Appendix E

Geotechnical Report and Peer Review

Geotechnical Report

ROCKRIDGE GEOTECHNICAL

Prepared for **Silicon Sage Builders**

PRELIMINARY GEOTECHNICAL INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
905 N. CAPITOL AVENUE
SAN JOSE, CALIFORNIA

December 20, 2018
Project No. 18-1608

270 Grand Avenue
Oakland, CA 94610

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ROCKRIDGE GEOTECHNICAL

December 20, 2018
Project No. 18-1608

Ms. Shaivali Desai
Senior Manager
Silicon Sage Builders
560 S. Mathilda Ave
Sunnyvale, California 94086

Subject: Preliminary Geotechnical Investigation Report
Proposed Residential Development
905 N. Capitol Avenue
San Jose, California

Dear Ms. Desai:

We are pleased to present the results of our preliminary geotechnical investigation for the property located at 905 N Capitol Avenue in San Jose, California. Our services were provided in accordance with our proposal dated October 25, 2018.

The subject site consists of two parcels on the southwest side of N Capitol Avenue which are separated by Penitencia Creek Road. The parcels are bounded by N Capitol Avenue on the northeast, Penitencia Creek on the southeast, Kestral Way on the southwest, and various townhomes to the west. The northern parcel is approximately L-shaped, has an area of about 2.1 acres, and maximum plan dimensions of about 390 by 300 feet. The southern parcel is approximately rectangular-shaped, has an area of about 1.3 acres, and maximum plan dimensions of about 390 by 150 feet. The northern parcel is currently occupied by a single-family home, paved driveways, and extensive landscaped areas. The southern parcel is currently undeveloped. The ground surface at the site is relatively level.

We understand SiliconSage Builders is considering purchasing the subject property and redeveloping the site. Current plans are to construct two residential buildings (one on each parcel) that will consist of four levels of wood-framed residential units over a one-level concrete podium structure that will house parking. As currently envisioned, the building will be supported at-grade.

Based on the results of our preliminary geotechnical investigation, we conclude there are no major geotechnical issues that would preclude development of the site, as currently proposed. The primary geotechnical issues affecting the proposed development include: 1) the potential presence of moderately expansive near-surface clay, and 2) providing

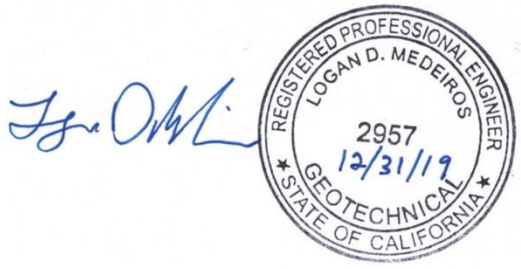
ROCKRIDGE GEOTECHNICAL

adequate foundation support for the proposed structures. We preliminarily conclude the proposed buildings may be supported on conventional shallow foundations.

This report presents our preliminary conclusions and recommendations regarding foundation design, seismic design, and other geotechnical aspects of the project. The recommendations contained in our report are based on limited subsurface exploration and review of available data for the site, and are not intended for final design. Variations between expected and actual soil conditions may be found in localized areas during construction. Therefore, we should be engaged to observe foundation installation, earthwork, and grading, during which time we may make changes in our recommendations, if deemed necessary.

We appreciate the opportunity to provide our services to you on this project. If you have any questions, please call.

Sincerely,
ROCKRIDGE GEOTECHNICAL, INC.



Clayton J. Proto, P.E.
Project Engineer

Logan D. Medeiros, P.E., G.E.
Senior Engineer

Enclosure

ROCKRIDGE GEOTECHNICAL

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PRELIMINARY GEOTECHNICAL INVESTIGATION
TO SUPPORT DUE DILIGENCE EVALUATION
PROPOSED RESIDENTIAL DEVELOPMENT
905 N CAPITOL AVENUE
San Jose, California

1.0 INTRODUCTION

This report presents the results of the preliminary geotechnical investigation performed by Rockridge Geotechnical, Inc. (Rockridge) for the due diligence evaluation of the property located at 905 N Capitol Avenue in San Jose, California.

The subject site consists of two parcels on the southwest side of N Capitol Avenue which are separated by Penitencia Creek Road, as shown on Figure 1, Site Location Map. The parcels are bounded by N Capitol Avenue on the northeast, Penitencia Creek on the southeast, Kestral Way on the southwest, and various townhomes to the west, as shown on Figure 2, Site Plan. The northern parcel is approximately L-shaped, has an area of about 2.1 acres, and maximum plan dimensions of about 390 by 300 feet. The southern parcel is approximately rectangular-shaped, has an area of about 1.3 acres, and maximum plan dimensions of about 390 by 150 feet. The northern parcel is currently occupied by a single-family home, paved driveways, and extensive landscaped areas. The southern parcel is currently undeveloped. The ground surface at the site is relatively level.

We understand SiliconSage Builders is considering purchasing the subject property and redeveloping the site. Current plans are to construct two residential buildings (one on each parcel) that will consist of four levels of wood-framed residential units over a one-level concrete podium structure that will house parking. As currently envisioned, the building will be supported at-grade.

2.0 SCOPE OF SERVICES

Our investigation was performed in accordance with our Proposal for Preliminary Geotechnical Investigation with SiliconSage Builders, dated October 25, 2018. The purpose of our

preliminary investigation was to evaluate whether there are any adverse geotechnical or geological conditions that may affect site development. Our scope of work consisted of evaluating the subsurface conditions at the site by reviewing available subsurface information, performing seven cone penetration tests (CPTs), and performing engineering analyses to develop conclusions and recommendations regarding:

- the most appropriate foundation type(s) for the proposed structures
- preliminary design criteria for the recommended foundation type(s)
- estimates of foundation settlement
- site seismicity and seismic hazards, including the potential for liquefaction and liquefaction-induced ground failure
- 2016 California Building Code (CBC) site class and design spectral response acceleration parameters
- construction considerations.

3.0 FIELD INVESTIGATION

Prior to performing the subsurface field investigation, we obtained a permit from Santa Clara Valley Water District (SCVWD) and contacted Underground Service Alert (USA) to notify them of our work, as required by law. We also retained Precision Locating LLC, a private utility locator, to check the CPT locations for the presence of underground utilities. Details of the field exploration are described below.

The CPTs, designated CPT-1 through CPT-7, were advanced on November 28, 2018 by Middle Earth Geo Testing, Inc. of Orange, California at the approximate locations shown on the Site Plan, Figure 2. The CPTs were advanced until practical refusal was encountered in very dense sand and gravel, which occurred at depths between about 33 and 42 feet. The CPTs were performed using a truck-mounted rig by hydraulically pushing a 1.7-inch-diameter cone-tipped probe into the ground. The probe measured tip resistance, pore water pressure, and frictional resistance on a sleeve behind the cone tip. Electrical sensors within the cone continuously measured these parameters for the entire depth advanced, and the readings were digitized and recorded by a computer. Accumulated data were processed by computer to provide engineering

information such as soil behavior types, correlated strength characteristics, and estimated liquefaction resistance of the soil encountered. The CPT logs, showing tip resistance, friction ratio, pore water pressure, and soil behavior type, are attached in Appendix A. Upon completion, the CPT holes were backfilled with neat cement grout in accordance with SCVWD requirements.

4.0 SUBSURFACE CONDITIONS

As presented on the Regional Geologic Map (Figure 3), the site is mapped as being underlain by Holocene-age (11,000 years to present) alluvial deposits (Qha). The results of our CPTs indicate that the site is generally underlain by clay with varying sand content to a depth of about 30 feet bgs. The clay is stiff to hard with occasional dense sand interbeds up to about 5 feet thick. The clay is underlain by dense to very dense sands and gravels from approximately 30 feet bgs to the maximum depth explored of 43 feet.

Free groundwater was not encountered in any of the CPTs during our investigation. To further evaluate the groundwater level at the site, we reviewed information on the State of California Water Resources Control Board GeoTracker website[1]. The website included information from monitoring wells installed at the Arco Station at 1145 N Capitol Avenue, about 1,500 feet northwest of the site. Street grades at 1145 N Capitol are approximately the same as grades at the site. Groundwater levels at the site were periodically monitored between the period of 1992-2014 and varied from about 50 to 70 feet bgs.

5.0 SEISMIC CONSIDERATIONS

The San Francisco Bay Area is considered to be one of the more seismically active regions in the world. We evaluated the potential for earthquake-induced geologic hazards including ground

[1] http://geotracker.waterboards.ca.gov/

shaking, ground surface rupture, liquefaction,[2] lateral spreading,[3] and cyclic densification[4]. The results of our evaluation regarding seismic considerations for the project site are presented in the following sections.

5.1 Regional Seismicity and Faulting

The major active faults in the area are the Hayward, San Andreas, and Calaveras faults. These and other faults of the region are shown on Figure 4. The fault systems in the Bay Area consist of several major right-lateral strike-slip faults that define the boundary zone between the Pacific and the North American tectonic plates. Numerous damaging earthquakes have occurred along these fault systems in recorded time. For these and other active faults within a 50-kilometer radius of the site, the distance from the site and estimated mean characteristic moment magnitude[5] [Working Group on California Earthquake Probabilities (WGCEP, 2008) and Cao et al. (2003)] are summarized in Table 1.

Since 1800, four major earthquakes (i.e., Magnitude > 6) have been recorded on the San Andreas fault. In 1836, an earthquake with an estimated maximum intensity of VII on the Modified Mercalli (MM) Intensity Scale occurred east of Monterey Bay on the San Andreas fault (Toppozada and Borchardt 1998). The estimated moment magnitude, M_w, for this earthquake is about 6.25. In 1838, an earthquake occurred on the Peninsula segment of the San Andreas fault. Severe shaking occurred with an MM of about VIII-IX, corresponding to an M_w of about 7.5. The San Francisco Earthquake of 1906 caused the most significant damage in the history of the Bay Area in terms of loss of lives and property damage. This earthquake created a surface rupture along the San Andreas fault from Shelter Cove to San Juan Bautista approximately 470

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2 Liquefaction is a phenomenon where loose, saturated, cohesionless soil experiences temporary reduction in strength during cyclic loading such as that produced by earthquakes.

3 Lateral spreading is a phenomenon in which surficial soil displaces along a shear zone that has formed within an underlying liquefied layer. Upon reaching mobilization, the surficial blocks are transported downslope or in the direction of a free face by earthquake and gravitational forces.

4 Cyclic densification is a phenomenon in which non-saturated, cohesionless soil is compacted by earthquake vibrations, causing ground-surface settlement.

5 Moment magnitude is an energy-based scale and provides a physically meaningful measure of the size of a faulting event. Moment magnitude is directly related to average slip and fault rupture area.

kilometers in length. It had a maximum intensity of XI (MM), an M_w of about 7.9, and was felt 560 kilometers away in Oregon, Nevada, and Los Angeles. The Loma Prieta Earthquake of October 17, 1989 had an M_w of 6.9 and occurred about 38 kilometers south of the site. On August 24, 2014 an earthquake with an estimated maximum intensity of VIII (severe) on the MM scale occurred on the West Napa fault. This earthquake was the largest earthquake event in the San Francisco Bay Area since the Loma Prieta Earthquake. The M_w of the 2014 South Napa Earthquake was 6.0.

TABLE 1
Regional Faults and Seismicity

Fault Segment	Approximate Distance from Site (km)	Direction from Site	Mean Characteristic Moment Magnitude
Total Hayward	9.0	Northeast	7.00
Total Hayward-Rodgers Creek	9.0	Northeast	7.33
Total Calaveras	11	Northeast	7.03
Monte Vista-Shannon	16	Southwest	6.50
N. San Andreas - Peninsula	22	Southwest	7.23
N. San Andreas (1906 event)	22	Southwest	8.05
N. San Andreas - Santa Cruz	25	Southwest	7.12
Zayante-Vergeles	33	South	7.00
Greenville Connected	34	East	7.00
Mount Diablo Thrust	39	North	6.70
San Gregorio Connected	45	West	7.50

In 1868, an earthquake with an estimated maximum intensity of X on the MM scale occurred on the southern segment (between San Leandro and Fremont) of the Hayward fault. The estimated M_w for the earthquake is 7.0. In 1861, an earthquake of unknown magnitude (probably an M_w of about 6.5) was reported on the Calaveras fault. The most recent significant earthquake on this fault was the 1984 Morgan Hill earthquake (M_w = 6.2).

The U.S. Geological Survey's 2014 Working Group on California Earthquake Probabilities has compiled the earthquake fault research for the San Francisco Bay area in order to estimate the probability of fault segment rupture. They have determined that the overall probability of moment magnitude 6.7 or greater earthquake occurring in the San Francisco Region during the next 30 years (starting from 2014) is 72 percent. The highest probabilities are assigned to the Hayward fault, Calaveras fault, and the northern segment of the San Andreas fault. These probabilities are 14.3, 7.4, and 6.4 percent, respectively.

5.2 Geologic Hazards

During a major earthquake on a segment of one of the nearby faults, strong to violent ground shaking is expected to occur at the project site. Strong shaking during an earthquake can result in ground failure such as that associated with soil liquefaction, lateral spreading, and cyclic densification. We used the results of the CPTs performed for this investigation to evaluate the potential of these phenomena occurring at the project site.

5.2.1 Ground Shaking

The ground shaking intensity felt at the project site will primarily depend on: 1) the size of the earthquake (magnitude), 2) the distance from the site to the fault source, 3) the directivity (focusing of earthquake energy along the fault in the direction of the rupture), and 4) site-specific soil conditions. The site is about 9 kilometers from the Hayward fault. Therefore, the potential exists for a large earthquake to induce strong to violent ground shaking at the site during the life of the project.

5.2.2 Liquefaction and Associated Hazards

Soil susceptible to liquefaction includes loose to medium dense sand and gravel, low-plasticity silt, and some low-plasticity clay deposits. Flow failure, lateral spreading, differential settlement, loss of bearing strength, ground fissures and sand boils are evidence of excess pore pressure generation and liquefaction. We evaluated the liquefaction potential of soil at the site using the results of the CPTs and regional groundwater information. Due to the depth of the

groundwater at the site (>50 feet bgs) and the consistency of the soil, we preliminarily conclude the potential for liquefaction to occur at the site is very low. We also conclude lateral-spreading resulting from liquefaction is also very low.

5.2.3 Cyclic Densification

Cyclic densification (also referred to as differential compaction) of non-saturated sand (sand above groundwater table) can occur during an earthquake, resulting in settlement of the ground surface and overlying improvements. The CPTs indicate the soil above the groundwater table at the site consists of clay and dense sand that is not susceptible to cyclic densification. Therefore, we preliminarily conclude the potential for cyclic densification at the site is very low.

5.2.4 Ground Surface Rupture

Historically, ground surface displacements closely follow the trace of geologically young faults. The site is not within an Earthquake Fault Zone, as defined by the Alquist-Priolo Earthquake Fault Zoning Act, and no known active or potentially active faults exist on the site. We therefore conclude the risk of fault offset at the site from a known active fault is very low. In a seismically active area, the remote possibility exists for future faulting in areas where no faults previously existed; however, we preliminarily conclude the risk of surface faulting and consequent secondary ground failure from previously unknown faults is also very low.

6.0 PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

Based on the results of our preliminary geotechnical investigation, we conclude there are no major geotechnical issues that would preclude development of the site as proposed. The primary geotechnical issues affecting the proposed development include:

- the potential presence of moderately expansive near-surface clay;
- providing adequate foundation support for the proposed structures;

Our preliminary conclusions and recommendations regarding these issues are presented in the following sections.

6.1 Expansive Soil

Based on our experience with subsurface conditions in the general site vicinity, we anticipate the near-surface clay is likely moderately expansive, however, this should be confirmed through exploratory borings and laboratory testing during the final geotechnical investigation. Expansive near-surface soil is subject to volume changes during seasonal fluctuations in moisture content. These volume changes can cause movement and cracking of foundations, slabs and pavements. Therefore, foundations and slabs should be designed and constructed to resist the effects of the expansive clay. These effects can be mitigated by moisture-conditioning the expansive soil below slabs, providing non-expansive soil below slabs, and either supporting foundations below the zone of severe moisture change or providing a stiff, shallow foundation that can limit deformation of the superstructure as the underlying soil shrinks and swells.

We preliminarily recommend the upper 6 to 12 inches of soil subgrade beneath slab-on-grade floors (if used) and exterior concrete flatwork be replaced with non-expansive fill. The non-expansive fill may consist of lime-treated on-site clay or select fill. Select fill should consist of imported or on-site soil that is free of organic matter, contain no rocks or lumps larger than three inches in greatest dimension, have a liquid limit less than 40 and plasticity index less than 12, and be approved by the Geotechnical Engineer.

For slab-on-grade floors (if used), the 6 to 12 inches of non-expansive fill should be measured from the bottom of the capillary moisture break. The non-expansive fill may be omitted if the building is supported on a mat foundation that is at least 18 inches thick.

Even with 6 to 12 inches of non-expansive fill, exterior slabs may experience some cracking due to shrinking and swelling of the underlying expansive soil. Thickening the slab edges and adding additional reinforcement will control this cracking to some degree. In addition, where slabs provide access to buildings, it may be prudent to dowel the entrance to the building to permit rotation of the slab as the exterior ground shrinks and swells and to prevent a vertical offset at the entries.

6.2 Foundations and Settlement

The soil underlying the site has moderate to high strength and moderate to low compressibility. Therefore, we preliminarily conclude the proposed structures may be supported on individual spread footings at interior column locations and continuous perimeter footings. The perimeter footings may need to be deepened to act as barriers to reduce the potential for seasonal or long-term moisture change beneath the slab-on-grade floors, depending on the expansion potential of the near-surface soil.

Preliminary foundation designs may use an allowable bearing pressure of 4,000 pounds per square foot (psf) for dead-plus-live loads. This value may be increased by one-third for total design loads, which include wind or seismic forces. The allowable bearing pressures for dead-plus-live and total loads include factors of safety of at least 2.0 and 1.5, respectively. We estimate total settlement of the proposed structures supported on spread footings designed using these allowable bearing pressures will be less than 1 inch and differential settlement will be less than 1/2 inch over a horizontal distance of 30 feet.

6.3 Seismic Design

We anticipate the proposed building will be designed using the seismic provisions in the 2016 California Building Code (CBC). We preliminarily conclude Site Class D designation is appropriate for the site. The latitude and longitude of the site are 37.3826° and -121.8573°, respectively. In accordance with the 2016 CBC, we recommend the following:

- S_S = 1.508g, S_1 = 0.600g
- S_{MS} = 1.508g, S_{M1} = 0.900g
- S_{DS} = 1.005g, S_{D1} = 0.600g
- Seismic Design Category D for Risk Categories I, II, and III.

6.4 Construction Considerations

The near-surface soils predominantly consist of clays and sands that can be excavated with conventional earth-moving equipment such as loaders and backhoes. If the site grading is

performed during the rainy season, the near-surface clay will likely be wet and will have to be dried before compaction can be achieved. Heavy rubber-tired equipment, such as haul trucks, scrapers, and vibratory rollers, could cause excessive deflection (pumping) of the wet clay and therefore should be avoided if this condition occurs. If the project schedule or weather conditions do not permit sufficient time for drying of the soil by aeration, the subgrade can be treated with lime and/or cement prior to compaction to create a stable "winterized" subgrade. It is also important that the moisture content of subgrade soil is sufficiently high to reduce the expansion potential. If the grading work is performed during the dry season, moisture-conditioning may be required.

Excavations that will be deeper than five feet and will be entered by workers should be sloped or shored in accordance with CAL-OSHA standards (29 CFR Part 1926). The contractor should be responsible for the construction and safety of temporary slopes.

7.0 ADDITIONAL GEOTECHNICAL SERVICES

The preliminary conclusions and recommendations presented in this report are based on a preliminary field investigation and not intended for final design. Prior to final design, we should be retained to provide a final geotechnical report based on a supplemental field investigation. Additional borings and CPTs will be required to further evaluate the subsurface conditions beneath the site and develop final foundation design recommendations. After our final report has been completed and the design team has selected a foundation system, we should review the project plans and specifications prior to construction to check their conformance with the intent of our final recommendations. During construction, we should observe site preparation, foundation installation, and the placement and compaction of backfill. These observations will allow us to compare the actual with the anticipated soil conditions and to check if the contractor's work conforms with the geotechnical aspects of the plans and specifications.

REFERENCES

2016 California Building Code

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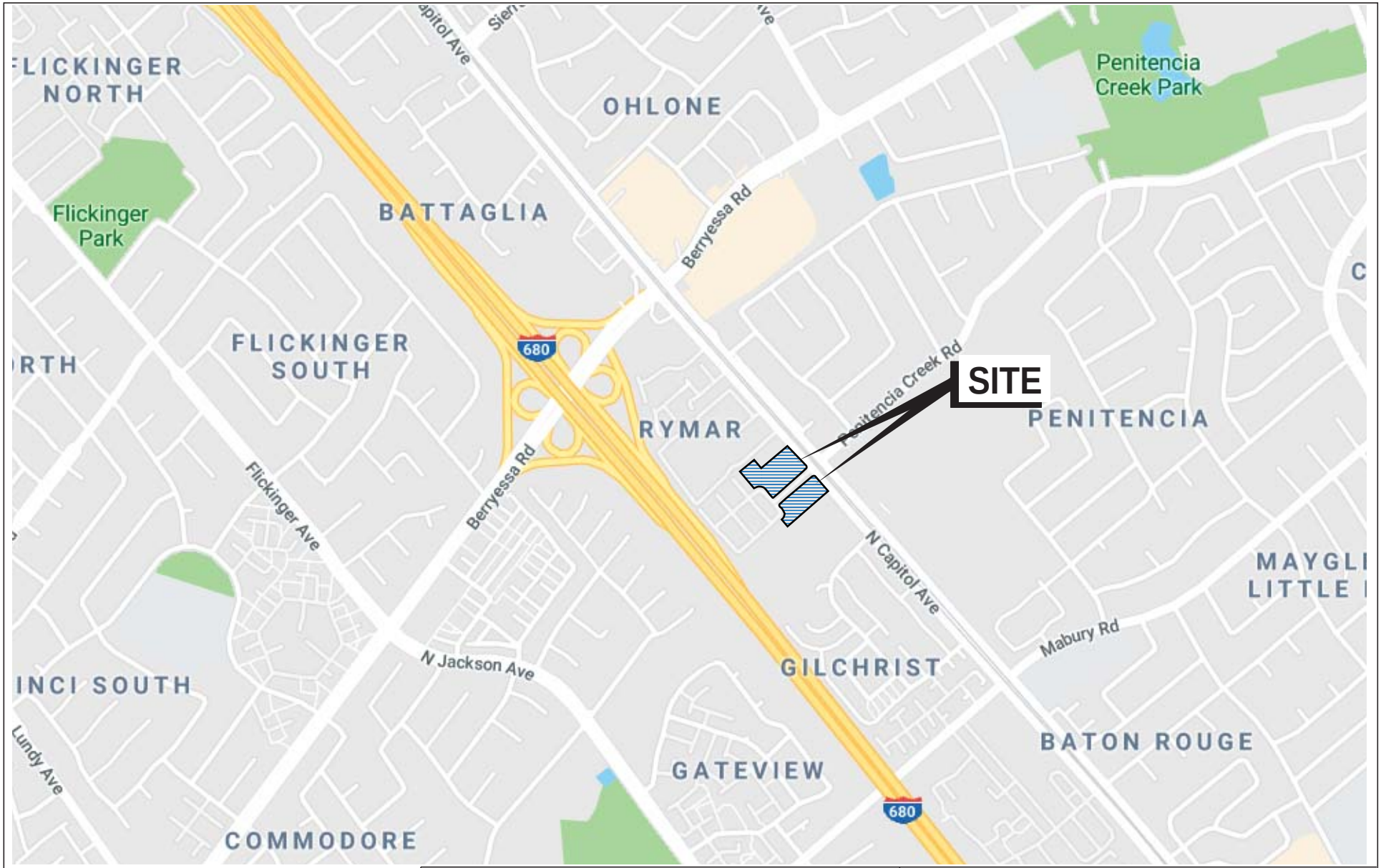
FIGURES



Base map: Google Map, 2018

0 1000 Feet

Approximate scale

905 N CAPITOL AVENUE
San Jose, California

ROCKRIDGE GEOTECHNICAL

SITE LOCATION MAP

Date 12/05/18 | Project No. 18-1608 | Figure 1

EXPLANATION

CPT-1 — Approximate location of cone penetration test by Rockridge Geotechnical Inc., November 28, 2018

Project limits

0 80 Feet

Approximate scale

Base map: Google Earth, 2018.

905 N CAPITOL AVENUE
San Jose, California

SITE PLAN

Date 12/06/18	Project No. 18-1608	Figure 2

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Base map: Google Earth with U.S. Geological Survey (USGS), Santa Clara County, 2018.

EXPLANATION

Qha	Alluvium (Holocene)
Tms	Sedimentary rocks (Miocene)
Kfm	Franciscan Complex metamorphic rocks (Cretaceous)
KJs	Great Valley complex sedimentary rocks (Early Cretaceous and (or) Late Jurassic)
Jv	Great Valley complex volcanic rocks (Jurassic)
Jsp	Great Valley complex serpentinite (Jurassic)

Geologic contact:
dashed where approximate and dotted where concealed, queried where uncertin

0 2000 Feet

Approximate scale

905 N CAPITOL AVENUE
San Jose, California

REGIONAL GEOLOGIC MAP

ROCKRIDGE GEOTECHNICAL

Date 12/05/18 | Project No. 18-1608 | Figure 3

Base Map: U.S. Geological Survey (USGS), National Seismic Hazards Maps - Fault Sources, 2008.

EXPLANATION

- Strike slip
- Thrust (Reverse)
- Normal

0 5 10 Miles

Approximate scale

905 N CAPITOL AVENUE
San Jose, California

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REGIONAL FAULT MAP

Date 12/05/18	Project No. 18-1608	Figure 4

Liquefaction Zones
Areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslide Zones
Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Reference:
State of California "Seismic Hazard Zones"
Calaveras Reservoir Quadrangle.
Released on October 17, 2001

0 2000 4000 Feet
Approximate scale

905 N CAPITOL AVENUE
San Jose, California

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SEISMIC HAZARDS ZONE MAP

Date 12/06/18	Project No. 18-1608	Figure 5

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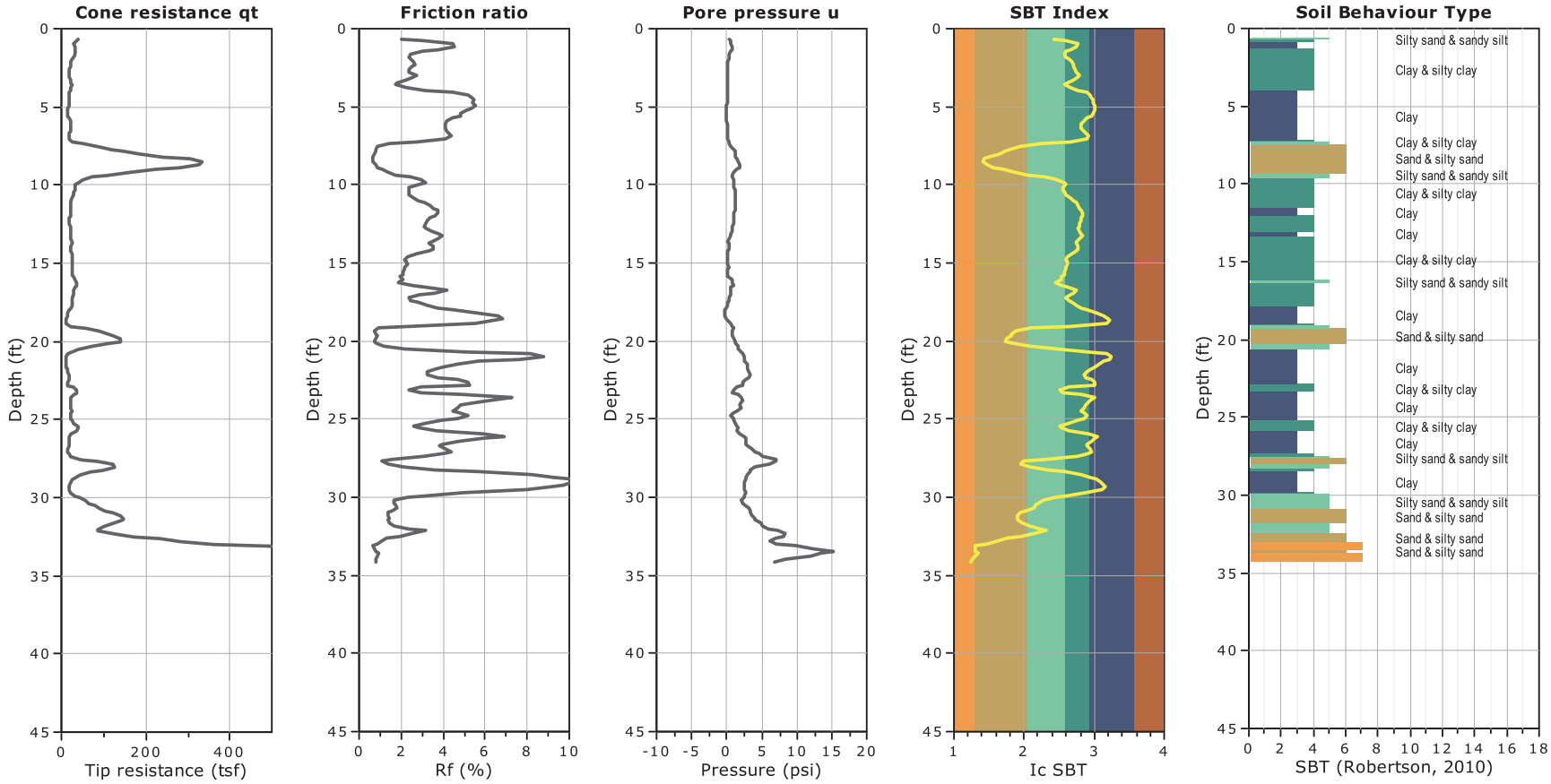
APPENDIX A

Cone Penetration Test Results



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

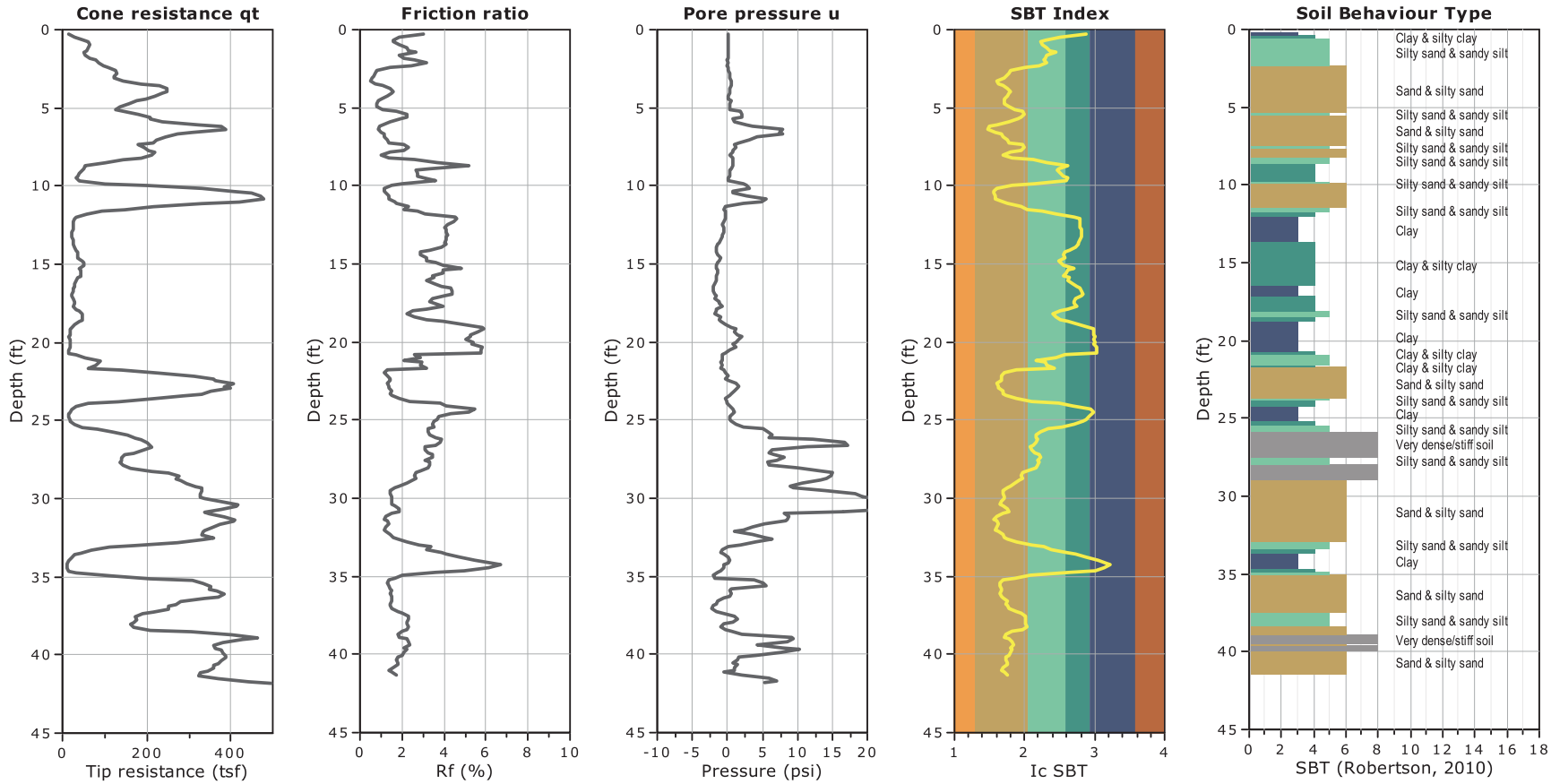
Total depth: 34.12 ft, Date: 11/28/2018
Groundwater not encountered
Cone Operator: Middle Earth Geo Testing, Inc.

905 N CAPITOL AVENUE
San Jose, California

ROCKRIDGE GEOTECHNICAL

CONE PENETRATION TEST RESULTS
CPT-1

Date 12/05/18	Project No. 18-1608	Figure A-1



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

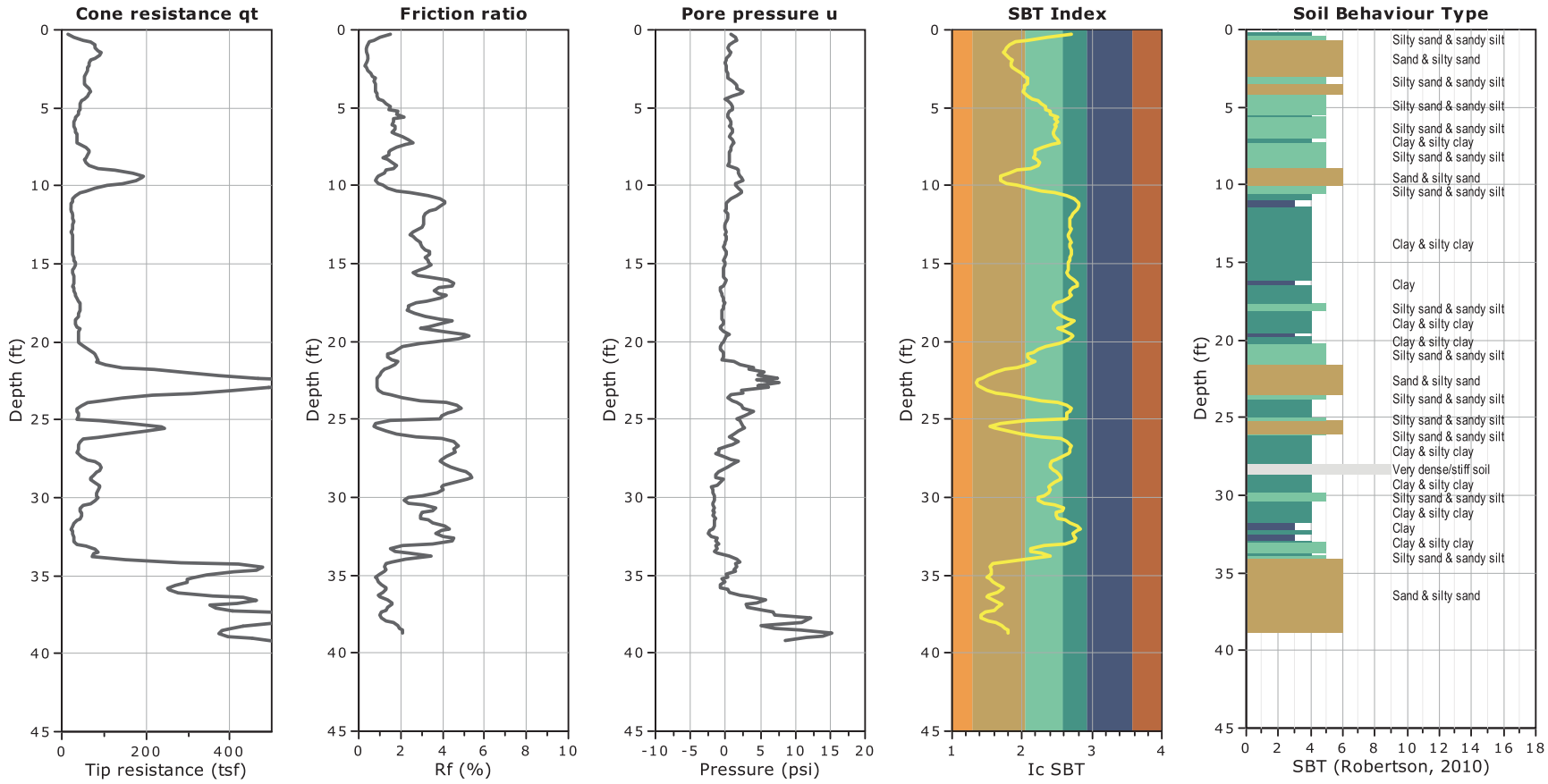
Total depth: 41.83 ft, Date: 11/28/2018
Groundwater not encountered
Cone Operator: Middle Earth Geo Testing, Inc.

905 N CAPITOL AVENUE
San Jose, California

ROCKRIDGE GEOTECHNICAL

CONE PENETRATION TEST RESULTS
CPT-2

Date 12/05/18	Project No. 18-1608	Figure A-2



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

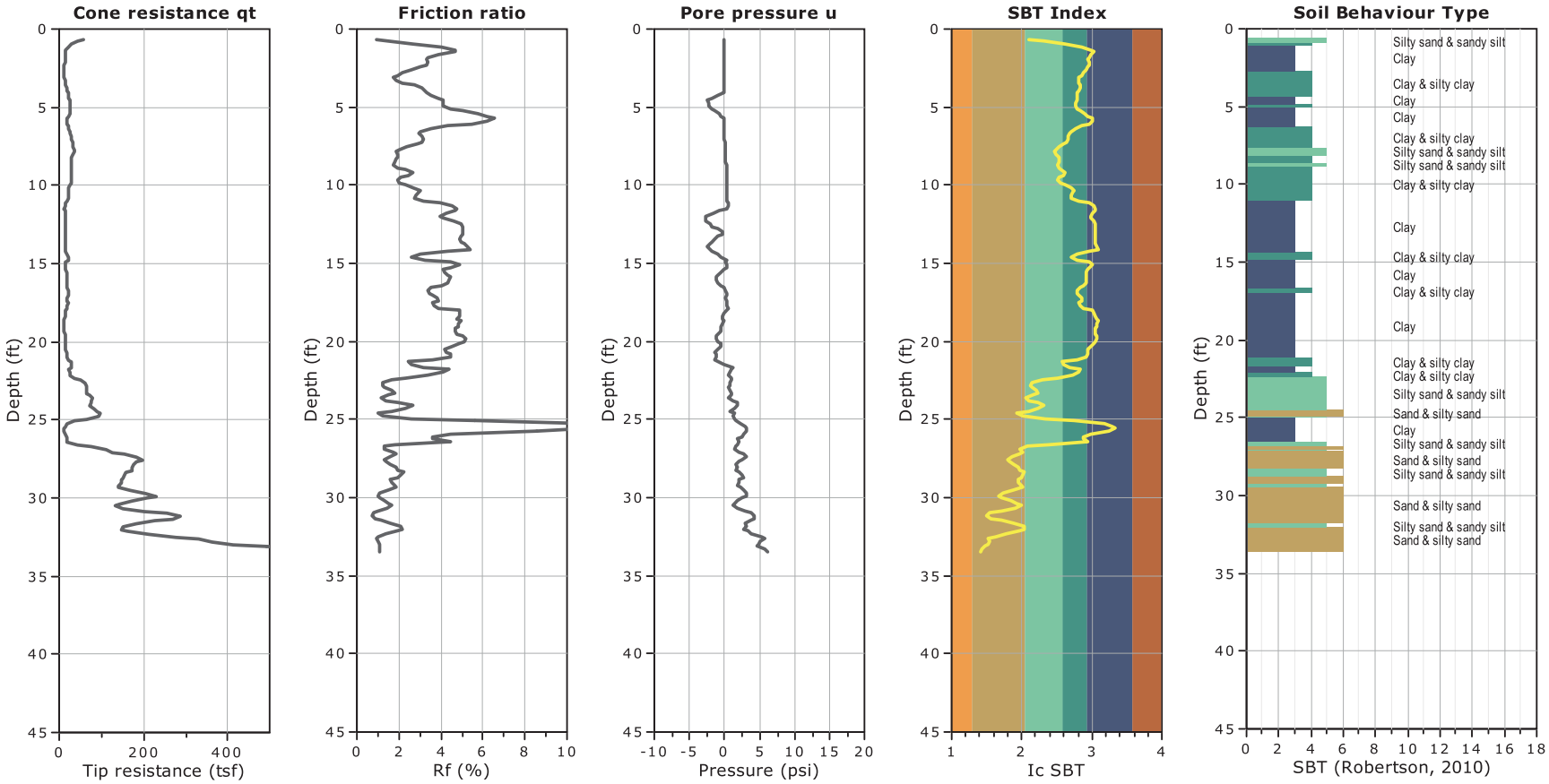
Total depth: 39.21 ft, Date: 11/28/2018
Groundwater not encountered
Cone Operator: Middle Earth Geo Testing, Inc.

905 N CAPITOL AVENUE
San Jose, California

ROCKRIDGE GEOTECHNICAL

CONE PENETRATION TEST RESULTS
CPT-3

Date 12/05/18	Project No. 18-1608	Figure A-3



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

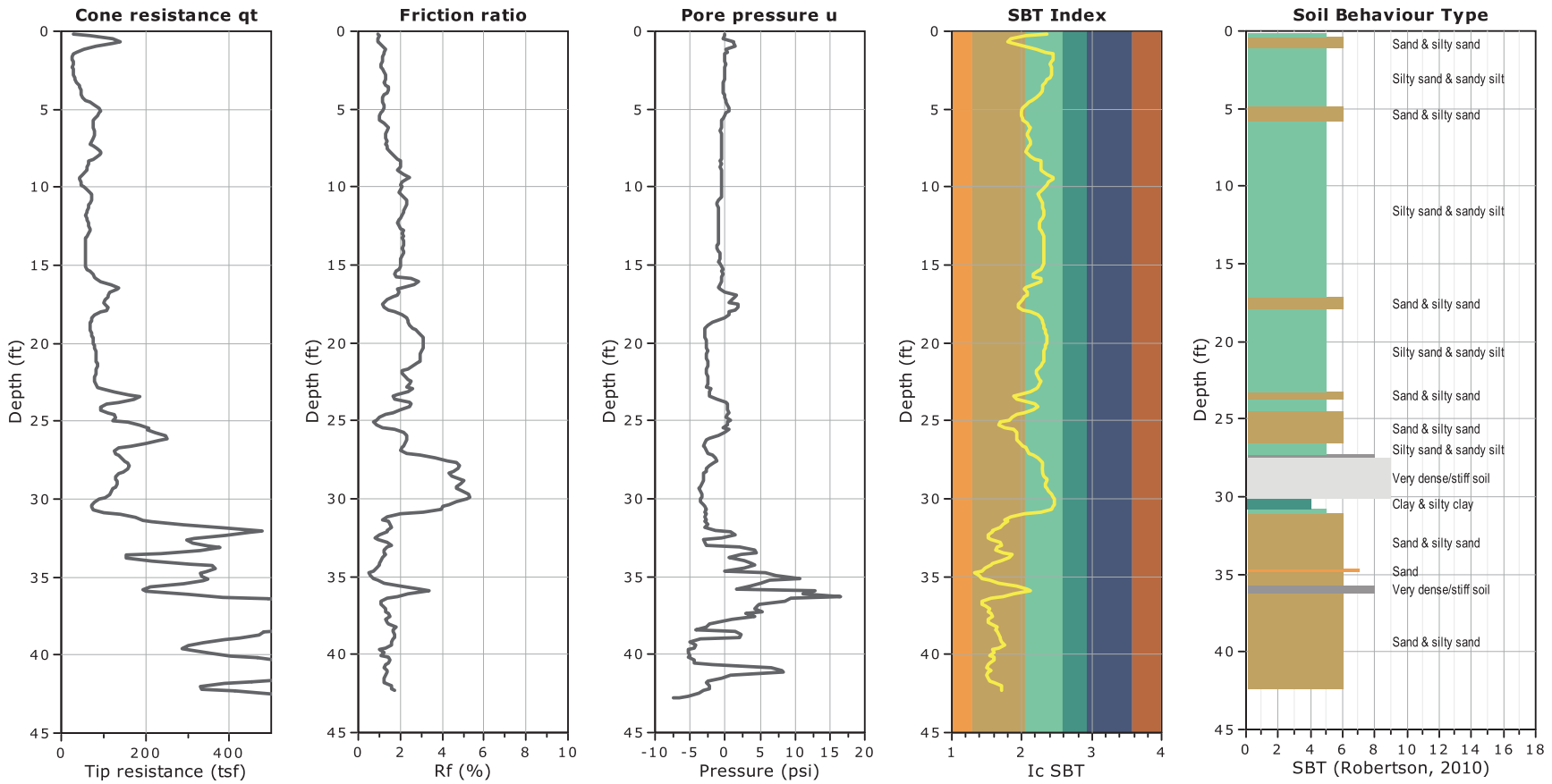
Total depth: 33.46 ft, Date: 11/28/2018
Groundwater not encountered
Cone Operator: Middle Earth Geo Testing, Inc.

905 N CAPITOL AVENUE
San Jose, California

ROCKRIDGE GEOTECHNICAL

CONE PENETRATION TEST RESULTS
CPT-4

Date 12/05/18	Project No. 18-1608	Figure A-4



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

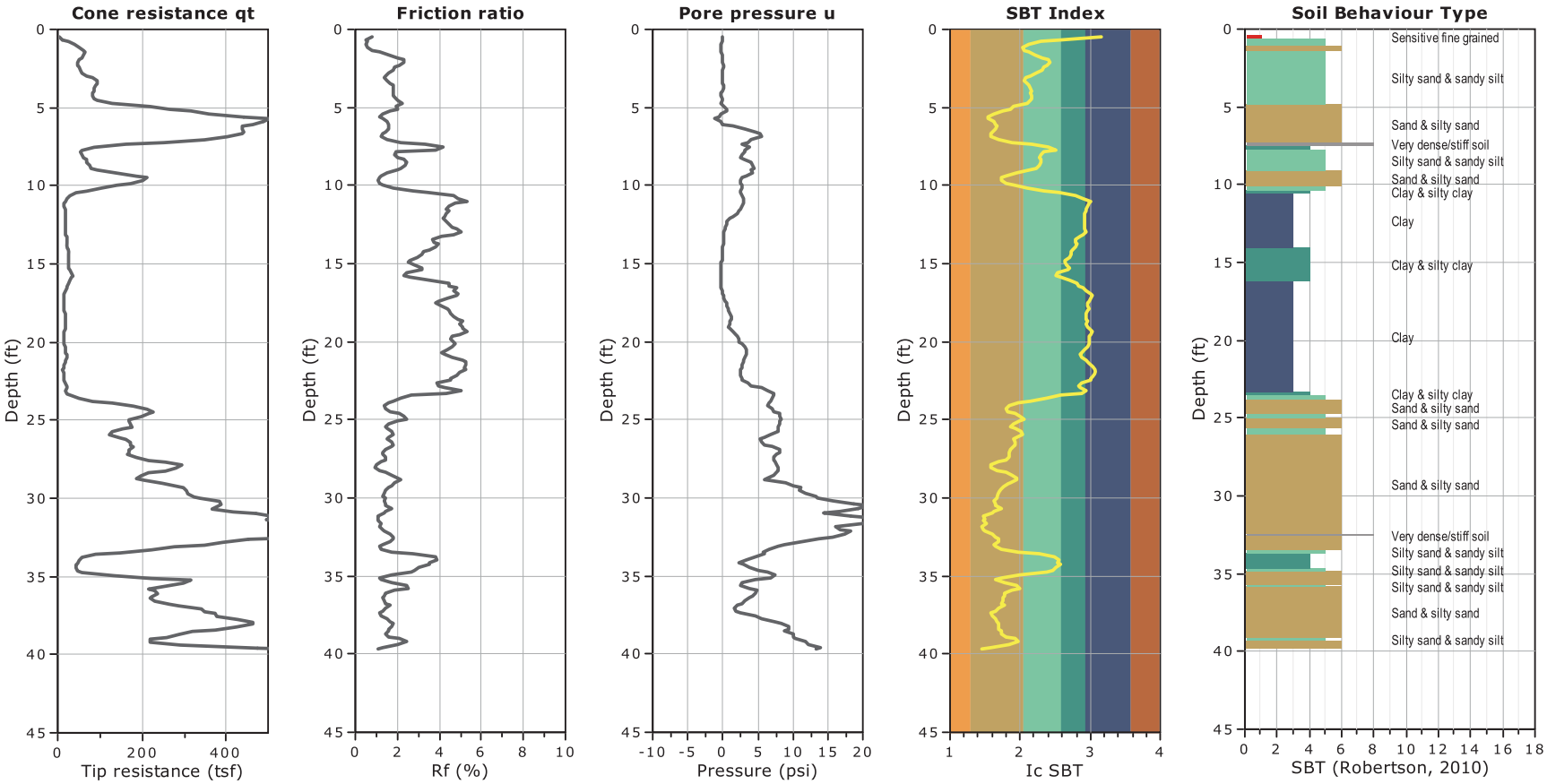
Total depth: 42.81 ft, Date: 11/28/2018
Groundwater not encountered
Cone Operator: Middle Earth Geo Testing, Inc.

905 N CAPITOL AVENUE
San Jose, California

ROCKRIDGE GEOTECHNICAL

CONE PENETRATION TEST RESULTS
CPT-5

Date 12/05/18	Project No. 18-1608	Figure A-5



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

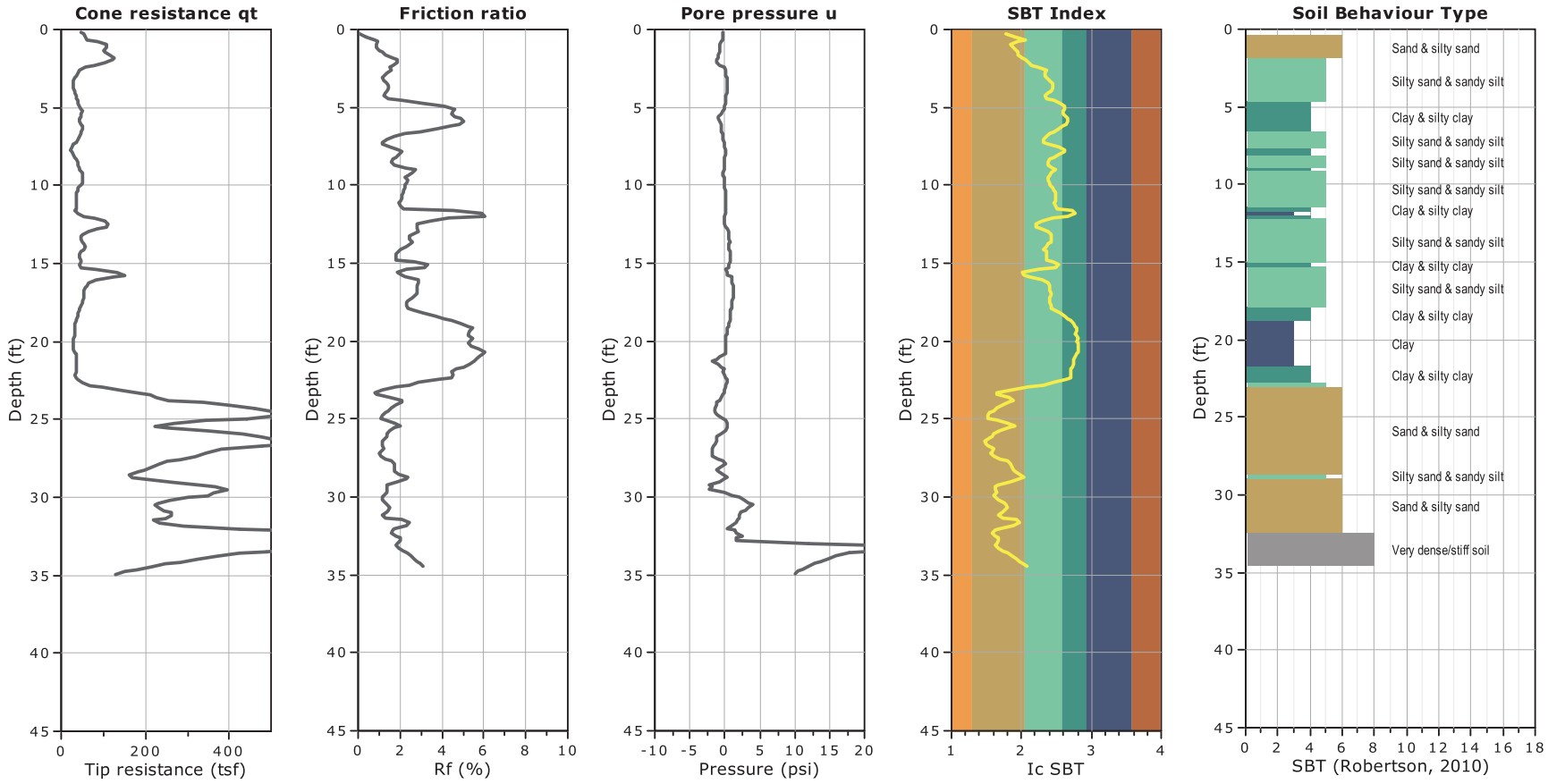
Total depth: 39.70 ft, Date: 11/28/2018
Groundwater not encountered
Cone Operator: Middle Earth Geo Testing, Inc.

905 N CAPITOL AVENUE
San Jose, California

ROCKRIDGE GEOTECHNICAL

CONE PENETRATION TEST RESULTS
CPT-6

Date 12/05/18	Project No. 18-1608	Figure A-6



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

Total depth: 34.94 ft, Date: 11/28/2018
Groundwater not encountered
Cone Operator: Middle Earth Geo Testing, Inc.

905 N CAPITOL AVENUE
San Jose, California

ROCKRIDGE GEOTECHNICAL

CONE PENETRATION TEST RESULTS
CPT-7

Date 12/05/18	Project No. 18-1608	Figure A-7

Peer Review of Geotechnical Report

Project No.
18124.000.001

December 23, 2020

Ms. Kristen Gates
The Hanover Company
1780 S. Post Oak Lane
Houston, TX 77056

Subject: 905 North Capitol Avenue
San Jose, California

GEOTECHNICAL PEER REVIEW

Dear Ms. Gates:

As requested, this letter presents the results of our geotechnical peer review for the 905 North Capitol Avenue project in San Jose, California. The purpose of our review was to summarize the 2018 Rockridge geotechnical report (Reference 1), identify any data gaps, and provide recommendations for future geotechnical investigation, as needed.

PROJECT DESCRIPTION AND PROPOSED DEVELOPMENT

The site address is 905 North Capitol Avenue in San Jose and is associated with Assessor's Parcel Numbers (APN) 254-290-028 (western parcel) and 254-290-026 (eastern parcel). Together, the parcels are approximately 3.4 acres in size. The western parcel is currently occupied by a single-family residential home, paved driveways, landscaped areas, and open space previously used for agricultural purposes. The eastern parcel is undeveloped, occupied by vegetation and several trees. The site is bounded by North Capitol Avenue to the north, Kestral Way to the south, undeveloped, vacant land to the east, and residential developments to the west.

Based on the site density study provided by you (Reference 2), we understand the proposed development will include construction of two 7-story apartment buildings with two stories of concrete parking founded at-grade, supporting five stories of wood-frame residential units.

HISTORIC AERIAL REVIEW

Historic aerial photographs show that the site was primarily used for agricultural purposes prior to 1968, with both parcels covered with orchards. Based on our review of aerial photographs from 1968 and 1980, the orchards appear to have been removed and single-family homes constructed on both the eastern and western parcel. The aerials also show that between 2005 and 2009, Penitencia Creek Road was constructed between the two parcels to provide access to the residential development to the southwest of the site. The residential structures on the eastern parcel were removed during the same period. The western parcel has remained largely unchanged since 1980, with the exception of the addition of a driveway connecting to Penitencia Creek Road.

REGIONAL GEOLOGY

The site is located within the Coast Ranges geomorphic province of California. The Coast Ranges geomorphic province is characterized by a system of northwest-trending, fault-bounded mountain ranges and intervening alluvial valleys. Bedrock in the Coast Ranges consists of igneous, metamorphic and sedimentary rocks that range in age from Jurassic to Pleistocene. The present topography and geology of the Coast Ranges are the result of deformation and deposition along the tectonic boundary between the North American plate and the Pacific plate. Plate boundary fault movements are largely concentrated along the well-known fault zones, which in the area include the San Andreas, Hayward, and Calaveras faults, as well as other lesser-order faults. More specifically, the site is located in the broad, north-south-trending, alluvial-filled Santa Clara Valley. Based on geologic mapping by Dibblee (2005), the soil underlying the site appears to consist of Holocene alluvial deposits. These deposits consist of clay, sand, and gravel. The subject site is not located within a mapped liquefaction hazard zone or Alquist-Priolo Earthquake Fault Zone (EFZ).

SUMMARY OF ROCKRIDGE GEOTECHNICAL STUDY

Rockridge Geotechnical (Rockridge) previously investigated the site in 2018 in order to assess the feasibility of constructing two 4-story, wood-frame structures, each supported by one level of concrete podium founded at-grade. Rockridge advanced seven cone penetration tests (CPTs) to depths between 33 and 42 feet below the existing ground surface. Four CPTs were performed in the larger western parcel and three were performed in the smaller eastern parcel. The CPTs were advanced until practical refusal.

The Rockridge subsurface description notes that the site is underlain by roughly 30 feet of hard clay with varying sand content and occasional interbedded dense sand layers, up to 5 feet thick. Beneath the clay, the CPTs encountered dense to very dense sands and gravels extending to the termination depth. Groundwater was not encountered in the Rockridge explorations, but the report notes that historical groundwater monitoring data in the vicinity of the site indicates a groundwater table around 50 to 70 feet below ground surface.

Rockridge provided a preliminary evaluation of the seismic hazards at the site, noting that due to the high seismicity of the area, the potential for severe ground shaking exists. However, due to the subsurface conditions and deep groundwater table, liquefaction is unlikely. Additionally, the report states that fault rupture is unlikely as the site is located outside of mapped Alquist-Priolo zones.

Rockridge concluded that the proposed development is feasible from a geotechnical standpoint. The report states that geotechnical site issues may include moderately expansive, near-surface clay deposits and includes preliminary recommendations for mitigation of potential issues arising from such soils. The report also provides recommendations for shallow foundation options, including spread footings and continuous perimeter footings. For these foundation types, Rockridge preliminarily recommends an allowable bearing pressure of 4,000 pounds per square foot (psf), which will also limit total consolidation settlement to 1 inch and differential settlement to ½ inch over 30 feet of horizontal distance.

Seismic design parameters were provided in the Rockridge report based on the 2016 California Building Code (CBC), which is currently outdated.

REVIEW COMMENTS

Based on our review, the site is feasible for the planned development provided the geotechnical risks are addressed in the design. The Rockridge report generally identifies the geotechnical hazards at this site, but additional, updated analyses are necessary to further assess the geotechnical implications to the project and provide design recommendations. We offer the following comments as they pertain to the current development concept.

1. Based on historical aerial photographs, a former single-family residence was present at the eastern lot. The residence has since been demolished. No documentation was provided to us regarding compaction during placement of potential excavated areas; without documentation, any such fill should be considered non-engineered. Additionally, buried foundation elements, utilities, and non-engineered surficial fill may be present throughout the site. Debris, deleterious material, or existing foundation elements are typically not suitable for supporting buildings on shallow foundations; therefore, we recommend they be removed. The nature of the fill should be characterized to determine the extent of fill needed to be removed and for determination of an appropriate disposal facility.

2. The previous Rockridge study was prepared in accordance with the 2016 California Building Code (CBC). Design and permit application will require design to be prepared based on the current 2019 CBC, which utilizes design criteria set forth in the ASCE 7-16 Standard. The seismic design parameters have changed since the code used by Rockridge; therefore, they will need to be updated. Based on the soils encountered, Rockridge classified the site as Site Class D. As described in Section 11.4.8 of ASCE 7-16, a site response analysis is necessary for structures located on Site Class D sites with S_1 greater than or equal to 0.2 second. However, the structural engineer may determine to use the exception(s) of Section 11.4.8 of ASCE 7-16. We recommend to collaborate with the structural engineer of record to further evaluate the effects of taking the exceptions on the structural design and identify the need for performing a site-specific seismic hazard analysis.

3. The previous Rockridge study determined that based on their exploration, the soil encountered is unlikely to be susceptible to liquefaction, and therefore, the potential for liquefaction at the site is very low. The liquefaction analysis should be performed using seismic parameters and peak ground accelerations in accordance with the latest building code.

4. The Rockridge study notes that near-surface soil may have expansive potential based on their experience in the site vicinity. We recommend evaluating the expansive potential of the near-surface soils using subsurface sampling and laboratory testing.

5. The foundation recommendations provided by the previous Rockridge study were formulated for individual spread footings and continuous perimeter footings. Where expansive soil is present, Rockridge recommends underlying the interior slab-on-grade with 6 to 12 inches of non-expansive engineered fill or lime-treated native material. Based on our experience with similar site conditions and foundations, we recommend the replaced or reworked subgrade material extend to 18 inches below the slab-on-grade. Additionally, footings should be founded a minimum of 36 inches below lowest adjacent grade. If alternative foundation types, such as a post-tensioned (PT) mat or structural mat, are employed in the final design, additional recommendations will be required.

6. The previous Rockridge study preliminarily categorizes the site as Site Class D, but offers no justification. The 2019 CBC provides seismic parameters for two different Site Class D qualifiers. One is with measured shear wave velocity of the subsurface, the other is considered "default" where no measurements are taken. A Site Class D that is justified with measured shear wave velocities may have a positive effect on the structural design. We recommend consulting with your structural engineer to determine if there is a beneficial effect on the seismic design of the structure when using measured shear wave velocities.

It is our opinion that the proposed project is feasible, but will require further exploration and laboratory testing to provide design-level recommendations appropriate for the proposed development.

We strived to perform our professional services in accordance with generally accepted principles and practices currently employed in the area; there is no warranty, express or implied. If you have any questions or comments regarding this letter, please call and we will be glad to discuss them with you.

Sincerely,

ENGEO Incorporated

Wyatt Iwanaga

Todd Bradford, PE

Jonas Bauer, EIT

wi/tb/rhb/jf

REFERENCES

1. Rockridge Geotechnical; Preliminary Geotechnical Investigation; Proposed Residential Development; 905 N. Capitol Avenue; San Jose, California; December 20, 2018; Project No. 18-1608.

2. The Hanover Company; Site Density Study v2.0; 905 N Capitol; San Jose, California; July 2, 2020.

3. California Building Code, 2019.

4. Davis, J. G. (2001). State of California Special Studies Zones: Calaveras Reservoir Quadrangle Revised Official Map, Division of Mines and Geology, scale 1:24,000.

5. Dibblee, T. W., and Minch, A. J. (2005). Geologic map of the Calaveras Reservoir quadrangle, Alameda & Santa Clara Counties, California: Dibblee Geological Foundation, Dibblee Foundation Map DF-154, scale 1:24,000.