GOLDEN STATE LOGISTICS HUB
TRACY, CALIFORNIA

GEOTECHNICAL FEASIBILITY REPORT

SUBMITTED TO
Mr. Steve Arthur
Ridgeline Property Group
915 Highland Pointe Drive, Suite 250
Roseville, CA 95678

PREPARED BY
ENGEO Incorporated

November 30, 2021

PROJECT NO.
19633.000.001

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GEOTECHNICAL
ENVIRONMENTAL
COASTAL/MARITIME
WATER RESOURCES
CONSTRUCTION SERVICES

Project No.
19633.000.001

November 30, 2021

Mr. Steve Arthur
Ridgeline Property Group
915 Highland Pointe Drive, Suite 250
Roseville, CA 95678

Subject: Golden State Logistics Hub
Tracy, California

GEOTECHNICAL FEASIBILITY REPORT

Dear Mr. Arthur:

We prepared this geotechnical feasibility report for the proposed development located in Tracy, California, as outlined in our agreement with you, dated October 26, 2021. We performed this feasibility study to identify basic geotechnical considerations for the development and potential geologic hazards within the project site.

The proposed development is feasible from a geotechnical engineering viewpoint, provided that subsurface explorations are performed at a future date to confirm the preliminary conclusions presented herein. Based on our feasibility study, the primary geotechnical considerations for the planned development include the potential for existing fill and expansive soil.

If you have any questions or comments regarding this report, please call and we will be glad to discuss them with you.

Sincerely,

ENGEO Incorporated

VDrake

Victoria Drake, PE

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REGISTERED PROFESSIONAL ENGINEER
STEVE HARRIS
No. 2804
GEOTECHNICAL
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vd/sh/dt

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1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

We prepared this geotechnical feasibility report for the Golden State Logistics Hub in Tracy, California. We prepared this report as outlined in our agreement dated October 26, 2021. Ridgeline Property Group authorized us to conduct the following scope of services.

- Review of available historical aerials and geologic maps
- Limited field exploration
- Limited soil sampling and laboratory testing
- Preliminary analysis and conclusions
- Report preparation

This report provides an assessment of geotechnical feasibility and does not provide design recommendations or design parameters; these items can be provided at a future date following supplemental subsurface exploration, sampling, lab testing, and engineering analysis once the project moves to the design phase.

We prepared this report for the exclusive use of our client and their consultants for evaluation of feasibility of this project. In the event that any changes are made in the character, design, or layout of the development, we must be contacted to review the conclusions and recommendations contained in this report to evaluate whether modifications are recommended. This document may not be reproduced in whole or in part by any means whatsoever, nor may it be quoted or excerpted without our express written consent.

1.2 PROJECT LOCATION AND DESCRIPTION

The proposed 1,625-acre logistics hub is located north of I-580, east of South Tracy Boulevard, and west of South Bird Road in Tracy, California, as shown in Figure 1. Based on our review of the provided information, we understand that Areas A, B, E, and F will be developed for industrial parks with concrete tilt-up warehouse structures, paved roadways and parking areas, and associated improvements. The preliminary site layout for Area E indicates a regional basin will be constructed in the northeast portion of the site, as shown in Figure 2B. Area D will be developed into the UofSA university campus, consisting of approximately 1.4 million square feet of university buildings and associated infrastructure. Based on our discussions with the project team, we understand the university buildings will be either glass over steel frame construction or concrete tilt-up construction.

Review of publicly available historical aerial photographs indicates that the property was utilized for agriculture, consisting of a mix of row crops, orchards, and dry land farming, since at least 1949. At the time of our site reconnaissance, the majority of the property consisted of active orchards. In addition, we observed existing structures on Areas B, E, and F. For additional information regarding site features observed during our site reconnaissance, please refer to Section 2.4.

2.0 FINDINGS

2.1 GEOLOGY AND SEISMICITY

2.1.1 Geology

The subject project in located within the margins of Great Valley and Coast Range Geomorphic Provinces of California. This valley is an elongate, asymmetric trough filled with a thick sequence of sediments beginning in the Jurassic period (180 million years ago) and continues currently. The sediments within the valley vary in thickness and are estimated to be up 10 km deep. These sediments are mostly derived from the erosion of the Sierra Nevada Mountain Range to the east, with lesser amounts of material from the Coast Range Mountains to the west.

As shown in Figure 3, Wagner (1991) mapped the project location as Holocene to Pleistocene aged alluvial fan deposits (Qf) consisting of unconsolidated gravel, sand, silt and clay in addition to Miocene to Pliocene fanglomerate deposits (Mf) consisting of conglomerates, siltstone, and sandstone primarily derived from the Coast Range to the southwest.

2.1.2 Seismicity

The site is located in an area of moderate seismicity. The site is not located within a currently designated Alquist-Priolo Earthquake Fault Zone and no known surface expressions of active faults[1] are believed to exist within the site. According to the 2008 National Seismic Hazard Maps Spatial Query, the two nearest earthquake faults zoned as active by the State of California Geological Survey are the Great Valley fault, located approximately 1 mile south, and the Greenville fault, located approximately 11.7 miles west. Other active faults in the region are summarized in the table below. Figure 4 shows the approximate locations of these faults and significant historic earthquakes recorded within the region.

TABLE 2.1.2-1: Active Faults Capable of Producing Significant Ground Shaking at the Site

FAULT NAME	DISTANCE FROM SITE (MILES)	DIRECTION FROM SITE	MAXIMUM MOMENT MAGNITUDE
Great Valley	1	South	6.9
Greenville Connected	12	West	7.0
Mount Diablo Thrust	24	West	6.7
Calaveras	26	West	7.0
Hayward-Rodgers Creek	29	West	7.3
Green Valley Connected	36	West	6.8

Portions of the Great Valley fault are considered seismically active blind thrust faults; however, since the Great Valley fault segments are not known to extend to the ground surface, the State of California has not defined Earthquake Fault Zones around postulated traces. The Great Valley fault is considered capable of causing significant ground shaking at the site, but the recurrence interval is believed longer than for more distant, strike-slip faults. Recent studies suggest that this boundary fault may have been the cause of the Vacaville-Winters earthquake sequence of April 1892 (Eaton, 1986; Wong and Biggar, 1989; Moores and others, 1991). Other large (>M_W7)

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[1] An active fault is defined by the State Mining and Geology Board as one that has had surface displacement within Holocene time (about the last 11,000 years) (California Geological Survey, 2007).

earthquakes have historically occurred in the Bay Area to the west and along the margins of the Central Valley and many earthquakes of low magnitude occur every year.

2.2 FIELD EXPLORATION

We performed our preliminary field exploration between November 11 and November 16, 2021. Our field exploration included drilling six borings and excavating 15 test pits at various locations across the proposed development. The locations of our explorations are approximate and were estimated by utilizing smart phones equipped with GPS; they should be considered accurate only to the degree implied by the method used.

2.2.1 Borings

Our field exploration included drilling six borings at various locations within Area E, as shown on Figure 2B. Two additional borings were drilled and converted for percolation testing, as described in Section 2.7.

An ENGEO representative observed the drilling and logged the subsurface conditions at each location. We retained a truck-mounted drill rig and crew to advance the borings using 4-inch-diameter solid-flight auger methods. The borings were advanced to a maximum depth of approximately 20½ feet below existing grade.

Soil samples were collected at frequent intervals using either a 3-inch outside-diameter (O.D.) California-type split-spoon sampler fitted with 6-inch-long brass liners, or a 2-inch O.D. Standard Penetration Test (SPT) split-spoon sampler. The samplers were advanced with a 140-pound hammer with a 30-inch drop, employing a rope-and-cathead hammer system. The penetration of the sampler was field recorded as the number of blows needed to drive the sampler 18 inches in 6-inch increments. The boring logs show the number of blows required for the last 1 foot of penetration, or the number of blows per depth of penetration for samples that met driving refusal. The blow counts depicted on the boring logs have not been converted using any correction factors.

We used the field logs to develop the report logs in Appendix A. The logs depict subsurface conditions at the exploration locations for the date of exploration; however, subsurface conditions may vary with time.

2.2.2 Test Pits

We also excavated 15 test pits across the proposed development, as shown on Figure 2A. Two of the test pits were converted for double ring infiltration testing, as described in Section 2.8.

An ENGEO representative observed the test pit excavations and logged the subsurface conditions at each location. We retained a rubber tired backhoe to excavate the test pits using a 2- to 3-foot-wide bucket and logged the type, location, and uniformity of the underlying soil. The test pits were excavated to a maximum depth of approximately 8 feet below existing grade. We obtained bulk soil samples from the test pits using hand sampling techniques.

We used the field logs to develop the report logs in Appendix A. The logs depict subsurface conditions at the exploration locations for the date of exploration; however, subsurface conditions may vary with time.

Following field logging and sample collection, the test pit excavations were loosely backfilled with the excavated material. During site grading, the loosely backfilled soil within our exploratory test pits should be removed and recompacted in accordance with Section 4.0. The test pits were lined with yellow caution tape to help identify the depth of the fill placed. The actual depth of removal of these materials should be determined by ENGEO in the field at the time of grading.

2.3 LABORATORY TESTING

We performed plasticity index testing on two soil samples collected from test pits in Area E. The purpose of this limited laboratory testing was to provide preliminary information on the expansion potential of the surficial soil at the site. Laboratory test results are provided in Appendix B.

2.4 SURFACE CONDITIONS

During our site reconnaissance, we observed the following site features.

- The majority of the site consists of active orchards.
- Pipeline markers for existing, underground oil and gas lines were observed across Areas A, B, and F, trending northwest to southeast.
- Existing structures were observed on the east portion of Area B, the south portion of Area E, and the southeast portion of Area F.

Please refer to Figures 2A and 2B, for more information on site features.

2.5 SUBSURFACE CONDITIONS

Based on our preliminary field exploration, the site consists of a surficial layer of lean to fat clay underlain by lean clay with sand to sandy lean clay. Our explorations within Area E encountered interbedded layers of sand and clay at depths ranging from 10 to 20 feet below the ground surface. Based on our limited laboratory testing, the surficial soil samples we analyzed consisted of moderate to highly expansive clay with plasticity index (PI) values ranging from 19 to 30.

We encountered undocumented fill in seven of our 14 test pit excavations. The undocumented fill was encountered in excavations within existing access roads. The undocumented fill was approximately ½ to 2 feet thick at the time of our field exploration and consisted of lean to fat clay with varying amounts of sand.

Consult the Site Plans and exploration logs for specific subsurface conditions at each location. We include our exploration logs in Appendix A. The logs contain the soil type, color, consistency, and visual classification in general accordance with the Unified Soil Classification System. The logs graphically depict the subsurface conditions encountered at the time of exploration.

2.6 GROUNDWATER CONDITIONS

We did not observe static or perched groundwater in any of our subsurface explorations. Our review of publically available data for groundwater wells in the immediate vicinity of the site indicates that groundwater is greater than 50 feet below the existing grade. Fluctuations in the level of groundwater may occur due to variations in rainfall, irrigation practice, and other factors not evident at the time measurements were made.

2.7 PERCOLATION TESTING

During our field exploration, we drilled two borings within the Area E Regional Basin. Borings 1-B05 and 1-B06 were drilled to depths of approximately 20½ and 15 feet below the ground surface, respectively. The purpose of these borings was to log the subsurface conditions below the proposed bottom of basin. Based on the subsurface conditions encountered in these borings, we selected percolation test elevations to target the layers with the highest infiltration potential.

Our percolation test holes were installed immediately adjacent to Borings 1-B05 and 1-B06 to depths of approximately 7½ feet and 12 feet, respectively. Preparation of the percolation test holes began by placing approximately 2 inches of fine gravel in the bottom of the holes. A 2-inch-diameter perforated PVC pipe was then placed in the test holes and surrounded by gravel. The holes were pre-soaked overnight prior to testing, with measurement of the percolation rate occurring the following day.

To perform the percolation tests, we measured the time until a relatively stable percolation rate was achieved. Municipal drinking water was used for the percolation testing. It is our opinion that the percolation rate of drinking water should be similar to stormwater. The results of the percolation tests are discussed below.

2.7.1 Percolation Testing Results

ENGEO performed the percolation testing on November 16, 2021. The following infiltration rates are based on a falling head percolation test where measurements are recorded for the time it took the water level to drop from a depth of approximately 12 inches from the bottom of the hole to a depth of approximately 6 inches from the bottom of the hole. Infiltration in the lateral and vertical direction is inherent in the rates provided below.

Based on our measured field test results, we converted the uncorrected field percolation rates to infiltration rates using Porchet's Method (Inverse Borehole Method), as summarized in the table below.

TABLE 2.7.1-1: Stabilized Percolation Rates and Converted Infiltration Rate

PERCOLATION TEST LOCATION	TEST DEPTH (FEET)	HOLE DIAMETER (INCHES)	RAW FIELD PERCOLATION RATE (INCHES/HOUR)	CONVERTED PORCHET DESIGN INFILTRATION RATE (INCHES/HOUR)	SOIL TYPE
1-B05	7½	4	9.7	0.9	Sandy Clay (30-40% sand)
1-B06	11¾	4	1.8	0.1	Sandy Clay (20-30% sand)

It should be noted that the radius used in our calculations equates to the radius of the borehole (approximately 4 inches).

2.8 DOUBLE RING INFILTRATION TESTING

We performed two double-ring infiltration tests at the locations shown on the Site Plan, Figure 2B. The purpose of these tests was to provide preliminary information pertinent to the design of the Area E Regional Basin.

Test pits 1-TP14 and 1-TP15 were excavated to depths ranging from approximately 7 to 8 feet. Double-ring infiltrometer tests were performed at the bottom of the two test pits, within representative soil strata located at the proposed bottom of basin elevation. The two double-ring infiltration tests were performed in general conformance with ASTM D3385-18, Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer, and the Multi-Agency Post-Construction Stormwater Standards Manual.

The infiltration test maintains a constant head within the rings. A graduated cylinder was used to maintain the water level at the selected head elevation in the inner ring throughout the test. The infiltration tests were run until the infiltration rate stabilized and then the test process was repeated to obtain a series of results.

2.8.1 Infiltration test results

The infiltration rate for the double-ring infiltrometer was calculated using the following equation from ASTM D3385:

$$VIR = \Delta VIR / (AIR * \Delta t)$$

Where:

VIR = inner ring incremental infiltration velocity, cm/hr
ΔVIR = volume of liquid used during time interval to maintain constant head in the inner ring, cm^3
AIR = interior area of inner ring, cm^2
Δt = time interval, h

Based on the encountered soil types, the soil would be anticipated to have an infiltration rate that is typical for Type A soil as presented in Table 3-1 of the Multi-Agency Post Construction Stormwater Standards Manual. Our double ring infiltration test results are summarized in the table below along with estimations of soil type and fines content.

TABLE 2.8.1-1: Double-Ring Infiltrometer Test Results

TEST LOCATION	TEST DEPTH (FEET)	SOIL TYPE	INFILTRATION RATE (INCHES/HOUR)
1-TP14	7	Sandy Silt (20-30% sand)	0.1
1-TP15	8	Sandy Silt (30-40% sand)	0.9

3.0 DISCUSSION AND CONCLUSIONS

Based on our review of existing information and limited field exploration, the primary geotechnical concerns that could affect development of the site are potential existing fill and expansive soil. We summarize our conclusions below.

3.1 EXISTING FILL

As noted in Section 2.5, we encountered undocumented fill in seven of our 14 test pit locations. The undocumented fill we encountered was limited to excavations within existing access roads. The undocumented fill ranged from ½ to 2 feet in thickness. We expect that a surficial layer of undocumented fill exists along the majority of the access roads throughout the site. We also expect that there is some amount of existing fill adjacent to the existing structures noted in Section 2.4. Based on our limited field exploration and records review, we expect that the undocumented is limited to these areas.

Without documentation regarding the manner of placement, type of material used, and degree of compaction, existing fill encountered at the site should be considered non-engineered. Non-engineered fill can undergo excessive settlement, especially under new fill or building loads. The approximate extent of undocumented fill at the site should be further investigated during a design-level geotechnical exploration. Refer to Section 4.1 for preliminary recommendations regarding existing fill.

3.2 EXPANSIVE SOIL

As discussed in Section 2.4, our limited soil sampling and laboratory testing indicated the near-surface site soil exhibits moderate to high expansion potential.

Expansive soil can change in volume with changes in moisture. It can shrink or swell and cause heaving and cracking of slabs-on-grade, pavements, and structures founded on shallow foundations. Building damage due to volume changes associated with expansive soil can be reduced by: (1) using a rigid mat foundation that is designed to resist the settlement and heave of expansive soil, (2) deepening the foundations to below the zone of moisture fluctuation, i.e. by using deep footings or drilled piers, and/or (3) using footings at normal shallow depths but bottomed on a layer of select fill having a low expansion potential.

To reduce the potential for damage to the planned buildings, we recommend that the upper 18 inches of the building pad, extending at least 5 feet laterally beyond the building pad, be underlain by fill with low expansion potential (PI<12). This may be achieved by either importing material with low expansion potential or chemically stabilizing the native material on site.

Preliminary grading recommendations for compaction of expansive soil at the site is included in Section 4.0. Preliminary foundation design recommendations are provided in Section 5.0.

3.3 SEISMIC HAZARDS

Potential seismic hazards resulting from a nearby moderate to major earthquake can generally be classified as primary and secondary. The primary effect is ground rupture, also called surface faulting. The common secondary seismic hazards include ground shaking and liquefaction. The following sections present a discussion of these hazards as they apply to the site. Based on topographic and lithologic data, the risk of regional subsidence or uplift, lateral spreading, landslides, tsunamis, or seiches is considered low to negligible at the site.

3.3.1 Ground Rupture

Since there are no known active faults crossing the property and the site is not located within an Earthquake Fault Special Study Zone, it is our opinion that ground rupture is unlikely at the subject property.

3.3.2 Ground Shaking

An earthquake of moderate to high magnitude generated within the San Francisco Bay region could cause considerable ground shaking at the site, similar to that which has occurred in the past. To mitigate the shaking effects, structures should be designed using sound engineering judgment and the latest California Building Code (CBC) requirements, as a minimum. Structures should be able to: (1) resist minor earthquakes without damage, (2) resist moderate earthquakes without structural damage but with some nonstructural damage, and (3) resist major earthquakes without collapse but with some structural as well as nonstructural damage. Conformance to the current building code recommendations does not constitute any kind of guarantee that significant structural damage would not occur in the event of a maximum magnitude earthquake; however, it is reasonable to expect that a well-designed and well-constructed structure will not collapse or cause loss of life in a major earthquake (SEAOC, 1996).

3.3.3 Liquefaction

Soil liquefaction results from loss of strength during cyclic loading, such as imposed by earthquakes. Soil most susceptible to liquefaction is clean, loose, saturated, uniformly graded, fine-grained sand. The sand encountered in our borings was generally medium dense and often contained a significant amount of fine-grained material. In addition, groundwater was not encountered to the terminal depth of our borings. For these reasons and based upon engineering judgment, it is our opinion on a preliminary basis that the potential for liquefaction at the site is low during seismic shaking. This should be studied further with additional explorations and analysis during a design-level study.

3.4 2019 CBC SEISMIC DESIGN PARAMETERS

The 2019 CBC utilizes design criteria set forth in the 2016 ASCE 7 Standard. Based on the subsurface conditions encountered, we characterized the site as Site Class D in accordance with the 2019 CBC. We provide the 2019 CBC seismic design parameters in Table 3.4-1 below, which include design spectral response acceleration parameters based on the mapped Risk Targeted Maximum Considered Earthquake (MCER) spectral response acceleration parameters.

TABLE 3.4-1: 2019 CBC Seismic Design Parameters, Latitude: 37.66022, **Longitude:** -121.39753

PARAMETER	VALUE
Site Class	D
Mapped MCE$_R$ Spectral Response Acceleration at Short Periods, S_S (g)	1.24
Mapped MCE$_R$ Spectral Response Acceleration at 1-second Period, S_1 (g)	0.43
Site Coefficient, F_A	1.00
Site Coefficient, F_V	Null See Section 11.4.8
MCE$_R$ Spectral Response Acceleration at Short Periods, S_{MS} (g)	1.25

PARAMETER	VALUE
MCE_R Spectral Response Acceleration at 1-second Period, S_{M1} (g)	Null See Section 11.4.8
Design Spectral Response Acceleration at Short Periods, S_{DS} (g)	0.83
Design Spectral Response Acceleration at 1-second Period, S_{D1} (g)	Null See Section 11.4.8
Mapped MCE Geometric Mean (MCE_G) Peak Ground Acceleration, PGA (g)	0.52
Site Coefficient, F_{PGA}	1.10
MCE_G Peak Ground Acceleration adjusted for Site Class effects, PGA_M (g)	0.57
Long period transition-period, T_L	8 sec

We recommend that we 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. We can provide a scope for site-specific seismic hazard analysis and ground motion study under separate cover, if needed.

4.0 PRELIMINARY EARTHWORK RECOMMENDATIONS

As used in this report, relative compaction refers to the in-place dry unit weight of soil expressed as a percentage of the maximum dry unit weight of the same soil, as determined by the ASTM D1557 laboratory compaction test procedure, latest edition. Compacted soil is not acceptable if it is unstable; it should exhibit only minimal flexing or pumping, as observed by an ENGEO representative.

The term “moisture condition” refers to adjusting the moisture content of the soil by either drying if too wet or adding water if too dry. We define “structural areas” as any area sensitive to settlement of compacted soil. These areas include, but are not limited to building pads, sidewalks, pavement areas, and retaining walls.

The following recommendations should be considered preliminary and should be verified in a design-level report.

4.1 SITE PREPARATION

Site development will commence with the general clearing of the site and the excavation and removal of buried structures. Areas to be developed should be cleared of all surface and subsurface deleterious materials, including existing structures and associated foundation systems, buried utilities and irrigation lines, septic systems, debris, and designated fencing, trees, shrubs, and associated roots. All debris should be removed from any location to be graded and from areas to receive fill or structures. The depth of removal of such materials should be determined by our representative in the field at the time of grading.

All undocumented fills encountered during grading, including fill placed during our exploratory test pits, should be removed to competent native soil, as determined in the field by ENGEO. We expect that in the locations where there are existing structures, we will need to overexcavate 2 feet of material and rip and additional 12 inches to confirm that all pipes, foundations, and debris are removed. The subexcavation area should extend approximately 10 feet beyond the footprints of the existing structures. Additional subexcavation may be required based on our field observations. Provided the excavated soil is free from debris, it can be placed back as engineered fill.

Existing vegetation should be removed from areas to receive fill or improvements. Tree roots should be removed down to a depth of approximately 2 feet below existing grade. Once the orchards are removed, we will need to overexcavate approximately 12 inches of material and rip and additional 12 inches to mitigate the areas disturbed by removing the orchards.

All excavations from demolition and clearing below design grades should be cleaned to a firm undisturbed native soil surface determined by our representative. This surface should then be scarified, moisture conditioned, and backfilled with compacted engineered fill, in accordance with Section 4.4.

4.2 OVER-OPTIMUM SOIL MOISTURE CONDITIONS

The contractor should anticipate encountering excessively over-optimum (wet) soil moisture conditions during winter or spring grading, or during or following periods of rain. Wet soil can make proper compaction difficult or impossible. Wet soil conditions can be mitigated by:

1. Frequent spreading and mixing during warm dry weather,
2. Mixing with drier materials,
3. Mixing with a lime and/or cement product, or
4. Stabilizing with aggregate or geotextile stabilization fabric, or both.

Options 3 and 4 should be evaluated by ENGEO prior to implementation.

4.3 ACCEPTABLE FILL

On-site soil may be suitable as fill material provided it is processed to remove concentrations of organic material, debris, and particles greater than 8 inches in maximum dimension.

Imported fill materials should meet the above requirements and have a plasticity index equal to or less than the on-site material. If nonexpansive material is imported for the building pads, it should have a plasticity index of less than 12. Allow ENGEO to sample and test proposed imported fill materials at least 5 days prior to delivery to the site.

4.4 FILL COMPACTION

4.4.1 Grading in Structural Areas

Perform subgrade compaction prior to fill placement, following cutting operations, and in areas left at grade as follows.

1. Scarify to a depth of at least 12 inches.

2. Moisture condition soil to at least 3 percentage points over the optimum moisture content for expansive soil (PI ≥ 12) and to at least 1 percentage point over the optimum moisture content for soil with low expansion potential (PI < 12).

3. Compact the soil to between 90 percent relative compaction. Prior to aggregate base placement, compact the upper 6 inches of finish pavement subgrade to at least 92 percent relative compaction for expansive soil or at least 95 percent relative compaction for soil with low expansion potential.

After the subgrade has been compacted, place and compact acceptable fill as follows.

1. Spread fill in loose lifts that do not exceed 12 inches.

2. Moisture condition soil to at least 3 percentage points over the optimum moisture content for expansive soil (PI ≥ 12) and to at least 1 percentage point over the optimum moisture content for soil with low expansion potential (PI < 12).

3. Compact fill to between 90 percent relative compaction. Prior to aggregate base placement, compact the upper 6 inches of finish pavement subgrade to at least 92 percent relative compaction for expansive soil or at least 95 percent relative compaction for soil with low expansion potential.

Compact the pavement Caltrans Class 2 aggregate base section to at least 95 percent relative compaction (ASTM D1557). Moisture condition aggregate base to or slightly above the optimum moisture content prior to compaction.

Where lime or cement treatment of the soil is used to mitigate expansive soil conditions, we recommend the type of chemical admixture (lime, quicklime, or cement) and percentage of chemical additive be based on testing of actual foundation soil after mass grading is substantially completed. Based on our experience, on a preliminary basis we estimate that chemical treatment with approximately 4 percent lime (by dry unit weight) may be appropriate to reduce the plasticity of the on-site soil. The soil should be moisture conditioned to at least 3 percentage points above the optimum moisture content before mixing. The mixing should be performed in accordance with the current version of Caltrans Standard Specifications with the following exceptions:

1. Following mixing, the treated soil should be allowed to fully hydrate prior to compaction.

2. Following hydration, the treated soil should compacted according to ASTM D1557 to at least 95 percent relative compaction at, or slightly above, the optimum moisture content.

We recommend that the chemical treatment be performed by a specialty contractor experienced in this type of work.

4.4.2 Underground Utility Backfill

4.4.2.1 General

The contractor is responsible for conducting trenching and shoring in accordance with CALOSHA requirements. Project consultants involved in utility design should specify pipe-bedding materials.

4.4.2.2 Structural Areas

Place and compact trench backfill as follows.

1. Trench backfill should have a maximum particle size of 6 inches.

2. Moisture condition trench backfill to a minimum of 3 percent above the optimum moisture content. Moisture condition backfill outside the trench.

3. Place fill in loose lifts not exceeding 12 inches.

4. Compact fill to 90 percent minimum relative compaction.

Where utility trenches cross underneath buildings, we recommend that a plug be placed within the trench backfill to help prevent the normally granular bedding materials from acting as a conduit for water to enter beneath the building. The plug should be constructed using a sand cement slurry (minimum 28-day compressive strength of 500 psi) or relatively impermeable native soil for pipe bedding and backfill. We recommend that the plug extend for a distance of at least 3 feet in each direction from the point where the utility enters the building perimeter.

Jetting of backfill is not an acceptable means of compaction.

4.5 SITE DRAINAGE

The project civil engineer is responsible for designing surface drainage improvements. With regard to geotechnical engineering issues, we recommend that finish grades be sloped away from buildings and pavements to the maximum extent practical to reduce the potentially damaging effects of expansive soil. As a minimum, we recommend the following.

1. Discharge roof downspouts into closed conduits and direct away from foundations and pavements to appropriate drainage devices.

2. Do not allow water to pond near foundations, pavements, or exterior flatwork.

5.0 PRELIMINARY FOUNDATION RECOMMENDATIONS

It is anticipated that the proposed development will consist of concrete tilt-up warehouse structures and university buildings consisting of either glass over steel frame construction or concrete tilt-up construction. Based on our limited field exploration, laboratory testing, and engineering analysis, we recommend that the proposed buildings be supported on continuous or isolated spread footing foundation systems with slab-on-grade floors bearing in compacted subgrade with low expansion potential.

We developed preliminary structural improvement recommendations using data obtained from our limited field exploration and laboratory test results. The following recommendations should be considered preliminary and should be verified in a design-level report.

5.1 BUILDING PAD SUBGRADE PREPARATION

We recommend the upper 18 inches of the building pad, and to at least 5 feet laterally beyond, should consist of imported low-expansive fill with a Plasticity Index less than 12. Alternatively, the upper 18 inches of the finished building pad, and to at least 5 feet laterally beyond, can be chemically treated to reduce the plasticity of site soil.

If chemical treatment is selected as an alternative to importing low-expansive fill for building pad construction, the type of chemical admixture (lime, quicklime, or cement) and percentage of chemical additive should be based on testing of actual foundation soil after mass grading is substantially completed. Based on our experience, on a preliminary basis, we estimate that chemical treatment with approximately 4 percent lime (by dry unit weight) may be appropriate to reduce the plasticity of on-site soil. Chemical treatment should be performed by a specialty contractor experienced in this type of work. In addition, excavations performed in chemically treated soil, such as for utility trenches, should be stockpiled and protected for reuse in the upper backfill area to match the treated section.

5.2 FOOTING DIMENSIONS AND ALLOWABLE BEARING CAPACITY

Preliminary minimum footing dimensions are presented in Table 5.2-1 below.

TABLE 5.2-1: Preliminary Minimum Footing Dimensions

FOOTING TYPE	MINIMUM DEPTH (INCHES)	MINIMUM WIDTH (INCHES)
Continuous	**24**	**12**
Isolated	**24**	**24**

Minimum footing depths shown above are taken from the lowest adjacent pad grade.

On a preliminary basis, conventional footing foundations can be designed for a maximum allowable bearing pressure of 2,000 pounds per square foot (psf) for dead-plus-live loads. Increase this bearing capacity by one-third for the short-term effects of wind or seismic loading.

The maximum allowable bearing pressure is a net value; the weight of the footing may be neglected for design purposes. All footings located adjacent to utility trenches should have their bearing surfaces below an imaginary 1:1 (horizontal:vertical) plane projected upward from the bottom edge of the trench to the footing.

For low expansive import material, a subgrade modulus of 150 pci should be used. For chemically treated native material, a subgrade modulus of 250 pci should be used.

5.3 INTERIOR SLAB-ON-GRADE

We anticipate that the operation of the warehouse facilities will include forklift and rack loads on the interior concrete slab. While no loading information was provide for our review, we developed our preliminary recommendations assuming a lightly loaded industrial concrete floor. This would include only small racks and forklifts.

As previously discussed, due to the expansive nature of the onsite material, the interior slabs should be underlain by 18 inches of low expansive imported material or chemically treated native material. Interior concrete floors that will support forklift or rack loads should be underlain by 6 inches of granular base having an R-value of at least 50 and a Plasticity Index less than 12. The base should be compacted to at least 95 percent relative compaction (ASTM D1557) to provide firm, uniform support for the slab-on-grade. These 6 inches of base may be considered part of the low expansive fill recommended in Section 5.1 of this report.

Prior to construction of the slab, the surface should be proof-rolled with heavy equipment to check that the base material is uniformly compacted and does not deflect under equipment loads. Prior to placing the base material, the building subgrade should be prepared in accordance with Section 4.0.

The slab thickness and reinforcement should be designed by the structural engineer based on the intended use and loading of the slab.

Post-construction cracking of concrete slabs-on-grade is inherent in any project, especially where soil expansion potential is high. Adequate slab reinforcement should be provided to satisfy the anticipated use and loading requirements.

When buildings are constructed with concrete slab-on-grade, water vapor from beneath the slab will migrate through the slab and into the building. This water vapor can be reduced but not stopped. Vapor transmission can negatively affect floor coverings and lead to increased moisture within a building. When water vapor migrating through the slab would be undesirable, we recommend the following to reduce, but not stop, water vapor transmission upward through the slab-on-grade.

1. Install a vapor retarder membrane directly beneath the slab. Seal the vapor retarder at all seams and pipe penetrations. Vapor retarders shall conform to Class A vapor retarder in accordance with ASTM E 1745, latest edition, “Standard Specification for Plastic Water Vapor Retarders used in Contact with Soil or Granular Fill under Concrete Slabs.”

2. Provide inspection and testing during concrete placement to check that the proper concrete and water cement ratio are used.

6.0 PRELIMINARY PAVEMENT DESIGN

6.1 FLEXIBLE PAVEMENTS

Based on our limited field exploration and laboratory testing, we determined an R-Value of 5 to be appropriate for untreated native soil. As an alternative, we also provide preliminary design recommendations for lime-treated native soil. Lime treatment increases the subgrade R-value and allows for a decrease in the pavement structural section. Based on experience, we recommend an R-value of 40 to represent lime-treated subgrade soil.

Using estimated traffic indexes for various pavement loading requirements, we developed the following recommended pavement sections using Topic 633 of the Caltrans Highway Design Manual (including the asphalt factor of safety). The recommendations in Table 6.1-1 should be considered preliminary and should be verified in a design-level report.

TABLE 6.1-1: Preliminary Asphalt Concrete Pavement Section Recommendations

TRAFFIC INDEX	SECTION		
	ASPHALT CONCRETE (INCHES)	CLASS 2 AB (INCHES), NO LIME TREATMENT OF SUBGRADE	CLASS 2 AB (INCHES), WITH 12 INCHES OF LIME TREATED SUBGRADE
5	3	10	4
6	3½	13	5½
7	4	15½	7
8	5	17½	8
9	5½	20½	9½
10	6½	23	10½
11	7	25	12½
12	8	25	13½

The civil engineer should determine the appropriate traffic indexes based on the estimated traffic loads and frequencies.

6.2 RIGID PAVEMENTS

We developed the preliminary rigid pavement sections in accordance with the methods contained in the Guide for the Design and Construction of Concrete Parking Lots, based on ACI 330R-08. Table 6.2-1 presents recommended PCCP and aggregate base (AB) thicknesses for various allowable Average Daily Truck Traffic (ADTT) indices that correspond to R-values of 5 for untreated subgrade and the use of concrete with a Modulus of Rupture equal to 500 psi, which corresponds to a compressive strength of approximately 4,000 psi. As an alternative, you may lime treat the pavement subgrade in order to reduce the overall pavement section. Table 6.2-2 presents recommended PCCP thicknesses for various allowable ADTT indices that correspond to 12 inches of lime treated subgrade and a Modulus of Rupture equal to 500 psi.

TABLE 6.2-1: Preliminary Concrete Pavement Section Recommendations, Class 2 AB

ADTT	AXLE CATEGORY	SECTION	
		PCCP (INCHES) NO LIME TREATMENT OF SUBGRADE	CLASS 2 AB (INCHES)
100	C	7.0	6
300	C	7.5	6
700	D	8.5	6

TABLE 6.2-2: Preliminary Concrete Pavement Section Recommendations, Lime Treated Subgrade

ADTT	AXLE CATEGORY	SECTION	
		PCCP (INCHES)	LIME TREATED SUBGRADE (INCHES)
100	C	6.5	12
300	C	6.5	12
700	D	7.0	12

6.3 SUBGRADE AND AGGREGATE BASE COMPACTION

Compact finish subgrade and aggregate base in accordance with Section 4.4. Aggregate Base should meet the requirements for ¾-inch maximum Class 2 AB in accordance with Section 26 1.02B of the latest Caltrans Standard Specifications.

7.0 DESIGN-LEVEL GEOTECHNICAL REPORT

This report presents preliminary geotechnical findings, conclusions and recommendations intended for preliminary planning purposes only. A design-level geotechnical exploration and assessment should be performed when development plans are available. The design-level geotechnical report should further discuss topics presented in this report and address the following items.

- Field exploration and laboratory testing to support design-level recommendations based on the actual development layout.

- Design-level analyses related to geologic and geotechnical hazards.
- Design-level earthwork, improvements, and construction recommendations.

8.0 LIMITATIONS AND UNIFORMITY OF CONDITIONS

This report presents a discussion of geotechnical feasibility for the project discussed in Section 1.2 for the Golden State Logistics Hub project. If changes occur in the nature or design of the project, we should be allowed to review this report and provide additional recommendations, if any. It is the responsibility of the owner to transmit the information and recommendations of this report to the appropriate organizations or people involved in design of the project, including but not limited to developers, owners, buyers, architects, engineers, and designers. The conclusions and recommendations contained in this report are solely professional opinions and are valid for a period of no more than 2 years from the date of report issuance.

We strived to perform our professional services in accordance with generally accepted principles and practices currently employed in the area; no warranty is express or implied. There are risks of earth movement and property damages inherent in building on or with earth materials. We are unable to eliminate all risks; therefore, we are unable to guarantee or warrant the results of our services.

This report is based upon field and other conditions discovered at the time of report preparation. We developed this desktop report with limited site-specific data. We recommend that the owner perform a design-level geotechnical report prior to construction.

Our services did not include a geotechnical exploration, excavation sloping or shoring, soil volume change factors, flood potential, or a geohazard exploration. In addition, our scope did not include work to determine the existence of possible hazardous materials.

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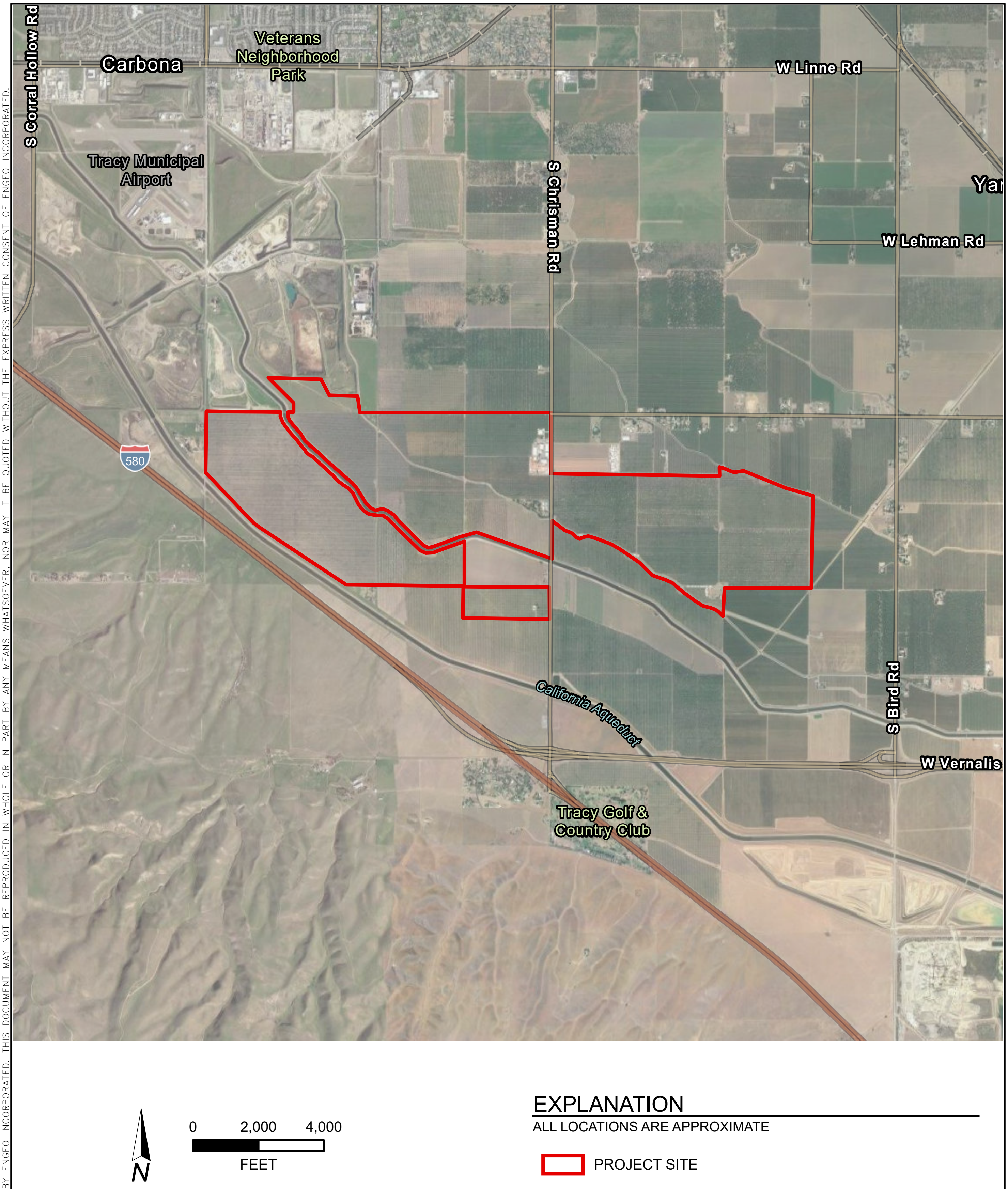
FIGURES



BASEMAP SOURCE: GOOGLE MAPPING SERVICE 2021

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VICINITY MAP

GOLDEN STATE LOGISTICS HUB

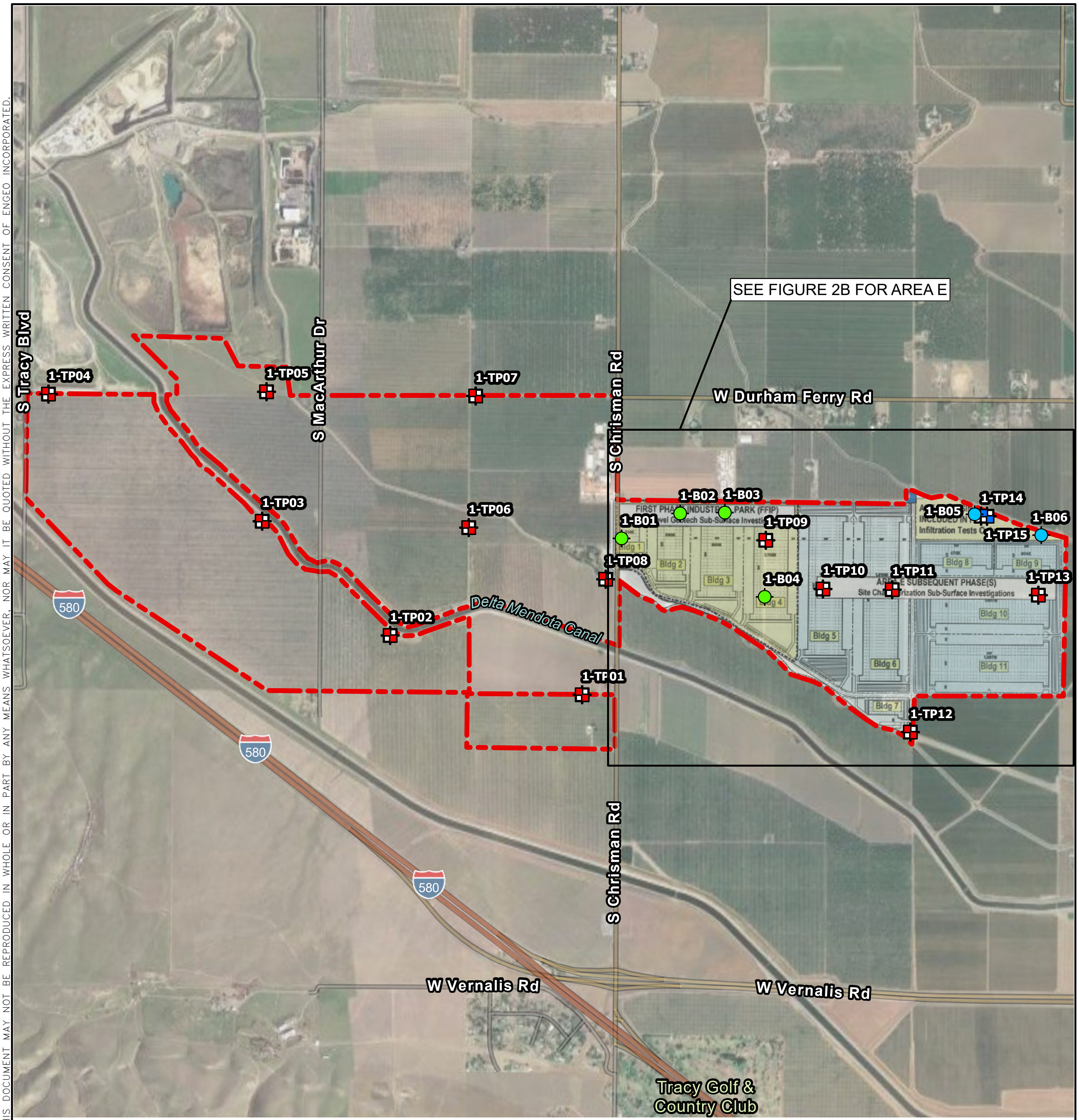
TRACY, CALIFORNIA

PROJECT NO. : 19633.000.001	
SCALE: AS SHOWN	
DRAWN BY: QRL	CHECKED BY: SDH

FIGURE NO.
1

PATH: G:\DRAFTING\PROJECTS_18000 TO 19999\19633\19633000001\GEOTECH\GEX\GOLDEN STATE LOGISTICS HUB.APRX
LAYOUT: VICINITY USER: QLIANG

ORIGINAL FIGURE PRINTED IN COLOR



EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

▭	PROJECT SITE
🟥	TEST PIT (ENGEO, 2021)
🟦	TEST PIT/DOUBLE RING INFILTROMETER (ENGEO, 2021)
🟢	BORING (ENGEO, 2021)
🔵	BORING/PERCOLATION TEST (ENGEO, 2021)

BASEMAP SOURCE: GOOGLE MAPPING SERVICE 2021

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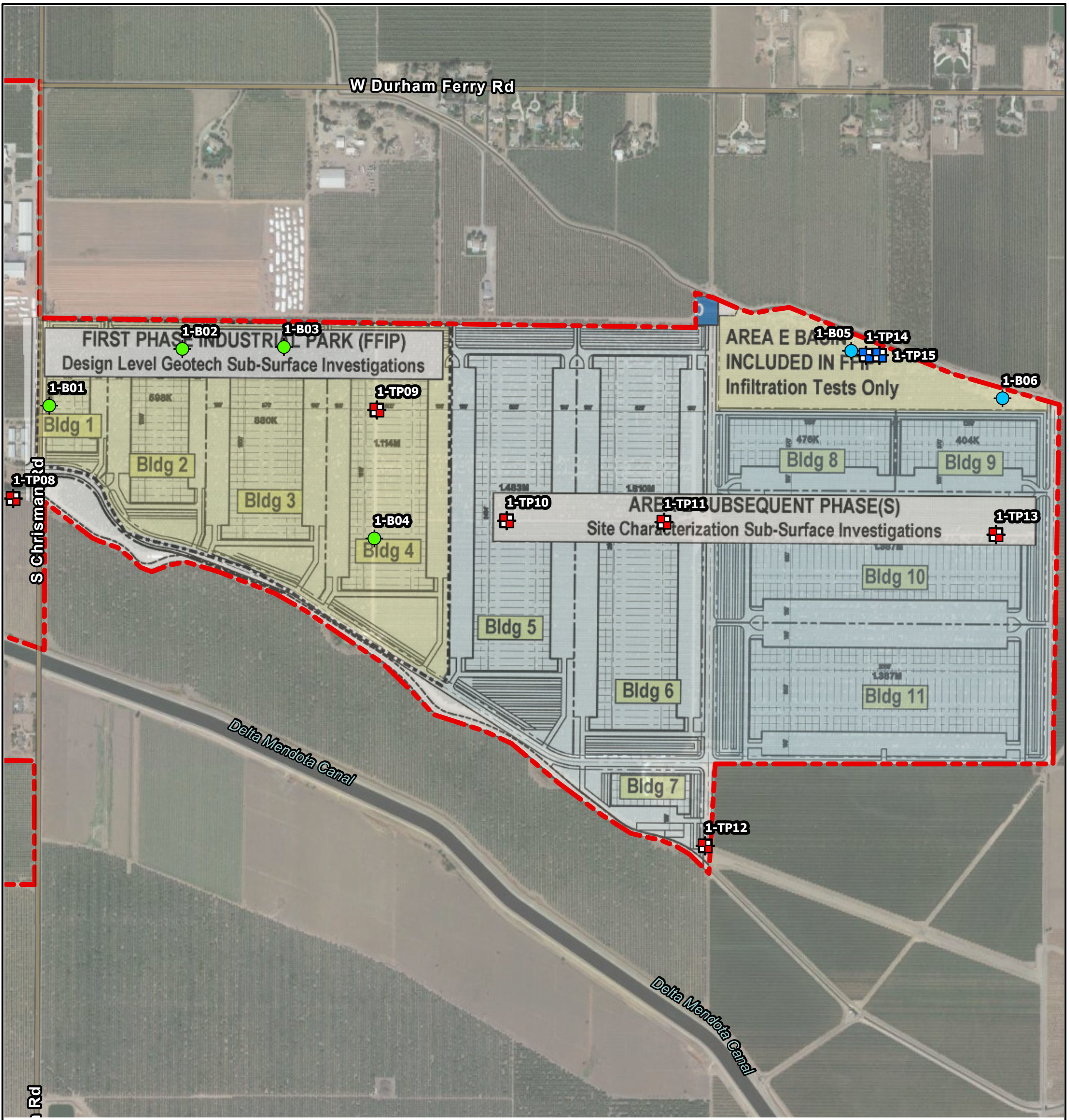
SITE PLAN - OVERALL
GOLDEN STATE LOGISTICS HUB
TRACY, CALIFORNIA

PROJECT NO. : 19633.000.001
SCALE: AS SHOWN
DRAWN BY: QRL
CHECKED BY: SDH
FIGURE NO. 2A

PATH: G:\DRAFTING\PROJECTS_18000 TO 19999\19633\19633000001\GEOTECH\GEX\GOLDEN STATE LOGISTICS HUB.APRX
LAYOUT: SITE PLAN USER: QLIANG

ORIGINAL FIGURE PRINTED IN COLOR



BASEMAP SOURCE: GOOGLE MAPPING SERVICE 2021

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- 🟥 PROJECT SITE
- 🟥 TEST PIT (ENGEO, 2021)
- 🟦 TEST PIT/DOUBLE RING INFILTROMETER (ENGEO, 2021)
- 🟢 BORING (ENGEO, 2021)
- 🔵 BORING/PERCOLATION TEST (ENGEO, 2021)

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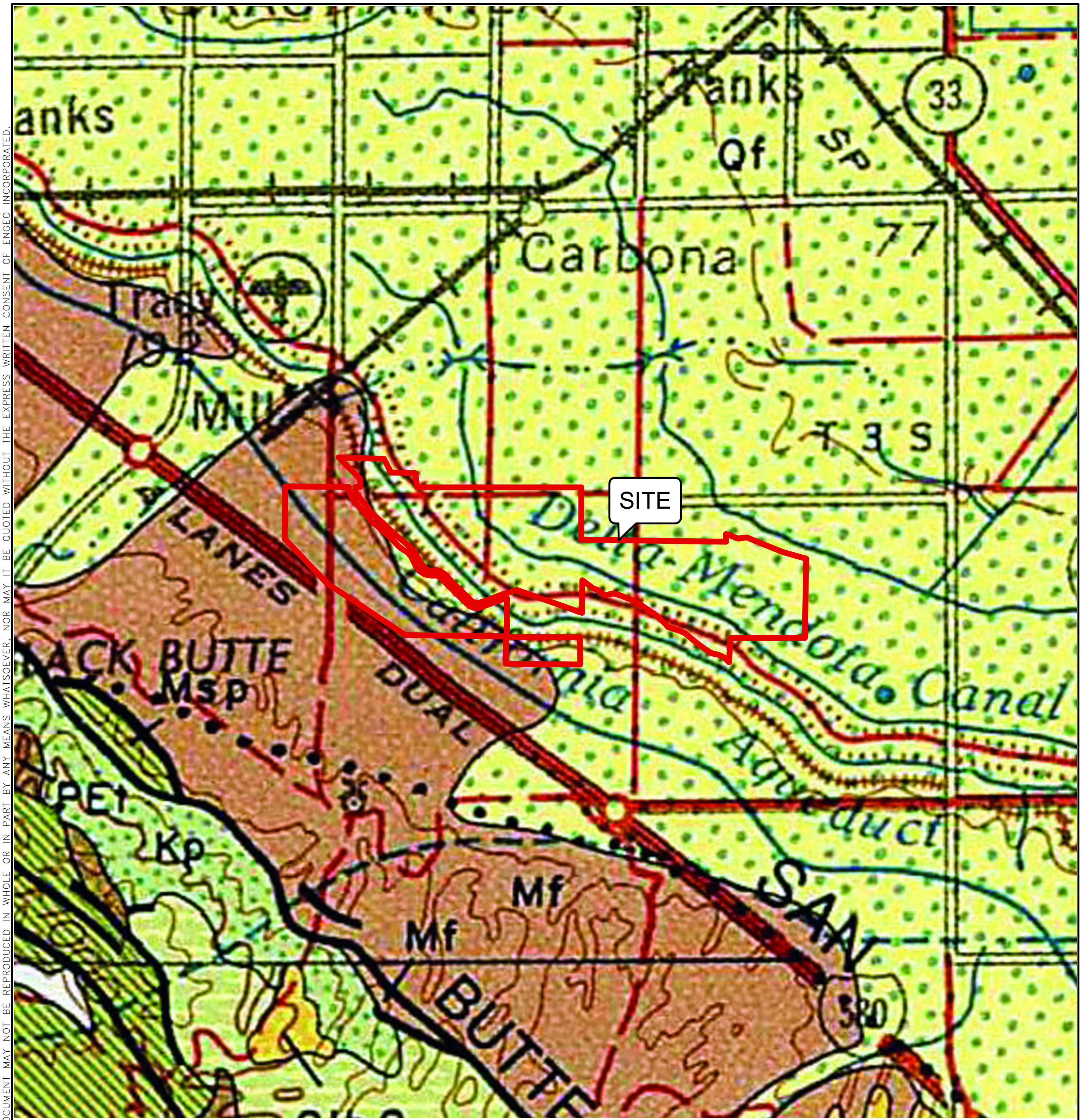
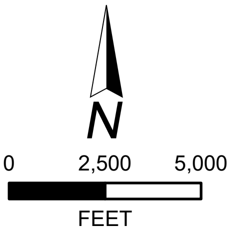
SITE PLAN - AREA E
GOLDEN STATE LOGISTICS HUB
TRACY, CALIFORNIA

PROJECT NO. : 19633.000.001
SCALE: AS SHOWN
DRAWN BY: QRL
CHECKED BY: SDH
FIGURE NO. 2B

PATH: G:\DRAFTING\PROJECTS_18000 TO 19999\19633\19633000001\GEOTECH\GEX\GOLDEN STATE LOGISTICS HUB.APRX
USER: QLIANG

ORIGINAL FIGURE PRINTED IN COLOR





EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

Qf	ALLUVIAL FAN DEPOSITS
Qlb	LOS BANOS ALLUVIUM
Msp	SAN PABLO GROUP
Mf	FANGLOMERATE
kp	PANOCHE FORMATION

BASEMAP SOURCE: WAGNER 1991

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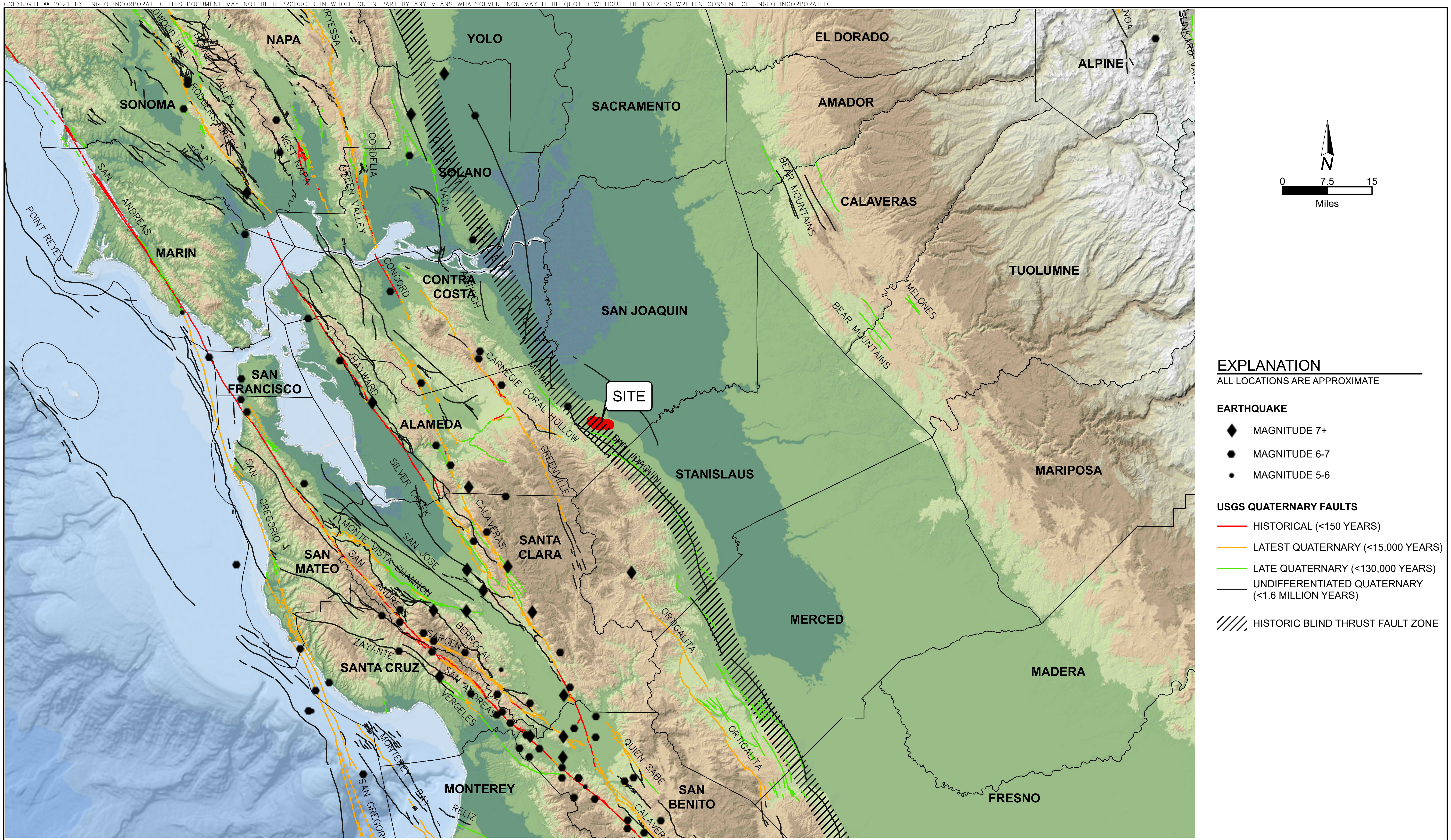
REGIONAL GEOLOGIC MAP

GOLDEN STATE LOGISTICS HUB
TRACY, CALIFORNIA

PROJECT NO. : 19633.000.001
SCALE: AS SHOWN
DRAWN BY: QRL
CHECKED BY: SDH
FIGURE NO. 3

PATH: G:\DRAFTING\PROJECTS_18000 TO 19999\19633\19633000001\GEOTECH\GEX\GOLDEN STATE LOGISTICS HUB.APRX
LAYOUT: GEOLOGIC USER: QLIANG

ORIGINAL FIGURE PRINTED IN COLOR



BASE MAP SOURCE
ESRI, GEBCO, DELORME, NATURALVUE
COLOR HILLSHADE IMAGE BASED ON THE NATIONAL ELEVATION DATA SET (NED) AT 30 METER RESOLUTION
U.S.G.S. QUATERNARY FAULT DATABASE, 2018
U.S.G.S. HISTORIC EARTHQUAKE DATABASE (1800-PRESENT)

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REGIONAL FAULTING AND SEISMICITY
GOLDEN STATE LOGISTICS HUB
TRACY, CALIFORNIA

PROJECT NO. : 19633.000.001	FIGURE NO. 4
SCALE: AS SHOWN	
DRAWN BY: JV	CHECKED BY: SDH

PATH: G:\DRAFTING\PROJECTS_18000 TO 19999\19633\19633000001\GEOTECH\GEX\GOLDEN STATE LOGISTICS HUB.APRX
LAYOUT: FAULT&SEISMICITY USER: QLIANG

ORIGINAL FIGURE PRINTED IN COLOR

APPENDIX A

BORING LOG KEY
BORING LOGS
TEST PIT LOGS

KEY TO BORING LOGS

MAJOR TYPES				DESCRIPTION
COARSE-GRAINED SOILS MORE THAN HALF OF MAT'L LARGER THAN #200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LESS THAN 5% FINES	▨	GW - Well graded gravels or gravel-sand mixtures
			▨	GP - Poorly graded gravels or gravel-sand mixtures
		GRAVELS WITH OVER 12 % FINES	▨	GM - Silty gravels, gravel-sand and silt mixtures
			▨	GC - Clayey gravels, gravel-sand and clay mixtures
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LESS THAN 5% FINES	▨	SW - Well graded sands, or gravelly sand mixtures
			▨	SP - Poorly graded sands or gravelly sand mixtures
		SANDS WITH OVER 12 % FINES	▨	SM - Silty sand, sand-silt mixtures
			▨	SC - Clayey sand, sand-clay mixtures
FINE-GRAINED SOILS MORE THAN HALF OF MAT'L SMALLER THAN #200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50 % OR LESS		▨	ML - Inorganic silt with low to medium plasticity
			▨	CL - Inorganic clay with low to medium plasticity
			▨	OL - Low plasticity organic silts and clays
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50 %		▨	MH - Elastic silt with high plasticity
			▨	CH - Fat clay with high plasticity
			▨	OH - Highly plastic organic silts and clays
	HIGHLY ORGANIC SOILS		▨	PT - Peat and other highly organic soils

For fine-grained soils with 15 to 29% retained on the #200 sieve, the words "with sand" or "with gravel" (whichever is predominant) are added to the group name.

For fine-grained soil with >30% retained on the #200 sieve, the words "sandy" or "gravelly" (whichever is predominant) are added to the group name.

GRAIN SIZES

U.S. STANDARD SERIES SIEVE SIZE

200 40 10 4

CLEAR SQUARE SIEVE OPENINGS

3/4 " 3" 12"

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

RELATIVE DENSITY

SANDS AND GRAVELS	BLOWS/FOOT (S.P.T.)
VERY LOOSE	0-4
LOOSE	4-10
MEDIUM DENSE	10-30
DENSE	30-50
VERY DENSE	OVER 50

CONSISTENCY

SILTS AND CLAYS	STRENGTH*
VERY SOFT	0-1/4
SOFT	1/4-1/2
MEDIUM STIFF	1/2-1
STIFF	1-2
VERY STIFF	2-4
HARD	OVER 4

MOISTURE CONDITION

DRY	Dusty, dry to touch
MOIST	Damp but no visible water
WET	Visible freewater

SAMPLER SYMBOLS

■	Modified California (3" O.D.) sampler
▤	California (2.5" O.D.) sampler
◪	S.P.T. - Split spoon sampler
▯	Shelby Tube
▤	Dames and Moore Piston
▮	Continuous Core
☒	Bag Samples
✋	Grab Samples
NR	No Recovery

LINE TYPES

———	Solid - Layer Break
– – – – – –	Dashed - Gradational or approximate layer break

GROUNDWATER SYMBOLS

▽	Groundwater level during drilling
▼	Stabilized groundwater level

(S.P.T.) Number of blows of 140 lb. hammer falling 30" to drive a 2-inch O.D. (1-3/8 inch I.D.) sampler

* Unconfined compressive strength in tons/sq. ft., asterisk on log means determined by pocket penetrometer

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LOG OF BORING 1-B01

LATITUDE: 37.66022
LONGITUDE: -121.397533

Geotechnical Feasibilty
Golden State Logistics Hub
Tracy, California
19633.000.001

DATE DRILLED: 11/15/2021
HOLE DEPTH: Approx. 20 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (WGS84): Approx. 159 ft.

LOGGED / REVIEWED BY: C. Johnson / SH
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Rope and Cathead

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (psf) *field approximation	Unconfined Strength (tsf) *field approximation	Strength Test Type
							Liquid Limit	Plastic Limit	Plasticity Index						
			LEAN CLAY (CL), brown, hard, moist, medium plasticity, 10% fine- to coarse-grained sand, <5% fine to coarse gravel	▨											
		■	Grades to yellowish brown, stiff	▨		38								>4.5* >4.5*	PP PP
		◣		▨		7									
	155			▨											
5				▨											
		◣	Grades to 15% fine- to coarse-grained sand	▨		9									
			Grades to <5% fine- to coarse-grained sand	▨											
	150			▨											
10		■	Grades to 10% fine- to coarse grained sand, very stiff	▨		37								>4.5*	PP
	145	◣		▨		22									
15				▨											
			CLAYEY SAND (SC), yellowish brown, medium dense, moist, fine- to coarse-grained sand, 20% fines	▨											
	140	■		▨		54									
20			Bottom of boring at approximately 20 feet below ground surface. Groundwater not encountered during drilling.												

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LOG OF BORING 1-B02

LATITUDE: 37.662131
LONGITUDE: -121.39397

Geotechnical Feasibilty
Golden State Logistics Hub
Tracy, California
19633.000.001

DATE DRILLED: 11/15/2021
HOLE DEPTH: Approx. 16½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (WGS84): Approx. 150 ft.
LOGGED / REVIEWED BY: C. Johnson / SH
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Rope and Cathead

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (psf) *field approximation	Unconfined Strength (tsf) *field approximation	Strength Test Type
							Liquid Limit	Plastic Limit	Plasticity Index						
		■	LEAN CLAY (CL), dark brown, medium stiff, moist, medium plasticity, <5% fine to coarse gravel	▨										3.25*	PP
		◣	SANDY LEAN CLAY (CL), yellowish brown, medium stiff, moist, low plasticity, 40% fine- to coarse-grained sand, <5% fine gravel	▨		18 7								3.0*	PP
5 10	145 140	■	LEAN CLAY (CL), yellowish brown, very stiff, moist, medium plasticity, 5% fine- to coarse-grained sand	▨		37									
15	135	◣	CLAYEY SAND (SC), yellowish brown, medium dense, moist, fine- to coarse-grained sand, 25% fines, <5% fine gravel Grades to 40% fines, 10% fine- to coarse-grained gravel	▨		20									
		■	LEAN CLAY WITH SAND (CL), yellowish brown, very stiff, moist, medium plasticity, 15% fine- to coarse-grained sand	▨		40									

Bottom of boring at approximately 16 1/2 feet below ground surface. Groundwater not encountered during drilling.

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LOG OF BORING 1-B03

LATITUDE: 37.662157 LONGITUDE: -121.391202

Geotechnical Feasibilty
Golden State Logistics Hub
Tracy, California
19633.000.001

DATE DRILLED: 11/15/2021
HOLE DEPTH: Approx. 17½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (WGS84): Approx. 145 ft.

LOGGED / REVIEWED BY: C. Johnson / SH
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Rope and Cathead

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (psf) *field approximation	Unconfined Strength (tsf) *field approximation	Strength Test Type
							Liquid Limit	Plastic Limit	Plasticity Index						
			LEAN CLAY (CL), dark brown, moist, medium plasticity, 5% fine- to coarse-grained sand, <5% fine to coarse gravel												
			LEAN CLAY WITH SAND (CL), yellowish brown, hard, moist, medium plasticity, 15% fine- to coarse-grained sand, <5% coarse gravel			30								>4.5*	PP
5	140		Grades to very stiff			25									
			Grades to hard, 5% fine- to coarse-grained sand			68								>4.5*	PP
			Grades to 15% fine- to coarse-grained sand												
10	135														
			POORLY GRADED SAND WITH CLAY (SP-SC), yellowish brown, medium dense to dense, moist, fine- to coarse-grained sand, 10% fines, 10% fine to coarse gravel			30									
15	130		CLAYEY SAND (SC), yellowish brown, medium dense to dense, moist, fine- to coarse-grained sand, 40% fines												
			POORLY GRADED SAND WITH CLAY AND GRAVEL (SP-SC), yellowish brown, medium dense, moist, fine- to coarse-grained sand, 25% fine to coarse gravel, 5-10% fines			43								>4.5*	PP
			LEAN CLAY (CL), yellowish brown, hard, moist, medium plasticity, <5% fine- to coarse-grained sand												

Bottom of boring at approximately 17 1/2 feet below ground surface. Groundwater not encountered during drilling.

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LOG OF BORING 1-B04

LATITUDE: 37.657422
LONGITUDE: -121.388672

Geotechnical Feasibilty
Golden State Logistics Hub
Tracy, California
19633.000.001

DATE DRILLED: 11/15/2021
HOLE DEPTH: Approx. 19 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (WGS84): Approx. 156 ft.

LOGGED / REVIEWED BY: C. Johnson / SH
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Rope and Cathead

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (psf) *field approximation	Unconfined Strength (tsf) *field approximation	Strength Test Type
							Liquid Limit	Plastic Limit	Plasticity Index						
	155	■	SANDY LEAN CLAY (CL), dark brown, hard, moist, medium plasticity, 30% fine- to coarse-grained sand	▨		24								>4.5* >4.5*	PP PP
		◣	LEAN CLAY WITH SAND (CL), yellowish brown, hard, moist, medium plasticity, 15% fine- to coarse-grained sand	▨		24									
5	150	◣	LEAN CLAY (CL), yellowish brown, very stiff, moist, medium plasticity, <5% fine- to coarse-grained sand	▨		16									
10	145	■	Grades to hard, medium to high plasticity, 5% fine- to coarse-grained sand	▨		70								>4.5*	PP
15	140	◣	SANDY LEAN CLAY (CL), yellowish brown, hard, moist, medium plasticity, 40% fine- to coarse-grained sand	▨		38									
		■	LEAN CLAY (CL), yellowish brown, hard, moist, medium to high plasticity, <5% fine- to coarse-grained sand	▨		68								>4.5*	PP
			Bottom of boring at approximately 19 feet below ground surface. Groundwater not encountered during drilling.												

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LOG OF BORING 1-B05

LATITUDE: 37.661565
LONGITUDE: -121.375773

Geotechnical Feasibilty
Golden State Logistics Hub
Tracy, California
19633.000.001

DATE DRILLED: 11/15/2021
HOLE DEPTH: Approx. 20½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (WGS84): Approx. 127 ft.

LOGGED / REVIEWED BY: C. Johnson / SH
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Rope and Cathead

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (psf) *field approximation	Unconfined Strength (tsf) *field approximation	Strength Test Type
	125		LEAN CLAY (CL), dark brown, stiff, moist, medium plasticity, 5% fine- to coarse-grained sand	▨											
5		◣	LEAN CLAY WITH SAND (CL), yellowish brown, stiff, moist, medium plasticity, 15% fine- to coarse-grained sand	▨		13									
	120	◣	SANDY LEAN CLAY (CL), yellowish brown, very stiff, moist, low plasticity, 30-40% fine- to coarse-grained sand	▨		25									
10		◣	LEAN CLAY WITH SAND (CL), dark yellowish brown, very stiff, moist, medium plasticity, 15% fine- to coarse-grained sand	▨		22									
15	115	◣ ◣	LEAN CLAY (CL), dark yellowish brown, very stiff, moist, medium plasticity, <5% fine- to coarse-grained sand	▨		26 27									
			CLAYEY SAND (SC), yellowish brown, medium dense, moist, fine- to coarse-grained sand, 35% fines	▨											
	110	◣	LEAN CLAY (CL), yellowish brown, very stiff, moist, medium plasticity, 5% fine- to coarse-grained sand	▨		25									
20		◣	SANDY LEAN CLAY (CL), yellowish brown, stiff, moist, low plasticity, 35% fine- to coarse-grained sand	▨		18									

Bottom of boring at approximately 20 1/2 feet below ground surface. Groundwater not encountered during drilling.

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LOG OF BORING 1-B06

LATITUDE: 37.660573
LONGITUDE: -121.371652

Geotechnical Feasibilty
Golden State Logistics Hub
Tracy, California
19633.000.001

DATE DRILLED: 11/15/2021
HOLE DEPTH: Approx. 15 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (WGS84): Approx. 129 ft.

LOGGED / REVIEWED BY: C. Johnson / SH
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Rope and Cathead

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (psf) *field approximation	Unconfined Strength (tsf) *field approximation	Strength Test Type
							Liquid Limit	Plastic Limit	Plasticity Index						
			LEAN CLAY (CL), dark brown, moist, medium plasticity, <5% fine- to coarse-grained sand	▨											
			SANDY LEAN CLAY (CL), yellowish brown, medium stiff, moist, low plasticity, 30% fine- to coarse-grained sand	▨											
	125														
5															
		◣				7									
	120	◣	Grades to 35% medium- to coarse-grained sand			10									
10															
		◣	Grades to 20-30% fine- to coarse-grained sand			14									
			POORLY GRADED SAND WITH CLAY (SP-SC), yellowish brown, medium dense, moist, fine- to coarse-grained sand, 10% fines	⁙▨											
	115	◣	SANDY LEAN CLAY (CL), yellowish brown, stiff, moist, low plasticity, 30-40% fine- to coarse-grained sand, contains silt fines	▨		15									
15															

Bottom of boring at approximately 15 feet below ground surface. Groundwater not encountered during drilling.

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TEST PIT LOG

Golden State Industrial Hub
Tracy, California
19633.000.001

Logged By: Jason Sedore
Logged Date: November 11, 2021

Test Pit Number	Depth (feet)	Description
1-TP01	0 – 3	FAT CLAY (CH), dark grayish brown, hard (Pocket Penetrometer >4.5 tsf at 2 feet), moist, high plasticity, <15% fine- to medium-grained sand, contains gravel
		Bottom of test pit at approximately 3 feet below ground surface. No groundwater encountered during excavation.
1-TP02	0 – 1½	LEAN CLAY WITH SAND (CL), dark grayish brown mottled with brown, very stiff (Pocket Penetrometer = 3.5 tsf at 1 foot), moist, medium to high plasticity, 15-25% fine- to medium-grained sand, contains silt fines and gravel
	1 ½ - 3	FAT CLAY (CH) very dark grayish brown, hard (Pocket Penetrometer >4.5 tsf at 2 feet), moist, high plasticity, <15% fine-grained sand
		Bottom of test pit at approximately 3 feet below ground surface. No groundwater encountered during excavation.
1-TP03	0 – 2	FAT CLAY (CH), very dark brown mottled with yellowish brown, hard (Pocket Penetrometer = 4.0 tsf at 1 foot), moist, high plasticity, <15% fine-grained sand [Undocumented Fill]
	2 – 3	FAT CLAY (CH), very dark brown, hard, moist, high plasticity, <15% fine-grained sand [Native]
		Bottom of test pit at approximately 3 feet below ground surface. No groundwater encountered during excavation.
1-TP04	0 – 6	SANDY LEAN CLAY (CL), grayish brown, hard (Pocket Penetrometer >4.5 tsf), moist, medium plasticity, 30-40% fine-grained sand, contains fine gravel
		Grades to brown, low to medium plasticity, contains silt fines at 3½ feet
		Grades to yellowish brown to brown, contains carbonates at 4½ feet
		Bottom of test pit at approximately 6 feet below ground surface. No groundwater encountered during excavation.

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TEST PIT LOG

Golden State Industrial Hub
Tracy, California
19633.000.001

Logged By: Jason Sedore
Logged Date: November 11, 2021

Test Pit Number	Depth (feet)	Description
1-TP05	0 – 3	SANDY LEAN CLAY (CL), dark grayish brown, medium to high plasticity, 30-40% fine-grained sand, <10% fine to coarse gravel, contains cobbles
	3 – 5½	SILTY GRAVEL WITH SAND (GM), brown, dense to very dense, moist, fine to coarse, subangular to to subrounded gravel, 25-35% fine- to coarse-grained sand, 15-20% fines, contains cobbles
		Bottom of test pit at approximately 5½ feet below ground surface. No groundwater encountered during excavation.
1-TP06	0 – 4	FAT CLAY (CH), very dark grayish brown, hard (Pocket Penetrometer >4.5 tsf), moist, high plasticity, <15% fine-grained sand
		Grades to brown, contains carbonates at 3 feet
	4 – 5	LEAN CLAY (CL), brown, very stiff to hard, moist, medium plasticity, <15% fine-grained sand, contains silt fines and carbonates
	5 – 5½	SANDY LEAN CLAY (CL), brown to yellowish brown, moist, medium plasticity, 30-40% fine-grained sand, contains silt fines
		Bottom of test pit at approximately 5½ feet below ground surface. No groundwater encountered during excavation.
1-TP07	0 – ⅔	SANDY LEAN CLAY (CL), dark brown with strong brown, hard, moist, medium plasticity, 30-40% fine- to coarse-grained sand, contains debris [Undocumented Fill]
	⅔ – 2½	FAT CLAY (CH), brown mottled with grayish brown, hard (Pocket Penetrometer >4.5 tsf), moist, high plasticity, <15% fine-grained sand [NATIVE]
	2½ – 4	LEAN CLAY WITH SAND (CL), brown, very stiff (Pocket Penetrometer = 3.5 to 4.0 tsf), moist, medium plasticity, 15-25% fine-grained sand, contains silt fines
	4 – 6½	SANDY LEAN CLAY (CL), brown, very stiff (Pocket Penetrometer = 3.75 to 4.0 tsf), moist, medium plasticity, 30-40% fine-grained sand, contains silt fines
		Bottom of test pit at approximately 6½ feet below ground surface. No groundwater encountered during excavation.

TEST PIT LOG

Golden State Industrial Hub
Tracy, California
19633.000.001

Logged By: Jason Sedore
Logged Date: November 11, 2021

Test Pit Number	Depth (feet)	Description
1-TP08	0 – 1	FAT CLAY WITH SAND (CH), very dark grayish brown, very stiff (Pocket Penetrometer = 3.5 to 4.0 tsf), moist, high plasticity, <15% fine-grained sand, <15% fine gravel [Undocumented Fill]
	1 – 4	FAT CLAY (CH), very dark brown to very dark grayish brown, very stiff (Pocket Penetrometer = 3.0 tsf), moist, high plasticity, <15% fine-grained sand [Native]
		Grades to hard at 3½ feet (Pocket Penetrometer >4.5 tsf)
	4 – 5	LEAN CLAY WITH SAND (CL), brown, hard (Pocket Penetrometer >4.5 tsf), moist, medium to high plasticity, 15-25% fine-grained sand
	5 – 6½	SANDY LEAN CLAY (CL), brown to yellowish brown, moist, medium plasticity, 30-40% fine-grained sand, contains silt fines and carbonates
		Bottom of test pit at approximately 6½ feet below ground surface. No groundwater encountered during excavation.
1-TP09	0 – ½	SANDY LEAN CLAY (CL), dark grayish brown, hard (Pocket Penetrometer >4.5 tsf), moist, medium plasticity, 30-40% fine- to coarse-grained sand, contains gravel [Undocumented Fill]
	½ - 4½	SANDY LEAN CLAY (CL), dark grayish brown, hard (Pocket Penetrometer 4.0 to 4.5 tsf), moist, medium plasticity, 30-40% fine-grained sand, contains silt fines
		Graded to brown, very stiff (Pocket Penetrometer = 3.0 tsf), contains carbonates at 4 feet
		Bottom of test pit at approximately 4½ feet below ground surface. No groundwater encountered during excavation.

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TEST PIT LOG

Golden State Industrial Hub
Tracy, California
19633.000.001

Logged By: Jason Sedore
Logged Date: November 11, 2021

Test Pit Number	Depth (feet)	Description
1-TP10	0 – ¾	FAT CLAY WITH SAND (CH), dark brown, hard (Pocket Penetrometer >4.5 tsf), moist, high plasticity, 10-20% fine- to medium-grained sand, <10% fine gravel
	¾ – 3½	FAT CLAY (CH), dark brown mottled with brown, hard (Pocket Penetrometer >4.5 tsf), moist, high plasticity, <15% fine-grained sand, contains carbonates
	3½ – 4	SANDY LEAN CLAY (CL), brown, hard (Pocket Penetrometer >4.5 tsf), moist, medium plasticity, 30-40% fine-grained sand
	4 – 5	SILTY SAND (SM), brown, moist, fine-grained sand, 25-35% fines
		Bottom of test pit at approximately 5 feet below ground surface. No groundwater encountered during excavation.
1-TP11	0 – 1	FAT CLAY WITH SAND (CH), dark grayish brown, very stiff to hard (Pocket Penetrometer = 4.0 to 4.5 tsf), moist, high plasticity, <15% fine- to coarse-grained sand, 5-10% fine gravel [UNDOCUMENTED FILL]
	1 – 2	FAT CLAY (CH), dark grayish brown, very stiff to hard (Pocket Penetrometer = 4.0 tsf), moist, high plasticity, <15% fine- to coarse-grained sand [NATIVE]
	2 – 3½	LEAN CLAY WITH SAND (CL), brown mottled with dark brown, very stiff to hard (Pocket Penetrometer = 3.5 to 4.5 tsf), moist, 15-25% fine-grained sand, contains silt fines
	3½ – 5	SANDY LEAN CLAY (CL), yellowish brown, hard (Pocket Penetrometer >4.5 tsf), moist, medium plasticity, 30-40% fine-grained sand, contains silt fines and carbonates
		Bottom of test pit at approximately 5 feet below ground surface. No groundwater encountered during excavation.

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TEST PIT LOG

Golden State Industrial Hub
Tracy, California
19633.000.001

Logged By: Jason Sedore
Logged Date: November 11, 2021

Test Pit Number	Depth (feet)	Description
1-TP12	0 – 2	SANDY LEAN CLAY (CL), brown to grayish brown, hard (Pocket Penetrometer >4.5 tsf), moist, medium plasticity, 30-40% fine- to coarse-grained sand, <10% gravel [UNDOCUMENTED FILL]
	2 – 4½	SANDY LEAN CLAY (CL), brown to grayish brown, hard (Pocket Penetrometer >4.5 tsf), moist, medium plasticity, 30-40% fine- to medium-grained sand, trace gravel [NATIVE]
		Grades to brown with silt fines at 3¾ feet
		Bottom of test pit at approximately 4½ feet below ground surface. No groundwater encountered during excavation.
1-TP13	0 – 1	FAT CLAY (CH), very dark brown, hard (Pocket Penetrometer >4.5 tsf), moist, high plasticity, <15% fine- to coarse-grained sand, trace gravel [UNDOCUMENTED FILL]
	1 – 2	FAT CLAY (CH), very dark brown, hard (Pocket Penetrometer >4.5 tsf), moist, high plasticity, <15% fine- to coarse-grained sand, trace gravel [NATIVE]
	2 – 5	LEAN CLAY (CL), yellowish brown, very stiff to hard (Pocket Penetrometer = 3.0 to 4.0 tsf), moist, medium plasticity, contains carbonates
		Grades to brown at 4 feet
		Bottom of test pit at approximately 5 feet below ground surface. No groundwater encountered during excavation.
1-TP14	0 – 5	LEAN CLAY (CL), dark brown, moist, medium plasticity, <5% fine- to coarse-grained sand
		Grades to dark yellowish brown at 2½ feet
	5 – 7	SANDY SILT (ML), yellowish brown, moist, low plasticity, 20-30% fine- to coarse-grained sand
		Bottom of test pit at approximately 7 feet below ground surface. No groundwater encountered during excavation.

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TEST PIT LOG

Golden State Industrial Hub
Tracy, California
19633.000.001

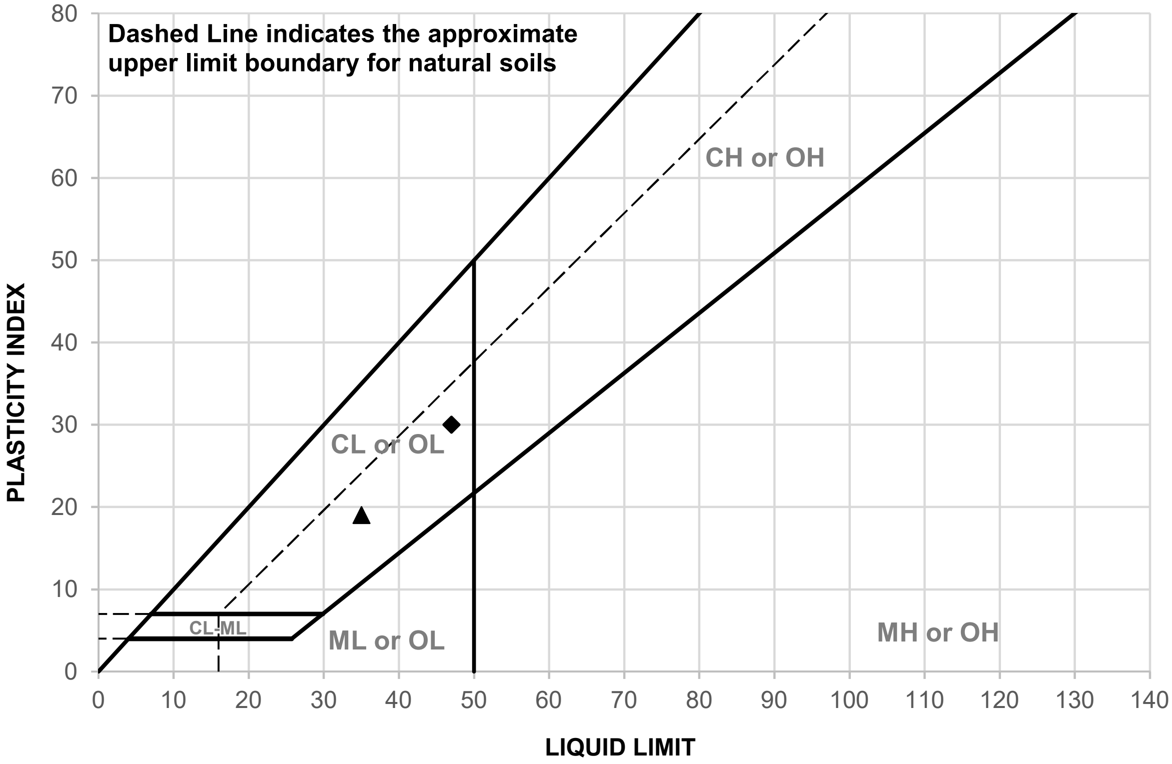
Logged By: Jason Sedore
Logged Date: November 11, 2021

Test Pit Number	Depth (feet)	Description
1-TP15	0 – 5½	LEAN CLAY (CL), dark brown, moist, medium plasticity, <5% fine- to coarse-grained sand Grades to dark yellowish brown, 10% fine- to coarse-grained sand at 3½ feet
	5½ – 8	SANDY SILT (ML), yellowish brown, moist, low plasticity, 30-40% fine- to coarse grained sand Bottom of test pit at approximately 8 feet below ground surface. No groundwater encountered during excavation.

APPENDIX B

LABORATORY TEST DATA

LIQUID AND PLASTIC LIMITS TEST REPORT
ASTM D4318



SAMPLE ID	DEPTH (ft)	MATERIAL DESCRIPTION	LL	PL	PI
1-TP09 @ 1'	1 foot	See exploration logs	35	16	19
1-TP13 @ 1'	1 foot	See exploration logs	47	17	30

SAMPLE ID	TEST METHOD	REMARKS
1-TP09 @ 1'	PI: ASTM D4318, Wet Method	
1-TP13 @ 1'	PI: ASTM D4318, Wet Method	

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CLIENT: Ridgeline Property Group
PROJECT NAME: Golden State Logistics Hub
PROJECT NO: 19633.000.001 PH001
PROJECT LOCATION: Tracy, CA
REPORT DATE: 11/18/2021
TESTED BY: D. Bryant
REVIEWED BY: K. Lecce

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