REPORT TO

ANJIN DESIGN INC.
SAN JOSE, CALIFORNIA

FOR

PROPOSED RESIDENTIAL SUBDIVISION

2303 GIANERA STREET
SANTA CLARA, CALIFORNIA

GEOTECHNICAL INVESTIGATION

FEBRUARY 2023

PREPARED BY

SILICON VALLEY SOIL ENGINEERING
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GEOTECHNICAL CONSULTANTS

File No. SV2529
February 23, 2023

Anjin Design Inc.
1885 Lundy Avenue, Ste 200
San Jose, CA 95131

Attention: Vincent Yan

Subject: Proposed Residential Subdivision
2303 Gianera Street
Santa Clara, California
GEOTECHNICAL INVESTIGATION

Dear Vincent Yan:

Pursuant to your request, we are pleased to transmit herein the results of our geotechnical investigation for the proposed residential subdivision. The subject site is located at 2303 Gianera Street in Santa Clara, 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

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SV2529.GI/Copies: 1 to Anjin Design Inc.

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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 subject site is located at 2303 Gianera Street in Santa Clara, California (Figure 1 – Vicinity Map). Gianera Street bounds the subject site to the southeast, existing residences to the southwest and northeast, and utility easement to the northwest. At the time of our investigation, the site was a rectangular shaped, relatively flat parcel of land occupied by residential structures. The proposed development will include the demolition of the existing structure(s) and construction of seven two-story residences with associated improvements. Location of the proposed residences and our exploratory soil borings is shown on the 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 subject site under the direction of our geotechnical engineer. It included a site reconnaissance to detect any unusual surface features, and the drilling of four exploratory test borings to determine the subsurface soil characteristics. The borings were drilled on February 14, 2023 to the depths of 5, 10, and 50 feet below the existing ground surface elevation. The borings were drilled with a truck-mounted drill rig using 8-inch diameter hollow stem augers and hand-held augers. The approximate location of the borings is shown on Figure 2 – Site Plan.

The soils encountered were logged continuously in the field during the drilling operations. Relatively undisturbed soil samples were obtained by hammering a 2.0-inch outside diameter (O.D.) split-tube sampler for a Standard Penetration Test (SPT), ASTM Standard D1586 into the ground at various depths. A 2.5-inch diameter split-tube sampler (Modified California) was utilized to obtain soil sample for direct shear tests at the depths of 1.5 feet to 3 feet. 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 log as penetration resistance. In addition, disturbed bulk samples of the near-surface soil were collected for laboratory analyses. The Exploratory Boring Log(s) 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.

1. Water content and dry unit weight 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).

2. The strength parameters of the foundation soils were determined from direct shear tests that were performed on selected relatively undisturbed soil samples (Table I).

3. 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 and liquefaction analysis (Table I & Figure 4).

4. Laboratory compaction tests of the native soil material were performed to determine the maximum dry density per the ASTM D1557 test procedure (Figure 5).
5. One R-Value test was performed on a near surface soil sample for pavement section design recommendations (Figure 6).

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, the surface material consists of 3.0 inches organic material. Below the organic layer to a depth of 7.0 feet, a black, moist, stiff silty clay layer was encountered. A color change of medium gray was noted at the depth of 4 feet. From the depths of 7 feet to 12 feet, the soil became medium brown, moist, stiff sandy silty clay. From the depths of 12 feet to 20 feet, an olive brown, moist, stiff clayey silt/silty clay layer was encountered. From the depths of 20 feet to the end of the boring at 50 feet, the soil became olive brown, moist, stiff silty clay. A color change of bluish gray was noted at the depth of 43 feet. Similar soil profile were encountered in other borings.

Groundwater was initially encountered in Boring B-1 to the depth of 23 feet and stabilized at the end of the drilling operation at 22 feet. 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(s) 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). Earthquake probability and faults are shown on Figure 3.

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 subject site is underlain by fluvial deposits (Helley and Brabb, 1971, Rogers & Williams, 1974).

LIQUEFACTION ANALYSIS:

The site is located within the State of California Seismic Hazard Zone for liquefaction (CGS, USGS). Therefore, a liquefaction analysis was performed.

A. GROUNDWATER

Groundwater was initially encountered in Boring B-1 to the depth of 23 feet and stabilized at the end of the drilling operation at 22 feet. Based on the State guidelines and CGS Seismic Hazard Zone Report 051 [Seismic Hazard Evaluation of the Milpitas 7.5-Minute Quadrangle, Alameda and Santa Clara Counties, California (Updated 1/13/2006). Department of Conservation. Division of Mines and Geology], the highest expected groundwater level is approximately 7 feet below ground elevation. Therefore, this depth of the groundwater table will be used for the liquefaction analysis.

B. SUSPECTED LIQUEFIABLE SOIL LAYERS

The site is located within the State of California Seismic Hazard Zone for liquefaction (CGS, USGS). The State Guidelines (CGS Special Publication 117A, revised 2008, Southern California Earthquake Center, 1999) were followed by this study. Based on recent studies (Bray and Sancio, 2006, Boulanger and Idriss, 2004), the "Chinese Criteria", previously used as the liquefaction screening (CGS SP 117, SCEC, 1999) is no longer valid indicator of liquefaction susceptibility. The revised screening criteria clearly stated that liquefaction is the transformation of loose saturated silts, sands, and clay with a Plasticity Index (PI) < 12 and moisture content (MC) > 85% of the liquid limits are susceptible to liquefaction and with a plasticity index 12 < (PI) < 18 and moisture content (MC) > 80% of the liquid limits (LL) are moderately susceptible to liquefaction. Moreover, sensitive soils having PI > 18 can undergo severe strength loss, so engineering judgement must be applied when using screening criteria. Therefore, it is recommended that both PI and water content criteria be considered for screening criteria. This occurs under vibratory conditions such as those induced by a seismic event. To help evaluate liquefaction potential, samples of potentially liquefiable soil were obtained by hammering the split tube sampler into the ground. The number of blows required driving the sampler the last 12 inches of the 18-inch sampled interval were recorded on the log of test boring. The number of blows was recorded as a Standard Penetration Test (SPT), ASTM Standard D1586-92.

The results from our exploratory boring show that the subsurface soil material in Boring B-1 to the depth of 50.0 feet consists of stiff silty clay to stiff sandy silty clay to stiff clayey silt/silty clay to stiff silty clay. The following is the determination of the liquefiable soil for each soil layer in Boring B-1.

1. The stiff silty clay layer from the surface to the depth of 7 feet is not liquefiable soil because it is above the highest expected groundwater table (7 feet).

2. The stiff sandy silty clay layer from the depths of 7 feet to 12 feet is not liquefiable soil based on the Plasticity Index (PI) and Water content (Wc) over Liquid Limit (LL) ratio:

   - Sample No. 1-3 (10 feet); Wc = 21.0%; LL = 35; Wc/LL = 0.60; PI = 19

3. The stiff clayey silt/silty clay layer from the depths of 12 feet to 20 feet is not liquefiable soil based on the Plasticity Index (PI) and Water content (Wc) over Liquid Limit (LL) ratio:

   - Sample No. 1-4 (15 feet); Wc = 22.8%; LL = 32; Wc/LL = 0.71; PI = 18

4. The stiff silty clay layer from the depths of 20 feet to the end of boring at 50 feet is not liquefiable soil based on the Plasticity Index (PI) and Water content (Wc) over Liquid Limit (LL) ratio:

   - Sample No. 1-6 (25 feet); Wc = 22.6%; LL = 36; Wc/LL = 0.63; PI = 19
   - Sample No. 1-8 (35 feet); Wc = 21.1%; LL = 37; Wc/LL = 0.57; PI = 18
   - Sample No. 1-9 (40 feet); Wc = 20.9%; LL = 35; Wc/LL = 0.60; PI = 19
   - Sample No. 1-10 (50 feet); Wc = 21.5%; LL = 37; Wc/LL = 0.58; PI = 19

The similar liquefaction screening process was used for Boring B-3.

In summary, there is no suspected liquefiable soil layer underlying Boring B-1 and Boring B-3.

The screening analysis for the suspected liquefiable soil layer is presented in a graphical format as shown in Figure 7A and Figure 7B – Liquefaction susceptible Criteria (Boring B-1) and Figure 8A and Figure 8B – Liquefaction susceptible Criteria (Boring B-3).

C. LIQUEFACTION CONCLUSION

Since there is no liquefiable soil layer underlying the subject site, the potential for liquefaction is minimal.

INUNDATION POTENTIAL

The subject site is located at 2303 Gianera Street in Santa Clara, California. Based on FEMA Flood Map, the site is located in Zone “X” – “Area with Reduced Flood Risk Due to Levee”.

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 and the native surface soil at the subject site has been found to have a high expansion potential when subjected to fluctuations in moisture.

3. The final exterior grade adjacent to the proposed structures should be graded to permit proper drainage and diversion of water away from the foundation.

4. The proposed residences should be supported either on conventional spread foundation, mat slab foundation, or pier and grade beam foundation.

5. We recommend that a reference to our report should be stated in the grading and foundation plans that includes the geotechnical investigation report file number and date.

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

7. All earthwork including grading, backfilling, and foundation excavation shall be observed and inspected by a representative from Silicon Valley Soil Engineering (SVSE). Contact our office 48 hours prior to the commencing of any earthwork operations for inspection services.

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 which will not be incorporated in the final improvements shall be removed from the subject site prior to any grading operations.

3. The depressions left by the removal of subsurface structures should be cleaned of all debris, backfilled and compacted with clean, native or approved import soil. 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 and after stripping the organic material from the soil, the improved 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, native soil should be moisture conditioned with 3% over optimum moisture, compacted to not less than 90% relative maximum density using ASTM D1557 procedure over the entire improved area, 5 feet beyond the perimeter of the pad as permitted and 3 feet beyond the edge of the driveway area.

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 90% 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 improved area.

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. Driveway asphalt pavement section designs are presented in Table II. Rigid concrete and paver pavement section designs are presented in Table III and IV.

11. All imported soil material, if any, 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 (non-hazardous). The import soil should contain at least 30 percent fines (particles passing the No. 200 sieve) to reduce the potential for surface water to infiltrate beneath structure.

12. 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.

13. 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

14. Any water wells and/or monitoring wells that are to be discovered and abandoned on the site shall be capped according to the requirements of the Valley Water (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

15. The proposed structures should be supported either on continuous perimeter and interior spread foundation, mat slab foundation, or pier and grade beam foundation.

16. Conventional spread foundation (no isolated spread footings) should be founded at a minimum depth of 36 inches below finished subgrade pad elevation. Under these conditions, the allowable bearing capacity is 2,500 psf for conventional spread footings.

17. The mat slab foundation should have a minimum thickness of 10 inches with an 18 inch total thickened edge and 12 inch wide. A value of 120 pci as the soil modulus of subgrade of reaction and contact pressure of 1,800 psf can be used in the design of the mat foundation. The weight of the mat slab can be neglected for bearing pressures.

18. The mat slab foundation should be underlain by 16 inches of ¾-inch clean crushed rock (recycled material not acceptable) with Stego 15-mil vapor barrier. The vapor barrier should be placed between the rock layer and concrete slab. The vapor barrier membrane should be overlapped, taped at seams and/or mastic applied for protrusions.

19. Skin friction piers shall have a minimum diameter of 16 inches and penetrate a minimum of 6 feet below the lowest adjacent grade with 6 feet maximum spacing on-center. These piers can be designed with an allowable skin friction value of 600 psf. The top 1 foot of the pier should be neglected in the calculation of the allowable skin friction force and passive resistance. This value is for dead plus live loads and may be increased by 1/3 for short term seismic and wind loads.

20. All piers should be reinforced with at least four No. 5 rebars, which shall run the entire length of the piers, with the perimeter piers tied at least 12 inches into the grade beam's upper section.

21. The grade beams width should be limited to 10 inches and be founded a minimum depth of 6 inches below adjacent pad grades and should be reinforced with a minimum of two No. 4 rebars, one near the top and one near the bottom. Grade beams should be kept to a recommended width above in order to minimize any effect of uplift pressures and underlain with 3 inches of void form.

22. The above bearing values are for dead plus live loads and may be increased by one-third for short term seismic and wind loads.

23. We estimated that the total and differential settlements of the proposed structures would be on the order of 0.5 inch and 0.25 inch, respectively.

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

25. Because of the high expansion potential of the surface native soil, we recommend any footing excavation should be saturated with water (not overly saturated) and periodically daily after footing excavation and prior to concrete placement.

26. The project structural engineer responsible for the foundation design should determine the final design of the foundation and reinforcing

required. The design of the structure and the foundation shall meet local building code requirements. We recommend that the foundation plans be reviewed by our office prior to submitting to the appropriate local agency and/or to construction.

2022 CBC SEISMIC VALUES

27. Chapter 16 of the 2022 California Building Code (CBC) outlines the procedure for seismic design. The site categorization and site coefficients are shown in the following table.

Classification/Coefficient*	Design Value
Site Latitude	37.400934° N.
Site Longitude	121.965485° W.
Site Class (ASCE 7-16)	D
Risk Category	I,II,III
0.2-second Mapped Spectra Acceleration, S_s	1.500g
1-second Mapped Spectra Acceleration, S_1	0.600g
Short-Period Site Coefficient, F_a	1.0
Long-Period Site Coefficient, F_V	1.7
0.2-second Period, Maximum considered Earthquake Spectral Response Acceleration, S_{MS} ($S_{MS} = F_a S_S$)	1.50g
1-second Period, Maximum Considered Earthquake Spectral Response Acceleration, S_{M1} ($S_{M1} = F_V S_1$)	1.02g
0.2-second Period, Designed Spectra Acceleration, S_{DS} ($S_{DS} = 2/3 S_{MS}$)	1.00g
1-second Period, Designed Spectra Acceleration, S_{D1} ($S_{D1} = 2/3 S_{M1}$)	0.68g

*2022 CBC

CONCRETE SLAB-ON-GRADE CONSTRUCTION

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

29. The concrete slab-on-grade should be underlain by a minimum of 16 inches of ¾-inch crushed rock (recycled crushed rock is not acceptable) should be placed on the compacted native subgrade. The rock should be compacted in-place with vibratory plate. The subgrade soil should be compacted to at least 90% relative maximum density.

30. The concrete slab should have a minimum thickness of 5 inches and reinforced with No. 4 rebar at maximum spacing of 18 inches on-center both ways. If the concrete slab would receive a floor covering or sealant, a Stego 15-mil vapor barrier should be placed between the rock layer and concrete slab. The vapor barrier membrane should be overlapped, taped at seams and/or mastic applied for protrusions.

RETAINING WALLS

31. General retaining walls, if any, shall be designed for a lateral earth pressure (active) equivalent to 65 pounds equivalent fluid pressure for cantilevered condition with horizontal backfill. If the retaining walls are restrained from free movement at both ends, the walls shall be designed for the earth pressure resulting from 75 pounds equivalent fluid pressure, to which shall be added surcharge loads. The structural engineer shall discuss the surcharge loads with the geotechnical engineer prior to designing the retaining walls.

32. 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 shall be neglected for computation of passive resistance.

33. The aforementioned values assume a drained condition and a moisture content compatible with those encountered during our investigation.

34. For undrained condition, lateral earth pressure (active) is 80 psf and restrained at 85 psf.

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

36. For drained condition, drainage should be provided behind the retaining wall. The drainage (subdrain) system should consist of perforated 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 drain to an appropriate discharge facility.

37. As an alternative to the drain rock and fabric backfill, Miradrain 2000 or 6000 or approved equivalent drain mat may be used behind the retaining wall. The drain mat should extend from the base of the wall to within 12 inches of 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 drain to an appropriate discharge facility.

EXCAVATION

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

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

DRAINAGE

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

41. The final exterior grade adjacent to the structures should be such that the surface drainage will flow away from the proposed structures. Rain water discharge at downspouts should be directed into hard pipes to acceptable drainage facilities which will prevent water from collecting in the soil adjacent to the foundation.

42. Utility lines that cross under or through perimeter foundation 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.

43. 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 landscape grade adjacent to the perimeter foundation should be at a minimum slope of 5 percent away from structures.

44. Bioretention systems, if any, should not be located within 10 feet from building foundation or 5 feet from driveway/parking edge and should not undermine parking curbs. If the bioretentions are no more than 5 feet from foundation and 3 feet from driveway/parking curb, the bioretention should be lined with impermeable liner (15 mil plastic or thicker) to above the overflow elevation and waterproofed if adjacent to building. Reinforced concrete curbs adjacent to bioretentions shall be deepened for proper support to bottom elevation of the bioretention gravel. Biosoil mix and gravel should not be used for calculation to support curbs.

45. Based on laboratory test results of the near surface soil at the subject site, we estimated that the infiltration rate is approximately 0.1 inches per hour ($K_{SAT} = 7x10^{-5}$ cm/sec). This rate can be used in the design of the retention system for on-site storm drainage.

ON-SITE UTILITY TRENCHING

46. Utility trenches within the public right-of-way should be excavated, bedded, and backfilled in accordance with local or governing jurisdiction requirements.

47. All utility lines including plumbing should be bedded with at least 6 inches over the pipe or conduit with 1/4, 3/8 or 3/4 inch crushed rock or well graded sand conforming to pipe manufacture's requirements. Sand and gravel should be compacted in-place.

48. The remaining excavated area should be backfilled with native on-site material or imported fill and compacted to at least 90% relative maximum density. Backfill should be placed in uniform 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.

49. 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 1H:1V (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 (75 psi minimum compressive strength).

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

PAVEMENT DESIGN

51. 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 parking area and driveway (travel way). Asphalt pavement section designs, which satisfy the State of California Standard Design Criteria, and above traffic indices, are presented in Table II. Concrete and paver pavement section designs are presented in Table III and IV.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The recommendations presented herein are based on the soil conditions revealed by our test borings 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 borings 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 borings 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. Stormwater management, structure, foundation design and calculations are not part of our investigation or scope.

8. 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.

9. 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

ASCE 7 Hazard Tool, https://asce7.online.

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. USGS MF-709.

USGS (2008). *Guidelines for Evaluating and Mitigating Seismic Hazards in California*. Special Publication 117A. Department of Conservation. Division of Mines and Geology.

USGS (2001). CGS Seismic Hazard Zone Report 051 [*Seismic Hazard Evaluation of the Milpitas 7.5-Minute Quadrangle, Alameda and Santa Clara Counties, California*. *(Updated 1/13/06)*. Department of Conservation. Division of Mines and Geology].

2022 (CBC) California Building Code, Title 24, Part 2.

TABLES

TABLE I

SUMMARY OF LABORATORY TESTS

Sample No.	Depth (Ft.)	In-Place Conditions		Direct Shear Testing		Atterberg Limits	
		Water Content (% Dry Wt.)	Dry Unit Weight (pcf)	Unit Cohesion (ksf)	Internal Friction Angle (Degrees)	Liquid Limits (L.L.)	Plasticity Index (P.I.)
1-1	3	21.6	102.9	0.8	10		
1-2	5	23.2	102.5				
1-3	10	21.0	110.6			35	19
1-4	15	22.8	102.9			32	18
1-5	20	22.8	111.1				
1-6	25	22.6	107.3			36	19
1-7	30	25.6	101.0				
1-8	35	21.1	111.7			37	18
1-9	40	20.9	111.2			35	19
1-10	50	21.5	112.7			37	19
2-1	3	23.2	96.1				
2-2	5	24.7	102.5				
2-3	10	16.7	105.0				
3-1	3	18.5	107.9				
3-2	5	26.0	100.6				
3-3	10	22.3	108.6			37	19
3-4	15	21.2	105.1			34	19
3-5	20	23.3	101.9				
3-6	25	26.4	102.0			38	19
3-7	30	21.7	104.3				
3-8	35	22.1	109.1			36	18
3-9	40	24.5	104.6			36	19
3-10	50	22.4	110.8			38	20

TABLE II

PROPOSED ASPHALT PAVEMENT SECTIONS

Location: Proposed Residential Subdivision
2303 Gianera Street
Santa Clara, California

	PARKING STALLS			DRIVEWAY *		
Design R-Value	6.0			6.0		
Traffic Index	4.5			6.0		
Gravel Equivalent	17.0			21.0		
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	9.0"	8.0"	7.0"	12.0"	11.0"	10.0"
Subgrade soil scarified & compacted to at least 90% relative maximum density	12.0"	12.0"	12.0"	12.0"	12.0"	12.0"

* Support fire apparatus of 75,000 lbs.

TABLE III

PROPOSED CONCRETE PAVEMENT SECTIONS

Location: Proposed Residential Subdivision
2303 Gianera Street
Santa Clara, California

	DRIVEWAY*	CURB & GUTTER	SIDEWALK/PATIO **
Recommended Rigid Pavement Sections:	1	2	3
P.C. Concrete*	6.0”	6.0”	4.0”
Class II Baserock (R=78 min.) compacted to at least 95% relative max. density	12.0”	8.0”	6.0”
Subgrade soil scarified & compacted to at least 90% relative max. density	12.0”	12.0”	12.0”

* Including trash enclosures, stress pads, and valley gutters.
* Reinforcement: Rebar No. 4 at 18” on-center, maximum spacing both ways. Control joints maximum spacing at 10’ by 10’.
** Reinforcement: Rebar No. 3 at 18” on-center, maximum spacing both ways. Control joints maximum spacing at 5’ by 5’.
Vertical curbs should be keyed at least 3 inches into pavement subgrade.

TABLE IV

PROPOSED PAVER PAVEMENT SECTIONS

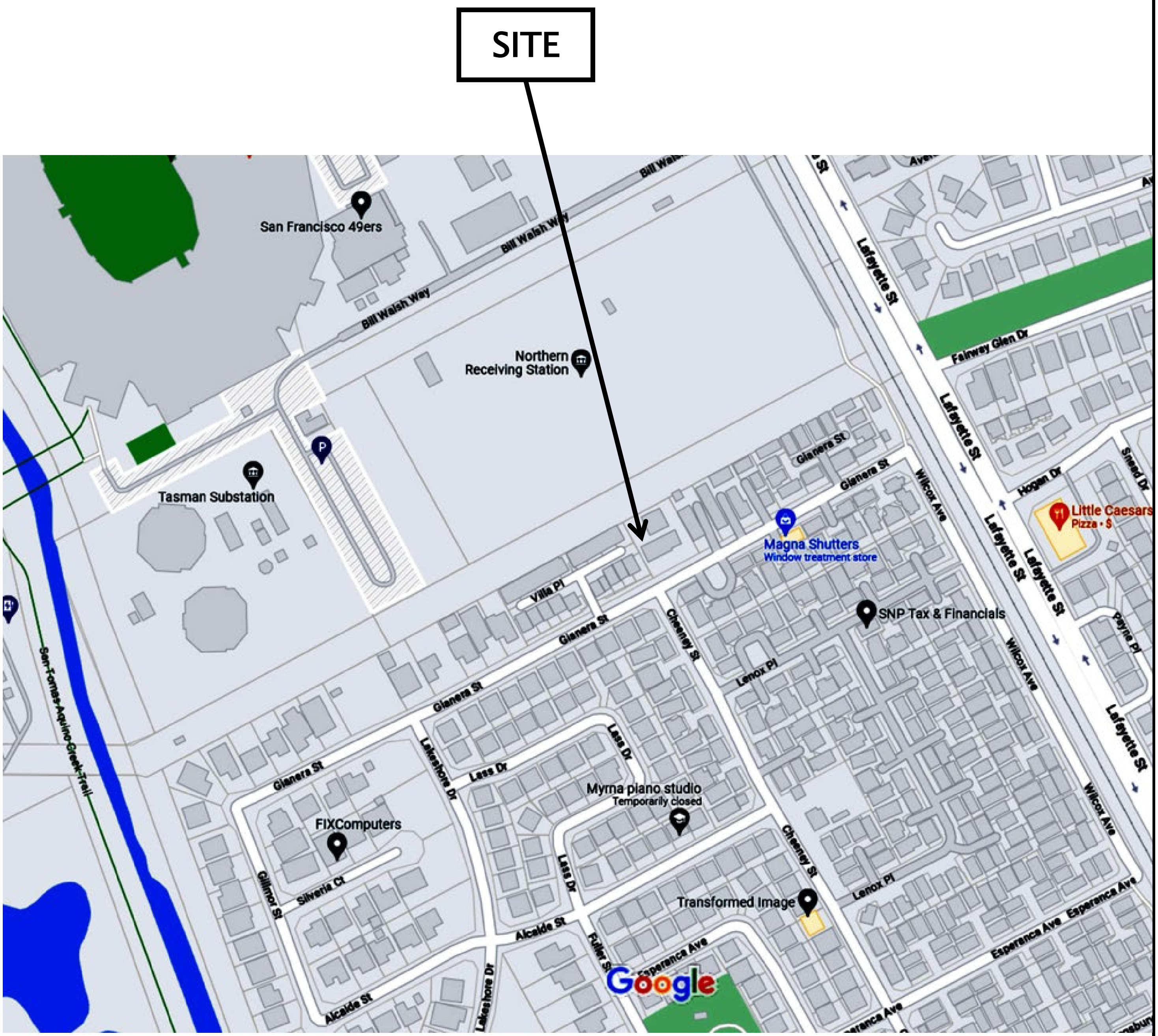
Location: Proposed Residential Subdivision
2303 Gianera Street
Santa Clara, California

	DRIVEWAY/PARKING AREA*			
Recommended Paver Pavement Sections:	1A	1B	2A**	2B**
Vehicular Rated Pavers	Min. 3.25" ± Permeable Paver Parking Stalls With subdrain	Min. 3.25" ± Permeable Paver Parking Stalls	Min. 3.25" ± Permeable Paver Driveway With subdrain	Min. 3.25" ± Permeable Paver Driveway
ASTM No. 8 Bedding Course & Paver Filler	2.0"	2.0"	2.0"	2.0"
3/4" Clean Crushed Rock or ASTM No. 57 Stone	12.0"	4.0"	16.0"	6.0"
ASTM No. 2 Stone	---	12.0"	---	12.0"
Subgrade scarified & compacted to at least 90% relative maximum density	12.0"	12.0"	12.0"	12.0"

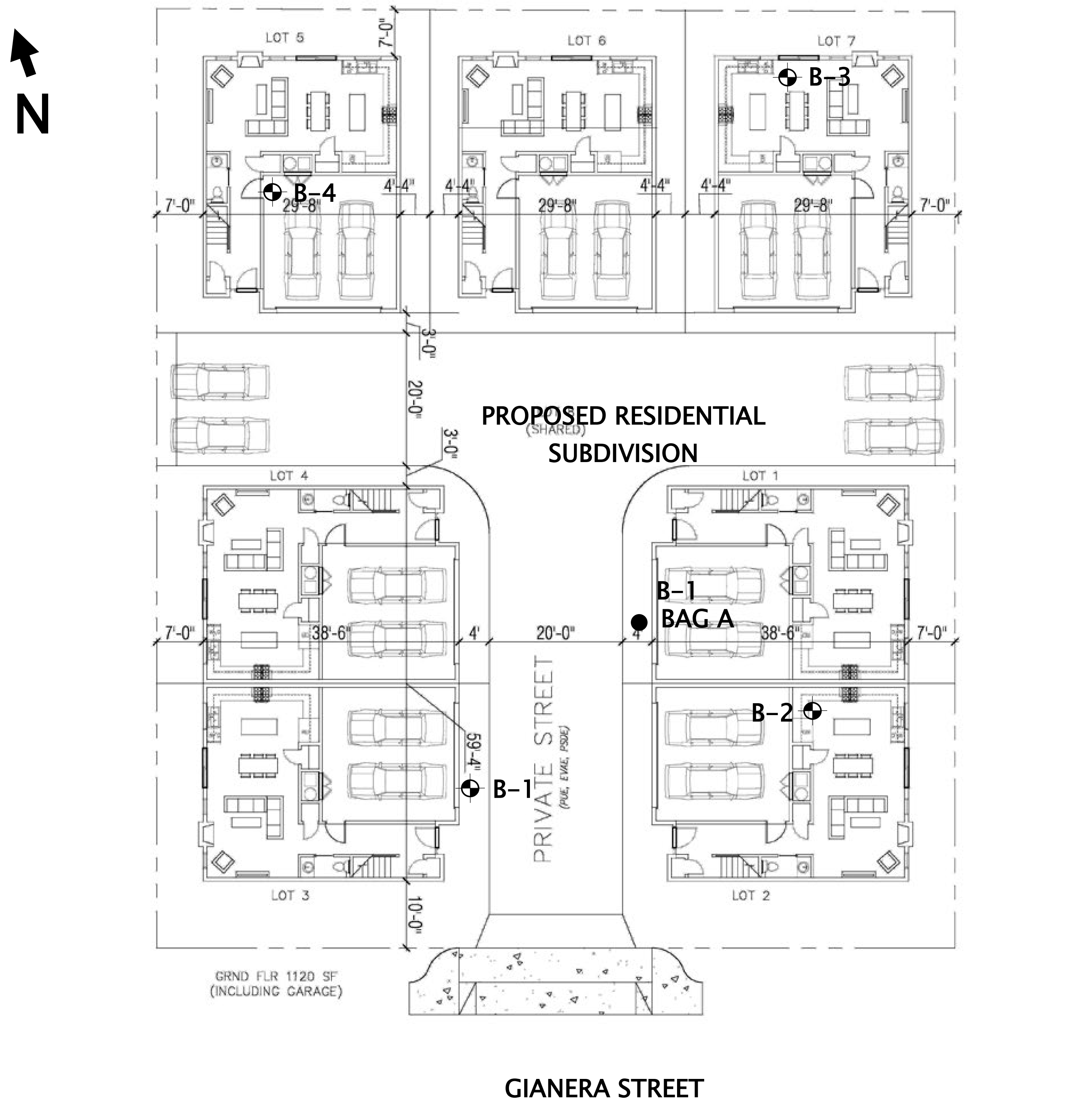
* The subgrade should be lined with Mirafi 140N Filter Fabric and Tensar BX1100 Geogrid or equivalent. Subgrade should be sloped at a minimum of 2% towards the subdrain system, if necessary. If subdrain is allowed to be notched in the subgrade, the subdrain trench should be at least 12 inches wide and 6 inches below the finished subgrade elevation and the walls and bottom should be lined with filter fabric. The subdrain system should consist of a 4-inch diameter perforated pipe schedule 40, SDR 35, or equivalent surrounded by ASTM No. 57 Stone (¾ inch drain rock). Or, the subdrain pipe may be required to be within the ASTM No. 2 Stone section. The drainage system should drain to a discharge facility. The pavers should be bordered with a concrete curb/band to avoid water infiltration into non-permeable parking areas. Typically, minor maintenance would be required during the life of the pavers.

** Support fire apparatus of 75,000 lbs.

FIGURES

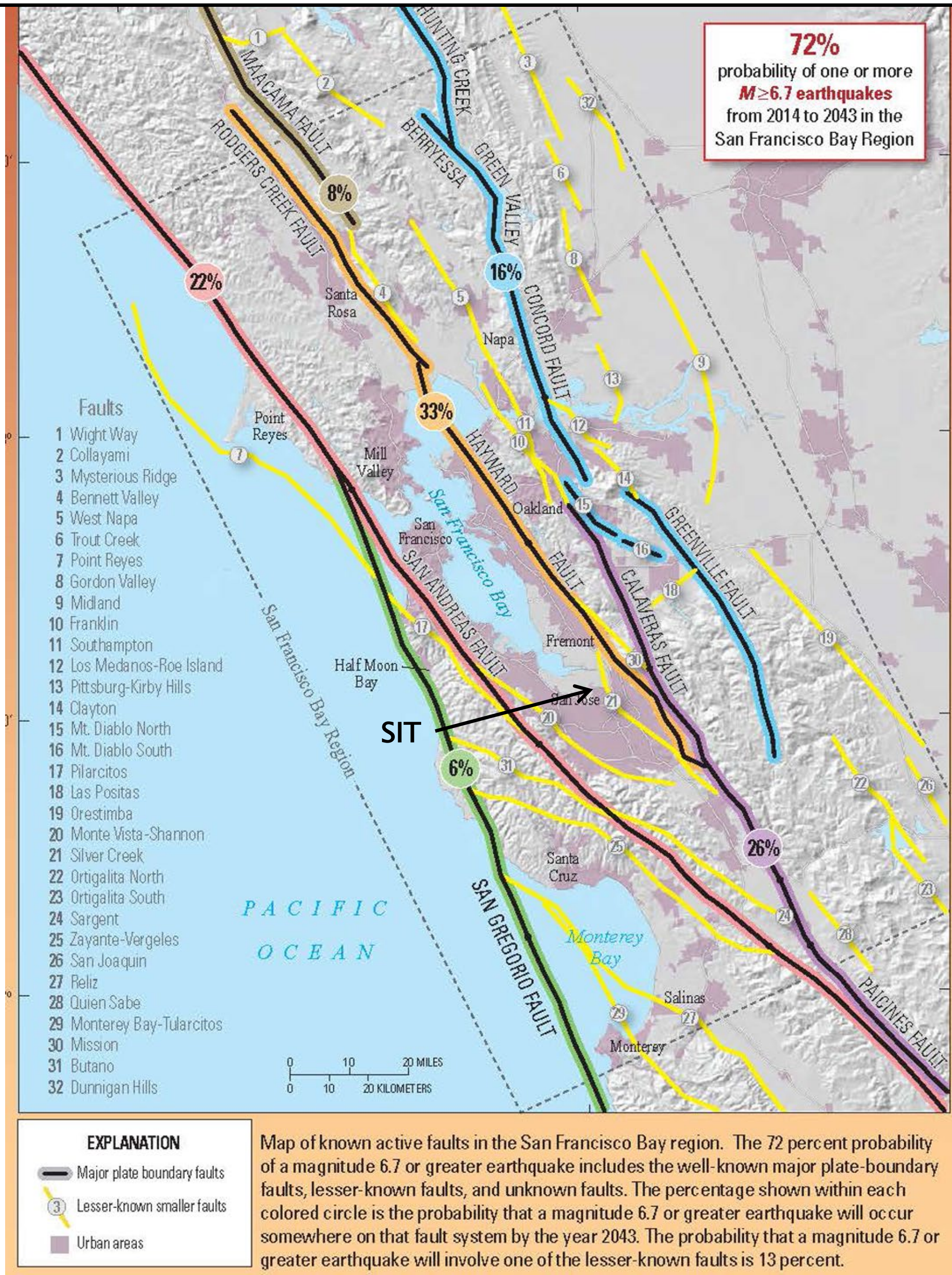


Silicon Valley Soil Engineering 1916 O'Toole Way San Jose, CA 95131 (408) 324-1400	**VICINITY MAP** Proposed Residential Subdivision 2303 Gianera Street Santa Clara, California	File No.: SV2529 Drawn by: V.V. Scale: NOT TO SCALE	FIGURE 1 February 2023



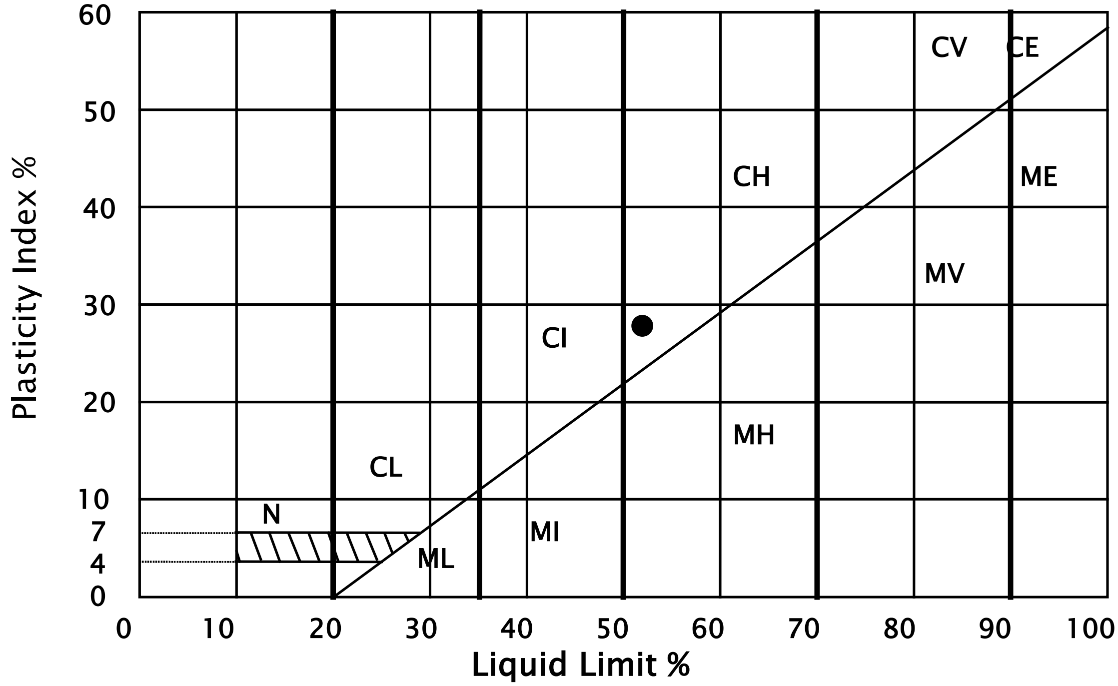
NOTE: ⊕ DENOTES APPROXIMATE EXPLORATORY BORING LOCATION
● DENOTES APPROXIMATE EXPLORATORY BAG SAMPLE LOCATION

Silicon Valley Soil Engineering 1916 O'Toole Way San Jose, CA 95131 (408) 324-1400	**SITE PLAN** Proposed Residential Subdivision 2303 Gianera Street Santa Clara, California	File No.: SV2529 Drawn by: V.V. Scale: NOT TO SCALE	FIGURE 2 February 2023



Silicon Valley Soil Engineering 1916 O'Toole Way San Jose, CA 95131 (408) 324-1400	**EARTHQUAKE PROBABILITY AND FAULT MAP** Proposed Residential Subdivision 2303 Gianera Street Santa Clara, California	File No.: SV2529 Drawn by: V.V. Scale: NOT TO SCALE	FIGURE 3 February 2023

PLASTICITY CHART

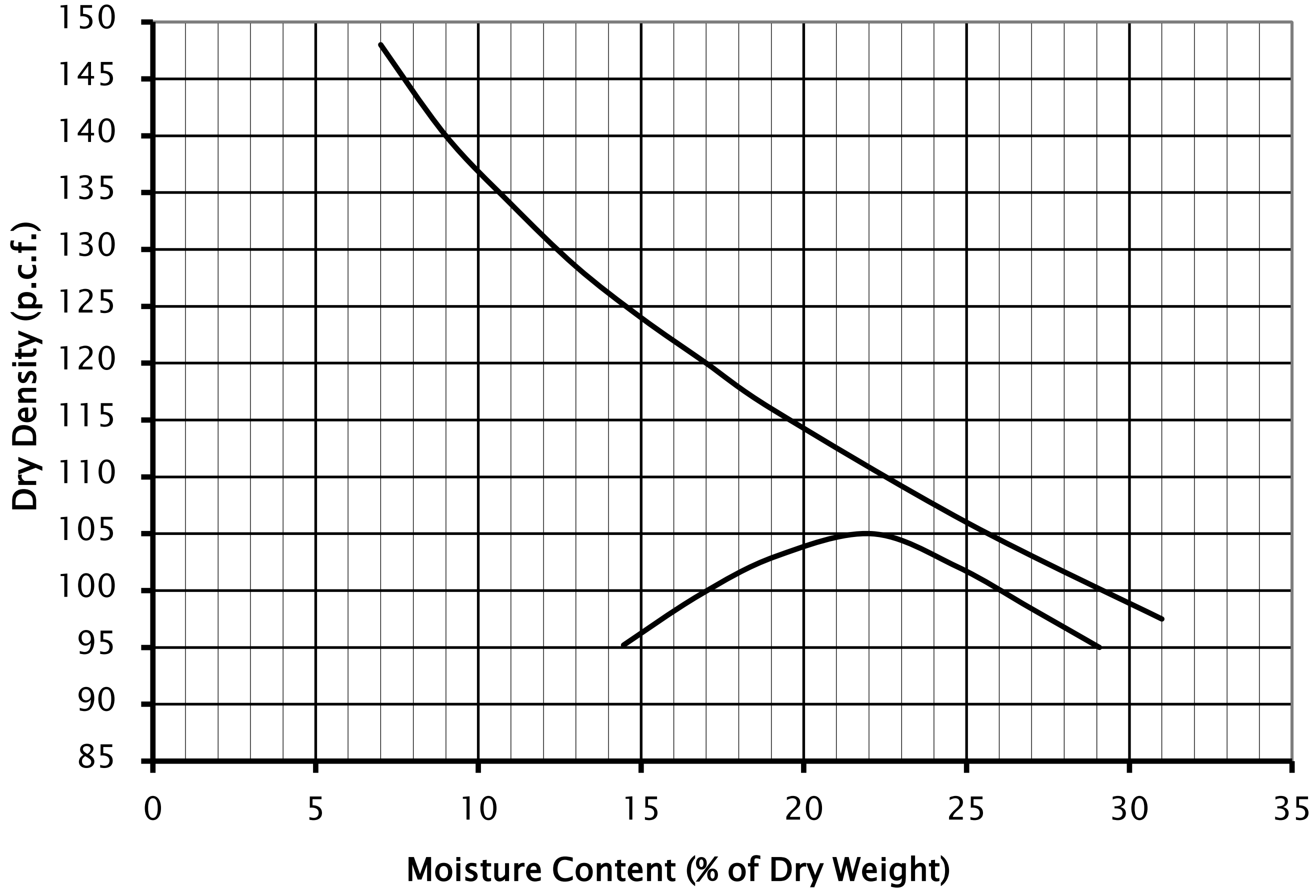


PLASTICITY DATA

Key Symbol	Sample No.	Depth ft.	Liquid Limit %	Plasticity Index %	Unified Soil Classification Symbol *
●	BAG A	0-1	53	28	CH

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

Silicon Valley Soil Engineering 1916 O'Toole Way San Jose, CA 95131 (408) 324-1400	**PLASTICITY INDEX** Proposed Residential Subdivision 2303 Gianera Street Santa Clara, California	File No.: SV2529 Drawn by: V.V. Scale: NOT TO SCALE	FIGURE 4 February 2023



SAMPLE: A

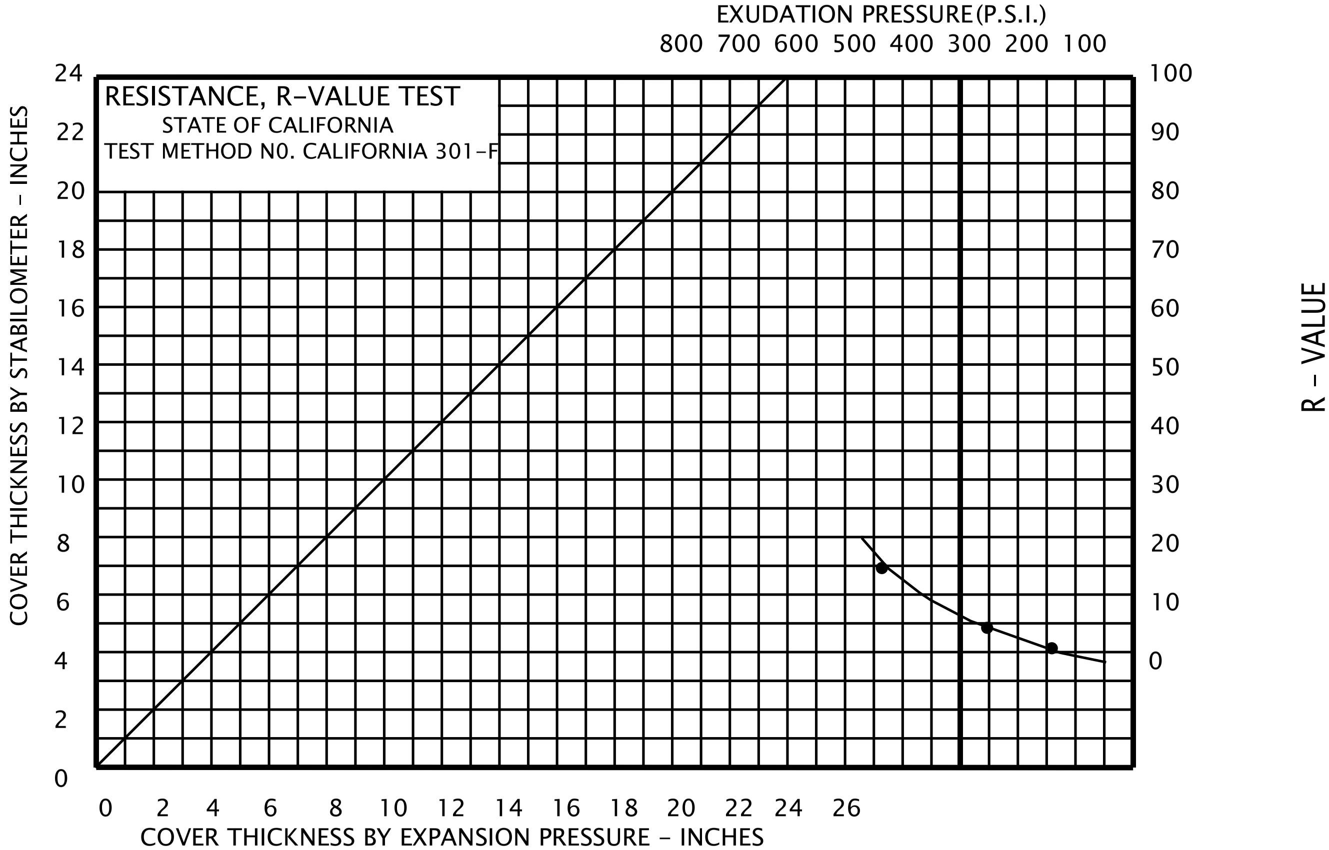
DESCRIPTION: Black Silty CLAY

LABORATORY TEST PROCEDURE: ASTM D1557

MAXIMUM DRY DENSITY: 105.0 p.c.f.

OPTIMUM MOISTURE CONTENT: 22.0 %

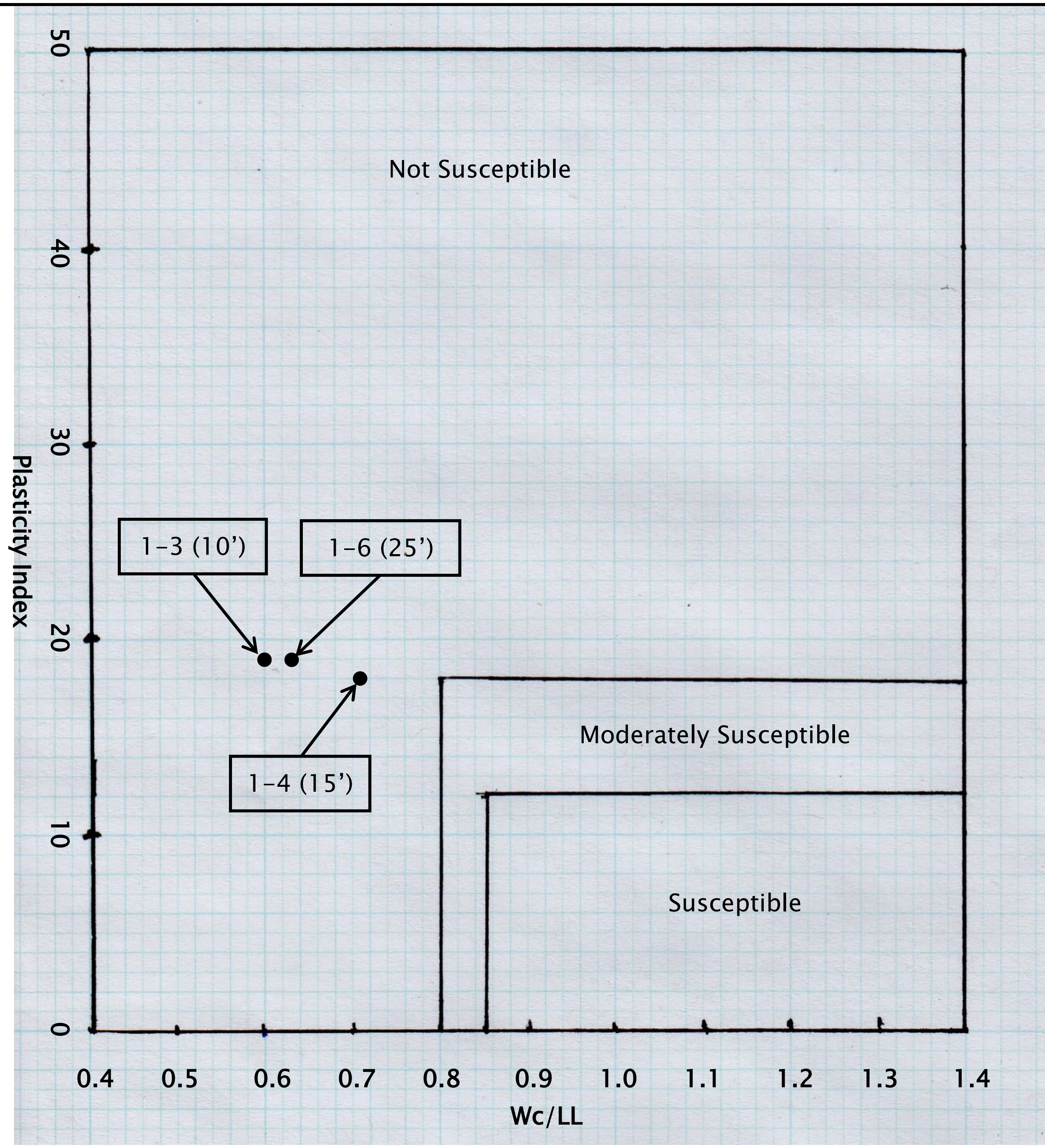
Silicon Valley Soil Engineering 1916 O'Toole Way San Jose, CA 95131 (408) 324-1400	**COMPACTION TEST A** Proposed Residential Subdivision 2303 Gianera Street Santa Clara, California	File No. SV2529 Drawn by: V.V. Scale: NOT TO SCALE	FIGURE 5 February 2023



SAMPLE: A
DESCRIPTION: Black Silty CLAY

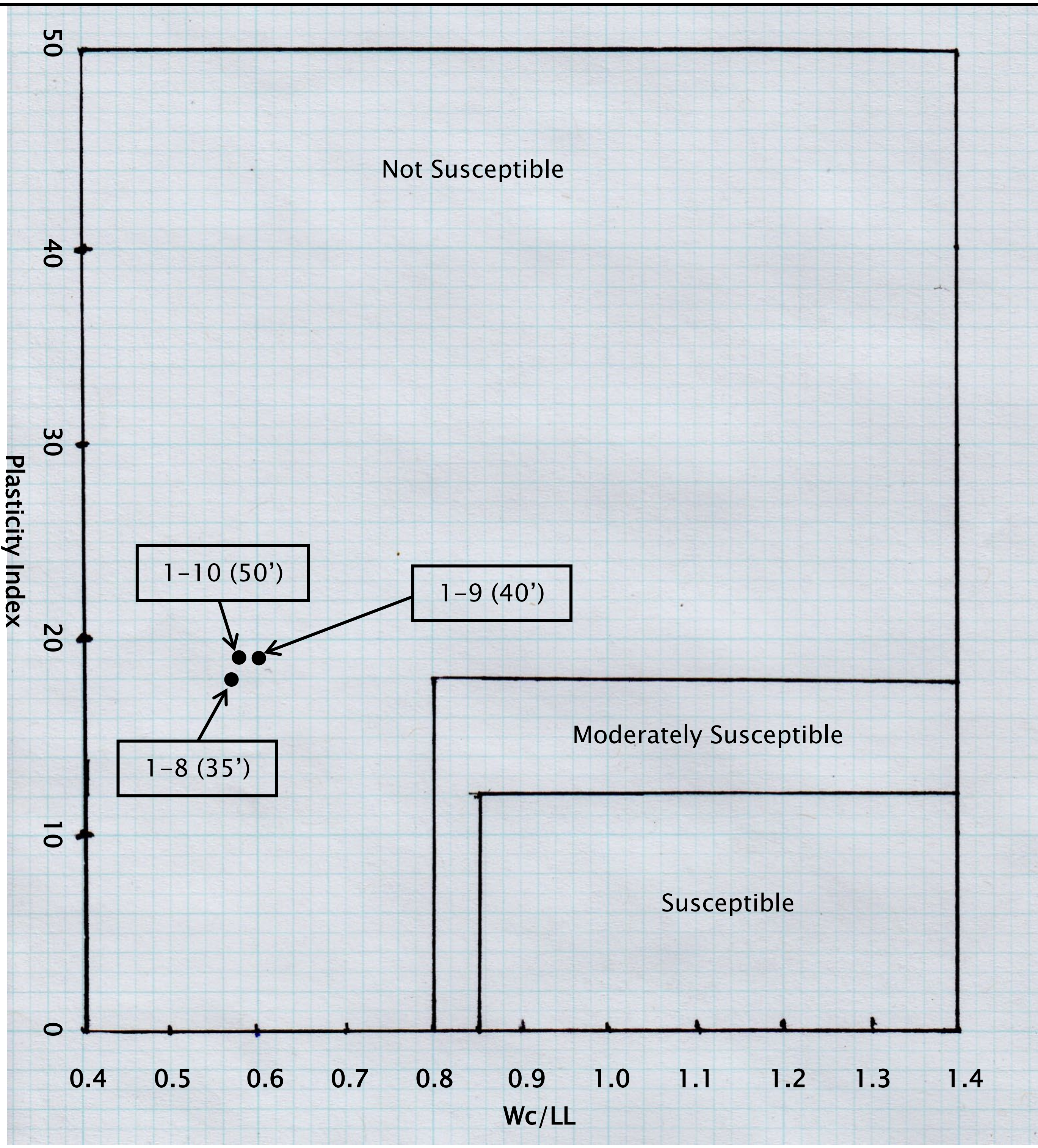
SPECIMEN	A	B	C
EXUDATION PRESSURE (P.S.I.)	149.0	251.0	449.0
EXPANSION DIAL (.0001")	9.0	14.0	20.0
EXPANSION PRESSURE (P.S.F.)	45.0	76.0	94.0
RESISTANCE VALUE, "R"	1.0	4.0	15.0
% MOISTURE AT TEST	20.7	18.0	17.6
DRY DENSITY AT TEST (P.C.F.)	106.7	108.5	111.2
R-VALUE AT 300 P.S.I. EXUDATION PRESSURE	= (6)		

Silicon Valley Soil Engineering 1916 O'Toole Way San Jose, CA 95131 (408) 324-1400	**R-VALUE TEST** Proposed Residential Subdivision 2303 Gianera Street Santa Clara, California	File No. SV2529	FIGURE
		Drawn by: V.V.	6
		Scale: NOT TO SCALE	February 2023



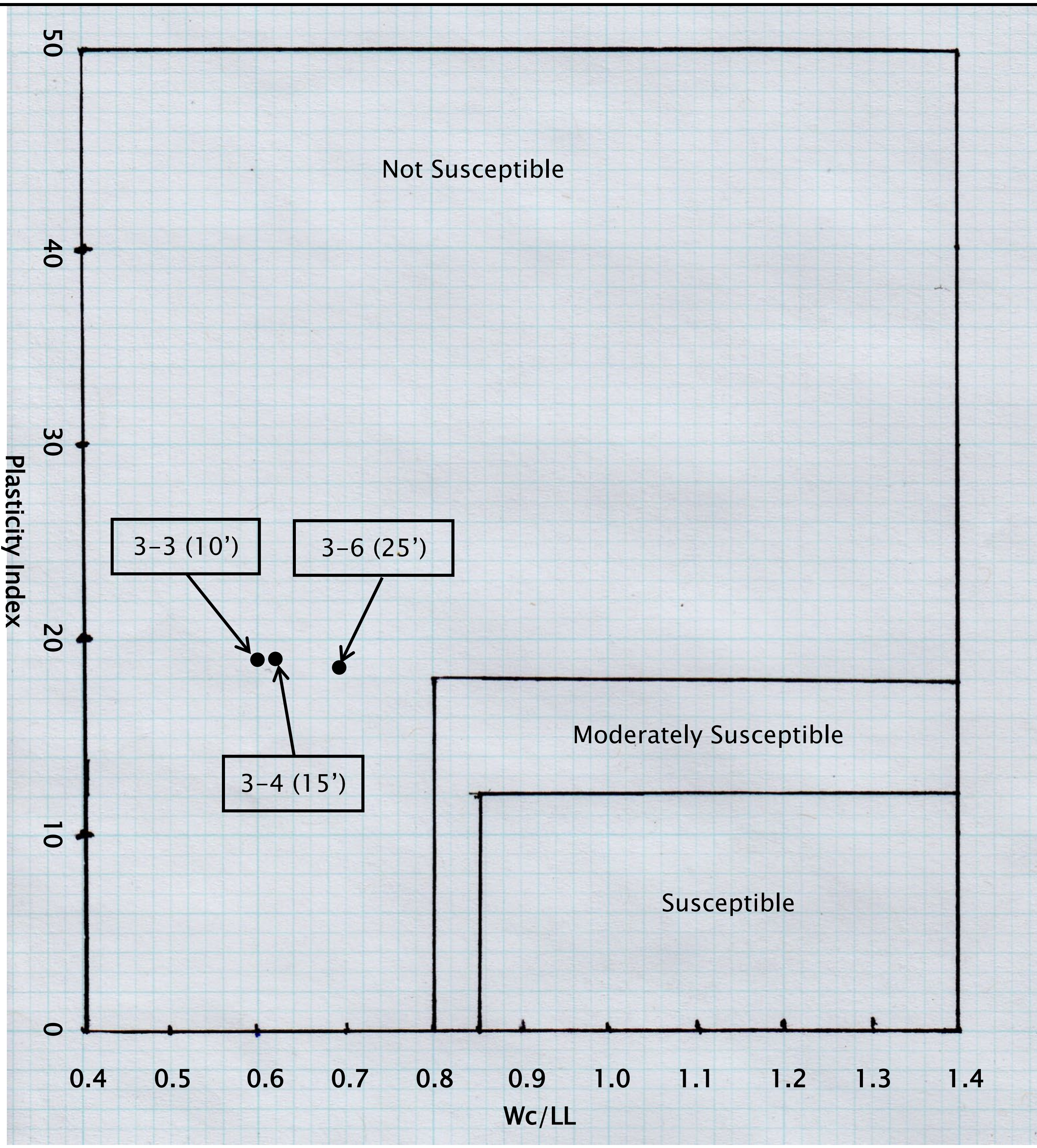
NOTES: Wc: Water Content LL: Liquid Limit 1-3: Sample Number (10'): Sample Depth

Silicon Valley Soil Engineering 1916 O'Toole Way San Jose, CA 95131 (408) 324-1400	**LIQUEFACTION SUSCEPTIBLE CRITERIA (BORING B-1)** Proposed Residential Subdivision 2303 Gianera Street Santa Clara, California	File No.: SV2529	FIGURE
		Drawn by: V.V.	7A
		Scale: NOT TO SCALE	February 2023



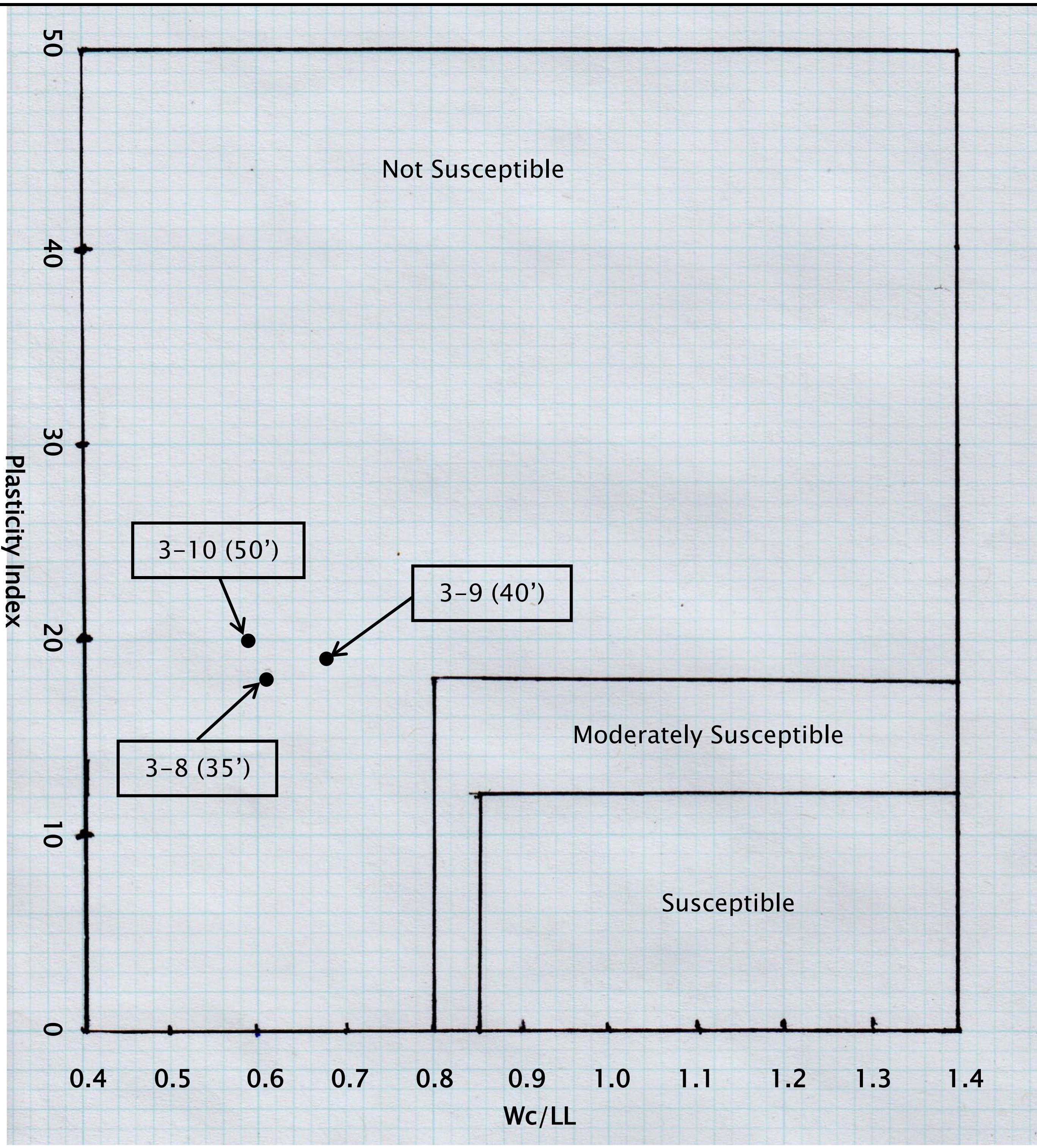
NOTES: Wc: Water Content LL: Liquid Limit 1-8: Sample Number (35'): Sample Depth

Silicon Valley Soil Engineering 1916 O'Toole Way San Jose, CA 95131 (408) 324-1400	**LIQUEFACTION SUSCEPTIBLE CRITERIA (BORING B-1)** Proposed Residential Subdivision 2303 Gianera Street Santa Clara, California	File No.: SV2529 Drawn by: V.V. Scale: NOT TO SCALE	FIGURE 7B February 2023



NOTES: Wc: Water Content LL: Liquid Limit 3-3: Sample Number (10'): Sample Depth

Silicon Valley Soil Engineering 1916 O'Toole Way San Jose, CA 95131 (408) 324-1400	**LIQUEFACTION SUSCEPTIBLE CRITERIA (BORING B-3)** Proposed Residential Subdivision 2303 Gianera Street Santa Clara, California	File No.: SV2529 Drawn by: V.V. Scale: NOT TO SCALE	FIGURE 8A February 2023



NOTES: Wc: Water Content LL: Liquid Limit 3-8: Sample Number (35'): Sample Depth

Silicon Valley Soil Engineering 1916 O'Toole Way San Jose, CA 95131 (408) 324-1400	**LIQUEFACTION SUSCEPTIBLE CRITERIA (BORING B-3)** Proposed Residential Subdivision 2303 Gianera Street Santa Clara, California	File No.: SV2529	FIGURE
		Drawn by: V.V.	8B
		Scale: NOT TO SCALE	February 2023

APPENDICES

MODIFIED MERCALLI SCALE

METHOD OF SOIL CLASSIFICATION

KEY TO LOG OF BORING

EXPLORATORY BORING LOGS (B-1 THROUGH B-4)

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.	Architec-tural 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.

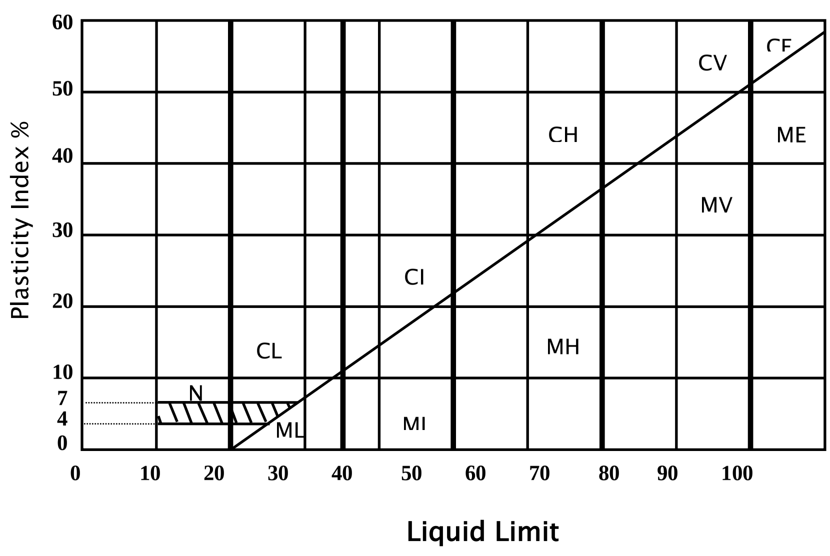
METHOD OF SOIL CLASSIFICATION CHART

MAJOR DIVISIONS		SYMBOL		TYPICAL NAMES
COARSE GRAINED SOILS (More than 1/2 of soil > no. 200 sieve size)	GRAVELS (More than 1/2 of coarse fraction > no. 4 sieve size)	GW		Well graded gravel or gravel-sand mixtures, little or no fines
		GP		Poorly graded gravel or gravel-sand moistures, little or no fines
		GM		Silty gravels, gravel-sand-silt mixtures
		GC		Clayey Gravels, gravel-sand-clay mixtures
	SANDS (More than 1/2 of coarse fraction < no. 4 sieve size	SW		Well graded sands or gravelly sands, no fines
		SP		Poorly graded sands or gravelly sands, no fines
		SM		Silty sands, sand-silt mixtures
		SC		Clayey sands, sand-clay mixtures
FINE GRAINED SOILS (More than 1/2 of soil < no. 200 sieve size)	SILTS & CLAYS LL < 50	ML		Inorganic silts and very fine sand, rock, flour, silty or clayey fine sand or clayey silt/slight plasticity
		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 LL > 50	MH		Inorganic silts, micaceous or diatocaceous fine sandy, or silty soils, elastic silt
		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 Subdivision Project Location: 2303 Gianera Street Santa Clara, California Project Number: SV2529	Silicon Valley Soil Engineering 1916 O'Toole Way 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

Fat CLAY, CLAY w/SAND, SANDY CLAY (CH)
Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)
SILTY CLAY (CL-ML)
Grass and/or topsoil

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 Subdivision **Project Location:** 2303 Gianera Street Santa Clara, California **Project Number:** SV2529	**Silicon Valley Soil Engineering** **1916 O'Toole Way** **San Jose, CA 95131** **(408) 324-1400**	Log of Boring B-1 **Sheet 1 of 2**

Date(s) Drilled **02/14/2023**	Logged By **V.V.**	Checked By
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8-inch**	Total Depth of Borehole **50.0 feet**
		Approximate Surface Elevation **feet**
Groundwater Level and Date Measured **22 feet (02/14/2023)**	Sampling Method(s) **SPT**	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, %
0–0.25				Grass		3.0 inches of Organic Material						
0.25				CH		Black Silty CLAY Moist, stiff						
		1-1	22				21.6	102.9	0.8	10		
		1-2	21			Color changed to medium gray	23.2	102.5				
7				CL		Medium Brown Sandy Silty CLAY Moist, stiff						
		1-3	9				21.0	110.6			35	19
12				CL-ML		Olive Brown Clayey SILT/Silty CLAY Moist, stiff						
		1-4	11				22.8	102.9			32	18
		1-5	10				22.8	111.1				
20				CL		Olive Brown Silty CLAY Moist, stiff						
22						Stabilized at drilling completion ▼						
23						Initially encountered ▽						
		1-6	23				22.6	107.3			36	19
		1-7	10				25.6	101.0				
30												

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, %
30				CL		Olive Brown Silty CLAY Moist, stiff						
35		1-8	21				21.1	111.7			37	18
40		1-9	31				20.9	111.2			35	19
						Color changed to bluish gray						
45												
50		1-10	35				21.5	112.7			37	19
						Boring terminated at 50.0 feet						
55												
60												
65												

Project: Proposed Residential Subdivision Project Location: 2303 Gianera Street Santa Clara, California Project Number: SV2529	Silicon Valley Soil Engineering 1916 O'Toole Way San Jose, CA 95131 (408) 324-1400	Log of Boring B-2 Sheet 1 of 1

Date(s) Drilled **02/14/2023**	Logged By **V.V.**	Checked By
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8-inch**	Total Depth of Borehole **10.0 feet**
		Approximate Surface Elevation **feet**
Groundwater Level and Date Measured **Not encountered**	Sampling Method(s) **SPT**	Hammer Data **170 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				Grass		3.0 inches of Organic Material						
				CH		Black Silty CLAY Moist, stiff						
		2-1	16				23.2	96.1				
		2-2	21			Color changed to medium gray	24.7	102.5				
5												
8				SP-SC		Yellowish Brown Clayey SAND Moist, medium dense SAND: medium-grained, poorly graded						
		2-3	17				16.7	105.0				
10						Boring terminated at 10.0 feet						
15												
20												
25												
30												

Project: Proposed Residential Subdivision **Project Location:** 2303 Gianera Street Santa Clara, California **Project Number:** SV2529	**Silicon Valley Soil Engineering** **1916 O'Toole Way** **San Jose, CA 95131** **(408) 324-1400**	Log of Boring B-3 **Sheet 1 of 2**

Date(s) Drilled **02/14/2023**	Logged By **V.V.**	Checked By
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8-inch**	Total Depth of Borehole **50.0 feet**
		Approximate Surface Elevation **feet**
Groundwater Level and Date Measured **22 feet (02/14/2023)**	Sampling Method(s) **SPT**	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 – 0.33				Concrete		4.0 inches of Concrete Slab (PCC)						
0.33 – 7				CH		Black Silty CLAY Moist, stiff						
		3-1	19				18.5	107.9				
		3-2	16			Color changed to medium gray	26.0	100.6				
7 – 12				CL		Reddish Brown Sandy Silty CLAY Moist, stiff						
		3-3	9				22.3	108.6			37	19
12 – 20				CL-ML		Olive Brown Clayey SILT Moist, stiff						
		3-4	13				21.2	105.1			34	19
		3-5	11				23.3	101.9				
20 – 30				CL		Olive Brown Silty CLAY Moist, stiff						
						Stabilized at drilling completion ▼						
						Initially encountered ▽						
		3-6	22				26.4	102.0			38	19
		3-7	12				21.7	104.3				

Project: Proposed Residential Subdivision **Project Location:** 2303 Gianera Street Santa Clara, California **Project Number:** SV2529	**Silicon Valley Soil Engineering** **1916 O'Toole Way** **San Jose, CA 95131** **(408) 324-1400**	Log of Boring B-3 **Sheet 2 of 2**

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, %
30				CL		Olive Brown Silty CLAY Moist, stiff						
35		3-8	20				22.1	109.1			36	18
40		3-9	30				24.5	104.6			36	19
						Color changed to bluish gray						
45												
50		3-10	33				22.4	110.8			38	20
						Boring terminated at 50.0 feet						
55												
60												
65												

Project: Proposed Residential Subdivision **Project Location:** 2303 Gianera Street Santa Clara, California **Project Number:** SV2529	**Silicon Valley Soil Engineering** **1916 O'Toole Way** **San Jose, CA 95131** **(408) 324-1400**	Log of Boring B-4 **Sheet 1 of 1**

Date(s) Drilled **02/14/2023**	Logged By **V.V.**	Checked By
Drilling Method **Hand-Held Auger**	Drill Bit Size/Type **3-inch**	Total Depth of Borehole **5.0 feet**
		Approximate Surface Elevation **feet**
Groundwater Level and Date Measured **Not encounterd**	Sampling Method(s) **SPT**	Hammer Data **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				Grass		3.0 inches of Organic Material						
				CH		Black Silty CLAY Moist, stiff Color changed to medium gray						
5						Boring terminated at 5.0 feet						
10												
15												
20												
25												
30												