GEOTECHNICAL INVESTIGATION
PROPOSED MADISON PLAZA

NWC Riverside Freeway at Madison Street
Riverside, California
for
HFC/PRP MADISON, LLC

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

January 7, 2016

HFC/PRP Madison, LLC
c/o Peninsula Retail Partners
417 29th Street
Newport Beach, California 92663

Attention: Mr. Greg Lukosky
Vice President, Development

Project No.: **15G226-1**

Subject: **Geotechnical Investigation**
Proposed Madison Plaza
NWC Riverside Freeway at Madison Street
Riverside, California

Dear Mr. Lukosky:

In accordance with your request, we have conducted a geotechnical investigation at the subject site. We are pleased to present this report summarizing the conclusions and recommendations developed from our investigation.

We sincerely appreciate the opportunity to be of service on this project. We look forward to providing additional consulting services during the course of the project. If we may be of further assistance in any manner, please contact our office.

Respectfully Submitted,

SOUTHERN CALIFORNIA GEOTECHNICAL, INC.

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Distribution: (2) Addressee

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1.0 EXECUTIVE SUMMARY

Presented below is a brief summary of the conclusions and recommendations of this investigation. Since this summary is not all inclusive, it should be read in complete context with the entire report.

Geotechnical Design Considerations

- The subject site is underlain by existing fill soils, extending to depths of 2½ to 5½± feet. In addition, some of the near-surface alluvial soils possess unfavorable consolidation and collapse characteristics. These existing soils are not considered suitable in their present condition, to support the loads of the new building. Remedial grading will be necessary to remove these soils and replace them as compacted structural fill.
- The onsite soils are not subject to liquefaction. Therefore, no design considerations related to liquefaction are considered warranted for this project.

Site Preparation

- Initial site preparation should include demolition of the existing Bally's Fitness Club, the surrounding pavements, and any other improvements associated with the previous developments. Demolition debris should be disposed of offsite in accordance with local regulations. Alternatively, asphalt and concrete debris may be crushed to a maximum 2-inch particle size and incorporated into new structural fills.
- Remedial grading should be performed within the proposed building areas to remove all of the existing undocumented fill soils. These materials extend to depths of 2½ to 5½± feet at the boring locations. Within the area of the new health club and the market, the overexcavation should also extend to a depth of at least 5 feet below the proposed building pad subgrade elevation. Within the drive-thru restaurant and other lightly loaded single story structures, the overexcavation should extend to a depth of at least 3 feet below the proposed building pad subgrade elevation. The overexcavations should extend to a depth of at least 3 feet below the proposed foundation bearing grade, within the influence zones of the new foundations.
- After overexcavation has been completed, the resulting subgrade soils should be evaluated by the geotechnical engineer to identify any additional soils that should be removed. Resulting subgrade should then be scarified to a depth of 10 to 12 inches and moisture conditioned to 2 to 4 percent above optimum. The previously excavated soils may then be replaced as compacted structural fill. All structural fill soils should be compacted to at least 90 percent of the ASTM D-1557 maximum dry density.
- The exposed soils within both pavement and flatwork areas should evaluated by the geotechnical engineer and then be scarified to a depth of 12± inches, thoroughly moisture conditioned and recompacted to at least 90 percent of the ASTM D-1557 maximum dry density. These areas may then be raised to grade with compacted structural fill.

Building Foundations

- Conventional shallow foundations, supported in newly placed compacted fill.
- 2,500 lbs/ft^2 maximum allowable soil bearing pressure.

- Reinforcement consisting of at least four (4) No. 5 rebars (2 top and 2 bottom) in strip footings. Additional reinforcement may be necessary for structural considerations.
- Minimum foundation embedment: 18 inches below adjacent exterior grade.

Building Floor Slab

- Conventional Slab-on-Grade, 5 inches thick.
- Reinforcement consisting of at least No. 3 bars at 18 inches on center, in both directions. The actual floor slab reinforcement to be determined by the structural engineer. Additional reinforcement may be necessary for structural considerations.

Pavements

ASPHALT PAVEMENTS (R = 40)			
Materials	**Thickness (inches)**		
	Auto Parking (TI = 4.0)	Auto Drive Lanes (TI = 5.0)	Light Truck Traffic (TI = 6.0)
Asphalt Concrete	3	3	3½
Aggregate Base	3	4	6
Compacted Subgrade	12	12	12

PORTLAND CEMENT CONCRETE PAVEMENTS		
Materials	**Thickness (inches)**	
	Automobile Parking and Drive Areas	Light Truck Traffic Areas (TI =6.0)
PCC	5	5½
Compacted Subgrade (95% minimum compaction)	12	12

2.0 SCOPE OF SERVICES

The scope of services performed for this project was in accordance with our Proposal No. 15P435, dated November 4, 2015. The scope of services included a visual site reconnaissance, subsurface exploration, field and laboratory testing, and geotechnical engineering analysis to provide criteria for preparing the design of the building foundations, building floor slab, and parking lot pavements along with site preparation recommendations and construction considerations for the proposed development. The evaluation of the environmental aspects of this site was beyond the scope of services for this geotechnical investigation.

This geotechnical report also serves to update two previous geotechnical reports which were performed for the subject site. These reports are referenced in Section 3.3 of this report. The current report incorporates all of the field exploration and laboratory testing from the previous studies.

3.0 SITE AND PROJECT DESCRIPTION

3.1 Site Conditions

The subject site is located at the northwest corner of Madison Street and the west bound on-ramp for the Riverside Freeway, in Riverside, California. Madison Street runs in a northwest to southeast orientation. For the purposes of this report, Madison Street is assumed to run north-south. The site is bounded to the north by multi-family residential structures, to the west by single family residences, to the south by the westbound on-ramp of the Riverside Freeway, and to the east by Madison Street. The general location of the site is illustrated on the Site Location Map, included as Plate 1 in Appendix A of this report.

The site consists of a square-shaped parcel, 8.57± acres in size. The site is currently developed with a non-operational Bally's Fitness Club and a Denny's restaurant. An existing gasoline service station is located immediately adjacent to the intersection of Madison Street and the Riverside Freeway; this gasoline service station is not part of the proposed development. The western and north-central portions of the site are currently vacant and undeveloped. Ground surface cover in these areas consists of exposed soil and asphaltic concrete pavements, which are in poor condition. Throughout the remainder of the site, the two existing structures are surrounded by asphaltic concrete pavements with numerous landscape planters.

Topographic information was not available at the time of this report. Based on visual observations made at the time of our subsurface investigation, the site topography dips gently downward to the south-southwest at an estimated gradient of less than 1 to 2 percent. There appears to be less than 10± feet of elevation differential across the subject site.

3.2 Proposed Development

A site plan depicting the currently proposed development was provided to our office by the client. This plan indicates that a new 24-Hour Fitness will be constructed in the southwestern region of the property. The 24-Hour Fitness will be 37,811± ft^2 in size. A building identified as Major B – Market will be constructed immediately north of the health club. The Market will be 41,117± ft^2 in size. A new Starbucks with an attached drive-thru will be located in the eastern region of the site, adjacent to Madison Street and south of the existing Denny's restaurant. The remaining areas of the site will be developed with asphaltic concrete pavements for automobile parking and drive lanes, new landscape planters, and areas of concrete flatwork.

Based on the current site plan, the existing Bally's Fitness Club, located in the south-central region of the property, will be demolished in its entirety. Demolition of large areas of asphaltic concrete pavements, including landscape planters, will also be required.

Detailed structural information for the proposed buildings is not currently available. Based on previous experience, the 24-Hour Fitness and the Major B will be one or two story structures of masonry block or tilt-up concrete construction. Maximum column and wall loads for these facilities are expected to be in the range of 150 kips and 3 to 5 kips per linear foot, respectively. The Starbucks facility and any other small retail buildings are expected to be single story structures of wood frame or masonry block construction, with maximum column and wall loads on the order of 50 kips and 1 to 2 kips per linear foot, respectively. It is assumed that none of the proposed facilities will include any significant amounts of below grade construction such as basements or crawl spaces.

3.3 Previous Studies

Southern California Geotechnical, Inc. (SCG) previously conducted two geotechnical investigations for the subject site. These previous reports are identified as follows:

> Geotechnical Investigation, Proposed Office Building and Bally's Fitness Center, NWC Riverside Freeway at Madison Street, Riverside California, prepared for Peninsula Retail Development by Southern California Geotechnical, Inc. (SCG), dated May 15, 2006, SCG Project No. 06G168-1.
>
> Supplementary Geotechnical Investigation, Madison Plaza, Proposed Parking Structure, Retail Shops, and Denny's Restaurant, NWC Riverside Freeway at Madison Street, Riverside California, prepared for Peninsula Retail Development by SCG, dated February 16, 2007, SCG Project No. 06G168-2.

At the time of these investigations, the site was proposed for development of a new health club, a five story office building, a parking structure and a restaurant. The configuration of these structures is somewhat different from the currently proposed development.

During the subsurface exploration for the previous studies, a total of eighteen (18) borings were drilled to depths of 10 to 50± feet below existing site grades. The borings drilled identified undocumented fill soils extending to depths of 2½ to 5½± feet, with additional possible fill soils extending to depths of up to 6½± feet. These fill and possible fill materials consisted of loose silty fine to medium sands and stiff fine to medium sandy clays. The underlying native alluvium consisted of loose to medium dense silty sands, generally becoming medium dense to dense at greater depths. The native alluvial soils extended to at least the maximum depth explored of 50± feet. No free water was encountered within the borings. The report provides recommendations for supporting the proposed structure on conventional shallow foundations, following completion of remedial grading. The boring logs and some of the laboratory test results from the previous report are included in the Appendix F of this report.

4.0 SUBSURFACE EXPLORATION

4.1 Scope of Exploration/Sampling Methods

The subsurface exploration conducted for this phase of the project consisted of two (2) borings, identified as Boring Nos. B-19 and B-20. One (1) of the borings was drilled to a depth of 50± feet below currently existing site grades, as part of the updated liquefaction evaluation. The second boring was drilled to a depth of 20± feet. Both of these borings were drilled within the limits of the proposed 24-Hour Fitness building and were logged during drilling by a member of our staff.

The borings were advanced with hollow-stem augers, by a conventional truck-mounted drilling rig. Representative bulk and relatively undisturbed soil samples were taken during drilling. Relatively undisturbed soil samples were taken with a split barrel "California Sampler" containing a series of one inch long, 2.416± inch diameter brass rings. This sampling method is described in ASTM Test Method D-3550. In-situ samples were also taken using a 1.4± inch inside diameter split spoon sampler, in general accordance with ASTM D-1586. Both of these samplers are driven into the ground with successive blows of a 140-pound weight falling 30 inches. The blow counts obtained during driving are recorded for further analysis. Bulk samples were collected in plastic bags to retain their original moisture content. The relatively undisturbed ring samples were placed in molded plastic sleeves that were then sealed and transported to our laboratory.

The approximate locations of the borings are indicated on the Boring Location Plan, included as Plate 2 in Appendix A of this report. Plate 2 also identifies the locations of the borings drilled as part of the previous geotechnical investigations. The Boring Logs, which illustrate the conditions encountered at the boring locations, as well as the results of some of the laboratory testing, are included in Appendix B.

4.2 Geotechnical Conditions

The geotechnical conditions discussed below are a summary of the conditions encountered at the two new borings, as well as the eighteen borings performed as part of the previous geotechnical investigations.

Pavements

Asphaltic concrete pavements were encountered at several of the boring locations. Where encountered, these pavements consist of 1½ to 4 inches of asphaltic concrete underlain by 0 to 4 inches of aggregate base. Boring No. B-19 was drilled in an area developed with asphaltic concrete pavements. At this boring location, the pavement consists of 3± inches of asphaltic concrete with no discernible layer of underlying aggregate base.

Artificial Fill

Artificial fill soils were encountered at most of the boring locations, extending from the ground surface to depths of 2½ to 5½± feet. The fill materials generally consist of loose silty fine to medium sands and stiff fine to medium sandy clays.

Additional soils classified as possible fill were encountered at several of the boring locations, extending to depths of 2½ to 6½± feet. The possible fill soils generally consist of loose to medium dense silty fine to medium sands with varying clay content. The possible fill soils possess some indicators of fill, but also resemble the underlying native alluvium, thereby resulting in their classification as possible fill.

Alluvium

Native alluvial soils were encountered beneath the fill and possible fill soils at all of the boring locations and at the ground surface at the remaining boring locations. Within the upper 20 to 30± feet, the alluvium generally consists of loose to medium dense silty fine to medium sands and fine sandy silts. Occasional strata of medium stiff clayey silts as well as sand with some clay were also encountered. At greater depths, the alluvium generally becomes more dense, and several zones of medium dense to dense soils were encountered at Boring Nos. B-12, B-13, and B-19. The native alluvial soils extend to at least the maximum depth explored of 50 feet.

Groundwater

Groundwater was not encountered during drilling of the borings. Based on the lack of any water within the borings, and the moisture contents of the recovered soil samples, the static groundwater table is considered to have existed at a depth in excess of 50± feet at the time of the subsurface exploration.

As part of our research, we reviewed available groundwater data in order to determine the historic high groundwater level for the site. The primary reference used to determine recent water level data was obtained from the Geotracker website, http://geotracker.waterboards.ca.gov/. There are several monitoring wells located within the vicinity of the project site. Water level readings within these monitoring wells indicate a historic high groundwater level of 83± feet (May 2011), below the ground surface.

5.0 LABORATORY TESTING

The soil samples recovered from the subsurface exploration were returned to our laboratory for further testing to determine selected physical and engineering properties of the soils. The tests are briefly discussed below. It should be noted that the test results are specific to the actual samples tested, and variations could be expected at other locations and depths.

Classification

All recovered soil samples were classified using the Unified Soil Classification System (USCS), in accordance with ASTM D-2488. Field identifications were then supplemented with additional visual classifications and/or by laboratory testing. The USCS classifications are shown on the Boring Logs and are periodically referenced throughout this report.

In-situ Density and Moisture Content

The density has been determined for selected relatively undisturbed ring samples. These densities were determined in general accordance with the method presented in ASTM D-2937. The results are recorded as dry unit weight in pounds per cubic foot. The moisture contents are determined in accordance with ASTM D-2216, and are expressed as a percentage of the dry weight. These test results are presented on the Boring Logs.

Consolidation

Selected soil samples have been tested to determine their consolidation potential, in accordance with ASTM D-2435. The testing apparatus is designed to accept either natural or remolded samples in a one-inch high ring, approximately 2.416 inches in diameter. Each sample is then loaded incrementally in a geometric progression and the resulting deflection is recorded at selected time intervals. Porous stones are in contact with the top and bottom of the sample to permit the addition or release of pore water. The samples are typically inundated with water at an intermediate load to determine their potential for collapse or heave. The results of the consolidation testing are plotted on Plates C-1 through C-5 in Appendix C of this report.

As part of the previous geotechnical investigations at the site, a total of twenty (20) consolidation tests were performed. The results of the previous consolidation testing are enclosed in Appendix F of this report.

Maximum Dry Density and Optimum Moisture Content

Representative bulk samples were tested as part of the previous geotechnical investigations, for their maximum dry density and optimum moisture content. The results were obtained using the Modified Proctor procedure, per ASTM D-1557 and are presented in Appendix F of this report. These tests are generally used to compare the in-situ densities of undisturbed field samples, and for later compaction testing. Additional testing of other soil types or soil mixes may be necessary at a later date.

Direct Shear

A direct shear test was previously performed on a selected soil sample to determine its shear strength parameters as part of the previous geotechnical investigation. The test was performed in accordance with ASTM D-3080. The testing apparatus is designed to accept either natural or remolded samples in a one-inch high ring, approximately 2.416 inches in diameter. Three samples of the same soil are prepared by remolding them to 90± percent compaction and near optimum moisture. Each of the three samples are then loaded with different normal loads and the resulting shear strength is determined for that particular normal load. The shearing of the samples is performed at a rate slow enough to permit the dissipation of excess pore water pressure. Porous stones are in contact with the top and bottom of the sample to permit the addition or release of pore water. The results of the previous direct shear testing are enclosed in Appendix F of this report.

Soluble Sulfates

Representative samples of the near-surface soils were submitted to a subcontracted analytical laboratory for determination of soluble sulfate content. Soluble sulfates are naturally present in soils, and if the concentration is high enough, can result in degradation of concrete which comes into contact with these soils. The results of the soluble sulfate testing are presented below, and are discussed further in a subsequent section of this report.

Sample Identification	**Soluble Sulfates (%)**	**ACI Classification**
B-2 @ 0 to 5 feet	0.013	Negligible
B-2 @ 0 to 5 feet	0.013	Negligible
B-12 @ 0 to 5 feet	0.013	Negligible
B-18 @ 0 to 5 feet	0.001	Negligible
B-20 @ 0 to 5 feet	0.003	Negligible

Expansion Index

The expansion potential of the on-site soils was determined in general accordance with ASTM D-4829. The testing apparatus is designed to accept a 4-inch diameter, 1-in high, remolded sample. The sample is initially remolded to 50± 1 percent saturation and then loaded with a surcharge equivalent to 144 pounds per square foot. The sample is then inundated with water, and allowed to swell against the surcharge. The resultant swell or consolidation is recorded after a 24-hour period. The results of the EI testing are as follows:

Sample Identification	**Expansion Index**	**Expansive Potential**
B-20 @ 0 to 5 feet	2	Very Low

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of our review, field exploration, laboratory testing and geotechnical analysis, the proposed development is considered feasible from a geotechnical standpoint. The recommendations contained in this report should be taken into the design, construction, and grading considerations. The recommendations are contingent upon all grading and foundation construction activities being monitored by the geotechnical engineer of record. The Grading Guide Specifications, included as Appendix D, should be considered part of this report, and should be incorporated into the project specifications. The contractor and/or owner of the development should bring to the attention of the geotechnical engineer any conditions that differ from those stated in this report, or which may be detrimental for the development.

6.1 Seismic Design Considerations

The subject site is located in an area which is subject to strong ground motions due to earthquakes. The performance of a site specific seismic hazards analysis was beyond the scope of this investigation. However, numerous faults capable of producing significant ground motions are located near the subject site. Due to economic considerations, it is not generally considered reasonable to design a structure that is not susceptible to earthquake damage. Therefore, significant damage to structures may be unavoidable during large earthquakes. The proposed structures should, however, be designed to resist structural collapse and thereby provide reasonable protection from serious injury, catastrophic property damage and loss of life.

Faulting and Seismicity

Research of available maps indicates that the subject site is not located within an Alquist-Priolo Earthquake Fault Zone. Therefore, the possibility of significant fault rupture on the site is considered to be low.

Seismic Design Parameters

Beginning January 1, 2014, the 2013 CBC was adopted by all municipalities within Southern California. The CBC provides procedures for earthquake resistant structural design that include considerations for on-site soil conditions, occupancy, and the configuration of the structure including the structural system and height. The seismic design parameters presented below are based on the soil profile and the proximity of known faults with respect to the subject site.

The 2013 CBC Seismic Design Parameters have been generated using U.S. Seismic Design Maps, a web-based software application developed by the United States Geological Survey. This software application, available at the USGS web site, calculates seismic design parameters in accordance with the 2013 CBC, utilizing a database of deterministic site accelerations at 0.01 degree intervals. The table below is a compilation of the data provided by the USGS application. A copy of the output generated from this program is included in Appendix E of this report. A copy of the Design Response Spectrum, as generated by the USGS application is also included in Appendix E. Based on this output, the following parameters may be utilized for the subject site:

2013 CBC SEISMIC DESIGN PARAMETERS

Parameter		Value
Mapped Spectral Acceleration at 0.2 sec Period	S_S	1.500
Mapped Spectral Acceleration at 1.0 sec Period	S_1	0.600
Site Class	---	D
Site Modified Spectral Acceleration at 0.2 sec Period	S_{MS}	1.500
Site Modified Spectral Acceleration at 1.0 sec Period	S_{M1}	0.900
Design Spectral Acceleration at 0.2 sec Period	S_{DS}	1.000
Design Spectral Acceleration at 1.0 sec Period	S_{D1}	0.600

Liquefaction

Liquefaction is the loss of strength in generally cohesionless, saturated soils when the pore-water pressure induced in the soil by a seismic event becomes equal to or exceeds the overburden pressure. The primary factors which influence the potential for liquefaction include groundwater table elevation, soil type and grain size characteristics, relative density of the soil, initial confining pressure, and intensity and duration of ground shaking. The depth within which the occurrence of liquefaction may impact surface improvements is generally identified as the upper 50 feet below the existing ground surface. Liquefaction potential is greater in saturated, loose, poorly graded fine sands with a mean (d_{50}) grain size in the range of 0.075 to 0.2 mm (Seed and Idriss, 1971). Clayey (cohesive) soils or soils which possess clay particles (d<0.005mm) in excess of 20 percent (Seed and Idriss, 1982) are generally not considered to be susceptible to liquefaction, nor are those soils which are above the historic static groundwater table.

Based on mapping obtained from the Riverside County TLMA GIS website, the subject site is located within a zone of low liquefaction susceptibility. In addition, the static groundwater table at the subject site does not exist within the upper 50 feet of the subsurface profile. Furthermore, research of available historic groundwater data indicates that the historic high groundwater table was present at a depth of at least 83 feet. Based on these factors, liquefaction is not considered to be a significant design concern for this project.

6.2 Geotechnical Design Considerations

General

The subsurface conditions encountered at the boring locations generally consist of loose to medium dense sands and silty sands. Most of the borings encountered fill and possible fill soils extending to depths of 2½ to 6½± feet. Laboratory testing indicates that the near-surface alluvium as well as the existing fill soils are subject to moderate amounts of consolidation when exposed to load increases in the range of those that will be exerted by the foundations of the new structures, as well as minor amounts of collapse when exposed to moisture infiltration. The consolidation and collapse characteristics of the soils generally improve with depth. Most of the soils encountered below depths of 5 to 6± feet exhibit favorable consolidation and collapse characteristics. In addition, the existing fill and possible fill soils are considered to represent undocumented fill and are not suitable for support of the proposed structures, in their present condition.

Based on existing conditions, remedial grading will be necessary within the proposed building areas, in order to provide a subgrade suitable for support of the foundations and floor slabs of the new structures. Detailed recommendations regarding these remedial grading procedures are presented in a subsequent section of this report.

Settlement

The proposed remedial grading will remove the existing undocumented fill soils and a portion of the underlying loose native alluvium from within the proposed building areas. The native soils that will remain in place beneath the recommended depth of overexcavation possess favorable consolidation and collapse characteristics and will be subject to only moderate stress increases from the foundations of the new structures. Therefore, following completion of the recommended remedial grading, post-construction settlements are expected to be within tolerable limits.

Expansion

Laboratory testing performed on representative samples of the near surface soils indicates that these materials possess a very low expansive potential (EI = 2). Based on the presence of very low to non-expansive soils at this site, no further recommendations with regard to expansive soils are considered warranted. It is recommended that additional expansion index testing be conducted at the completion of rough grading to verify the expansion potential of the as-graded building pads.

Soluble Sulfates

The results of the soluble sulfate testing indicate that the selected samples of the on-site soils contain negligible concentration of soluble sulfates, in accordance with American Concrete Institute (ACI) guidelines. Therefore, specialized concrete mix designs are not considered to be necessary, with regard to sulfate protection purposes. It is, however, recommended that additional soluble sulfate testing be conducted at the completion of rough grading to verify the soluble sulfate concentrations of the soils which are present at pad grade within the building area.

Shrinkage/Subsidence

Removal and recompaction of the near surface fill and alluvial soils is estimated to result in an average shrinkage of 8 to 13 percent. Minor ground subsidence is expected to occur in the soils below the zone of removal, due to settlement and machinery working. The subsidence is estimated to be 0.1± feet. This estimate may be used for grading in areas that are underlain by existing native alluvial soils.

These estimates are based on previous experience and the subsurface conditions encountered at the boring locations. The actual amount of subsidence is expected to be variable and will be dependant on the type of machinery used, repetitions of use, and dynamic effects, all of which are difficult to assess precisely.

Grading and Foundation Plan Review

No detailed grading or foundation plans were available at the time of this report. It is therefore recommended that we be provided with copies of the preliminary plans, when they become available, for review with regard to the conclusions, recommendations, and assumptions contained within this report.

6.3 Site Grading Recommendations

The grading recommendations presented below are based on the subsurface conditions encountered at the boring locations and our understanding of the proposed development. We recommend that all grading activities be completed in accordance with the Grading Guide Specifications included as Appendix D of this report, unless superseded by site-specific recommendations presented below.

Site Stripping and Demolition

Any existing improvements that will not remain in place for use with the new development should be removed in their entirety. This should include all foundations, floor slabs, utilities, and any other subsurface improvements associated with the previously existing structures, including the presently existing Bally’s Fitness Club. The existing pavements are in very poor condition and should also be demolished. Debris resultant from demolition should be disposed of offsite. Alternatively, concrete and asphalt debris may be crushed to a maximum 2 inch particle size and incorporated into new structural fills.

The existing sparse native grass and weed growth which was present in some areas of the site should be stripped and removed from the site. In addition, any vegetation and organic materials within demolished landscape planters should be removed. Removal of some large tree root masses is expected to be necessary. The actual extent of site stripping should be determined by the geotechnical engineer at the time of grading, based on the organic content and the stability of the encountered materials.

Treatment of Existing Soils: New Building Pads

It is recommended that remedial grading be performed within new building areas to remove the existing undocumented fill soils. Based on conditions encountered at the boring locations, these fill soils extend to depths of 2½ to 5½± feet. These fill soils should be removed in their entirety. In addition to removing the existing undocumented fill soils, the building pads should be overexcavated to provide a layer of new structural fill below the new foundations and floor slabs. Building specific overexcavation recommendations are as follows:

- Health Club and Market: Overexcavate the existing soils to a depth of at least 5 feet below proposed pad grade, throughout the building pad area. Within the influence zones of the new foundations, the overexcavation should extend to a depth of at least 3 feet below proposed foundation bearing grade.

- Drive-thru Restaurant and Small Retail Buildings: Overexcavate the existing soils to a depth of at least 3 feet below proposed pad grade, throughout the building pad area. Within the influence zones of the new foundations, the overexcavation should extend to a depth of at least 3 feet below proposed foundation bearing grade.

The overexcavations should extend at least 5 feet beyond the building perimeters, and to an extent equal to the depth of new fill below the foundation bearing grade. If the proposed structures incorporate any exterior columns (such as for a building canopy or overhang) the overexcavation should also encompass these areas.

Following completion of the overexcavation, the subgrade soils within the building areas should be evaluated by the geotechnical engineer to verify their suitability to serve as the structural fill subgrade, as well as to support the foundation loads of the new structures. This evaluation should include proofrolling and probing to identify any soft, loose or otherwise unstable soils that must be removed. Some localized areas of deeper excavation may be required if additional fill materials or loose, porous, or low density native soils are encountered at the base of the overexcavation.

After a suitable overexcavation subgrade has been achieved, the exposed soils should be scarified to a depth of at least 12 inches, and moisture conditioned to at least 2 to 4 percent above optimum moisture content, and recompacted to at least 90 percent of the ASTM D-1557 maximum dry density. The previously excavated soils may then be replaced as compacted structural fill.

<u>Treatment of Existing Soils: Parking and Drive Areas</u>

Based on economic considerations, overexcavation of the existing fill soils in the new parking and drive areas is not considered warranted, with the exception of areas where lower strength, or unstable, soils are identified by the geotechnical engineer during grading.

Subgrade preparation in the new parking and drive areas should initially consist of removal of all soils disturbed during stripping and demolition operations. The geotechnical engineer should then evaluate the subgrades to identify any areas of additional unsuitable soils. The subgrade soils should then be scarified to a depth of 12± inches, moisture conditioned to 2 to 4 percent above optimum moisture content, and recompacted to at least 90 percent of the ASTM D-1557 maximum dry density.

The grading recommendations presented above for the proposed parking and drive areas assume that the owner and/or developer can tolerate minor amounts of settlement within the proposed parking areas. The grading recommendations presented above do not completely mitigate the extent of existing undocumented fill soils in the parking areas. As such, settlement and associated pavement distress could occur. Typically, repair of such distressed areas involves significantly lower costs than completely mitigating these soils at the time of construction. If the owner cannot tolerate the risk of such settlements, the parking and drive areas should be overexcavated to provide for a new layer of compacted structural fill, extending to a depth of at least 2 feet below proposed pavement subgrade elevation.

Treatment of Existing Soils: Retaining Walls and Site Walls

The existing soils within the areas of new retaining walls should be overexcavated to a depth of 2 feet below foundation bearing grade and replaced as compacted structural fill, as discussed above for the proposed building pad. Any existing undocumented fill soils should also be removed in their entirety. The foundation subgrade soils within the areas of any proposed non-retaining site walls should be overexcavated to a depth of 2 feet below proposed foundation bearing grade. For both types of walls, the overexcavation subgrade soils should be evaluated by the geotechnical engineer prior to scarifying, moisture conditioning and recompacting the upper 12 inches of exposed subgrade soils. The previously excavated soils may then be replaced as compacted structural fill.

Treatment of Existing Soils: Flatwork Areas

Areas proposed for new concrete flatwork should be evaluated and prepared in the same manner described above for the parking and drive areas.

Fill Placement

- Fill soils should be placed in thin (6± inches), near-horizontal lifts, moisture conditioned to 2 to 4 percent above the optimum moisture content, and compacted.
- On-site soils may be used for fill provided they are cleaned of any debris to the satisfaction of the geotechnical engineer. All fill should conform with the recommendations presented in the Grading Guide Specifications, included as Appendix D. Some of the existing fill soils possess elevated moisture contents. Drying of these materials may be required prior to reuse as structural fill.
- All grading and fill placement activities should be completed in accordance with the requirements of the 2013 CBC and the grading code of the City of Riverside.
- All fill soils should be compacted to at least 90 percent of the ASTM D-1557 maximum dry density. Fill soils should be well mixed.
- Compaction tests should be performed periodically by the geotechnical engineer as random verification of compaction and moisture content. These tests are intended to aid the contractor. Since the tests are taken at discrete locations and depths, they may not be indicative of the entire fill and therefore should not relieve the contractor of his responsibility to meet the job specifications.

Imported Structural Fill

All imported structural fill should consist of very low expansive (EI < 20), well graded soils possessing at least 10 percent fines (that portion of the sample passing the No. 200 sieve). Additional specifications for structural fill are presented in the Grading Guide Specifications, included as Appendix D.

Utility Trench Backfill

In general, all utility trench backfill should be compacted to at least 90 percent of the ASTM D-1557 maximum dry density. As an alternative, a clean sand (minimum Sand Equivalent of 30) may be placed within trenches and compacted in place (jetting or flooding is not recommended). It is recommended that materials in excess of 3 inches in size not be used for utility trench backfill. Compacted trench backfill should conform to the requirements of the local grading code, and more restrictive requirements may be indicated by the City of Riverside. All utility trench backfills should be witnessed by the geotechnical engineer. The trench backfill soils should be compaction tested where possible; probed and visually evaluated elsewhere.

Utility trenches which parallel a footing, and extending below a 1h:1v plane projected from the outside edge of the footing should be backfilled with structural fill soils, compacted to at least 90 percent of the ASTM D-1557 standard. Pea gravel backfill should not be used for these trenches.

6.4 Construction Considerations

Excavation Considerations

The near-surface soils at this site generally consist of sands and silty sands. These materials may be subject to caving within shallow excavations. Where caving occurs within shallow excavations, flattened excavation slopes may be sufficient to provide excavation stability. Deeper excavations may require some form of external stabilization such as shoring or bracing. Maintaining adequate moisture content within the near-surface soils will improve excavation stability. Temporary excavation slopes should be no steeper than 2h:1v. All excavation activities on this site should be conducted in accordance with Cal-OSHA regulations.

Groundwater

The static groundwater table at this site is considered to exist at a depth in excess of 50± feet. Therefore, groundwater is not expected to impact grading or foundation construction activities.

6.5 Foundation Design and Construction

Based on the preceding grading recommendations, it is assumed that the new building pads will be underlain by new structural fill soils used to replace the existing undocumented fill soils and a portion of the near-surface alluvial soils. These structural fill soils are expected to extend to depths of at least 3 feet below proposed foundation bearing grade. Based on this subsurface profile, the proposed structures may be supported on conventional shallow foundations.

Foundation Design Parameters

New square and rectangular footings may be designed as follows:

- Maximum, net allowable soil bearing pressure: 2,500 lbs/ft^2.

- Minimum wall/column footing width: 14 inches/24 inches.

- Minimum longitudinal steel reinforcement within strip footings: Four (4) No. 5 rebars (2 top and 2 bottom).

- Minimum foundation embedment: 12 inches into suitable structural fill soils, and at least 18 inches below adjacent exterior grade. Interior column footings may be placed immediately beneath the floor slab.

- It is recommended that the perimeter building foundations be continuous across all exterior doorways. Any flatwork adjacent to the exterior doors should be doweled into the perimeter foundations in a manner determined by the structural engineer.

The allowable bearing pressures presented above may be increased by 1/3 when considering short duration wind or seismic loads. The minimum steel reinforcement recommended above is based on geotechnical considerations; additional reinforcement may be necessary for structural considerations. The actual design of the foundations should be determined by the structural engineer.

Foundation Construction

The foundation subgrade soils should be evaluated at the time of overexcavation, as discussed in Section 6.3 of this report. It is further recommended that the foundation subgrade soils be evaluated by the geotechnical engineer immediately prior to steel or concrete placement. Soils suitable for direct foundation support should consist of existing or newly placed structural fill, compacted to at least 90 percent of the ASTM D-1557 maximum dry density. Any unsuitable materials should be removed to a depth of suitable bearing compacted structural fill, with the resulting excavations backfilled with compacted fill soils. As an alternative, lean concrete slurry (500 to 1,500 psi) may be used to backfill such isolated overexcavations.

The foundation subgrade soils should also be properly moisture conditioned to 2 to 4 percent above the Modified Proctor optimum, to a depth of at least 12 inches below bearing grade. Since it is typically not feasible to increase the moisture content of the floor slab and foundation subgrade soils once rough grading has been completed, care should be taken to maintain the moisture content of the building pad subgrade soils throughout the construction process.

Estimated Foundation Settlements

Post-construction total and differential settlements of shallow foundations designed and constructed in accordance with the previously presented recommendations are estimated to be less than 1.0 and 0.5 inches, respectively. Differential movements are expected to occur over a 30-foot span, thereby resulting in an angular distortion of less than 0.002 inches per inch.

Lateral Load Resistance

Lateral load resistance will be developed by a combination of friction acting at the base of foundations and slabs and the passive earth pressure developed by footings below grade. The following friction and passive pressure may be used to resist lateral forces:

- Passive Earth Pressure: 300 lbs/ft^3
- Friction Coefficient: 0.30

These are allowable values, and include a factor of safety. When combining friction and passive resistance, the passive pressure component should be reduced by one-third. These values assume that footings will be poured directly against compacted structural fill. The maximum allowable passive pressure is 3000 lbs/ft^2.

6.6 Floor Slab Design and Construction

Subgrades which will support new floor slabs should be prepared in accordance with the recommendations contained in the ***Site Grading Recommendations*** section of this report. Based on the anticipated grading which will occur at this site, the floors of the new buildings may be constructed as a conventional slabs-on-grade supported on existing or newly placed structural fill soils, extending to a depth of at least 3 or 5 feet below pad grade. Based on geotechnical considerations, the floor slabs may be designed as follows:

- Minimum slab thickness: 5 inches.

- Minimum slab reinforcement: No. 3 bars at 18 inches on center in both directions. The actual floor slab reinforcement should be determined by the structural engineer, based on the imposed loading.

- Slab underlayment: If moisture sensitive floor coverings will be used or if vapor transmission into the area above the building slab is problematic, then minimum slab underlayment should consist of a moisture vapor barrier constructed below the entire area of the proposed slab. The moisture vapor barrier should meet or exceed the Class A rating as defined by ASTM E 1745-97 and have a permeance rating less than 0.01 perms as described in ASTM E 96-95 and ASTM E 154-88. A polyolefin material such as 15-mil Stego Wrap Vapor barrier or equivalent will meet these specifications. The moisture vapor barrier should be properly constructed in accordance with all applicable manufacturer specifications. Given that a rock free subgrade is anticipated and that a capillary break is not required, sand below the barrier is not required. The need for sand and/or the amount of sand above the moisture vapor barrier should be specified by the structural engineer or concrete contractor. The selection of sand above the barrier is not a geotechnical engineering issue and hence outside our purview. Where moisture sensitive floor coverings are not anticipated, the vapor barrier may be eliminated.

- Moisture condition the floor slab subgrade soils to 2 to 4 percent above the Modified Proctor optimum moisture content, to a depth of 12 inches. The moisture content of the floor slab subgrade soils should be verified by the geotechnical engineer within 24 hours prior to concrete placement.

- Proper concrete curing techniques should be utilized to reduce the potential for slab curling or the formation of excessive shrinkage cracks.

The actual design of the floor slab should be completed by the structural engineer to verify adequate thickness and reinforcement.

6.7 Trash Enclosure Design Parameters

The site plan provided to our office indicates that the proposed development will include several trash enclosures. It is expected that the trash enclosures as well as the approach slab will be subjected to relatively heavy wheel loads, imposed by trash removal equipment.

The subgrade soils in the areas of the trash enclosures and the approach slabs should be prepared in accordance with the recommendations for the parking areas, presented in Section 6.3 of this report. As such, it is expected that the trash enclosure will be underlain by structural fill soils, extending to a depth of 1 foot below proposed subgrade elevation. Based on geotechnical considerations, the following recommendations are provided for the design of the trash enclosure and the trash enclosure approach slab:

- The trash enclosure may consist of a 6-inch thick concrete slab incorporating a perimeter footing or a turned down edge, extending to a depth of at least 12 inches below adjacent finished grade. If the trash enclosure will incorporate rigid walls such as masonry block or tilt-up concrete, the perimeter foundations should be designed in accordance with the recommendations previously presented in Section 6.5 of this report.

- Reinforcement within the trash enclosure slab should consist of at least No. 3 bars at 18-inches on-center, in both directions.

- The trash enclosure approach slab should be constructed of Portland cement concrete, at least 6 inches in thickness. Reinforcement within the approach slab should consist of at least No. 3 bars at 18-inches on-center, in both directions.

- The trash enclosure and approach slab subgrades should be moisture conditioned to 2 to 4 percent above the optimum moisture content to a depth of 12 inches. The trash enclosure slab and the approach slab should be structurally connected, to reduce the potential for differential movement between the two slabs.

- The actual design of the trash enclosure and the trash enclosure approach slab should be completed by the structural engineer to verify adequate thickness and reinforcement.

6.8 Exterior Flatwork Design and Construction

Subgrades which will support new exterior slabs-on-grade for patios and sidewalks should be prepared in accordance with the recommendations contained in Section 6.3 of this report. Based on these recommendations, the exterior flatwork will be supported on existing fill soils that have been scarified and moisture conditioned to a depth of 12 inches and recompacted to 90 percent of the ASTM D-1557 maximum dry density. Based on geotechnical considerations, exterior slabs on grade which are not subjected to any vehicular traffic may be designed as follows:

- Minimum slab thickness: 4 inches
- Minimum slab reinforcement: No. 4 bars at 18 inches on center, in both directions.
- Moisture condition the flatwork subgrade soils to 2 to 4 percent of the optimum moisture content, to a depth of at least 12 inches.
- Proper concrete curing techniques should be utilized to reduce the potential for slab curling or the formation of excessive shrinkage cracks.
- Control joints should be provided at a maximum spacing of 8 feet on center in two directions for slabs and at 6 feet on center for sidewalks. Control joints are intended to direct cracking.
- Expansion or felt joints should be used at the interface of exterior slabs on grade and any fixed structures to permit relative movement.
- Where the flatwork is adjacent to a landscape planter or another area with exposed soil, it should incorporate a turned down edge. This turned down edge should be at least 12 inches in depth and 6 inches in width. The turned down edge should incorporate longitudinal steel reinforcement consisting of at least one No. 4 bar.
- Flatwork which is constructed immediately adjacent to the new structure should be dowelled into the perimeter foundations in a manner determined by the structural engineer.

6.9 Retaining Wall Design and Construction

We assume understand that walls up to 5 feet in height will be required in the truck loading dock areas for the market. Some walls of 5 feet or less in height may also be required to facilitate the new site grades. The parameters recommended for use in the design of these walls are presented below.

Retaining Wall Design Parameters

Based on the soil conditions encountered at the boring locations, the following parameters may be used in the design of new retaining walls for this site. We have provided parameters assuming the use of on-site soils for retaining wall backfill. The on-site soils generally consist of sands and silty sands. Based on their classification, these materials are expected to possess a friction angle of at least 32 degrees.

If desired, SCG could provide design parameters for an alternative select backfill material behind the retaining walls. The use of select backfill material could result in lower lateral earth pressures. In order to use the design parameters for the imported select fill, this material must be placed within the entire active failure wedge. This wedge is defined as extending from the heel of the retaining wall upwards at an angle of approximately 60° from horizontal. If select backfill material behind the retaining wall is desired, SCG should be contacted for supplementary recommendations.

RETAINING WALL DESIGN PARAMETERS

Design Parameter		Soil Type
		On-site Sands and Silty Sands
Internal Friction Angle (ϕ)		32°
Unit Weight		125 lbs/ft^3
Equivalent Fluid Pressure:	Active Condition (level backfill)	38 lbs/ft^3
	Active Condition (2h:1v backfill)	59 lbs/ft^3
	At-Rest Condition (level backfill)	59 lbs/ft^3

The walls should be designed using a soil-footing coefficient of friction of 0.30 and an equivalent passive pressure of 300 lbs/ft^3. The structural engineer should incorporate appropriate factors of safety in the design of the retaining walls.

The active earth pressure may be used for the design of retaining walls that do not directly support structures or support soils that in turn support structures and which will be allowed to deflect. The at-rest earth pressure should be used for walls that will not be allowed to deflect such as those which will support foundation bearing soils, or which will support foundation loads directly.

Where the soils on the toe side of the retaining wall are not covered by a "hard" surface such as a structure or pavement, the upper 1 foot of soil should be neglected when calculating passive resistance due to the potential for the material to become disturbed or degraded during the life of the structure.

Seismic Lateral Earth Pressures

In accordance with the 2013 CBC, any retaining walls more than 6 feet in height must be designed for seismic lateral earth pressures. The proposed development is not expected to include any retaining walls that exceed 6 feet in height. If such walls are proposed for the site, SCG should be contacted for supplementary recommendations.

Retaining Wall Foundation Design

The retaining wall foundations should be supported within newly placed compacted structural fill, extending to a depth of at least 3 feet below proposed foundation bearing grade. Foundations to support new retaining walls should be designed in accordance with the general Foundation Design Parameters presented in a previous section of this report.

Backfill Material

On-site soils may be used to backfill the retaining walls. However, all backfill material placed within 3 feet of the back wall face should have a particle size no greater than 3 inches. The retaining wall backfill materials should be well graded.

It is recommended that a minimum 1 foot thick layer of free-draining granular material (less than 5 percent passing the No. 200 sieve) be placed against the face of the retaining walls. This material should extend from the top of the retaining wall footing to within 1 foot of the ground surface on the back side of the retaining wall. This material should be approved by the geotechnical engineer. In lieu of the 1 foot thick layer of free-draining material, a properly installed prefabricated drainage composite such as the MiraDRAIN 6000XL (or approved equivalent), which is specifically designed for use behind retaining walls, may be used. If the layer of free-draining material is not covered by an impermeable surface, such as a structure or pavement, a 12-inch thick layer of a low permeability soil should be placed over the backfill to reduce surface water migration to the underlying soils. The layer of free draining granular material should be separated from the backfill soils by a suitable geotextile, approved by the geotechnical engineer.

All retaining wall backfill should be placed and compacted under engineering controlled conditions in the necessary layer thicknesses to ensure an in-place density between 90 and 93 percent of the maximum dry density as determined by the Modified Proctor test (ASTM D1557). Care should be taken to avoid over-compaction of the soils behind the retaining walls, and the use of heavy compaction equipment should be avoided.

Subsurface Drainage

As previously indicated, the retaining wall design parameters are based upon drained backfill conditions. Consequently, some form of permanent drainage system will be necessary in conjunction with the appropriate backfill material. Subsurface drainage may consist of either:

- A weep hole drainage system typically consisting of a series of 4-inch diameter holes in the wall situated slightly above the ground surface elevation on the exposed side of the wall and at an approximate 8-foot on-center spacing. The weep holes should include a 2 cubic foot pocket of open graded gravel, surrounded by an approved geotextile fabric, at each weep hole location.

- A 4-inch diameter perforated pipe surrounded by 2 cubic feet of gravel per linear foot of drain placed behind the wall, above the retaining wall footing. The gravel layer should be wrapped in a suitable geotextile fabric to reduce the potential for migration of fines. The footing drain should be extended to daylight or tied into a storm drainage system.

6.10 Pavement Design Parameters

Site preparation in the pavement area should be completed as previously recommended in the ***Site Grading Recommendations*** section of this report. The subsequent pavement recommendations assume proper drainage and construction monitoring, and are based on either PCA or CALTRANS design parameters for a twenty (20) year design period. However, these designs also assume a routine pavement maintenance program to obtain the anticipated 20-year pavement service life.

Pavement Subgrades

It is anticipated that the new pavements will be supported on the existing fill and/or native soils that have been scarified, moisture conditioned, and recompacted. These materials generally consist of silty sands. These materials are expected to exhibit good pavement support characteristics, with estimated R-values of 40 to 60. Since R-value testing was not included in the scope of services for the current project, the subsequent pavement designs are based upon a conservatively assumed R-value of 40. Any fill material imported to the site should have support characteristics equal to or greater than that of the on-site soils and be placed and compacted under engineering controlled conditions. It may be desirable to perform R-value testing after the completion of rough grading to verify the R-value of the as-graded parking subgrade.

Asphaltic Concrete

Presented below are the recommended thicknesses for new flexible pavement structures consisting of asphaltic concrete over a granular base. The pavement designs are based on the traffic indices (TI's) indicated. The client and/or civil engineer should verify that these TI's are representative of the anticipated traffic volumes. If the client and/or civil engineer determine that the expected traffic volume will exceed the applicable traffic index, we should be contacted for supplementary recommendations. The design traffic indices equate to the following approximate daily traffic volumes over a 20 year design life, assuming seven operational traffic days per week.

Traffic Index	No. of Heavy Trucks per Day
4.0	0
5.0	1
6.0	3

For the purpose of the traffic volumes indicated above, a truck is defined as a 5-axle tractor trailer unit with one 8-kip axle and two 32-kip tandem axles. All of the traffic indices allow for 1,000 automobiles per day.

ASPHALT PAVEMENTS (R = 40)			
Materials	**Thickness (inches)**		
	Auto Parking (TI = 4.0)	Auto Drive Lanes (TI = 5.0)	Light Truck Traffic (TI = 6.0)
Asphalt Concrete	3	3	3½
Aggregate Base	3	4	6
Compacted Subgrade	12	12	12

The aggregate base course should be compacted to at least 95 percent of the ASTM D-1557 maximum dry density. The asphaltic concrete should be compacted to at least 95 percent of the Marshall maximum density, as determined by ASTM D-2726. The aggregate base course may consist of crushed aggregate base (CAB) or crushed miscellaneous base (CMB), which is a recycled gravel, asphalt and concrete material. The gradation, R-Value, Sand Equivalent, and Percentage Wear of the CAB or CMB should comply with appropriate specifications contained in the current edition of the "Greenbook" Standard Specifications for Public Works Construction.

Portland Cement Concrete

The preparation of the subgrade soils within Portland cement concrete pavement areas should be performed as previously described for proposed asphalt pavement areas. The minimum recommended thicknesses for the Portland Cement Concrete pavement sections are as follows:

PORTLAND CEMENT CONCRETE PAVEMENTS		
Materials	**Thickness (inches)**	
	Automobile Parking and Drive Areas	Light Truck Traffic Areas (TI =6.0)
PCC	5	5½
Compacted Subgrade (95% minimum compaction)	12	12

The concrete should have a 28-day compressive strength of at least 3,000 psi. Reinforcing within all pavements should be designed by the structural engineer. The maximum joint spacing within all of the PCC pavements is recommended to be equal to or less than 30 times the pavement thickness. The actual joint spacing and reinforcing of the Portland cement concrete pavements should be determined by the structural engineer.

7.0 GENERAL COMMENTS

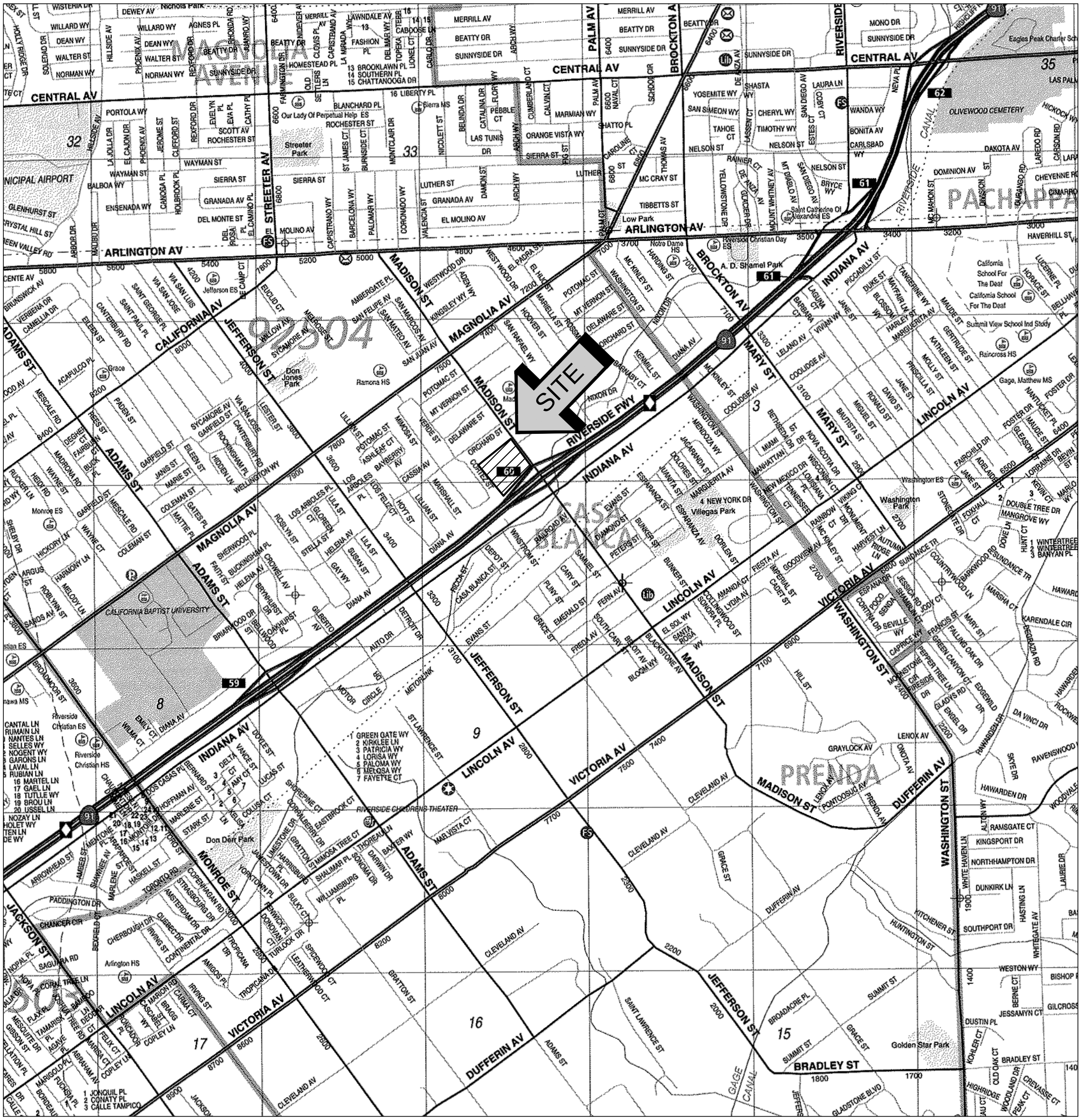
This report has been prepared as an instrument of service for use by the client, in order to aid in the evaluation of this property and to assist the architects and engineers in the design and preparation of the project plans and specifications. This report may be provided to the contractor(s) and other design consultants to disclose information relative to the project. However, this report is not intended to be utilized as a specification in and of itself, without appropriate interpretation by the project architect, civil engineer, and/or structural engineer. The reproduction and distribution of this report must be authorized by the client and Southern California Geotechnical, Inc. Furthermore, any reliance on this report by an unauthorized third party is at such party's sole risk, and we accept no responsibility for damage or loss which may occur. The client(s)' reliance upon this report is subject to the Engineering Services Agreement, incorporated into our proposal for this project.

The analysis of this site was based on a subsurface profile interpolated from limited discrete soil samples. While the materials encountered in the project area are considered to be representative of the total area, some variations should be expected between boring locations and sample depths. If the conditions encountered during construction vary significantly from those detailed herein, we should be contacted immediately to determine if the conditions alter the recommendations contained herein.

This report has been based on assumed or provided characteristics of the proposed development. It is recommended that the owner, client, architect, structural engineer, and civil engineer carefully review these assumptions to ensure that they are consistent with the characteristics of the proposed development. If discrepancies exist, they should be brought to our attention to verify that they do not affect the conclusions and recommendations contained herein. We also recommend that the project plans and specifications be submitted to our office for review to verify that our recommendations have been correctly interpreted.

The analysis, conclusions, and recommendations contained within this report have been promulgated in accordance with generally accepted professional geotechnical engineering practice. No other warranty is implied or expressed.

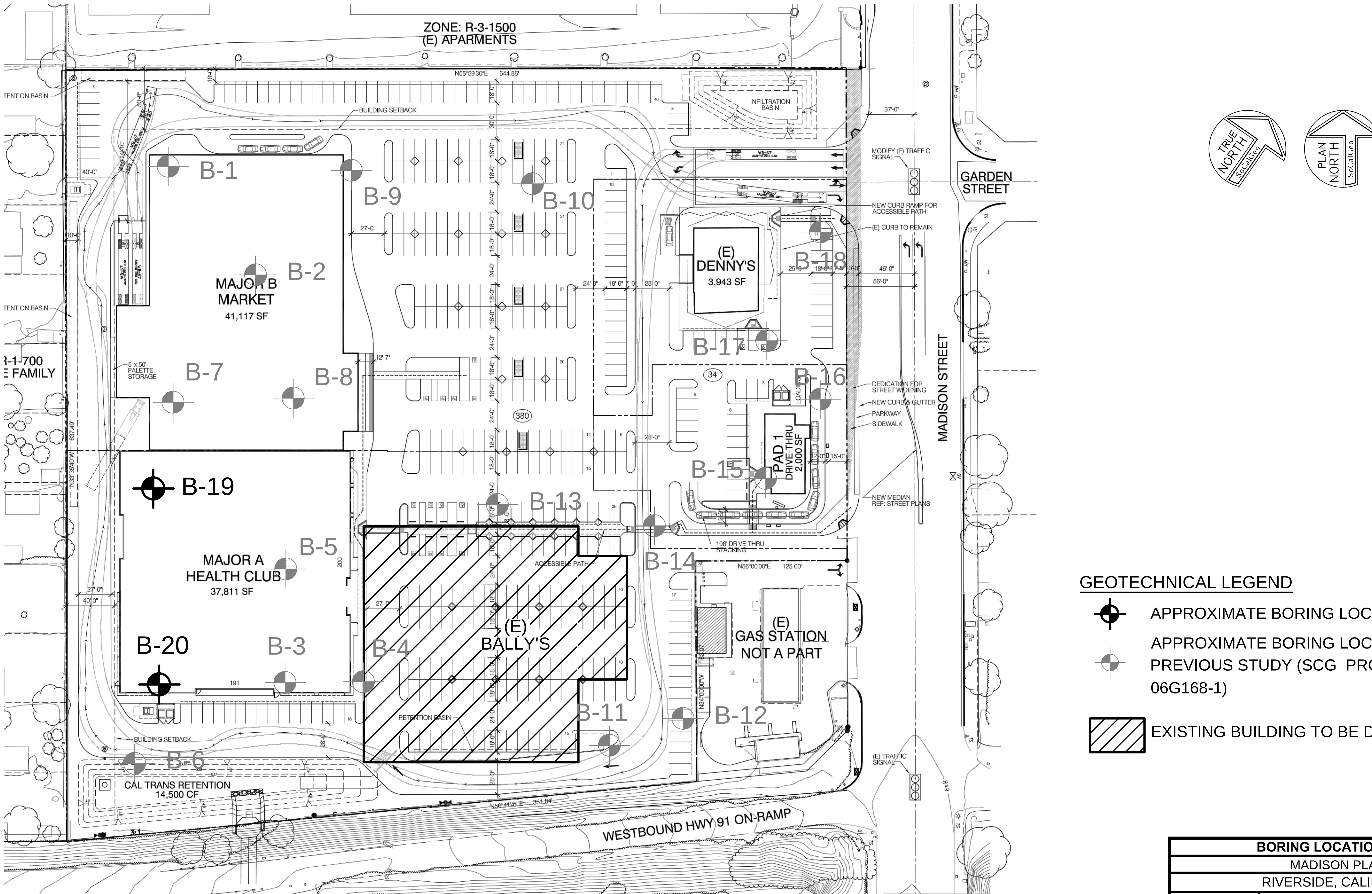
APPENDIX A



SOURCE: RIVERSIDE COUNTY
THOMAS GUIDE, 2013

SITE LOCATION MAP
MADISON PLAZA
RIVERSIDE, CALIFORNIA

SCALE: 1" = 2400'	SoCalGeo SOUTHERN CALIFORNIA GEOTECHNICAL
DRAWN: JL CHKD: GKM	
SCG PROJECT 15G226-1	
PLATE 1	



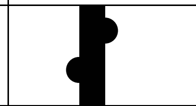
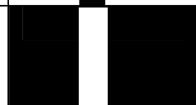
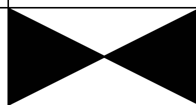
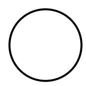
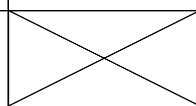
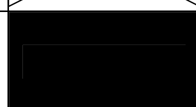
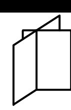
GEOTECHNICAL LEGEND

- APPROXIMATE BORING LOCATION
- APPROXIMATE BORING LOCATION FROM PREVIOUS STUDY (SCG PROJECT NO. 06G168-1)
- EXISTING BUILDING TO BE DEMOLISHED

BORING LOCATION PLAN	
MADISON PLAZA	
RIVERSIDE, CALIFORNIA	
SCALE: 1" = 80'	SOUTHERN CALIFORNIA GEOTECHNICAL
DRAWN: MRM CHKD: GKM	
SCG PROJECT 15G226-1	
PLATE 2	

APPENDIX B

BORING LOG LEGEND

SAMPLE TYPE	GRAPHICAL SYMBOL	SAMPLE DESCRIPTION
AUGER		SAMPLE COLLECTED FROM AUGER CUTTINGS, NO FIELD MEASUREMENT OF SOIL STRENGTH. (DISTURBED)
CORE		ROCK CORE SAMPLE: TYPICALLY TAKEN WITH A DIAMOND-TIPPED CORE BARREL. TYPICALLY USED ONLY IN HIGHLY CONSOLIDATED BEDROCK.
GRAB		SOIL SAMPLE TAKEN WITH NO SPECIALIZED EQUIPMENT, SUCH AS FROM A STOCKPILE OR THE GROUND SURFACE. (DISTURBED)
CS		CALIFORNIA SAMPLER: 2-1/2 INCH I.D. SPLIT BARREL SAMPLER, LINED WITH 1-INCH HIGH BRASS RINGS. DRIVEN WITH SPT HAMMER. (RELATIVELY UNDISTURBED)
NSR		NO RECOVERY: THE SAMPLING ATTEMPT DID NOT RESULT IN RECOVERY OF ANY SIGNIFICANT SOIL OR ROCK MATERIAL.
SPT		STANDARD PENETRATION TEST: SAMPLER IS A 1.4 INCH INSIDE DIAMETER SPLIT BARREL, DRIVEN 18 INCHES WITH THE SPT HAMMER. (DISTURBED)
SH		SHELBY TUBE: TAKEN WITH A THIN WALL SAMPLE TUBE, PUSHED INTO THE SOIL AND THEN EXTRACTED. (UNDISTURBED)
VANE		VANE SHEAR TEST: SOIL STRENGTH OBTAINED USING A 4 BLADED SHEAR DEVICE. TYPICALLY USED IN SOFT CLAYS-NO SAMPLE RECOVERED.

COLUMN DESCRIPTIONS

DEPTH: Distance in feet below the ground surface.

SAMPLE: Sample Type as depicted above.

BLOW COUNT: Number of blows required to advance the sampler 12 inches using a 140 lb hammer with a 30-inch drop. 50/3" indicates penetration refusal (>50 blows) at 3 inches. WH indicates that the weight of the hammer was sufficient to push the sampler 6 inches or more.

POCKET PEN.: Approximate shear strength of a cohesive soil sample as measured by pocket penetrometer.

GRAPHIC LOG: Graphic Soil Symbol as depicted on the following page.

DRY DENSITY: Dry density of an undisturbed or relatively undisturbed sample in lbs/ft^3.

MOISTURE CONTENT: Moisture content of a soil sample, expressed as a percentage of the dry weight.

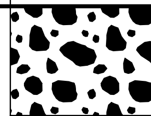
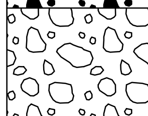
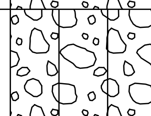
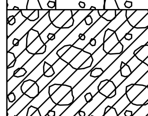
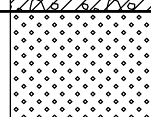
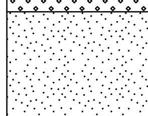
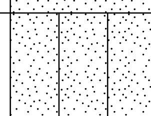
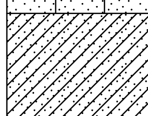
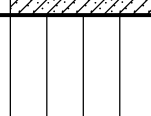
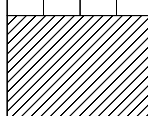
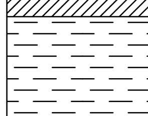
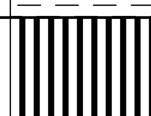
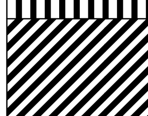
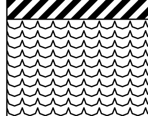
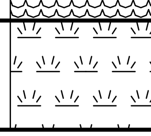
LIQUID LIMIT: The moisture content above which a soil behaves as a liquid.

PLASTIC LIMIT: The moisture content above which a soil behaves as a plastic.

PASSING #200 SIEVE: The percentage of the sample finer than the #200 standard sieve.

UNCONFINED SHEAR: The shear strength of a cohesive soil sample, as measured in the unconfined state.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	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
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				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 BORDERLINE SOIL CLASSIFICATIONS

SOUTHERN CALIFORNIA GEOTECHNICAL
SoCalGeo
A California Corporation

BORING NO. B-19

JOB NO.: 15G226	DRILLING DATE: 12/21/15	WATER DEPTH: Dry
PROJECT: Proposed Madison Plaza	DRILLING METHOD: Hollow Stem Auger	CAVE DEPTH: 30 feet
LOCATION: Riverside, California	LOGGED BY: Scott McCann	READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					3± inches Asphaltic concrete, no discernible Aggregate base							
	X	6			POSSIBLE FILL: Brown Silty fine to coarse Sand, trace fine Gravel, loose to medium dense-damp to moist		8					
	X	4			ALLUVIUM: Brown Silty fine to medium Sand, trace to little coarse Sand, trace fine Gravel, loose-damp		7					
5												
	X	9			Brown Silty fine Sand, trace medium to coarse Sand, loose-damp to moist		8					
	X	7			Gray Brown Silty fine to medium Sand, trace coarse Sand, trace fine Gravel, loose-damp to moist		4					
10												
	X	7					9					
15												
	X	10			@ 18½ to 19½ feet, loose to medium dense		6					
					Light Brown Silty fine Sand, trace medium to coarse Sand, loose to medium dense-moist		10					
20												
	X	16			@ 23½ to 24 feet, medium dense		10					
					Light Gray Silty fine to medium Sand, little coarse Sand, trace fine Gravel, medium dense-damp		6					
25												
	X	10			@ 28½ to 30 feet, loose to medium dense		4					
30												
					Gray Brown Silty fine to medium Sand, trace coarse Sand, trace Clay, trace calcareous veining, medium dense-damp to moist							
	X	21					9					

TBL 15G226.GPJ SOCALGEO.GDT 1/7/16

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-19

JOB NO.: 15G226
PROJECT: Proposed Madison Plaza
LOCATION: Riverside, California

DRILLING DATE: 12/21/15
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Scott McCann

WATER DEPTH: Dry
CAVE DEPTH: 30 feet
READING TAKEN: At Completion

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION (Continued)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					Gray Brown Silty fine to medium Sand, trace coarse Sand, trace Clay, trace calcareous veining, medium dense-damp to moist							
	X	17					10					
40												
					Light Brown fine Sand, trace coarse Sand, little Silt, trace fine Gravel, medium dense-damp							
	X	22					5					
45												
					Light Brown Silty fine to coarse Sand, trace fine Gravel, medium dense-damp							
	X	23					8					
50												
					Boring Terminated at 50'							

TBL 15G226.GPJ SOCALGEO.GDT 1/7/16

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-20

JOB NO.: 15G226
PROJECT: Proposed Madison Plaza
LOCATION: Riverside, California

DRILLING DATE: 12/21/15
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Scott McCann

WATER DEPTH: Dry
CAVE DEPTH: 13 feet
READING TAKEN: At Completion

SURFACE ELEVATION: --- MSL

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					FILL: Brown Silty fine to coarse Sand, trace fine Gravel, loose to medium dense-damp							
	X	15				111	6					EI = 2 @ 0 to 5'
					FILL: Gray Brown Silty fine to medium Sand, trace coarse Sand, trace Clay, loose to medium dense-damp							
	X	11			ALLUVIUM: Brown Silty fine to medium Sand, trace coarse Sand, loose-damp	114	5					
5	X	9			Brown Silty fine to coarse Sand, trace Clay, loose-moist	104	10					
	X	17			@ 7 to 8 feet, trace fine Gravel, medium dense - damp	115	7					
	X	16			Gray Brown fine to coarse Sand, trace Silt, trace fine Gravel, medium dense-damp	118	5					
10												
					Light Brown Silty fine to coarse Sand, loose to medium dense-damp to moist							
	X	11					9					
15					Light Gray Brown fine to coarse Sand, trace Silt, trace fine Gravel, loose to medium dense-damp		4					
					Gray Brown Silty fine to medium Sand, trace Clay, trace coarse Sand, trace calcareous veining, loose to medium dense-moist							
	X	10					12					
20												

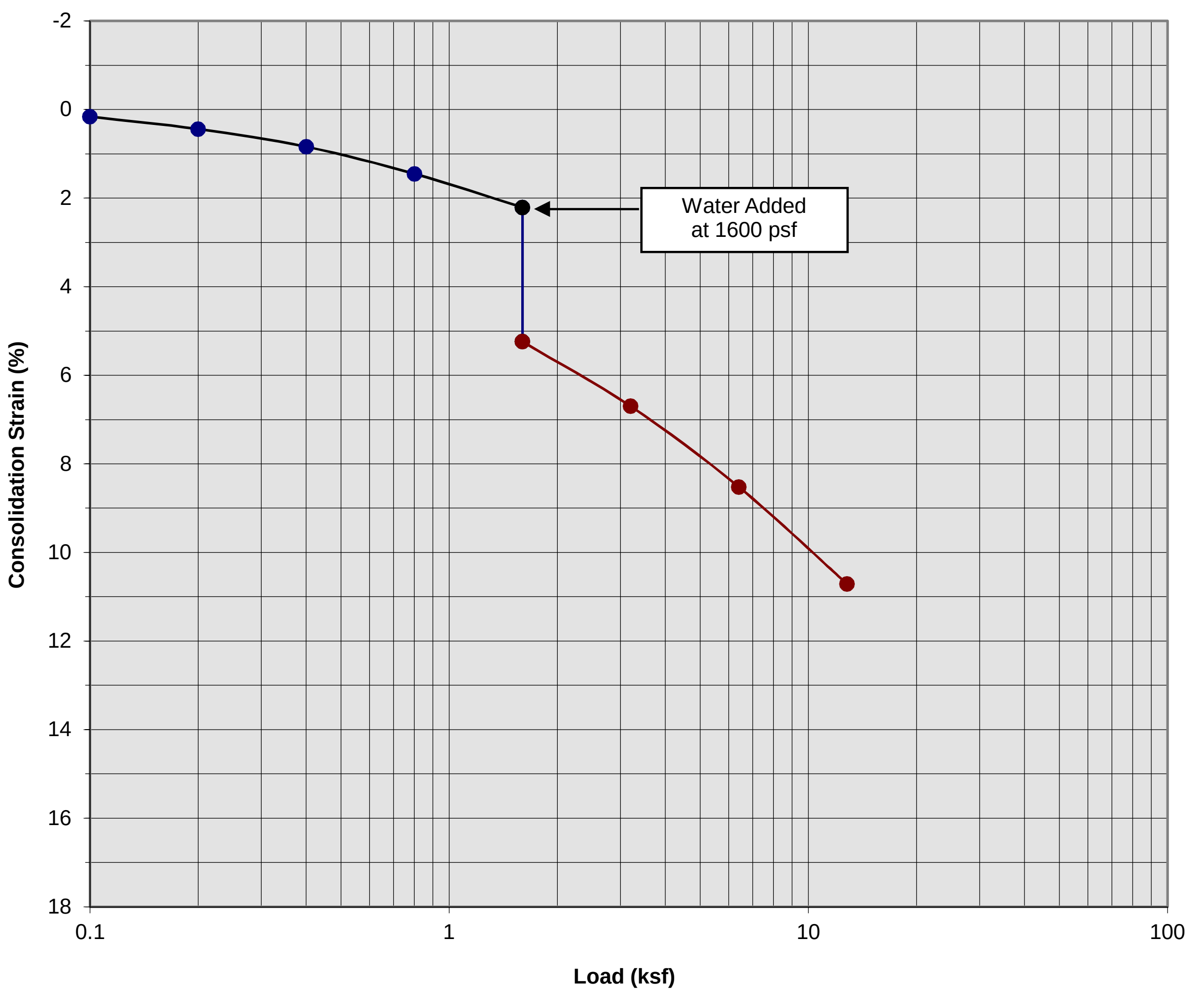
Boring Terminated at 20'

TBL 15G226.GPJ SOCALGEO.GDT 1/7/16

TEST BORING LOG

APPENDIX C

Consolidation/Collapse Test Results



Classification: Gray Brown Silty fine to medium Sand, trace coarse Sand, trace Clay

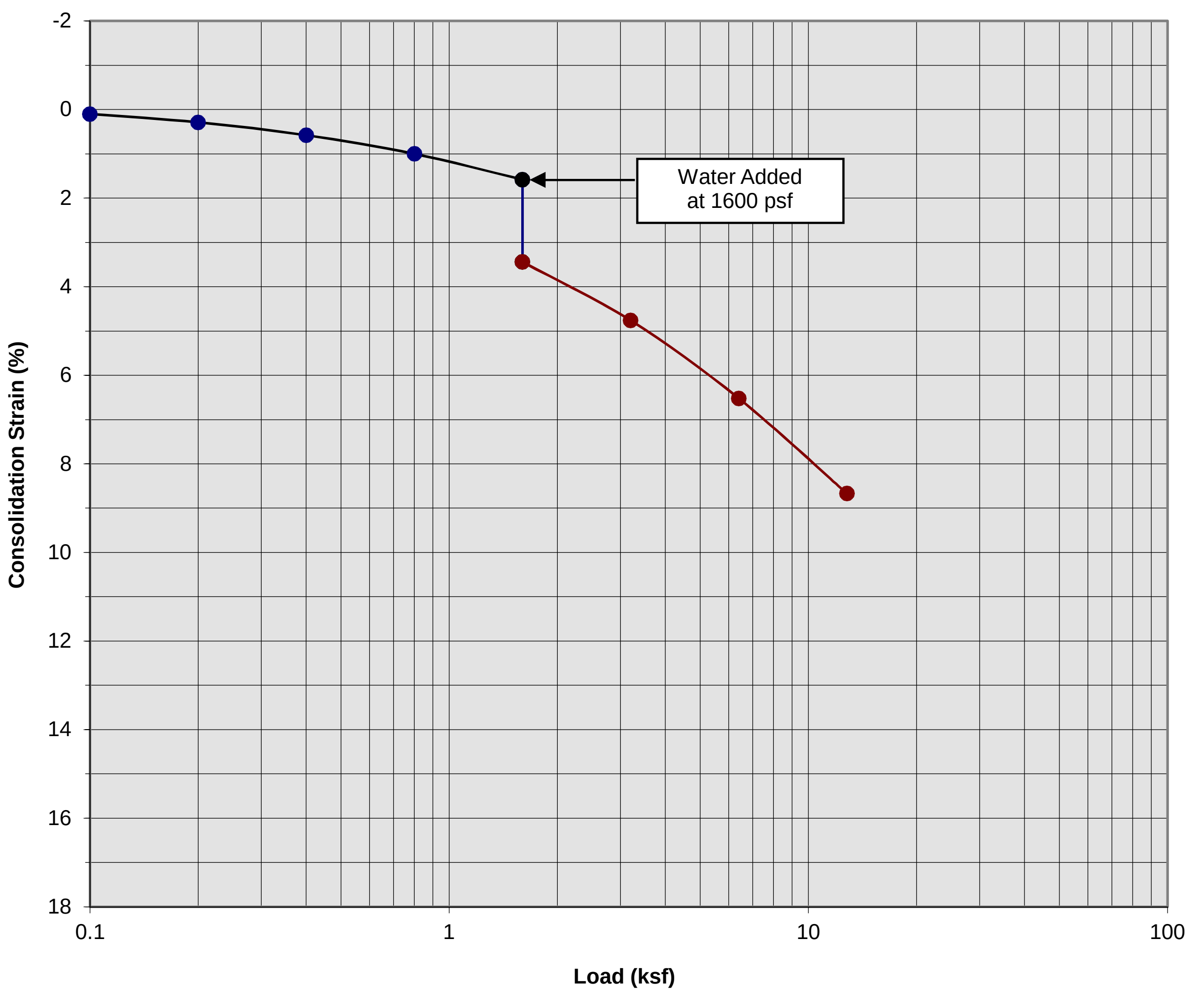
Boring Number:	B-20	Initial Moisture Content (%)	6
Sample Number:	---	Final Moisture Content (%)	13
Depth (ft)	1 to 2	Initial Dry Density (pcf)	111.2
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	124.3
Specimen Thickness (in)	1.0	Percent Collapse (%)	3.03

Madison Plaza
Riverside, California
Project No. 15G226

PLATE C- 1

SoCalGeo SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results

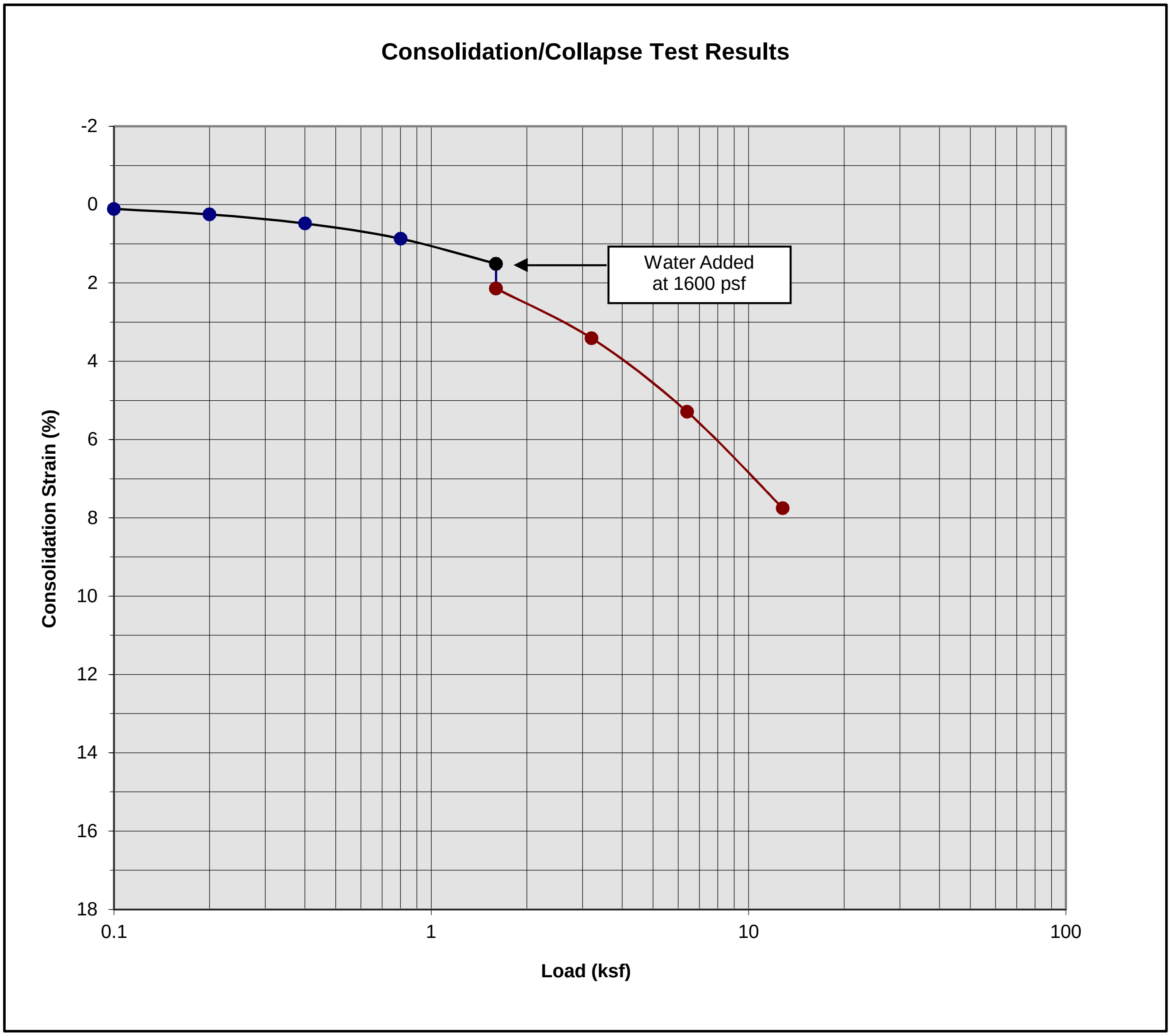


Classification: Brown Silty fine to medium Sand, trace coarse Sand

Boring Number:	B-20	Initial Moisture Content (%)	5
Sample Number:	---	Final Moisture Content (%)	16
Depth (ft)	3 to 4	Initial Dry Density (pcf)	114.2
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	125.1
Specimen Thickness (in)	1.0	Percent Collapse (%)	1.86

Madison Plaza
Riverside, California
Project No. 15G226
PLATE C- 2

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation



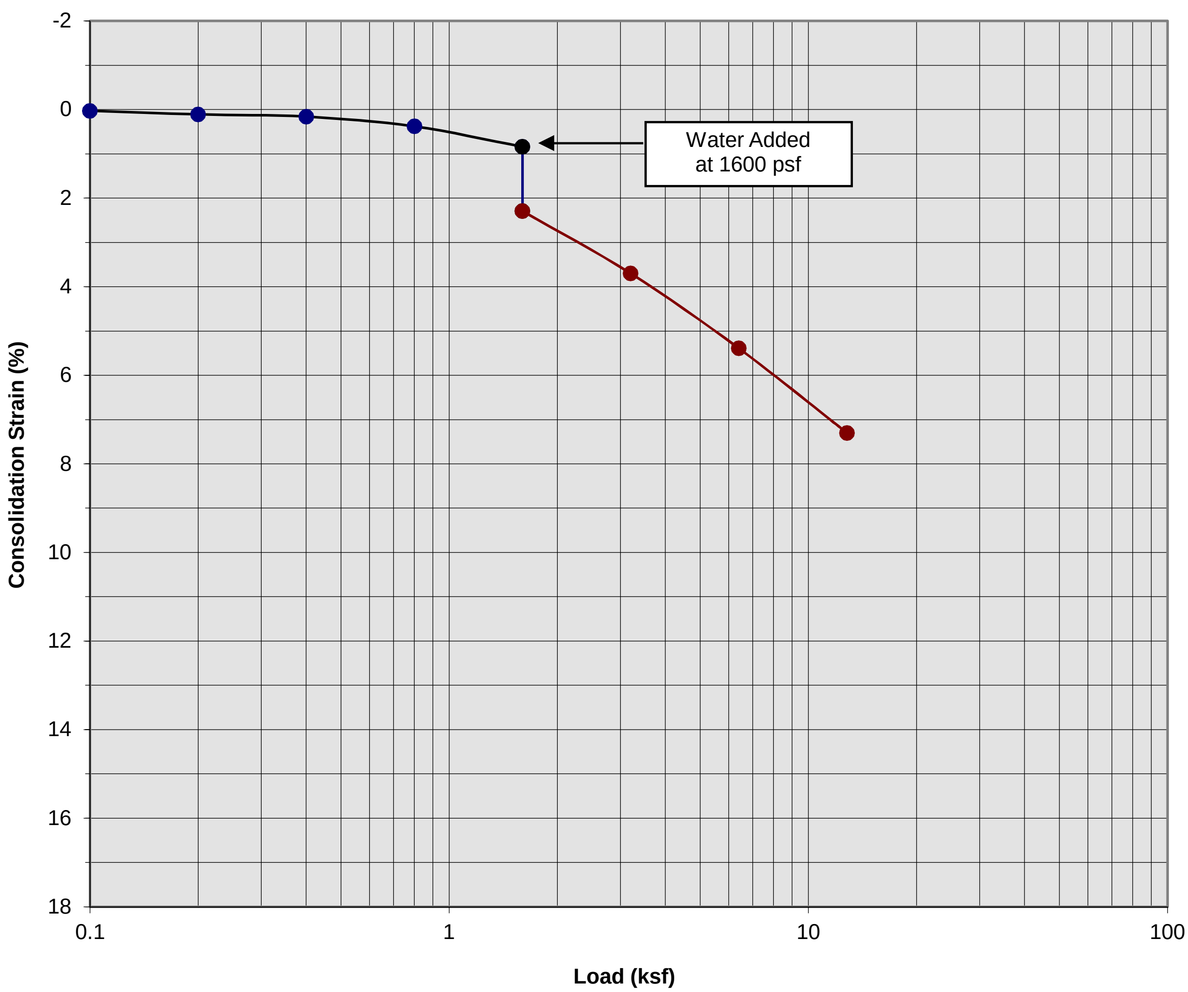
Classification: Brown Silty fine to coarse Sand, trace Clay

Boring Number:	B-20	Initial Moisture Content (%)	10
Sample Number:	---	Final Moisture Content (%)	16
Depth (ft)	5 to 6	Initial Dry Density (pcf)	104.3
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	113.0
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.63

Madison Plaza
Riverside, California
Project No. 15G226
PLATE C- 3

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



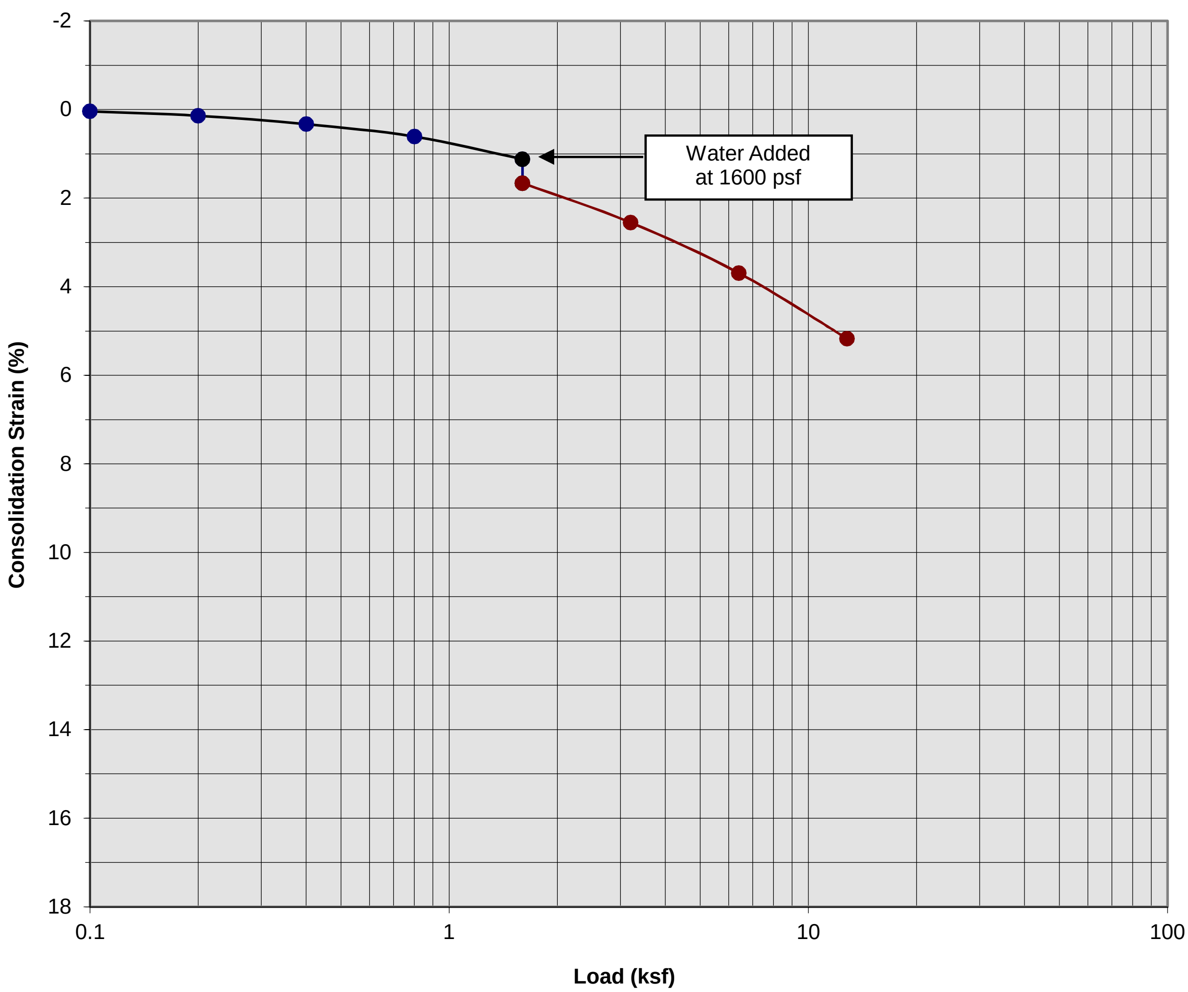
Classification: Brown Silty fine to coarse Sand, trace Clay

Boring Number:	B-20	Initial Moisture Content (%)	7
Sample Number:	---	Final Moisture Content (%)	14
Depth (ft)	7 to 8	Initial Dry Density (pcf)	115.1
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	124.0
Specimen Thickness (in)	1.0	Percent Collapse (%)	1.45

Madison Plaza
Riverside, California
Project No. 15G226
PLATE C- 4

SoCalGeo SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



Classification: Gray Brown fine to coarse Sand, trace Silt, trace fine Gravel

Boring Number:	B-20	Initial Moisture Content (%)	5
Sample Number:	---	Final Moisture Content (%)	14
Depth (ft)	9 to 10	Initial Dry Density (pcf)	118.1
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	124.6
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.54

Madison Plaza
Riverside, California
Project No. 15G226
PLATE C- 5

SoCalGeo SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

APPENDIX D

GRADING GUIDE SPECIFICATIONS

These grading guide specifications are intended to provide typical procedures for grading operations. They are intended to supplement the recommendations contained in the geotechnical investigation report for this project. Should the recommendations in the geotechnical investigation report conflict with the grading guide specifications, the more site specific recommendations in the geotechnical investigation report will govern.

General

- The Earthwork Contractor is responsible for the satisfactory completion of all earthwork in accordance with the plans and geotechnical reports, and in accordance with city, county, and applicable building codes.

- The Geotechnical Engineer is the representative of the Owner/Builder for the purpose of implementing the report recommendations and guidelines. These duties are not intended to relieve the Earthwork Contractor of any responsibility to perform in a workman-like manner, nor is the Geotechnical Engineer to direct the grading equipment or personnel employed by the Contractor.

- The Earthwork Contractor is required to notify the Geotechnical Engineer of the anticipated work and schedule so that testing and inspections can be provided. If necessary, work may be stopped and redone if personnel have not been scheduled in advance.

- The Earthwork Contractor is required to have suitable and sufficient equipment on the job-site to process, moisture condition, mix and compact the amount of fill being placed to the approved compaction. In addition, suitable support equipment should be available to conform with recommendations and guidelines in this report.

- Canyon cleanouts, overexcavation areas, processed ground to receive fill, key excavations, subdrains and benches should be observed by the Geotechnical Engineer prior to placement of any fill. It is the Earthwork Contractor's responsibility to notify the Geotechnical Engineer of areas that are ready for inspection.

- Excavation, filling, and subgrade preparation should be performed in a manner and sequence that will provide drainage at all times and proper control of erosion. Precipitation, springs, and seepage water encountered shall be pumped or drained to provide a suitable working surface. The Geotechnical Engineer must be informed of springs or water seepage encountered during grading or foundation construction for possible revision to the recommended construction procedures and/or installation of subdrains.

Site Preparation

- The Earthwork Contractor is responsible for all clearing, grubbing, stripping and site preparation for the project in accordance with the recommendations of the Geotechnical Engineer.

- If any materials or areas are encountered by the Earthwork Contractor which are suspected of having toxic or environmentally sensitive contamination, the Geotechnical Engineer and Owner/Builder should be notified immediately.

- Major vegetation should be stripped and disposed of off-site. This includes trees, brush, heavy grasses and any materials considered unsuitable by the Geotechnical Engineer.

- Underground structures such as basements, cesspools or septic disposal systems, mining shafts, tunnels, wells and pipelines should be removed under the inspection of the Geotechnical Engineer and recommendations provided by the Geotechnical Engineer and/or city, county or state agencies. If such structures are known or found, the Geotechnical Engineer should be notified as soon as possible so that recommendations can be formulated.

- Any topsoil, slopewash, colluvium, alluvium and rock materials which are considered unsuitable by the Geotechnical Engineer should be removed prior to fill placement.

- Remaining voids created during site clearing caused by removal of trees, foundations basements, irrigation facilities, etc., should be excavated and filled with compacted fill.

- Subsequent to clearing and removals, areas to receive fill should be scarified to a depth of 10 to 12 inches, moisture conditioned and compacted

- The moisture condition of the processed ground should be at or slightly above the optimum moisture content as determined by the Geotechnical Engineer. Depending upon field conditions, this may require air drying or watering together with mixing and/or discing.

<u>Compacted Fills</u>

- Soil materials imported to or excavated on the property may be utilized in the fill, provided each material has been determined to be suitable in the opinion of the Geotechnical Engineer. Unless otherwise approved by the Geotechnical Engineer, all fill materials shall be free of deleterious, organic, or frozen matter, shall contain no chemicals that may result in the material being classified as "contaminated," and shall be very low to non-expansive with a maximum expansion index (EI) of 50. The top 12 inches of the compacted fill should have a maximum particle size of 3 inches, and all underlying compacted fill material a maximum 6-inch particle size, except as noted below.

- All soils should be evaluated and tested by the Geotechnical Engineer. Materials with high expansion potential, low strength, poor gradation or containing organic materials may require removal from the site or selective placement and/or mixing to the satisfaction of the Geotechnical Engineer.

- Rock fragments or rocks less than 6 inches in their largest dimensions, or as otherwise determined by the Geotechnical Engineer, may be used in compacted fill, provided the distribution and placement is satisfactory in the opinion of the Geotechnical Engineer.

- Rock fragments or rocks greater than 12 inches should be taken off-site or placed in accordance with recommendations and in areas designated as suitable by the Geotechnical Engineer. These materials should be placed in accordance with Plate D-8 of these Grading Guide Specifications and in accordance with the following recommendations:

  - Rocks 12 inches or more in diameter should be placed in rows at least 15 feet apart, 15 feet from the edge of the fill, and 10 feet or more below subgrade. Spaces should be left between each rock fragment to provide for placement and compaction of soil around the fragments.

  - Fill materials consisting of soil meeting the minimum moisture content requirements and free of oversize material should be placed between and over the rows of rock or concrete. Ample water and compactive effort should be applied to the fill materials as they are placed in order that all of the voids between each of the fragments are filled and compacted to the specified density.

- Subsequent rows of rocks should be placed such that they are not directly above a row placed in the previous lift of fill. A minimum 5-foot offset between rows is recommended.

- To facilitate future trenching, oversized material should not be placed within the range of foundation excavations, future utilities or other underground construction unless specifically approved by the soil engineer and the developer/owner representative.

- Fill materials approved by the Geotechnical Engineer should be placed in areas previously prepared to receive fill and in evenly placed, near horizontal layers at about 6 to 8 inches in loose thickness, or as otherwise determined by the Geotechnical Engineer for the project.

- Each layer should be moisture conditioned to optimum moisture content, or slightly above, as directed by the Geotechnical Engineer. After proper mixing and/or drying, to evenly distribute the moisture, the layers should be compacted to at least 90 percent of the maximum dry density in compliance with ASTM D-1557-78 unless otherwise indicated.

- Density and moisture content testing should be performed by the Geotechnical Engineer at random intervals and locations as determined by the Geotechnical Engineer. These tests are intended as an aid to the Earthwork Contractor, so he can evaluate his workmanship, equipment effectiveness and site conditions. The Earthwork Contractor is responsible for compaction as required by the Geotechnical Report(s) and governmental agencies.

- Fill areas unused for a period of time may require moisture conditioning, processing and recompaction prior to the start of additional filling. The Earthwork Contractor should notify the Geotechnical Engineer of his intent so that an evaluation can be made.

- Fill placed on ground sloping at a 5-to-1 inclination (horizontal-to-vertical) or steeper should be benched into bedrock or other suitable materials, as directed by the Geotechnical Engineer. Typical details of benching are illustrated on Plates D-2, D-4, and D-5.

- Cut/fill transition lots should have the cut portion overexcavated to a depth of at least 3 feet and rebuilt with fill (see Plate D-1), as determined by the Geotechnical Engineer.

- All cut lots should be inspected by the Geotechnical Engineer for fracturing and other bedrock conditions. If necessary, the pads should be overexcavated to a depth of 3 feet and rebuilt with a uniform, more cohesive soil type to impede moisture penetration.

- Cut portions of pad areas above buttresses or stabilizations should be overexcavated to a depth of 3 feet and rebuilt with uniform, more cohesive compacted fill to impede moisture penetration.

- Non-structural fill adjacent to structural fill should typically be placed in unison to provide lateral support. Backfill along walls must be placed and compacted with care to ensure that excessive unbalanced lateral pressures do not develop. The type of fill material placed adjacent to below grade walls must be properly tested and approved by the Geotechnical Engineer with consideration of the lateral earth pressure used in the design.

Foundations

- The foundation influence zone is defined as extending one foot horizontally from the outside edge of a footing, and proceeding downward at a ½ horizontal to 1 vertical (0.5:1) inclination.
- Where overexcavation beneath a footing subgrade is necessary, it should be conducted so as to encompass the entire foundation influence zone, as described above.
- Compacted fill adjacent to exterior footings should extend at least 12 inches above foundation bearing grade. Compacted fill within the interior of structures should extend to the floor subgrade elevation.

Fill Slopes

- The placement and compaction of fill described above applies to all fill slopes. Slope compaction should be accomplished by overfilling the slope, adequately compacting the fill in even layers, including the overfilled zone and cutting the slope back to expose the compacted core
- Slope compaction may also be achieved by backrolling the slope adequately every 2 to 4 vertical feet during the filling process as well as requiring the earth moving and compaction equipment to work close to the top of the slope. Upon completion of slope construction, the slope face should be compacted with a sheepsfoot connected to a sideboom and then grid rolled. This method of slope compaction should only be used if approved by the Geotechnical Engineer.
- Sandy soils lacking in adequate cohesion may be unstable for a finished slope condition and therefore should not be placed within 15 horizontal feet of the slope face.
- All fill slopes should be keyed into bedrock or other suitable material. Fill keys should be at least 15 feet wide and inclined at 2 percent into the slope. For slopes higher than 30 feet, the fill key width should be equal to one-half the height of the slope (see Plate D-5).
- All fill keys should be cleared of loose slough material prior to geotechnical inspection and should be approved by the Geotechnical Engineer and governmental agencies prior to filling.
- The cut portion of fill over cut slopes should be made first and inspected by the Geotechnical Engineer for possible stabilization requirements. The fill portion should be adequately keyed through all surficial soils and into bedrock or suitable material. Soils should be removed from the transition zone between the cut and fill portions (see Plate D-2).

Cut Slopes

- All cut slopes should be inspected by the Geotechnical Engineer to determine the need for stabilization. The Earthwork Contractor should notify the Geotechnical Engineer when slope cutting is in progress at intervals of 10 vertical feet. Failure to notify may result in a delay in recommendations.
- Cut slopes exposing loose, cohesionless sands should be reported to the Geotechnical Engineer for possible stabilization recommendations.
- All stabilization excavations should be cleared of loose slough material prior to geotechnical inspection. Stakes should be provided by the Civil Engineer to verify the location and dimensions of the key. A typical stabilization fill detail is shown on Plate D-5.

- Stabilization key excavations should be provided with subdrains. Typical subdrain details are shown on Plates D-6.

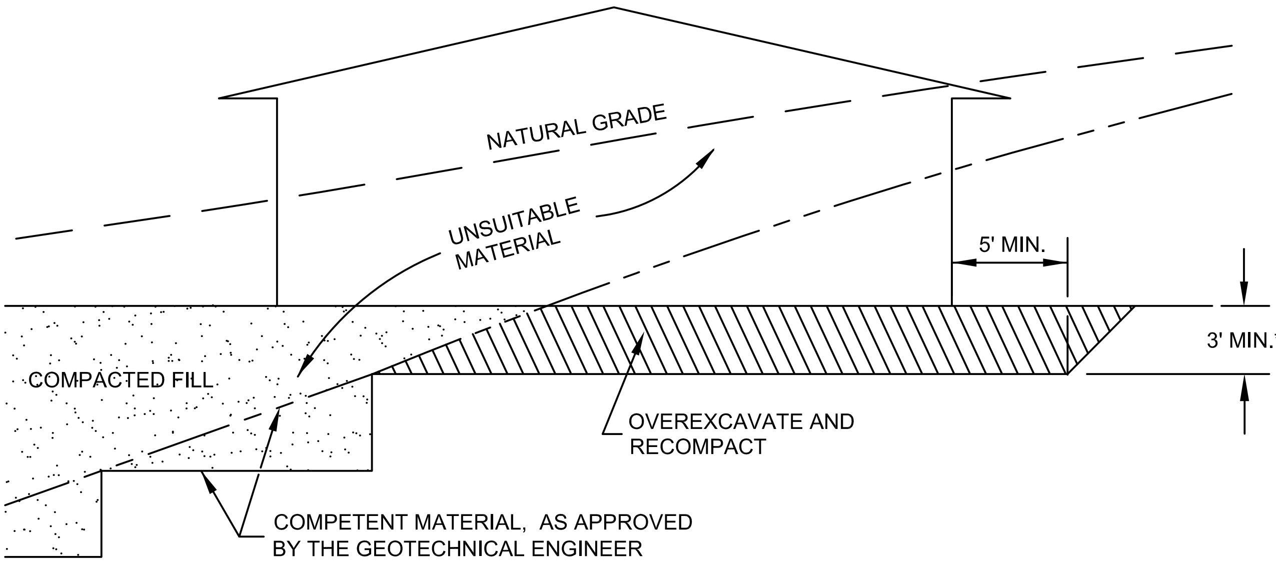
Subdrains

- Subdrains may be required in canyons and swales where fill placement is proposed. Typical subdrain details for canyons are shown on Plate D-3. Subdrains should be installed after approval of removals and before filling, as determined by the Soils Engineer.

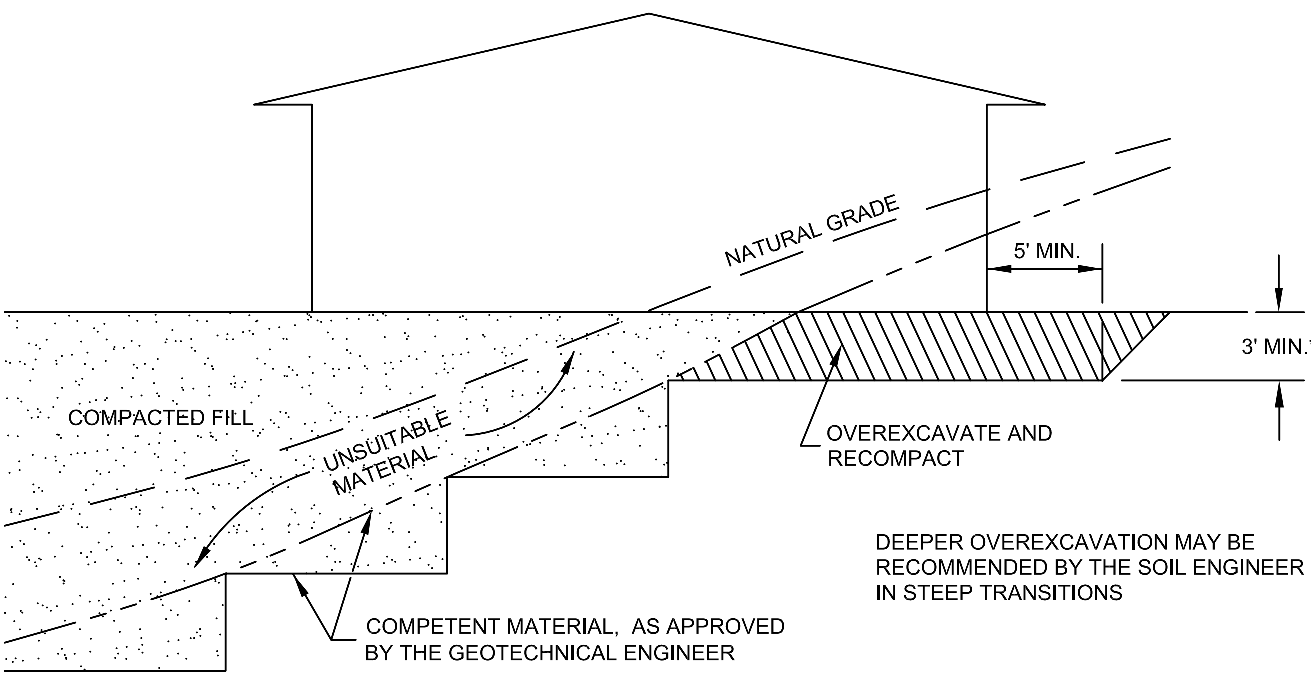
- Plastic pipe may be used for subdrains provided it is Schedule 40 or SDR 35 or equivalent. Pipe should be protected against breakage, typically by placement in a square-cut (backhoe) trench or as recommended by the manufacturer.

- Filter material for subdrains should conform to CALTRANS Specification 68-1.025 or as approved by the Geotechnical Engineer for the specific site conditions. Clean ¾-inch crushed rock may be used provided it is wrapped in an acceptable filter cloth and approved by the Geotechnical Engineer. Pipe diameters should be 6 inches for runs up to 500 feet and 8 inches for the downstream continuations of longer runs. Four-inch diameter pipe may be used in buttress and stabilization fills.

CUT LOT



CUT/FILL LOT (TRANSITION)



*SEE TEXT OF REPORT FOR SPECIFIC RECOMMENDATION.
ACTUAL DEPTH OF OVEREXCAVATION MAY BE GREATER.

TRANSITION LOT DETAIL

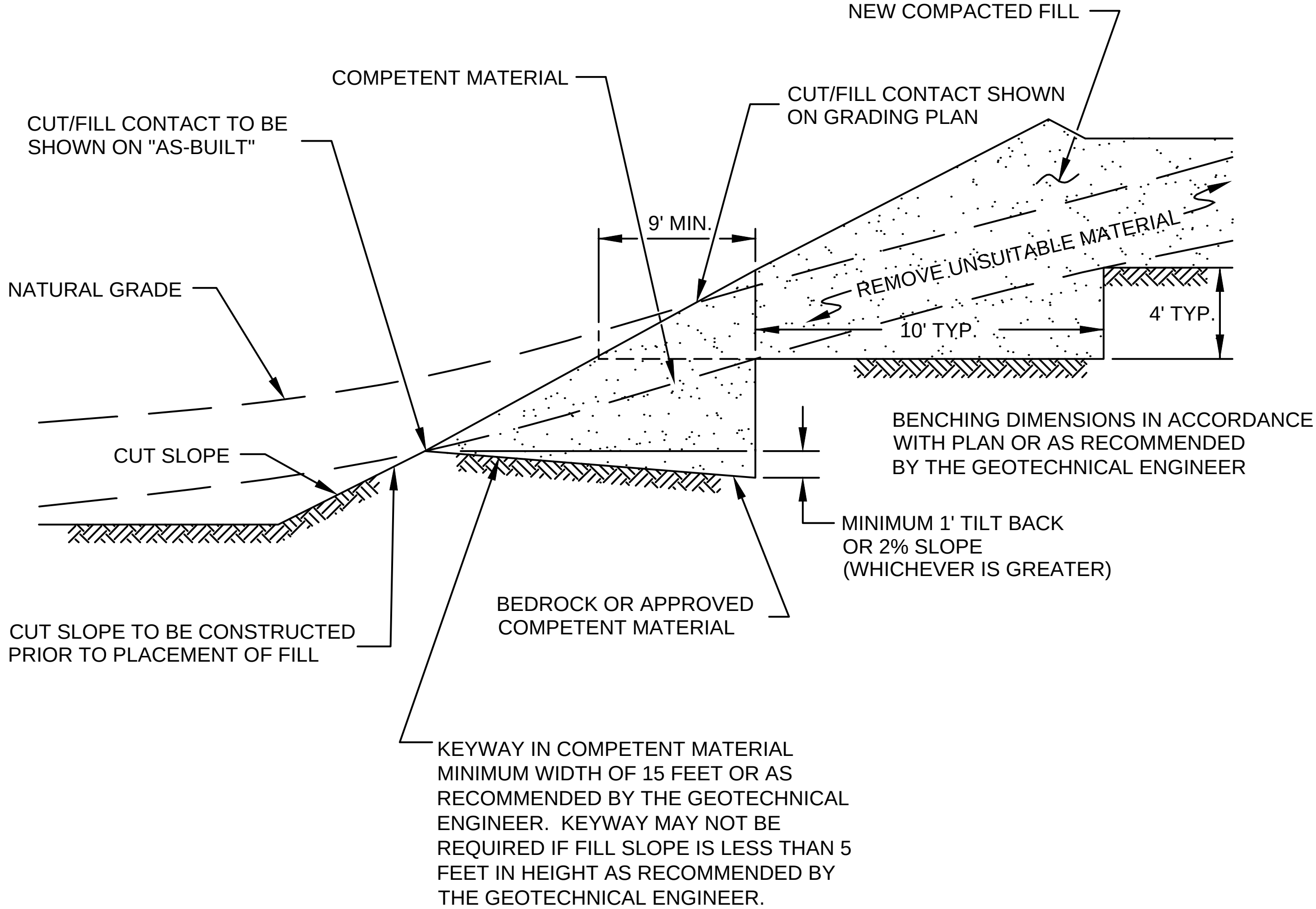
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-1

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL



FILL ABOVE CUT SLOPE DETAIL

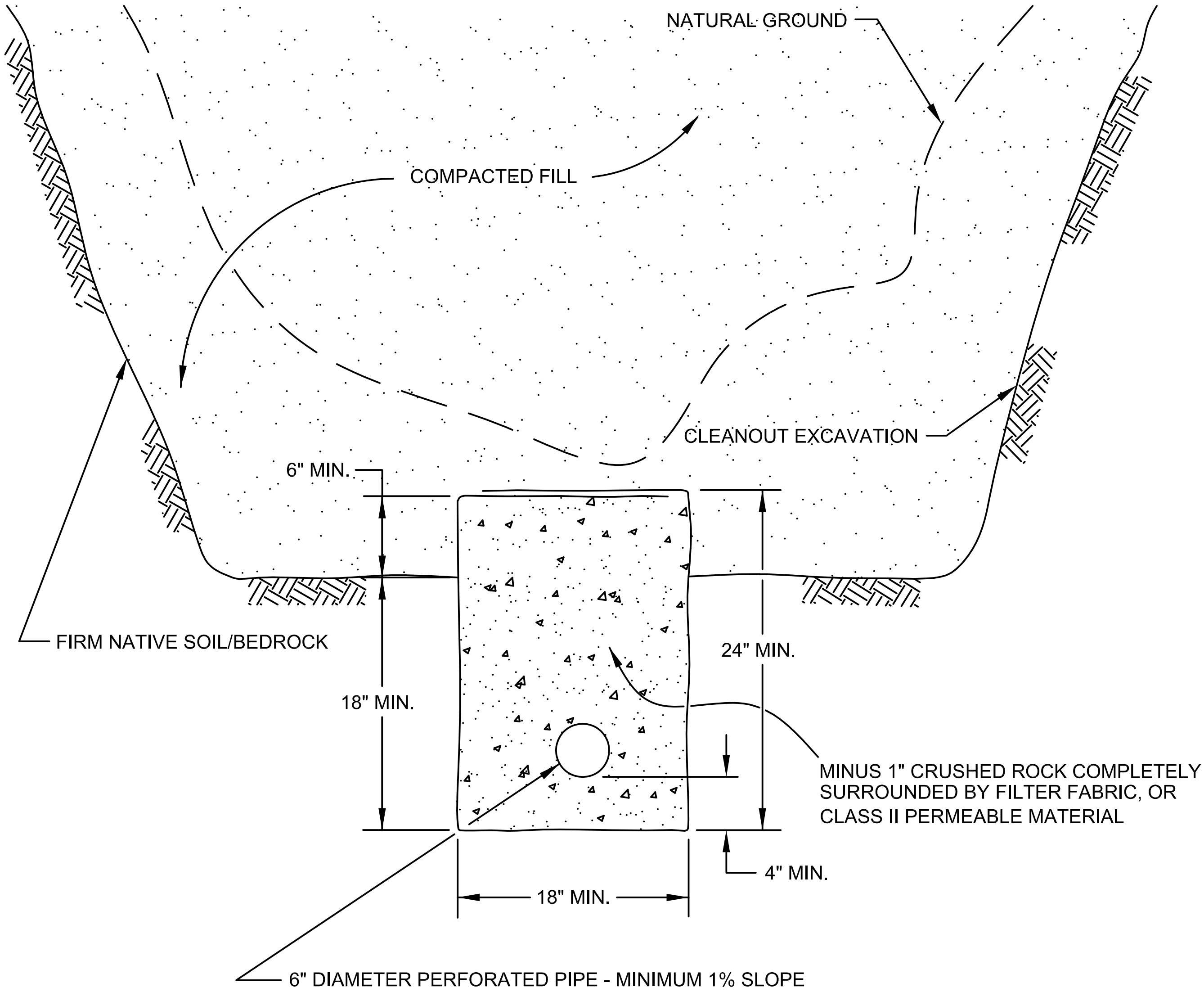
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-2

SoCalGeo SOUTHERN CALIFORNIA GEOTECHNICAL



PIPE MATERIAL	DEPTH OF FILL OVER SUBDRAIN
ADS (CORRUGATED POLETHYLENE)	8
TRANSITE UNDERDRAIN	20
PVC OR ABS: SDR 35	35
SDR 21	100

SCHEMATIC ONLY
NOT TO SCALE

CANYON SUBDRAIN DETAIL

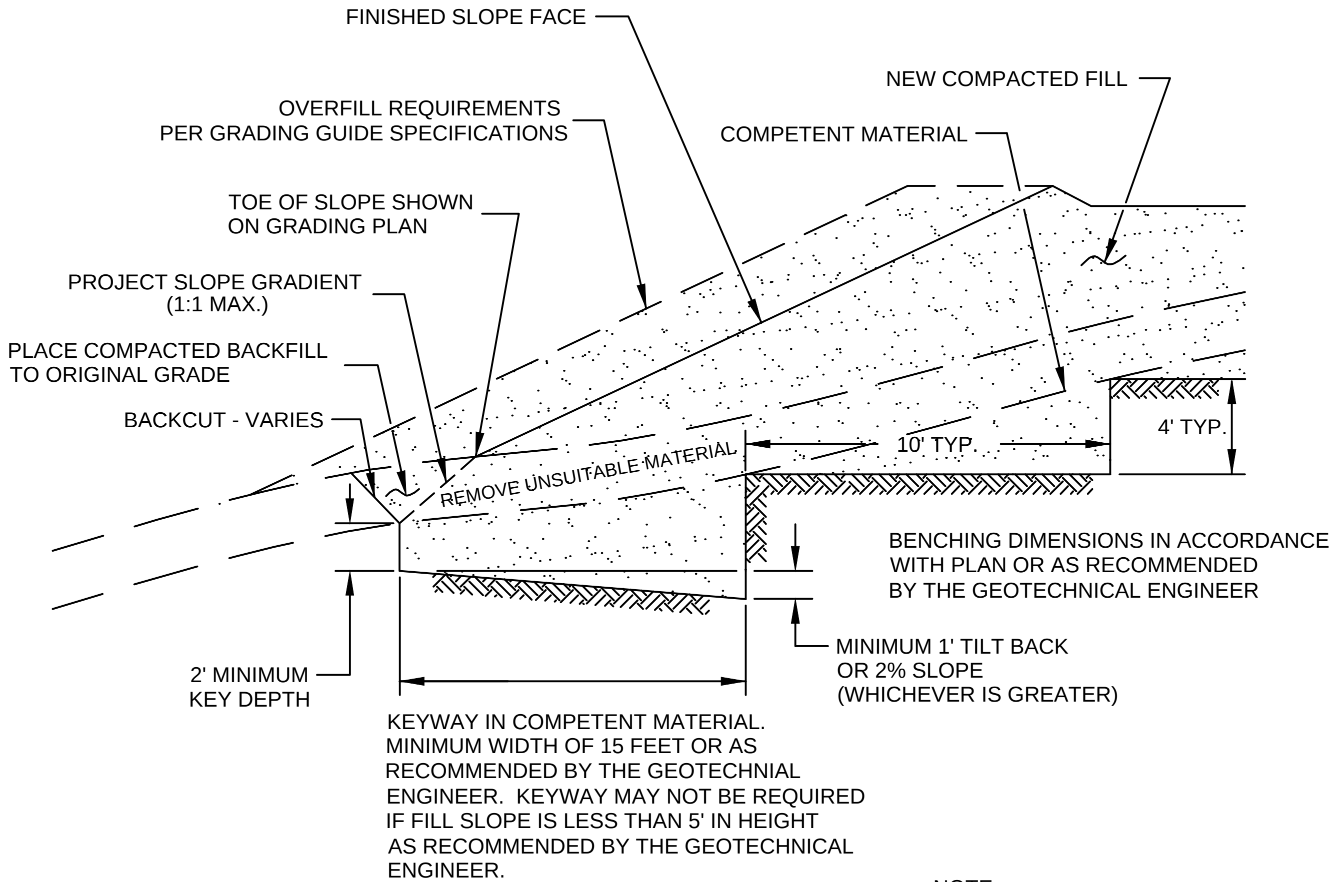
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-3

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL



NOTE:
BENCHING SHALL BE REQUIRED WHEN NATURAL SLOPES ARE EQUAL TO OR STEEPER THAN 5:1 OR WHEN RECOMMENDED BY THE GEOTECHNICAL ENGINEER.

FILL ABOVE NATURAL SLOPE DETAIL

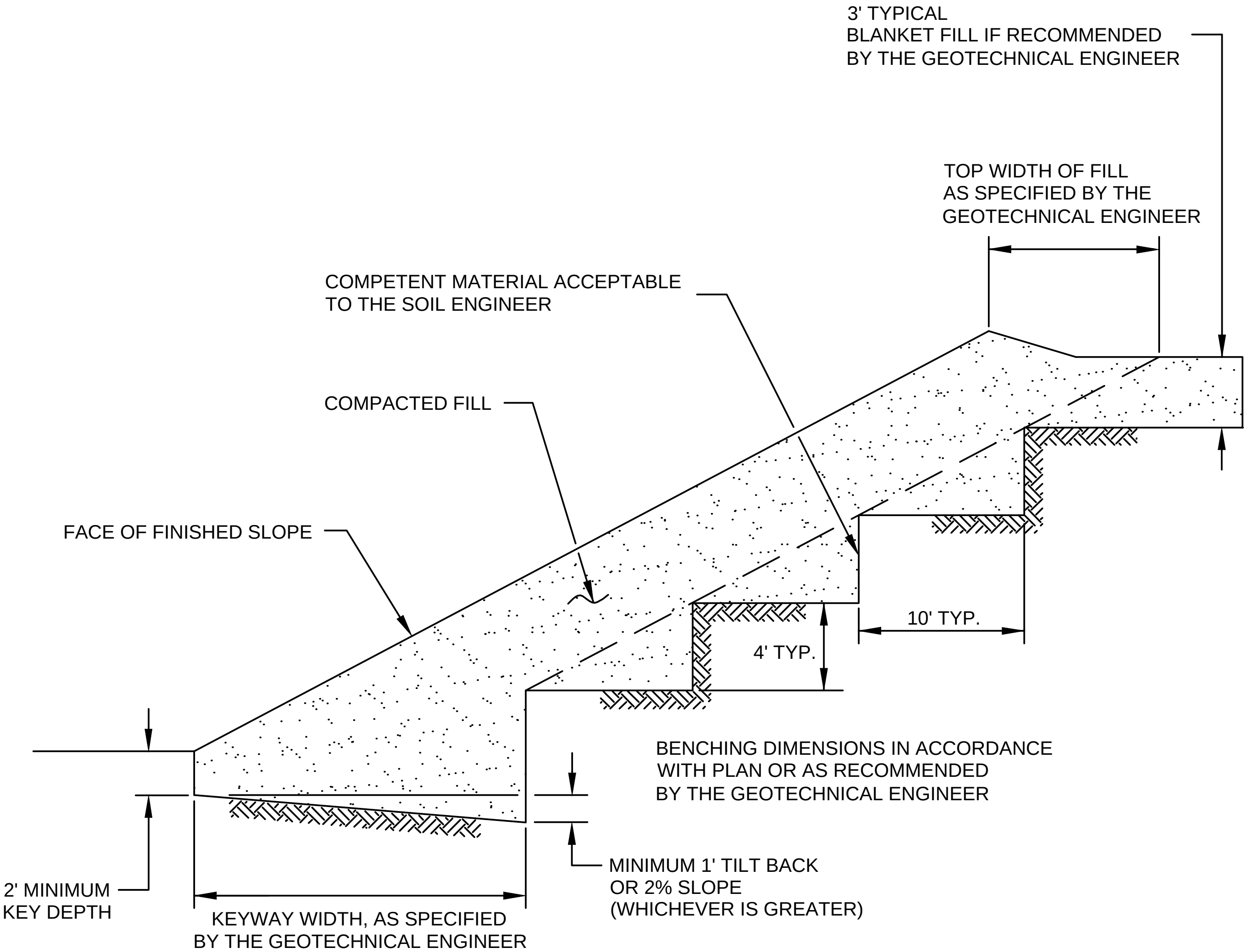
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-4

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL



STABILIZATION FILL DETAIL

GRADING GUIDE SPECIFICATIONS

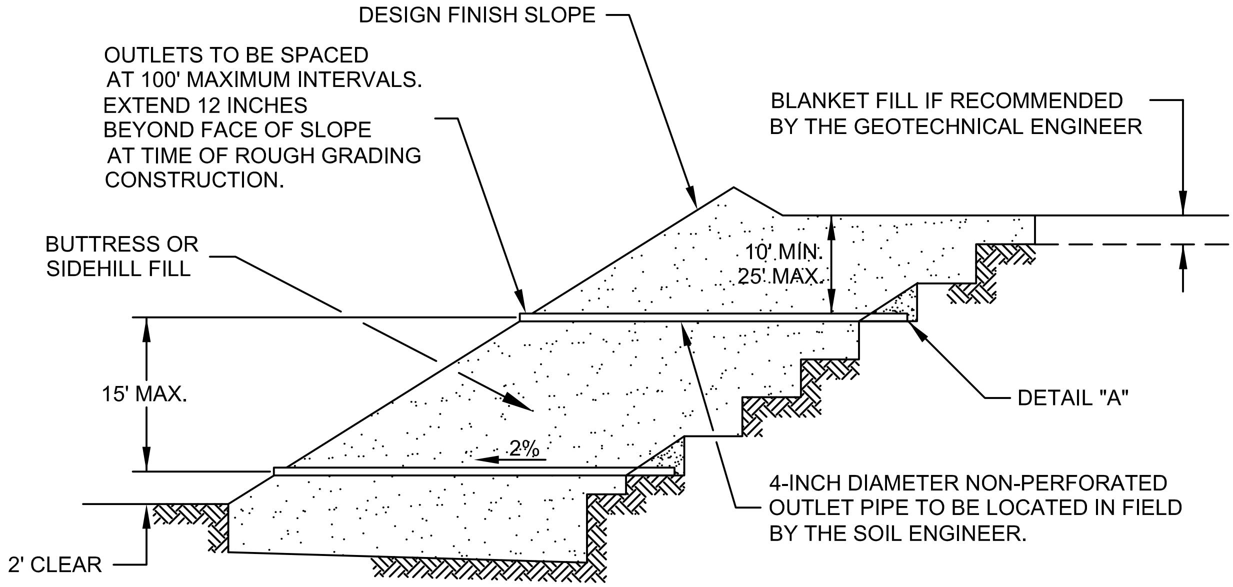
NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-5

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL



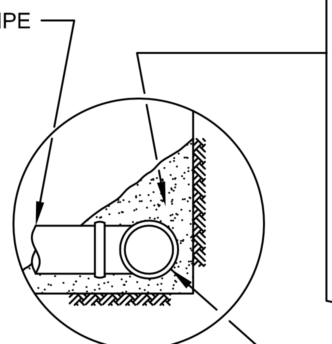
"FILTER MATERIAL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT: (CONFORMS TO EMA STD. PLAN 323)

SIEVE SIZE	PERCENTAGE PASSING
1"	100
3/4"	90-100
3/8"	40-100
NO. 4	25-40
NO. 8	18-33
NO. 30	5-15
NO. 50	0-7
NO. 200	0-3

"GRAVEL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT:

SIEVE SIZE	MAXIMUM PERCENTAGE PASSING
1 1/2"	100
NO. 4	50
NO. 200	8

SAND EQUIVALENT = MINIMUM OF 50



DETAIL "A"

NOTES:
1. TRENCH FOR OUTLET PIPES TO BE BACKFILLED WITH ON-SITE SOIL.

SLOPE FILL SUBDRAINS

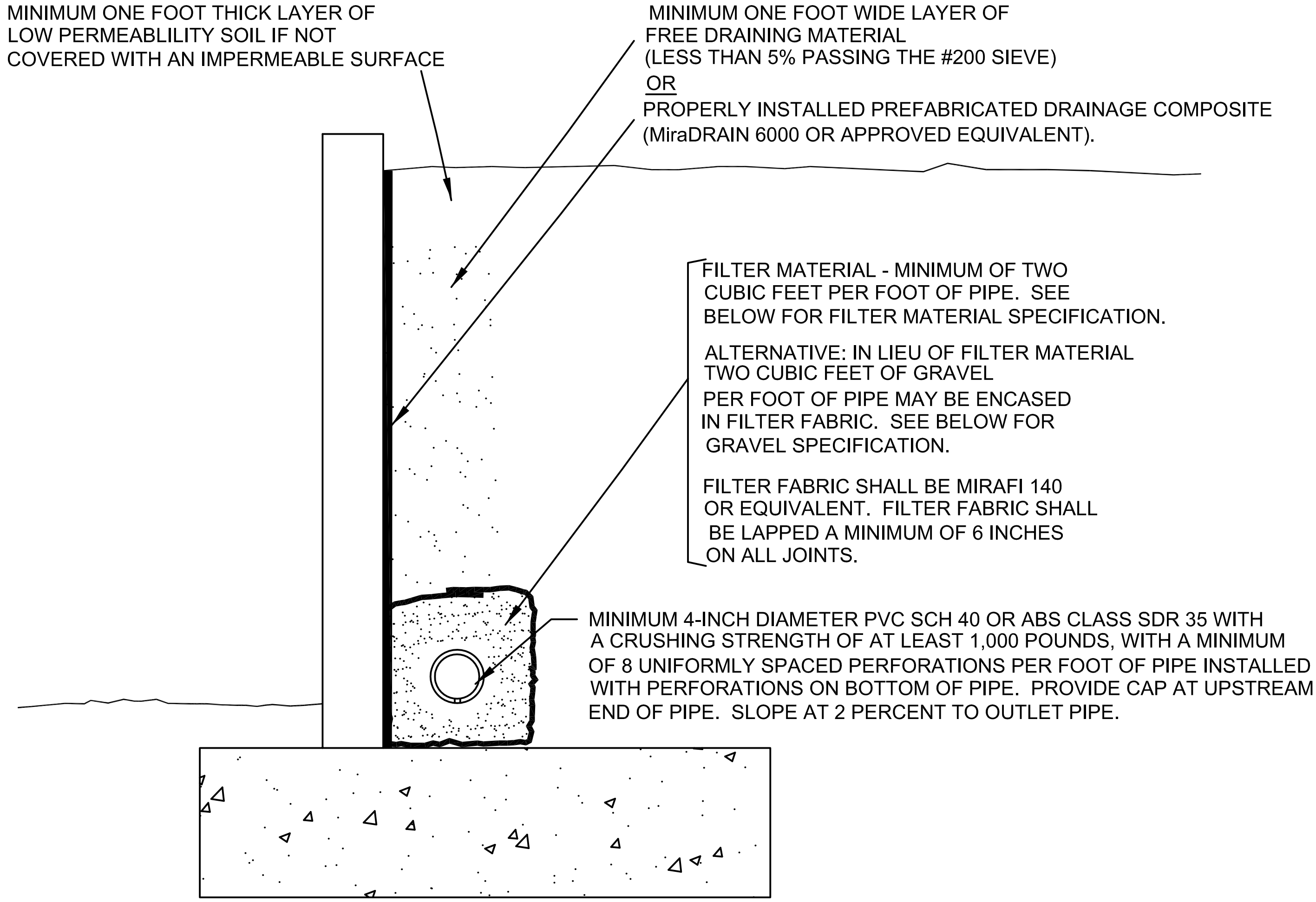
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-6

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL



"FILTER MATERIAL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT: (CONFORMS TO EMA STD. PLAN 323)

SIEVE SIZE	PERCENTAGE PASSING
1"	100
3/4"	90-100
3/8"	40-100
NO. 4	25-40
NO. 8	18-33
NO. 30	5-15
NO. 50	0-7
NO. 200	0-3

"GRAVEL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT:

SIEVE SIZE	MAXIMUM PERCENTAGE PASSING
1 1/2"	100
NO. 4	50
NO. 200	8

SAND EQUIVALENT = MINIMUM OF 50

RETAINING WALL BACKDRAINS

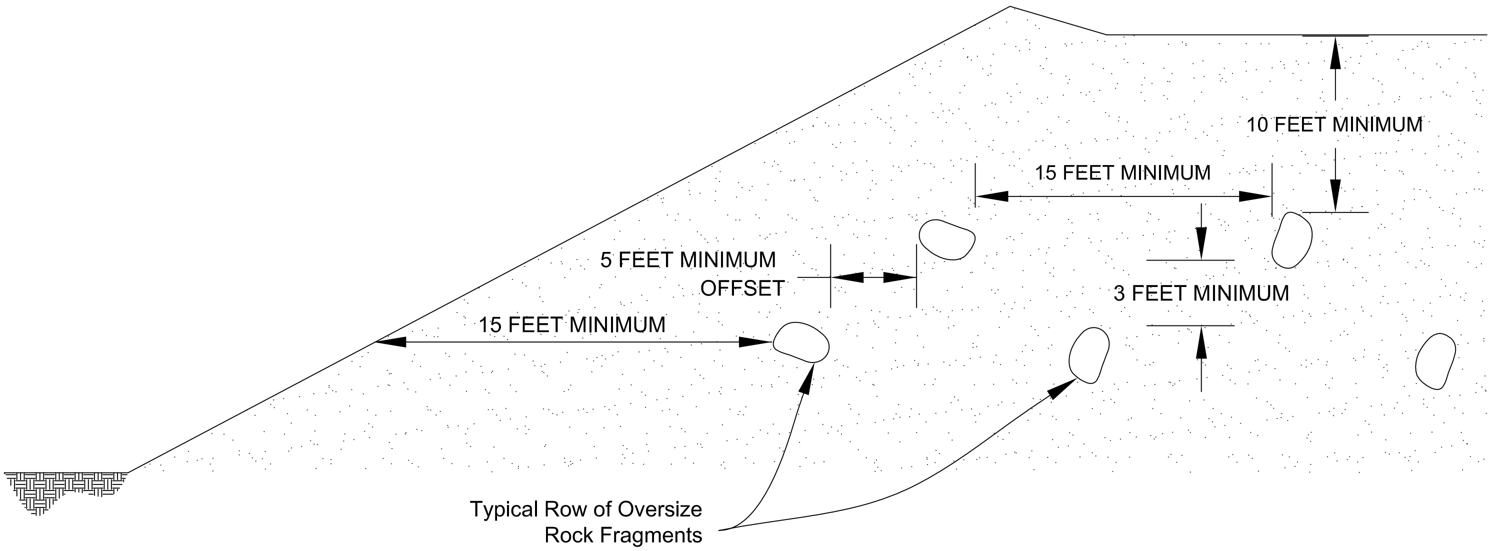
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

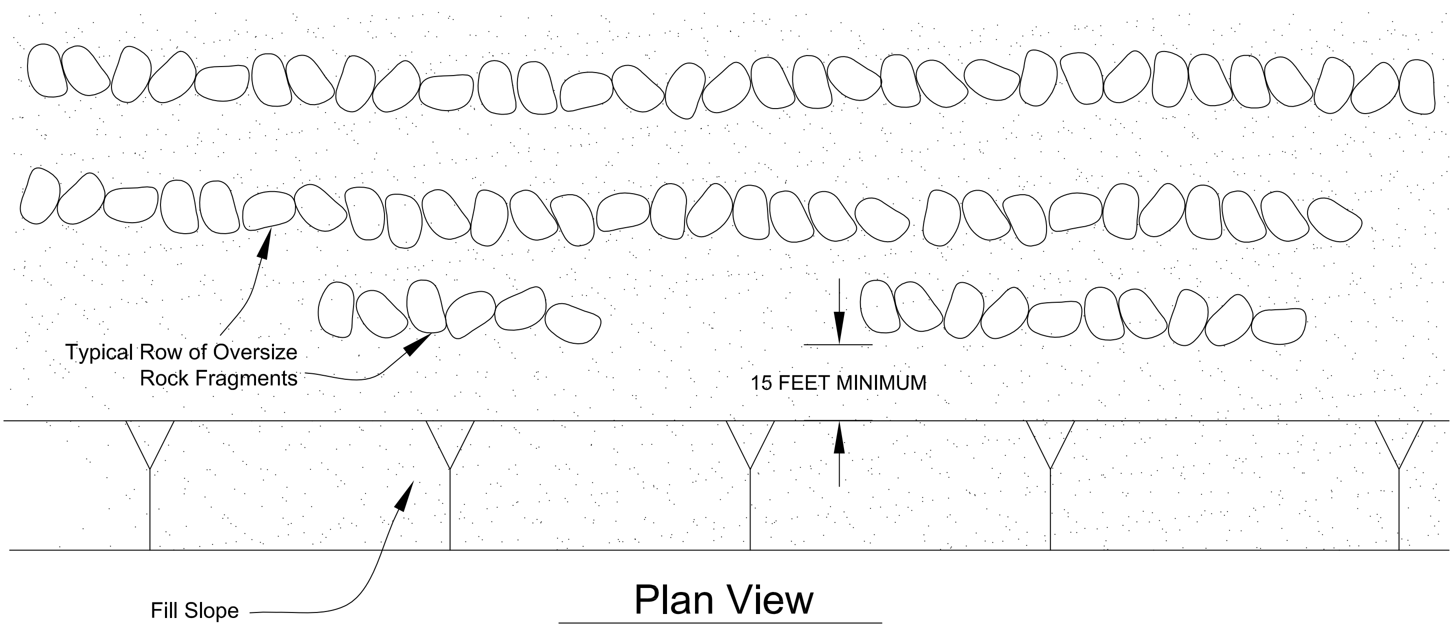
DRAWN: JAS
CHKD: GKM

PLATE D-7

SoCalGeo SOUTHERN CALIFORNIA GEOTECHNICAL



Section View



Plan View

PLACEMENT OF OVERSIZED MATERIAL	
GRADING GUIDE SPECIFICATIONS	
NOT TO SCALE	SOUTHERN CALIFORNIA GEOTECHNICAL
DRAWN: PM CHKD: GKM	
PLATE D-8	

APPENDIX E

USGS Design Maps Summary Report

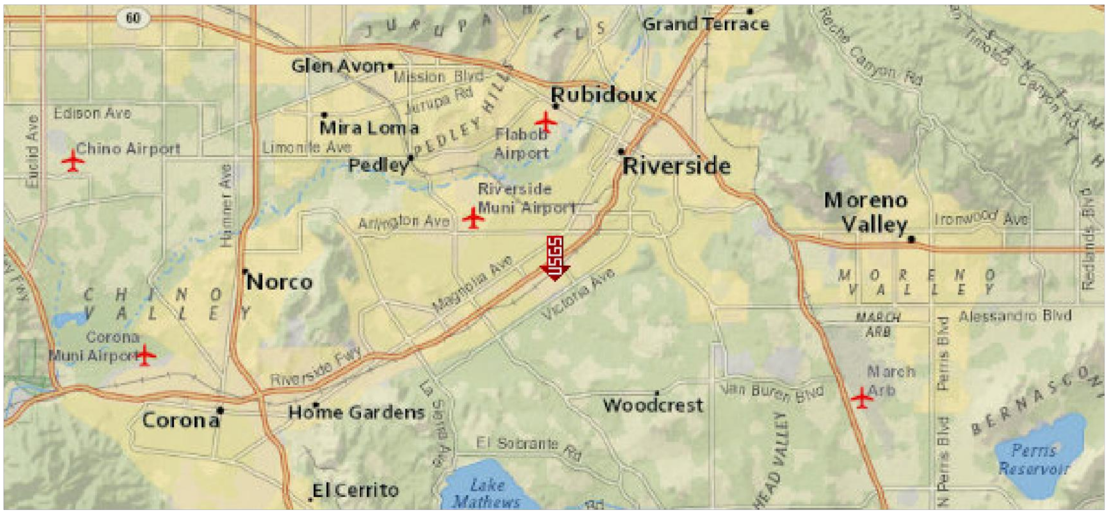
User–Specified Input

Building Code Reference Document ASCE 7-10 Standard
(which utilizes USGS hazard data available in 2008)

Site Coordinates 33.93627°N, 117.40668°W

Site Soil Classification Site Class D – "Stiff Soil"

Risk Category I/II/III

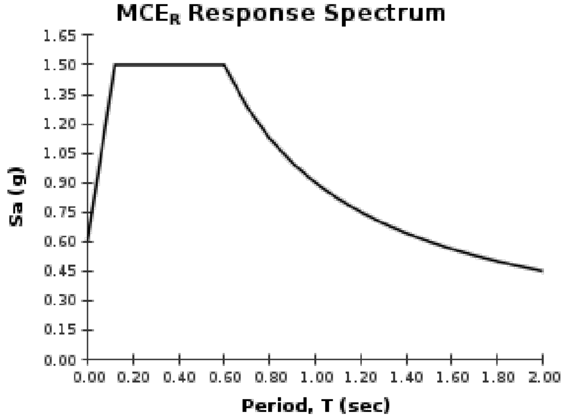


USGS–Provided Output

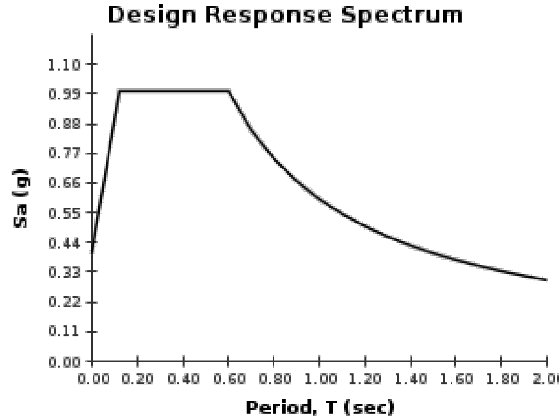
S_S =	1.500 g	S_{MS} =	1.500 g	S_{DS} =	1.000 g
S_1 =	0.600 g	S_{M1} =	0.900 g	S_{D1} =	0.600 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.

MCE_R Response Spectrum



Design Response Spectrum



SOURCE: U.S. GEOLOGICAL SURVEY (USGS)
<http://geohazards.usgs.gov/designmaps/us/application.php>

SEISMIC DESIGN PARAMETERS

MADISON PLAZA

RIVERSIDE, CALIFORNIA

DRAWN: JL
CHKD: GKM

SCG PROJECT
15G226-1

PLATE E-1

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL

APPENDIX F

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-1

JOB NO.: 06G168
PROJECT: New Office Buildings and Bally's
LOCATION: Riverside, California

DRILLING DATE: 4/24/06
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Joaquin Baca

WATER DEPTH: Dry
CAVE DEPTH: 22 feet
READING TAKEN: At Completion

SURFACE ELEVATION: --- MSL

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
0					3± inches Asphaltic concrete over 3± inches Aggregate base							
					POSSIBLE FILL: Red Brown to Brown Silty fine to medium Sand, loose-moist							
	X	14				120	9					
	X	9				118	7					
5	X	12			@ 5 to 6 feet, damp	118	5					
					ALLUVIUM: Brown Silty fine Sand, little Clay, medium dense-moist							
	X	19				115	13					
					Brown Silty fine to medium Sand, medium dense-damp to moist							
10	X	15				115	7					
					Brown Silty fine Sand, trace medium to coarse Sand, calcareous nodules, loose-damp to moist							
15	X	9					9					
					Brown Silty fine to medium Sand, medium dense-damp to moist							
20	X	15					10					
25	X	19					5					

Boring Terminated at 25'

TBL 06G168.GPJ SOCALGEO.GDT 1/7/16

TEST BORING LOG **PLATE B-1**

BORING NO. B-2

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

JOB NO.: 06G168 | DRILLING DATE: 4/24/06 | WATER DEPTH: Dry
PROJECT: New Office Buildings and Bally's | DRILLING METHOD: Hollow Stem Auger | CAVE DEPTH: 44 feet
LOCATION: Riverside, California | LOGGED BY: Joaquin Baca | READING TAKEN: At Completion

FIELD RESULTS | LABORATORY RESULTS

SURFACE ELEVATION: --- MSL

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					FILL: Dark Brown to Red Brown Silty fine to medium Sand, little Clay, dense-dry							
	X	62				132	6					
					POSSIBLE FILL: Brown Silty fine to medium Sand, medium dense-damp							
	X	24				115	2					
					ALLUVIUM: Red Brown fine Sand, little Silt, medium dense-dry to damp							
5	X	15				105	3					
	X	16				111	2					
					Red Brown fine to coarse Sand, little Silt, medium dense-dry to damp							
	X	15				109	2					
10												
					Brown Silty fine Sand, loose to medium dense-damp to moist							
	X	7					8					
15												
	X	11					6					
20												
	X	9					6					
25												
					Red Brown Silty fine Sand, trace Clay, medium dense-damp to moist							
	X	12					11					
30												
	X	15					8					

TBL 06G168.GPJ SOCALGEO.GDT 1/7/16

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-2

JOB NO.: 06G168
PROJECT: New Office Buildings and Bally's
LOCATION: Riverside, California

DRILLING DATE: 4/24/06
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Joaquin Baca

WATER DEPTH: Dry
CAVE DEPTH: 44 feet
READING TAKEN: At Completion

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION (Continued)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					Red Brown Silty fine Sand, trace Clay, medium dense-damp to moist							
					Brown Silty fine Sand, some Clay, occasional calcareous deposits, medium dense to dense-moist							
	X	28					13					
40												
					Red Brown Silty fine to medium Sand, medium dense-moist							
	X	24					7					
45												
					Brown Silty fine to medium Sand, trace Clay, dense-damp to moist							
	X	31					12					
50												
					Boring Terminated at 50'							

TBL 06G168.GPJ SOCALGEO.GDT 1/7/16

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-3

JOB NO.: 06G168
PROJECT: New Office Buildings and Bally's
LOCATION: Riverside, California

DRILLING DATE: 4/24/06
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Joaquin Baca

WATER DEPTH: Dry
CAVE DEPTH: 42 feet
READING TAKEN: At Completion

SURFACE ELEVATION: --- MSL

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
				3± inches Asphaltic concrete over 2± inches Aggregate base							
	X	5		FILL: Dark Brown Silty fine to medium Sand, loose-damp to moist		12					
5	X	4		ALLUVIUM: Dark Brown Silty fine Sand, loose-damp to moist		7					
	X	4		Brown to Red Brown fine to medium Sand, trace Silt, loose-moist		6					
10	X	5		Red Brown Clayey fine to medium Sand, loose-moist		17					
15	X	10		Brown Silty fine Sand, loose to medium dense-moist		7					
20	X	10		Brown Silty fine Sand, little Clay, loose to medium dense-moist		13					
25	X	9				10					
30	X	10				12					
	X	14				10					

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-3

JOB NO.: 06G168
PROJECT: New Office Buildings and Bally's
LOCATION: Riverside, California

DRILLING DATE: 4/24/06
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Joaquin Baca

WATER DEPTH: Dry
CAVE DEPTH: 42 feet
READING TAKEN: At Completion

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION (Continued)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					Brown Silty fine Sand, little Clay, loose to medium dense-moist							
					Brown Silty fine to medium Sand, medium dense-damp to moist							
	X	11					8					
40												
					Orange Brown Silty fine to coarse Sand, trace to some Clay, trace fine Gravel, dense to very dense-moist							
	X	40					13					
45												
	X	50/5"					4					
50					Boring Terminated at 50'							

TBL 06G168.GPJ SOCALGEO.GDT 1/7/16

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-4

JOB NO.: 06G168
PROJECT: New Office Buildings and Bally's
LOCATION: Riverside, California

DRILLING DATE: 4/24/06
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Joaquin Baca

WATER DEPTH: Dry
CAVE DEPTH: 17 feet
READING TAKEN: At Completion

SURFACE ELEVATION: --- MSL

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					3± inches Asphaltic concrete over 4± inches Aggregate base							
	X	14			POSSIBLE FILL: Dark Brown Silty fine to medium Sand, trace Clay, loose-damp to moist	116	12					
	X	8			ALLUVIUM: Brown to Dark Red Brown Silty fine Sand, trace medium Sand, little Clay, loose-moist	114	9					
5	X	6				110	9					
	X	17			ALLUVIUM: Brown Clayey fine to medium Sand, trace Silt, medium dense-moist	120	7					
10	X	9			Brown Silty fine to medium Sand, trace Clay, occasional Leachate deposits, loose to medium dense-damp to moist	116	5					
15	X	10					8					
20	X	12			@ 18 to 20 feet, Clayey fine Sand, medium dense-moist		14					

Boring Terminated at 20'

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-5

JOB NO.: 06G168 | DRILLING DATE: 4/24/06 | WATER DEPTH: Dry
PROJECT: New Office Buildings and Bally's | DRILLING METHOD: Hollow Stem Auger | CAVE DEPTH: 3 feet
LOCATION: Riverside, California | LOGGED BY: Joaquin Baca | READING TAKEN: At Completion

FIELD RESULTS					DESCRIPTION	LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					3± inches Asphaltic concrete over 3± inches Aggregate base							
	X	6			Dark Brown Silty fine to medium Sand, little Clay, loose-damp to moist		7					
	X	4					8					
5												
					Boring Terminated at 5'							

TBL 06G168.GPJ SOCALGEO.GDT 1/7/16

TEST BORING LOG **PLATE B-5**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-6

JOB NO.: 06G168
PROJECT: New Office Buildings and Bally's
LOCATION: Riverside, California

DRILLING DATE: 4/24/06
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Joaquin Baca

WATER DEPTH: Dry
CAVE DEPTH: 17 feet
READING TAKEN: At Completion

SURFACE ELEVATION: --- MSL

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					3± inches Asphaltic concrete over 2± inches Aggregate base							
					POSSIBLE FILL: Dark Brown Silty fine to medium Sand, little Clay, loose to medium dense-damp to moist							
					ALLUVIUM: Red Brown to Brown fine Sand, some Silt, loose-damp to moist							
	X	4					4					
5												
	X	4					5					
					Brown Clayey fine to medium Sand, loose-moist							
	X	8					9					
10												
					Brown Silty fine to medium Sand, trace Clay, loose to medium dense-damp to moist							
	X	10					13					
15												
	X	14					11					
20												

Boring Terminated at 20'

TBL 06G168.GPJ SOCALGEO.GDT 1/7/16

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-7

JOB NO.: 06G168
PROJECT: New Office Buildings and Bally's
LOCATION: Riverside, California

DRILLING DATE: 4/24/06
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Joaquin Baca

WATER DEPTH: Dry
CAVE DEPTH: 17 feet
READING TAKEN: At Completion

SURFACE ELEVATION: --- MSL

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					3± inches Asphaltic concrete over 3± inches Aggregate base							
	X	5			POSSIBLE FILL: Dark Brown Silty fine to medium Sand, little Clay, loose-damp to moist		9					
					ALLUVIUM: Red Brown Silty fine to medium Sand, some Clay, loose-damp to moist							
5												
	X	3					11					
	X	8			Red Brown fine to medium Sand, trace coarse Sand, little Silt, little Clay, loose to medium dense-damp		2					
10												
	X	10					13					
15												
					Brown Silty fine to medium Sand, little Clay, medium dense-damp to moist							
	X	11					8					
20												

Boring Terminated at 20'

TBL 06G168.GPJ SOCALGEO.GDT 1/7/16

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-8

JOB NO.: 06G168
PROJECT: New Office Buildings and Bally's
LOCATION: Riverside, California

DRILLING DATE: 4/24/06
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Joaquin Baca

WATER DEPTH: Dry
CAVE DEPTH: 16 feet
READING TAKEN: At Completion

SURFACE ELEVATION: --- MSL

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					FILL: Red Brown fine to medium Sandy Clay, stiff-damp to moist							
	X	20	4.5+			125	9					
					ALLUVIUM: Red Brown Silty fine to medium Sand, loose to medium dense-damp							
	X	16				113	3					
5	X	9				108	3					
	X	12				110	4					
					Brown Silty fine to coarse Sand, medium dense-damp to moist							
	X	14				119	5					
10												
					Brown Silty fine Sand, trace Clay, medium dense-damp to moist							
	X	12					13					
15												
	X	10					10					
20												
					Boring Terminated at 20'							

TBL 06G168.GPJ SOCALGEO.GDT 1/7/16

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-9

JOB NO.: 06G168
PROJECT: New Office Buildings and Bally's
LOCATION: Riverside, California

DRILLING DATE: 4/24/06
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Joaquin Baca

WATER DEPTH: Dry
CAVE DEPTH: 16 feet
READING TAKEN: At Completion

SURFACE ELEVATION: --- MSL

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					2½± inches Asphaltic concrete over 4± inches Aggregate base							
	X	4			POSSIBLE FILL: Dark Brown Silty fine to medium Sand, trace Clay, loose-damp to moist		8					
	X	4			ALLUVIUM: Brown to Red Brown Silty fine to medium Sand, little Clay, loose-damp to moist		7					
5												
	X	8					13					
	X	6			Brown Silty fine Sand, loose-damp to moist		12					
10												
					Red Brown Silty fine Sand, little Clay, trace medium Sand, loose to medium dense-moist							
	X	10					11					
15												
	X	9					12					
20					Boring Terminated at 20'							

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-10

JOB NO.: 06G168
PROJECT: New Office Buildings and Bally's
LOCATION: Riverside, California

DRILLING DATE: 4/24/06
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Joaquin Baca

WATER DEPTH: Dry
CAVE DEPTH: 3 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					3± inches Asphaltic concrete over 3± inches Aggregate base							
	X	4			ALLUVIUM: Red Brown Silty fine to medium Sand, loose-damp to moist		6					
	X	6					6					
5												
					Boring Terminated at 5'							

TBL 06G168.GPJ SOCALGEO.GDT 1/7/16

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-11

JOB NO.: 06G168
PROJECT: New Office Buildings and Bally's
LOCATION: Riverside, California

DRILLING DATE: 4/24/06
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Joaquin Baca

WATER DEPTH: Dry
CAVE DEPTH: 12 feet
READING TAKEN: At Completion

SURFACE ELEVATION: --- MSL

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					3± inches Asphaltic concrete over 5± inches Aggregate base							
		13			POSSIBLE FILL: Brown fine to medium Sand, trace Silt, loose to medium dense-damp to moist	116	5					
		13				126	6					
5		18			ALLUVIUM: Brown Silty fine Sand to fine Sandy Silt, some Clay, medium dense-moist	112	16					
		18				117	14					
		17			Brown fine Sandy Silt, little Clay, medium dense-moist	105	15					
10												
					Red Brown Silty fine Sand, little Clay, medium dense-moist							
		20					8					
15												
					Red Brown Silty fine Sand, trace Clay, medium dense-moist							
		14					11					
20												
		10					13					
25												

Boring Terminated at 25'

TBL 06G168.GPJ SOCALGEO.GDT 1/7/16

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-12

JOB NO.: 06G168
PROJECT: Madison Plaza, Phase II
LOCATION: Riverside, California

DRILLING DATE: 1/29/07
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Daryl Kas

WATER DEPTH: Dry
CAVE DEPTH: 23 feet
READING TAKEN: At Completion

SURFACE ELEVATION: --- MSL

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					1½± inches Asphaltic concrete over 4± inches Aggregate base							
	X	14			FILL: Brown Silty fine to medium Sand, loose-damp	118	6					
	X	12			FILL: Brown fine to medium Sand, loose-dry	102	3					
					POSSIBLE FILL: Gray Brown Silty fine Sand, trace Clay, loose-damp							
5	X	23			ALLUVIUM: Brown Silty fine Sand, trace medium Sand, medium dense-moist	109	6					
	X	13			Brown Silty fine to medium Sand, loose to medium dense-damp	101	9					
10	X	42			Brown fine Sandy Silt, medium dense-damp to moist	118	9					
15	X	15			Brown Silty fine Sand to fine Sandy Silt, medium dense-damp to moist		11					
20	X	48			Brown fine to medium Sand, dense-damp	125	4					
25	X	17			Brown to Red Brown Silty fine Sand to fine Sandy Silt, little Clay, medium dense-damp to moist		9					
30	X	32				121	6					
	X	10			Red Brown Silty fine Sand, trace Clay, loose to medium dense-damp to moist		5					

BORING NO. B-12

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

JOB NO.: 06G168 | DRILLING DATE: 1/29/07 | WATER DEPTH: Dry
PROJECT: Madison Plaza, Phase II | DRILLING METHOD: Hollow Stem Auger | CAVE DEPTH: 23 feet
LOCATION: Riverside, California | LOGGED BY: Daryl Kas | READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION (Continued)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					Red Brown Silty fine Sand, trace Clay, loose to medium dense-damp to moist							
					Red Brown Silty fine to medium Sand, trace Clay, dense-damp to moist							
40	X	42				124	9					
					Gray Brown to Red Brown Silty fine to medium Sand, medium dense to dense-damp to moist							
45	X	16					7					
50	X	64				116	6					
					Boring Terminated at 50'							

TBL 06G168-2.GPJ SOCALGEO.GDT 1/7/16

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-13

JOB NO.: 06G168
PROJECT: Madison Plaza, Phase II
LOCATION: Riverside, California

DRILLING DATE: 1/29/07
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Daryl Kas

WATER DEPTH: Dry
CAVE DEPTH: 24.5 feet
READING TAKEN: At Completion

SURFACE ELEVATION: --- MSL

DEPTH (FEET)	BLOW COUNT	POCKET PEN. (TSF)	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
0			2½± inches Asphaltic concrete over 3½± inches Aggregate base							
	5		FILL: Brown Silty fine Sand, trace medium Sand, little Clay, trace fine root fibers, loose-moist	106	8					
	9			115	8					
5	8		ALLUVIUM: Brown Silty fine to medium Sand, loose-damp to moist	110	6					
	14		Brown fine to medium Sand, loose to medium dense-damp	110	4					
10	20		Brown fine Sandy Silt, little Clay, medium dense-moist	97	15					
15	30		Light Gray to Gray Brown fine to medium Sand, little Silt, medium dense-damp to moist	115	6					
20	13		Brown fine Sandy Silt, loose to medium dense-damp to moist		11					
25	20			113	3					
30	5		Brown Clayey Silt, some fine Sand, medium stiff-moist		16					
	20		Brown fine to medium Sandy Silt to Silty fine Sand, some Clay, medium dense-damp to moist	116	9					

TBL 06G168-2.GPJ SOCALGEO.GDT 1/7/16

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-13

JOB NO.: 06G168	DRILLING DATE: 1/29/07	WATER DEPTH: Dry
PROJECT: Madison Plaza, Phase II	DRILLING METHOD: Hollow Stem Auger	CAVE DEPTH: 24.5 feet
LOCATION: Riverside, California	LOGGED BY: Daryl Kas	READING TAKEN: At Completion

FIELD RESULTS					DESCRIPTION (Continued)	LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG		DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					Brown fine to medium Sandy Silt to Silty fine Sand, some Clay, medium dense-damp to moist							
	X	19					13					
40												
	X	40			@ 44 to 45 feet, dense	122	12					
45												
					Brown Silty fine Sand, medium dense-damp to moist							
	X	17					12					
50												
					Boring Terminated at 50'							

TBL 06G168-2.GPJ SOCALGEO.GDT 1/7/16

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-14

JOB NO.: 06G168
PROJECT: Madison Plaza, Phase II
LOCATION: Riverside, California

DRILLING DATE: 1/29/07
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Daryl Kas

WATER DEPTH: Dry
CAVE DEPTH: 14 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					3± inches Asphaltic concrete over 3½± inches Aggregate base							
	X	2			FILL: Brown Silty fine to medium Sand, very loose-damp		7					
	X	2					8					
5												
	X	5			Brown Silty fine to medium Sand, loose-damp		6					
	X	7			Brown Silty fine Sand, little Clay, loose-moist		12					
10												
					Brown fine Sandy Silt, trace Clay, little medium Sand, loose to medium dense-damp to moist							
	X	10					10					
15												
					Brown Silty fine to medium Sand, medium dense-moist							
	X	11					9					
20												
	X	14					9					
25												
					Brown fine Sandy Silt, little Clay, loose to medium dense-moist							
	X	10					11					
30												
					Boring Terminated at 30'							

TBL 06G168-2.GPJ SOCALGEO.GDT 1/7/16

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-15

JOB NO.: 06G168
PROJECT: Madison Plaza, Phase II
LOCATION: Riverside, California

DRILLING DATE: 1/29/07
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Daryl Kas

WATER DEPTH: Dry
CAVE DEPTH: 9 feet
READING TAKEN: At Completion

SURFACE ELEVATION: --- MSL

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					4± inches Asphaltic concrete underlain by no discernible Aggregate base							
	X	11			FILL: Red Brown Silty fine to medium Sand, loose-damp	113	5					
	X	9			ALLUVIUM: Gray Brown to Brown fine to medium Sand, trace coarse Sand, loose-damp	104	3					
5	X	10				110	3					
	X	17			Light Brown Silty fine Sand to fine Sandy Silt, medium dense-damp	101	6					
	X	26			Brown Silty fine to medium Sand, medium dense-damp	109	5					
10												
	X	18					4					
15												

Boring Terminated at 15'

TBL 06G168-2.GPJ SOCALGEO.GDT 1/7/16

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-16

JOB NO.: 06G168
PROJECT: Madison Plaza, Phase II
LOCATION: Riverside, California

DRILLING DATE: 1/29/07
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Daryl Kas

WATER DEPTH: Dry
CAVE DEPTH: 8 feet
READING TAKEN: At Completion

FIELD RESULTS					DESCRIPTION	LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
0					3½± inches Asphaltic concrete underlain by no discernible Aggregate base							
	X	13			FILL: Brown Silty fine Sand, trace medium Sand, loose-damp		6					
	X	7					5					
5												
	X	6			ALLUVIUM: Gray Brown fine to medium Sand, trace fine Gravel, trace coarse Sand, loose-damp		3					
	X	10			Brown Silty fine Sand, trace medium Sand, loose to medium dense-damp		5					
10												
					Light Brown Silty fine Sand, medium dense-damp							
	X	20					4					
15												

Boring Terminated at 15'

TBL 06G168-2.GPJ SOCALGEO.GDT 1/7/16

TEST BORING LOG **PLATE B-16**

BORING NO. B-17

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

JOB NO.: 06G168
PROJECT: Madison Plaza, Phase II
LOCATION: Riverside, California

DRILLING DATE: 1/29/07
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Daryl Kas

WATER DEPTH: Dry
CAVE DEPTH: 3.5 feet
READING TAKEN: At Completion

FIELD RESULTS					DESCRIPTION	LABORATORY RESULTS						COMMENTS
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	
					3½± inches Asphaltic concrete underlain by no discernible Aggregate base							
	X	4			FILL: Dark Brown to Brown Silty fine to medium Sand, loose-damp		8					
	X	4					6					
5												
	X	7			ALLUVIUM: Gray Brown to Brown Silty fine Sand, loose-damp to moist		4					
	X	20			Brown Silty fine Sand, trace medium Sand, medium dense-damp		4					
10												
	X	12					5					
15												
					Boring Terminated at 15'							

TBL 06G168-2.GPJ SOCALGEO.GDT 1/7/16

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-18

JOB NO.: 06G168
PROJECT: Madison Plaza, Phase II
LOCATION: Riverside, California

DRILLING DATE: 1/29/07
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Daryl Kas

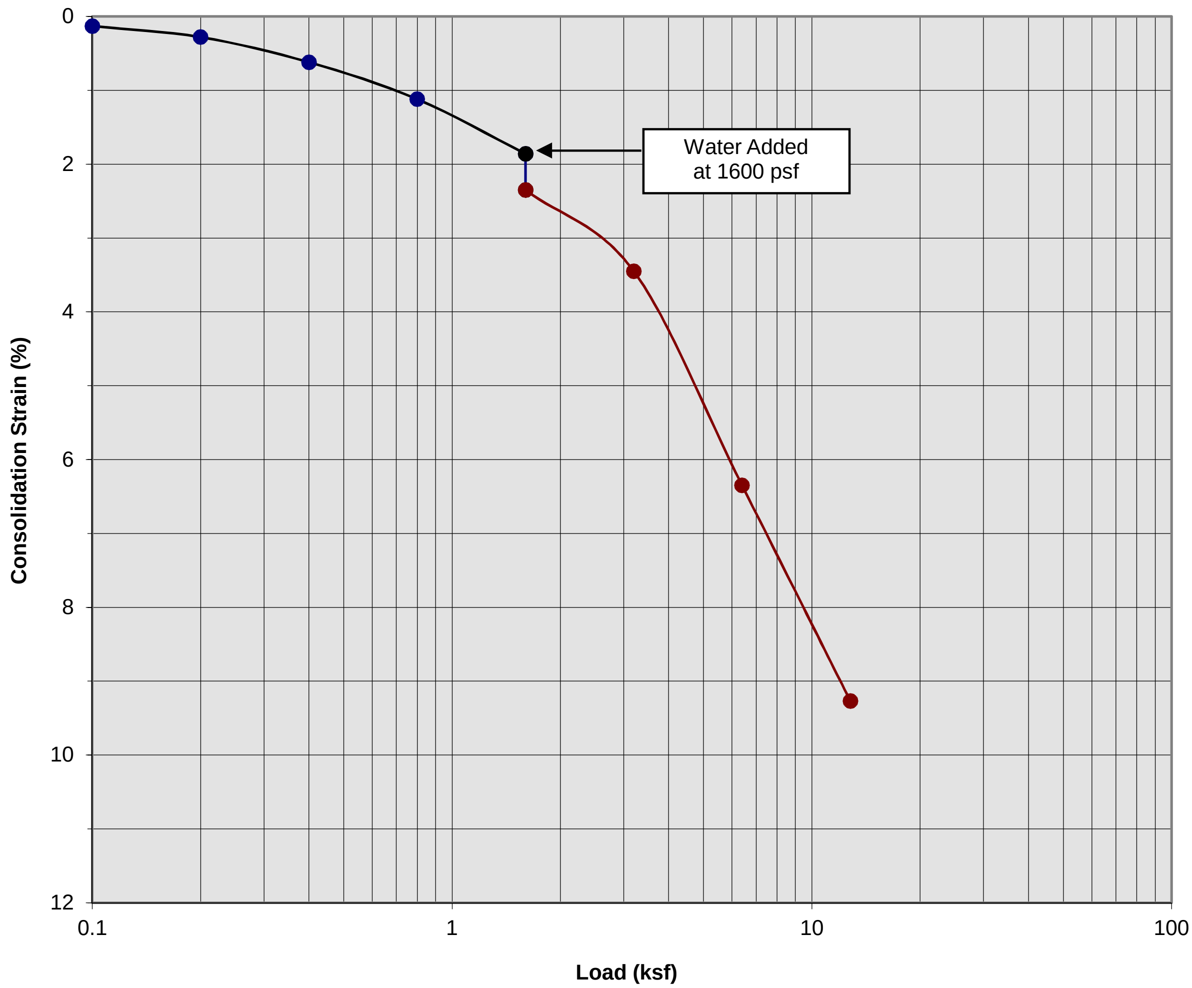
WATER DEPTH: Dry
CAVE DEPTH: 9 feet
READING TAKEN: At Completion

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION (SURFACE ELEVATION: --- MSL)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					3½± inches Asphaltic concrete underlain by no discernible Aggregate base							
	X	5			POSSIBLE FILL: Red Brown Silty fine Sand, loose-moist	102	7					
	X	4			ALLUVIUM: Brown Silty fine to medium Sand, little Clay, loose-moist	103	9					
5	X	8				108	7					
	X	5				101	8					
	X	13			ALLUVIUM: Gray Brown fine Sand, little Silt, loose to medium dense-damp	105	9					
10												
					ALLUVIUM: Brown Silty fine Sand, trace medium Sand, medium dense-damp							
	X	15					9					
15												

Boring Terminated at 15'

TBL 06G168-2.GPJ SOCALGEO.GDT 1/7/16

Consolidation/Collapse Test Results



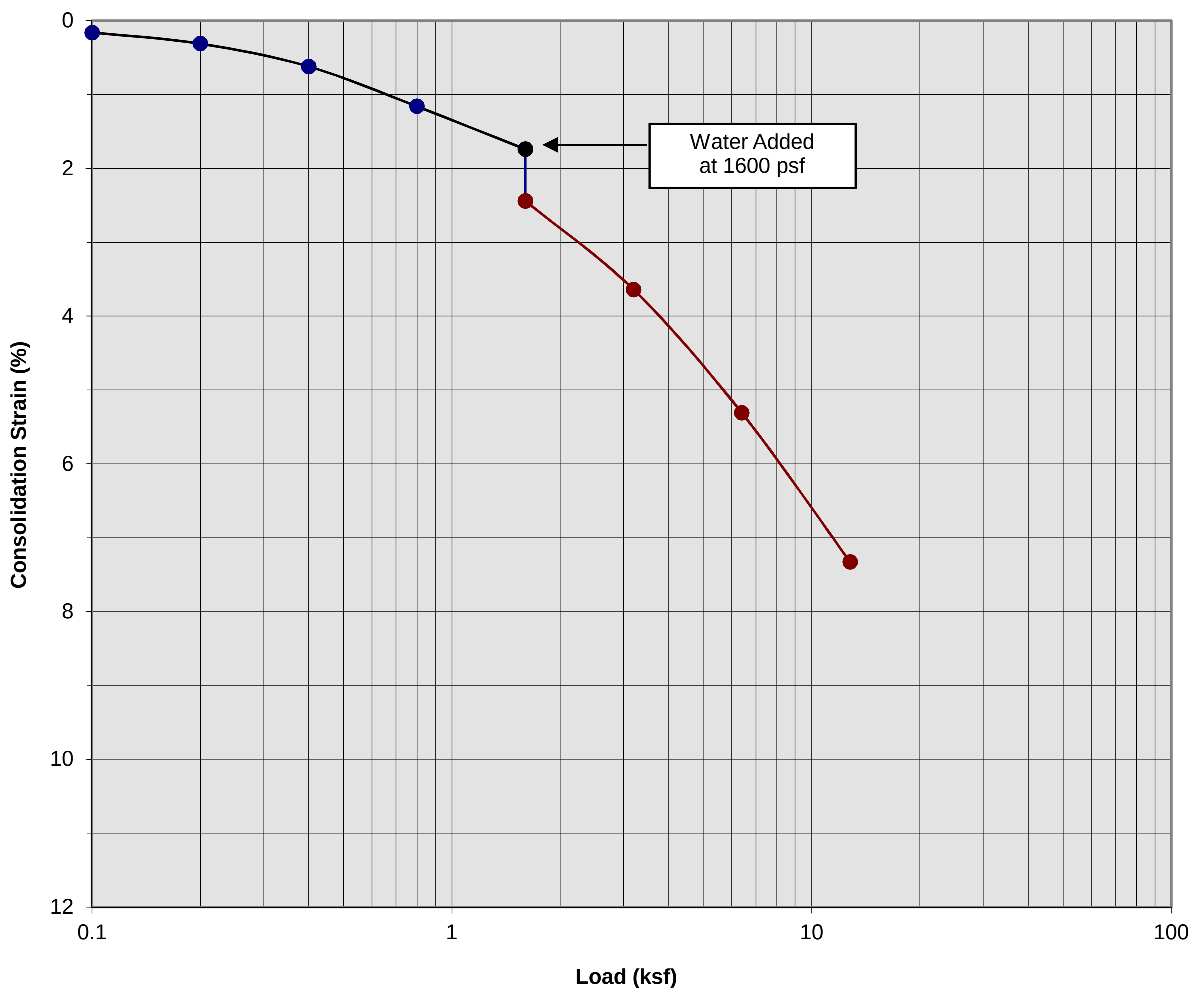
Classification: POSSIBLE FILL: Red Brown to Brown Silty fine to medium Sand

Boring Number:	B-1	Initial Moisture Content (%)	9
Sample Number:	---	Final Moisture Content (%)	12
Depth (ft)	1 to 2	Initial Dry Density (pcf)	121.2
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	134.1
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.49

New Office Buildings and Bally's
Riverside, California
Project No. 06G168
PLATE C- 1

Southern California Geotechnical INC.
1260 North Hancock Street, Suite 101
Anaheim, California 92807
Phone: (714) 777-0333 Fax: (714) 777-0398

Consolidation/Collapse Test Results

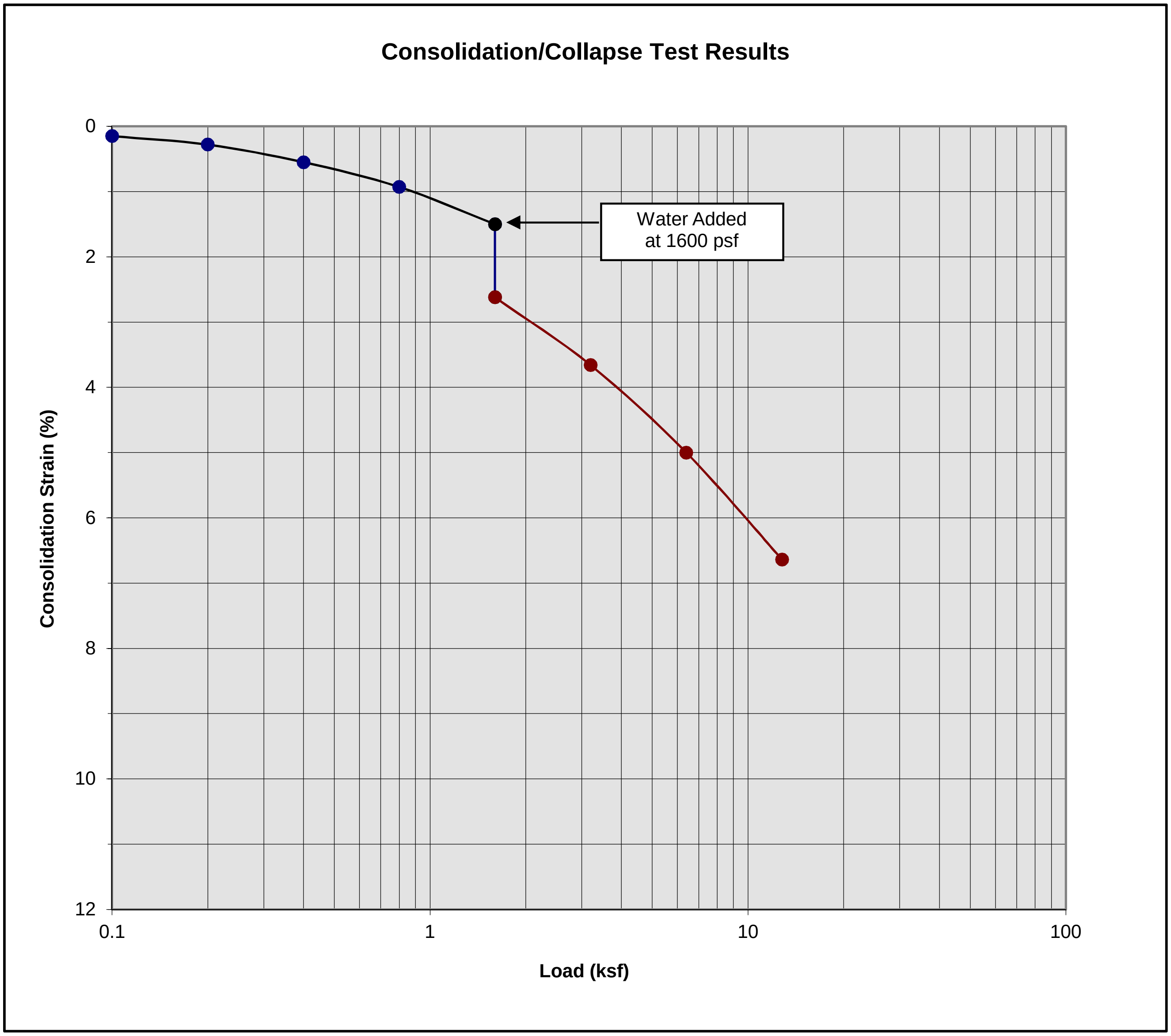


Classification: POSSIBLE FILL: Red Brown to Brown Silty fine to medium Sand

Boring Number:	B-1	Initial Moisture Content (%)	7
Sample Number:	---	Final Moisture Content (%)	14
Depth (ft)	3 to 4	Initial Dry Density (pcf)	118.1
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	128.1
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.70

New Office Buildings and Bally's
Riverside, California
Project No. 06G168
PLATE C- 2

Southern California Geotechnical INC.
1260 North Hancock Street, Suite 101
Anaheim, California 92807
Phone: (714) 777-0333 Fax: (714) 777-0398



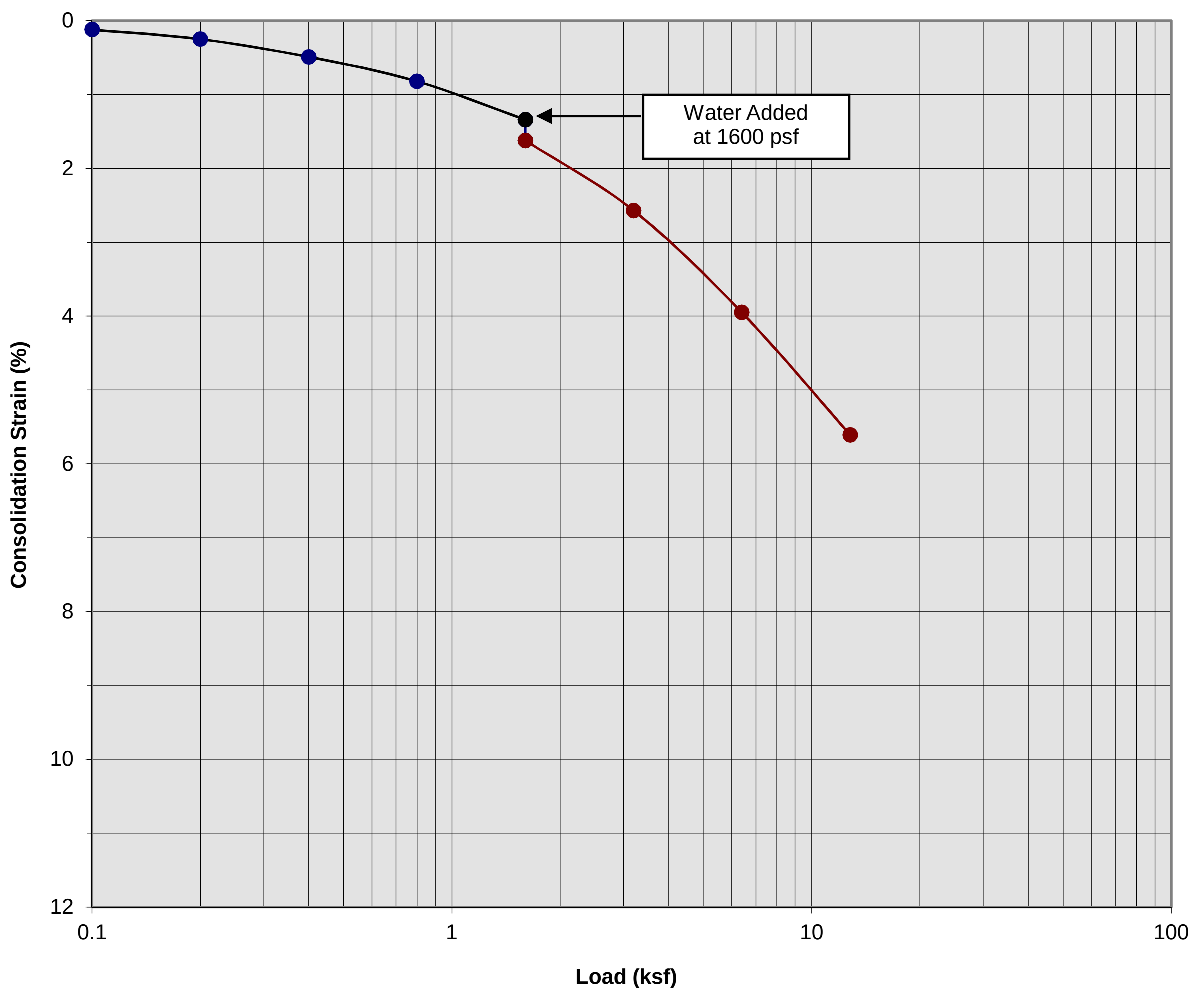
Classification: POSSIBLE FILL: Red Brown to Brown Silty fine to medium Sand

Boring Number:	B-1	Initial Moisture Content (%)	4
Sample Number:	---	Final Moisture Content (%)	12
Depth (ft)	5 to 6	Initial Dry Density (pcf)	119.1
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	127.3
Specimen Thickness (in)	1.0	Percent Collapse (%)	1.12

New Office Buildings and Bally's
Riverside, California
Project No. 06G168
PLATE C- 3

Southern California Geotechnical INC.
1260 North Hancock Street, Suite 101
Anaheim, California 92807
Phone: (714) 777-0333 Fax: (714) 777-0398

Consolidation/Collapse Test Results



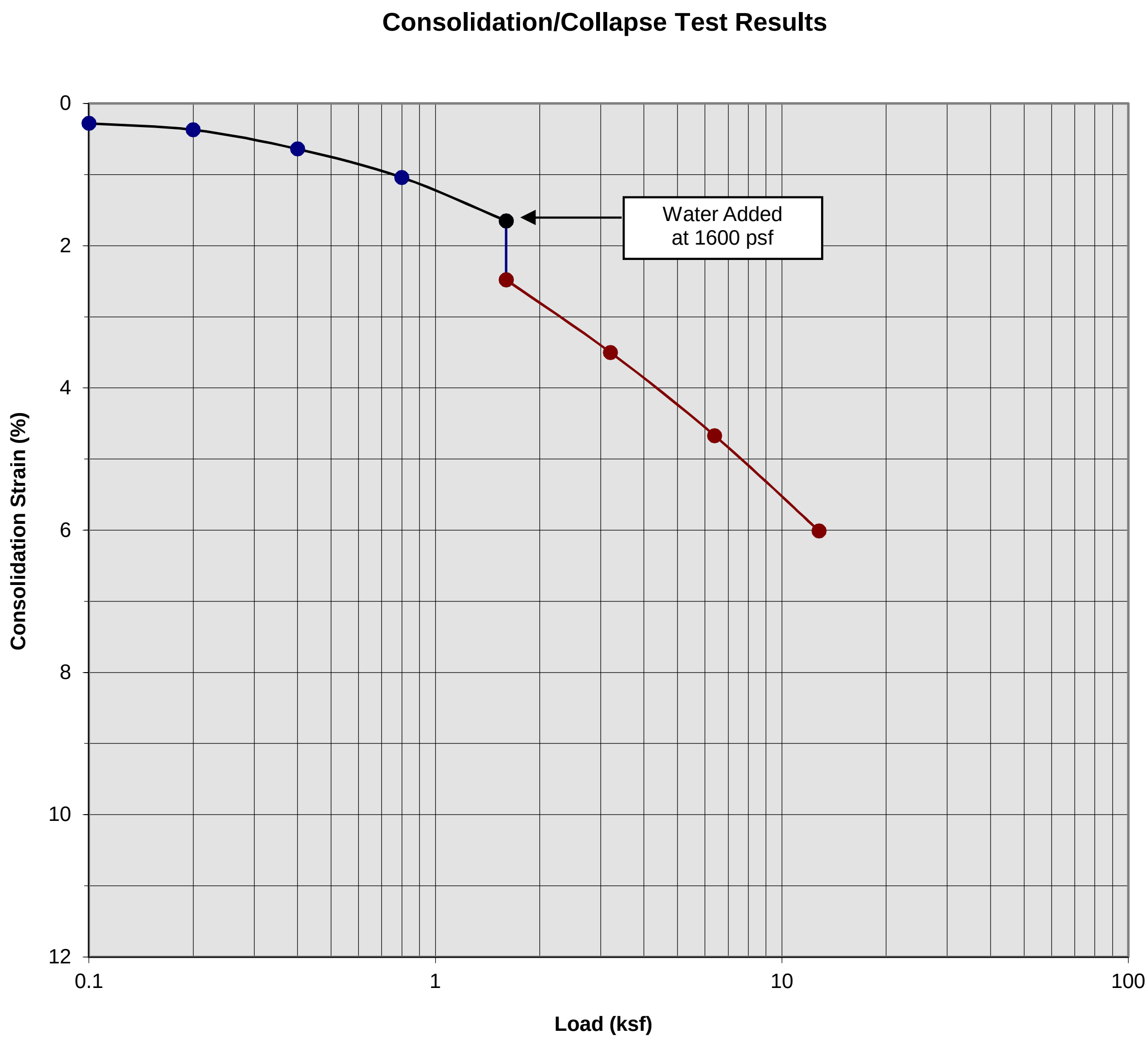
Classification: ALLUVIUM: Brown Silty fine Sand, little Clay

Boring Number:	B-1	Initial Moisture Content (%)	13
Sample Number:	---	Final Moisture Content (%)	16
Depth (ft)	7 to 8	Initial Dry Density (pcf)	112.9
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	120.0
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.28

New Office Buildings and Bally's
Riverside, California
Project No. 06G168
PLATE C- 4

Southern California Geotechnical INC.

1260 North Hancock Street, Suite 101
Anaheim, California 92807
Phone: (714) 777-0333 Fax: (714) 777-0398

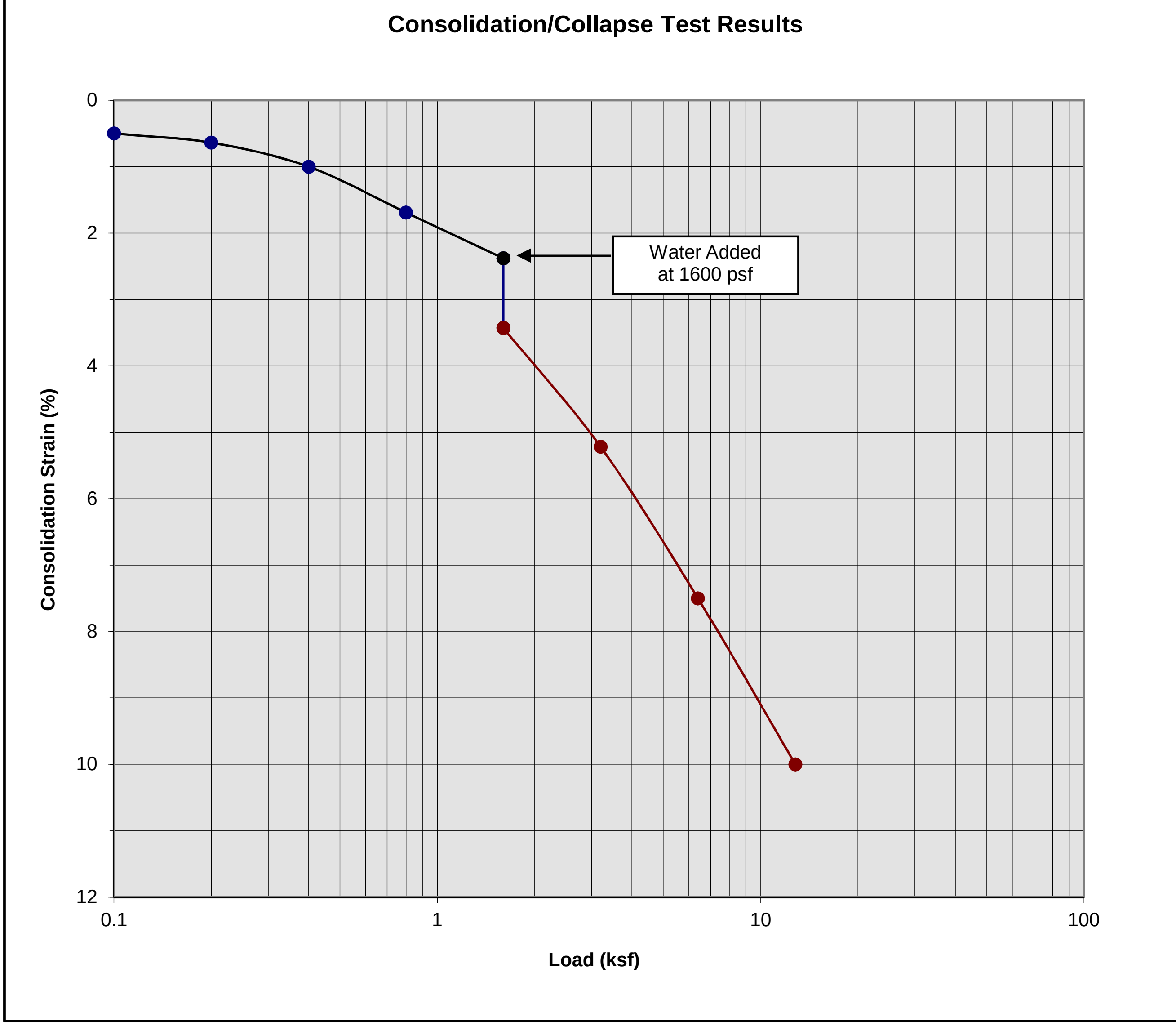


Classification: POSSIBLE FILL: Dark Brown Silty fine to medium Sand, trace Clay

Boring Number:	B-4	Initial Moisture Content (%)	12
Sample Number:	---	Final Moisture Content (%)	17
Depth (ft)	1 to 2	Initial Dry Density (pcf)	114.4
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	121.5
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.83

New Office Buildings and Bally's
Riverside, California
Project No. 06G168
PLATE C- 5

Southern California Geotechnical INC.
1260 North Hancock Street, Suite 101
Anaheim, California 92807
Phone: (714) 777-0333 Fax: (714) 777-0398

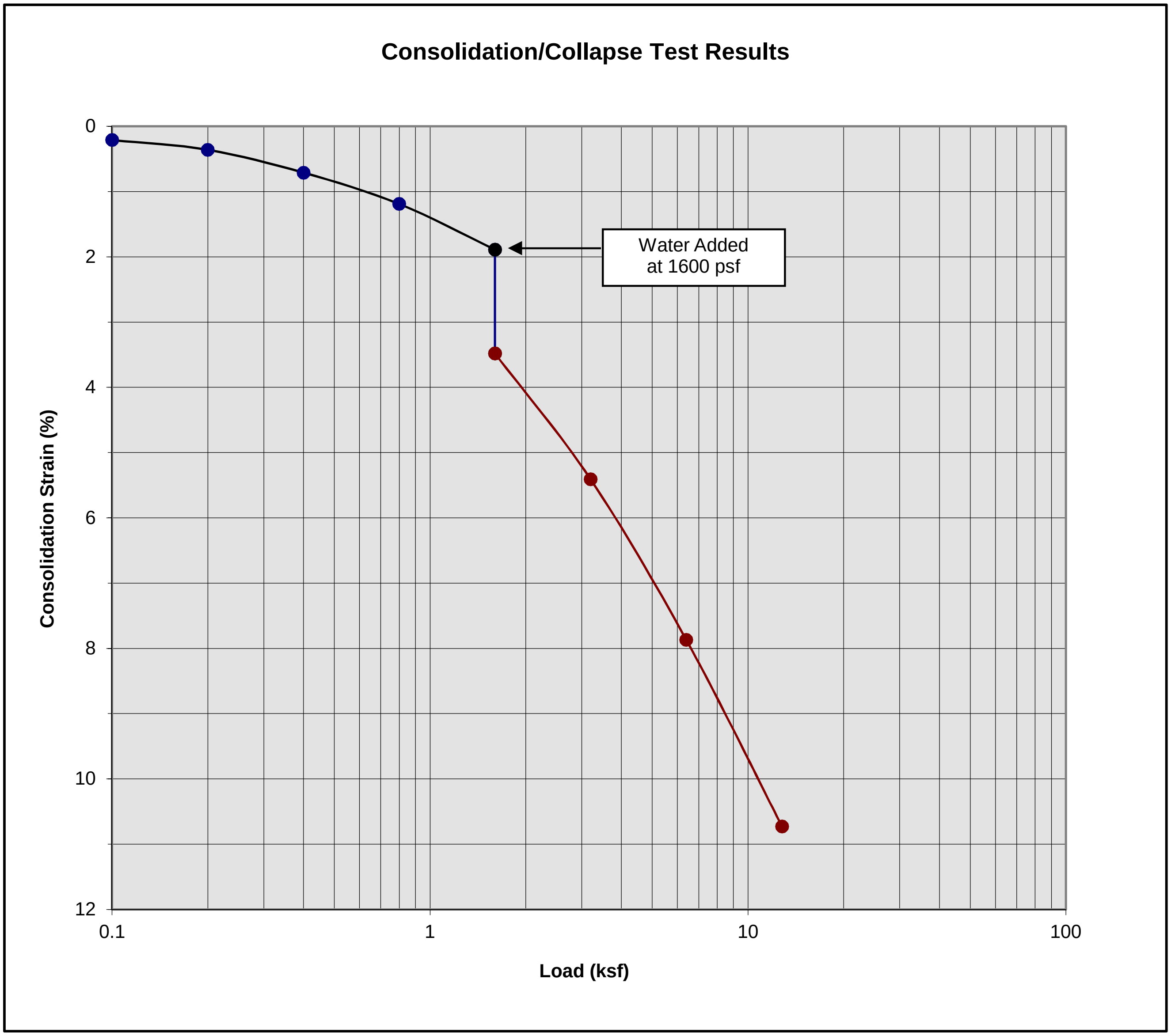


Classification: ALLUVIUM: Brown to Dark Red Brown Silty fine Sand, trace medium Sand

Boring Number:	B-4	Initial Moisture Content (%)	8
Sample Number:	---	Final Moisture Content (%)	15
Depth (ft)	3 to 4	Initial Dry Density (pcf)	113.9
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	126.8
Specimen Thickness (in)	1.0	Percent Collapse (%)	1.05

New Office Buildings and Bally's
Riverside, California
Project No. 06G168
PLATE C- 6

Southern California Geotechnical INC.
1260 North Hancock Street, Suite 101
Anaheim, California 92807
Phone: (714) 777-0333 Fax: (714) 777-0398



Classification: ALLUVIUM: Brown to Dark Red Brown Silty fine Sand, trace medium Sand

Boring Number:	B-4	Initial Moisture Content (%)	9
Sample Number:	---	Final Moisture Content (%)	16
Depth (ft)	5 to 6	Initial Dry Density (pcf)	110.1
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	123.3
Specimen Thickness (in)	1.0	Percent Collapse (%)	1.59

New Office Buildings and Bally's
Riverside, California
Project No. 06G168
PLATE C- 7

Southern California Geotechnical
INC.
1260 North Hancock Street, Suite 101
Anaheim, California 92807
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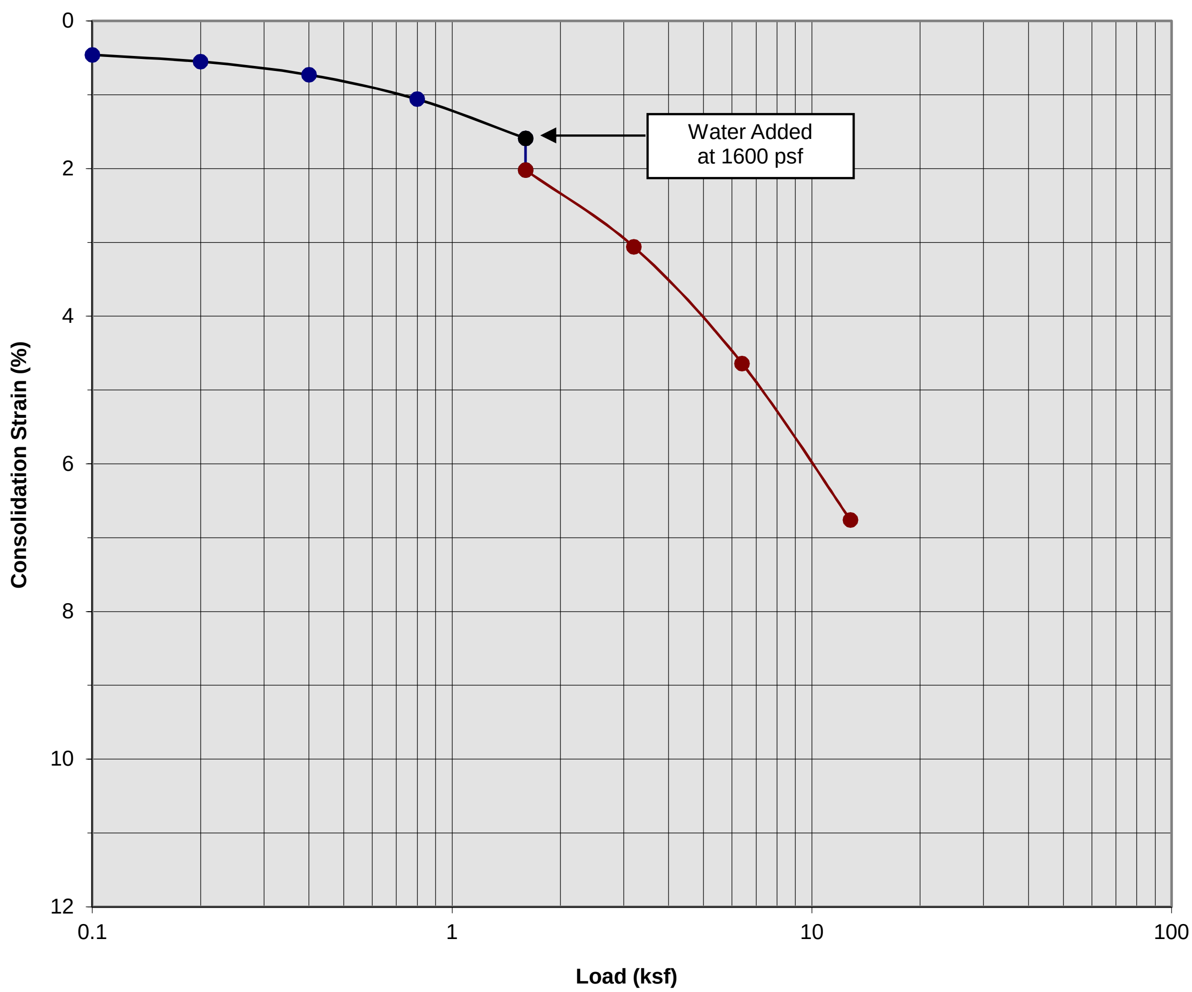
Consolidation/Collapse Test Results



Classification: ALLUVIUM: Brown Clayey fine to medium Sand, trace Silt

Boring Number:	B-4	Initial Moisture Content (%)	6
Sample Number:	---	Final Moisture Content (%)	14
Depth (ft)	7 to 8	Initial Dry Density (pcf)	119.1
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	127.4
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.43

New Office Buildings and Bally's
Riverside, California
Project No. 06G168
PLATE C- 8

Southern California Geotechnical INC.
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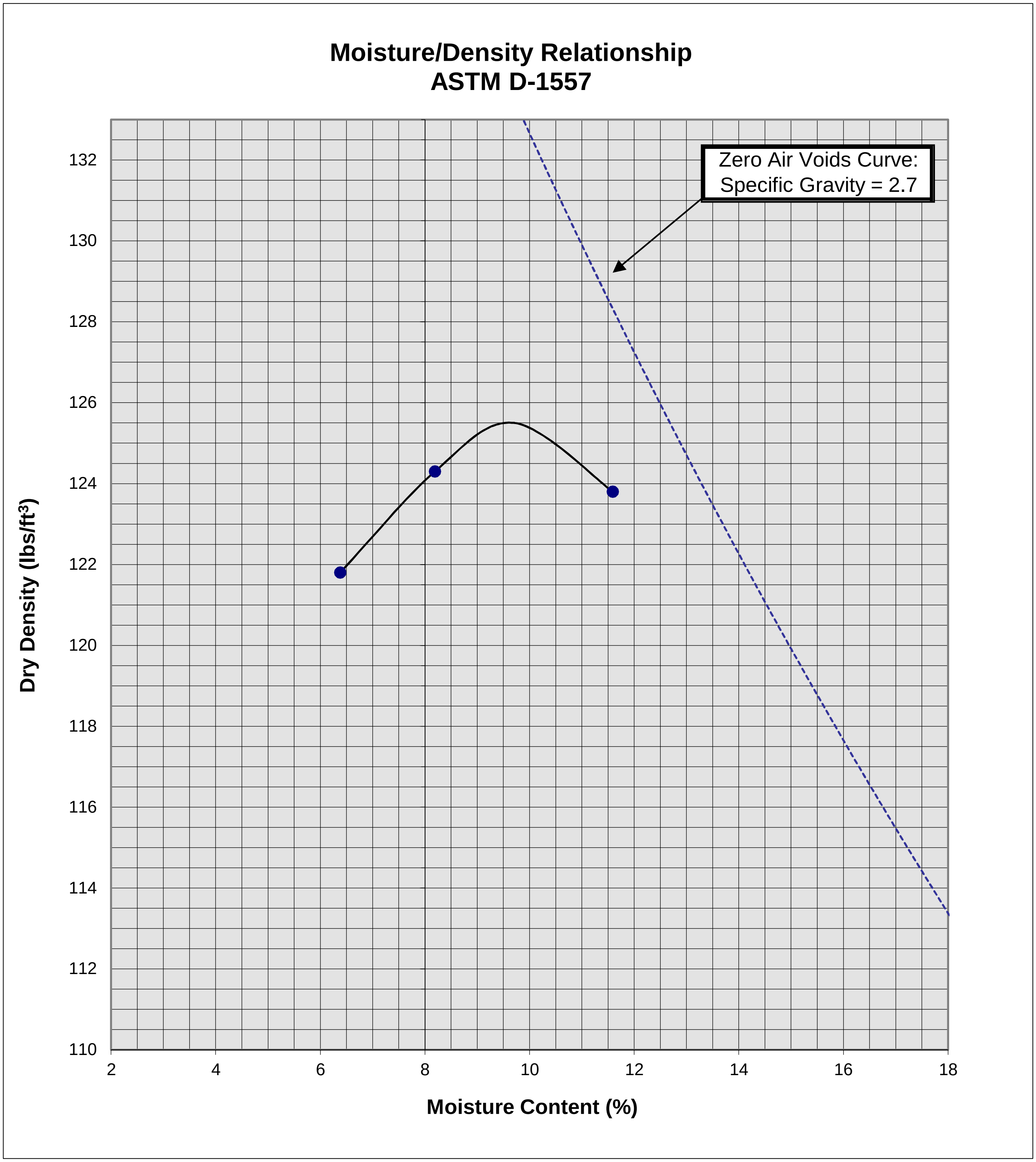
Phone: (714) 777-0333 Fax: (714) 777-0398



Soil ID Number	B-2 @ 0 to 5'
Optimum Moisture (%)	9.5
Maximum Dry Density (pcf)	125.5
Soil Classification	Brown Silty fine to medium Sand, trace Clay

New Office Buildings and Bally's
Riverside, California
Project No. 06G168

PLATE C-9

Southern California Geotechnical INC.
1260 North Hancock Street, Suite 101
Anaheim, California 92807
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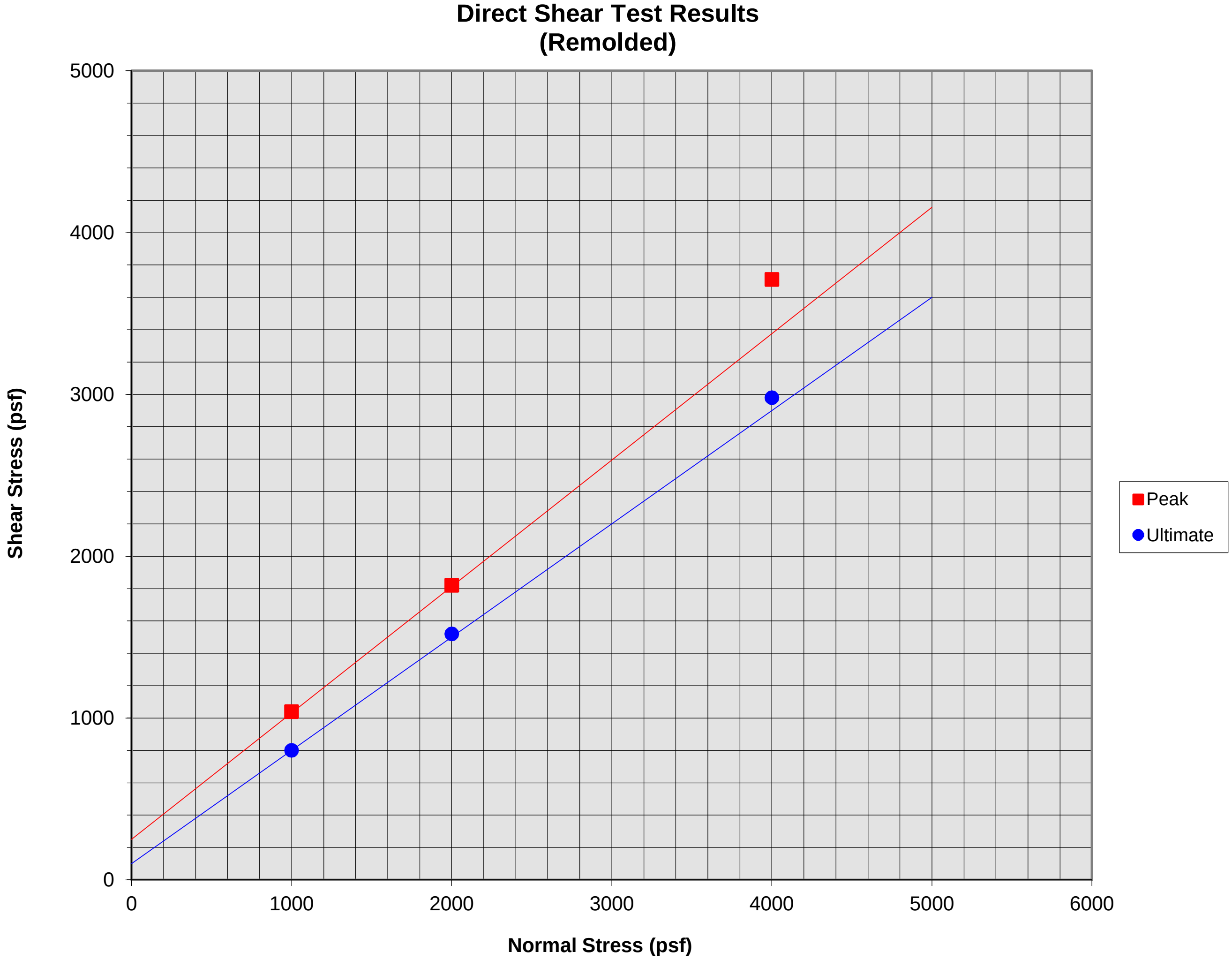

Sample Description: Brown Silty fine to medium Sand, trace Clay

Classification: B-2 @ 0 to 5'

Sample Data		Test Results	Peak	Ultimate
Remolded Moisture Content	10			
Final Moisture Content	---		Peak	Ultimate
Remolded Dry Density	119.2	ϕ (°)	38.0	35.0
Percent Compaction	95	C (psf)	250	100
Final Dry Density	---			
Specimen Diameter (in)	2.4			
Specimen Thickness (in)	1.0			

New Office Buildings and Bally's
Riverside, California
Project No. 06G168
PLATE C-10

Southern California Geotechnical
INC.
1260 North Hancock Street, Suite 101
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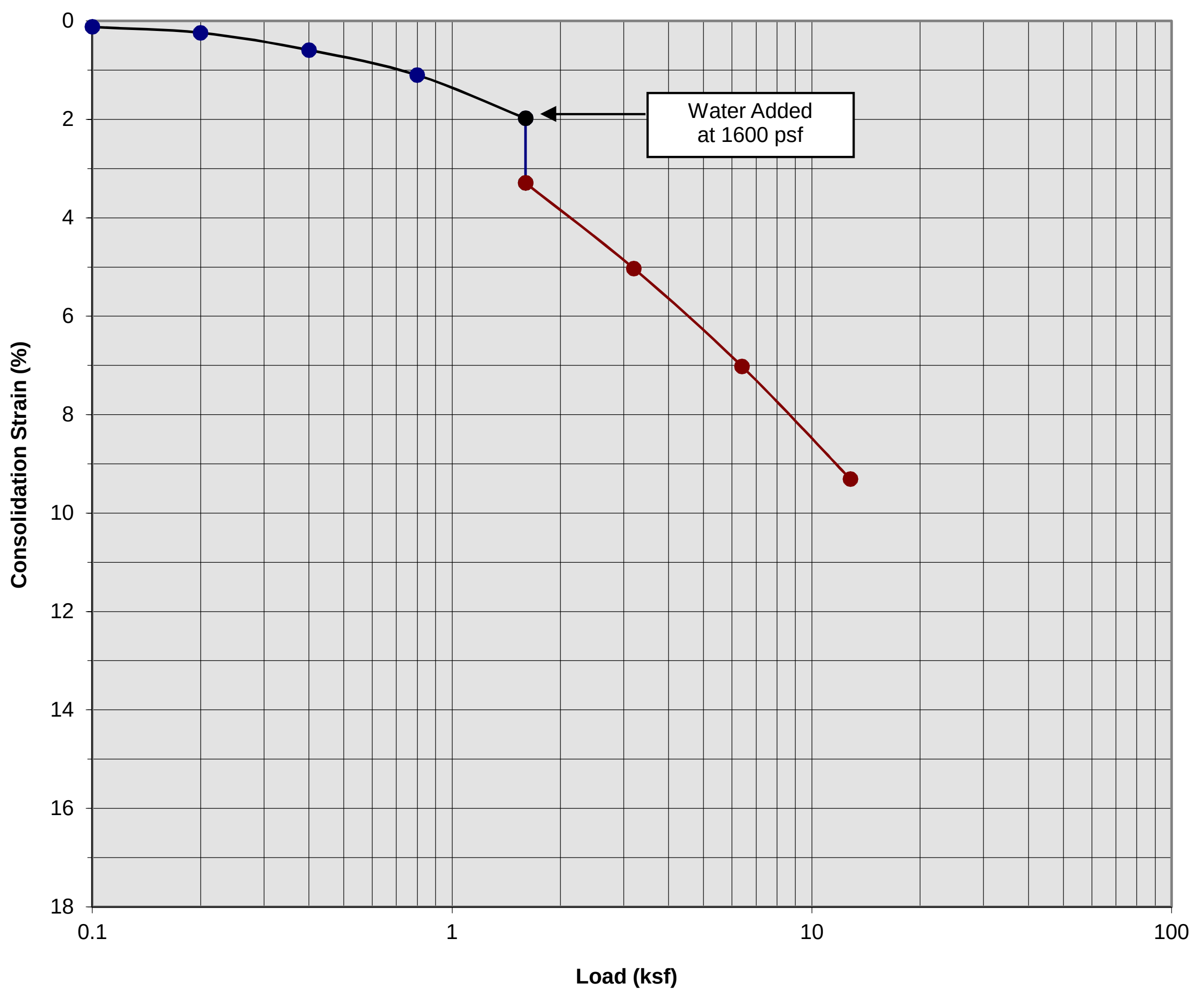
Consolidation/Collapse Test Results



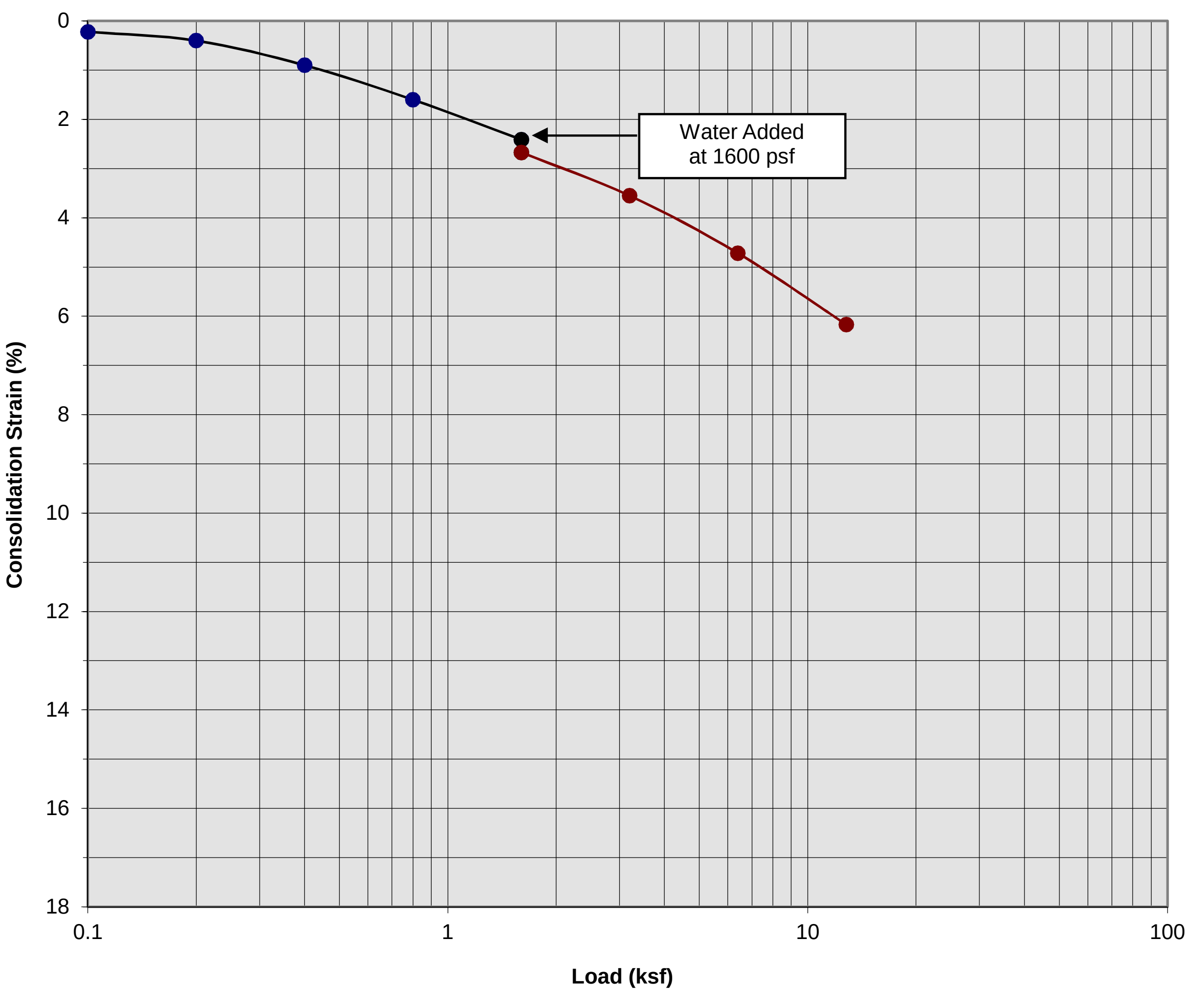
Classification: ALLUVIUM: Brown Silty fine Sand, trace medium Sand

Boring Number:	B-12	Initial Moisture Content (%)	9
Sample Number:	---	Final Moisture Content (%)	20
Depth (ft)	5 to 6	Initial Dry Density (pcf)	104.9
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	115.5
Specimen Thickness (in)	1.0	Percent Collapse (%)	1.31

Madison Plaza, Phase II
Riverside, California
Project No. 06G168-2
PLATE C- 1

SoCalGeo SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



Classification: ALLUVIUM: Brown fine Sandy Silt

Boring Number:	B-12	Initial Moisture Content (%)	9
Sample Number:	---	Final Moisture Content (%)	20
Depth (ft)	9 to 10	Initial Dry Density (pcf)	114.9
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	122.5
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.26

Madison Plaza, Phase II
Riverside, California
Project No. 06G168-2
PLATE C- 2

SoCalGeo
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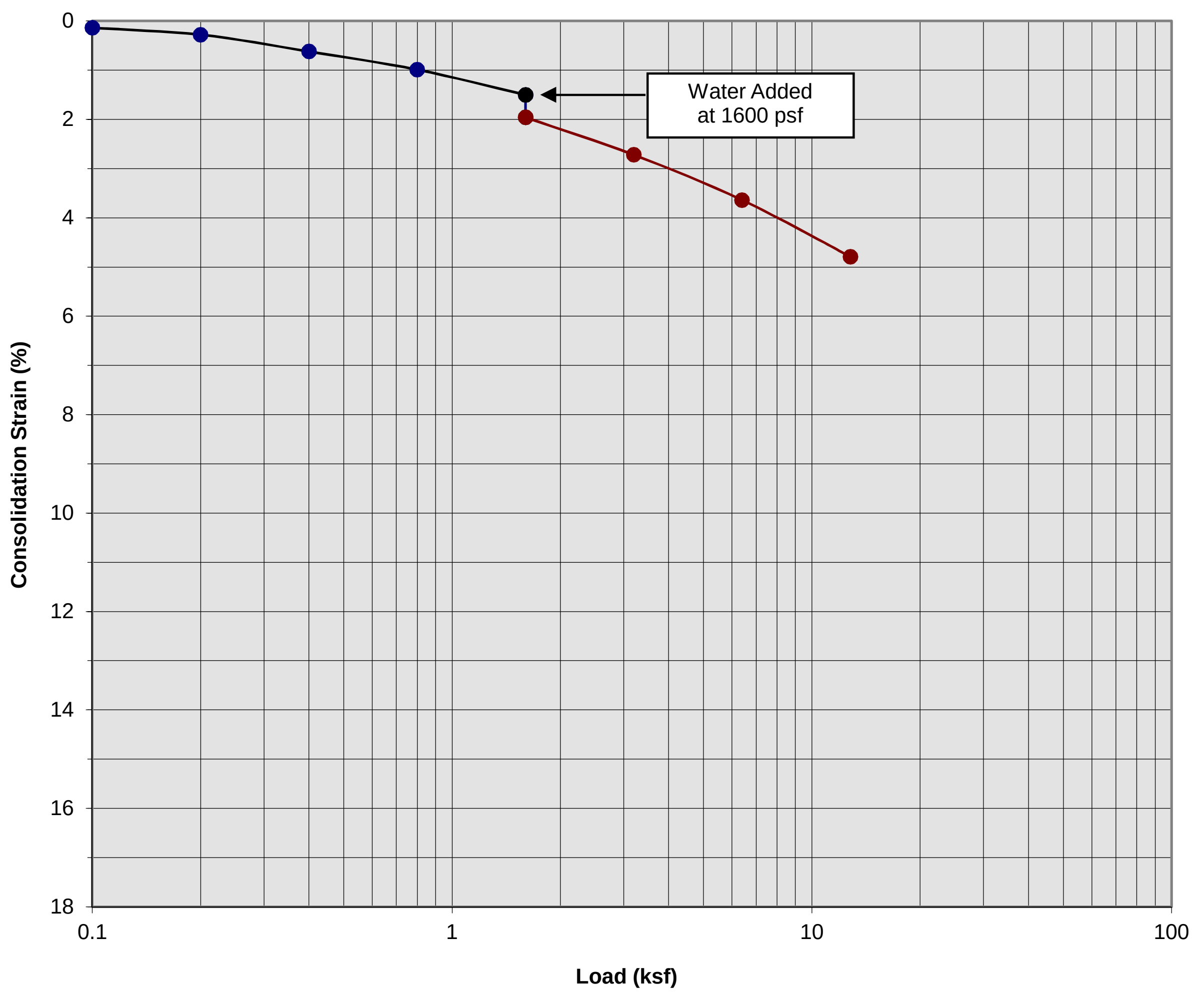
Consolidation/Collapse Test Results



Classification: ALLUVIUM: Brown fine to medium Sand

Boring Number:	B-12	Initial Moisture Content (%)	5
Sample Number:	---	Final Moisture Content (%)	13
Depth (ft)	19 to 20	Initial Dry Density (pcf)	123.7
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	129.8
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.46

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PLATE C- 3

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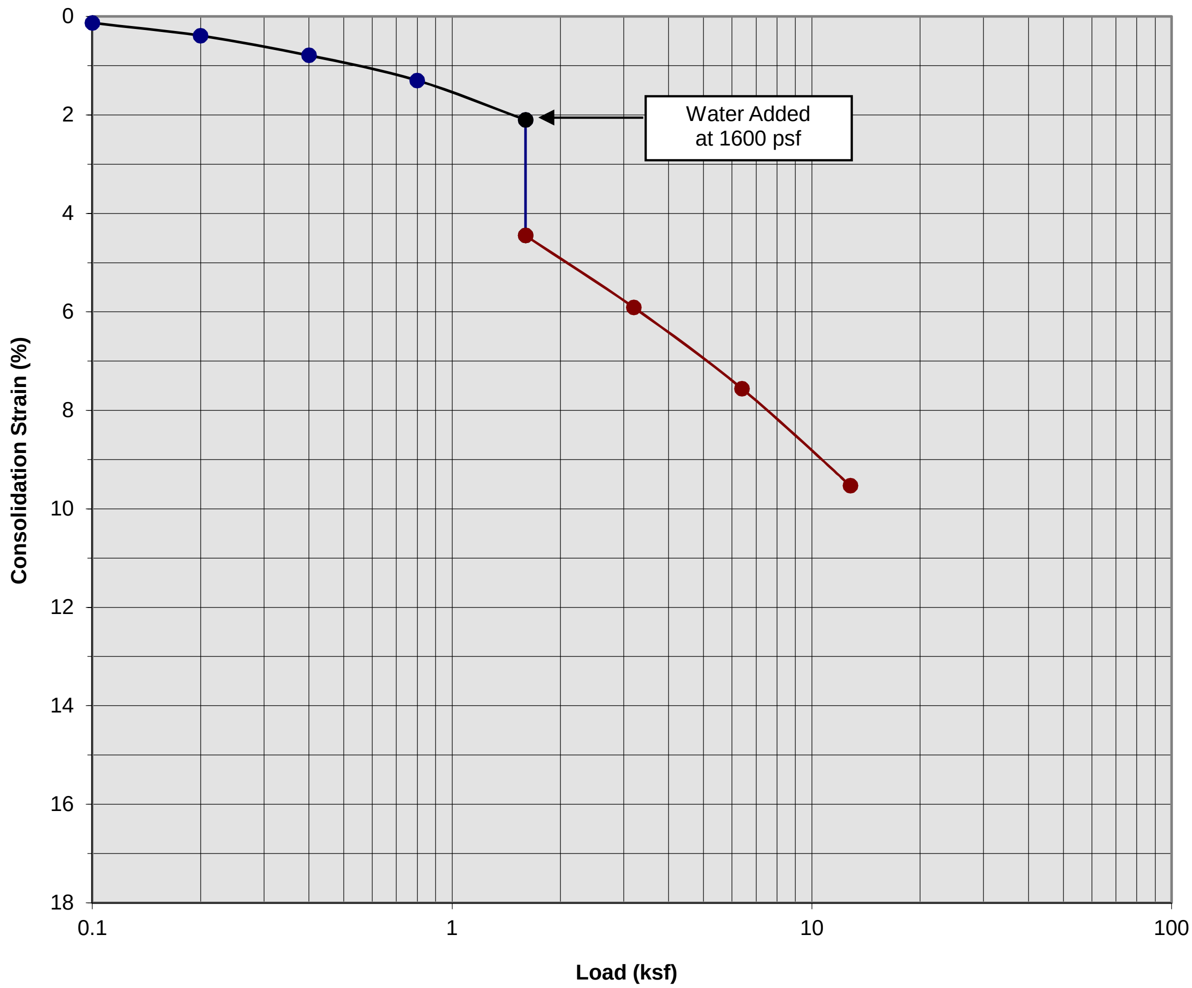
Consolidation/Collapse Test Results



Classification: ALLUVIUM: Brown Silty fine to medium Sand

Boring Number:	B-13	Initial Moisture Content (%)	6
Sample Number:	---	Final Moisture Content (%)	14
Depth (ft)	5 to 6	Initial Dry Density (pcf)	109.2
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	120.6
Specimen Thickness (in)	1.0	Percent Collapse (%)	2.35

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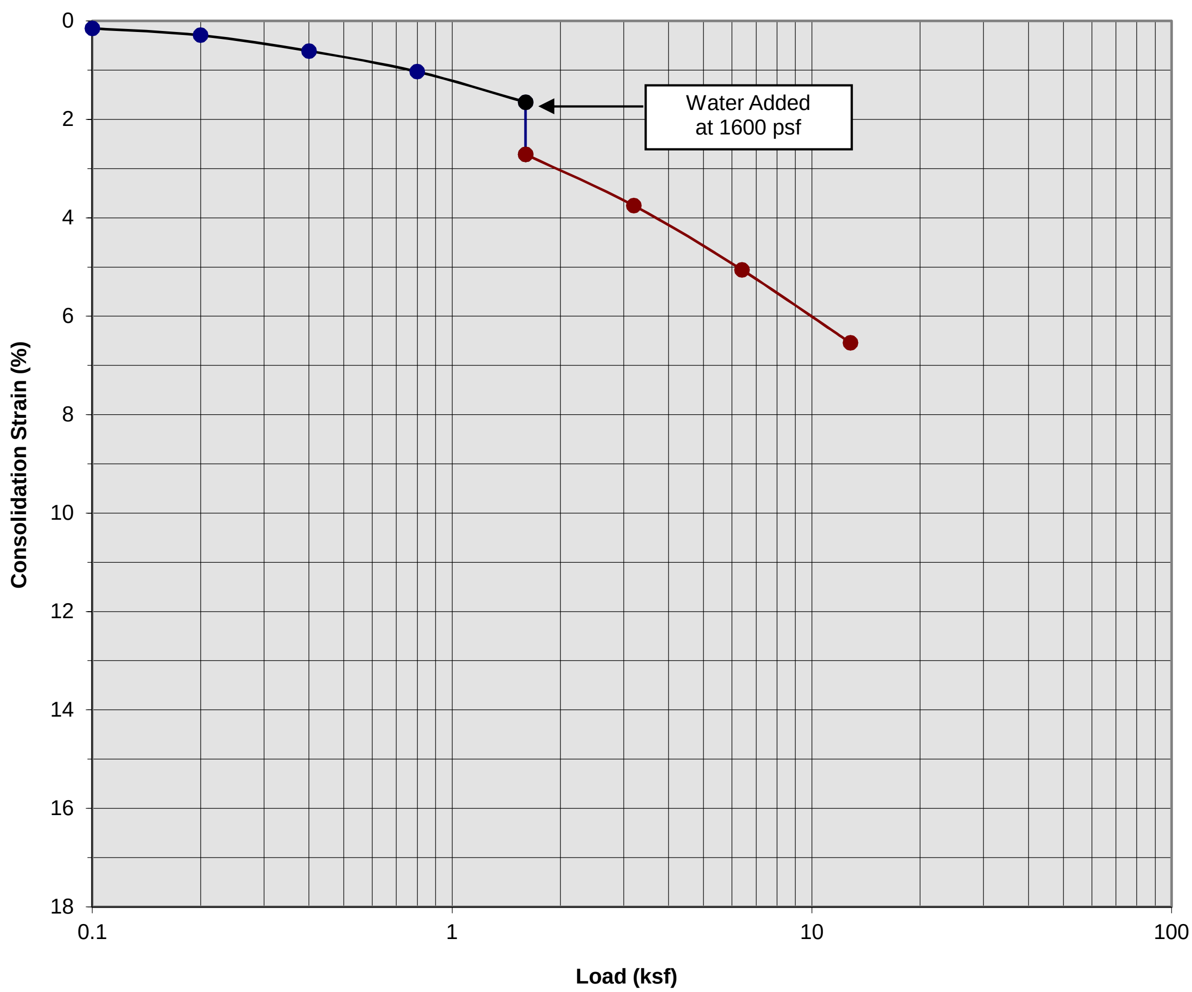
Consolidation/Collapse Test Results



Classification: Brown fine to medium Sand

Boring Number:	B-13	Initial Moisture Content (%)	4
Sample Number:	---	Final Moisture Content (%)	15
Depth (ft)	7 to 8	Initial Dry Density (pcf)	109.1
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	117.2
Specimen Thickness (in)	1.0	Percent Collapse (%)	1.06

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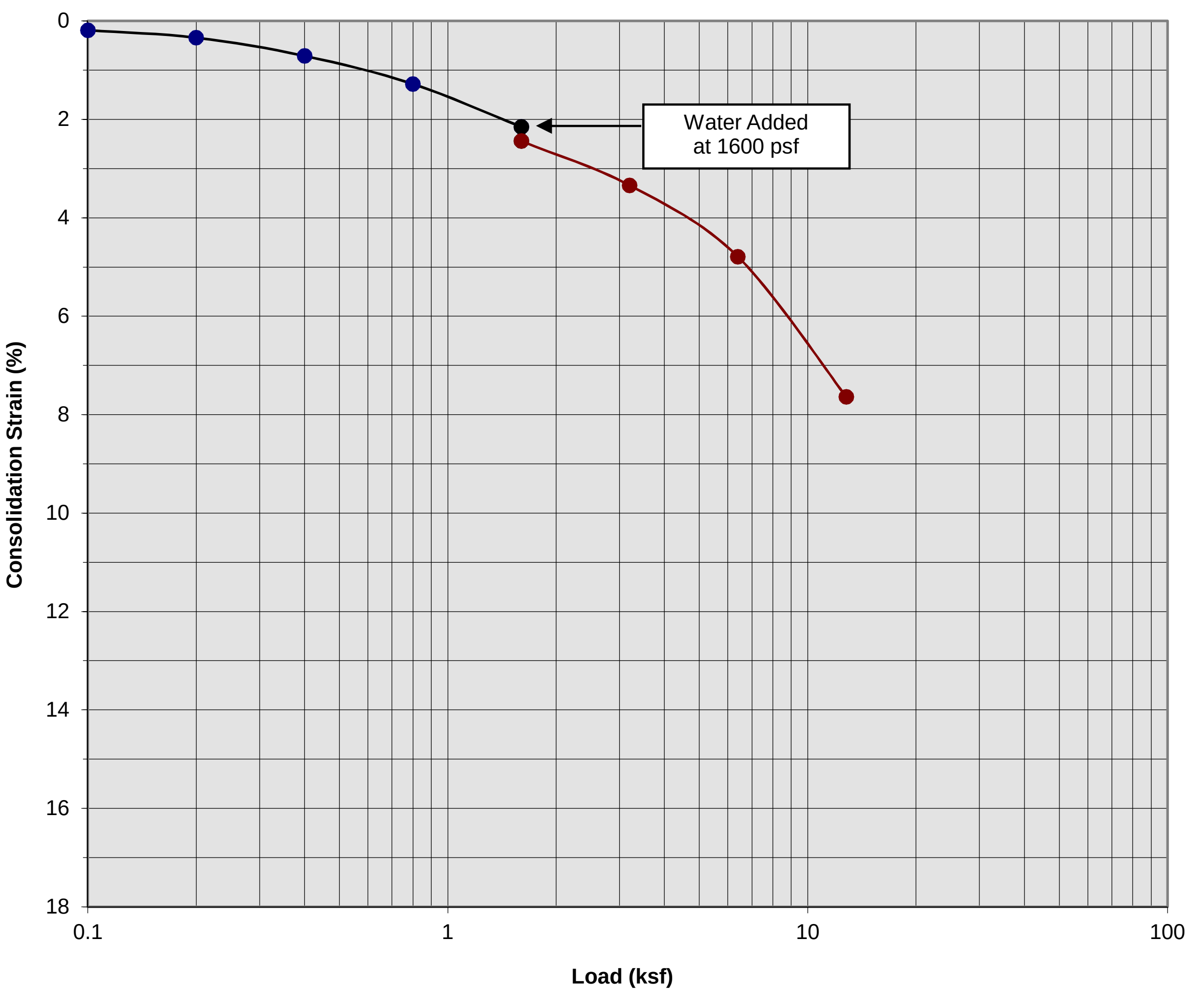
Consolidation/Collapse Test Results



Classification: Brown fine Sandy Silt, little Clay

Boring Number:	B-13	Initial Moisture Content (%)	16
Sample Number:	---	Final Moisture Content (%)	27
Depth (ft)	9 to 10	Initial Dry Density (pcf)	96.1
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	103.1
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.29

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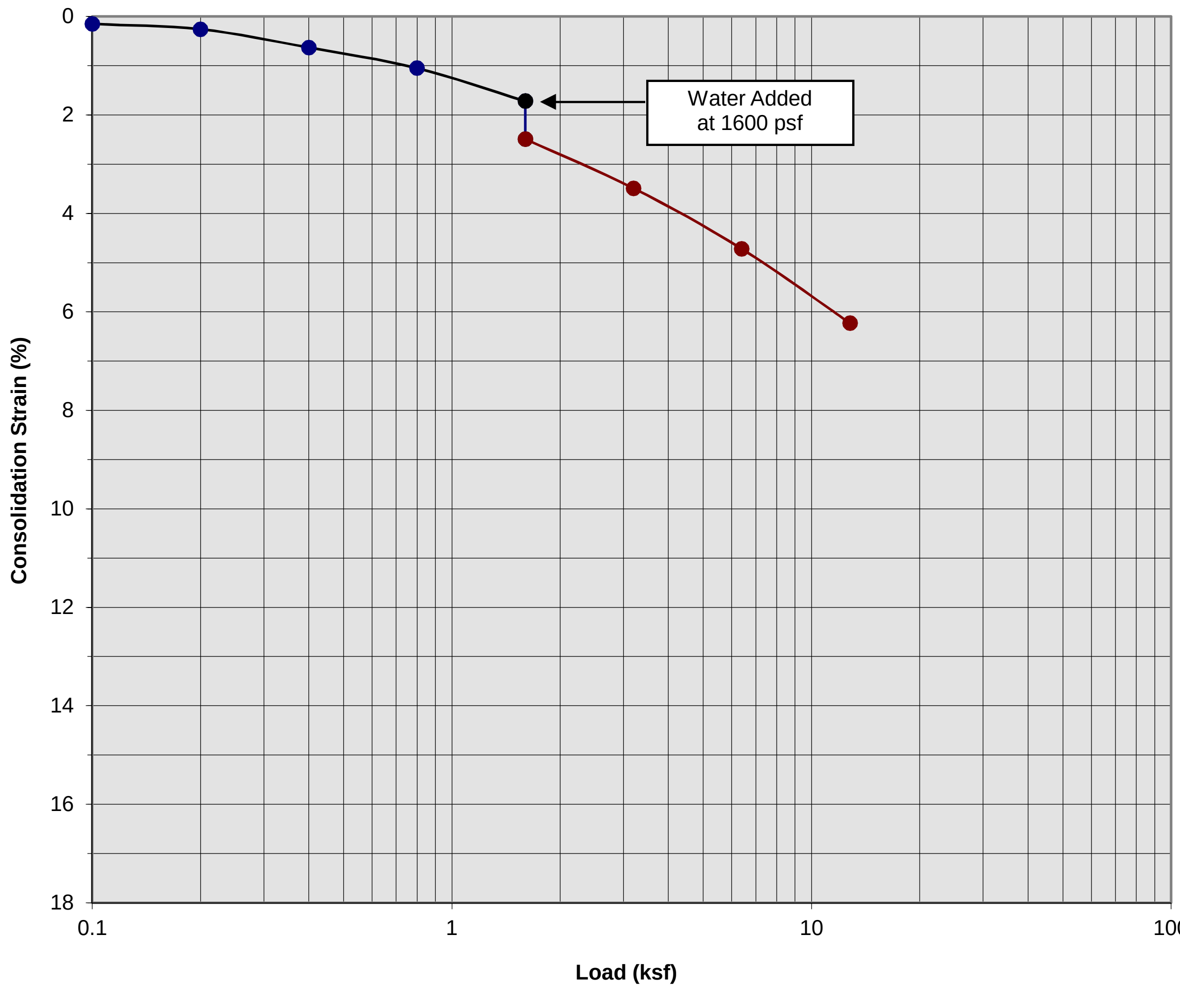
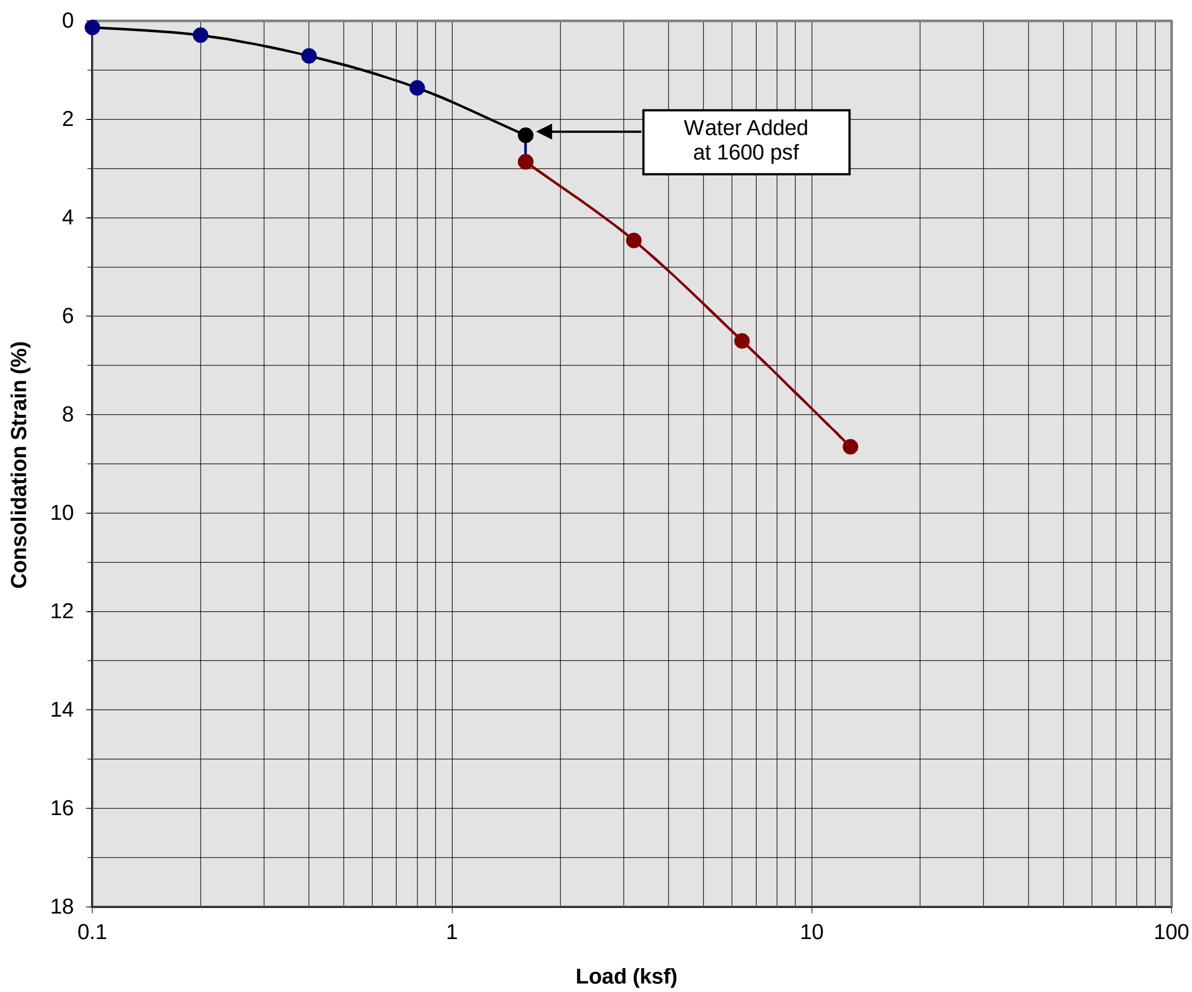
Consolidation/Collapse Test Results



Classification: Light Gray to Gray Brown fine to medium Sand, little Silt

Boring Number:	B-13	Initial Moisture Content (%)	6
Sample Number:	---	Final Moisture Content (%)	17
Depth (ft)	14 to 15	Initial Dry Density (pcf)	114.2
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	121.9
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.77

Consolidation/Collapse Test Results



Classification: Brown fine Sandy Silt

Boring Number:	B-13	Initial Moisture Content (%)	5
Sample Number:	---	Final Moisture Content (%)	20
Depth (ft)	24 to 25	Initial Dry Density (pcf)	108.5
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	117.6
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.54

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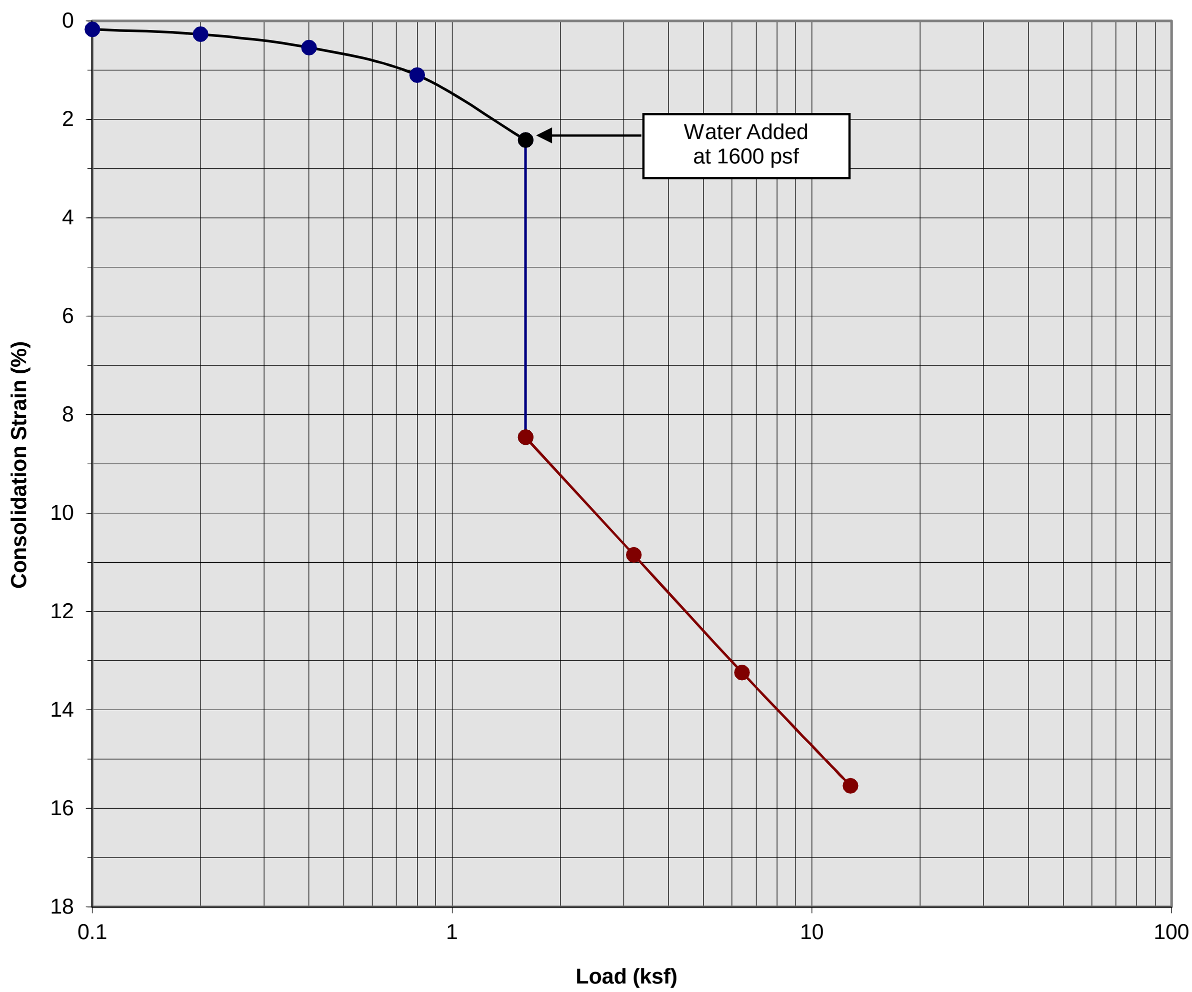
Consolidation/Collapse Test Results



Classification: POSSIBLE FILL: Red Brown Silty fine Sand

Boring Number:	B-18	Initial Moisture Content (%)	7
Sample Number:	---	Final Moisture Content (%)	15
Depth (ft)	1 to 2	Initial Dry Density (pcf)	101.0
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	120.0
Specimen Thickness (in)	1.0	Percent Collapse (%)	6.04

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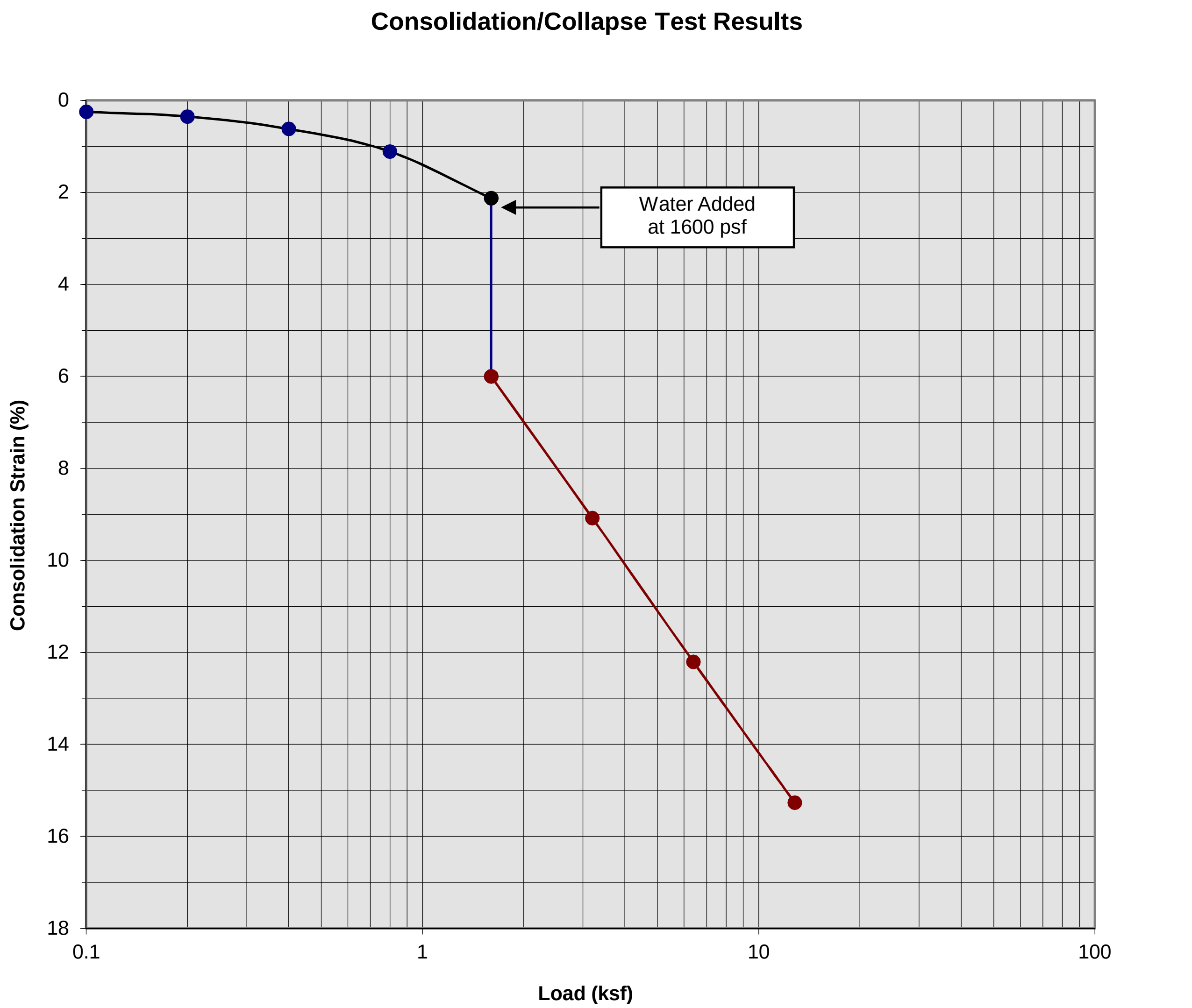

Classification: ALLUVIUM: Brown Silty fine to medium Sand, little Clay

Boring Number:	B-18	Initial Moisture Content (%)	10
Sample Number:	---	Final Moisture Content (%)	18
Depth (ft)	3 to 4	Initial Dry Density (pcf)	102.6
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	121.7
Specimen Thickness (in)	1.0	Percent Collapse (%)	3.87

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PLATE C- 9

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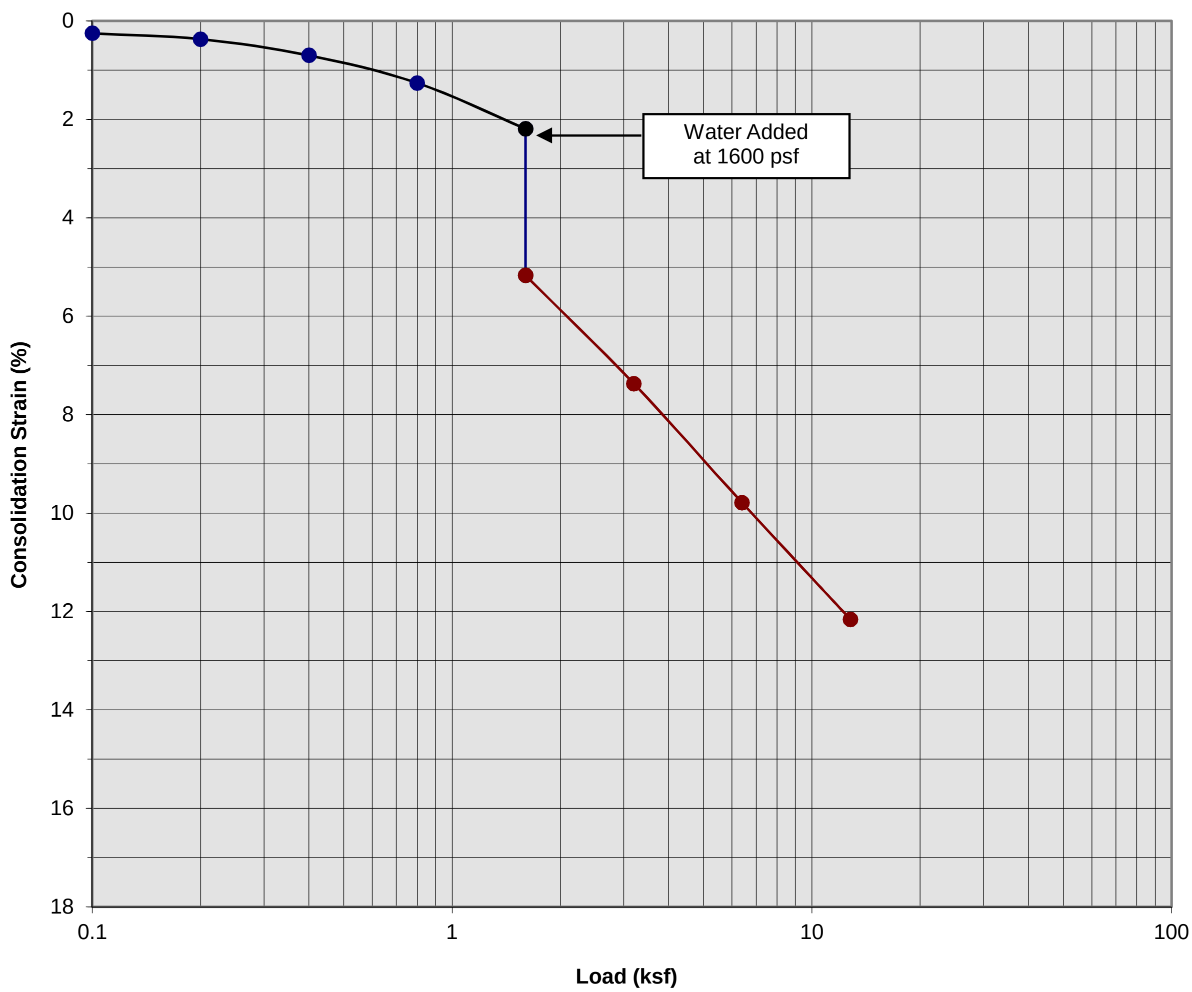

Classification: ALLUVIUM: Brown Silty fine to medium Sand, little Clay

Boring Number:	B-18	Initial Moisture Content (%)	7
Sample Number:	---	Final Moisture Content (%)	18
Depth (ft)	5 to 6	Initial Dry Density (pcf)	107.8
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	122.5
Specimen Thickness (in)	1.0	Percent Collapse (%)	2.98

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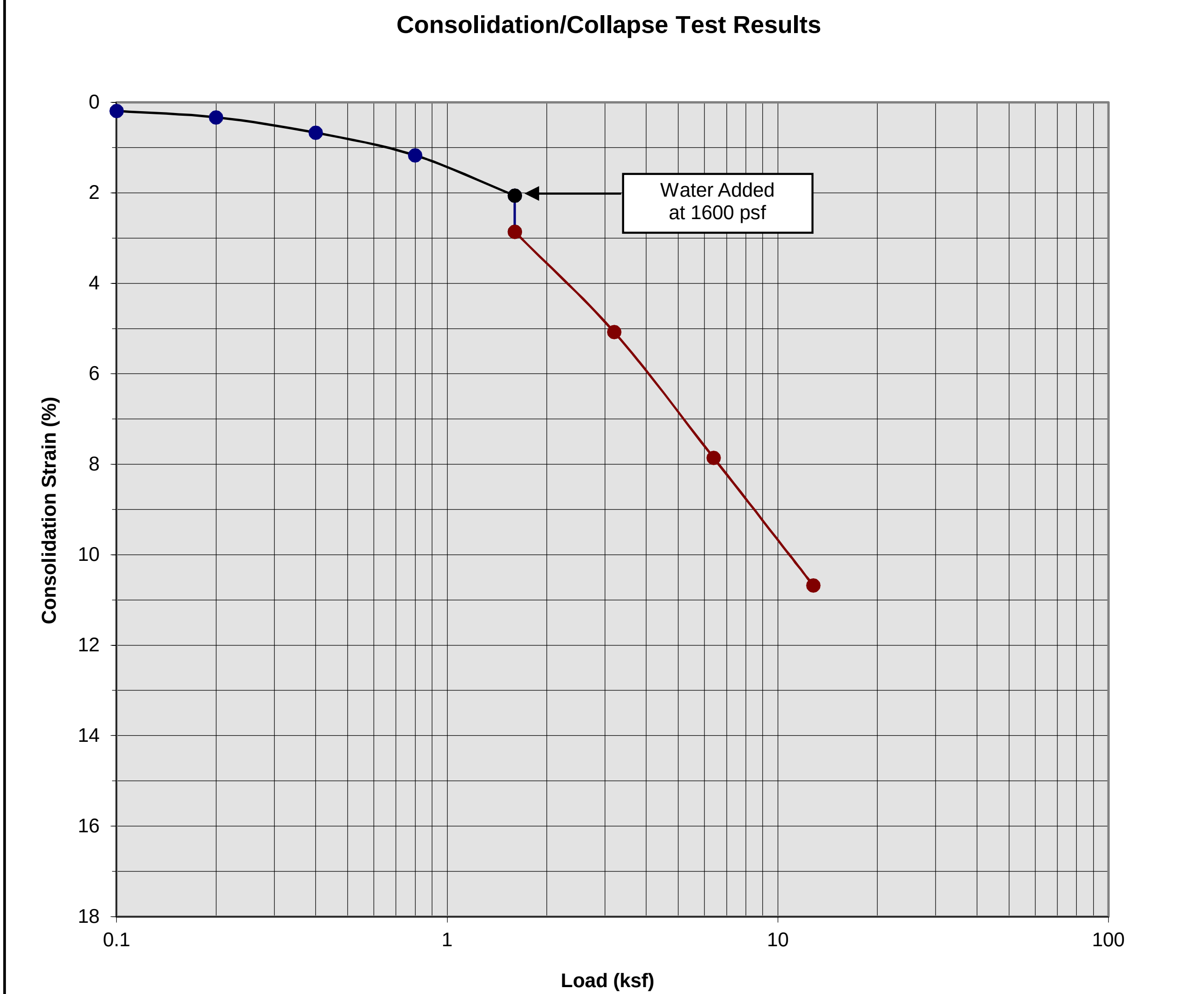

Classification: ALLUVIUM: Brown Silty fine to medium Sand, little Clay

Boring Number:	B-18	Initial Moisture Content (%)	9
Sample Number:	---	Final Moisture Content (%)	22
Depth (ft)	7 to 8	Initial Dry Density (pcf)	99.4
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	111.8
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.80

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PLATE C- 11

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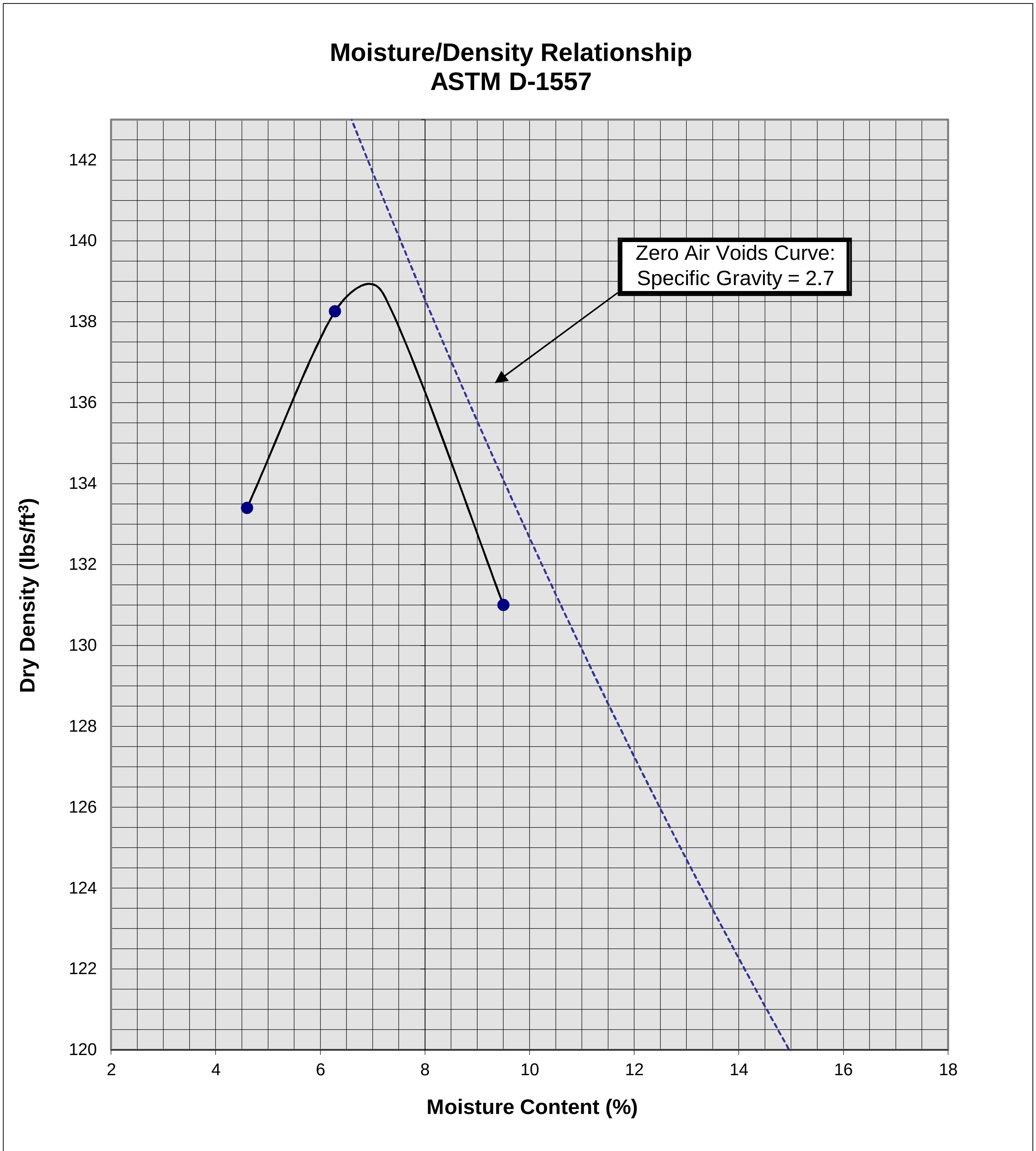

Soil ID Number		B-13 @ 0 to 5'
Optimum Moisture (%)		7
Maximum Dry Density (pcf)		139
Soil Classification	Dark Brown Silty fine to medium Sand	

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