Report To

Calero Lot # 2 Partnership
San Jose, California

For

Proposed Residential Development

APN: 421-13-060

15980 Carlton Avenue
San Jose, California

GEOTECHNICAL INVESTIGATION

December 2016

Prepared By

Silicon Valley Soil Engineering
2391 Zanker Road, Suite 350
San Jose, California

SILICON VALLEY SOIL ENGINEERING
GEOTECHNICAL CONSULTANTS

File No. SV1511
December 19, 2016

Calero Lot #2 Partnership
6475 Camden Ave., Suite 202
San Jose, CA 95120

Attention: Mr. Michael Veprinsky & Mr. Garret Rajkovich

Subject: Proposed Residential Development
APN: 421-13-060
15980 Carlton Avenue
San Jose, California
GEOTECHNICAL INVESTIGATION

Dear Mr. Veprinsky & Mr. Rajkovich:

Pursuant to your request, we are pleased to transmit herein the results of our geotechnical investigation for the proposed residential development. The subject site is located at 15980 Carlton Avenue in San Jose, California.

Our findings indicate that the site is suitable for the proposed development provided the recommendations contained in this report are carefully followed. Our field reconnaissance, drilling, sampling, and laboratory testing of the surface and subsurface material evaluate the suitability of the site. The following report details our investigation, outlines our findings, and presents our conclusions based on those findings.

If you have any questions or require additional information, please feel free to contact our office at your convenience.

Very truly yours,

SILICON VALLEY SOIL ENGINEERING

REGISTERED PROFESSIONAL ENGINEER
VIEN M. VO
C 32296
EXP. 12/31/18
CIVIL
STATE OF CALIFORNIA

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Project Manager

Vien Vo, P.E.

SV1511.GI/Copies: 4 to Calero Lot #2 Partnership

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INTRODUCTION

Per your authorization, Silicon Valley Soil Engineering (SVSE) conducted a geotechnical investigation. The purpose of this investigation was to determine the nature of the surface and subsurface soil conditions at the project site through field investigations and laboratory testing. This report presents an explanation of investigative procedures, results of the testing program, our conclusions, and our recommendations for earthwork and foundation design to adapt the proposed development to the existing soil conditions.

PROJECT LOCATION AND DESCRIPTION

The project site is located at 15980 Carlton Avenue in San Jose, California (Figure 1 - Vicinity Map). Carlton Avenue bounds the subject site to the north, existing residential developments are located to the east, south, and west. At the time of our investigation, the site was a rectangular shaped, relatively flat parcel of land. The site is occupied by several residential structures. Based on the plans prepared by the Project Architect, the proposed development will include the demolition of the existing structures and the construction of seven three-story single-family residences with associated improvements. Location of the proposed residences and our borings are shown on Figure 2 - Site Plan.

FIELD INVESTIGATION

After considering the nature of the proposed development and reviewing available data on the area, a field investigation was conducted at the project site under the direction of our geotechnical engineer. It included a site reconnaissance to detect any unusual surface features, and the drilling of three exploratory test borings to determine the subsurface soil characteristics. The borings were drilled on December 12, 2016 to the depths of 11.5 feet and 21.5 feet below the existing ground surface elevation. The borings were drilled with a truck-mounted drill rig using 4-inch diameter solid stem augers. The approximate location of these borings is shown on Figure 2.

The soils encountered were logged continuously in the field during the drilling operations. Relatively undisturbed soil samples were obtained by hammering a 2.5-inch outside diameter (O.D.) split-tube sampler (Modified California) into the ground at various depths. A 140-pound hammer with a free fall of 30 inches was used to drive the sampler 18 inches into the ground. Blow counts were recorded on each 6-inch increment of the sampled interval. The blows required for advancing the sampler the last 12 inches of the 18 inch sampled interval were recorded on the boring logs as penetration resistance.

In addition, disturbed bulk samples of the near-surface soil were collected for laboratory analyses. The Exploratory Boring Log contained in the Appendix are a graphic representation of the encountered soil profile; and also show the depths at which the relatively undisturbed soil samples were obtained.

LABORATORY INVESTIGATION

A laboratory-testing program was performed to determine the physical and engineering properties of the soils underlying the site. Moisture content and dry density tests were performed on the relatively undisturbed soil samples in order to determine soil consistency and the moisture variation throughout the explored soil profile (Table I). The strength parameters of the foundation soils were determined from direct shear tests that were performed on selected relatively undisturbed soil samples. Atterberg Limits tests were also performed on the near-surface soil to assist in the classification of these soils and to obtain an evaluation of their expansion and shrinkage potential. Laboratory compaction tests of the native soil material were performed to determine the maximum dry density per the ASTM D1557-12 test procedure. One R-Value test was performed on a near surface soil sample for pavement section design recommendations. The results of the laboratory-testing program are presented in the Tables and Figures at the end of this report.

SOIL CONDITIONS

In Boring B-1, from the surface soils to the depth of 4 feet, a brown, damp, dense, gravelly sand layer was encountered. The sand was medium grained and poorly graded. From the depths of 4 feet to the end of the boring at 21.5 feet, the soil became brown, dry, dense, sandy gravel. The gravel was 2.5 inches maximum diameter, sub-angular to sub-rounded, and well graded. A similar soil profile was encountered in other borings.

Groundwater was not encountered in the borings to the depths explored. It should be noted that the groundwater table would fluctuate as a result of seasonal changes and hydrogeologic variations such as groundwater pumping and/or recharging. A detailed description of the soil profiles encountered is presented in Exploratory Boring Log contained in the Appendix.

GENERAL GEOLOGY

The site lies in the Santa Clara Valley, which is part of the Coast Ranges geological province. The Santa Clara Valley occupies the structural trough formed by two northwest trending mountain ranges; the Santa Cruz Mountains to the southwest of the valley and the Diablo Range to the northeast. The Diablo Range is predominantly composed of Franciscan Formation, which is uppermost Jurassic to lower Upper Cretaceous eugosynclinal assemblage. The Santa Cruz Mountains are predominantly composed of material formed of Cenozoic shelf and slope deposits. A thick blanket of latest Cretaceous and Tertiary clastic sedimentary rocks and isolated intrusions of serpentine covers large parts of the province. Folds, thrust faults, steep reverse faults, and strikeslip faults developed as a consequence of Cenozoic deformations that occur very often within the province and some of them are continuing today (CDMG; 1966).

Sedimentary marine strata alternating with non-marine strata record the Quaternary history of the region. The changes of the depositional environment are related to the fluctuation of sea level corresponding to the glacial and interglacial periods. Late Quaternary deposits fill the center of the Santa Clara Valley and most of the strata are of continental origin characterized as alluvial and fluvial materials. The project site is underlain by fluvial deposits (Helley and Brabb, 1971, Rogers & Williams, 1974).

LIQUEFACTION

The site is not located in a liquefaction hazard zone (USGS, 2002).

INUNDATION POTENTIAL

The subject site is located at 15980 Carlton Avenue in San Jose, California. According to the Limerinos and others, 1973 report, the site is not located in an area that has potential for inundation as the result of a 100 years flood (Limerinos; 1973).

CONCLUSIONS

1. The site covered by this investigation is suitable for the proposed development provided the recommendations set forth in this report are carefully followed.

2. Based on the laboratory testing results of the near-surface soil, the native surface soil at the project site has been found to have a low expansion potential when subjected to fluctuations in moisture.

3. We recommend that the proposed residences should be supported on conventional spread foundation with concrete slab-on-grade.

4. A reference to our report should be stated in the grading and foundation plans (this includes the *Geotechnical Investigation* File No. and date).

5. On the basis of the engineering reconnaissance and exploratory borings, it is our opinion that trenches excavated to depths less than 5 feet below the existing ground surface will not need shoring. However, for trenches greater than 5 feet in depth, shoring will be required.

6. Specific recommendations are presented in the remainder of this report.

7. All earthwork and grading shall be observed and inspected by a representative from Silicon Valley Soil Engineering (SVSE). These operations are not limited to testing and inspection during grading.

RECOMMENDATIONS

GRADING

1. The placement of fill and control of any grading operations at the site should be performed in accordance with the recommendations of this report. These recommendations set forth the minimum standards to satisfy other requirements of this report.

2. All existing surface and subsurface structures, if any, which will not be incorporated in the final development shall be removed from the project site prior to any grading operations. These objects should be accurately located on the grading plans to assist the field engineer in establishing proper control over their removal. All utility lines, if any, must be removed prior to any grading at the site.

3. The depressions left by the removal of subsurface structures should be cleaned of all debris, backfilled and compacted with clean, native and/or approved import soil material. This backfill must be engineered fill and should be conducted under the supervision of a SVSE representative.

4. All organic surface material and debris shall be stripped prior to any other grading operations, and transported away from all areas that are to receive structures or structural fills. Soil containing organic material may be stockpiled for later use in landscaping areas only.

5. After removing all the subsurface structures, if any, and after stripping the organic material from the soil, the building pad area including driveway area should be scarified by machine to a depth of 12 inches and thoroughly cleaned of vegetation and other deleterious matter.

6. After stripping, scarifying and cleaning operations, the subgrade soil should be compacted to not less than 95% relative maximum density using

ASTM D1557-12 procedure over the entire building pad, 5 feet beyond the perimeter of the pad, and 3 feet beyond the driveway edge.

7. All engineered fill or imported soil should be placed in uniform horizontal lifts of not more than 8 inches in un-compacted thickness, and compacted to not less than 95% relative maximum density. This should extend a minimum of 5 feet beyond the perimeter of the pad. The baserock, if any, should be compacted to not less than 95% relative maximum density. Before compaction begins, the fill shall be brought to a water content that will permit proper compaction by either; 1) aerating the material if it is too wet, or 2) spraying the material with water if it is too dry. Each lift shall be thoroughly mixed before compaction to assure a uniform distribution of water content.

8. When fill material includes rocks, nesting of rocks will not be allowed and all voids must be carefully filled by proper compaction. Rocks larger than 4 inches in diameter should not be used for the final 2 feet of building pad.

9. Unstable (yielding) subgrade should be aerated or moisture conditioned as necessary. Yielding isolated area in the subgrade can be stabilized with an excavation of the subgrade to the depth of 12 to 18 inches, lined with stabilization fabric membrane (Mirafi 500X or equivalent) and backfilled with aggregate base.

10. SVSE should be notified at least two days prior to commencement of any grading operations so that our office may coordinate the work in the field with the contractor. All imported borrow must be approved by SVSE before being brought to the site. Import soil must have a plasticity index no greater than 15, an R-Value greater than 25, and environmentally clean.

11. All grading work shall be observed and approved by a representative from SVSE. The geotechnical engineer shall prepare a final report upon completion of the grading operations.

WATER WELLS

12. Any water wells and/or monitoring wells that are to be abandoned on the site shall be capped according to the requirements of the Santa Clara Valley Water District. The final elevation of the top of the well casing must be a minimum of 3 feet below the adjacent grade prior to any grading operation.

FOUNDATION DESIGN CRITERIA

13. The proposed residences should be supported on conventional continuous perimeter and isolated interior spread foundation with concrete slab-on-grade. Recommendations are presented in the following paragraphs.

14. The conventional spread foundation must be founded at a minimum depth of 24 inches below finished subgrade pad elevation. Under these conditions, the allowable bearing capacity is 2,800 psf for both continuous perimeter and isolated and interior spread footings. Both interior and perimeter foundations should be founded at the same elevation below pad grade.

15. The footing bottoms should be compacted with jumping jack prior to rebar and form work placement.

16. The fore-mentioned bearing values are for dead plus live loads and may be increased by one-third for short term seismic and wind loads. The design of the structure and the foundations shall meet local building code requirements.

17. The project structural engineer responsible for the foundation design shall determine the final design of the foundations and reinforcing required. We recommend that the foundation plans be reviewed by our office prior to submitting to the appropriate local agency and/or to construction.

2013 CBC SEISMIC VALUES

18. The site categorization and site coefficients are shown in the following table.

Classification/Coefficient	**Design Value**
Site Class (Table 20.3-1 CBC 2013)	D
Risk Category	I,II,III
Site Latitude	37.24735° N.
Site Longitude	121.949006° W.
0.2-second Mapped Spectra Acceleration[1], S_S	2.341g*
1-second Mapped Spectra Acceleration[1], S_1	0.879g*
Short-Period Site Coefficient, F_a (Table 11.4-1 CBC 2013)	1.0
Long-Period Site Coefficient, F_V (Table 11.4-2 CBC 2013)	1.5
0.2-second Period, Maximum considered Earthquake Spectral Response Acceleration S_{MS} ($S_{MS} = F_aS_S$ - Equation 11.4-1 CBC 2013)	2.341g*
1-second Period, Maximum Considered Earthquake Spectral Response Acceleration S_{M1} ($S_{M1} = F_VS_1$ - Equation 11.4-2 CBC 2013)	1.319g*
0.2-second Period, Designed Spectra Acceleration, S_{DS} ($S_{DS} = 2/3S_{MS}$ - Equation 11.4-3 CBC 2013)	1.561g*
1-second Period, Designed Spectra Acceleration, S_{D1} ($S_{D1} = 2/3S_{M1}$ - Equation 11.4-4 CBC 2013)	0.879g*

[1] For Site Class B, 5 percent damped.
* USGS Seismic Design Maps for 2013 CBC analysis.

CONCRETE SLAB-ON-GRADE CONSTRUCTION

19. Based on the laboratory testing results of the near-surface soil, the native soil on the site was found to have a low expansion potential when subjected to fluctuation in moisture.

20. A minimum of 5 inches of ¾ inch crushed rock (recycled crushed asphalt concrete is not acceptable) should be placed on the subgrade soil. The subgrade soil should be compacted to not less than 95% relative maximum density.

21. The concrete slab should have a minimum thickness of 5 inches and reinforced with No. 4 rebar with maximum spacing of 18 inches on-center both ways. If the concrete slab were to receive floor covering, a Stego 15-mil vapor barrier should be placed between the rock section and concrete slab.

RETAINING WALLS

22. Any facilities that will retain a soil mass such as retaining walls should be designed for a lateral earth pressure (active) equivalent to 50 pounds equivalent fluid pressure for horizontal backfill. If the retaining walls are restrained from free movement at both ends, the walls should be designed for the earth pressure resulting from 60 pounds equivalent fluid pressure, to which should be added surcharge loads. The structural engineer should discuss the surcharge loads with the geotechnical engineer prior to designing the retaining walls.

23. In designing for allowable resistive lateral earth pressure (passive) of 250 pounds equivalent fluid pressure may be used with the resultant acting at the third point. The top foot of subgrade soil should be neglected for computation of passive resistance.

24. A friction coefficient of 0.3 should be used for retaining wall design. This can be increased by 1/3 for short term seismic and wind loads.

25. The fore-mentioned values assume a drained condition and a moisture content compatible with those encountered during our investigation.

26. Drainage should be provided behind the retaining wall. The drainage system should consist perforated (subdrain) pipe placed at the base of the retaining wall and surrounded by ¾ inch drain rock wrapped in a filter fabric. The drain rock wrapped in fabric should be at least 12 inches wide and extend from the base of the wall to within 1.5 feet of the ground surface. The upper 1.5 feet of backfill should consist of compacted native soil. The retaining wall drainage system should be sloped to an appropriate discharge facility.

27. As an alternative to the drain rock and fabric, Miradrain or approved drain mat equivalent may be used behind the retaining wall. The drain mat should extend from the base of the wall to the ground surface. A perforated pipe (subdrain system) should be placed at the base of the wall in direct contact with the drain mat. The pipe should be sloped to an appropriate discharge facility.

28. We recommend a thorough review by our office of all designs pertaining to facilities retaining a soil mass.

EXCAVATION

29. No difficulties due to soil conditions are anticipated in excavating the on-site material. Conventional earth moving equipment will be adequate for this project.

30. Any vertical cuts deeper than 5 feet must be properly shored. The minimum cut slope for excavation to the desired elevation is one horizontal to one vertical (1:1). The cut slope should be increased to 2:1 if the excavation is conducted during the rainy season or when the soil is highly saturated with water.

DRAINAGE

31. It is considered essential that positive drainage be provided during construction and be maintained throughout the life of the proposed structure.

32. The final exterior grade adjacent to the proposed structure should be such that the surface drainage will flow away from the structure. Rain water discharge at downspouts should be directed onto pavement sections, splash blocks, or other acceptable facilities which will prevent water from collecting in the soil adjacent to the foundations.

33. Utility lines that cross under or through perimeter footings should be completely sealed to prevent moisture intrusion into the areas under the slab and/or footings. The utility trench backfill should be of impervious material and this material should be placed at least 4 feet on either side of the exterior footings.

34. Consideration should be given to collection and diversion of roof runoff and the elimination of planted areas or other surfaces which could retain water in areas adjoining the building. The grade adjacent to the perimeter foundation should be at a minimum slope of 2 percent away from structure.

35. Based on laboratory test results of the near surface soil at the subject site, we estimated that the infiltration rate is approximately 1 inch per hour

(K_{SAT} = 7×10^{-4}cm/sec). This rate can be used in the design of the bio-retention system for on-site storm drainage.

ON-SITE UTILITY TRENCHING

36. All on-site utility trenches must be backfilled with native on-site material or imported fill and compacted to at least 90% relative maximum density and 95% for the top 12 inches. Backfill should be placed in 8 inch lifts and compacted. Jetting of trench backfill is not recommended. An engineer from our firm should be notified at least 48 hours before the start of any utility trench backfilling operations.

37. The utility trenches running parallel to the building foundation should not be located in an influence zone that will undermine the stability of the foundation. The influence zone is defined as the imaginary line extending at the outer edge of the footing at a downward slope of 1:1 (one unit horizontal distance to one unit vertical distance). If the utility trenches were encroaching the influence zone, the encroached area should be stabilized with cement sand slurry with minimum compression strength of 75 psi.

38. If utility trench excavation is to encounter groundwater, our office should be notified for dewatering recommendations.

PAVEMENT DESIGN

39. Due to the uniformity of the near-surface soil at the site, one R-Value Test was performed on a representative bulk sample. The result of the R-Value test is enclosed in this report. The following alternate sections are based on our laboratory resistance R-Value test of near-surface soil samples and traffic indices (T.I.) of 4.5 for parking stalls and 5.5 for driveway and street. Asphalt pavement section designs, which satisfy the State of California

Standard Design Criteria, and above traffic indices, are presented in Table II. Concrete pavement sections are presented in Table III. Paver pavement sections are presented in Table IV.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The recommendations presented herein are based on the soil conditions revealed by our test boring(s) and evaluated for the proposed construction planned at the present time. If any unusual soil conditions are encountered during the construction, or if the proposed construction will differ from that planned at the present time, Silicon Valley Soil Engineering (SVSE) should be notified for supplemental recommendations.

2. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the necessary steps are taken to see that the contractor carries out the recommendations of this report in the field.

3. The findings of this report are valid, as of the present time. However, the passing of time will change the conditions of the existing property due to natural processes, works of man, from legislation or the broadening of knowledge. Therefore, this report is subjected to review and should not be relied upon after a period of three years.

4. The conclusions and recommendations presented in this report are professional opinions derived from current standards of geotechnical practice and no warranty is intended, expressed, or implied, is made or should be inferred.

5. The area of the boring(s) is very small compared to the site area. As a result, buried structures such as septic tanks, storage tanks, abandoned utilities, or etc. may not be revealed in the boring(s) during our field investigation. Therefore, if buried structures are encountered during grading or construction, our office should be notified immediately for proper disposal recommendations.

6. Standard maintenance should be expected after the initial construction has been completed. Should ownership of this property change hands, the prospective owner should be informed of this report and recommendations so as not to change the grading or block drainage facilities of this subject site.

7. This report has been prepared solely for the purpose of geotechnical investigation and does not include investigations for toxic contamination studies of soil or groundwater of any type. If there are any environmental concerns, our firm can provide additional studies.

8. Any work related to grading and/or foundation operations during construction performed without direct observation from SVSE personnel will invalidate the recommendations of this report and, furthermore, if we are not retained for observation services during construction, SVSE will cease to be the Geotechnical Engineer of Record for this subject site.

REFERENCES

Borcherdt R.D., Gibbs J. F., Lajoie K.R., 1977 - Maps showing maximum earthquake intensity predicted in the southern San Francisco Bay Region, California, for large earthquakes on the San Andreas and Hayward faults. U.S.G.S. MF-709.

Day W. Robert (2002). *Geotechnical Earthquake Engineering Handbook*. McGraw-Hill, New York.

Limerinos J.T., Lee K.W., Lugo P.E.; 1973 - Flood Prone Areas in the San Francisco Bay Region, California; United States Geological Survey Open File Report.

2013 (CBC) California Building Code, Title 24, Part 2.

TABLES

TABLE I

SUMMARY OF LABORATORY TESTS

Sample No.	Depth Ft.	In-Place Conditions: Moisture Content % Dry Wt.	In-Place Conditions: Dry Density p.c.f.	Direct Shear Testing: Unit Cohesion k.s.f.	Direct Shear Testing: Angle of Internal Friction Degrees	Liquid Limit L.L.	Plasticity Index P.I.
1-1	2	4.6	105.3	0	34		
1-2	5	5.3	123.1				
1-3	10	5.0	124.7				
1-4	15	6.2	125.5				
1-5	20	4.8	124.3				
2-1	2	5.6	103.1				
2-2	5	5.1	120.5				
2-3	10	4.7	123.3				
2-4	15	6.0	126.4				
2-5	20	4.5	125.8				
3-1	2	5.0	104.7				
3-2	5	5.9	122.2				
3-3	10	4.4	124.8				

TABLE II

PROPOSED ASPHALT PAVEMENT SECTIONS

Location: Proposed Residential Development
15980 Carlton Avenue
San Jose, California

	PARKING STALLS			DRIVEWAY/STREET*		
Design R-Value	24.0			24.0		
Traffic Index	4.5			5.5		
Gravel Equivalent	14.0			16.0		
Recommended Alternate Pavement Sections:	1A	1B	1C	2A	2B	2C
Asphalt Concrete	3.0"	3.5"	4.0"	3.0"	3.5"	4.0"
Class II Baserock (R=78 min.) compacted to at least 95% relative maximum density	6.0"	5.0"	4.0"	9.0"	8.0"	7.0"
Subgrade soil scarified and compacted to at least 95% relative maximum density	12.0"	12.0"	12.0"	12.0"	12.0"	12.0"

*Can support 75,000 lb fire apparatus.

TABLE III

PROPOSED CONCRETE PAVEMENT SECTIONS

Location: Proposed Residential Development
15980 Carlton Avenue
San Jose, California

	DRIVEWAY *	SIDEWALK/PATIO**
Recommended Rigid Pavement Sections:		
P.C. Concrete	6.0"	4.0"
Class II Baserock (R=78 min.) compacted to at least 95% relative maximum density	6.0"	4.0"
Subgrade soil scarified and compacted to at least 95% relative maximum density	12.0"	12.0"

* Including trash enclosures, stress slabs, valley gutters, and curb & gutters. Minimum reinforcement with No. 4 rebar at 18" maximum spacing, on-center, both ways. Maximum control joints at 10' x 10'.

** Minimum reinforcement with No. 3 rebar at 18" maximum spacing, on-center, both ways. Maximum control joints at 10' x 10'.

TABLE IV

PROPOSED PAVER PAVEMENT SECTIONS

Location: Proposed Residential Development
15980 Carlton Avenue
San Jose, California

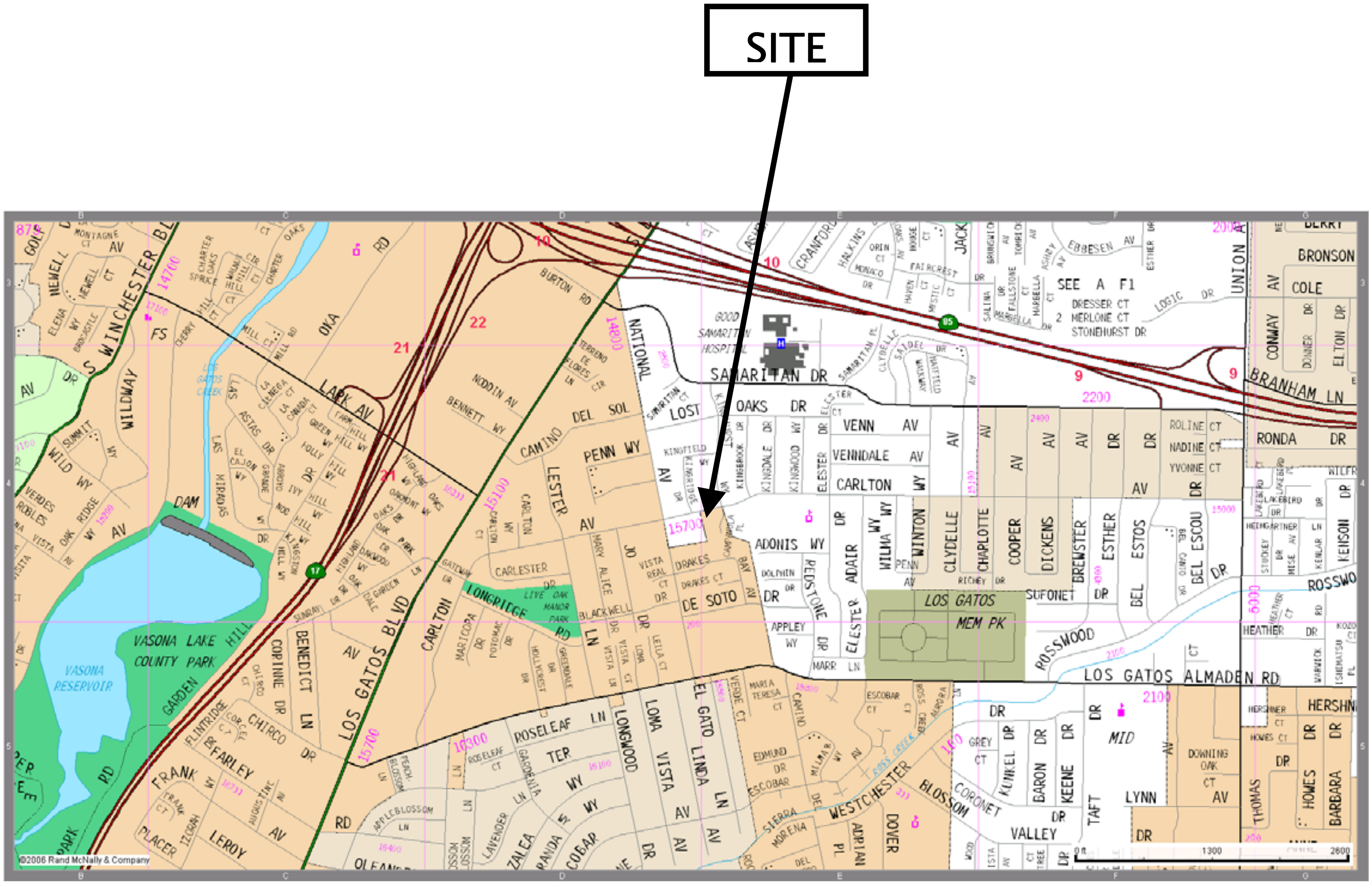
	DRIVEWAY AREA**		
Recommended Paver Pavement Sections:	1A*	1B	1C
Vehicular Rated Pavers	Min. 3.25" ± Permeable Paver	Min. 3.25" ± Permeable Paver	Min. 3.25" ± Non-Permeable Paver
ASTM No. 8 Bedding Course & Paver Filler	2.0"	2.0"	2.0"
3/4" Clean Crushed Rock (ASTM No. 57 Stone)	12.0"	4.0"	---
ASTM No. 2 Stone	---	12.0"	---
Class II Baserock (R=78 min.) compacted to at least 95% relative maximum density	---	---	12.0"
Subgrade soil scarified and compacted to at least 90% relative maximum density	12.0"	12.0"	12.0"

* The subgrade should be lined with a geotextile membrane Mirafi 500X or equivalent. The membrane should be place and overlapped properly for drainage. The subgrade should be sloped at a minimum of 2% towards the subdrain system away from the building foundation. The Mirafi 500X should not cover the subdrain system.

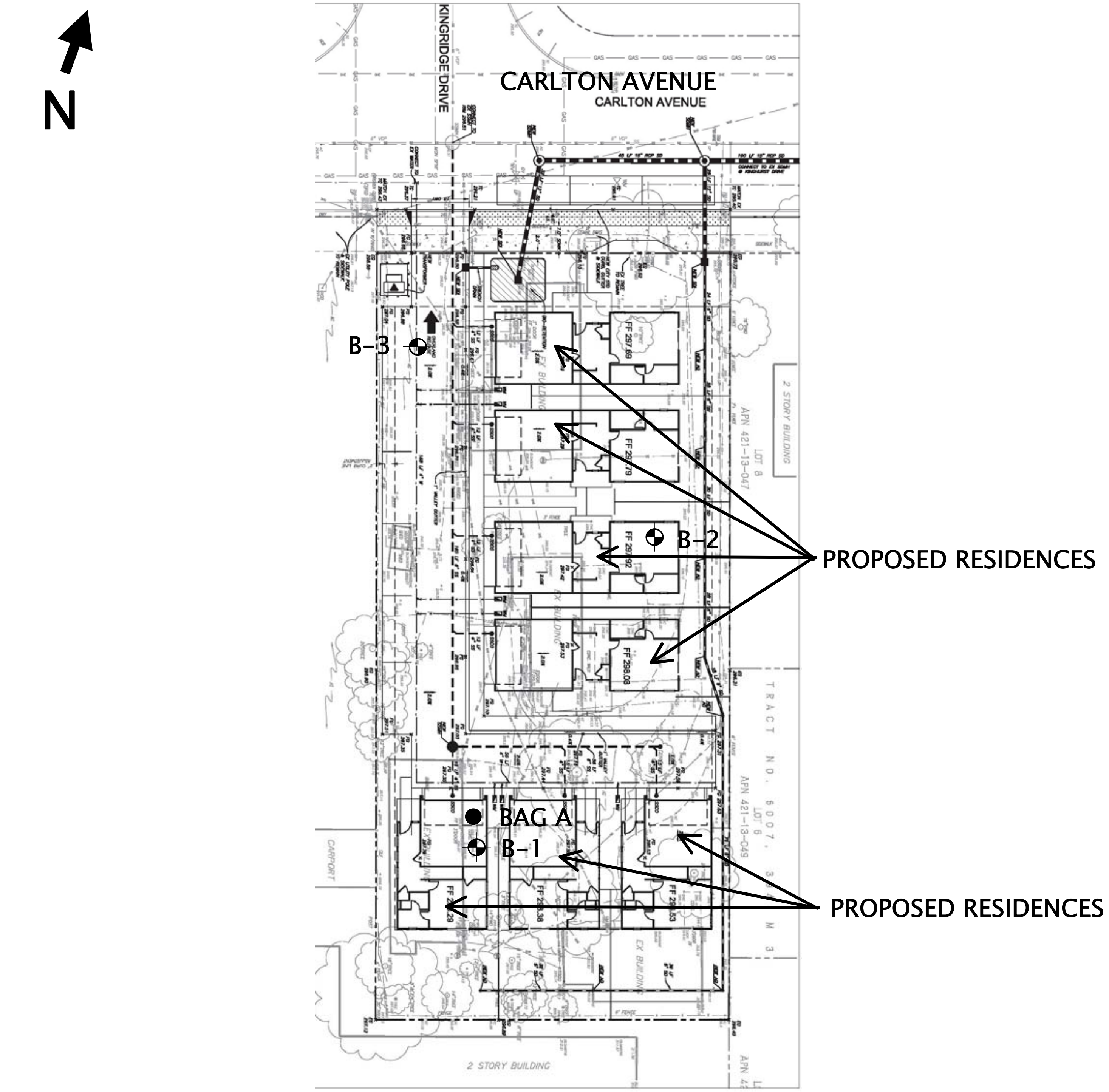
The subdrain system should consist of a 4-inch diameter perforated pipe surrounded by ¾ inch drain rock wrapped in a filter fabric. The drain rock wrapped in fabric should be at least 12 inches wide and 12 inches below the finished subgrade elevation. The drainage system should be sloped to a discharge facility.

** The pavers should be bordered with a concrete curb/band. Typically, minor maintenance would be required during the life of the pavers.

<u>FIGURES</u>

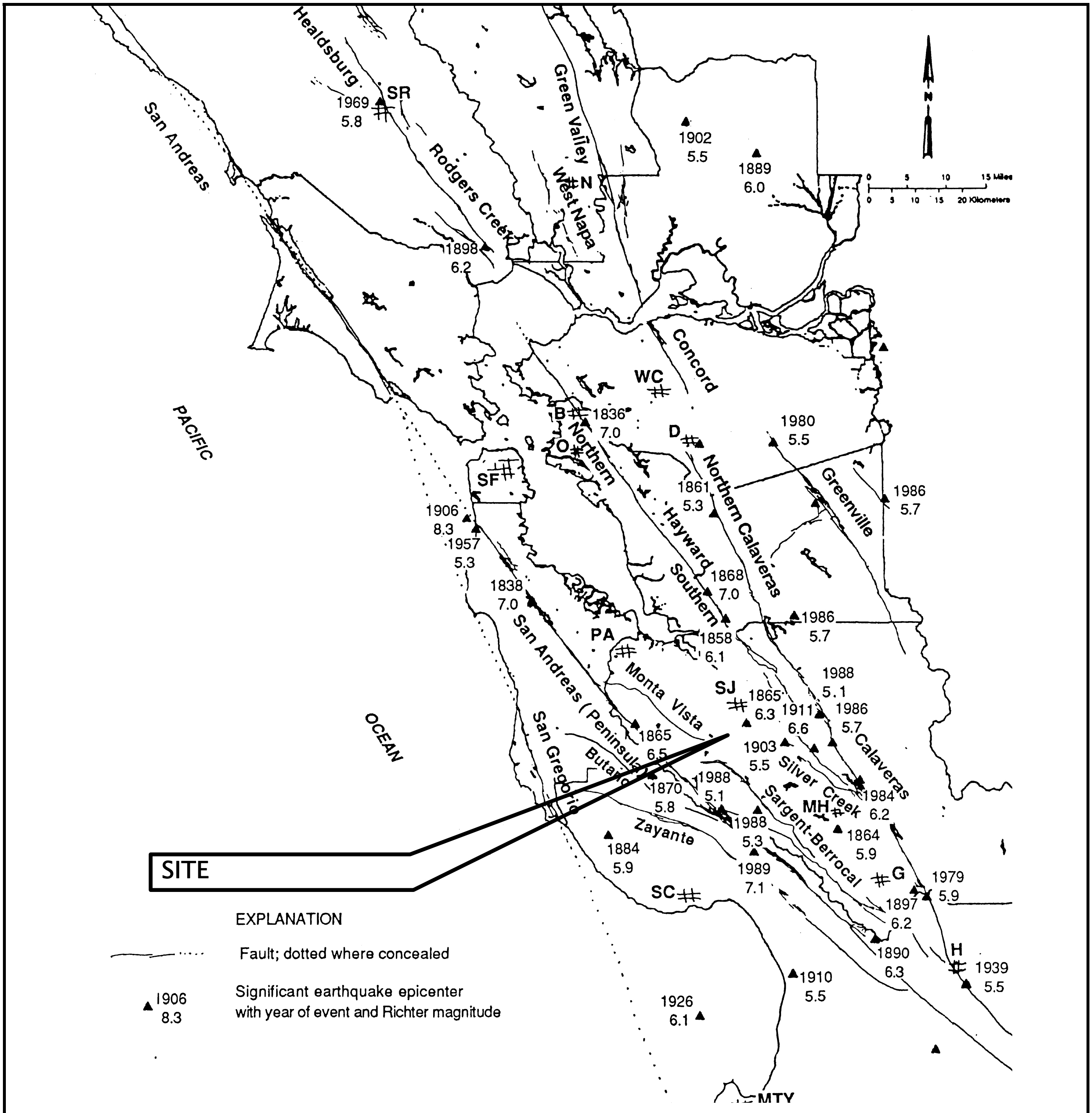


Silicon Valley Soil Engineering 2391 Zanker Road, #350 San Jose, CA 95131 (408) 324-1400	**VICINITY MAP** Proposed Residential Development 15980 Carlton Avenue San Jose, California	File No.: SV1511	FIGURE
		Drawn by: V.V.	1
		Scale: NOT TO SCALE	December 2016



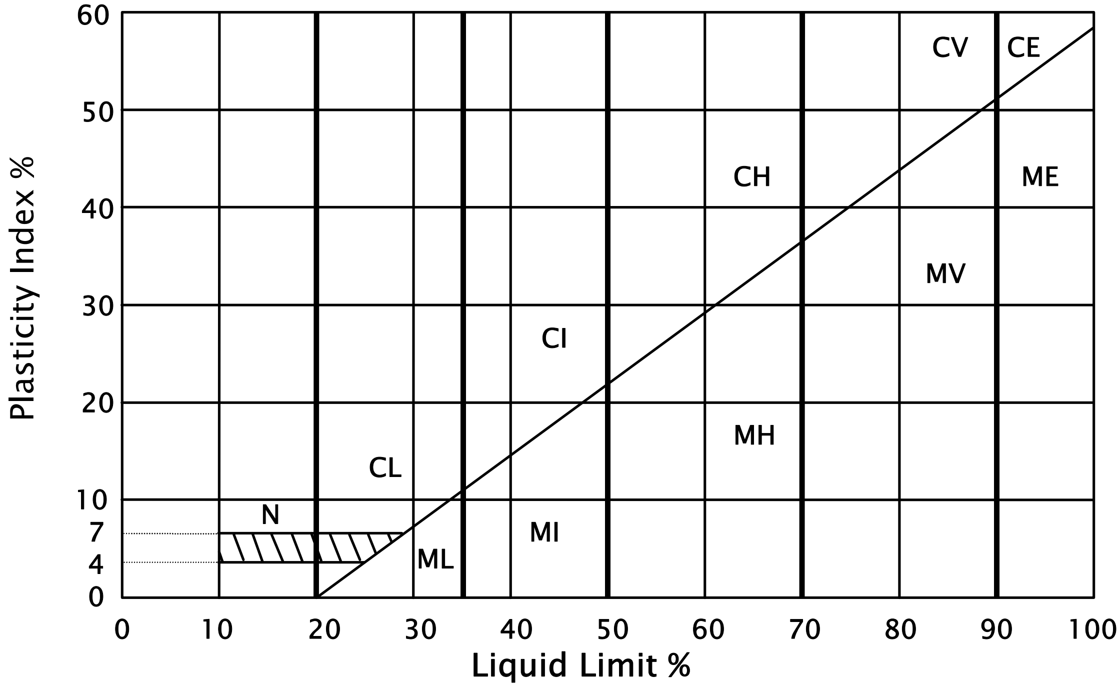
NOTE: ⊕ DENOTES APPROXIMATE EXPLORATORY BORING LOCATION
● DENOTES APPROXIMATE EXPLORATORY BAG SAMPLE LOCATION

Silicon Valley Soil Engineering 2391 Zanker Road, #350 San Jose, CA 95131 (408) 324-1400	**SITE PLAN** Proposed Residence Development 15980 Carlton Avenue San Jose, California	File No.: SV1511 Drawn by: V.V. Scale: NOT TO SCALE	FIGURE 2 December 2016



Silicon Valley Soil Engineering 2391 Zanker Road, #350 San Jose, CA 95131 (408) 324-1400	**FAULT LOCATION MAP** Proposed Residential Development 15980 Carlton Avenue San Jose, California	File No.: SV1511 Drawn by: V.V. Scale: NOT TO SCALE	FIGURE 3 December 2016

PLASTICITY CHART

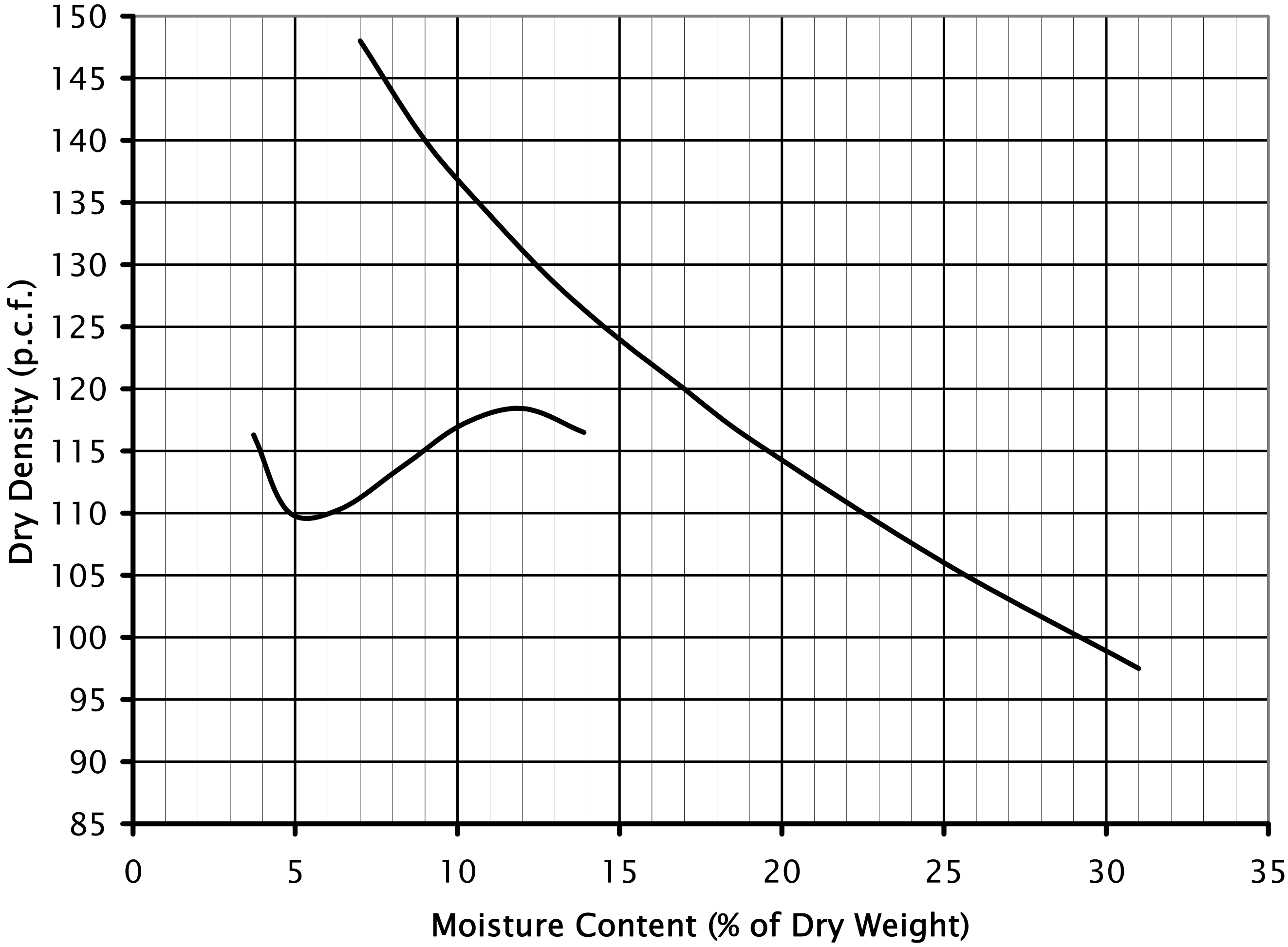


PLASTICITY DATA

Key Symbol	Hole No.	Depth ft.	Liquid Limit %	Plasticity Index %	Unified Soil Classification Symbol *
●	BAG A	0-1	---	---	NON-PLASTIC

*Soil type classification Based on British suggested revisions to Unified Soil Classification System

Silicon Valley Soil Engineering 2391 Zanker Road, #350 San Jose, CA 95131 (408) 324-1400	**PLASTICITY INDEX** Proposed Residential Development 15980 Carlton Avenue San Jose, California	File No.: SV1511 Drawn by: V.V. Scale: NOT TO SCALE	FIGURE 4 December 2016



SAMPLE: A

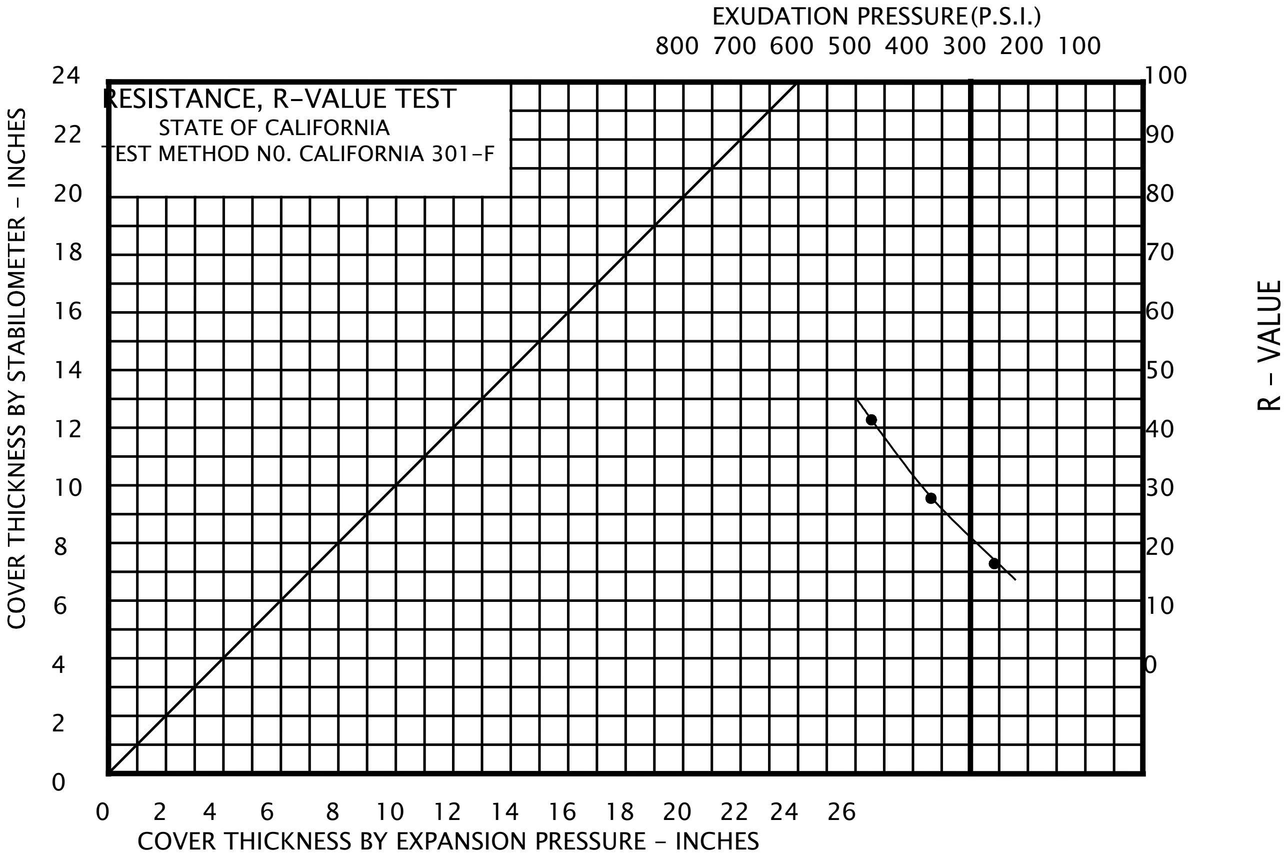
DESCRIPTION: Brown Gravelly SAND

LABORATORY TEST PROCEDURE: ASTM D1557-12

MAXIMUM DRY DENSITY: 118.0 p.c.f.

OPTIMUM MOISTURE CONTENT: 12.0 %

Silicon Valley Soil Engineering 2391 Zanker Road, #350 San Jose, CA 95131 (408) 324-1400	COMPACTION TEST A Proposed Residential Development 15980 Carlton Avenue San Jose, California	File No. SV1511	FIGURE
		Drawn by: V.V.	5
		Scale: NOT TO SCALE	December 2016



SAMPLE: A
DESCRIPTION: Brown Gravelly SAND

SPECIMEN	A	B	C
EXUDATION PRESSURE (P.S.I.)	216.0	329.0	431.0
EXPANSION DIAL (.0001")	33.0	60.0	85.0
EXPANSION PRESSURE (P.S.F.)	143.0	260.0	368.0
RESISTANCE VALUE, "R"	16.0	27.0	41.0
% MOISTURE AT TEST	16.3	15.3	14.4
DRY DENSITY AT TEST (P.C.F.)	110.1	112.3	115.3
R-VALUE AT 300 P.S.I. EXUDATION PRESSURE	= (24)		

Silicon Valley Soil Engineering 2391 Zanker Road, #350 San Jose, CA 95131 (408) 324-1400	**R-VALUE TEST** Proposed Residential Development 15980 Carlton Avenue San Jose, California	File No. SV1511 Drawn by: V.V. Scale: NOT TO SCALE	FIGURE 6 December 2016

APPENDICES

MODIFIED MERCALLI SCALE

METHOD OF SOIL CLASSIFICATION

KEY TO LOG OF BORING

EXPLORATORY BORING LOGS (B-1, B-2, & B-3)

GENERAL COMPARISON BETWEEN EARTHQUAKE MAGNITUDE AND THE EARTHQUAKE EFFECTS DUE TO GROUND SHAKING

Earthquake Category	Richter Magnitude	Modified Mercalli Intensity Scale* (After Housner, 1970)	Damage to Structure
		I – Detected only by sensitive instruments.	
	2.0	II – Felt by few persons at rest, especially on upper floors; delicate suspended objects may swing.	
	3.0	III – Felt noticeably indoors, but not always recognized as an earthquake; standing cars rock slightly, vibration like passing truck.	No Damage
Minor		IV – Felt indoors by many, outdoors by a few; at night some awaken; dishes, windows, doors disturbed; cars rock noticeably.	
	4.0	V – Felt by most people; some breakage of dishes, windows, and plaster; disturbance of tall objects.	Architectural Damage
		VI – Felt by all; many are frightened and run outdoors; falling plaster and chimneys; damage small.	
5.3	5.0	VII – Everybody runs outdoors. Damage to building varies, depending on quality of construction; noticed by drivers of cars.	
Moderate	6.0	VIII – Panel walls thrown out of frames; fall of walls, monuments, chimneys; sand and mud ejected; drivers of cars disturbed.	
6.9		IX – Buildings shifted off foundations, cracked, thrown out of plumb; ground cracked, underground pipes broken; serious damage to reservoirs and embankments.	Structural Damage
Major	7.0	X – Most masonry and frame structures destroyed; ground cracked; rail bent slightly; landslides.	
7.7		XI – Few structures remain standing; bridges destroyed; fissures in ground; pipes broken; landslides; rails bent.	
Great	8.0	XII – Damage total; waves seen on ground surface; lines of sight and level distorted; objects thrown into the air; large rock masses displaced.	Near Total Destruction

*Intensity is a subject measure of the effect of the ground shaking, and is not engineering measure of the ground acceleration.

File No. SV1511

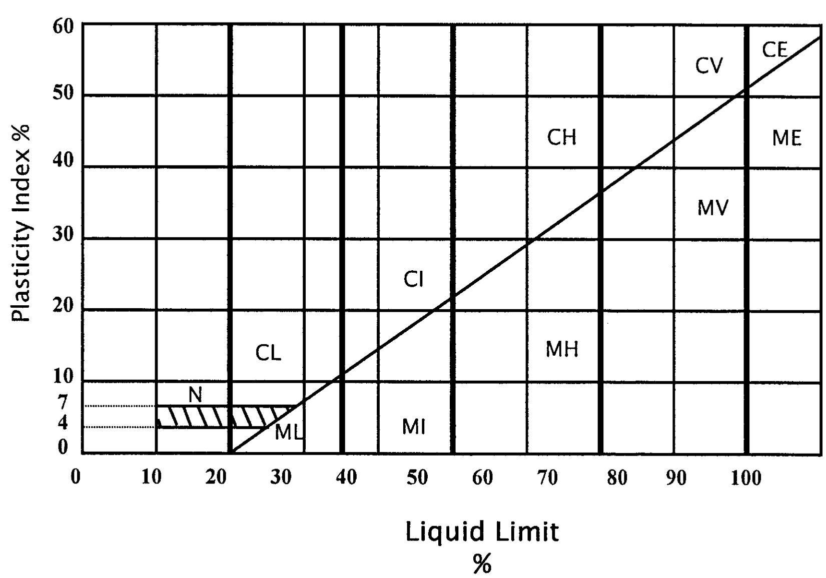
METHOD OF SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOL	TYPICAL NAMES
COARSE GRAINED SOILS	(More than 1/2 of soil > no. 200 sieve size)	GRAVELS	GW	Well graded gravel or gravel-sand mixtures, little or no fines
		(More than 1/2 of	GP	Poorly graded gravel or gravel-sand moistures, little or no fines
		coarse fraction >	GM	Silty gravels, gravel-sand-silt mixtures
		no. 4 sieve size)	GC	Clayey Gravels, gravel-sand-clay mixtures
		SANDS	SW	Well graded sands or gravelly sands, no fines
		(More than 1/2 of	SP	Poorly graded sands or gravelly sands, no fines
		coarse fraction <	SM	Silty sands, sand-silt mixtures
		no. 4 sieve size	SC	Clayey sands, sand-clay mixtures
FINE GRAINED SOILS	(More than 1/2 of soil < no. 200 sieve size)	SILTS & CLAYS	ML	Inorganic silts and very fine sand, rock, flour, silty or clayey fine sand or clayey silt/slight plasticity
		LL < 50	CL	Inorganic clay of low to medium plasticity, gravelly clayes, sandy clay, silty clay, lean clays
			OL	Organic siltys and organic silty clay of low plasticity
		SILTS & CLAYS	MH	Inorganic silts, micaceous or diatocaceous fine sandy, or silty soils, elastic silt
		LL > 50	CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOIL			PT	Peat and other highly organic soils

CLASSIFICATION CHART - UNIFIED SOIL CLASSIFICATION SYSTEM

CLASSIFICATION	RANGE OF GRAIN SIZES	
	U.S. Standard Sieve Size	Grain Size In Millimeters
BOULDERS	Above 12"	Above 305
COBBLES	12" to 3"	305 to 76.2
GRAVELS Coarse Fine	3" to No. 4 3" to 3/4" 3/4" to No. 4	76.2 to 4.76 76.2 to 19.1 19.1 to 4.76
SAND Coarse Medium Fine	No. 4 to No. 200 No. 4 to No. 10 No.10 to No. 40 No.40 to No. 200	4.76 to 0.074 4.76 to 2.00 2.00 to 0.420 0.420 to 0.074
SILT AND CLAY	Below No. 200	Below 0.074

PLASTICITY INDEX CHART



Project: Proposed Residential Development **Project Location:** 15980 Carlton Avenue San Jose, California **Project Number:** SV1511	**Silicon Valley Soil Engineering** **2391 Zanker Road, Suite 350** **San Jose, CA 95131** **(408) 324-1400**	Key to Log of Boring **Sheet 1 of 1**

Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Direct Shear Test - Cohesion in ksf	Direct Shear Test - Internal Friction Angle in degrees	Liquid Limit - LL, %	Plasticity Index - PI, %
1	2	3	4	5	6	7	8	9	10	11	12	13

COLUMN DESCRIPTIONS

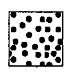
1 Depth (feet): Depth in feet below the ground surface.
2 Sample Type: Type of soil sample collected at the depth interval shown.
3 Sample Number: Sample identification number.
4 Sampling Resistance, blows/ft: Number of blows to advance driven sampler one foot (or distance shown) beyond seating interval using the hammer identified on the boring log.
5 Material Type: Type of material encountered.
6 Graphic Log: Graphic depiction of the subsurface material encountered.
7 MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
8 Water Content, %: Water content of the soil sample, expressed as percentage of dry weight of sample.
9 Dry Unit Weight, pcf: Dry weight per unit volume of soil sample measured in laboratory, in pounds per cubic foot.
10 Direct Shear Test - Cohesion in ksf: Cohesion is the y-axis intercept of the failure envelope tangent to the Mohr circles.
11 Direct Shear Test - Internal Friction Angle in degrees: The internal friction angle (Phi) is the angle inclination of the failure envelope.
12 Liquid Limit - LL, %: Liquid Limit, expressed as a water content.
13 Plasticity Index - PI, %: Plasticity Index, expressed as a water content.

FIELD AND LABORATORY TEST ABBREVIATIONS

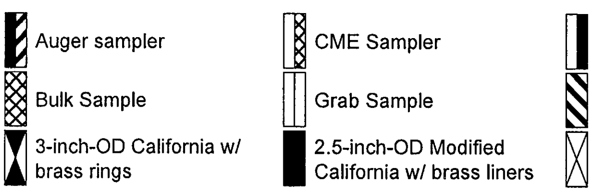
CHEM: Chemical tests to assess corrosivity
COMP: Compaction test
CONS: One-dimensional consolidation test
LL: Liquid Limit, percent
PI: Plasticity Index, percent
SA: Sieve analysis (percent passing No. 200 Sieve)
UC: Unconfined compressive strength test, Qu, in ksf
WA: Wash sieve (percent passing No. 200 Sieve)

MATERIAL GRAPHIC SYMBOLS

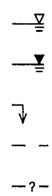

Poorly graded GRAVEL (GP)


Poorly graded SAND (SP)

TYPICAL SAMPLER GRAPHIC SYMBOLS


Auger sampler
Bulk Sample
3-inch-OD California w/ brass rings
CME Sampler
Grab Sample
2.5-inch-OD Modified California w/ brass liners
Pitcher Sample
2-inch-OD unlined split spoon (SPT)
Shelby Tube (Thin-walled, fixed head)

OTHER GRAPHIC SYMBOLS


Water level (at time of drilling, ATD)
Water level (after waiting)
Minor change in material properties within a stratum
Inferred/gradational contact between strata
Queried contact between strata

GENERAL NOTES

1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

Project: Proposed Residential Development Project Location: 15980 Carlton Avenue San Jose, California Project Number: SV1511	Silicon Valley Soil Engineering 2391 Zanker Road, Suite 350 San Jose, CA 95131 (408) 324-1400	# Log of Boring B-1 Sheet 1 of 1

Date(s) Drilled **12/12/16**	Logged By **V.V.**	Checked By
Drilling Method **Solid Stem Auger**	Drill Bit Size/Type **4-inch**	Total Depth of Borehole **21.5 feet**
		Approximate Surface Elevation **feet**
Groundwater Level and Date Measured	Sampling Method(s) **Modified California**	Hammer Data **140 lbs**
Borehole Backfill **Grout**	Location	

Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Direct Shear Test - Cohesion in ksf	Direct Shear Test - Internal Friction Angle in degrees	Liquid Limit - LL, %	Plasticity Index - PI, %
0				SP		Brown Gravelly SAND Damp, dense SAND: Medium grained, poorly graded						
		1-1	45				4.6	105.3	0	34		
4				GP		Brown Sandy GRAVEL Dry, dense GRAVEL: 2.5 inches maximum diameter Sub-angular to sub-rounded, well graded						
5		1-2	45				5.3	123.1				
10		1-3	55+				5.0	124.7				
15		1-4	55+				6.2	125.5				
20		1-5	55+				4.8	124.3				
21.5						Boring terminated at 21.5 feet						
25												
30												

Project: Proposed Residential Development Project Location: 15980 Carlton Avenue San Jose, California Project Number: SV1511	**Silicon Valley Soil Engineering** **2391 Zanker Road, Suite 350** **San Jose, CA 95131** **(408) 324-1400**	# Log of Boring B-2 **Sheet 1 of 1**

Date(s) Drilled **12/12/16**	Logged By **V.V.**	Checked By
Drilling Method **Solid Stem Auger**	Drill Bit Size/Type **4-inch**	Total Depth of Borehole **21.5 feet**
		Approximate Surface Elevation **feet**
Groundwater Level and Date Measured	Sampling Method(s) **Modified California**	Hammer Data **140 lbs**
Borehole Backfill **Grout**	Location	

Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Direct Shear Test - Cohesion in ksf	Direct Shear Test - Internal Friction Angle in degrees	Liquid Limit - LL, %	Plasticity Index - PI, %
0				SP		Brown Gravelly SAND Damp, dense SAND: Medium grained, poorly graded						
		2-1	43				5.6	103.1				
4				GP		Brown Sandy GRAVEL Dry, dense GRAVEL: 2.5 inches maximum diameter Sub-angular to sub-rounded, well graded						
5		2-2	46				5.1	120.5				
10		2-3	55+				4.7	123.3				
15		2-4	55+				6.0	126.4				
20		2-5	55+				4.5	125.8				
21.5						Boring terminated at 21.5 feet						
25												
30												

Project: Proposed Residential Development **Project Location:** 15980 Carlton Avenue San Jose, California **Project Number:** SV1511	**Silicon Valley Soil Engineering** **2391 Zanker Road, Suite 350** **San Jose, CA 95131** **(408) 324-1400**	# Log of Boring B-3 **Sheet 1 of 1**

Date(s) Drilled **12/12/16**	Logged By **V.V.**	Checked By
Drilling Method **Solid Stem Auger**	Drill Bit Size/Type **4-inch**	Total Depth of Borehole **11.5 feet**
		Approximate Surface Elevation **feet**
Groundwater Level and Date Measured	Sampling Method(s) **Modified California**	Hammer Data **140 lbs**
Borehole Backfill **Grout**	Location	

Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Direct Shear Test - Cohesion in ksf	Direct Shear Test - Internal Friction Angle in degrees	Liquid Limit - LL, %	Plasticity Index - PI, %
0				SP		Brown Gravelly SAND Damp, dense SAND: Medium grained, poorly graded						
	■	3-1	46				5.0	104.7				
4				GP		Brown Sandy GRAVEL Dry, dense GRAVEL: 2.5 inches maximum diameter Sub-angular to sub-rounded, well graded						
5	■	3-2	44				5.9	122.2				
10	■	3-3	55+				4.4	124.8				
11.5						Boring terminated at 11.5 feet						
15												
20												
25												
30												