO. 08034-01

NMG Geotechnical, Inc.



Boring No. HS-13		**Sample No. B-1**		**Depth: 2.0 ft**	
Sample Description:	(Af) Brown Silty SAND				
Liquid Limit:	NP	**Plasticity Index:**	NP	**Percent Passing No. 200 Sieve:**	27
Comments:	1557A				

COMPACTION TEST RESULTS

Fashion Island/Eastside
Newport Beach, California
PROJECT NO. 08034-01

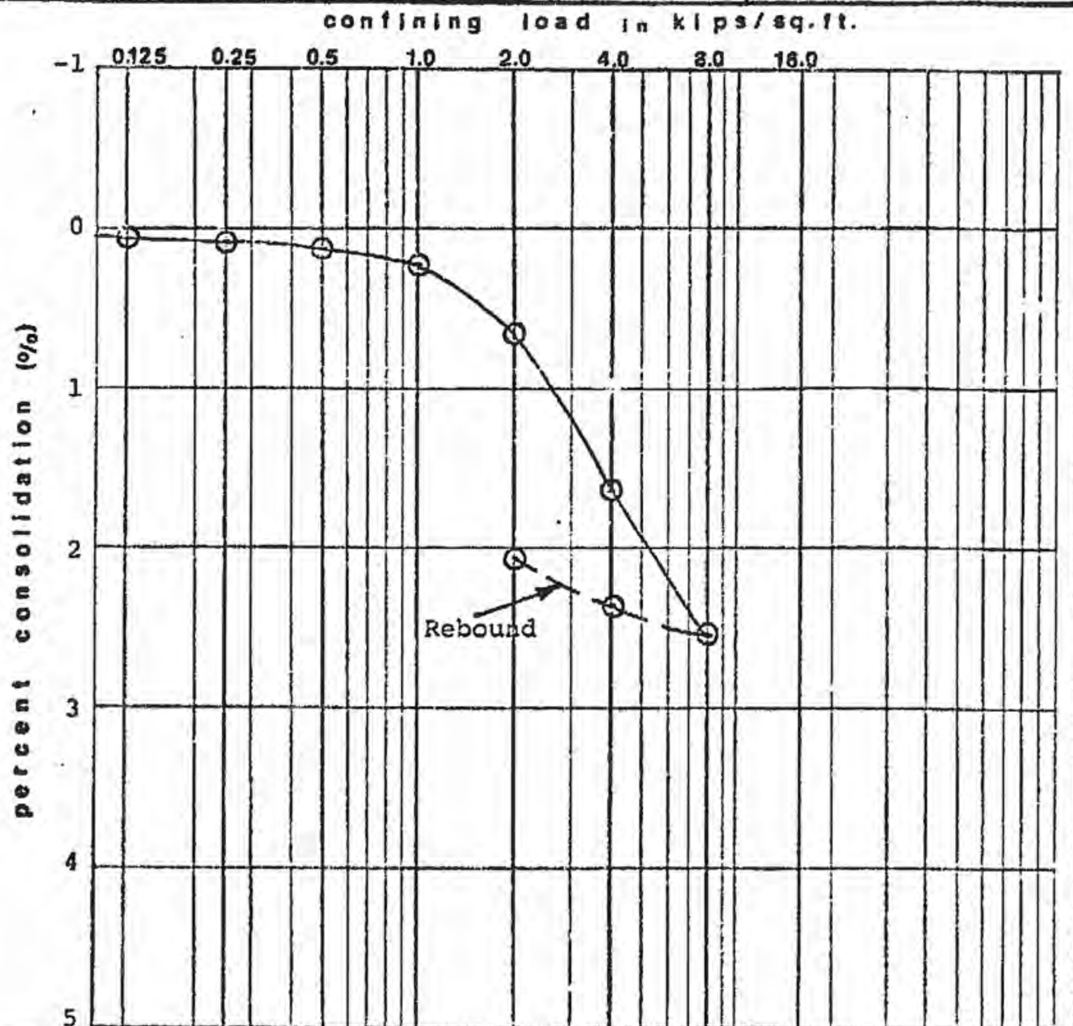
NMG Geotechnical, Inc.

LABORATORY TEST RESULTS BY

G.A. NICOLL & ASSOCIATES (1972)

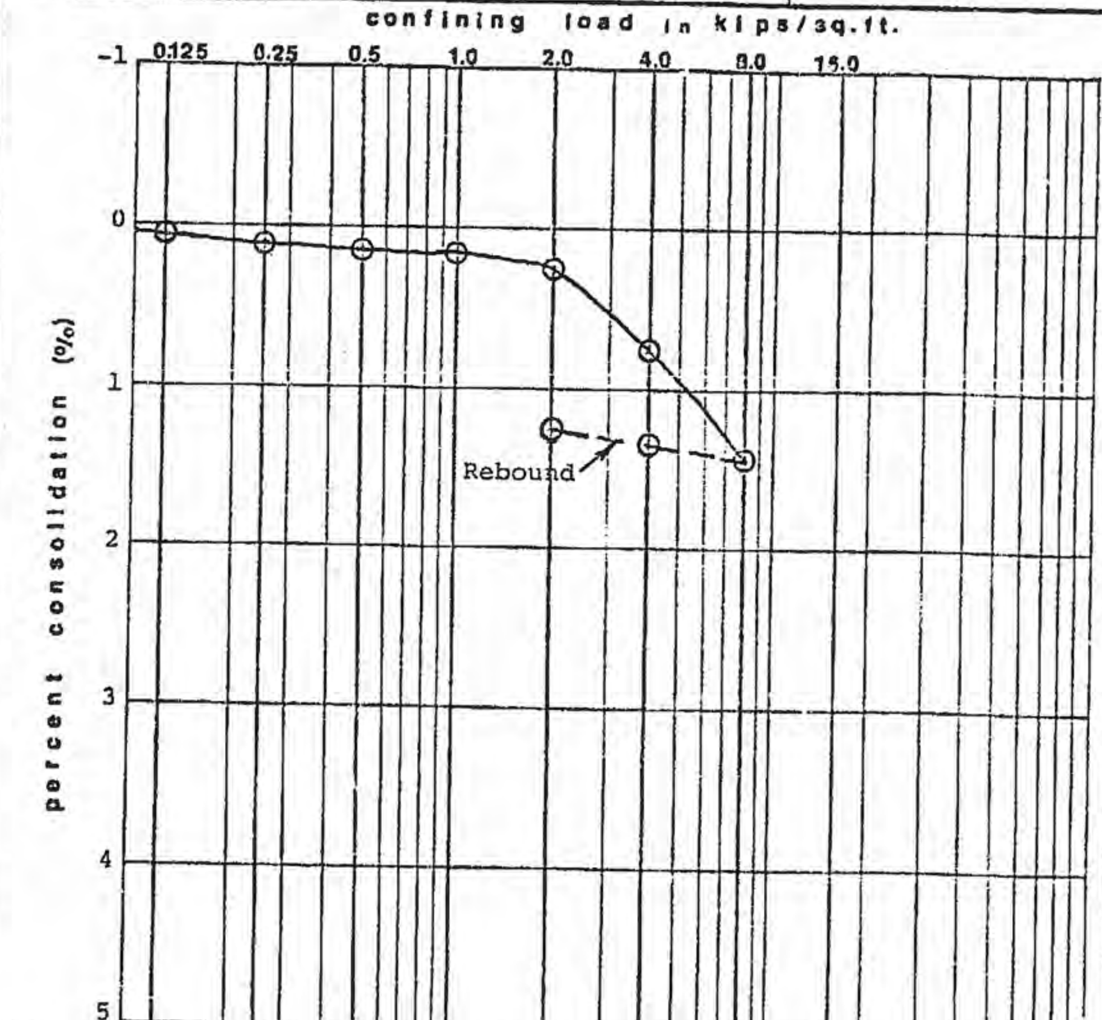
FOR SIX PROPOSED OFFICE BUILDINGS

symbol	specimen	boring no.	sample depth	sample condition	moisture condition
○	A	B-3	2.0 ft	Silty Sand, med/den.	Moist
◐	A				
⬡	B				
⬢	B				
▽	C				
▼	C				



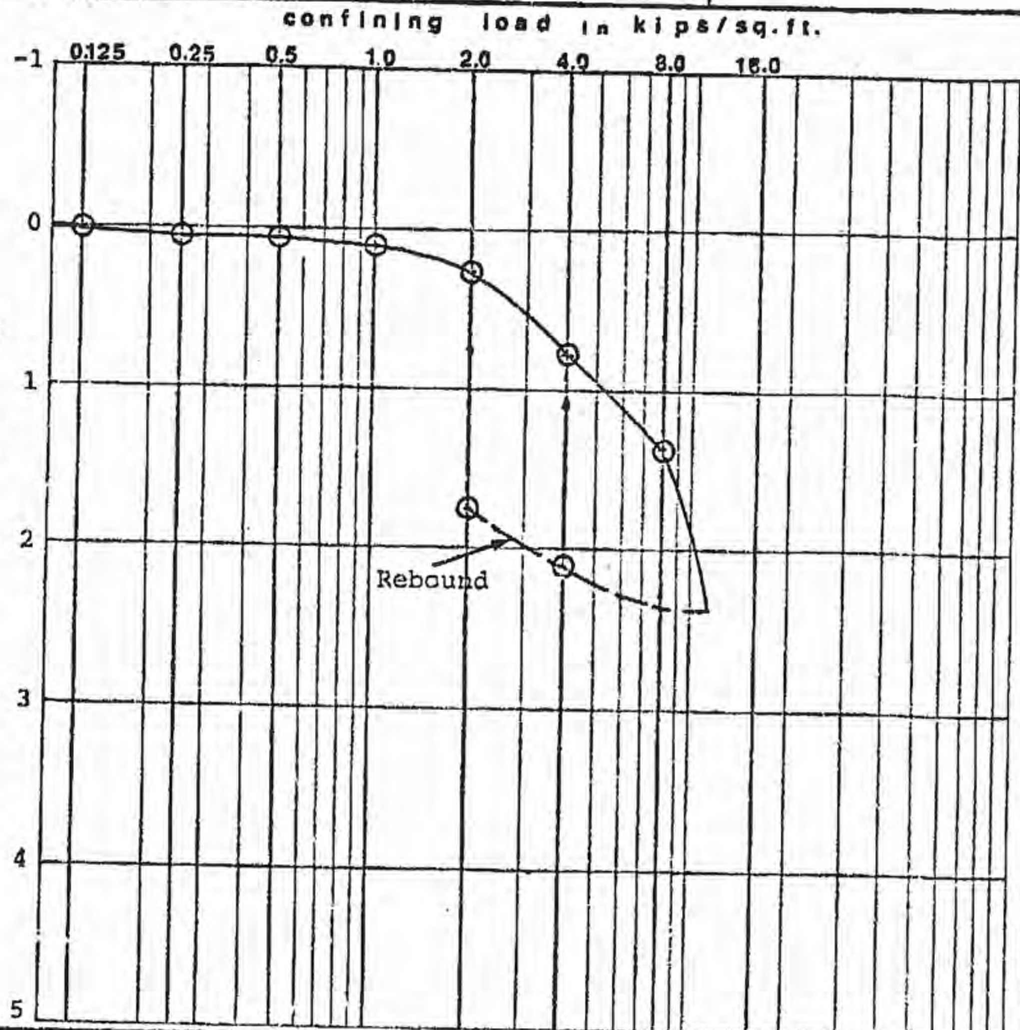
G. A. NICOLL & ASSOCIATES	Block 100 Newport Center The Irvine Company	CONSOLIDATION TEST		
		Project no. 1010	date Nov. 1972	figure no. 2

symbol	specimen	boring no.	sample depth	sample condition	moisture condition
○	A	B-6	2.0 Ft.	Silty SAND, med/den.	Moist
◐	A				
⬡	B				
⬢	B				
▽	C				
▼	C				



G. A. NICOLL & ASSOCIATES	Block 100 Newport Center The Irvine Company	CONSOLIDATION TEST		
		Project no. 1010	date Nov. 1972	figure no. 3

symbol	specimen	boring no.	sample depth	sample condition	moisture condition
○	A	B-10	5.0 Ft.	Silty SAND, Med/den. Silty CLAY, Stiff	Moist
◑	A				
⬡	B				
⬡ (half-filled)	B				
▽	C				
▼ (half-filled)	C				



G. A. NICOLL & ASSOCIATES	Block 100 Newport Center The Irvine Company	CONSOLIDATION TEST		
		Project no. 1010	date Nov. 1972	figure no. 4

DIRECT SHEAR TEST RESULTS

Boring Number	B-3	B-6	B-10
Sample Depth, Feet	2	2	5
Soil Classification	SM	SM	CL/SM
Normal Stress 1000 PSF Shear Stress, PSF	1016	508	508
Normal Stress 3000 PSF Shear Stress, PSF	2016	1760	1251
Normal Stress 8000 PSF Shear Stress, PSF	563	4653	3461
Angle of Internal Friction, Degrees	27-1/2	30-1/2	23
Apparent Cohesion, PSF	500	0	75

Table 1

LABORATORY TEST RESULTS BY

MOORE & TABER
(1975)

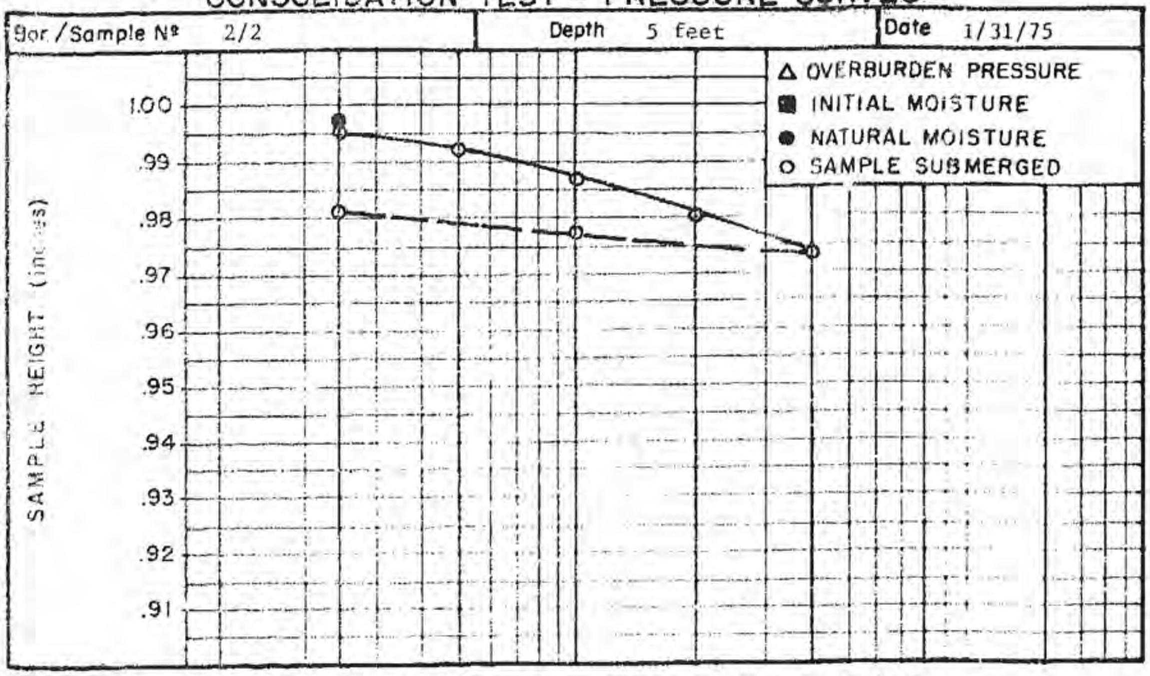
FOR GLENDALE FEDERAL BANK

SOIL TEST RESULTS

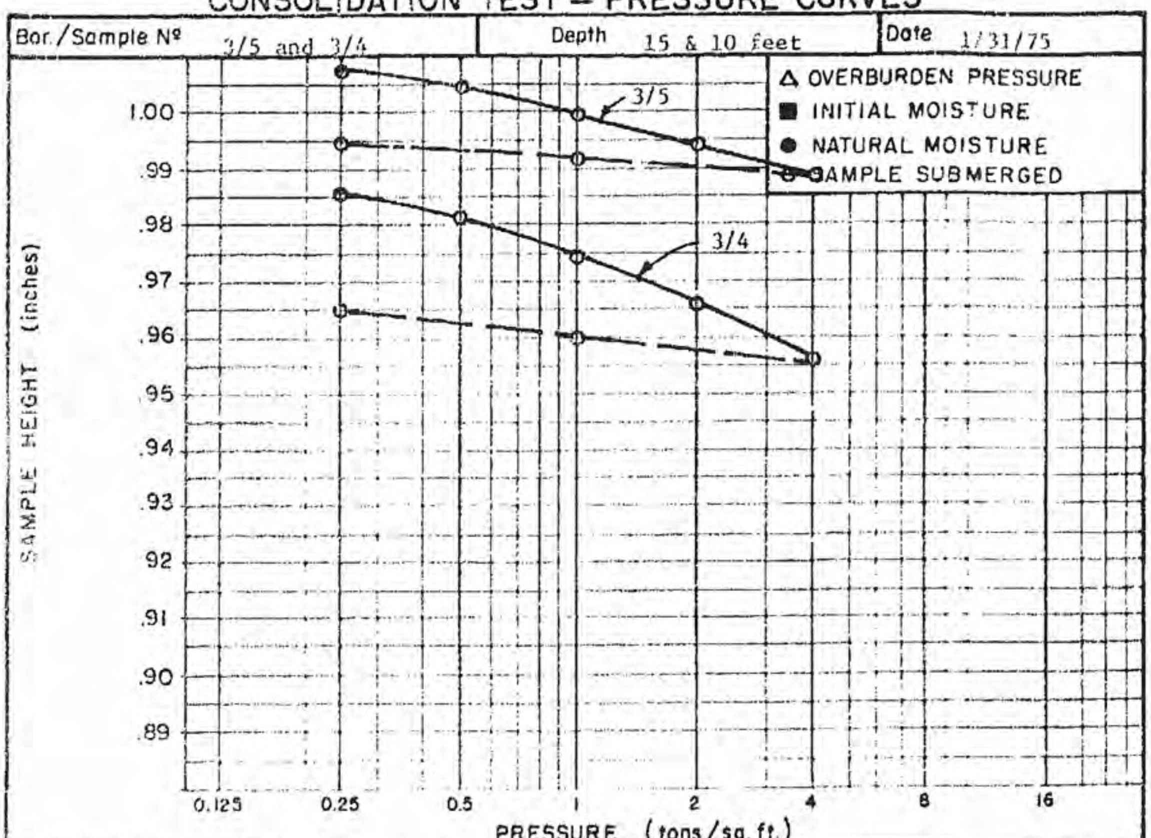
BORING Nº / SAMPLE Nº	1/2	3/1	3/2		
DESCRIPTION	Light Brown fine SILTY SAND	Yellow-brown SANDY SILT	Light Brown SANDY SILT		
UNIFIED SOIL CLASSIFICATION	SM	ML	ML		
MECHANICAL ANALYSIS					
Passing Nº 200 sieve %					
ATTERBERG LIMITS					
Liquid Limit %					
Plastic Limit %					
Plastic Index %					
COMPACTION TEST *(ASTM D1557-66T)*					
Maximum Density (lbs/cu.ft)					
Optimum Moisture %					
EXPANSION TEST *(type)*	INDEX		INDEX		
Initial Dry Density (lbs./cu.ft.)	109.2		101.9		
Initial Moisture %	10.0		12.0		
Confining Pressure (lbs./sq.ft.)	144		144		
Expansion Index	0		21		
DIRECT SHEAR TEST *(type)*		UNDISTURBED			
Initial Moisture Content %		23.8 / 23.8 / 23.8			
Test Moisture Content %		SATURATED			
Normal Stress (lbs./sq.ft.)		990 / 1980 / 2970			
Peak Shear Stress (lbs./sq.ft.)		1610 / 2260 / 3680			
Ultimate Shear Stress (lbs./sq.ft.)		960 / 2090 / 2810			
Angle of Internal Friction (degrees)		40 (ult.)			
Cohesion (lbs/sq.ft.)		250 (ult.)			

MOORE & TABER CONSULTING ENGINEERS AND GEOLOGISTS

CONSOLIDATION TEST – PRESSURE CURVES



CONSOLIDATION TEST – PRESSURE CURVES



Job No. 75-507 - January 31, 1975

RESISTANCE VALUES

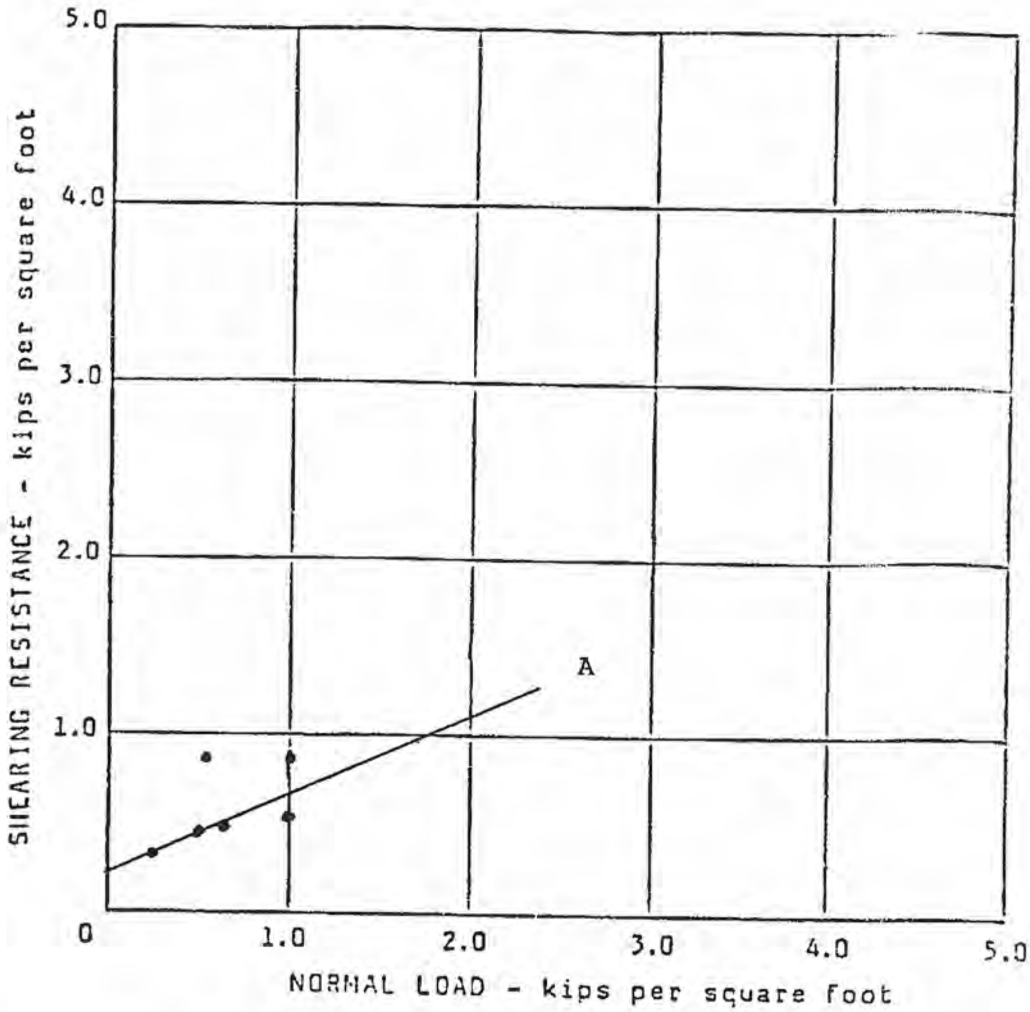
Moisture Content (%)	Dry Density (p.c.f.)	Exudation Pressure (p.s.i.)	Expansion Dial ($x10^{-4}$)	Stabilometer 'R' Value
12.8	121.1	400	0	45
13.7	118.6	215	0	38
14.6	116.5	175	0	28

LABORATORY TEST RESULTS BY

SOILS INTERNATIONAL
(1988)

FOR EDWARDS THEATER

DIRECT SHEAR TEST



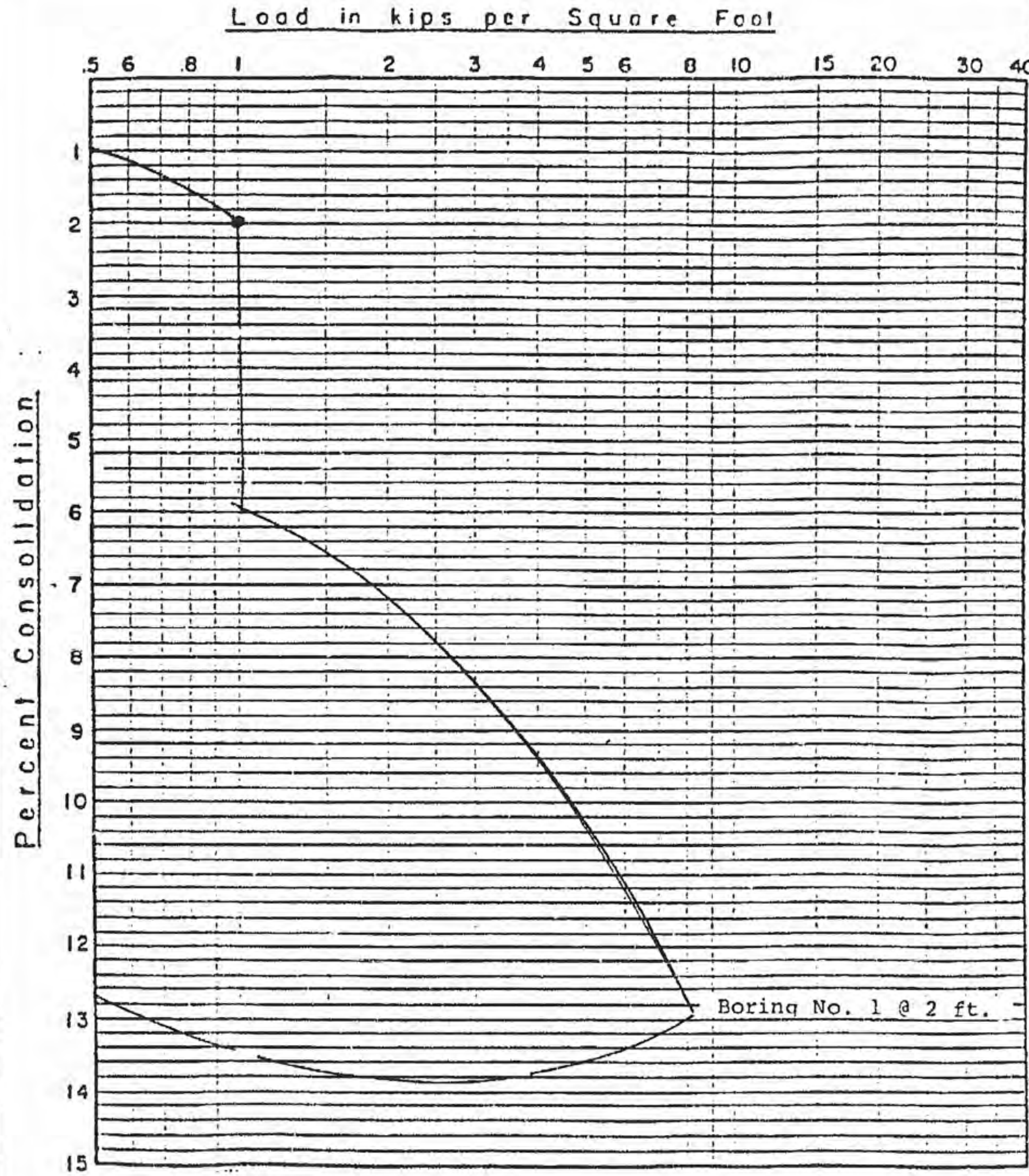
SYMBOL	LOCATION	DEPTH (FT.)	TEST CONDITION	COHESION (P.S.F.)	FRICTION (DEG.)
A	Boring No. 1	2-4	Saturated and Drained	200	20

Edwards Theatre 300 Newport Center Drive Newport Beach, Calif.	PROJECT No	S1-093-F
	PLATE	F

SOILS INTERNATIONAL

CONSULTING FOUNDATION ENGINEERS & ENGINEERING GEOLOGISTS

CONSOLIDATION TESTS



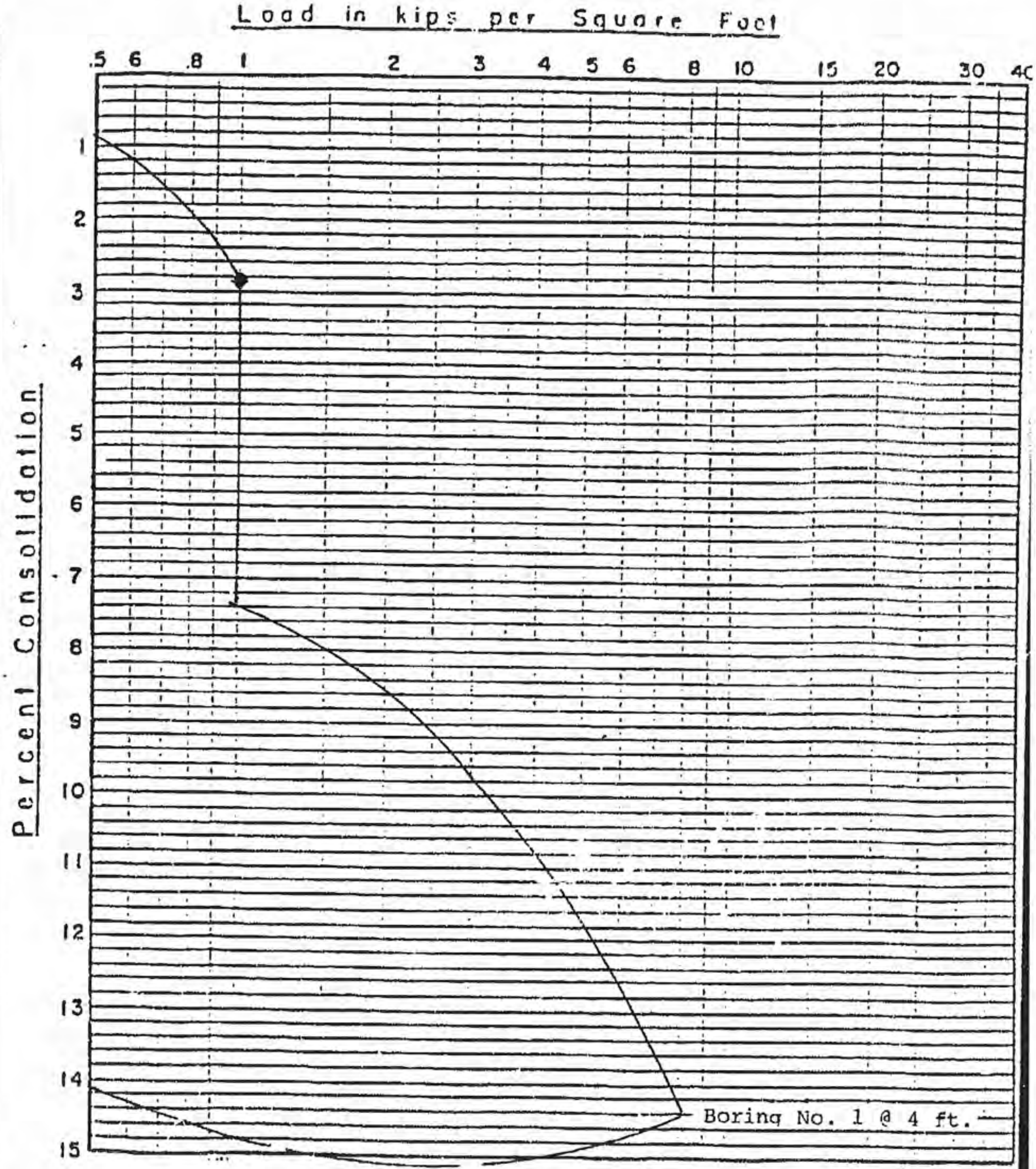
● WATER PERMITTED TO CONTACT SAMPLE

Edwards Theatre 300 Newport Center Drive Newport Beach, Calif.	PROJECT No	S-1093-F
	PLATE	G

SOILS INTERNATIONAL

CONSULTING FOUNDATION ENGINEERS & ENGINEERING GEOLOGISTS

CONSOLIDATION TESTS

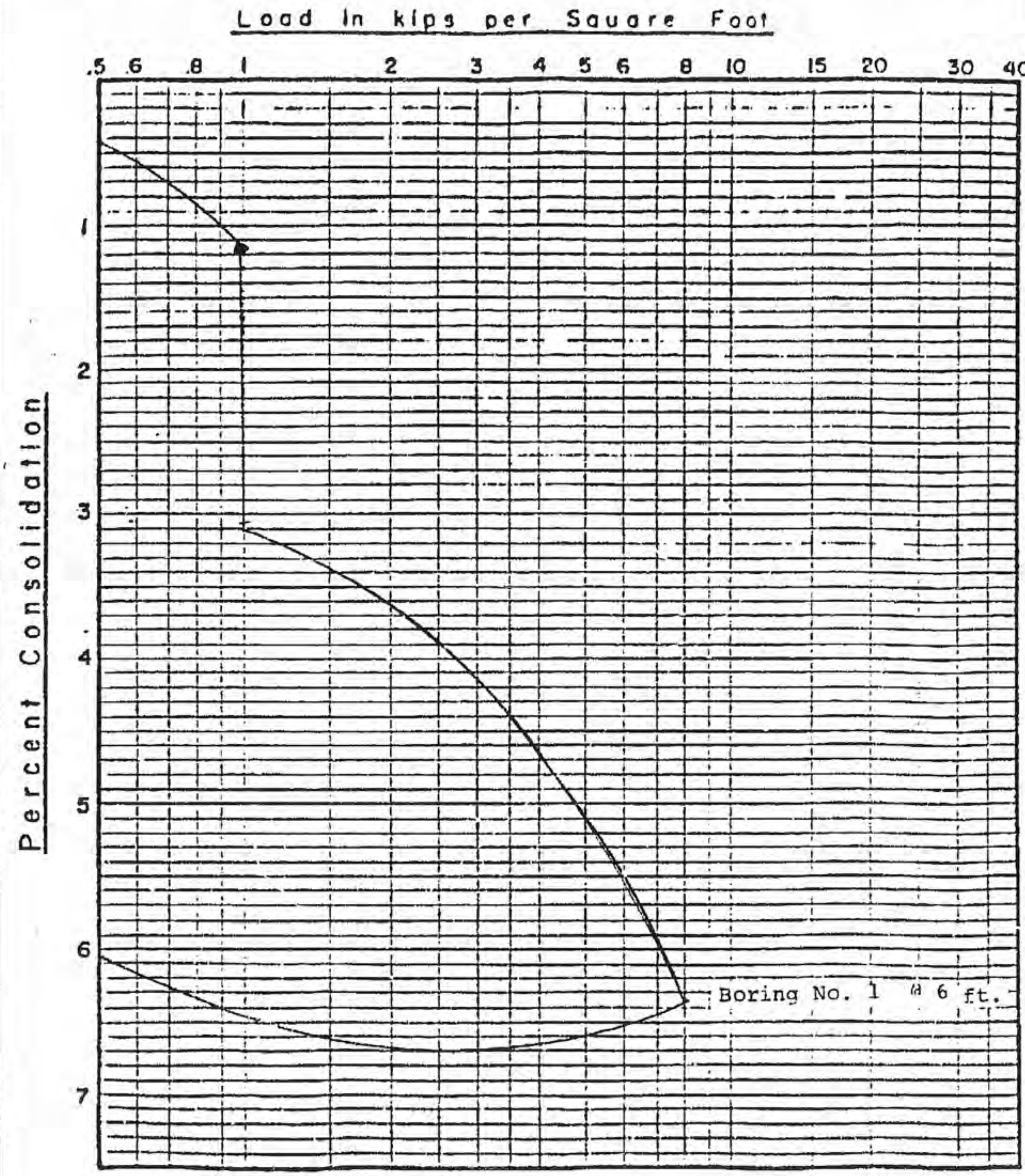


● WATER PERMITTED TO CONTACT SAMPLE

Edwards Theatre 300 Newport Center Drive Newport Beach, Calif.	PROJECT No	S-1093-F
	PLATE	H

SOILS INTERNATIONAL
CONSULTING FOUNDATION ENGINEERS & ENGINEERING GEOLOGISTS

CONSOLIDATION TESTS



○ WATER PERMITTED TO CONTACT SAMPLE

Edwards Theatre 300 Newport Center Drive Newport Beach, Calif.	PROJECT No	S-1093-F
	PLATE	I

SOILS INTERNATIONAL

CONSULTING FOUNDATION ENGINEERS & ENGINEERING GEOLOGISTS

APPENDIX D

USGS Design Maps Detailed Report

ASCE 7-10 Standard (33.612°N, 117.875°W)

Site Class D – "Stiff Soil", Risk Category I/II/III

Section 11.4.1 — Mapped Acceleration Parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_S) and 1.3 (to obtain S_1). Maps in the 2010 ASCE-7 Standard are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 11.4.3.

From Figure 22-1 [1]	$S_S = 1.681$ g
From Figure 22-2 [2]	$S_1 = 0.615$ g

Section 11.4.2 — Site Class

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Chapter 20.

Table 20.3–1 Site Classification

Site Class	$\bar{v}_S$	$\bar{N}$ or $\bar{N}_{ch}$	$\bar{s}_u$
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
	Any profile with more than 10 ft of soil having the characteristics: • Plasticity index *PI* > 20, • Moisture content $w \geq 40\%$, and • Undrained shear strength $\bar{s}_u < 500$ psf		
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 11.4.3 — Site Coefficients and Risk-Targeted Maximum Considered Earthquake (MCE_R) Spectral Response Acceleration Parameters

Table 11.4-1: Site Coefficient F_a

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at Short Period				
	$S_S \leq 0.25$	$S_S = 0.50$	$S_S = 0.75$	$S_S = 1.00$	$S_S \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_S

For Site Class = D and S_S = 1.681 g, F_a = 1.000

Table 11.4-2: Site Coefficient F_v

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at 1-s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_1

For Site Class = D and S_1 = 0.615 g, F_v = 1.500

Equation (11.4–1): $S_{MS} = F_aS_S = 1.000 \times 1.681 = 1.681$ g

Equation (11.4–2): $S_{M1} = F_vS_1 = 1.500 \times 0.615 = 0.922$ g

Section 11.4.4 — Design Spectral Acceleration Parameters

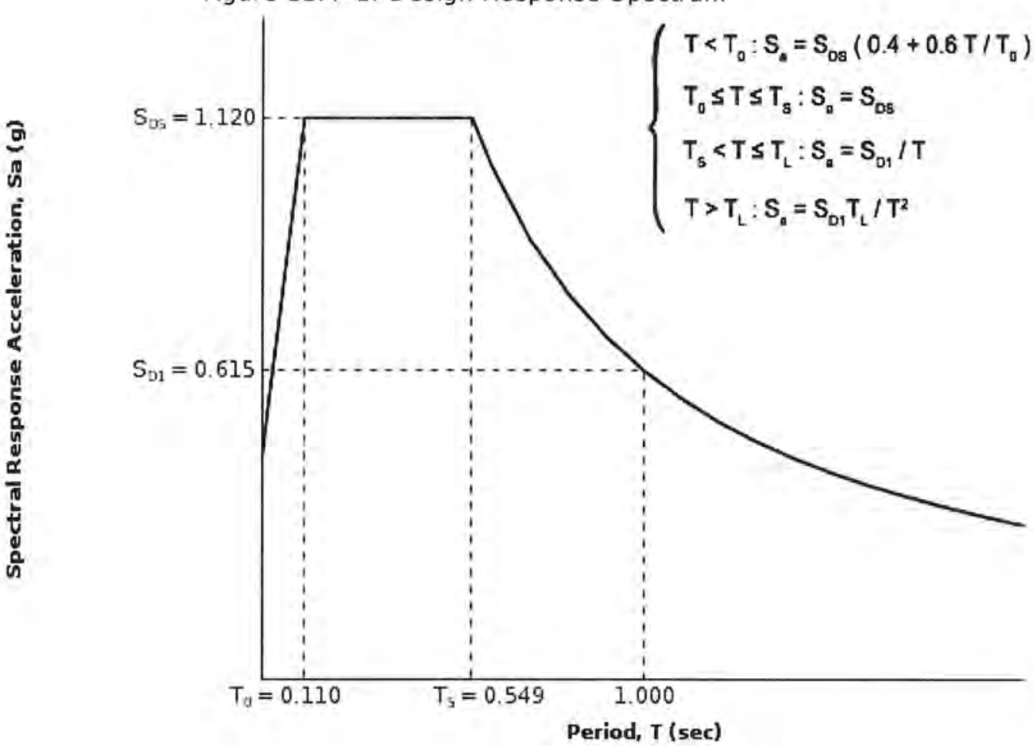
Equation (11.4–3): $S_{DS} = ⅔\ S_{MS} = ⅔ \times 1.681 = 1.120$ g

Equation (11.4–4): $S_{D1} = ⅔\ S_{M1} = ⅔ \times 0.922 = 0.615$ g

Section 11.4.5 — Design Response Spectrum

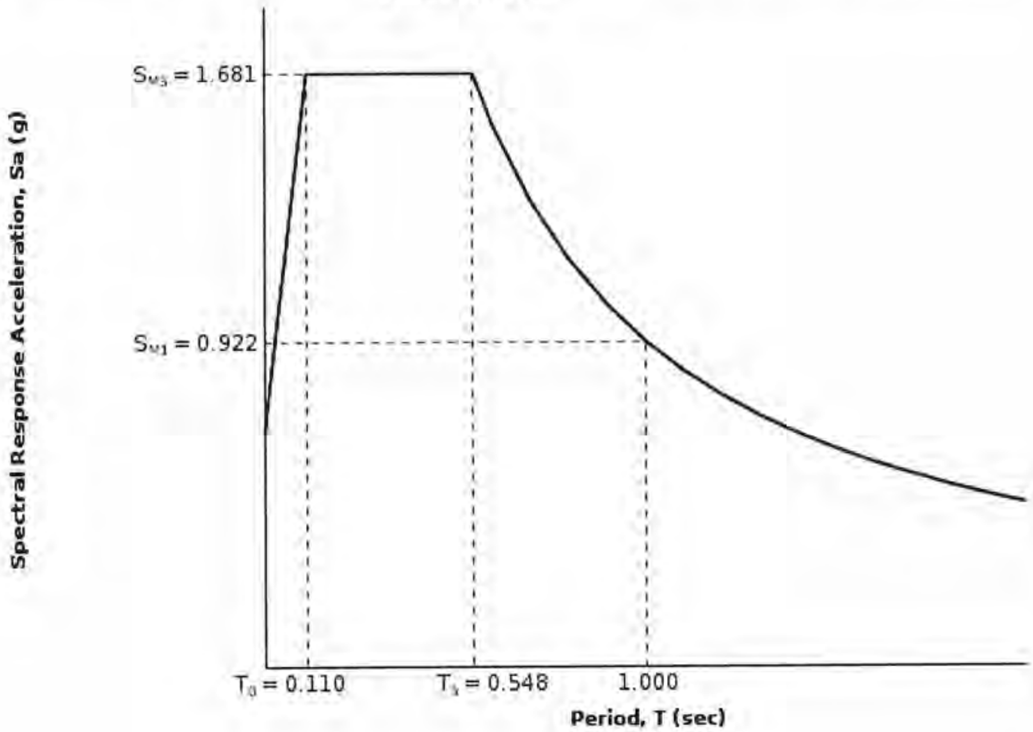
From Figure 22-12 [3] $T_L = 8$ seconds

Figure 11.4-1: Design Response Spectrum



Section 11.4.6 — Risk-Targeted Maximum Considered Earthquake (MCE_R) Response Spectrum

The MCE_R Response Spectrum is determined by multiplying the design response spectrum above by 1.5.



Section 11.8.3 — Additional Geotechnical Investigation Report Requirements for Seismic Design Categories D through F

From Figure 22-7 [4] PGA = 0.685

Equation (11.8–1): $PGA_M = F_{PGA}PGA = 1.000 \times 0.685 = 0.685$ g

Table 11.8–1: Site Coefficient F_{PGA}

Site Class	Mapped MCE Geometric Mean Peak Ground Acceleration, PGA				
	PGA ≤ 0.10	PGA = 0.20	PGA = 0.30	PGA = 0.40	PGA ≥ 0.50
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of PGA

For Site Class = D and PGA = 0.685 g, F_{PGA} = 1.000

Section 21.2.1.1 — Method 1 (from Chapter 21 – Site-Specific Ground Motion Procedures for Seismic Design)

From Figure 22-17 [5] C_{RS} = 0.909

From Figure 22-18 [6] C_{R1} = 0.930

Section 11.6 — Seismic Design Category

Table 11.6-1 Seismic Design Category Based on Short Period Response Acceleration Parameter

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \leq S_{DS} < 0.33g$	B	B	C
$0.33g \leq S_{DS} < 0.50g$	C	C	D
$0.50g \leq S_{DS}$	D	D	D

For Risk Category = I and S_{DS} = 1.120 g, Seismic Design Category = D

Table 11.6-2 Seismic Design Category Based on 1-S Period Response Acceleration Parameter

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \leq S_{D1} < 0.133g$	B	B	C
$0.133g \leq S_{D1} < 0.20g$	C	C	D
$0.20g \leq S_{D1}$	D	D	D

For Risk Category = I and S_{D1} = 0.615 g, Seismic Design Category = D

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category ≡ "the more severe design category in accordance with Table 11.6-1 or 11.6-2" = D

Note: See Section 11.6 for alternative approaches to calculating Seismic Design Category.

References

1. *Figure 22-1*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-1.pdf
2. *Figure 22-2*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-2.pdf
3. *Figure 22-12*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-12.pdf
4. *Figure 22-7*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-7.pdf
5. *Figure 22-17*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-17.pdf
6. *Figure 22-18*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-18.pdf

*** Deaggregation of Seismic Hazard at One Period of Spectral Accel. ***
*** Data from U.S.G.S. National Seismic Hazards Mapping Project, 2008 version ***
PSHA Deaggregation. %contributions. site: 150_Newport_Cen long: 117.875 W., lat: 33.612 N.
Vs30(m/s)= 260.0 (some WUS atten. models use Site Class not Vs30).
NSHMP 2007-08 See USGS OFR 2008-1128. dM=0.2 below
Return period: 2475 yrs. Exceedance PGA =0.6372 g. Weight * Computed_Rate_Ex 0.404E-03
#Pr[at least one eq with median motion>=PGA in 50 yrs]=0.00391
#This deaggregation corresponds to Mean Hazard w/all GMPEs

DIST(KM)	MAG(MW)	ALL_EPS	EPSILON>2	1<EPS<2	0<EPS<1	-1<EPS<0	-2<EPS<-1	EPS<-2
6.3	5.05	1.100	0.611	0.489	0.000	0.000	0.000	0.000
12.7	5.05	0.141	0.141	0.000	0.000	0.000	0.000	0.000
6.3	5.20	2.225	1.014	1.211	0.000	0.000	0.000	0.000
12.9	5.20	0.375	0.375	0.000	0.000	0.000	0.000	0.000
6.4	5.40	2.182	0.809	1.268	0.105	0.000	0.000	0.000
13.1	5.40	0.514	0.514	0.000	0.000	0.000	0.000	0.000
6.5	5.60	2.010	0.645	1.156	0.209	0.000	0.000	0.000
13.3	5.60	0.641	0.633	0.008	0.000	0.000	0.000	0.000
6.5	5.80	1.745	0.467	1.048	0.230	0.000	0.000	0.000
13.5	5.80	0.717	0.673	0.044	0.000	0.000	0.000	0.000
7.1	6.02	2.237	0.638	1.401	0.199	0.000	0.000	0.000
14.3	5.99	0.687	0.612	0.075	0.000	0.000	0.000	0.000
23.2	6.01	0.078	0.078	0.000	0.000	0.000	0.000	0.000
7.4	6.20	2.859	0.725	1.885	0.249	0.000	0.000	0.000
14.6	6.20	0.859	0.693	0.166	0.000	0.000	0.000	0.000
24.1	6.21	0.135	0.135	0.000	0.000	0.000	0.000	0.000
7.5	6.40	2.699	0.545	1.788	0.365	0.000	0.000	0.000
14.5	6.40	1.021	0.692	0.330	0.000	0.000	0.000	0.000
24.9	6.41	0.213	0.213	0.000	0.000	0.000	0.000	0.000
32.9	6.41	0.116	0.116	0.000	0.000	0.000	0.000	0.000
5.4	6.61	14.179	1.326	6.369	6.137	0.347	0.000	0.000
13.4	6.60	0.542	0.339	0.202	0.000	0.000	0.000	0.000
25.6	6.60	0.240	0.240	0.000	0.000	0.000	0.000	0.000
34.2	6.59	0.288	0.288	0.000	0.000	0.000	0.000	0.000
5.2	6.80	16.718	1.556	7.539	7.028	0.594	0.000	0.000
13.6	6.79	0.573	0.315	0.258	0.000	0.000	0.000	0.000
25.2	6.79	0.280	0.279	0.001	0.000	0.000	0.000	0.000
34.6	6.78	0.739	0.739	0.000	0.000	0.000	0.000	0.000
5.1	6.97	19.615	1.679	8.445	8.435	1.048	0.007	0.000
13.6	6.98	0.368	0.172	0.193	0.003	0.000	0.000	0.000
24.3	7.02	0.461	0.389	0.072	0.000	0.000	0.000	0.000
34.0	6.98	0.780	0.735	0.045	0.000	0.000	0.000	0.000
45.5	7.00	0.096	0.096	0.000	0.000	0.000	0.000	0.000
5.1	7.15	9.071	0.809	3.756	3.735	0.753	0.018	0.000
13.1	7.16	0.085	0.030	0.052	0.004	0.000	0.000	0.000
23.6	7.20	0.694	0.486	0.207	0.000	0.000	0.000	0.000
35.3	7.20	0.695	0.574	0.121	0.000	0.000	0.000	0.000
4.5	7.39	4.252	0.434	1.888	1.723	0.205	0.003	0.000
23.5	7.36	0.857	0.487	0.370	0.000	0.000	0.000	0.000
35.9	7.37	0.416	0.330	0.086	0.000	0.000	0.000	0.000
75.7	7.42	0.074	0.074	0.000	0.000	0.000	0.000	0.000
4.1	7.55	2.356	0.275	1.314	0.731	0.036	0.000	0.000
23.6	7.58	0.353	0.179	0.174	0.000	0.000	0.000	0.000
35.4	7.57	0.346	0.268	0.078	0.000	0.000	0.000	0.000
45.4	7.57	0.150	0.127	0.022	0.000	0.000	0.000	0.000
75.6	7.60	0.146	0.146	0.000	0.000	0.000	0.000	0.000
83.0	7.56	0.067	0.067	0.000	0.000	0.000	0.000	0.000
4.1	7.71	0.353	0.036	0.164	0.139	0.014	0.000	0.000
23.5	7.74	0.803	0.355	0.448	0.000	0.000	0.000	0.000
35.0	7.76	0.489	0.354	0.135	0.000	0.000	0.000	0.000
45.5	7.74	0.137	0.108	0.029	0.000	0.000	0.000	0.000
74.3	7.80	0.143	0.143	0.000	0.000	0.000	0.000	0.000

83.1	7.77	0.143	0.143	0.000	0.000	0.000	0.000	0.000
23.5	7.91	0.100	0.041	0.060	0.000	0.000	0.000	0.000
35.1	7.93	0.056	0.038	0.019	0.000	0.000	0.000	0.000
83.1	7.98	0.286	0.286	0.000	0.000	0.000	0.000	0.000

Summary statistics for above PSHA PGA deaggregation, R=distance, e=epsilon:
Contribution from this GMPE(%): 100.0
Mean src-site R= 9.0 km; M= 6.71; eps0= 0.79. Mean calculated for all sources.
Modal src-site R= 5.1 km; M= 6.97; eps0= 0.33 from peak (R,M) bin
MODE R*= 5.0km; M*= 6.97; EPS.INTERVAL: 1 to 2 sigma % CONTRIB.= 8.445

Principal sources (faults, subduction, random seismicity having > 3% contribution)

Source Category:	% contr.	R(km)	M	epsilon0 (mean values).
California B-faults Char	42.73	6.9	7.06	0.53
California B-faults GR	28.33	6.5	6.78	0.43
California A-faults	4.22	46.0	7.36	2.21
CA Compr. crustal gridded	24.71	9.0	5.90	1.39

Individual fault hazard details if its contribution to mean hazard > 2%:

Fault ID	% contr.	Rcd(km)	M	epsilon0	Site-to-src azimuth(d)
Newport-Inglewood (Offshore) Cha	11.05	4.1	6.88	0.83	-139.3
Newport-Inglewood, alt 1 Char	2.13	5.4	7.15	0.75	-85.1
Newport-Inglewood, alt 2 Char	2.39	4.6	7.15	0.68	-98.2
San Joaquin Hills Char	18.56	5.4	6.97	0.04	4.3
Newport Inglewood Connected alt	2.46	4.1	7.50	0.53	-139.3
Newport Inglewood Connected alt	2.45	4.1	7.50	0.53	-139.3
Newport-Inglewood (Offshore) GR	2.39	7.6	6.71	1.15	-176.7
San Joaquin Hills GR	20.28	5.5	6.73	0.16	5.6

#*********End of deaggregation corresponding to Mean Hazard w/all GMPEs *********#

PSHA Deaggregation. %contributions. site: 150_Newport_Cen long: 117.875 W., lat: 33.612 N.
Vs30(m/s)= 260.0 (some WUS atten. models use Site Class not Vs30).
NSHMP 2007-08 See USGS OFR 2008-1128. dM=0.2 below
Return period: 2475 yrs. Exceedance PGA =0.6372 g. Weight * Computed_Rate_Ex 0.144E-03
#Pr[at least one eq with median motion>=PGA in 50 yrs]=0.00045
#This deaggregation corresponds to Boore-Atkinson 2008

DIST(KM)	MAG(MW)	ALL_EPS	EPSILON>2	1<EPS<2	0<EPS<1	-1<EPS<0	-2<EPS<-1	EPS<-2
5.9	5.05	0.194	0.186	0.008	0.000	0.000	0.000	0.000
6.0	5.20	0.413	0.357	0.056	0.000	0.000	0.000	0.000
6.1	5.40	0.428	0.341	0.088	0.000	0.000	0.000	0.000
12.9	5.41	0.038	0.038	0.000	0.000	0.000	0.000	0.000
6.2	5.60	0.423	0.323	0.099	0.000	0.000	0.000	0.000
13.4	5.61	0.083	0.083	0.000	0.000	0.000	0.000	0.000
6.3	5.80	0.400	0.291	0.109	0.000	0.000	0.000	0.000
13.8	5.80	0.132	0.132	0.000	0.000	0.000	0.000	0.000
6.7	6.02	0.544	0.367	0.177	0.000	0.000	0.000	0.000
14.8	6.00	0.164	0.164	0.000	0.000	0.000	0.000	0.000
23.8	6.01	0.040	0.040	0.000	0.000	0.000	0.000	0.000
7.0	6.20	0.696	0.472	0.224	0.000	0.000	0.000	0.000
15.2	6.20	0.237	0.237	0.000	0.000	0.000	0.000	0.000
24.6	6.21	0.079	0.079	0.000	0.000	0.000	0.000	0.000
33.0	6.23	0.026	0.026	0.000	0.000	0.000	0.000	0.000
7.2	6.40	0.651	0.409	0.242	0.000	0.000	0.000	0.000
15.1	6.40	0.298	0.298	0.001	0.000	0.000	0.000	0.000
25.4	6.41	0.131	0.131	0.000	0.000	0.000	0.000	0.000
32.9	6.41	0.112	0.112	0.000	0.000	0.000	0.000	0.000
5.3	6.61	4.204	0.566	2.243	1.395	0.000	0.000	0.000
13.8	6.60	0.254	0.195	0.059	0.000	0.000	0.000	0.000
25.7	6.60	0.207	0.207	0.000	0.000	0.000	0.000	0.000
34.2	6.59	0.287	0.287	0.000	0.000	0.000	0.000	0.000
5.1	6.79	5.230	0.631	2.829	1.770	0.000	0.000	0.000

14.1	6.79	0.285	0.196	0.088	0.000	0.000	0.000	0.000
25.3	6.79	0.237	0.237	0.000	0.000	0.000	0.000	0.000
34.6	6.78	0.733	0.733	0.000	0.000	0.000	0.000	0.000
45.4	6.79	0.044	0.044	0.000	0.000	0.000	0.000	0.000
56.8	6.77	0.018	0.018	0.000	0.000	0.000	0.000	0.000
5.0	6.97	6.459	0.713	3.601	2.102	0.043	0.000	0.000
14.1	6.99	0.198	0.109	0.088	0.001	0.000	0.000	0.000
24.3	7.02	0.383	0.317	0.066	0.000	0.000	0.000	0.000
34.0	6.98	0.754	0.709	0.045	0.000	0.000	0.000	0.000
45.5	7.00	0.095	0.095	0.000	0.000	0.000	0.000	0.000
57.3	7.04	0.023	0.023	0.000	0.000	0.000	0.000	0.000
5.1	7.15	2.988	0.301	1.442	1.168	0.077	0.000	0.000
13.5	7.16	0.051	0.016	0.032	0.002	0.000	0.000	0.000
23.6	7.20	0.567	0.380	0.187	0.000	0.000	0.000	0.000
35.3	7.20	0.644	0.523	0.120	0.000	0.000	0.000	0.000
45.3	7.19	0.030	0.030	0.000	0.000	0.000	0.000	0.000
57.7	7.20	0.032	0.032	0.000	0.000	0.000	0.000	0.000
74.8	7.25	0.034	0.034	0.000	0.000	0.000	0.000	0.000
4.4	7.42	2.155	0.234	1.254	0.660	0.007	0.000	0.000
23.5	7.37	0.680	0.366	0.313	0.000	0.000	0.000	0.000
35.9	7.37	0.381	0.295	0.086	0.000	0.000	0.000	0.000
45.2	7.40	0.027	0.026	0.001	0.000	0.000	0.000	0.000
57.6	7.34	0.037	0.037	0.000	0.000	0.000	0.000	0.000
75.7	7.42	0.074	0.074	0.000	0.000	0.000	0.000	0.000
83.3	7.38	0.026	0.026	0.000	0.000	0.000	0.000	0.000
4.1	7.60	0.446	0.063	0.250	0.133	0.000	0.000	0.000
23.7	7.59	0.242	0.107	0.134	0.000	0.000	0.000	0.000
35.4	7.57	0.306	0.228	0.078	0.000	0.000	0.000	0.000
45.4	7.57	0.141	0.119	0.022	0.000	0.000	0.000	0.000
75.6	7.60	0.146	0.146	0.000	0.000	0.000	0.000	0.000
83.0	7.56	0.067	0.067	0.000	0.000	0.000	0.000	0.000
4.1	7.71	0.141	0.015	0.077	0.049	0.000	0.000	0.000
23.5	7.74	0.549	0.207	0.342	0.000	0.000	0.000	0.000
34.9	7.76	0.410	0.277	0.133	0.000	0.000	0.000	0.000
45.5	7.74	0.125	0.096	0.029	0.000	0.000	0.000	0.000
74.3	7.80	0.143	0.143	0.000	0.000	0.000	0.000	0.000
83.1	7.77	0.143	0.143	0.000	0.000	0.000	0.000	0.000
23.5	7.92	0.043	0.018	0.025	0.000	0.000	0.000	0.000
35.3	7.93	0.039	0.025	0.015	0.000	0.000	0.000	0.000
83.1	7.98	0.282	0.282	0.000	0.000	0.000	0.000	0.000
82.5	8.20	0.030	0.030	0.000	0.000	0.000	0.000	0.000

Summary statistics for above PSHA PGA deaggregation, R=distance, e=epsilon:
Contribution from this GMPE(%): 35.6
Mean src-site R= 13.2 km; M= 6.87; eps0= 1.12. Mean calculated for all sources.
Modal src-site R= 5.0 km; M= 6.97; eps0= 0.64 from peak (R,M) bin
MODE R*= 4.9km; M*= 6.97; EPS.INTERVAL: 1 to 2 sigma % CONTRIB.= 3.601

Principal sources (faults, subduction, random seismicity having > 3% contribution)

Source Category:	% contr.	R(km)	M	epsilon0 (mean values).
California B-faults Char	16.25	9.0	7.09	0.86
California B-faults GR	9.58	8.2	6.82	0.82
California A-faults	4.01	46.5	7.34	2.20
CA Compr. crustal gridded	5.77	10.1	6.02	1.61

Individual fault hazard details if its contribution to mean hazard > 2%:

Fault ID	% contr.	Rcd(km)	M	epsilon0	Site-to-src azimuth(d)
Newport-Inglewood (Offshore) Cha	4.53	4.1	6.88	0.93	-139.3
Newport-Inglewood, alt 1 Char	0.90	5.4	7.15	0.84	-85.1
Newport-Inglewood, alt 2 Char	0.97	4.6	7.15	0.80	-98.2
San Joaquin Hills Char	5.00	5.4	6.97	0.34	4.3
Newport Inglewood Connected alt	0.99	4.1	7.50	0.66	-139.3
Newport Inglewood Connected alt	0.97	4.1	7.50	0.67	-139.3

Newport-Inglewood (Offshore) GR	1.06	8.6	6.71	1.33	-176.7
San Joaquin Hills GR	5.51	5.5	6.73	0.42	5.6

#*********End of deaggregation corresponding to Boore-Atkinson 2008 *********#

PSHA Deaggregation. %contributions. site: 150_Newport_Cen long: 117.875 W., lat: 33.612 N.
Vs30(m/s)= 260.0 (some WUS atten. models use Site Class not Vs30).
NSHMP 2007-08 See USGS OFR 2008-1128. dM=0.2 below
Return period: 2475 yrs. Exceedance PGA =0.6372 g. Weight * Computed_Rate_Ex 0.675E-04
#Pr[at least one eq with median motion>=PGA in 50 yrs]=0.00211
#This deaggregation corresponds to Campbell-Bozorgnia 2008

DIST(KM)	MAG(MW)	ALL_EPS	EPSILON>2	1<EPS<2	0<EPS<1	-1<EPS<0	-2<EPS<-1	EPS<-2
6.2	5.05	0.162	0.162	0.000	0.000	0.000	0.000	0.000
6.3	5.20	0.394	0.338	0.056	0.000	0.000	0.000	0.000
12.3	5.22	0.019	0.019	0.000	0.000	0.000	0.000	0.000
6.4	5.40	0.477	0.365	0.112	0.000	0.000	0.000	0.000
12.7	5.41	0.061	0.061	0.000	0.000	0.000	0.000	0.000
6.5	5.60	0.469	0.334	0.136	0.000	0.000	0.000	0.000
13.0	5.60	0.102	0.102	0.000	0.000	0.000	0.000	0.000
6.6	5.80	0.391	0.265	0.126	0.000	0.000	0.000	0.000
13.2	5.80	0.113	0.113	0.000	0.000	0.000	0.000	0.000
7.1	6.01	0.455	0.349	0.106	0.000	0.000	0.000	0.000
13.9	5.99	0.106	0.106	0.000	0.000	0.000	0.000	0.000
7.4	6.20	0.596	0.454	0.142	0.000	0.000	0.000	0.000
14.1	6.20	0.138	0.138	0.000	0.000	0.000	0.000	0.000
7.5	6.40	0.612	0.401	0.211	0.000	0.000	0.000	0.000
14.1	6.40	0.176	0.176	0.000	0.000	0.000	0.000	0.000
24.1	6.42	0.016	0.016	0.000	0.000	0.000	0.000	0.000
5.4	6.61	3.309	0.362	1.355	1.526	0.067	0.000	0.000
13.4	6.60	0.059	0.056	0.003	0.000	0.000	0.000	0.000
25.3	6.60	0.010	0.010	0.000	0.000	0.000	0.000	0.000
5.4	6.80	3.396	0.389	1.404	1.525	0.077	0.000	0.000
13.6	6.80	0.059	0.056	0.003	0.000	0.000	0.000	0.000
25.7	6.78	0.010	0.010	0.000	0.000	0.000	0.000	0.000
5.4	6.96	3.560	0.368	1.317	1.714	0.162	0.000	0.000
13.5	6.95	0.028	0.026	0.002	0.000	0.000	0.000	0.000
5.4	7.13	1.602	0.168	0.567	0.708	0.159	0.000	0.000
4.7	7.38	0.308	0.096	0.137	0.061	0.014	0.000	0.000
4.1	7.61	0.041	0.018	0.022	0.000	0.000	0.000	0.000
4.1	7.71	0.014	0.006	0.008	0.000	0.000	0.000	0.000

Summary statistics for above PSHA PGA deaggregation, R=distance, e=epsilon:
Contribution from this GMPE(%): 16.7
Mean src-site R= 6.2 km; M= 6.59; eps0= 0.72. Mean calculated for all sources.
Modal src-site R= 5.4 km; M= 6.96; eps0= 0.35 from peak (R,M) bin
MODE R*= 5.4km; M*= 6.95; EPS.INTERVAL: 1 to 2 sigma % CONTRIB.= 1.714

Principal sources (faults, subduction, random seismicity having > 3% contribution)

Source Category:	% contr.	R(km)	M	epsilon0 (mean values).
California B-faults Char	5.99	5.4	6.99	0.43
California B-faults GR	5.90	5.4	6.73	0.34
CA Compr. crustal gridded	4.84	8.1	5.94	1.53

Individual fault hazard details if its contribution to mean hazard > 2%:

Fault ID	% contr.	Rcd(km)	M	epsilon0	Site-to-src azimuth(d)
Newport-Inglewood (Offshore) Cha	0.37	4.1	6.90	1.92	-139.3
Newport-Inglewood, alt 1 Char	0.08	5.4	7.15	1.76	-85.1
Newport-Inglewood, alt 2 Char	0.10	4.6	7.15	1.69	-98.2
San Joaquin Hills Char	5.22	5.4	6.97	0.23	4.3
Newport Inglewood Connected alt	0.10	4.1	7.50	1.61	-139.3
Newport Inglewood Connected alt	0.10	4.1	7.50	1.61	-139.3
Newport-Inglewood (Offshore) GR	0.01	5.1	6.71	2.52	-176.7

San Joaquin Hills GR	5.85	5.5	6.72	0.32	5.6

#*********End of deaggregation corresponding to Campbell-Bozorgnia 2008 *********#

PSHA Deaggregation. %contributions. site: 150_Newport_Cen long: 117.875 W., lat: 33.612 N.
Vs30(m/s)= 260.0 (some WUS atten. models use Site Class not Vs30).
NSHMP 2007-08 See USGS OFR 2008-1128. dM=0.2 below
Return period: 2475 yrs. Exceedance PGA =0.6372 g. Weight * Computed_Rate_Ex 0.192E-03
#Pr[at least one eq with median motion>=PGA in 50 yrs]=0.00923
#This deaggregation corresponds to Chiou-Youngs 2008

DIST(KM)	MAG(MW)	ALL_EPS	EPSILON>2	1<EPS<2	0<EPS<1	-1<EPS<0	-2<EPS<-1	EPS<-2
6.4	5.05	0.744	0.586	0.158	0.000	0.000	0.000	0.000
12.8	5.05	0.138	0.138	0.000	0.000	0.000	0.000	0.000
6.5	5.20	1.418	0.976	0.441	0.000	0.000	0.000	0.000
13.0	5.20	0.345	0.345	0.000	0.000	0.000	0.000	0.000
6.5	5.40	1.276	0.740	0.536	0.000	0.000	0.000	0.000
13.2	5.40	0.415	0.415	0.000	0.000	0.000	0.000	0.000
6.6	5.60	1.118	0.567	0.551	0.000	0.000	0.000	0.000
13.4	5.60	0.456	0.456	0.000	0.000	0.000	0.000	0.000
6.6	5.80	0.954	0.437	0.517	0.000	0.000	0.000	0.000
13.6	5.80	0.471	0.471	0.000	0.000	0.000	0.000	0.000
7.3	6.02	1.239	0.605	0.634	0.000	0.000	0.000	0.000
14.2	5.99	0.417	0.412	0.005	0.000	0.000	0.000	0.000
22.7	6.01	0.034	0.034	0.000	0.000	0.000	0.000	0.000
7.6	6.20	1.567	0.705	0.862	0.000	0.000	0.000	0.000
14.4	6.20	0.484	0.452	0.032	0.000	0.000	0.000	0.000
23.4	6.21	0.048	0.048	0.000	0.000	0.000	0.000	0.000
7.7	6.40	1.436	0.532	0.901	0.002	0.000	0.000	0.000
14.3	6.40	0.547	0.482	0.065	0.000	0.000	0.000	0.000
23.9	6.41	0.066	0.066	0.000	0.000	0.000	0.000	0.000
5.3	6.61	6.575	0.576	2.693	3.027	0.280	0.000	0.000
12.9	6.60	0.229	0.162	0.067	0.000	0.000	0.000	0.000
24.3	6.61	0.024	0.024	0.000	0.000	0.000	0.000	0.000
5.2	6.79	8.039	0.641	3.225	3.657	0.516	0.000	0.000
13.1	6.79	0.229	0.156	0.073	0.000	0.000	0.000	0.000
24.6	6.79	0.033	0.033	0.000	0.000	0.000	0.000	0.000
5.1	6.96	9.328	0.645	3.461	4.372	0.843	0.007	0.000
13.0	6.98	0.142	0.086	0.055	0.002	0.000	0.000	0.000
24.3	7.03	0.069	0.066	0.003	0.000	0.000	0.000	0.000
5.1	7.15	4.932	0.368	1.911	2.117	0.518	0.018	0.000
12.5	7.16	0.035	0.013	0.019	0.002	0.000	0.000	0.000
23.5	7.20	0.129	0.106	0.022	0.000	0.000	0.000	0.000
35.1	7.18	0.045	0.045	0.000	0.000	0.000	0.000	0.000
4.4	7.39	2.267	0.167	0.874	1.038	0.184	0.003	0.000
23.5	7.35	0.177	0.120	0.057	0.000	0.000	0.000	0.000
35.9	7.36	0.036	0.036	0.000	0.000	0.000	0.000	0.000
4.1	7.55	1.351	0.128	0.653	0.534	0.036	0.000	0.000
23.5	7.56	0.111	0.072	0.040	0.000	0.000	0.000	0.000
35.3	7.57	0.040	0.040	0.000	0.000	0.000	0.000	0.000
4.1	7.71	0.198	0.015	0.079	0.091	0.014	0.000	0.000
23.5	7.74	0.272	0.149	0.123	0.000	0.000	0.000	0.000
35.2	7.76	0.079	0.077	0.002	0.000	0.000	0.000	0.000
23.5	7.91	0.037	0.019	0.018	0.000	0.000	0.000	0.000

Summary statistics for above PSHA PGA deaggregation, R=distance, e=epsilon:
Contribution from this GMPE(%): 47.7
Mean src-site R= 6.7 km; M= 6.63; eps0= 0.56. Mean calculated for all sources.
Modal src-site R= 5.1 km; M= 6.96; eps0= 0.12 from peak (R,M) bin
MODE R*= 5.2km; M*= 6.96; EPS.INTERVAL: 1 to 2 sigma % CONTRIB.= 4.372

Principal sources (faults, subduction, random seismicity having > 3% contribution)
Source Category: % contr. R(km) M epsilon0 (mean values).

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California B-faults Char          20.50      5.6   7.06     0.29
California B-faults GR            12.86      5.8   6.79     0.19
CA Compr. crustal gridded         14.11      8.8   5.84     1.26
Individual fault hazard details if its contribution to mean hazard > 2%:
Fault ID                         % contr.   Rcd(km)  M   epsilon0 Site-to-src
azimuth(d)
Newport-Inglewood (Offshore) Cha   6.15      4.1   6.88     0.69     -139.3
Newport-Inglewood, alt 1 Char      1.15      5.4   7.15     0.61      -85.1
Newport-Inglewood, alt 2 Char      1.32      4.6   7.15     0.52      -98.2
San Joaquin Hills Char             8.34      5.4   6.97    -0.26        4.3
Newport Inglewood Connected alt    1.37      4.1   7.50     0.35     -139.3
Newport Inglewood Connected alt    1.37      4.1   7.50     0.35     -139.3
Newport-Inglewood (Offshore) GR    1.31      6.9   6.70     1.00     -176.7
San Joaquin Hills GR               8.92      5.5   6.73    -0.11        5.6
#*********End of deaggregation corresponding to Chiou-Youngs 2008        *********#

******************** Southern California ****************************************
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APPENDIX E

APPENDIX E

GENERAL EARTHWORK AND GRADING SPECIFICATIONS

1.0 General

1.1 Intent: These General Earthwork and Grading Specifications are for the grading and earthwork shown on the approved grading plan(s) and/or indicated in the geotechnical report(s). These Specifications are a part of the recommendations contained in the geotechnical report(s). In case of conflict, the specific recommendations in the geotechnical report shall supersede these more general Specifications. Observations of the earthwork by the project Geotechnical Consultant during the course of grading may result in new or revised recommendations that could supersede these specifications or the recommendations in the geotechnical report(s).

1.2 Geotechnical Consultant: Prior to commencement of work, the owner shall employ a geotechnical consultant. The geotechnical consultant shall be responsible for reviewing the approved geotechnical report(s) and accepting the adequacy of the preliminary geotechnical findings, conclusions, and recommendations prior to the commencement of the grading.

Prior to commencement of grading, the Geotechnical Consultant shall review the "work plan" prepared by the Earthwork Contractor (Contractor) and schedule sufficient personnel to perform the appropriate level of observation, mapping, and compaction testing.

During the grading and earthwork operations, the Geotechnical Consultant shall observe, map, and document the subsurface exposures to verify the geotechnical design assumptions. If the observed conditions are found to be significantly different than the interpreted assumptions during the design phase, the Geotechnical Consultant shall inform the owner, recommend appropriate changes in design to accommodate the observed conditions, and notify the review agency where required. Subsurface areas to be geotechnically observed, mapped, elevations recorded, and/or tested include natural ground after it has been cleared for receiving fill but before fill is placed, bottoms of all "remedial removal" areas, all key bottoms, and benches made on sloping ground to receive fill.

The Geotechnical Consultant shall observe the moisture-conditioning and processing of the subgrade and fill materials and perform relative compaction testing of fill to determine the attained level of compaction. The Geotechnical Consultant shall provide the test results to the owner and the Contractor on a routine and frequent basis.

1.3 The Earthwork Contractor: The Earthwork Contractor (Contractor) shall be qualified, experienced, and knowledgeable in earthwork logistics, preparation and processing of ground to receive fill, moisture-conditioning and processing of fill, and compacting fill. The Contractor shall review and accept the plans, geotechnical report(s), and these Specifications prior to commencement of grading. The Contractor shall be solely responsible for performing the grading in accordance with the plans and specifications.

The Contractor shall prepare and submit to the owner and the Geotechnical Consultant a work plan that indicates the sequence of earthwork grading, the number of "spreads" of work and the estimated quantities of daily earthwork contemplated for the site prior to commencement of grading. The Contractor shall inform the owner and the Geotechnical Consultant of changes in work schedules and updates to the work plan at least 24 hours in advance of such changes so that appropriate observations and tests can be planned and accomplished. The Contractor shall not assume that the Geotechnical Consultant is aware of all grading operations.

The Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish the earthwork in accordance with the applicable grading codes and agency ordinances, these Specifications, and the recommendations in the approved geotechnical report(s) and grading plan(s). If, in the opinion of the Geotechnical Consultant, unsatisfactory conditions, such as unsuitable soil, improper moisture condition, inadequate compaction, insufficient buttress key size, adverse weather, etc., are resulting in a quality of work less than required in these specifications, the Geotechnical Consultant shall reject the work and may recommend to the owner that construction be stopped until the conditions are rectified.

2.0 Preparation of Areas to be Filled

2.1 Clearing and Grubbing: Vegetation, such as brush, grass, roots, and other deleterious material shall be sufficiently removed and properly disposed of in a method acceptable to the owner, governing agencies, and the Geotechnical Consultant.

The Geotechnical Consultant shall evaluate the extent of these removals depending on specific site conditions. Earth fill material shall not contain more than 1 percent of organic materials (by volume). No fill lift shall contain more than 5 percent of organic matter. Nesting of the organic materials shall not be allowed.

If potentially hazardous materials are encountered, the Contractor shall stop work in the affected area, and a hazardous material specialist shall be informed immediately for proper evaluation and handling of these materials prior to continuing to work in that area.

As presently defined by the State of California, most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant, etc.) have chemical constituents that are considered to be hazardous waste. As such, the indiscriminate dumping or spillage of these fluids onto the ground may constitute a misdemeanor, punishable by fines and/or imprisonment, and shall not be allowed.

2.2 Processing: Existing ground that has been declared satisfactory for support of fill by the Geotechnical Consultant shall be scarified to a minimum depth of 6 inches. Existing ground that is not satisfactory shall be overexcavated as specified in the following section. Scarification shall continue until soils are broken down and free of large clay lumps or clods and the working surface is reasonably uniform, flat, and free of uneven features that would inhibit uniform compaction.

2.3 Overexcavation: In addition to removals and overexcavations recommended in the approved geotechnical report(s) and the grading plan, soft, loose, dry, saturated, spongy, organic-rich, highly fractured or otherwise unsuitable ground shall be overexcavated to competent ground as evaluated by the Geotechnical Consultant during grading.

2.4 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. Please see the Standard Details for a graphic illustration. The lowest bench or key shall be a minimum of 15 feet wide and at least 2 feet deep, into competent material as evaluated by the Geotechnical Consultant. Other benches shall be excavated a minimum height of 4 feet into competent material or as otherwise recommended by the Geotechnical Consultant. Fill placed on ground sloping flatter than 5:1 shall also be benched or otherwise overexcavated to provide a flat subgrade for the fill.

2.5 Evaluation/Acceptance of Fill Areas: All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive fill. The Contractor shall obtain a written acceptance from the Geotechnical Consultant prior to fill placement. A licensed surveyor shall provide the survey control for determining elevations of processed areas, keys, and benches.

3.0 Fill Material

3.1 General: Material to be used as fill shall be essentially free of organic matter and other deleterious substances evaluated and accepted by the Geotechnical Consultant prior to placement. Soils of poor quality, such as those with unacceptable gradation, high expansion potential, or low strength shall be placed in areas acceptable to the Geotechnical Consultant or mixed with other soils to achieve satisfactory fill material.

3.2 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 fill unless location, materials, and placement methods are specifically accepted by the Geotechnical Consultant. Placement operations shall be such that nesting of oversized material does not occur and such that oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 vertical feet of finish grade or within 2 feet of future utilities or underground construction.

3.3 Import: If importing of fill material is required for grading, proposed import material shall meet the requirements of Section 3.1. The potential import source shall be given to the Geotechnical Consultant at least 48 hours (2 working days) before importing begins so that its suitability can be determined and appropriate tests performed.

4.0 Fill Placement and Compaction

4.1 Fill Layers: Approved fill material shall be placed in areas prepared to receive fill (per Section 3.0) in near-horizontal layers not exceeding 8 inches in loose thickness. The Geotechnical Consultant may accept thicker layers if testing indicates the grading procedures can adequately compact the thicker layers. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture throughout.

4.2 Fill Moisture Conditioning: Fill soils shall be watered, dried back, blended, and/or mixed, as necessary to attain a relatively uniform moisture content at or slightly over optimum. Maximum density and optimum soil moisture content tests shall be performed in accordance with the American Society of Testing and Materials (ASTM Test Method D1557-91).

4.3 Compaction of Fill: After each layer has been moisture-conditioned, mixed, and evenly spread, it shall be uniformly compacted to not less than 90 percent of maximum dry density (ASTM Test Method D1557-91). Compaction equipment shall be adequately sized and be either specifically designed for soil compaction or of proven reliability to efficiently achieve the specified level of compaction with uniformity.

4.4 Compaction of Fill Slopes: In addition to normal compaction procedures specified above, compaction of slopes shall be accomplished by backrolling of slopes with sheepsfoot rollers at increments of 3 to 4 feet in fill elevation, or by other methods producing satisfactory results acceptable to the Geotechnical Consultant. Upon completion of grading, relative compaction of the fill, out to the slope face, shall be at least 90 percent of maximum density per ASTM Test Method D1557-91.

4.5 Compaction Testing: Field tests for moisture content and relative compaction of the fill soils shall be performed by the Geotechnical Consultant. Location and frequency of tests shall be at the Consultant's discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations shall be selected to verify adequacy of compaction levels in areas that are judged to be prone to inadequate compaction (such as close to slope faces and at the fill/bedrock benches).

4.6 Frequency of Compaction Testing: Tests shall be taken at intervals not exceeding 2 feet in vertical rise and/or 1,000 cubic yards of compacted fill soils embankment. In addition, as a guideline, at least one test shall be taken on slope faces for each 5,000 square feet of slope face and/or each 10 feet of vertical height of slope. The Contractor shall assure that fill construction is such that the testing schedule can be accomplished by the Geotechnical Consultant. The Contractor shall stop or slow down the earthwork construction if these minimum standards are not met.

4.7 Compaction Test Locations: The Geotechnical Consultant shall document the approximate elevation and horizontal coordinates of each test location. The Contractor shall coordinate with the project surveyor to assure that sufficient grade stakes are established so that the Geotechnical Consultant can determine the test locations with sufficient accuracy. At a minimum, two grade stakes within a horizontal distance of 100 feet and vertically less than 5 feet apart from potential test locations shall be provided.

5.0 Subdrain Installation

Subdrain systems shall be installed in accordance with the approved geotechnical report(s), the grading plan, and the Standard Details. The Geotechnical Consultant may recommend additional subdrains and/or changes in subdrain extent, location, grade, or material depending on conditions encountered during grading. All subdrains shall be surveyed by a land surveyor/civil engineer for line and grade after installation and prior to burial. Sufficient time should be allowed by the Contractor for these surveys.

6.0 Excavation

Excavations, as well as over-excavation for remedial purposes, shall be evaluated by the Geotechnical Consultant during grading. Remedial removal depths shown on geotechnical plans are estimates only. The actual extent of removal shall be determined by the Geotechnical Consultant based on the field evaluation of exposed conditions during grading. Where fill-over-cut slopes are to be graded, the cut portion of the slope shall be made, evaluated, and accepted by the Geotechnical Consultant prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by the Geotechnical Consultant.

7.0 Trench Backfills

7.1 Contractor shall follow all OHSA and Cal/OSHA requirements for safety of trench excavations.

7.2 Bedding and backfill of utility trenches shall be done in accordance with the applicable provisions of Standard Specifications of Public Works Construction. Bedding material shall have a Sand Equivalent greater than 30 (SE>30). The bedding shall be placed to 1 foot over the top of the conduit and densified by jetting. Backfill shall be placed and densified to a minimum 90 percent of maximum from 1 foot above the top of the conduit to the surface, except in traveled ways (see Section 7.6 below).

7.3 Jetting of the bedding around the conduits shall be observed by the Geotechnical Consultant.

7.4 Geotechnical Consultant shall test the trench backfill for relative compaction. At least one test should be made for every 300 feet of trench and 2 feet of fill.

7.5 Lift thickness of trench backfill shall not exceed those allowed in the Standard Specifications of Public Works Construction unless the Contractor can demonstrate to the Geotechnical Consultant that the fill lift can be compacted to the minimum relative compaction by his alternative equipment and method.

7.6 Trench backfill in the upper foot measured from finish grade within existing or future traveled way, shoulder, and other paved areas (or areas to receive pavement) should be placed to a minimum 95 percent relative compaction.