DRAFT REPORT

DRAFT GEOTECHNICAL EXPLORATION AND RECOMMENDATIONS REPORT

Proposed Residential Development,

8150 Sunset Blvd., Los Angeles, California

Submitted To: Townscape Partners, LLC
1 West Century Drive
Los Angeles, CA 90067

Submitted By: Golder Associates Inc.
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Irvine, California 92602 USA

Distribution: Tyler Siegel, Townscape Partners, LLC
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May 20, 2013 **123-92034**

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Mr. Tyler Siegel
Townscape Partners, LLC
1 West Century Drive
Los Angeles, California

RE: DRAFT GEOTECHNICAL EXPLORATION AND RECOMMENDATIONS REPORT PROPOSED RESIDENTIAL DEVELOPMENT, 8899 BEVERLY BLVD, WEST HOLLYWOOD, CALIFORNIA

Dear Mr. Siegel:

Golder Associates Inc. (Golder) presents this report containing the results of our geotechnical study for the proposed residential and commercial development to be located at 8150 Sunset Blvd., in the City of Los Angeles, California. This report has been prepared per our proposal dated January 30, 2013 and your authorization to proceed dated February 5, 2013.

Golder's opinion, based on the geotechnical analysis of field and laboratory results, is that the proposed residential development is feasible from a geotechnical standpoint. Our opinion is conditional upon incorporation of this report's recommendations into the design and construction of the proposed residential structures. Please refer to Section 1.1 and Appendix C for important information regarding the proper use and interpretation of this report.

Golder appreciates the opportunity to be of service on this important project. If you have any questions, please contact any of the undersigned.

Sincerely,

GOLDER ASSOCIATES INC.

DRAFT **DRAFT**

Jaime Bueno, P.E.
Senior Engineer

Andrew Walker, P.E.
Principal

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1.0 INTRODUCTION

This report presents the results of the geotechnical study performed by Golder Associates Inc. (Golder) for the proposed Residential Development to be located at the 8150 Sunset Blvd. project site (Site) in Los Angeles, California. The location of the project is shown on Figure 1. This report presents a project description, information on our geotechnical field investigation, laboratory test results, and geotechnical design recommendations for the proposed development.

1.1 Site Description

1.1.1 Existing Site Conditions

The Site consists of Lot 1 of Tract No. 31173 in the City of Los Angeles, California and has an area of approximately 2.56 acres. It is bordered to the east by Crescent Heights Blvd., to the north by Sunset Blvd., to the west by Havenhurst Drive, and to the south by two apartment buildings. Havenhurst Drive and Crescent Heights Blvd. slope to the south with an elevation of approximately 405 feet (ft.) at Sunset Boulevard to an elevation of approximately 385 ft. at the southern end of the Site. The City of West Hollywood begins one block to the west of the property and adjacent to the south of the property.

The Site is currently occupied by a commercial development, which includes one single-story stucco building in the northwest corner and a centrally-located two-story stucco building occupied by multiple retail spaces. The retail structures are at the elevation of Sunset Boulevard. There is an east-west oriented retaining wall under the two-story building with a height of approximately 20 feet constructed to achieve the grade change from Sunset Boulevard to the southern end of the site. There is at-grade parking in most of the areas not occupied by the site buildings, and a parking garage and storage area located below the top floor of the two-story stucco building. The parking garage and storage area are below grade as compared to Sunset Blvd and at grade as compared to the south end of the Site. The storage area extends from the western half of the centrally located retail spaces towards Sunset Blvd, while the underground parking garage is located underneath the eastern section of the centrally located retail spaces.

1.2 Proposed Development

At the time of this report, details of the proposed project are under development; however, based on information provided to Golder by Townscape on January 9, 2013, the project consists of demolishing the existing retail buildings and replacing them with a residential and commercial development.

The building is proposed to have eight to ten levels. The bottom two levels will consist of basement levels along Sunset Blvd. and partial basement to the south. The basement and first two levels above the basement will consist of parking and commercial space. The residential units will be located above.

1.3 Objective and Scope

The objective of Golder's study was to provide geotechnical recommendations for the design of foundations, earthwork, retaining structures, and pavement for the proposed residential development. Golder's data review, field exploration, sampling, site characterization, laboratory testing, and engineering design recommendations are provided in the following sections.

2.0 GEOTECHNICAL EXPLORATION

2.1 Utility Clearance and Data Review

Golder performed a visual site reconnaissance of the Site on February 13, 2013 to mark out soil borehole locations and meet with Mr. Tyler Siegel from Townscape to review available subsurface data at the proposed locations. Dig Alert was notified by Golder of the proposed borehole locations as required by law. Golder did not contract the services of any utility location company during this phase of the project.

Appropriate permits and clearances were obtained from the County of Los Angeles Department of Public Health prior to the field investigation.

Geological and geotechnical data available for the region and site were gathered from the following sources:

- Residential Options conceptual plans for 8150 Sunset Blvd, Los Angeles, California, prepared by Hart Howerton Ltd., dated November 7, 2012.
- "Alta/ACSM Land Title Survey, Townscape Partners, LLC, 8142-8148 Sunset Blvd.," prepared by PSOMAS, dated July 5, 2011.
- "State of California Special Studies Zones Map, Hollywood Quadrangle," prepared by the State of California Department of Conservation, Division of Mines and Geology, dated July 1, 1986.
- "State of California Seismic Hazard Zones Map, Hollywood Quadrangle," prepared by the State of California Department of Conservation, Division of Mines and Geology, dated March 25, 1999.
- "Geologic and Seismic Technical Background Report, City of West Hollywood General Plan Update, West Hollywood, Los Angeles County, California," prepared by KFM Geoscience for the City of West Hollywood, dated March 15, 2010.
- "Soils Engineering Investigation, Proposed Retail and Office Buildings, 8148 through 8150 Sunset Boulevard, Hollywood, California," report prepared by Robert Stone and Associates, dated February 20, 1986.
- "Report of Geotechnical Investigation, Proposed Sunset / Crescent Heights Hotel, Sunset and Crescent Heights Boulevards, Los Angeles California, for Laurel Avenue Associates," report prepared by Leroy Crandall and Associates, dated July 27, 1984.

Based on our preliminary data review and observations, we understand that the geotechnical conditions at the Site include the following:

- The Site is not located within an area mapped as a Liquefaction Hazard Zone by the State of California.
- The Site is not located within an area mapped as a Landslide Hazard Zone by the State of California.
- The Site is not located within a State of California Alquist-Priolo (fault rupture) special studies zone.
- The City of West Hollywood has mapped the faults within the city limits. The city defines the area around the fault as Fault Precaution Zones. The Hollywood fault Fault

Precaution Zone ends at the southern boundary of the site and one block west of the Site. This corresponds with the border between the City of West Hollywood and City of Los Angeles. If the City of West Hollywood Fault Precaution Zone were extrapolated to the northeast, it would extend under the property. Figure 3 shows the location of the Fault Precaution Zone with respect to the Site. Being located within a Fault Precaution Zone does not prevent building on a site; however, for properties in the City of West Hollywood, additional studies and development of additional design criteria would have to be performed depending on whether it was in Zone 1 or 2 as defined by the City of West Hollywood. The Site is not located in the City of West Hollywood so there is not a legal requirement to perform a fault investigation, but a fault assessment is warranted from an engineering standpoint based on the geologic information available.

- The historic high groundwater level is at a depth of over 150 ft. Groundwater was not encountered during the geotechnical investigations for the reports reviewed for the Site and the property at 8000 Sunset Blvd, which advanced boreholes to a depth of 102 ft. below ground surface (bgs). Perched or isolated zones of ground water could be present at the site.

2.2 Drilling Activities

The purpose of the drilling investigation was to evaluate the subsurface conditions within the proposed project site in order to determine the engineering characteristics of the underlying soils. The drilling stage was executed on February 23, 2013 and consisted of advancing three boreholes to a total depth of 61.5 ft., and one borehole to a total depth of 76.5 ft. below the existing ground surface.

Boreholes were labeled B-101, B-102, B-103, and B-104 (Figure 3). Prior to drilling, the borehole locations were cleared of underground utilities through Underground Service Alert of Southern California, Dig Alert. Groundwater was not expected to be encountered during drilling activities; therefore, drilling permits were not required by the County of Los Angeles Department of Public Health.

The borings were advanced by Martini Drilling Corp. of Huntington Beach, California using a truck-mounted CME-75 hollow-stem auger drill rig. The drill rig was equipped with 5-feet long augers of 7.5-inch outside diameter (O.D.) and 3.5-inch inside diameter (I.D.), and a custom-made 4-claw bit. Samples were obtained using an unlined standard sampler consisting of a 2-inch O.D., and 1.4-inch I.D. split barrel shaft advanced into the soils at the bottom of the boring a total of 18-inches. The standard sampler is used for the Standard Penetration Test (SPT).

A modified California (MC) sampler was also used to obtain samples of the soils encountered. This sampler consisted of a three-inch O.D., 2.4-inch I.D. and 24-inch long split barrel driven a total of 18 inches into the soil at the bottom of the borehole. The sampler was lined with three 2.4-inch diameter brass rings located inside the split barrel shaft which were used to retain soil for laboratory tests as well as visual classification in the field. The borehole records indicate when the MC sampler was used.

Both samplers were driven into the soil using a 140-pound hammer free-falling a vertical distance of 30 inches. The number of hammer blows required to drive the sampler (standard or MC) in three six-inch segments, blow count, were recorded during sampling. The combined blow count for the final two six inch segments with the standard sampler is referred to as the SPT N-value. Sampling procedures employed in the field were generally consistent with those described in ASTM D1586.

Samples were collected at five-foot intervals. Soil collected inside the split barrel shaft was visually classified in the field, placed in sealed plastic bags and stored for future reference and laboratory testing. The boring logs are presented in Appendix A. The soils were described in general accordance with ASTM D2487 and internal Golder procedures. The boundaries between different soil and rock types shown on the logs are approximate because the actual transition between layers may be gradual. All boreholes were completely backfilled with soil cuttings; and asphalt pavement where boreholes were advanced was repaired with cold patch asphalt mix. Remaining soil cuttings were used as bedding soil in planters at the site. Groundwater was not encountered during drilling to the depths explored.

2.3 Laboratory Testing

Representative samples retrieved during the field exploration program were evaluated and selected at Golder's Irvine office, and transported to a geotechnical laboratory for testing. The laboratory testing was performed by Hushmand Associates, Inc. (Hushmand) of La Habra, California for the purposes of:

- Substantiating visual field classifications; and
- Providing engineering parameters necessary for geotechnical design.

Laboratory testing consisted of grain size distribution (ASTM D1140 and D422/C 136), water content (D2216), unit weight (D2937), Modified Proctor (D1557), R-value (ASTM D2844), and chemical testing to evaluate the corrosivity of the soils underlying the site. Results of laboratory testing are presented in Appendix B.

3.0 GEOLOGIC CONDITIONS

3.1 Regional Geologic Setting

The project site is located along the northern boundary of the Hollywood basin, and approximately 500 feet away of the southwest end of the Hollywood Hills, which are part of the broader reaching Santa Monica Mountains, and within the Los Angeles Coastal Plain Hydrologic Unit. The Santa Monica Mountains are located along the southern boundary of the Transverse Ranges Geomorphic Province which is dominated by east-west trending north over south thrust faults. The Santa Monica-Hollywood-Raymond Fault Zone represents the northern structural boundary between the Santa Monica Mountains and the Los Angeles Basin to the south (KFM GeoScience, 2010).

Most of the land along the southern base of the Santa Monica Mountains area is underlain by igneous and meta-sedimentary rocks primarily dating from the Tertiary era, 66 million years ago (CDC 1998). The oldest geologic unit mapped in the Hollywood Quadrangle is the Cretaceous granodiorite and quartz diorite, which is exposed in the northern part of the map area in the Santa Monica Mountains. Locally, at the surface, the granitic rocks are soft and crumbly due to weathering.

The cretaceous granite is overlain unconformably by deep-marine clastic sedimentary rocks of the Cretaceous Tuna Canyon Formation, which consists of interbedded sandstone, siltstone, and pebble-cobble conglomerate. Overlying the Tuna Canyon Formation are the Paleocene and Eocene nonmarine clastic sedimentary rocks of the Simi Conglomerate and Las Virgenes Sandstone and marine fine-grained sandstones of the Santa Susana Formation (Colburn and Novak, 1989).

The tertiary sedimentary rock is overlain with alluvial deposits of varying ages, all within the Quaternary era. These units consist of alluvial basin and fan deposits forming alluviated valleys, floodplains, and canyons comprised mainly of sand, silt, and clay of Holocene age (less than 1.6 million years) that have been deposited on the older alluvial plains by streams draining from the Santa Monica Mountains.

3.2 Site Geology and Generalized Subsurface Conditions

A majority of the City is located on alluvial soils derived from the adjacent Santa Monica Mountain range. The alluvial sediments occur in deposits that are vertically and horizontally cut into each other as a result of periods of stream erosion and subsequent alluvial deposition. The alluvial soils are punctuated with a series of buried and stacked relic soils. The buried soils are generally conspicuous as reddish brown in color and typically are clay-enriched due to extended exposure at the ground surface. The alluvium and sequences of stacked and buried soils are thickest along southern City boundary and gradually thin toward the north. The alluvial soils are typically coarser-grained (sandier) near the base of the hills and become finer-grained (silty and clayey) in the southern portion of the City (KMF GeoScience, 2010).

Golder's geotechnical exploration conducted for the current study confirmed that the area within the proposed residential development is underlain by alluvial soil deposits to the depths explored. These deposits generally consist of a mixture of silts, sands, and/or gravels (see Appendix A).

3.3 Groundwater

The Site lies in the Hollywood Hydrologic subarea of the Coastal Plain of Los Angeles County. According to the groundwater level contour map prepared by the California Division of Mines and Geology (CDMG, 1998) and presented in the Seismic Hazard Zone Report for the Hollywood 7.5–minute Quadrangle, the historical groundwater level at the site is approximately 150 feet below ground surface. Reviews of previous exploration programs show that groundwater has not been encountered in the area at shallow depths; however, perched or isolated zones of groundwater may be present in the Site area.

3.4 Potential Geological Hazards

3.4.1 Ground Shaking

The 8150 Sunset Blvd. project site is located in Seismic Zone 4 according to the California Seismic Safety Commission (CSSC, 2005) which corresponds to sites located near active earthquake zones. Golder recommends that a soil profile type D be used in the CBC design procedure. CDMG (1998) provide estimates of peak ground acceleration (PGA) for Hollywood and adjoining quadrangles. Those PGA values represent free field ground surface horizontal accelerations.

3.4.2 Surface Faulting

Active faults are defined as demonstrating displacement of Holocene-age materials (i.e. less than 11,000 years old) and/or documented historic seismicity. Potentially active faults are defined as demonstrating displacement of Pleistocene-age materials (i.e. 11,000 to 1.6 million years ago). Both, active and potentially active faults are located within, or in close proximity to the project site. Major faults that are considered to most influence the seismic exposure of the Site include the Hollywood Fault, Santa Monica Fault, Newport-Inglewood Fault, and the Upper Elysian Blind Thrust faults. A list of known major active faults located within 100 km (62 miles) of the Project Site is presented in Table 1.

3.4.2.1 Hollywood Fault

The active Hollywood fault trends approximately east-west along the base of the Santa Monica Mountains from the Beverly Hills area to the Los Feliz area of Los Angeles. Studies by several investigators have indicated that the fault is active, based on geomorphic evidence, stratigraphic correlation between exploratory borings, and fault trenching studies (Dolan et al., 2000). The fault is also considered active by the State Geologist.

Based on fault studies performed in the City of West Hollywood, the Hollywood Fault has been interpreted to have a strong lateral component of displacement. The linear trace of the Hollywood Fault and steep dips found in exposures and borings (65 to 90 degrees) suggest that motion along the fault may be largely strike-slip (Dolan et al, 1997). Other westerly trending faults in the Transverse Ranges exhibit a left-lateral component of slip such as the San Fernando, Raymond, and Malibu Coast Faults. Thus, the orientation of the Hollywood Fault suggests that the horizontal component of slip also should be left-lateral. Based on a comparison between geodetic and geologic data, Walls and others (1998) suggested that this fault is one of several faults that accommodate left-lateral slip along the northern margin of the Los Angeles basin, allowing for the relative westward translation of the Santa Monica Mountains.

Ground surface rupture has historically occurred in southern California, and topographic relief and paleo-earthquake studies suggest that the Hollywood fault has produced ground surface rupture in the past; however, this fault has not produced any damaging earthquakes during the historical period and has had relatively minor microseismic activity. Dolan and others (1997) suggest that if the entire 15 km long Hollywood Fault ruptured by itself, it could produce a **M**6.6 earthquake. However, if the fault ruptured together with other faults to the west (Santa Monica, Malibu Coast) or to the east (Raymond), then earthquakes much larger than **M**6.6 could result. Assuming a minimum slip rate of 0.35 mm/yr for the Hollywood Fault, a recurrence interval of approximately 4,000 years for a **M**6.6 event was estimated (Dolan et al, 1997). Although the timing of the most recent rupture of the Hollywood Fault is currently poorly constrained, trench and borehole data suggest that the last rupture occurred approximately 7,000 years ago (Dolan et al, 1997). Several of the studies have identified additional faults within the Hollywood Fault system that offset Holocene-aged sediments, and, therefore, are considered active. However, there is an absence of well-defined surface fault traces. For this reason, and due to dense urbanization, a state-sponsored fault evaluation has not been conducted to define an Earthquake Fault Zone along this fault.

3.4.1 Landslides and Liquefaction

According to the CDMG (1998), landslides have not been mapped in or around the vicinity of the proposed residential development, and no evidence of landsliding has been observed in this area. However, since the site is located at the base of the Santa Monica Mountains, under the right geological, geotechnical, and saturation conditions, landslides in the vicinity of the Site are possible to occur.

Liquefaction potential has been thought to be the greatest where the groundwater level is shallow and submerged loose, fine sands occur within a depth of about 50 feet or less. The Site is not located within an area mapped as a liquefaction hazard zone by the State of California Division of Mines and Geology (CDMG, 1999).

4.0 GEOTECHNICAL DESIGN RECOMMENDATIONS

4.1 Geotechnical Feasibility

Based on the results of the field exploration, laboratory testing, and geotechnical analyses conducted, Golder believes that it is feasible from a geotechnical standpoint to proceed with the proposed residential development at the Site provided the recommendations presented in this report are incorporated into the project's design and construction.

4.2 Seismic Design Considerations

4.2.1 General

The Site is located in the seismically active region of Southern California. The site is expected to be subjected to seismic hazards during its design life. Potential seismic hazards include strong ground shaking, ground surface rupture due to faulting, liquefaction and seismic settlement, and slope instability. The following sections discuss these potential seismic hazards with respect to the proposed residential development at the project Site.

4.2.2 Ground Shaking

The bases for the 2010 California Building Code (CBC) seismic design are 5%-damped spectral accelerations for 0.2 seconds (SS) and 1 second (S1) at a rock site (Site Class B). These 5%-damped spectral accelerations are established for a Maximum Considered Earthquake (MCE). Typically, the MCE spectral accelerations have a mean return period of 2,475 years (2% probability of being exceeded in 50 years). Site coefficients (Fa and Fv) are then used to scale the spectral accelerations as a function of Site Class to develop a site-specific, 5%-damped acceleration response spectrum. The values for S_S and S_1 are selected from maps provided in the 2010 CBC. Table 1 provides the recommended 2010 CBC seismic design parameters for the Site based on the results of Golder's geotechnical exploration and on Section 1613 of the 2010 CBC.

Table 1. 2010 California Building Code (CBC) Seismic Design Parameters

2010 CBC Seismic Design Parameter	Value
Site Class	D
5%-damped, 0.2-sec spectral acceleration (S_S)	1.82
5%-damped, 1-sec spectral acceleration (S_1)	0.6
Site Coefficient, F_a	1.0
Site Coefficient, F_v	1.5

4.2.3 Liquefaction Potential and Seismic Settlement

The Site does not lie within an area mapped as a liquefaction hazard zone by the State of California Division of Mines and Geology. The historical high groundwater table is approximately 150 feet bgs at the site (CDMG, 1998), and groundwater was not encountered during our field investigation.

Seismically-induced settlement at the site was estimated using the procedure proposed by Tokimatsu and Seed (Tokimatsu and Seed, 1984). Both total and differential seismic settlements are estimated to be less than 1 inch at the Site.

4.2.4 Surface Fault Rupture

There have been no reported observations of potential scarps or other field indications of modern or Holocene faulting within the Site. The Site is not located in an Alquist-Priolo Earthquake Fault Zone; however, numerous faults and fault segments in the vicinity of the Site have been categorized as active or potentially active.

The Hollywood fault is the nearest active fault to the site, and it is located approximately 0.3 km northwest. The Hollywood fault City of West Hollywood Fault Precaution Zone ends at the southern boundary of the site and one block west of the Site. This corresponds with the border between the City of West Hollywood and City of Los Angeles. The fault mapping did not extend to the site because it is located in the City of Los Angeles; however, if the City of West Hollywood Fault Precaution Zone was extrapolated to the northeast, it would extend under the property which, in turn, would locate the project Site within Zone 1, thus requiring a site-specific rupture evaluation program. This evaluation would likely consist of a trenching program across the site. However, neither the City of Los Angeles nor the State of California has mapped the area of the site as a fault rupture special studies zone; therefore a site-specific fault investigation is not required under the current regulatory environment.

Due to the presence of existing structures on the project Site, a trenching program to assess the potential presence of a fault on the Site is not practical at this time. One alternative is to perform a trenching program after demolition of the existing structures and prior to construction. This approach would mean that, if a fault is present on site, this would not be known until after demolition of the existing buildings has been completed.

4.2.5 Other Seismic Considerations

Tsunamis are very large waves in the ocean caused by seismic events, landslides, or volcanic eruptions. Seiches are waves in lakes, bays, or gulfs that result from seismic events, landslides, or atmospheric disturbances. The distance of the project site from the ocean (approximately 9.5 miles) and other large bodies of water and its elevation of over 420 feet above mean sea level suggest that the probability of experiencing adverse effects from tsunamis and seismic seiches is negligible at the site.

4.3 Foundation Design

4.3.1 General

Golder evaluated both shallow and deep foundation systems for the proposed development based on the information obtained from field and laboratory data. The results of this evaluation suggest that the proposed structures may be supported by shallow foundations (spread or strip footings, or mat foundations), or deep foundations (drilled shafts). The final selection of the foundation system in each specific portion of the project will be made by the structural engineer based on the specific design loads

The following sections present Golder's foundation recommendations for the various foundation systems evaluated.

4.3.2 Shallow Foundations

4.3.2.1 Allowable Bearing

As discussed in Section 4.3.1, the proposed development will be located entirely in native soil or engineered fill. Therefore, the following design criteria are recommended for the footings:

- Shallow spread footings should have a minimum dimension of 2 feet.
- Shallow continuous footings should have a minimum width of 1.5 feet.
- Locate the bottoms of all footings at least 2 feet below the lowest adjacent grade.
- Individual spread footings should bear on firm, undisturbed native soils or on a minimum of four (4) feet of engineered fill placed in accordance with the recommendations of Section 6.5.
- Design footings bearing on the engineered fill and undisturbed native soils using the maximum static allowable (factor of safety equal to 3.0 in bearing capacity calculations) bearing pressures shown in Tables 2 and 3. The recommended bearing values in Tables 2 and 3 are for equivalent gross loads and may be increased by one-third for wind, seismic, or other transient loading conditions.
- The allowable bearing pressures in Tables 2 and 3 are for a static settlement one inch or less. For the smaller footing, bearing capacity controls the allowable capacity. A differential settlement equal to one-half of the total settlement should be expected.

Table 2: Maximum Static Allowable Bearing Pressures for Shallow Footing Foundations

Footing Width (feet)	Allowable Bearing Pressure* (psf)
2	7,000
5	5,500
10	3,500
15	2,750
20	2,250

*values can be linearly interpolated for intermediate footing widths

Table 3: Maximum Static Allowable Bearing Pressures Strip Footing Foundations

Footing Width (feet)	Allowable Bearing Pressure* (psf)
1.5	5,000
5	5,000
10	3,000
15	2,250

*values can be linearly interpolated for intermediate footing widths

If larger bearing pressures are required, additional settlements should be expected. Alternatively, an engineering solution could be used to increase the bearing pressure.

4.3.2.2 Settlement

Based on the allowable bearing pressures presented in Tables 3 and 4, the total static settlements for shallow footings are anticipated to be a maximum of 1 inch. Differential, post-construction settlements between adjacent columns are expected to be a maximum of 0.5 inch under the building (e.g., keeping any landscaping and irrigation away from the face of the building).

4.3.2.3 Lateral Resistance

Footing foundations located below grade may derive lateral load resistance from passive resistance along the vertical sides of the foundations, friction acting on the bases of the foundations, or a combination of the two. An allowable (factor of safety equal to 3.0) passive resistance of 170 psf per foot of depth up to a maximum of 2,000 psf may be used for design. An ultimate friction factor of 0.50 between the bases of the concrete foundations and the native alluvial deposits can be used for sliding resistance using the dead load forces. Friction and passive resistance may be combined without reduction.

The passive resistance and friction factor are based on the native on-site soils. If other soils or borrow material are used, then these values will vary. Friction and passive earth pressure resistance may be combined without reduction provided the passive resistance does not exceed two-thirds of the allowable lateral bearing. Golder recommends that the upper 1 foot of soil cover be neglected in the passive resistance calculations

4.3.3 Deep Foundations

Cast-In-Drilled-Hole (CIDH) piles may be used for the proposed project. The design capacity curves presented herein were developed following the procedures outlined in LRFD for Drilled Shaft Design published by the Federal Highway Administration (FHWA, 2010).

4.3.3.1 Axial Capacity

Unfactored axial compressive capacities of the drilled piles are presented on Figure 4 for pile diameters of 18, 24, and 30 inches. In developing the design curves presented in Figure 4, the following assumptions were made:

- No permanent casings will be used.
- No drilling fluids will be used. If drilling fluids are used, a one-third reduction in axial and uplift pile capacities is necessary. This reduction of one-third assumes the shaft is excavated and concreted within one work shift (i.e., the holes are not left open overnight).
- All drilled piles are straight-sided and do not have enlarged or belled bases.
- End bearing has been ignored in the unfactored axial capacities. Only side friction has been considered.

The axial capacities presented for CIDH piles correspond to values for individual piles. The settlement of a pile group will be larger than that of an individual pile. Thus, the total axial capacity of a pile group will be less than the sum of the individual pile capacities based upon limiting pile cap deformation. Therefore, the individual pile capacities should be multiplied by a reduction factor when calculating the total axial capacity of the pile group. The following reduction factors, based on the spacing between individual piles in a group, should be applied for preliminary design. For final design, it may be appropriate to refine these factors to account for the number of piles per group:

Table 4: Axial Load Capacity Reduction Factors for Pile Groups

S/D	Reduction Factor
2	0.65
3	0.8
4	0.9

4.3.3.2 Lateral Resistance

Lateral deflections, moments, and shear for piles can be estimated once load combinations at the pile head are known. Golder can provide these analyses at that time.

4.3.4 Slab-on-Grade Floors

Conventional concrete slab-on-grade floors may be used for the proposed development. It is recommended that the floor slab areas be over-excavated by 2 feet and that the slab-on-grade floors be placed on a minimum of 2 feet of engineered fill to provide a uniform subgrade bearing surface. The engineered fill should be compacted to a minimum of 95 percent of its maximum dry density at a water content within 3 percent of its optimum moisture content, as determined by ASTM D1557.

The modulus of subgrade reaction concept can be used in the design of slabs-on-grade. The modulus of subgrade reaction is not an intrinsic property of the soil/rock since it also depends on the dimensions and stiffness of the slab and the stress level. The modulus of subgrade reaction can be calculated as follows:

$$k = k_1 \left(\frac{B+1}{2B}\right)^2$$

where:

k = static, vertical modulus of subgrade reaction for the loaded slab;

k1 = static, vertical modulus of subgrade reaction for a 1-foot diameter loaded area;

B = effective diameter of the slab's reaction area (in feet), given by the following equation:

$$B = \frac{4h}{\pi}\left(\frac{E}{E_S}\right)^{0.33}$$

h = slab thickness (in feet);

E = elastic modulus of concrete slab; and

E_S = elastic modulus of subgrade soil.

It is anticipated that the native alluvium to be over-excavated from within the building footprint and the surrounding areas will be used as engineered fill under the slabs-on-grade. These soils consist mostly of silty sands. Therefore, Golder recommends that a k_1 of 500 kips per cubic foot (kcf) and a E_S of 250 kips per square foot (ksf) be used to evaluate the modulus of subgrade reaction for the slab-on-grade floors.

4.4 Lateral Earth Pressures for Retaining Walls

Active earth pressures may be used for retaining walls that are free to rotate at least 0.1 percent of the wall height. The active earth pressures can be computed using an equivalent fluid weight of 32 pounds per cubic foot (pcf). Retaining walls restrained against rotation should be designed for the higher at-rest earth pressure conditions. For design purposes, the at-rest earth pressure exerted on retaining walls can be taken as that exerted by an equivalent fluid having a unit weight of 50 pcf. These recommended values do not include compaction-, truck-, or building-induced wall pressures or water pressures (see below). Additional loads on retaining walls may be imposed by surcharges. Golder should be contacted when development plans are finalized for review of wall, backfill, and surcharge conditions on a case-by-case basis. It should be noted that the above lateral earth pressure recommendations assume that the retained fill will be granular soils obtained from processing the native soils at the site.

Care must be taken during compaction operations not to overstress the retaining wall. Heavy construction equipment should be kept at least 3 feet away from the wall while the backfill soils are being placed. Hand-operated compaction equipment should be used to compact the backfill soils within the 3-foot-wide zone adjacent to the walls. Soil at the toes of retaining walls should be in place and compacted prior to backfilling behind the walls.

Under earthquake loading, basement retaining walls will be subjected to an additional lateral force equal to $26H^2$ pounds per linear foot of wall, where H is the height of the wall in units of feet. This force should be applied at a point located 0.6H above the base of the wall and it acts in addition to the static lateral pressures discussed above.

The recommended lateral earth pressures provided herein assume that 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. Backdrains could consist of a 2-foot wide zone of Caltrans Class 2 permeable material located immediately behind the wall and extending to within 1 foot of the ground surface. A perforated pipe could be installed at the base of the backdrain and sloped to discharge to a suitable collection point. Alternatively, commercially available synthetic drainage layers could be used for drainage of the wall backfill. The synthetic manufacturer's recommendations should be followed in the installation of synthetic drainage layers or backdrains. Additionally, waterproofing of basement walls may be desirable to prevent moisture intrusion and water seepage through the walls due to perched water tables of lateral migration of subsurface water from the landscaped areas or adjacent properties or streets. However, waterproofing is not required if the owner is willing to accept water staining of the basement walls and minor seepage through the basement walls.

4.5 Soil Corrosivity

Golder performed laboratory testing to evaluate soil corrosivity at the site, and reviewed the results of laboratory tests performed by HDR Schiff of Claremont,CA. Golder tested a sample retrieved from 11.5 to 15 feet bgs in boring B-101 for soil pH, sulfate content, chloride content, and electrical resistivity. The test results were as follows:

- Minimum Soil Resistivity – 18,330 ohm-cm
- Sulfate Content – 8.3 mg/kg
- Chloride Content – 2.7 mg/kg
- pH – 8.0

Based on Caltrans' corrosion guidelines (Caltrans, 2012) and Golder's experience with the underlying materials in the vicinity of the project site, the on-site soils at shallow depths are expected to be to be non-corrosive to buried metallic structures such as ductile iron pipes. If the proposed development includes buried metallic structures that will require protection, Golder recommends that a specialist corrosion engineer be retained to evaluate the general corrosion potential with respect to construction materials at the site.

The soils in the area are alluvial fans from the Santa Monica Mountains. In this area, the Santa Monica Mountains are composed of sedimentary rock of marine origin. Marine sediments often contain sulfates and Type II cement provides a moderate amount of protection against sulfates. Because the soils at the site have been repeatedly infiltrated by fresh water, some of the sulfates in the upper soils would have been leached out. Due to the horizontal and vertical variability of the on-site soils, this leaching would not occur evenly across the site and there could be an accumulation of sulfates at depth. Thus, some of the on-site soils may be moderately corrosive to concrete, and Type II cement should be used at the project site for concrete elements in contact with earth materials.

4.6 Pavements

4.6.1 General Pavement Recommendations

Laboratory testing on soil samples for pavement design was performed a sample retrieved from 26.5 to 30 feet bgs in boring B-101, and from 21.5 to 25 feet bgs in boring B-104 by Labelle Marvin, Inc. (Labelle Marvin) of Santa Ana, California. Results from laboratory testing indicate the minimum R-value corresponding to the tested samples is 63. The flexible pavement recommendations provided below are based on this R-Value.

Subgrade drainage is an important 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 5.6.2 and 5.6.3 are preliminary. The actual soils present at subgrade elevation after grading may be different than those assumed for the preliminary design contained herein. Golder 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.

4.6.2 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, 2012), Golder has developed the following recommendations for preliminary flexible pavement design:

Table 5. Preliminary Flexible Pavement Design Sections

Traffic Index	Asphalt Concrete Thickness (inches)	Class II Aggregate Base Thickness (inches)
5.0	3.0	2.5
5.5	3.0	3.0
6.0	3.5	3.0
6.5	3.5	3.5
7.0	4.0	3.5

The asphalt concrete thickness can be divided into base and finish courses.

The uppermost 6 inches of subgrade and the Class II aggregate base should be compacted to at least 95 percent of the maximum dry density. Pavement section thicknesses will increase for areas of heavy vehicular use and for areas where larger wheel loads are anticipated.

4.6.3 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, 2012). The simplified analysis indicates that 9 inch thickness of Jointed Plain Concrete Pavement 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 (Table 7).

Table 6. Rigid Pavement Structural Depth

TI	With Lateral Support (in)		Without Lateral Support (in)	
	JPCP(1)	AB(2)	JPCP(1)	AB(2)
< 9	8.5	6	9	6
9.5 to 10	9	7.5	10	12

(1)JPCP Jointed plain concrete pavement
(2)AB Aggregate base

5.0 CONSTRUCTION CONSIDERATIONS

5.1 Existence of Unsuitable Soils

Expansive or collapsible soils were not encountered during the field exploration. If these are encountered in the construction phase, proper mitigation measures should be designed and implemented.

5.2 Site Preparation

Site preparation and earthwork operations should be performed in accordance with all applicable codes. In this report, all references to maximum dry density and optimum moisture content refer to those values obtained in accordance with ASTM D1557 ("Modified Proctor" compaction test).

Existing debris and obstructions should be removed from within the building footprint and all areas to be graded. Additionally, any existing underground structures such as abandoned pipelines should be completely removed from areas underlying the building footprint. After removal of these items, exposed deleterious, vegetative, inert, and oversized materials (materials greater than 8 inches in maximum dimension) should be stripped and isolated prior to removal of reusable soils. The soils exposed in excavation subgrades should be observed by a Golder representative to confirm that these soils have the desired engineering properties. Additional removals may be required as a result of observation and testing of the exposed subgrade soils.

Prior to placement of the first lift of engineered fill, the upper 8 inches of the exposed subgrade should be brought to within 3 percent of its optimum moisture content and compacted to a minimum of 90 percent (95 percent if within the building footprint plus a horizontal distance equal to the depth of removal) of its maximum dry density as determined by ASTM D1557 to provide a uniform bearing surface.

If the subsurface conditions exposed during grading operations vary from those described in this report, Golder should be notified immediately and a revision of the recommendations contained herein may be necessary.

5.3 Excavations

The borings performed at the site were advanced using a track-mounted hollow stem auger drill rig. Drilling was completed with low effort through the existing native alluvium. Therefore, conventional earth moving equipment will be capable of performing a portion of the excavations required for the development. All surface water should be diverted away from excavations.

5.4 Engineered Fill

Golder anticipates that the majority of the existing on-site native soils may be reusable as engineered fill. Particles greater than 8 inches in maximum dimension should be removed or crushed and any vegetative, expansive, and deleterious material and debris should also be removed. Engineered fill should be placed in lifts no greater than 10 inches thick (loose measurement) and should be compacted to:

- At least 95 percent of its ASTM D1557 maximum dry density in areas underlying slabs-on-grade or spread footings, and adjacent to any type of structures.
- At least 90 percent of its ASTM D1557 maximum dry density elsewhere.

Existing on-site soils used as engineered fill should be placed at a water content that is within 3 percent of their optimum moisture content, as evaluated from ASTM D1557.

No backfill shall be placed around concrete until all forms and shoring have been removed, and the concrete has cured sufficiently to withstand the loading incurred due to backfill.

Imported materials to be used as engineered fill, if required, should have the following characteristics:

- Uniformly-graded with no less than 70 percent passing the ¾-inch sieve and no greater than 20 percent of the particles passing the U.S. No. 200 sieve.
- Have no particles greater than 8 inches in maximum dimension.
- The percent passing the #40 sieve should have a plasticity index less than 15.
- Non-corrosive to buried concrete and metallic structures.

If the imported materials deviate from the above-listed properties, then special earthwork recommendations may be required.

5.5 Utility Trenches

Shallow, temporary utility trench excavations may be required for installation of new utility lines. If steep or vertical-sided excavations deeper than 4 feet are necessary, Golder recommends that the sidewalls be braced and shored in accordance with Cal/OSHA standards and all other applicable safety ordinances and codes to provide temporary trench stability during construction. The contractor should be responsible for the structural design and safety of the temporary shoring system and it is recommended that this design be submitted to Golder for review and approval.

Due to the potential for local trench wall instability, Golder recommends that temporary cut slopes needed to achieve the proposed subgrade elevations be constructed at inclinations no steeper than 2H:1V in the native or fill soils. Heavy construction loads, such as those resulting from material stockpiles or heavy machinery, should be set back from the top of an excavation a minimum distance equal to the depth of the excavation unless the excavation is specifically designed by a qualified professional to accommodate these additional surcharge loads. All surface water should be diverted away from excavations.

6.0 ADDITIONAL SERVICES

Golder should review the project's construction documents before they are finalized. This review is necessary to verify that the geotechnical recommendations contained in this report have been properly interpreted and implemented into the project's design. If Golder does not perform this review, then Golder can assume no responsibility for misinterpretation of the geotechnical recommendations provided herein.

The construction process is an integral design component with respect to the geotechnical aspects of a project. Geotechnical engineering is not an exact science because of the variability of natural processes. Only a very small portion of the soils that will affect the performance of the proposed project has been sampled, observed, and tested. Unanticipated or changed conditions can occur during grading and excavating (see Appendix C). Proper geotechnical observation and testing during construction is necessary to allow the geotechnical engineer the opportunity to verify design assumptions. Therefore, Golder should be retained during site grading and construction to observe compliance with the design concepts and geotechnical recommendations contained herein. Golder can recommend design changes if subsurface conditions or methods of construction differ from those assumed in this report.

7.0 LIMITATIONS

This report has been prepared for the exclusive use of Townscape Partners, LLC. for the Proposed Residential Development at the 8150 Sunset Blvd project in Los Angeles, California. The findings, conclusions, and recommendations presented in this report were prepared in a manner consistent with the level of care and skill ordinarily exercised by other members of the geotechnical engineering profession currently practicing under similar conditions subject to the time limits and financial, physical, and other constraints applicable to the scope of work. No warranty, express or implied, is made. Section 1.1 and Appendix C contain further information regarding the proper use and interpretation of this geotechnical report.

The Owner has the responsibility to see that all parties to the project, including the designer, contractor, subcontractors, etc., are made aware of this report in its entirety. This report contains information that may be useful in the preparation of contract specifications and contractor cost estimates. However, this report is not written as a specification document and may not contain sufficient information for this use without proper modification.

8.0 REFERENCES

California Department of Transportation (Caltrans), 2012, Corrosion Guidelines Version 2.0, Sacramento, California.

California Division of Mines and Geology, 1998, Seismic Hazard Zone Report for the Hollywood 7.5 – Minute Quadrangle, Los Angeles County, California.

California Seismic Safety Commission, 2005, Homeowner's Guide to Earthquake Safety. Sacramento, California.

City of Los Angeles, 2005, Draft EIR for the Hollywood Community Plan, City of Los Angeles Planning Department, EIR N_o 2005-2154, Los Angeles, California.

Colburn, I.P. and Novak, G.A., 1989, Paleocene Conglomerates of the Santa Monica Mountains, California, Society of Economic Paleontologists and Mineralogists.

Dolan, Sieh, Rockwell, Guptill and Miller, 1997, Seismology of Hollywood, Northern Los Angeles Basin, California. Geological Society of America, Bulletin December 1997, vol. 109, no. 12.

Dolan, J. F., Stevens, D., and Rockwell, T. K., 2000, Paleoseismologic Evidence for an Early to Mid-Holocene Age of the Most Recent Surface Fault Rupture on the Hollywood Fault, Los Angeles; California, Bulletin of the Seismological Society of America.

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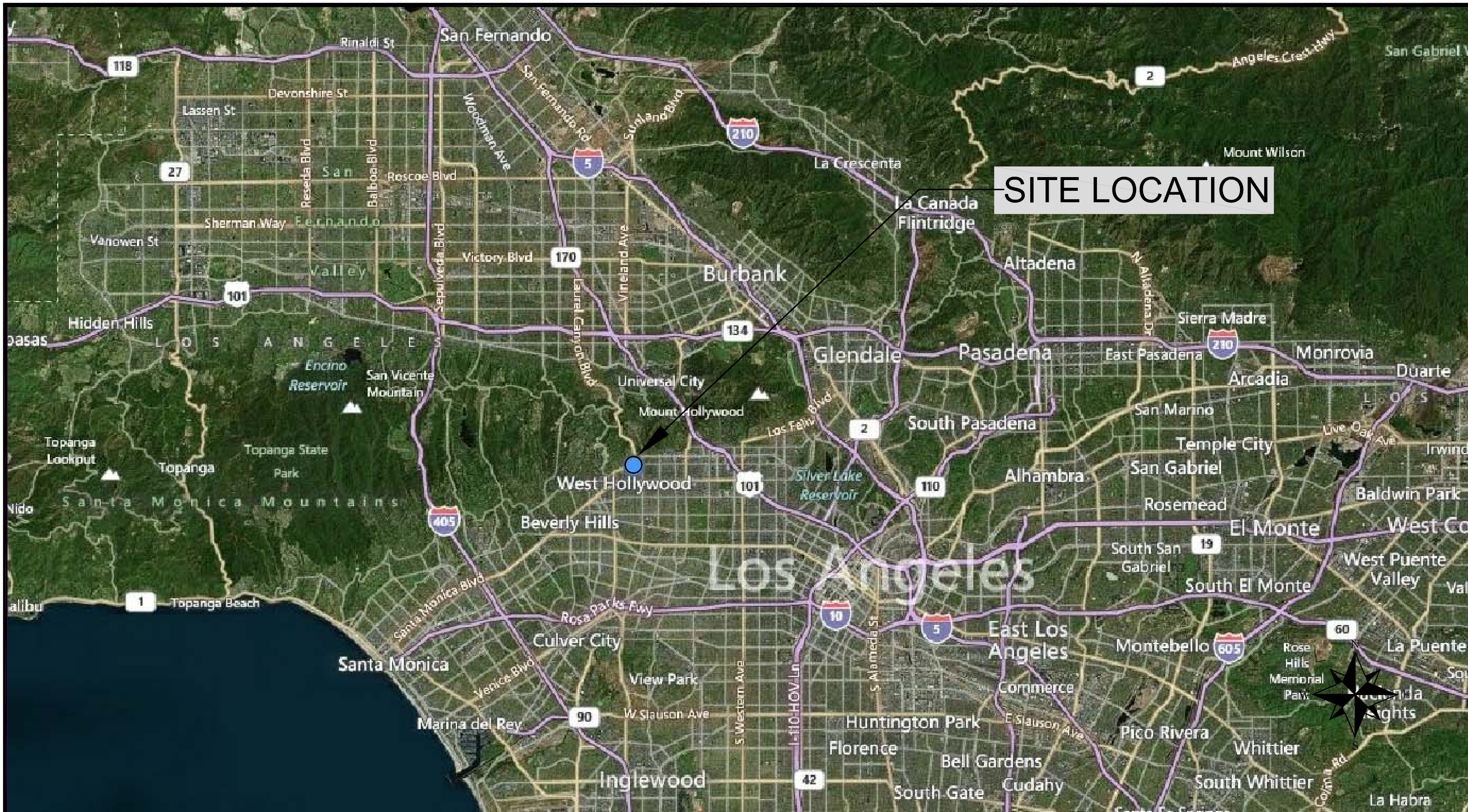
FIGURES

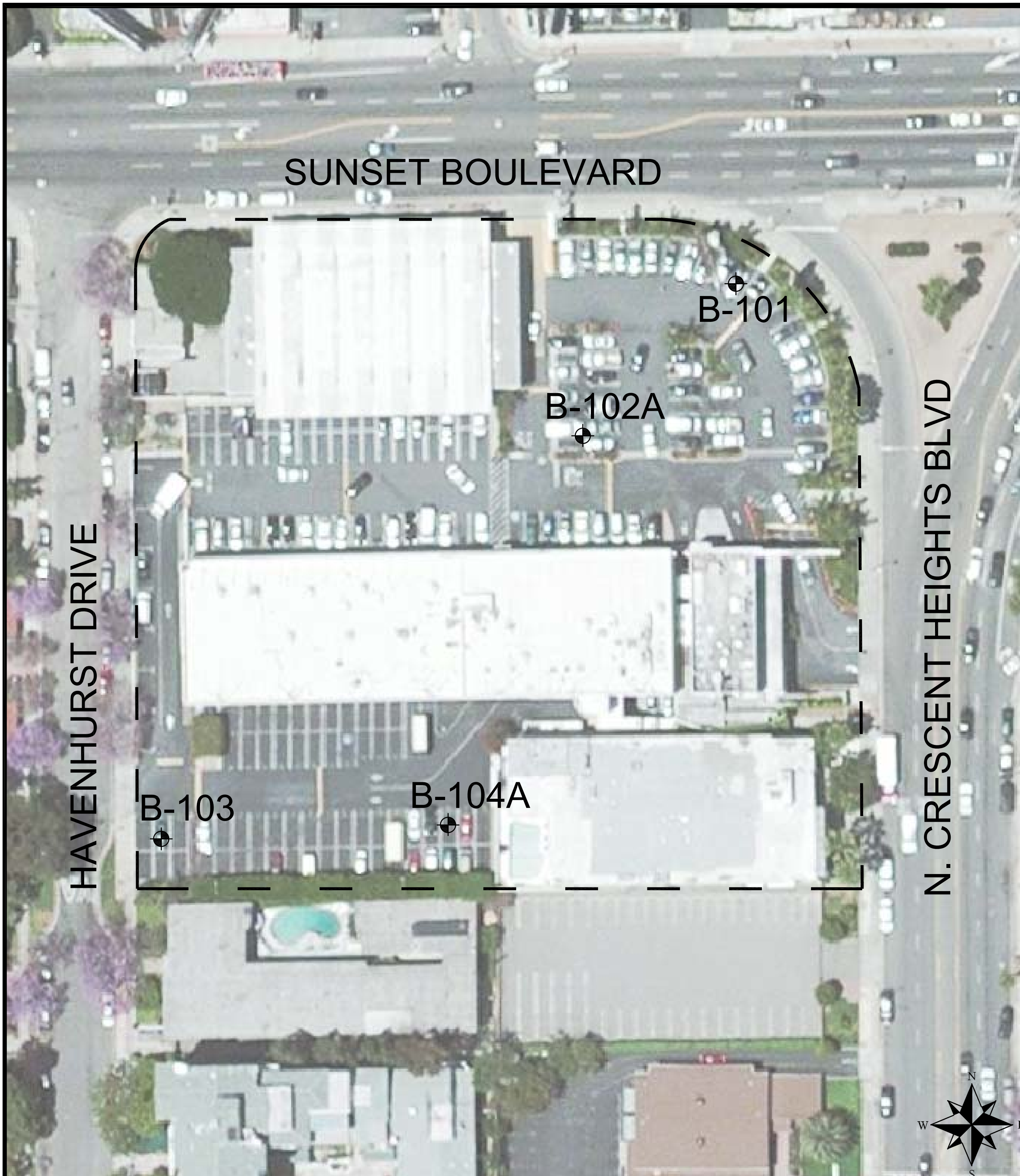
Drawing file: Figure 1.dwg Apr 02, 2013 – 3:42pm



PROJECT	
8150 SUNSET BOULEVARD LOS ANGELES, CA 90046	
TITLE	
SITE LOCATION MAP	

Golder Associates

PROJECT No.		123–92034	FILE No.	FIGURE 1.DWG
DESIGN	LG	04/2013	SCALE NTS	REV. 0
CADD	LG	04/2013		
CHECK	JB	04/2013	**FIG. 1**	
REVIEW	AW	04/2013		



LEGEND
IMAGE SOURCE: BING MAPS
BOREHOLE
SITE BOUNDARY

Drawing file: Figure 2.dwg Apr 02, 2013 - 3:45pm

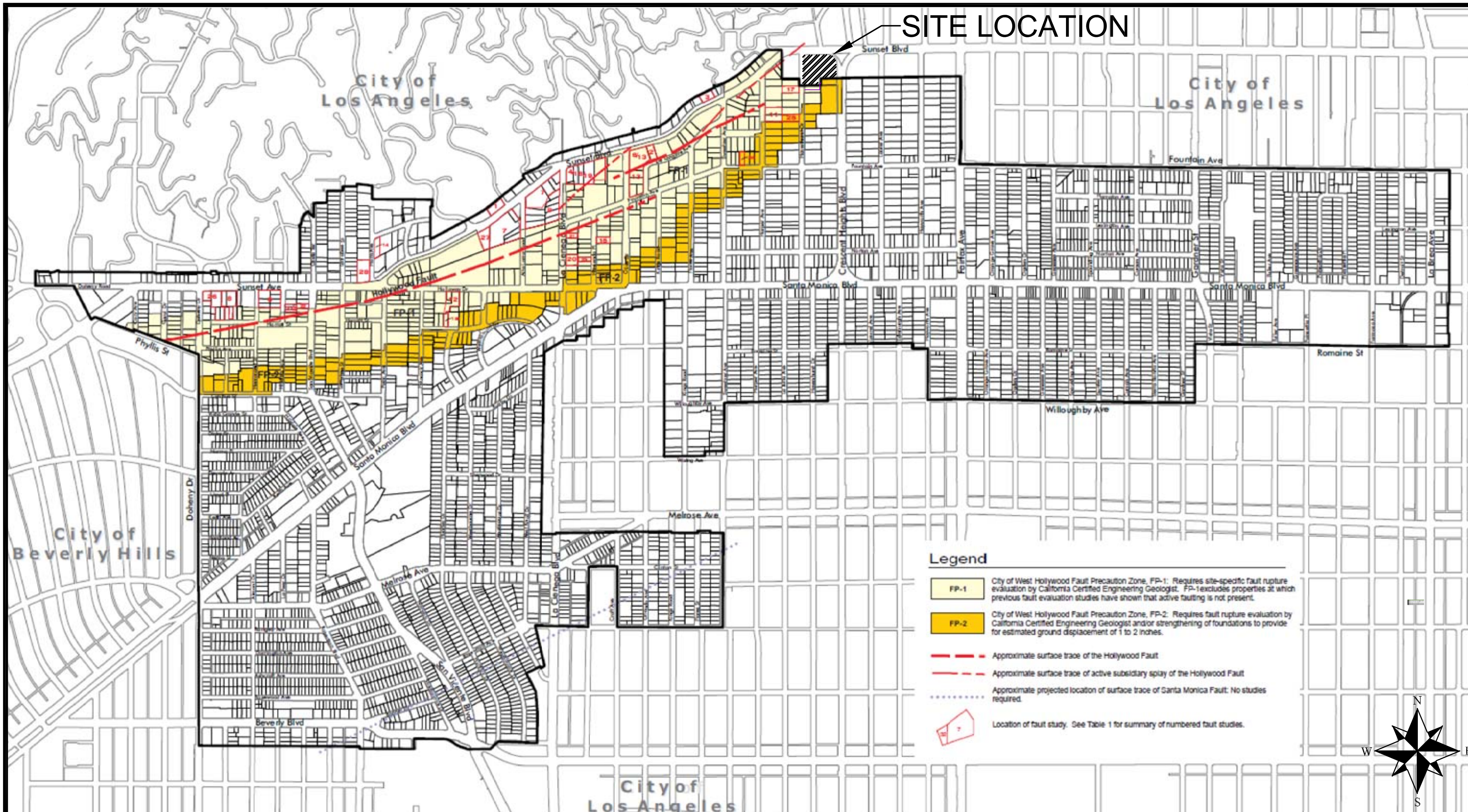
PROJECT
8150 SUNSET BOULEVARD
LOS ANGELES,CA 90046

TITLE
BOREHOLE LOCATIONS MAP

Golder Associates

PROJECT No.		123-92035	FILE No.	FIGURE 2.DWG
DESIGN	LG	04/2013	SCALE NTS	REV. 1
CADD	LG	04/2013		
CHECK	JB	04/2013	**FIG. 2**	
REVIEW	AW	04/2013		

Drawing file: Figure 3.dwg May 28, 2013 - 9:33am



LEGEND

SITE

REFERENCE

"Geologic and Seismic Technical Background Report, City of West Hollywood General Plan Update, West Hollywood, Los Angeles County, California," prepared by KFM Geoscience for the City of West Hollywood, dated March 15, 2010.

PROJECT

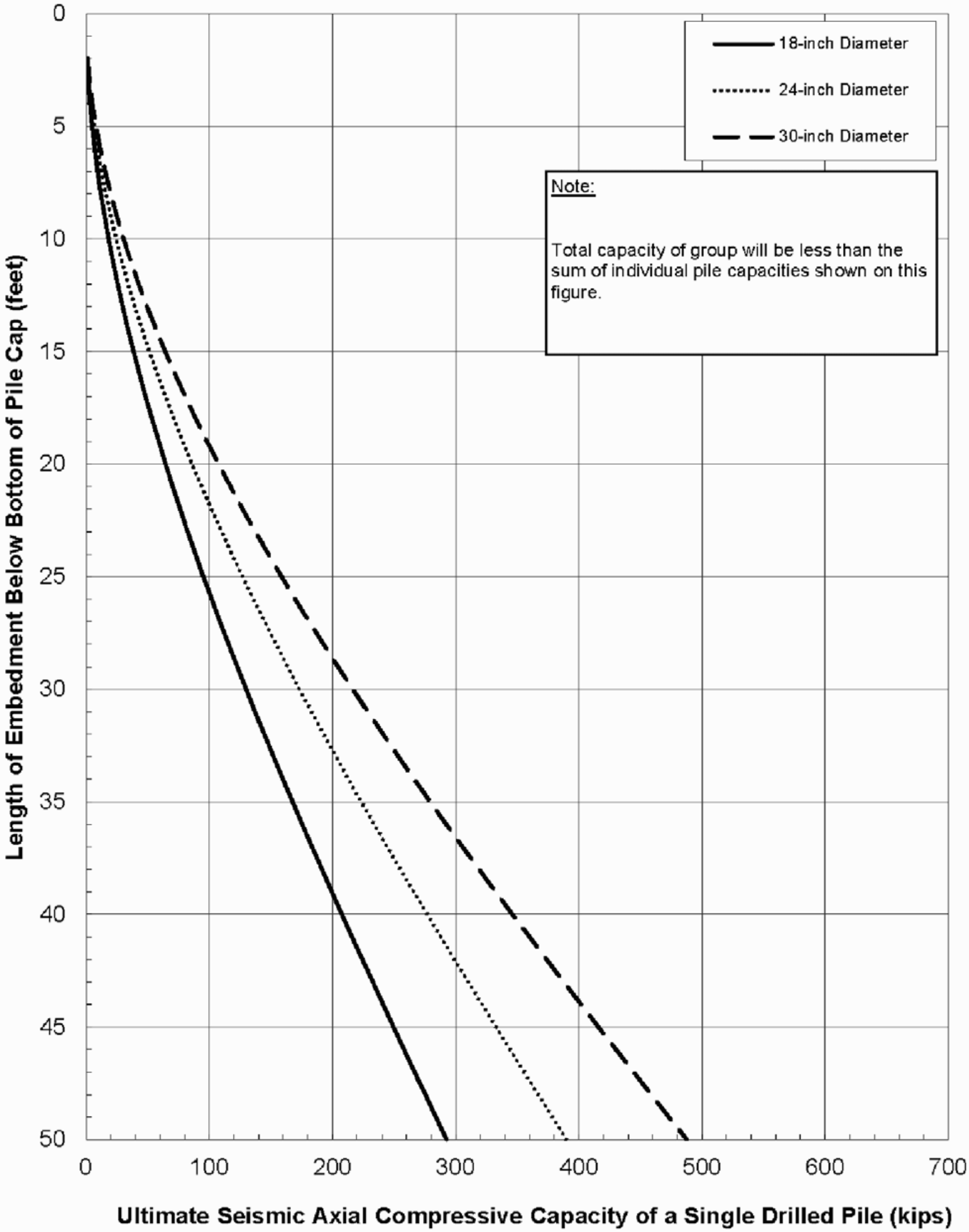
8150 SUNSET BOULEVARD
LOS ANGELES, CA 90046

TITLE

CITY OF WEST HOLLYWOOD FAULT PRECAUTION ZONE MAP

Golder Associates

PROJECT No.		123-92034	FILE No.	FIGURE 3.DWG
DESIGN	LG	05/2013	SCALE NTS	REV. 0
CADD	LG	05/2013		
CHECK	JB	05/2013	**FIG. 3**	
REVIEW	AW	05/2013		



Drawing file: Figure 4_1_1_1898.sv$.dwg May 28, 2013 - 10:02am

PROJECT

8150 SUNSET BOULEVARD
LOS ANGELES, CA 90046

TITLE

ULTIMATE CIDH PILE CAPACITIES BASED ON SIDE FRICTION

Golder Associates

PROJECT No.		123-92034	FILE No.	FIGURE 4.DWG
DESIGN	JB	05/2013	SCALE NTS	REV. 0
CADD	LG	05/2013		
CHECK	AJA	05/2013	**FIG. 4**	
REVIEW	AW	05/2013		

APPENDIX A

BORING LOGS

REPORT OF BOREHOLE: B-101

Golder Associates

CLIENT: AG-SCH 8150 Sunset Boulevard
PROJECT: Townscape Sunset
LOCATION: Los Angeles, CA
PROJECT NO.: 123-92034

DRIVE WEIGHT: 140 lbs.
DROP DISTANCE: 30 in.
N: E:
ELEVATION: DATUM:
INCLINATION: -90°
BOREHOLE DIAMETER: 8 inches

DRILLER: Martini Drilling Corp.
DRILL RIG: CME-75
LOGGED: C. Valenzuela DATE: 2/23/13
CHECKED: J. Bueno DATE: 2/23/13

Drilling					Sampling			Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE OR FIELD TEST	SAMPLE TYPE	BLOWS PER 6 INCHES	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisture, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
8-INCH HOLLOW STEM AUGER			0							2.5-inch asphalt pavement.			
									SM	SILTY SAND, coarse grained, poorly graded, subangular to subrounded; non-plastic; brown; non-cohesive; moist; loose to compact.			
			5		S-1		1 3 4						
			10		S-2		2 4 7			Increased fines content.			
					Bulk 1								
			15		S-3		3 5 6			Mostly coarse grained sand, traces of fine gravel.			
			20		S-4		4 6 7						
			25										

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: B-101

Golder Associates

CLIENT: AG-SCH 8150 Sunset Boulevard
PROJECT: Townscape Sunset
LOCATION: Los Angeles, CA
PROJECT NO.: 123-92034

DRIVE WEIGHT: 140 lbs.
DROP DISTANCE: 30 in.
N: E:
ELEVATION: DATUM:
INCLINATION: -90°
BOREHOLE DIAMETER: 8 inches

DRILLER: Martini Drilling Corp.
DRILL RIG: CME-75
LOGGED: C. Valenzuela DATE: 2/23/13
CHECKED: J. Bueno DATE: 2/23/13

METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE OR FIELD TEST	SAMPLE TYPE	BLOWS PER 6 INCHES	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisure, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
8-INCH HOLLOW STEM AUGER			25		S-5		4 5 7		SM	SILTY SAND, coarse grained, poorly graded, subangular to subrounded; non-plastic; brown; non-cohesive; moist; loose to compact. *(continued)*			
					Bulk 2								
			30		MC-1		5 11 14						
			35	35.0	S-7		3 5 5		SM ML	SILTY SAND/SANDY SILT, fine grained sand, traces of coarse grained sand, subangular to subrounded; non-plastic; brown; non-cohesive; moist; loose to compact.			
			40	40.0	MC-2		4 8 15		CL	SILTY CLAY, traces of coarse grained sand, subangular to subrounded; red-brown; low to medium plasticity; cohesive; moist; stiff.			
			45		S-8		9 9 8		SP	SAND WITH SILT, coarse grained, poorly graded, subangular to subrounded; traces of pebbles (< 5mm.); non plastic; light brown; non-cohesive; moist; compact.			
			50										

REPORT OF BOREHOLE: B-101

CLIENT:	AG-SCH 8150 Sunset Boulevard
PROJECT:	Townscape Sunset
LOCATION:	Los Angeles, CA
PROJECT NO.:	123-92034

DRIVE WEIGHT: 140 lbs.
DROP DISTANCE: 30 in.
N: E:
ELEVATION: DATUM:
INCLINATION: -90°
BOREHOLE DIAMETER: 8 inches

DRILLER: Martini Drilling Corp.
DRILL RIG: CME-75
LOGGED: C. Valenzuela DATE: 2/23/13
CHECKED: J. Bueno DATE: 2/23/13

Drilling					Sampling			Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE OR FIELD TEST	SAMPLE TYPE	BLOWS PER 6 INCHES	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisture, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
8-INCH HOLLOW STEM AUGER			50	50.0	S-9		3 6 4		SM	SILTY SAND, fine grained sand, subangular to subrounded; low plasticity; brown; cohesive; moist; loose to compact.			
			55		S-10		4 6 9						
			60	60.0	S-11		4 8 10		SP	SAND WITH SILT, coarse grained sand, subangular to subrounded, non-plastic, brown; non-cohesive; moist; compact.			
			65		S-12		7 10 12						
			70		S-13		6 11 11						
			75										

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: B-101

Golder Associates

CLIENT: AG-SCH 8150 Sunset Boulevard
PROJECT: Townscape Sunset
LOCATION: Los Angeles, CA
PROJECT NO.: 123-92034

DRIVE WEIGHT: 140 lbs.
DROP DISTANCE: 30 in.
N: E:
ELEVATION: DATUM:
INCLINATION: -90°
BOREHOLE DIAMETER: 8 inches

SHEET: 4 OF 4
DRILLER: Martini Drilling Corp.
DRILL RIG: CME-75
LOGGED: C. Valenzuela DATE: 2/23/13
CHECKED: J. Bueno DATE: 2/23/13

Drilling					Sampling			Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE OR FIELD TEST	SAMPLE TYPE	BLOWS PER 6 INCHES	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisture, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
			75		S-14		7 8 9		SP	SAND WITH SILT, coarse grained sand, subangular to subrounded, non-plastic, brown; non-cohesive; moist; compact. *(continued)*			
				76.5						Bottom of borehole at 76.5 feet. No groundwater observed during drilling. Borehole backfilled with soil cuttings. Asphalt pavement repaired with cold asphalt mix.			

REPORT OF BOREHOLE: B-102

Golder Associates

CLIENT:	AG-SCH 8150 Sunset Boulevard
PROJECT:	Townscape Sunset
LOCATION:	Los Angeles, CA
PROJECT NO.:	123-92034

DRIVE WEIGHT: 140 lbs.
DROP DISTANCE: 30 in.
N: E:
ELEVATION: DATUM:
INCLINATION: -90°
BOREHOLE DIAMETER: 8 inches

DRILLER: Martini Drilling Corp.
DRILL RIG: CME-75
LOGGED: C. Valenzuela DATE: 2/23/13
CHECKED: J. Bueno DATE: 2/23/13

Drilling					Sampling			Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE OR FIELD TEST	SAMPLE TYPE	BLOWS PER 6 INCHES	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisture, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			0							4-inch asphalt pavement			
				0.3						SANDY GRAVEL, coarse grained sand, fine gravel, subangular to subrounded; light brown; moist; loose.			
			5		S-1		3 3 3						
			10	10.0	S-2		5 5 7		SM	SILTY SAND, fine to coarse grained sand, poorly graded, subangular to subrounded; non-plastic; brown; non-cohesive; moist; loose to compact.			
			15		S-3		1 2 3			Increased moisture content, mostly fine grained sand.			
			20		S-4		2 3 3						
			25										

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: B-102

Golder Associates

CLIENT: AG-SCH 8150 Sunset Boulevard	DRIVE WEIGHT: 140 lbs.	SHEET: 2 OF 3	
PROJECT: Townscape Sunset	DROP DISTANCE: 30 in.	DRILLER: Martini Drilling Corp.	
LOCATION: Los Angeles, CA	N: E:	DRILL RIG: CME-75	
PROJECT NO.: 123-92034	ELEVATION: DATUM:	LOGGED: C. Valenzuela	DATE: 2/23/13
	INCLINATION: -90°	CHECKED: J. Bueno	DATE: 2/23/13
	BOREHOLE DIAMETER: 8 inches		

Drilling					Sampling			Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE OR FIELD TEST	SAMPLE TYPE	BLOWS PER 6 INCHES	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisture, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			25		S-5		4 5 4		SM	SILTY SAND, fine to coarse grained sand, poorly graded, subangular to subrounded; non-plastic; brown; non-cohesive; moist; loose to compact. *(continued)* Decreased fines content.			
			30	30.0	MC-1		7 10 13		SP	SAND, fine to coarse, poorly graded, subangular to subrounded; brown; moist; loose to compact. Middle third of sample collected.			
					Bulk 1								
			35		S-6		3 4 6			Increased fines content.			
			40		S-7		4 8 8						
			45	45.0	S-8		3 6 6		SM	SILTY SAND, fine grained, poorly graded, subangular to subrounded; non-plastic; brown; low cohesion; moist; compact.			
			50										

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: B-102

CLIENT:	AG-SCH 8150 Sunset Boulevard
PROJECT:	Townscape Sunset
LOCATION:	Los Angeles, CA
PROJECT NO.:	123-92034

DRIVE WEIGHT: 140 lbs.
DROP DISTANCE: 30 in.
N: E:
ELEVATION: DATUM:
INCLINATION: -90°
BOREHOLE DIAMETER: 8 inches

SHEET: 3 OF 3
DRILLER: Martini Drilling Corp.
DRILL RIG: CME-75
LOGGED: C. Valenzuela DATE: 2/23/13
CHECKED: J. Bueno DATE: 2/23/13

Drilling					Sampling			Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE OR FIELD TEST	SAMPLE TYPE	BLOWS PER 6 INCHES	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisture, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			50		S-9		4 6 7		SM	SILTY SAND, fine grained, poorly graded, subangular to subrounded; non-plastic; brown; low cohesion; moist; compact. *(continued)* Increased coarse grained sand content, traces of gravel, pebbles, and fragments of rock.			
			55	55.0	S-10		2 5 7		SC SM	SILTY CLAYEY SAND, fine grained sand, subangular to subrounded; low plasticity; red-brown; low cohesion; moist; compact.			
			60	60.0	S-11		6 9 9		SP	SAND, coarse to fine grained (mostly coarse grained), poorly graded, subangular to subrounded; brown; moist; compact.			
				61.5						Bottom of borehole at 61.5 feet. No groundwater observed during drilling. Borehole backfilled with soil cuttings. Asphalt pavement repaired with cold asphalt mix.			

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: B-103

Golder Associates

CLIENT: AG-SCH 8150 Sunset Boulevard
PROJECT: Townscape Sunset
LOCATION: Los Angeles, CA
PROJECT NO.: 123-92034

DRIVE WEIGHT: 140 lbs.
DROP DISTANCE: 30 in.
N: E:
ELEVATION: DATUM:
INCLINATION: -90°
BOREHOLE DIAMETER: 8 inches

SHEET: 1 OF 3
DRILLER: Martini Drilling Corp.
DRILL RIG: CME-75
LOGGED: C. Valenzuela DATE: 2/23/13
CHECKED: J. Bueno DATE: 2/23/13

Drilling					Sampling			Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE OR FIELD TEST	SAMPLE TYPE	BLOWS PER 6 INCHES	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisture, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			0							4.5-inch asphalt pavement.			
				0.4					SM	SILTY SAND, fine to coarse grained sand (mostly medium to coarse grained), poorly graded, subangular to subrounded; non-plastic; brown; non-cohesive; moist; loose.			
			5		S-1		2 2 4						
			10		S-2		2 3 3						
			15	15.0	S-3		2 3 3		SM ML	SILTY SAND/SANDY SILT, fine grained sand, subangular to subrounded; non-plastic; brown; low to non-cohesive; moist; loose.			
			20	20.0	MC-1		6 9 11		SP	SAND, coarse grained, poorly graded, subangular to subrounded, traces of fine grained sand, non-plastic; brown; low cohesion; moist; loose to compact.			
			25										

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: B-103

Golder Associates

CLIENT: AG-SCH 8150 Sunset Boulevard	DRIVE WEIGHT: 140 lbs.	SHEET: 2 OF 3	
PROJECT: Townscape Sunset	DROP DISTANCE: 30 in.	DRILLER: Martini Drilling Corp.	
LOCATION: Los Angeles, CA	N: E:	DRILL RIG: CME-75	
PROJECT NO.: 123-92034	ELEVATION: DATUM:	LOGGED: C. Valenzuela	DATE: 2/23/13
	INCLINATION: -90°	CHECKED: J. Bueno	DATE: 2/23/13
	BOREHOLE DIAMETER: 8 inches		

Drilling					Sampling			Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE OR FIELD TEST	SAMPLE TYPE	BLOWS PER 6 INCHES	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisture, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			25		S-4		3 4 6		SP	SAND, coarse grained, poorly graded, subangular to subrounded, traces of fine grained sand, non-plastic; brown; low cohesion; moist; loose to compact. *(continued)*			
					Bulk 1								
			30		S-5		4 8 7			Decreased fine sand, and moisture content.			
			35		S-6		3 6 6			Increased fines content, and fine sand.			
			40		S-7		4 4 5						
			45		S-8		9 8 8						
			50										

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: B-103

Golder Associates

CLIENT: AG-SCH 8150 Sunset Boulevard
PROJECT: Townscape Sunset
LOCATION: Los Angeles, CA
PROJECT NO.: 123-92034

DRIVE WEIGHT: 140 lbs.
DROP DISTANCE: 30 in.
N: E:
ELEVATION: DATUM:
INCLINATION: -90°
BOREHOLE DIAMETER: 8 inches

SHEET: 3 OF 3
DRILLER: Martini Drilling Corp.
DRILL RIG: CME-75
LOGGED: C. Valenzuela DATE: 2/23/13
CHECKED: J. Bueno DATE: 2/23/13

METHOD	DRILL DATE/TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE OR FIELD TEST	SAMPLE TYPE	BLOWS PER 6 INCHES	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisture, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			50		S-9		3 7 8		SP	SAND, coarse grained, poorly graded, subangular to subrounded, traces of fine grained sand, non-plastic; brown; low cohesion; moist; loose to compact. *(continued)*			
			55	55.0	S-10		9 9 10			SANDY GRAVEL, coarse grained sand, fine gravel, poorly graded, subangular to subrounded; light brown; moist; compact.			
			60	60.0	S-11		4 7 10		SM	SILTY SAND, coarse grained sand, poorly graded, subangular to subrounded; non-plastic; brown; non-cohesive; moist, compact.			
				61.5						Bottom of borehole at 61.5 feet. No groundwater observed during drilling. Borehole backfilled with soil cuttings. Asphalt pavement repaired with cold asphalt mix.			

REPORT OF BOREHOLE: B-104

Golder Associates

CLIENT: AG-SCH 8150 Sunset Boulevard	DRIVE WEIGHT: 140 lbs.	SHEET: 1 OF 3	
PROJECT: Townscape Sunset	DROP DISTANCE: 30 in.	DRILLER: Martini Drilling Corp.	
LOCATION: Los Angeles, CA	N: E:	DRILL RIG: CME-75	
PROJECT NO.: 123-92034	ELEVATION: DATUM:	LOGGED: C. Valenzuela	DATE: 2/23/13
	INCLINATION: -90°	CHECKED: J. Bueno	DATE: 2/23/13
	BOREHOLE DIAMETER: 8 inches		

Drilling					Sampling			Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE OR FIELD TEST	SAMPLE TYPE	BLOWS PER 6 INCHES	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisture, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			0							4.5-inch asphalt pavement.			
				0.4					SM ML	SILTY SAND/ SANDY SILT, fine grained sand, poorly graded, subangular to subrounded; non-plastic; brown; non-cohesive; moist; loose.			
			5		S-1		2 3 3						
			10	10.0	S-2		1 2 2		SM	SILTY SAND, fine to coarse grained sand; poorly graded; subangular to subrounded; low plasticity; red-brown; low cohesion; very loose to compact.			
			15		S-3		2 3 3			Increased coarse grained sand.			
			20		S-4		4 6 5			Decreased moisture content.			
					Bulk 1								
			25										

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: B-104

Golder Associates

CLIENT:	AG-SCH 8150 Sunset Boulevard	DRIVE WEIGHT: 140 lbs.	SHEET: 2 OF 3		
PROJECT:	Townscape Sunset	DROP DISTANCE: 30 in.	DRILLER: Martini Drilling Corp.		
LOCATION:	Los Angeles, CA	N: E:	DRILL RIG: CME-75		
PROJECT NO.:	123-92034	ELEVATION: DATUM:	LOGGED: C. Valenzuela	DATE: 2/23/13	
		INCLINATION: -90°	CHECKED: J. Bueno	DATE: 2/23/13	
		BOREHOLE DIAMETER: 8 inches			

Drilling					Sampling			Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE OR FIELD TEST	SAMPLE TYPE	BLOWS PER 6 INCHES	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisture, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			25	25.0	MC-1		8 10 11		GP SP	SANDY GRAVEL, coarse grained sand; poorly graded; subangular to subrounded; tan to light brown; dry ; very loose to compact.			
			30	30.0	S-5		5 6 7		SM	SILTY SAND, fine grained sand, poorly graded, subangular to subrounded; non-plastic; brown; non-cohesive; compact.			
			35		S-6		4 7 7						
			40		S-7		4 6 6			Increased coarser grained sand.			
			45		S-8		3 5 6			Decreased moisture content.			
			50										

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: B-104

CLIENT:	AG-SCH 8150 Sunset Boulevard
PROJECT:	Townscape Sunset
LOCATION:	Los Angeles, CA
PROJECT NO.:	123-92034

DRIVE WEIGHT: 140 lbs.
DROP DISTANCE: 30 in.
N: E:
ELEVATION: DATUM:
INCLINATION: -90°
BOREHOLE DIAMETER: 8 inches

SHEET: 3 OF 3
DRILLER: Martini Drilling Corp.
DRILL RIG: CME-75
LOGGED: C. Valenzuela DATE: 2/23/13
CHECKED: J. Bueno DATE: 2/23/13

Drilling					Sampling			Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE OR FIELD TEST	SAMPLE TYPE	BLOWS PER 6 INCHES	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisture, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			50		S-9		5 8 9		SM	SILTY SAND, fine grained sand, poorly graded, subangular to subrounded; non-plastic; brown; non-cohesive; compact. *(continued)*			
			55	55.0	S-10		5 8 8		GP SP	SANDY GRAVEL, coarse sand, fine gravel, poorly graded, subangular to subrounded; tan to light brown; compact.			
			60	60.0	S-11		6 10 11		SP	SAND, traces of silt, coarse grained sand, poorly graded, subangular to subrounded; brown, compact.			
				61.5						Bottom of borehole at 61.5 feet. No groundwater observed during drilling. Borehole backfilled with soil cuttings. Asphalt pavement repaired with cold asphalt mix.			

REPORT OF BOREHOLE: KEY

CLIENT: AG-SCH 8150 Sunset Boulevard	DRIVE WEIGHT: 140 lbs.	SHEET: 1 OF 1	
PROJECT: Townscape Sunset	DROP DISTANCE: 30 in.	DRILLER: Martini Drilling Corp.	
LOCATION: Los Angeles, CA	N: E:	DRILL RIG: CME-75	
PROJECT NO.: 123-92034	ELEVATION: DATUM:	LOGGED: C. Valenzuela	DATE: 2/23/13
	INCLINATION: -90°	CHECKED: J. Bueno	DATE: 2/23/13
	BOREHOLE DIAMETER: 8 inches		

METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE OR FIELD TEST	SAMPLE TYPE	BLOWS PER 6 INCHES	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisture, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
Hollow Stem Auger			0						GP	**Graphic Log:** Standard symbols for soil and rock types **USCS:** Unified Soil Classification System per ASTM D2487 **MATERIAL DESCRIPTION FOR SOIL:** Soil Classifications are based on the Unified Soil Classification System per ASTM D2487 and include density, particle size, color, moisture and minor components.			
			5		S-1		7 8 9			Standard Penetration Test (SPT) **Blows Per 6 Inches/Penetration** : Number of hammer blows required to drive sampler 6 inches			
					MC-1		8 10 11			Modified California Sample (MC)			
			10	11.0					SP	Inferred material contact (dashed line) - actual material contact may be gradual			
				22.5						Bottom of borehole (solid line)			

RELATIVE DENSITY OR CONSISTENCY:

Blows	Coarse-Grained Soil	Blows	Fine-Grained Soil
0-4	Very Loose	0-2	Very soft
5-10	Loose	3-4	Soft
11-30	Compact	5-8	Firm
31-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very stiff
		>30	Hard

DESCRIPTIVE TERMINOLOGY DENOTING PROPORTIONS:

Descriptive Terms:	Range of Proportions:
Trace	0-5%
Little	5-12%
Some	12-30%
And	30-50%

Report of borehole must be read in conjunction with accompanying notes and abbreviations

GEOTECH WITH MATERIAL GRAPHICS AND USCS TOWNSCAPE SUNSET.GPJ GINT STD US LAB.GDT 5/23/13

APPENDIX B

GEOTECHNICAL LABORATORY TEST RESULTS

SUMMARY OF LABORATORY TEST RESULTS

Client: Golder Associates Inc.
Project Name: Townscope Sunset
Project No.: 123-92034

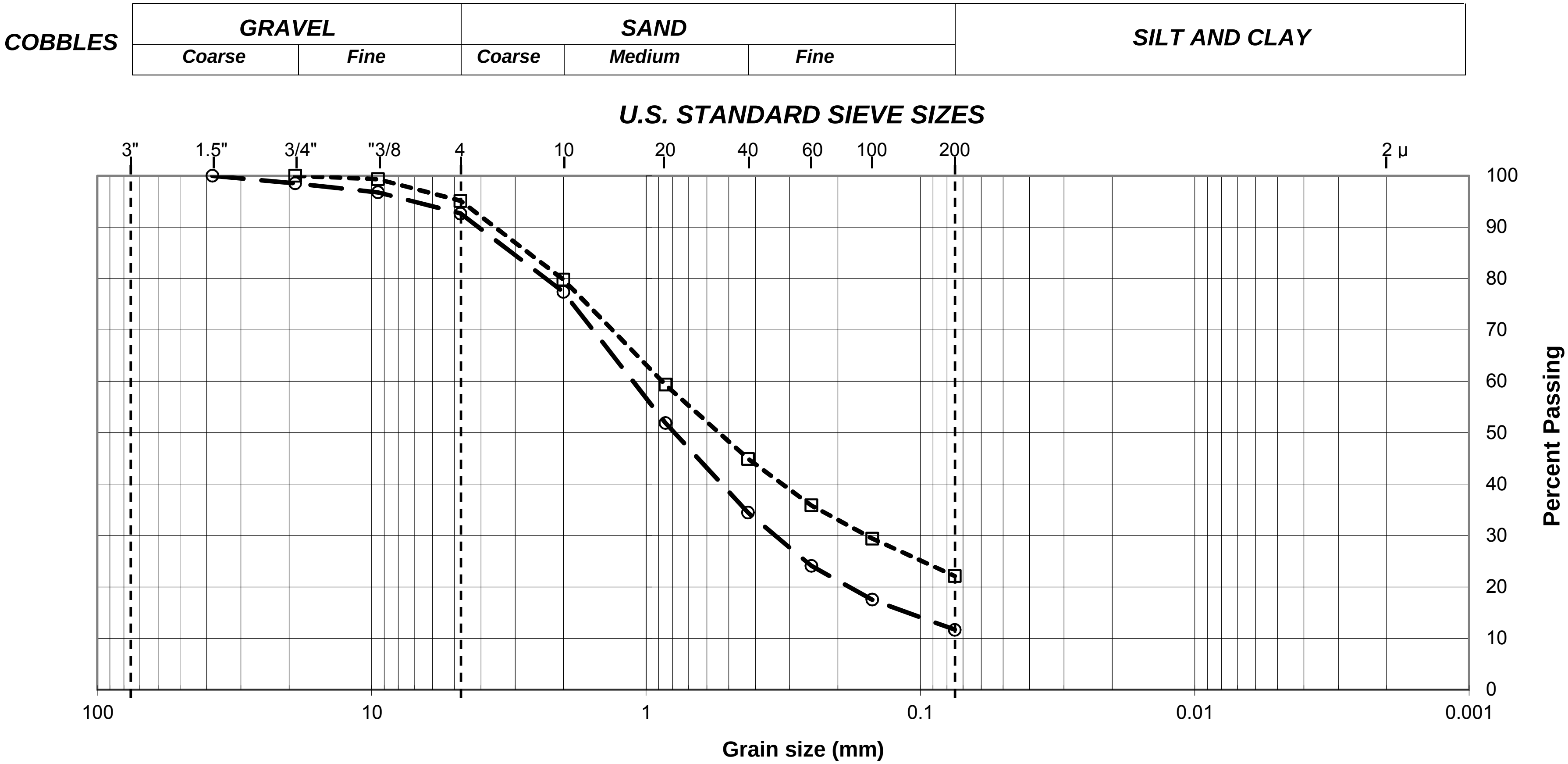
HAI Project No: GLDL-13-003
Performed by: JT
Date: 3/7/2013

Boring No.	Sample No.	Depth (ft)	In-situ Moisture Content (%)	In-situ Dry Density (pcf)	Modified Proctor (ASTM D1557)		R Value (CTM 301)	Particle-size Analysis of Soils (ASTM D422) (Percent Passing)									
					Optimum Moisture Content (%)	Maximum Dry Density (pcf)		1 1/2 "	3/4 "	3/8 "	# 4	# 10	# 20	# 40	# 60	# 100	# 200
B-101	Bulk 1	11.5-15						100.0	98.5	96.8	92.6	77.4	51.9	34.5	24.1	17.5	11.7
	Bulk 2	26.5-30			7.8	136.0	71		100.0	99.4	95.1	79.8	59.4	44.9	35.9	29.4	22.1
	MC-1	30	5.4	117.3						100.0	97.5	83.8	59.6	38.4	25.0	17.0	10.6
	MC-2	40	10.2	124.1					100.0	99.1	96.2	82.2	64.0	50.2	40.8	32.5	25.0
B-102	S-1	5							100.0	89.2	82.8	64.5	39.5	23.4	15.1	10.6	6.8
	S-5	25							100.0	98.6	95.9	77.4	53.7	37.5	26.9	18.8	11.1
	MC-1	30	3.7	111.8					100.0	98.2	94.6	73.8	42.9	24.6	14.9	9.4	5.4
	S-7	40								100.0	99.0	86.7	57.6	32.2	18.6	11.8	7.4
B-103	S-2	10								100.0	97.5	82.0	56.2	37.1	25.2	18.1	12.0
	S-3	15							100.0	99.7	98.5	87.6	71.0	57.6	46.7	37.4	25.6
	MC-1	20	4.0	109.2					100.0	99.5	98.2	82.7	57.3	35.2	20.4	11.9	6.5
B-104	Bulk 1	21.5-25			7.0	134.1	63	100.0	99.3	98.3	93.2	67.7	43.9	29.9	21.6	16.0	11.1
	S-7	40							100.0	98.6	95.7	80.0	63.6	51.9	41.7	33.2	23.1

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

PARTICLE-SIZE ANALYSIS OF SOILS
(ASTM D422)

Client:	Golder Associates Inc.	***HAI Project No.:***	GLDL-13-003
Project Name:	Townscope Sunset	***Tested by:***	KL/PM
Project No.:	123-92034	***Checked by:***	JT
		Date:	3/5/2013

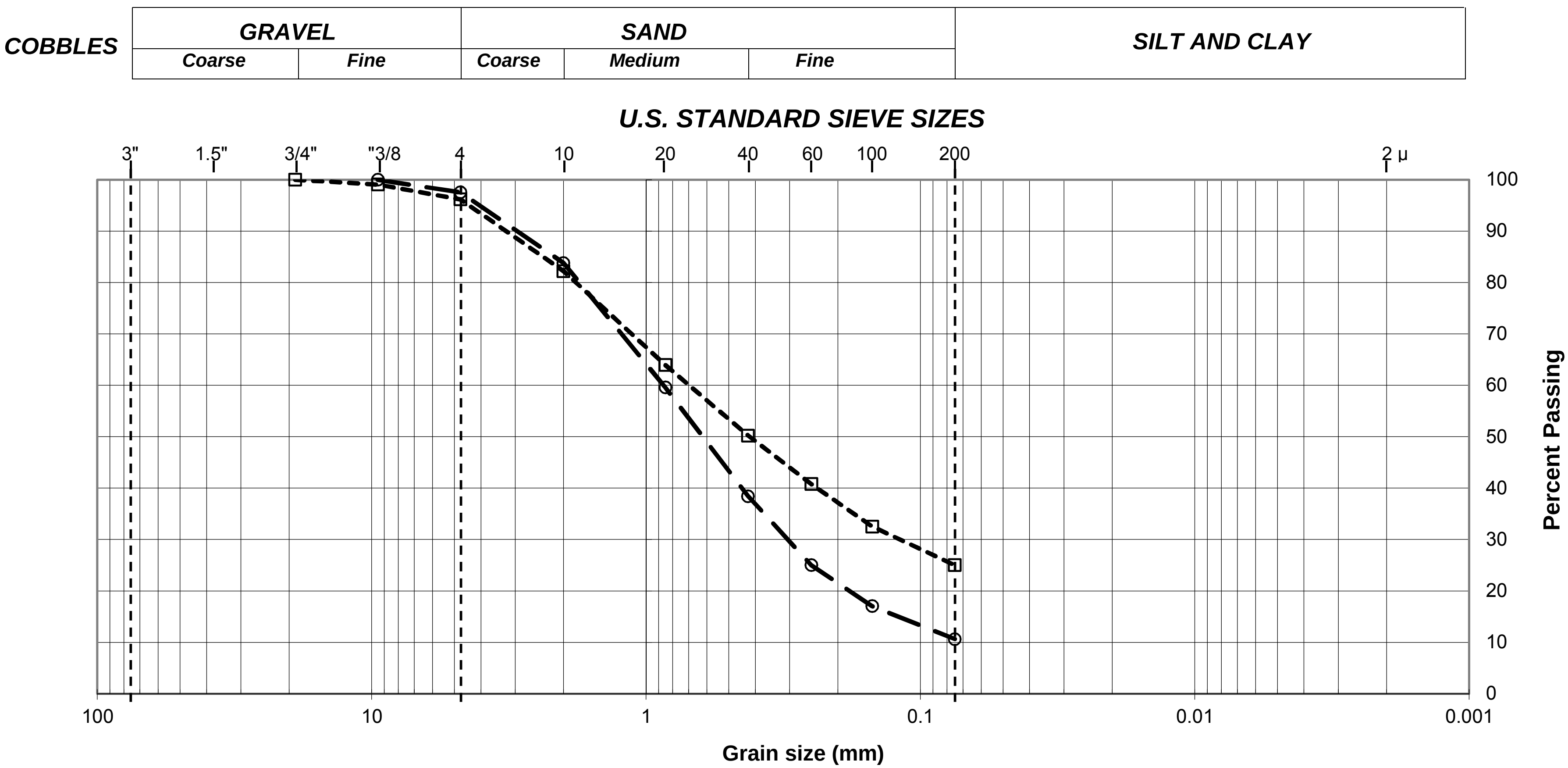


Boring No.	Sample No.	Depth (ft)	Symbol	USCS	% Gravel	% Sand	% Fines
B-101	Bulk 1	11.5-15	○	Brown, Well-Graded Sand with Silt (SW-SM)	7.4	81.0	11.7
	Bulk 2	26.5-30	□	Brown, Silty Sand (SM)	4.9	73.0	22.1

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

PARTICLE-SIZE ANALYSIS OF SOILS
(ASTM D422)

Client:	Golder Associates Inc.	**HAI Project No.:**	GLDL-13-003
Project Name:	Townscope Sunset	**Tested by:**	KL/PM
Project No.:	123-92034	**Checked by:**	JT
		Date:	3/5/2013

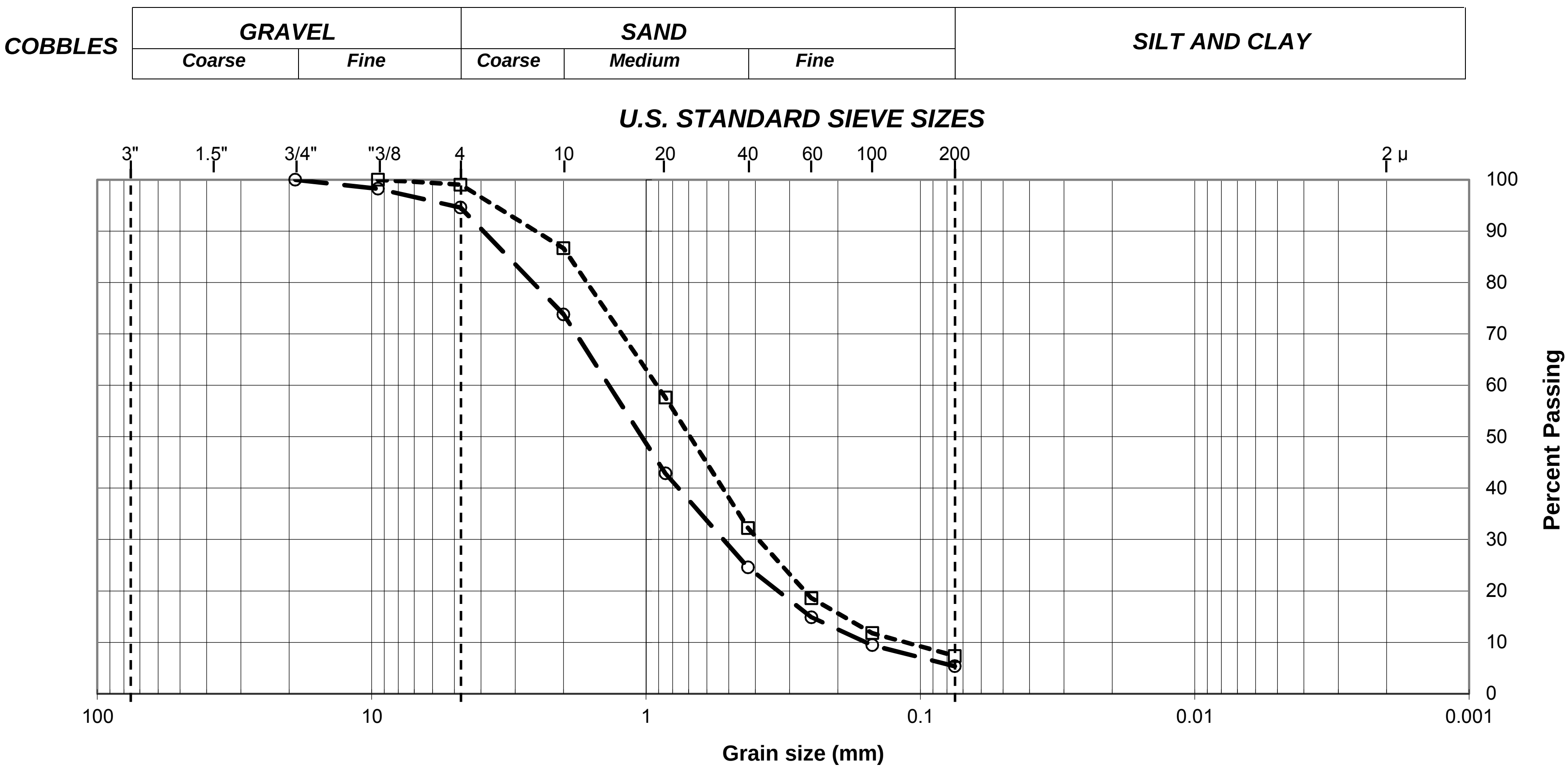


Boring No.	Sample No.	Depth (ft)	Symbol	USCS	% Gravel	% Sand	% Fines
B-101	MC-1	30	○	Brown, Well-Graded Sand with Silt (SW-SM)	2.5	86.9	10.6
	MC-2	40	□	Brown, Clayey Sand (SC)	3.8	71.2	25.0

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

PARTICLE-SIZE ANALYSIS OF SOILS
(ASTM D422)

Client:	Golder Associates Inc.	***HAI Project No.:***	GLDL-13-003
Project Name:	Townscope Sunset	***Tested by:***	KL/PM
Project No.:	123-92034	***Checked by:***	JT
		Date:	3/5/2013

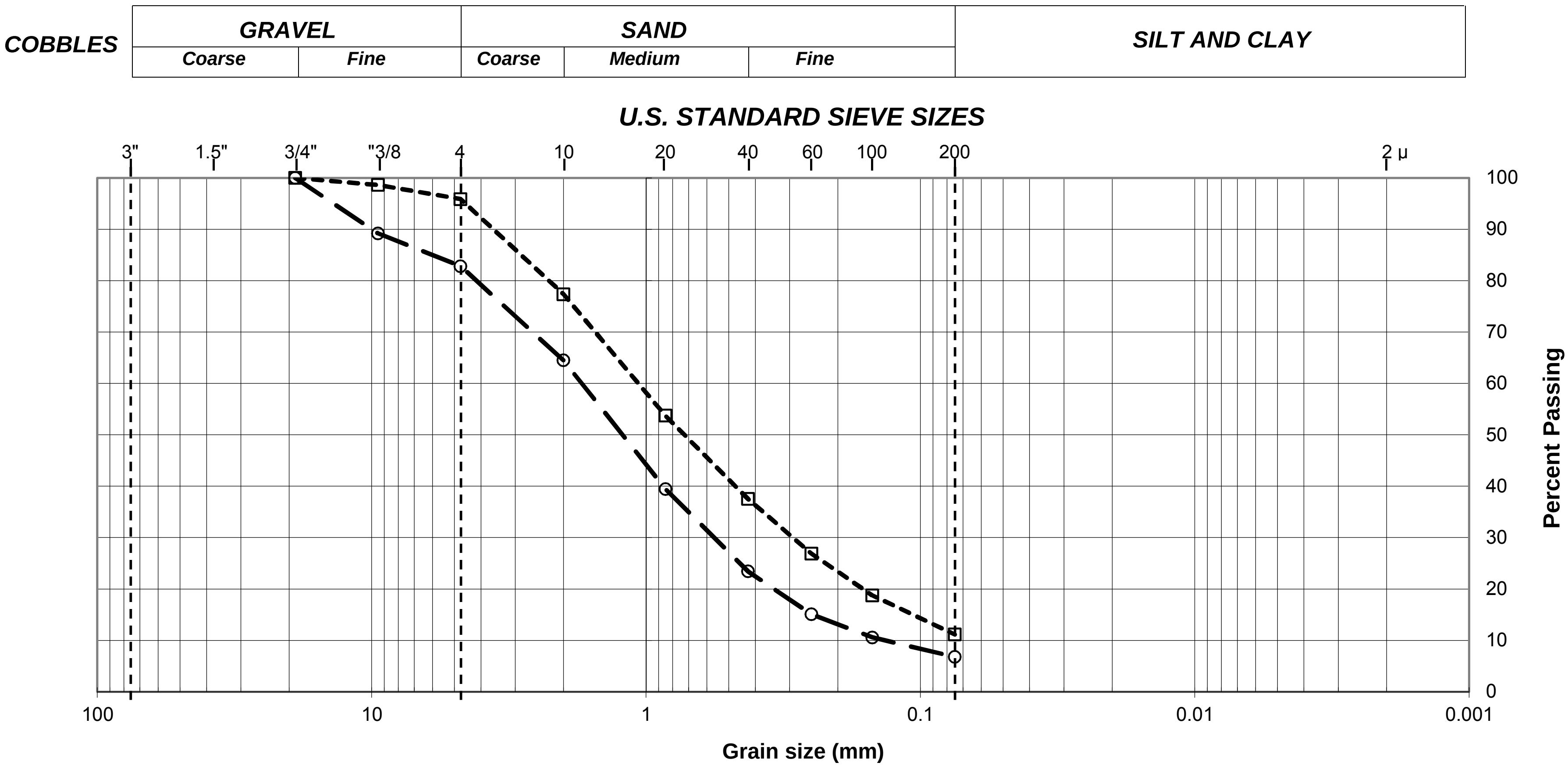


Boring No.	Sample No.	Depth (ft)	Symbol	USCS	% Gravel	% Sand	% Fines
B-102	MC-1	30	○	Brown, Well-Graded Sand with Silt (SW-SM)	5.4	89.2	5.4
	S-7	40	□	Brown, Well-Graded Sand with Silt (SW-SM)	1.0	91.7	7.4

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

PARTICLE-SIZE ANALYSIS OF SOILS
(ASTM D422)

Client:	Golder Associates Inc.	***HAI Project No.:***	GLDL-13-003
Project Name:	Townscope Sunset	***Tested by:***	KL/PM
Project No.:	123-92034	***Checked by:***	JT
		Date:	3/5/2013

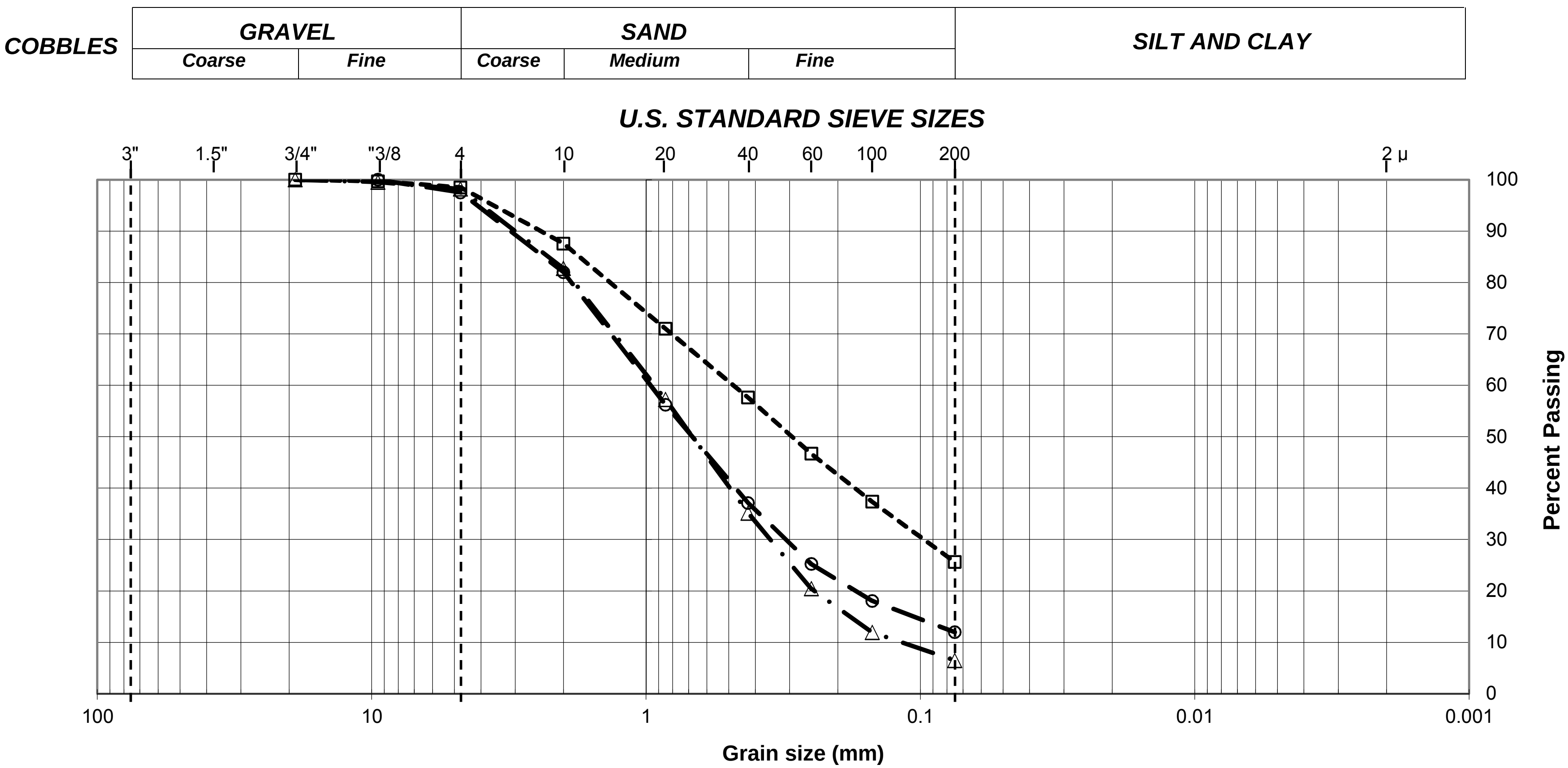


Boring No.	Sample No.	Depth (ft)	Symbol	USCS	% Gravel	% Sand	% Fines
B-102	S-1	5	○	Brown, Well-Graded Sand with Silt and Gravel (SW-SM)	17.2	76.1	6.8
	S-5	25	□	Brown, Well-Graded Sand with Silt (SW-SM)	4.1	84.7	11.1

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

PARTICLE-SIZE ANALYSIS OF SOILS
(ASTM D422)

Client:	Golder Associates Inc.	***HAI Project No.:***	GLDL-13-003
Project Name:	Townscope Sunset	***Tested by:***	KL/PM
Project No.:	123-92034	***Checked by:***	JT
		Date:	3/5/2013

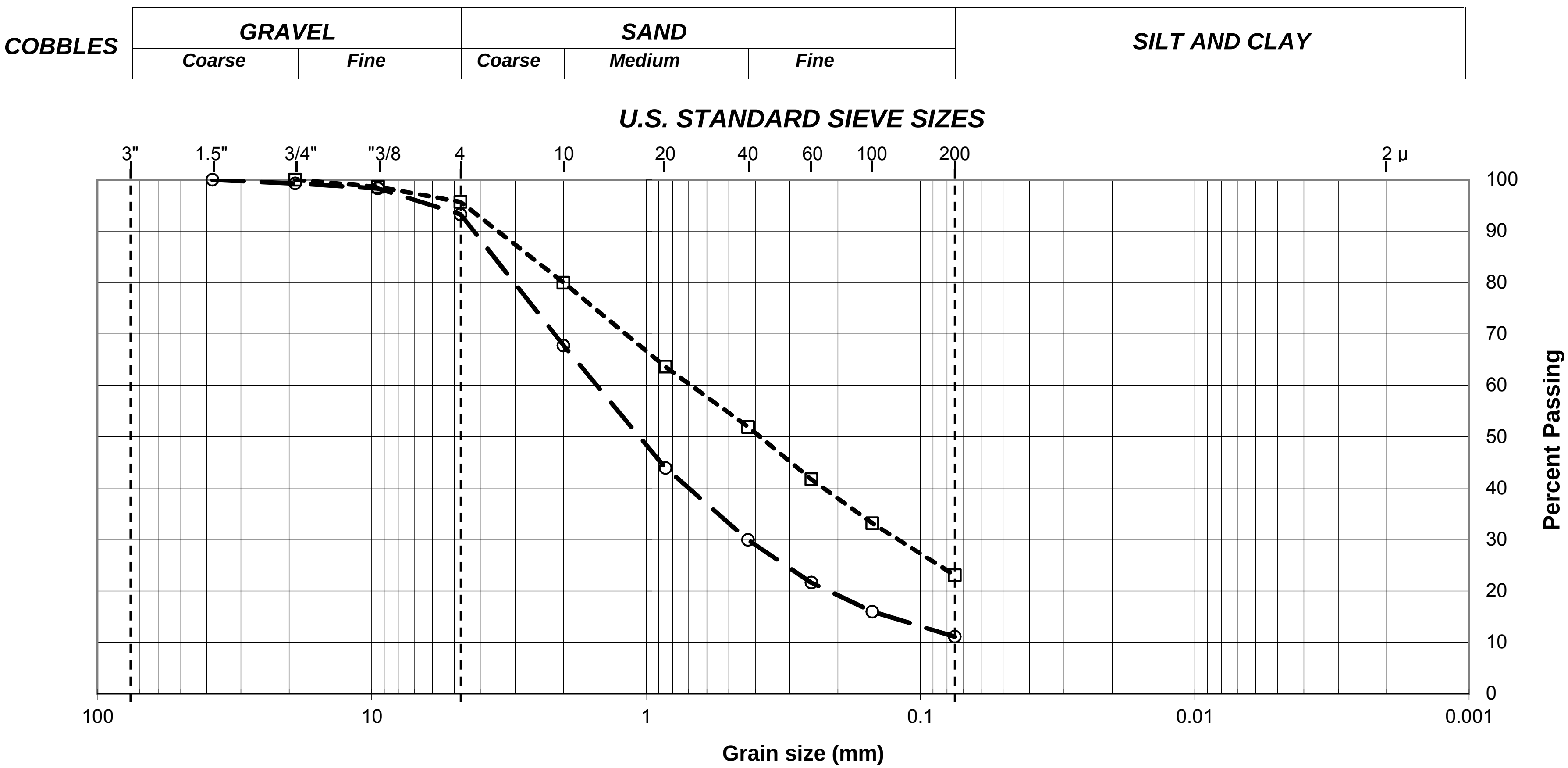


Boring No.	Sample No.	Depth (ft)	Symbol	USCS	% Gravel	% Sand	% Fines
B-103	**S-2**	**10**	○	Brown, Silty Sand (SM)	2.5	85.5	12.0
	S-3	**15**	□	Brown, Clayey Sand (SC)	1.5	72.9	25.6
	MC-1	**20**	△	Brown, Well-Graded Sand with Silt (SW-SM)	1.8	91.7	6.5

HAI **HUSHMAND ASSOCIATES, INC.**
Geotechnical and Earthquake Engineers

PARTICLE-SIZE ANALYSIS OF SOILS
(ASTM D422)

Client:	Golder Associates Inc.	***HAI Project No.:***	GLDL-13-003
Project Name:	Townscope Sunset	***Tested by:***	KL/PM
Project No.:	123-92034	***Checked by:***	JT
		Date:	3/5/2013



Boring No.	Sample No.	Depth (ft)	Symbol	USCS	% Gravel	% Sand	% Fines
B-104	**Bulk 1**	**21.5-25**	○	Brown, Well-Graded Sand with Silt (SW-SM)	6.8	82.1	11.1
	S-7	**40**	□	Brown, Silty Sand (SM)	4.3	72.6	23.1

MOISTURE CONTENT AND DRY DENSITY OF RING SAMPLES

Client: Golder Associates Inc.
Project Name: Townscope Sunset
Project No.: 123-92034

HAI Project No.: GLDL-13-003
Performed by: KL/PM
Checked by: JT
Date: 3/5/2013

Boring No.		**B-101**		**B-102**	**B-103**
Sample No.		**MC-1**	**MC-2**	**MC-1**	**MC-1**
Depth (ft)		**30**	**40**	**30**	**20**
Total wt of rings and soil	gr	581.20	1257.39	922.91	908.86
Height of sample	in	3	6	5	5
Diameter of sample	in	2.416	2.416	2.416	2.416
Volume of sample	cu.ft	0.0080	0.0159	0.0133	0.0133
Weight of rings	gr	135.09	270.19	225.15	225.15
Weight of soil	lbs.	0.983	2.176	1.538	1.507
Wet Density	pcf	123.6	136.7	116.0	113.6
Container No.		84	85	88	92
Weight of cont.+ wet soil	gr	390.94	549.91	407.83	414.85
Weight of cont.+ dry soil	gr	371.39	499.84	393.50	399.06
Weight of container	gr	8.37	8.45	8.36	8.30
Weight of water	gr	19.55	50.07	14.33	15.79
Weight of dry soil	gr	363.02	491.39	385.14	390.76
Moisture Content	**%**	**5.4**	**10.2**	**3.7**	**4.0**
Dry Density	**pcf**	**117.3**	**124.1**	**111.8**	**109.2**

HAI **HUSHMAND ASSOCIATES INC.**
Geotechnical and Earthquake Engineers

• ANALYSIS
• DESIGN

LaBelle • Marvin

PROFESSIONAL PAVEMENT ENGINEERING
A CALIFORNIA CORPORATION

• SOILS, ASPHALT TECHNOLOGY

March 1, 2013

Mr. Peter Moore
Hushmand Associates
250 Goddard
Irvine, California 92618

Fax: (949) 777-1276
Project No. 38571

Dear Mr. Moore:

Testing of the bulk soil samples delivered to our laboratory on 2/27/2013 has been completed.

Reference:	***GLDL-13-003***
Project Name:	***GOLDER- Townscape Sunset***
Sample:	***B-101 @ 26.5"- 30.0" (T.I. 4.0)***
	B-104 @ 21.5"- 25.0" (T.I. 4.0)

Data sheets are attached for your use and file. Any untested portion of the sample will be retained for a period of 60 days prior to disposal. The opportunity to be of service is sincerely appreciated and should you have any questions, kindly call.

Respectfully Submitted,

REGISTERED PROFESSIONAL ENGINEER
STEVEN R. MARVIN
NO. 30659
CIVIL
STATE OF CALIFORNIA

Steven R. Marvin
RCE 30659

SRM:tw

2700 S. GRAND AVENUE • SANTA ANA, CA 92705-5404 • (714) 546-3468 • FAX (714) 546-5841
INFO@LABELLEMARVIN.COM

R - VALUE DATA SHEET

P.N. GLDL-13-003
Golder Townscape

PROJECT NUMBER 38571 BORING NUMBER: B-101 @ 26.5"-30.0"

SAMPLE DESCRIPTION: Brown Silty Sand

Item	SPECIMEN		
	a	b	c
Mold Number	1	3	4
Water added, grams	75	100	86
Initial Test Water, %	8.5	10.6	9.4
Compact Gage Pressure,psi	350	95	230
Exudation Pressure, psi	623	209	361
Height Sample, Inches	2.62	2.59	2.58
Gross Weight Mold, grams	3155	3162	3153
Tare Weight Mold, grams	1965	1977	1977
Sample Wet Weight, grams	1190	1185	1176
Expansion, Inches x 10exp-4	10	4	5
Stability 2,000 lbs (160psi)	14 / 26	16 / 29	15 / 27
Turns Displacement	4.74	5.45	5.40
R-Value Uncorrected	73	67	70
R-Value Corrected	75	69	72
Dry Density, pcf	126.8	125.3	126.2
	DESIGN CALCULATION DATA		
Traffic Index Assumed:	4.0	4.0	4.0
G.E. by Stability	0.26	0.32	0.29
G. E. by Expansion	0.33	0.13	0.17

Equilibrium R-Value 71 by EXUDATION

Examined & Checked: 3 /1/ 13

REMARKS: Gf = 1.25
0.0% Retained on the 3/4" Sieve.

REGISTERED PROFESSIONAL ENGINEER STEVEN R. MARVIN C 30659 STATE OF CALIFORNIA

Steven R. Marvin, RCE 30659

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301.

LaBelle • Marvin

R-VALUE GRAPHICAL PRESENTATION

PROJECT NO. 38571
P.N. GLDL-13-003

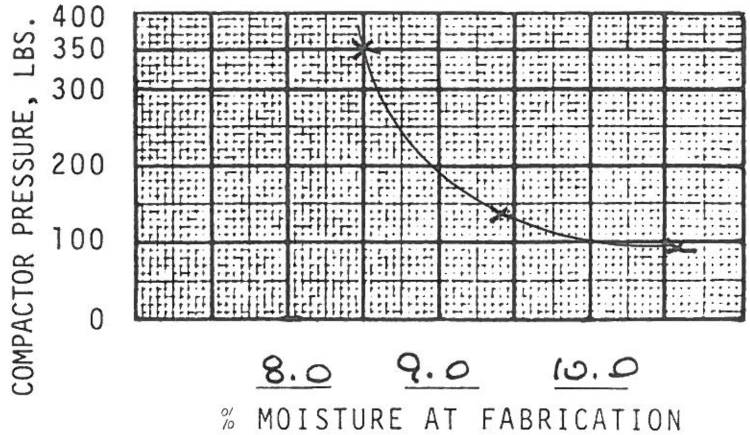
BORING NO. B-101 @ 26.5"-30.0"
Golder-Townscape Sunset

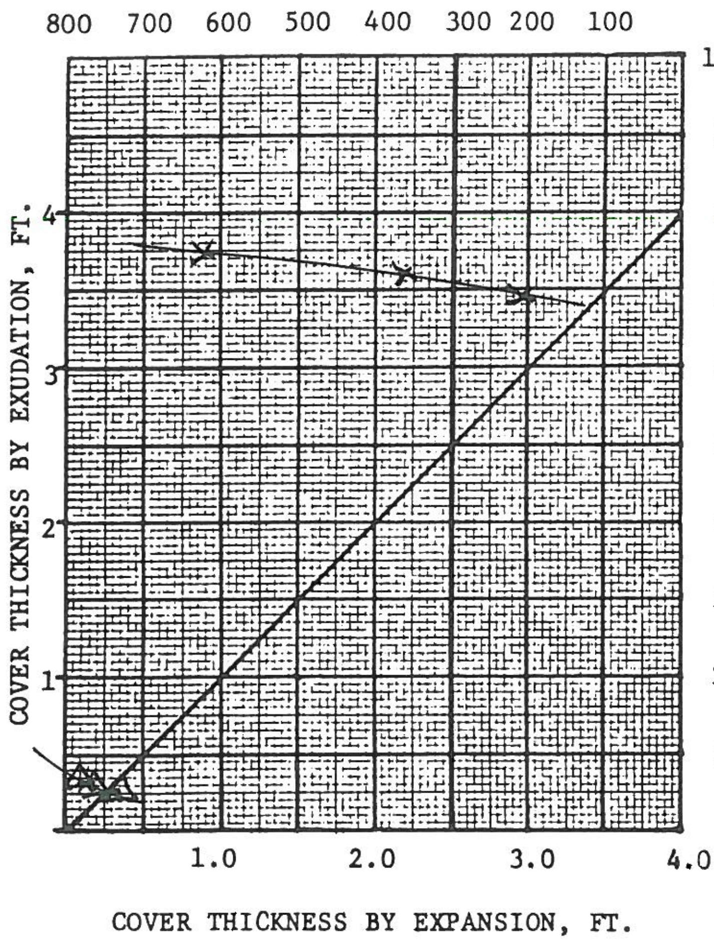
DATE 3/1/13

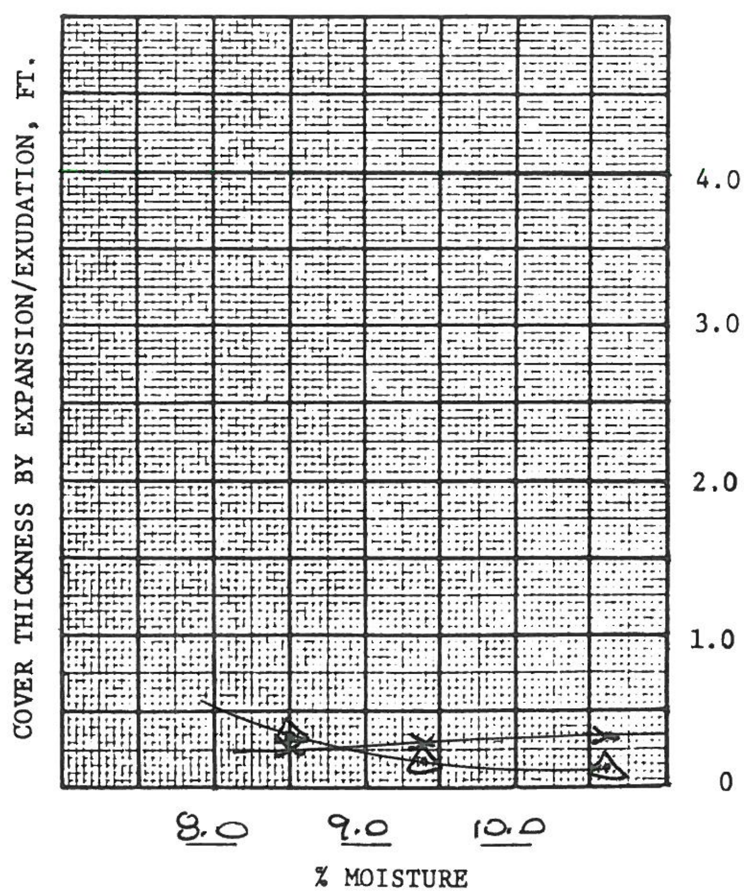
TRAFFIC INDEX Assume 4.0

R-VALUE BY EXUDATION 71

R-VALUE BY EXPANSION ——







R-VALUE vs. EXUD. PRES. — T by EXUDATION

EXUD. T vs. EXPAN. T — T by EXPANSION

REMARKS

Gf=1.25

LaBelle • Marvin
PROFESSIONAL PAVEMENT ENGINEERING

R - VALUE DATA SHEET

P.N. GLDL-13-003
Golder Townscape

PROJECT NUMBER 38571 BORING NUMBER: B-104 @ 21.5"-25.0"

SAMPLE DESCRIPTION: Brown Sandy Silt

Item	SPECIMEN		
	a	b	c
Mold Number	7	8	9
Water added, grams	80	60	51
Initial Test Water, %	9.9	8.2	7.4
Compact Gage Pressure,psi	60	165	240
Exudation Pressure, psi	179	370	772
Height Sample, Inches	2.64	2.62	2.49
Gross Weight Mold, grams	3184	3180	2951
Tare Weight Mold, grams	1968	1964	1789
Sample Wet Weight, grams	1216	1216	1162
Expansion, Inches x 10exp-4	9	14	24
Stability 2,000 lbs (160psi)	33 / 71	18 / 37	15 / 25
Turns Displacement	4.73	4.30	4.01
R-Value Uncorrected	40	66	77
R-Value Corrected	44	69	77
Dry Density, pcf	127.0	130.0	131.7
	DESIGN	CALCULATION	DATA
Traffic Index Assumed:	4.0	4.0	4.0
G.E. by Stability	0.57	0.32	0.24
G. E. by Expansion	0.30	0.47	0.80

Equilibrium R-Value **63** by EXUDATION

Examined & Checked: 3 /1/ 13

REMARKS:
Gf = 1.25
0.0% Retained on the 3/4" Sieve.

REGISTERED PROFESSIONAL ENGINEER STEVEN R. MARVIN C 30659 CIVIL STATE OF CALIFORNIA

Steven R. Marvin, RCE 30659

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301.

LaBelle • Marvin

R-VALUE GRAPHICAL PRESENTATION

PROJECT NO. 38571
P.N. GLPL-13-003

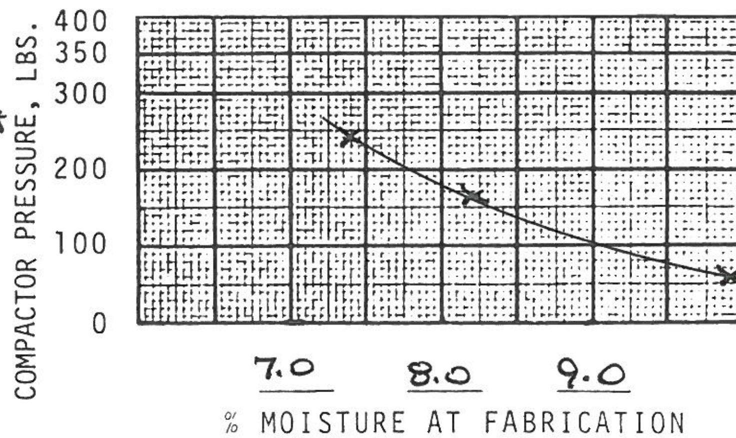
BORING NO. B-104 @ 21.5'-25.0"
Golder-Townscape Sunset

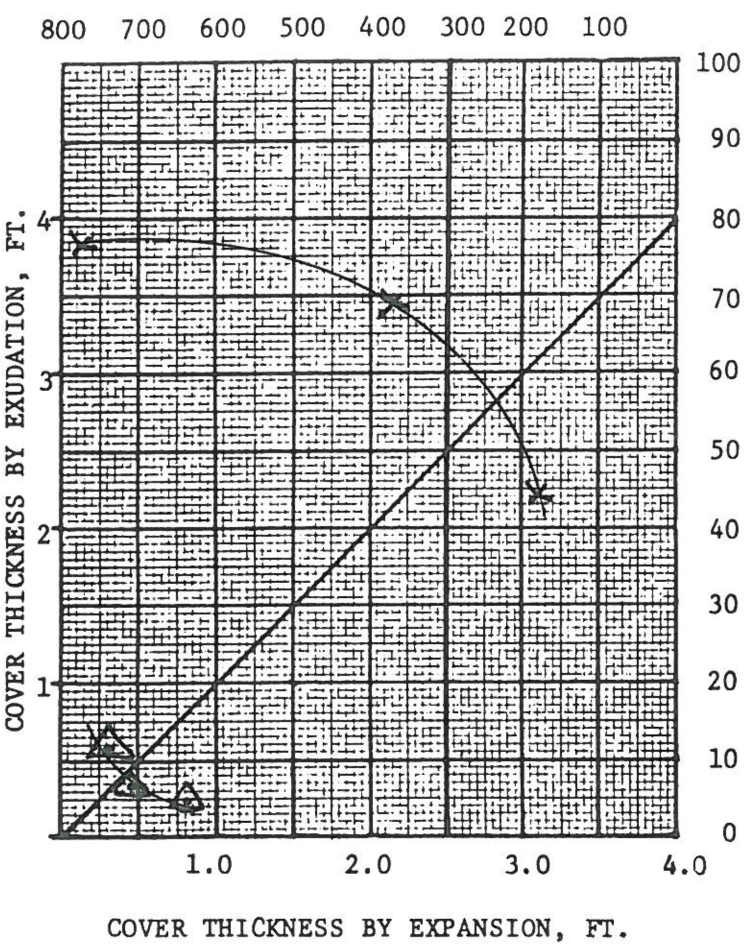
DATE 3-1-13

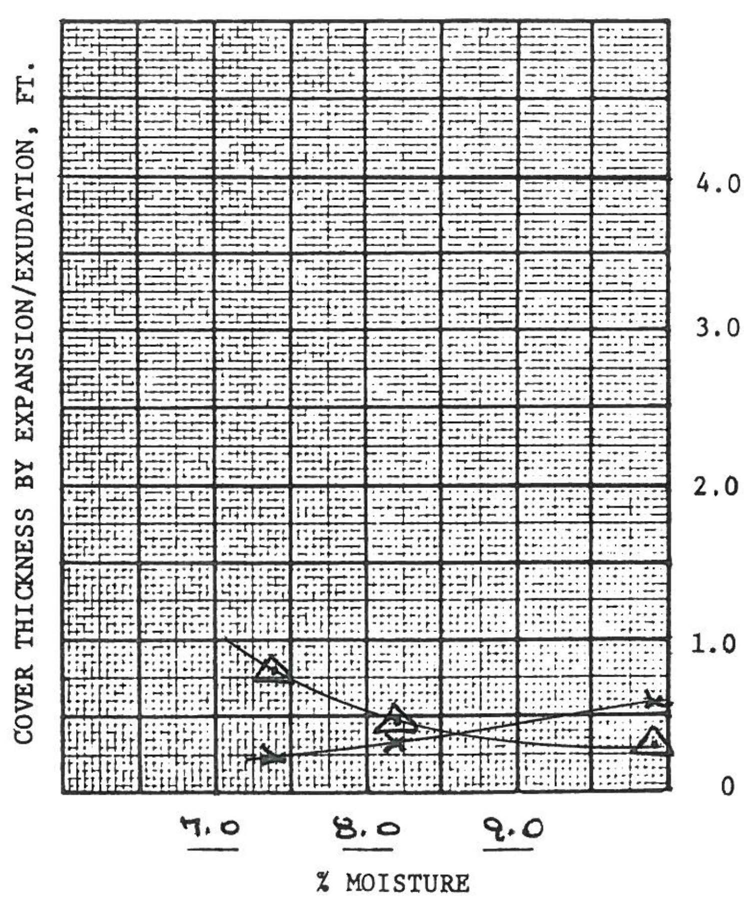
TRAFFIC INDEX Assume 4.0

R-VALUE BY EXUDATION 63

R-VALUE BY EXPANSION —







R-VALUE vs. EXUD. PRES. — T by EXUDATION

EXUD. T vs. EXPAN. T — T by EXPANSION

REMARKS

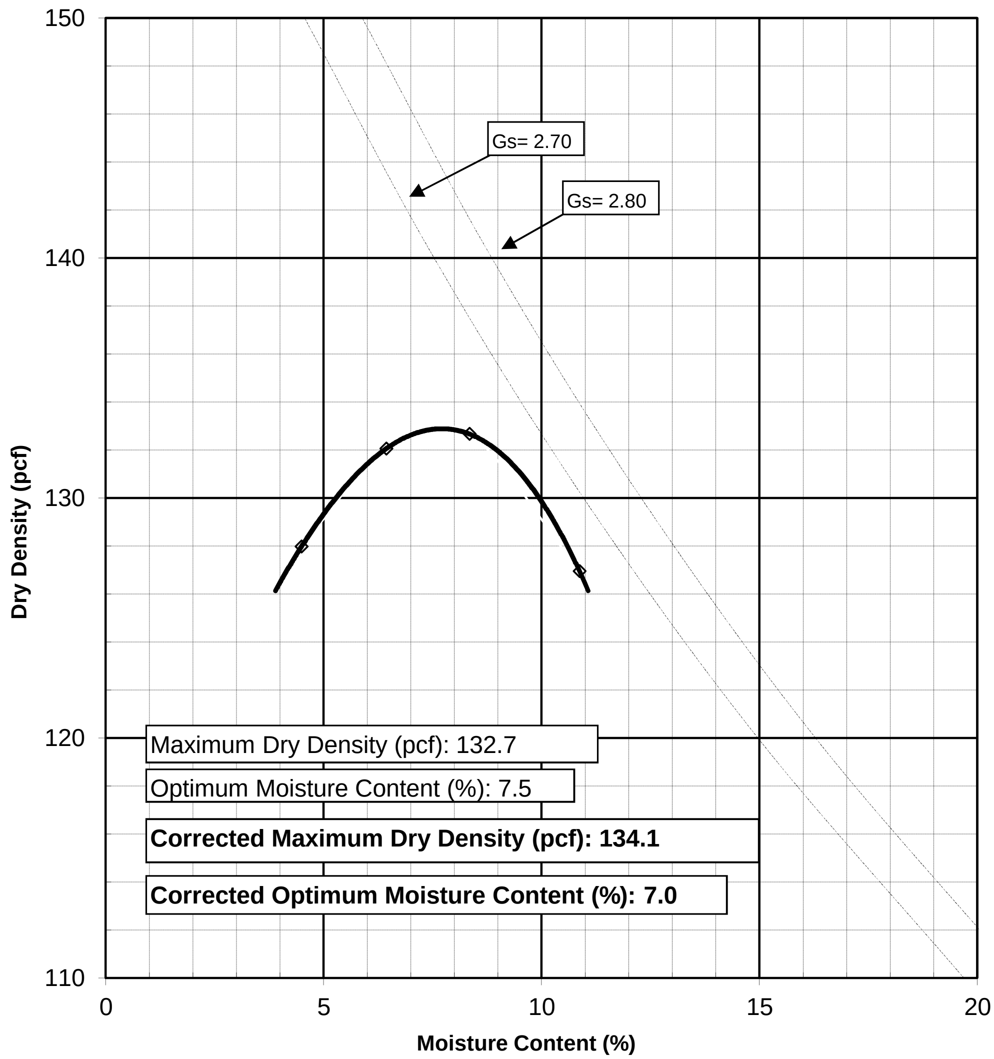
GF=1.25

LaBelle • Marvin
PROFESSIONAL PAVEMENT ENGINEERING

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

COMPACTION CURVE (ASTM D1557)

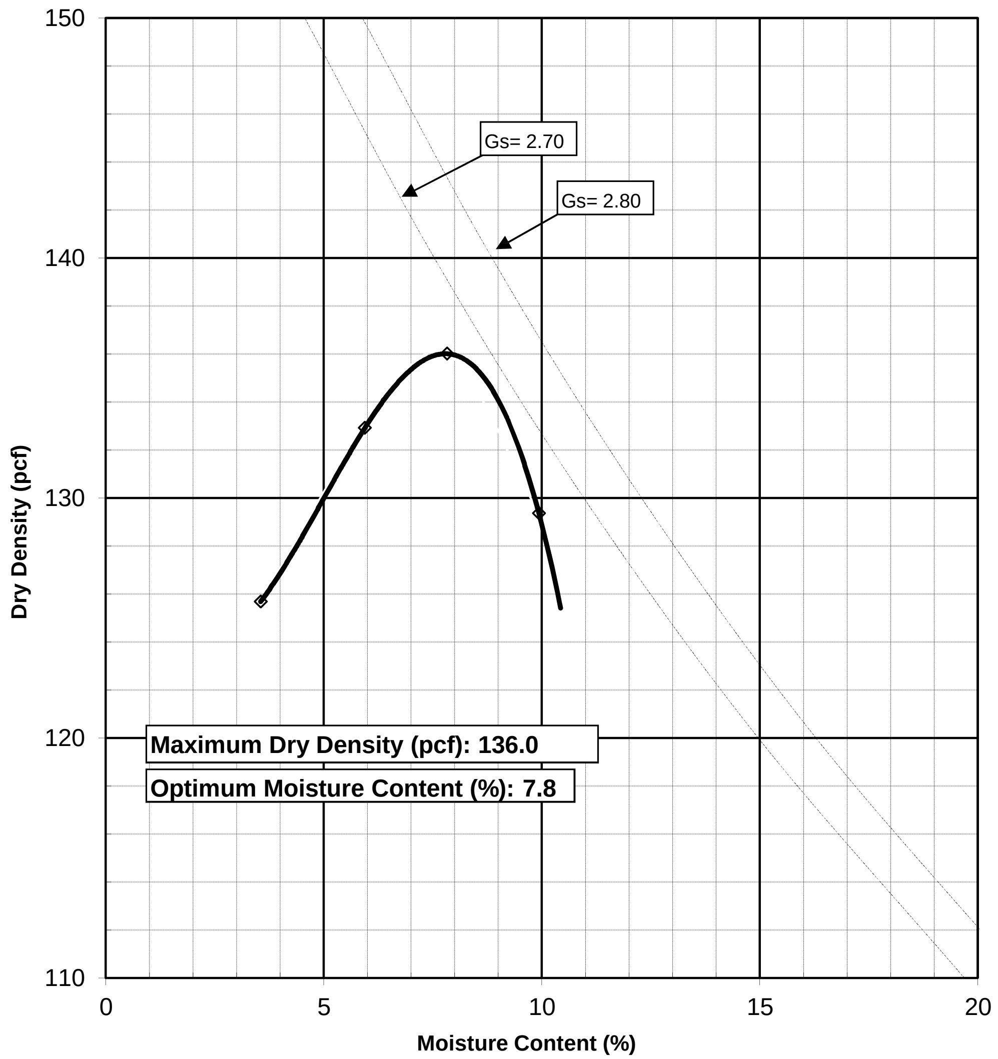
Client :	Golder Associates Inc.	***HAI Project No.:***	GLDL-13-003
Project Name:	Townscope Sunset	***Tested by:***	KL/PM
Project No.:	123-92034	***Checked by:***	JT
Boring No:	**B-104**	***Date:***	3/5/2013
Sample No.:	**Bulk 1** ***Depth:*** **21.5-25'**	***Mold size:***	4 in
Soil Description:	Brown, Well-Graded Sand with Silt (SW-SM)	***Procedure:***	A
		% Ret. on # 4:	6.8



HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

COMPACTION CURVE
(ASTM D1557)

Client :	Golder Associates Inc.			***HAI Project No.:***	GLDL-13-003
Project Name:	Townscope Sunset			***Tested by:***	KL/PM
Project No.:	123-92034			***Checked by:***	JT
Boring No:	**B-101**			***Date:***	3/5/2013
Sample No.:	**Bulk 2**	***Depth:***	**26.5-30'**	***Mold size:***	4 in
Soil Description:	Brown, Silty Sand (SM)			***Procedure:***	A
				% Ret. on # 4:	4.9



APPENDIX C
IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT
(by ASFE)

Important Information About Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.
The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared solely for the client. *No one except you* should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one - not even you -* should apply the report for any purpose or project except the one originally contemplated.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, Project-specific factors when establishing the scope of a study. Typical factors include the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, *do not rely on a geotechnical engineering report that was:*

- not prepared for you,
- not prepared for your project.
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, always inform your geotechnical engineer of project changes-even minor ones-and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations*. Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an *opinion* about subsurface conditions throughout the site. Actual sub-surface conditions may differ - sometimes significantly - from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions

A Report's Recommendations Are *Not* Final

Do not over-rely on the construction recommendations included in your report. Those *recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability* for the report's recommendations if that engineer does not perform construction observation.

A Geotechnical Engineering Report Is Subject To Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should never be redrawn for inclusion in architectural or other design drawings. Only photo graphic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, but preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A brand conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce such risks, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations", many of these provisions indicate where geotechnical engineers responsibilities begin and end, to help others recognize their own responsibilities and risks. Read these provisions closely. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a geoenvironmental study differ significantly from those used to perform a geotechnical study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations: e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures*. If you have not yet obtained your own geoenviromental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Rely on Your Geotechnical Engineer for Additional Assistance

Membership in ASFE exposes geotechnical engineers to a wide army of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE

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