Environmental Geotechnology Laboratory, Inc.

September 30, 2021

Del Mar Property LLC
120 E. Valley Boulevard
San Gabriel, California 91776
c/o Scales Lab Architects

Subject: **Report of Geotechnical Engineering Investigation, Proposed Mixed-Use Buildings and Associated Structures, APN: 5286-022-009 & 010, 7539 & 7545 Garvey Avenue, Rosemead, County of Los Angeles, California, EGL Project No.: 21-AA-106GE**

Ladies and Gentlemen:

In accordance with your request, Environmental Geotechnology Laboratory, Inc. (EGL) is pleased to submit this Geotechnical Engineering Report for the subject site. The purpose of this report was to evaluate the subsurface conditions and provide recommendations for foundation designs and other relevant parameters of the proposed construction.

Based on the findings of our field exploration, laboratory testing and engineering analysis, the proposed construction of the subject site for the intended use is considered feasible from the geotechnical engineering viewpoints, provided that specific recommendations set forth herein are followed.

This opportunity to be of service is sincerely appreciated. If you have any questions pertaining to this report, please call the undersigned.

Respectfully submitted,
Environmental Geotechnology Laboratory, Inc.

Ryan Jones, GE 2852
Project Engineer

Dist: (4) Addressee
RJ/ky

REPORT OF GEOTECHNICAL ENGINEERING INVESTIGATION

Proposed

Mixed-Use Buildings and Associated Structures

At

APN: 5286-022-009 & 010

7539 & 7545 Garvey Avenue
Rosemead, California

Prepared by

ENVIRONMENTAL GEOTECHNOLOGY LABORATORY, INC.

Project No.: 21-AA-106GE

September 30, 2021

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1.0 INTRODUCTION

1.1 Purpose

This report presents a summary of EGL's preliminary geotechnical engineering investigation for the proposed development located at 7539 & 7545 Garvey Avenue (APN: 5286-022-009 & 010) in the City of Rosemead, County of Los Angeles, California. The approximate regional location is shown on the Site Location Map (Figure 1). Purposes of this investigation were to evaluate subsurface conditions at the subject site and to provide preliminary recommendations pertinent to grading, including foundation design and other relevant parameters for future development.

1.2 Scope of Services

Our scope of services included:

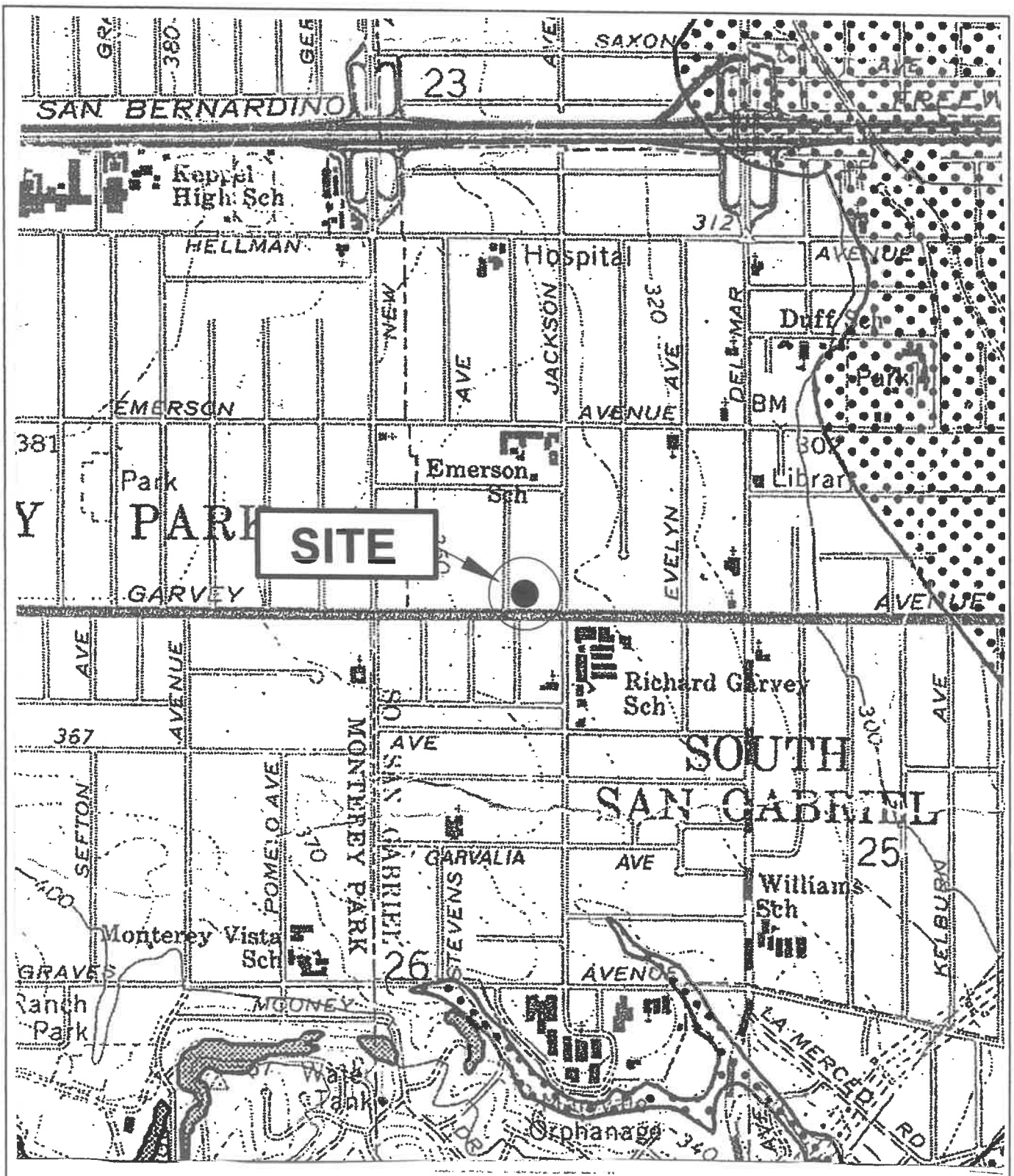
- Review of available soil data of the area.
- Subsurface exploration consisting of logging and sampling of five (5) 8-inch diameter hollow-stem auger borings. Borings were extended to a maximum depth of 30.0 feet below the existing ground surface. The boring logs are presented in Appendix A.
- Laboratory testing of representative samples to establish engineering characteristics of the on-site soil. The laboratory test results are presented in Appendix B and on the Boring Logs of Appendix A.
- Engineering analyses of the geotechnical data obtained from our background studies, field investigation, and laboratory testing.
- Infiltration testing on boring (B-1) at a depth of 8 feet.
- Preparation of this report presenting our findings, conclusions, and recommendations for the proposed construction.

1.3 Site Conditions

The subject site is located on the northeast corner of Garvey Avenue and Prospect Avenue in the City of Rosemead, County of Los Angeles, California. The approximate regional location is shown on the Site Location Map (Figure 1). The project site consists of two lots (7539 & 7545 Garvey Avenue) and is currently vacant. Topographically, the subject site is relatively flat. Detailed configurations of the site are shown on the Site Plan, Figure 2.

1.4 Proposed Construction

Based on the *Site Plan* provided by Scales Lab Architects (2021), it is our understanding that the proposed development at the site consists of new mixed-use buildings and associated



Note: Map modified from "Seismic Hazard Zones, El Monte Quadrangle" by California Department of Conservation, Division of Mines and Geology.

Approximate Scale: 1" = 1000'

Potential Liquefaction Area

Potential Earthquake-Induced Landslide Areas

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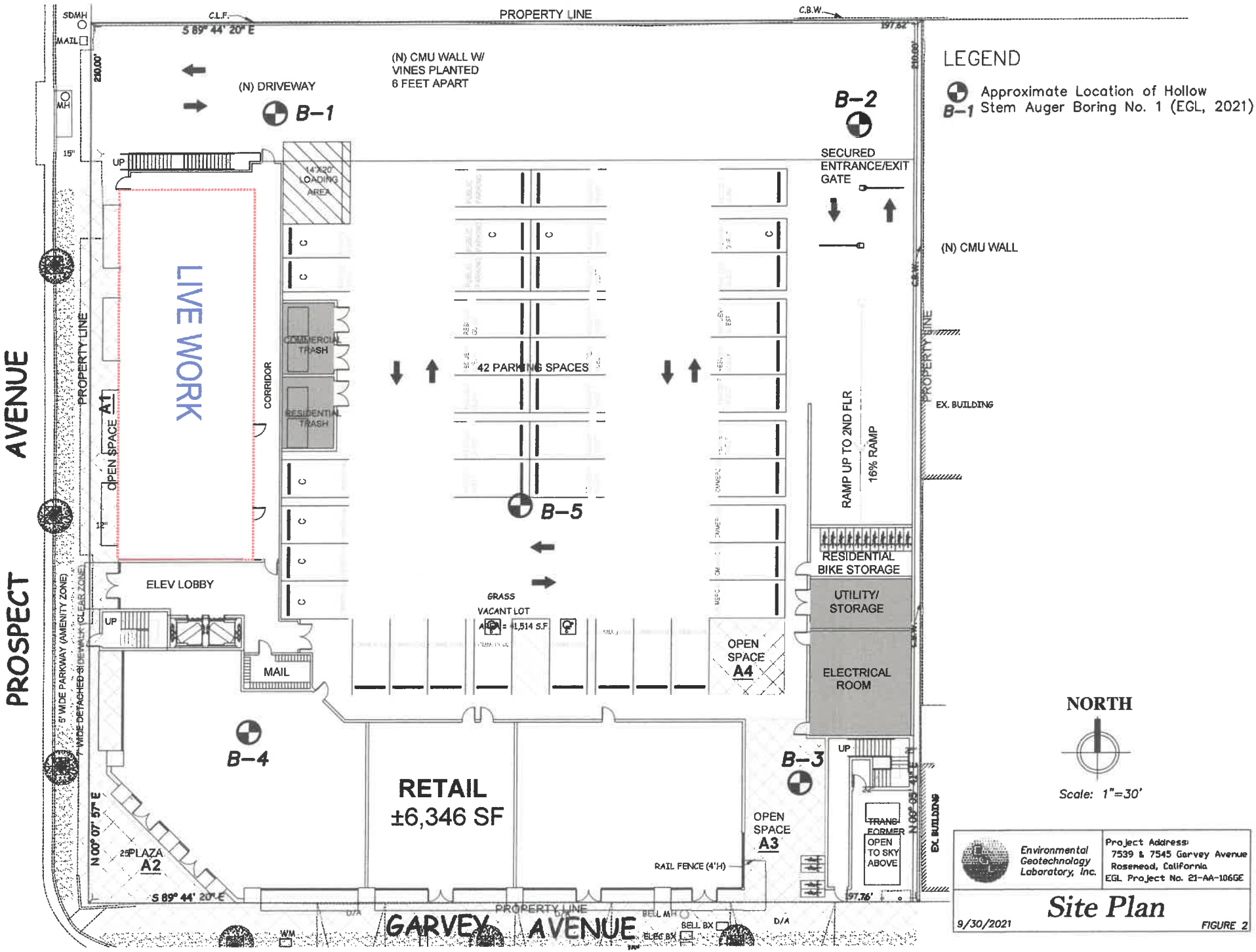
SITE LOCATION MAP

09/21

Figure 1



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Site Plan

9/30/2021

FIGURE 2

structures. The proposed buildings are anticipated to be seven-story wood frame structures with concrete slab-on-grade. Column loads are unknown at this time, but are expected to be light to medium. Minor cut/fill grading operation is anticipated to achieve the desired grades.

2.0 FIELD EXPLORATION AND LABORATORY TESTING

2.1 Field Exploration

Our field exploration was performed at the subject property September 8, 2021 with the aid of a hollow-stem drill rig of ACE Drilling Services. A total of five (5) 8-inch diameter hollow-stem auger borings were drilled to a maximum depth of 30.0 feet below the existing ground surface. Upon completion of drilling and percolation testing, all borings were backfilled with onsite soil removed from excavations and tamped. The purpose of the excavation was to investigate the engineering characteristics of the onsite soils with respect to the proposed development.

The borings were supervised and logged by EGL's engineer. Relatively undisturbed ring samples and bulk samples were collected during drilling for laboratory testing. The approximate locations of these borings are shown on the Site Plan (Figure 2). Logs of borings are presented in Appendix A. Ring samples were taken at frequent intervals. The samples taken by a hollow stem auger were obtained by driving a sampler with successive blows of a 140-pound hammer dropping from a height of 30 inches.

2.2 Laboratory Testing

Representative samples were tested for the following parameters: in-situ moisture content and density, direct shear strength, consolidation, corrosion potential, expansion index and Atterberg Limits. The results of our laboratory testing along with a summary of the testing procedures are presented in Appendix B. In-situ moisture and density test results are presented on the boring logs in Appendix A.

3.0 SUMMARY OF GEOTECHNICAL CONDITIONS

3.1 Soil Conditions

Our subsurface exploration and testing program revealed the existence of alluvial soil to the maximum explored depth of 30.0 feet. The onsite soils consist predominantly of dark yellowish brown and olive brown sandy clayey silt (ML) and sandy clay (CL). In general, our boring B-5 encountered dark yellowish brown, slightly moist to moist, and stiff sandy clayey silt (ML) to a depth of approximately 3.0 feet. Below this, layers of olive brown and dark yellowish brown, slightly moist to very moist, and stiff to very stiff sandy clay (CL) were encountered to the

maximum explored depth of 30.0 feet below the existing ground surface. Refusal was encountered within boring B-3 at depth of 16.0 feet due to the very dense and hard soil. Based on Dibblee (1989), the site is underlain by slightly elevated and locally dissected alluvial gravel and sand at base of hill areas (Qae; see Figure 3).

3.2 Groundwater

Static ground water levels were not encountered during our subsurface investigation to the maximum explored depth of 30 feet below the existing ground surface. Based on the historically high groundwater depth map prepared by CDMG Seismic Hazard Zone Report 024 the historic groundwater is approximately greater than 50 feet below ground surface at the subject site (High Ground Water Map El Monte Quadrangle). Groundwater is therefore not expected to be a significant constraint during the construction. However, groundwater may be a significant constraint if grading is completed during the rainy season when perched water is more likely to occur.

4.0 CONCLUSIONS

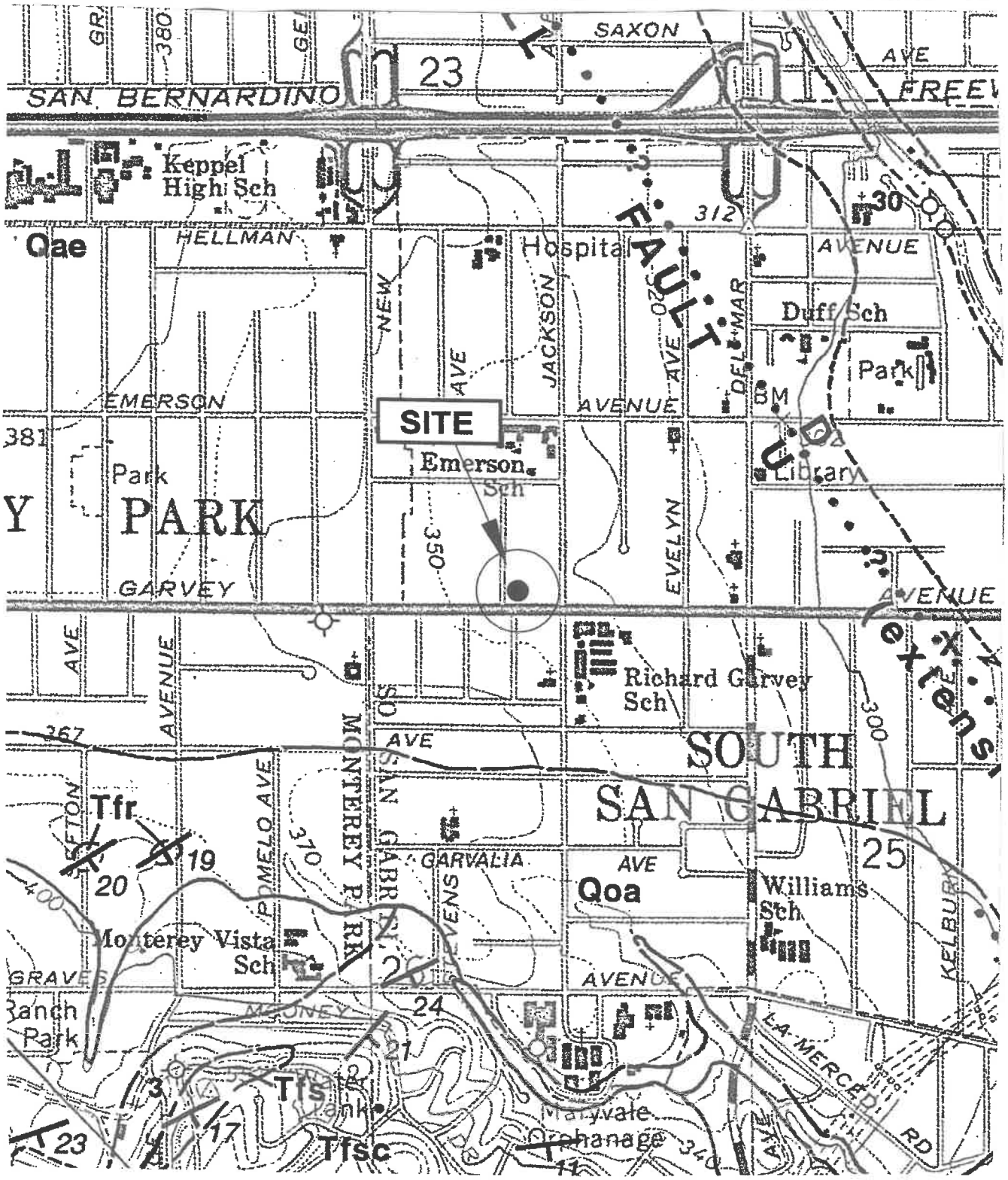
Based on the results of our subsurface investigation and engineering analyses, it is our opinion that the proposed construction is feasible from a geotechnical standpoint, provided the recommendations contained herein are incorporated in the design and construction. The following is a summary of the geotechnical design and construction factors that may affect the development of the site:

4.1 Seismicity

Our studies of regional and local seismicity indicate that there are no known active faults crossing the property. However, the site is located in a seismically active region and is subject to seismically induced ground shaking from nearby and distant faults, which is a characteristic of all Southern California communities.

4.2 Seismic Induced Hazards

Based on our review of the "Seismic Hazard Zones, El Monte Quadrangles" by California Department of Conservation, Division of Mines and Geology, it is concluded that the site is located outside the mapped potential liquefaction areas. It is our opinion that a liquefaction study is not required by the city for the subject site.



Note: Map modified from Geologic Map of the "El Monte Quadrangle" by Thomas W. Dibblee, Jr.

Qae: Older, Dissected Surficial Sediments: Slightly elevated and locally dissected alluvial gravel and sand at base of hill areas.

Approximate Scale: 1" = 1000'

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REGIONAL GEOLOGY MAP

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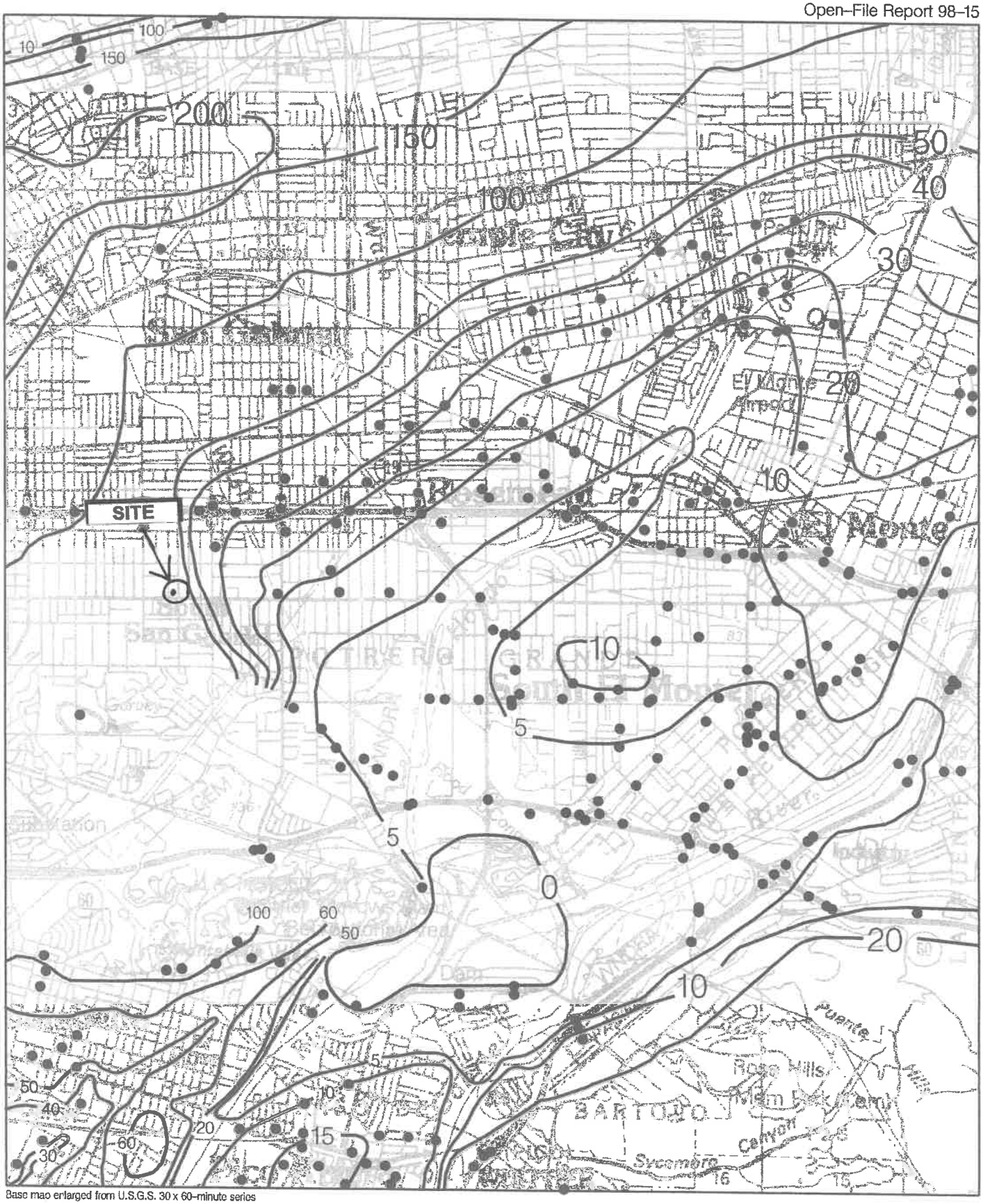
Figure 3



Base map enlarged from U.S.G.S. 30 x 60–minute series

Plate 1.2 Historically Highest Ground Water Contours and Borehole Log Data Locations, El Monte Quadrangle.

● Borehole Site

— 30 — Depth to ground water in feet

ONE MILE

SCALE

4.3 Excavatability

Excavation of the subsurface materials should be able to be accomplished with conventional earthwork equipment.

4.4 Surficial Soil Removal and Recompaction

Based on our investigation, it is concluded that the existing surficial soils may not be suitable for structure support as they presently exist and will require remedial grading as discussed herein.

4.5 Groundwater

Static ground water levels were not encountered during our subsurface investigation to the maximum explored depth of 30 feet below the existing ground surface. Based on the historically high groundwater depth map prepared by CDMG Seismic Hazard Zone Report 024 the historic groundwater is approximately greater than 50 feet below ground surface at the subject site (High Ground Water Map El Monte Quadrangle). Groundwater is therefore not expected to be a significant constraint during the construction. However, groundwater may be a significant constraint if grading is completed during the rainy season when perched water is more likely to occur.

5.0 RECOMMENDATIONS

Based on the subsurface conditions exposed during field investigation and laboratory testing program, it is recommended that the following recommendations be incorporated in the design and construction phases of the project.

5.1 Grading

5.1.1 Site Preparation

Prior to initiating grading operations, any existing vegetation, trash, debris, over-sized materials (greater than 6 inches), and other deleterious materials within construction areas should be removed from the site.

5.1.2 Surficial Soil Removals

No detailed grading plan was available at the time of preparing this report however, based on our field exploration and laboratory data obtained to date, it is recommended that the surficial soils be removed to a depth of at least 5 feet below existing grade or 3 feet below the bottom of the footing, whichever is deeper. The recommended removal should be extended at least 5 feet

beyond the proposed building lines. Existing near surface soils should also be removed at least one foot within proposed concrete slab, driveway and parking areas. The construction areas should be excavated and then observed by a representative of this office to verify the soil conditions for any potential needs of removal of loose soils and replacement with compacted fill. This may also be necessary due to difference in expansion characteristics of foundation materials beneath a structure.

During the grading of the proposed slab areas if expansive material is encountered it should not be used for the top 12 inches but should be replaced with sandy import material (EI < 20). If import is mixed with onsite material EGL should provide inspections to verify the soils are mixed uniformly and testing of the mixed fill material to determine the expansion potential. The expansion index of the mixed soil should be less than 20. Some preliminary testing of the import and onsite should be performed to determine the soil mixture ratio prior to backfilling the building pad.

Locally deeper removals may be necessary to expose competent natural ground. The actual removal depths should be determined in the field as conditions are exposed. Visual inspection and/or testing may be used to define removal requirements.

5.1.3 Treatment of Removal Bottoms

Soils exposed within areas approved for fill placement should be scarified to a depth of 6 inches, conditioned to near optimum moisture content, then compacted in-place to minimum project standards.

5.1.4 Structural Backfill

The onsite soils may be used as compacted fill provided they are free of organic materials and debris. During the grading of the proposed slab area if expansive material is encountered it should not be used for the top 12 inches but should be replaced with sandy import material (EI < 20). If import is mixed with onsite material EGL should provide inspections to verify the soils are mixed uniformly and testing of the mixed fill material to determine the expansion potential. The expansion index of the mixed soil should be less than 20. Some preliminary testing of the import and onsite should be performed to determine the soil mixture ratio prior to backfilling the building pads. Fills should be placed in relatively thin lifts; brought to near optimum moisture content, then compacted to obtain at least 90 percent relative compaction based on laboratory standard ASTM D-1557-12.

5.1.5 ABC Slot Cuts

It is recommended that slot cuts must be used to support temporary excavations where the lateral support of the adjacent property or public right-of-ways is removed. Due to the closeness of the proposed excavation and the westerly, southerly and easterly property lines, it is our opinion that ABC slot cut must be used to support the vertical cut during grading of the proposed 5 feet excavation on the west, south and east sides of the property. The following presents our ABC Slot cut recommendations:

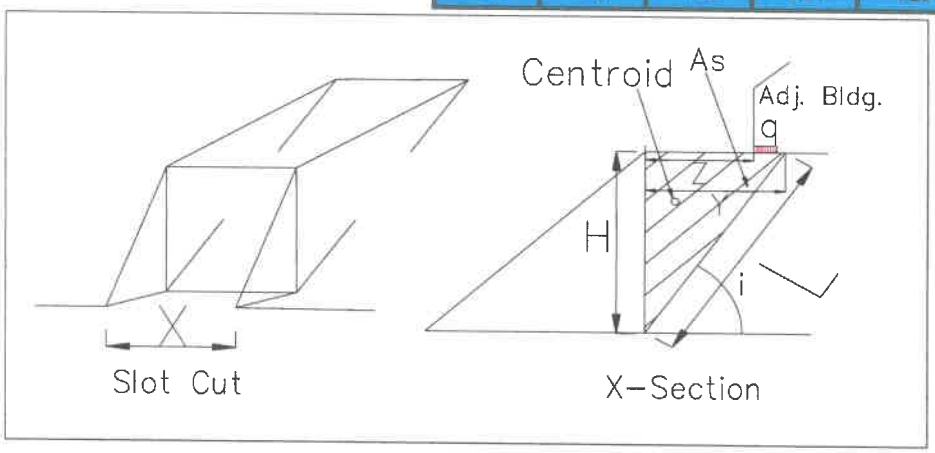
a. Excavate to over-excavation at side slopes no steeper than 1 to 1, horizontal to vertical,
b. Excavate in alternate slots, no wider than 8 feet (See Calculations, Figure 4).
c. Additional temporary shoring should be provided within the slot cuts. Shoring should be designed by structural engineer and capable of supporting 0.41 kips/ft where the adjacent building and/or property line is less than 5 feet away from the proposed excavation (See Figure 4 for details).
d. Once the excavations have been completed the bottom should be inspected and backfilled without delay.
e. All excavations should be made under the observation of the geotechnical engineer or his representative.
f. Care must be taken to prevent additional surcharge loads above un-shored cuts a horizontal distance from the top of the cut equal to the depth of the excavation.
g. Provisions for drainage should be implemented to prevent saturation of unshored excavations.
h. It is recommended that the excavations be inspected during construction by geotechnical engineer, so that necessary modifications can be made.

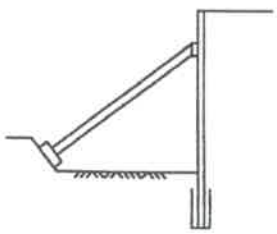
All trench excavations should conform to CAL-OSHA and local safety codes. All excavations should be made under the observation of the geotechnical engineer or his representative.

In as much as the proposed excavations may remove lateral support from the adjacent buildings a survey monitoring program or periodic inspection by project geotechnical consultant will be necessary to monitor potential movement in the excavation. In addition, the contractor should be solely responsible for safety during construction.

Slot Cut Calculation with Building Surcharge Load & Temporary Bracing

θ = Angle of influence (i) = 45 + ϕ/2 (Multiple provided)	30	45	50	59.5	75	degrees
H =Height of Slot Cut =	5	5	5	5	5	ft
L = Length of failure surface = H/sinθ =	10.0	7.1	6.5	5.8	5.2	ft
ϕ = Angle of internal friction =	29	29	29	29	29	degrees
C = Cohesion =	72	72	72	72	72	psf
γ = Unit weight of soil =	110	110	110	110	110	pcf
X = Width of slot cut =	8	8	8	8	8	ft
A = Area of failure = H^2/(2*tanθ) =	21.7	12.5	10.5	7.4	3.3	ft
D = Depth of Centroid = H/3 =	1.7	1.7	1.7	1.7	1.7	ft
Z = Distance to Adjacent Building =	0.0	0.0	0.0	0.0	0.0	ft
q = Adjacent Building Load =	500.0	500.0	500.0	500.0	500.0	psf
Depth of the failure wedge, Y = H/tan(θ)	8.7	5.0	4.2	2.9	1.3	ft
Adjacent footing within the failure wedge? 1=Yes, 0=No	1	1	1	1	1	
Q = Surcharge on Failure Wedge =qx1/1000 =	0.5	0.5	0.5	0.5	0.5	kips/ft
W = Weight+Q = γ*(A/1000)+Q =	2.9	1.9	1.7	1.3	0.9	kips/ft
F_T = Tangent force = Wsinθ =	1.4	1.3	1.3	1.1	0.8	kips/ft
F_N = Normal force = Wcosθ =	2.5	1.3	1.1	0.7	0.2	kips/ft
R = Resistance force along failure plane = F_N*tanϕ + L(C/1000) =	2.1	1.2	1.1	0.8	0.5	kips/ft
Lateral Resistance from Bracing, R_L =	0.41	0.41	0.41	0.41	0.41	kips/ft
Forces along sides						
Area (A_S)=	21.7	12.5	10.5	7.4	3.3	ft^2
Average intergranular stress, τ = C + γ*Dtanϕ =	173.6	173.6	173.6	173.6	173.6	psf
Resistance force along sides of wedge = R_S = τ*2(A_S/1000) =	7.5	4.3	3.6	2.6	1.2	kips
F.S. = (R*X + R_S + R_L*X) / F_T*X =	2.40	1.66	1.52	1.34	1.25	





Bracing within Slot Cuts

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Provide bracing within the slot cuts for additional support. Bracing should be designed by structural engineer and capable of supporting 0.41 kips/ft where the adjacent building & property line is approximately less than 1 foot away from the proposed excavation.

Figure 4

5.2 Shallow Foundation Design

5.2.1 Bearing Value

For the proposed mixed-use builings, an allowable bearing value of 1800 pounds per square foot (psf) may be used for design of the footings placed at a depth of at least 18 inches below the lowest adjacent ground and founded on the new certified compacted fill. Single spread footings should be at least 24 inches square and continuous footings should be at least 12 inches wide. These bearing values may be increased by 200 psf for each additional foot of depth or width to a maximum value of 4000 psf. The above recommended value may be increased by one third (1/3) when considering short duration seismic or wind loads.

5.2.2 Settlement

Settlement of the footings placed as recommended and subject to no more than allowable loads is not expected to exceed 3/4 inch. Differential settlement between adjacent columns is not anticipated to exceed 1/4 inch for a span of 30 feet or less.

5.2.3 Lateral Pressures

Passive earth pressure may be computed as an equivalent fluid pressure of 300 pounds per cubic foot, with a maximum earth pressure of 2500 pounds per square foot. An allowable coefficient of friction between soil and concrete of 0.35 may be used with the dead load forces. When combining passive pressure and frictional resistance, the passive pressure component should be reduced by one third (1/3).

Active earth pressure from horizontal backfill may be computed as an equivalent fluid weighting of 35 pounds per cubic foot. The above value assumes free-draining conditions.

5.3 Foundation Construction

It is anticipated that the entire structure will be underlain by onsite soils of very low expansion potential. The following presents our recommendations for the foundation construction. All footings should be founded at a minimum depth of 18 inches below the lowest adjacent ground surface and founded into new certified compacted fill. Proposed footings should include surcharge from adjacent neighboring structures, including structural footings and/or walls. All continuous footings should have at least two No. 4 reinforcing bar placed both at the top and two No. 4 reinforcing bar placed at the bottom of the footings. A grade beam of at least 12 inches square, reinforced as recommended above for footings, should be utilized across the

garage entrance. Base of the reinforced beam should be at the same elevation as the bottom of the adjoining footings.

5.4 Concrete Slab

Concrete slabs should be designed by the structural engineer using an expansion index of 16 and an effective plasticity index of 10. Concrete slabs should be a minimum of 4 inches thick, underlain with 2 inches of sand and reinforced with a minimum of #3 rebar spaced at 24" on center each way, or its equivalent. All slab reinforcement should be supported to ensure proper positioning during placement of concrete. A positive separation should be maintained with expansive joint material to permit relative movement. Concrete slabs in moisture sensitive areas should be underlain with a vapor barrier consisting of a minimum of six-mil polyethylene membrane with all laps sealed. A minimum of two inches of sand should be placed over the membrane to aid in uniform curing of concrete.

5.5 Retaining Wall

Wall should be provided with subdrains to reduce the potential for the buildup of hydrostatic pressure. Backdrains could consist of free drainage materials (SE of 30 or greater) or CalTrans Class 2 permeable materials immediately behind the wall and extending to within 18 inches of the ground surface. A 4-inch diameter perforated pipe wrapped in gravel and geofabric should be installed at the base of the wall and sloped to discharge to a suitable collection facility or through weep holes. Alternatively, commercially available drainage fabric could be used. The fabric manufacturer's recommendations should be followed in the installation of the drainage fabric backdrain.

5.6 Temporary Excavation and Backfill of Utility Trenches

All trench excavations should conform to CAL-OSHA and local safety codes. All utilities trench backfill should be brought to near optimum moisture content and then compacted to obtain a minimum relative compaction of 90 percent of ASTM D-1557-12. All temporary excavations should be observed by a field engineer of this office so as to evaluate the suitability of the excavation to the exposed soil conditions.

6.0 SEISMIC DESIGN

Based on our studies on seismicity, there are no known active faults crossing the property. However, the subject site is located in Southern California, which is a tectonically active area. The following CBC 2019 (Chapter 16) & ASCE 7-16 seismic related values may be used:

Site Classification: (ASCE, Table 20.3-1)	D
Spectral Response Accelerations (g):	
(CBC, Figure 1613.2.1 (1) 0.2-Second, S_S	1.965
(CBC, Figure 1613.2.1 (2)) 1-Second, S_1	0.708
Site Coefficient:	
(CBC, Table 1613.2.3 (1)) F_a	1.0
(CBC, Table 1613.2.3 (2)) F_v	1.7

Based on the U.S. Seismic Design Maps (USGS, updated January 2019), the proposed structures may be designed to accommodate up to a maximum site horizontal acceleration of 0.935g with 2% probability of being exceeded in 50 years. However, the Project Structural Engineer should be aware of the information provided to determine if any additional structural strengthening is warranted.

7.0 TEMPORARY TRENCH EXCAVATION AND BACKFILL

All trench excavations should conform to CAL-OSHA and local safety codes. Based on our field investigation we believe some caving may occur in trenches. All utilities trench backfill should be brought to near optimum moisture content and then compacted to obtain a minimum relative compaction of 90 percent of ASTM D-1557-12.

8.0 CORROSION POTENTIAL

Chemical laboratory tests were conducted on the existing onsite near surface materials sampled during EGL's field investigation to aid in evaluation of soil corrosion potential and the attack on concrete by sulfate in the soils. The test results are presented in the Appendix B.

According to ACI 318-14 Table 19.3.1.1, a sulfate content of 0.006 percent by weight in soils is assigned to Class "S0" and the severity of exposure to sulfate for concrete placed in contact with the onsite soil is considered "Not Applicable". Based on the testing results and ACI 318-14 Table 19.3.2.1, it is concluded that there is no restriction on the type of cement ("No Type Restriction") to be used at the site; however EGL recommends that Type II cement be used.

Based on the minimum resistivity test results, the subsurface soils are moderately corrosive to buried metal pipe. Any underground steel utilities should be blasted and given protective

coating. Should additional protective measures be warranted, a corrosion specialist should be consulted.

9.0 INSPECTION

As a necessary requisite to the use of this report, the following inspection is recommended:

- Temporary excavations.
- Removal of surficial and unsuitable soils.
- Backfill placement and compaction.
- Utility trench backfill.
- Foundation excavation.

The geotechnical engineer should be notified at least 1 day in advance of the start of construction. A joint meeting between the client, the contractor, and the geotechnical engineer is recommended prior to the start of construction to discuss specific procedures and scheduling.

10.0 111 STATEMENT

Based on our field investigation and the laboratory testing results, it is our opinion that the grading and proposed structures will be safe against hazard from landslide, settlement, or slippage and the proposed construction will have no adverse effect on the geologic stability of the adjacent properties provided our recommendations are followed.

11.0 PERCOLATION TEST

Building pads should be properly drained toward the street away from the slope and structure via swales or area drains. Positive pad drainage shall be incorporated into the final plans. In no cases should water be allowed to pond within the site, impound against structures or flow in a concentrated and/or uncontrolled manner down the descending slope areas.

In order to evaluate the feasibility of the infiltration system, EGL has performed percolation tests at the subject site based on the County of Los Angeles Department of Public Works of "*Guidelines for Geotechnical Investigation and Reporting; Low Impact Development Stormwater Infiltration*" (GS200.2, 2017). The test was performed within test boring B-1. Approximate location of the test boring is shown on the Site Plan, Figure 2. The test boring was filled with a depth of minimum 12 inches water two consecutive times for the presoak prior to filling for the

percolation test on September 8, 2021 and the water only drained 2.75" and 0.13" in 30 minutes, respectively. Due to the hard clayey material at the site and the slow percolation the testing was stopped. It is EGL's opinion that the infiltration rate of water within the very stiff to hard clayey soil is expected to be less than 0.3 inch/hour. An infiltration/detention basin within the natural soil is not feasible due to the fine-grained clayey material. An infiltration system using planter boxes or approved equivalent may be used. If planter boxes are used, they should be waterproofed and designed with an overflow to the street.

12.0 DRAINAGE

Building pad should be properly drained toward the street away from the slope and structure via swales or area drains. Positive pad drainage shall be incorporated into the final plans. In no cases should water be allowed to pond within the site, impound against structures or flow in a concentrated and/or uncontrolled manner down the descending slope areas.

13.0 REMARKS

The conclusions and recommendations contained herein are based on the findings and observations at the exploratory locations. However, soil materials may vary in characteristics between locations of the exploratory locations. If conditions are encountered during construction which appear to be different from those disclosed by the exploratory work, this office shall be notified so as to recommend the need for modifications.

This report has been prepared in accordance with generally accepted professional engineering principles and practice. No warranty is expressed or implied. This report is subject to review by controlling public agencies having jurisdiction.

REFERENCES

1. American Concrete Institute, (2014), "*Building Code Requirements for Structural Concrete (ACI 318-14) and Commentary*", Chapter 19: Durability Requirements, Sections 19.3.1: Exposure Categories and Classes & 19.3.2: Requirements for Concrete Mixtures; pages 317 to 323, Tables 19.3.1.1 and 19.3.2.1".
2. ASCE, (2017), "ASCE/SEI 7-16, Minimum Design Loads and Associated Criteria for Buildings and Other Structures; dated 05-31-2017, 889 pages; prepared and published by American Society of Civil Engineers.
3. CBC, (2019), "California Building Code: California Code of Regulations, Title 24, Part 2, Volume 2 of 2, California Building Standards Commission"; Section 1613 Earthquake Loads; pages 33-46.
4. CDMG, (1998), "Seismic Hazard Evaluation of the El Monte 7.5-minute Quadrangle, Los Angeles County, California"; updated 2005; prepared by California Division of Mines and Geology; Seismic Hazard Zone Report 024; 59 pgs, 6 figs, 4 tables and 3 plates.
5. CDMG, (1999), "Seismic Hazard Zones of El Monte 7.5-minute Quadrangle, Los Angeles County, California"; prepared by California Division of Mines and Geology; Official Map; scale 1" = 2000'
6. Dibblee, Jr., Thomas W., (1999), "Geological Map of the El Monte and Baldwin Park Quadrangles, Los Angeles County, California"; published by Dibblee Geological Foundation; DF-69, Scale 1" = 2000'
7. Los Angeles County, (2017), "Guidelines For Geotechnical, Investigation, And Reporting Low Impact Development Stormwater Infiltration"; dated 06-30-2017; Administrative Manual GS200.2, prepared by County of Los Angeles Department of Public Works, Geotechnical and Materials Engineering Division, 40 pages; http://ladpw.org/gmed/permits/docs/policies/GS200.2.pdf
8. Scales Lab Architects (2021), "Site Plan, Proposed Villa Mixed-Use, 7539 Garvey Avenue, Rosemead, California", Scale: 3/32" =1', Sheet A-101, dated June 1, 2021.
9. USGS, (2019), "US Seismic Design Maps"; updated 01-2019; prepared by United States Geological Survey; https://earthquake.usgs.gov/ws/designmaps/asce7-16.html
10. Yeats, Robert S., (2004) "Tectonics of the San Gabriel Basin and Surroundings, Southern California"; GSA Bulletin; September/October 2004; v.116; no. 9/10; p. 1158-1182

APPENDIX A
FIELD INVESTIGATION

Our field exploration was performed at the subject property September 8, 2021 with the aid of a hollow-stem drill rig of ACE Drilling Services. A total of five (5) 8-inch diameter hollow-stem auger borings were drilled to a maximum depth of 30.0 feet below the existing ground surface. Upon completion of drilling and percolation testing, all borings were backfilled with onsite soil removed from excavations and tamped. The purpose of the excavation was to investigate the engineering characteristics of the onsite soils with respect to the proposed development.

The borings were supervised and logged by EGL's engineer. Relatively undisturbed ring samples and bulk samples were collected during drilling for laboratory testing. The approximate locations of these borings are shown on the Site Plan (Figure 2). Ring samples were taken at frequent intervals. The samples taken by a hollow stem auger were obtained by driving a sampler with successive blows of a 140-pound hammer dropping from a height of 30 inches.

Representative undisturbed samples of the subsurface soils were retained in a series of brass rings, each having an inside diameter of 2.42 inches and a height of 1.00 inch. All ring samples were transported to our laboratory. Bulk surface soil samples were also collected for additional classification and testing.

EGL

BORING LOG: B-1

PROJECT LOCATION: 7539 & 7545 Garvey Avenue, Rosemead, California

PROJECT NO: 21-AA-106GE

EXCAVATION SERVICE:	ACE Drilling
DATE EXCAVATED:	09/08/2021
DATE LOGGED:	09/08/2021
EXCAVATION METHOD:	Hollow-Stem
SAMPLE METHOD:	Split-Tube
ELEVATION:	-----
LOGGED BY:	KY

S: Standard Penetration Test B: Bulk Sample R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows Counts; 12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	*Earth Material Descriptions*
0 - 2		R	32	CL/ML	93.5	4.0	@ 2.0' Sandy silty clay with sandy clayey silt, olive brown, dry, very stiff
4 - 6		R	50	CL	105.7	7.7	@ 5.0' Sandy clay, dark yellowish brown, dry to slightly moist, hard
8		R	50	CL	102.4	17.1	@ 7.0' Silty clay, olive yellow, moist, hard
10 - 46							Total Depth = 8.0 feet No Caving; No Groundwater Boring Backfilled and Tamped After Percolation Test Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches

EGL

BORING LOG: B-2

PROJECT LOCATION: 7539 & 7545 Garvey Avenue, Rosemead, California

PROJECT NO: 21-AA-106GE

EXCAVATION SERVICE:	ACE Drilling
DATE EXCAVATED:	09/08/2021
DATE LOGGED:	09/08/2021
EXCAVATION METHOD:	Hollow-Stem
SAMPLE METHOD:	Split-Tube
ELEVATION:	-----
LOGGED BY:	KY

S: Standard Penetration Test B: Bulk Sample R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows Counts; 12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	*Earth Material Descriptions*
0							
2		R	32	CL	105.8	5.4	@ 2.0' Sandy clay, olive brown to dark yellowish brown, dry, very stiff
4							
6		R	50/11"	CL	109.5	9.7	@ 5.0' Sandy clay, dark yellowish brown, slightly moist, hard
8							
10		R	33	CL	106.4	16.0	@ 10.0' Sandy clay, dark yellowish brown, slightly moist to moist, very stiff
12							
14							
16		R	30	CL	98.4	18.9	@ 15.0' Sandy clay, olive brown, moist, very stiff
18							
20		R	41	CL	91.4	21.9	@ 20.0' Silty clay, olive gray, moist to very moist, very stiff
22							
24							Total Depth = 20.0 feet No Caving; No Groundwater Boring Backfilled and Tamped Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches
26							
28							
30							
32							
34							
36							
38							
40							
42							
44							
46							

EGL

BORING LOG: B-3

PROJECT LOCATION: 7539 & 7545 Garvey Avenue, Rosemead, California

PROJECT NO: 21-AA-106GE

EXCAVATION SERVICE:	ACE Drilling
DATE EXCAVATED:	09/08/2021
DATE LOGGED:	09/08/2021
EXCAVATION METHOD:	Hollow-Stem
SAMPLE METHOD:	Split-Tube
ELEVATION:	-----
LOGGED BY:	KY

S: Standard Penetration Test B: Bulk Sample R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows Counts; 12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Earth Material Descriptions
0							
2		R	50/11"	CL/ML	102.7	6.7	@ 2.0' Sandy silty clay with sandy clayey silt, dark yellowish brown, dry to slightly moist, hard
4							
6		R	37	CL/ML	99.9	4.7	@ 5.0' Sandy silty clay with sandy clayey silt, dark yellowish brown, dry, very stiff
8							
10		R	50	CL	96.4	19.0	@ 10.0' Sandy clay, olive brown, moist, hard
12							
14							
16		R	60/6"	CL	98.9	10.3	@ 15.0' Sandy clay, olive brown, slightly moist, hard
18							Refusal @ 16.0 feet Total Depth = 16.0 feet No Caving; No Groundwater Boring Backfilled and Tamped Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches
20							
22							
24							
26							
28							
30							
32							
34							
36							
38							
40							
42							
44							
46							

EGL

BORING LOG: B-4

PROJECT LOCATION: 7539 & 7545 Garvey Avenue, Rosemead, California

PROJECT NO: 21-AA-106GE

EXCAVATION SERVICE:	ACE Drilling
DATE EXCAVATED:	09/08/2021
DATE LOGGED:	09/08/2021
EXCAVATION METHOD:	Hollow-Stem
SAMPLE METHOD:	Split-Tube
ELEVATION:	-----
LOGGED BY:	KY

S: Standard Penetration Test B: Bulk Sample R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows Counts; 12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Earth Material Descriptions
2		R	50/10"	SC	106.6	5.3	@ 2.0' Clayey sand, fine to coarse grained, olive brown, slightly moist, very dense, few gravel up to 2.0" in size
6		R	15	SC	108.0	6.9	@ 5.0' Clayey sand, fine to coarse grained, dark yellowish brown, slightly moist, medium dense, few fine gravel
10		R	35	CL	109.3	13.4	@ 10.0' Sandy clay, dark yellowish brown, slightly moist, very stiff
16		R	35	CL	96.8	22.1	@ 15.0' Sandy clay, olive brown, very moist, very stiff
20		R	30	CL	92.7	19.2	@ 20.0' Silty clay, olive gray, moist to very moist, very stiff

Total Depth = 20.0 feet
No Caving; No Groundwater
Boring Backfilled and Tamped

Hammer Driving Weight = 140 lbs.
Hammer Driving Height = 30 inches

EGL

BORING LOG: B-5

PROJECT LOCATION: 7539 & 7545 Garvey Avenue, Rosemead, California

PROJECT NO: 21-AA-106GE

EXCAVATION SERVICE:	ACE Drilling
DATE EXCAVATED:	09/08/2021
DATE LOGGED:	09/08/2021
EXCAVATION METHOD:	Hollow-Stem
SAMPLE METHOD:	Split-Tube
ELEVATION:	----
LOGGED BY:	KY

S: Standard Penetration Test B: Bulk Sample R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows Counts; 12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	*Earth Material Descriptions*
0 - 2	B	R	20	ML	106.6	13.1	@ 2.0' Sandy clayey silt, dark yellowish brown, slightly moist to moist, stiff
4 - 6		R	25	CL	118.8	12.7	@ 5.0' Sandy clay, dark, brown, slightly moist, stiff
8 - 10		R	25	CL	117.3	13.0	@ 10.0' Sandy clay, dark yellowish brown, slightly moist, stiff
12 - 14 - 16		R	23	CL	108.2	17.8	@ 15.0' Sandy clay, dark yellowish brown, moist, stiff
18 - 20		R	30	CL	99.3	23.1	@ 20.0' Sandy clay, dark yellowish brown, very moist, very stiff
22 - 24 - 26		R	27	CL	97.3	15.8	@ 25.0' Sandy clay, dark yellowish brown, slightly moist, stiff
28 - 30		R	36	CL	90.9	24.6	@ 30.0' Sandy clay, dark yellowish brown, very moist, very stiff
32 - 34 - 36 - 38 - 40 - 42 - 44 - 46							Total Depth = 30.0 feet No Caving; No Groundwater Boring Backfilled and Tamped After Groundwater Observation Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches

APPENDIX B

LABORATORY TESTING

During the subsurface exploration, EGL personnel collected relatively undisturbed ring samples and bulk samples. The following tests were performed on selected soil samples:

Moisture-Density

The moisture content and dry unit weight were determined for each relatively undisturbed soil sample obtained in the test borings in accordance with ASTM D2937 standard. The results of these tests are shown on the boring logs in Appendix A.

Shear Tests

Shear tests were performed in a direct shear machine of strain-control type in accordance with ASTM D3080 standard. The rate of deformation was 0.025 inch per minute. Selected samples were sheared under varying confining loads in order to determine the Coulomb shear strength parameters: internal friction angle and cohesion. The shear test results are presented in the attached plates.

Consolidation Tests

Consolidation tests were performed on selected undisturbed soil samples in accordance with ASTM D2435 standard. The consolidation apparatus is designed for a one-inch high soil filled brass ring. Loads are applied in several increments in a geometric progression and the resulting deformations are recorded at selected time intervals. Porous stones are placed in contact with the top and bottom of each specimen to permit addition and release of pore fluid. The samples were inundated with water at a load of one kilo-pounds (kips) per square foot, and the test results are shown on the attached Figures.

Corrosion Test

Corrosion series of bulk sample was tested in accordance with Caltrans test methods. The series consist of Chloride Content, Sulfate Content, pH, and Minimum Resistivity tests. The methods used and test results are as follows:

Sample Location	pH	CT-412 Chloride (ppm)	CT-417 Sulfate (% by weight)	CT-643 Min. Resistivity (ohm-cm)
B-5 @ 0-5'	6.86	350	0.006	3,900

Expansion Index

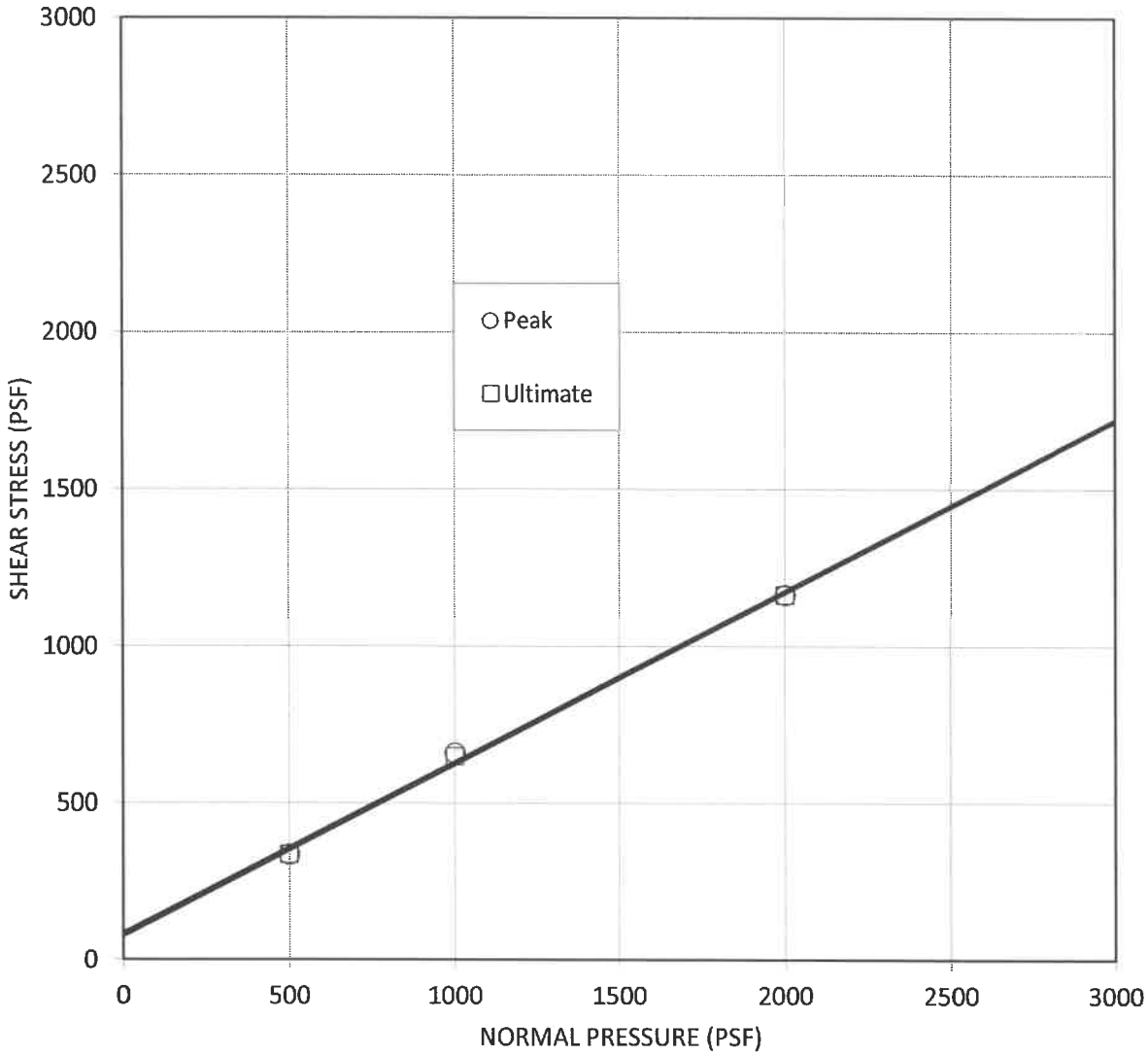
The Expansion Index was determined for the typical site material encountered in the borings. The laboratory standard used was ASTM D4829-95 and the test results are as follows:

Sample Location	Expansion Index	UBC Classification
B-5 @ 0-5'	16	Very Low

Atterberg Limits

The Atterberg Limits was determined for the typical site material encountered in the borings. The laboratory standard used was ASTM D4318 and the test results are as follows:

Sample Location	Liquid Limit	Plastic Limit	Plastic Index
B-2 @ 2'	20	14	6
B-2 @ 5'	24	14	10
B-5 @ 10'	28	17	11



Boring No.:	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
B-1	1	2.0	Ring	CL/ML	○	84	29
					□	78	29

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)	γ_d (pcf)	S (%)
500	4.0	29.5	92.6	97.1
1000	4.0	29.5	93.4	99.1
2000	4.0	29.0	94.4	99.8

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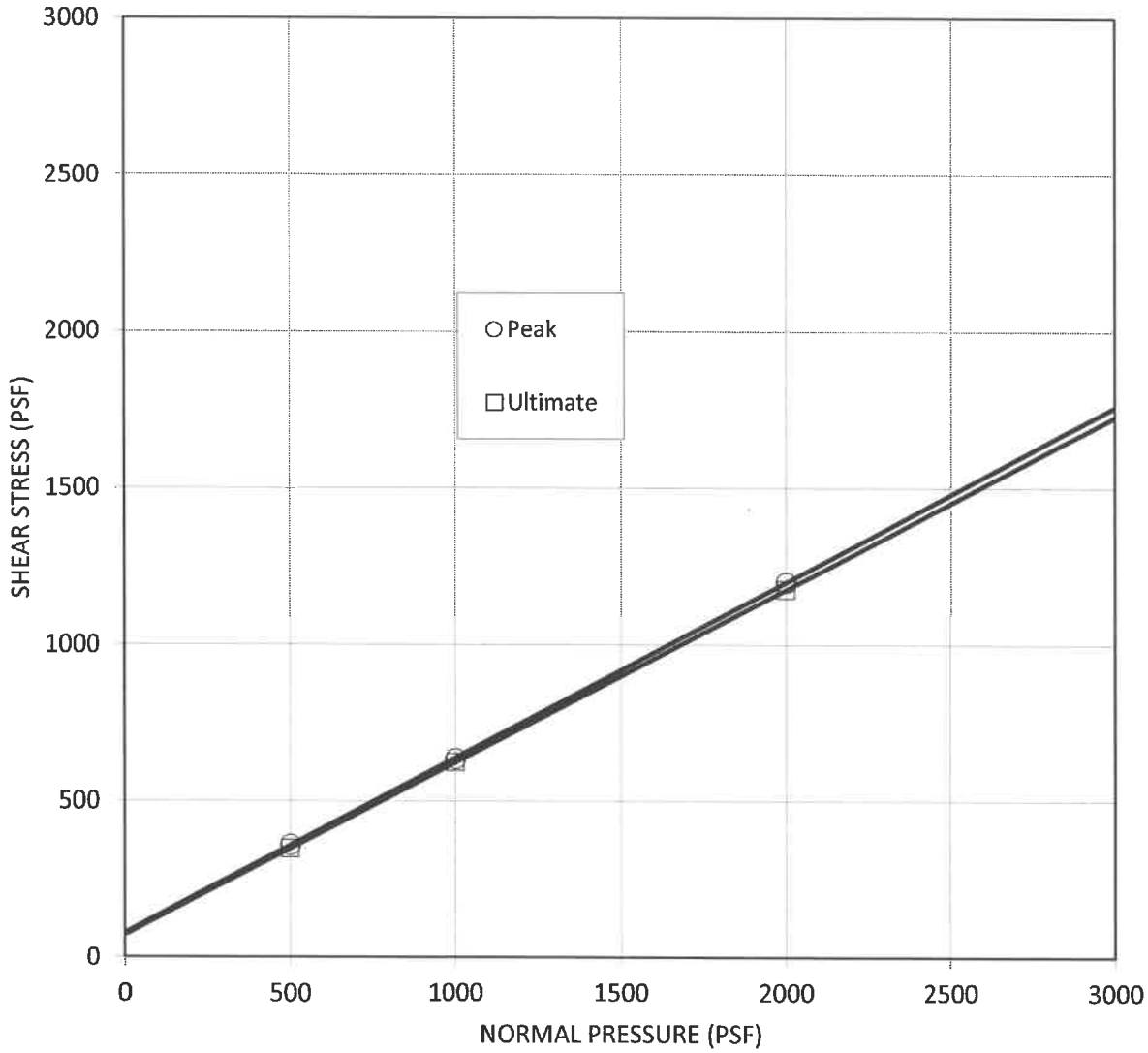
DIRECT SHEAR

09/21 (ASTM D3080) Figure

11819 Goldring Road, Unit A, Arcadia, California 91006; Phone (626) 263-3588; Fax (626) 263-3599



Boring No.:	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
B-3	2	5.0	Ring	CL/ML	○	78	29
					□	72	29

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)	γ_d (pcf)	S (%)
500	4.7	25.6	98.5	97.4
1000	4.7	24.6	100.5	98.1
2000	4.7	24.1	101.5	98.7

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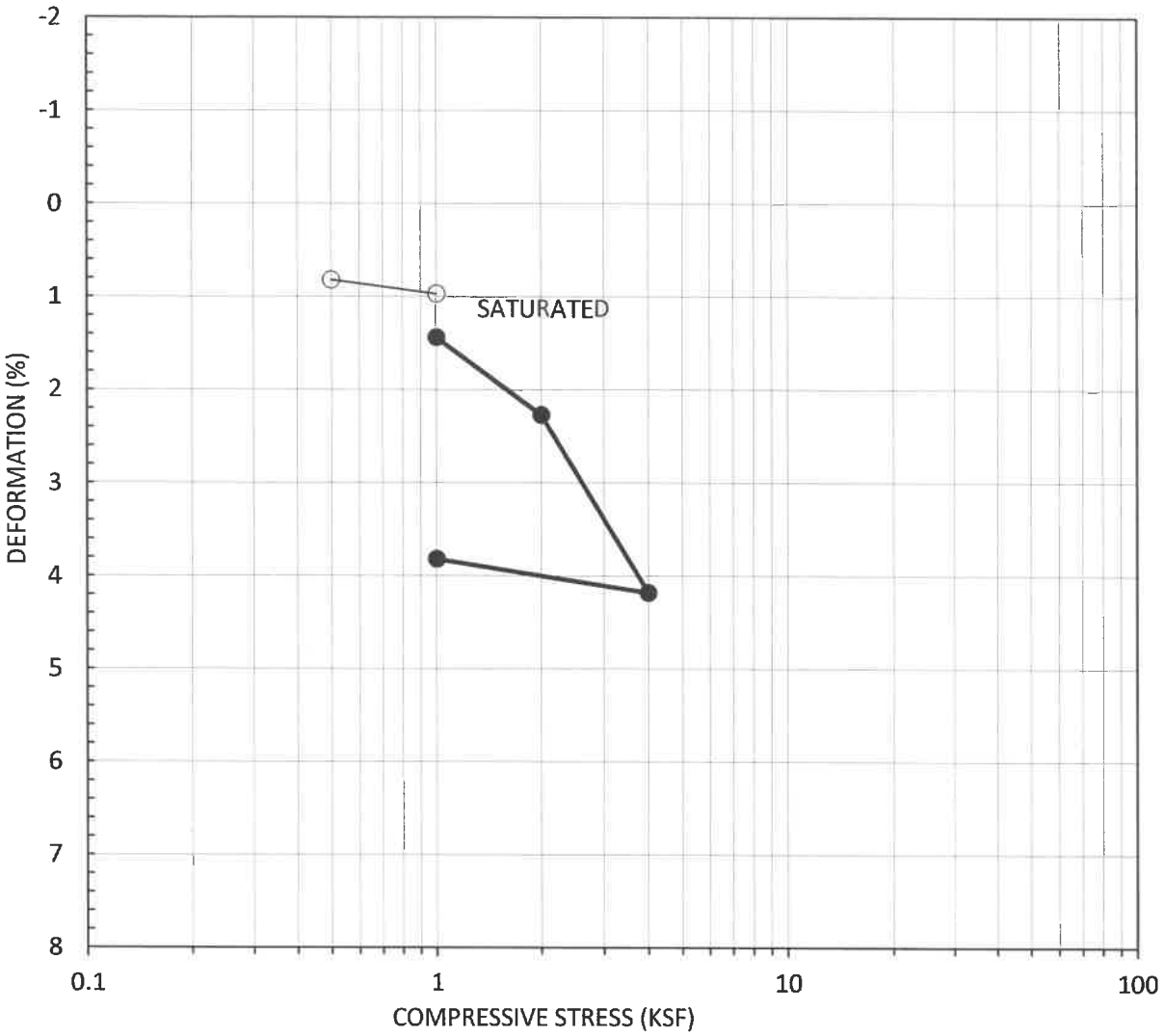
DIRECT SHEAR

09/21 (ASTM D3080) Figure

11819 Goldring Road, Unit A, Arcadia, California 91006; Phone (626) 263-3588; Fax (626) 263-3599



Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-2	2	5.0	CL	9.7	110.1	0.530

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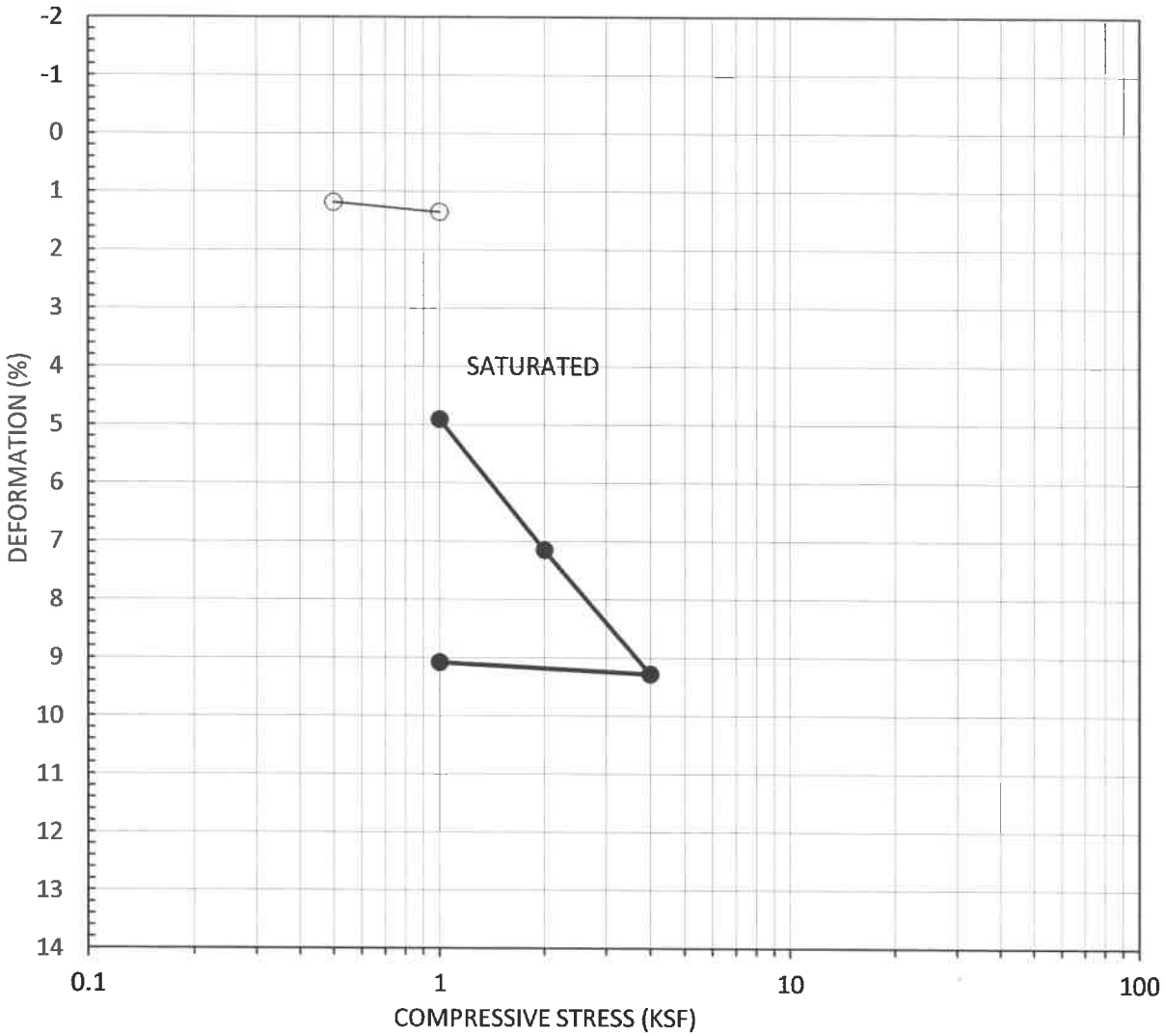
CONSOLIDATION

09/21 (ASTM D2435) Figure



Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-4	2	5.0	SC	6.9	109.2	0.543

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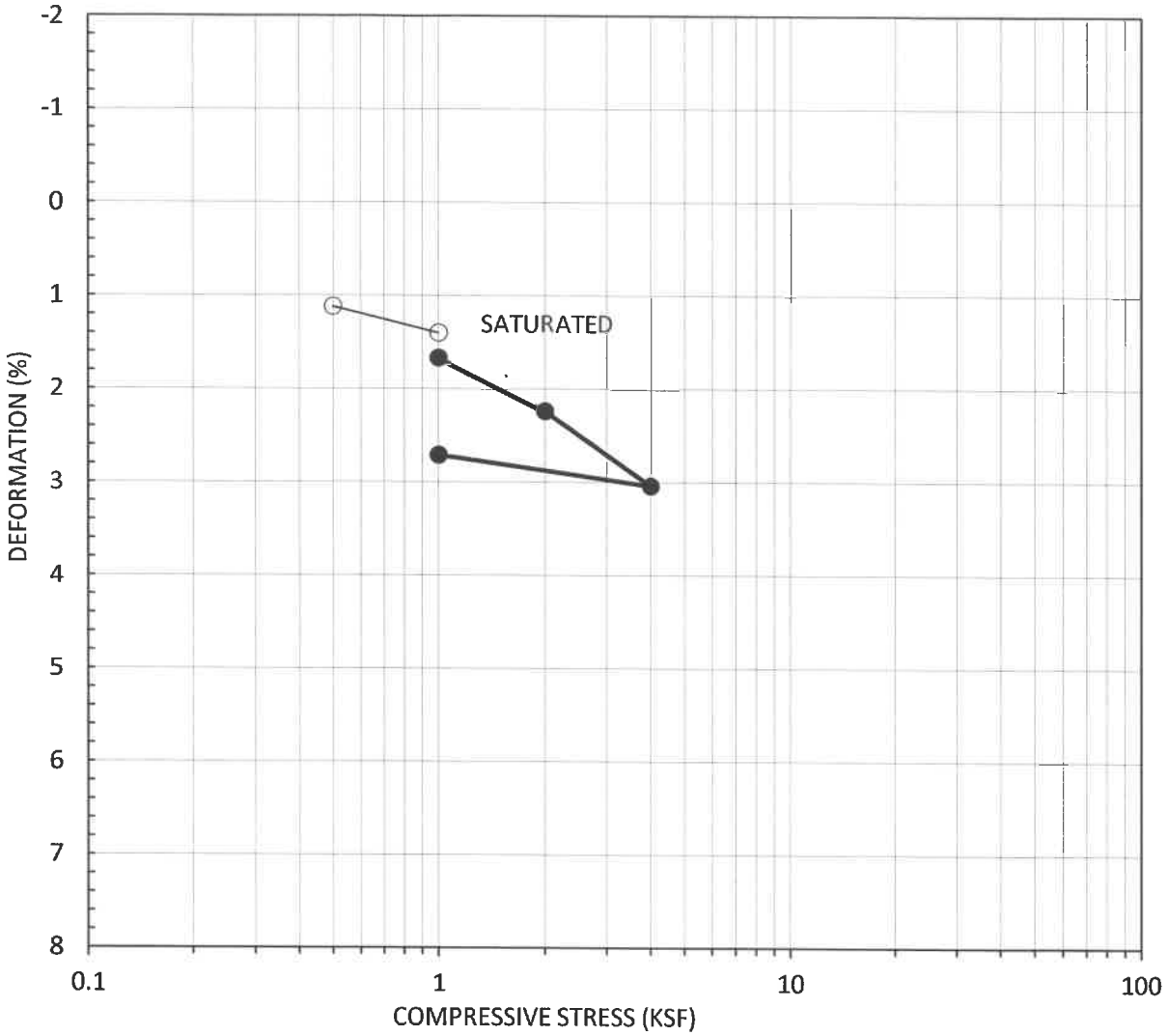
CONSOLIDATION

09/21 (ASTM D2435) Figure



Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-5	1	2.0	ML	13.1	107.0	0.575

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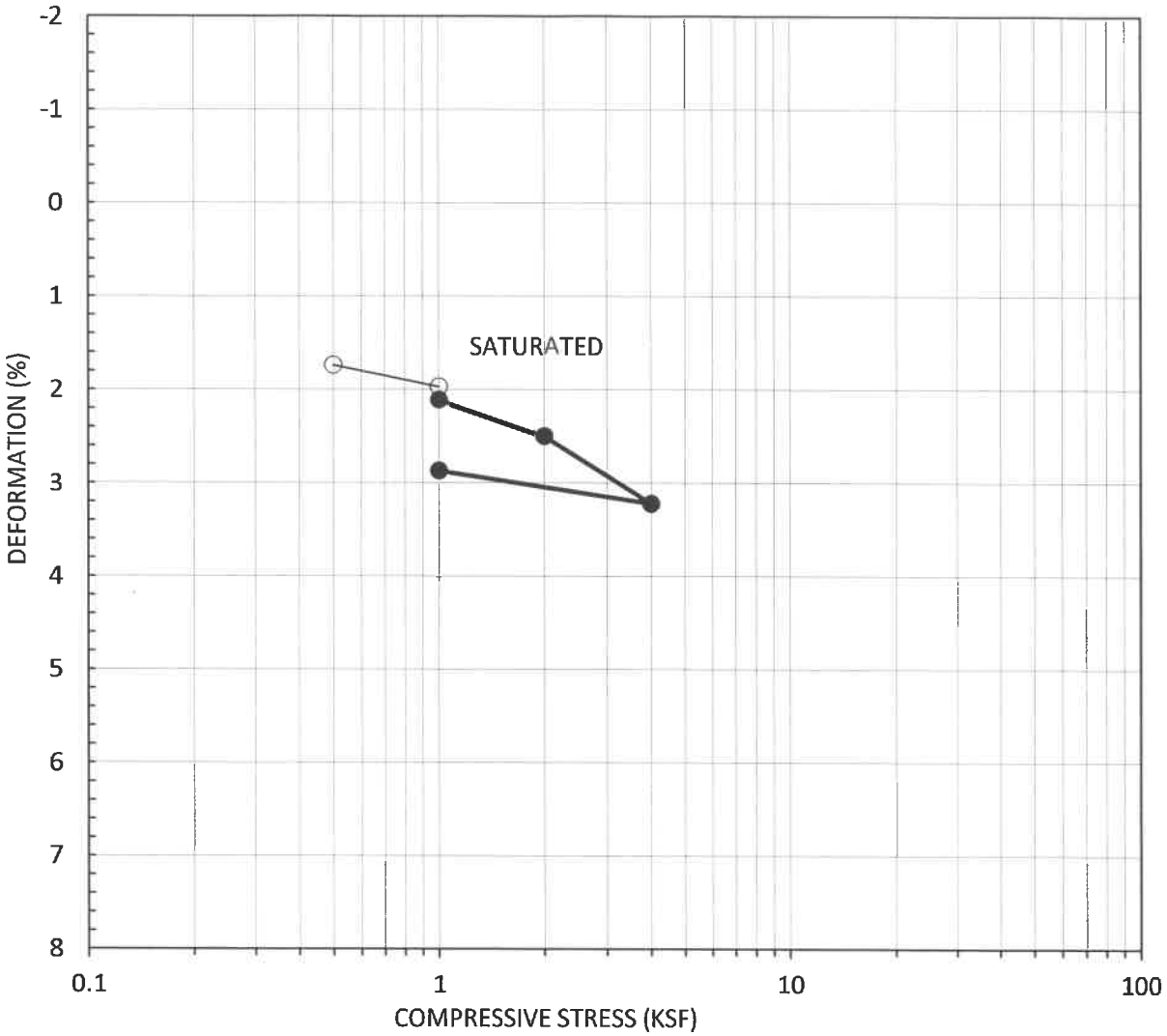
09/21 (ASTM D2435) Figure



Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-5	3	10.0	CL	13.0	117.7	0.431

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09/21 (ASTM D2435) Figure