LA GEECS

Luciralia Ibarra <luciralia.ibarra@lacity.org>

8150 Sunset: Golder Response to 6.29.15 LADBS Geology and Soils Report Correction Letter

Nytzen, Michael <michaelnytzen@paulhastings.com> Fri, Sep 25, 2015 at 10:44 AM
To: Luci Ibarra <luciralia.ibarra@lacity.org>

Good morning. Attached is a copy of Golder Associates' response to the 6.29.15 LADBS Geology and Soils Report Correction Letter, which was submitted to LADBS today. Please post this on the 8150 Sunset Boulevard Web site.

Thanks you for your attention to this, and please let me know if you have any questions.

Thanks,

Michael

PAUL HASTINGS

E. Michael Nytzen | Senior Land Use Project Manager
Paul Hastings LLP | 515 South Flower Street, Twenty-Sixth Floor, Los Angeles, CA 90071 | Direct: +1.213.683.5713 | Main: +1.213.683.6000 | Fax: +1.213.996.3003 | michaelnytzen@paulhastings.com |
www.paulhastings.com

8150 Sunset - 8.10.15 Response to City's 6.29.15 Comments .pdf
2980K

August 10, 2015

Golder Project No.: 123-92034

John Irwin
AG SCH 8150
Sunset Boulevard Owner, L.P.
P.O. Box 10506
Beverly Hills, California 90213

RE: RESPONSE TO THE JUNE 29, 2015 CITY OF LOS ANGELES GEOLOGY AND SOILS REPORT CORRECTION LETTER
PROPOSED RESIDENTIAL AND COMMERCIAL DEVELOPMENT
8150 SUNSET BOULEVARD, LOS ANGELES, CALIFORNIA

Dear Mr. Irwin:

Golder Associates Inc. (Golder) is submitting this letter that contains our responses to the review comments provided by the City of Los Angeles (the City) Department of Building and Safety in the following document:

- "Geology and Soils Report Correction Letter," Log # 83343-01 for Tentative Tract 72370 at 8150 West Sunset Boulevard, dated June 29, 2015.

A copy of the City's correction letter is included as Attachment A to this letter. The City's comments pertain to the following Golder reports that have been prepared for the proposed residential and commercial development at 8150 Sunset Boulevard in Los Angeles, California (the site):

- "Surface Fault Rupture Hazard Assessment, Proposed Residential and Commercial Development, 8150 Sunset Boulevard, City of Los Angeles, California," dated May 18, 2015 (referred to as "Golder's Fault Hazard Report" herein).
- "Geotechnical Exploration and Recommendations Report, Proposed Residential and Commercial Development, 8150 Sunset Blvd., Los Angeles, California," dated May 18, 2015 (referred to as "Golder's Geotechnical Report" herein).

The remainder of this letter contains each of the City's comments, which are presented verbatim in italics, followed by our response to each of the comments.

COMMENT 1

Based on the figure titled "Cross Section Locations" in the response report, a proposed structure is located at the northwest corner of the site. Provide geologic exploration 50 feet northwest of the structure (offsite) to determine the possible existence of an active fault within 50 feet of its planned location. Alternatively, show a setback area (building exclusion zone) or reinforced foundation zone on all site plans included in the reports.

RESPONSE 1

Golder gathered continuous core samples in boring B-106 on November 20, 2013 at a location approximately 29 feet south of the intersection of Havenhurst Drive and Sunset Boulevard, as shown on

Figure 1 to this letter. Soil samples were collected as part of Golder's fault rupture hazard assessment of the Hollywood Fault at the site, as described in Golder's Fault Hazard Report. In addition, Golder performed cone penetration test (CPT) sounding CPT-14 immediately north of boring B-106, as shown on Figure 1 to this letter. Golder's fault hazard study established that the main trace of the Hollywood Fault is located northwest of B-106 and CPT-14. However, Golder's fault rupture investigation was unable to extend 50 feet beyond the site's boundary because of access and traffic restrictions on Sunset Boulevard. While the State of California Alquist-Priolo map shows the main trace of the Hollywood Fault more than 100 feet northwest of the site's northwest corner (see Figure 1 to this letter), our investigation was unable to unequivocally establish that the main Hollywood Fault trace is more than 50 feet from the northwest corner of the site.

In light of the above, Golder has followed the City's policy and established a 50-foot wide reinforced foundation zone in the northwest corner of the site as shown on Figure 1 to this letter. This zone does not contain the main trace of the Hollywood Fault, but could be subject to secondary surface fault rupture or off-fault displacements. Secondary fault rupture displacements are expected to be less than the displacements on the main Hollywood Fault trace that is located an unknown distance northwest of the reinforced foundation zone.

Figure 1 to this letter presents a composite site map showing the proposed reinforced foundation zone, the location of the main trace of the Hollywood Fault, the extents of the Alquist-Priolo Earthquake Fault Zone, CPT and boring locations, and the approximate limits of the proposed basement excavation and building development. Figure 1 to this letter is also included in Addendum No. 1 to Golder's Geotechnical Report along with the above-described recommendations for the reinforced foundation zone.

COMMENT 2

As explained in Comment 1 of the previous letter, dated 11/21/2014, the Department does not except a zero setback without considering a reinforced foundation that accommodates off-fault deformation. As noted in the current reports, the Department (Grading Division) has allowed a zero setback for a structure that was designed 10 inches of horizontal and 2 inches of vertical offset deformation. This design was for a specific project at 1840 Highland Avenue, which was recommended by GeoPentech (project consultants). Review the previous geologic work for 1840 Highland and compare the geologic/fault conditions of that site with the subject site. If appropriate, and based on independent review, indicate that the recommendations for that project (foundations that accommodate 10 inches of horizontal and 2 inches of vertical offset) would be adequate for the proposed project on Sunset Blvd.

RESPONSE 2

Golder has completed its own review the report titled "Potential Fault Surface Rupture Hazard and the Proposed Development at 1840 Highland Site, Hollywood, California" prepared by GeoPentech, dated January 24, 2001. We also reviewed the following addenda to this main report:

- Addendum 2 to January 24, 2001 Report: Structural Design Approach for Proposed Development at 1840 Highland Site, Highland District, Los Angeles, California, dated September 17, 2001.
- Addendum No. 3 to January 24, 2001 Report: Potential Fault Surface Rupture Hazard and Proposed Development at 1840 Highland Site, Highland District, Los Angeles, California, dated October 19, 2004.
- Addendum No. 4 to January 24, 2001 Report: Potential Fault Surface Rupture Hazard and Proposed Development at 1840 Highland Site, Highland District, Los Angeles, California, dated May 2, 2005.
- Response to the City of Los Angeles Department of Building and Safety Geologic Report Correction Letter Dated August 27, 2012 and Addendum No. 5 to January 24, 2001

Report: Potential Fault Surface Rupture Hazard and Proposed Development at 1840 Highland Site, Hollywood District, Los Angeles, California, dated July 2, 2013.

Summary of Review Findings

- The site that was assessed by GeoPentech for fault surface rupture hazard is located at 1840 Highland Avenue in Los Angeles, California (the Highland Site). The Highland Site is located adjacent to the mapped trace of the Hollywood Fault about 1.8 miles east-northeast of the 8150 Sunset Boulevard site.
- Four Holocene-active faults (F-1, F-2, F-3, and F-4) were identified from multiple investigations undertaken at the Highland Site from 2000 to 2005. These faults are located the northern portion of the 1840 Highland Site. The faults were identified by subsurface investigations that consisted of cone penetration testing (CPT); drilling, sampling, and logging of continuous core borings; and pedogenic (soil), stratigraphic, and radiocarbon dating analyses of the continuous core borings. These same methods were used by Golder in the subsurface investigations at the 8150 Sunset Boulevard site, and led to Golder's ultimate conclusion that faults are not present at the 8150 Sunset Boulevard site.
- The proposed development at the 1840 Highland Site consists of a five-story residential building with three below-grade levels. Building footprints of the proposed structures were sited to not be located across the traces of the mapped faults.
- Because Holocene-active faults were identified on the 1840 Highland Site, secondary displacement adjacent to the mapped faults was considered for the design of the proposed building. The magnitude of secondary displacements was established by comparing the Hollywood Fault to other strike-slips faults where surface rupture and secondary faulting has been documented from post-earthquake field investigations.
- Detailed engineering analyses, independent review of the Hollywood Fault characterization, and estimates of the expected primary and secondary fault displacement were used to develop the following recommended secondary fault design ground displacements for the Highland Site:
  - Horizontal design ground displacement: 8.4 to 10 inches (left lateral movement).
  - Vertical design ground displacement: 1.7 to 2 inches.

Conclusions

The 1840 Highland Site is located on or adjacent to the active trace of the Hollywood Fault about 1.8 miles east-northeast of the 8150 Sunset Boulevard site. Both the Highland Site and the 8150 Sunset Boulevard site are located within the State of California Alquist-Priolo Earthquake Fault Zone and within a few hundred feet of the estimated location of the principal trace of the Hollywood Fault. Unlike the Highland Site, however, traces of the Hollywood Fault have not been found on the 8150 Sunset Boulevard site. Therefore, we consider the probability of both primary and secondary fault ruptures to be lower on the 8150 Sunset Boulevard site than on the 1840 Highland Site.

GeoPentech argue that a technically sound approach is to design the proposed development to accommodate a reasonable estimate of future ground deformations from fault surface rupture. Golder concurs with the analytical approach taken by GeoPentech and its reviewers. We also concur that the estimated secondary displacement of 10 inches horizontal and 2 inches vertical are conservative estimates for the amounts of off-fault displacement for the Hollywood Fault. We consider that the adoption of a 10-inch horizontal ground displacement and a 2-inch vertical ground displacement for the design of foundations in the reinforced foundation zone located in the northwest corner of the 8150 Sunset Boulevard site, as shown on Figure 1 to this letter, is sufficiently conservative because:

- Neither the main trace nor secondary traces of the Hollywood Fault have been identified on the 8150 Sunset Boulevard site.
- The reinforced foundation zone has been included for the 8150 Sunset Boulevard site only because it has not been possible to unequivocally prove that the main trace of the Hollywood Fault is more than 50 feet from this site's northwest corner, and not because structures are being placed adjacent to known mapped traces of the Hollywood Fault such as at the 1840 Highland Site.
- The 50-foot setback distance is an accepted setback based on established urban planning practice rather than on fault and/or site-specific scientific analyses.
- Probabilistic fault displacement hazard analysis (PFDHA), an analysis technique that is increasingly being used to quantify primary and secondary surface displacements at sites on or adjacent to Holocene-active faults, indicates that little or no displacement can be expected in the reinforced foundation zone at 8150 Sunset Boulevard in the next 2,475 years. This return period is for the Maximum Considered Earthquake for ground shaking in the City of Los Angeles Building Code.

Addendum No. 1 to Golder's Geotechnical Report contains Golder's recommendation that structures located within the reinforced foundation zone in the northwest corner of the 8150 Sunset Boulevard site be designed for a 10-inch horizontal ground displacement and a 2-inch vertical ground displacement.

We note, however, that the footprint of the proposed structure to be developed at 8150 Sunset has not yet been finalized. It is possible that that final building footprint can be set back 50 feet southeast of the boring where faults have not been found. Such a setback would fit within existing Department policy for a building exclusion zone when building within 50 feet of known or suspected active fault traces.

Should the final proposed building footprint extend into the special foundation zone shown on Figure 1, then the owner may undertake further fault investigations surrounding the 8150 Sunset site. The purpose of these investigations will be to use subsurface investigations to establish whether a trace (main or secondary) of the Hollywood fault occurs within 50 feet of the final building footprint. If these proposed investigations prove to not be feasible (they will need to be located on part of Sunset Boulevard), then structures will be designed initially to accommodate 10 inches of left-lateral horizontal displacement and 2 inches of vertical displacement (up-to-the-north). Should the owner choose to build within the special foundation zone, then further analysis of the locations and orientations of known and possible faults will be undertaken at that time.

COMMENT 3

Regarding the response to Comment 5, if the consultant is referring to Figure 5 as the geotechnical map, the aerial photography thereon shows existing buildings, however proposed buildings are not shown. If the consultant is referring to Figures 6a and 6b as the cross-sections, no existing or proposed buildings, retaining or walls or basements are shown. Provide a complete response. (P/BC 2014-113)

RESPONSE 3

Figure 4 in Golder's Geotechnical Report contains a map of the site that shows the site's boundary, the limits of the proposed basement excavation, the proposed footprints of new buildings, boring locations, and the locations of geotechnical/geologic cross-sections. Figures 5A and 5B in Golder's Geotechnical Report contain the geotechnical/geologic cross-sections through the site. These figures show the property line, existing ground surface, approximate limits of the basement excavation, extents of proposed grading work, boring locations, and earth material contacts.

COMMENT 4

Regarding the response to Comment 6, the Department does not allow estimation of shear strength parameters for analyses. In addition, the values presented for widths less than 10 feet are much higher than calculated by Terzaghi's bearing capacity equation. Provide bearing capacities based on direct shear testing (3-points minimum) correctly calculated. Provide settlement analyses. Alternatively, use Code bearing values.

RESPONSE 4

In Golder's professional opinion, the use of standard penetration test (SPT) and cone penetration test (CPT) results for use in designing foundations bearing on sand (such as the foundations at the site) is superior to using the results of laboratory direct shear tests (ASTM D3080) due to the great difficulty in obtaining relatively undisturbed samples of sand for laboratory strength testing. However, realizing that the City no longer allows estimation of shear strength parameters from SPT and CPT results, Golder had three representative soil samples from the site direct shear tested in accordance with ASTM D3080. The direct shear tests were performed by Hushmand Associates, Inc.'s (HAI) geotechnical testing laboratory under the direction of Golder. The direct shear tests were performed on the following samples that were collected during Golder's previous field work at the site (as described in Golder's Geotechnical and Fault Hazard Reports):

- Bulk sample 1 from boring B-102A (depth = 30 to 35 feet below ground surface)
- Core sample from boring B-105 (depth = 14 to 15 feet below ground surface)
- Core sample from boring B-106 (depth = 30 to 31 feet below ground surface)

The above-listed samples were selected for direct shear testing as they are considered to be representative and provide an appropriate areal and elevation coverage across the site. Three-point, consolidated-drained direct shear testing was performed on remolded and saturated test specimens from each of the above-listed samples. Remolding of the test specimens was necessary since the samples were disturbed bulk and core samples. The measured in-situ dry density and moisture content of previously tested samples from the site ranged from 109.2 to 124.1 pounds per cubic foot (pcf) and 3.7 to 10.2 percent, respectively, as shown in Appendix C of Golder's Geotechnical Report. Therefore, Golder instructed the laboratory to remold each direct shear test specimen to a dry density of 110 pcf at a moisture content of 5 percent. Remolding the direct shear test specimens to a dry density (110 pcf) that is approximately equal to the lowest measured in-situ dry density (109.2 pcf) yielded conservative results as the shear strengths measured in the direct shear tests would increase if the samples were remolded to a higher dry density. The direct shear tests were performed at effective normal stresses of 1, 5, and 10 ksf, which are considered to bound the range of normal stresses that will be present beneath the proposed foundations and behind the retaining walls and shoring system(s). The laboratory direct shear test results are presented in Attachment B to this letter. Golder has reviewed the laboratory direct shear data provided by HAI and concurs with the results. As such, Golder accepts responsibility for use of the laboratory direct shear data presented in Attachment B to this letter.

Figure 2 to this letter presents a summary plot of shear stress at failure (i.e., shear stress at the end of the direct shear tests) versus normal stress for each of the three sets of direct shear tests. Figure 2 also shows a conservative best-fit linear failure envelope for the direct shear test data, with the cohesion intercept set at zero (which is appropriate for the granular soils at the site). As can be seen on Figure 2, the conservative best-fit linear failure envelope for the direct shear test data corresponds to a friction angle of 32 degrees (with a cohesion intercept of zero). Figure 2 and Attachment B to this letter are included in Addendum No. 1 to Golder's Geotechnical Report.

As described in Section 4.4 of Golder's Geotechnical Report, a friction angle of 32 degrees (with zero cohesion) was used in the calculation of bearing capacities of shallow foundations. Based on the direct shear laboratory test results described above and summarized on Figure 2, use of a friction angle of 32 degrees for the site's soils has been justified. Therefore, the allowable bearing pressures given in Tables 2 and 3 of Golder's Geotechnical Report are valid. Attachment C to this letter contains the shallow foundation bearing capacity and settlement calculations on which Tables 2 and 3 of Golder's Geotechnical Report are based. The allowable foundation bearing pressure for a given footing size equals the lower of the following two values:

- The allowable bearing pressure based on bearing capacity, where the allowable bearing pressure is calculated using Terzaghi's ultimate bearing capacity equation and then applying a factor of safety of 3.
- The allowable bearing pressure based on settlement, where the allowable bearing pressure is that pressure that is calculated to induce a foundation settlement of approximately one inch using the method developed by Burland and Burbidge (1985).

COMMENT 5

Comment 10 on the relatively low blow count data was to question the bearing capacity values recommended. The Department does not allow determination of the internal angle of friction, bearing capacities and pile skin friction by SPT or CPT data. Determine bearing capacity and/or skin friction by direct shear test results.

RESPONSE 5

As discussed in the response to comment 4 above, the results of laboratory direct shear tests on subsurface soils from the site, which are summarized in Figure 2 to this letter, have corroborated the friction angle of 32 degrees that was used to develop the allowable bearing pressures for shallow foundations that are given in Section 4.3.2 of Golder's Geotechnical Report. Therefore, the allowable bearing pressures in Section 4.3.2 of Golder's Geotechnical Report are valid.

As stated in Golder's Geotechnical Report, the ultimate axial pile capacities were calculated using SPT and CPT data in conjunction with proven conservative methods (i.e., the FHWA and LCPC design methods). The FHWA and LCPC methods use SPT blowcounts and CPT tip resistances, respectively, as direct input into empirical pile capacity equations (i.e., SPT blowcounts and CPT tip resistances are not converted into friction angle values or other soil parameters). In preparing this response letter, Golder re-calculated the ultimate axial pile capacities using the method of Kulhawy (1996)[1] since this method uses the soil's friction angle, and not SPT or CPT data, in the calculation of pile capacity. Figure 3 to this letter presents a plot of the CIDH pile ultimate axial capacities calculated using the method of Kulhawy (1996) as compared to the capacities calculated using the FHWA and LCPC methods. On Figure 3 to this letter, the Kulhawy (1996) capacities are referred to as "Direct Shear" while the FHWA and LCPC methods are referred to as "CPT/SPT." The FHWA and LCPC capacities shown on Figure 3 to this letter are the same as those shown on Figure 6 of Golder's Geotechnical Report. As can be seen on Figure 3 to this letter, using the Kulhawy (1996) method results in axial pile capacities that exceed those calculated by the FHWA and LCPC methods. Therefore, we consider it prudent to use the ultimate axial pile capacities presented on Figure 6 of Golder's Geotechnical Report.

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[1] Kulhawy, F. H. (1996) Chapter 14, Drilled Shaft Foundations, in Foundation Engineering Handbook, H. Y. Fang, 2nd Edition

COMMENT 6

Regarding the response to Comment 11, the Department does not accept SPT/CPT derived shear strengths in long-term slope stability and retaining wall analyses. Provide saturated direct shear test data on the earth material to be retained, and utilize the saturated unit weights of earth materials in long-term slope stability and retaining wall analyses where these result in more critical computed factors of safety. (P/BC 2014-049)

RESPONSE 6

As discussed in the response to comment 4 above, the results of direct shear tests on subsurface soils from the site, which are summarized in Figure 2 to this letter, have corroborated the friction angle value of 32 degrees that was used to develop the lateral earth pressure recommendations in Section 4.5 of Golder's Geotechnical Report. Therefore, based on the results of the direct shear tests, the lateral earth pressures provided in Golder's Geotechnical Report are valid.

COMMENT 7

Regarding the response to Comment 13, provide recommendations for shoring, including the lateral earth pressure shoring is the retaining.

Where an excavation would remove lateral support (as defined in Code Section 3307.3.1) from an adjacent public way, property or structure, provide analysis demonstrating that shoring has an acceptable factor of safety (FS ≥ 1.25) against failure based on the shear strength parameters of the earth materials the shoring is to support, at the most critical degree of saturation that is expected to occur. All surcharge loads shall be considered. (P/BC 2014-113)

RESPONSE 7

Addendum No. 1 to Golder's Geotechnical Report presents our geotechnical recommendations for shoring at the site. The actual design of the shoring system(s) will be performed by others using Golder's recommendations. Therefore, analyses that demonstrate the shoring has an acceptable factor of safety against failure cannot be provided at this time. Addendum No. 1 to Golder's Geotechnical Report states that the shoring designer will be responsible for analyzing the shoring system(s) to demonstrate that the shoring has an acceptable factor of safety (FS ≥ 1.25) against failure.

COMMENT 8

Regarding the response to Comment 15, were is the laboratory report cover letter? Provide it.

RESPONSE 8

The cover letter for the geotechnical laboratory results contained in Golder's Geotechnical Report is presented in Attachment D to this letter along with all of the laboratory test sheets.

We trust this response letter addresses the City's review comments in a satisfactory manner. If you have any questions or require additional information, please contact either of the undersigned.

Sincerely,

GOLDER ASSOCIATES INC.

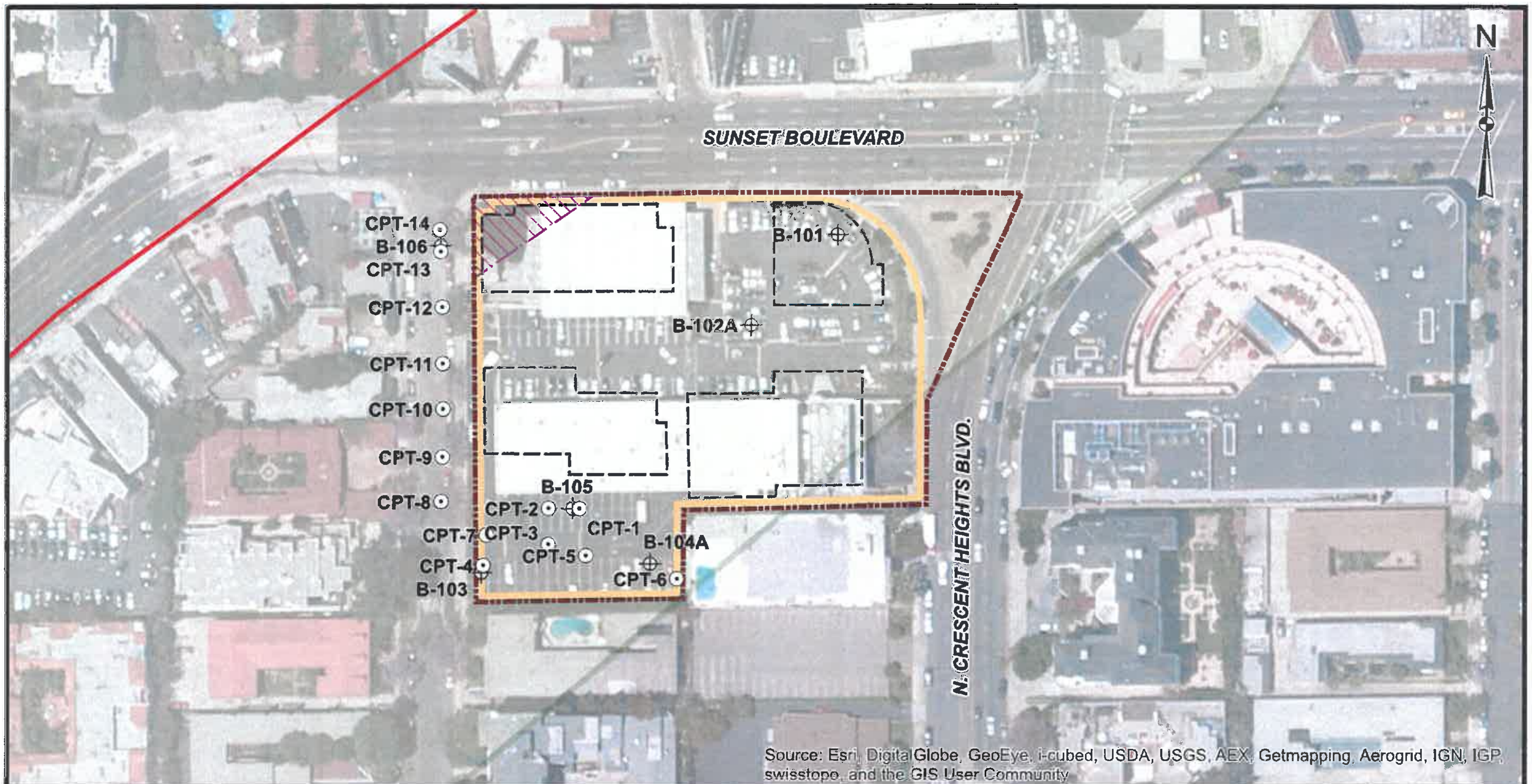
Ryan Hillman, P.E.
Senior Engineer

Alan Hull, Ph.D., C.E.G.
Principal and Practice Leader

Attachments:
- Figure 1 – Map of CPT, Borehole Locations and Reinforced Foundation Zone
- Figure 2 – Results of Direct Shear Tests
- Figure 3 – Comparison of CIDH Pile Axial Capacities from CPT/SPT Data and Direct Shear Data
- Attachment A – City of Los Angeles Geology and Soils Report Correction Letter
- Attachment B – Direct Shear Laboratory Test Results
- Attachment C – Shallow Foundation Bearing Capacity and Settlement Calculations
- Attachment D – Geotechnical Laboratory Test Results

FIGURES

M:\Projects\123 Jobs\123-92034 Townscape Sunset\99_PROJECTS\LetterToCity\02_PRODUCTION\ResponseToComments\BoreholeLocationMap.mxd, 8/5/2015, 03:05 PM by kkavli



LEGEND

- SITE BOUNDARY
- BORING LOCATION
- CPT LOCATION
- HOLLYWOOD FAULT (CGS 2014)
- HOLLYWOOD FAULT ZONE
- REINFORCED FOUNDATION ZONE
- APPROXIMATE LIMITS OF BASEMENT EXCAVATION FOR PROPOSED DEVELOPMENT
- APPROXIMATE LOCATION OF PROPOSED BUILDINGS

REFERENCES

1. COORDINATE SYSTEM: NAD 1983 StatePlane California V FIPS 0405 Feet
2. Imagery provided by ESRI online mapping service.
3. CGS, 2014, EARTHQUAKE ZONES OF REQUIRED INVESTIGATION, HOLLYWOOD QUADRANGLE, PRELIMINARY REVIEW MAP, CALIFORNIA GEOLOGICAL SURVEY RELEASED FOR COMMENT NOVEMBER 6, 2014

PROJECT

8150 SUNSET BLVD.
CITY OF LOS ANGELES, CALIFORNIA

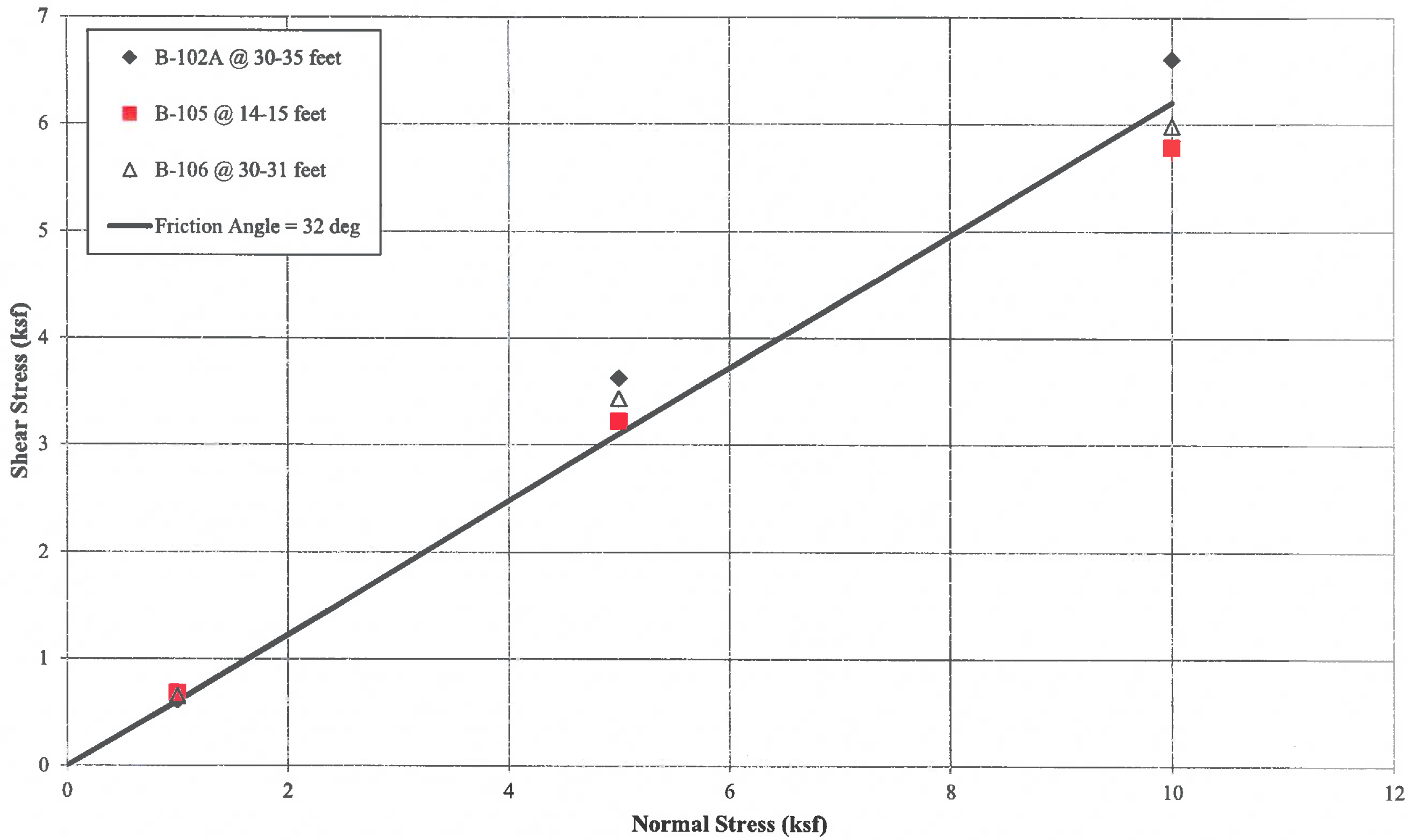
TITLE

MAP OF CPT, BOREHOLE LOCATIONS AND REINFORCED FOUNDATION ZONE

Golder Associates

PROJECT NO. 123-92034.02			FILE No.	BoreholeLocationMap.mxd	
DESIGN	DL	12/18/2013	SCALE:	AS SHOWN	REV. 0
GIS	KJK	8/5/2015			
CHECK	CV	8/5/2015			
REVIEW	AH	8/5/2015			

FIGURE 1



Note: Shear strengths plotted are those from the end of the test (i.e., post-peak).

FIGURE 2

Results of Direct Shear Tests

8150 Sunset Boulevard, Los Angeles, California

PROJECT NO.: 12392034 DATE: AUGUST 2015

Golder Associates

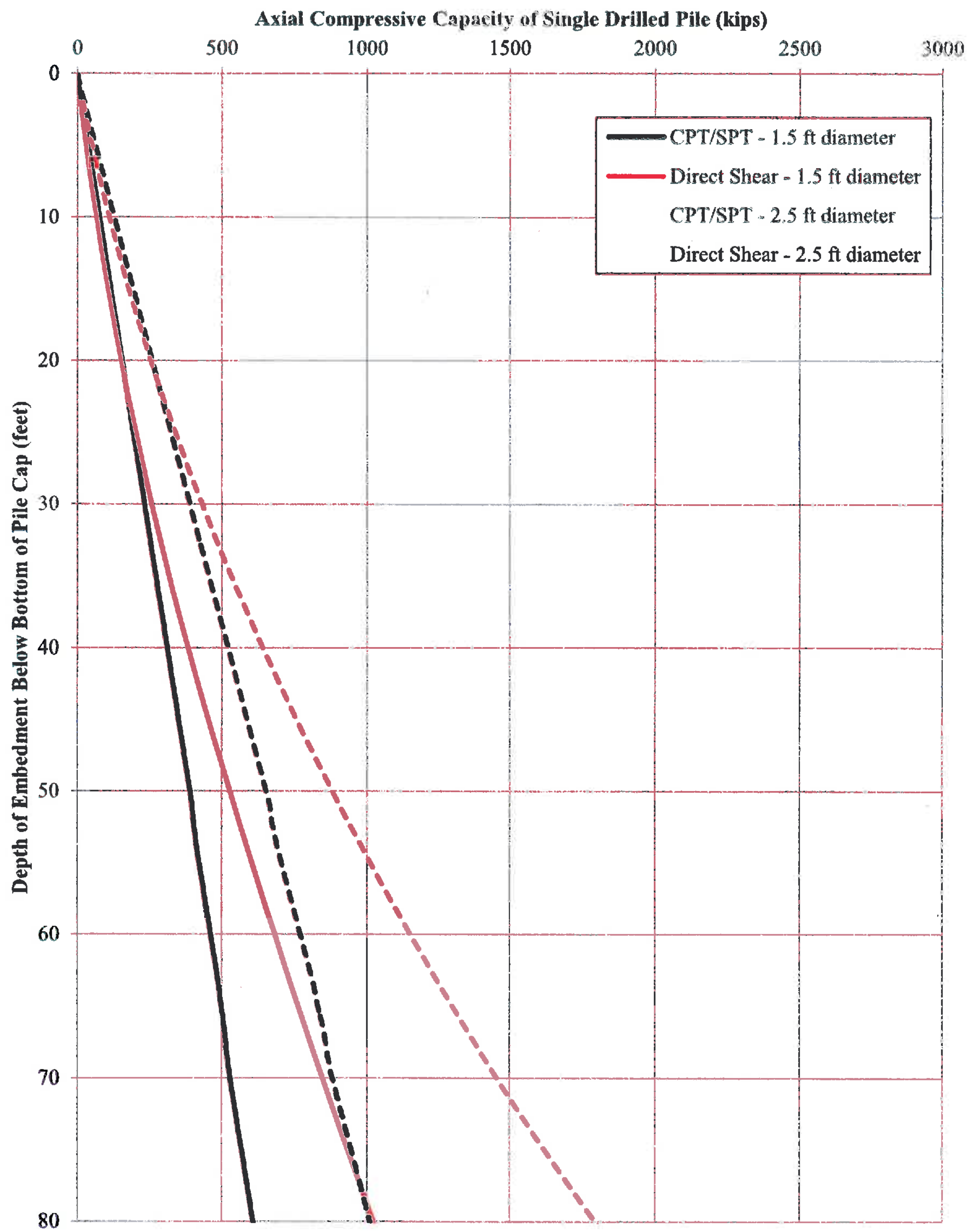


FIGURE 3

COMPARISON OF CIDH PILE AXIAL CAPACITIES FROM CPT/SPT DATA AND DIRECT SHEAR DATA

8150 SUNSET BOULEVARD, LOS ANGELES, CALIFORNIA

PROJECT NO.: 123-92034 DATE: AUGUST 2015

Golder Associates

ATTACHMENT A

CITY OF LOS ANGELES GEOLOGY AND SOILS REPORT CORRECTION LETTER

CITY OF LOS ANGELES
INTER-DEPARTMENTAL CORRESPONDENCE

GEOLOGY AND SOILS REPORT CORRECTION LETTER

June 29, 2015

LOG # 83343-01
SOILS/GEOLOGY FILE - 2
AP

To: Jim Tokunaga, Deputy Advisory Agency
Department of City Planning
200 N. Spring Street, 7th Floor, Room 750

From: John Weight, Grading Division Chief
Department of Building and Safety

Tentative Tract: 72370
LOT(S): 1 Master Lot and 10 Airspace Lots
LOCATION: 8150 W. Sunset Boulevard

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE(S) OF DOCUMENT	PREPARED BY
Soils Report	123-92034	05/18/2015	Golder Associates
Response Report	123-92034	05/18/2015	Golder Associates
Geology Report	123-92034-02	"	"

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE(S) OF DOCUMENT	PREPARED BY
Dept. Correction Letter	83343	11/21/2014	LADBS
Geology Report	123-92034-02	01/27/2014	Golder Associates
Soils Report	123-92034	10/03/2014	"

The Grading Division of the Department of Building and Safety has reviewed the referenced reports that concern a proposed multi-level residential and commercial development, including one building with a 9-story and a 16-story portion and a separate 3 story building. Two subterranean levels are proposed. According to the reports, the site gently slopes to the south and is occupied by commercial developments. All of the existing structures are to be removed to accommodate the proposed development. The earth materials at the subsurface exploration locations consist of alluvium.

The property is located within an Official Alquist-Priolo Earthquake Fault Zone (APEFZ) that was established (November 6, 2014) by the California Geological Survey for the Hollywood fault on the USGS 7.5 minute Hollywood Quadrangle. Along with the response report that addresses the comments of the 11/21/2014 Department Correction Letter, a new revised geologic report, dated 05/18/2015 was submitted and is intended to replace the geologic report dated 01/27/2014.

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

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2014 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. Based on the figure titled "Cross Section Locations" in the response report, a proposed structure is located at the northwest corner of the site. Provide geologic exploration 50 feet northwest of the structure (offsite) to determine the possible existence of an active fault within 50 feet of its planned location. Alternatively, show a setback area (building exclusion zone) or reinforced foundation zone on all site plans included in the reports.

2. As explained in Comment 1 of the previous letter, dated 11/21/2014, the Department does not except a zero setback without considering a reinforced foundation that accommodates off-fault deformation. As noted in the current reports, the Department (Grading Division) has allowed a zero setback for a structure that was designed 10 inches of horizontal and 2 inches of vertical offset deformation. This design was for a specific project at 1840 Highland Avenue, which was recommended by GeoPentech (project consultants). Review the previous geologic work for 1840 Highland and compare the geologic/fault conditions of that site with the subject site. If appropriate, and based on independent review, indicate that the recommendations for that project (foundations that accommodate 10 inches of horizontal and 2 inches of vertical offset) would be adequate for the proposed project on Sunset Blvd.

3. Regarding the response to Comment 5, if the consultant is referring to Figure 5 as the geotechnical map, the aerial photography thereon shows existing buildings, however proposed buildings are not shown. If the consultant is referring to Figures 6a and 6b as the cross-sections, no existing or proposed buildings, retaining or walls or basements are shown. Provide a complete response. (P/BC 2014-113)

4. Regarding the response to Comment 6, the Department does not allow estimation of shear strength parameters for analyses. In addition, the values presented for widths less than 10 feet are much higher than calculated by Terzaghi's bearing capacity equation. Provide bearing capacities based on direct shear testing (3-points minimum) correctly calculated. Provide settlement analyses. Alternatively, use Code bearing values.

5. Comment 10 on the relatively low blow count data was to question the bearing capacity values recommended. The Department does not allow determination of the internal angle of friction, bearing capacities and pile skin friction by SPT or CPT data. Determine bearing capacity and/or skin friction by direct shear test results.

6. Regarding the response to Comment 11, the Department does not accept SPT/CPT derived shear strengths in long-term slope stability and retaining wall analyses. Provide saturated direct shear test data on the earth material to be retained, and utilize the saturated unit weights of earth materials in long-term slope stability and retaining wall analyses where these result in more critical computed factors of safety. (P/BC 2014-049)

7. Regarding the response to Comment 13, provide recommendations for shoring, including the lateral earth pressure shoring is the retaining.

   Where an excavation would remove lateral support (as defined in Code Section 3307.3.1) from an adjacent public way, property or structure, provide analysis demonstrating that shoring has an acceptable factor of safety (FS ≥ 1.25) against failure based on the shear strength parameters of the earth materials the shoring is to support, at the most critical degree of saturation that is expected to occur. All surcharge loads shall be considered. (P/BC 2014-113)

8. Regarding the response to Comment 15, were is the laboratory report cover letter? Provide it.

The geologist and soils engineer shall prepare a report containing the corrections indicated in this letter. The report shall be in the form of an itemized response. It is recommended that once all correction items have been addressed in a response report, to contact the report review engineer and/or geologist to schedule a verification appointment to demonstrate compliance with all the corrections. Do not schedule an appointment until all corrections have been addressed. Bring three copies of the response report, including one unbound wet-signed original for microfilming in the event that the report is found to be acceptable.

DCS / [signature]

DCS/CD:dcs/cd
Log No. 83343-01
213-482-0480

cc: AG SCH 8150 Sunset Boulevard Owner LP, Owner
Michael Nytzen, Applicant
Golder Associates, Project Consultant
LA District Office

ATTACHMENT B

DIRECT SHEAR LABORATORY TEST RESULTS

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

Hushmand Associates, Inc.
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July 30th, 2015

Golder Associates Inc.
3 Corporate Park, Suite 200
Irvine, CA 92602

Attention: Ms. Cynthia Valenzuela

SUBJECT: Laboratory Test Results
Golder Project Name: Townscape Sunset Geotech. Recommendations
Golder Project No.: 12392034-02
HAI Project No.: GLDL-15-008

Dear Ms. Valenzuela:

Enclosed are the results of the laboratory testing conducted on samples for the subject project. The testing was conducted in general accordance with the following test procedures:

Type of Test	**Test Procedure**
Direct Shear	ASTM D3080

Attached are: three (3) three-point Direct Shear test results on remolded samples.

We appreciate the opportunity to provide our testing services to Golder Associates Inc. If you have any questions regarding these test results, please contact us.

Sincerely,

HUSHMAND ASSOCIATES, INC.

Min Zhang, PhD, PE
Project Engineer

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

DIRECT SHEAR TEST
(ASTM D3080)

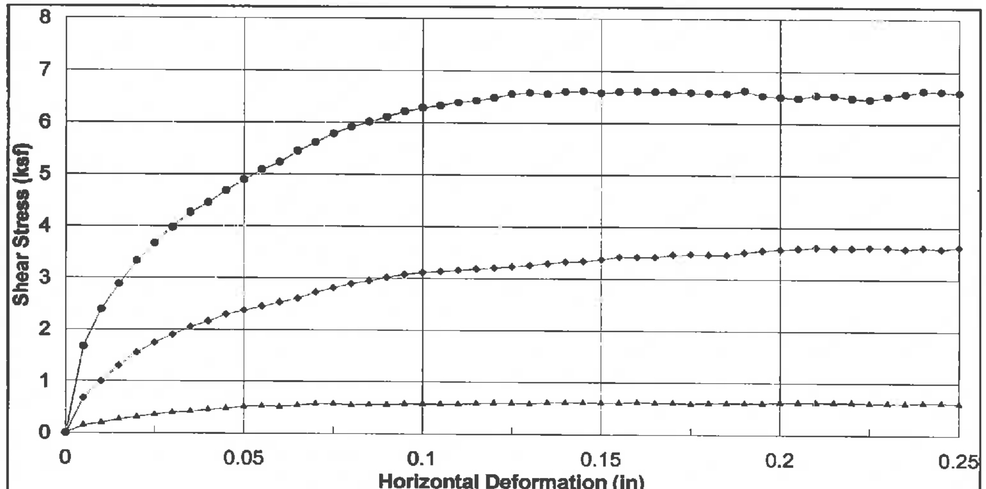
HAI Pr No.: GLDL-15-008
Tested by: SE/KL
Checked by: MZ
Date: 7/28/2015

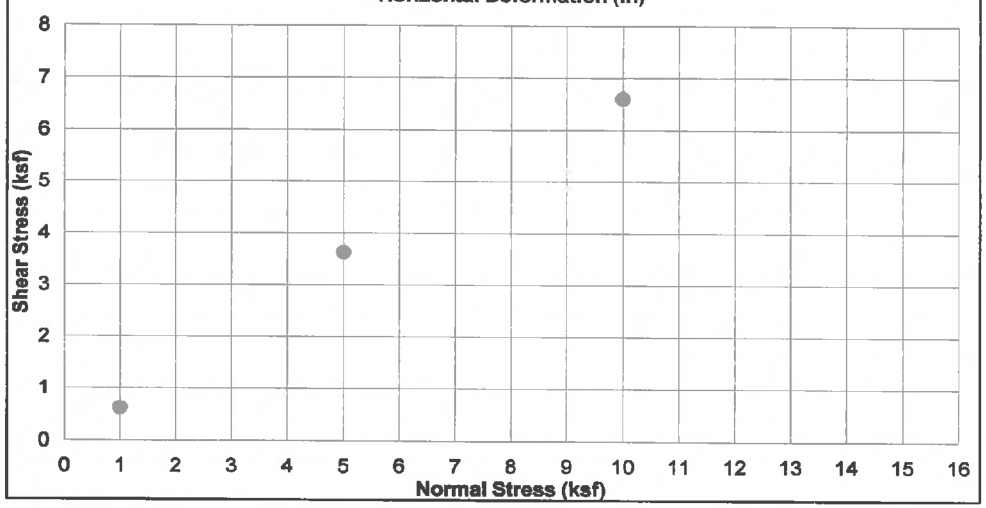
Client: Golder Associates Inc.
Project Name: Townscape Sunset Geotechnical Recommendations
Project Number: 12392034-02
Boring No.: B-102A
Sample No.: Bulk 1
Depth (ft): 30-35'
Soil description: Dark Yellowish Brown, Silty Sand (SM)
Sample type: Remolded to 110 pcf @ 5%
Type of test: Consolidated, Drained

	▲	◆	●
Normal Stress (ksf)	1	5	10
Deformation Rate (in/min)		0.002	

Peak Shear Stress (ksf) ◆	0.62	3.62	6.64
Shear stress @ end of test (ksf) ●	0.61	3.62	6.60

Initial height of sample (in)	1	1	1
Height of sample before shear (in)	0.9817	0.9544	0.9268
Diameter of sample (in)	2.42	2.42	2.42
Initial Moisture Content (%)	5.0	5.0	5.0
Final Moisture Content (%)	13.4	11.7	11.0
Dry Density (pcf)	110.0	110.0	110.0
Final Saturation (%)	72.7	69.4	72.2





HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

DIRECT SHEAR TEST
(ASTM D3080)

HAI Pr No.: GLDL-15-008
Tested by: SE/KL
Checked by: MZ
Date: 7/28/2015

Client: Golder Associates Inc.
Project Name: Townscape Sunset Geotechnical Recommendations
Project Number: 12392034-02

Boring No.: B-105

Sample No.: Core

Depth (ft): 14-15'

Soil description: Dark Yellowish Brown, Silty Sand (SM)

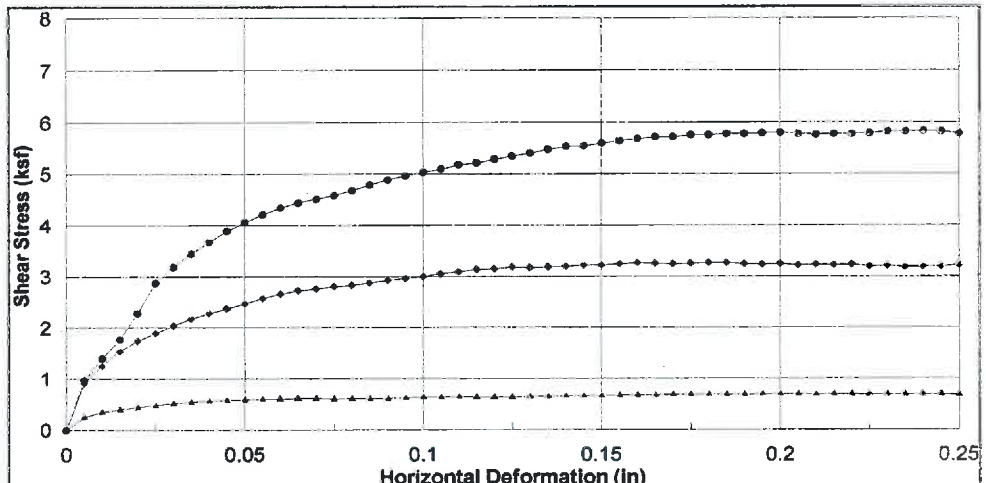
Sample type: Remolded to 110 pcf @ 5%

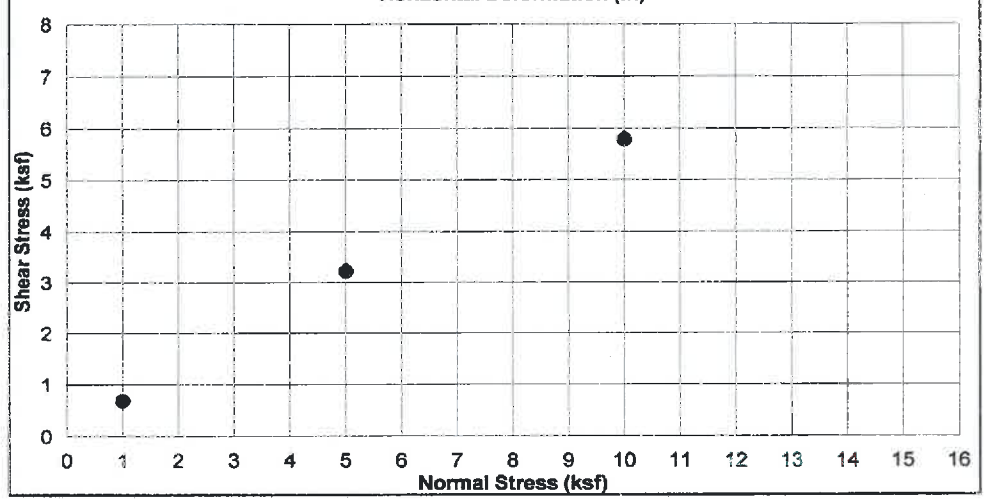
Type of test: Consolidated, Drained

	▲	◆	●
Normal Stress (ksf)	1	5	10
Deformation Rate (in/min)		0.002	

Peak Shear Stress (ksf) ◆	0.70	3.26	5.83
Shear stress @ end of test (ksf) ●	0.68	3.22	5.78

Initial height of sample (in)	1	1	1
Height of sample before shear (in)	0.9788	0.9200	0.8769
Diameter of sample (in)	2.42	2.42	2.42
Initial Moisture Content (%)	5.0	5.0	5.0
Final Moisture Content (%)	14.6	12.7	11.8
Dry Density (pcf)	110.0	110.0	110.0
Final Saturation (%)	80.2	85.2	94.6





HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

DIRECT SHEAR TEST
(ASTM D3080)

HAI Pr No.: GLDL-15-008
Tested by: SE/KL
Checked by: MZ
Date: 7/28/2015

Client: Golder Associates Inc.
Project Name: Townscape Sunset Geotechnical Recommendations
Project Number: 12392034-02

Boring No.: B-106

Sample No.: Core

Depth (ft): 30-31'

Soil description: Brown, Poorly Graded Sand with Silt (SP-SM)

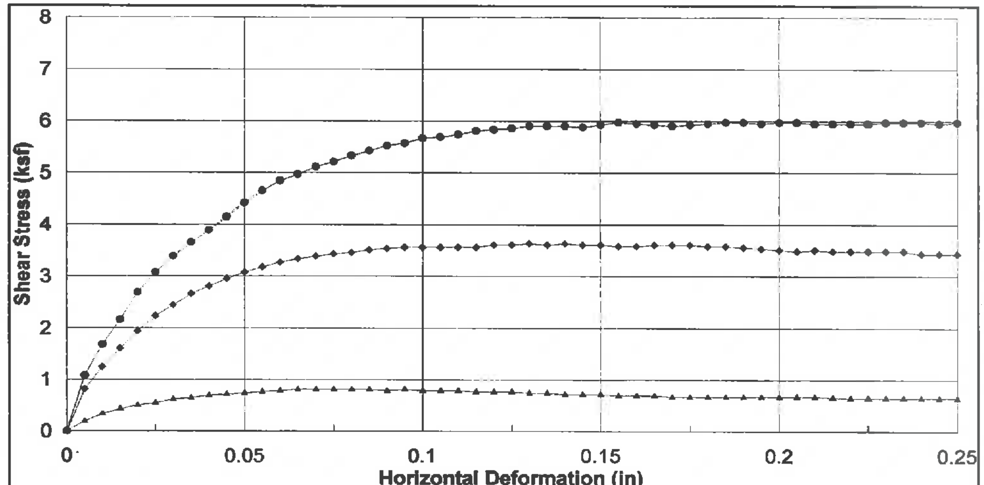
Sample type: Remolded to 110 pcf @ 5%

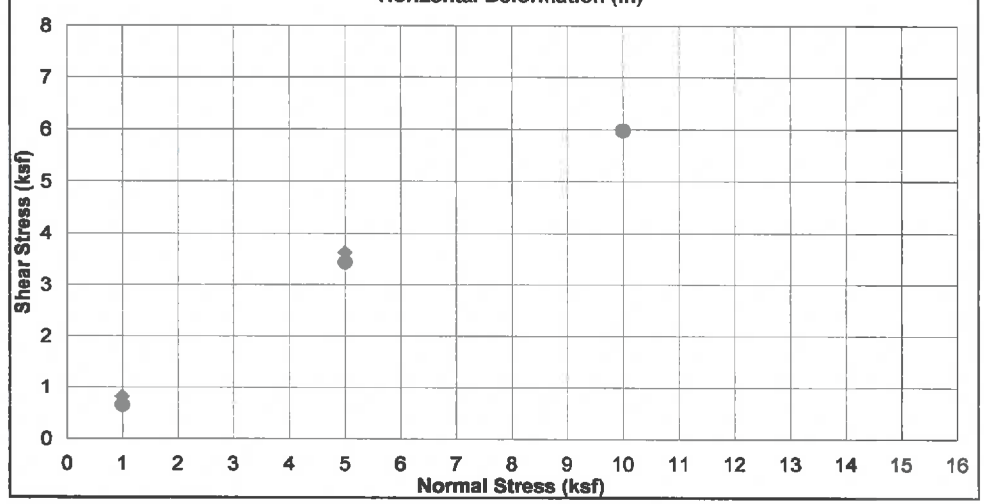
Type of test: Consolidated, Drained

	▲	◆	●
Normal Stress (ksf)	1	5	10
Deformation Rate (in/min)		0.002	

Peak Shear Stress (ksf) ◆	0.82	3.62	5.98
Shear stress @ end of test (ksf) ●	0.65	3.43	5.98

Initial height of sample (in)	1	1	1
Height of sample before shear (in)	0.9869	0.9595	0.9215
Diameter of sample (in)	2.42	2.42	2.42
Initial Moisture Content (%)	5.0	5.0	5.0
Final Moisture Content (%)	16.0	15.4	14.9
Dry Density (pcf)	110.0	110.0	110.0
Final Saturation (%)	84.2	88.8	97.6





ATTACHMENT C

SHALLOW FOUNDATION BEARING CAPACITY AND SETTLEMENT CALCULATIONS

ALLOWABLE BEARING PRESSURES FROM BEARING CAPACITY AND SETTLEMENT ANALYSES
8150 Sunset Boulevard, Los Angeles, California

2-foot by 2-foot Square Footing

Soil Properties:		***Foundation Properties:***		***Other Parameters:***	
friction angle, ϕ' or ϕ (deg):	32	width, B (ft):	2.0	ground inclination, β (deg):	0.0
cohesion intercept, c' or c (psf):	0	length, L (ft):	2.0	depth to groundwater table, D_w (ft):	120
total unit weight, γ (pcf):	122	embedment depth, D (ft):	2.0	applied shear load, V (lbs):	0.0
thickness of granular layer (ft):	150	base inclination, α (deg):	0.0	depth of removed soil over foundation (ft):	10.0

Bearing Capacity Calculations:

q_{ult} = gross ultimate bearing capacity of foundation soil

$= c'N_cs_cd_ci_cb_cg_c + \sigma'_DN_qs_qd_qi_qb_qg_q + 0.5\gamma'BN_\gamma s_\gamma d_\gamma i_\gamma b_\gamma g_\gamma$

where:

N_c, N_q, N_γ = dimensionless bearing capacity factors = function of soil friction angle

$N_q = e^{\pi\tan\phi'}\tan^2(45+\phi'/2) =$ 23.2

$N_c = (N_q-1)/\tan\phi' =$ 35.5 (if $\phi = 0$ then $N_c = 5.1$)

$N_\gamma = 2(N_q+1)\tan\phi' =$ 30.2

s_c, s_q, s_γ = dimensionless footing shape factors

$s_c = 1+(B/L)(N_q/N_c) =$ 1.65

$s_q = 1+(B/L)\tan\phi' =$ 1.62

$s_\gamma = 1-0.4(B/L) =$ 0.60

d_c, d_q, d_γ = dimensionless footing depth factors

$k = D/B$ if $D/B \leq 1$ and $\tan^{-1}(D/B)$ if $D/B > 1 =$ 1.00

$d_c = 1+0.4k =$ 1.40

$d_q = 1+2k\tan\phi'(1-\sin\phi')^2 =$ 1.28

$d_\gamma =$ 1.00

(i, b, and g factors all equal 1 for this analysis)

σ'_D = vertical effective stress at depth D below the ground surface (psf) = 244

γ' = effective unit weight of soil (pcf)

$= \gamma - \gamma_w$ (if $D_w \leq D$)

$= \gamma - \gamma_w(1-(D_w-D)/B)$ (if $D < D_w < D+B$)

$= \gamma$ (if $D_w \geq D+B$ or if $\phi = 0$)

where:

γ_w = unit weight of water (pcf) = 62.4

$\gamma' =$ 122 pcf

$q_{ult} =$ 13,938 psf

q_{allow} = gross allowable bearing pressure of foundation soil

$= q_{ult} / FS$

where:

FS = factor of safety = 3.0

$q_{allow} =$	**4,646**	**psf**	**(based on bearing capacity)**

Settlement Calculations:

S = foundation settlement

$= fs*fl*ft*(q'-\sigma v')*(1.71/N^{1.4})*B^{0.7}$ (Burland and Burbidge, 1985)

where:

fs= shape factor

$= [(1.25*L/B)/(L/B+0.25)]^{0.2} =$ 1.0

fl= correction factor for the depth of sand or gravel layer

$= Hs/Z_l*(2-Hs/Z_l) =$ 1.0

ft= time factor

$= (1+R_3+R_t*\log(t/3)) =$ 1.57 (Generally: R3=0.2, Rt=0.3 for static loads, and R3=0.8, Rt=0.7 for fluctuating loads)

q'= Average gross effective applied pressure (kPa) = 1,023 = 21,370 psf

σv'= Maximum previous effective overburden pressure (kPa) = 58.4

N= Average SPT N-value within $B^{0.7}$ of the foundation = 15

B= Foundation width (m)= 0.6

S = 25 mm

$q_{allow} =$	**21,370**	**psf**	**for S <= 25 mm = 1 inch**

Golder Associates

ALLOWABLE BEARING PRESSURES FROM BEARING CAPACITY AND SETTLEMENT ANALYSES
8150 Sunset Boulevard, Los Angeles, California

5-foot by 5-foot Square Footing

Soil Properties:		*Foundation Properties:*		*Other Parameters:*	
friction angle, ϕ' or ϕ (deg):	32	width, B (ft):	5.0	ground inclination, β (deg):	0.0
cohesion intercept, c' or c (psf):	0	length, L (ft):	5.0	depth to groundwater table, D_w (ft):	120
total unit weight, γ (pcf):	122	embedment depth, D (ft):	2.0	applied shear load, V (lbs):	0.0
thickness of granular layer (ft):	150	base inclination, α (deg):	0.0	depth of removed soil over foundation (ft):	10.0

Bearing Capacity Calculations:

q_{ult} = gross ultimate bearing capacity of foundation soil

$= c'N_c s_c d_c i_c b_c g_c + \sigma'_D N_q s_q d_q i_q b_q g_q + 0.5\gamma' B N_\gamma s_\gamma d_\gamma i_\gamma b_\gamma g_\gamma$

where:

N_c, N_q, N_γ = dimensionless bearing capacity factors = function of soil friction angle

$N_q = e^{\pi\tan\phi'} \tan^2(45+\phi'/2) =$ 23.2

$N_c = (N_q-1)/\tan\phi' =$ 35.5 (if $\phi = 0$ then $N_c = 5.1$)

$N_\gamma = 2(N_q+1)\tan\phi' =$ 30.2

s_c, s_q, s_γ = dimensionless footing shape factors

$s_c = 1+(B/L)(N_q/N_c) =$ 1.65

$s_q = 1+(B/L)\tan\phi' =$ 1.62

$s_\gamma = 1-0.4(B/L) =$ 0.60

d_c, d_q, d_γ = dimensionless footing depth factors

$k = D/B$ if $D/B \leq 1$ and $\tan^{-1}(D/B)$ if $D/B > 1 =$ 0.40

$d_c = 1+0.4k =$ 1.16

$d_q = 1+2k \tan\phi' (1-\sin\phi')^2 =$ 1.11

$d_\gamma =$ 1.00

(i, b, and g factors all equal 1 for this analysis)

σ'_D = vertical effective stress at depth D below the ground surface (psf) = 244

γ' = effective unit weight of soil (pcf)

$= \gamma - \gamma_w$ (if $D_w \leq D$)

$= \gamma - \gamma_w(1-(D_w-D)/B)$ (if $D < D_w < D+B$)

$= \gamma$ (if $D_w \geq D+B$ or if $\phi = 0$)

where:

γ_w = unit weight of water (pcf) = 62.4

$\gamma' =$ 122 pcf

$q_{ult} =$ 15,733 psf

q_{allow} = gross allowable bearing pressure of foundation soil

$= q_{ult}$ / FS

where:

FS = factor of safety = 3.0

q_{allow} =	**5,244**	**psf**	**(based on bearing capacity)**

Settlement Calculations:

S = foundation settlement

$= fs*fl*ft*(q'-\sigma v')*(1.71/N^{1.4})*B^{0.7}$ (Burland and Burbidge, 1985)

where:

fs= shape factor

$= [(1.25*L/B)/(L/B+0.25)]^{0.2} =$ 1.0

fl= correction factor for the depth of sand or gravel layer

$= Hs/Z_l*(2-Hs/Z_l) =$ 1.0

ft= time factor

$= (1+R_3+R_t*\log(t/3)) =$ 1.57 (Generally: R3=0.2, Rt=0.3 for static loads, and R3=0.8, Rt=0.7 for fluctuating loads)

q'= Average gross effective applied pressure (kPa) = 261 = 5,460 psf

σv'= Maximum previous effective overburden pressure (kPa) = 58.4

N= Average SPT N-value within $B^{0.7}$ of the foundation = 15

B= Foundation width (m)= 1.5

S = 25 mm

q_{allow} =	**5,460**	**psf**	**for S <= 25 mm = 1 inch**

ALLOWABLE BEARING PRESSURES FROM BEARING CAPACITY AND SETTLEMENT ANALYSES
8150 Sunset Boulevard, Los Angeles, California

10-foot by 10-foot Square Footing

Soil Properties:		*Foundation Properties:*		*Other Parameters:*	
friction angle, ϕ' or ϕ (deg):	32	width, B (ft):	10.0	ground inclination, β (deg):	0.0
cohesion intercept, c' or c (psf):	0	length, L (ft):	10.0	depth to groundwater table, D_w (ft):	120
total unit weight, γ (pcf):	122	embedment depth, D (ft):	2.0	applied shear load, V (lbs):	0.0
thickness of granular layer (ft):	150	base inclination, α (deg):	0.0	depth of removed soil over foundation (ft):	20.0

Bearing Capacity Calculations:

q_{ult} = gross ultimate bearing capacity of foundation soil

$= c'N_c s_c d_c i_c b_c g_c + \sigma'_D N_q s_q d_q i_q b_q g_q + 0.5\gamma' B N_\gamma s_\gamma d_\gamma i_\gamma b_\gamma g_\gamma$

where:

N_c, N_q, N_γ = dimensionless bearing capacity factors = function of soil friction angle

$N_q = e^{\pi\tan\phi'}\tan^2(45+\phi'/2) =$ 23.2

$N_c = (N_q-1)/\tan\phi' =$ 35.5 (if $\phi = 0$ then $N_c = 5.1$)

$N_\gamma = 2(N_q+1)\tan\phi' =$ 30.2

s_c, s_q, s_γ = dimensionless footing shape factors

$s_c = 1+(B/L)(N_q/N_c) =$ 1.65

$s_q = 1+(B/L)\tan\phi' =$ 1.62

$s_\gamma = 1-0.4(B/L) =$ 0.60

d_c, d_q, d_γ = dimensionless footing depth factors

$k = D/B$ if $D/B \le 1$ and $\tan^{-1}(D/B)$ if $D/B > 1 =$ 0.20

$d_c = 1+0.4k =$ 1.08

$d_q = 1+2k\tan\phi'(1-\sin\phi')^2 =$ 1.06

$d_\gamma =$ 1.00

(i, b, and g factors all equal 1 for this analysis)

σ'_D = vertical effective stress at depth D below the ground surface (psf) = 244

γ' = effective unit weight of soil (pcf)

$= \gamma - \gamma_w$ (if $D_w \le D$)

$= \gamma - \gamma_w(1-(D_w-D)/B)$ (if $D < D_w < D+B$)

$= \gamma$ (if $D_w \ge D+B$ or if $\phi = 0$)

where:

γ_w = unit weight of water (pcf) = 62.4

$\gamma' =$ 122 pcf

$q_{ult} =$ 20,755 psf

q_{allow} = gross allowable bearing pressure of foundation soil

$= q_{ult}$ / FS

where:

FS = factor of safety = 3.0

$q_{allow} =$	**6,918**	**psf**	**(based on bearing capacity)**

Settlement Calculations:

S = foundation settlement

$= fs*fl*ft*(q'-\sigma v')*(1.71/N^{1.4})*B^{0.7}$ (Burland and Burbidge, 1985)

where:

fs= shape factor

$= [(1.25*L/B)/(L/B+0.25)]^{0.2} =$ 1.0

fl= correction factor for the depth of sand or gravel layer

$= Hs/Z_I*(2-Hs/Z_I) =$ 1.0

ft= time factor

$= (1+R_3+R_t*\log(t/3)) =$ 1.57 (Generally: R3=0.2, Rt=0.3 for static loads, and R3=0.8, Rt=0.7 for fluctuating loads)

q'= Average gross effective applied pressure (kPa) = 170 = 3,550 psf

$\sigma v'$= Maximum previous effective overburden pressure (kPa) = 116.8

N= Average SPT N-value within $B^{0.7}$ of the foundation = 15

B= Foundation width (m)= 3.0

S = 21 mm

$q_{allow} =$	**3,550**	**psf**	**for S <= 25 mm = 1 inch**

ALLOWABLE BEARING PRESSURES FROM BEARING CAPACITY AND SETTLEMENT ANALYSES
8150 Sunset Boulevard, Los Angeles, California

15-foot by 15-foot Square Footing

Soil Properties:		*Foundation Properties:*		*Other Parameters:*	
friction angle, ϕ' or ϕ (deg):	32	width, B (ft):	15.0	ground inclination, β (deg):	0.0
cohesion intercept, c' or c (psf):	0	length, L (ft):	15.0	depth to groundwater table, D_w (ft):	120
total unit weight, γ (pcf):	122	embedment depth, D (ft):	2.0	applied shear load, V (lbs):	0.0
thickness of granular layer (ft):	150	base inclination, α (deg):	0.0	depth of removed soil over foundation (ft):	20.0

Bearing Capacity Calculations:

q_{ult} = gross ultimate bearing capacity of foundation soil

$= c'N_c s_c d_c i_c b_c g_c + \sigma'_D N_q s_q d_q i_q b_q g_q + 0.5\gamma' B N_\gamma s_\gamma d_\gamma i_\gamma b_\gamma g_\gamma$

where:

N_c, N_q, N_γ = dimensionless bearing capacity factors = function of soil friction angle

$N_q = e^{\pi \tan\phi'} \tan^2(45+\phi'/2) =$ 23.2

$N_c = (N_q-1)/\tan\phi' =$ 35.5 (if $\phi = 0$ then $N_c = 5.1$)

$N_\gamma = 2(N_q+1)\tan\phi' =$ 30.2

s_c, s_q, s_γ = dimensionless footing shape factors

$s_c = 1+(B/L)(N_q/N_c) =$ 1.65

$s_q = 1+(B/L)\tan\phi' =$ 1.62

$s_\gamma = 1-0.4(B/L) =$ 0.60

d_c, d_q, d_γ = dimensionless footing depth factors

$k = D/B$ if $D/B \le 1$ and $\tan^{-1}(D/B)$ if $D/B > 1 =$ 0.13

$d_c = 1+0.4k =$ 1.05

$d_q = 1+2k \tan\phi' (1-\sin\phi')^2 =$ 1.04

$d_\gamma =$ 1.00

(i, b, and g factors all equal 1 for this analysis)

σ'_D = vertical effective stress at depth D below the ground surface (psf) = 244

γ' = effective unit weight of soil (pcf)

$= \gamma - \gamma_w$ (if $D_w \le D$)

$= \gamma - \gamma_w(1-(D_w-D)/B)$ (if $D < D_w < D+B$)

$= \gamma$ (if $D_w \ge D+B$ or if $\phi = 0$)

where:

γ_w = unit weight of water (pcf) = 62.4

$\gamma' =$ 122 pcf

$q_{ult} =$ 26,115 psf

q_{allow} = gross allowable bearing pressure of foundation soil

$= q_{ult}$ / FS

where:

FS = factor of safety = 3.0

q_{allow} =	**8,705**	**psf**	**(based on bearing capacity)**

Settlement Calculations:

S = foundation settlement

$= fs*fl*ft*(q'-\sigma v')*(1.71/N^{1.4})*B^{0.7}$ (Burland and Burbidge, 1985)

where:

fs= shape factor

$= [(1.25*L/B)/(L/B+0.25)]^{0.2} =$ 1.0

fl= correction factor for the depth of sand or gravel layer

$= Hs/Z_1*(2-Hs/Z_1) =$ 1.0

ft= time factor

$= (1+R_3+R_t*\log(t/3)) =$ 1.57 (Generally: R3=0.2, Rt=0.3 for static loads, and R3=0.8, Rt=0.7 for fluctuating loads)

q'= Average gross effective applied pressure (kPa) = 146 = 3,050 psf

σv'= Maximum previous effective overburden pressure (kPa) = 116.8

N= Average SPT N-value within $B^{0.7}$ of the foundation = 15

B= Foundation width (m)= 4.6

S = 23 mm

q_{allow} =	**3,050**	**psf**	**for S <= 25 mm = 1 inch**

ALLOWABLE BEARING PRESSURES FROM BEARING CAPACITY AND SETTLEMENT ANALYSES
8150 Sunset Boulevard, Los Angeles, California

20-foot by 20-foot Square Footing

Soil Properties:		*Foundation Properties:*		*Other Parameters:*	
friction angle, ϕ' or ϕ (deg):	32	width, B (ft):	20.0	ground inclination, β (deg):	0.0
cohesion intercept, c' or c (psf):	0	length, L (ft):	20.0	depth to groundwater table, D_w (ft):	120
total unit weight, γ (pcf):	122	embedment depth, D (ft):	2.0	applied shear load, V (lbs):	0.0
thickness of granular layer (ft):	150	base inclination, α (deg):	0.0	depth of removed soil over foundation (ft):	20.0

Bearing Capacity Calculations:

q_{ult} = gross ultimate bearing capacity of foundation soil
$= c'N_c s_c d_c i_c b_c g_c + \sigma'_D N_q s_q d_q i_q b_q g_q + 0.5\gamma' B N_\gamma s_\gamma d_\gamma i_\gamma b_\gamma g_\gamma$
where:
N_c, N_q, N_γ = dimensionless bearing capacity factors = function of soil friction angle
$N_q = e^{\pi \tan\phi'} \tan^2(45+\phi'/2) =$ 23.2
$N_c = (N_q-1)/\tan\phi' =$ 35.5 (if $\phi = 0$ then $N_c = 5.1$)
$N_\gamma = 2(N_q+1)\tan\phi' =$ 30.2
s_c, s_q, s_γ = dimensionless footing shape factors
$s_c = 1+(B/L)(N_q/N_c) =$ 1.65
$s_q = 1+(B/L)\tan\phi' =$ 1.62
$s_\gamma = 1-0.4(B/L) =$ 0.60
d_c, d_q, d_γ = dimensionless footing depth factors
$k = D/B$ if $D/B \leq 1$ and $\tan^{-1}(D/B)$ if $D/B > 1 =$ 0.10
$d_c = 1+0.4k =$ 1.04
$d_q = 1+2k \tan\phi' (1-\sin\phi')^2 =$ 1.03
$d_\gamma =$ 1.00
(i, b, and g factors all equal 1 for this analysis)
σ'_D = vertical effective stress at depth D below the ground surface (psf) = 244
γ' = effective unit weight of soil (pcf)
$= \gamma - \gamma_w$ (if $D_w \leq D$)
$= \gamma - \gamma_w(1-(D_w-D)/B)$ (if $D < D_w < D+B$)
$= \gamma$ (if $D_w \geq D+B$ or if $\phi = 0$)
where:
γ_w = unit weight of water (pcf) = 62.4
$\gamma' =$ 122 pcf

$q_{ult} =$ 31,560 psf

q_{allow} = gross allowable bearing pressure of foundation soil
$= q_{ult}$ / FS
where:
FS = factor of safety = 3.0

$q_{allow} =$	**10,520**	**psf**	**(based on bearing capacity)**

Settlement Calculations:

S = foundation settlement
$= fs*fl*ft*(q'-\sigma v')*(1.71/N^{1.4})*B^{0.7}$ (Burland and Burbidge, 1985)
where:
fs= shape factor
$= [(1.25*L/B)/(L/B+0.25)]^{0.2} =$ 1.0
fl= correction factor for the depth of sand or gravel layer
$= Hs/Z_l*(2-Hs/Z_l) =$ 1.0
ft= time factor
$= (1+R_3+R_t*\log(t/3)) =$ 1.57 (Generally: R3=0.2, Rt=0.3 for static loads, and R3=0.8, Rt=0.7 for fluctuating loads)
q'= Average gross effective applied pressure (kPa) = 136 = 2,850 psf
σv'= Maximum previous effective overburden pressure (kPa) = 117.1
N= Average SPT N-value within $B^{0.7}$ of the foundation = 15
B= Foundation width (m)= 6.1

S = 25 mm

$q_{allow} =$	**2,850 psf**	**for S <= 25 mm = 1 inch**

ALLOWABLE BEARING PRESSURES FROM BEARING CAPACITY AND SETTLEMENT ANALYSES
8150 Sunset Boulevard, Los Angeles, California

1.5-foot Wide Strip Footing

Soil Properties:		*Foundation Properties:*		*Other Parameters:*	
friction angle, ϕ' or ϕ (deg):	32	width, B (ft):	1.5	ground inclination, β (deg):	0.0
cohesion intercept, c' or c (psf):	0	length, L (ft):	100.0	depth to groundwater table, D_w (ft):	120
total unit weight, γ (pcf):	122	embedment depth, D (ft):	2.0	applied shear load, V (lbs):	0.0
thickness of granular layer (ft):	150	base inclination, α (deg):	0.0	depth of removed soil over foundation (ft):	10.0

Bearing Capacity Calculations:

q_{ult} = gross ultimate bearing capacity of foundation soil

$= c'N_c s_c d_c i_c b_c g_c + \sigma'_D N_q s_q d_q i_q b_q g_q + 0.5\gamma' B N_\gamma s_\gamma d_\gamma i_\gamma b_\gamma g_\gamma$

where:

N_c, N_q, N_γ = dimensionless bearing capacity factors = function of soil friction angle

$N_q = e^{\pi \tan\phi'} \tan^2(45+\phi'/2) =$ 23.2

$N_c = (N_q-1)/\tan\phi' =$ 35.5 (if $\phi = 0$ then $N_c = 5.1$)

$N_\gamma = 2(N_q+1)\tan\phi' =$ 30.2

s_c, s_q, s_γ = dimensionless footing shape factors

$s_c = 1+(B/L)(N_q/N_c) =$ 1.01

$s_q = 1+(B/L)\tan\phi' =$ 1.01

$s_\gamma = 1-0.4(B/L) =$ 0.99

d_c, d_q, d_γ = dimensionless footing depth factors

$k = D/B$ if $D/B \leq 1$ and $\tan^{-1}(D/B)$ if $D/B > 1 =$ 0.93

$d_c = 1+0.4k =$ 1.37

$d_q = 1+2k \tan\phi' (1-\sin\phi')^2 =$ 1.26

$d_\gamma =$ 1.00

(i, b, and g factors all equal 1 for this analysis)

σ'_D = vertical effective stress at depth D below the ground surface (psf) = 244

γ' = effective unit weight of soil (pcf)

$= \gamma - \gamma_w$ (if $D_w \leq D$)

$= \gamma - \gamma_w(1-(D_w-D)/B)$ (if $D < D_w < D+B$)

$= \gamma$ (if $D_w \geq D+B$ or if $\phi = 0$)

where:

γ_w = unit weight of water (pcf) = 62.4

$\gamma' =$ 122 pcf

$q_{ult} =$ 9,918 psf

q_{allow} = gross allowable bearing pressure of foundation soil

$= q_{ult} / FS$

where:

FS = factor of safety = 3.0

$q_{allow} =$	**3,306**	**psf**	**(based on bearing capacity)**

Settlement Calculations:

S = foundation settlement

$= fs*fl*ft*(q'-\sigma v')*(1.71/N^{1.4})*B^{0.7}$ (Burland and Burbidge, 1985)

where:

fs= shape factor

$= [(1.25*L/B)/(L/B+0.25)]^{0.2} =$ 1.0

fl= correction factor for the depth of sand or gravel layer

$= Hs/Z_1*(2-Hs/Z_1) =$ 1.0

ft= time factor

$= (1+R_3+R_t*\log(t/3)) =$ 1.57 (Generally: R3=0.2, Rt=0.3 for static loads, and R3=0.8, Rt=0.7 for fluctuating loads)

q'= Average gross effective applied pressure (kPa) = 1,580 = 33,000 psf

σv'= Maximum previous effective overburden pressure (kPa) = 58.4

N= Average SPT N-value within $B^{0.7}$ of the foundation = 15

B= Foundation width (m)= 0.5

S = 25 mm

$q_{allow} =$	**33,000**	**psf**	**for S <= 25 mm = 1 inch**

ALLOWABLE BEARING PRESSURES FROM BEARING CAPACITY AND SETTLEMENT ANALYSES
8150 Sunset Boulevard, Los Angeles, California

5-foot Wide Strip Footing

Soil Properties:		*Foundation Properties:*		*Other Parameters:*	
friction angle, ϕ' or ϕ (deg):	32	width, B (ft):	5.0	ground inclination, β (deg):	0.0
cohesion intercept, c' or c (psf):	0	length, L (ft):	100.0	depth to groundwater table, D_w (ft):	120
total unit weight, γ (pcf):	122	embedment depth, D (ft):	2.0	applied shear load, V (lbs):	0.0
thickness of granular layer (ft):	150	base inclination, α (deg):	0.0	depth of removed soil over foundation (ft):	10.0

Bearing Capacity Calculations:

q_{ult} = gross ultimate bearing capacity of foundation soil
$= c'N_c s_c d_c i_c b_c g_c + \sigma'_D N_q s_q d_q i_q b_q g_q + 0.5\gamma' B N_\gamma s_\gamma d_\gamma i_\gamma b_\gamma g_\gamma$
where:
N_c, N_q, N_γ = dimensionless bearing capacity factors = function of soil friction angle
$N_q = e^{\pi \tan\phi'} \tan^2(45+\phi'/2) =$ 23.2
$N_c = (N_q-1)/\tan\phi' =$ 35.5 (if $\phi = 0$ then $N_c = 5.1$)
$N_\gamma = 2(N_q+1)\tan\phi' =$ 30.2
s_c, s_q, s_γ = dimensionless footing shape factors
$s_c = 1+(B/L)(N_q/N_c) =$ 1.03
$s_q = 1+(B/L)\tan\phi' =$ 1.03
$s_\gamma = 1-0.4(B/L) =$ 0.98
d_c, d_q, d_γ = dimensionless footing depth factors
$k = D/B$ if $D/B \leq 1$ and $\tan^{-1}(D/B)$ if $D/B > 1 =$ 0.40
$d_c = 1+0.4k =$ 1.16
$d_q = 1+2k \tan\phi' (1-\sin\phi')^2 =$ 1.11
$d_\gamma =$ 1.00
(i, b, and g factors all equal 1 for this analysis)
σ'_D = vertical effective stress at depth D below the ground surface (psf) = 244
γ' = effective unit weight of soil (pcf)
$= \gamma - \gamma_w$ (if $D_w \leq D$)
$= \gamma - \gamma_w(1-(D_w-D)/B)$ (if $D < D_w < D+B$)
$= \gamma$ (if $D_w \geq D+B$ or if $\phi = 0$)
where:
γ_w = unit weight of water (pcf) = 62.4
$\gamma' =$ 122 pcf

$q_{ult} =$ 15,507 psf

q_{allow} = gross allowable bearing pressure of foundation soil
$= q_{ult}$ / FS
where:
FS = factor of safety = 3.0

$q_{allow} =$	**5,169**	**psf**	**(based on bearing capacity)**

Settlement Calculations:

S = foundation settlement
$= fs*fl*ft*(q'-\sigma v')*(1.71/N^{1.4})*B^{0.7}$ (Burland and Burbidge, 1985)
where:
fs= shape factor
$= [(1.25*L/B)/(L/B+0.25)]^{0.2} =$ 1.0
fl= correction factor for the depth of sand or gravel layer
$= Hs/Z_l*(2-Hs/Z_l) =$ 1.0
ft= time factor
$= (1+R_3+R_t*\log(t/3)) =$ 1.57 (Generally: R3=0.2, Rt=0.3 for static loads, and R3=0.8, Rt=0.7 for fluctuating loads)
q'= Average gross effective applied pressure (kPa) = 254 = 5,300 psf
σv'= Maximum previous effective overburden pressure (kPa) = 58.4
N= Average SPT N-value within $B^{0.7}$ of the foundation = 15
B= Foundation width (m)= 1.5

S = 25 mm

$q_{allow} =$	**5,300**	**psf**	**for S <= 25 mm = 1 inch**

ALLOWABLE BEARING PRESSURES FROM BEARING CAPACITY AND SETTLEMENT ANALYSES
8150 Sunset Boulevard, Los Angeles, California

10-foot Wide Strip Footing

Soil Properties:		*Foundation Properties:*		*Other Parameters:*	
friction angle, ϕ' or ϕ (deg):	32	width, B (ft):	10.0	ground inclination, β (deg):	0.0
cohesion intercept, c' or c (psf):	0	length, L (ft):	100.0	depth to groundwater table, D_w (ft):	120
total unit weight, γ (pcf):	122	embedment depth, D (ft):	2.0	applied shear load, V (lbs):	0.0
thickness of granular layer (ft):	150	base inclination, α (deg):	0.0	depth of removed soil over foundation (ft):	20.0

Bearing Capacity Calculations:

q_{ult} = gross ultimate bearing capacity of foundation soil

$= c'N_c s_c d_c i_c b_c g_c + \sigma'_D N_q s_q d_q i_q b_q g_q + 0.5\gamma' B N_\gamma s_\gamma d_\gamma i_\gamma b_\gamma g_\gamma$

where:

N_c, N_q, N_γ = dimensionless bearing capacity factors = function of soil friction angle

$N_q = e^{\pi \tan\phi'} \tan^2(45+\phi'/2) =$ 23.2

$N_c = (N_q-1)/\tan\phi' =$ 35.5 (if $\phi = 0$ then $N_c = 5.1$)

$N_\gamma = 2(N_q+1)\tan\phi' =$ 30.2

s_c, s_q, s_γ = dimensionless footing shape factors

$s_c = 1+(B/L)(N_q/N_c) =$ 1.07

$s_q = 1+(B/L)\tan\phi' =$ 1.06

$s_\gamma = 1-0.4(B/L) =$ 0.96

d_c, d_q, d_γ = dimensionless footing depth factors

$k = D/B$ if $D/B \le 1$ and $\tan^{-1}(D/B)$ if $D/B > 1 =$ 0.20

$d_c = 1+0.4k =$ 1.08

$d_q = 1+2k \tan\phi' (1-\sin\phi')^2 =$ 1.06

$d_\gamma =$ 1.00

(i, b, and g factors all equal 1 for this analysis)

σ'_D = vertical effective stress at depth D below the ground surface (psf) = 244

γ' = effective unit weight of soil (pcf)

$= \gamma - \gamma_w$ (if $D_w \le D$)

$= \gamma - \gamma_w(1-(D_w-D)/B)$ (if $D < D_w < D+B$)

$= \gamma$ (if $D_w \ge D+B$ or if $\phi = 0$)

where:

γ_w = unit weight of water (pcf) = 62.4

$\gamma' =$ 122 pcf

$q_{ult} =$ 24,034 psf

q_{allow} = gross allowable bearing pressure of foundation soil

$= q_{ult}$ / FS

where:

FS = factor of safety = 3.0

$q_{allow} =$	**8,011**	**psf**	**(based on bearing capacity)**

Settlement Calculations:

S = foundation settlement

$= fs*fl*ft*(q'-\sigma v')*(1.71/N^{1.4})*B^{0.7}$ (Burland and Burbidge, 1985)

where:

fs= shape factor

$= [(1.25*L/B)/(L/B+0.25)]^{0.2} =$ 1.0

fl= correction factor for the depth of sand or gravel layer

$= Hs/Z_l*(2-Hs/Z_l) =$ 1.0

ft= time factor

$= (1+R_3+R_t*\log(t/3)) =$ 1.57 (Generally: R3=0.2, Rt=0.3 for static loads, and R3=0.8, Rt=0.7 for fluctuating loads)

q'= Average gross effective applied pressure (kPa) = 168 = 3,500 psf

σv'= Maximum previous effective overburden pressure (kPa) = 116.8

N= Average SPT N-value within $B^{0.7}$ of the foundation = 15

B= Foundation width (m)= 3.0

S = 21 mm

$q_{allow} =$	**3,500**	**psf**	**for S <= 25 mm = 1 inch**

ALLOWABLE BEARING PRESSURES FROM BEARING CAPACITY AND SETTLEMENT ANALYSES
8150 Sunset Boulevard, Los Angeles, California

15-foot Wide Strip Footing

Soil Properties:		*Foundation Properties:*		*Other Parameters:*	
friction angle, ϕ' or ϕ (deg):	32	width, B (ft):	15.0	ground inclination, β (deg):	0.0
cohesion intercept, c' or c (psf):	0	length, L (ft):	100.0	depth to groundwater table, D_w (ft):	120
total unit weight, γ (pcf):	122	embedment depth, D (ft):	2.0	applied shear load, V (lbs):	0.0
thickness of granular layer (ft):	150	base inclination, α (deg):	0.0	depth of removed soil over foundation (ft):	20.0

Bearing Capacity Calculations:

q_{ult} = gross ultimate bearing capacity of foundation soil

$= c'N_c s_c d_c i_c b_c g_c + \sigma'_D N_q s_q d_q i_q b_q g_q + 0.5\gamma' B N_\gamma s_\gamma d_\gamma i_\gamma b_\gamma g_\gamma$

where:

N_c, N_q, N_γ = dimensionless bearing capacity factors = function of soil friction angle

$N_q = e^{\pi\tan\phi'} \tan^2(45+\phi'/2) =$ 23.2

$N_c = (N_q-1)/\tan\phi' =$ 35.5 (if $\phi = 0$ then $N_c = 5.1$)

$N_\gamma = 2(N_q+1)\tan\phi' =$ 30.2

s_c, s_q, s_γ = dimensionless footing shape factors

$s_c = 1+(B/L)(N_q/N_c) =$ 1.10

$s_q = 1+(B/L)\tan\phi' =$ 1.09

$s_\gamma = 1-0.4(B/L) =$ 0.94

d_c, d_q, d_γ = dimensionless footing depth factors

$k = D/B$ if $D/B \leq 1$ and $\tan^{-1}(D/B)$ if $D/B > 1$ = 0.13

$d_c = 1+0.4k =$ 1.05

$d_q = 1+2k\tan\phi'(1-\sin\phi')^2 =$ 1.04

$d_\gamma =$ 1.00

(i, b, and g factors all equal 1 for this analysis)

σ'_D = vertical effective stress at depth D below the ground surface (psf) = 244

γ' = effective unit weight of soil (pcf)

$= \gamma - \gamma_w$ (if $D_w \leq D$)

$= \gamma - \gamma_w(1-(D_w-D)/B)$ (if $D < D_w < D+B$)

$= \gamma$ (if $D_w \geq D+B$ or if $\phi = 0$)

where:

γ_w = unit weight of water (pcf) = 62.4

$\gamma' =$ 122 pcf

$q_{ult} =$ 32,401 psf

q_{allow} = gross allowable bearing pressure of foundation soil

$= q_{ult} / FS$

where:

FS = factor of safety = 3.0

q_{allow} =	**10,800**	**psf**	**(based on bearing capacity)**

Settlement Calculations:

S = foundation settlement

$= fs*fl*ft*(q'-\sigma v')*(1.71/N^{1.4})*B^{0.7}$ (Burland and Burbidge, 1985)

where:

fs= shape factor

$= [(1.25*L/B)/(L/B+0.25)]^{0.2} =$ 1.0

fl= correction factor for the depth of sand or gravel layer

$= Hs/Z_I*(2-Hs/Z_I) =$ 1.0

ft= time factor

$= (1+R_3+R_t*\log(t/3)) =$ 1.57 (Generally: R3=0.2, Rt=0.3 for static loads, and R3=0.8, Rt=0.7 for fluctuating loads)

q'= Average gross effective applied pressure (kPa) = 144 = 3,000 psf

σv'= Maximum previous effective overburden pressure (kPa) = 116.8

N= Average SPT N-value within $B^{0.7}$ of the foundation = 15

B= Foundation width (m)= 4.6

S = 22 mm

q_{allow} =	**3,000**	**psf**	**for S <= 25 mm = 1 inch**

ATTACHMENT D

GEOTECHNICAL LABORATORY TEST RESULTS

HAI HUSHMAND ASSOCIATES, INCORPORATED
Geotechnical, Earthquake and Environmental Engineers

March 7, 2013

Golder Associates Inc.
230 Commerce, Suite 200
Irvine, CA 92602

Attention: Mr. Jaime Bueno

SUBJECT: Laboratory Test Results
Golder Project Name: Townscope Sunset
Golder Project No.: 123-92034
HAI Project No.: GLDL-13-003

Dear Mr. Bueno:

Enclosed are the results of the laboratory testing conducted on samples from the above referenced project. The testing was conducted in general accordance with the following test procedures:

Type of Test	Test Procedure
Moisture Content and Dry Density	ASTM D2937
Modified Proctor Compaction	ASTM D1557
R Value	CTM 301
Particle-Size Analysis	ASTM D422

Attached are: Summary of Laboratory Test Results, four (4) Moisture Content and Dry Density tests, two (2) Modified Proctor Compaction tests, two (2) R Value tests, and thirteen (13) Particle-Size Analysis tests.

We appreciate the opportunity to provide our testing services to Golder Associates Inc. If you have any questions regarding these test results, please contact us.

Sincerely,

HUSHMAND ASSOCIATES, INC.

Jorge Turbay, MS, PE
Senior Project Engineer

1721 East Lambert Road, Suite B, La Habra, California 90631 Phone / Fax: (562) 690-3737
www.hushmand-associates.com

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

HAI HUSHMAND ASSOCIATES INC.
Geotechnical and Earthquake Engineers

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

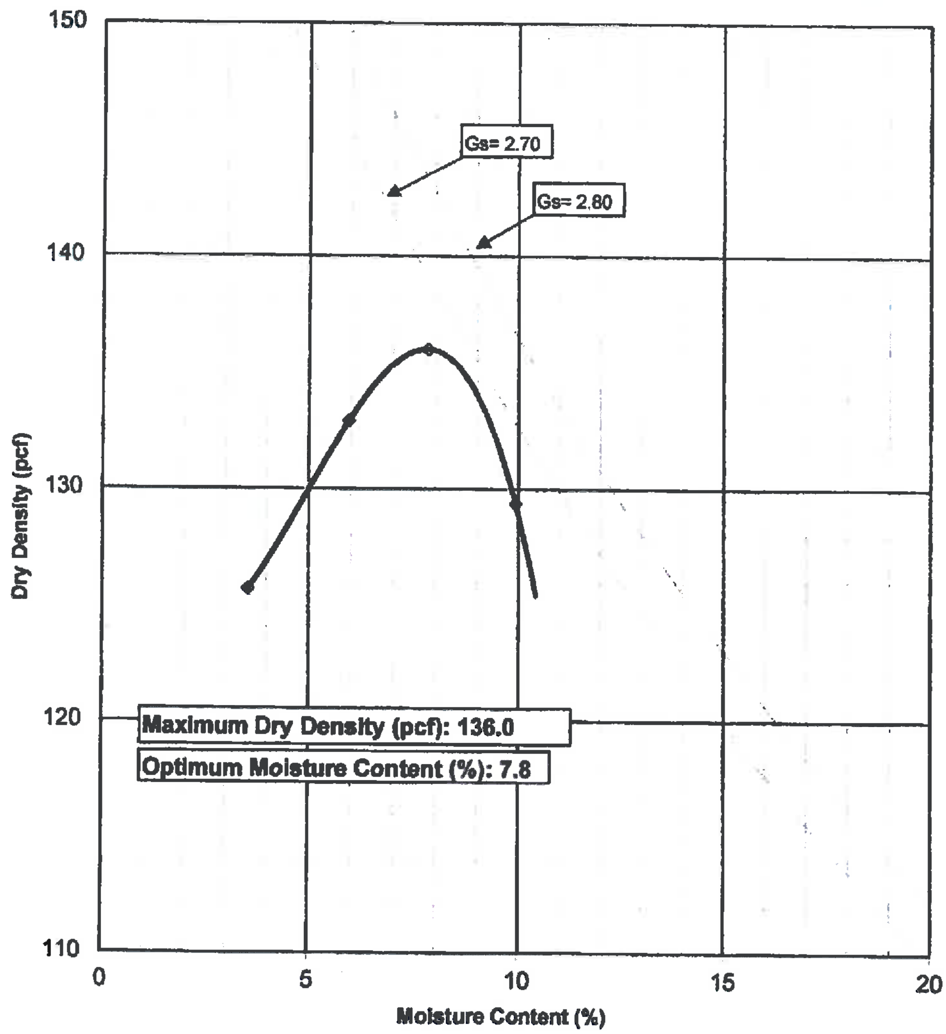
Boring No.		**B-101**		**B-102**	**B-103**
Sample No.		**MC-1**	**MC-2**	**MC-1**	**MC-1**
Depth (ft)		**30**	**40**	**30**	**20**
Total wt of rings and soil	gr	581.20	1257.39	922.91	908.86
Height of sample	in	3	6	5	5
Diameter of sample	in	2.416	2.416	2.416	2.416
Volume of sample	cu.ft	0.0080	0.0159	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

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



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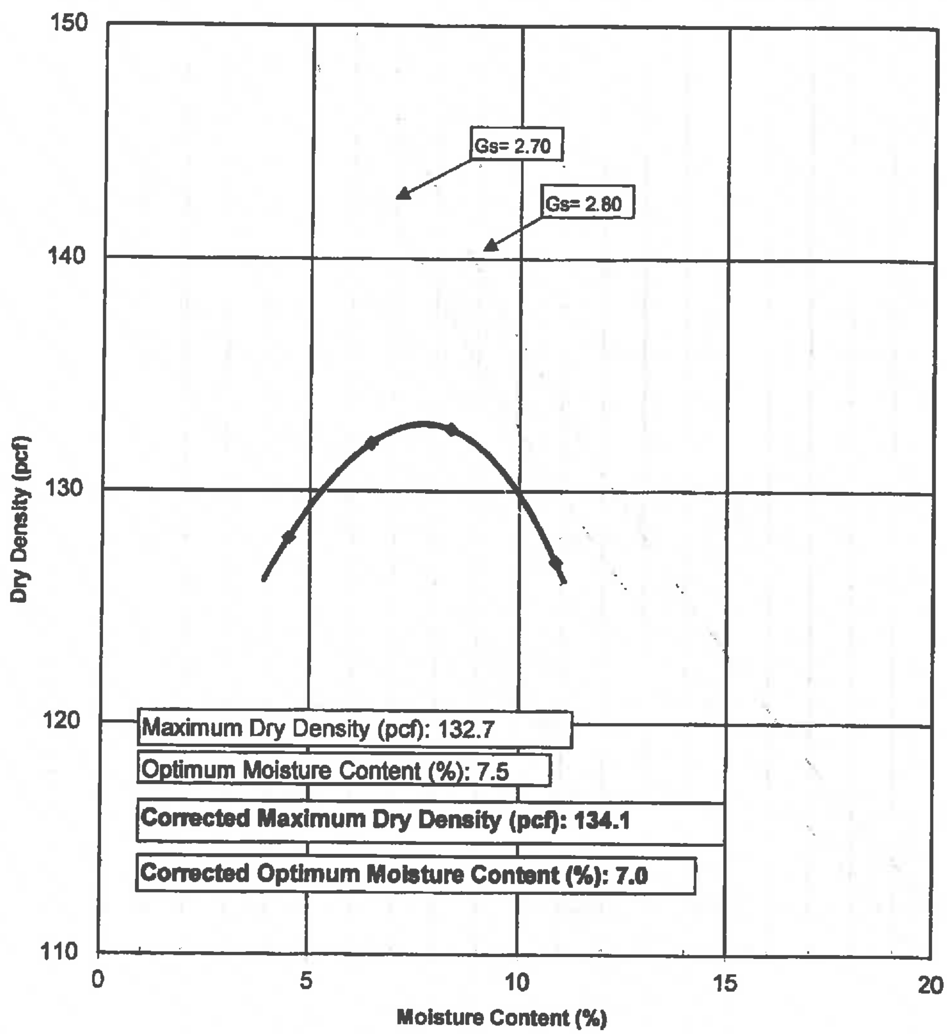
COMPACTION CURVE
(ASTM D1557)

Client :	Golder Associates Inc.
Project Name:	Townscope Sunset
Project No.:	123-92034
Boring No:	B-104
Sample No.:	Bulk 1 ***Depth:*** 21.5-25'
Soil Description:	Brown, Well-Graded Sand with Silt (SW-SM)

HAI Project No.:	GLDL-13-003
Tested by:	KL/PM
Checked by:	JT
Date:	3/5/2013
Mold size:	4 in
Procedure:	A
% Ret. on # 4:	6.8

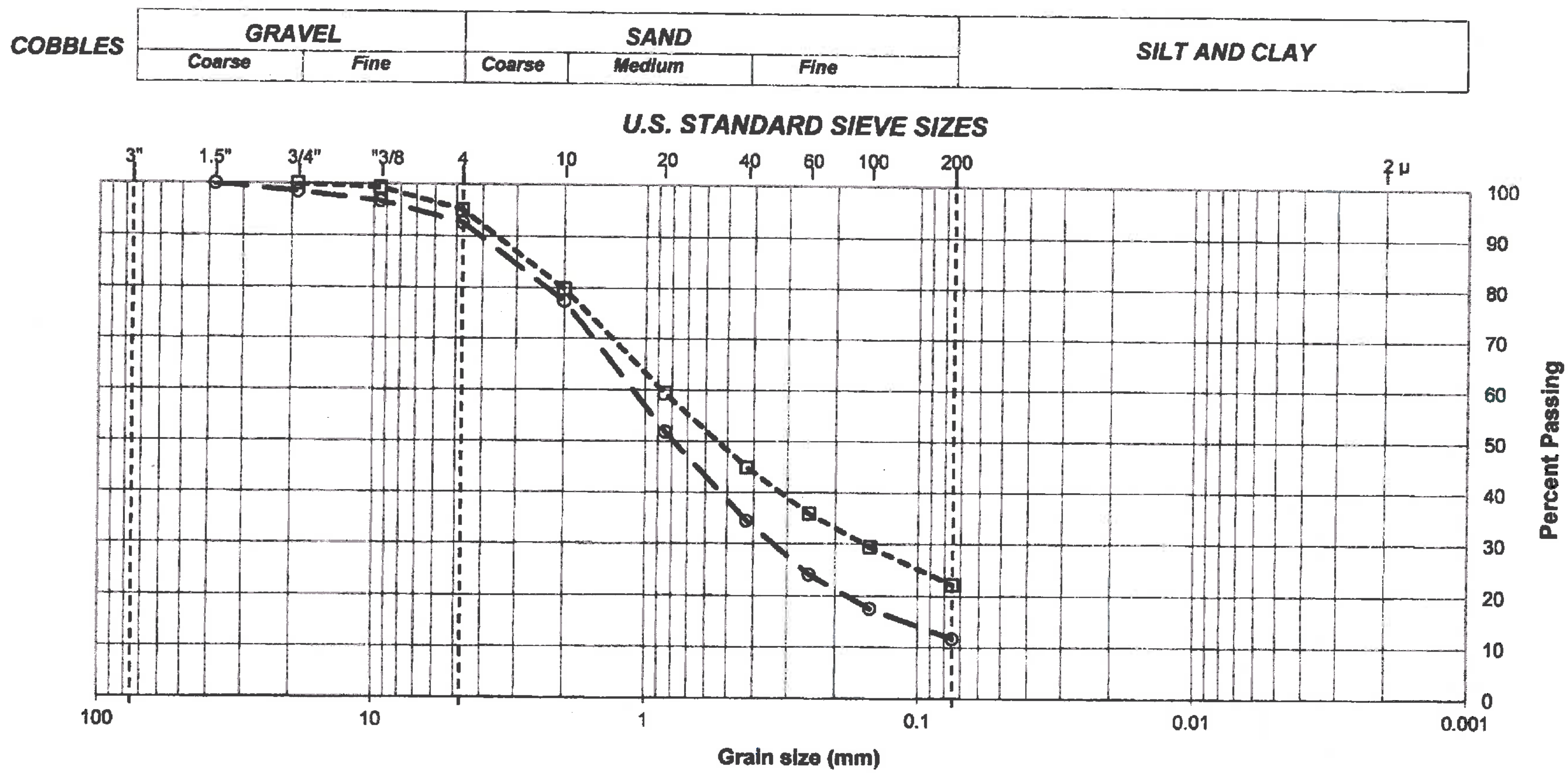


HAI **HUSHMAND ASSOCIATES, INC.**
Geotechnical and Earthquake Engineers

PARTICLE-SIZE ANALYSIS OF SOILS
(ASTM D422)

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

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



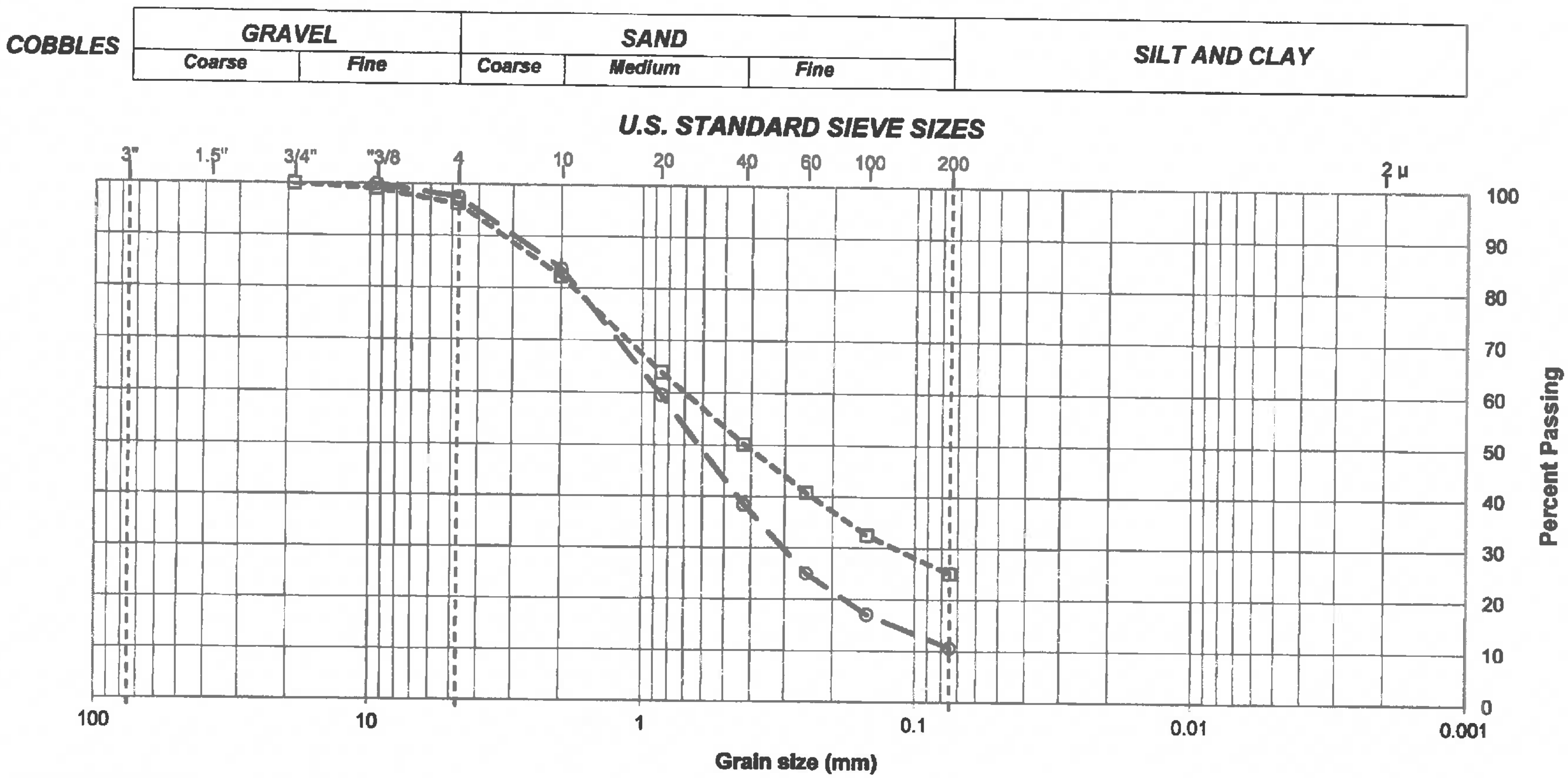
Boring No.	Sample No.	Depth (ft)	Symbol	USCS	% Gravel	% Sand	% Fines
B-101	Bulk 1	11.5-15	○	Brown, Well-Graded Sand with Silt (SW-SM)	7.4	81.0	11.7
	Bulk 2	26.5-30	□	Brown, Silty Sand (SM)	4.9	73.0	22.1

HAI HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

PARTICLE-SIZE ANALYSIS OF SOILS
(ASTM D422)

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

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



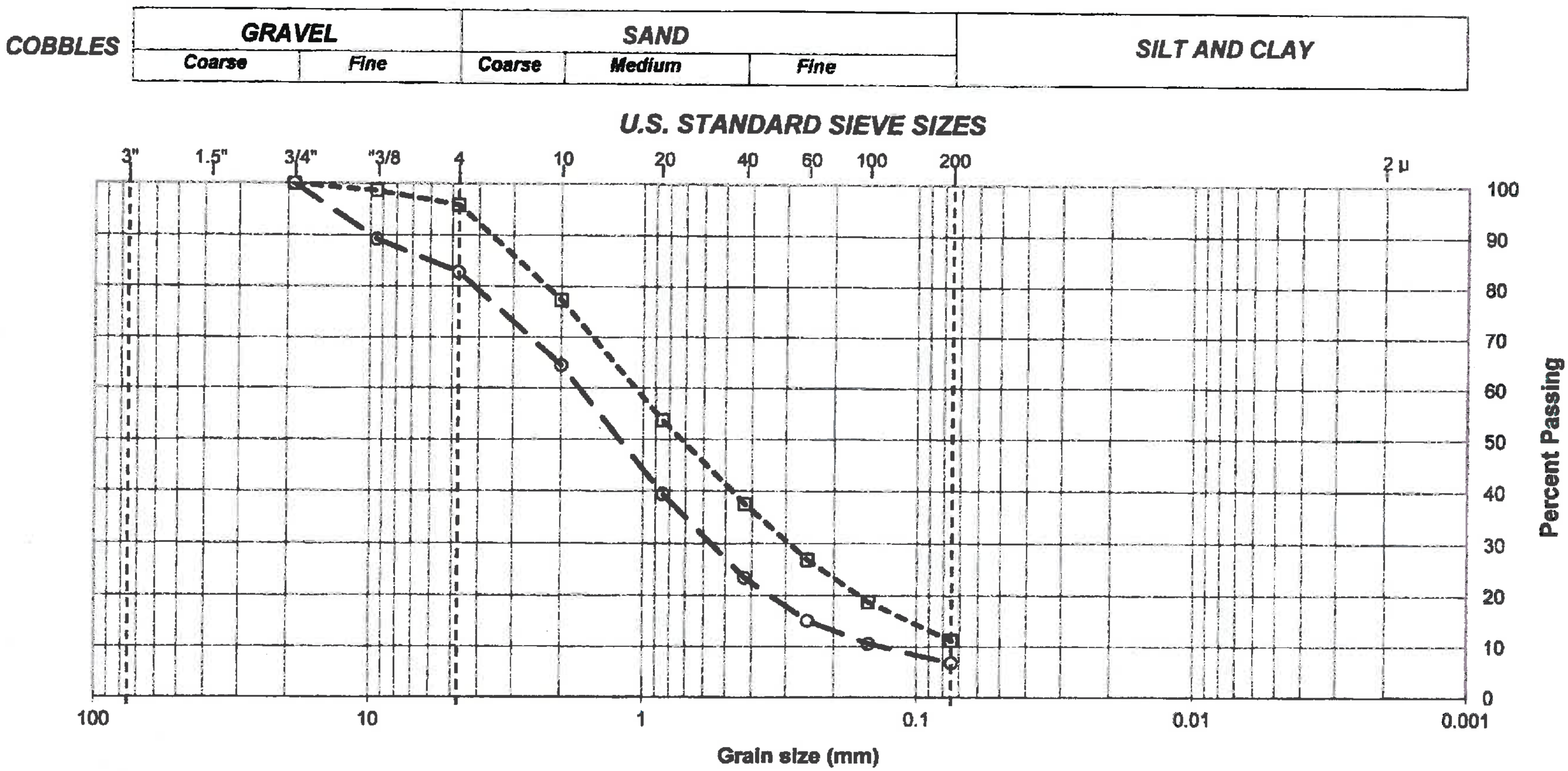
Boring No.	Sample No.	Depth (ft)	Symbol	USCS	% Gravel	% Sand	% Fines
B-101	MC-1	30	○	Brown, Well-Graded Sand with Silt (SW-SM)	2.5	86.9	10.6
	MC-2	40	□	Brown, Clayey Sand (SC)	3.8	71.2	25.0

HAI HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

PARTICLE-SIZE ANALYSIS OF SOILS
(ASTM D422)

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

HAI Project No.: GLDL-13-003
Tested by: KL/PM
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)

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Project Name: Townscope Sunset
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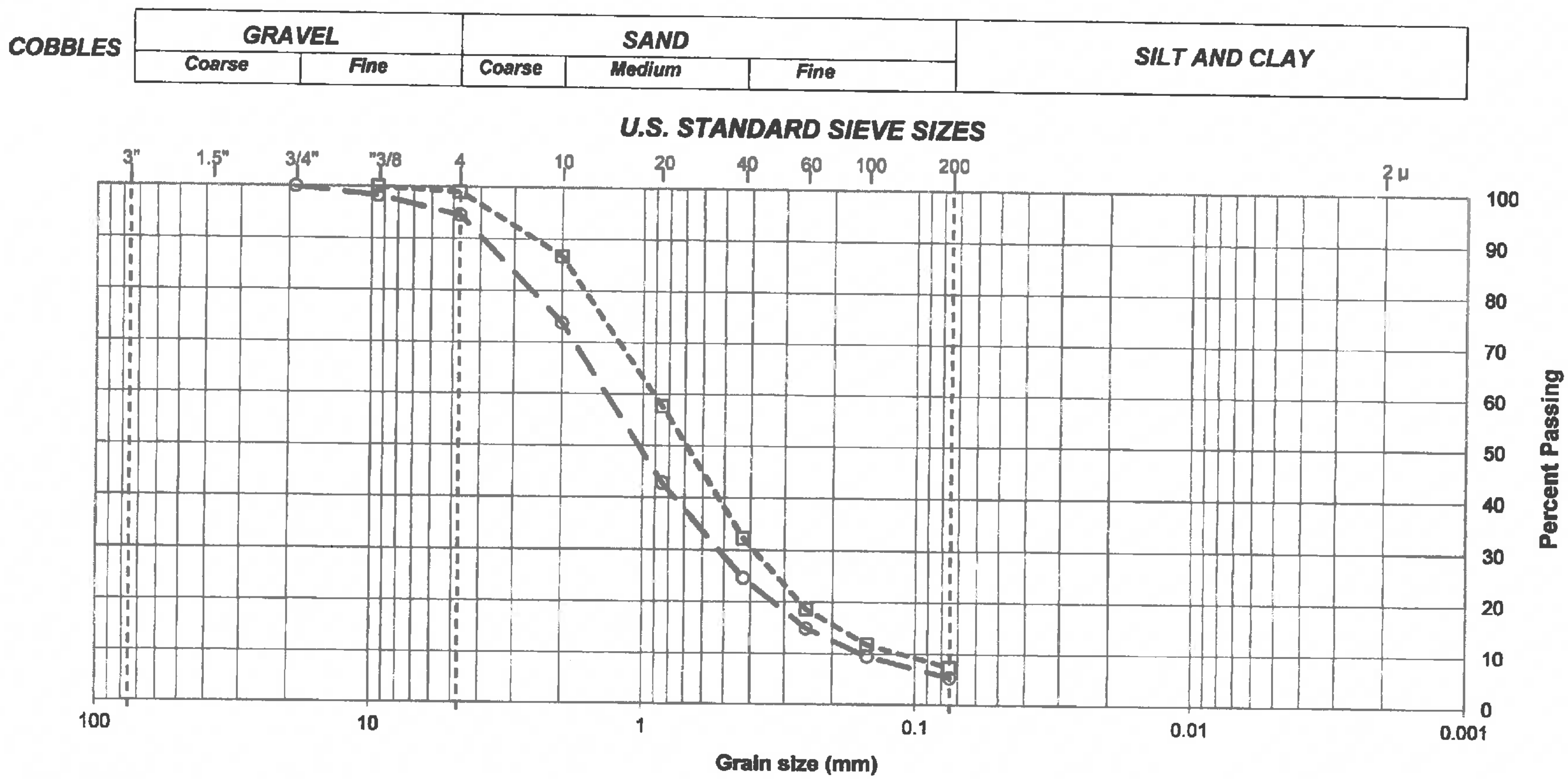


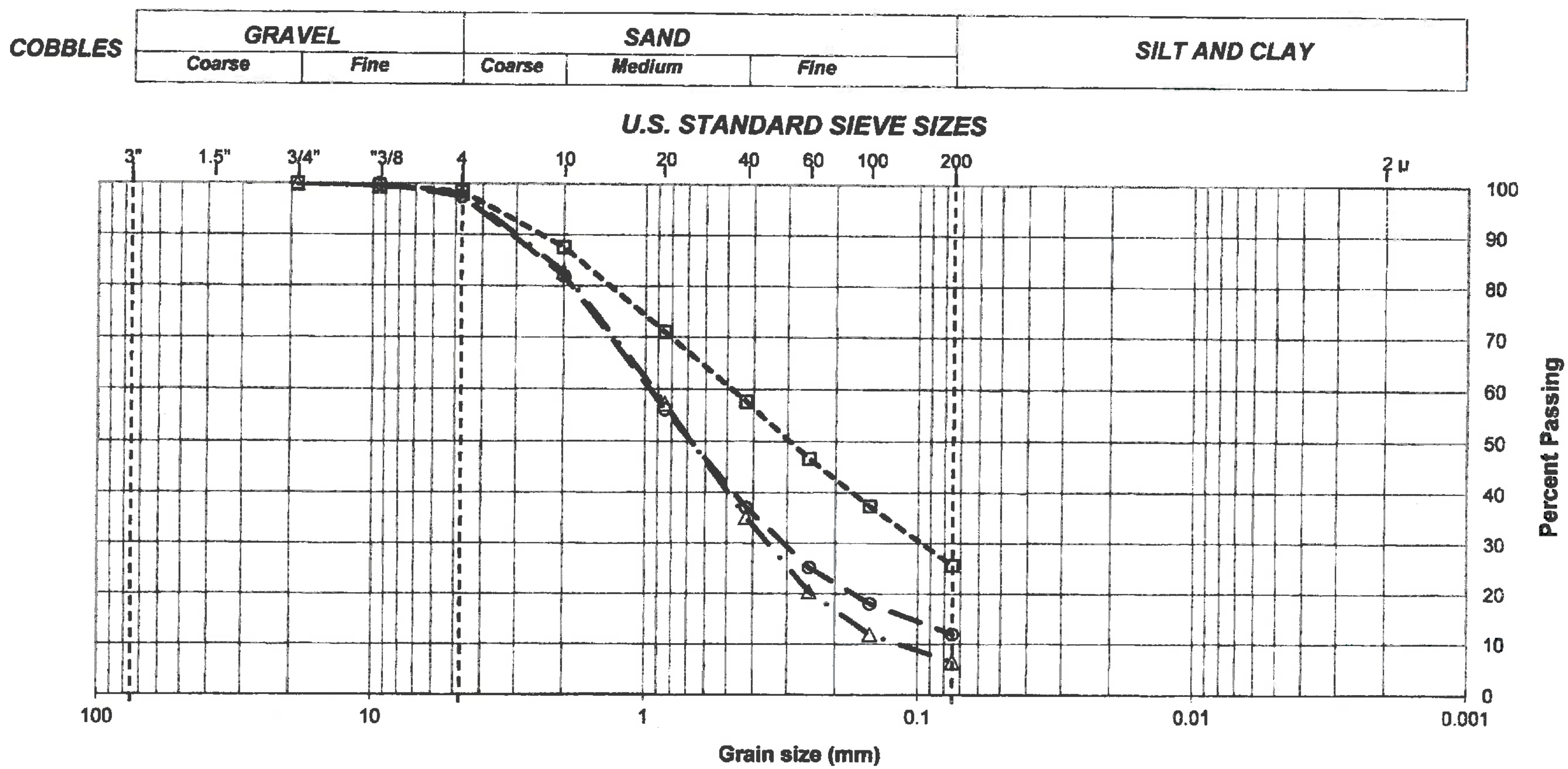
Boring No.	Sample No.	Depth (ft)	Symbol	USCS	% Gravel	% Sand	% Fines
B-102	MC-1	30	O	Brown, Well-Graded Sand with Silt (SW-SM)	5.4	89.2	5.4
	S-7	40	□	Brown, Well-Graded Sand with Silt (SW-SM)	1.0	91.7	7.4

HAI HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

PARTICLE-SIZE ANALYSIS OF SOILS
(ASTM D422)

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

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



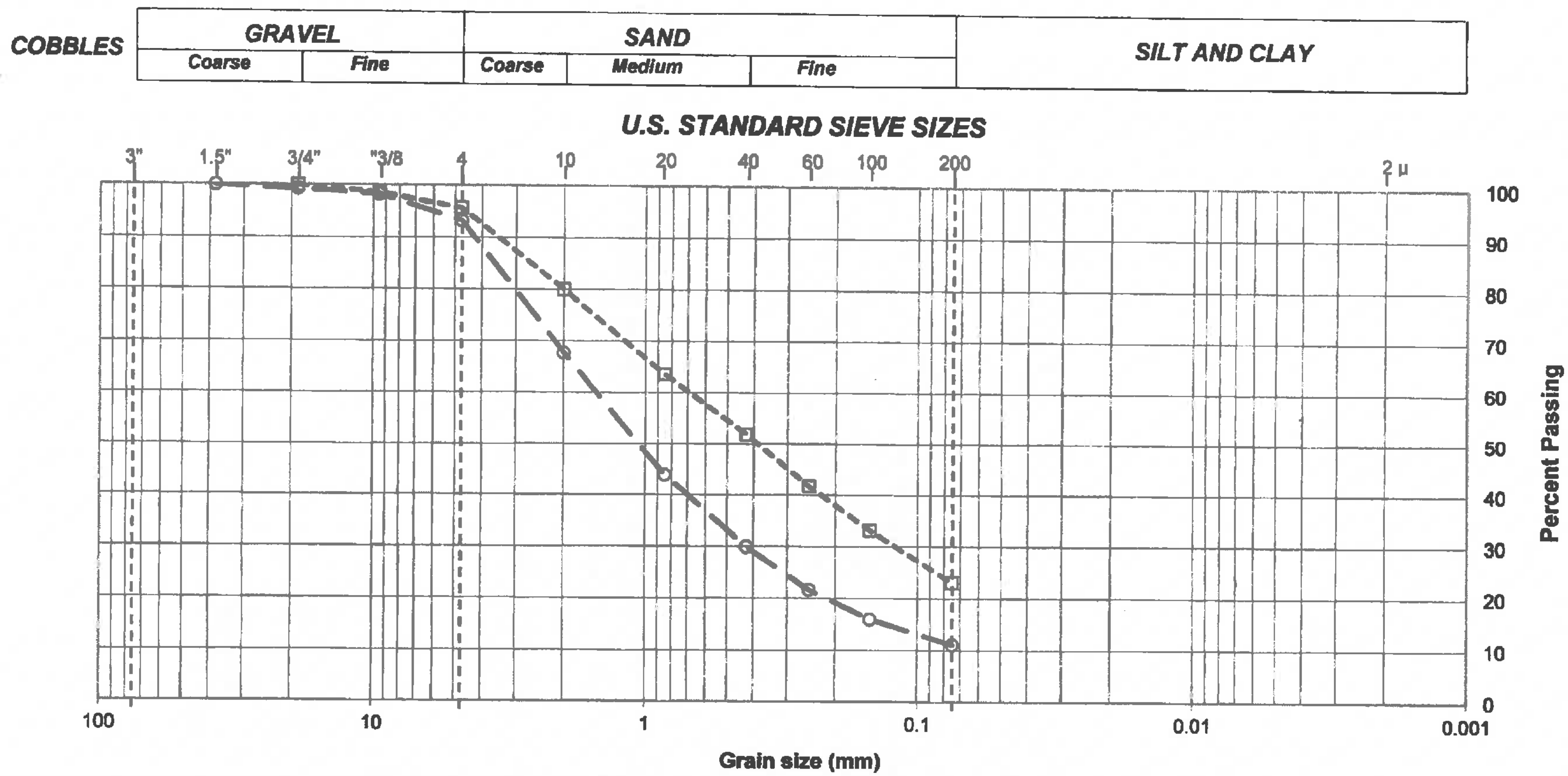
Boring No.	Sample No.	Depth (ft)	Symbol	USCS	% Gravel	% Sand	% Fines
B-103	S-2	10	○	Brown, Silty Sand (SM)	2.5	85.5	12.0
	S-3	15	□	Brown, Clayey Sand (SC)	1.5	72.9	25.6
	MC-1	20	△	Brown, Well-Graded Sand with Silt (SW-SM)	1.8	91.7	6.5

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

PARTICLE-SIZE ANALYSIS OF SOILS
(ASTM D422)

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

HAI Project No.:	GLDL-13-003
Tested by:	KL/PM
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

• ANALYSIS
• DESIGN

LaBelle • Marvin

• SOILS, ASPHALT TECHNOLOGY

PROFESSIONAL PAVEMENT ENGINEERING
A CALIFORNIA CORPORATION

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

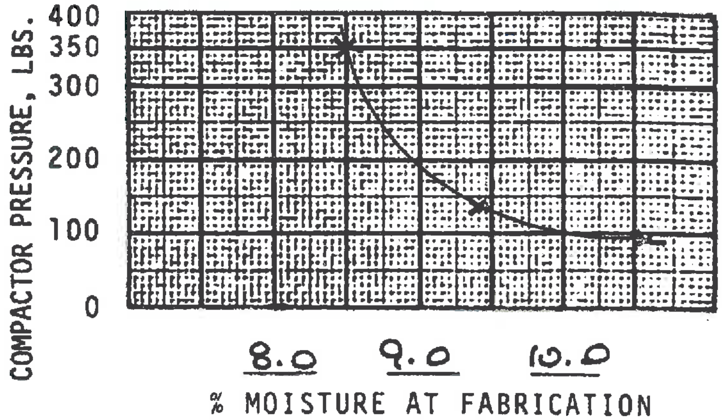
BORING NO. B-101 @ 26.5"-30.0"
Golder-Townscape Sunset

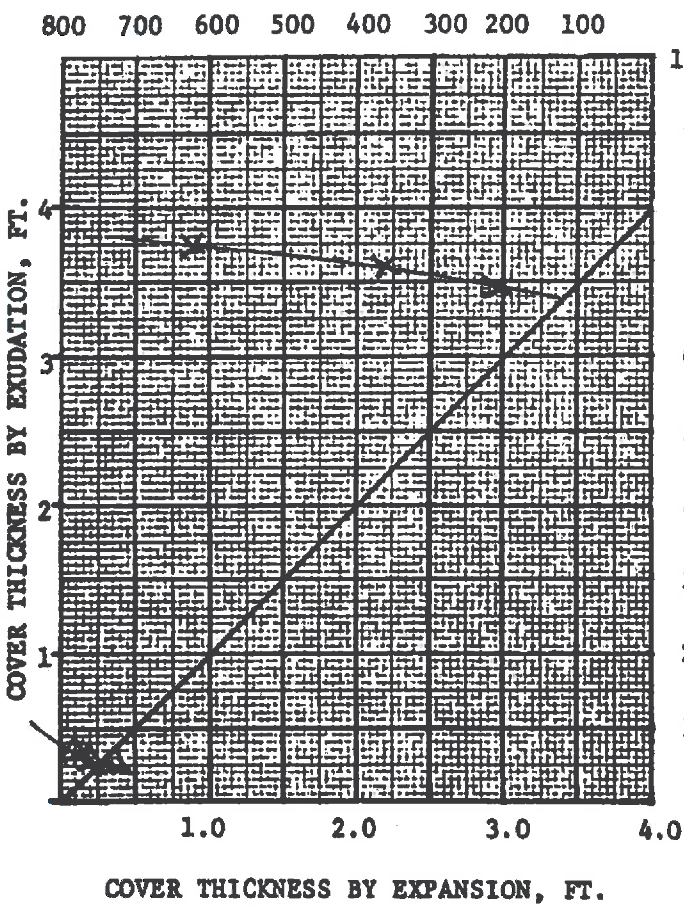
DATE 3/1/13

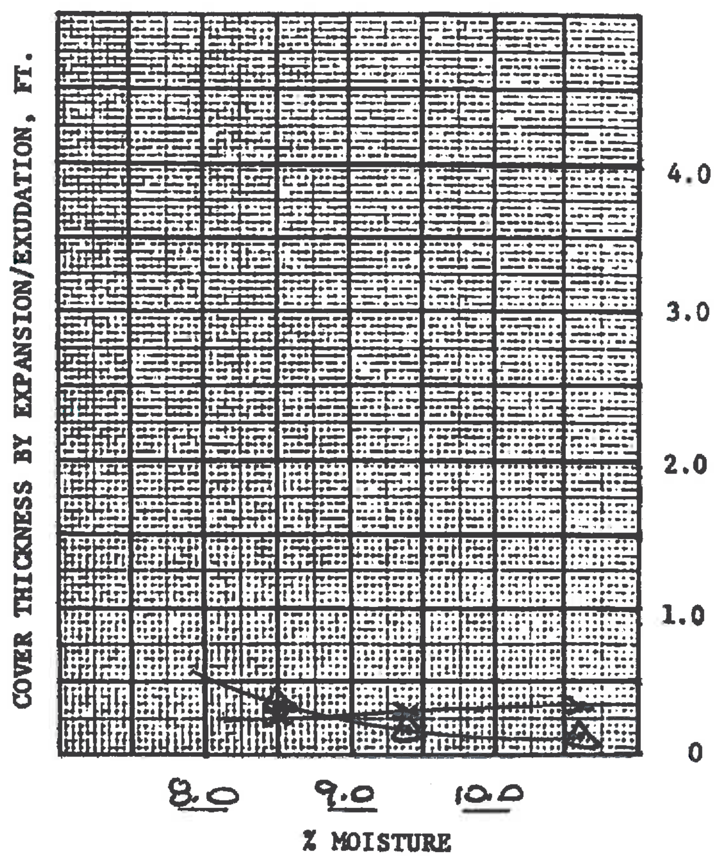
TRAFFIC INDEX Assume 4.0

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

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

Steven R. Marvin, RCE 30659

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

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. 385'71
P.N. GLDL-13-003

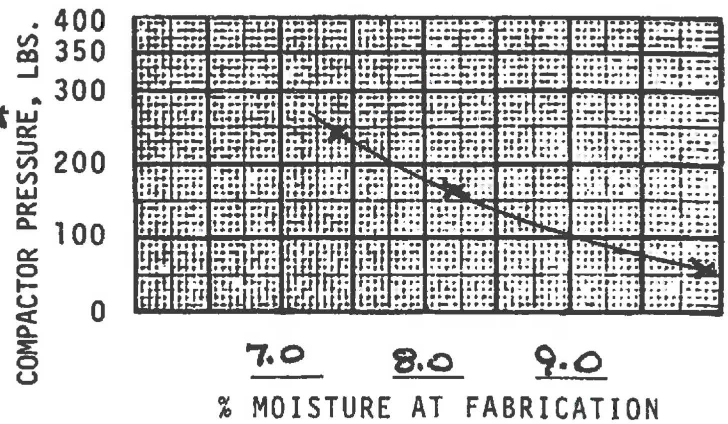
BORING NO. B-10A @ 21.5'-25.0"
Golder-Transcape Sunset

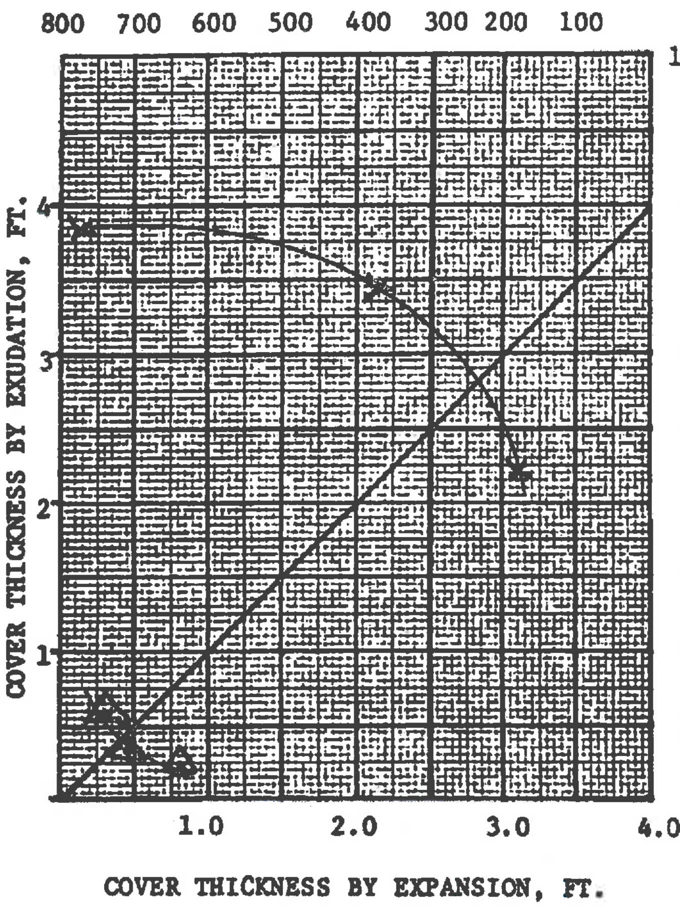
DATE 3-1-13

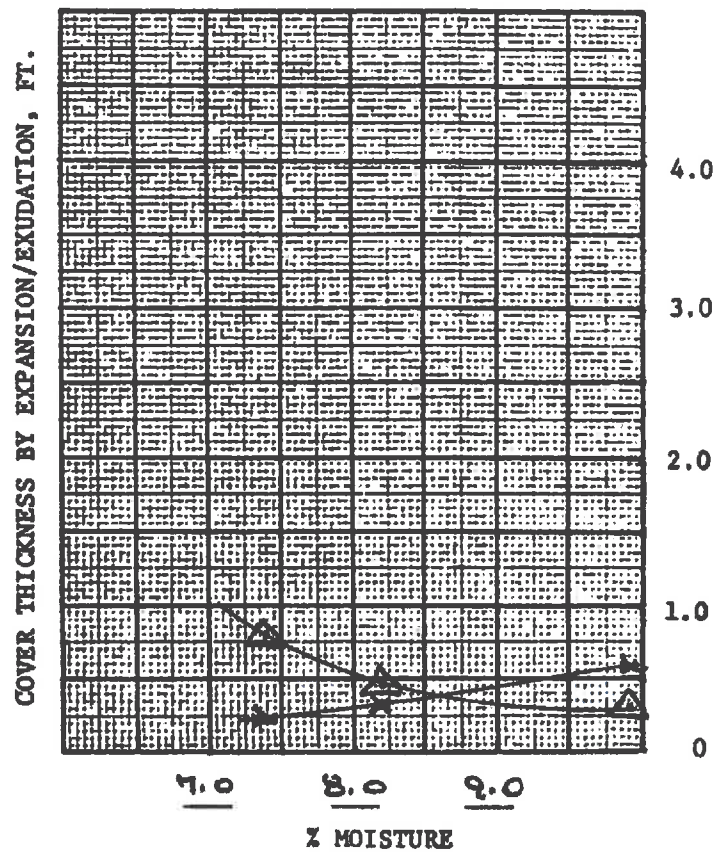
TRAFFIC INDEX Assume 4.0

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, INCORPORATED
Geotechnical, Earthquake and Environmental Engineers

RECEIVED
MAR 13 2013
GOLDER ASSOCIATES INC.
IRVINE, CALIFORNIA

March 11, 2013

Golder Associates Inc.
230 Commerce, Suite 200
Irvine, CA 92602

Attention: Mr. Jaime Bueno

SUBJECT: **Laboratory Test Results**
Golder Project Name: Townscope Sunset
Golder Project No.: 123-92034
HAI Project No.: GLDL-13-003

Dear Mr. Bueno:

Enclosed are the results of the laboratory testing conducted on samples from the above referenced project. The testing was conducted in general accordance with the following test procedures:

Type of Test	Test Procedure
Corrosion Suite	CTM 643, 417, and 422

Attached are: Updated Summary of Laboratory Test Results, and one (1) Corrosion Suite.

We appreciate the opportunity to provide our testing services to Golder Associates Inc. If you have any questions regarding these test results, please contact us.

Sincerely,

HUSHMAND ASSOCIATES, INC.

Jorge Turbay D.L.

Jorge Turbay, MS, PE
Senior Project Engineer

1721 East Lambert Road, Suite B, La Habra, California 90631 Phone / Fax: (562) 690-3737
www.hushmand-associates.com

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: 3/11/2013

Boring No.	Sample No.	Depth (ft)	In-situ Moisture Content (%)	In-situ Dry Density (pcf)	Modified Proctor (ASTM D1557) Optimum Moisture Content (%)	Modified Proctor (ASTM D1557) Maximum Dry Density (pcf)	R Value (CTM 301)	Particle-size Analysis of Soils (ASTM D422) (Percent Passing) 1 1/2"	3/4"	3/8"	#4	#10	#20	#40	#60	#100	#200	Corrosion pH	Sulfates (ppm)	Sulfates (%) by weight	Chlorides (ppm)	Resistivity (ohm-cm)
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	8.0	8.3	0.00083	2.7	18,330
	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					

HAI HUSHMAND ASSOCIATES INC.
Geotechnical and Earthquake Engineers

HDR | SCHIFF
www.hdrinc.com
Corrosion Control and Condition Assessment (C3A) Department

Table 1 - Laboratory Tests on Soil Samples

Hushmand Associates, Inc.
Townscope Sunset
Your #GLDL-13-003, HDR|Schiff #13-0167LAB
28-Feb-13

Sample ID			B101 @ 11.5 - 15'
Resistivity		**Units**	
as-received		ohm-cm	60,000
minimum		ohm-cm	18,330
pH			8.0
Electrical Conductivity		mS/cm	0.03
Chemical Analyses			
Cations			
calcium	Ca^{2+}	mg/kg	16
magnesium	Mg^{2+}	mg/kg	4.2
sodium	Na^{1+}	mg/kg	32
potassium	K^{1+}	mg/kg	3.1
Anions			
carbonate	CO_3^{2-}	mg/kg	ND
bicarbonate	HCO_3^{1-}	mg/kg	70
fluoride	F^{1-}	mg/kg	1.0
chloride	Cl^{1-}	mg/kg	2.7
sulfate	SO_4^{2-}	mg/kg	8.3
phosphate	PO_4^{3-}	mg/kg	4.0
Other Tests			
ammonium	NH_4^{1+}	mg/kg	ND
nitrate	NO_3^{1-}	mg/kg	1.3
sulfide	S^{2-}	qual	na
Redox		mV	na

Minimum resistivity per CTM 643, Chlorides per CTM 422, Sulfates per CTM 417
Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
ND = not detected
na = not analyzed

431 West Baseline Road · Claremont, CA 91711
Phone: 909.626.0967 · Fax: 909.626.3316

Golder Associates

August 10, 2015 | Golder Project No.: 123-92034

John Irwin
AG SCH 8150
Sunset Boulevard Owner, L.P.
P.O. Box 10506
Beverly Hills, California 90213

RE: ADDENDUM NO. 1 TO MAY 18, 2015 GEOTECHNICAL REPORT PROPOSED RESIDENTIAL AND COMMERCIAL DEVELOPMENT 8150 SUNSET BOULEVARD, LOS ANGELES, CALIFORNIA

Dear Mr. Irwin:

Golder Associates Inc. (Golder) is submitting this letter report that serves as Addendum No. 1 to the following geotechnical report that we prepared for proposed residential and commercial development at 8150 Sunset Boulevard in Los Angeles, California (the site):

- "Geotechnical Exploration and Recommendations Report, Proposed Residential and Commercial Development, 8150 Sunset Blvd., Los Angeles, California," dated May 18, 2015 (referred to as "Golder's Geotechnical Report" herein).

Specifically, this addendum report addresses the following three items:

1. Inclusion of a reinforced foundation zone in the northwest corner of the site.
2. Results of direct shear tests performed on representative soil samples from the site.
3. Geotechnical recommendations for shoring systems.

The remainder of this letter discusses the above-listed items.

REINFORCED FOUNDATION ZONE

Golder's fault hazard study for the site (Golder, 2015[1]) established that the main trace of the Hollywood Fault is located northwest of boring B-106 and cone penetration test (CPT) sounding CPT-14 (see Figure 1 to this letter). However, Golder's fault rupture investigation was unable to extent 50 feet beyond the site's boundary because of access and traffic restrictions on Sunset Boulevard. While the State of California Alquist-Priolo map shows the main trace of the Hollywood Fault more than 100 feet northwest of the site's northwest corner (see Figure 1 to this letter), our investigation was unable to unequivocally establish that the main Hollywood Fault trace is more than 50 feet from the northwest corner of the site. Therefore, in accordance with City of Los Angeles policy, Golder recommends that a 50-foot wide reinforced foundation zone be established in the northwest corner of the site as shown on Figure 1 to this letter (Figure 1 also shows the location of the main trace of the Hollywood Fault, the extents of the Alquist-Priolo Earthquake Fault Zone, CPT and boring locations, and the approximate limits of the proposed basement excavation and building development).

[1] Golder Associates Inc., "Surface Fault Rupture Hazard Assessment, Proposed Residential and Commercial Development, 8150 Sunset Boulevard, City of Los Angeles, California," dated May 18, 2015

Golder Associates Inc.
3 Corporate Park, Suite 200
Irvine, CA 92606 USA
Tel: (714) 508-4400 Fax: (949) 483-2339 www.golder.com

The reinforced foundation zone does not contain the main trace of the Hollywood Fault, but could be subject to secondary surface fault rupture or off-fault displacements. Golder recommends that structures located within the reinforced foundation zone in the northwest corner of the site be designed for a 10-inch horizontal ground displacement and a 2-inch vertical ground displacement. These recommended ground displacement values are the same as those recommended by GeoPentech for a site located at 1840 Highland Avenue in Los Angeles (the Highland Site), which is on or adjacent to the active trace of the Hollywood Fault about 1.8 miles east-northeast of the 8150 Sunset Boulevard site. We consider that the adoption of a 10-inch horizontal ground displacement and a 2-inch vertical ground displacement for the design of foundations in the reinforced foundation zone is sufficiently conservative for the 8150 Sunset Boulevard site because:

- Neither the main trace nor secondary traces of the Hollywood Fault have been identified on the 8150 Sunset Boulevard site, unlike the Highland Site where active fault traces were identified.
- The reinforced foundation zone has been included for the 8150 Sunset Boulevard site only because it has not been possible to unequivocally prove that the main trace of the Hollywood Fault is more than 50 feet from this site's northwest corner, and not because structures are being placed adjacent to known traces of the Hollywood Fault such as at the Highland Site.
- Probabilistic fault displacement hazard analysis (PFDHA), an analysis technique that is increasingly being used to evaluate the risk of surface displacements at sites on or adjacent to Holocene-active faults, indicates that little or no ground displacement can be expected in the reinforced foundation zone at 8150 Sunset Boulevard in the next 2,475 years, which is the basis of the Maximum Considered Earthquake for ground shaking in the City of Los Angeles Building Code.

DIRECT SHEAR TEST RESULTS

In July 2015, Golder had three representative soil samples from the site direct shear tested in accordance with ASTM D3080. The direct shear tests were performed by Hushmand Associates, Inc.'s (HAI) geotechnical testing laboratory under the direction of Golder. The direct shear tests were performed on the following samples that were collected during Golder's previous field work at the site (as described in Golder's Geotechnical Report):

- Bulk sample 1 from boring B-102A (depth = 30 to 35 feet below ground surface)
- Core sample from boring B-105 (depth = 14 to 15 feet below ground surface)
- Core sample from boring B-106 (depth = 30 to 31 feet below ground surface)

The above-listed samples were selected for direct shear testing as they are considered to be representative and provide an appropriate areal and elevation coverage across the site. Three-point, consolidated-drained direct shear testing was performed on remolded and saturated test specimens from each of the above-listed samples. Remolding of the test specimens was necessary since the samples were disturbed bulk and core samples. The measured in-situ dry density and moisture content of previously tested samples from the site ranged from 109.2 to 124.1 pounds per cubic foot (pcf) and 3.7 to 10.2 percent, respectively, as shown in Appendix C of Golder's Geotechnical Report. Therefore, Golder instructed the laboratory to remold each direct shear test specimen to a dry density of 110 pcf at a moisture content of 5 percent. Remolding the direct shear test specimens to a dry density (110 pcf) that is approximately equal to the lowest measured in-situ dry density (109.2 pcf) yielded conservative results as the shear strengths measured in the direct shear tests would increase if the samples were remolded to a higher dry density. The direct shear tests were performed at effective normal stresses of 1, 5, and 10 ksf, which are considered to bound the range of normal stresses that will be present beneath the proposed foundations and behind the retaining walls and shoring system(s). The laboratory direct shear test results are presented in Attachment A to this letter. Golder has reviewed the laboratory direct shear data provided by HAI and concurs with the results. As such, Golder accepts responsibility for use of the laboratory direct shear data presented in Attachment A to this letter.

Figure 2 to this letter presents a summary plot of shear stress at failure (i.e., shear stress at the end of the direct shear tests) versus normal stress for each of the three sets of direct shear tests. Figure 2 also shows a conservative best-fit linear failure envelope for the direct shear test data, with the cohesion intercept set at zero (which is appropriate for the granular soils at the site). As can be seen on Figure 2, the conservative best-fit linear failure envelope for the direct shear test data corresponds to a friction angle of 32 degrees (with a cohesion intercept of zero). As described in Section 4.4 of Golder's Geotechnical Report, a friction angle of 32 degrees (with zero cohesion) was assigned to the subsurface soils at the site based on the results of standard penetration test (SPT) and CPT results. Based on the direct shear laboratory test results described above and summarized on Figure 2, use of a friction angle of 32 degrees for the site's soils is justified.

SHORING RECOMMENDATIONS

Excavation and shoring is a major part of the proposed project and will need to be carefully evaluated once the final design of the proposed development is complete. We understand that the shoring system will be designed by the contractor. Issues that will have to be addressed by the contractor include:

- Surcharge on the proposed shoring system from existing structures.
- Anticipated movements of the shoring system and their effect on nearby structures.

The shoring designer should develop a system that satisfies the requirements and reflects the actual loading conditions of the proposed buildings and structures at the site. Golder is providing the information and recommendations below to aid in this process. The shoring designer will be responsible for analyzing the shoring system(s) to demonstrate that the shoring has an acceptable factor of safety (i.e., a factor of safety greater than or equal to 1.3) against failure.

Because of the depth of the proposed excavations and the space limitations, excavation shoring will be required at the site. Depending on the final depth of excavation and the presence of adjacent surface and/or underground structures, shoring may consist of cantilever soldier pile and lagging walls, tied-back soldier pile and lagging walls, internally braced soldier pile and lagging walls, secant or tangent pile walls, or a combination of these systems. Where control of excavation-induced ground movements is critical, the use of secant and/or tangent pile walls may be considered because of the greater lateral stiffness of these systems. The lateral stiffness of soldier pile and lagging walls can be increased by adjusting the horizontal spacing of the soldier piles, the vertical spacing of the supports, and the support pre-load.

Lateral Pressures for Shoring Design

- Cantilever-type shoring systems should be designed to resist lateral earth pressures calculated as those from an equivalent fluid weighing 39 pcf.
- Tied-back or internally-braced shoring systems should be designed using the apparent earth pressure distribution presented in Figure 3.
- Soldier piles can be designed using the apparent earth pressure distribution presented in Figure 3.
- A vertical surcharge load of 250 psf should be applied to the ground surface immediately behind the shoring system to represent construction and street traffic in accordance with Figure 4.
- Surcharge loading from adjacent building foundations should be applied in accordance with Figure 4.
- An allowable passive earth pressure of 200 psf per foot of depth below the bottom of the excavation should be used for design of the shoring system. The allowable passive

pressure can be assumed to act over two times the concreted pile diameter or the pile spacing, whichever is less. For piles spaced closer than three diameters, a reduction in the allowable passive earth pressure may be necessary. Golder recommends that the upper 1 foot below the bottom of the excavation be neglected in the passive resistance calculations. The passive pressure should not exceed 4,000 psf.

The shoring recommendations presented above are for level ground behind the shoring system. It is also assumed that no material or equipment will be stockpiled within a distance of one times the excavation depth behind the wall. The shoring walls should be designed for additional lateral pressures if these assumptions are not met.

We have assumed that the majority of the site will be braced by tiebacks (i.e., ground anchors). Ground anchors provide open excavations that will simplify below-grade construction. Due to the proximity of adjacent properties and foundations for existing structures, it may be necessary to use rakers or horizontal struts as internal bracing for lateral support of excavation shoring systems in certain areas of the site. However, several factors must be considered when evaluating the use of ground anchors, including the proximity to foundation systems of adjacent buildings and temporary construction easement requirements. If a mixed system of struts and ground anchors is used for excavation support, the differing stiffness, response to thermal changes, and general behavior of the two types of systems must be considered in the design and construction so that the loads are shared between the two systems as intended.

Figure 3 shows the apparent earth pressure distribution that is recommended for shoring design. The recommended uniform apparent pressure distribution for sandy soils conforms to the standard practice in geotechnical engineering based upon measured strut loads in deep excavations. The cantilever portion of the wall down to the depth excavated to install the first brace/ground anchor should be checked separately using an equivalent fluid pressure of 39 pcf.

The considerations above apply only to forces in the wall supports and stresses in the soldier piles. Excavation induced wall movements are a separate issue. Movement of shoring walls are a function of many factors including the soil and groundwater conditions, changes in groundwater level, the depth and shape of the excavation, type and stiffness of the wall and its supports, methods of construction of the wall and adjacent facilities, surcharge loads, and the duration of wall exposure among others. Reported typical horizontal wall movements in sandy soils tend to average about 0.2% of the wall height for walls with good workmanship. The range of possible horizontal wall movements is approximately 0.5 inches to 2.5 inches. Reported typical vertical movements behind walls in sandy soils tend to average about 0.15% of the wall height for walls with good workmanship. The range of possible vertical movements behind the walls is approximately 0.5 inches to 2 inches. A reduction in the stiffness of the wall system (soldier pile and supports) could result in an increase in wall movements. The actual wall movement and settlement could exceed the values shown above in the case of soldier beam and ground anchors. With this system, the wall movement and settlement can be affected by the location of the first row of anchors (the cantilever height), the spacing of the soldier beams, and the effectiveness of the lagging (including workmanship) to minimize ground loss.

The anticipated ground movements at the adjacent structures should be checked by the contractor. If the movement criteria for an adjacent structure cannot be met by the shoring design, then the structure should be underpinned prior to excavation.

It is noted that, in an urban environment, it is possible that previously undetected fills and underground structures and utilities may be encountered once excavation begins. The excavation should be conducted under the observation of a Golder representative. Observing the soil conditions during excavation is very important so that the shoring design may be re-evaluated as soon as conditions differing from those assumed during the design are encountered to avoid delay or shoring failure.

Soldier Pile and Ground Anchor Design

If ground anchors (tiebacks) are installed, the soldier piles should be designed to have adequate vertical capacity to resist the vertical components of the ground anchor loads, and permanent structural loads if required.

For vertical loads on soldier piles spaced at least 2.5 pile diameters center-to-center, the following design criteria are recommended:

- A minimum pile embedment of 10 feet below the base of the excavation.
- Allowable end bearing resistance of 10 ksf.
- Allowable side friction of 0.4 ksf per foot below the bottom of the excavation, neglecting the upper one foot of embedment.

The embedment depth of the soldier piles below the base of the excavation should be designed to provide adequate lateral resistance below the lowest ground anchor.

The anchor portion of the tieback should be located sufficiently far behind the excavation shoring to stabilize the excavation face. The "no load" zone limits are defined by a horizontal distance equal to 25 percent of the excavation height rising at an angle of 60 degrees from horizontal starting from the base of the excavation.

The selection of tieback materials and the installation methods should be the responsibility of the contractor. The actual adhesion values will depend on the materials and installation methods. The adhesion values should be confirmed in the field by testing.

For non-pressure grouted anchors, an allowable design concrete/soil adhesion of 8 pounds per square inch (psi) is estimated for preliminary design. This value should be confirmed in the field by testing during construction.

A minimum anchor spacing of 4 feet center-to-center is recommended. Anchor holes should be drilled at an angle between 20 to 30 degrees down from horizontal. A minimum anchor bond zone of 10 feet is recommended. A minimum drill hole diameter of 6 inches is also recommended. The presence of man-made features such as existing utilities and foundations should be checked and located during the design as these may affect the locations of the tiebacks.

Shoring Monitoring and Instrumentation

Vertical and lateral movement of the ground and structures surrounding the shored excavation is recommended. Even with well-designed shoring systems there is a risk of greater-than-expected movements and possible damage to adjacent structures. Survey points should be established on the top of every third pile. Pile monitoring is to include both horizontal and vertical measurements. Several survey monitoring points (and possibly crack gauges) should be established on adjacent structures. In particular, monitoring is required to ensure that lateral movements on adjacent structures do not exceed 0.05% of the height from the structure to the base of the excavation. Monitoring points should also be established on the sidewalks and/or pavements surrounding the site. The survey monitoring should be accurate to at least 0.01 feet for both horizontal and vertical measurements.

In order to establish the baseline condition of the adjacent facilities prior to construction, a complete inspection and evaluation of the pavements, buildings, structures, and utilities near the perimeter of the excavation should be performed. Existing signs of damage should be thoroughly documented prior to construction. This documentation can include photographs, notes, survey, drawings, or video. A video survey of the utilities adjacent to the construction should also be considered.

CLOSING

We appreciate the opportunity to support AG SCH 8150 Sunset Boulevard Owner, L.P. on this important project. If you have any questions or require additional information, please contact either of the undersigned.

Sincerely,

GOLDER ASSOCIATES INC.

Ryan Hillman, P.E.
Senior Engineer

REGISTERED PROFESSIONAL ENGINEER
RYAN HILLMAN
No. C71988
CIVIL
STATE OF CALIFORNIA

Alan Hull, Ph.D., C.E.G.
Principal and Practice Leader

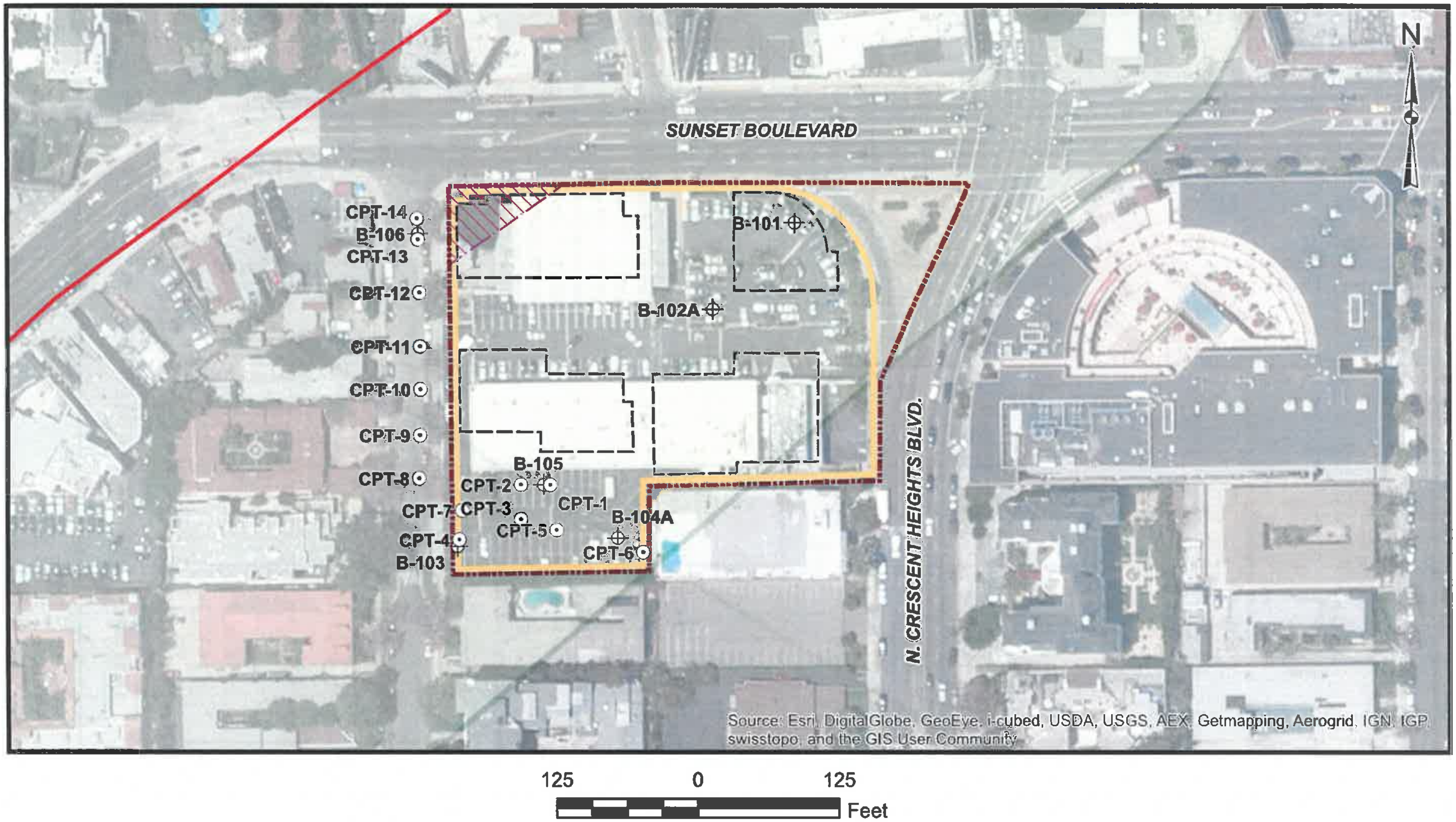
REGISTERED GEOLOGIST
ALAN G. HULL
NO. EG 2315
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Attachments:

- Figure 1 – Map of CPT, Borehole Locations and Reinforced Foundation Zone
- Figure 2 – Results of Direct Shear Tests
- Figure 3 – Apparent Earth Pressure Distribution for Braced and Tied-Back Excavations
- Figure 4 – Surcharge Earth Pressures for Shored Excavations and Permanent Walls
- Attachment A – Direct Shear Laboratory Test Results

FIGURES

M:\Projects\123 Jobs\123-92034 Townscape Sunset\99_PROJECTS\LetterToCity\02_PRODUCTION\ResponseToComments\BoreholeLocationMap.mxd, 8/5/2015, 03:05 PM by kkavli



LEGEND

- SITE BOUNDARY
- BORING LOCATION
- CPT LOCATION
- HOLLYWOOD FAULT (CGS 2014)
- HOLLYWOOD FAULT ZONE
- REINFORCED FOUNDATION ZONE
- APPROXIMATE LIMITS OF BASEMENT EXCAVATION FOR PROPOSED DEVELOPMENT
- APPROXIMATE LOCATION OF PROPOSED BUILDINGS

REFERENCES

1. COORDINATE SYSTEM: NAD 1983 StatePlane California V FIPS 0405 Feet
2. Imagery provided by ESRI online mapping service.
3. CGS, 2014, EARTHQUAKE ZONES OF REQUIRED INVESTIGATION, HOLLYWOOD QUADRANGLE, PRELIMINARY REVIEW MAP, CALIFORNIA GEOLOGICAL SURVEY RELEASED FOR COMMENT NOVEMBER 6, 2014

PROJECT

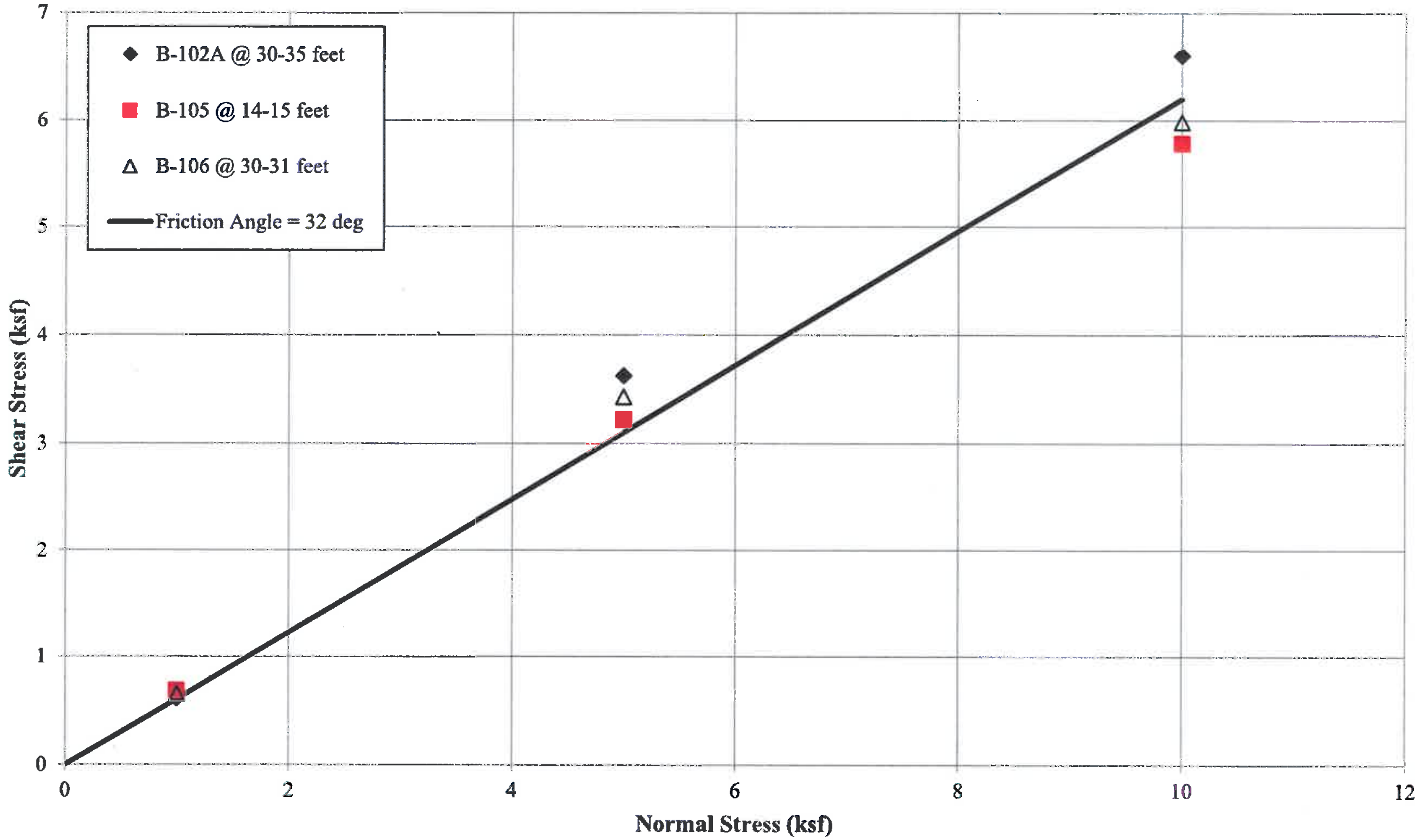
8150 SUNSET BLVD.
CITY OF LOS ANGELES, CALIFORNIA

TITLE

MAP OF CPT, BOREHOLE LOCATIONS AND REINFORCED FOUNDATION ZONE

Golder Associates

PROJECT NO. 123-92034.02			FILE No.	BoreholeLocationMap.mxd
DESIGN	DL	12/18/2013	SCALE: AS SHOWN	REV. 0
GIS	KJK	8/5/2015		
CHECK	CV	8/5/2015	**FIGURE 1**	
REVIEW	AH	8/5/2015		

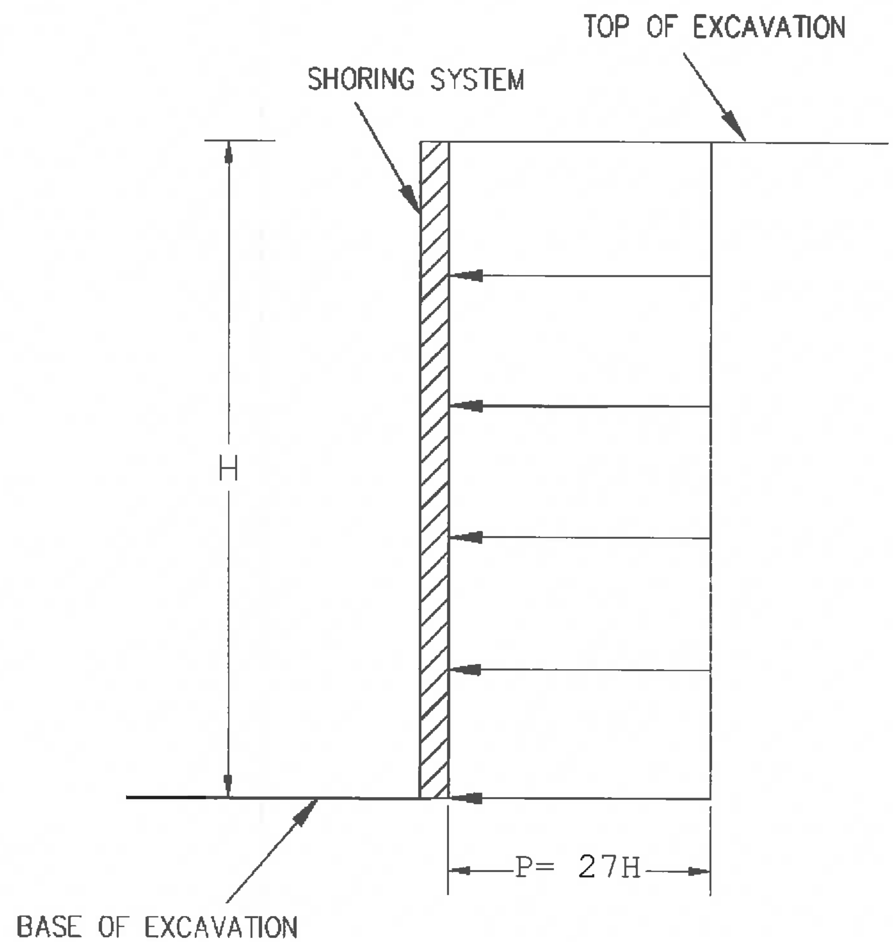


Note: Shear strengths plotted are those from the end of the test (i.e., post-peak).

FIGURE 2

Results of Direct Shear Tests

8150 Sunset Boulevard, Los Angeles, California



H= Height of excavation in feet
P= Apparent earth pressure in pounds per square foot

FIGURE 3

APPARENT EARTH PRESSURE DISTRIBUTION FOR BRACED AND TIED-BACK EXCAVATIONS

8150 Sunset Boulevard, Los Angeles, California

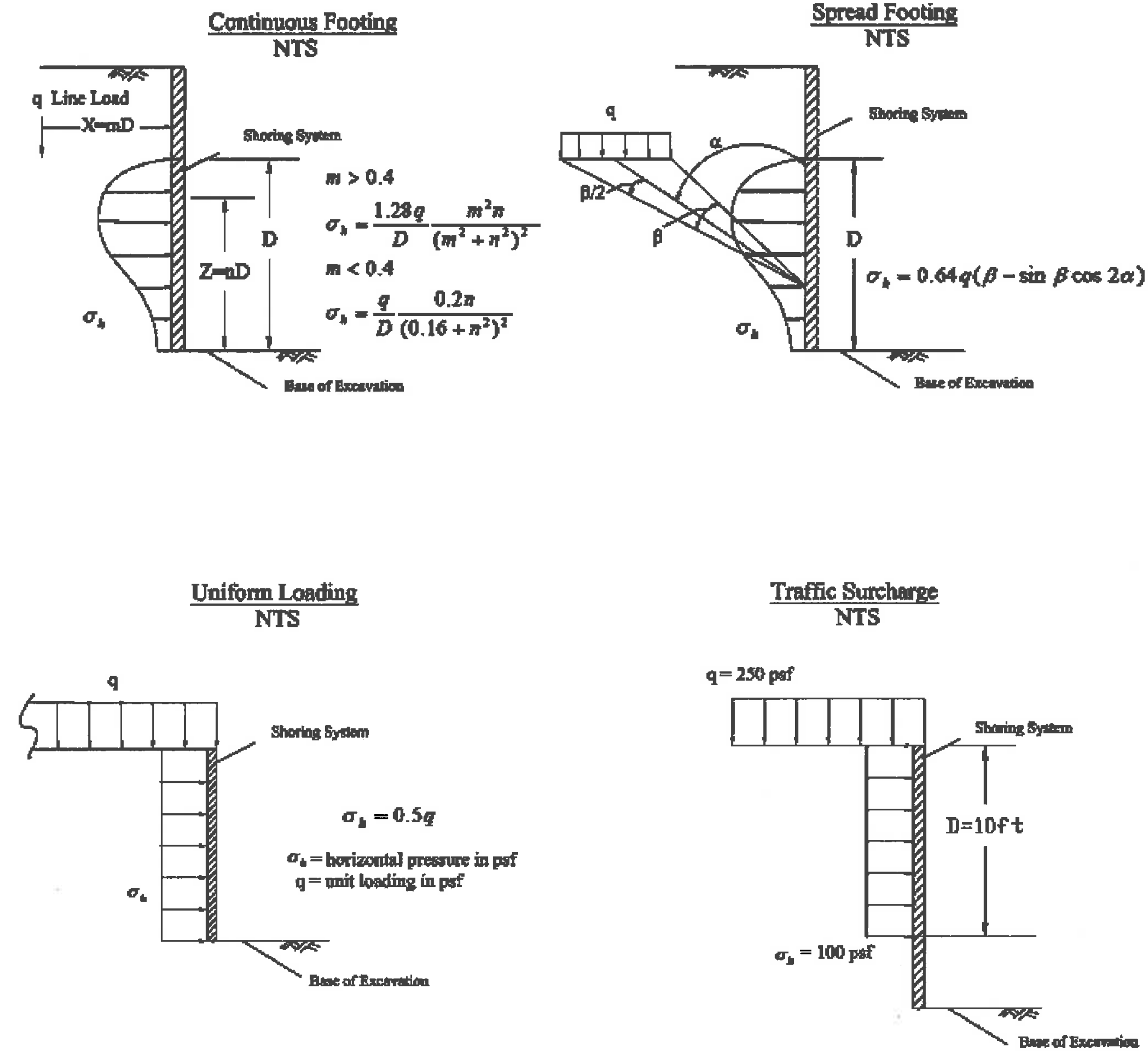


FIGURE **4**

SURCHARGE EARTH PRESSURES FOR SHORED EXCAVATIONS AND PERMANENT WALLS

8150 Sunset Boulevard, Los Angeles, California

ATTACHMENT A

DIRECT SHEAR LABORATORY TEST RESULTS

HAI
HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

Hushmand Associates, Inc.
1721 E. Lambert Rd, Ste. B
La Habra, CA 90631

p. (562) 690-3737
w. haieng.com
e. hai@haieng.com

July 30th, 2015

Golder Associates Inc.
3 Corporate Park, Suite 200
Irvine, CA 92602

Attention: Ms. Cynthia Valenzuela

SUBJECT: Laboratory Test Results
Golder Project Name: Townscape Sunset Geotech. Recommendations
Golder Project No.: 12392034-02
HAI Project No.: GLDL-15-008

Dear Ms. Valenzuela:

Enclosed are the results of the laboratory testing conducted on samples for the subject project. The testing was conducted in general accordance with the following test procedures:

Type of Test	Test Procedure
Direct Shear	ASTM D3080

Attached are: three (3) three-point Direct Shear test results on remolded samples.

We appreciate the opportunity to provide our testing services to Golder Associates Inc. If you have any questions regarding these test results, please contact us.

Sincerely,

HUSHMAND ASSOCIATES, INC.

Min Zhang, PhD, PE
Project Engineer

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

DIRECT SHEAR TEST
(ASTM D3080)

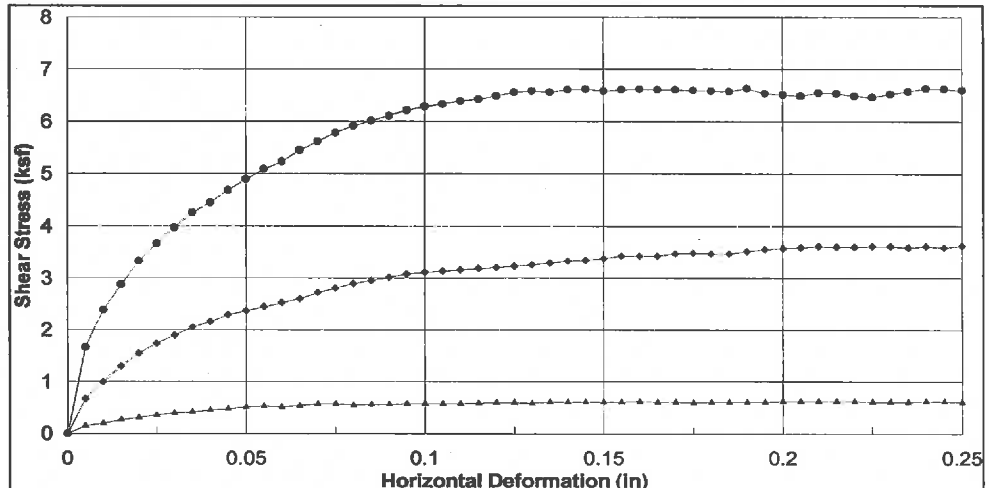
HAI Pr No.: GLDL-15-008
Tested by: SE/KL
Checked by: MZ
Date: 7/28/2015

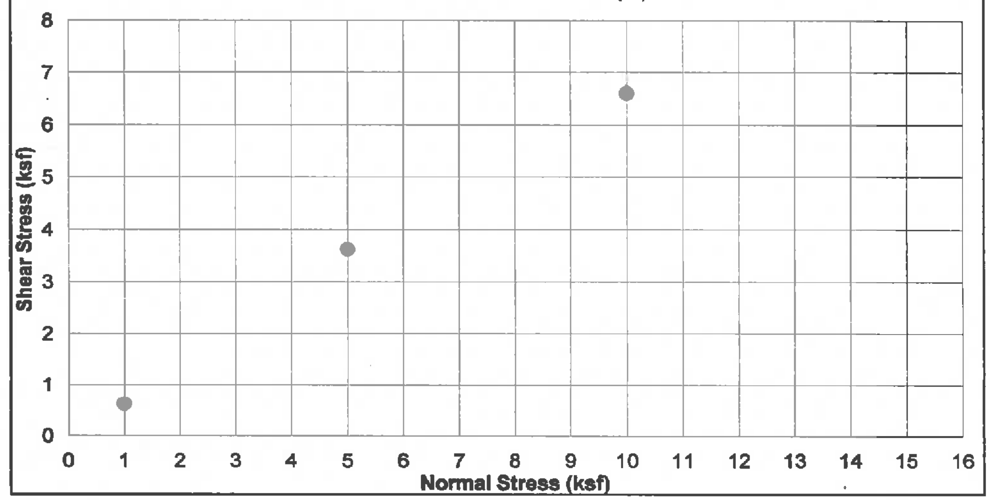
Client: Golder Associates Inc.
Project Name: Townscape Sunset Geotechnical Recommendations
Project Number: 12392034-02
Boring No.: B-102A
Sample No.: Bulk 1
Depth (ft): 30-35'
Soil description: Dark Yellowish Brown, Silty Sand (SM)
Sample type: Remolded to 110 pcf @ 5%
Type of test: Consolidated, Drained

	▲	◆	●
Normal Stress (ksf)	1	5	10
Deformation Rate (in/min)		0.002	

Peak Shear Stress (ksf) ◆	0.62	3.62	6.64
Shear stress @ end of test (ksf) ●	0.61	3.62	6.60

Initial height of sample (in)	1	1	1
Height of sample before shear (in)	0.9817	0.9544	0.9268
Diameter of sample (in)	2.42	2.42	2.42
Initial Moisture Content (%)	5.0	5.0	5.0
Final Moisture Content (%)	13.4	11.7	11.0
Dry Density (pcf)	110.0	110.0	110.0
Final Saturation (%)	72.7	69.4	72.2





HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

DIRECT SHEAR TEST
(ASTM D3080)

HAI Pr No.: GLDL-15-008
Tested by: SE/KL
Checked by: MZ
Date: 7/28/2015

Client: Golder Associates Inc.
Project Name: Townscape Sunset Geotechnical Recommendations
Project Number: 12392034-02

Boring No.: B-105

Sample No.: Core

Depth (ft): 14-15'

Soil description: Dark Yellowish Brown, Silty Sand (SM)

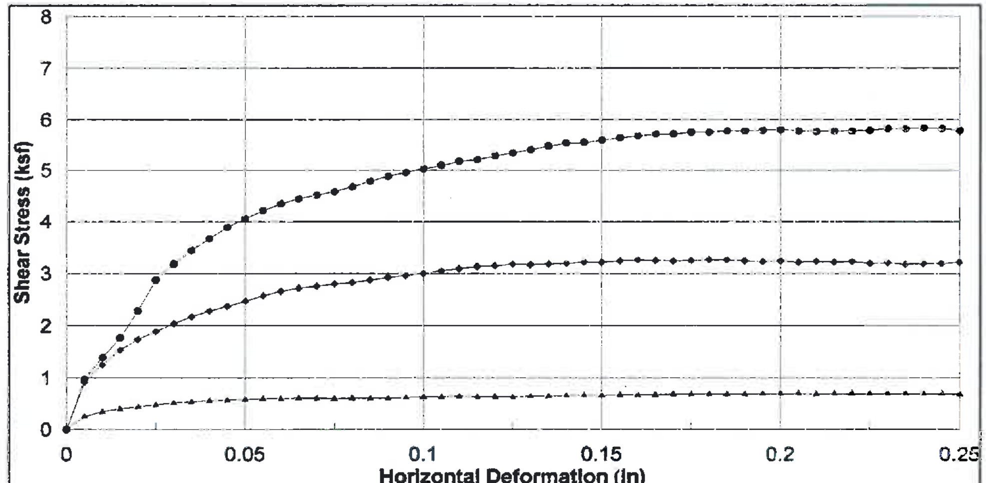
Sample type: Remolded to 110 pcf @ 5%

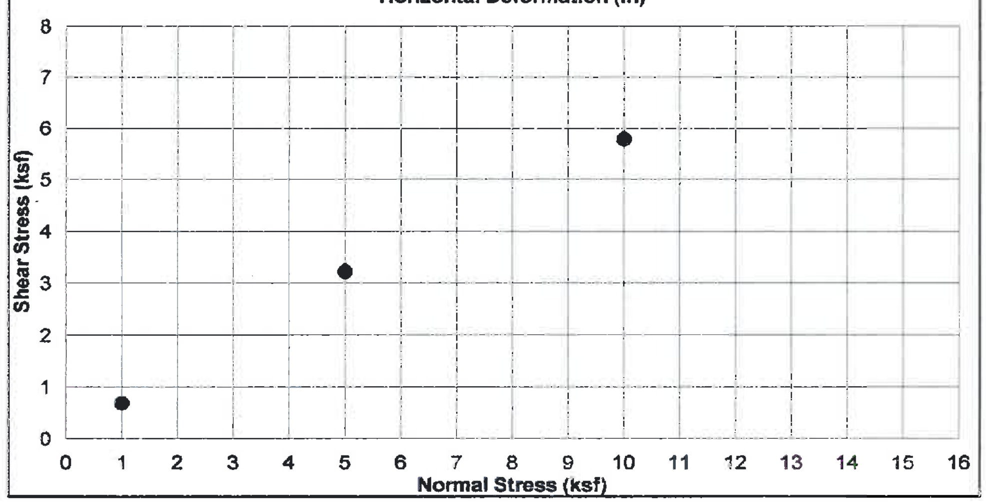
Type of test: Consolidated, Drained

	▲	◆	●
Normal Stress (ksf)	1	5	10
Deformation Rate (in/min)		0.002	

Peak Shear Stress (ksf) ◆	0.70	3.26	5.83
Shear stress @ end of test (ksf) ●	0.68	3.22	5.78

Initial height of sample (in)	1	1	1
Height of sample before shear (in)	0.9788	0.9200	0.8769
Diameter of sample (in)	2.42	2.42	2.42
Initial Moisture Content (%)	5.0	5.0	5.0
Final Moisture Content (%)	14.6	12.7	11.8
Dry Density (pcf)	110.0	110.0	110.0
Final Saturation (%)	80.2	85.2	94.6





HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

DIRECT SHEAR TEST
(ASTM D3080)

HAI Pr No.: GLDL-15-008
Tested by: SE/KL
Checked by: MZ
Date: 7/28/2015

Client: Golder Associates Inc.
Project Name: Townscape Sunset Geotechnical Recommendations
Project Number: 12392034-02

Boring No.: B-106

Sample No.: Core

Depth (ft): 30-31'

Soil description: Brown, Poorly Graded Sand with Silt (SP-SM)

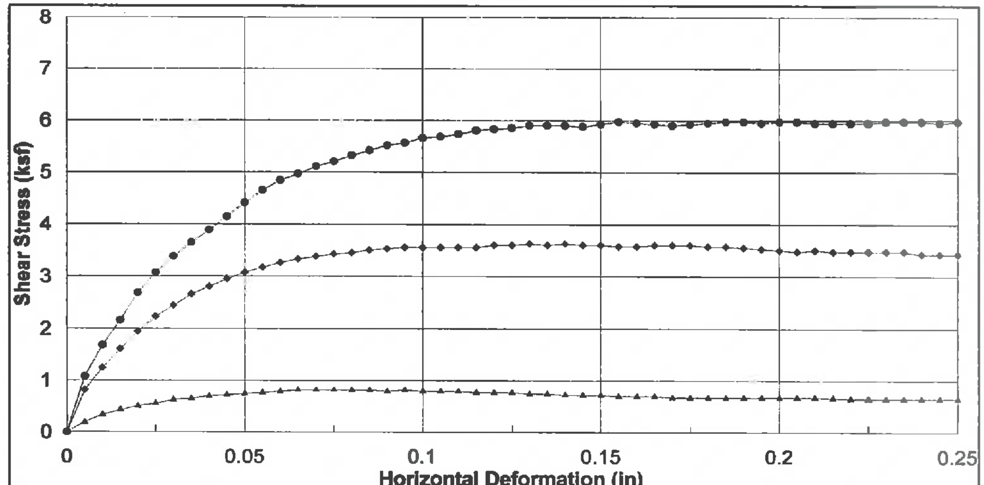
Sample type: Remolded to 110 pcf @ 5%

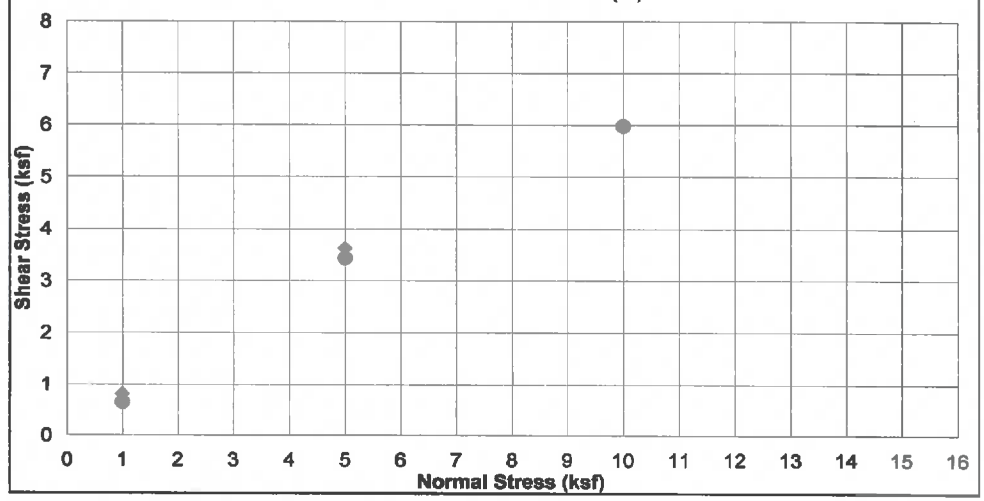
Type of test: Consolidated, Drained

	▲	◆	●
Normal Stress (ksf)	1	5	10
Deformation Rate (in/min)		0.002	

Peak Shear Stress (ksf) ◆	0.82	3.62	5.98
Shear stress @ end of test (ksf) ●	0.65	3.43	5.98

Initial height of sample (in)	1	1	1
Height of sample before shear (in)	0.9869	0.9595	0.9215
Diameter of sample (in)	2.42	2.42	2.42
Initial Moisture Content (%)	5.0	5.0	5.0
Final Moisture Content (%)	16.0	15.4	14.9
Dry Density (pcf)	110.0	110.0	110.0
Final Saturation (%)	84.2	88.8	97.6





CITY OF LOS ANGELES
DEPARTMENT OF BUILDING AND SAFETY
Grading Division

District Metro	Log No. 83343-2

APPLICATION FOR REVIEW OF TECHNICAL REPORTS

INSTRUCTIONS

A. Address all communications to the Grading Division, LADBS, 201 N. Figueroa St., 3rd Fl., Los Angeles, CA 90012 Telephone No. (213)482-0480.

B. Submit three copies (four for subdivisions) of reports, one "pdf" copy of the report on a CD-Rom, and one copy of application with items "1" through "10" completed.

C. Check should be made to the City of Los Angeles.

1. LEGAL DESCRIPTION
Tract: 31173
Block: ____ Lots: 1

2. PROJECT ADDRESS: 8150 SUNSET BOULEVARD

3. OWNER: AGISCH 8150 SUNSET BOULEVARD OWNER
Address: P.O. BOX 10506
City: BEVERLY HILLS Zip: 90213
Phone (Daytime): (310) 285-7081

4. APPLICANT MICHAEL NYTZEN
Address: 515 S. FLOWER ST, 26th FLOOR
City: LOS ANGELES CA Zip: 90071
Phone (Daytime): (213) 683-5713
E-mail address: MICHAELNYTZEN@PAULHASTINGS.COM

5. Report(s) Prepared by: GOLDER ASSOCIATES

6. Report Date(s): 8/10/2015

7. Status of project: ☒ Proposed ☐ Under Construction ☐ Storm Damage

8. Previous site reports? ☒ YES if yes, give date(s) of report(s) and name of company who prepared report(s)
GOLDER ASSOCIATES - 5/18/15; 10/3/14; 1/27/14

9. Previous Department actions? ☐ YES if yes, provide dates and attach a copy to expedite processing.
Dates: 6/29/15; 11/21/14

10. Applicant Signature: [signature] Position: AGENT

(DEPARTMENT USE ONLY)

REVIEW REQUESTED	FEES	REVIEW REQUESTED		FEES
☐ Soils Engineering	[initials]	No. of Lots		
☐ Geology		No. of Acres		
☒ Combined Soils Engr. & Geol.		☐ Division of Land		
☐ Supplemental		Other		
☐ Combined Supplemental		☒ Expedite		
☐ Import-Export Route		☒ Response to Correction		363.00
Cubic Yards:		☐ Expedite ONLY		181.50
		Sub-total		544.50
		One-Stop Surcharge		113.46
		TOTAL FEE		657.96

Fee Due: 657.96
Fee Verified By: [signature] Date: 8-25-15
(Cashier Use Only)

LA Department of Building and Safety
LA ERIC 102064275 8/25/2015 8:54:22 AM

GRADING REPORT	$363.00
SYSTEMS DEV SURCH	$21.78
GEN PLAN MAINT SURCH	$18.15
ONE STOP SURCH	$7.26
CITY PLAN SURCH	$21.78
PLAN APPROVAL FEE	$181.50
SYSTEMS DEV SURCH	$10.89
GEN PLAN MAINT SURCH	$9.08
ONE STOP SURCH	$3.63
CITY PLAN SURCH	$10.89
MISCELLANEOUS	$10.00
Sub Total:	$657.96

Receipt #: 0102493220

ACTION BY:

THE REPORT IS: ☐ NOT APPROVED

☐ APPROVED WITH CONDITIONS ☐ BELOW ☐ ATTACHED

For Geology ______ Date ______

For Soils ______ Date ______