GEOTECHNICAL FEASIBILITY STUDY

MANZANITA AND SUNSET
1085 & 1087 MANZANITA STREET
LOS ANGELES, CALIFORNIA

Terracon Project No. 60077065
January 15, 2008

Prepared for:

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F&S Silverlake II
32100 Telegraph Road, Suite 220
Bingham Farms, Michigan 48025

Attention: Mr. Steven Robinson

Re: Geotechnical Feasibility Study
Manzanita and Sunset
1085 & 1087 Manzanita Street
Los Angeles, California
Terracon Project No. 60077065

Mr. Robinson:

Terracon is pleased to transmit our geotechnical feasibility study report for the site at 1085 & 1087 Manzanita Street in the City of Los Angeles, California. The scope of our services was outlined in our Proposal dated October 4, 2007. Mr. Robinson gave the authorization to proceed on December 17, 2007.

We appreciate the opportunity to work with you on this project, and we are prepared to provide any construction observation and testing services the project may require. If you have any questions regarding this report, or if we may be of further service in other ways, please let us know.

Sincerely,
Terracon Consultants, Inc.

Authorized Reviewer:

Jinny Park, EIT
Staff Engineer

Michael W. Laney, P.E., G.E.
Geotechnical Department Manager

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TABLE OF CONTENTS

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INTRODUCTION

The subsurface exploration and geotechnical feasibility study report for the site at 1085 & 1087 Manzanita Street in the City of Los Angeles, California has been completed. As proposed, exploration of the subsurface materials at the project site consisted of five hollow-stem auger borings taken to depths ranging from approximately 15-¾ to 40-½ feet below the ground surface (bgs). The logs of these borings and a diagram showing their approximate locations are included in this report.

The recommendations contained in this report are based upon the results of field and laboratory testing, engineering analysis, and experience with similar soil conditions, structures and our understanding of the proposed project.

These recommendations are also subject to the limitations presented in the "**General Comments**" section of this report. An information sheet prepared by ASFE (the Association of Engineering Firms Practicing in the Geosciences) is also included as Appendix C. We recommend that all individuals utilizing this report read the limitations along with the attached document.

PROJECT DESCRIPTION

This report describes the subsurface conditions encountered in the borings, presents the laboratory data obtained, and provides geotechnical recommendations for the design of building foundations, support of floor slabs and pavements, and general earthwork.

SITE EXPLORATION PROCEDURES

Field Exploration

Terracon personnel located the borings in the field by taping or pacing distances and estimating right angles from the references shown on the attached boring location diagram, Plate 2. The locations of the borings should be considered accurate only to the degree implied by the methods used to define them.

A limited access drill rig operated by JET Drilling of Signal Hill, California was used to advance the boreholes. Representative samples were obtained by the split-barrel sampling procedure described below. The borings were completed under the continuous technical supervision of a Terracon staff engineer, who visually inspected the soil samples, maintained detailed logs of the boring, interpreted stratigraphy, classified the soils, and obtained drive samples and bulk samples. Logs of the soil borings, including blowcount data and in-situ moisture content and soil density are presented on *Plates A-1 to A-5.* The soils were classified in the field and further examined in the laboratory in general accordance with the Unified Soil Classification System (*a summary of the USCS and General Notes regarding Drilling are included in Appendix A, after the Boring Logs*). Field classifications were modified, where necessary, on the basis of laboratory test results.

The split-barrel sampling procedure uses a 3-inch outer diameter (O.D.), 2.4-inch inner diameter (I.D.) California type or a 2-inch O.D., 1.5-inch I.D. standard split spoon (SPT) type sampler that is driven into the bottom of the boring (elevation shown at sample depth) with a 140-pound drive hammer falling 30 inches. The number of blows required to advance the sampling spoon the last 12 inches, or less, of an 18-inch sampling interval or portion thereof, is recorded as the field resistance value, N. The samples were tagged for identification, sealed to reduce water (moisture) loss and returned to the laboratory for further examination, testing and classification.

A rope and cat-head hammer was used to advance the sampler. A greater mechanical efficiency is achieved with the automatic drive hammer when compared to a conventional safety drive hammer operated with a cathead and rope. This higher efficiency has been considered in our interpretation and analysis of the subsurface information provided with this report.

The final boring logs included with this report, in Appendix A, represent the engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in the laboratory.

Laboratory Testing

Relatively undisturbed small bag and bulk samples were carefully sealed in the field to prevent moisture loss. All samples were then transported to our laboratory in Irvine, California (City of Los Angeles Approved Testing Lab for soils #10213) for examination and testing.

Each of the relatively undisturbed samples in the upper 15 feet was tested to determine the in-situ moisture content and dry density. Where applicable, the sample's unconfined compressive strength was estimated using a calibrated hand penetrometer. The laboratory testing was performed in general accordance with appropriate ASTM, Uniform Building Code (UBC) and California (Caltrans) Standard Test standards, as appropriate. The results of these laboratory tests are summarized below, on the boring logs in Appendix A and graphical results are presented in the Laboratory Summary in Appendix B of this report.

Tests were performed on selected samples as an aid in classifying the soils and to evaluate their physical properties and engineering characteristics that may be present in the soil samples. Details of the laboratory testing program and test results are discussed in the following sections.

WATER CONTENT/DRY DENSITY DETERMINATION

Water (moisture) content and dry density were determined for selected samples, where applicable. The drive samples were trimmed to obtain volume and wet weight, then were dried in accordance with ASTM D2937 (current edition). After drying, the weight of each sample was measured, and water content and dry density were calculated. The water content of selected drive samples and bulk samples were also determined. Water content and dry density values are summarized in the following tables and presented on the boring logs in Appendix A.

ATTERBERG LIMITS

The Atterberg limits were performed in general accordance with ASTM D4318 (current edition) and are used frequently in soil classification and identification. The soil descriptions defined by the USCS are based on these limits. Fine-grained soils are classified in the laboratory by performing several tests that define the plastic and liquid limits. The test results are presented in Table B-1, and graphically represented in Appendix B.

DIRECT SHEAR

To determine the shear strength parameters of the on-site soils, direct shear tests were performed on selected samples, in general accordance with ASTM D3080 (current edition). After the initial weight and volume measurements were made, the samples were placed in a direct shear machine and a selected normal load was applied (1, 2, and 4 kips per square foot [ksf]). The sample was submerged, allowed to consolidate, and then was sheared to failure. Shear stress and sample deformations were monitored throughout the test. The process was repeated on the same soil layer under two additional normal loads. The test results are graphically represented in Appendix B.

CONSOLIDATION TESTS

Consolidation tests were performed in general accordance with ASTM D2435 (current edition) on selected, relatively undisturbed, ring samples recovered from the exploratory excavations. Samples are placed in a consolidometer where increasing load increments are applied in geometric progression. The soil specimen is placed between porous stones that allow water to infiltrate and to flow of the soil sample. During the loading stages prior to the addition of water, the soil sample is sealed in order to prevent evaporation of soil water. The load increment where water was added is indicated on the consolidation pressure curves. The percent consolidation for each load cycle is recorded as the ratio of the amount of vertical compression to the original 1-inch height. The test results are graphically represented in Appendix B.

SOLUBLE SULFATES

Soluble sulfate testing was performed to determined in general accordance with California Test Method No. 417 were also performed on representative samples collected during the field investigation. The results of this test are presented in Table B-2, Appendix B.

MINIMUM RESISTIVITY AND pH

Minimum electrical resistivity and pH testing of the near surface soils was performed in general accordance with California Test Method No. 532. The results of this test are presented in Table B-3, Appendix B.

UNIFIED SOIL CLASSIFICATION SYSTEM

As part of the testing program, a geotechnical engineer examined the soil samples in the laboratory. Based on the laboratory test results and the material's texture and plasticity, the soil samples were described according to the attached General Notes and classified in general accordance with the USCS, in accordance with ASTM Test Methods D2487 and D2488 (current editions). The estimated group symbols for the USCS is shown in the appropriate column on the boring logs. A brief description of the USCS is included in the Appendix A, after the boring logs.

SITE CONDITIONS

The proposed site is located at 1085 & 1087 Manzanita Street in Los Angeles, California. At the time the borings were advanced, the site was developed as a paved driveway and storage yard. Based on our field observations and boring elevations, the site generally sloped downward from the northeast to the southwest.

GEOLOGIC CONDITIONS

Regional Geology

The site is situated within the Northeastern Block of the Los Angeles Basin. The Los Angeles Basin represents a transition between the Peninsular and the Transverse Range Geomorphic Provinces in Southern California. Geologic structures within the Transverse Range Province trend mostly east-west, in contrast to the prevailing northwest trend elsewhere in the state including the Peninsular Range Province.[1,2] The Property is located

[1] Harden, D. R., "*California Geology*, *Second Edition*," Pearson Prentice Hall, 2004.

nearest to the Hollywood Fault, a more detailed discussion of seismicity is included in the **Faulting and Estimated Ground Motions** Section of this report.

The Northeastern block is bounded by the Central block to the southwest, the San Gabriel Mountains to the north, the San Jacinto Fault to the east and the Whittier Fault to the southwest. [3]

Local Geology

In general, the Hollywood Geologic Quadrangle Map indicates that Quaternary alluvial deposits (Qa) consisting of "alluvial clay, sand and gravel; includes gravel and sand of minor stream channels" underlie the site.[4] It should also be mentioned that bedrock of unnamed Shale (Tush) Formation is mapped to the immediate southeast vicinity of the site. This material is described as "gray to light brown, thin-bedded silty clay shale, soft and crumbly; locally contains scattered hard calcareous nodules; in places contains laminae of fine grained soft sandstone."[5]

Faulting and Estimated Ground Motions

The subject site is located in Southern California, which is a seismic active area. The type and magnitude of seismic hazards affecting the site are dependent on the distance to causative faults, the intensity, and the magnitude of the seismic event. Table 1 indicates the distance of the fault zones and the associated maximum credible earthquake that can be produced by nearby seismic events, as calculated using the EQFAULT program.[6] The Hollywood Fault (a Type B Fault), which is located < 2 miles of the site, is considered to have the most significant affect at the site from a design standpoint.

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[2] Norris, R. M. and Webb, R. W., *"Geology of California, Second Edition,"* John Wiley & Sons, Inc., 1990.

[3] *ibid*

[4] Dibblee Geological Foundation, "*Geologic Map of the Hollywood and Burbank (South ½) Quadrangles, Los Angeles County, California*," Map DF-30, May 1991.

[5] *Ibid.*

[6] Blake, T. F., "*EQFAULT: A Computer Program for the Deterministic Prediction of Peak Horizontal Acceleration from Digitized California Fault*", User Manual and Program, 1989, (Updated 1999).

TABLE 1
Characteristics and Estimated Earthquakes for Regional Faults

Fault Name	Approximate Distance to Site (miles)	Fault Type	Maximum Credible Earthquake (MCE) Magnitude
Elysian Park Blind Thrust	0.4	Blind thrust	6.4
Puente Hills Blind Thrust	0.7	Blind thrust	7.1
Hollywood	1.4	B	6.4
Raymond	3.9	B	6.5
Verdugo	5.3	B	6.9
Newport-Inglewood	7.1	B	7.1
Santa Monica	7.9	B	6.6
Sierra Madre	9.7	B	7.2
Northridge (E. Oak Ridge)	12.4	B	7.0
Sierra Madre (San Fernando)	12.7	B	6.7
Malibu Coast	14.3	B	6.7
San Gabriel	15.5	B	7.2
Clamshell-Sawpit	16.7	B	6.5
Whittier	16.7	B	6.8
Palos Verdes	18.3	B	7.3

In order to estimate the seismic ground motions at the subject site, Terracon reviewed seismic hazard map information;[7] and performed a probabilistic analysis using the FRISKSP computer program[8] utilizing the Joyner Boore (1997), Campbell (1997), and Abrahamson and Silva (1997) attenuation curves.[9] Based on these sources the peak ground acceleration at the subject site for a 10% Probability of Exceedance in 50 years is expected to be about 0.73g.

Furthermore, the site is not located within an Alquist-Priolo Earthquake Fault Zone based on our review of the State Fault Hazard Maps.[10]

Liquefaction Potential

Liquefaction is the phenomenon where saturated soils develop high pore water pressures during seismic shaking and lose their strength characteristics. This phenomenon generally occurs in areas of high seismicity, where ground water is shallow and loose granular soils or hydraulic fill soils are present.

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[7] California Geologic Survey (CGS), "The Revised 2002 California Probabilistic Seismic Hazard Maps" June 2003. Note: Supersedes the "Probabilistic Seismic Hazard Assessment for the State of California", Open File Report 96-08 (1996) and 97-706 (1997).

[8] Blake, T. F., "FRISKSP: A Computer Program for the Probabilistic Prediction of Peak Ground Acceleration from Digitized California Faults," ver. 4.00, User Manual and Program, 2000.

[9] Seismological Society of America, "Equations for the Estimating Horizontal Response Spectra and Peak Acceleration from Western North American Earthquakes: A Summary of Recent Work": Seismological Research Letters, Vol. 68, No. 1, pp. 128-153.

[10] California Department of Conservation Division of Mines and Geology (CDMG), *"Digital Images of Official Maps of Alquist-Priolo Earthquake Fault Zones of California, Southern Region"*, CDMG Compact Disc 2000-003, 2000.

The site is not located within an area, which the State of California has designated as a Seismic Hazard Zones for Liquefaction and/or Slope Instability. [11]

Based on our liquefaction analysis, performed in general accordance with the California State standards,[12] the potential for liquefaction is considered "low" for the design level earthquake event. We estimate that seismically induced settlement of the silty clay layer from 20 to 25 feet bgs is approximately 1-inch and that these soils are deep enough that manifestation of this settlement on the surface is unlikely. Our liquefaction analysis is presented in Appendix C of this report.

SUBSURFACE CONDITIONS

Beneath the asphaltic concrete pavement cover, we encountered approximately 10 to 30 feet of native alluvial soils consisting of damp to moist silty clays and lean to fat clays underlain by siltstone to the maximum depth explored, approximately 40-½ feet bgs.

The subsurface conditions encountered at each boring location are indicated on the boring logs in Appendix A. The stratification boundaries shown on the boring logs represent the approximate locations of changes in soil types; in-situ, the transition between material types may be gradual and indistinct

GROUNDWATER CONDITIONS

The borings were monitored for groundwater while drilling and immediately after completing the drilling operations. As indicated in the lower left corner of the boring logs, groundwater was encountered at a depth of approximately 35 feet bgs in borings B-02 and B-03. Based on our research, historical groundwater has been as high as 20 feet bgs in this area.[13]

Fluctuations in groundwater levels can occur due to seasonal variations in the amount of rainfall, runoff, altered natural drainage paths, and other factors not evident at the time the borings were advanced. Consequently, the designer and contractor should be aware of this possibility while designing and constructing the building.

[11] CDMG, "Official Seismic Hazard Zone Map Hollywood 7.5-Minute Quadrangle, Los Angeles County, California," 1998.

[12] CDMG, "Guidelines for Evaluating and Mitigating Seismic Hazards in California," SP 117, 1997.

[13] CDMG, "*Seismic Hazard Report Hollywood*, 7.5-Minute Quadrangle, Los Angeles County, *California*," Seismic Hazard Report 98-17, 1998.

ENGINEERING RECOMMENDATIONS

Geotechnical Considerations

Based on the data, analysis and findings presented in this report and as required by Section 111 of the 2002 Los Angeles Building Code, it is our opinion that the grading/building site will be safe from hazards from future landsliding, settlement, or slippage, as long as the recommendations presented it the above referenced report are followed. Also, it is our opinion that grading construction will not adversely affect the geotechnical stability of adjacent properties outside the site.

This report provides recommendations to help mitigate the effects of expected soil shrinkage and expansion. However, even if these procedures are followed, some movement and cracking in structures should be anticipated. The severity of cracking and other damage such as uneven floor slabs will probably increase if any modification of the site results in excessive wetting or drying of the expansive soils. Eliminating the risk of movement and distress may not be feasible, but it may be possible to further reduce the risk of movement if significantly more expensive measures are used during construction.

Recommendations regarding foundations and other issues related to the geotechnical aspects of the project are presented in the following sections.

Site and Building Pad Preparation

Following existing building demolition and removal, site preparation for the proposed project should include removing any vegetation, topsoil, existing pavements, existing foundations, existing floor slabs and any other unsuitable materials encountered on-site. Loose materials in depressions or excavations should also be removed. The depressions or excavations should be backfilled as outlined in the following paragraphs. Based on boring information, we expect removal of 3 to 4 inches of asphaltic pavement and aggregate base will be required. Actual stripping depths should be determined at the time of construction by a representative of the geotechnical engineer.

Shallow Footing Foundations

A shallow footing foundation system, founded on a minimum of 3 feet of properly compacted fill extending horizontally at least five feet beyond the outside face of the footing edges, can be used to support the proposed building. For the design of footings bearing within tested and approved new fill we recommend using a net allowable bearing pressure of 1,000 psf. This is the pressure at the base of the footing in excess of the adjacent overburden pressure. The allowable bearing pressure may be increased by on-third for short-term seismic and wind load conditions.

Resistance to lateral loads may be developed by friction acting at the base of footings and passive earth pressure developed on the sides of footings below grade. Passive earth pressure and friction may be used in combination, without reduction, in evaluating total resistance to lateral loads. An allowable resistance to lateral sliding of 130 psf may be used for dead load forces for footings cast directly against approved compacted fill. An allowable passive pressure of 100 (pounds per square foot per linear foot of footing embedment) may be used for the sides of footings, provided the footings are poured tight against approved compacted fill or competent natural soils.

Terracon personnel should be retained to observe and evaluate that footing excavations terminate in soils suitable for the design bearing pressure. If unsuitable soil is present, the excavation should be extended until suitable material is encountered. Unsuitable soil or fill removal should also extend at least 8 inches beyond the foundation edge for each 12-inch thickness of unsuitable soil being removed. The material removed should be replaced with an approved granular soil, placed and compacted as described in the **"Earthwork Considerations"** section.

If site preparation and foundation observation services are conducted as outlined in this report, long-term settlement is expected to be less than 1 inch for footings bearing within the materials described above. Differential settlement across the structure is not expected to exceed about ½ this value.

Continuous footings should have a minimum width of at least 18 inches, and isolated column footings should have a minimum width of at least 24 inches. For continuous footings, we recommend minimum reinforcement of two #5 rebars, at the top and bottom of the footing be used. For isolated footings, we recommend minimum reinforcement of #5 rebars, 12–inches on center be used. Actual required footing reinforcement should be determined by the project structural engineer.

To reduce moisture changes beneath the footing soils, we recommend that perimeter footings bear at least 24 inches below final exterior grade. Interior footings may be placed at shallower depths.

Care should be taken to prevent wetting or drying of the bearing materials during construction. Any extremely wet or dry material, or any loose or disturbed material in the bottom of the footing excavations, should be removed prior to placing concrete.

Building addition footings should be designed and constructed so that they do not contact the existing footings, if possible. Also, to avoid imposing additional loads on existing footings, new footings that are constructed adjacent to existing footings should have a bottom elevation equal to or lower than the bottom of the existing footings.

Foundations adjacent to slopes should have a minimum setback of 1/3 the height of the slope, not to exceed 40 feet for descending slopes. For ascending slopes the setback from the face of future proposed structures shall be ½ the height of the slope, not to exceed 15 feet. Slope set backs are illustrated on Figure 18-I-1 in the 2001 CBC.

Floor Slab Subgrade

Generally, a building is designed for post-construction vertical floor slab movements of less than ½ inch. The near surface soils encountered in the borings were low to moderately plastic clays. Based on correlations with Atterberg Limits testing and soil classifications these soils are expected to exhibit "moderate" expansion potential (Table 18-1-B, 2001 CBC) with variations in the subgrade moisture content. Based on the measured in-situ moisture contents and dry densities, the near surface soils are considered unsuitable for providing direct support for floor slabs in their current condition (without additional site preparation/recompaction)

After stripping the site, the building area should be overexcavated to a minimum depth of 4 feet below the bottom of the subgrade.

We recommend minimum thickness of the slab be of #6–inches. The actual required slab thickness and reinforcement should be determined by the project structural engineer.

Care should be taken to maintain the minimum recommended moisture content in the subgrade until floor slabs are constructed. Positive drainage should also be developed away from the building to prevent water from ponding along the perimeter and affecting future floor slab performance. We recommend a positive cutoff in utility trenches at the building lines to reduce the potential for water migrating through the utility trench backfill to areas under the building.

The use of a vapor retarder should be considered beneath concrete slabs on grade that will be covered with wood, tile, carpet or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer and slab contractor should refer to ACI 302 for procedures and cautions regarding the use and placement of a vapor retarder.

Retaining Walls

Lateral Earth Pressures

For soils above any free water surface, recommended equivalent fluid pressures for unrestrained foundation elements are:

Active:

Cohesive soil backfill (on-site clay or silt)	60 psf/ft
Compacted granular backfill	35 psf/ft

Passive:

Cohesive soil backfill (on-site clay or silt)	250 psf/ft
Undisturbed soils or bedrock	350 psf/ft

Coefficient of base friction	0.35*

*The coefficient of base friction should be reduced to 0.30 when used in conjunction with passive pressure.

Where the design includes restrained elements, the following equivalent fluid pressures are recommended:

At rest:

Cohesive soil backfill (on-site clay or silt)	70 psf/ft

The lateral earth pressures herein do not include any factor of safety and are not applicable for submerged soils/hydrostatic loading. Additional recommendations may be necessary if submerged conditions are to be included in the design.

Fill against grade beams and retaining walls should be compacted to densities specified in Earthwork. Medium to high plasticity clay soils or claystone shale should not be used as backfill against retaining walls. Compaction of each lift adjacent to walls should be accomplished with hand-operated tampers or other lightweight compactors. Overcompaction may cause excessive lateral earth pressures which could result in wall movement.

Retaining Wall Drainage

To reduce hydrostatic loading on retaining walls, a subsurface drain system should be placed behind the wall. The drain system should consist of free-draining granular soils containing less than five percent fines (by weight) passing a No. 200 sieve placed adjacent to the wall. The free-draining granular material should be graded to prevent the intrusion of fines or encapsulated in a suitable filter fabric. A drainage system consisting of either weep holes or perforated drain lines (placed near the base of the wall) should be used to intercept and discharge water which would tend to saturate the backfill. Where used, drain lines should be embedded in a uniformly graded filter material and provided with adequate clean-outs for periodic maintenance. An impervious soil should be used in the upper layer of backfill to reduce the potential for water infiltration. As an alternative, a prefabricated drainage structure, such as geocomposite, may be used as a substitute for the granular backfill adjacent to the wall.

Pavements

The near surface soils at the boring locations generally consisted of low to moderate plastic clays. In their existing condition these soils are not expected to provide adequate long-term support for the proposed pavements. Recommendations regarding subgrade preparation are provided in the following paragraphs.

Site preparation for the proposed pavement areas should include removing any vegetation, topsoil, existing pavements, existing foundations, existing floor slabs and any other unsuitable materials encountered. Loose materials in depressions or excavations should also be removed. The depressions or excavations should be backfilled as outlined in the **"Earthwork Considerations"** section.

After site stripping and completing any required cuts, we recommend the exposed subgrade be overexcavated to a depth of 12-inches below the proposed pavement subgrade. A representative of the geotechnical engineer should observe the overexcavation bottom.

We recommend the top 8 inches of the overexcavation bottom be scarified and be compacted to at least 90 percent of the material's maximum dry density in accordance with ASTM D 1557 (current edition).

If fill is required to develop final grade lines, it should consist of approved materials which are free of organic matter and debris. These fill materials should conform to the plasticity specifications for low volume change soil, outlined in the **"Earthwork Considerations"** section of this report.

Based on our previous experience with soils similar to those encountered on-site, our recommendations for preparing the pavement subgrades, a Resistance Value (R-Value) of 30 may be used in determining the asphaltic concrete pavement sections. A modulus of subgrade reaction value (k) of 100 pounds per cubic inch (pci) may be used in determining the Portland cement concrete pavement sections.

MINIMUM PAVEMENT RECOMMENDATIONS *		
	Light (Automobile) Parking **Assumed Traffic Index (T.I.) = 4.0**	**Heavy Parking and Drive Areas** **Assumed T.I. 6.0**
Section I Portland Cement Concrete (3,500 psi, Air Entrained)	5.0" Concrete 4.0" Class II Aggregate Base	6.0" Concrete 6.0" Class II Aggregate Base
Section II Asphaltic Concrete	3.0" Asphaltic Concrete over 3.0" Class II Aggregate Base	4.0" Asphaltic Concrete over 8.0" Class II Aggregate Base
* All materials should meet the CALTRANS Standard Specifications for Highway Construction.		

Minimizing subgrade saturation is an important factor in maintaining subgrade strength. Water allowed to pond on or adjacent to pavements could saturate the subgrade and cause premature pavement deterioration. The pavement should be sloped to provide rapid surface drainage, and positive surface drainage should be maintained away from the edge of the paved areas. Design alternatives which could reduce the risk of subgrade saturation and improve long-term pavement performance include crowning the pavement subgrades to drain toward the edges, rather than to the center of the pavement areas; and installing surface drains next to any areas where surface water could pond. Properly designed and constructed subsurface drainage will reduce the time subgrade soils are saturated and can also improve subgrade strength and performance. In areas where there will be irrigation adjacent to pavements, we recommend the owner consider installing perimeter drains for the pavements.

Periodic maintenance extends the service life of the pavement and should include crack sealing, surface sealing and patching of any deteriorated areas. Also, thicker pavement sections could be used to reduce the required maintenance and extend the service life of the pavement. The owner/user should consider placing signs at entryways to deter heavy duty trucks from light duty pavement areas, or by extending concrete curbs to a depth of 12-inches below the pavement subgrade.

If asphaltic concrete is used for this project, we recommend that reinforced concrete pads be provided in front of and beneath trash receptacles. The trash collection trucks should be parked on the rigid concrete pavement when the trash receptacles are lifted. The concrete pads should be a minimum of 7 inches thick and properly reinforced. Thickened edges should be used along outside edges of concrete pavements. Edge thickness should be at least 2 inches thicker than concrete pavement thickness and taper to the actual concrete pavement thickness 36 inches inward from the edge. Integral curbs may be used in lieu of thickened edges.

Care should be taken to properly backfill utility cuts in pavement areas. Backfilling should be accomplished by compacting the backfill to meet the requirements for fill as outlined in the **"Earthwork Considerations"** section of this report.

Earthwork Considerations

General

Based on our findings, we expect remedial removals on the order of 4 feet below footings within building pads, and 2 feet below pavement subgrade to be necessary.

After completing the overexcavation and any corrective work, we recommend all exposed subgrade soils be scarified and compacted to a depth of 8 inches. The moisture content of the scarified soil should be adjusted to at least 3 percentage points above its optimum value, as determined by ASTM D1557 (current edition), prior to being compacted to at least 90 percent of its maximum dry density.

All fill required to develop the design subgrade elevation should consist of an approved granular soil that is free of organic matter and debris, placed in lifts not exceeding 9 inches in loose thickness, and compacted to at least 90 percent of the maximum dry density and at least 3 percentage points above its optimum value, as determined by test method ASTM D1557 (current edition). The zone of fill compacted to meet this criteria should extend beyond the building footprint at least 1 foot laterally for each foot of fill required to develop design grade.

Excavation and Trench Construction

Excavations into the on-site soils will encounter caving soils and possibly groundwater, depending upon the final depth of excavation. The individual contractor(s) should be made responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. All excavations should be sloped or shored in the interest of safety following local, and federal regulations, including current OSHA excavation and trench safety standards.

For this site, the subsurface soils consisting of the granular materials can be considered Type A soils when applying the OSHA regulations. OSHA allows a maximum slope inclination of ¾:1 (horizontal to vertical) for Type A soils in excavations of 20 feet or less. Flatter slopes may be required if caving soils or seepage is encountered in any excavation. If any excavation, including a utility trench, is extended to a depth of more than 20 feet, it will be necessary to have the side slopes designed by a professional engineer.

The soils to be penetrated by the proposed excavations may vary significantly across the site. The preliminary soil classifications are based solely on the materials encountered in widely spaced exploratory test borings. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are encountered at the time of construction, the actual conditions should be evaluated to determine any excavation modifications necessary to maintain safe conditions.

As a safety measure, it is recommended that all vehicles and soil piles be kept to a minimum lateral distance from the crest of the slope equal to no less than the slope height. The exposed slope face should be protected against the elements.

The contractor should retain a geotechnical engineer to monitor the soils exposed in all excavations and provide engineering services for slopes. This will provide an opportunity to monitor the soil types encountered and to modify the excavation slopes as necessary. It also offers an opportunity to verify the stability of the excavation slopes during construction.

Exterior Slab Design and Construction

Compacted subgrade or existing clay soils will expand with increasing moisture content; therefore, exterior concrete grade slabs may heave, resulting in cracking or vertical offsets. The potential for damage would be greatest where exterior slabs are constructed adjacent to the building or other structural elements. To reduce the potential for damage caused by movement, we recommend:

- exterior slabs be supported on fill with no, or very low expansion potential
- strict moisture-density control during placement of subgrade fills
- placement of effective control joints on relatively close centers and isolation joints between slabs and other structural elements
- provision for adequate drainage in areas adjoining the slabs
- use of designs which allow vertical movement between the exterior slabs and adjoining structural elements

In those locations where movement of exterior slabs cannot be tolerated or must be reduced, consideration should be given to:

- Constructing slabs with a stem or key-edge, a minimum of 6 inches in width and at least 12 inches below grade;
- supporting keys or stems on drilled piers; or
- providing structural exterior slabs supported on foundations similar to the building.

Underground Utility Systems

Underground piping within or near the proposed structure should be designed with flexible couplings, so minor deviations in alignment do not result in breakage or distress. Utility knockouts in foundation walls should be oversized to accommodate differential movements.

Geotechnical Observation and Testing during Grading

Geotechnical observation and testing should be conducted during the following stages of grading:

- Upon completion of clearing and grubbing;
- During Demolition of existing foundations, pavement and utilities;
- During excavation and overexcavation of the building and pavement subgrade;
- During all phases of grading, including, fill placement and recompaction;
- When any unusual conditions are encountered during grading

The exposed subgrade and each lift of compacted fill should be tested, evaluated, and reworked, as necessary, until approved by the geotechnical engineer's representative prior to placement of additional lifts.

Surface Drainage

Positive drainage should be provided during construction and maintained throughout the life of the proposed project. Infiltration of water into utility or foundation excavations must be prevented during construction. Planters and other surface features which could retain water in areas adjacent to the building or pavements should be sealed or eliminated. In areas where sidewalks or paving do not immediately adjoin the structure, we recommend that protective slopes be provided with a minimum grade of approximately 5 percent for at least 10 feet from perimeter walls. Backfill against footings, exterior walls, and in utility and sprinkler line trenches should be well compacted and free of all construction debris to reduce the possibility of moisture infiltration.

Downspouts, roof drains or scuppers should discharge into splash blocks or extensions when the ground surface beneath such features is not protected by exterior slabs or paving. Sprinkler systems should not be installed within 5 feet of foundation walls. Landscaped irrigation adjacent to the foundation system should be minimized or eliminated.

Corrosion Considerations

Two selected samples of the near surface soils encountered in our borings were tested for soluble sulfate concentrations. The test results indicated sulfate concentrations of 0.0001 and 0.013 percentage by weight, which according to Table 19-A-4 of the 2001 CBC, indicates that the on-site soils of similar concentration should be "negligibly" corrosive towards concrete elements in contact with the ground. We recommend that the concrete mix design take into account using the cement type and parameters presented in Table 19-A-4 of the CBC for this level.

Minimum resistivity testing and pH of the near surface soils were performed on two selected sample. Based on the Caltrans criteria, these soils exhibit a "severe" potential for corrosion to ferrous metals in contact with the soils. These corrosion test results are included in Appendix B, and should be reviewed by a qualified corrosion engineer to provide recommendations for protecting ferrous metals in contact with the soil.

California Building Code Seismic Coefficients

The 2007 CBC, which is based on the 2006 International Building Code (IBC), will be adopted by the State of California on January 1, 2008. Therefore, we are providing the following Seismic Coefficients if the proposed project submittal is expected to occur after this date:

Item	Value	Location
Site Class	D	Table 1613.5.2 [R1]
Mapped Spectral Accelerations		USGS [R2]
Short Period, S_s	2.047	
1-second Period, S_1	0.737	
Site Coefficient, F_a	1.0	Table 1613.5.3(1) [R1]
Site Coefficient, F_v	1.5	Table 1613.5.3(2) [R1]

R1 California Building Standards Commission (CBSC), "California Building Code," 2007 Edition.
R2 United States Geologic Survey (USGS), "Interpolated Probabilistic Ground Motion for the Conterminous 48 States by Latitude Longitude, 2002 Data," URL http://eqint.cr.usgs.gov/eq-men/html/lookup-2002-interp-06.html

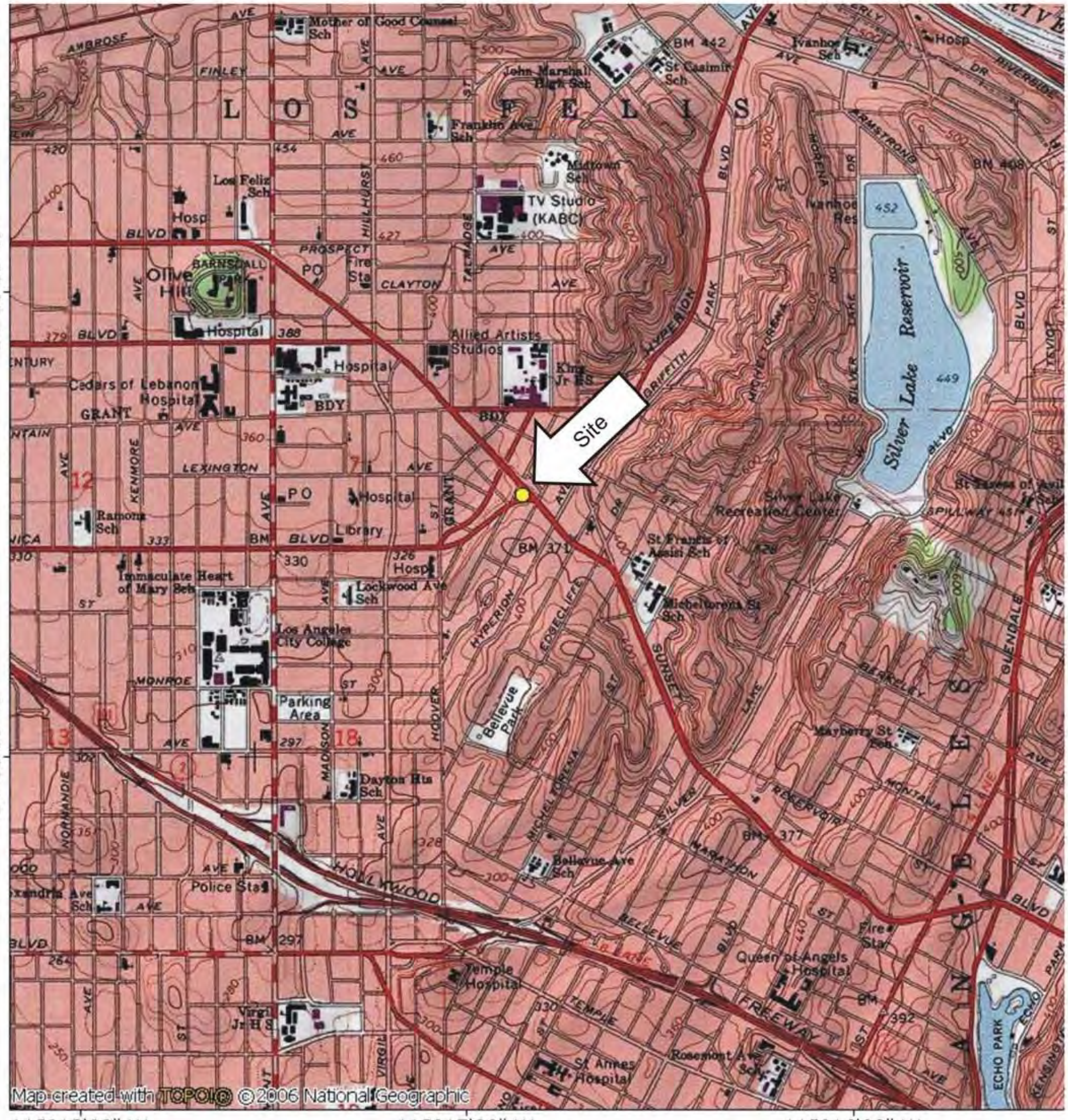
GENERAL COMMENTS

Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide testing and observation during excavation, grading, foundation and construction phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services of this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential of such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that any changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes, and either verifies or modifies the conclusions of this report in writing.



34°06'00" N

34°05'00" N

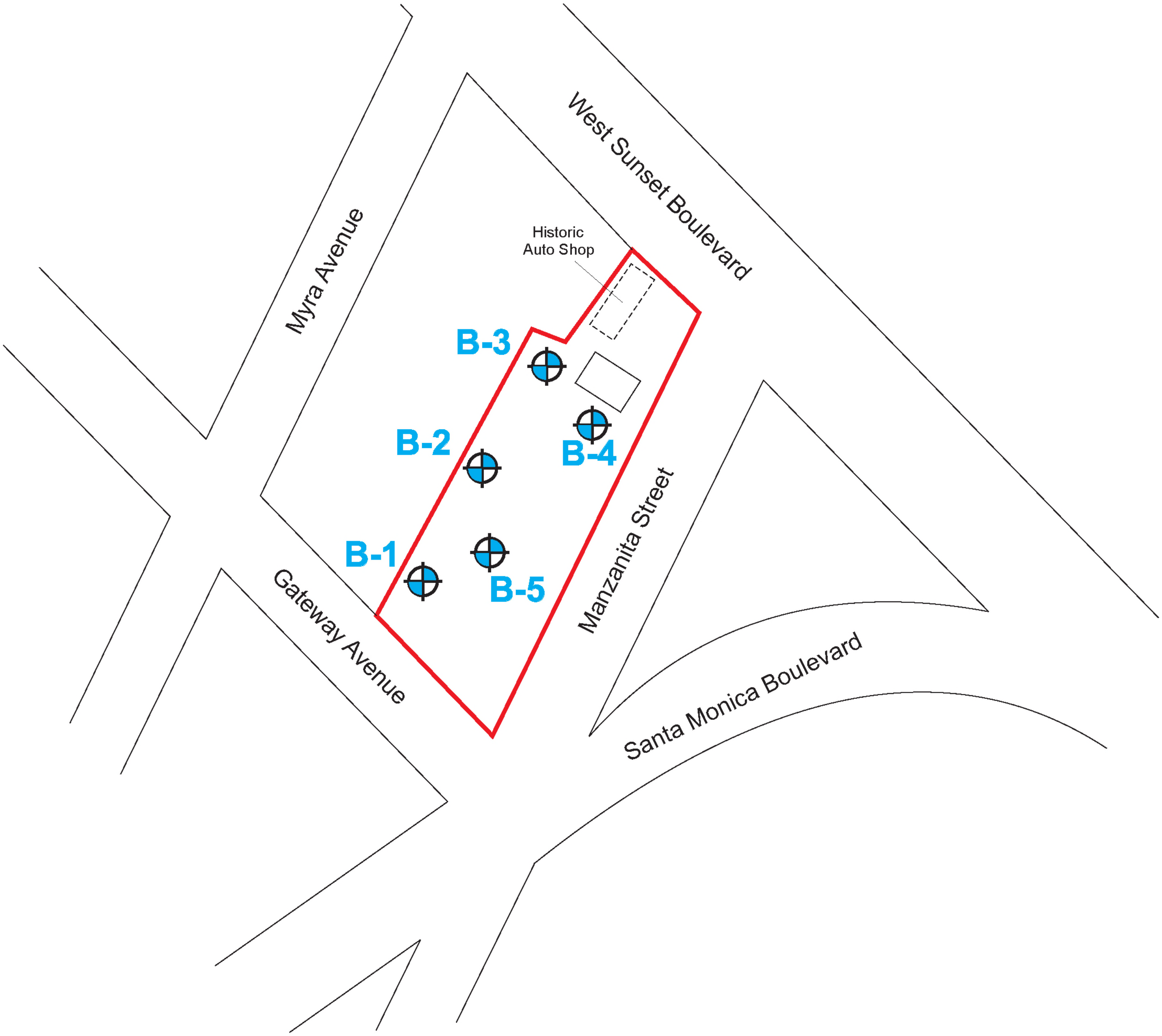
118°18'00" W   118°17'00" W   118°16'00" W

Reference: USGS Hollywood, California 7.5-minute Quadrangle (Photorevised 1994)

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

TOPOGRAPHIC MAP
MANZANITA AND SUNSET
1085 & 1087 MANZANITA STREET
LOS ANGELES, CALIFORNIA 90029
For F & S Silverlake II

Project Mngr:	MWL	Terracon	Project No.	60077065
Designed By:	PK		Scale:	1" = 2000'
Checked By:	MWL	16662 Millikan Avenue	Date:	01-03-2008
Approved By:	MWL	Irvine, California 92606	Drawn By:	JP
File Name:		L(Layout1)	Plate No.	1



LEGEND:

B-5 Boring Location

N

BORING LOCATION MAP
MANZANITA AND SUNSET
1085 AND 1087 MANZANITA STREET
LOS ANGELES, CALIFORNIA
FOR F&S Silverlake II

Project Mngr:	MWL	Terracon	Project No.	60077065
Designed By:	PK		Scale:	Not to scale
Checked By:	MWL	16662 Millikan Avenue	Date:	1-11-08
Approved By:	MWL	Irvine, California 92606	Drawn By:	TAW
File Name:	\Plate_2.cdr	L(Layout1)	Plate No.	2

DIAGRAM IS FOR GENERAL LOCATION ONLY,
AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

APPENDIX A

Field Investigation

LOG OF BORING NO. B-01

CLIENT	SITE
F&S SILVERLAKE II	LOS ANGELES, CA
ELEVATION feet	PROJECT MANZANITA AND SUNSET

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: GRAPHICS	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: N- FIELD BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, tsf
	ASPHALT		CH							
	CLAY - gray brown to dark gray, moist, white mottling.	0–5			B					
	- fine to medium grained sand.									
	- trace silt.	5–6.5	CH		RS		48	28	93	2.3*
	- white mottling, increasing silt.	10–11.5	CL		RS		51	25	97	3.6*
	Continued Next Page									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			BORING STARTED	12-26-07
WL	None		BORING COMPLETED	12-26-07
WL			RIG	Logged by:
BORING LOCATION	See Boring Location Plan		JOB # 60077065	PLATE A-1a

Terracon

BOREHOLE SAMPLE BOTTOM BORING LOGS.GPJ TERRACON.GDT 1/16/08

LOG OF BORING NO. B-01

CLIENT	SITE
F&S SILVERLAKE II	LOS ANGELES, CA
ELEVATION feet	PROJECT MANZANITA AND SUNSET

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: GRAPHICS	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: N- FIELD BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, tsf
	- red gray, damp.	16	CL		RS		52	27	97	3.6*
		17								
		18								
		19								
	SILTSTONE - yellow brown to light gray, moist, slight chemical or organic odor.	20	CL							
		21			RS		50	29	89	4.5*
		22								
		23								
		24								
	- fine grained.	25	ML							
		26			RS			29	93	>4.5*
		27								
		28								
		29								

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		BORING STARTED	12-26-07
WL ∇ None	WL	BORING COMPLETED	12-26-07
WL	WL	RIG	Logged by:
BORING LOCATION See Boring Location Plan		JOB # 60077065	PLATE A-1b

Terracon

LOG OF BORING NO. B-01

CLIENT	SITE
F&S SILVERLAKE II	LOS ANGELES, CA
ELEVATION feet	PROJECT MANZANITA AND SUNSET

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: GRAPHICS	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: N- FIELD BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, tsf
		31	ML		RS		50/4"	25	97	>4.5*
		32								
		33								
		34								
	- olive.	35	ML							
		36			RS		50/2"	29	92	>4.5*
		37								
		38								
		39								
	- gray brown, damp.	40	ML		RS		50/2"	22	99	
	Total depth of 40.5 feet. No groundwater encountered. Backfilled with bentonite and cement grout.									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			BORING STARTED	12-26-07
WL	∇ None	▼	BORING COMPLETED	12-26-07
WL	▼	▼	RIG	Logged by:
BORING LOCATION	See Boring Location Plan		JOB # 60077065	PLATE A-1c

Terracon

LOG OF BORING NO. B-02

CLIENT	SITE
F&S SILVERLAKE II	LOS ANGELES, CA
ELEVATION feet	PROJECT MANZANITA AND SUNSET

DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: GRAPHICS	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: N- FIELD BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, tsf
ASPHALT									
LEAN CLAY - dark brown, moist, some fine to medium graded sand, pieces of red brick.	0–5	CL		B					
- dark gray.	4								
- no recovery.	5								
FAT CLAY - layer of yellow to white sand, fine to medium grained.	12–13.5	CH		SPT					

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	35	
WL		
BORING LOCATION	See Boring Location Plan	

Terracon

BORING STARTED	12-26-07
BORING COMPLETED	12-26-07
RIG	Logged by:
JOB # 60077065	PLATE A-2a

LOG OF BORING NO. B-02

CLIENT	SITE
F&S SILVERLAKE II	**LOS ANGELES, CA**
ELEVATION **feet**	PROJECT **MANZANITA AND SUNSET**

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: GRAPHICS	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: N-FIELD BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, tsf
	- red to gray, white mottling, yellow to light gray silt stone.	16	CH		SPT		24			
		17								
		18								
		19								
	SILTY CLAY - dark gray, damp, hard, chemical to organic odor, some green and brown.	20	CL							
		21			RS			34	84	2.5*
		22								
		23								
		24								
	- trace silt, yellow brown, moist.	25	CL							
		26			SPT		64			
		27								
		28								
		29								

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	∇ 35	
WL		
BORING LOCATION	See Boring Location Plan	

Terracon

BORING STARTED	12-26-07
BORING COMPLETED	12-26-07
RIG	Logged by:
JOB # 60077065	PLATE A-2b

LOG OF BORING NO. B-02

CLIENT	SITE
F&S SILVERLAKE II	LOS ANGELES, CA
ELEVATION feet	PROJECT MANZANITA AND SUNSET

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: GRAPHICS	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: N- FIELD BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, tsf
	SILTSTONE - yellow brown, moist.	31	ML		RS		50/5"	29	90	> 4.5*
		32								
		33								
		34								
	- wet. ▽	35	ML							
		36			RS		50/4"	21	104	> 4.5*
		37								
		38								
		39								
		40	ML		RS		50/4"	35	92	
	Total depth of 40 feet. Groundwater encountered at 35 feet. Backfilled with bentonite and cement grout.									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			BORING STARTED	12-26-07
WL	▽ 35	▼	BORING COMPLETED	12-26-07
WL	▼	▼	RIG	Logged by:
BORING LOCATION	See Boring Location Plan		JOB # 60077065	PLATE A-2c

Terracon

LOG OF BORING NO. B-03

CLIENT	SITE
F&S SILVERLAKE II	LOS ANGELES, CA
ELEVATION feet	PROJECT MANZANITA AND SUNSET

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: GRAPHICS	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: N- FIELD BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, tsf
	ASPHALT		CH							
	FAT CLAY - dark gray, moist, trace fine grained sand.	0-5	CH		B					
	- stiff.	5	CH		RS		39	25		3.8*
	SILTY CLAY - brown, stiff, trace asphalt.	10	CL		RS		38	27		3.4*
	Continued Next Page									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		BORING STARTED	12-27-07
WL ∇ 35	▼	BORING COMPLETED	12-27-07
WL ▼	▼	RIG	Logged by:
BORING LOCATION See Boring Location Plan		JOB # 60077065	PLATE A-3a

Terracon

LOG OF BORING NO. B-03

CLIENT	SITE
F&S SILVERLAKE II	LOS ANGELES, CA
ELEVATION feet	PROJECT MANZANITA AND SUNSET

DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: TYPE	RECOVERY, in.	N-FIELD BLOWS / ft.	TESTS: WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, tsf
- some silt.	15–16.5	CL	RS		58	27	92	2.5*
- yellow brown with brown-red veining, slight odor, stiff.	19							
- no red veining, trace fine grained sand, some silt, firm.	20–21.5	CL	SPT		14			
SILTSTONE - yellow brown, moist, weak.	25–26.5	ML	SPT		26	27		3.8*

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	∇ 35	
WL		
BORING LOCATION	See Boring Location Plan	

BORING STARTED	12-27-07
BORING COMPLETED	12-27-07
RIG	Logged by:
JOB # 60077065	PLATE A-3b

Terracon

LOG OF BORING NO. B-03

CLIENT	SITE
F&S SILVERLAKE II	**LOS ANGELES, CA**
ELEVATION **feet**	PROJECT **MANZANITA AND SUNSET**

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: GRAPHICS	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: N-FIELD BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, tsf
	- yellow brown, moist, trace fine grained white sand.	31	ML		SPT		42	27		> 4.5*
		32								
		33								
		34								
	- wet. ∇	35	ML							
		36			SPT		50	25		> 4.5*
		37								
		38								
		39								
	- yellow brown, moist, severly weathered, weak.	40	ML		SPT		50	27		
	Total depth of 40.5 feet. Groundwater encountered at 35 feet. Backfilled with bentonite and cement grout.									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			BORING STARTED	12-27-07
WL	∇ 35	▼	BORING COMPLETED	12-27-07
WL	▼	▼	RIG	Logged by:
BORING LOCATION	See Boring Location Plan		JOB # 60077065	PLATE A-3c

Terracon

LOG OF BORING NO. B-04

CLIENT	SITE
F&S SILVERLAKE II	LOS ANGELES, CA
ELEVATION feet	PROJECT MANZANITA AND SUNSET

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: GRAPHICS	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: N- FIELD BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, tsf
	ASPHALT		CH							
	FAT CLAY - dark brown, moist, stiff, some fine to medium grained sand, some silt.	0–5			B					
	- yellow brown, moist, stiff, fine grained.	5	CH		RS		26	25	96	3.8*
	SILTSTONE - yellow brown, moist, severely weathered, friable.	10	ML		RS		50/5"	26	93	4.0*

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			BORING STARTED	12-27-07
WL	None		BORING COMPLETED	12-27-07
WL			RIG	Logged by:
BORING LOCATION	See Boring Location Plan		JOB # 60077065	PLATE A-4a

Terracon

BOREHOLE SAMPLE BOTTOM BORING LOGS.GPJ TERRACON.GDT 1/16/08

LOG OF BORING NO. B-04

CLIENT	SITE
F&S SILVERLAKE II	LOS ANGELES, CA
ELEVATION feet	PROJECT MANZANITA AND SUNSET

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: GRAPHICS	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: N- FIELD BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, tsf
	SILTSTONE - yellow brown, moist, severely weathered, friable.		ML		RS		50/3"	29	91	
	Refusal at 15.75 feet. No groundwater encountered. Backfilled with bentonite and cement grout.									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			BORING STARTED	12-27-07
WL	None		BORING COMPLETED	12-27-07
WL			RIG	Logged by:
BORING LOCATION	See Boring Location Plan		JOB # 60077065	PLATE A-4b

Terracon

LOG OF BORING NO. B-05

CLIENT	SITE
F&S SILVERLAKE II	LOS ANGELES, CA
ELEVATION feet	PROJECT MANZANITA AND SUNSET

DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: GRAPHICS	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: N- FIELD BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, tsf
ASPHALT									
LEAN CLAY - dark brown to red gray, moist, trace silt.	0–5	CL		B					
- dark gray, trace fine grained.	5–6.5	CL		RS		42	25	95	2.8*
SILTSTONE - trace fine grained sand, fine to medium grained.	10–11.5	ML		RS		84	23	98	4.0*

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	None	BORING STARTED	12-27-07
WL		BORING COMPLETED	12-27-07
BORING LOCATION See Boring Location Plan		RIG	Logged by:
		JOB # 60077065	PLATE A-5a

Terracon

LOG OF BORING NO. B-05

CLIENT	SITE
F&S SILVERLAKE II	**LOS ANGELES, CA**
ELEVATION **feet**	PROJECT **MANZANITA AND SUNSET**

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: GRAPHICS	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: N- FIELD BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, tsf
	- moist, fine grained, friable.		ML							
		16			RS		48	27	92	4.0*
		17								
		18								
		19								
	- yellow brown, red veining, severely weathered, friable.	20								
	Refusal at 20.25 feet. No groundwater encountered. Backfilled with bentonite and cement grout.									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	None	
WL		
BORING LOCATION	See Boring Location Plan	

Terracon

BORING STARTED	12-27-07
BORING COMPLETED	12-27-07
RIG	Logged by:
JOB # 60077065	PLATE **A-5b**

GENERAL NOTES

DRILLING & SAMPLING SYMBOLS:

SS:	Split Spoon - 1-^{3}/8" I.D., 2" O.D., unless otherwise noted	HS:	Hollow Stem Auger
ST:	Thin-Walled Tube - 2" O.D., unless otherwise noted	PA:	Power Auger
RS:	Ring Sampler - 2.42" I.D., 3" O.D., unless otherwise noted	HA:	Hand Auger
DB:	Diamond Bit Coring - 4", N, B	RB:	Rock Bit
BS:	Bulk Sample or Auger Sample	WB:	Wash Boring or Mud Rotary

The number of blows required to advance a standard 2-inch O.D. split-spoon sampler (SS) the last 12 inches of the total 18-inch penetration with a 140-pound hammer falling 30 inches is considered the "Standard Penetration" or "N-value". For 3" O.D. ring samplers (RS) the penetration value is reported as the number of blows required to advance the sampler 12 inches using a 140-pound hammer falling 30 inches, reported as "blows per foot," and is not considered equivalent to the "Standard Penetration" or "N-value."

WATER LEVEL MEASUREMENT SYMBOLS:

WL:	Water Level	WS:	While Sampling	N/E:	Not Encountered
WCI:	Wet Cave in	WD:	While Drilling		
DCI:	Dry Cave in	BCR:	Before Casing Removal		
AB:	After Boring	ACR:	After Casing Removal		

Water levels indicated on the boring logs are the levels measured in the borings at the times indicated. Groundwater levels at other times and other locations across the site could vary. In pervious soils, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels may not be possible with only short-term observations.

DESCRIPTIVE SOIL CLASSIFICATION: Soil classification is based on the Unified Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

CONSISTENCY OF FINE-GRAINED SOILS

Unconfined Compressive Strength, Qu, psf	Standard Penetration or N-value (SS) Blows/Ft.	Consistency
< 500	<2	Very Soft
500 – 1,000	2-3	Soft
1,001 – 2,000	4-6	Medium Stiff
2,001 – 4,000	7-12	Stiff
4,001 – 8,000	13-26	Very Stiff
8,000+	26+	Hard

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Standard Penetration or N-value (SS) Blows/Ft.	Ring Sampler (RS) Blows/Ft.	Relative Density
0 – 3	0-6	Very Loose
4 – 9	7-18	Loose
10 – 29	19-58	Medium Dense
30 – 49	59-98	Dense
50+	99+	Very Dense

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 – 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75 mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm)
Silt or Clay	Passing #200 Sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 – 12
Modifiers	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1-10
Medium	11-30
High	30+

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UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]

Soil Classification

				Group Symbol	Group Name[B]
Coarse Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines[C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$[E]	GW	Well-graded gravel[F]
			$Cu < 4$ and/or $1 > Cc > 3$[E]	GP	Poorly graded gravel[F]
		Gravels with Fines More than 12% fines[C]	Fines classify as ML or MH	GM	Silty gravel[F,G,H]
			Fines classify as CL or CH	GC	Clayey gravel[F,G,H]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines[D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$[E]	SW	Well-graded sand[I]
			$Cu < 6$ and/or $1 > Cc > 3$[E]	SP	Poorly graded sand[I]
		Sands with Fines More than 12% fines[D]	Fines classify as ML or MH	SM	Silty sand[G,H,I]
			Fines Classify as CL or CH	SC	Clayey sand[G,H,I]
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays Liquid limit less than 50	inorganic	$PI > 7$ and plots on or above "A" line[J]	CL	Lean clay[K,L,M]
			$PI < 4$ or plots below "A" line[J]	ML	Silt[K,L,M]
		organic	Liquid limit – oven dried / Liquid limit – not dried < 0.75	OL	Organic clay[K,L,M,N]
					Organic silt[K,L,M,O]
	Silts and Clays Liquid limit 50 or more	inorganic	PI plots on or above "A" line	CH	Fat clay[K,L,M]
			PI plots below "A" line	MH	
		organic	Liquid limit – oven dried / Liquid limit – not dried < 0.75	OH	Organic clay[K,L,M,P]
					Organic silt[K,L,M,Q]
Highly organic soils	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-in. (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10} \quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains $\geq$ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains $\geq$ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains $\geq$ 30% plus No. 200 predominantly sand, add "sandy" to group name.

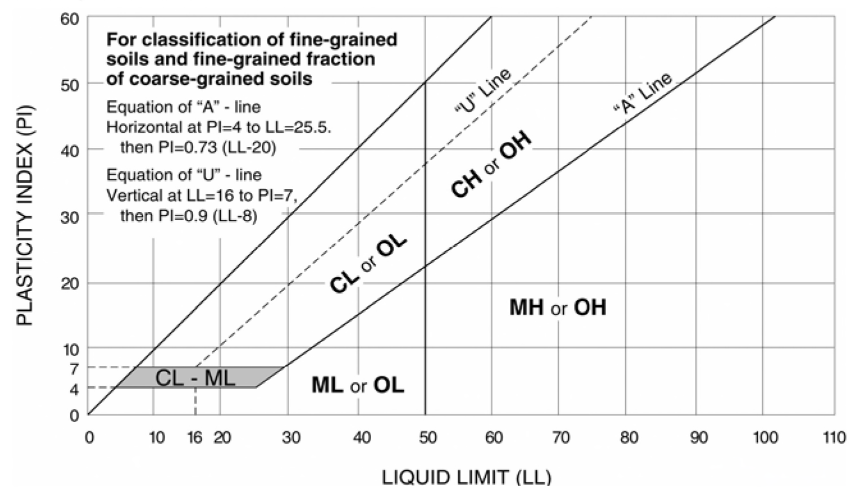
[M] If soil contains $\geq$ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] $PI \geq 4$ and plots on or above "A" line.

[O] $PI < 4$ or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



APPENDIX B

Laboratory Testing

Table B-1
Atterberg Limits

Boring No.	Depth [feet]	Liquid Limit [%]	Plastic Limit [%]	Plastic Index [%]
B-02	0	40	16	24
B-02	12	51	22	29
B-03	0	52	19	33
B-03	20	46	20	26
B-04	0	51	20	31
B-05	0	42	19	23

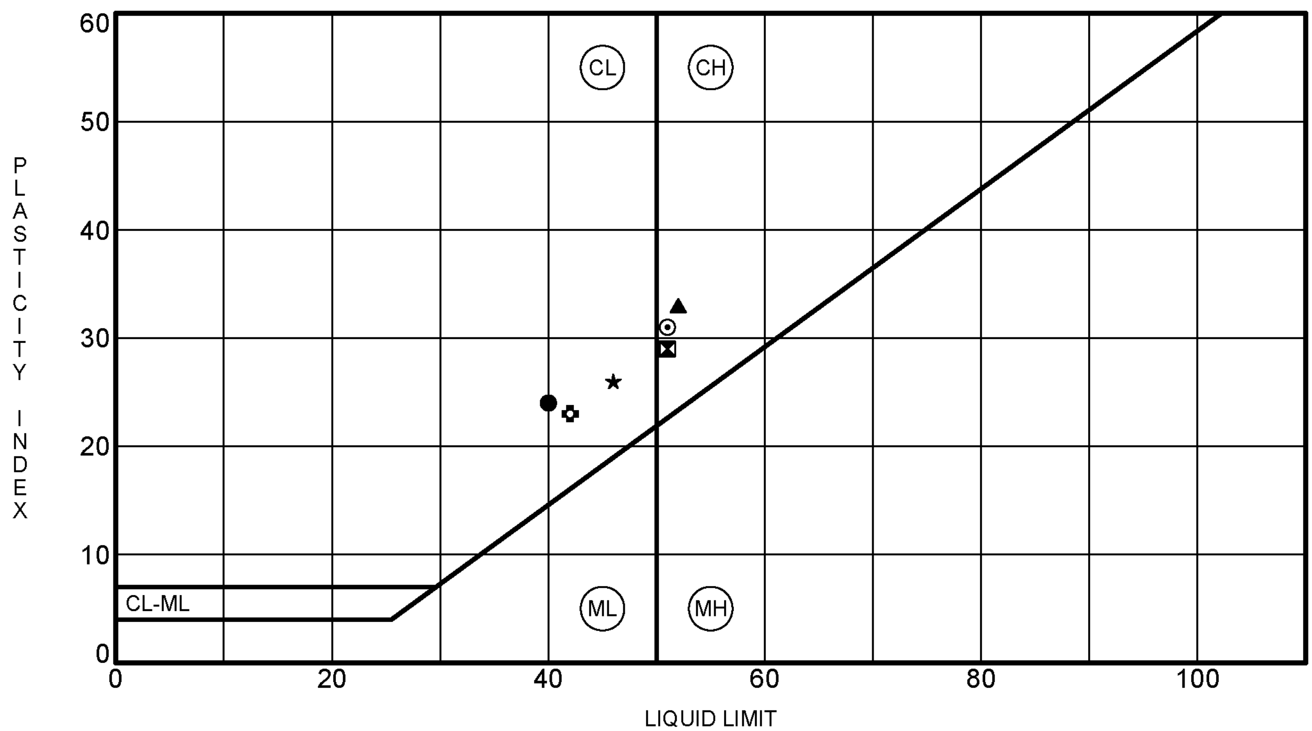
Table B-2
Sulfate Content

Boring No.	Depth [feet]	Sulfate Content [ppm]	Sulfate Exposure [N]
B-01	0 to 5	0.0001	Negligible
B-04	0 to 5	0.013	Negligible

[N] As presented in Table 19-A-4 of the 2001 CBC

Table B-3
Minimum Resistivity and pH

Boring No.	Depth [feet]	Resistivity [ohm-cm]	pH
B-01	0 to 5	610	6.55
B-04	0 to 5	620	6.38



	Specimen Identification		LL	PL	PI	%Fines	Classification
●	**B-02**	**0.0ft**	**40**	**16**	**24**		**LEAN CLAY (CL)**
⊠	**B-02**	**12.0ft**	**51**	**22**	**29**		**FAT CLAY (CH)**
▲	**B-03**	**0.0ft**	**52**	**19**	**33**		**FAT CLAY (CH)**
★	**B-03**	**20.0ft**	**46**	**20**	**26**		**LEAN CLAY (CL)**
⊙	**B-04**	**0.0ft**	**51**	**20**	**31**		**FAT CLAY (CH)**
✿	**B-05**	**0.0ft**	**42**	**19**	**23**		**LEAN CLAY (CL)**

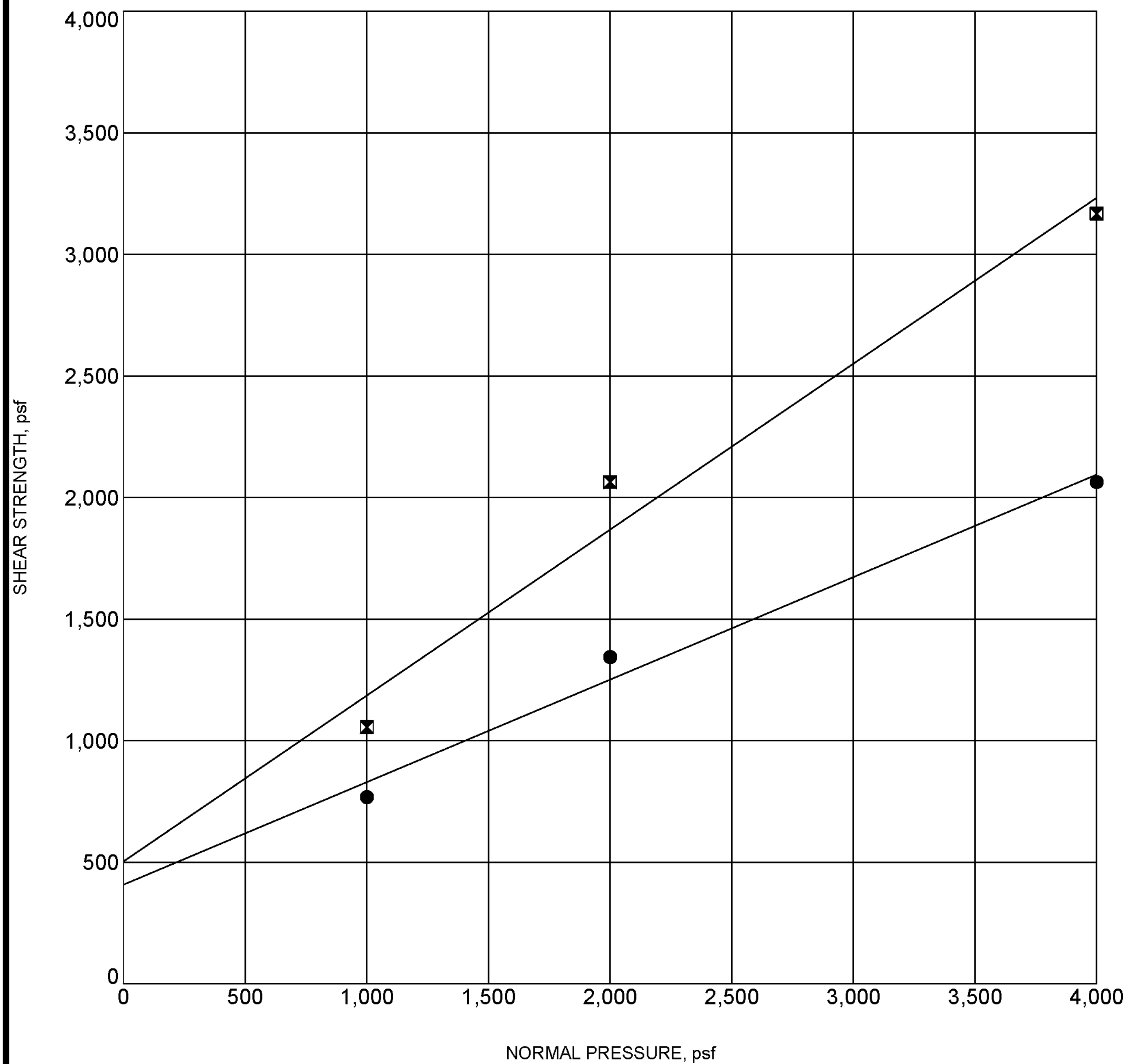
Terracon

ATTERBERG LIMITS RESULTS

Project: MANZANITA AND SUNSET
Site: LOS ANGELES, CA
Job #: 60077065
Date: 1-15-08

B-1

TC ATTERBERG LIMITS BORING LOGS.GPJ TERRACON.GDT 1/15/08



	Specimen Identification		Classification	γ_d, pcf	WC,%	c, psf	ϕ°
●	**B-02**	**20.0ft**	**SILTY CLAY (CL)**	**84**	**34**	**408**	**23**
⊠	**B-04**	**5.0ft**	**FAT CLAY (CH)**	**96**	**25**	**504**	**34**

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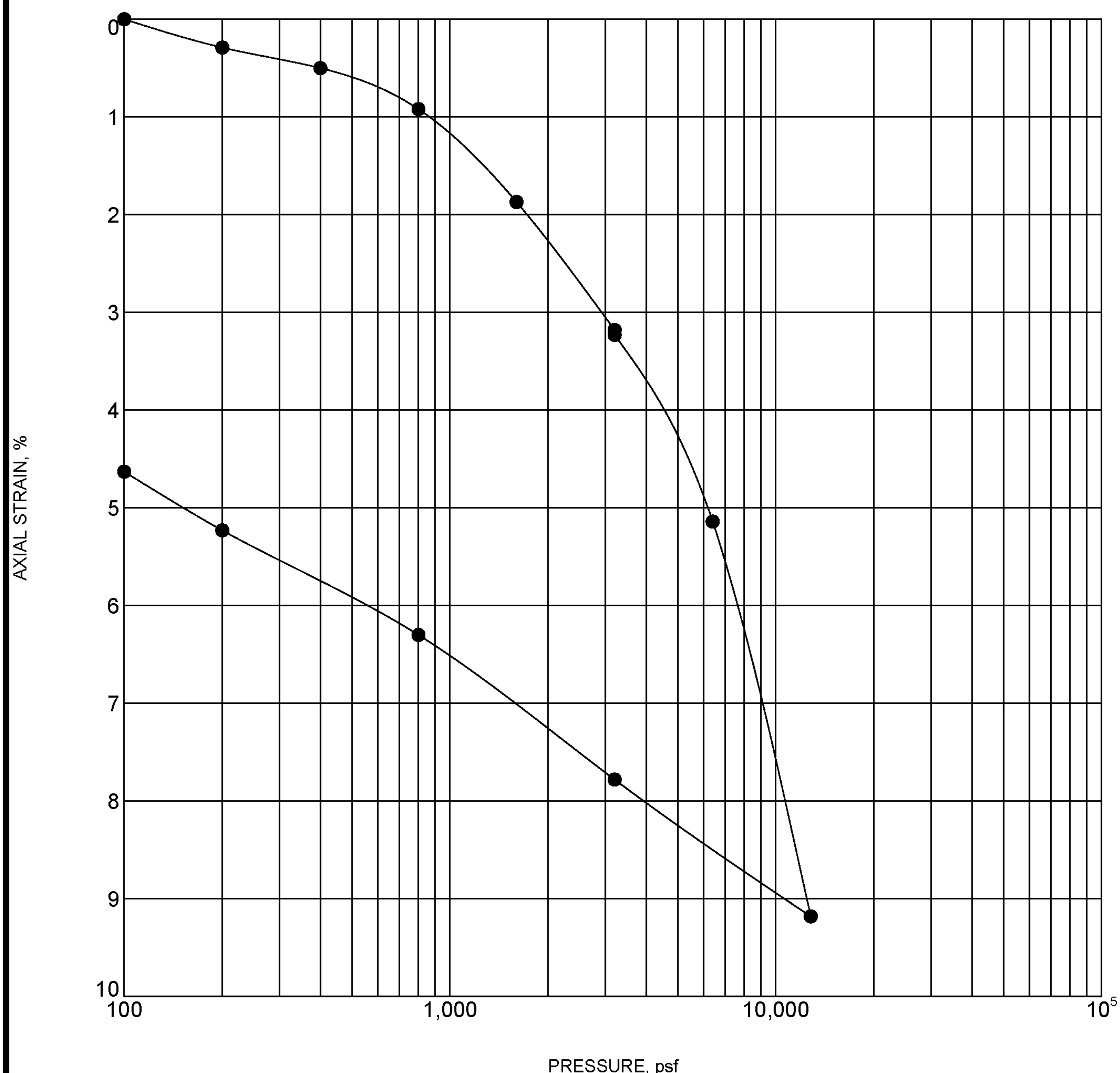
DIRECT SHEAR TEST

Project: MANZANITA AND SUNSET
Site: LOS ANGELES, CA
Job #: 60077065
Date: 1-15-08

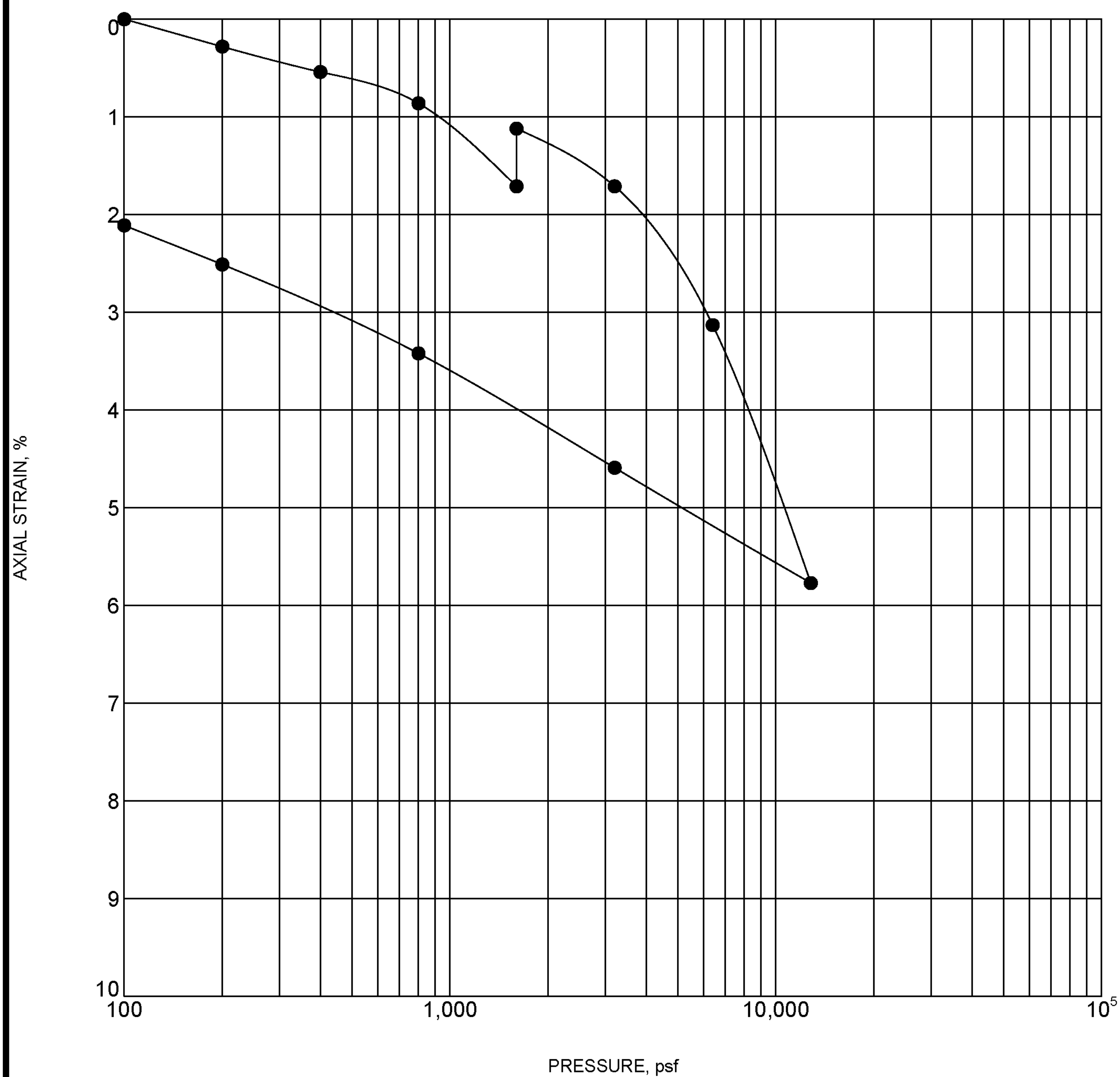


	Specimen Identification		Classification	γ_d, pcf	WC,%
●	**B-02**	**20.0ft**	**SILTY CLAY (CL)**	**86**	**34**

Notes:

CONSOLIDATION TEST

Project: MANZANITA AND SUNSET
Site: LOS ANGELES, CA
Job #: 60077065
Date: 1-15-08



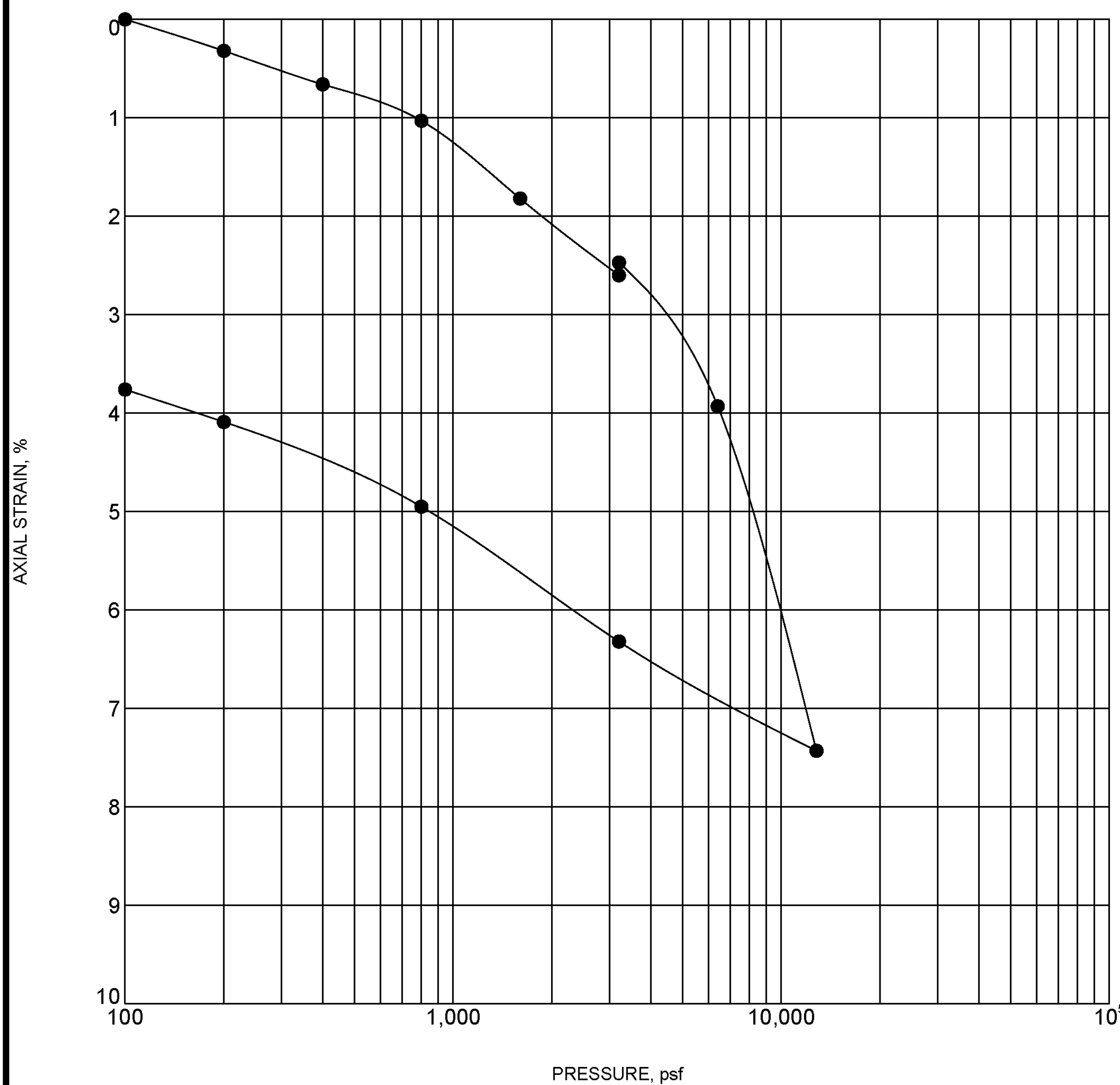
	Specimen Identification		Classification	γ_d, pcf	WC,%
●	**B-04**	**5.0ft**	**FAT CLAY (CH)**	**96**	**25**

Notes:

Terracon

CONSOLIDATION TEST

Project: MANZANITA AND SUNSET
Site: LOS ANGELES, CA
Job #: 60077065
Date: 1-15-08



Specimen Identification		Classification	γ_d, pcf	WC,%
● B-03	15.0ft	LEAN CLAY (CL)	92	27

Notes:

TC_CONSOL_STRAIN BORING LOGS.GPJ TERRACON.GDT 1/15/08

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CONSOLIDATION TEST

Project: MANZANITA AND SUNSET
Site: LOS ANGELES, CA
Job #: 60077065
Date: 1-15-08

APPENDIX C

Liquefaction Analysis

Terracon

Date: 10/2/2007
By: MWL
Reviewed By:

Liquefaction Analysis

(1997 NCEER Procedures)

Project: Sunset and Manzanita
Project Number: 60077065

Boring: B-03
Depth to Historic GW = 20 ft

M = 6.7
MSF = 1.23 1.23
a_{max} = 0.87 g

FS (req'd) = 1.1

References
1- Idriss, I.M. and Boulanger, R.W., 2004, "Semi-emperical Procedures for Evaluating Liquefaction Potential During Earthquakes,"
2- Seed, H. B, Tokimatsu, K. and Harder, L. F., "Influence of SPT Procedures in Soil Liquefaction Resistance Evaluations,"Journal of Geotechnical Engineering, vol. 111, pp. 1425-1445.
3- Tokimatsu, K. and Seed, H.B., "Evaluation of Settlements in Sands Due to Earthquake Shaking," Journal of Geotechnical Engineering, vol. 113, pp. 861-878.
4- Robertson, P. K. and Wride, C. E., "Cyclic Liquefaction and it's Evaluation Based on SPT and CPT," Evaluation and Mitigation of Earthquake Induced Liquefaction Hazards- Proceeding, March 13-14, 1997, San Francisco.

Blow Count Correction Factors:

Energy Correction	Ce
Rope and Cathead	1.0
Automatic Hammer	1.2
Winch System*	0.7

*Not reliable, use to be avoided

Borehole Correction**	Cb
2.5 to 4.5 inches	1.00
6 inches	1.05
8 inches	1.10

**Inside diamater of Boring/Auger

Rod Length Correction	Cr
< 10 feet	0.75
10 to 20 feet	0.85
20 to 30 feet	0.95
>30 feet	1.00
Liner Correction	**Cl**
Liner/Rings/Tubes	1.0
No Liner	1.2
Sampler Correction	**Cs**
SPT	1.0
California	0.7

Field and Lab Data

Layer	Top Layer [ft]	Bottom Layer [ft]	unit weight [pcf]	fines [%]	N	Ce	Cb	Cr	Cl	Cs	overburden [psf]	eff. overburden [psf]	Coarse or Fine? {C or F}	Density/ Consistency
1	0	5	119	100	30	1.0	1.00	0.75	1.0	0.7	297.5	297.5	f	Firm
2	5	10	119	100	39	1.0	1.00	0.75	1.0	0.7	892.5	892.5	f	Stiff
3	10	15	117	100	38	1.0	1.00	0.85	1.0	0.7	1482.5	1482.5	f	Stiff
4	15	20	116	100	58	1.0	1.00	0.85	1.0	0.7	2065.0	2065.0	f	Hard
5	20	25	118	100	14	1.0	1.00	0.85	1.2	1.0	2650.0	2494.0	f	Firm
6	25	30	119	45	26	1.0	1.00	0.95	1.2	1.0	3242.5	2774.5	c	Medium Dense
7	30	35	123	45	42	1.0	1.00	0.95	1.2	1.0	3847.5	3067.5	c	Dense
8	35	40	120	45	50	1.0	1.00	1.00	1.2	1.0	4455.0	3363.0	c	Very Dense
9	40	45	120	45	50	1.0	1.00	1.00	1.2	1.0	5055.0	3651.0	c	Very Dense
10	45	50	120	45	50	1.0	1.00	1.00	1.2	1.0	5655.0	3939.0	c	Very Dense
11	50	52	120	45	50	1.0	1.00	1.00	1.2	1.0	6075.0	4140.6	c	Very Dense

Liquefaction Potential

Layer	Top Layer [ft]	Depth to m.p. [ft]	Layer Thickness [in]	N_{60} blows	C_N	$(N_{60})_1$ blows	fines [%]	Strength $CRR_{7.5}$	CRR_M	r_d	Induced CSR_L	FS	LIQUEFY? (SPT)	Notes
1	0	2.5	60	16	2.59	41	100	0.50	0.62	0.99	0.56	1.10	NO	
2	5	7.5	60	20	1.50	31	100	0.50	0.62	0.98	0.55	1.12	NO	
3	10	12.5	60	23	1.16	26	100	0.50	0.62	0.96	0.54	1.14	NO	
4	15	17.5	60	35	0.98	34	100	0.50	0.62	0.94	0.53	1.16	NO	
5	20	22.5	60	14	0.90	13	100	0.60	0.74	0.93	0.56	1.33	NO	
6	25	27.5	60	30	0.85	25	45	0.70	0.86	0.91	0.60	1.44	NO	
7	30	32.5	60	48	0.81	39	45	0.70	0.86	0.89	0.63	1.37	NO	
8	35	37.5	60	60	0.77	46	45	0.70	0.86	0.88	0.66	1.32	NO	
9	40	42.5	60	60	0.74	44	45	0.70	0.86	0.86	0.67	1.29	NO	
10	45	47.5	60	60	0.71	43	45	0.70	0.86	0.84	0.68	1.26	NO	
11	50	51	24	60	0.69	42	45	0.70	0.86	0.83	0.69	1.25	NO	

Seismically Induced Settlement

Layer	Depth to m.p. [ft]	k_{spt}	fines correction $(N_{60})_{1,CS}$ (fines)	CSR_L	$CSR_{7.5}$	LIQUEFY?	Volumetric Strain [%]	Settlement [in]
1	2.5	0.5	82	na	0.00	NO	0.00	0.00
2	7.5	0.5	61	na	0.00	NO	0.00	0.00
3	12.5	0.5	53	na	0.00	NO	0.00	0.00
4	17.5	0.5	68	na	0.00	NO	0.00	0.00
5	22.5	0.5	26	na	0.00	NO	0.00	0.00
6	27.5	0.5	50	na	0.00	NO	0.00	0.00
7	32.5	0.5	77	na	0.00	NO	0.00	0.00
8	37.5	0.5	93	na	0.00	NO	0.00	0.00
9	42.5	0.5	89	na	0.00	NO	0.00	0.00
10	47.5	0.5	86	na	0.00	NO	0.00	0.00
11	51	0.5	83	na	0.00	NO	0.00	0.00
							sum=	0.00 [in]

Liquefaction Potential Eqn's:

C_N : [Eqn 18, ref 1]
MSF : [Eqn 8, ref 1]

$CRR_{7.5}$: [Figure 6, Ref 2]

$$CRR_M = MSF \bullet CRR_{7.5}$$

$$CSR_L = \frac{0.65 \bullet a_{max} \bullet r_d \bullet \sigma_v}{\sigma_v'}$$

$$FS = \frac{CRR_M}{CSR_L}$$

Settlement Eqn's:

k_{spt} : [Eqn 6, ref 4]
Volumetric Strain, e_c : [Figure 9, Ref. 3]

$$(N_{60})_1(fines) = \frac{(N_{60})_1}{(1-k_{spt})}$$

$$settlement = e_c \; x \; layer \; thickness$$

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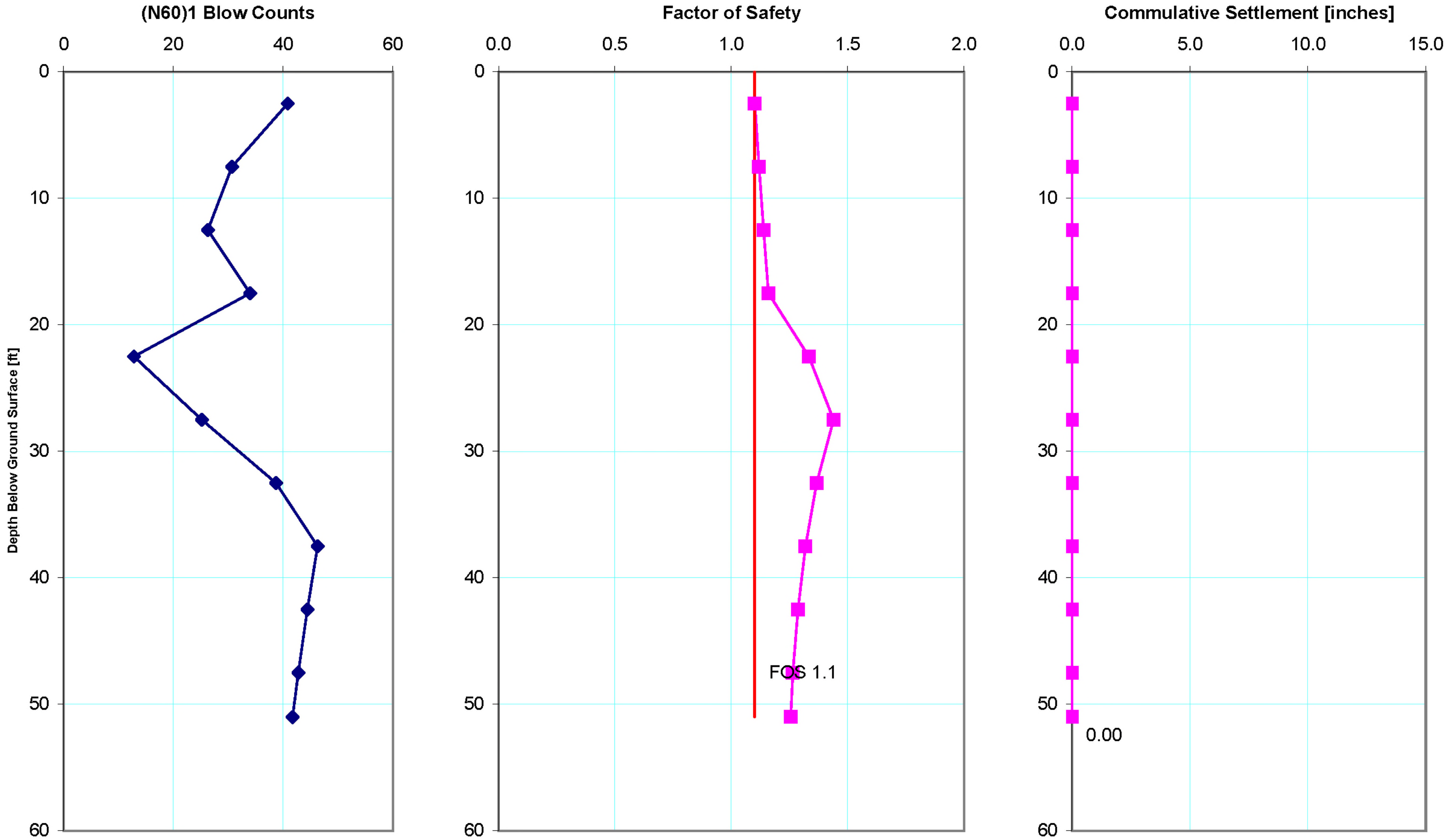
Liquefaction Analysis Results

Project Sunset and Manzanita

Project Number: 60077065



IF FOS < 1.1 the layer is considered liquifiable

APPENDIX D

ASFE Insert

August 11, 2014
Revised on January 13, 2015

Terracon

Junction Gateway, LLC
7551 W. Sunset Boulevard
#203 Los Angeles, CA 90046

Attn: Mr. James Frost
P: 323.883.1800

Re: Revised Geotechnical Update Letter
Manzanita and Sunset
1085 & 1087 Manzanita Street and 4100 Sunset Boulevard
Los Angeles, CA

Dear Mr. Frost

Pursuant to your request, we are providing the following letter which provides supplemental information and serves as an "update" letter to Terracon's previous report No. 60077065 dated January 15, 2008 concerning the subject site. These services were performed in general accordance with our Master Agreement and Task Order, P60140202 dated July 14, 2014.

It is our understanding that Junction Gateway is processing plans through the reviewing agencies for construction, and that a Geotechnical update letter is required as a supporting document to that process.

A geotechnical reconnaissance has been performed for the project site. During our site reconnaissance on July 18, 2014, it was noted that the existing site surface conditions are similar to those that existed at the time the referenced report was prepared.

Based on the information obtained from our reconnaissance and our review of our original report, the site is suitable for development of the proposed project provided our report recommendations are implemented. It is our opinion that the recommendations for design and construction provided in our previous report can be utilized for the proposed project. Please note that the referenced report is considered preliminary and further investigations and analysis will be required prior to final design.

Due to recent code changes and seismic information, this letter includes faulting data, estimated ground motions, and seismic considerations as supplemental information.

The site is located in Southern California, which is a seismically active area. The type and magnitude of seismic hazards affecting the site are dependent on the distance to causative faults, the intensity, and the magnitude of the seismic event. The table below indicates the distance of the fault zones and the associated maximum credible earthquake that can be produced by nearby seismic events, as calculated using the USGS Earthquake Hazard Program 2002 interactive deaggregations. The Upper Elysian Park, which is located approximately 2.9 kilometers from the site, is considered to have the most significant effect at the site from a design standpoint. In addition, the modal magnitude is anticipated to be on the order of 6.4.

Characteristics and Estimated Earthquakes for Regional Faults

Fault Name	Approximate Distance to Site (kilometers)	Maximum Credible Earthquake (MCE) Magnitude
Upper Elysian Park	2.9	6.4
Hollywood*	2.5	6.4
Raymond	6.4	6.5

Based on these sources the peak ground acceleration (PGA) at the subject site is expected to be about 1.05g per USGS design maps.

*In November 2014, CGS released an official map of earthquake fault zones in the Hollywood Quadrangle. The official map shows the Hollywood Fault Zone beginning near the Atwater Village neighborhood in the east, through central Hollywood and ending near La Cienega and Sunset Boulevard in the west. Based on our review, the project site is not located within the Hollywood fault zone or other Alquist-Priolo Earthquake fault zone, and is approximately 1.9 kilometers from the Hollywood fault alignment.

DESCRIPTION	VALUE
2013 California Building Code Site Classification (CBC) [1]	D
Site Latitude	N 34.0929°
Site Longitude	W 118.2815°
S_s Spectral Acceleration for a Short Period	2.72g
S_1 Spectral Acceleration for a 1-Second Period	0.97g
S_{DS} Design Spectral Acceleration for a Short Period	1.81g
S_{D1} Design Spectral Acceleration for a 1-Second Period	0.97g

[1] Note: The 2013 California Building Code (CBC) requires a site soil profile determination extending to a depth of 100 feet for seismic site classification. The current scope does not include the required 100 foot soil profile determination. Borings extended to a maximum depth of approximately 40½ feet, and this seismic site class definition considers that similar soils continue below the maximum depth of the subsurface exploration. .

Architectural schematic plans were reviewed at the time this letter was prepared. However, no structural or civil plans were reviewed for this project at the time of preparation of this letter. Any future development of the site will need to be reviewed by a qualified geotechnical consultant and appropriate recommendations need to be provided based on the site subsurface conditions.

Terracon should be retained to provide geotechnical and materials testing services in support of future development of the site including reviews of plans, preparation of supplemental reports, and providing observation and testing services during earthwork and construction.

The analyses and comments in this letter are based in part upon data obtained from the field exploration. The nature and extent of variations beyond the location of the test borings may not become evident until construction. If variations then appear evident, it may be necessary to re-evaluate the recommendations of the reports.

We appreciate being of service to you in the geotechnical engineering phase of this project, and are prepared to assist you during the construction phases as well. If you have any questions concerning this report or any of our testing, inspection, design, and consulting services, please contact us.

Sincerely,
Terracon Consultants, Inc.

Kimsear (Sear) Tang
Staff Professional

Fouad (Fred) Abuhamdan, P.E.
Senior Project Manager