APPENDIX B:

GEOTECHNICAL INVESTIGATION

B.1: Group Delta Consultants, Inc.,
Geotechnical Investigation Report, Proposed Renovation of Existing Building and New Structures,
837 N. Cahuenga Boulevard,
Los Angeles, California,
September 17, 2019.

B.2: Los Angeles Department of Building and Safety,
Soils Report Review Letter, LOG # 110580,
November 4, 2019

B.3: Group Delta Consultants, Inc.,
Response to City of Los Angeles Comments on Soils Report,
Proposed Renovation of Existing Building and New Structures,
837 N. Cahuenga Boulevard,
Los Angeles, California
December 6, 2019

B.4: Los Angeles Department of Building and Safety,
Soils Report Approval Letter, LOG # 110580-01,
December 24, 2019

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837 N. Cahuenga Boulevard,
Los Angeles, California,
September 17, 2019.

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GEOTECHNICAL INVESTIGATION REPORT
PROPOSED RENOVATION OF EXISTING BUILDING AND NEW STRUCTURES
837 N CAHUENGA BOULEVARD, LOS ANGELES, CA

Prepared for

837 N Cahuenga LLC
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Prepared by

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GDC Project No. LA-1403

September 17, 2019

GROUP DELTA

837 N Cahuenga LLC
745 Merchant St
Los Angeles, CA 90021

September 17, 2019
Project No. LA-1403

Attention: Daniel Glenn

SUBJECT: Geotechnical Investigation Report
Proposed Renovation of Existing Building and New Structures
837 N Cahuenga Boulevard, Los Angeles, California

Mr. Glenn

Group Delta Consultants, Inc. (Group Delta) is pleased to submit this geotechnical investigation report for the renovation of the existing building and new structures proposed at 837 N Cahuenga Boulevard in Los Angeles, California. Our scope of work was conducted in general accordance with our proposal dated May 12, 2019.

We appreciate the opportunity to provide geotechnical services for this project. If you have any questions pertaining to this report or if we can be of further service, please do not hesitate to contact us.

Sincerely

GROUP DELTA CONSULTANTS, INC.

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GEOTECHNICAL INVESTIGATION REPORT
PROPOSED RENOVATION OF EXISTING BUILDING AND NEW STRUCTURES
837 N CAHUENGA BOULEVARD, LOS ANGELES, CALIFORNIA

1.0 INTRODUCTION

1.1 Background

Group Delta is pleased to submit this geotechnical investigation report for the proposed renovation of the existing building and new structures at 837 N Cahuenga Boulevard in the City of Los Angeles. The subject property is located at 837 N Cahuenga Blvd as shown in Figure 1. The project site is occupied by one existing 2-story building with one basement level. Asphalt-paved parking is located south of the building. The project site (Site) has an area of approximately 17,500 square feet. The existing building was constructed in 1990/1991. The basement level is approximately 9'-10" below the first-floor level. We understand the building is supported on masonry and concrete bearing walls supported on strip footing foundations.

1.2 Project Description

The proposed project includes the renovation of the existing building and new small structures on the Site. An at-grade pool is also being considered in the existing parking area to the south of the existing building. The renovation of the existing building includes modifying the existing structure which will result in the addition of structural loads, which will require modifications to the existing foundation system. Based on the current design, the new load will be supported on both existing wall footings and new interior footings that are being constructed.

1.3 Scope of Work

The objective of our geotechnical investigation was to provide geotechnical recommendations for the design and construction of the proposed renovation of the existing building and proposed new structures. We performed the following general scope of work:

- Reviewed existing building as-builts and proposed footing details for the property.
- Reviewed published geologic and/or geotechnical maps and reports pertaining to the site area.
- Performed a geotechnical field investigation at the site that included performing three (3) exploratory borings and (1) infiltration test within the south parking lot to evaluate existing subsurface conditions, and one (1) test pit within the building's basement level to assess existing foundations and subsurface soil conditions.
- Performed geotechnical laboratory testing.
- Performed geologic and seismic hazard analysis including fault surface rupture, ground shaking, liquefaction, and ground motion analysis.

- Performed engineering analyses including recommendations for foundation design, allowable bearing capacity, estimated settlements, and resistance to lateral loading for the proposed and existing foundations.
- Provided geotechnical seismic design parameters in accordance with the California Building Code (CBC).
- Calculated retaining wall earth pressures for existing basement walls and proposed minor retaining walls.
- Developed earthwork recommendations, including over-excavation requirements, excavatability of site soils and placement of compacted earth fill materials as structural backfill and utility/landscape backfill.
- Developed geotechnical pavement design recommendations for access driveways and parking.
- Prepared this Geotechnical Investigation Report.

2.0 GEOTECHNICAL INVESTIGATION

2.1 Data Review

Group Delta's data review included a review of conceptual plans and as-built drawings for the existing building provided by Blvd Hospitality. We also reviewed geotechnical information available from publicly-available sources as noted in the References section of this report.

Based on our review of the available as-built drawings for the existing building, the building is supported on strip footings bearing on native soils at a depth of approximately 10 feet below the first story grade and were designed for an allowable bearing pressure of 3,000 psf.

2.2 Field Investigation

The field investigation program on site included drilling three (3) hollow-stem-auger borings, performing one infiltration test, excavating one test pit at the basement level, and advancing one hand-auger boring within the test pit in the basement level. Exploration locations are shown on Figure 2.

Three (3) hollow-stem-auger borings (B-1, B-2 and B-3) were drilled on the southern parking lot of the 837 N Cahuenga building to depths ranging from 11.5 to 51.5 feet below grade. Both relatively undisturbed California drive samples and Standard Penetration Test (SPT) samples were taken at intervals of 5 feet to a maximum depth of 51.5 feet. Bulk samples of the near surface soils were collected at exploration locations to evaluate the fill material. Deeper bulk samples were collected at borings to evaluate proposed basement level subgrade soils. Infiltration testing was performed within boring B-1 to assess water infiltration at the site.

The infiltration test was performed within boring B-1. After the drilling of boring B-1 a 2.5-inch diameter PVC infiltration casing was installed to a depth of 10 feet below ground surface. The bottom 5 feet of the casing from 5 feet to 10 feet below ground surface was slotted PVC casing and the bottom was end-capped. The casing from 0 feet to 5 feet was solid PVC casing. Fine gravel was placed in the annulus space between the slotted PVC pipe and the boring wall. Soil backfill was placed in the annulus space between the solid pipe and the boring walls. The infiltration testing included filling the PVC casing with water which was allowed to drain out and pre-soak the soil before running the test. The test was performed in general accordance with the Los Angeles County procedures for percolation testing in a boring. Water was placed in the PVC pipes and the time and water level drop were monitored to assess water infiltration into the ground. Results for of the infiltration test are discussed further in Section 7.11.

Group Delta excavated one test pit (TP-1) within the basement level of the existing building along the north wall. The existing concrete slab was sawcut and removed in the area of the test pit to expose the subsurface conditions in this area. The test pit was excavated to a depth of 2.5-feet below top-of-slab where the top-of-footing was encountered. Group Delta then advanced a hand-auger boring to a depth of 11 feet from the top of the basement slab. Relatively undisturbed California drive samples and bulk samples were collected within the hand-auger boring. Cross sections of both test pit TP-1 and the hand-auger boring within the test pit are shown in Figures 3A and 3B.

The explorations were performed under the supervision of our field engineer, who maintained logs of the soil encountered, classified the materials, and assisted in obtaining soil samples. Details of the field exploration program, including copies of boring logs are presented in Appendix A.

2.3 Laboratory Testing Program

The soil samples obtained from the borings were taken to our laboratory for further visual examination and laboratory testing. Laboratory tests were performed to assist in classifying and correlating samples and evaluating their physical characteristics and engineering properties. The laboratory tests included soil classification, moisture content and dry density, percent passing number 200 sieve, Atterberg limits, consolidation, unconfined compression, R-value, and soil corrosivity. The results of our laboratory testing from our investigation at the project site are included in Appendix B.

3.0 GEOLOGIC AND SEISMIC SETTING

3.1 Geology

Regionally, the site is located within the seismically active Los Angeles Basin area of southern California Peninsula Ranges Geomorphic Province. The basin began forming over 7 million years ago during transtensional stresses and subsidence between north-west and east-west trending fault systems (Wright, 1991). Today, the basin is undergoing transpresssional stress bound by surrounding uplifting thrust blocks including the Santa Monica-Hollywood-Raymond fault system locally (Dolan, 1995). Internally, the basin is filled with sedimentation thousands of feet thick, structurally influenced by thrusting fault blocks and strike-slip faults dividing the basin into northwest trending valleys and ridges (Wright, 1991).

Locally, the site is situated mid-fan in the central block Los Angeles Basin (Wright, 1991). The alluvial fan extends down to the south south-west from the Santa Monica Mountains in the north and Puente Hills in the east. Tertiary sedimentary rocks and granitic rocks are exposed within the mountains and hills. Older alluvial deposits blanket the site and sedimentation is thousands of feet thick below the surface. The location of the site with respect to the geological features described above is presented in the Regional Geology Map, Figure 4**.**

3.2 Seismic Setting

The site is located within the seismically active area of southern California and there is a high potential for the site to experience strong ground shaking from local and regional faults. These hazards and their potential impact can be mitigated with proper seismic design. The intensity of ground shaking is highly dependent upon the distance of the fault to the site, the magnitude of the earthquake, and the underlying soil conditions. Data evaluated for the local fault and seismic hazard at the site was obtained from U.S. Geological Survey (USGS) and California Geological Survey (CGS) online earthquake catalog and Quaternary Fault Database resources unless otherwise noted. The site in relation to regional seismic faults and significant historical earthquake epicenters is presented in Figure 5, Regional Seismicity and Fault Map.

Local historical earthquakes recorded within a 100 km radius of the site from 1918 to present include 336 recorded events with M4.0 or greater (USGS, 2019). Of the 336 events, 3 were M6.0 and greater and include the 1971 M6.6 San Fernando Earthquake and the 1994 M6.7 Northridge Earthquake. Thirty-three recorded events were M5.0 to M6.0 earthquakes. While not within the search radius, earthquakes of M7.0 and greater have been recorded in southern California. A M7.5 earthquake occurred in 1952 located about 72 miles north of the site and a M7.3 earthquake in 1992 was located about 100 miles east of the site. Construction in this area should be designed with accepted engineering practices and in compliance with current building codes that accommodate strong seismic ground motion.

A list of faults considered capable of producing significant shaking at the site is provided in Table 1 below:

Table 1: List of Known Earthquake Faults Closest to the Subject Site

Abbreviated Fault Name	Fault Type	Max. Magnitude (Mw)	Approximate Closest Distance (Km)
Newport Inglewood Fault Zone (NIFZ)	Strike Slip	7.5	6.70
Puente Hills (LA)	Reverse	6.9	5.30
Hollywood Fault	Strike Slip	6.6	2.80
Elysian Park (Upper)	Reverse	6.6	3.88

Notes: USGS, Accessed July 7, 2017.

4.0 SITE AND SUBSURFACE CONDITIONS

4.1 Surface Conditions

The site is approximately a 0.48-acre lot located in the Hollywood area of the City of Los Angeles. The site is currently being used as a surface asphalt paved parking lot with the main 2-story plus basement building to the north. The site is bordered by N Cahuenga Blvd to the east, 832 Cole St to the west, and commercial buildings and parking lots to the north and south. There is a metal gate in place on the east side of the parking lot. The surface is fairly level, with an approximate elevation difference of 2 feet from El +288 to +290 within the parking lot surface. The existing site building has a basement level located approximately 9 feet and 10 inches below the first-floor level.

4.2 Subsurface Conditions

The near-surface soils generally included approximately 5 to 7 feet of fill near the building and up to approximately 3 feet of fill further away from the building as shown in Cross Section A-A' in Figure 3A. The fill encountered consists predominantly of gray very stiff lean clay to sandy clay. Below the uncertified fill we encountered the native alluvial soils. A stiff to hard sandy clay, clay and silty clay layer were encountered to an approximate depth of 41 feet to 45.5 feet below ground surface. Below the stiff to hard clays we encountered dense to very dense sand.

4.3 Groundwater

Groundwater was encountered at depths of 20.5 and 21.3 feet below ground surface during drilling. Higher perched water layers were not encountered in our field investigation but may exist in other areas of the site due to the clayey nature of subsurface soils encountered. The historic high ground water at the site is about 20 feet below ground surface according the Seismic Hazard Zone Report for the Hollywood 7.5-Minute Quadrangle, CGS SHZ Report 026.

5.0 GEOLOGIC HAZARDS

A geologic hazard evaluation was performed through review of published reports and maps made available by USGS and CGS as well as the City of Los Angeles General Plan Safety Element (1996). While the site is located within a seismically active area of southern California, proper engineering design can mitigate the potential hazard to life and property. Significant geologic hazards include ground surface rupture, landslide, and liquefaction have a low potential hazard at the site. A discussion of these hazards and others is presented below.

5.1 Ground Surface Rupture

The site is not located within an Alquist-Priolo Earthquake Required Investigation Zone for Holocene-active fault potential. Published maps indicate that the north boundary of the subject site is approximately 1.62 kilometers from the CGS Earthquake Required Investigation Zone for the Hollywood fault (2017). Based on review of available published USGS and CGS geologic maps as well as the City of Los Angeles Navigatela Preliminary Fault Rupture Study Areas, there are no mapped active faults that cross through or project toward the site. Therefore, the potential for surface fault rupture at the site is low.

5.2 Liquefaction and Seismic Settlement

The project is not located in the zone of required investigation for liquefaction based on the earthquake fault zones and seismic hazard zones map for Hollywood 7.5-Minute Quadrangle (CGS, 2014) as shown in Figure 6. It is not located within the City of Los Angeles potentially liquefiable areas, as illustrated in NavigateLA geotechnical liquefaction layer. The subsurface conditions encountered during our field investigation indicate predominately very stiff to hard clay soil profile. Therefore, the liquefaction potential at the site is considered low.

5.3 Landslide and Slope Instability

The site and surrounding vicinity are relatively level, as shown in Figure 2. There are no mapped landslides or potential earthquake induced landslide slopes at or near the site. The potential for landslide hazard at the site is negligible. With proper engineered shoring and/or laying back of cut slopes, potential hazard of slope instability at the site is low.

5.4 Flooding

Flooding hazards maps including flooding due to tsunami events, dam failures, and significant storm events were reviewed for their potential impact at the project site. The site is located about 10.9 miles from the coast and has relative high elevation (El. +288 feet), therefore, tsunamis is not a hazard at the site. There are no large bodies of water near the site which may present a potential seiche hazard. FEMA National Flood Hazard Layer (NFHL) maps indicate the site is outside the 0.2% Annual chance Floodplain, Zone X (FEMA, 2017). The potential hazard at the site for flooding due to storm events or tsunami event is considered low. Based on information provided on the City of Los Angeles' Navigate LA website, (https://navigatela.lacity.org) the site is not located in a flood hazard zone.

The Hollywood Reservoir which is just about 2.2 mile north and topographically uphill from the site, as shown in Figure 1. The City of Los Angeles General Plan Safety Element (1996) indicates the site is within an inundation zone related to the Hollywood Reservoir. The Hollywood Reservoir was created with the construction of the Mulholland Dam. Breach of the dam by seiche or failure of the dam has the potential to impact the site. According to the City of Los Angeles General Plan, dams and reservoirs are monitored during storms, and measures are instituted in the event of potential overflow. These measures apply to facilities within the City's borders and facilities owned and operated by the City within other jurisdictions. Appropriate measures to be implemented in the event of potential overflow are specific to each dam and are based on the risk level associated with the dam. The City determines the risk of each dam that would impact the City based on the age and design of the dam, the holding capacity, as well as the density of existing and planned development within the inundation area.

Dam safety regulations are the primary means of reducing damage or injury due to inundation occurring from dam failure. The California Division of Safety of Dams regulates the siting, design, construction, and periodic review of all dams in the State. It is unknown when the last seismic safety evaluation was performed for the reservoir. The dam has survived recent earthquakes in the vicinity, including the 1994 Northridge Mw 6.7 earthquake epicentered about 13 miles northwest of the reservoir.

The Los Angeles Department of Water and Power (LADWP), operates the dam and mitigates the potential for over flow and seiche hazard through control of water levels and dam wall height. Records indicate some improvements to the Mulholland Dam global stability were implemented following the 1928 catastrophic failure of the St. Francis Dam. In addition, the water storage was lowered in the Hollywood Reservoir to approximately half of the storage capacity of the original intended design. The City's Local Hazard Mitigation Plan, which was adopted in July 2011, provides a list of existing programs, proposed activities and specific projects that may assist the City of Los Angeles in reducing risk and preventing loss of life and property damage from natural and human-caused hazards, including dam failure. The Hazard Mitigation Plan evaluation of dam

failure vulnerability classifies dam failure as a moderate risk rating. Considering these risk reduction projects, potential hazard for inundation at the site is low.

5.5 Naturally Occurring Hazardous Elements

Naturally occurring hazardous elements within subsurface materials can include asbestos, radon, and oil and methane gas. CGS Map Sheet 59, showing known sites with naturally occurring asbestos indicates there is no known naturally occurring asbestos at or near the site (USGS, 2011). The California Geological Survey Special Radon Potential Zone Map indicates the site has low potential for indoor radon levels above 4 picocuries per liter (CGS, 2005). Four picocuries per liter is recommended to be an action level for radon reduction by the U.S. Environmental Protection Agency.

A revision of the General Plan Safety Element Exhibit E (1996) indicates the site is outside of major oil drilling areas and the boundaries of the closest State-Designated oil field is Salt Lake, about 0.2 miles south from the site. Therefore, the occurrence of naturally occurring oil onsite is considered low. The City of Los Angeles Methane Zone Map (2004) indicates the site is mapped within a buffer methane zone. The potential hazard for methane at the site should be evaluated by a methane engineer and the hazard may be mitigated through proper engineering design considerations.

6.0 SEISMIC GROUND MOTION VAULES

Design ground motion parameters were developed in accordance with the California Building Code (CBC) 2016/ASCE 7-10 for new buildings and ASCE 41-13 for existing buildings to be retrofitted. The site coordinates used in our seismic hazard analysis are: -118.32916 (Longitude) and 34.08640 (Latitude). Site Class D, corresponding to a “Stiff Soil” profile was assumed at the site.

The seismic design parameters were estimated using the SEAOC/OSHPD Seismic Design Map Tool (https://seismicmaps.org/) from OSHPD website and are summarized below in Table 2. As described in Sections 3.0 and 5.0, numerous faults exist in the area. The design of the project should address the current building code and seismic ground motion requirements.

Table 2: CBC 2016 Seismic Parameters for Site Class D

Latitude: 34.08640 Longitude: -118.32916	
Parameter	Value
ASCE 7-10 (New Buildings)	
Site Class	D
Mapped MCE Spectral Response Acceleration at Short Period (S_S)	2.178g
Mapped MCE Spectral Response Acceleration at Period of 1 Second (S_1)	0.795g
Site Coefficient, F_a	1
Site Coefficient, F_v	1.5
Adjusted MCE Spectral Response Acceleration at Short Period (S_{MS})	2.40g
Adjusted MCE Spectral Response Acceleration at Period of 1 Second (S_{M1})	1.192g
Design Earthquake Spectral Response Acceleration at Short Period (S_{DS})	1.452g
Design Earthquake Spectral Response Acceleration at Period of 1 Second (S_{D1})	0.795g
Peak Ground Acceleration Adjusted for Site Class (PGA_M)	0.831g
ASCE 41-13 Retrofit Standard, BSE-1E (Retrofitting Existing Buildings)	
Site Class	D
20%/50-year max. Direction Spectral Response Acceleration at Period 0.2 Seconds ($S_{S,20/50}$)	0.881g
20%/50-year max. Direction Spectral Response Acceleration at Period 1 Second ($S_{1,20/50}$)	0.314g
Site Coefficient, F_a	1.148
Site Coefficient, F_v	1.773
Design Earthquake Spectral Response Acceleration at Period 0.2 Seconds ($S_{XS,BSE-1E}$)	1.011g
Design Earthquake Spectral Response Acceleration at Period of 1 Second ($S_{X1,BSE-1E}$)	0.556g

7.0 DISCUSSION AND RECOMMENDATIONS

7.1 General

Based on a review of the site conditions, the laboratory results, and our engineering analyses, it is our opinion that the proposed project is feasible from a geotechnical standpoint. Geotechnical recommendations for site grading and foundation design are provided in the following sections.

7.2 Demolition and Removals

Demolition of portions of the basement slab and other building components may be necessary prior to the start of earthwork. The civil engineer should identify the presence and location of all existing utilities on and adjacent to the site. Precautions will be required to remove, relocate or protect existing utilities, as appropriate.

Borings drilled at the site encountered fill extending to a depth of about 5 to 7 feet next to the building, and up to approximately 3 feet of fill in the parking lot further away from the building

as shown in the boring logs and in Figure 3A. It is possible that fill is present in other areas of the site, and may be locally deeper, where any previous basements, tanks or buried structures may have been removed and backfilled.

7.3 Earthwork and Grading

All new structures should be supported on foundations bearing on native soils or compacted structural fill. All uncertified fill should be removed prior to construction of structural foundations. Following the removal of uncertified fill and unsuitable native soils, structural fill must be placed to the elevation of the bottom of the proposed new footings. The basement footings are supported on native soils and do not require removal of uncertified fill.

All grading should conform to the requirements of the City of Los Angeles, and the general grading recommendations outlined below.

1. The contractor is responsible for notifying the project geotechnical engineer of a pre-construction meeting prior to the start of construction and anytime that the earthwork/foundation operations are resumed after an interruption.

2. Existing utilities and underground storage tanks should be removed, relocated or protected, as appropriate.

3. To support paving or hardscape outside of the building footprint, if required, uncertified fill beneath proposed hardscape or pavement should be removed and replaced with structural fill. The actual limits for removals should be determined by the project Geotechnical Engineer depending on the actual conditions encountered.

4. The bottoms of footings and slabs should be brought to optimum moisture content and compacted to 95 percent relative compaction in accordance with the maximum dry density determined by ASTM D-1557. The term “maximum dry density” in this report refers to the maximum dry density determined by ASTM D-1557, unless otherwise noted.

5. Structural fill or backfill should be compacted to at least 95 percent of the maximum dry density. Fill placed in non-structural areas should be compacted to at least 90 percent of the maximum dry density.

6. All structural fill soils should be sandy soils, free of highly expansive clay, organics, debris, rocks greater than 3 inches in any dimension, and other deleterious material. All fill soils shall be approved by the project geotechnical engineer. Import soils should be approved before being brought to the site. If expansive soils are found, they should be removed and replaced with non-expansive compacted fill.

7. All earthwork and grading should be performed under the observation of Group Delta. Testing should be performed for approximately every 2 feet in fill thickness or 500 cubic yards of fill placed, whichever occur first. If specified compaction is not achieved, additional compactive effort, moisture conditioning of the fill soils, and/or removal and recompaction of the below-minimum-compaction soils will be required.

8. All materials used for aggregate base shall conform to the most recent version of the "Green Book" specifications or the equivalent and shall be compacted to at least 95 percent relative compaction.

9. Underground utility trenches below structures and/or pavement should be backfilled with properly compacted fill. Fill should be placed in loose lifts appropriate for the type of compaction equipment utilized. Fill should be compacted to a minimum of 90 percent of the maximum density as determined by ASTM D1557. Jetting or flooding of backfill materials should not be allowed.

The contractor will be responsible for performing excavations in a safe manner in accordance with OSHA and any other pertinent regulations.

7.4 Temporary Excavation

Temporary excavations, if needed, will be made primarily in soils consisting of sandy clays and clays, which are classified as CalOSHA Type B soils. Temporary vertical cuts and sloped excavations can be accomplished in accordance with CalOSHA requirements.

All excavations shall meet minimum requirements of the Occupational Safety and Health (OSHA) Standards. Maintaining safe and stable excavations is the responsibility of the contractor and will depend on the nature of the soils and subsurface conditions encountered and his method of excavation. Excavations during construction should be carried out in such a manner that failure or ground movement will not occur. The short-term stability of excavation depends on many factors, including slope angle, engineering characteristics of the subsurface materials, height of the excavation, and length of time the excavation remains unsupported and exposed to equipment vibrations, rainfall, and desiccation.

7.5 Drainage or Dewatering

Groundwater was encountered at a depth of approximately 20 feet in one of our borings. The bottoms of footings are planned to be located approximately 12 feet below the adjacent parking lot grade. Based on the field exploration, groundwater is not anticipated to flow into the excavation. The need for dewatering is not anticipated at the site.

7.6 Foundations

Foundations for the proposed project include the following:

- New foundations and foundation widening for the existing building.
- New shallow foundations for new lightly-loaded structures on site.
- New pole foundations for new lightly-loaded structures on site.

The following sections present recommendations for each of these.

7.6.1 Bearing Capacity

Existing wall for the existing building may be designed for an allowable bearing capacity of 4,500 pounds per square foot (psf). New shallow spread footing supporting new columns may be designed for an allowable bearing capacity of 3,200 psf. The allowable bearing pressure may be increased by one-third when considering temporary loads associated with wind and seismic loading. The recommended bearing value is a net value, and the weight of concrete may be taken as 30 pounds per cubic foot; the weight of soil backfill can be neglected when determining the downward loads. Widening of the existing footings may induce additional settlements of the existing structure. This is discussed in Section 7.6.2 below.

Footings for the proposed lightly-loaded structures outside of the existing building may be designed for an allowable bearing capacity of 2,500 psf.

The recommended bearing values stated above are for use with loadings determined by a conventional working stress design. When considering an ultimate design approach, the recommended design values shall be multiplied by a factor of 3.

Bottom of footings should be placed a minimum of 12 inches below lowest adjacent grade. Foundation excavations and placement of backfill should be observed by the project geotechnical engineer before placement of concrete to verify that the foundation conditions meet the requirements of the geotechnical report. The project geotechnical engineer may perform compaction tests, probing, or use other methods, to verify that the foundations will be supported in competent soils. If disturbed, wet, or otherwise unsuitable soils are encountered, or if water saturates the soils, the soils shall be excavated or stabilized as recommended by the project geotechnical engineer.

7.6.2 Settlement

We estimate the settlement of the structure supported on shallow foundations in the manner recommended is expected to about 1½ inch or less. The differential settlement between adjacent columns is expected to be ¾ inch or less.

For strip or spread footings for the lightly-loaded structures and an allowable bearing of 2,500 psf, settlements are expected to be less than 1 inch and differential settlements to be less than ½ inch between similarly-loaded footings.

7.6.3 Lateral Capacity

Resistance to lateral loads can be provided by friction developed between the bottom of footings and supporting soil, and by the passive soil pressure developed on the face of the footing. An allowable passive fluid pressure of 250 pounds-per-cubic-foot, with a maximum resisting pressure of 2,500 psf, and a coefficient of friction of 0.3 may be used for lateral sliding resistance of footings. Both values include a factor of safety of about 1.5 and may be combined in design without reduction.

7.6.4 Modulus of Subgrade Reaction

For structural analyses of the long-term behavior of foundations established in the supporting material, a vertical modulus of subgrade reaction of 30 pounds per cubic inch may be used. The modulus of subgrade reaction would vary beneath different portions of the mat due to natural variability in the material. Based on the variability of the materials as tested, we recommend that the modulus of subgrade reaction may be taken as varying within a range of 25% below to 25% above the recommended value.

7.6.5 Pole Foundations

The following recommendations should be used in design of pole foundations:

- Bottom of pole foundations should bear on native site soils.
- Lateral support may be derived from the native soils and/or new compacted structural fill. Uncertified fill soils should not be used to provide lateral support..
- For pole foundations installed as noted above, the following may be used for design:
  - Use an allowable bearing capacity of 2,500 pounds per square foot (psf).
  - For resistance of lateral loads use a passive earth pressure of 500 psf per foot of depth up to a maximum of 5,000 psf for lateral bearing pressure for pole foundations. The 500 psf corresponds to a passive resistance of 250 psf per foot of depth times two to account for the round shape of the pole foundation (CBC Section 1806A.3.4)

7.7 Lateral Earth Pressures

Basement retaining walls braced against movement at the top of the wall should be designed to resist at-rest earth pressures using an equivalent fluid weight of 55 pounds per cubic foot (pcf), provided non-expansive soils are used for backfill behind the walls and drainage is included in the wall design to prevent the buildup of hydrostatic pressures.

The recommended lateral earth pressures provided above are based on the assumption that non-expansive soils are used for backfill and adequate drainage is provided behind the walls to prevent the buildup of hydrostatic pressures. Walls should be provided with backdrains to prevent the buildup of hydrostatic pressure behind the walls. If backdrains are not included behind the basement walls, walls should be designed for an earth pressure using an equivalent fluid weight of 90 pcf to account for hydrostatic water pressures.

If expansive clay soils are used for backfill, walls should be designed for an earth pressure using an equivalent fluid weight of 100 pcf.

Normal traffic loads (if applicable) can be modeled as two (2) feet of soil surcharge, or 240 psf vertical pressures acting on the paved surface subject to traffic loading. For rigid walls, the lateral pressure coefficient can be estimated as 40 percent of the vertical pressure, i.e. a uniform horizontal pressure of 96 psf. This lateral pressure should be applied from the ground level to a depth of 10 feet. Additional loading from other surcharges such as adjacent structures should be considered in the design.

7.8 Utility Installations

Excavations for utility trenches should be readily accomplished with conventional excavating equipment. All shoring and excavation should comply with current OSHA and CALOSHA regulations and should be observed by the designated competent person on site. The contractor should be responsible for the structural design and safety of any temporary shoring system.

The bedding for any new sewer and water service pipeline should be a minimum of 4 inches thick and should consist of clean sand, No. 4 concrete aggregate, or gravel and should have a sand equivalent of not less than 30. The pipe zone material, which extends to a level 12 inches above the pipe, should consist of sand and should have a sand equivalent of no less than 30, and a maximum rock size of 1 inch. All imported materials should be approved by the project geotechnical engineer before being brought on site.

Fill placement within the trench zone above the pipe backfill should be performed in accordance with the recommendations of this report. Jetting or flooding of backfill should not be permitted. In backfill areas where mechanical compaction of soil backfill is impractical due to space constraints, CLSM may be substituted for compacted backfill.

7.9 Expansive Soil

Based on the laboratory testing, the subsurface clayey soils have a moderate to high expansion potential. Therefore, the following requirements in LADBS Information Bulletin P/BC 2017-116 shall be implemented in design:

- Depth of footings below the natural and finish grades shall not be less than 24 inches for exterior and 18 inches for interior footings.
- Exterior walls and interior bearing walls shall be supported on continuous footings.
- Footings shall be reinforced with four ½-inch-diameter deformed reinforcing bars. Two bars shall be placed within 4 inches of the bottom of the footings and two bars within 4 inches of the top of the footing with a minimum concrete cover per ACI 318, Section 20.6.1.3.
- On-grade concrete floor slabs shall be placed on a 4-inch fill of coarse aggregate or on a 2-inch sand bed over a moisture barrier membrane. The slabs shall be at least 3 ½ inches thick and shall be reinforced with ½-inch-diameter deformed reinforcing bars. Reinforcing bars shall be spaced at intervals not exceeding 16 inches each way.
- The soil below an interior concrete slab shall be pre-saturated to a depth of 18 inches prior to placing the concrete.
- All drainage adjacent to footings shall be conducted away from the structure by a minimum 3-foot-wide apron sloped at no less than 2 percent and draining into an approved non-erosive device.

7.10 Soil Corrosivity

Representative samples collected on the near surface soils (5 feet below grade), were tested to evaluate corrosion characteristics. The results indicate the test samples had a pH of 7.67; a water-soluble sulfate content of less than 0.01%, and a soluble chloride content of less than 0.01%, for both samples. The sulfate results indicate that sulfate exposure is classified as negligible.

The tested samples were also found to have a minimum measured electrical resistivity of 619 Ohm-cm. The following correlation can generally be used between electrical resistivity and corrosion potential:

Electrical Resistivity (Ohm-Cm)	Corrosion Potential
Less than 1,000	Severe
1,000 to 2,000	Corrosive
2,000 to 10,000	Moderate
Greater than 10,000	Mild

Based on the low electrical resistivity measured, the test samples are classified to have a severe corrosion potential to buried metals. Further evaluation/testing and recommendations for corrosion protection should be provided by a corrosion consultant.

7.11 Infiltration

An infiltration test was performed in boring B-1 in general accordance with the Boring Percolation Test procedure of Los Angeles County's Guidelines for Design, Investigation, And Reporting Low Impact Development Stormwater Infiltration. Infiltration test data is included in Appendix C.

The field infiltration rates were calculated based on the percolation rata data in the following manner:

- Calculate the field percolation rate as the rate of drop in water level in inches per hour.
- Convert the percolation rate to an infiltration rate by accounting for flow out of the sides of the borehole and the volume of water in the pipe.
- A Reduction Factor of 2 was applied for running the test in a boring.
- A Reduction Factor of 2 was applied for site variability and number of infiltration tests and thoroughness of subsurface investigation.
- A Reduction Factor of 1 was applied for Long-term siltation, plugging and maintenance.
- The storm water BMP should be designed to provide maintenance and avoid siltation of the BMP over time. The reduction factor can be re-assessed during final design based on the specific BMPs used, upstream land uses, and pretreatment systems incorporated.

The recommended design infiltration rate is shown in Table 3 below.

Table 3: Summary of Percolation Test

Boring	Zone Evaluated (depth in feet below ground surface)	Design Infiltration Rate (in/hr)	Material
B-1	5-10	1.89E-03	Sandy Clay

The design infiltration rate of 1.89E-03 inches per hour is significantly less than the required minimum design infiltration rate of 0.3 inches per hour by the LA County storm water infiltration. Based on this measured infiltration rate, we do not recommend infiltration on site.

7.12 Pavement Design

Pavements may be required for the access driveways to the site. A design R-value of 5 for flexible pavement design, was estimated based on near surface soil.

Subgrade drainage is a key factor that enhances pavement performance. Subgrade surfaces below the pavement structural sections should be sloped to direct runoff to suitable collection points and to prevent ponding. Concrete curbs separating pavement from landscape or exposed earth areas should extend at least 6 inches below subgrade surfaces to reduce the potential for the movement of moisture through the aggregate base-course layers.

The recommended pavement sections described in Sections 7.12.1 and 7.12.2 are preliminary. The actual soils present at subgrade elevation after grading may be different than those assumed for the preliminary design contained herein. Group Delta recommends that the subgrade soils be observed after grading is completed and that the actual subgrade materials be sampled and a tested. Final pavement design recommendations may be presented after the observation and R-value testing is reviewed.

7.12.1 Flexible Asphalt Pavements

By assuming the traffic index (TI) values shown below, a 20-year design life and based on the Caltrans Highway Design Manual (Caltrans, 2017), GDC has developed the following recommendations for preliminary flexible pavement design:

Table 4: Flexible Pavement Design Sections

Traffic Index (TI)	Asphalt Concrete Thickness (inches)	Class II Aggregate Base Thickness (inches)
4.0	**4**	**6**
5.0	**4**	**8**

7.12.2 Rigid Concrete Pavements

Concrete pavements may be desirable in certain areas where heavy equipment may induce large pavement loads. A simplified rigid pavement analysis was performed in general accordance with Caltrans Highway Design Manual (Caltrans, 2017). The simplified analysis indicates that 9-inch thickness of Jointed Plain Concrete Pavement (JPCP) over 6-inches thickness of Class II aggregate base is sufficient for Traffic Indexes less than 9. The thickness corresponds to a 28-day concrete modulus of rupture of 625 pounds per square inch (psi) and a pavement design life of 20 years. The transverse joints in the pavement should be spaced 15 feet apart or less.

The asphalt concrete thickness can be divided into base and finish courses. The uppermost 12 inches of subgrade and the Class II aggregate base should be compacted to at least 95 percent of the maximum dry density as determined by ASTM D1557. Pavement section thicknesses will increase for areas of heavy vehicular use and for areas where larger wheel loads are anticipated.

8.0 LIMITATIONS

This investigation was performed in accordance with generally accepted Geotechnical Engineering principles and practice. The professional engineering work and judgments presented in this report meet the standard of care of our profession at this time. No other warranty, expressed or implied, is made. This report has been prepared for 837 N Cahuenga LLC, and their design consultants. It may not contain sufficient information for other parties or other purposes and should not be used for other projects or other purposes without review and approval by Group Delta.

The recommendations for this project, to a high degree, are dependent upon proper quality control of site grading, fill and backfill placement, and pile foundation installation. The recommendations are made contingent on the opportunity for Group Delta to observe the earthwork operations. This firm should be notified of any pertinent changes in the project, or if conditions are encountered in the field, which differ from those described herein. If parties other than Group Delta are engaged to provide such services, they must be notified that they will be required to assume complete responsibility for the geotechnical phase of the project and must either concur with the recommendations in this report or provide alternate recommendations.

9.0 REFERENCES

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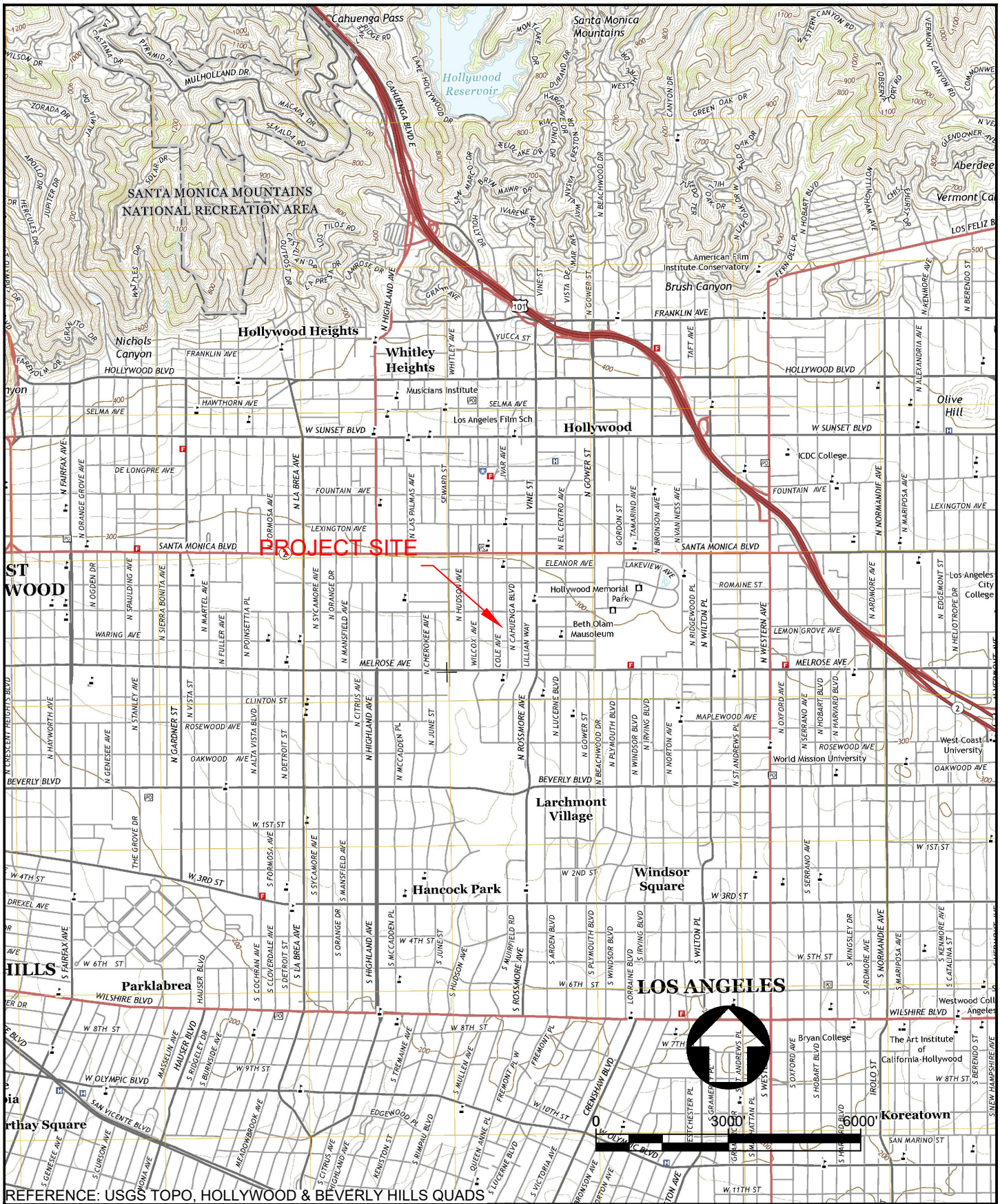
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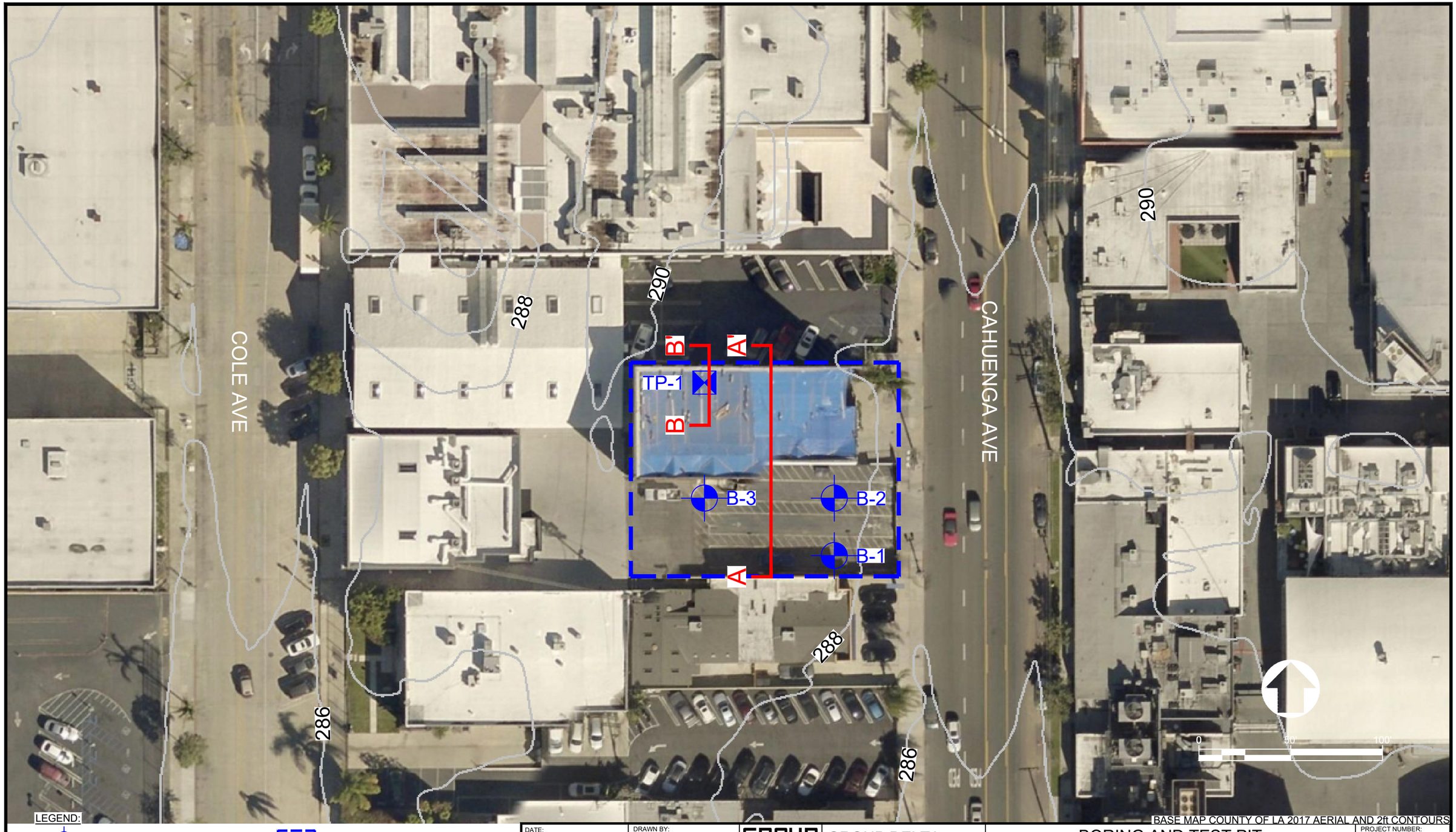
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FIGURES



DATE: 06/18/2019	DRAWN BY: JMT	GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	SITE VICINITY MAP	PROJECT NUMBER: LA-1403	
REVIEWED BY: -	APPROVED BY: -			SCALE: AS SHOWN	
PREPARED BY: -			837 N. CAHUENGA BLVD. LOS ANGELES, CALIFORNIA	FIGURE NUMBER: 1	

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BASE MAP COUNTY OF LA 2017 AERIAL AND 2ft CONTOURS

LEGEND:

- B-3 — LOCATION OF BORING
- A — A' — LOCATION OF CROSS SECTION
- TP-1 — LOCATION OF TEST PIT
- PROJECT LIMITS

DATE: 06/18/2019	DRAWN BY: JMT
REVIEWED BY: -	APPROVED BY: -
REVISED: -	

GROUP DELTA CONSULTANTS, INC
370 Amapola Ave.
Suite 212
Torrance, CA. 90501

BORING AND TEST PIT LOCATION PLAN

837 N. CAHUENGA BLVD.
LOS ANGELES, CALIFORNIA

PROJECT NUMBER:	LA-1403
SCALE:	AS SHOWN
FIGURE NUMBER:	2

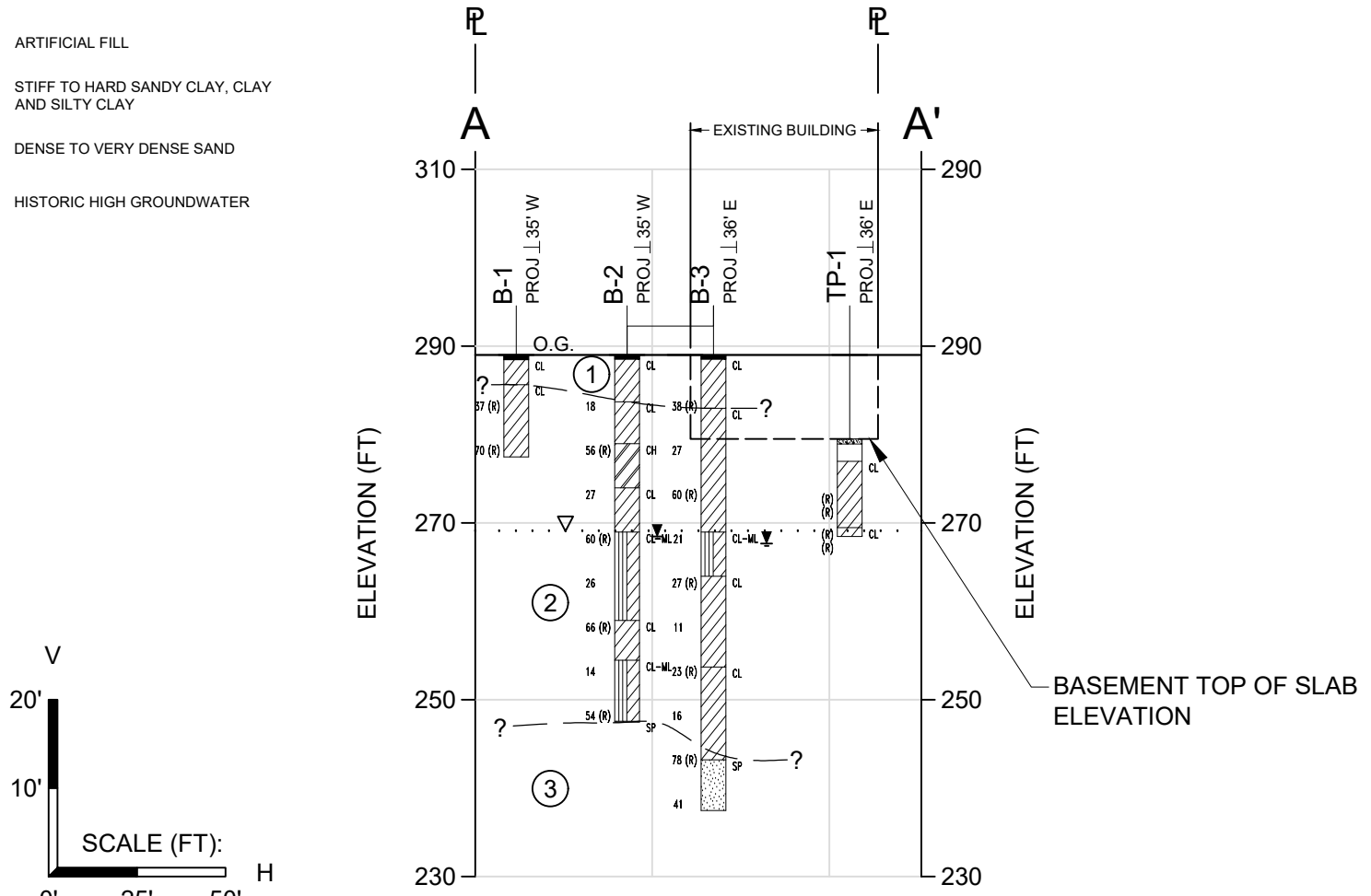
LEGEND:

1 ARTIFICIAL FILL

2 STIFF TO HARD SANDY CLAY, CLAY AND SILTY CLAY

3 DENSE TO VERY DENSE SAND

HISTORIC HIGH GROUNDWATER



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MAP UNITS AND SYMBOL EXPLORATION

Late Holocene (Surficial Deposits)

af — **Artificial Fill** - deposits of fill resulting from human construction, mining, or quarrying activities; includes engineered fill for buildings, roads, dams, airport runways, harbor facilities, and waste landfills

Qsu — **Undifferentiated Surficial Deposits** - includes colluvium, slope wash, talus deposits, and other surface deposits of all ages; generally unconsolidated but locally may contain consolidated layers

Qls — **Landslide Deposits** - may include debris flows and older landslides of various earth material and movement types; unconsolidated to moderately well-consolidated

Qb — **Beach Deposits** - unconsolidated marine beach sediments consisting mostly of fine- and medium-grained, well-sorted sand

Qw — **Alluvial Wash Deposits** - unconsolidated sandy and gravelly sediment deposited in recently active channels of streams and rivers; may contain loose to moderately loose sand and silty sand

Qf — **Alluvial Fan Deposits** - unconsolidated boulders, cobbles, gravel, sand, and silt recently deposited where a river or stream issues from a confined valley or canyon; sediment typically deposited in a fan-shaped cone; gravelly sediment generally more dominant than sandy sediment

Qa — **Alluvial Valley Deposits** - unconsolidated clay, silt, sand, and gravel recently deposited parallel to localized stream valleys and/or spread more regionally onto alluvial flats of larger river valleys; sandy sediment generally more dominant than gravelly sediment

Qt — **Terrace Deposits** - includes marine and stream terrace deposits; marine deposits include slightly to moderately consolidated and bedded gravel and conglomerate, sand and sandstone, and silt and siltstone; river terrace deposits consist of unconsolidated thin- to thick-bedded gravel

Ql — **Lacustrine, Playa, and Estuarine (Paralic) Deposits** - mostly unconsolidated fine-grained sand, silt, mud, and clay from fresh water (lacustrine) lakes, saline (playa) dry lakes that are periodically flooded, and estuaries; deposits may contain salt and other evaporites

Qe — **Eolian and Dune Deposits** - unconsolidated, generally well-sorted wind-blown sand; may occur as dune forms or sheet sand

Holocene to Late Pleistocene (Surficial Deposits)

Qyf — **Young Alluvial Fan Deposits** - unconsolidated to slightly consolidated, undissected to slightly dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon

Qya — **Young Alluvial Valley Deposits** - unconsolidated to slightly consolidated, undissected to slightly dissected clay, silt, sand, and gravel along stream valleys and alluvial flats of larger rivers

Late to Middle Pleistocene (Surficial Deposits)

Qof — **Old Alluvial Fan Deposits** - slightly to moderately consolidated, moderately dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon

Qoa — **Old Alluvial Valley Deposits** - slightly to moderately consolidated, moderately dissected clay, silt, sand, and gravel along stream valleys and alluvial flats of larger rivers

Qot — **Old Terrace Deposits** - slightly to moderately consolidated, moderately dissected marine and stream terrace deposits

Qol — **Old Lacustrine, Playa, and Estuarine (Paralic) Deposits** - slightly to moderately consolidated, moderately dissected fine-grained sand, silt, mud, and clay from lake, playa, and estuarine deposits of various types

Middle to Early Pleistocene (Surficial Deposits)

Qvof — **Very Old Alluvial Fan Deposits** - moderately to well-consolidated, highly dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon

Qvoa — **Very Old Alluvial Valley Deposits** - moderately to well-consolidated, highly dissected clay, silt, sand, and gravel along stream valleys and alluvial flats of larger rivers; generally uplifted and deformed

Quaternary (Bedrock)

Qss — **Coarse-grained formations of Pleistocene age and younger** - primarily sandstone and conglomerate

Qsh — **Fine-grained formations of Pleistocene age and younger** - includes fine-grained sandstone, siltstone, mudstone, shale, siliceous and calcareous sediments

Tertiary (Bedrock)

Tss — **Coarse-grained Tertiary age formations** - primarily sandstone and conglomerate

Tsh — **Fine-grained Tertiary age formations** - includes fine-grained sandstone, siltstone, mudstone, shale, siliceous and calcareous sediments

Tv — **Tertiary age formations of volcanic origin**

Mesozoic and Older (Bedrock)

Kss — **Coarse-grained Cretaceous age formations of sedimentary origin**

Ksh — **Fine-grained Cretaceous age formations of sedimentary origin**

pKm — **Cretaceous and pre-Cretaceous metamorphic formations of sedimentary and volcanic origin**

sp — **Serpentinite of all ages**

gr — **Granitic and other intrusive crystalline rocks of all ages**

Contact

Gradational contact

Reference contact -- Used to delineate geologic units that were mapped as separate units on the original source map, but are consolidated on this map.

Fault -- Includes strike-slip, normal, reverse, oblique, and unspecified slip

Lineament

Folds -- Showing direction of plunge where appropriate

Anticline

Overturned anticline

Syncline

Dike

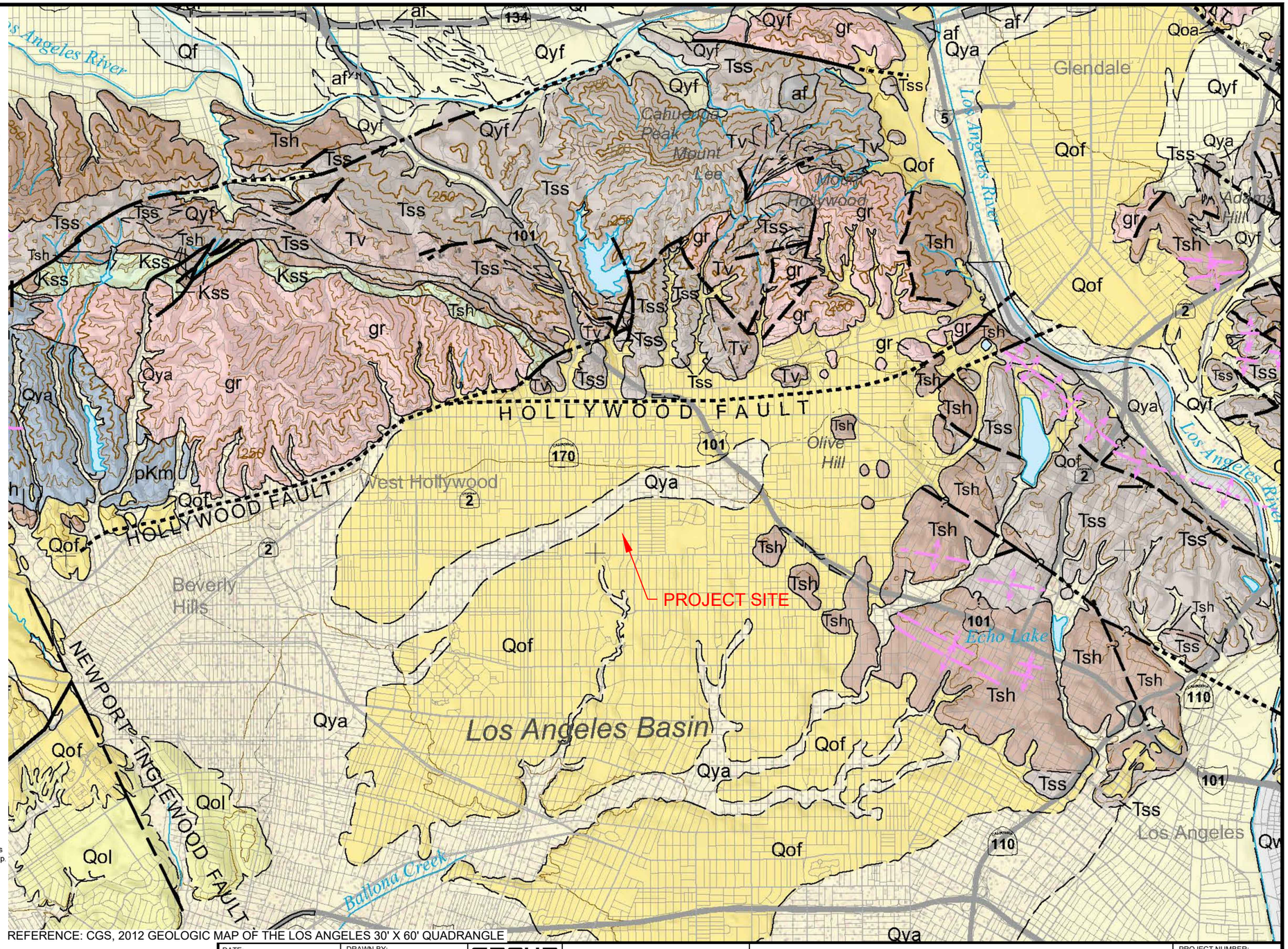
Stream

Spring

Road

County boundary

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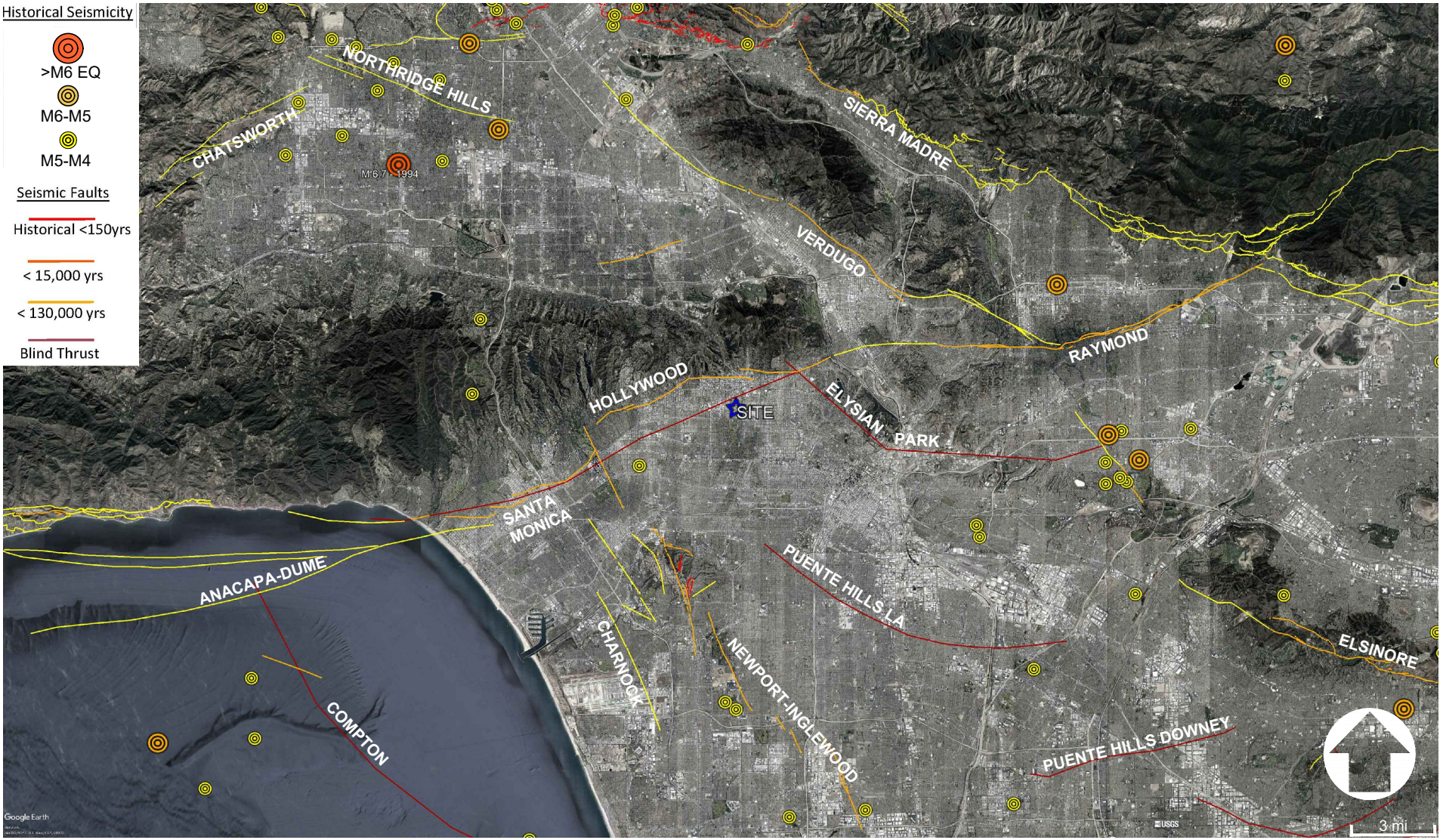
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REGIONAL GEOLOGY MAP

837 N. CAHUENGA BLVD.
LOS ANGELES, CALIFORNIA

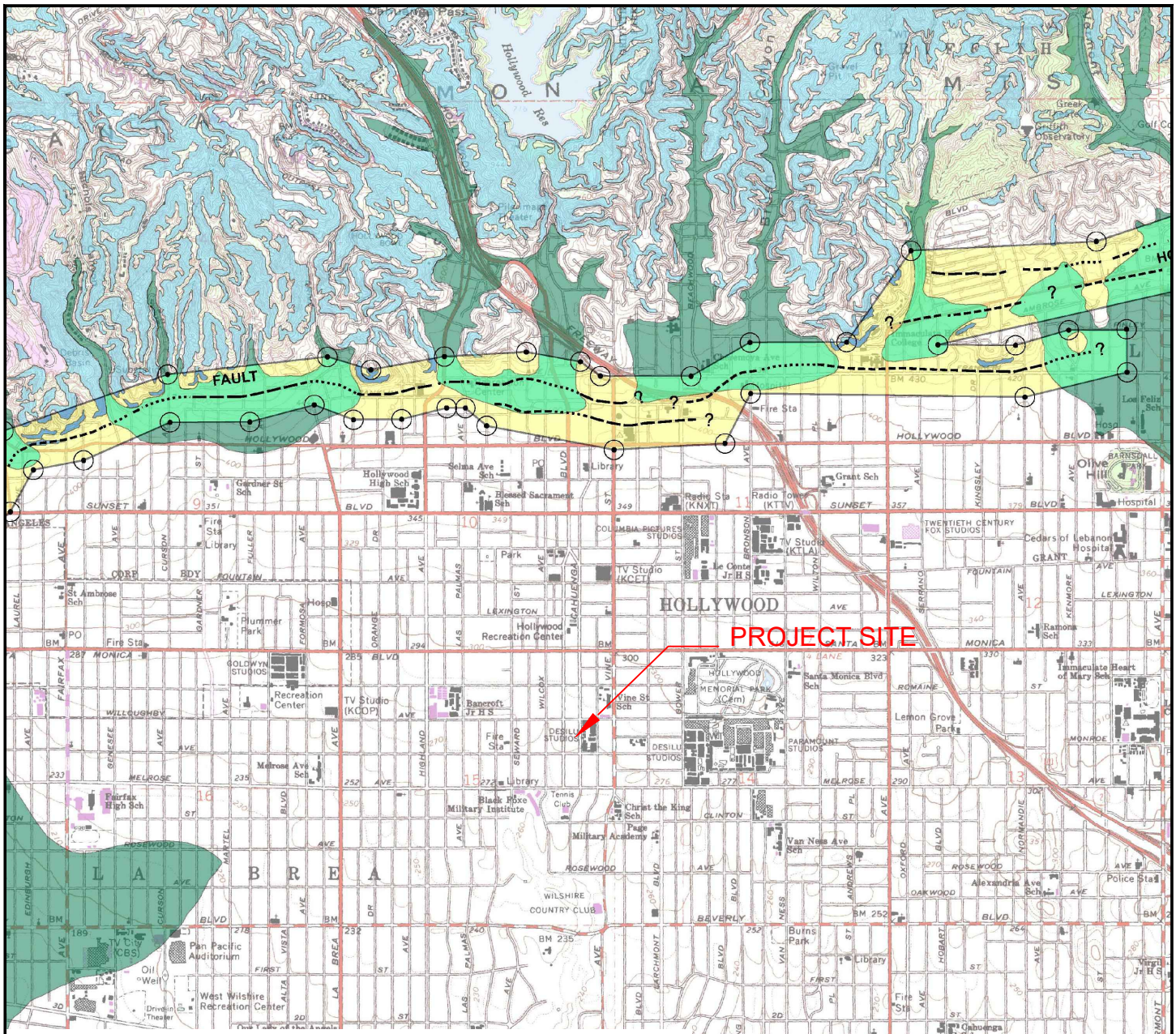
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DATE: 06/18/2019	DRAWN BY: JMT	GROUP DELTA	GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	PROJECT NUMBER: LA-1403
REVIEWED BY: -	APPROVED BY: -		REGIONAL SIESMICITY AND FAULT MAP 837 N. CAHUENGA BLVD. LOS ANGELES, CALIFORNIA	SCALE: AS SHOWN
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MAP EXPLANATION

ALQUIST-PRIOLO EARTHQUAKE FAULT ZONES

Earthquake Fault Zones
Zone boundaries are delineated by straight-line segments that connect encircled turning points; the boundaries define the zone encompassing active faults that constitute a potential hazard to structures from surface faulting or fault creep such that avoidance as described in Public Resources Code Section 2621.5(a) would be required.

Active Fault Traces
Faults considered to have been active during Holocene time and to have potential for surface rupture; solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where concealed; query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by fault creep.

SEISMIC HAZARD ZONES

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.

OVERLAPPING ALQUIST-PRIOLO AND SEISMIC HAZARD ZONES

Overlap of Earthquake Fault Zone and Liquefaction Zone
Areas that are covered by both Earthquake Fault Zone and Liquefaction Zone.

Overlap of Earthquake Fault Zone and Earthquake-Induced Landslide Zone
Areas that are covered by both Earthquake Fault Zone and Earthquake-Induced Landslide Zone.

Note: Mitigation methods differ for each zone – AP Act only allows avoidance; Seismic Hazard Mapping Act allows mitigation by engineering/geotechnical design as well as avoidance.

REFERENCE: CGS, EARTHQUAKE FAULT ZONES, 2014; SEISMIC HAZARD ZONES, 1999

DATE: 06/18/2019	DRAWN BY: JMT	GROUP DELTA	GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	EARTHQUAKE ZONES OF REQUIRED INVESTIGATION 837 N. CAHUENGA BLVD. LOS ANGELES, CALIFORNIA	PROJECT NUMBER: LA-1403
REVIEWED BY: -	APPROVED BY: -				SCALE: AS SHOWN
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APPENDIX A – FIELD EXPLORATION

APPENDIX A
FIELD EXPLORATION

A.1 Introduction

Group Delta conducted a geotechnical subsurface investigation for proposed renovation of existing building and new structures at 837 N Cahuenga Blvd in Los Angeles, CA on May 29 and June 6, 2019. The investigation consisted of three (3) hollow-stem-auger borings and one (1) test pit with a hand auger boring advanced within the test pit.

The exploration locations and numbers are shown in Figure 2 of the main report. A summary table of the field investigation by Group Delta is provided in Table A-1.

A.2 Soil Borings

Three hollow-stem-auger borings were advanced in the parking lot to the south of the existing building from the ground surface to depths varying from 11.5 to 51.5 feet below existing ground surface. The ground surface in the area of the borings was at an approximate Elevation of +288 feet. The borings were performed under the supervision of a Group Delta field engineer, who maintained logs of the soil encountered, classified the materials according to the Unified Soil Classification System (USCS), and assisted in obtaining soil samples.

Drive samples and bulk samples of the encountered materials were obtained from the borings and recorded on the boring logs. Drive samples were obtained with a Modified California Sampler lined with 1-inch-high brass sample rings and a Standard Penetration Test (SPT) sampler. The Modified California Sampler has an outside diameter of 3 inches, and the inside diameter of the rings is 2.42 inches. The samples were retained in brass rings and placed in sealed plastic canisters to prevent moisture loss. Standard penetration tests (SPT) were conducted using a standard 2-inch outside diameter, 1.375-inch inside diameter, split-spoon sampler in accordance with ASTM D 1586. SPT samples were placed in sealable plastic bags to protect the field moisture. The SPT and Modified California samplers were driven into the soil at the bottom of the borehole using a 140-pound hammer free-falling 30 inches. The penetration resistance in blows per six inches of driving was recorded on the logs. Bulk samples were obtained in the upper 5 feet and from 10 to 15 feet below ground surface by a shovel and placed into polyethylene bags.

A key for soil classification and a boring record legend are presented in Figures A-0a and A-0b, respectively. The boring logs are presented in Figures A-1 to A-3c.

A.3 Infiltration Testing

One infiltration test was performed in the hollow-stem-auger boring B-1. After location B-1 was drilled down to 11.5 feet. A 10-foot-long, 2.5-inch diameter PVC infiltration casing was placed

into the 8-inch diameter open hole. The top section of PVC casing (0 to 5 feet) was solid. The bottom section of PVC casing (5 to 10 feet) was perforated with an end cap. Fine gravel was placed into the annulus space between the between the slotted PVC pipe and the boring wall of the perforated section. Soil backfill was placed above the annulus space above the fine gravel. The PVC casing with water to "pre-soak" the soil before running the test. The infiltration test was performed by filling the PVC casing, recording the time duration and change in water level within the PVC casing to assess the water infiltration of the subsurface soil. The test was performed following the general procedure of the Los Angeles County procedures for percolations testing in a boring.

A.4 Test Pit and Hand Auger

One test pit was hand-excavated to approximately 2.5 feet below the top of concrete slab of the basement level of the existing building, and then extended as a hand-auger boring to a depth of 11 feet below the top of concrete slab. Based on as-build information provided, we understand that the top of basement slab is at approximate elevation El. +278.5 feet. Group Delta did not survey any of borings or the test pit. The test pit was performed under the supervision of a Group Delta Engineer who maintained logs of soils encountered, classified the materials according to the Unified Soil Classification System (USCS), and assisted in obtaining soil samples.

Drive samples and bulk samples of the encountered materials were obtained from the test pit boring and recorded on the test pit boring log. Drive samples were obtained with a Modified California Sampler lined with 1-inch high metal sample rings. The Modified California Sampler has an outside diameter of 3 inches, and the inside diameter of the rings is 2.42 inches. The samples were retained in brass rings and placed in sealed plastic canisters to prevent moisture loss. The Modified California samples were driven into the soil at the bottom of the borehole using hand-held equipment. A bulk sample was obtained and placed into a polyethylene bag.

The test pit log is shown in Figure 3B of the main report and the log for the boring in the test pit is presented in Figure A-4.

A.5 List of Attached Tables and Figures

The following table and figures are attached and complete this appendix:

Table A-1	Summary of Recent GDC Field Exploration
Figure A-0a	Key for Soil Classification
Figure A-0b	Boring Record Legend
Figures A-1 to A-4	GDC Boring Logs

TABLES

Table A-1
Summary of Subsurface Explorations

Exploration No.	Date Performed	*Ground Surface Elevation (feet, MSL)	Total Depth (ft)	Groundwater Depth (ft)	Exploration Type
B-1	5/29/19	288	11.5	Not Encountered	Hollow Stem Auger/Infiltration Test
B-2	5/29/19	288	41.5	20.5	Hollow Stem Auger
B-3	5/29/19	290	51.5	21.3	Hollow Stem Auger
Boring at TP-1	6/6/19	278.5	11	Not Encountered	Test Pit/Hand Auger

*Approximate Elevations taken from Google Earth and as-built drawings; not surveyed on site.

FIGURES

KEY FOR SOIL CLASSIFICATION

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)				
PRIMARY DIVISIONS			***GROUP SYMBOL***	***SECONDARY DIVISIONS***
COARSE GRAINED SOILS (less than 50% fines passing the No. 200 Sieve)	GRAVEL (% GRAVEL > % SAND)	CLEAN GRAVEL (Less than 5% fines)	GW	Well-graded gravel, gravel with sand, little or no fines
			GP	Poorly-graded gravel, gravel with sand, little or no fines
		"DIRTY" GRAVEL (More than 12% fines)	GM	Silty gravel, silty gravel with sand, silty or non-plastic fines
			GC	Clayey gravel, clayey gravel with sand, clayey or plastic fines
	SAND (% SAND ≥ % GRAVEL)	CLEAN SAND (Less than 5% fines)	SW	Well-graded sand, sand with gravel, little or no fines
			SP	Poorly-graded sand, sand with gravel, little or no fines
		"DIRTY" SAND (More than 12% fines)	SM	Silty sand, silty sand with gravel, silty or non-plastic fines
			SC	Clayey sand, clayey sand with gravel, clayey or plastic fines
FINE GRAINED SOILS (50% or more fines passing the No. 200 Sieve)	SILTS AND CLAYS (Liquid Limit less than 50)		ML	Inorganic silt, sandy silt, gravelly silt, or clayey silt with low plasticity
			CL	Inorganic clay of low to medium plasticity, sandy clay, gravelly clay, silty clay, Lean Clay
			OL	Low to medium plasticity Silt or Clay with significant organic content (vegetative matter)
	SILTS AND CLAYS (Liquid Limit 50 or more)		MH	Inorganic elastic silt, sandy silt, gravelly silt, or clayey silt of medium to high plasticity
			CH	Inorganic clay of high plasticity, Fat Clay
			OH	Medium to high plasticity Silt or Clay with significant organic content (vegetative matter)
HIGHLY ORGANIC SOILS			PT	Peat or other highly organic soils

Note: Dual symbols are used for coarse grained soils with 5 to 12% fines (ex: SP-SM), and for soils with Atterberg Limits falling in the CL-ML band in the Plasticity Chart. Borderline classifications between groups may be indicated by two symbols separated by a slash (ex: CL/CH, SW/GW).

CONSISTENCY CLASSIFICATION				
COARSE GRAINED SOILS		***FINE GRAINED SOILS***		
Blowcount SPT[1] (CAL)[2]	Consistency	Blowcount[3] SPT[1] (CAL)[2]	Consistency	Undrained Shear Strenth[3], S_u (ksf)
0-4 (0-6)	Very Loose	<2 (<3)	Very Soft	< 0.25
		2-4 (3-6)	Soft	0.25 -0.50
5-10 (7-15)	Loose	5-8 (7-12)	Firm	0.50 - 1.0
11-30 (16-45)	Med. Dense	9-15 (13-22)	Stiff	1.0 - 2
31-50 (46-75)	Dense	16-30 (23-45)	Very Stiff	2.0 - 4.0
>50 (>75)	Very Dense	>31 (>45)	Hard	>4.0

MOISTURE CLASSIFICATION
DRY - Absence of moisture, dusty, dry to the touch **MOIST-** Damp but no visible water **WET-** Visible free water, usually soil is below water table

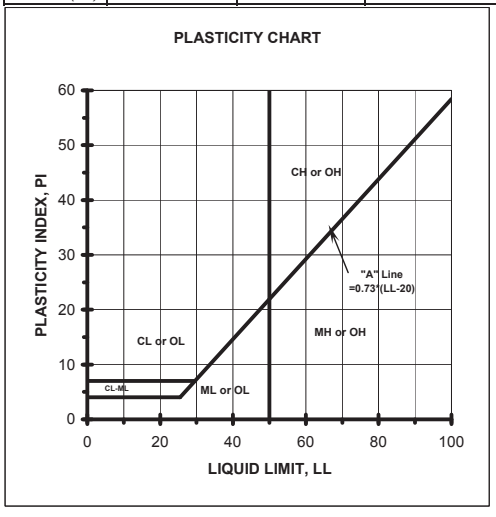
CONSISTENCY NOTES:

1. Number of blows of a 140-lb. hammer falling 30-inches to drive a 2-inch OD (1.375-inch ID) **SPT Sampler** [ASTM D-1585] the final 12-inches of driving
2. Number of blows of a 140-lb. hammer falling 30-inches to drive a 3-inch OD (2.42-inch ID) **California Ring Sampler** the final 12-inches of driving.
3. Undrained shear strength of cohesive soils predicted from field blowcounts is generally unreliable. Where possible, consistency should be based on S_u data from pocket penetrometer, torvane, or laboratory testing.

CLASSIFICATION CRITERIA BASED ON LABORATORY TESTS

Grain Size Classification

CLAY AND SILT	SAND			GRAVEL		COBBLES		BOULDERS	
	Fine	Medium	Coarse	Fine	Coarse				
US Std Sieve	**No. 200**	**No. 40**	**No. 10**	**No. 4**	**3/4"**	**3"**		**12"**		
Grain Size (mm)	0.075	0.425	2	4.75	19.1	76.2		304.8		



Classification of earth materials shown on the logs is based on field inspection and should not be construed to imply laboratory analysis unless so stated.

Granular Soil Gradation Parameters

Coefficient of Uniformity: $C_u = D_{60} / D_{10}$

Coefficient of Curvature: $C_C = (D_{30})^2 / (D_{10} \times D_{60})$

D_{10}= 10% of the soil is finer than this diameter

D_{30}= 30% of the soil is finer than this diameter

D_{30}= 60% of the soil is finer than this diameter

Group Symbol	Gradation or Plasticity Requirement
SW	C_u>6 and C_c between 1 and 3
GW	C_u>4 and C_c between 1 and 3
GP or SP	Clean gravel or sand not meeting requirement for GW or SW
GM or SM	Plots below "A" Line on Plasticity Chart or PI < 4
GC or SC	Plots above "A" Line on Plasticity Chart and PI > 7

GROUP DELTA

FIGURE A-0a

GROUP SYMBOLS AND NAMES

Graphic / Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GM	SILTY GRAVEL SILTY GRAVEL with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL
SP	Poorly graded SAND Poorly graded SAND with GRAVEL
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SM	SILTY SAND SILTY SAND with GRAVEL
SC	CLAYEY SAND CLAYEY SAND with GRAVEL
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL
PT	PEAT
	COBBLES COBBLES and BOULDERS BOULDERS

Graphic / Symbol	Group Names
CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY elastic ELASTIC SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND

FIELD AND LABORATORY TESTS

C	Consolidation (ASTM D 2435-04)
CL	Collapse Potential (ASTM D 5333-03)
CP	Compaction Curve (CTM 216 - 06)
CR	Corrosion, Sulfates, Chlorides (CTM 643 - 99; CTM 417 - 06; CTM 422 - 06)
CU	Consolidated Undrained Triaxial (ASTM D 4767-02)
DS	Direct Shear (ASTM D 3080-04)
EI	Expansion Index (ASTM D 4829-03)
M	Moisture Content (ASTM D 2216-05)
OC	Organic Content (ASTM D 2974-07)
P	Permeability (CTM 220 - 05)
PA	Particle Size Analysis (ASTM D 422-63 [2002])
PI	Liquid Limit, Plastic Limit, Plasticity Index (AASHTO T 89-02, AASHTO T 90-00)
PL	Point Load Index (ASTM D 5731-05)
PM	Pressure Meter
PP	Pocket Penetrometer
R	R-Value (CTM 301 - 00)
SE	Sand Equivalent (CTM 217 - 99)
SG	Specific Gravity (AASHTO T 100-06)
SL	Shrinkage Limit (ASTM D 427-04)
SW	Swell Potential (ASTM D 4546-03)
TV	Pocket Torvane
UC	Unconfined Compression - Soil (ASTM D 2166-06) Unconfined Compression - Rock (ASTM D 2938-95)
UU	Unconsolidated Undrained Triaxial (ASTM D 2850-03)
UW	Unit Weight (ASTM D 4767-04)
VS	Vane Shear (AASHTO T 223-96 [2004])

SAMPLER GRAPHIC SYMBOLS

- Standard Penetration Test (SPT)
- Standard California Sampler
- Modified California Sampler
- Shelby Tube
- Piston Sampler
- NX Rock Core
- HQ Rock Core
- Bulk Sample
- Other (see remarks)

DRILLING METHOD SYMBOLS

- Auger Drilling
- Rotary Drilling
- Dynamic Cone or Hand Driven
- Diamond Core

WATER LEVEL SYMBOLS

- First Water Level Reading (during drilling)
- Static Water Level Reading (after drilling, date)

DEFINITIONS FOR CHANGE IN MATERIAL

Term	Definition	Symbol
Material Change	Change in material is observed in the sample or core, and the location of change can be accurately measured.	———
Estimated Material Change	Change in material cannot be accurately located because either the change is gradational or because of limitations in the drilling/sampling methods used.	- - - - - - - -
Soil/Rock Boundary	Material changes from soil characteristics to rock characteristics.	~~~~~

Ref.: Caltrans Soil and Rock Logging Classification, and Presentation Manual (2010)

GROUP DELTA

GROUP DELTA CONSULTANTS, INC. GEOTECHNICAL ENGINEERS AND GEOLOGISTS	FIGURE NUMBER A-0b
PROJECT NAME	PROJECT NUMBER

BORING RECORD LEGEND

BORING RECORD

PROJECT NAME	PROJECT NUMBER	HOLE ID
837 N Cahuenga	LA-1403	B-1

SITE LOCATION	START	FINISH	SHEET NO.
Los Angeles, CA	5/29/2019	5/29/2019	1 of 1

DRILLING COMPANY	DRILL RIG	DRILLING METHOD	LOGGED BY	CHECKED BY
2R Drilling	CME 85	Hollow Stem Auger	KM	KM

HAMMER TYPE (WEIGHT/DROP)	HAMMER EFFICIENCY (ERi)	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GW (ft)
Hammer: 140 lbs., Drop: 30 in.		8	11.5	288	▽ NE / *na* DURING DRILLING

DRIVE SAMPLER TYPE(S) & SIZE (ID)	NOTES	
Bulk, ModCAL		▼ NE / *na* AFTER DRILLING

DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	MOISTURE (%)	DRY DENSITY (PCF)	PASSING #200 (%)	ATTERBERG LIMITS (LL:PL:PI)	POCKET PEN (tsf)	OTHER TESTS	DRILLING METHOD	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
														6" Asphalt; No Base
	285		Bulk-1								R			**ARTIFICIAL FILL** Lean CLAY (CL); olive gray; moist; trace coarse SAND; medium plasticity.
			Bulk-2											**OLD ALLUVIUM** Sandy Lean CLAY (CL); orange brown; moist; some medium SAND; trace coarse SAND; low plasticity.
5			R-3	10 17 20	37					>4.5				- Hard; slightly less CLAY.
	280													
10			R-4	24 32 38	70					>4.5				- Few to little fine SAND.
	275													Boring terminated at 11.5 feet. Well casing installed. Infiltration test performed 5 to 10 feet. Well casing removed. Backfill with soil cuttings and tamped. Asphalt patched.
15														
	270													
20														
	265													

GDC_LOG_BORING_2011 LA-1403 (B-1 TO B-3).GPJ GDCLOG.GDT 6/21/19

GROUP DELTA CONSULTANTS, INC.
370 Amapola Ave., Suite 212
Torrance, CA 90501

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

FIGURE
A-1

BORING RECORD

PROJECT NAME	PROJECT NUMBER	HOLE ID
837 N Cahuenga	LA-1403	B-2

SITE LOCATION	START	FINISH	SHEET NO.
Los Angeles, CA	5/29/2019	5/29/2019	1 of 2

DRILLING COMPANY	DRILL RIG	DRILLING METHOD	LOGGED BY	CHECKED BY
2R Drilling	CME 85	Hollow Stem Auger	KM	KM

HAMMER TYPE (WEIGHT/DROP)	HAMMER EFFICIENCY (ERi)	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GW (ft)
Hammer: 140 lbs., Drop: 30 in.		8	41.5	288	▽ 20.5 / *267.5* DURING DRILLING

DRIVE SAMPLER TYPE(S) & SIZE (ID)	NOTES	AFTER DRILLING
Bulk, ModCAL, SPT		▼ N/A / *na*

DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	MOISTURE (%)	DRY DENSITY (PCF)	PASSING #200 (%)	ATTERBERG LIMITS (LL:PL:PI)	POCKET PEN (tsf)	OTHER TESTS	DRILLING METHOD	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
														5" AC; No Base
	285		Bulk-1											**ARTIFICIAL FILL** Sandy Lean CLAY (CL); dark olive gray; moist; some fine SAND; low to medium plasticity.
5			S-2	3 8 10	18	17.7		54	39 18 21		CR			**OLD ALLUVIUM** Sandy Lean CLAY (CL); stiff; orange brown; moist; some fine SAND; low plasticity.
	280													
10			R-3	13 26 30	56	14.9	117			>4.5				Sandy Fat CLAY (CH); stiff; orange brown; moist; some fine SAND; low plasticity.
	275		Bulk-2						52 20 32					
15			S-4	6 12 15	27									Sandy Lean CLAY (CL); stiff; reddish brown; moist; some fine SAND; low plasticity. Thin laminations of fine SAND.
	270													
20			R-5	12 25 35	60	19.9	109			>4.5	UC			▽ Silty CLAY / Clayey SILT (CL-ML / ML-CL); Hard; reddish brown, mottled with gray; increase in moisture.
	265													

GDC_LOG_BORING_2011 LA-1403 (B-1 TO B-3).GPJ GDCLOG.GDT 6/21/19

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FIGURE
A-2 a

BORING RECORD

PROJECT NAME	PROJECT NUMBER	HOLE ID
837 N Cahuenga	LA-1403	B-2

SITE LOCATION	START	FINISH	SHEET NO.
Los Angeles, CA	5/29/2019	5/29/2019	2 of 2

DRILLING COMPANY	DRILL RIG	DRILLING METHOD	LOGGED BY	CHECKED BY
2R Drilling	CME 85	Hollow Stem Auger	KM	KM

HAMMER TYPE (WEIGHT/DROP)	HAMMER EFFICIENCY (ERi)	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GW (ft)
Hammer: 140 lbs., Drop: 30 in.		8	41.5	288	▽ 20.5 / *267.5* DURING DRILLING

DRIVE SAMPLER TYPE(S) & SIZE (ID)	NOTES	AFTER DRILLING
Bulk, ModCAL, SPT		▼ N/A / *na*

DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	MOISTURE (%)	DRY DENSITY (PCF)	PASSING #200 (%)	ATTERBERG LIMITS (LL:PL:PI)	POCKET PEN (tsf)	OTHER TESTS	DRILLING METHOD	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
			S-6	9 13 13	26									- Wet; decrease in SAND; trace cobbles.
	260													
30			R-7	15 35 31	66					3.0				Sandy Lean CLAY (CL); very stiff; orange brown; some medium SAND; trace fine GRAVEL; low to medium plasticity; trace cobbles.
	255													
35			S-8	4 6 8	14									Silty CLAY (CL-ML); stiff; orange brown; wet; few fine SAND; medium plasticity. Thin laminations of Poorly-graded SAND (SP); orange brown; fine SAND.
	250													
40			R-9	7 14 40	54					>4.5				Poorly-graded SAND (SP); dense; wet; mostly fine SAND.
	245													Boring terminated at 41.5 feet. Groundwater encountered at 20'-6." Backfill with grout. Asphalt patched. Two 55-gallon drums produced.
45														
	240													

GDC_LOG_BORING_2011 LA-1403 (B-1 TO B-3).GPJ GDCLOG.GDT 6/21/19

GROUP DELTA CONSULTANTS, INC.
370 Amapola Ave., Suite 212
Torrance, CA 90501

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

FIGURE
A-2 b

BORING RECORD

PROJECT NAME	PROJECT NUMBER	HOLE ID
837 N Cahuenga	LA-1403	B-3

SITE LOCATION	START	FINISH	SHEET NO.
Los Angeles, CA	5/29/2019	5/29/2019	1 of 3

DRILLING COMPANY	DRILL RIG	DRILLING METHOD	LOGGED BY	CHECKED BY
2R Drilling	CME 85	Hollow Stem Auger	KM	KM

HAMMER TYPE (WEIGHT/DROP)	HAMMER EFFICIENCY (ERi)	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GW (ft)
Hammer: 140 lbs., Drop: 30 in.		8	51.5	290	▽ 21.3 / *268.7* DURING DRILLING

DRIVE SAMPLER TYPE(S) & SIZE (ID)	NOTES	
Bulk, ModCAL, SPT		AFTER DRILLING ▼ 22.7 / *267.3*

DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	MOISTURE (%)	DRY DENSITY (PCF)	PASSING #200 (%)	ATTERBERG LIMITS (LL:PL:PI)	POCKET PEN (tsf)	OTHER TESTS	DRILLING METHOD	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
			Bulk-1											5" Asphalt; No Base **ARTIFICIAL FILL** Lean CLAY (CL); olive gray; moist; trace fine SAND; low to medium plasticity.
5	285		R-2	11 18 20	38					3.0 4.25				- Very stiff. **OLD ALLUVIUM** Sandy Lean CLAY (CL); hard; brownish orange; moist; some fine SAND; low plasticity.
10	280		S-3	7 12 15	27	17.9		56	33 18 15					- Very stiff; orange brown; few fine SAND.
15	275		R-4	14 30 30	60					>4.5	C			- Few coarse SAND.
20	270		S-5	6 10 11	21									Silty CLAY / Clayey SILT (CL-ML / ML-CL); very stiff; orange brown; wet; few fine SAND; low to medium plasticity.

GDC_LOG_BORING_2011 LA-1403 (B-1 TO B-3).GPJ GDCLOG.GDT 6/21/19

GROUP DELTA CONSULTANTS, INC.
370 Amapola Ave., Suite 212
Torrance, CA 90501

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

FIGURE
A-3 a

BORING RECORD

PROJECT NAME	PROJECT NUMBER	HOLE ID
837 N Cahuenga	LA-1403	B-3

SITE LOCATION	START	FINISH	SHEET NO.
Los Angeles, CA	5/29/2019	5/29/2019	2 of 3

DRILLING COMPANY	DRILL RIG	DRILLING METHOD	LOGGED BY	CHECKED BY
2R Drilling	CME 85	Hollow Stem Auger	KM	KM

HAMMER TYPE (WEIGHT/DROP)	HAMMER EFFICIENCY (ERi)	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GW (ft)
Hammer: 140 lbs., Drop: 30 in.		8	51.5	290	▽ 21.3 / *268.7* DURING DRILLING

DRIVE SAMPLER TYPE(S) & SIZE (ID)	NOTES	
Bulk, ModCAL, SPT		AFTER DRILLING ▼ 22.7 / *267.3*

DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	MOISTURE (%)	DRY DENSITY (PCF)	PASSING #200 (%)	ATTERBERG LIMITS (LL:PL:PI)	POCKET PEN (tsf)	OTHER TESTS	DRILLING METHOD	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
			R-6	11 12 15	27					3.0	C UC			Lean CLAY (CL); very stiff; orange brown; wet; medium plasticity. Thin interbeds of Lean CLAY with GRAVEL and SAND (CL); fine GRAVEL; fine SAND.
30	260		S-7	2 4 7	11									
35	255		R-8	8 9 14	23					3.75	C			Lean CLAY (CL); very stiff; yellow olive gray; wet; trace fine SAND; medium plasticity.
40	250		S-9	6 6 10	16									- Increase in fine SAND.
45	245		R-10	13 42 36	78									Poorly-graded SAND (SP); very dense; gray; wet; mostly fine SAND.

GDC_LOG_BORING_2011 LA-1403 (B-1 TO B-3).GPJ GDCLOG.GDT 6/21/19

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FIGURE
A-3 b

BORING RECORD

PROJECT NAME	PROJECT NUMBER	HOLE ID
837 N Cahuenga	LA-1403	B-3

SITE LOCATION	START	FINISH	SHEET NO.
Los Angeles, CA	5/29/2019	5/29/2019	3 of 3

DRILLING COMPANY	DRILL RIG	DRILLING METHOD	LOGGED BY	CHECKED BY
2R Drilling	CME 85	Hollow Stem Auger	KM	KM

HAMMER TYPE (WEIGHT/DROP)	HAMMER EFFICIENCY (ERi)	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GW (ft)
Hammer: 140 lbs., Drop: 30 in.		8	51.5	290	▽ 21.3 / *268.7* DURING DRILLING

DRIVE SAMPLER TYPE(S) & SIZE (ID)	NOTES	
Bulk, ModCAL, SPT		AFTER DRILLING ▼ 22.7 / *267.3*

DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	MOISTURE (%)	DRY DENSITY (PCF)	PASSING #200 (%)	ATTERBERG LIMITS (LL:PL:PI)	POCKET PEN (tsf)	OTHER TESTS	DRILLING METHOD	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
		X	S-11	8 18 23	41									
55	235													Boring terminated at 51.5 feet. Groundwater encountered at 22'-8." Backfill with grout. Asphalt patched. Two 55-gallon drums produced.
60	230													
65	225													
70	220													

GDC_LOG_BORING_2011 LA-1403 (B-1 TO B-3).GPJ GDCLOG.GDT 6/21/19

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FIGURE
A-3 c

BORING RECORD

PROJECT NAME	PROJECT NUMBER	HOLE ID
837 N Cahuenga	LA-1403	TP-1

SITE LOCATION	START	FINISH	SHEET NO.
Los Angeles, CA	6/6/2019	6/6/2019	1 of 1

DRILLING COMPANY	DRILL RIG	DRILLING METHOD	LOGGED BY	CHECKED BY
Gold Construction	Hand Auger	Hand Auger	SB	KM

HAMMER TYPE (WEIGHT/DROP)	HAMMER EFFICIENCY (ERi)	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GW (ft)
Human Effort		6	11	280	▽ NE / *na* DURING DRILLING

DRIVE SAMPLER TYPE(S) & SIZE (ID)	NOTES	
Bulk, ModCAL		▼ NE / *na* AFTER DRILLING

DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	MOISTURE (%)	DRY DENSITY (PCF)	PASSING #200 (%)	ATTERBERG LIMITS (LL:PL:PI)	POCKET PEN (tsf)	OTHER TESTS	DRILLING METHOD	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
0														6.5" Concrete Slab
														TEST PIT - SEE FIGURE
	275													Lean CLAY with SAND (CL); brown (7.5YR 5/4); moist; mostly fines; little fine to medium SAND; medium plasticity.
5			Bulk-1						48 19 29					
			R-1 R-2			24.3		72		3.5				- Very Stiff.
	270													
			Bulk-2											- Increase in fine SAND.
10			R-3 R-4							2.0				Sandy Lean CLAY (CL); strond brown (7.5YR 5/6); moist; mostly fines; some fine to medium SAND; low to medium plasticity.
														Boring terminated at 11 feet. No groundwater encountered. No caving. Backfilled with soil cuttings.
	265													
15														
	260													
20														
	255													

GDC_LOG_BORING_2011 LA-1403 (B-1 TO B-3).GPJ GDCLOG.GDT 6/21/19

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FIGURE
A-4

APPENDIX B
LABORATORY TESTING

B.1 Introduction

The laboratory testing was performed using appropriate American Society for Testing and Materials (ASTM) and Caltrans Test Methods (CTM).

Modified California drive samples, Standard Penetration Test (SPT) drive samples, and bulk samples collected during the field investigation were carefully sealed in the field to prevent moisture loss. The samples of earth materials were then transported to the laboratory for further examination and testing. Tests were performed on selected samples as an aid in classifying the earth materials and to evaluate their physical properties and engineering characteristics. Laboratory testing for this investigation included:

- Soil Classification: USCS (ASTM D 2487) and Visual Manual (ASTM D 2488);
- Moisture content (ASTM D 2216) and Dry Unit Weight (ASTM D 2937);
- Atterberg Limits (ASTM D 4318);
- Pocket Penetrometer;
- Percent Passing #200 Sieve (ASTM D 1140);
- Consolidation (ASTM D2435);
- Unconfined Compressive Strength (ASTM D 2166);
- R-Value (ASTM D2844, CTM 301);
- Soil Corrosivity:
  - pH (CTM 643);
  - Water-Soluble Sulfate (ASTM D 516, CTM 417);
  - Water-Soluble Chloride(Ion-Specific Probe, CTM 422);
  - Minimum Electrical Resistivity (CTM 643);

A Brief descriptions of the laboratory testing program and test results are presented below.

B.2 Moisture Content and Dry Unit Weight

The natural moisture content of selected SPT and California ring samples and dry unit weight of California ring samples were determined in general accordance with ASTM D 2216 and ASTM D2937. Results of these tests are presented on the boring logs in Appendix A.

B.3 Atterberg Limits

Soil plasticity was evaluated by measuring the Atterberg limits. This test includes Liquid Limit (LL) and Plastic Limit (PL) tests to determine the Plasticity Index (PI) in accordance with ASTM D4318. Results of these tests are illustrated in the plasticity chart shown in Figures B-1.1 to B-1.4 and on the boring logs of Appendix A.

B.4 Pocket Penetrometer

Compressive soil strength of cohesive samples were measured using a pocket penetrometer. The measured values (in tsf) are presented in the boring logs of Appendix A.

B.5 Percent Passing #200 Sieve

Determination of fines verses coarser soil particles was performed by the percent #200 Sieve test. Representative samples were dried, weighed, soaked in water until individual soil particles were separated, and then washed on the No. 200 sieve. The percentage of fines (soil passing No. 200 sieve) was determined in accordance with ASTM D1140. The results of percent passing No. 200 sieve are presented on the boring logs in Appendix A.

B.6 Consolidation

The consolidation characteristics of the foundation soils were determined by performing one-dimensional consolidation in general accordance with ASTM D2435, using a floating ring consolidometer and dead weight system. Results of the tests from the current investigation are presented in Figures B-2.1 to B-2.3.

B.7 Unconfined Compressive Strength

The unconfined compressive strength test measures the compressive strength of cohesive soils. The test allows to obtain shear strength parameters of cohesive soils. Samples were remolded into a cylindrical shape and placed into a loading frame where an axial load is applied. The load is increased in increments and readings are taken of the resulting deformation until the sample develops and noticeable shear plane or the resulting deformation becomes excessive. The test was run in general accordance with ASTM D2166. Results of the test from the investigation are presented in Figures B-3.1 to B-3.2.

B.8 R-Value

An R-Value test was performed to measure the potential strength of the upper soils on site to use as potential subgrade. The results of this test are shown in Figure B-4.

B.9 Soil Corrosivity

Tests were performed in order to determine corrosion potential of site soils on concrete and ferrous metals. Corrosivity testing included minimum electrical resistivity and soil pH (Caltrans method 643), water soluble chlorides (Orion 170A+ Ion Probe or Caltrans Test Method 422), and water-soluble sulfates (ASTM D 516). The test results are summarized in Table B-1.

B.10 List of Attached Tables and Figures

The following tables and figures are attached and complete this appendix:

Table B-1 Summary of Soil Corrosivity

Figures B-1.1 to B-1.4	Atterberg Test Results
Figures B-2.1 to B-2.3	Consolidation Test Results
Figures B-3.1 to B-3.2	Unconfined Compressive Strength Test Results
Figures B-4	R-Value Test Results

TABLES

Table B-1
Summary of Soil Corrosivity

Boring No.	Depth (ft)	pH	Sulfate Content (%)	Chloride Content (%)	Minimum Resistivity (ohm-cm)
B-2	0-5	7.67	<0.01	<0.01	619

FIGURES

ATTERBERG LIMITS

ASTM D-4318 / AASHTO T-89 / CTM 204

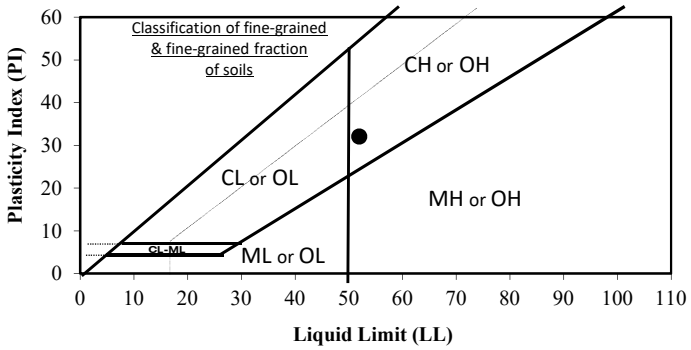
Project Name:	*837 N. Cahuenga Blvd.*	Tested By :	*Eric Y.*	Date:	*06/12/19*
Project No. :	*LA1403*	Data Input By:	*Eric Y.*	Date:	*06/13/19*
Boring No.:	*B-2*	Checked By:		Date:	
Sample No. :	*B-2*	Depth (ft.) :	*10 - 15*		
Initial Moisture:		Container No.:	*AL-15*		
Description.:	*Brown Sandy Fat Clay - CH*				

	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	4
Number of Blows [N]			34	25	19	
Container No.	A-11	A-12	A-13	A-14	A-15	
Wet Wt. of Soil + Cont. (gm.)	21.89	21.94	27.04	28.31	29.46	
Dry Wt. of Soil + Cont. (gm.)	20.83	20.86	23.00	23.85	24.50	
Wt. of Container (gm.)	15.39	15.35	14.97	15.26	15.22	
Moisture Content (%) [Wn]	19.49	19.60	50.31	51.92	53.45	

LIQUID LIMIT	**52**
PLASTIC LIMIT	**20**
PLASTICITY INDEX	**32**

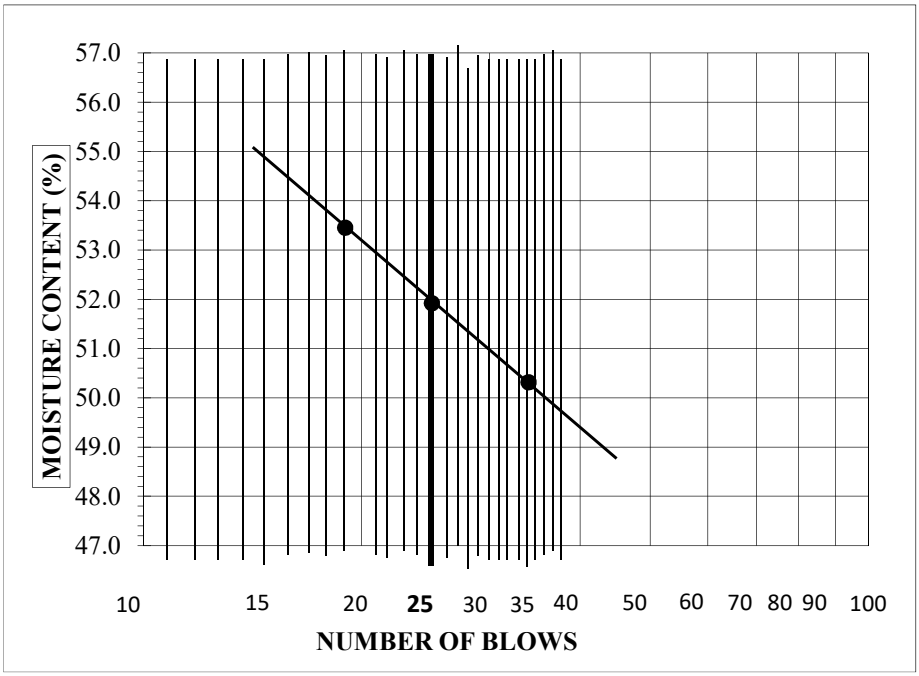
PI at "A" - Line = 0.73(LL-20) = **23.4**

One - Point Liquid Limit Calculation $LL=Wn(N/25)^{0.121}$



PROCEDURES USED

- ☐ Wet Preparation
  Multipoint Wet Preparation
- ☒ Dry Preparation
  Multipoint Dry Preparation
- ☒ Procedure A
  Multipoint Test
- ☐ Procedure B
  One-point Test



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Figure B-1.1

ATTERBERG LIMITS

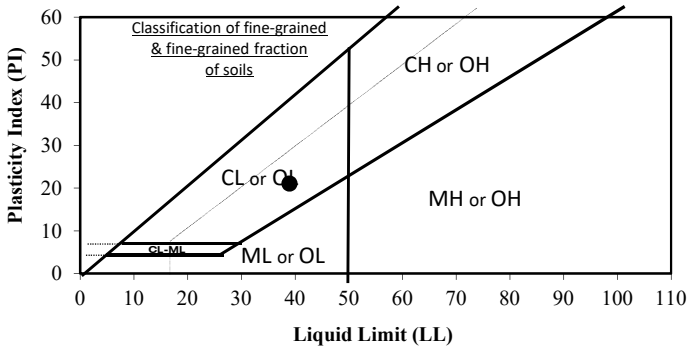
ASTM D-4318 / AASHTO T-89 / CTM 204

Project Name:	*837 N. Cahuenga Blvd.*	Tested By :	*Eric Y.*	Date:	*06/12/19*
Project No. :	*LA1403*	Data Input By:	*Eric Y.*	Date:	*06/13/19*
Boring No.:	*B-2*	Checked By:		Date:	
Sample No. :	*S-2*	Depth (ft.) :	*5*		
Initial Moisture:		Container No.:	*AL-14*		
Description.:	*Brown Sandy Lean Clay - CL*				

	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	4
Number of Blows [N]			32	25	16	
Container No.	A-16	A-17	A-18	A-19	A-20	
Wet Wt. of Soil + Cont. (gm.)	21.66	21.82	27.34	28.31	29.22	
Dry Wt. of Soil + Cont. (gm.)	20.64	20.79	24.04	24.56	25.16	
Wt. of Container (gm.)	14.96	15.04	15.28	14.95	15.18	
Moisture Content (%) [Wn]	17.96	17.91	37.67	39.02	40.68	

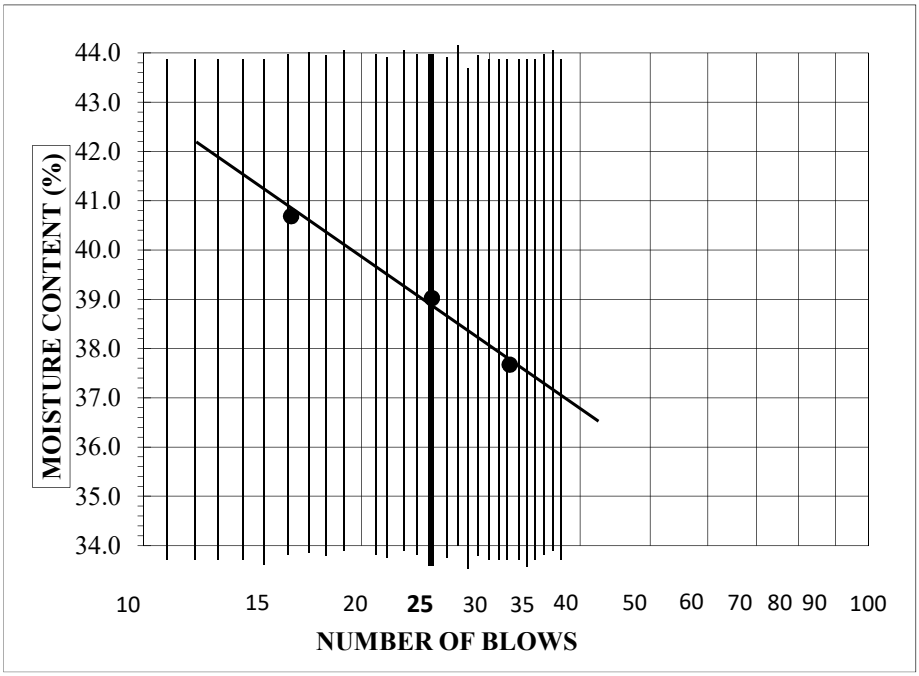
LIQUID LIMIT	**39**
PLASTIC LIMIT	**18**
PLASTICITY INDEX	**21**
PI at "A" - Line = 0.73(LL-20) =	**13.9**

One - Point Liquid Limit Calculation $LL=Wn(N/25)^{0.121}$



PROCEDURES USED

- ☐ Wet Preparation
  - Multipoint Wet Preparation
- ☒ Dry Preparation
  - Multipoint Dry Preparation
- ☒ Procedure A
  - Multipoint Test
- ☐ Procedure B
  - One-point Test



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Figure B-1.2

ATTERBERG LIMITS

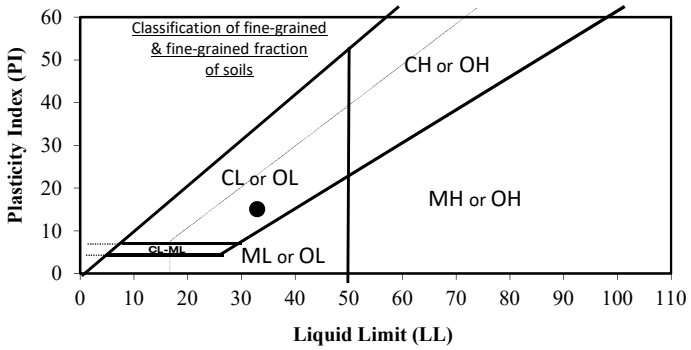
ASTM D-4318 / AASHTO T-89 / CTM 204

Project Name:	*837 N. Cahuenga Blvd.*	Tested By :	*Eric Y.*	Date:	*06/12/19*
Project No. :	*LA1403*	Data Input By:	*Eric Y.*	Date:	*06/13/19*
Boring No.:	*B-3*	Checked By:		Date:	
Sample No. :	*S-3*	Depth (ft.) :	*10*		
Initial Moisture:		Container No.:	*AL-16*		
Description.:	*Brown Sandy Lean Clay - CL*				

	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	4
Number of Blows [N]			31	24	16	
Container No.	# 5	# 6	# 7	# 8	# 9	
Wet Wt. of Soil + Cont. (gm.)	21.79	21.87	27.68	28.69	29.51	
Dry Wt. of Soil + Cont. (gm.)	20.79	20.85	24.67	25.33	25.74	
Wt. of Container (gm.)	15.25	15.20	15.27	15.29	14.99	
Moisture Content (%) [Wn]	18.05	18.05	32.02	33.47	35.07	

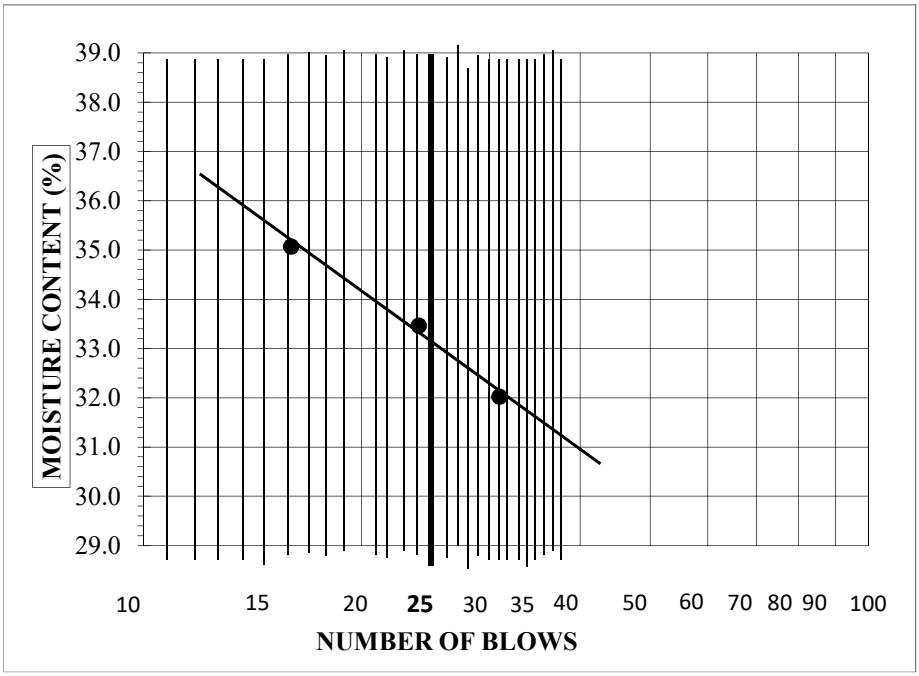
LIQUID LIMIT	**33**
PLASTIC LIMIT	**18**
PLASTICITY INDEX	**15**
PI at "A" - Line = 0.73(LL-20) =	**9.5**

One - Point Liquid Limit Calculation $LL=Wn(N/25)^{0.121}$



PROCEDURES USED

- ☐ Wet Preparation
  Multipoint Wet Preparation
- ☒ Dry Preparation
  Multipoint Dry Preparation
- ☒ Procedure A
  Multipoint Test
- ☐ Procedure B
  One-point Test



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Figure B-1.3

ATTERBERG LIMITS

ASTM D-4318 / AASHTO T-89 / CTM 204

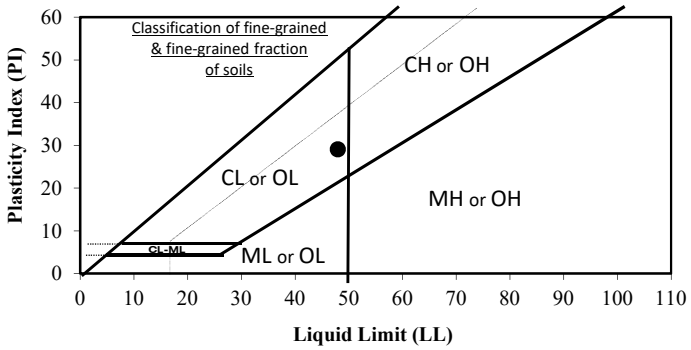
Project Name:	*837 N. Cahuenga Blvd.*	Tested By :	*Eric Y.*	Date:	*06/12/19*
Project No. :	*LA1403*	Data Input By:	*Eric Y.*	Date:	*06/13/19*
Boring No.:	*TP-1*	Checked By:		Date:	
Sample No. :	*B-1*	Depth (ft.) :	*2.5 - 6*		
Initial Moisture:		Container No.:	*AL-13*		
Description.:	*Brown Lean Clay with Sand - CL*				

	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	4
Number of Blows [N]			33	25	17	
Container No.	Z-1	Z-2	A-5	A-6	A-7	
Wet Wt. of Soil + Cont. (gm.)	21.49	22.23	26.25	27.76	28.94	
Dry Wt. of Soil + Cont. (gm.)	20.46	21.19	22.71	23.66	24.32	
Wt. of Container (gm.)	14.94	15.61	15.00	15.04	15.03	
Moisture Content (%) [Wn]	18.66	18.64	45.91	47.56	49.73	

LIQUID LIMIT	**48**
PLASTIC LIMIT	**19**
PLASTICITY INDEX	**29**

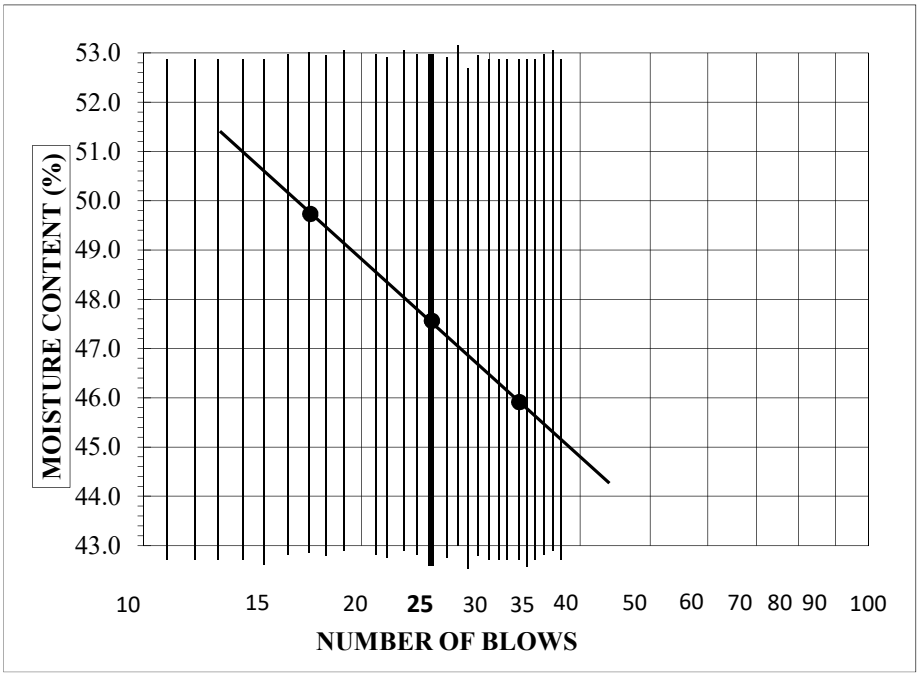
PI at "A" - Line = 0.73(LL-20) = **20.4**

One - Point Liquid Limit Calculation $LL=Wn(N/25)^{0.121}$



PROCEDURES USED

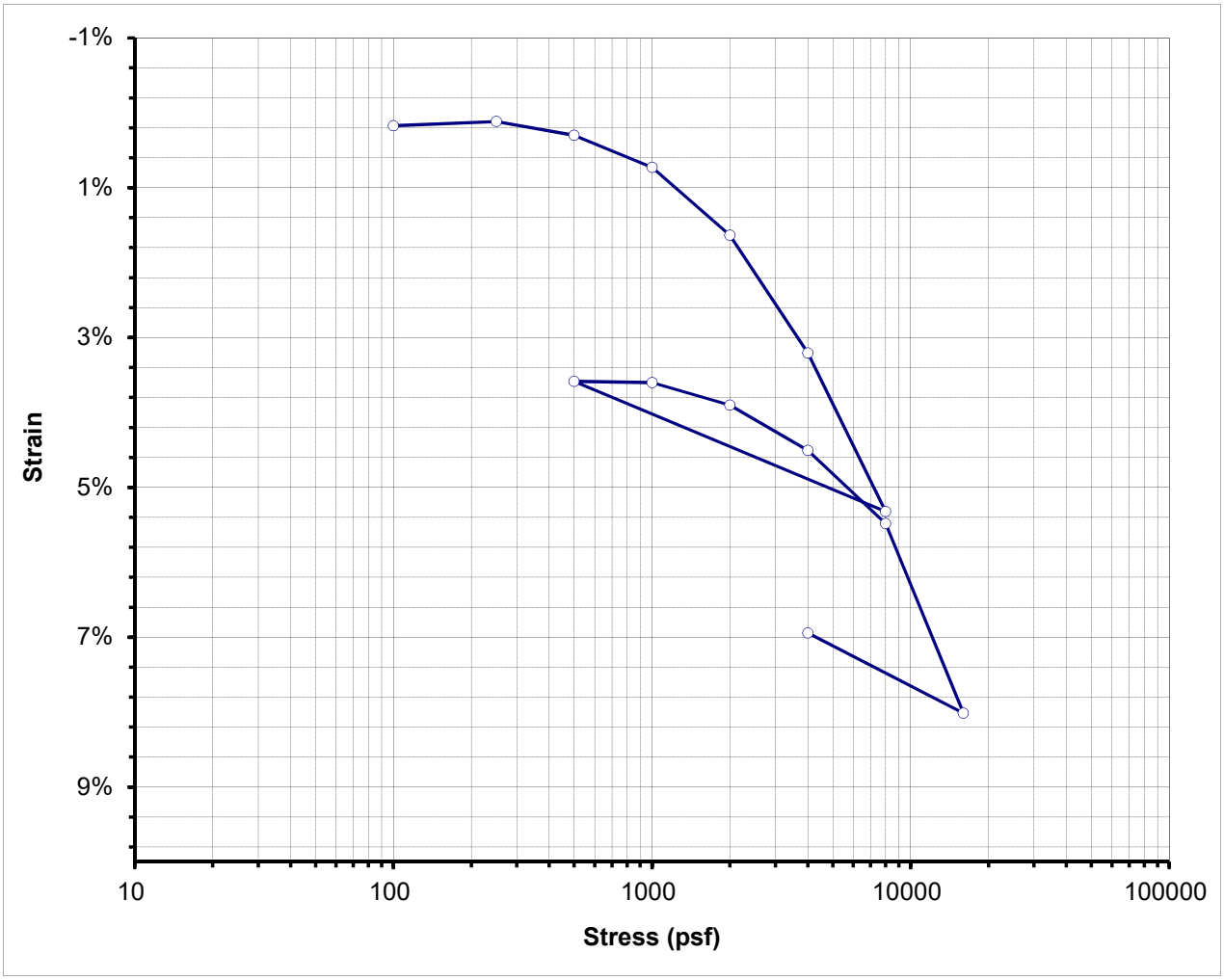
- ☐ Wet Preparation
  Multipoint Wet Preparation
- ☒ Dry Preparation
  Multipoint Dry Preparation
- ☒ Procedure A
  Multipoint Test
- ☐ Procedure B
  One-point Test



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Figure B-1.4

CONSOLIDATION TEST RESULTS
ASTM D-2435



Boring No.	B-3	Sample Depth	25'
Sample No.	R-6	USCS	CL

BEFORE TEST

Initial Moisture Content:	27.99%	
Initial Dry Unit Wt:	96.9	pcf
Initial Total Unit Wt.:	124.0	pcf
Initial Void Ratio:	0.8041	
Initial Degree of Saturation:	97.5%	

AFTER TEST

Final Moisture Content:	25.67%	
Final Dry Unit Wt:	101.7	pcf
Final Total Unit Wt.:	127.8	pcf
Final Void Ratio:	0.7189	
Final Degree of Saturation:	100.0%	

Water Added at: 250 psf

ATTERBERG LIMITS					
LL=		PL=		PI=	

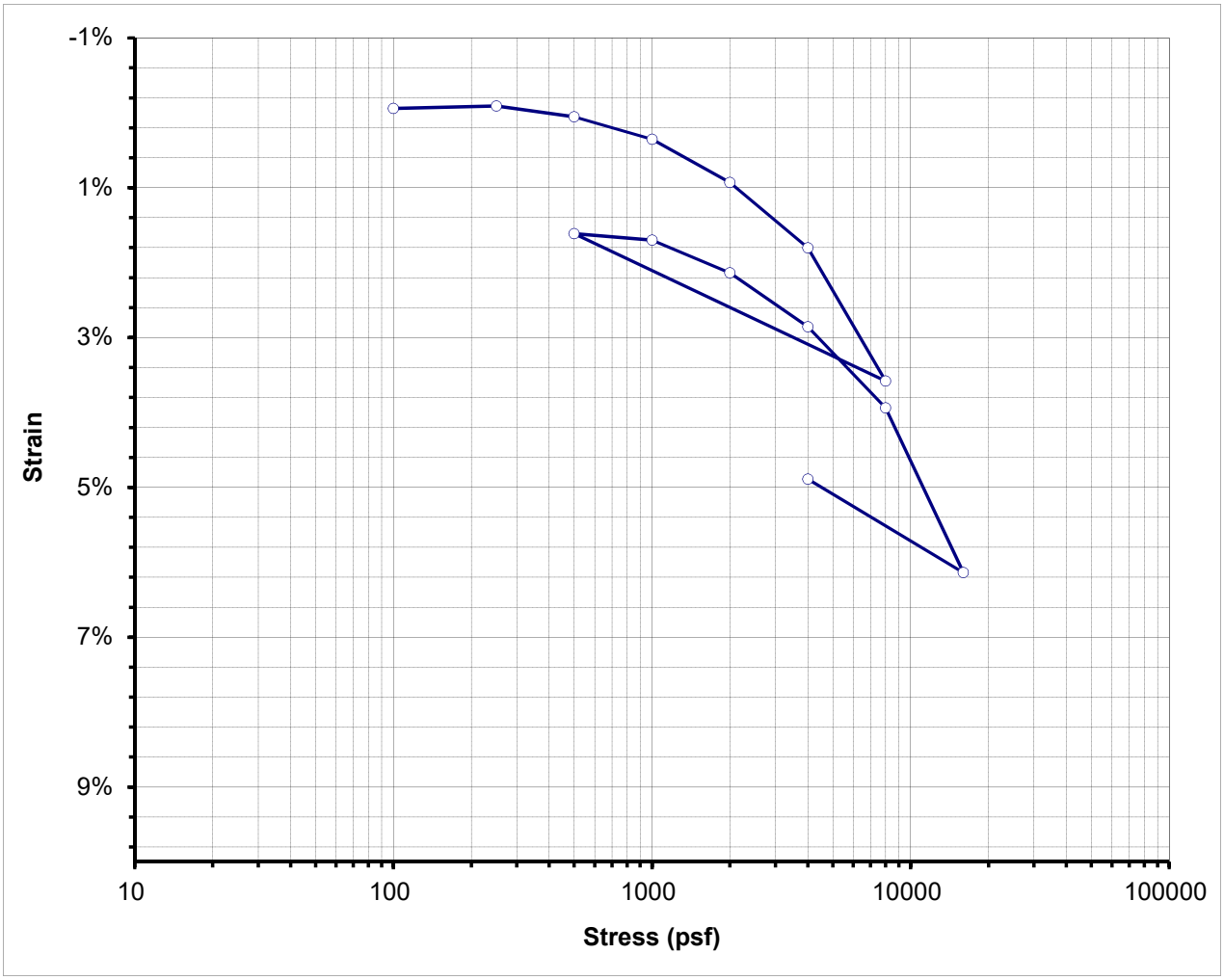
Assumed Specific Gravity of Solids, Gs: 2.80

PRESSURE (psf)	SAMPLE STRAIN	VOID RATIO
100	0.172%	0.801
250	0.115%	0.802
500	0.299%	0.799
1000	0.729%	0.791
2000	1.633%	0.775
4000	3.206%	0.746
8000	5.322%	0.708
500	3.584%	0.739
1000	3.602%	0.739
2000	3.902%	0.734
4000	4.508%	0.723
8000	5.483%	0.705
16000	8.014%	0.660
4000	6.943%	0.679
250	4.754%	0.718

PROJECT NUMBER: LA1403	PROJECT NAME: 837 N. Cahuenga Blvd.	FIGURE NO. B-3 R-6	GROUP DELTA

Figure B-2.1

CONSOLIDATION TEST RESULTS
ASTM D-2435



Boring No.	B-3	Sample Depth	35'
Sample No.	R-8	USCS	CL

BEFORE TEST

Initial Moisture Content:	28.24%	
Initial Dry Unit Wt:	95.8	pcf
Initial Total Unit Wt.:	122.8	pcf
Initial Void Ratio:	0.8223	
Initial Degree of Saturation:	96.1%	

AFTER TEST

Final Moisture Content:	27.90%	
Final Dry Unit Wt:	98.0	pcf
Final Total Unit Wt.:	125.4	pcf
Final Void Ratio:	0.7806	
Final Degree of Saturation:	100.0%	

Water Added at: 250 psf

ATTERBERG LIMITS					
LL=		PL=		PI=	

Assumed Specific Gravity of Solids, Gs: 2.80

PRESSURE (psf)	SAMPLE STRAIN	VOID RATIO
100	-0.059%	0.823
250	-0.091%	0.824
500	0.052%	0.821
1000	0.352%	0.816
2000	0.930%	0.805
4000	1.800%	0.789
8000	3.580%	0.757
500	1.612%	0.793
1000	1.701%	0.791
2000	2.134%	0.783
4000	2.857%	0.770
8000	3.939%	0.750
16000	6.139%	0.710
4000	4.889%	0.733
250	2.325%	0.780

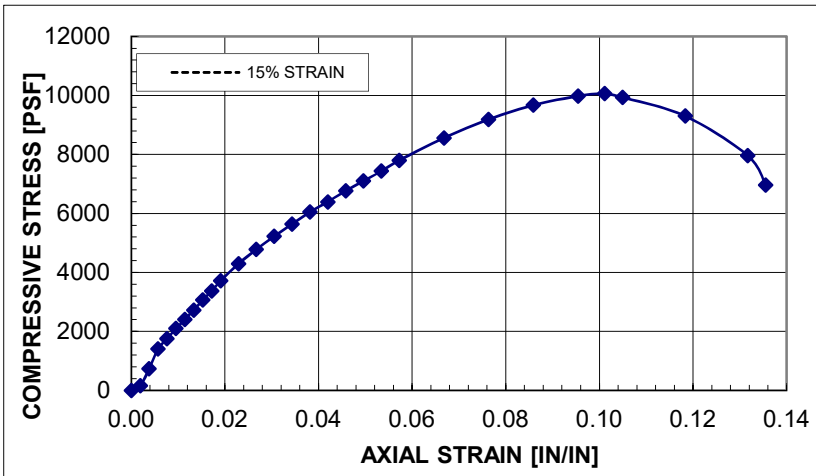
PROJECT NUMBER:	PROJECT NAME:	FIGURE NO.
LA1403	837 N. Cahuenga Blvd.	B-3 R-8

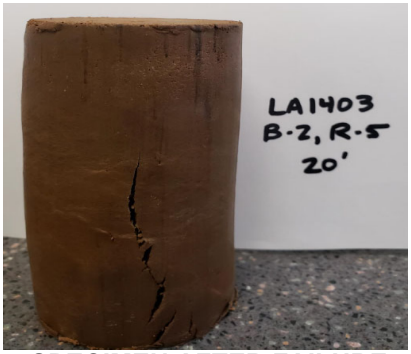
GROUP DELTA

Figure B-2.2

PROJECT:	**837 N. Cahuenga Blvd.**	TEST METHOD:	**ASTM D2166**
SAMPLE I.D.:	**B-2, R-5 @ 20'**	TESTED BY:	**J. Krehbiel**
DESCRIPTION:	**Yellowish brown lean CLAY (CL)**	DATE:	**6/18/19**

TYPE OF SAMPLE	CAL	
WET WT. OF SAMPLE	808.38	[g]
INITIAL DIAM.	2.391	[in]
INITIAL HEIGHT	5.240	[in]
INITIAL AREA	4.490	[in^2]
INITIAL VOLUME	23.53	[in^3]
WET DENSITY	130.9	[pcf]
DRY WT. OF SAMPLE	674	[g]
WEIGHT OF WATER	134.4	[g]
INITIAL TOTAL MOISTURE	19.9	[%]
DRY DENSITY	109.1	[pcf]
L-D RATIO	2.2:1	
STRAIN RATE	1.26	[%/min]
STRAIN AT FAILURE	10.11	[%]
STRAIN AT FAILURE	0.530	[in]
15% STRAIN	0.786	[in]
FAILURE CRITERIA:	Yield	
COMP. STRENGTH:	10061	[psf]
SHEAR STRENGTH:	5030	[psf]
SPEC. GRAVITY (Assumed)	2.7	
SATURATION:	99	[%]
FAILURE MODE:	Semi-plastic	





SPECIMEN AFTER FAILURE

Elapsed Time [min]	Axial Load [lb]	Strain Dial [in]	Total Deformation [in]	Axial Strain [in/in]	Corrected Area [in^2]	Stress [psf]
0.0	0.0	1.000	0.000	0.000	4.49	0.0
0.0	5.0	0.990	0.010	0.002	4.50	160.0
0.0	23.0	0.980	0.020	0.004	4.51	734.8
0.0	55.0	0.960	0.040	0.008	4.52	1750.4
0.0	66.0	0.950	0.050	0.010	4.53	2096.5
0.0	76.0	0.940	0.060	0.011	4.54	2409.5
1.0	107.0	0.910	0.090	0.017	4.57	3372.7
1.0	118.0	0.900	0.100	0.019	4.58	3712.2
1.0	137.0	0.880	0.120	0.023	4.60	4293.1
2.0	153.0	0.860	0.140	0.027	4.61	4775.8
2.0	168.0	0.840	0.160	0.031	4.63	5223.4
2.0	182.0	0.820	0.180	0.034	4.65	5636.4
3.0	196.0	0.800	0.200	0.038	4.67	6046.0
3.0	208.0	0.780	0.220	0.042	4.69	6390.7
3.0	221.0	0.760	0.240	0.046	4.71	6763.1
4.0	233.0	0.740	0.260	0.050	4.72	7101.8
4.0	245.0	0.720	0.280	0.053	4.74	7437.6
4.0	258.0	0.700	0.300	0.057	4.76	7800.6
5.0	286.0	0.650	0.350	0.067	4.81	8559.7
6.0	310.0	0.600	0.400	0.076	4.86	9183.1

GROUP DELTA

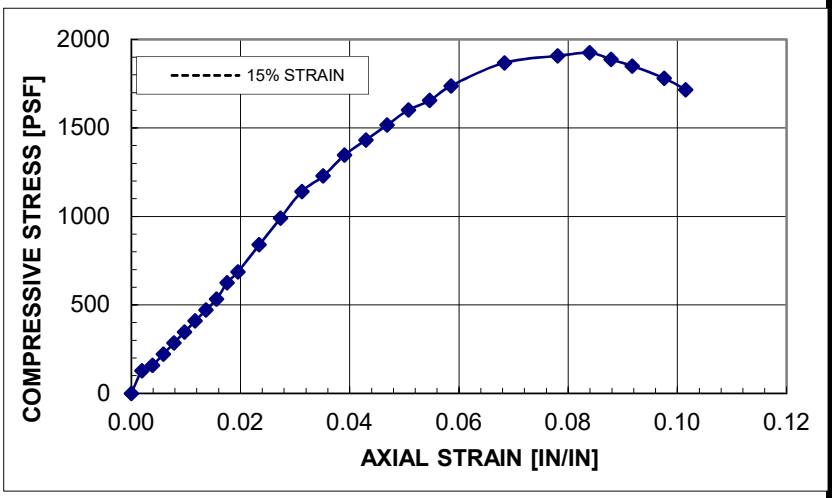
UNCONFINED COMPRESSIVE STRENGTH

Project No. LA1403

FIGURE B-3.1

PROJECT:	**837 N. Cahuenga Blvd.**	TEST METHOD:	**ASTM D2166**
SAMPLE I.D.:	**B-3, R-6 @ 25'**	TESTED BY:	**J. Krehbiel**
DESCRIPTION:	**Yellowish brown lean CLAY (CL)**	DATE:	**6/18/19**

TYPE OF SAMPLE	CAL	
WET WT. OF SAMPLE	759.49	[g]
INITIAL DIAM.	2.4	[in]
INITIAL HEIGHT	5.123	[in]
INITIAL AREA	4.524	[in^2]
INITIAL VOLUME	23.18	[in^3]
WET DENSITY	124.8	[pcf]
DRY WT. OF SAMPLE	611.81	[g]
WEIGHT OF WATER	147.7	[g]
INITIAL TOTAL MOISTURE	24.1	[%]
DRY DENSITY	100.6	[pcf]
L-D RATIO	2.1:1	
STRAIN RATE	1.20	[%/min]
STRAIN AT FAILURE	8.39	[%]
STRAIN AT FAILURE	0.430	[in]
15% STRAIN	0.768	[in]
FAILURE CRITERIA:	Yield	
COMP. STRENGTH:	1925	[psf]
SHEAR STRENGTH:	962	[psf]
SPEC. GRAVITY (Assumed)	2.7	
SATURATION:	97	[%]
FAILURE MODE:	Semi-plastic	





SPECIMEN AFTER FAILURE

Elapsed Time [min]	Axial Load [lb]	Strain Dial [in]	Total Deformation [in]	Axial Strain [in/in]	Corrected Area [in^2]	Stress [psf]
0.0	0.0	1.000	0.000	0.000	4.52	0.0
0.0	4.0	0.990	0.010	0.002	4.53	127.1
0.0	5.0	0.980	0.020	0.004	4.54	158.5
0.0	9.0	0.960	0.040	0.008	4.56	284.2
0.0	11.0	0.950	0.050	0.010	4.57	346.7
0.0	13.0	0.940	0.060	0.012	4.58	409.0
1.0	20.0	0.910	0.090	0.018	4.60	625.4
1.0	22.0	0.900	0.100	0.020	4.61	686.6
1.0	27.0	0.880	0.120	0.023	4.63	839.3
2.0	32.0	0.860	0.140	0.027	4.65	990.8
2.0	37.0	0.840	0.160	0.031	4.67	1141.0
2.0	40.0	0.820	0.180	0.035	4.69	1228.5
3.0	44.0	0.800	0.200	0.039	4.71	1345.9
3.0	47.0	0.780	0.220	0.043	4.73	1431.8
3.0	50.0	0.760	0.240	0.047	4.75	1517.0
4.0	53.0	0.740	0.260	0.051	4.77	1601.4
4.0	55.0	0.720	0.280	0.055	4.79	1655.0
4.0	58.0	0.700	0.300	0.059	4.81	1738.1
5.0	63.0	0.650	0.350	0.068	4.86	1868.3
6.0	65.0	0.600	0.400	0.078	4.91	1907.5

GROUP DELTA

UNCONFINED COMPRESSIVE STRENGTH

Project No. LA1403

FIGURE B-3.2

BORING NO.: B-1 **SAMPLE DATE:** 6/10/19

BORING DEPTH: 0-3.3' **TEST DATE:** 6/16/19

SAMPLE DESCRIPTION: Dark yellowish brown lean CLAY (CL)

LABORATORY TEST DATA

	TEST SPECIMEN	1	2	3	4	5	
A	COMPACTOR PRESSURE	60					[PSI]
B	INITIAL MOISTURE	2.4					[%]
C	BATCH SOIL WEIGHT	1200					[G]
D	WATER ADDED	160					[ML]
E	WATER ADDED (D*(100+B)/C)	13.7					[%]
F	COMPACTION MOISTURE (B+E)	16.1					[%]
G	MOLD WEIGHT	2114.2					[G]
H	TOTAL BRIQUETTE WEIGHT						[G]
I	NET BRIQUETTE WEIGHT (H-G)						[G]
J	BRIQUETTE HEIGHT						[IN]
K	DRY DENSITY (30.3*I/((100+F)*J))						[PCF]
L	EXUDATION LOAD	9000+					[LB]
M	EXUDATION PRESSURE (L/12.54)						[PSI]
N	STABILOMETER AT 1000 LBS						[PSI]
O	STABILOMETER AT 2000 LBS						[PSI]
P	DISPLACEMENT FOR 100 PSI						[Turns]
Q	R VALUE BY STABILOMETER						
R	CORRECTED R-VALUE (See Fig. 14)						
S	EXPANSION DIAL READING						[IN]
T	EXPANSION PRESSURE (S*43,300)						[PSF]
U	COVER BY STABILOMETER						[FT]
V	COVER BY EXPANSION						[FT]

TRAFFIC INDEX:	5.0
GRAVEL FACTOR:	1.43
UNIT WEIGHT OF COVER [PCF]:	130
R-VALUE BY EXUDATION:	<5
R-VALUE BY EXPANSION:	<5
R-VALUE AT EQUILIBRIUM:	<5

NOTE: Section B.4k of CT301 states that: "Occasionally, material from exceptionally heavy clay test specimens will extrude from under the mold and around the follower ram during the loading operation. If this occurs when the 5520 kPa point is reached and less than 5 lights are lit, this should be noted and the soil should be reported as R-Value < 5."

*Note: Gravel factor estimated from required AC pavement section using CT301, Part 6.B.2.

Design Infiltration Rate

Project Number: LA1403

Project Number: 837 N Cahuenga

Infiltration Number: **B-1**

Diameter of Boring (in):	8
Diameter of Casing (in):	2.5
Depth of Casing Above Ground (ft):	1.1
Depth of Boring (ft):	10
Bentonite Plug at bottom of test section?:	NO
Length of Test Section (ft):	5
Standard Time Interval Between Readings (min):	30

Average Water Drop (in): **1.2**

Volume of Water Dischaged (in^3): **5.89** in^3

Surface Area of Test Section (in^2): **1558.23** in^2

Raw Percolation Rate (in/hr): 7.56E-03 in/hr

Reduction Factors

Boring Percolation (RFt=2)	RF_t=	2
Site variability, number of tests, and thoroughness of subsurface investigation (RFv= 1 to 3)	RF_v=	2
Long-term siltation, plugging and maintenance (RFs= 1 to 3):	RF_s=	1
Total Reduction Factor, RF = RFt x RFv x RFs	RF=	4

Design Infiltration Rate = Raw Percolation Rate / RF

Design Infiltration Rate (in/hr): 1.89E-03 in/hr

GROUP DELTA

Calculation method taken from the "Administrative Manual County of Los Angeles Department of Public Works Geotechnical and Materials Engineering Division" (GS200.2 6/30/17)

Excavation Percolation Testing Field Log

Date 5/29/19

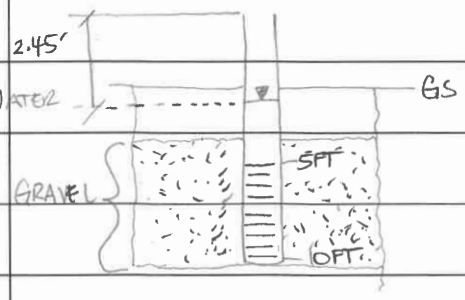
Project Location 837 N CAHUENGA
Earth Description SANDY CLAY
Tested by KM
Liquid Description TAP WATER
Measurement Method SOUNDER

Boring/Test Number B-1
Diameter of Boring 8" **Diameter of Casing** 2.5"
Depth of Boring 10 FEET
Depth to Invert of BMP
Depth to Water Table ~22 FEET
Depth to Initial Water Depth (d_1)

Time Interval Standard
Start Time for Pre-Soak 9:45
Start Time for Standard 10:45

Water Remaining In Boring (Y/N) Y
Standard Time Interval Between Readings 30 Min

Reading Number	Time Start/End (hh:mm)	Elapsed Time Δtime (mins)	Water Drop During Standard Time Interval Δd (inches)	Percolation Rate for Reading (in/hr)	Soil Description/Notes/Comments
1	10:45 11:15	30	1.8"	3.6 in/HR	
2	11:15 11:45	30	1.2"	2.4 in/HR	
3	11:45 12:15	30	1.2"	2.4 in/HR	
4	12:15 12:45	30	1.2"	2.4 in/HR	
5	12:45 1:15	30	1.2"	2.4 in/HR	
6	1:15 1:45	30	1.2"	2.4 in/HR	
7	1:45 2:15	30	1.2"	2.4 in/HR	LAST 3 CONSECUTIVE READINGS WITHIN 10% OF EACHOTHER
8	2:15 2:45	30	1.2"	2.4 in/HR	



APPENDIX B:

GEOTECHNICAL INVESTIGATION

B.2: Los Angeles Department of Building and Safety,
Soils Report Review Letter, LOG # 110580,
November 4, 2019

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SUPERINTENDENT OF BUILDING

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EXECUTIVE OFFICER

SOILS REPORT REVIEW LETTER

November 4, 2019

LOG # 110580
SOILS/GEOLOGY FILE - 2

837 N. Cahuenga, LLC
745 Merchant St.
Los Angeles, CA 90021

TRACT:	SENECA HEIGHTS (M P 16-72)
BLOCK:	J
LOT(S):	20
LOCATION:	837 N. Cahuenga Blvd.

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Soils Report	LA-1403	09/17/2019	Group Delta

The Grading Division of the Department of Building and Safety has reviewed the referenced report that provides recommendations for the proposed building renovation and small structure addition. The site is currently developed with a 2-story commercial building over a basement. Subsurface exploration performed by the consultant consisted of three hollow-stem auger borings to a maximum depth of 51.5 feet. The earth materials at the subsurface exploration locations consist of up to 7 feet of uncertified fill underlain by alluvium. The consultants recommend to support the proposed structure(s) on conventional foundations bearing on native undisturbed soils or a blanket of properly placed fill.

The review of the subject report(s) cannot be completed at this time and will be continued upon submittal of an addendum to the report which shall include, but not be limited to, the following:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2017 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. Clarify for the record if the improvements proposed will exceed 50% of the replacement value of the existing dwelling. If so, identify all non-conforming conditions and provide recommendations to bring the entire site into conformance with the current Code standard (7005.9).

   Note: This shall include but not be limited to [removal and/or support of all existing non-conforming graded slopes and, underpinning/replacement of all existing foundations where not in conformance with current Code standards.

2. Provide a site plan drawn at an appropriate engineering scale clearly showing all existing and proposed structures, grades, borings, and property lines. The plan shall be suitable for reproduction and archival purposes. Note: Aerial photos on their own are not acceptable. (P/BC 2014-113)

3. Provide geological cross sections illustrating existing and proposed grades and structures.

4. Provide Section B-B'

5. Revise lateral earth pressure for basement walls and other walls in which horizontal movement is restricted at the top so that they are designed for at-rest pressure in accordance to the Jaky formula. Provide calculations to substantiate the recommendations.

6. Provide retaining wall/basement design calculations and recommendations for lateral earth pressure due to earthquake motions for walls higher than 6 feet, as required by section 1803.5.12 of the 2017 Los Angeles Building Code.

   Note: The Department requires that the acceleration to be applied to the retained mass not be less than ½ of 2/3 the PGAM (Maximum Considered Earthquake-Geometric Mean, MCEG peak ground acceleration adjusted for Site Class effects, ASCE 7-10 Eq. 11.8-1).

The soils engineer shall prepare a report containing an itemized response to the review items indicated in this letter. If clarification concerning the review letter is necessary, the report review engineer may be contacted. Two copies of the response report, including one unbound wet-signed original for archiving purposes, a pdf-copy of the complete report in a CD or flash drive, and the appropriate fees will be required for submittal.

DAN RYAN EVANGELISTA
Structural Engineering Associate II

Log No. 110580
213-482-0480

cc: Group Delta, Project Consultant
LA District Office

APPENDIX B:

GEOTECHNICAL INVESTIGATION

B.3: Group Delta Consultants, Inc.,
Response to City of Los Angeles Comments on Soils Report,
Proposed Renovation of Existing Building and New Structures,
837 N. Cahuenga Boulevard,
Los Angeles, California
December 6, 2019

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GROUP DELTA

837 N Cahuenga LLC
745 Merchant St.
Los Angeles, CA 90021

December 6, 2019
LA-1403

Attention: Mr. Daniel Glenn

Subject: Response to City of Los Angeles Comments on Soil Report
Proposed Renovation of Existing Building and New Structures
837 N. Cahuenga Boulevard
Los Angeles, California
LADBS Log No. 110580
Tract: SENECA HEIGHTS (M P 16-72)
Block: J
Lot: 20
Location: 837 N Cahuenga Blvd.

Dear Mr. Glenn,

This letter provides our response to the City review comments dated November 4, 2019 regarding our report dated September 17, 2019, which provided geotechnical recommendations for the proposed development for the subject project. A copy of the City review letter is provided in Appendix A. Our response to each city comment is provided below.

The recommendations were developed in accordance with generally accepted geotechnical engineering principles and practice. The professional engineering work and judgments presented in this memorandum meet the standard of care of our profession at this time. No other warranty, expressed or implied, is made.

1.0 PROJECT DESCRIPTION

The proposed project includes the renovation of the existing building and construction of a new small structure immediate west of the existing structure. The locations of the existing structure to be renovated and the proposed kitchen structure is shown on Figure 1.

The existing structure to be renovated is a 2-story building with one subterranean level. It is proposed to add 2 levels of super structure to the existing structure. Few columns are being added to support the new load. The existing basement wall is about 9’-10” high. No modification is being planned on the existing basement wall.

A new kitchen is being planned immediately west of the existing structure that are being renovated. The proposed kitchen will be one story above grade and no subterranean level.

2.0 RESPONSES TO CITY'S COMMENTS

Comment No.1
Clarify for the record if the improvements proposed will exceed 50% of the replacement value of the existing dwelling. If so, identify all non-conforming conditions and provide recommendations to bring the entire site into conformance with the current Code standard (7005.9)

GDC Response to Comment No. 1

Based on the information provided by the project design team, the improvements proposed to the existing structure will be less than 50% of the replacement value of the existing dwelling.

Comment No.2

Provide a site plan drawn at an appropriate engineering scale clearly showing all existing and proposed structures, grade, borings, and property lines. The plan shall be suitable for reproduction and archival purposes. Note: Aerial photos on their own are not acceptable.

GDC Response to Comment No. 2

The revised site plan is shown on Figure 1.

Comment No.3
Provide geologic cross section illustrating existing and proposed grades and structures.

GDC Response to Comment No. 3

The finished basement floor elevation of the existing structure will remain the same. The geologic cross section was previously provided in the original September 17, 2019 and remains applicable.

Comment No.4
Provide Section B-B'.

GDC Response to Comment No. 4

The Section B-B' illustrates the thickness of the existing foundation and floor slab explored during our test pit (TP-1) excavation. The Section B-B' is shown on Figure 2.

Comment No.5
Revise lateral earth pressure for basement walls and other walls in which horizontal movement is restricted at the top so that they are designed for at-rest pressure in accordance to the Jacky's formula. Provide calculations to substantiate the recommendations.

GDC Response to Comment No. 5

Braded walls below grade should be designed to resist at-rest earth pressures. Accordingly, for the case where the grade is level behind the walls, a triangular distribution of lateral earth pressure equivalent to that developed by a fluid with a density of 58 pounds per cubic foot plus

any surcharge loadings occurring as a result of traffic and adjacent foundations should be used. The at-rest earth pressure calculation is presented in Appendix A, Calculation Package.

For existing basement walls adjacent to the new kitchen structures foundations, the basement wall should be designed to resist surcharge pressure from the kitchen foundation. Uniformly distributed loads may be considered as equivalent added depth of retained earth. Surcharge loading due to continuous or isolated footings shall be determined by the following formula:

$$R = \frac{0.3Ph^2}{x^2 + h^2}$$

Where R= Resultant lateral force measured in pounds per foot of foundation width
P= Resultant surcharge loads of continuous or isolated footings measured in pounds per.
x= Distance of resultant load from back face of wall measured in feet
h= Depth below point of application of surcharge loading to top of wall footing measured in feet

The location of lateral resultant force may be determined by the following formula:

$$d = x\left[\left(\frac{x^2}{h^2} + 1\right)\left(\tan^{-1}\frac{h}{x}\right) - \left(\frac{x}{h}\right)\right]$$

Where d= depth of lateral resultant below point of application of surcharge loading measured in feet

Loads applied within a horizontal distance equal to the wall height, measured from the back face of the wall, shall be considered as surcharge. For isolated footings having a width parallel to the wall less than 3 feet, "R" may be reduced to one-sixth the calculated value. The resultant lateral force "R" shall be assumed to be uniform for the length of footing parallel to the wall and to diminish uniformly to zero at the distance "x" beyond the ends of the footing.

Comment No.6
Provide retaining wall/basement design calculations and recommendations for lateral earth pressure due to earthquake motions for walls higher than 6 feet, as required by section 1803.5.12 of the 2017 Los Angeles Building Code.

GDC Response to Comment No. 4

Retaining wall where wall height is greater than 6 feet should be designed to resist an active pressure combined with a seismic increment of lateral active earth pressure. We have used computer program SLIDE 2018 to back calculate the combined active static and seismic lateral earth pressure based on an k_{eq} of 0.27g (one-half of two-third of PGA_M). The combined active static and seismic lateral earth pressure is equivalent to a fluid with a density of 48 pounds per cubic foot. The active static lateral earth pressure is equivalent to a fluid with a density of 33 pounds per cubic foot. Therefore, a seismic increment of 15 pounds per cubic foot may be used for design of seismic earth pressure..

The calculation package for the seismic earth pressure is presented in Appendix A.

Sincerely,

GROUP DELTA CONSULTANTS, INC.

REGISTERED PROFESSIONAL ENGINEER
ETHAN TSAI
GE 3004
Exp 12/31/2021
GEOTECHNICAL
STATE OF CALIFORNIA

Ethan Tsai, G.E.
Associate Engineer

Attachment – Soil Report Review Letter
Figure 1 – Boring and Test Pit Location Plan
Figure 2 – Cross Section B-B'
Appendix A - Calculation Package

SOIL REPORT REVIEW LETTER (11/4/19, LADBS LOG# 110580)

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November 4, 2019

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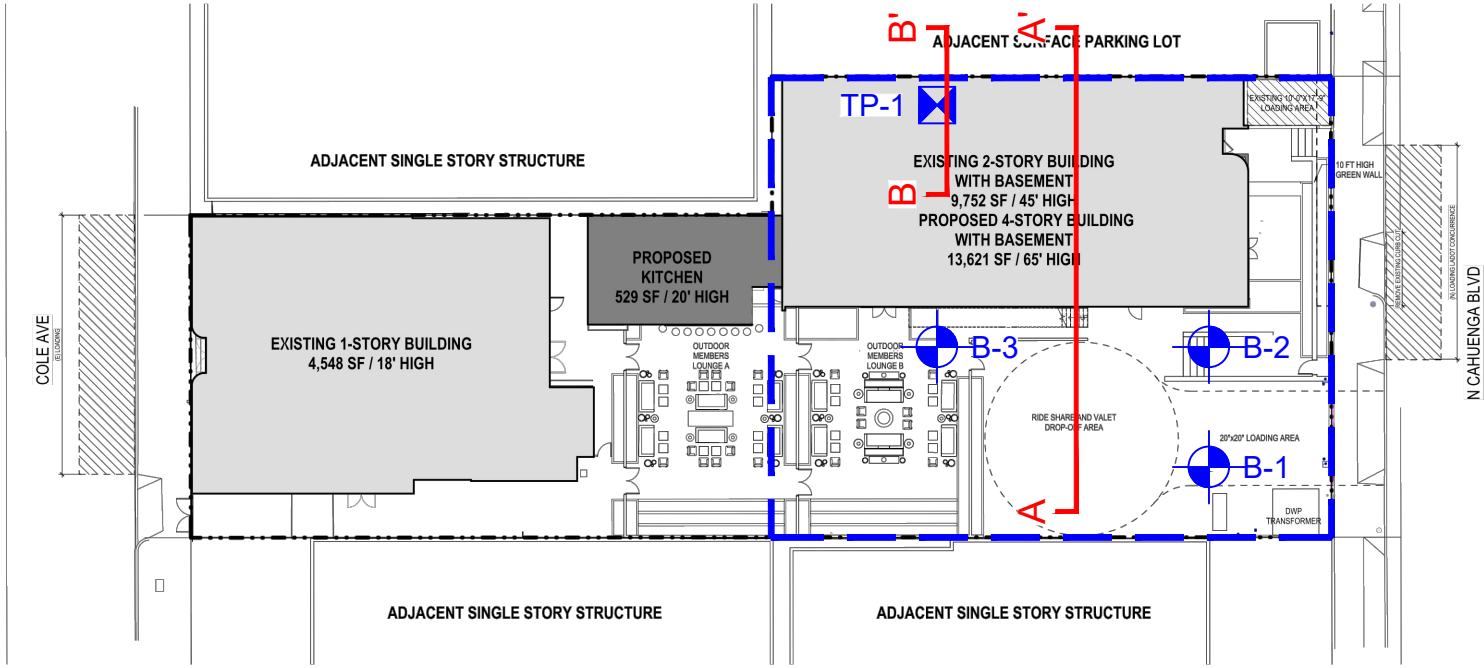
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DAN RYAN EVANGELISTA
Structural Engineering Associate II

Log No. 110580
213-482-0480

cc: Group Delta, Project Consultant
LA District Office

FIGURES



LEGEND:

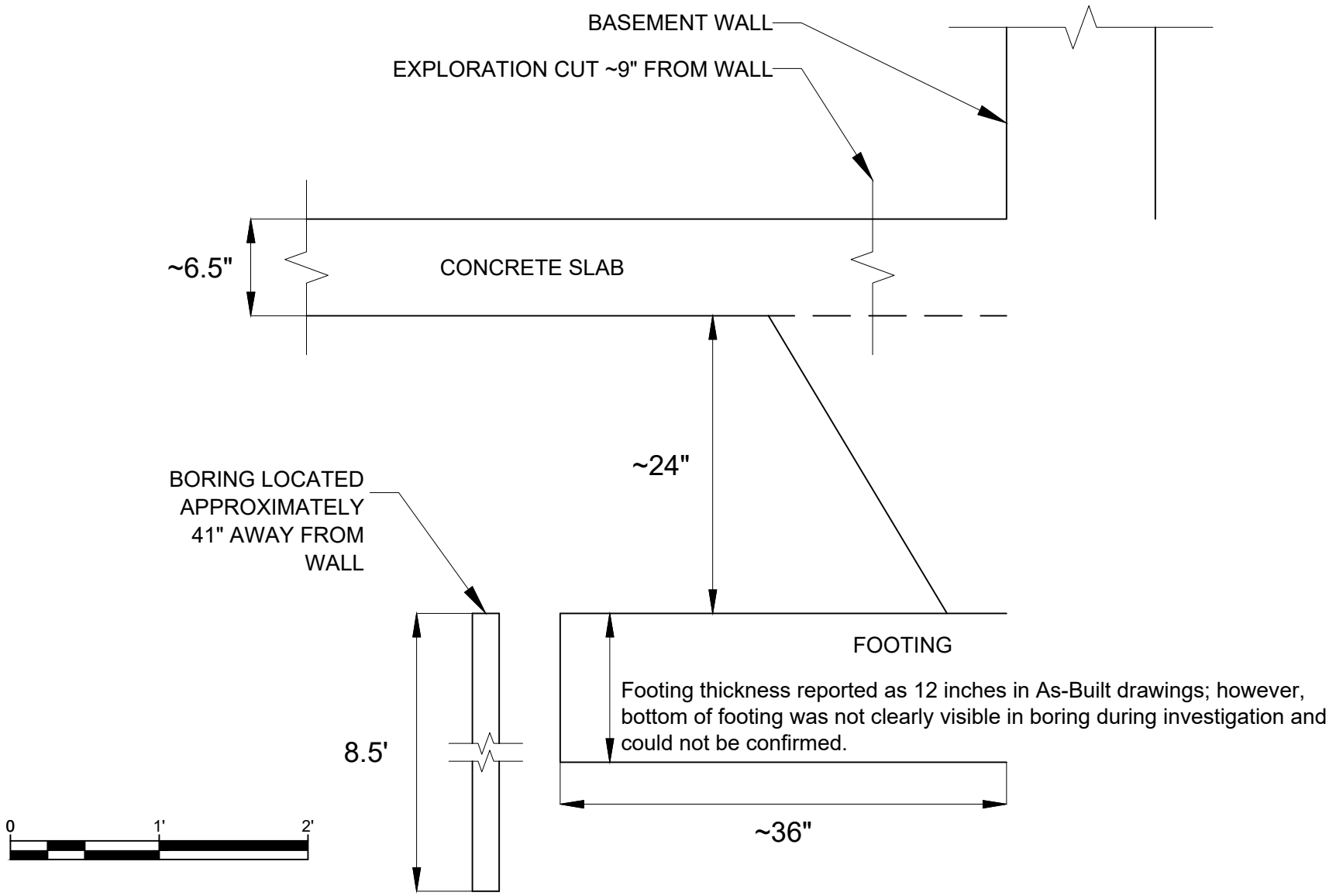
- B-3 — LOCATION OF BORING
- A — A' — LOCATION OF CROSS SECTION
- TP-1 — LOCATION OF TEST PIT
- PROJECT LIMITS

0 50' 100'

REFERENCE: BASE MAP BY PERKINS & WILL, DATED 10/4/2019

DATE: 06/18/2019	DRAWN BY: JMT	GROUP DELTA	GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	PROJECT NUMBER: LA-1403
REVIEWED BY: 11/21/2019	APPROVED BY: -		BORING AND TEST PIT LOCATION PLAN 837 N. CAHUENGA BLVD. LOS ANGELES, CALIFORNIA	SCALE: AS SHOWN
PREPARED BY: -				FIGURE NUMBER: 1

N:\Projects\1400-1499\LA1403 BLVD Hopitality _837 N. Cahuenga Geotech\600 Drafting\LA-1403.dwg, 11/21/2019 6:45:35 AM, DWG To PDF.pc3



DATE: 06/21/2019	DRAWN BY: JMT	GROUP DELTA	GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212 Torrance, CA. 90501	CROSS SECTION B-B'	PROJECT NUMBER: LA-1403
REVIEWED BY: -	APPROVED BY: -				SCALE: AS SHOWN
PREPARED BY: -				837 N. CAHUENGA BLVD. LOS ANGELES, CALIFORNIA	FIGURE NUMBER: 2

APPENDIX A - CALCULATION PACKAGE

CALCULATION PACKAGE FOR EARTH PRESSURE FOR 9'-10" HIGH WALL

1. Shear Strength:
   - Direct Shear Test Results:
     - Peak: $c = 967\ pdf, \emptyset = 35\ deg$
     - Ultimate: $c = 48\ pdf, \emptyset = 31\ deg$
   - Use following strength for earth pressure calculation:
     - Apply FS=1.5 to peak strength: $c = 640\ pdf, \emptyset = 25\ deg$
       - Equivalent Strength @ 10'

       $$\emptyset = arctan\left[\frac{(640 + 10 \times 120 \times tan(25))}{120 \times 10}\right] = 56\ deg.$$

     - Conservatively use ultimate strength without FS :

       $c = 48\ pdf, \emptyset = 31\ deg$
       - Equivalent Strength @ 10'

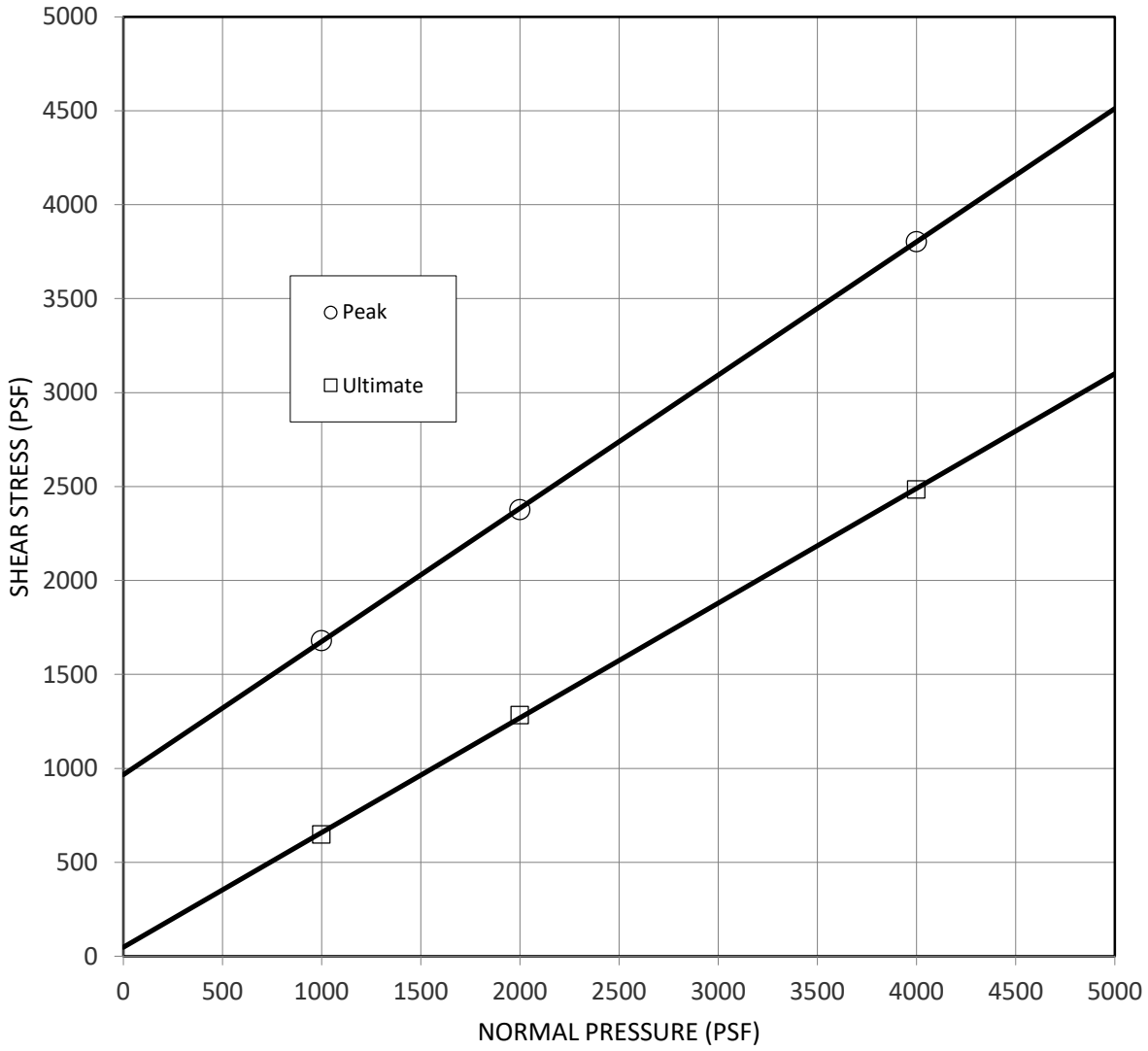
       $$\emptyset = arctan\left[\frac{(48 + 10 \times 120 \times tan(31))}{120 \times 10}\right] = 31\ deg.$$

   - Soil strength used for calculation:
     - $\boldsymbol{c = 48\ pdf, \emptyset = 31\ deg}$

2. At-Rest Pressure $= 120 \times \big(1 - sin(31)\big) =$ **58 pcf**
3. Active Pressure (H=10'):
   - K_A= 0.32
   - Active Pressure $\frac{(0.32 \times 120 \times 10 - 2 \times 48 \times \sqrt{0.32})}{10} =$ **33 pcf**

4. Seismic Earth Pressure:
   - PGA_M=0.83g
   - Kh=0.5x.066x0.83g=0.27g
   - Use slope stability analyses to back calculate the total earth pressure with Factor of Safety of 1.0 (See next page)
     - The total static plus seismic earth force for 10' wall = 2,370lbs
     - Total static plus seismic earth pressure=$\frac{2370 \times 2}{100}$=48 pcf
   - Therefore, the seismic increment is 48-33=**15 pcf**

GROUP DELTA	**Calculation Package – Earth Pressure**
	837 N. Cahuenga LLC Los Angeles, CA
	PROJECT NUMBER: **LA-1403** | FIGURE NUMBER: **1**
	GROUP DELTA CONSULTANTS, INC 370 Amapola Ave. Suite 212, Torrance, CA 90501



Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
B-1	3	5.0	Ring	SC	○	967	35
					□	48	31

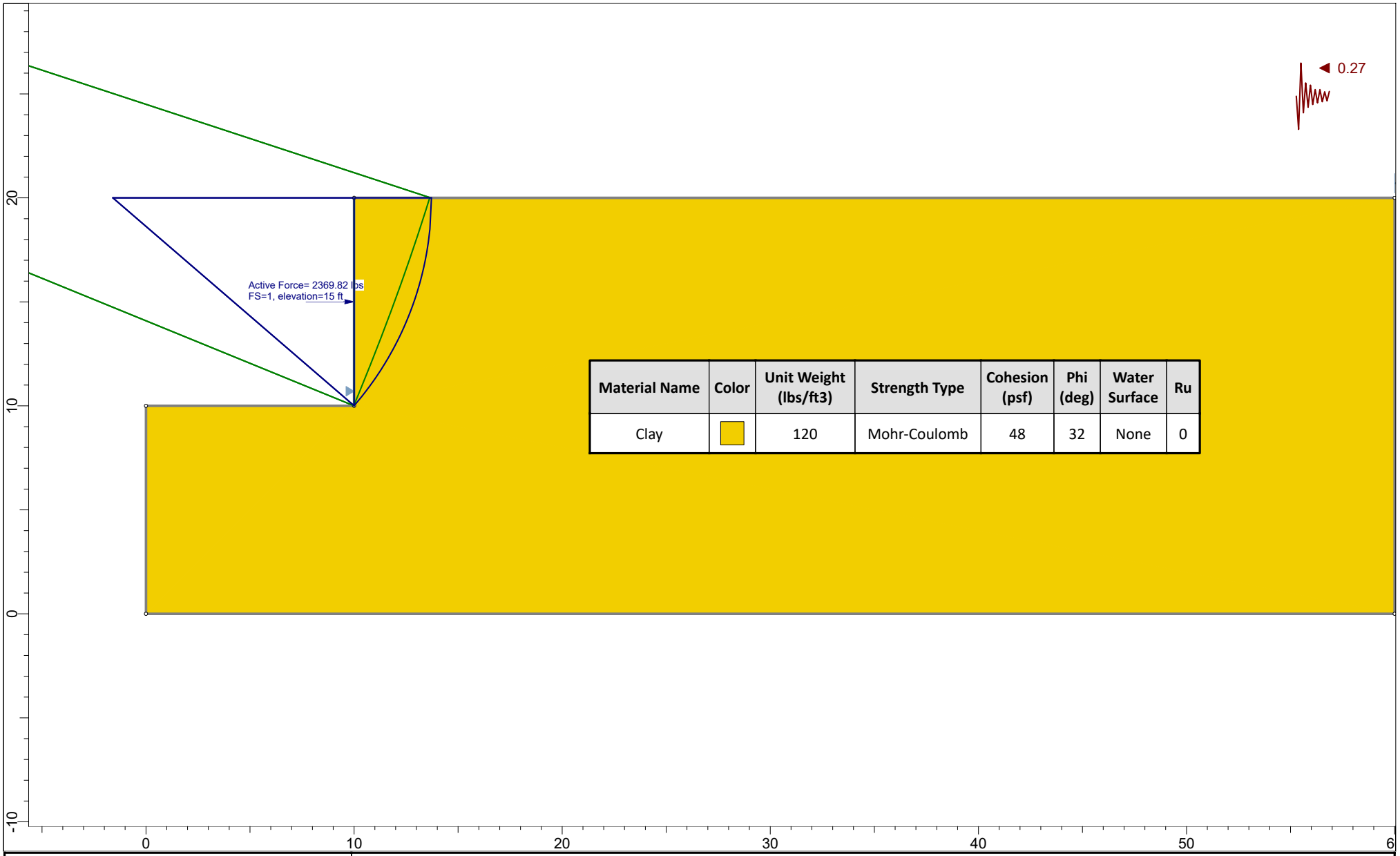
Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)	γ_d (pcf)	S (%)
1000	11.2	17.6	123.6	100
2000	11.2	16.7	124.2	100
4000	11.2	15.9	125.1	100

EGLAB, INC.

Project Name:
837 N. Cahuenga Boulevard
Client: Group Delta Consultants, Inc.
Project No.: LA1403
EGLAB Project No.: 19-053-018

DIRECT SHEAR

12/19 (ASTM D3080) Figure



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Clay		120	Mohr-Coulomb	48	32	None	0

rocscience	Project: SLIDE - An Interactive Slope Stability Program		
	Analysis Description:		
	Drawn By:	Scale: 1:76	Company:
	Date: 11/21/2019, 10:40:59 AM		File Name: Seismic Earth Pressure.slmd

SLIDEINTERPRET 8.010

APPENDIX B:

GEOTECHNICAL INVESTIGATION

B.4: Los Angeles Department of Building and Safety,
Soils Report Approval Letter, LOG # 110580-01,
December 24, 2019

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BOARD OF
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LOS ANGELES, CA 90012

FRANK M. BUSH
GENERAL MANAGER
SUPERINTENDENT OF BUILDING

OSAMA YOUNAN, P.E.
EXECUTIVE OFFICER

SOILS REPORT APPROVAL LETTER

December 24, 2019

LOG # 110580-01
SOILS/GEOLOGY FILE - 2

837 N. Cahuenga, LLC
745 Merchant St.
Los Angeles, CA 90021

TRACT:	SENECA HEIGHTS (M P 16-72)
BLOCK:	J
LOT(S):	20
LOCATION:	837 N. Cahuenga Blvd.

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Soils Report	LA-1403	12/06/2019	Group Delta

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Review Letter	110580	10/31/2019	LADBS
Soils Report	LA-1403	09/17/2019	Group Delta

The Grading Division of the Department of Building and Safety has reviewed the referenced report that provides recommendations for the proposed building renovation and small structure addition. The site is currently developed with a 2-story commercial building over a basement. Subsurface exploration performed by the consultant consisted of three hollow-stem auger borings to a maximum depth of 51.5 feet. The earth materials at the subsurface exploration locations consist of up to 7 feet of uncertified fill underlain by alluvium. The consultants recommend to support the proposed structure(s) on conventional foundations bearing on native undisturbed soils or a blanket of properly placed fill.

The referenced report is acceptable, provided the following conditions are complied with during site development:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2017 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. The soils engineer shall review and approve the detailed plans prior to issuance of any permit. This approval shall be by signature on the plans that clearly indicates the soils

AN EQUAL EMPLOYMENT OPPORTUNITY - AFFIRMATIVE ACTION EMPLOYER

engineer has reviewed the plans prepared by the design engineer; and, that the plans included the recommendations contained in their reports (7006.1).

2. An on-site storm water infiltration system at the subject site shall not be implemented, as recommended.

3. All recommendations of the report(s) that are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

4. A copy of the subject and appropriate referenced reports and this approval letter shall be attached to the District Office and field set of plans (7006.1). Submit one copy of the above reports to the Building Department Plan Checker prior to issuance of the permit.

5. A grading permit shall be obtained for all structural fill and retaining wall backfill (106.1.2).

6. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557. Where cohesionless soil having less than 15 percent finer than 0.005 millimeters is used for fill, it shall be compacted to a minimum of 95 percent relative compaction based on maximum dry density. Placement of gravel in lieu of compacted fill is only allowed if complying with LAMC Section 91.7011.3.

7. Existing uncertified fill shall not be used for support of footings, concrete slabs or new fill (1809.2, 7011.3).

8. Drainage in conformance with the provisions of the Code shall be maintained during and subsequent to construction (7013.12).

9. All loose foundation excavation material shall be removed prior to commencement of framing. Slopes disturbed by construction activities shall be restored (7005.3).

10. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the General Safety Orders of the California Department of Industrial Relations (3301.1).

11. Excavations shall not remove lateral support from a public way, adjacent property or an existing structure. Note: Lateral support shall be considered to be removed when the excavation extends below a plane projected downward at an angle of 45 degrees from the bottom of a footing of an existing structure, from the edge of the public way or an adjacent property. (3307.3.1)

12. A supplemental report shall be submitted to the Grading Division of the Department containing recommendations for shoring, underpinning, and sequence of construction in the event that any excavation would remove lateral support to the public way, adjacent property, or adjacent structures (3307.3). A plot plan and cross-section(s) showing the construction type, number of stories, and location of the structures adjacent to the excavation shall be part of the excavation plans (7006.2).

13. Prior to the issuance of the permits, the soils engineer and/or the structural designer shall evaluate the surcharge loads used in the report calculations for the design of the retaining walls and shoring. If the surcharge loads used in the calculations do not conform to the

actual surcharge loads, the soil engineer shall submit a supplementary report with revised recommendations to the Department for approval.

14. The seismic design shall be based on a Site Class D as recommended. All other seismic design parameters shall be reviewed by LADBS building plan check.

15. Retaining walls shall be designed for the lateral earth pressures specified on page 2 in the 12/06/2019 report. Note: All surcharge loads shall be included into the design.

16. Basement walls and other walls in which horizontal movement is restricted at the top shall be designed for at-rest pressure as specified on page 2 of the 12/06/2019 report (1610.1). All surcharge loads shall be included into the design.

17. Retaining walls higher than 6 feet shall be designed for lateral earth pressure due to earthquake motions as specified on page 4 of the 11/06/2019 report (1803.5.12).

18. All retaining walls shall be provided with a standard surface backdrain system and all drainage shall be conducted in a non-erosive device to the street in an acceptable manner (7013.11).

19. With the exception of retaining walls designed for hydrostatic pressure, all retaining walls shall be provided with a subdrain system to prevent possible hydrostatic pressure behind the wall. Prior to issuance of any permit, the retaining wall subdrain system recommended in the soils report shall be incorporated into the foundation plan which shall be reviewed and approved by the soils engineer of record (1805.4).

20. Installation of the subdrain system shall be inspected and approved by the soils engineer of record and the City grading/building inspector (108.9).

21. Basement walls and floors shall be waterproofed/damp-proofed with an LA City approved "Below-grade" waterproofing/damp-proofing material with a research report number (104.2.6).

22. Prefabricated drainage composites (Miradrain, Geotextiles) may be only used in addition to traditionally accepted methods of draining retained earth.

23. Where the ground water table is lowered and maintained at an elevation not less than 6 inches below the bottom of the lowest floor, or where hydrostatic pressures will not occur, the floor and basement walls shall be damp-proofed. Where a hydrostatic pressure condition exists, and the design does not include a ground-water control system, basement walls and floors shall be waterproofed. (1803.5.4, 1805.1.3, 1805.2, 1805.3)

24. All roof, pad and deck drainage shall be conducted to the street in an acceptable manner in non-erosive devices or other approved location in a manner that is acceptable to the LADBS and the Department of Public Works (7013.10).

25. All concentrated drainage shall be conducted in an approved device and disposed of in a manner approved by the LADBS (7013.10).

26. The soils engineer shall inspect all excavations to determine that conditions anticipated in the report have been encountered and to provide recommendations for the correction of hazards found during grading (7008, 1705.6 & 1705.8).

27. Prior to pouring concrete, a representative of the consulting soils engineer shall inspect and approve the footing excavations. The representative shall post a notice on the job site for the LADBS Inspector and the Contractor stating that the work inspected meets the conditions of the report. No concrete shall be poured until the LADBS Inspector has also inspected and approved the footing excavations. A written certification to this effect shall be filed with the Grading Division of the Department upon completion of the work. (108.9 & 7008.2)

28. Prior to excavation an initial inspection shall be called with the LADBS Inspector. During the initial inspection, the sequence of construction; protection fences; and, dust and traffic control will be scheduled (108.9.1).

29. Prior to the placing of compacted fill, a representative of the soils engineer shall inspect and approve the bottom excavations. The representative shall post a notice on the job site for the LADBS Inspector and the Contractor stating that the soil inspected meets the conditions of the report. No fill shall be placed until the LADBS Inspector has also inspected and approved the bottom excavations. A written certification to this effect shall be included in the final compaction report filed with the Grading Division of the Department. All fill shall be placed under the inspection and approval of the soils engineer. A compaction report together with the approved soil report and Department approval letter shall be submitted to the Grading Division of the Department upon completion of the compaction. In addition, an Engineer's Certificate of Compliance with the legal description as indicated in the grading permit and the permit number shall be included (7011.3).

30. No footing/slab shall be poured until the compaction report is submitted and approved by the Grading Division of the Department.

DAN RYAN EVANGELISTA
Structural Engineering Associate II

DRE/dre
Log No. 110580-01
213-482-0480

cc: Group Delta, Project Consultant
LA District Office