CITY OF LOS ANGELES
CALIFORNIA

ERIC GARCETTI
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

FRANK BUSH
GENERAL MANAGER
SUPERINTENDENT OF BUILDING

OSAMA YOUNAN, P.E.
EXECUTIVE OFFICER

GEOLOGY AND SOILS REPORT APPROVAL LETTER

October 5, 2017

LOG # 99156-01
SOILS/GEOLOGY FILE - 2
LIQ/AP

Thomas Safran and Associates
11812 San Vicente Boulevard, #600
Los Angeles, CA 90049

TRACT:	Hollywood Ocean View Tract (MP 1-62)
BLOCK:	2
LOT(S):	11 (Arbs. 1-4) and 12 (Arb. 1)
LOCATION:	6650 & 6668 W. Franklin Avenue and 1855 N. Cherokee Avenue

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE(S) OF DOCUMENT	PREPARED BY
Addendum Report	1584-54	09/12/2017	Feffer Geological Consulting

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE(S) OF DOCUMENT	PREPARED BY
Dept. Review Letter	99156	08/11/2017	LADBS
Geology/Soils Report	1584-54	07/06/2017	Feffer Geological Consulting
Laboratory Test Report	SL15.1966	06/19/2017	Soil Labworks LLC
Laboratory Test Report	SL15.1966	01/15/2016	Soil Labworks LLC
Dept. Approval Letter	92628-01	10/03/2016	LADBS
Addendum Report (Fault Study)	1584-54	09/08/2016	Feffer Geological Consulting
Dept. Correction Letter	92628	05/04/2016	LADBS
Geology Report (Fault Study)	1584-54	03/23/2016	Feffer Geological Consulting

The Grading Division of the Department of Building and Safety has reviewed the referenced reports that provide recommendations for the proposed six-story apartment building over two levels of parking (8-stories total). The parking levels will be partially to fully subterranean. Retaining walls ranging up to 20 feet in height are proposed for the subterranean parking levels. The subject property is developed with 10-story apartment building at the northeast portion of the property. The remaining areas to the west and south of the existing structure consist of a terraced landscaping area and parking lot. Subsurface exploration performed by the consultant consisted of three hollow-stem auger borings, six bucket-auger borings, three fault trenches, and three test pits along the central portion of the property. The earth materials at the subsurface exploration locations consist of up to 21½ feet of uncertified fill underlain by alluvium/colluvium and sandstone and siltstone bedrock. Geologic structure observed by the consultant consisted of northeasterly dipping bedding of 42 degrees. The consultants recommend to support the proposed structure on mat-type foundations bearing on a blanket of properly placed fill a minimum of 5 feet thick.

The subject property was previously investigated by the consultant in 2016 to evaluate the potential for fault rupture. Subsurface exploration included continuous core borings and CPT soundings in addition to the exploration described above. The consultant identified two fault strands traversing east-west across the site. The faults were determined to be inactive. The fault displacement had resulted in relatively shallow bedrock on the northern portion of the site and thick alluvium/colluvium on the southern portion. The report had been reviewed by the Department and conditionally approved in a letter dated 10/03/2016, Log #92628-01.

Engineering analyses provided by Feffer Geological Consulting is based on laboratory testing performed by Soil Labworks LLC. Feffer Geological Consulting is accepting responsibility for use of the data in accordance to Code section 91.7008.5 of LABC.

The property is located within an Official Alquist-Priolo Earthquake Fault Zone that was established (November 6, 2014) by the California Geological Survey (CGS) for the Hollywood fault. The site is also located in a designated liquefaction hazard zone as shown on the Seismic Hazard Zones map issued by the State of California. The Liquefaction study included as a part of the report demonstrates that the site soils are subject to liquefaction. The earthquake induced total and differential settlements are calculated to be 1.87 and 1.2 inches, respectively. To mitigate the earthquake induced settlements it is proposed to use a mat foundation. The requirements of the 2017 City of Los Angeles Building Code have been satisfied.

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

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

1. All conditions of the above referenced Department approval letter dated 10/03/2016, Log #92628-01 shall apply except as specifically modified herein.

2. Approval shall be obtained from the Department of Public Works, Bureau of Engineering, Development Services and Permits Program for the proposed removal of support and/or retaining of slopes adjoining to public way. (3307.3.2)

   201 N. Figueroa Street 3rd Floor, LA (213) 482-7045

3. The geologist and soils engineer shall review and approve the detailed plans prior to issuance of any permits. This approval shall be by signature on the plans that clearly indicates the geologist and soils engineer have reviewed the plans prepared by the design engineer and that the plans include the recommendations contained in their reports. (7006.1)

4. All recommendations of the reports that are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

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

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

7. All graded, brushed or bare slopes shall be planted with low-water consumption, native-type plant varieties to protect slopes against erosion. (7012)

8. All new graded slopes shall be no steeper than 2H:1V (7010.2 & 7011.2).

9. Prior to the issuance of any permit, an accurate volume determination shall be made and included in the final plans, with regard to the amount of earth material to be exported from the site. For grading involving import or export of more than 1000 cubic yards of earth materials within the grading hillside area, approval is required by the Board of Building and Safety. Application for approval of the haul route must be filed with the Board of Building and Safety Commission Office. Processing time for application is approximately 8 weeks to hearing plus 10-day appeal period.

10. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557. Where cohesionless soil having less than 15 percent finer than 0.005 millimeters is used for fill, it shall be compacted to a minimum of 95 percent relative compaction based on maximum dry density (D1556). Placement of gravel in lieu of compacted fill is allowed only if complying with Section 91.7011.3 of the Code. (7011.3)

11. If import soils are used, no footings shall be poured until the soils engineer has submitted a compaction report containing in-place shear test data and settlement data to the Grading Division of the Department, and obtained approval. (7008.2)

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

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

14. Grading shall be scheduled for completion prior to the start of the rainy season, or detailed temporary erosion control plans shall be filed in a manner satisfactory to the Grading Division of the Department and the Department of Public Works, Bureau of Engineering, B-Permit Section, for any grading work in excess of 200 cu yd. (7007.1)

    201 N. Figueroa Street 3rd Floor, LA (213) 482-7045

15. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the State Construction Safety Orders enforced by the State Division of Industrial Safety. (3301.1)

16. Temporary excavations that remove lateral support to the public way, adjacent property, or adjacent structures shall be supported by shoring. Note: Lateral support shall be considered to be removed when the excavation extends below a plane projected downward at an angle

of 45 degrees from the bottom of a footing of an existing structure, from the edge of the public way or an adjacent property. (3307.3.1)

17. Where any excavation, not addressed in the approved reports, would remove lateral support (as defined in 3307.3.1) from a public way, adjacent property or structures, a supplemental report shall be submitted to the Grading Division of the Department containing recommendations for shoring, underpinning, and sequence of construction. Report shall include a plot plan and cross-section(s) showing the construction type, number of stories, and location of adjacent structures, and analysis incorporating all surcharge loads that demonstrate an acceptable factor of safety against failure. (7006.2 & 3307.3.2)

18. Prior to the issuance of any permit which authorizes an excavation where the excavation is to be of a greater depth than are the walls or foundation of any adjoining building or structure and located closer to the property line than the depth of the excavation, the owner of the subject site shall provide the Department with evidence that the adjacent property owner has been given a 30-day written notice of such intent to make an excavation. (3307.1)

19. Unsurcharged temporary excavations exposing unsupported geology and/or unsupported bedding planes shall be trimmed back along the lowest unsupported plane or shored.

20. The soils engineer shall review and approve the shoring plans prior to issuance of the permit. (3307.3.2)

21. Prior to the issuance of the permits, the soils engineer and the structural designer shall evaluate all applicable surcharge loads for the design of the retaining walls and shoring.

22. Unsurcharged temporary excavation may be cut vertical up to 5 feet. For excavations over 5 feet, the lower 5 feet may be cut vertically and the portion of the excavation above 5 feet shall be trimmed back at a gradient not exceeding 1:1 (horizontal to vertical), as recommended.

23. Shoring shall be designed for a minimum EFP of 30 PCF; all surcharge loads shall be included into the design, as recommended.

24. Shoring shall be designed for a maximum lateral deflection of ½ inch, as recommended.

25. A shoring monitoring program shall be implemented to the satisfaction of the soils engineer.

26. All foundations shall derive entire support from a blanket of properly placed fill a minimum of 3 feet thick, as recommended and approved by the geologist and soils engineer by inspection.

27. Slabs placed on approved compacted fill shall be at least 5 inches thick and shall be reinforced with ½-inch diameter (#4) reinforcing bars spaced maximum of 16 inches on center each way.

28. Concrete floor slabs placed on expansive soil shall be placed on a 4-inch fill of coarse aggregate or on a moisture barrier membrane.

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

30. Retaining walls shall be designed for the lateral earth pressures specified in the section titled "Retaining Walls" starting on page 17 of the 07/06/2017 report. All surcharge loads shall be included into the design.

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

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

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

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

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

36. The structure shall be connected to the public sewer system. (P/BC 2014-027)

37. All roof and pad drainage shall be conducted to the street in an acceptable manner. (7013.10)

38. An on-site storm water infiltration system at the subje ct site shall not be implemented, as recommended.

39. Any recommendations prepared by the geologist and/or the soils engineer for correction of geological hazards found during grading shall be submitted to the Grading Division of the Department for approval prior to utilization in the field. (7008.2, 7008.3)

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

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

42. Prior to excavation, an initial inspection shall be called with LADBS Inspector at which time sequence of construction, shoring, pile installation, protection fences and dust and traffic control will be scheduled. (108.9.1)

43. Installation of shoring, underpinning, slot cutting excavations and/or pile installation shall be performed under the inspection and approval of the soils engineer and deputy grading inspector. (1705.6)

44. The installation and testing of tie-back anchors shall comply with the recommendations included in the report or the standard sheets titled "Requirement for Tie-back Earth Anchors", whatever is more restrictive. (Research Report #23835)

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

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

EDMOND LEE
Engineering Geologist Associate II

YING LIU
Geotechnical Engineer I

Log No. 99156-01
213-482-0480

cc: Feffer Geological Consulting, Project Consultant
LA District Office

EXPEDITE

CITY OF LOS ANGELES
DEPARTMENT OF BUILDING AND SAFETY
Grading Division

District LA	Log No. 99156-01

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 two copies (three for subdivisions) of reports, one "pdf" copy of the report on a CD-Rom or flash drive, 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: HOLLYWOOD OCEAN VIEW TRACT (MP 1-62)
   Block: 2 Lots: 11 (Arbs. 4, 3, 2 & 1) and 12 (Arb. 1)

2. PROJECT ADDRESS: 6650 & 6668 Franklin Avenue &1850 Cherokee Court

3. OWNER: Thomas Safran and Associates
   Address: 11812 San Vicente Blvd. #600
   City: ~~Los Angeles~~ Zip: ~~90049~~
   Phone (Daytime):

4. APPLICANT Feffer Geological Consulting
   Address: 1990 S Bundy Drive Suite 400
   City: Los Angeles Zip: 90024
   Phone (Daytime): 310 207 5048
   E-mail address: admin@feffergeo.com, yvette@feffergeo.com

5. Report(s) Prepared by: Feffer Geological Consulting

6. Report Date(s): 9/12/17

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)
   7/6/17; Feffer Geological Consulting

9. Previous Department actions? ☒ YES if yes, provide dates and attach a copy to expedite processing.
   Dates: 8/11/17

10. Applicant Signature: [signature] Position: Geologist

EXPEDITE

(DEPARTMENT USE ONLY)

REVIEW REQUESTED	FEES	REVIEW REQUESTED		FEES
☐ Soils Engineering		No. of Lots		
☐ Geology		No. of Acres		
☐ Combined Soils Engr. & Geol.		☐ Division of Land		
☐ Supplemental		Other		
☒ Combined Supplemental	363.00	☒ Expedite EXPEDITE		181.50
☐ Import-Export Route		☐ Response to Correction		
Cubic Yards:		☐ Expedite ONLY		
		Sub-total		544.50
		One-Stop Surcharge		179.80
		TOTAL FEE		674.30

Fee Due: 674.30
Fee Verified By: PP Date: 9/20/17
(Cashier Use Only)

ACTION BY:

THE REPORT IS: ☐ NOT APPROVED

☐ APPROVED WITH CONDITIONS ☐ BELOW ☐ ATTACHED

For Geology Date

For Soils Date

1051122017 45876

FEFFER
GEOLOGICAL CONSULTING

September 12, 2017 File No: 1584-54

Steve Frandsen
Thomas Safran and Associates
11812 San Vicente Blvd. #600
Los Angeles, CA 90049

Subject: **RESPONSE TO CITY OF LA CORRECTION LETTER**
Correction Letter Dated August 11, 2017 Log #99156

Reference: **GEOTECHNICAL INVESTIGATION**
Proposed Six-Story Building Over Two Subterranean Levels
Montecito Apartments 6650 And 6668 W. Franklin Avenue
And 1855 N. Cherokee Avenue, Hollywood, CA 90028
By Feffer Geological Consulting, Dated July 6, 2017

Dear Mr. Frandsen:

As requested, Feffer Geological Consultants is providing this response to the referenced City of Los Angeles correction letter.

We appreciate the opportunity to be of service. Should you have any questions regarding the information contained in this report, please do not hesitate to contact us.

Sincerely,

FEFFER GEOLOGICAL CONSULTING, INC.

PROFESSIONAL GEOLOGIST JOSHUA FEFFER No. 2138 Certified Engineering Geologist STATE OF CALIFORNIA

Joshua R. Feffer
Principal Geologist
C.E.G. 2138

Dan Daneshfar
Principal Engineer
P.E. 68377

REGISTERED PROFESSIONAL ENGINEER KOUROSH DAN DANESHFAR No. C 68377 EXP. 9-30-17 CIVIL STATE OF CALIFORNIA

Distribution: Addressee– (1)

Item 1
The subject site is located in a State of California liquefaction hazard zone and groundwater seepage was encountered at a depth of 30 feet below ground surface. Provide liquefaction analysis in conformance with the Department guidelines presented in the Memorandum dated 07/16/2014.

Response
The latest California Geological Survey, Special Publication 117A, (*Guidelines for Evaluating and Mitigating Seismic Hazards in California, 2008*) states that previously used ground motion values contained in the Seismic Hazard Zone reports should not be used for liquefaction studies. The City of Los Angeles issued a memo on July 16, 2014 that provided updated 2014 requirements that were required. Pursuant to the memo the PGA based on a 10% probability of exceedance in 50 years (475-year return interval) should correspond to 2/3 of the PGA_M used to determine seismically induced settlements. The PGA potential settlements are determined when factors of safety are less than 1.1. Based upon the USGS Interactive Deaggregation web site the probabilistic modal earthquake magnitude is 6.7 and the peak horizontal ground acceleration (PGA_M) is 0.998g, 2/3rds of the PGA_M is 0.665g.

Additionally, the City Bulletin/Memo requires that PGA corresponding to a 2% exceedance in 50 years (2475-year return interval) be assessed and that settlement may occur when factors of safety are below 1.0. The corresponding PGA_M for a 2475-year return interval is 0.998g and the probabilistic modal earthquake magnitude is 6.7. These ground motions, while unlikely to occur, have been adopted for the liquefaction study pursuant to the new requirements.

3.4.2 <u>Liquefaction</u>

Liquefaction is a process that occurs when saturated sediments are subjected to repeated strain reversals during an earthquake. The strain reversals cause increased pore water pressure such that the internal pore pressure approaches the overburden pressure and the shear strength approaches zero. Liquefied soils may be subject to flow or excessive strain, which can cause settlement. Liquefaction occurs in soils below the groundwater table. Soils commonly subject to liquefaction include loose to medium dense sand and silty sand. Predominantly fine-grained soils, such as silts and clay, are less susceptible to liquefaction. Generally, plastic soils with a plasticity index of 18 or more and a moisture content not greater than 80% of the liquid limit are not considered subject to liquefaction.

Soils and data collected in the borings were utilized to quantify the liquefaction potential of the site. Parameters consisting of latitude and longitude were used to obtain the predominant earthquake magnitude from the United States Geological Survey (USGS) Interactive Deaggregation web site (see references) for a peak ground acceleration (PGA) corresponding to a 10% probability in 50 years (475-year return period) and a 2% probability of exceedance in 50 years (2475-year return period). A ground acceleration of 0.665g (2/3rd of PGA for 10% exceedance) and 0.998g (PGA 2% exceedance) and a design magnitude earthquake of 6.7 were used for the analyses. It was assumed that the groundwater will be within 30 feet of the ground surface (seepage encountered in boring).

The stresses, strains, and safety factor for liquefaction were calculated using the methodologies by T.L. Youd, et. al., (*Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils*, 1998), P.K. Robertson (*Cyclic Liquefaction and its Evaluation Based on the SPT and CPT, 1997*), P.K. Robertson, 2009, (*Guide to Cone Penetration Testing for Geotechnical Engineering*), "*Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California*" (Southern California Earthquake Center, 2002), California Geological Survey, Special Publication 117A, (*Guidelines for Evaluating and Mitigating Seismic Hazards in California, 2008*) and R. B. Seed, et. al., 2003, *(Recent Advances in Soil Liquefaction Engineering: a Unified and Consistent Framework*), and *The City of Los Angeles issued memo on July 16, 2014.*

Dissipation of excess pore pressure after liquefaction can result in settlement. The volumetric strain and accompanying settlement of saturated soils was estimated using procedures set forth by the City of Los Angeles, 2014 Los Angeles Building Code (LABC) Requirements, and Special Publication 117 Guidelines for Evaluating and Mitigating Seismic Hazards in California. Our analyses focus on boring B-1, advanced within the project site. Using site averages of SPT blow counts and our engineering judgment, site specific soil parameters were utilized in our settlement analyses.

Seismic-induced settlements were determined for specific layers with a factor of safety less than 1.1 (475-year) and 1.0 (2475-year). Analysis of the settlement associated with the PGA of 10% probability of exceedance in 50 years (475-year return interval) indicates that total settlement of 1.87" (B-1) may occur. The associated differential settlement of 1.2" may occur. It should be noted that the total calculated settlement is limited only to the dry seismic settlement and the no liquefaction settlement will occur above the water table.

Analysis of the settlement associated with the PGA of 2% probability of exceedance in 50 years (2475-year return interval) indicates that total settlement of 5.58" (B-1) may occur. The associated differential settlement of 2.8" was determined.

We understand that a mat type foundation will be used for this project. The amount of seismic settlement for the PGA of 10% probability of exceedance in 50 years (475-year return interval) will be within the tolerable limits for mat type foundation however, the structural engineer should state positively that due to a 2475-return interval earthquake that the total and differential settlement will not cause collapse of the proposed structure. The dynamic settlement of "dry" soil, above the groundwater was evaluated using the procedure outline by Kramer, 1996.

<u>Liquefaction Screening of Fine-Grained Soils</u>

We also performed a liquefaction screening for the silty clay/clayey silt below a depth of 30 feet in Boring B-3, following the conclusions presented in the paper titled "Assessment of the Liquefaction Susceptibility of Fine-Grained Soils," prepared by Jonathan D. Bray and Rodolfo C. Sancio in 2006. The conclusions of the paper were that fine grained Soils with PI values less than 18 and moisture contents (WC) above 80 percent of the Liquid Limit (LL) are potentially susceptible to liquefaction.

We performed Atterberg Limits tests on representative soil samples collected from boring B-3 at a depth of approximately 30 feet. Results of the Atterberg Limits tests and our Liquefaction Screening are summarized in Table 1 below.

Table 1. Results of Liquefaction Screening – Bray and Sancio Method

Boring	Sample depth	Sample Description	LL	PI	WC*	WC/LL (percent)
B-3	30	Silty clay/clayey silt	34	13	13	38
B-3	35	Silty clay/clayey silt	35	20	16	46
B-3	45	Silty clay/clayey silt	32	16	13	72
B-3	50	Silty clay/clayey silt	34	19	16	47

Based on the results of the screening, it appears that the silty clay/clayey silt represented in the sample from Boring B-3 at a depth below 30 feet is not susceptible to liquefaction based on the Bray and Sancio Criteria as the WC is less than 80 percent of the LL.

Lateral Spreading Hazard

Saturated soils that have experienced liquefaction may be subject to lateral spreading where located adjacent to free-faces, such as slopes, channels, and rivers. The site is remote to free-faces and the lateral spreading hazard at the site is nil.

Secondary Ground Effects

The thickness of the over-burden relative to the depth and thickness of the liquefaction layers indicate that secondary ground effects will not occur. Special foundation design is not required.

Item 2
Provide seismic settlement analysis, including dynamic settlement of unsaturated soils.

Response

Please see response to item 1.

Item 3

Storm water infiltration is not allowed on any site where the water may saturate soils that are subject to liquefaction, and the total and differential settlement (static and seismic) is greater than 1.5 inches and 0.75 inches, respectively. Provide liquefaction analysis assuming that the groundwater will rise to the bottom of the infiltration device and revise recommendations accordingly.

Response

Infiltration at the subject site should not occur since the calculated total and differential settlement for the site is greater than the 1.5 and .75 inches, respectively (see response to Item 1).

We recommend an alternative to infiltration be used to conform to LID/SUSMP requirements.

CITY OF LOS ANGELES
CALIFORNIA

ERIC GARCETTI
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

FRANK M. BUSH
GENERAL MANAGER
SUPERINTENDENT OF BUILDING

OSAMA YOUNAN, P.E.
EXECUTIVE OFFICER

GEOLOGY AND SOILS REPORT REVIEW LETTER

August 11, 2017

LOG # 99156
SOILS/GEOLOGY FILE - 2
LIQ/AP

Thomas Safran and Associates
11812 San Vicente Boulevard, #600
Los Angeles, CA 90049

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The Grading Division of the Department of Building and Safety has reviewed the referenced reports that provide recommendations for the proposed six-story apartment building over two levels of parking (8-stories total). The parking levels will be partially to fully subterranean. Retaining walls ranging up to 20 feet in height are proposed for the subterranean parking levels. The subject property is developed with 10-story apartment building at the northeast portion of the property. The remaining areas to the west and south of the existing structure consist of a terraced landscaping area and parking lot. Subsurface exploration performed by the consultant consisted of three hollow-stem auger borings, six bucket-auger borings, three fault trenches, and three test pits along the central portion of the property. The earth materials at the subsurface exploration locations consist of up to 21½ feet of uncertified fill underlain by alluvium/colluvium and sandstone and siltstone bedrock. Geologic structure observed by the consultant consisted of northeasterly dipping bedding of 42 degrees. The consultants recommend to support the proposed structure on mat-type foundations bearing on a blanket of properly placed fill a minimum of 5 feet thick.

The subject property was previously investigated by the consultant in 2016 to evaluate the potential for fault rupture. Subsurface exploration included continuous core borings and CPT soundings in addition to the exploration described above. The consultant identified two fault strands traversing east-west across the site. The faults were determined to be inactive. The fault displacement had resulted in relatively shallow bedrock on the northern portion of the site and thick alluvium/colluvium on the southern portion. The report had been reviewed by the Department and conditionally approved in a letter dated 10/03/2016, Log #92628-01.

The property is located within an Official Alquist-Priolo Earthquake Fault Zone that was established (November 6, 2014) by the California Geological Survey (CGS) for the Hollywood fault. The site is also located in a designated liquefaction hazard zone as shown on the Seismic Hazard Zones map issued by the State of California. The review of the subject reports cannot be completed at this time and will be continued upon submittal of an addendum to the report which shall include, but not be limited to, the following:

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

1. The subject site is located in a State of California liquefaction hazard zone and groundwater seepage was encountered at a depth of 30 feet below ground surface. Provide liquefaction analysis in conformance with the Department guidelines presented in the Memorandum dated 07/16/2014.

2. Provide seismic settlement analysis, including dynamic settlement of unsaturated soils.

3. Storm water infiltration is not allowed on any site where the water may saturate soils that are subject to liquefaction, and the total and differential settlement (static and seismic) is greater than 1.5 inches and 0.75 inches, respectively. Provide liquefaction analysis assuming that the groundwater will rise to the bottom of the infiltration device and revise recommendations accordingly.

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

EDMOND LEE
Engineering Geologist Associate II

YING LIU
Geotechnical Engineer I

Log No. 99156
213-482-0480

cc: Feffer Geological Consulting, Project Consultant
Soil Labworks LLC, Project Consultant
LA District Office

105112720174 5876

SOIL LABWORKS LLC

SL15.1966
June 19, 2017

Feffer Geological Consulting
1990 S. Bundy Drive
4th Floor
Los Angeles, California 90025

Attn: Joshua R. Feffer

Subject: Laboratory Testing

Subject: Laboratory Testing

Site: 6650 W Franklin
Los Angeles, California

Job: FEFFER/SAFRON/MONTECITO APARTMENTS

Reference: Laboratory Testing, Soil Labworks, LLC., June 20, 2015 (Revised January 15, 2016)

Laboratory testing for the subject property was performed by Soil Labworks, LLC., under the supervision of the undersigned Engineer. Previous work is presented in the referenced report. Samples of the earth materials were obtained from the subject property by personnel of Feffer Geological and transported to the laboratory of Soil Labworks for testing and analysis. The laboratory tests performed are described and results are attached.

Services performed by this facility for the subject property were conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions.

Respectfully Submitted:

SOIL LABWORKS, LLC

JON A. IRVINE
G.E. 2891

REGISTERED PROFESSIONAL ENGINEER
JON ALAN IRVINE
GE 2891
Exp. 6-30-18
GEOTECHNICAL
STATE OF CALIFORNIA

Enc: Appendix

... J Townsgate Road, Suite E, Westlake Village, California 91361
(805) 370-1338 FAX (805) 371-4693

SL15.1966
June 19, 2017

SOIL LABWORKS LLC

APPENDIX

Laboratory Testing

Sample Retrieval - Drill Rig

Samples of earth materials were obtained at frequent intervals by driving a thick-walled steel sampler conforming to the most recent 2016 version of ASTM D 3550-01 (2007)(withdrawn 2016) with successive drops of a 140 pound hammer falling 30". The earth material was retained in brass rings of 2.416 inches inside diameter and 1.00 inch height. The central portion of the sample was stored in close-fitting, water-tight containers for transportation to the laboratory.

Moisture Density

The field moisture content and dry density were determined for each of the soil samples. The dry density was determined in pounds per cubic foot following ASTM 2937-17. The moisture content was determined as a percentage of the dry soil weight conforming to ASTM 2216-10. The results are presented below in the following table. The percent saturation was calculated on the basis of an estimated specific gravity. Description of earth materials used in this report and shown on the attached Plates were provided by the client.

Test Pit/Boring No.	Sample Depth (Feet)	Soil Type	Dry Density (pcf)	Moisture Content (percent)	Percent Saturation (G_s=2.65)
B3	7	Fill	97.3	10.1	38
B3	10	Alluvium	112.4	9.1	51
B3	15	Alluvium	113.9	13.6	79
B3	20	Alluvium	114.3	10.2	60
B3	25	Alluvium	121.6	11.9	88
B3	30	Alluvium	110.0	13.3	70
B3	35	Alluvium	112.2	15.7	88
B3	40	Alluvium	116.3	13.4	84
B3	45	Alluvium	119.9	12.6	88
B3	50	Alluvium	114.2	16.1	95

2500 Townsgate Road, Suite E, Westlake Village, California 91361
(805) 370-1338 FAX (805) 371-4693

Compaction Character

Compaction tests were performed on bulk samples of the earth materials in accordance with ASTM D1557-12ei. The results of the tests are provided on the table below and on the "Moisture-Density Relationship", A-Plates. The specific gravity of the fill/alluvium was estimated from the compaction curves.

Test Pit/Boring No.	Sample Depth (Feet)	Soil Type	Maximum Dry Density (pcf)	Optimum Moisture Content (Percent)
B3	0-50	Remolded Compacted fill	122.6	12.5

Shear Strength

The peak and ultimate shear strengths of the remolded compacted fill and alluvium were determined by performing consolidated and drained direct shear tests in conformance with ASTM D3080/D3080M-11. The tests were performed in a strain-controlled machine manufactured by GeoMatic. The rate of deformation was 0.01 inches per minute. Samples were sheared under varying confining pressures, as shown on the "Shear Test Diagrams," B-Plates. Remolded samples were prepared at 90 percent of the maximum density for shear tests. The remolding procedure consists of selecting a representative sample from a bulk bag and sieving it through a No. 4 sieve. The moisture content of the material is then determined. A formula is then used to calculate the weight of the material that must fit in a ring when compacted to 90 percent of the maximum density. This calculated amount of material is then weighed out and pounded into a ring until all the material is used and the ring is full. The moisture conditions during testing are shown on the following table and on the B-Plates. The samples indicated as saturated were artificially saturated in the laboratory. All saturated samples were sheared under submerged conditions.

Test Pit/ Boring No.	Sample Depth (Feet)	Dry Density (pcf)	As-Tested Moisture Content (percent)
B3	10	112.4	20.7
B3*	0-50	110.3	20.4

* Sample remolded to 90 % of the laboratory maximum density.

Consolidation

One-dimensional consolidation tests were performed on samples of the alluvium in a consolidometer manufactured by GeoMatic in conformance with ASTM D2435/D2435M-11. The tests were performed on 1-inch high samples retained in brass rings. The samples were initially loaded to approximately ½ of the field over-burden pressure and then unloaded to compensate for the effects of possible disturbance during sampling. Loads were then applied in a geometric progression and resulting deformation recorded. Water was added at a specific load to determine the effect of saturation. The results are plotted on the "Consolidation Test," C-Plates. Remolded sample was prepared at 90 percent of the maximum density for shear tests. The remolding procedure consists of selecting a representative sample from a bulk bag and sieving it through a No. 4 sieve. The moisture content of the material is then determined. A formula is then used to calculate the weight of the material that must fit in a ring when compacted to 90 percent of the maximum density. This calculated amount of material is then weighed out and pounded into a ring until all the material is used and the ring is full

Atterberg Limits

Atterberg limits determinations were performed on samples of the alluvium in accordance with ASTMD4318-10e1. The test results are presented on the table below.

Test Pit/Boring No.	Sample Depth (Ft)	Soil Type	Liquid Limit	Plastic Limit	Plasticity Index
B3	30	Alluvium	34	21	13
B3	35	Alluvium	35	20	15
B3	45	Alluvium	32	16	16
B3	50	Alluvium	34	19	15

Grain Size Distribution

The amount of material in the soil finer than 1 No. 200 sieve was determined on selected samples in conformance with ASTM D1140-17. Wash sieving disperses clay and other fine material that are removed from the soil during the test. The percent of fine material in the soil sample is the calculated base on the loss of mass. The results are present in the table below.

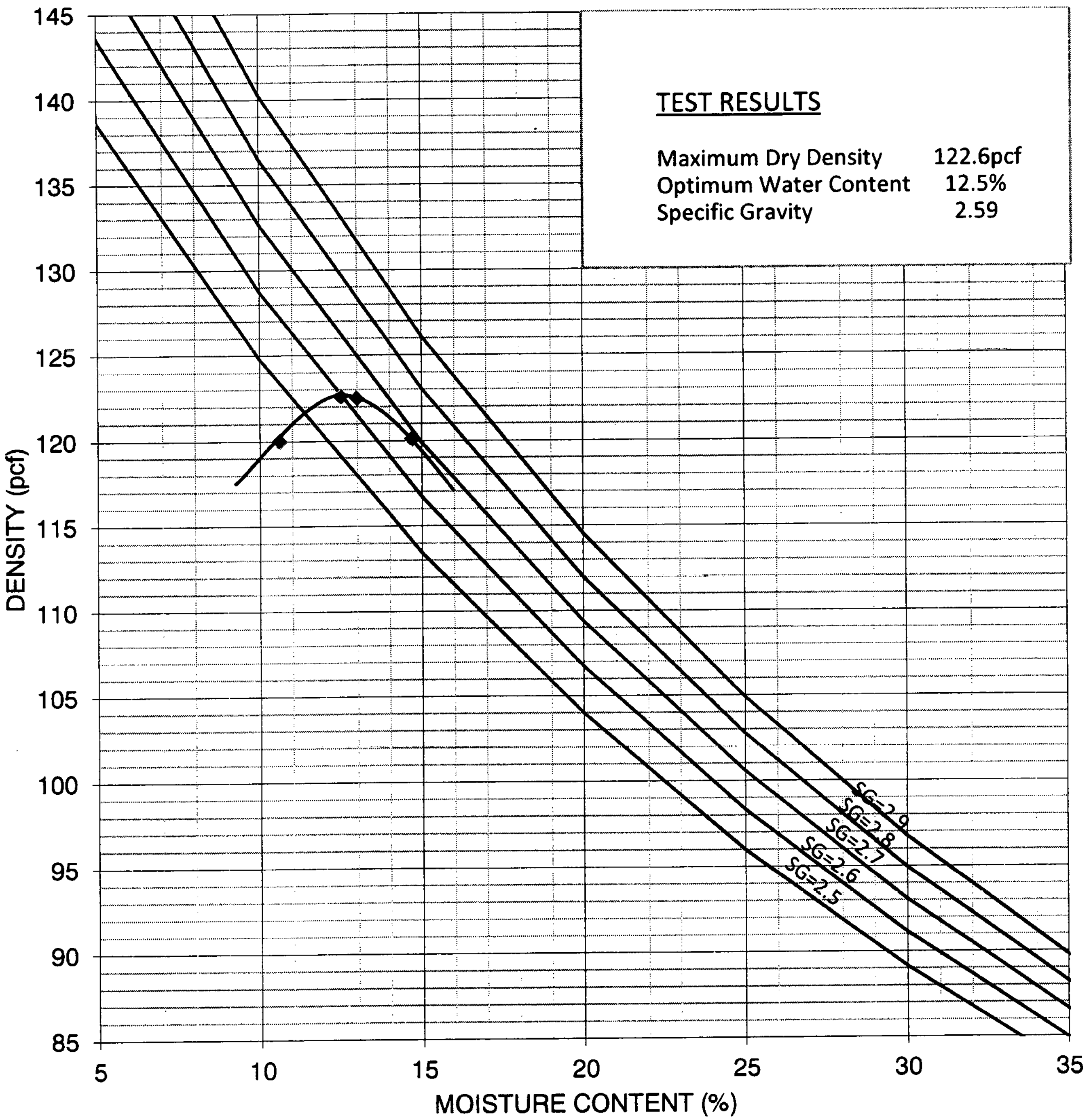
Boring No	Depth	Soil Type	(%) Passing 200 Sieve
B3	30	Alluvium	47.1
B3	35	Alluvium	52.6
B3	45	Alluvium	42.7
B3	50	Alluvium	52.9

SOIL LABWORKS LLC

MOISTURE-DENSITY RELATIONSHIP A-1

JN: SL15.1966 CONSULTANT: JAI
CLIENT: Feffer/Montecito AptsS-6650 W Franklin
B3 @ 0-50'
EARTH MATERIAL: Remolded Compacted Fill

NOTE: ASTM Test Method D-1557-12



TEST RESULTS

Maximum Dry Density	122.6pcf
Optimum Water Content	12.5%
Specific Gravity	2.59

1051127201745876

SHEAR DIAGRAM B-3

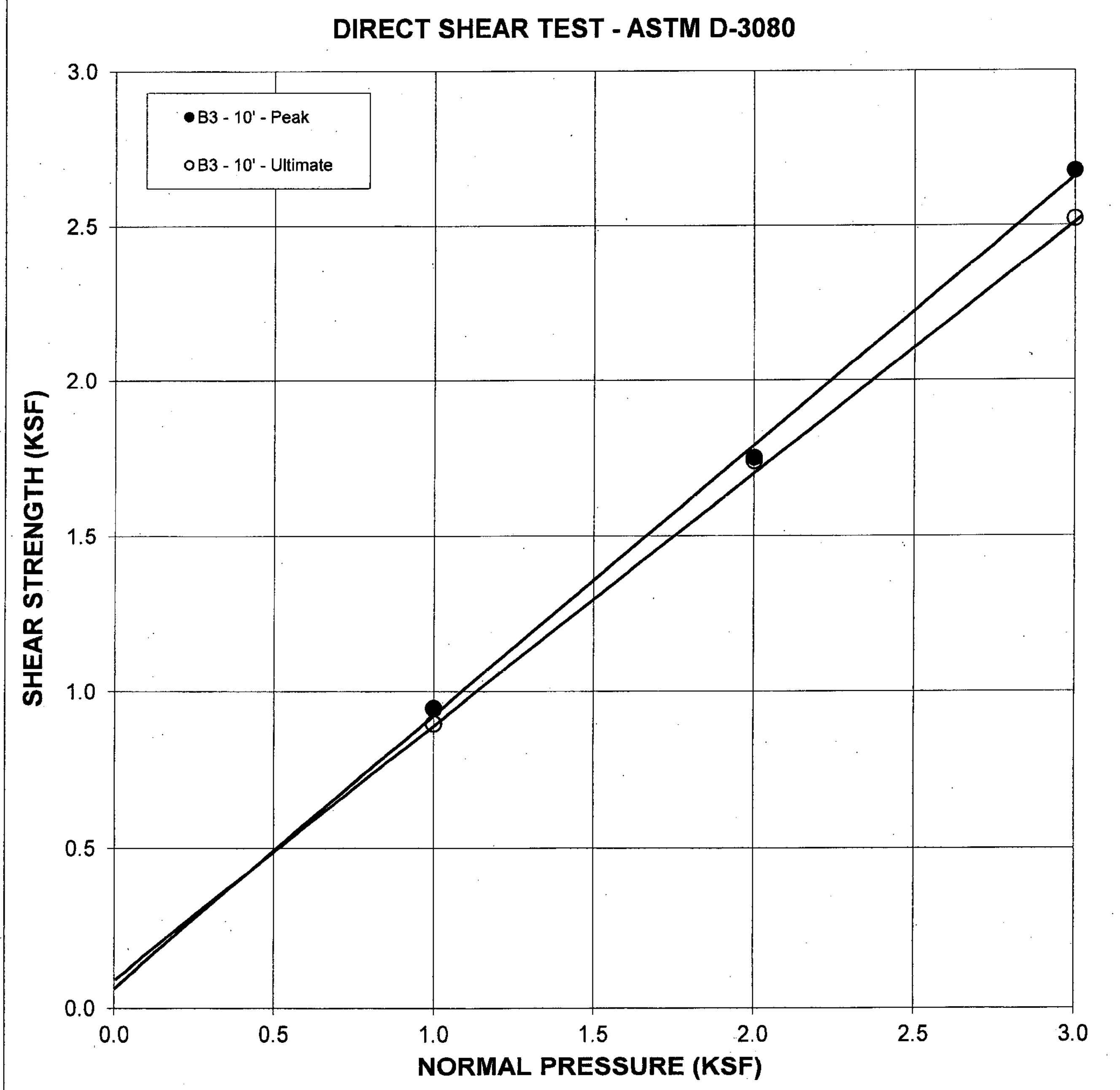
SOIL LABWORKS LLC

JN: **SL15.1966** CONSULTANT **JAI**
CLIENT: **Feffer/Montecito Apartments-6650 W Franklin**

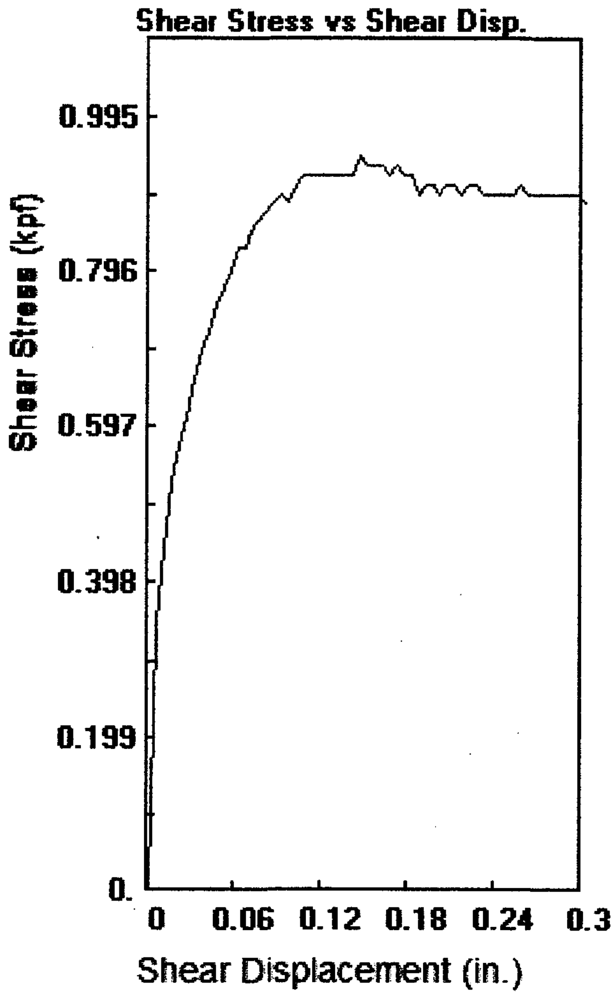
EARTH MATERIAL: **ALLUVIUM**

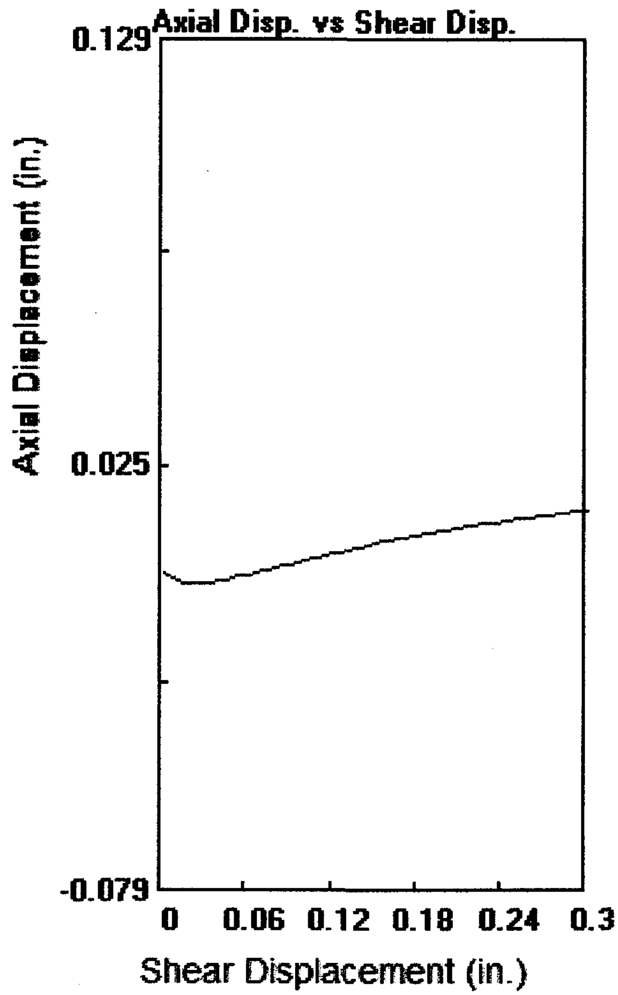
	PEAK	ULTIMATE	
Phi Angle	41	39	degrees
Cohesion	70	90	psf

Average Moisture Content	20.7%
Average Dry Density (pcf)	112.4
Percent Saturation	100.0%



1051127201745876





Parameters

Client: FEFFER/MONTECITO APT

Location: 6650 W FRANKLIN

Job # 1966

Sample: 1

Boring: B3

Depth: 10 ft.

File: 1966B3101.dat

Stress at Max Def
948 0.146

Soil Type:ALLUVIUM

Technician: BF

Axial Load: 1000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 900

Maximum Load

948 psf

Shear Displacement at maximum Load

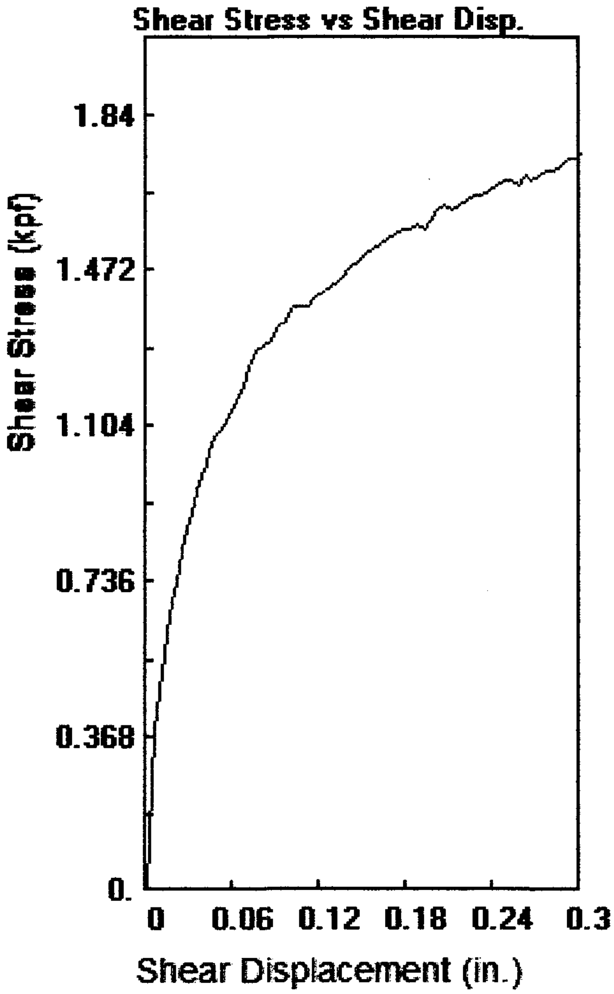
0.1456 in.

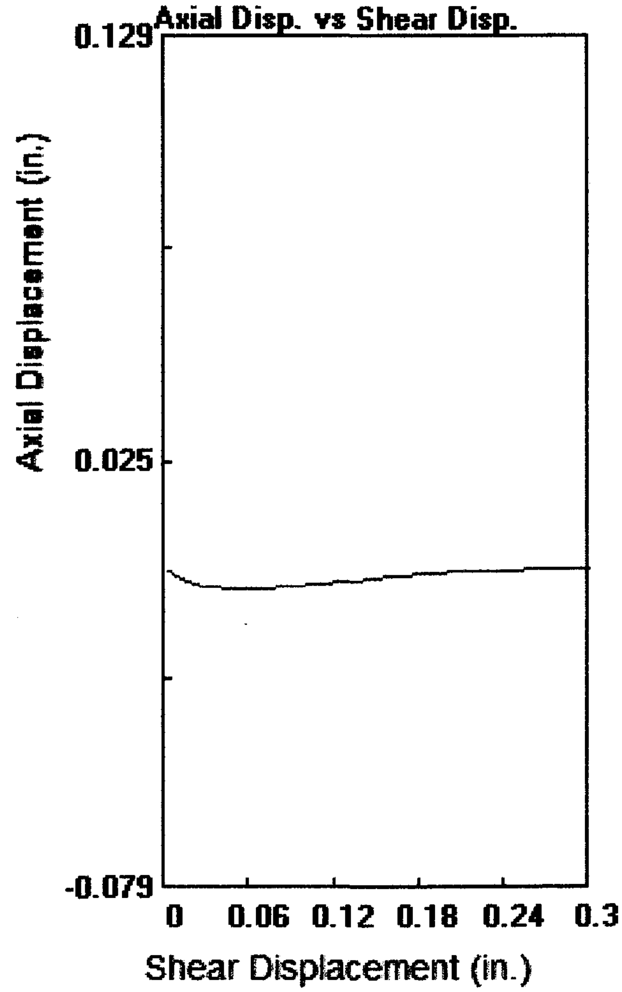
Date

6/6/2017

Robertson Geotechnical

1 0 5 1 1 2 7 2 0 1 7 4 5 8 7 6





Parameters

Client: FEFFER/MONTECITO APT

Location: 6650 W FRANKLIN

Job # 1966

Soil Type:ALLUVIUM

Sample: 2

Technician: BF

Boring: B3

Axial Load: 2000 psf

Depth: 10 ft.

Shear Rate: 0.010 in./sec.

File: 1966B3102.dat

Distance: 0.30 in.

Stress at Max Def
1752 0.3

Stress at Max Disp
0.296 1740

Maximum Load

1752 psf

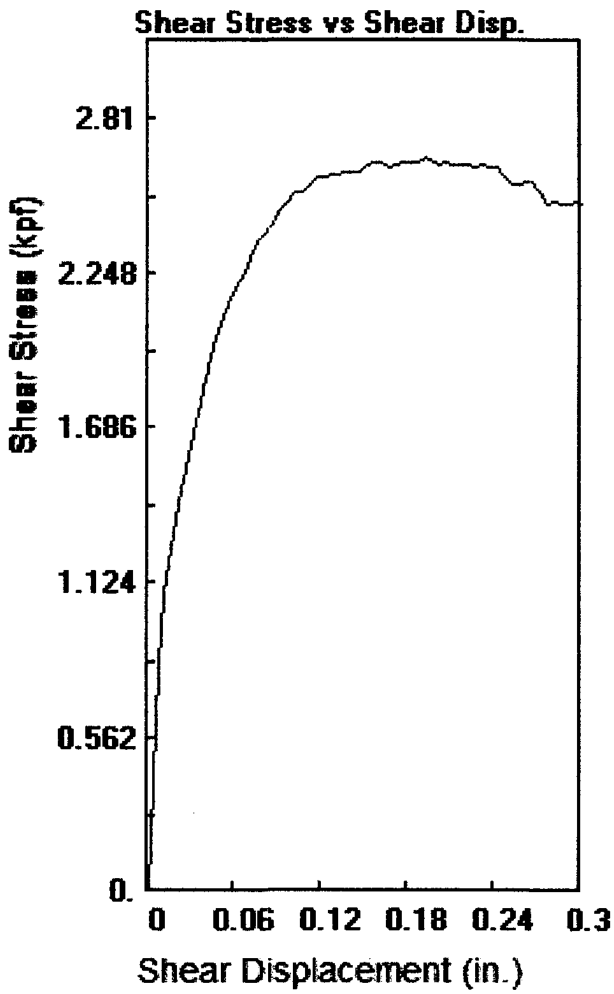
Shear Displacement at maximum Load

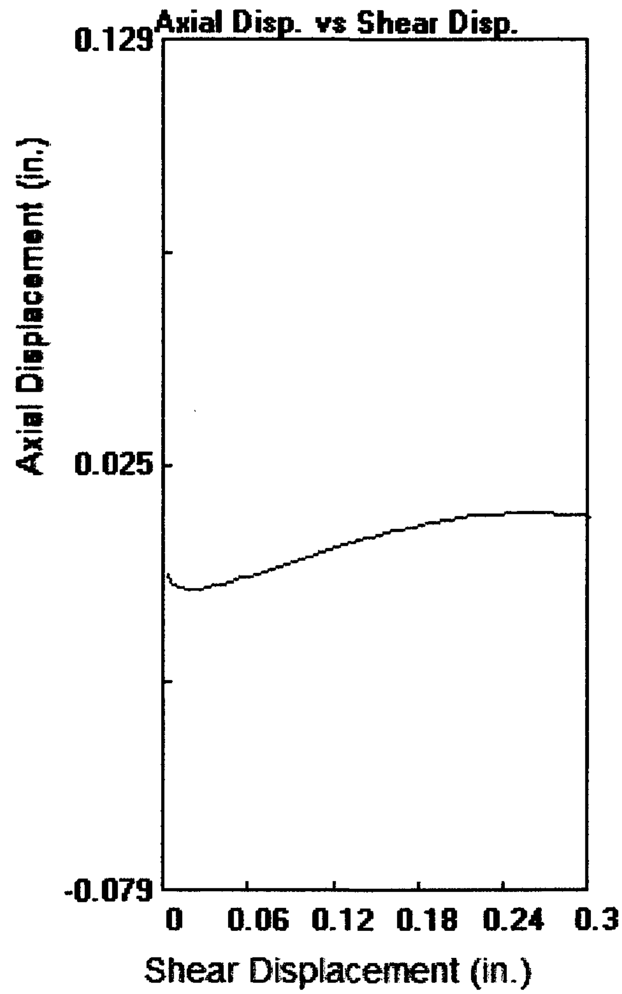
0.3004 in.

Date
6/6/2017

Robertson Geotechnical

1 0 5 1 1 2 7 2 0 1 7 4 5 8 7 6





Parameters

Client: FEFFER/MONTECITO APT

Location: 6650 W FRANKLIN

Job # 1966

Sample: 3

Boring: B3

Depth: 10 ft.

File: 1966B3103.dat

Stress at Max Def
2676 0.191

Soil Type:ALLUVIUM

Technician: BF

Axial Load: 3000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 2520

Maximum Load

2676 psf

Shear Displacement at maximum Load

0.1907 in.

Date
6/6/2017

Robertson Geotechnical

1051127201745876

SHEAR DIAGRAM B-4

SOIL LABWORKS LLC

JN: SL15.1966 CONSULTANT JAI

CLIENT: Feffer/Montecito Apartments-6650 W Franklin

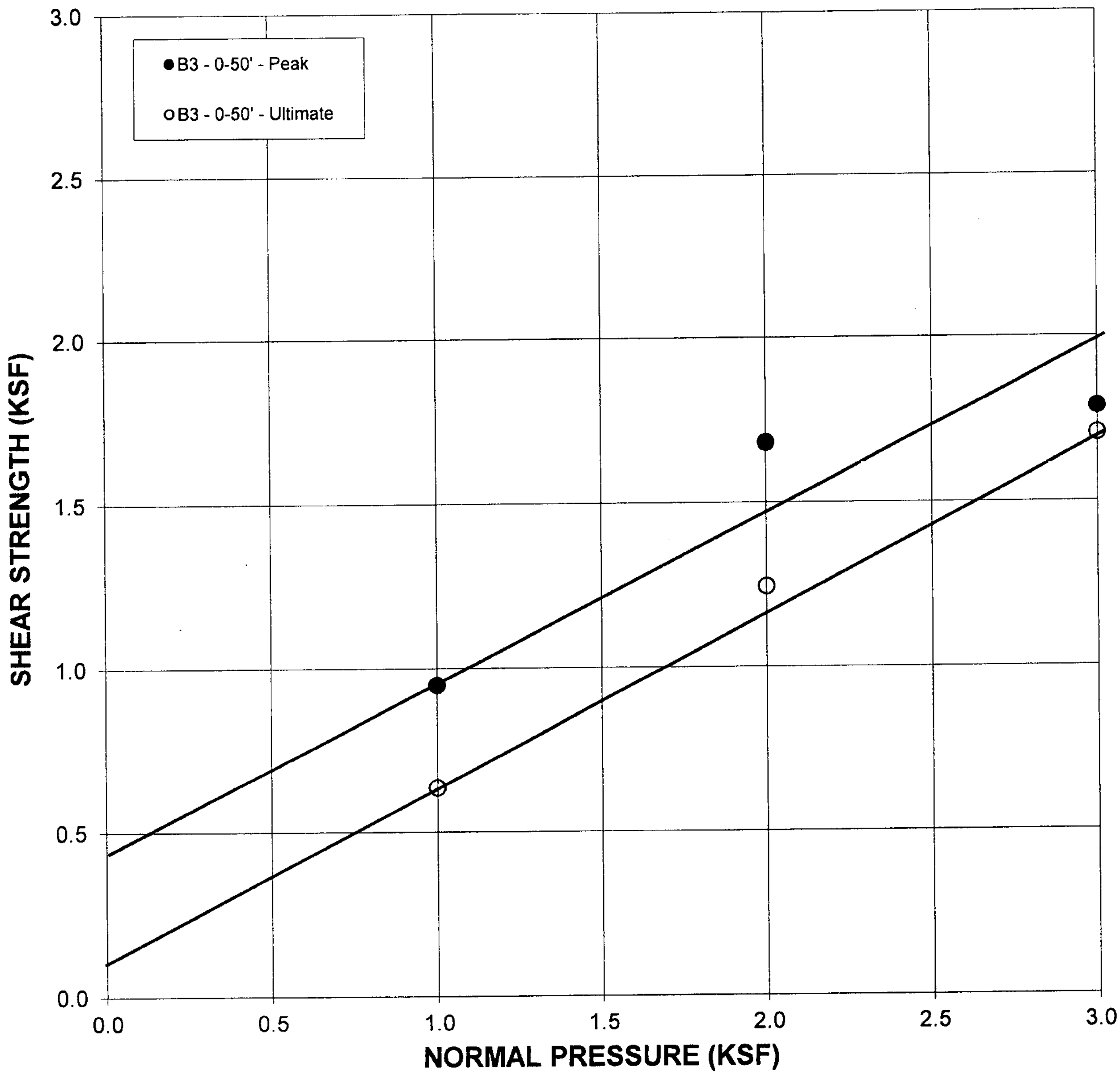
EARTH MATERIAL: REMOLDED COMPACTED FILL

Sample remolded to 90 % of the laboratory maximum density

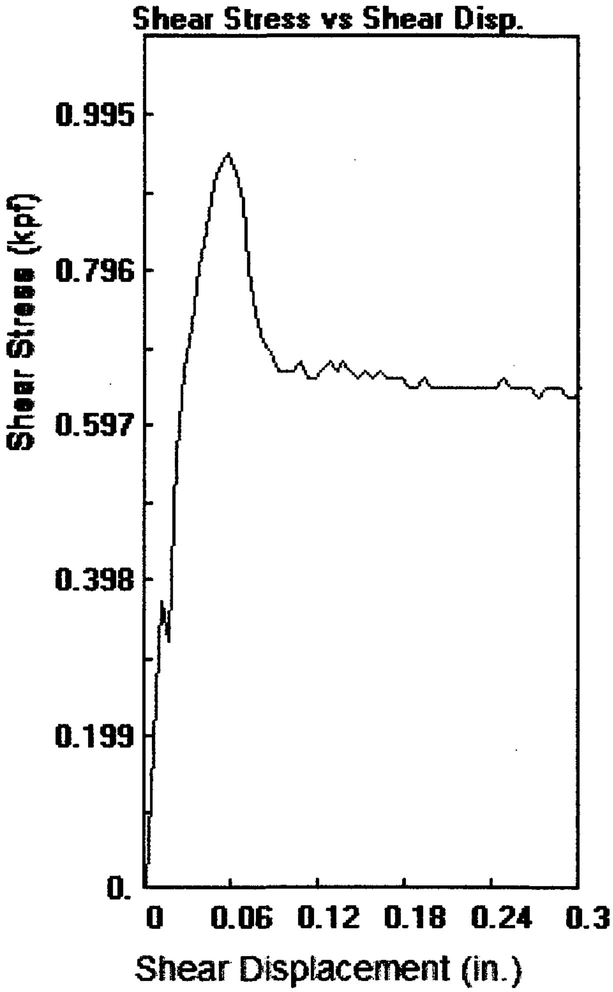
	PEAK	ULTIMATE	
Phi Angle	27	27.5	degrees
Cohesion	430	105	psf

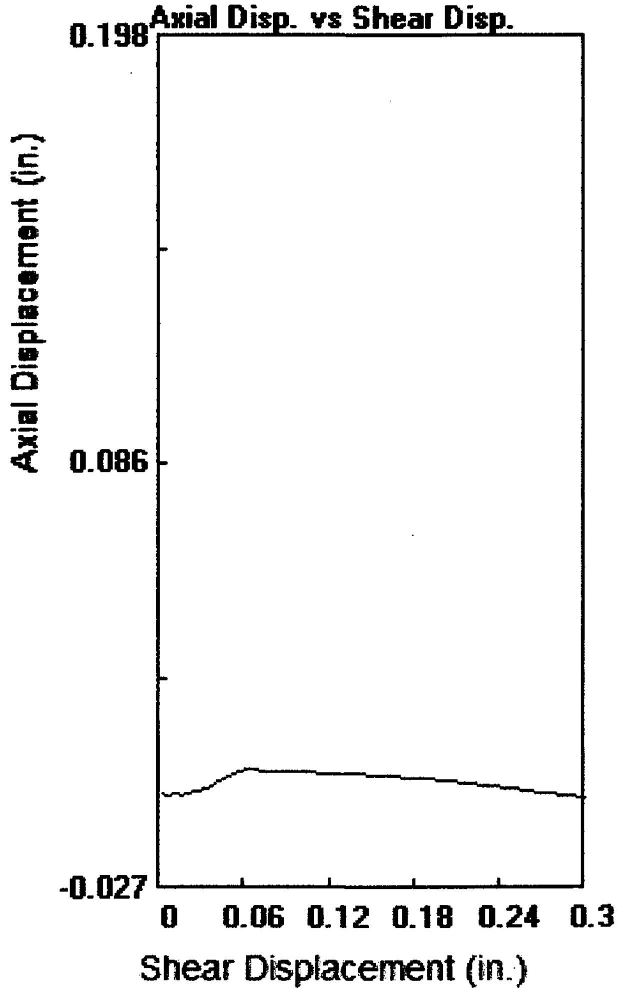
Average Moisture Content	20.4%
Average Dry Density (pcf)	110.3
Percent Saturation	100.0%

DIRECT SHEAR TEST - ASTM D-3080



1051127201745876



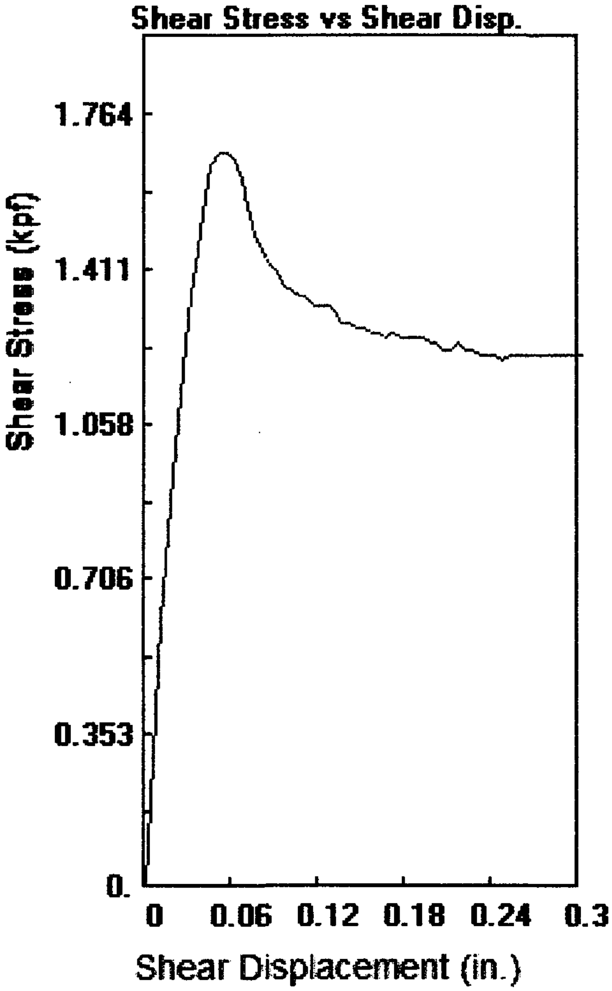


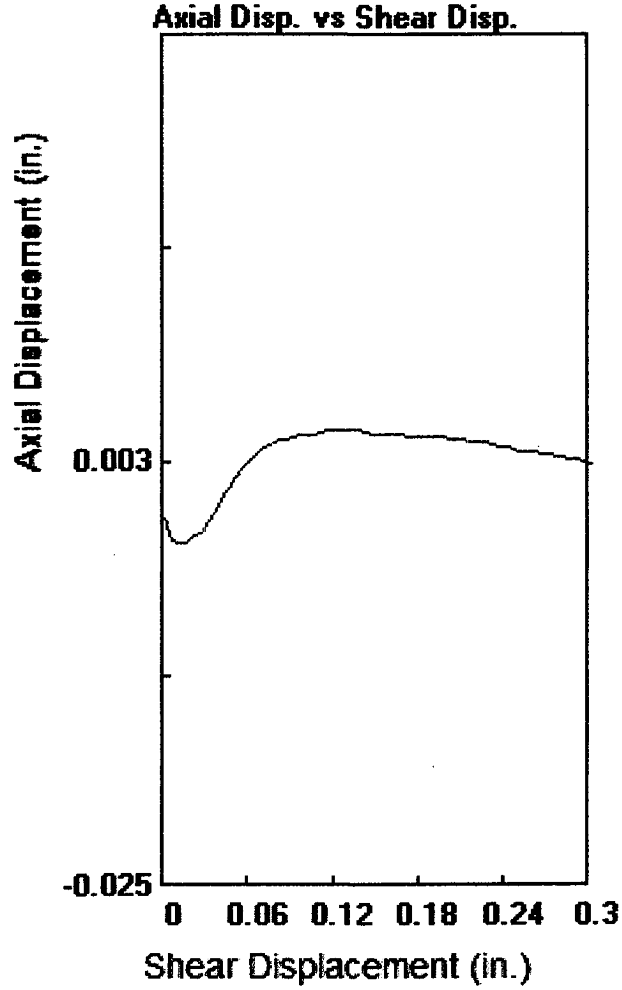
Parameters

Client: FEFFER/MONTECITO APTS		**Maximum Load**
Location: 6650 W FRANKLLIN		948 psf
Job # 1966	Soil Type:FILL/ALLUVIUM	**Shear Displacement at maximum Load**
Sample: 1	Technician: BF	
Boring: B3	Axial Load: 1000 psf	
Depth: 0-50 ft.	Shear Rate: 0.010 in./sec.	0.0556 in.
File: 1966B30-501 RMLD.dat	Distance: 0.30 in.	**Date**
Stress at Max Def 948 0.056	Stress at Max Disp 0.296 636	6/16/2017

Soil Labworks

1 0 5 1 1 2 7 2 0 1 7 4 5 8 7 6





Parameters

Client: FEFFER/MONTECITO

Location: 6650 W FRANKLIN

Job # 1966

Sample: 2

Boring: B3

Depth: 0-50 ft.

File: 1966B30-502 RMLD.dat

Stress at Max Def
1680 0.051

Soil Type:FILL/ALLUVIUM

Technician: BF

Axial Load: 2000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 1224

Maximum Load

1680 psf

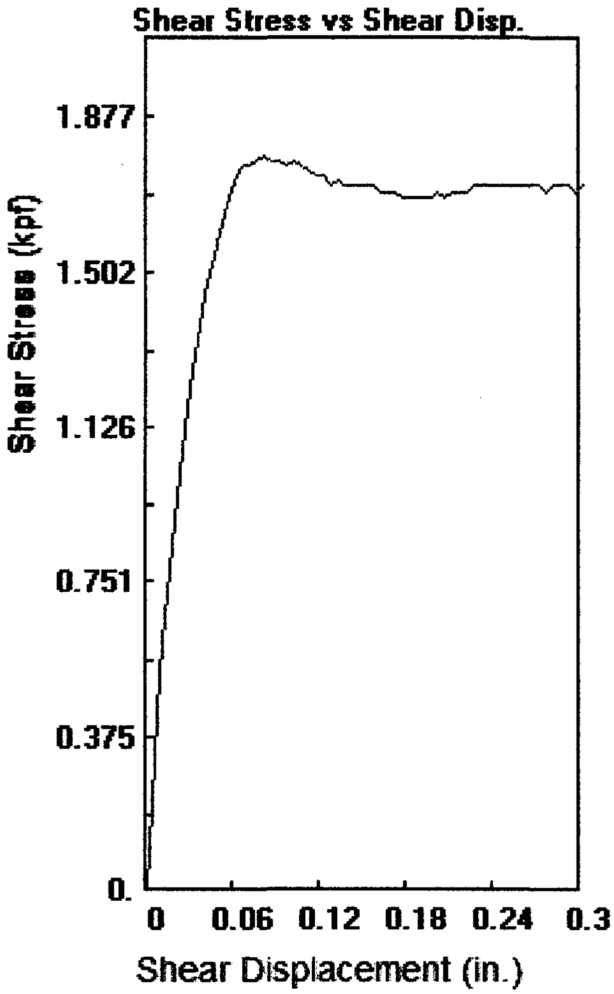
Shear Displacement at maximum Load

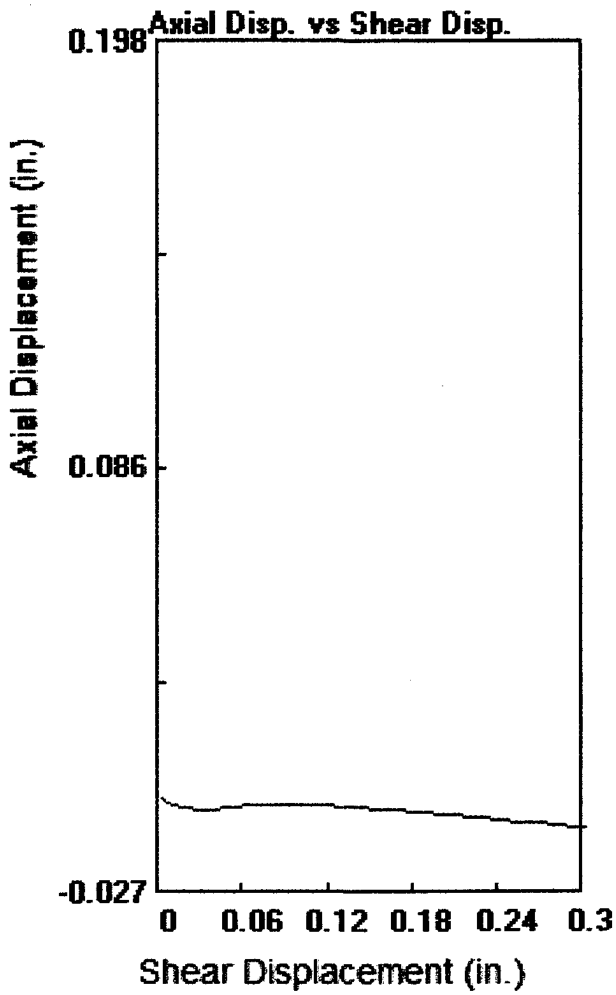
0.0506 in.

Date
6/16/2017

Robertson Geotechnical

1 0 5 1 1 2 7 2 0 1 7 4 5 8 7 6





Parameters

Client: FEFFER/MONTECITO APTS

Location: 6650 W FRANKLLIN

Job # 1966

Sample: 3.

Boring: B3

Depth: 0-50 ft.

File: 1966B30-503 RMLD.dat

Stress at Max Def
1788 0.081

Soil Type:FILL/ALLUVIUM

Technician: BF

Axial Load: 3000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 1704

Maximum Load

1788 psf

Shear Displacement at maximum Load

0.0807 in.

Date
6/16/2017

Soil Labworks

1051127201745876

SOIL LABWORKS LLC

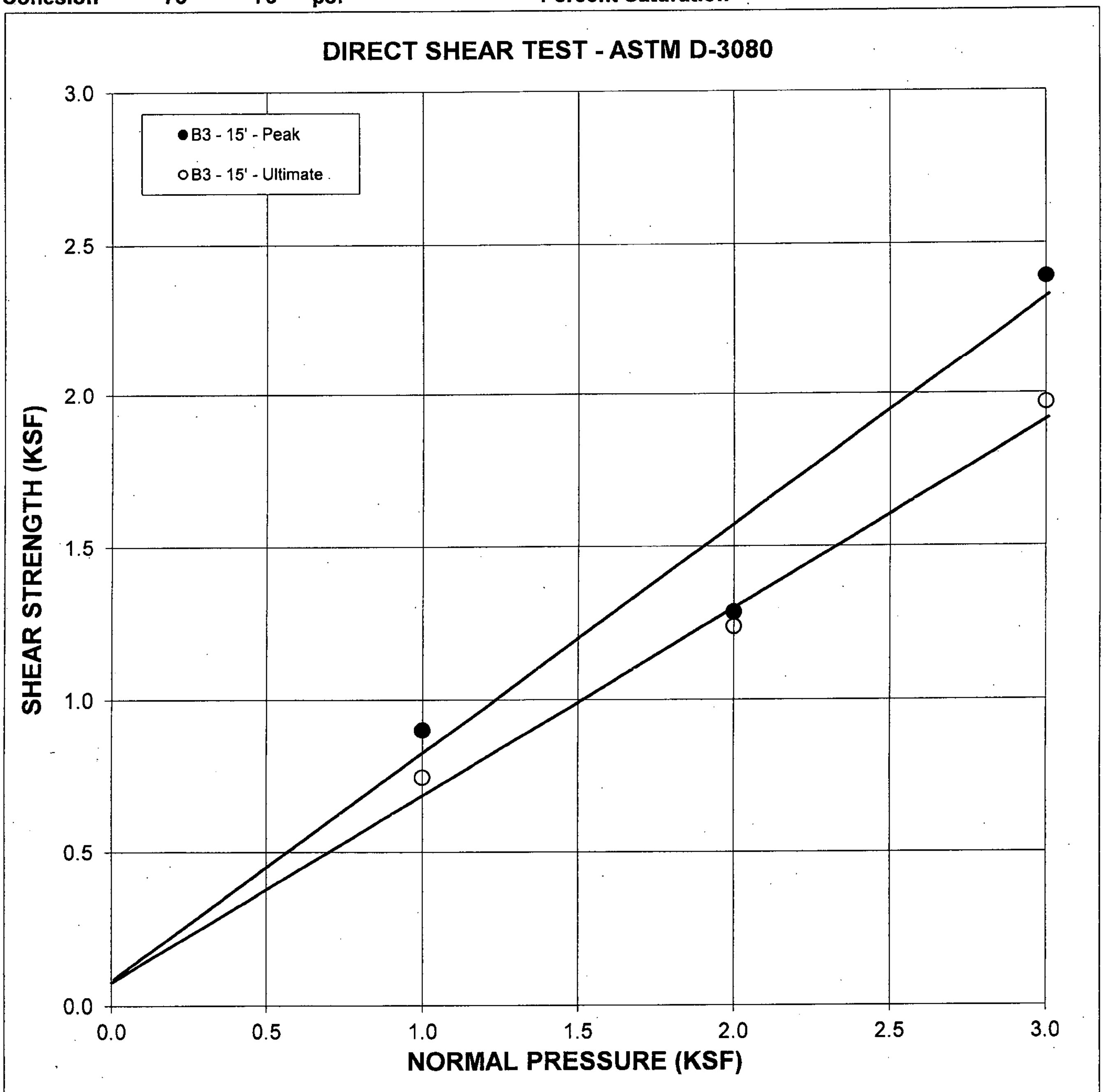
SHEAR DIAGRAM B-5

JN: SL15.1966 CONSULTANT JAI
CLIENT: Feffer/Montecito Apts-6650 W Franklin

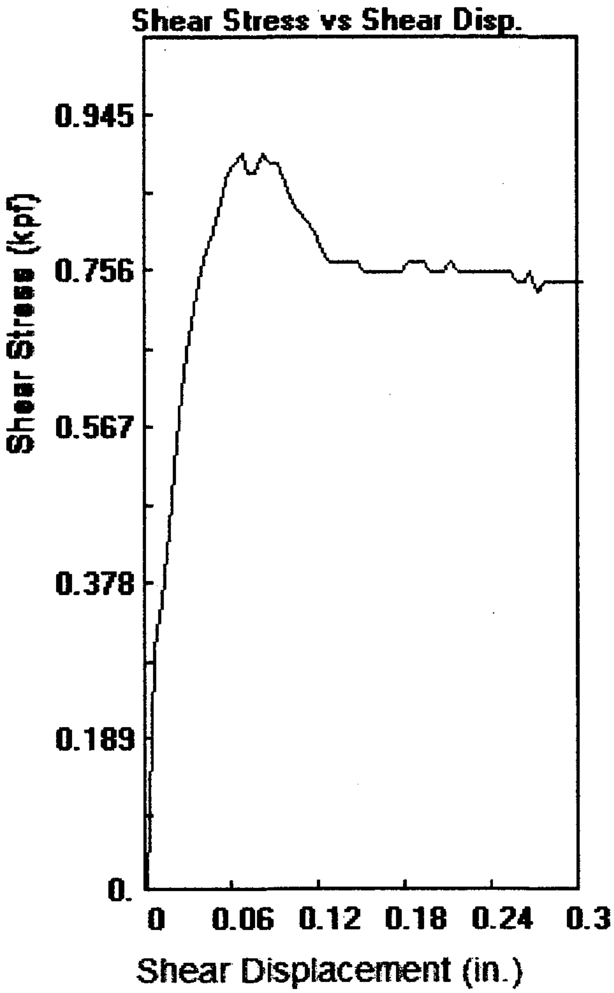
EARTH MATERIAL: ALLUVIUM

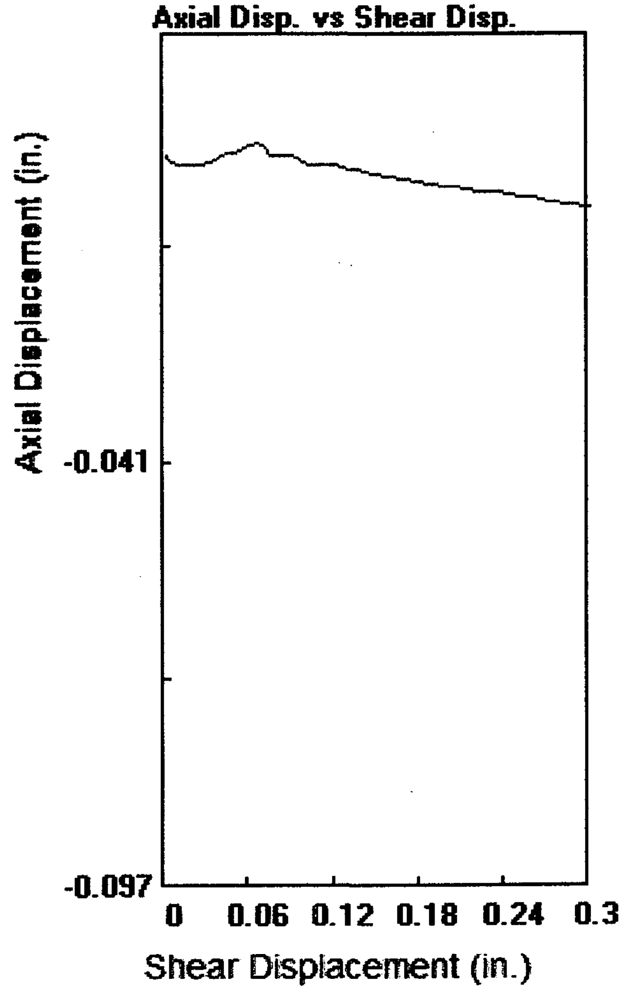
	PEAK	ULTIMATE	
Phi Angle	36.5	31	degrees
Cohesion	75	75	psf

Average Moisture Content	23.7%
Average Dry Density (pcf)	113.9
Percent Saturation	100.0%



1051127201745876





Parameters

Client: FEFFER/MONTECITO APTS

Location: 6650 W FRANKLIN

Job # 1966

Soil Type:ALLUVIUM

Sample: 1

Technician: BF

Boring: B3

Axial Load: 1000 psf

Depth: 15 ft.

Shear Rate: 0.010 in./sec.

File: 1966B3151.dat

Distance: 0.30 in.

Stress at Max Def
900 0.066

Stress at Max Disp
0.296 744

Maximum Load

900 psf

Shear Displacement at maximum Load

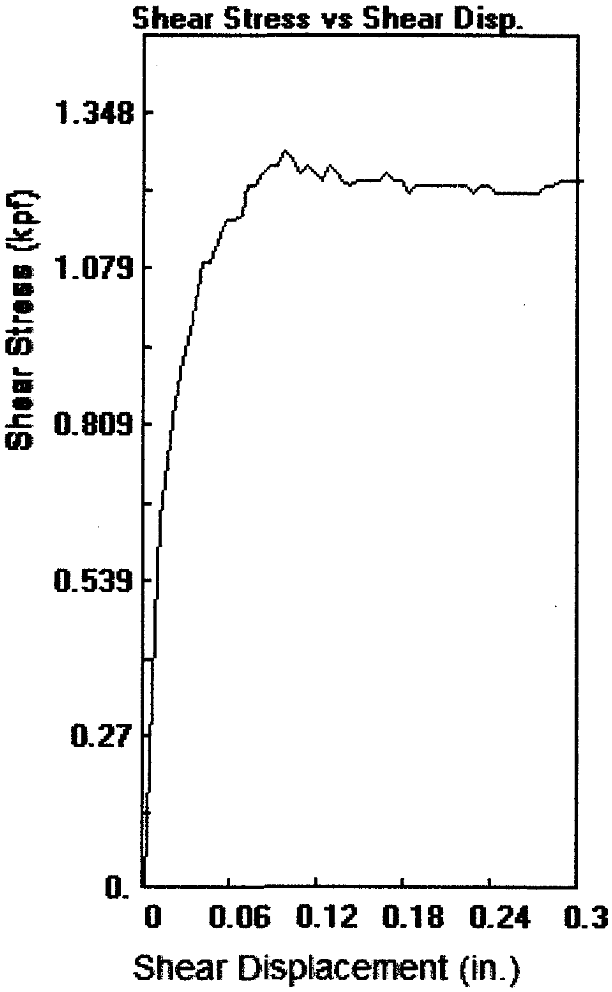
0.0656 in.

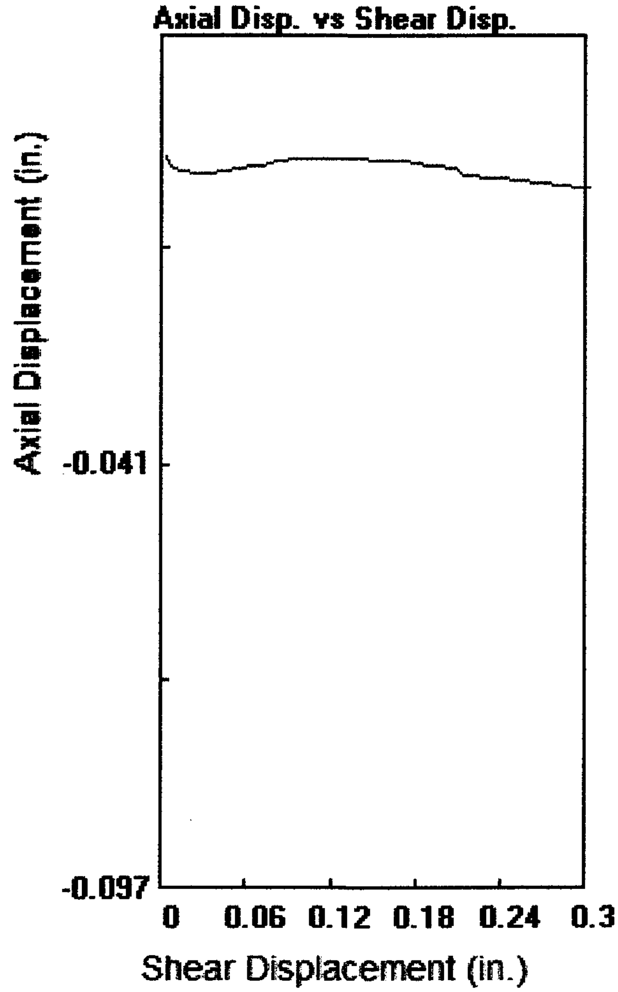
Date

6/30/2017

Robertson Geotechnical

1 0 5 1 1 2 7 2 0 1 7 4 5 8 7 6





Parameters

Client: FEFFER/MONTECITO APTS

Location: 6650 W FRANKLIN

Job # 1966

Sample: 2

Boring: B3

Depth: 15 ft.

File: 1966B3152.dat

Stress at Max Def
1284 0.096

Soil Type:ALLUVIUM

Technician: BF

Axial Load: 2000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 1236

Maximum Load

1284 psf

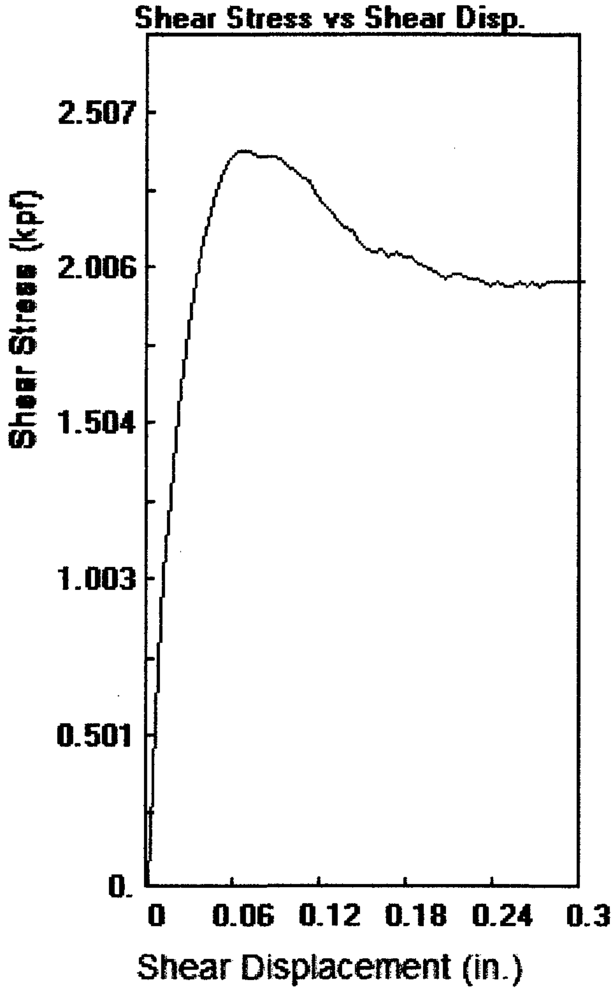
Shear Displacement at maximum Load

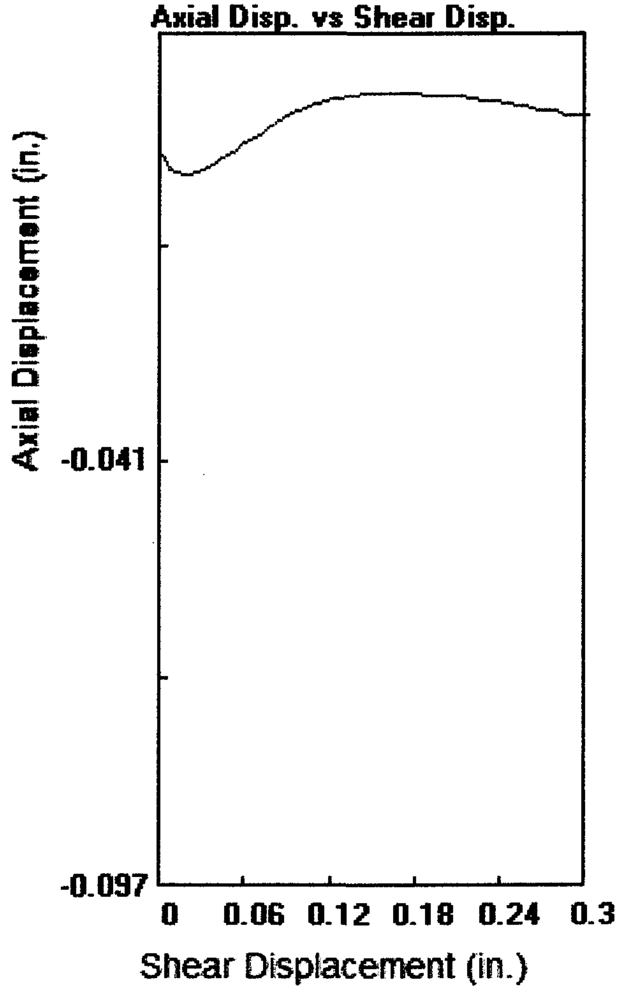
0.0955 in.

Date
6/30/2017

Robertson Geotechnical

1051127201745876





Parameters

Client: FEFFER/MONTECITO APTS

Location: 6650 W FRANKLIN

Job # 1966

Sample: 3

Boring: B3

Depth: 15 ft.

File: 1966B3153.dat

Stress at Max Def
2388 0.061

Soil Type:ALLUVIUM

Technician: BF

Axial Load: 3000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 1968

Maximum Load

2388 psf

Shear Displacement at maximum Load

0.0606 in.

Date
6/30/2017

Robertson Geotechnical

1 0 5 1 1 2 7 2 0 1 7 4 5 8 7 6

SHEAR DIAGRAM B-6

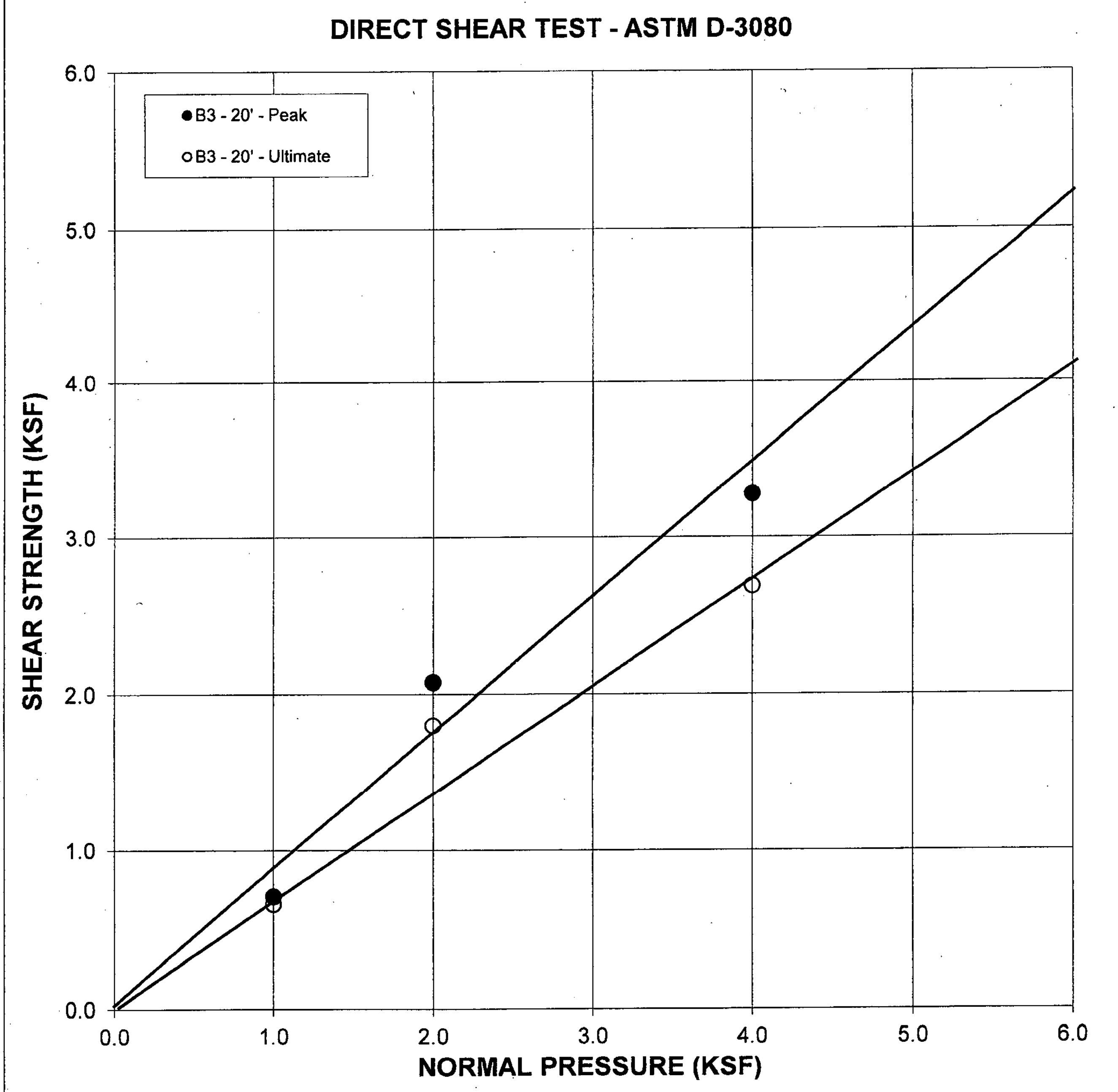
SOIL LABWORKS LLC

JN: **SL15.1966** CONSULTANT **JAI**
CLIENT: **Feffer/Montecito Apts-6650 W Franklin**

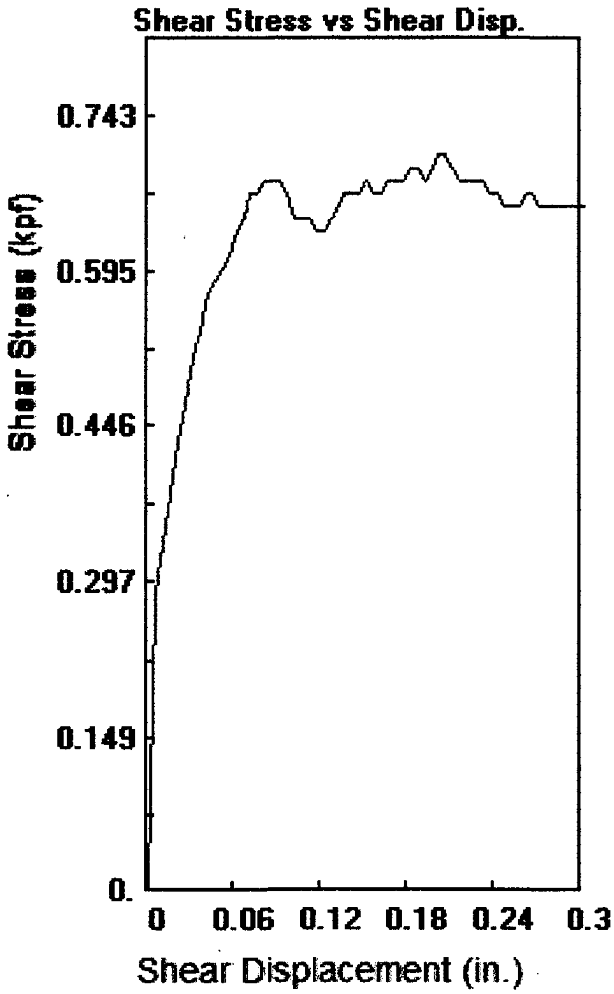
EARTH MATERIAL: **ALLUVIUM**

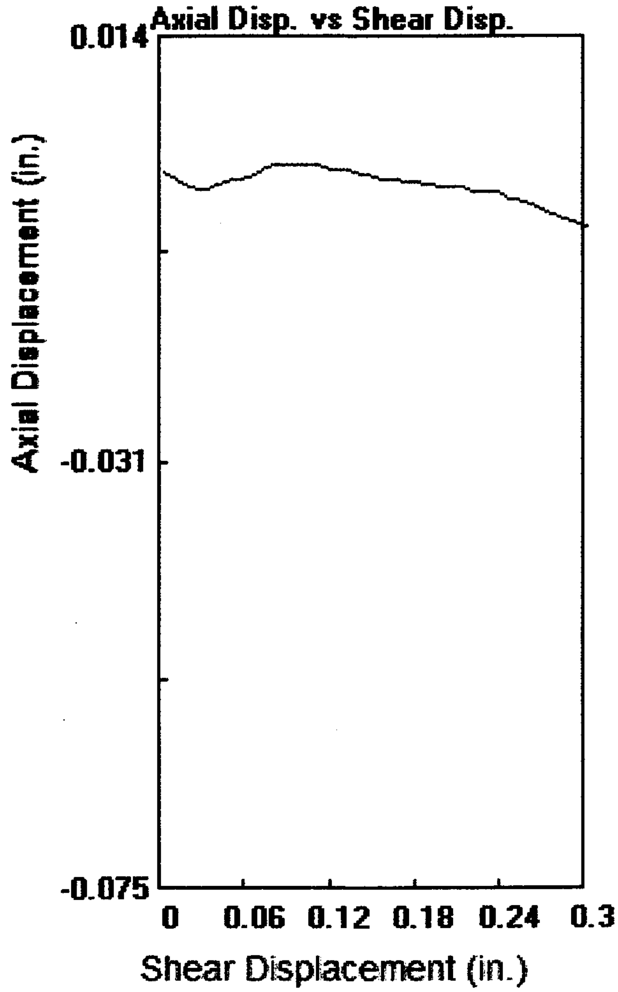
	PEAK	ULTIMATE	
Phi Angle	40.5	34	degrees
Cohesion	15	5	psf

Average Moisture Content	21.7%
Average Dry Density (pcf)	114.3
Percent Saturation	100.0%



1051127201745876





Parameters

Client: FEFFER/MONTECITO APTS

Location: 6650 W FRANKLIN

Job # 1966

Soil Type:ALLUVIUM

Sample: 1

Technician: BF

Boring: B3

Axial Load: 1000 psf

Depth: 20 ft.

Shear Rate: 0.010 in./sec.

File: 1966B3201.dat

Distance: 0.30 in.

Stress at Max Def
708 0.201

Stress at Max Disp
0.296 660

Maximum Load

708 psf

Shear Displacement at maximum Load

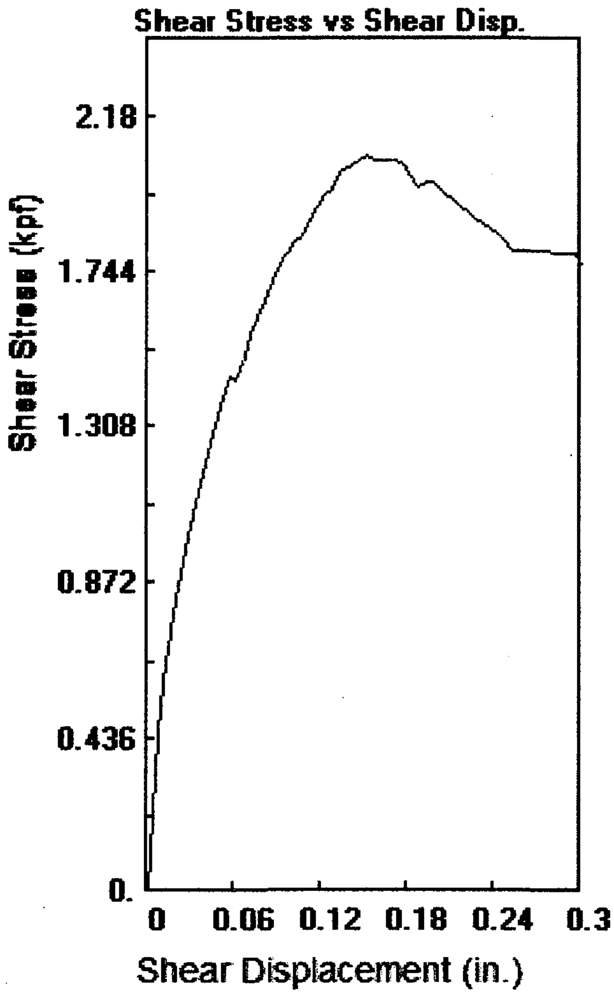
0.2005 in.

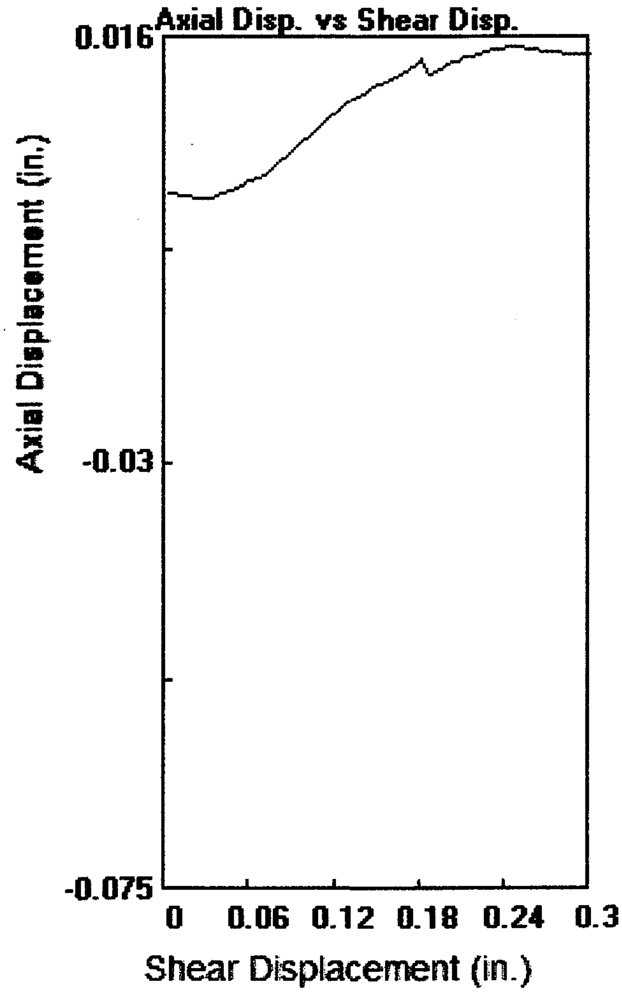
Date

6/30/2017

Soil Labworks

1051127201745876





Parameters

Client: FEFFER/MONTECITO APTS

Location: 6650 W FRANKLIN

Job # 1966

Sample: 2

Boring: B3

Depth: 20 ft.

File: 1966B3202.dat

Stress at Max Def
2076 0.151

Soil Type:ALLUVIUM

Technician: BF

Axial Load: 2000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 1800

Maximum Load

2076 psf

Shear Displacement at maximum Load

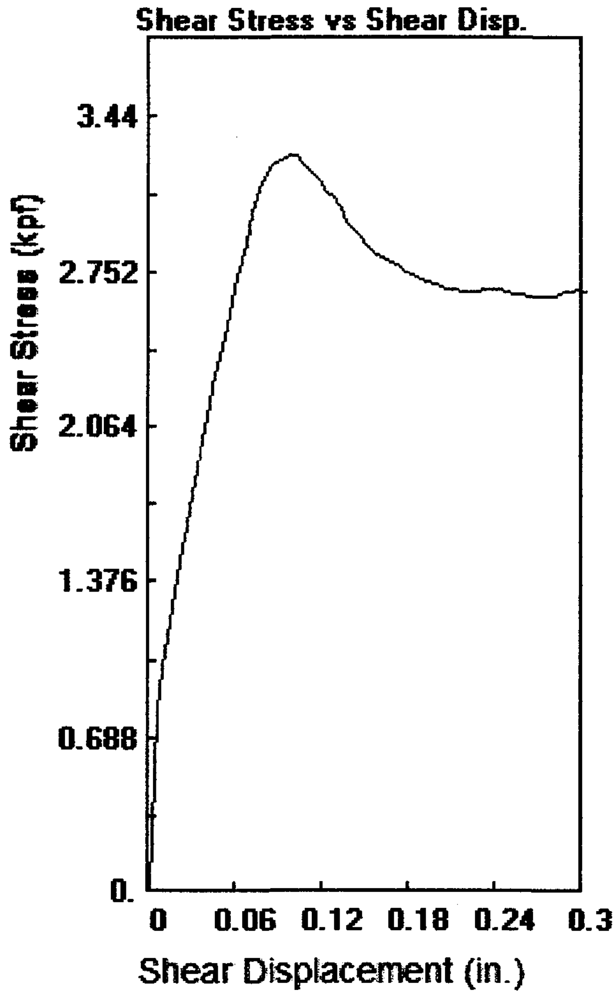
0.1507 in.

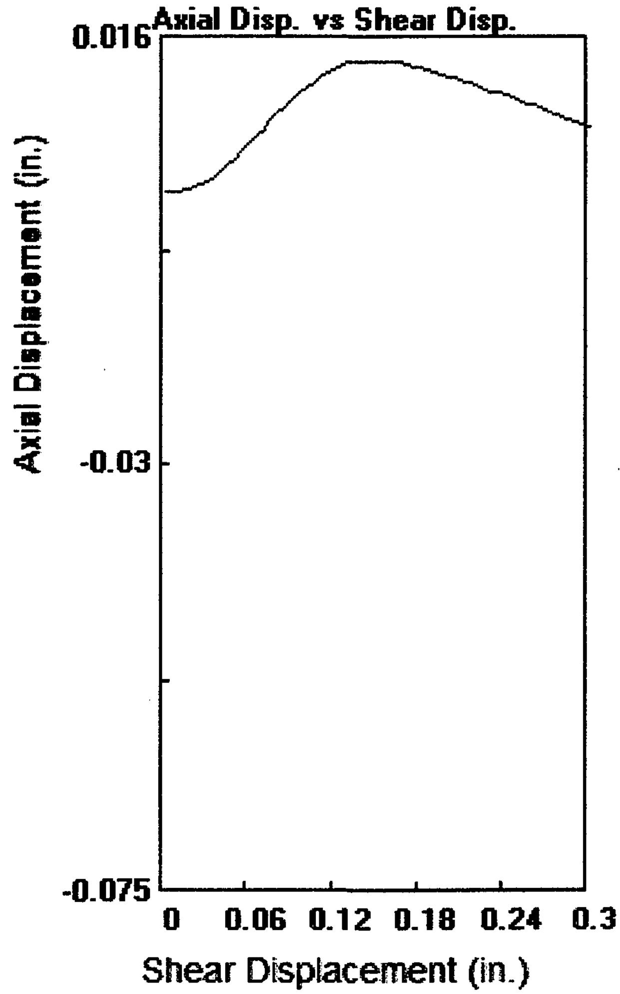
Date

6/30/2017

Soil Labworks

1051127201745876





Parameters

Client: FEFFER/MONTECITO APTS

Location: 6650 W FRANKLIN

Job # 1966

Soil Type:ALLUVIUM

Sample: 3

Technician: BF

Boring: B3

Axial Load: 4000 psf

Depth: 20 ft.

Shear Rate: 0.010 in./sec.

File: 1966B3204.dat

Distance: 0.30 in.

Stress at Max Def
3276 0.096

Stress at Max Disp
0.296 2688

Maximum Load

3276 psf

Shear Displacement at maximum Load

0.0956 in.

Date
6/30/2017

Soil Labworks

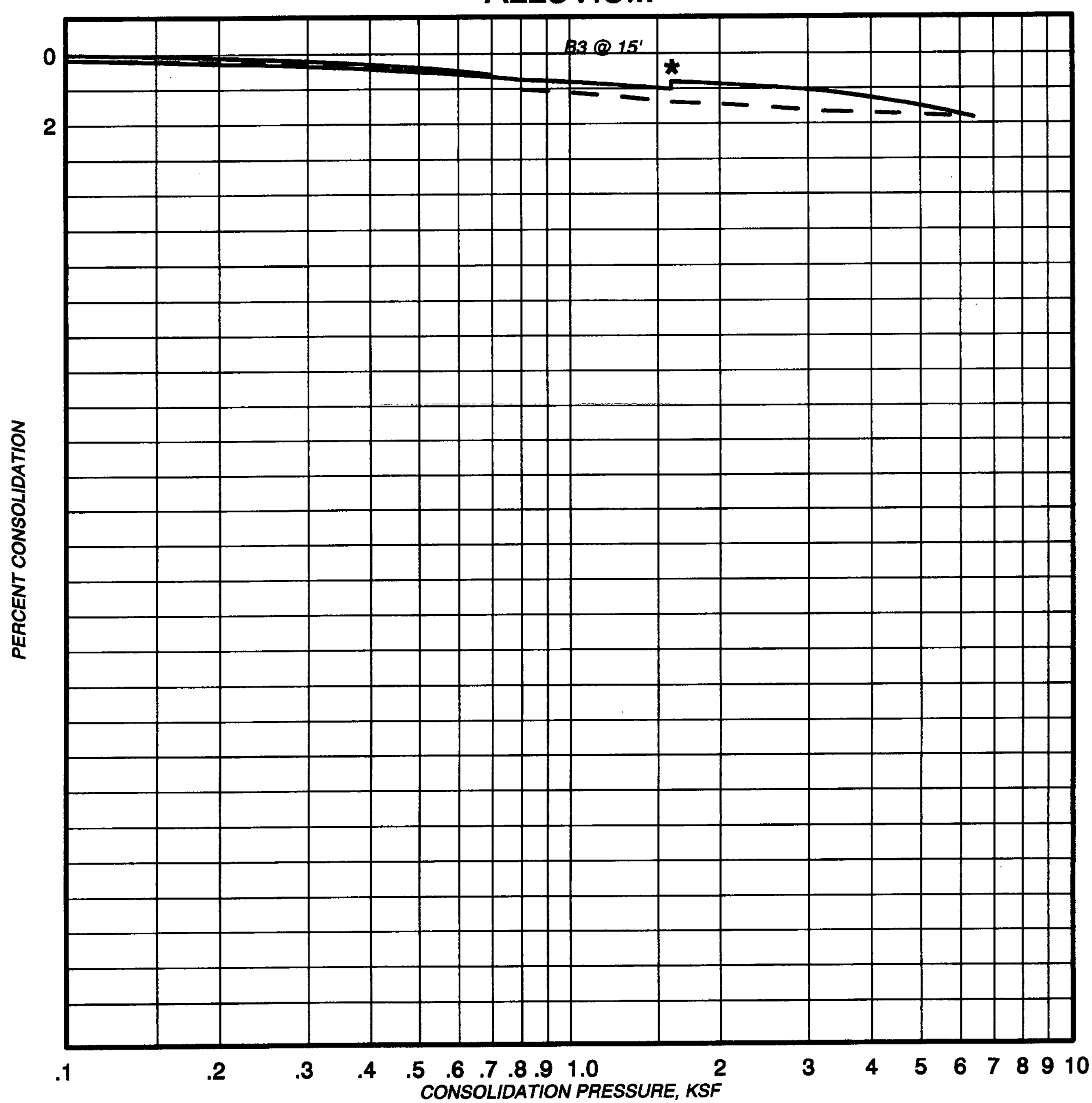
1051127201745876

CONSOLIDATION TEST

PROJECT: 1966 FEFFER MONTECITO APARTMENTS-6650 W FRANKLIN

SAMPLE: B3 @ 15'

ALLUVIUM



* Water Added

PLATE:

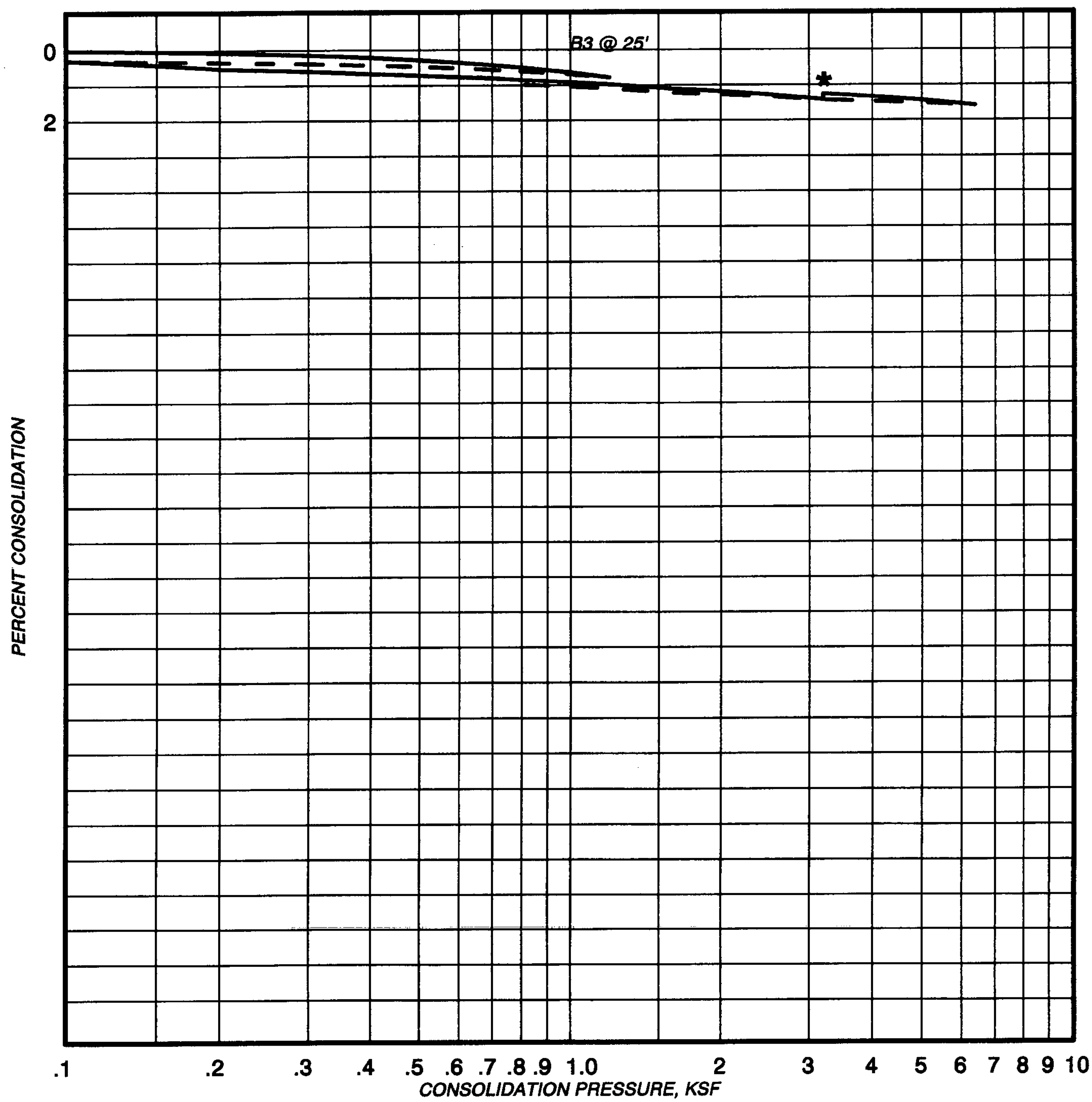
1 0 5 1 1 2 7 2 0 1 7 4 5 8 7 6

CONSOLIDATION TEST

PROJECT: 1966 FEFFER MONTECITO APARTMENTS-6650 W FRANKLIN

SAMPLE: B3 @ 25'

ALLUVIUM



* Water Added

PLATE:

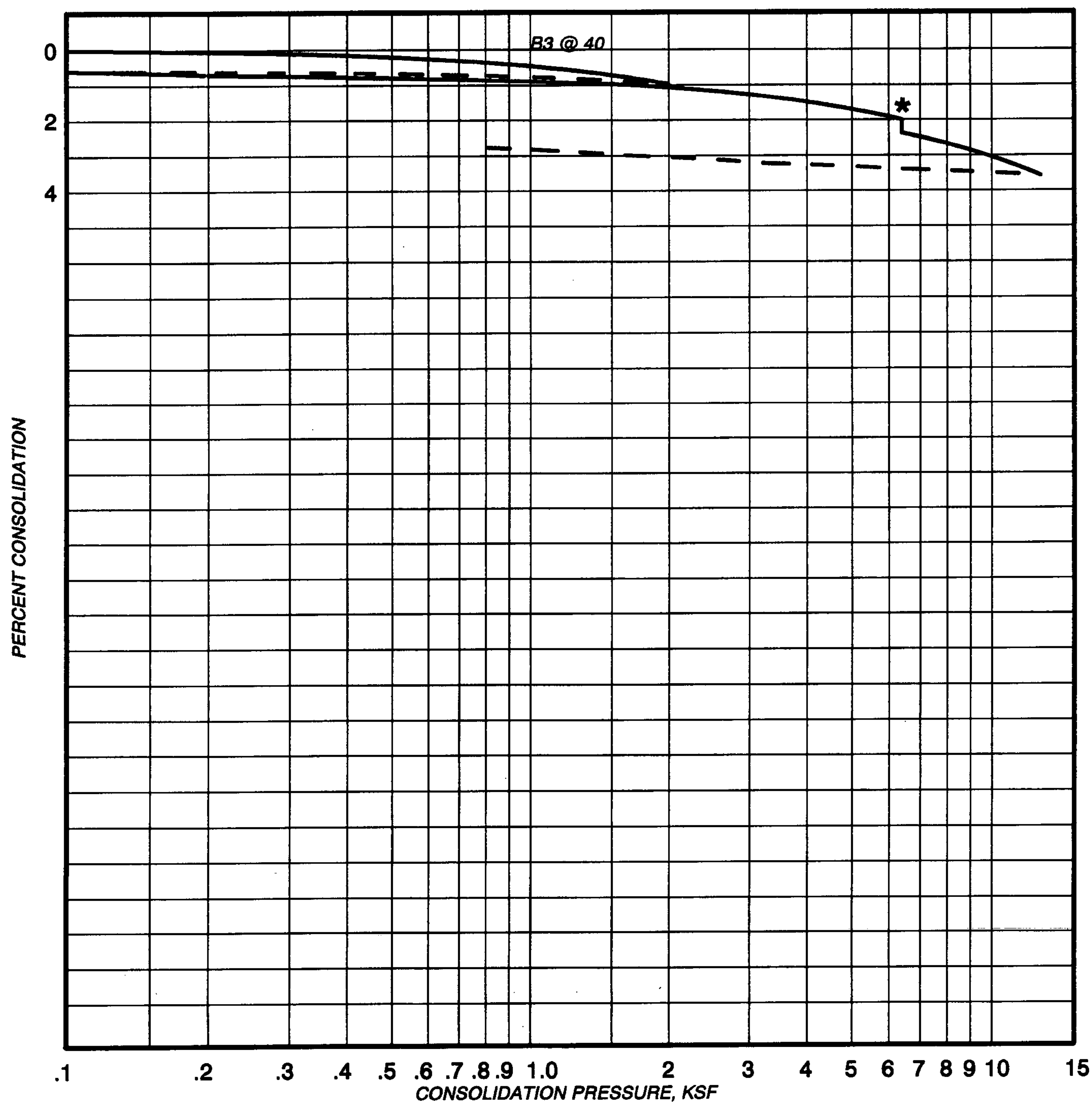
1 0 5 1 1 2 7 2 0 1 7 4 5 8 7 6

CONSOLIDATION TEST

PROJECT: 1966 FEFFER MONTECITO APARTMENTS-6650 W FRANKLIN

SAMPLE: B3 @ 40

ALLUVIUM



*** Water Added**

PLATE:

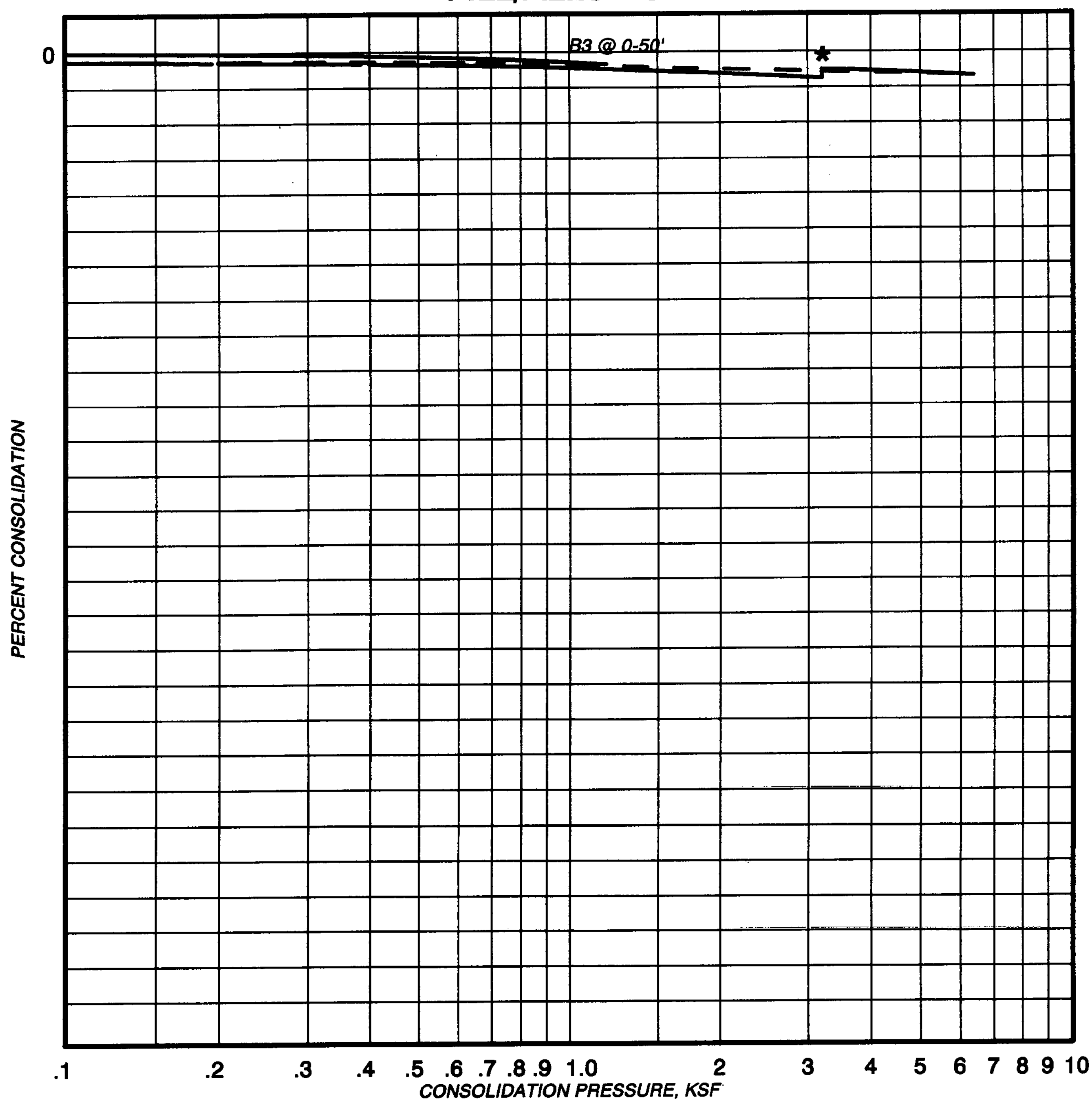
1 0 5 1 1 2 7 2 0 1 7 4 5 8 7 6

CONSOLIDATION TEST

PROJECT: 1966 FEFFER MONTECITO APARTMENTS-6650 W FRANKLIN - REMOLDED TO 90% MAX DENSITY

SAMPLE: B3 @ 0-50'

FILL/ALLUVIUM



* Water Added

PLATE:

1 0 5 1 1 2 7 2 0 1 7 4 5 8 7 6

File No.: SL15.1966 September 12, 2017

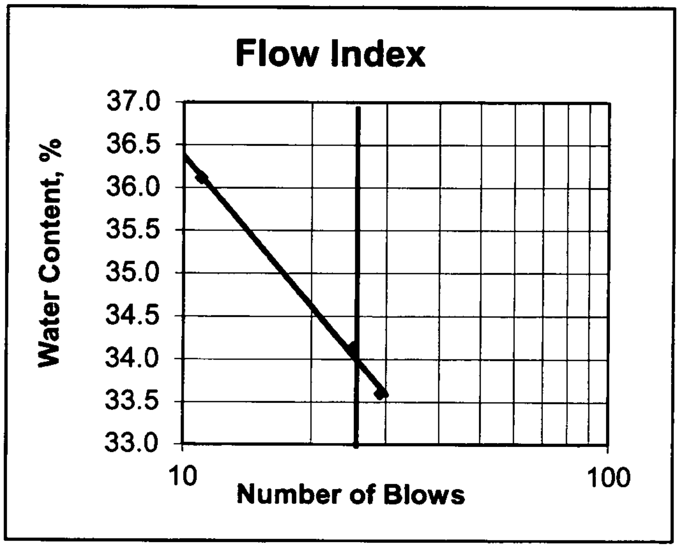
PLASTICITY INDEX

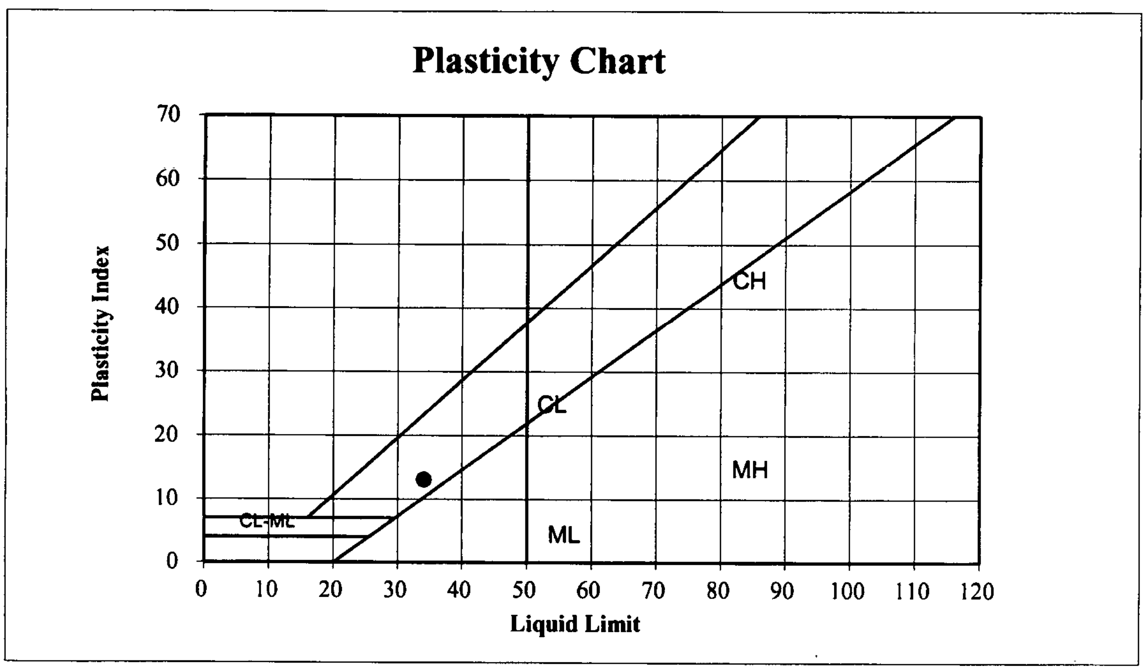
ASTM D-4318

Job Name: Feffer/Montecito Apts-6650 W Franklin
Sample ID: B3 @ 30'
Soil Description: ML/CL

DATA SUMMARY **TEST RESULTS**

Number of Blows:	11	25	29	**LIQUID LIMIT**	**34**
Water Content, %	36.1	34.1	33.6	**PLASTIC LIMIT**	**21**
Plastic Limit:	21.3	21.5		**PLASTICITY INDEX**	**13**





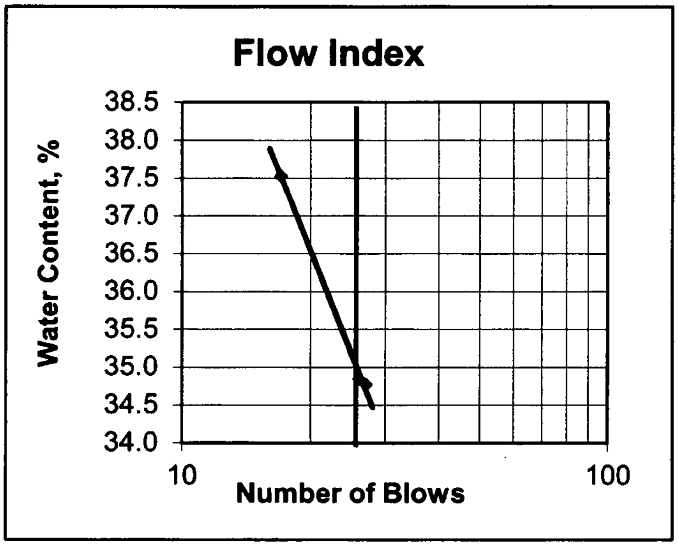
File No.: SL15.1966 September 12, 2017

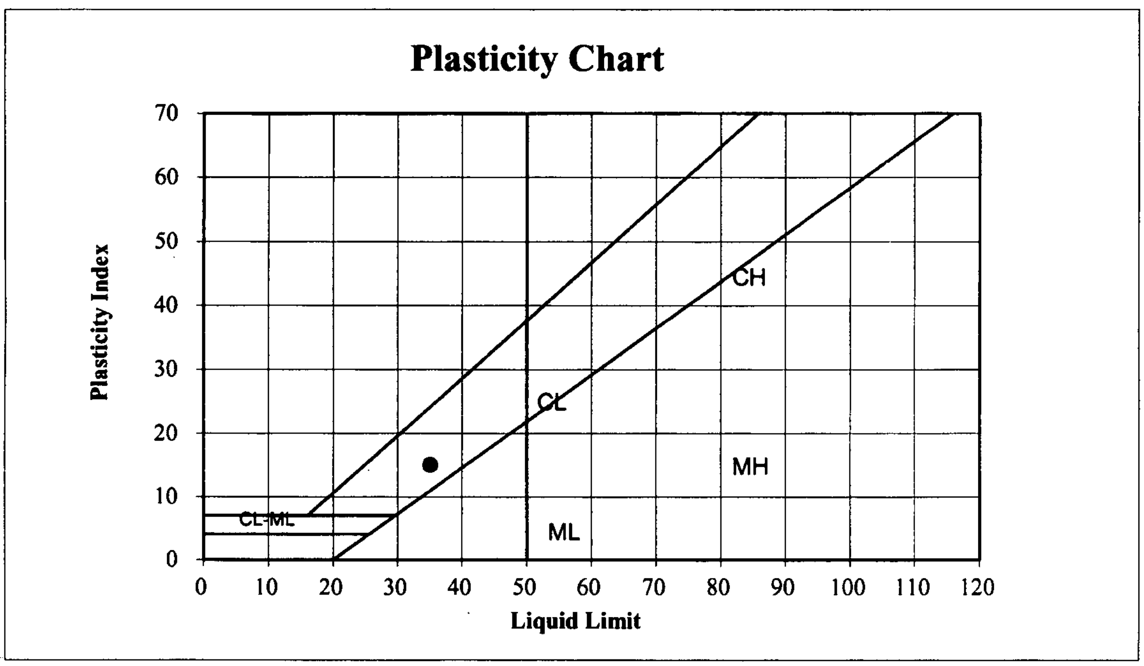
PLASTICITY INDEX

ASTM D-4318

Job Name: Feffer/Montecito Apts-6650 W Franklin
Sample ID: B3 @ 35'
Soil Description: ML/CL

DATA SUMMARY				TEST RESULTS	
Number of Blows:	17	26	27	**LIQUID LIMIT**	**35**
Water Content, %	37.5	34.8	34.8	**PLASTIC LIMIT**	**20**
Plastic Limit:	19.7	19.6		**PLASTICITY INDEX**	**15**





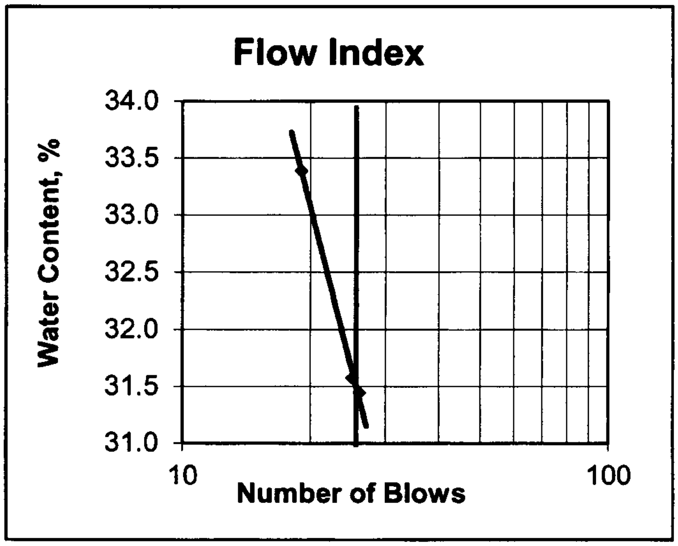
File No.: SL15.1966 September 12, 2017

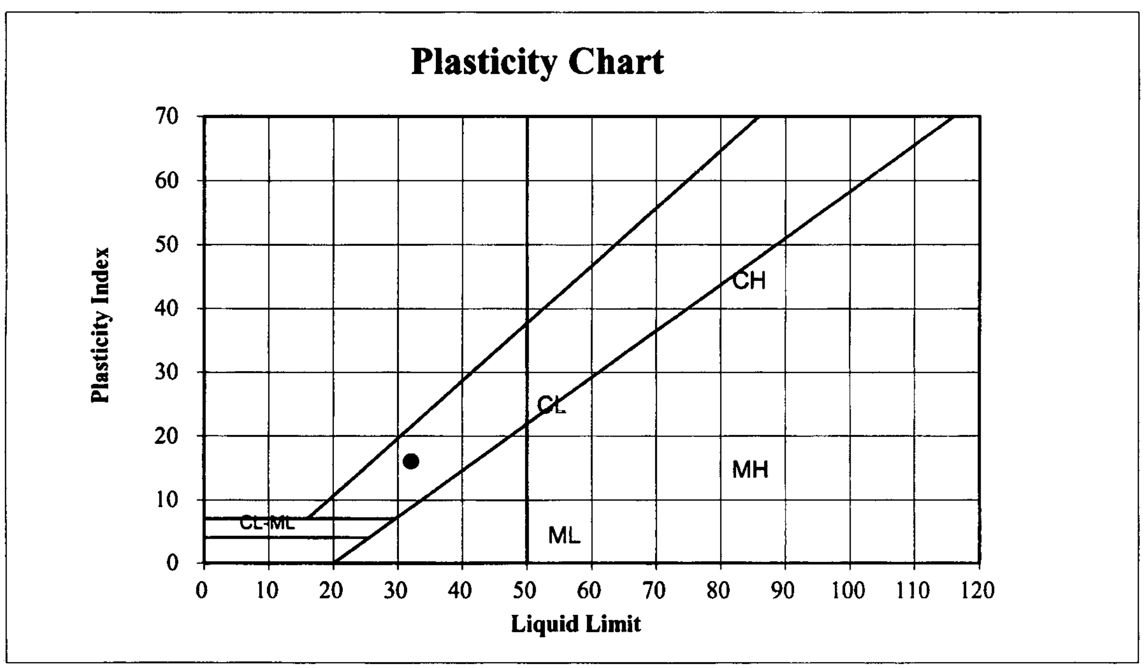
PLASTICITY INDEX

ASTM D-4318

Job Name: Feffer/Montecito Apts-6650 W Franklin
Sample ID: B3 @ 45'
Soil Description: ML/CL

DATA SUMMARY				TEST RESULTS	
Number of Blows:	19	25	26	**LIQUID LIMIT**	**32**
Water Content, %	33.4	31.6	31.4	**PLASTIC LIMIT**	**16**
Plastic Limit:	16.2	16.2		**PLASTICITY INDEX**	**16**





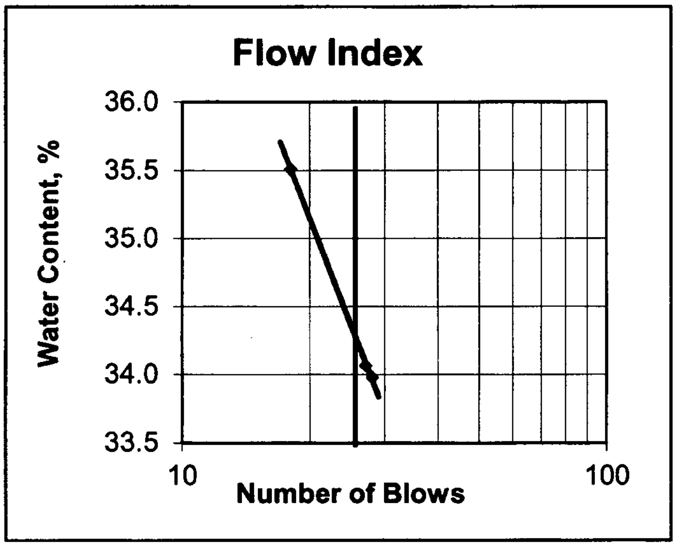
File No.: SL15.1966 September 12, 2017

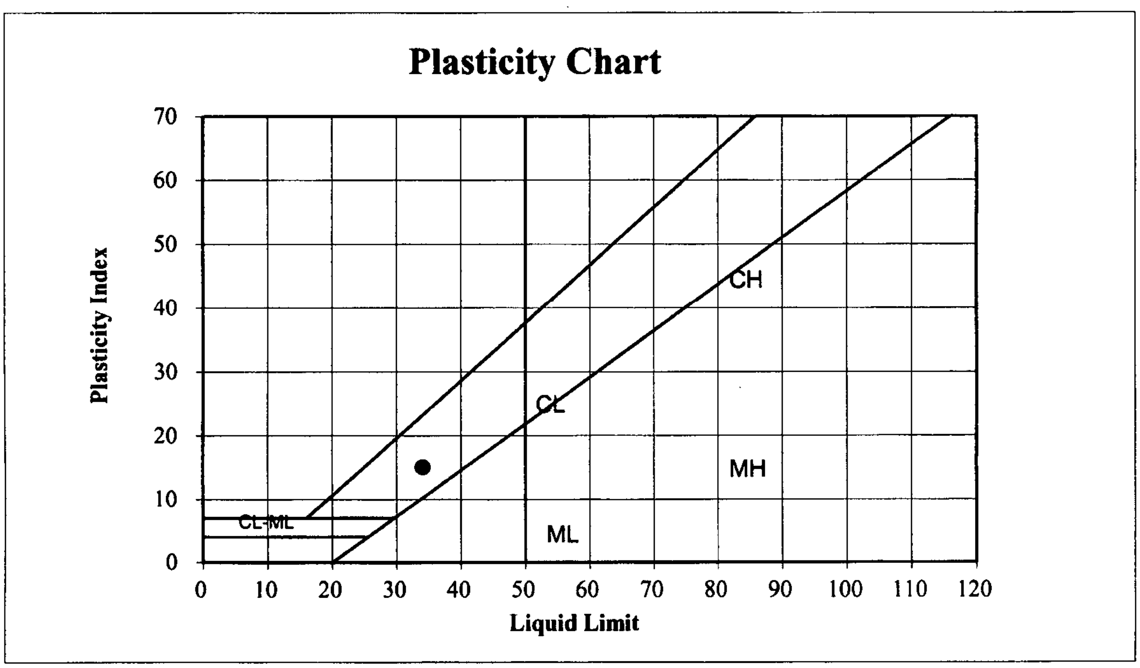
PLASTICITY INDEX

ASTM D-4318

Job Name: Feffer/Montecito Apts-6650 W Franklin
Sample ID: B3 @ 50'
Soil Description: ML/CL

DATA SUMMARY				TEST RESULTS	
Number of Blows:	18	27	28	**LIQUID LIMIT**	**34**
Water Content, %	35.5	34.1	34.0	**PLASTIC LIMIT**	**19**
Plastic Limit:	19.1	18.9		**PLASTICITY INDEX**	**15**



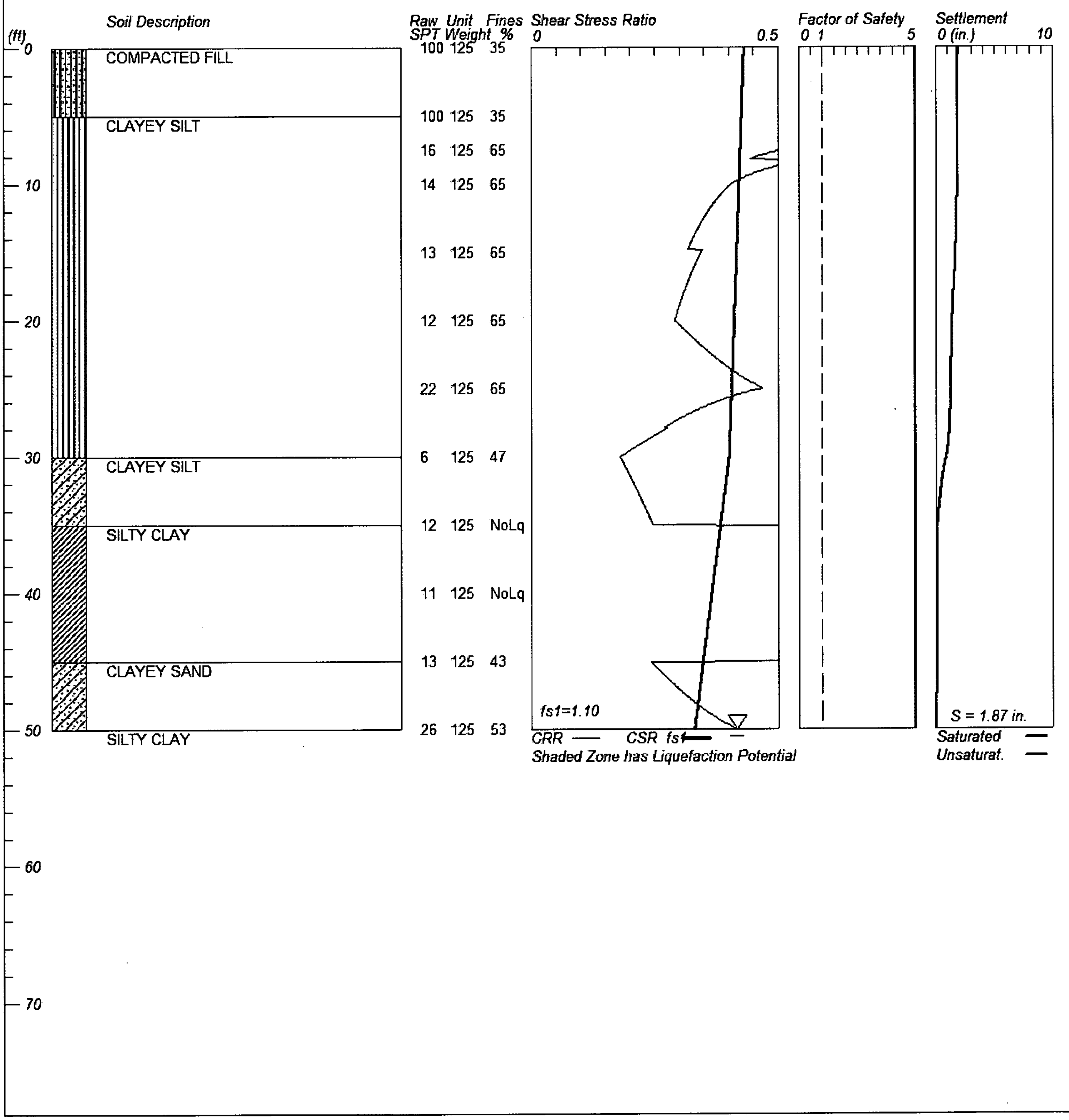


LIQUEFACTION ANALYSIS

Mptecito-B-1-10%

Hole No.=B-1 ***Water Depth=50 ft***

Magnitude=6.67
Acceleration=0.665g



Advanced Geo Group, Inc. **Subtitle or Proj No.** **Plate A-1**

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                    LIQUEFACTION ANALYSIS CALCULATION SHEET

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*************************************************************************************
*******************
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        Input File Name: E:\Liquefy5\Motecito-B-1--10%.liq
        Title:  Mptecito-B-1-10%
        Subtitle:  Subtitle or Proj No.

        Surface Elev.=
        Hole No.=B-1
        Depth of Hole= 50.0 ft
        Water Table during Earthquake= 50.0 ft
        Water Table during In-Situ Testing= 30.0 ft
        Max. Acceleration= 0.67 g
        Earthquake Magnitude= 6.7

 Irput Data:
        Surface Elev.=
        Hole No.=B-1
        Depth of Hole=50.0 ft
        Water Table during Earthquake= 50.0 ft
        Water Table during In-Situ Testing= 30.0 ft
        Max. Acceleration=0.67 g
        Earthquake Magnitude=6.7

        1. SPT or BPT Calculation.
        2. Settlement Analysis Method: Ishihara / Yoshimine*
        3. Fines Correction for Liquefaction: Stark/Olson et al.*
        4. Fine Correction for Settlement: During Liquefaction*
        5. Settlement Calculation in: All zones*
        6. Hammer Energy Ratio,                         Ce = 1.25
        7. Borehole Diameter,                               Cb= 1
        8. Sampling Method,                                Cs= 1
        9. User request factor of safety (apply to CSR) ,   User= 1.1

        10. Use Curve Smoothing: Yes*
        * Recommended Options
```


In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.0	100.0	125.0	35.0
5.0	100.0	125.0	35.0
7.5	16.0	125.0	65.0
10.0	14.0	125.0	65.0
15.0	13.0	125.0	65.0
20.0	12.0	125.0	65.0
25.0	22.0	125.0	65.0
30.0	6.0	125.0	47.0
35.0	12.0	125.0	NoLiq
40.0	11.0	125.0	NoLiq
45.0	13.0	125.0	43.0
50.0	26.0	125.0	53.0

Output Results:
Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=1.87 in.
Total Settlement of Saturated and Unsaturated Sands=1.87 in.
Differential Settlement=0.937 to 1.237 in.

Depth ft	CRRm	CSRsf	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	2.70	0.43	5.00	0.00	1.87	1.87
0.50	2.70	0.43	5.00	0.00	1.87	1.87
1.00	2.70	0.43	5.00	0.00	1.87	1.87
1.50	2.70	0.43	5.00	0.00	1.87	1.87
2.00	2.70	0.43	5.00	0.00	1.87	1.87
2.50	2.70	0.43	5.00	0.00	1.87	1.87
3.00	2.70	0.43	5.00	0.00	1.87	1.87
3.50	2.70	0.43	5.00	0.00	1.87	1.87
4.00	2.70	0.43	5.00	0.00	1.87	1.87
4.50	2.70	0.43	5.00	0.00	1.87	1.87
5.00	2.70	0.43	5.00	0.00	1.87	1.87
5.50	2.70	0.43	5.00	0.00	1.87	1.87
6.00	2.70	0.43	5.00	0.00	1.87	1.87
6.50	2.70	0.43	5.00	0.00	1.87	1.87
7.00	2.70	0.43	5.00	0.00	1.87	1.87
7.50	0.51	0.42	5.00	0.00	1.86	1.86
8.00	0.46	0.42	5.00	0.00	1.86	1.86
8.50	0.53	0.42	5.00	0.00	1.85	1.85
9.00	0.47	0.42	5.00	0.00	1.84	1.84
9.50	0.43	0.42	5.00	0.00	1.84	1.84
10.00	0.41	0.42	5.00	0.00	1.83	1.83

10.50	0.39	0.42	5.00	0.00	1.82	1.82
11.00	0.38	0.42	5.00	0.00	1.81	1.81
11.50	0.37	0.42	5.00	0.00	1.80	1.80
12.00	0.36	0.42	5.00	0.00	1.79	1.79
12.50	0.35	0.42	5.00	0.00	1.78	1.78
13.00	0.34	0.42	5.00	0.00	1.77	1.77
13.50	0.33	0.42	5.00	0.00	1.75	1.75
14.00	0.33	0.42	5.00	0.00	1.73	1.73
14.50	0.32	0.42	5.00	0.00	1.71	1.71
15.00	0.34	0.42	5.00	0.00	1.69	1.69
15.50	0.34	0.42	5.00	0.00	1.66	1.66
16.00	0.33	0.42	5.00	0.00	1.64	1.64
16.50	0.32	0.42	5.00	0.00	1.61	1.61
17.00	0.32	0.42	5.00	0.00	1.58	1.58
17.50	0.31	0.41	5.00	0.00	1.54	1.54
18.00	0.31	0.41	5.00	0.00	1.50	1.50
18.50	0.30	0.41	5.00	0.00	1.45	1.45
19.00	0.30	0.41	5.00	0.00	1.44	1.44
19.50	0.30	0.41	5.00	0.00	1.42	1.42
20.00	0.29	0.41	5.00	0.00	1.41	1.41
20.50	0.30	0.41	5.00	0.00	1.39	1.39
21.00	0.32	0.41	5.00	0.00	1.37	1.37
21.50	0.33	0.41	5.00	0.00	1.36	1.36
22.00	0.35	0.41	5.00	0.00	1.34	1.34
22.50	0.37	0.41	5.00	0.00	1.33	1.33
23.00	0.38	0.41	5.00	0.00	1.32	1.32
23.50	0.40	0.41	5.00	0.00	1.30	1.30
24.00	0.42	0.41	5.00	0.00	1.29	1.29
24.50	0.44	0.41	5.00	0.00	1.28	1.28
25.00	0.47	0.41	5.00	0.00	1.27	1.27
25.50	0.41	0.41	5.00	0.00	1.26	1.26
26.00	0.37	0.41	5.00	0.00	1.24	1.24
26.50	0.34	0.41	5.00	0.00	1.23	1.23
27.00	0.31	0.41	5.00	0.00	1.21	1.21
27.50	0.29	0.40	5.00	0.00	1.18	1.18
28.00	0.27	0.40	5.00	0.00	1.15	1.15
28.50	0.25	0.40	5.00	0.00	1.11	1.11
29.00	0.22	0.40	5.00	0.00	1.06	1.06
29.50	0.20	0.40	5.00	0.00	0.99	0.99
30.00	0.18	0.40	5.00	0.00	0.89	0.89
30.50	0.19	0.40	5.00	0.00	0.77	0.77
31.00	0.19	0.40	5.00	0.00	0.66	0.66
31.50	0.20	0.40	5.00	0.00	0.57	0.57
32.00	0.21	0.39	5.00	0.00	0.49	0.49
32.50	0.21	0.39	5.00	0.00	0.41	0.41
33.00	0.22	0.39	5.00	0.00	0.34	0.34
33.50	0.23	0.39	5.00	0.00	0.28	0.28
34.00	0.23	0.39	5.00	0.00	0.23	0.23

34.50	0.24	0.39	5.00	0.00	0.17	0.17
35.00	0.25	0.38	5.00	0.00	0.13	0.13
35.50	2.00	0.38	5.00	0.00	0.12	0.12
36.00	2.00	0.38	5.00	0.00	0.12	0.12
36.50	2.00	0.38	5.00	0.00	0.12	0.12
37.00	2.00	0.38	5.00	0.00	0.12	0.12
37.50	2.00	0.38	5.00	0.00	0.12	0.12
38.00	2.00	0.37	5.00	0.00	0.12	0.12
38.50	2.00	0.37	5.00	0.00	0.12	0.12
39.00	2.00	0.37	5.00	0.00	0.12	0.12
39.50	2.00	0.37	5.00	0.00	0.12	0.12
40.00	2.00	0.37	5.00	0.00	0.12	0.12
40.50	2.00	0.37	5.00	0.00	0.12	0.12
41.00	2.00	0.36	5.00	0.00	0.12	0.12
41.50	2.00	0.36	5.00	0.00	0.12	0.12
42.00	2.00	0.36	5.00	0.00	0.12	0.12
42.50	2.00	0.36	5.00	0.00	0.12	0.12
43.00	2.00	0.36	5.00	0.00	0.12	0.12
43.50	2.00	0.35	5.00	0.00	0.12	0.12
44.00	2.00	0.35	5.00	0.00	0.12	0.12
44.50	2.00	0.35	5.00	0.00	0.12	0.12
45.00	2.00	0.35	5.00	0.00	0.12	0.12
45.50	0.25	0.35	5.00	0.00	0.10	0.10
46.00	0.27	0.35	5.00	0.00	0.09	0.09
46.50	0.28	0.34	5.00	0.00	0.07	0.07
47.00	0.30	0.34	5.00	0.00	0.06	0.06
47.50	0.31	0.34	5.00	0.00	0.05	0.05
48.00	0.33	0.34	5.00	0.00	0.04	0.04
48.50	0.35	0.34	5.00	0.00	0.03	0.03
49.00	0.37	0.34	5.00	0.00	0.02	0.02
49.50	0.39	0.33	5.00	0.00	0.01	0.01
50.00	0.42	0.33	5.00	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units Depth = ft, Stress or Pressure = tsf (atm), Unit Weight = pcf, Settlement = in.

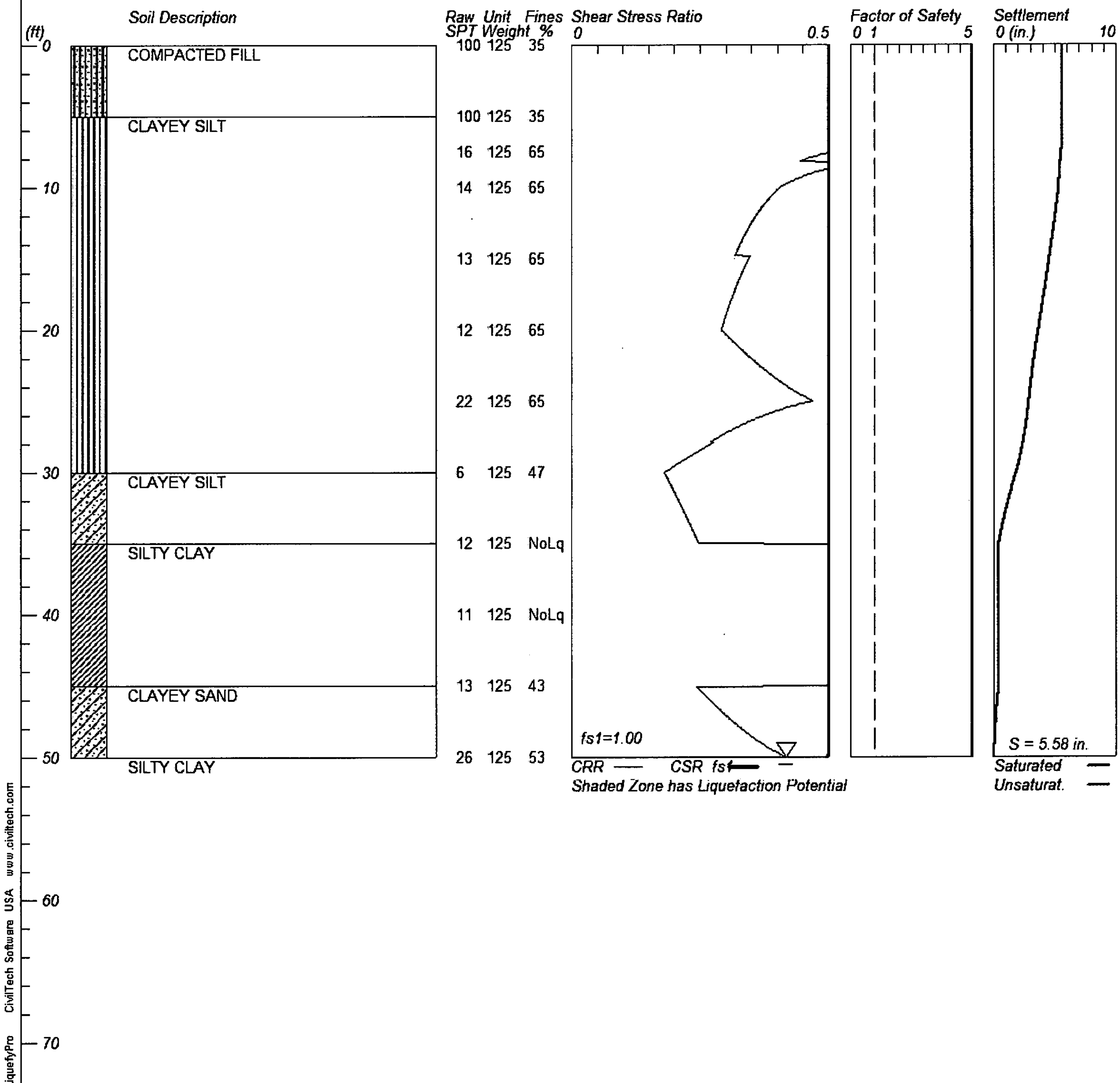
CRRm	Cyclic resistance ratio from soils
CSRsf	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat	Settlement from saturated sands
S_dry	Settlement from Unsaturated Sands
S_all	Total Settlement from Saturated and Unsaturated Sands
NoLiq	No-Liquefy Soils

LIQUEFACTION ANALYSIS

Mptecito-B-1-2%

Hole No.=B-1 Water Depth=50 ft

Magnitude=6.67
Acceleration=0.998g



Advanced Geo Group, Inc. **Subtitle or Proj No.** **Plate A-1**

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                    LIQUEFACTION ANALYSIS CALCULATION SHEET

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*******************************************************************************************
*******************
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        Input File Name: E:\Liquefy5\Motecito-B-1--2%.liq
        Title:  Mptecito-B-1-2%
        Subtitle:  Subtitle or Proj No.

        Surface Elev.=
        Hole No.=B-1
        Depth of Hole= 50.0 ft
        Water Table during Earthquake= 50.0 ft
        Water Table during In-Situ Testing= 30.0 ft
        Max. Acceleration= 1 g
        Earthquake Magnitude= 6.7

 Input Data:
        Surface Elev.=
        Hole No.=B-1
        Depth of Hole=50.0 ft
        Water Table during Earthquake= 50.0 ft
        Water Table during In-Situ Testing= 30.0 ft
        Max. Acceleration=1 g
        Earthquake Magnitude=6.7

        1. SPT or BPT Calculation.
        2. Settlement Analysis Method: Ishihara / Yoshimine*
        3. Fines Correction for Liquefaction: Stark/Olson et al.*
        4. Fine Correction for Settlement: During Liquefaction*
        5. Settlement Calculation in: All zones*
        6. Hammer Energy Ratio,                          Ce = 1.25
        7. Borehole Diameter,                                Cb= 1
        8. Sampling Method,                                 Cs= 1
        9. User request factor of safety (apply to CSR) ,   User= 1

        10. Use Curve Smoothing: Yes*
        * Recommended Options
```


In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.0	100.0	125.0	35.0
5.0	100.0	125.0	35.0
7.5	16.0	125.0	65.0
10.0	14.0	125.0	65.0
15.0	13.0	125.0	65.0
20.0	12.0	125.0	65.0
25.0	22.0	125.0	65.0
30.0	6.0	125.0	47.0
35.0	12.0	125.0	NoLiq
40.0	11.0	125.0	NoLiq
45.0	13.0	125.0	43.0
50.0	26.0	125.0	53.0

Output Results:
Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=5.58 in.
Total Settlement of Saturated and Unsaturated Sands=5.58 in.
Differential Settlement=2.789 to 3.681 in.

Depth ft	CRRm	CSRsf	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	2.70	0.65	5.00	0.00	5.58	5.58
0.50	2.70	0.65	5.00	0.00	5.58	5.58
1.00	2.70	0.65	5.00	0.00	5.58	5.58
1.50	2.70	0.65	5.00	0.00	5.58	5.58
2.00	2.70	0.65	5.00	0.00	5.58	5.58
2.50	2.70	0.64	5.00	0.00	5.57	5.57
3.00	2.70	0.64	5.00	0.00	5.57	5.57
3.50	2.70	0.64	5.00	0.00	5.57	5.57
4.00	2.70	0.64	5.00	0.00	5.57	5.57
4.50	2.70	0.64	5.00	0.00	5.57	5.57
5.00	2.70	0.64	5.00	0.00	5.57	5.57
5.50	2.70	0.64	5.00	0.00	5.57	5.57
6.00	2.70	0.64	5.00	0.00	5.57	5.57
6.50	2.70	0.64	5.00	0.00	5.56	5.56
7.00	2.70	0.64	5.00	0.00	5.56	5.56
7.50	0.51	0.64	5.00	0.00	5.52	5.52
8.00	0.46	0.64	5.00	0.00	5.46	5.46
8.50	0.53	0.64	5.00	0.00	5.40	5.40
9.00	0.47	0.64	5.00	0.00	5.37	5.37
9.50	0.43	0.63	5.00	0.00	5.34	5.34
10.00	0.41	0.63	5.00	0.00	5.29	5.29

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10.50	0.39	0.63	5.00	0.00	5.24	5.24
11.00	0.38	0.63	5.00	0.00	5.18	5.18
11.50	0.37	0.63	5.00	0.00	5.10	5.10
12.00	0.36	0.63	5.00	0.00	5.02	5.02
12.50	0.35	0.63	5.00	0.00	4.95	4.95
13.00	0.34	0.63	5.00	0.00	4.87	4.87
13.50	0.33	0.63	5.00	0.00	4.78	4.78
14.00	0.33	0.63	5.00	0.00	4.70	4.70
14.50	0.32	0.63	5.00	0.00	4.61	4.61
15.00	0.34	0.63	5.00	0.00	4.53	4.53
15.50	0.34	0.63	5.00	0.00	4.45	4.45
16.00	0.33	0.62	5.00	0.00	4.36	4.36
16.50	0.32	0.62	5.00	0.00	4.28	4.28
17.00	0.32	0.62	5.00	0.00	4.19	4.19
17.50	0.31	0.62	5.00	0.00	4.10	4.10
18.00	0.31	0.62	5.00	0.00	4.01	4.01
18.50	0.30	0.62	5.00	0.00	3.92	3.92
19.00	0.30	0.62	5.00	0.00	3.84	3.84
19.50	0.30	0.62	5.00	0.00	3.75	3.75
20.00	0.29	0.62	5.00	0.00	3.65	3.65
20.50	0.30	0.62	5.00	0.00	3.55	3.55
21.00	0.32	0.62	5.00	0.00	3.46	3.46
21.50	0.33	0.62	5.00	0.00	3.38	3.38
22.00	0.35	0.62	5.00	0.00	3.29	3.29
22.50	0.37	0.61	5.00	0.00	3.22	3.22
23.00	0.38	0.61	5.00	0.00	3.14	3.14
23.50	0.40	0.61	5.00	0.00	3.07	3.07
24.00	0.42	0.61	5.00	0.00	3.00	3.00
24.50	0.44	0.61	5.00	0.00	2.93	2.93
25.00	0.47	0.61	5.00	0.00	2.87	2.87
25.50	0.41	0.61	5.00	0.00	2.81	2.81
26.00	0.37	0.61	5.00	0.00	2.74	2.74
26.50	0.34	0.61	5.00	0.00	2.66	2.66
27.00	0.31	0.61	5.00	0.00	2.57	2.57
27.50	0.29	0.61	5.00	0.00	2.48	2.48
28.00	0.27	0.61	5.00	0.00	2.38	2.38
28.50	0.25	0.61	5.00	0.00	2.27	2.27
29.00	0.22	0.60	5.00	0.00	2.14	2.14
29.50	0.20	0.60	5.00	0.00	2.00	2.00
30.00	0.18	0.60	5.00	0.00	1.84	1.84
30.50	0.19	0.60	5.00	0.00	1.66	1.66
31.00	0.19	0.60	5.00	0.00	1.50	1.50
31.50	0.20	0.60	5.00	0.00	1.34	1.34
32.00	0.21	0.59	5.00	0.00	1.20	1.20
32.50	0.21	0.59	5.00	0.00	1.05	1.05
33.00	0.22	0.59	5.00	0.00	0.92	0.92
33.50	0.23	0.58	5.00	0.00	0.79	0.79
34.00	0.23	0.58	5.00	0.00	0.66	0.66

34.50	0.24	0.58	5.00	0.00	0.54	0.54
35.00	0.25	0.58	5.00	0.00	0.42	0.42
35.50	2.00	0.57	5.00	0.00	0.41	0.41
36.00	2.00	0.57	5.00	0.00	0.41	0.41
36.50	2.00	0.57	5.00	0.00	0.41	0.41
37.00	2.00	0.57	5.00	0.00	0.41	0.41
37.50	2.00	0.56	5.00	0.00	0.41	0.41
38.00	2.00	0.56	5.00	0.00	0.41	0.41
38.50	2.00	0.56	5.00	0.00	0.41	0.41
39.00	2.00	0.56	5.00	0.00	0.41	0.41
39.50	2.00	0.55	5.00	0.00	0.41	0.41
40.00	2.00	0.55	5.00	0.00	0.41	0.41
40.50	2.00	0.55	5.00	0.00	0.41	0.41
41.00	2.00	0.55	5.00	0.00	0.41	0.41
41.50	2.00	0.54	5.00	0.00	0.41	0.41
42.00	2.00	0.54	5.00	0.00	0.41	0.41
42.50	2.00	0.54	5.00	0.00	0.41	0.41
43.00	2.00	0.53	5.00	0.00	0.41	0.41
43.50	2.00	0.53	5.00	0.00	0.41	0.41
44.00	2.00	0.53	5.00	0.00	0.41	0.41
44.50	2.00	0.53	5.00	0.00	0.41	0.41
45.00	2.00	0.52	5.00	0.00	0.41	0.41
45.50	0.25	0.52	5.00	0.00	0.35	0.35
46.00	0.27	0.52	5.00	0.00	0.29	0.29
46.50	0.28	0.52	5.00	0.00	0.24	0.24
47.00	0.30	0.51	5.00	0.00	0.19	0.19
47.50	0.31	0.51	5.00	0.00	0.15	0.15
48.00	0.33	0.51	5.00	0.00	0.11	0.11
48.50	0.35	0.51	5.00	0.00	0.08	0.08
49.00	0.37	0.50	5.00	0.00	0.05	0.05
49.50	0.39	0.50	5.00	0.00	0.02	0.02
50.00	0.42	0.50	5.00	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units Depth = ft, Stress or Pressure = tsf (atm), Unit Weight = pcf, Settlement = in.

CRRm	Cyclic resistance ratio from soils
CSRsf	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat	Settlement from saturated sands
S_dry	Settlement from Unsaturated Sands
S_all	Total Settlement from Saturated and Unsaturated Sands
NoLiq	No-Liquefy Soils

CITY OF LOS ANGELES

CALIFORNIA

DEPARTMENT OF
BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

GEOLOGY AND SOILS REPORT REVIEW LETTER

August 11, 2017

LOG # 99156
SOILS/GEOLOGY FILE - 2
LIQ/AP

Thomas Safran and Associates
11812 San Vicente Boulevard, #600
Los Angeles, CA 90049

TRACT:	Hollywood Ocean View Tract (MP 1-62)
BLOCK:	2
LOT(S):	11 (Arbs. 1-4) and 12 (Arb. 1)
LOCATION:	6650 & 6668 W. Franklin Avenue and 1855 N. Cherokee Avenue

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE(S) OF DOCUMENT	PREPARED BY
Geology/Soils Report	1584-54	07/06/2017	Feffer Geological Consulting
Oversized Doc(s).	``	``	``
Laboratory Test Report	SL15.1966	06/16/2017	Soil Labworks LLC
Laboratory Test Report	SL15.1966	01/15/2016	Soil Labworks LLC

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE(S) OF DOCUMENT	PREPARED BY
Dept. Approval Letter	92628-01	10/03/2016	LADBS
Addendum Report (Fault Study)	1584-54	09/08/2016	Feffer Geological Consulting
Dept. Correction Letter	92628	05/04/2016	LADBS
Geology Report (Fault Study)	1584-54	03/23/2016	Feffer Geological Consulting

The Grading Division of the Department of Building and Safety has reviewed the referenced reports that provide recommendations for the proposed six-story apartment building over two levels of parking (8-stories total). The parking levels will be partially to fully subterranean. Retaining walls ranging up to 20 feet in height are proposed for the subterranean parking levels. The subject property is developed with 10-story apartment building at the northeast portion of the property. The remaining areas to the west and south of the existing structure consist of a terraced landscaping area and parking lot. Subsurface exploration performed by the consultant consisted of three hollow-stem auger borings, six bucket-auger borings, three fault trenches, and three test pits along the central portion of the property. The earth materials at the subsurface exploration locations consist of up to 21½ feet of uncertified fill underlain by alluvium/colluvium and sandstone and siltstone bedrock. Geologic structure observed by the consultant consisted of northeasterly dipping bedding of 42 degrees. The consultants recommend to support the proposed structure on mat-type foundations bearing on a blanket of properly placed fill a minimum of 5 feet thick.

The subject property was previously investigated by the consultant in 2016 to evaluate the potential for fault rupture. Subsurface exploration included continuous core borings and CPT soundings in addition to the exploration described above. The consultant identified two fault strands traversing east-west across the site. The faults were determined to be inactive. The fault displacement had resulted in relatively shallow bedrock on the northern portion of the site and thick alluvium/colluvium on the southern portion. The report had been reviewed by the Department and conditionally approved in a letter dated 10/03/2016, Log #92628-01.

The property is located within an Official Alquist-Priolo Earthquake Fault Zone that was established (November 6, 2014) by the California Geological Survey (CGS) for the Hollywood fault. The site is also located in a designated liquefaction hazard zone as shown on the Seismic Hazard Zones map issued by the State of California. The review of the subject reports cannot be completed at this time and will be continued upon submittal of an addendum to the report which shall include, but not be limited to, the following:

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

1. The subject site is located in a State of California liquefaction hazard zone and groundwater seepage was encountered at a depth of 30 feet below ground surface. Provide liquefaction analysis in conformance with the Department guidelines presented in the Memorandum dated 07/16/2014.

2. Provide seismic settlement analysis, including dynamic settlement of unsaturated soils.

3. Storm water infiltration is not allowed on any site where the water may saturate soils that are subject to liquefaction, and the total and differential settlement (static and seismic) is greater than 1.5 inches and 0.75 inches, respectively. Provide liquefaction analysis assuming that the groundwater will rise to the bottom of the infiltration device and revise recommendations accordingly.

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

EDMOND LEE
Engineering Geologist Associate II

YING LIU
Geotechnical Engineer I

Log No. 99156
213-482-0480

cc: Feffer Geological Consulting, Project Consultant
Soil Labworks LLC, Project Consultant
LA District Office

1050915201742371

FEFFER
GEOLOGICAL CONSULTING

July 6, 2017 File No: 1584-54

Steve Frandsen
Thomas Safran and Associates
11812 San Vicente Blvd. #600
Los Angeles, CA 90049

Subject: **GEOTECHNICAL INVESTIGATION**
Proposed Six-Story Building Over Two Subterranean Levels
Montecito Apartments 6650 And 6668 W. Franklin Avenue
And 1855 N. Cherokee Avenue, Hollywood, CA 90028

Dear Mr Frandsen,

As requested, Feffer Geological Consultants performed a geotechnical investigation at the subject site. The purpose of this investigation was to evaluate the geotechnical conditions at the site in the areas of the proposed construction and to provide geotechnical parameters for design and construction.

Based on our investigation, it is our opinion that the proposed construction is feasible from a geotechnical standpoint provided the recommendations contained herein are incorporated into the project plans and specifications. This report should be reviewed in detail prior to proceeding further with the planned development. When final plans for the proposed construction become available, they should be forwarded to this office for review and comment.

We appreciate the opportunity to be of service. Should you have any questions regarding the information contained in this report, please do not hesitate to contact us.

Sincerely,

FEFFER GEOLOGICAL CONSULTING, INC.

Joshua R. Feffer
Principal Geologist
C.E.G. 2138

Professional Geologist Joshua Feffer No. 2138 Certified Engineering Geologist State of California

Registered Professional Engineer Kourosh Dan Daneshfar No. C 68377 Exp. 9-30-17 Civil State of California

Dan Daneshfar
Principal Engineer
P.E. 68377

Distribution: Addressee– (1)

1990 S Bundy Drive, Suite 400, Los Angeles, CA 90025 o 310-207-5018 f 310-826-0182 www.feffergeo.com

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this investigation was to evaluate the existing geotechnical conditions at the subject site and to provide design and construction criteria for the proposed apartment building development.

1.2 SCOPE OF SERVICES

The scope of work performed during this investigation involved the following;

- Research and review of available pertinent geotechnical literature;
- Subsurface exploration consisting of the excavation of four test pits (TP-1, TP-2, TP-3, TP-4) and drilling of three borings (B-1, B-2, B-3);
- As part of a separate fault investigation, subsurface exploration consisted of advancing four cone penetration test soundings (CPT-1, CPT-2, CPT-3, CPT-4), excavation of three Fault Trenches (ST-1, ST-2, ST-3), drilling of two continuous core borings (B1, B2), drilling of six bucket auger borings (BA-1, BA-2, BA-3, BA-4, BA-5, BA-6) ;
- Sampling and logging of the subsurface soils;
- Laboratory testing of selected soil samples collected from the subsurface exploration to determine the engineering properties of underlying earth materials;
- Engineering and geologic analysis of the field and laboratory data;
- Preparation of this report presenting our findings, conclusions and recommendations for the proposed construction.

1.3 SITE DESCRIPTION

The project site is located at 6650 Franklin Avenue, on the southwest corner of the intersection of Franklin Avenue and Cherokee Avenue in the City of Los Angeles, CA (Figure 1). The project site consists of an on-grade parking lot on the southern half of the lot, open space on a gentle south-descending slope in the northwest quadrant, and a high rise residential building in the northeast quadrant (Figure 2). Existing apartment buildings and commercial buildings surround the site. The area surrounding the site slopes down to the west and south and the lot has about 20 feet of overall elevation change. In the area of the proposed development there is about 10 feet of gradient change. A recent aerial photograph of the site is shown as Figure 3. Surface drainage is by sheet flow to the east to the street.

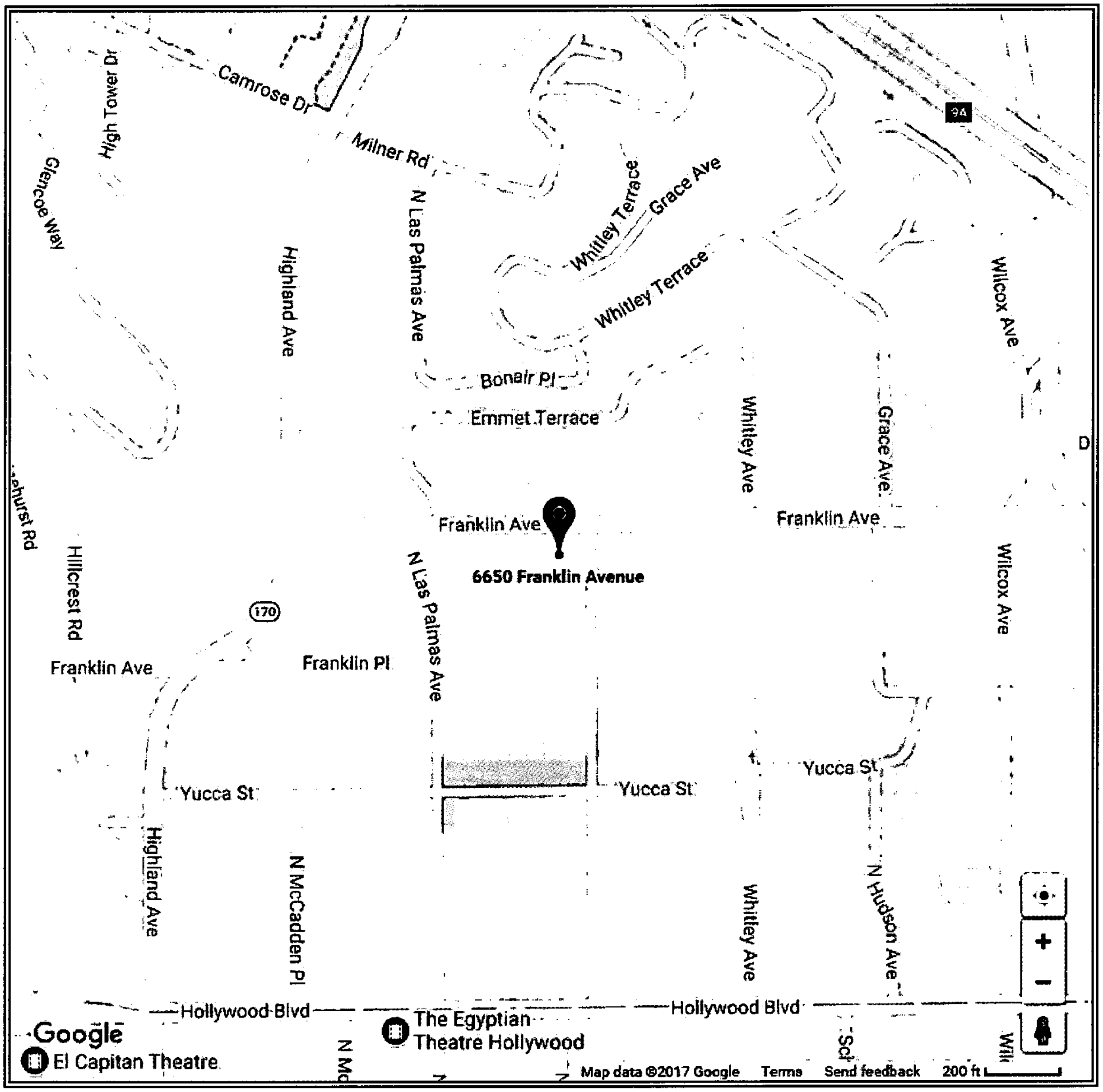


Figure 1. Location map of the subject site.

1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1

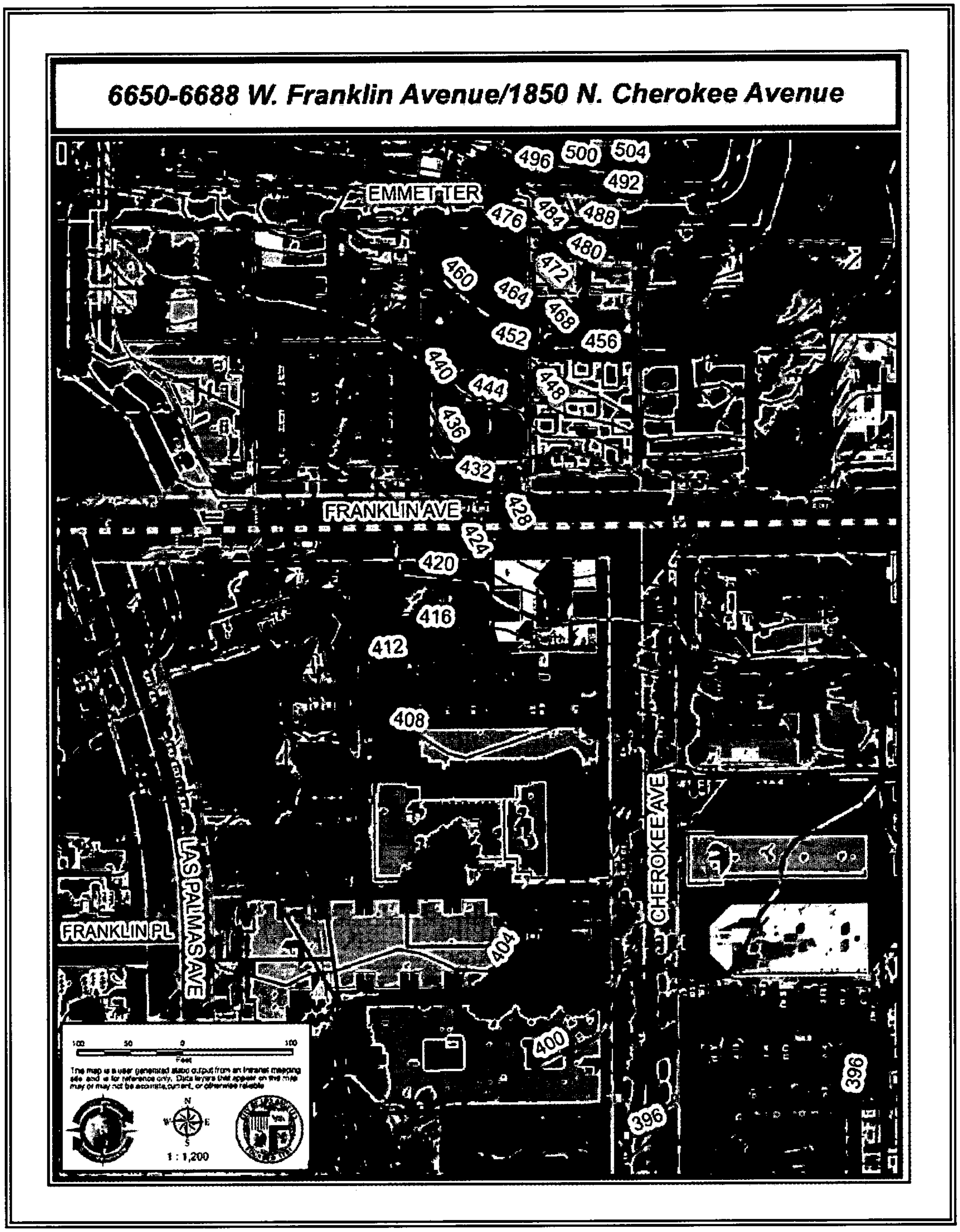


Figure 2. Aerial photograph with topographic overlay from Navigate LA. Location is designated by a red star.

Figure 3. Oblique aerial Photograph of subject lot and surrounding area.

1.4 PROPOSED CONSTRUCTION

Based on the information provided to us, the project will consist of constructing a new six story residential apartment building along the west side of the site in the existing open landscape area and parking lot. The building will be situated above two parking levels, one of which will be entirely subterranean, and one of which will be partially subterranean. A Site Plan and Cross Sections showing the proposed development are included in Appendix C.

Although formal plans have not yet been prepared it is our understanding that column loads will range from 400-500 kips and wall loads will be between 3 to 4 kips per foot.

1.5 DOCUMENT REVIEW

An Evaluation of Potential Faulting for the subject site was prepared by Feffer Geological Consulting on March 23, 2016. The City of Los Angeles issued a Correction Letter on May 4, 2016 (Log# 92628). Feffer Geological Consulting issued a Response Letter on September 8, 2016 and the City of Los Angeles issued an Approval Letter on October 3, 2016. No active faults were found on the subject site.

2.0 INVESTIGATION

2.1 GENERAL

Our field investigation was performed on July 10, 2015, March 18, 2016, and May 22, 2017 and consisted of a review of site conditions and exploration involving the drilling of three borings, excavation of four test pits, and soil sampling. Our investigation also included laboratory testing of selected soil samples. A brief summary of these various tasks is provided below.

2.2 FIELD EXPLORATION

The geotechnical subsurface investigation performed at the site consisted of drilling three borings (B-1, B-2, B-3) with a hollow-stem auger drill rig and excavating four test pits (TP-1, TP-2, TP-3, TP-4) with hand labor. The purpose of the exploratory borings and test pits were to determine the existing subsurface conditions and to collect subsurface soil in the areas of the proposed construction and throughout the site.

The borings were drilled to a maximum depth of 61.5' below the existing ground surface.

The earth materials encountered in the borings consisted of up to eight feet of artificial fill over Alluvium and Older Alluvium. The soil materials encountered in the test pits consisted of up to six feet of artificial fill over Alluvium, Quaternary Soil and Bedrock. A review of geologic maps[1] indicates that the material underlying the subject site is comprised of Alluvium (Qae) of Quaternary age (Figure 4).

The borings were logged by our field geologists using both visual and tactile means. Both bulk and relatively undisturbed soil samples were obtained.

The approximate locations of the borings and test pits, as well as explorations associated with the fault investigation are shown on the attached Site Plan included in Appendix C. Detailed test pit and boring logs are presented in Appendix A.

2.3 LABORATORY TESTING

Laboratory testing was performed on representative samples obtained during our field explorations. Samples were tested for the purpose of estimating material properties for use in subsequent engineering evaluations. Testing included in-place moisture and density, hydro-response-swell/collapse, and shear strength testing. A summary of the laboratory test results is included in Appendix B.

A summary of the laboratory test results is included in Appendix B. The physical properties of the soils were tested at Soil Labworks, LLC. The above signed geologist and engineer have reviewed the data and concur and accept responsibility for the data therein.

[1] Dibblee, T.W., 1991, Geologic Map of the Hollywood and Burbank (South ½) Quadrangles, Los Angeles County, California, Dibblee Foundation Map, DF #30.

3.0 SITE GEOLOGY, SEISMICITY, POTENTIAL HAZARDS

3.1 SITE GEOLOGY

Regional Geologic Maps[2,] and the subsurface exploration indicated that the property is underlain by Quaternary Age Alluvium (Qae) and Topanga Formation bedrock (Ttusi), which is overlain by fill (Af) and Quaternary Soil (Qs). Descriptions of the materials encountered in our exploratory borings are described below; for additional descriptions see the above referenced Evaluation of Potential Faulting and Response Letter to the City of Los Angeles Correction Letter.

3.1.1 Fill (Af)

The fill consists of pebbly silty sand to silty sand. The color is medium brown to mottled brown to light brown. The fill is moist and medium dense. The fill encountered is as deep as eight feet below the ground surface.

3.1.2 Soil (Qs)

The Soil consists of surficial deposits of silty sand and sandy silt that are generally tan to dark brown, moist, and medium dense.

3.1.3 Alluvium (Qae)

The Alluvium consists of admixtures of clayey sandy silt to clayey silty sand, silty clay, silty sand, pebbly silty sand, which vary from tan brown to mottled brown to orange brown to red brown. The Alluvium was moist, medium dense to dense/stiff. The Alluvium is generally weakly horizontally layered with no significant structural planes. Generally, the Alluvium becomes more granular with depth.

3.1.6 Bedrock (Ttusi)

The bedrock consists of Topanga Formation interbedded shales, claystones, and sandstones that are generally gray to tan to yellow, and variably semi-friable to hard. The observed bedrock was predominantly massive. Minor bedding was observed dipping to the northeast which is consistent with the regional geologic map.

[2] Dibblee, T.W., and Ehrenspeck, H.E., ed.: Geologic Map of the Hollywood and Burbank (south ½) quadrangles, Los Angeles, California - 1991, Dibblee Foundation Map, DF-30, scale 1:24,000.

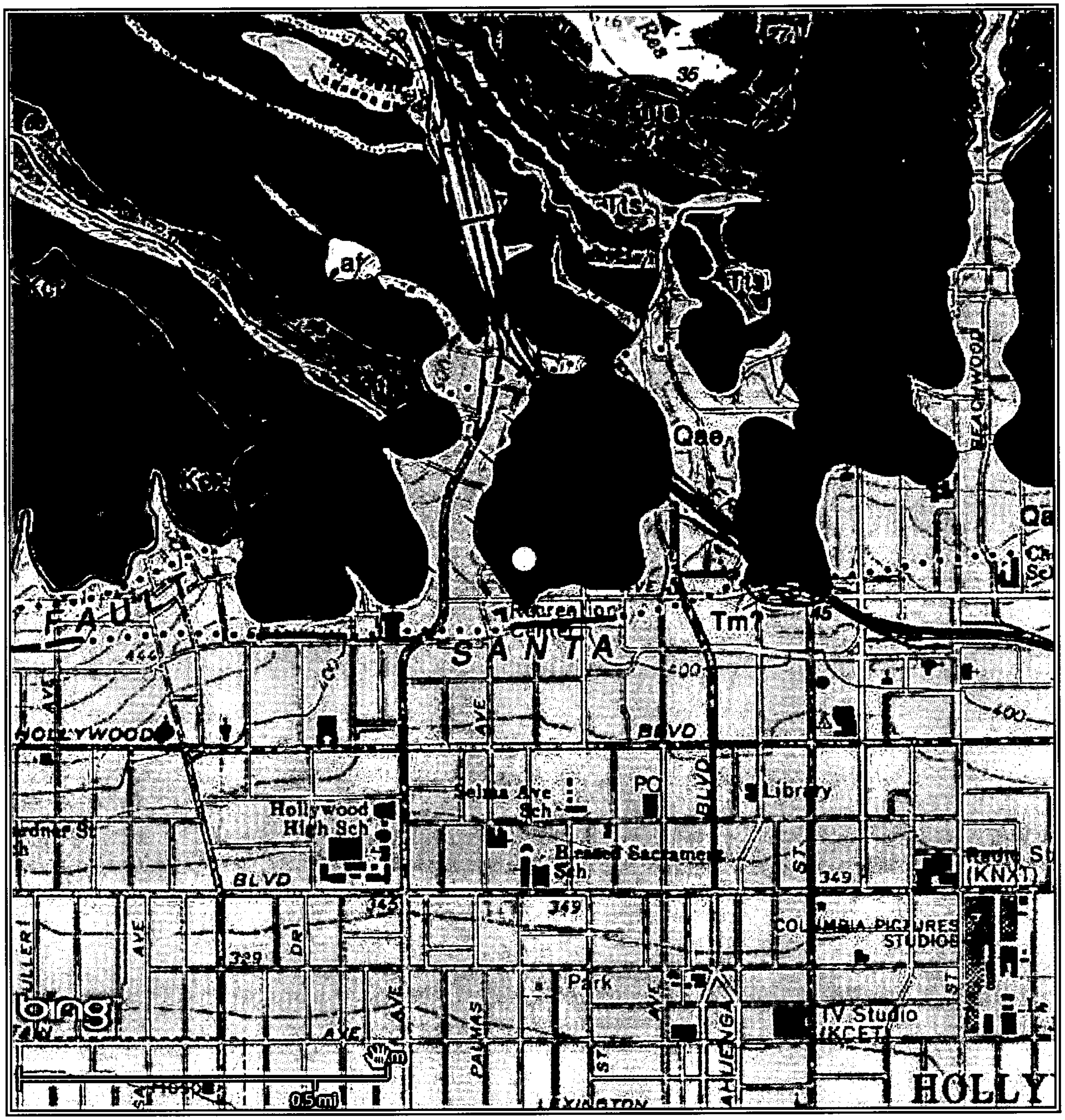


Figure 4. Portion of Geologic Map of the Hollywood and Burbank (south ½) quadrangles. Site is designated by a red diamond.

3.2 GROUNDWATER

Groundwater was not encountered at a depth of 61.5 feet during the excavations. A seep was encountered at 30 feet depth in boring B-1. Historically highest groundwater in this area of Los Angeles is estimated to be more than 80 feet below the ground surface (Plate 1.2, *Historically Highest Groundwater Contours and Borehole Log Data Locations, Hollywood 7½ Minute Quadrangle in Seismic Hazard Zone Report for the Hollywood Quadrangle,* SHZR-026).

3.2.1 Infiltration

The City of Los Angeles has prepared P/BC 2017-118 in order to provide guidelines for storm water infiltration in accordance with LID/SUSMP requirements. According to the guidelines (section IV.2) foundations shall be set back a minimum of 10 feet from the infiltration facility and the bottom of the footing shall be a minimum of 10 feet from the expected zone of saturation. Additionally, infiltration should not occur within 10 feet of the groundwater table.

When the preliminary design of the proposed system is provided to us we can perform the associated testing to determine infiltration rates.

3.3 SEISMICITY

A risk common to all areas of Southern California that should not be overlooked is the potential for damage resulting from seismic events (earthquakes). The site is located within a seismically active area, as is all of Southern California.

Review of the recently completed California Geological Survey Earthquake Zones of Required Investigation for the Hollywood Quadrangle indicates that the subject site is located in an area requiring investigation and also within an Alquist-Priolo Fault Zone (Figure 5) as shown on the recently published Hollywood Quadrangle (Figure 6). As per the findings of the referenced Evaluation of Potential Faulting for the site issued March 23, 2016, and Response to City of LA Correction Letter, issued September 8, 2016 by Feffer Geological Consulting, no active faults cross the subject property. Since no active faults cross the property, the surface rupture hazard at the site is nil.

Shaking from earthquakes generated on large regional faults such as the San Andreas and Newport-Inglewood Faults will affect the site.

Although we did not locate any active faults on or within the immediate vicinity of the site, earthquakes generated on large regional faults such as the San Andreas and Newport-Inglewood Faults could affect the site.

Due to the distance from the coastline the site is not susceptible to the effects of tsunamis and seiches. The subject site is not located in an area identified as being subject to earthquake-induced liquefaction or landslides.

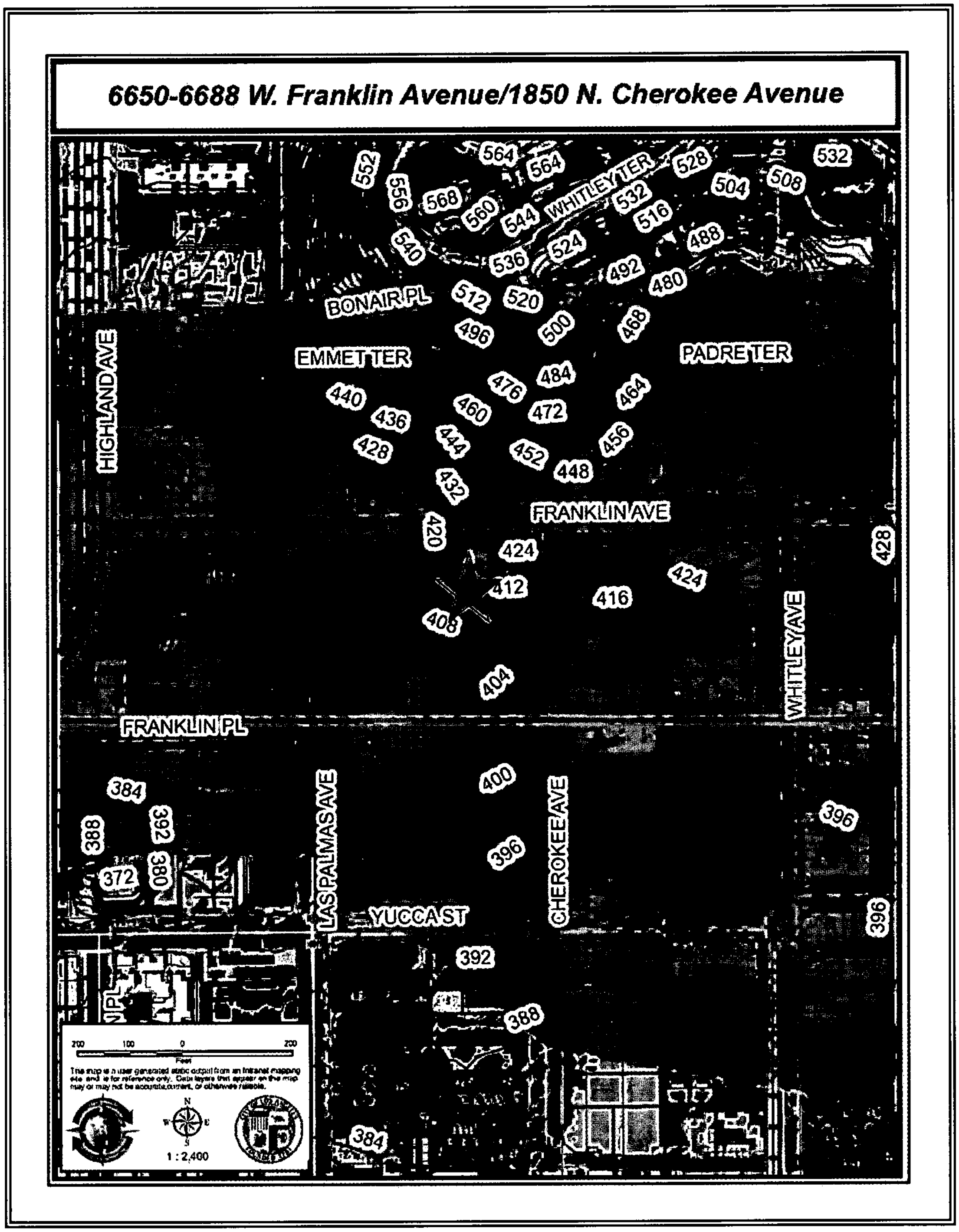


Figure 5. Navigate LA map of subject site designated with red star and vicinity. Purple shaded area designates Alquist-Priolo Zone.

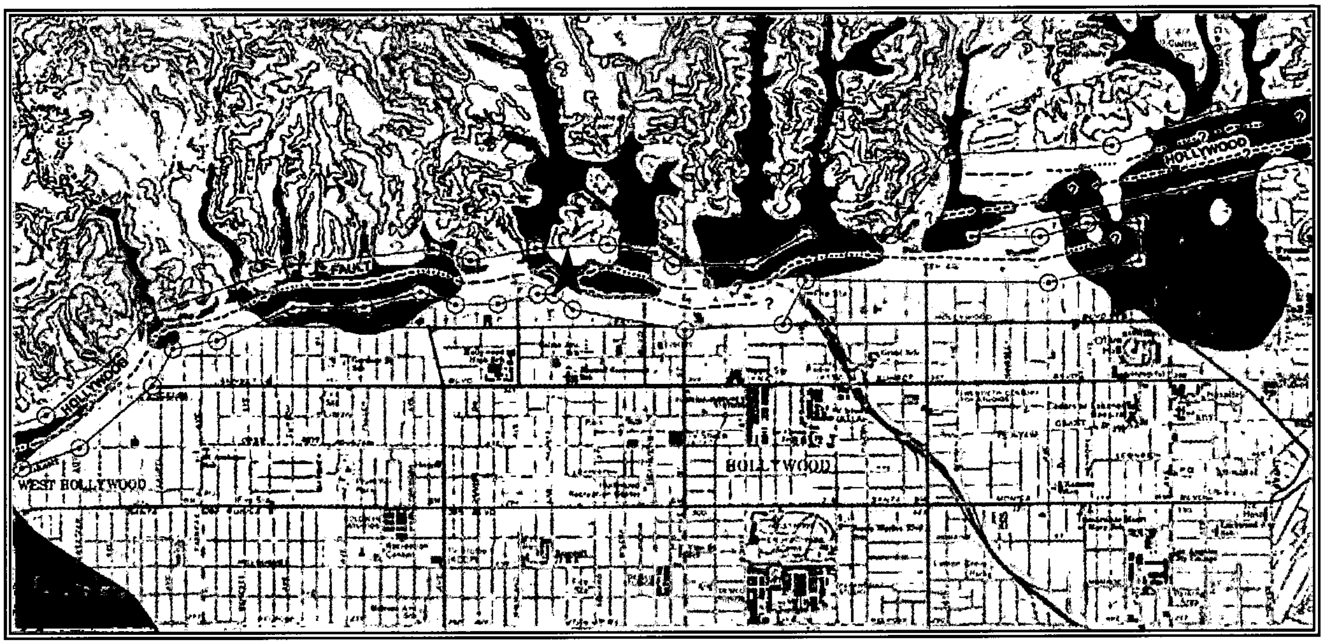


Figure 6. Portion of the CGS Earthquake Zones of Required Investigation, Hollywood Quadrangle. The location of the subject site is shown with a red star. The yellow and light green areas are zones where fault investigations are required.

1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1

3.4 2017 CALIFORNIA BUILDING CODE CONSIDERATIONS

The proposed development may be designed in accordance with seismic considerations contained in the 2017 California Building Code, Section 1613, the following parameters may be considered for design:

Mapped Spectral Response Acceleration Parameters:

	S_S	:	2.597g
	S_1	:	0.936g
Site Class:	D	:	Stiff Soil
Site Coefficients:	F_a	:	1.0
	F_v	:	1.5

Maximum Considered Earthquake Spectral Response Acceleration Parameters:

S_{MS}	:	2.597g
S_{M1}	:	1.404g

Design Spectral Response Acceleration Parameters:

S_{DS}	:	1.731g
S_{D1}	:	0.936g
PGA_M	:	0.998g

4.0 GEOTECHNICAL CONSIDERATIONS

4.1 SUBSURFACE SOIL CONDITIONS

Subsurface materials at the site consist of a layer of fill over alluvium in the southern portion of the site and a layer of fill and soil over bedrock in the northern portion of the site. Laboratory testing indicates that the alluvium and bedrock at the depth of the proposed foundation has a low potential for consolidation and hydrocollapse. The alluvium and bedrock at the subject site are competent and capable of supporting engineered structures and appurtenances. The following paragraph provides general discussions about settlement and expansive soil activity.

4.2 SETTLEMENT

Our investigation indicated that the consolidation and hydrocollapse potential of the alluvium and bedrock at the depth of the proposed construction is low. The in-situ dry densities are high for the samples taken at the foundation level and it is our experience that these earth materials have a very low potential for consolidation. Recommendations are presented below to mitigate the settlement hazard associated with consolidation of the near surface soils/earth materials.

4.3 EXPANSIVE SOILS

The on-site, near surface soils were found to possess low to medium expansive characteristics based upon field soil classifications.

4.4 SLOPE STABILITY

There are no significant slopes on the property.

The property has less than twenty feet of overall elevation change at gradients in excess of 5:1 (horizontal to vertical). A slope stability analysis is not required for the property per City of Los Angeles Department of Building and Safety Information Bulletin P/BC 2017-49.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 BASIS

Conclusions and recommendations contained in this report are based upon information provided, information gathered, laboratory testing, engineering, and geologic evaluations, experience, and judgment. Recommendations contained herein should be considered minimums consistent with industry practice. More rigorous criteria could be adopted if lower risk of future problems is desired. Where alternatives are presented, regardless of what approach is taken, some risk will remain, as is always the case. Usually the lowest risk is associated with the greatest cost.

5.2 SITE SUITABILITY

The site is within an area including completed housing and building developments. Geotechnical exploration, analyses, experience, and judgment result in the conclusion that the proposed development is suitable from a geotechnical standpoint.

It is our opinion that the site can be improved without hazard of landslide, slippage, or settlement, and improvement can occur without similar adverse impact on adjoining properties. Realizing this expectation will require adherence to good construction practice, agency and code requirements, the recommendations in this report, and possible addendum recommendations made after plan review and at the time of construction.

Based on the results of our subsurface investigation, the fact that the site is not located within a liquefaction zone, the over-consolidated nature of the alluvial deposits and bedrock, and the depth of groundwater at the subject site, the potential for liquefaction at the site during earthquake shaking is considered to be nil.

It should be realized that the purpose of the seismic design utilizing the above parameters is to safeguard against major structural failures and loss of life, but not to prevent damage altogether. Even if the structural engineer provides designs in accordance with the applicable codes for seismic design, the possibility of damage cannot be ruled out if moderate to strong shaking occurs as a result of a large earthquake. This is the case for essentially all structures in Southern California.

5.3 EARTHWORK

5.3.1 General

If the proposed construction will require grading of the site; it should be done in accordance with good construction practice, minimum code requirements, and recommendations to follow. Grading criteria are included within Appendix D.

5.3.2 Site Preparation and Grading

The subject site is underlain by both bedrock and alluvium. In order to create a uniform soil substrate we recommend that structural foundations be founded in a compacted fill cap and that a mat foundation be used. Prior to the start of grading operations, utility lines within the project area, if any, should be located and marked in the field so they can be rerouted or protected during site development. All debris and perishable material should be removed from the site. Although currently not anticipated, all permanent cut and fill slopes should not be constructed steeper than 2:1.

If fill is to be placed the upper six to eight inches of surface exposed by the excavation should be scarified; moisture conditioned to two to four percent over optimum moisture content, and compacted to 90 percent relative compaction[3]. If localized areas of relatively loose soils prevent proper compaction, over-excavation and re-compaction will be necessary.

5.3.3 Excavation Characteristics

The borings did not encounter hard earth materials. Within the portion of the site underlain by alluvium (Qae) difficult excavation conditions are not anticipated. However, the soil at the site has considerable amounts of sand and gravel and caving may occur in some excavations.

The test pits encountered moderately hard to cemented bedrock. Within the portion of the site underlain by bedrock (Ttusi), excavation difficulty is a function of the degree of weathering and amount of fracturing within the bedrock. The bedrock generally becomes harder and more difficult to excavate with increasing depth. Hard cemented layers are also known to occur at random locations and depths and may be encountered during foundation excavation. Should a hard cemented layer be encountered, coring or the use of jackhammers may be necessary.

[3] Relative compaction refers to the ratio of the in-place dry density of soil to the maximum dry density of the same material as obtained by the "modified proctor" (ASTM D1557-14) test procedure.

5.5 FOUNDATION SUPPORT

All proposed footings shall be embedded within a compacted fill cap in accordance with the recommendations below. The compacted fill cap should extend to a minimum of five feet below the bottom of the proposed mat foundation.

5.5.1 Mat Foundation

A mat foundation is appropriate for the subject site. For vertical capacity, the mat may be assumed to have an allowable uniform bearing capacity of 2,500 psf. The bearing value shown above is for the total of dead and frequently applied live loads and may be increased by one third for short duration loading, which includes the effects of wind or seismic forces.

For computing deflection, a subgrade modulus of 100 lbs/in^3 may be assumed. The Mat foundations should be a minimum of 12 inches in thickness and areas that support wall or column loads should be embedded at least 18" below the adjacent exterior grade. For aesthetic reasons, the deflection should not exceed ½ inch in 30 feet.

The actual design of the foundations and reinforcement should be determined by the structural engineer.

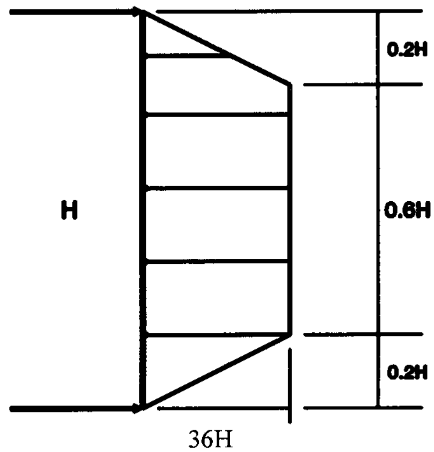
5.6 RETAINING WALLS

5.6.1 Retaining Wall

Cantilevered retaining walls up to 20 feet high supporting fill, soil, alluvium, bedrock, and approved retaining wall backfill may be designed for an equivalent fluid pressure of 37 pounds per cubic foot for level backslopes.

The design at-rest earth pressure on walls is 70 pcf. Restrained braced retaining walls that are pinned at the top by a non-yielding floor should be for the trapezoidal pressure distribution shown on the adjacent figure of 36H. The uniform trapezoidal pressure may be assumed over the central six tenths of the wall height. The pressure may be decreased to zero at the top and bottom of the wall.

TRAPEZOIDAL DISTRIBUTION OF PRESSURE



Retaining walls should be provided with a subdrain or weepholes covered with a minimum of 12 inches of ¾ inch crushed gravel.

It is recommended that retaining walls be waterproofed. Waterproofing design and inspection of its installation is not the responsibility of the geotechnical engineer. A qualified waterproofing consultant should be retained in order to recommend a product or method, which would provide protection to below grade walls.

Retaining walls higher than six feet need to consider a seismic surcharge from the Design Earthquake. The seismic surcharge should be calculated using a factor of safety of 1.0 with the PGA corresponding to ½ of 2/3rds of the PGA_M. The PGA_M is 0.998 and therefore the corresponding seismic design value is 0.33g.

A seismic surcharge for retaining walls designed for active conditions is considered for a 20 foot high retaining wall. For a 20 foot high retaining wall with level backfill, the static design force is equal to 7.4 kips (12ft^2 *37pcf /2).

For a ground motion of 0.33g and a FS of 1.0, the enclosed calculations indicate an unbalanced force under seismic conditions from the Maximum Considered Earthquake is 7.27 kips.

Since the static design force is higher than the seismic force for level backfill, an additional seismic surcharge need not be added to the wall design.

5.6.2 <u>Retaining Wall Backfill</u>

Retaining wall backfill should be compacted to a minimum of 90 percent of the maximum density as determined by ASTM D 1557-14. It should be pointed out that the use of heavy compaction equipment in close proximity to retaining walls can result in excess wall movement and/or soil loadings exceeding design values. In this regard, care should be taken during backfilling operations.

5.6.3 Waterproofing

Moisture affecting retaining walls is one of the most common post-construction complaints. Poorly applied or omitted waterproofing can lead to efflorescence or standing water inside the building. Efflorescence is a process in which a powdery substance is produced on the surface of the concrete by the evaporation of water. The white powder usually consists of soluble salts such as gypsum, calcite, and/or halite (common salt). Efflorescence is common to retaining walls and generally does not affect their strength or integrity.

It is recommended that retaining walls be waterproofed. Waterproofing design and inspection of its installation is not the responsibility of the geotechnical engineer. A qualified waterproofing consultant should be retained in order to recommend a product or method, which would provide protection to below grade walls.

5.7 TEMPORARY EXCAVATIONS

All vertical cuts shall be inspected by our office to verify geologic continuity.

Un-shored vertical cuts to a height of five feet (5') may be made in soil materials at the site. Un-shored cuts in excess of five feet (5') shall be sloped at a gradient of no steeper than 1:1 (horizontal to vertical) for the portion of the excavation above the vertical cut.

A representative of the geotechnical engineer or geologist should be present during grading to see temporary slopes. All excavations, including: caissons, footings, and utility trenches, shall be properly and adequately fenced and/or covered to ensure the safety of all those working on the project.

All temporary excavations shall be stabilized as soon as possible after the initial excavation.

Cuts that will remove support from offsite property and/or existing structures should be supported with shoring. Shoring should be designed to retain an equivalent fluid pressure of 30 PCF.

5.7.1 Shoring

Shoring may consist of cast-in-place concrete piles with wood-lagging. Shoring piles should be a minimum of 18 inches in diameter and a minimum of 8 feet below the base of the excavation. Piles may be assumed fixed 3 feet below the base of the excavation. For the vertical forces, piles may be designed for a skin friction of 300 pounds per square foot for that portion of pile in contact with the alluvium and 500 pounds per square foot for the portion in contact with bedrock. Shoring piles should be spaced a maximum of 10 feet on center.

The friction value is for the total of dead and frequently applied live loads and may be increased by one third for short duration loading, which includes the effects of wind or seismic forces. Resistance to lateral loading may be provided by passive earth pressure within the alluvium and bedrock below the base of the excavation.

Passive earth pressure may be computed as an equivalent fluid having a density of 400 pounds per cubic foot for alluvium and 600 pounds per cubic foot for bedrock. The maximum allowable earth pressure is 4,000 pounds per square foot for alluvium and 6,000 for bedrock. For design of isolated piles, the allowable passive and maximum earth pressures may be increased by 100 percent. Piles spaced more than 2½ pile diameters on center may be considered isolated.

5.7.2 Earth Anchors

If required, Tie-back anchors may be used to resist lateral loads. Pressure grouted friction anchors are recommended. For design purposes, it is assumed that the active wedge adjacent to the shoring is defined by a plane drawn at 30 degrees with the vertical through the bottom of the excavation. Friction anchors should extend at least 15 feet beyond the potential active wedge or to a greater length if necessary to develop the desired capacities.

The capacities of the anchors should be determined by testing of the initial anchors as outlined in a following section. For preliminary design purposes, it is estimated that cast-in-place gravity anchors will develop an average value of 300 pounds per square foot. Pressure grouted and post grouted anchors will develop much higher capacities. Only the frictional resistance developed beyond the active wedge would be effective in resisting lateral loads. If the anchors are spaced at least six feet on center, no reduction in the capacity of the anchors need be considered due to group action.

The anchors may be installed at angles of 20 to 40 degrees below the horizontal. Caving and sloughing of the anchor hole should be anticipated and provisions made to minimize such caving and sloughing. To minimize chances of caving and sloughing that portion of the anchor shaft within the active wedge should be backfilled with sand before testing the anchor. This portion of the shaft should be filled tightly and flush with the face of the excavation. The sand backfill should be placed by pumping; the sand may contain a small amount of cement to facilitate pumping.

At least 10 percent of the initial anchors for a 24-hour 200 percent test and 10 percent additional anchors for quick 200 percent tests. The specific anchors selected for the 200 percent test should be representative and acceptable to the geotechnical engineer. The purpose of the 200 percent tests is to verify the friction value assumed in design. The anchors should be tested to develop twice the assumed friction value. Anchor rods of sufficient strength should be installed in these anchors to support the 200 percent test loading. Where satisfactory tests are not achieved on the initial anchors, the anchor diameter, and/or length should be increased until satisfactory test results are obtained. The total deflection during the 24-hour 200 percent test should not exceed 12 inches. During the 24-hour test, the anchor deflection should not exceed 0.75 inch measured after the 200 percent test load is applied. If the anchor movement after the 200 percent load has been applied for 12 hours is less than 0.5 inch, and the movement over the previous four hours has been less than 0.1 inch, the 24-hour test may be terminated.

For the quick 200 percent tests, the 200 percent test load should be maintained for 30 minutes. The total deflection of the anchor during the 200 percent quick tests should not exceed 12 inches; the deflection after the 200 percent test load has been applied should not exceed 0.25 inch during the 30-minute period.

All of the anchors should be pretested to at least 150 percent of the design load; the total deflection during the test should not exceed 12 inches. The rate of creep under the 150 percent test should not exceed 0.1 inch over a 15-minute period for the anchor to be approved for the design loading.

After a satisfactory test, each anchor should be locked-off at the design load. The locked-off load should be verified by rechecking the load in the anchor. If the locked-off load varies by more than 10 percent from the design load, the load should be reset until the anchor is locked-off within 10 percent of the design load.

The installation of the anchors and the testing of the completed anchors should be observed by a deputy grading inspector under the direction of the geotechnical engineer.

5.7.3 Lagging

Lagging will be required between piles. Due to arching in the soils, the pressure on the lagging will be less that on the shoring piles. It is recommended that the lagging be designed for the full design pressure but be limited to a maximum of 400 pounds per square foot. The void between the lagging and the back-cut should be slurry-filled and observed by a representative of the geotechnical engineer.

5.7.4 Deflection

It is difficult to accurately predict the amount of deflection of a shored embankment. It should be realized that some deflection will occur. It is estimated that the deflection could be on the order of ½ to one inch at the top of the shored embankment. If greater deflection occurs during construction, additional bracing may be necessary to minimize settlement of adjacent buildings and utilities in adjacent street and alleys. If desired to reduce the deflection, a greater active pressure could be used in the shoring design. Where internal bracing is used, the rakers should be tightly wedged to minimize deflection. The proper installation of the raker braces and the wedging will be critical to the performance of the shoring.

5.7.5 Monitoring

Because of the depth of the excavation, some means of monitoring the performance of the shoring system are suggested. The monitoring should consist of periodic surveying of the lateral and vertical locations of the tops of all soldier piles and the lateral movement along the entire lengths of selected soldier piles. Also, some means of periodically checking the load on selected anchors will be necessary, where applicable.

Some movement of the shored embankments should be anticipated as a result of the relatively deep excavation. It is recommended that photographs of the existing buildings on the adjacent properties be made during construction to record any movements for use in the event of a dispute.

Monitoring of the performance of the shoring system is recommended. The monitoring should consist of periodic surveying of the lateral and vertical locations of the tops of all the soldier piles. Also, some means of periodically checking the load on selected anchors may be necessary.

5.8 SLAB-ON-GRADE

If a slab-on-grade is used for the interior of the building it should be a minimum of five inches thick and reinforced with No. 4 bars at 16 inches on center, both ways. The slab should be underlain by a 10-mil Visqueen plastic membrane. Green Building Code requirements should be followed. The plastic Visqueen barrier should be sealed at all splices, around plumbing, and at the perimeter of slab areas. Every effort should be made to provide a continuous barrier and care should be taken to not puncture the membrane. The splices between layers should be generously staggered. The slab can be placed directly on two feet of compacted fill.

5.9 EXTERIOR FLATWORK AND AUXILIARY STRUCTURES

Whenever planned, exterior flatwork should be placed directly on alluvium, bedrock, or over a two-foot blanket of approved compacted fill. Five inch net sections with #4 bars at 18 inches o.c.e.w. are also advised. Control joints should be planned at not more than twelve foot spacing for larger concrete areas. Narrower areas of flatwork such as walkways should have control joints planned at not greater than 1.5 times the width of the walkway. Recommendations provided above for interior slabs can also be used for exterior flatwork, but without a sand layer or Visqueen moisture barrier. Additionally, it is also recommended that at least 12-inch deepened footings be constructed along the edges of larger concrete areas.

Movement of slabs adjacent to structures can be mitigated by doweling slabs to perimeter footings. Doweling should consist of No. 4 bars bent around exterior footing reinforcement. Dowels should be extended at least two feet into planned exterior slabs. Doweling should be spaced consistent with the reinforcement schedule for the slab. With doweling, 3/8-inch minimum thickness expansion joint material should be provided. Where expansion joint material is provided, it should be held down about 3/8 inch below the surface. The expansion joints should be finished with a color matched, flowing, flexible sealer (e.g., pool deck compound) sanded to add mortar-like texture. As an option to doweling, an architectural separation could be provided between the main structures and abutting appurtenant improvements.

Auxiliary structures such as trash enclosures and garden walls can be placed directly on alluvium, bedrock, or on a two foot blanket of compacted fill.

5.10 CONCRETE

We recommend that the low permeable concrete be utilized at the site to limit moisture transmission through slab and foundation. If groundwater is encountered during construction pumping will be required to lower its level. Any concrete placed below the water table should have an appropriate increase of psi in accordance with the Building Code. For this purpose, the water/cement ratio to be used at the site should be limited to 0.5 (0.45 preferred). Limited use (subject to approval of mix designs) of a water reducing agent may be included to increase workability. The concrete should be properly cured to minimize risk of shrinkage cracking. One-inch hard rock mixes should be provided. Pea gravel mixes are specifically not recommended but could be utilized for relatively non-critical improvements (e.g., flatwork) and other improvements provided the mix designs consider limiting shrinkage.

Contractors/other designers should take care in all aspects of designing mixes, detailing, placing, finishing, and curing concrete. The mix designers and contractor are advised to consider all available steps to reduce cracking. The use of shrinkage compensating cement or fiber reinforcing should be considered. Mix designs proposed by the contractor should be considered subject to review by the project engineer.

5.11 DRAINAGE

Drainage should be directed away from structures via non-erodible conduits to suitable disposal areas. Two percent drainage is recommended directly away from structures. Building Code and Civil Engineer requirements and recommendations take precedence. All enclosed planters should be provided with a suitably located drain or drains and/or flooding protection in the form of weep holes or similar. Preferably, structures should have roof gutters and downspouts tied directly to the area drainage system.

5.12 PLAN REVIEW

When detailed grading and structural plans are developed, they should be forwarded to this office for review and comment.

5.13 AGENCY REVIEW

All soil, geologic, and structural aspects of the proposed development are subject to the review and approval of the governing agency(s). It should be recognized that the governing agency(s) can dictate the manner in which the project proceeds. They could approve or deny any aspect of the proposed improvements and/or could dictate which foundation and grading options are acceptable.

5.14 SUPPLEMENTAL CONSULTING

During construction, a number of reviews by this office are recommended to verify site geotechnical conditions and conformance with the intentions of the recommendations for construction. Although not all possible geotechnical observation and testing services are required by the governing agencies, the more site reviews requested, the lower the risk of future site problems. The following site reviews are advised, some of which will probably be required by the agencies.

Preconstruction/pregrading meeting	Advised
Cut and/or shoring observation	Required
Periodic geotechnical observations and testing during grading	Required
Reinforcement for all foundations	Advised
Slab subgrade moisture barrier membrane	Advised
Slab subgrade rock placement	Advised
Presaturation checks for all slabs in primary structure areas	Required
Presaturation checks for all slabs for appurtenant structures	Advised
Slab steel placement, primary and appurtenant structures	Advised

Compaction of utility trench backfill .... Advised

Unless otherwise agreed to in writing, all supplemental consulting services will be provided on an as-needed, time-and-expense, fee schedule basis.

5.15 PROJECT SAFETY

The contractor is the party responsible for providing a safe site. This consultant will not direct the contractor's operations and cannot be responsible for the safety of personnel other than his own representatives on site. The contractor should notify the owner if he is aware of and/or anticipates unsafe conditions. If the geotechnical consultant at the time of construction considers conditions unsafe, the contractor, as well as the owner's representative, will be notified. Within this report the terminology safe or safely may have been utilized. The intent of such use is to imply low risk. Some risk will remain, however, as is always the case.

6.0 REMARKS

Only a portion of subsurface conditions have been reviewed and evaluated. Conclusions, recommendations and other information contained in this report are based upon the assumptions that subsurface conditions do not vary appreciably between and adjacent to observation points. Although no significant variation is anticipated, it must be recognized that variations can occur.

This report has been prepared for the sole use and benefit of our client. The intent of the report is to advise our client on geotechnical matters involving the proposed improvements. It should be understood that the geotechnical consulting provided and the contents of this report are not perfect. Any errors or omissions noted by any party reviewing this report, and/or any other geotechnical aspect of the project, should be reported to this office in a timely fashion. The client is the only party intended by this office to directly receive the advice. Subsequent use of this report can only be authorized by the client. Any transferring of information or other directed use by the client should be considered "advice by the client."

Geotechnical engineering is characterized by uncertainty. Geotechnical engineering is often described as an inexact science or art. Conclusions and recommendations presented herein are partly based upon the evaluations of technical information gathered, partly on experience, and partly on professional judgment. The conclusions and recommendations presented should be considered "advice." Other consultants could arrive at different conclusions and recommendations. Typically, "minimum" recommendations have been presented. Although some risk will always remain, lower risk of future problems would usually result if more restrictive criteria were adopted. Final decisions on matters presented are the responsibility of the client and/or the governing agencies. No warranties in any respect are made as to the performance of the project.

APPENDIX 'A'

Subsurface Investigation Logs

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments
Date Performed: 7/10/15

Geotechnical Boring No: B-1
Boring Location: 6650 W. Franklin Avenue; west side of parking lot
Drill Type: 8"Hollow Stem Drill Rig

Depth in Feet	Blows per 6"	Sample Type: Undisturbed	Sample Type: Bulk	Bedrock/ Soil Description	Color	Density	Moisture
0				4" Asphalt, 3" Base Fill (Af): Silty sand	Medium brown Mottled brown	Medium dense Medium dense	Moist Moist
2.5	10/5/6		SPT				
5	3/4/5		SPT				
7.5	5/7/9		SPT	Alluvium (Qae): Clayey sandy silt	Tan, Light Brown	Medium dense	Moist
10	7/7/7		SPT				
12.5	7/7/7		SPT				
15	5/6/7		SPT				
17.5	5/7/7		SPT				
20	5/5/7		SPT	Sandy silty clay, contains scattered bedrock fragments	Tan to Mottled Brown, Orange-Brown	Medium dense	Moist
22.5	7/12/13		SPT				
25	7/11/11		SPT				
27.5	3/4/7		SPT	Clayey sandy silt	Mottled Brown	Medium dense	Moist
30	3/3/3		SPT	Seep At 30'			
32.5	3/3/6		SPT				
35	4/5/7		SPT	Silty clay	Red Brown	Stiff	Moist
37.5	5/7/9		SPT				
40	4/5/6		SPT				

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments
Date Performed: 7/10/15

Geotechnical Boring No: B-1
Boring Location: 6650 W. Franklin Avenue; west side of parking lot
Drill Type: 8"Hollow Stem Drill Rig

Depth in Feet	Blows per 6"	Sample Type: Undisturbed	Sample Type: Bulk	Bedrock/ Soil Description	Color	Density	Moisture
40	4/5/6		SPT	Silty clay	Red Brown	Stiff	Moist
42.5	7/9/11		SPT				
45	5/6/7		SPT				
47.5	9/11/13		SPT				
50	7/11/15		SPT	No Recovery			
52.5	7/11/13		SPT				
55	6/4/13		SPT				
55.5	9/11/23		SPT				
60	7/9/11		SPT				
				End At 61.5', Fill To 6', Seep At 30', No Caving			
65							
70							
75							
80							

Feffer Geological Consulting

Figure

1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments
Date Performed: 7/10/15

Geotechnical Boring No: B-2
Boring Location: 6650 W. Franklin Avenue; west side of parking lot
Drill Type: 8"Hollow Stem Drill Rig

Depth in Feet	Blows per 6"	Sample Type: Undisturbed	Sample Type: Bulk	Bedrock/ Soil Description	Color	Density	Moisture
0				4" Asphalt, 5" Base			
				Fill (Af): Sandy silt	Dark Brown	Dense	Moist
5	5/5	R					
				Alluvium (Qae): Sandy silt	Dark Brown	Medium dense	Moist
10	11/11	R					
15	8/10	R					
20	8/11	R		Gravelly silty sand	Tan to Mottled Brown	Medium dense	Moist
25	13/17	R		Clayey sandy silt	Tan to Mottled Brown	Medium dense	Moist
30	12/10	R		Silty clay	Red Brown, Mottled Brown, Brown	Stiff	Moist
32.5	7/12/13			No Recovery			
35	7/9	R					
37.5	9/11/16	R					
40	15/17						

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments
Date Performed: 7/10/15

Geotechnical Boring No: B-2
Boring Location: 6650 W. Franklin Avenue; west side of parking lot
Drill Type: 8"Hollow Stem Drill Rig

Depth in Feet	Blows per 6"	Sample Type: Undisturbed	Sample Type: Bulk	Bedrock/ Soil Description	Color	Density	Moisture
40	15/17		R	Silty clay, contains scattered bedrock fragments	Red Brown, Mottled Brown, Brown	Stiff	Moist
42.5	7/10/15		R				
45	9/19		R				
47.5	5/9/15		R				
50	9/11		R				
				End At 51.5', Fill To 6', No Water, No Caving			
55							
60							
65							
70							
75							
80							

1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments
Date Performed: 5/22/17

Geotechnical Boring No: B-3
Boring Location: 6650 W. Franklin Avenue; west side of parking lot
Drill Type: 8"Hollow Stem Drill Rig

Depth in Feet	Blows per 6"	Sample Type: Undisturbed	Sample Type: Bulk	Bedrock/ Soil Description	Color	Density	Moisture
0				3" Asphalt, 5" Base			
				Fill (Af): Pebbly silty sand, contains scattered concrete fragments, bricks, and debris	Medium Brown to Light Brown	Medium Dense	Moist
5							
	7/9	R					
				Alluvium (Qae):			
10	20/28	R		Pebbly silty sand	Medium Brown to Red Orange Brown	Dense	Moist
15	10/16	R		Silty sand, scattered pebbles	Medium Brown to Red Orange Brown	Dense	Moist
20	15/19	R		Silty sand, scattered pebbles	Medium Brown to Red Orange Brown	Dense	Moist
25	16/21	R		Silty sand, scattered pebbles	Medium Brown to Red Orange Brown	Dense	Moist
30	10/13	R		Silty sand, scattered pebbles	Medium Brown to Red Orange Brown	Dense	Moist
35	16/18	R		Clayey silty sand, scattered pebbles	Medium Brown to Brown Red Orange	Dense	Moist
40							

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments
Date Performed: 5/22/17

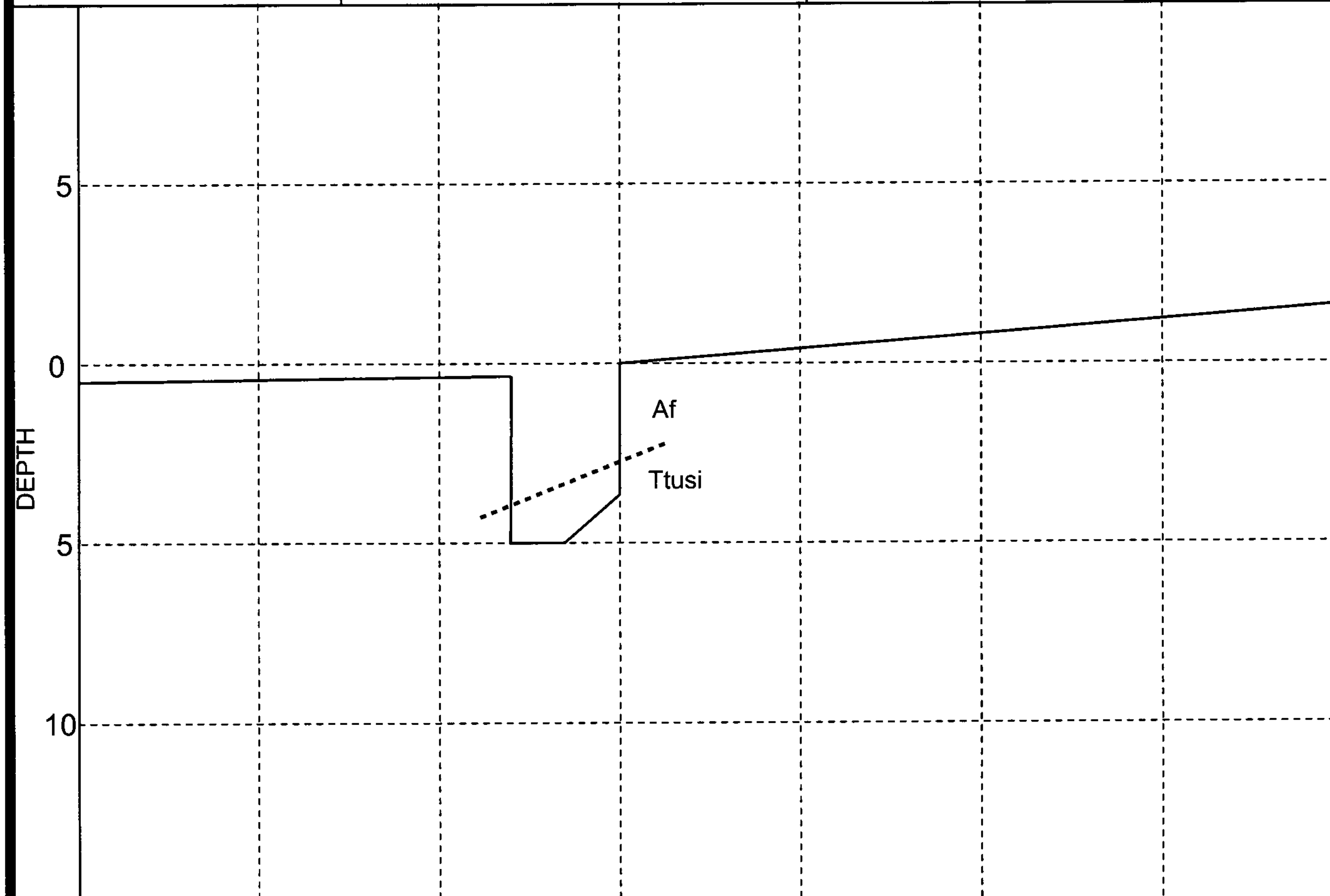
Geotechnical Boring No: B-3
Boring Location: 6650 W. Franklin Avenue; west side of parking lot
Drill Type: 8"Hollow Stem Drill Rig

Depth in Feet	Blows per 6"	Sample Type: Undisturbed	Sample Type: Bulk	Bedrock/ Soil Description	Color	Density	Moisture
40	14/16		R	Clayey silty sand, scattered pebbles	Medium Brown, Red Orange Brown	Dense	Moist
45	14/16		R	Clayey pebbly silty sand	Medium Brown, Red Orange Brown	Dense	Moist
50	19/30		R	Clayey pebbly silty sand	Dark Red Brown	Dense	Moist
				End At 51.5', Fill To 8', No Water, No Caving			
55							
60							
65							
70							
75							
80							

Feffer Geological Consulting

Figure

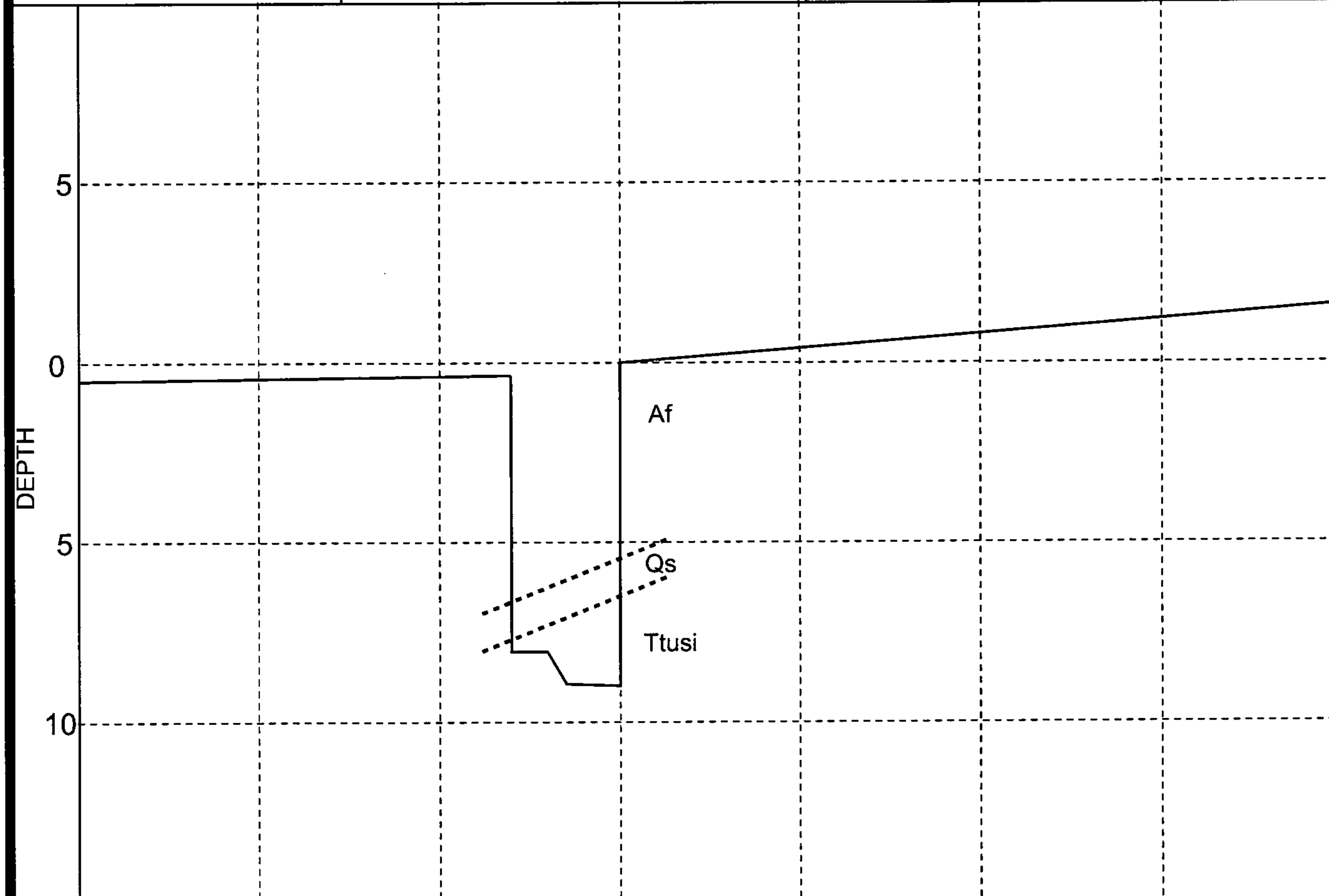
GRAPHIC LOG	APPROXIMATE SCALE : 1"=5'	TEST EXCAVATION : 1
	DATE LOGGED : 7/10/15 BY : RAM	ADDRESS: 6650 W. Franklin Avenue



RING	BULK	SAMPLE DEPTH	Blows	LOCATION : See Site Map DESCRIPTION: Classification (USCS), color, moisture, consistency etc.
		1–14		0-3' Fill (Af): Clayey sandy silt, tan, yellow brown, moist, dense, contains scattered rootlets, roots and rock fragments 3-5' Bedrock (Ttusi): Topanga Formation siltstone, orange brown, gray, moist, hard, thinly bedded moist, hard @4' Bedding Observed N24W 42NE End At 5', Fill To 3', No Water, No Caving

FEFFER GEO CONSULTING	F.N. 1584-54	Montecito Apartments (TSA)	PLATE

GRAPHIC LOG	APPROXIMATE SCALE : 1"=5'	TEST EXCAVATION : 2
	DATE LOGGED : 7/10/15 BY : RAM	ADDRESS: 6650 W. Franklin Avenue

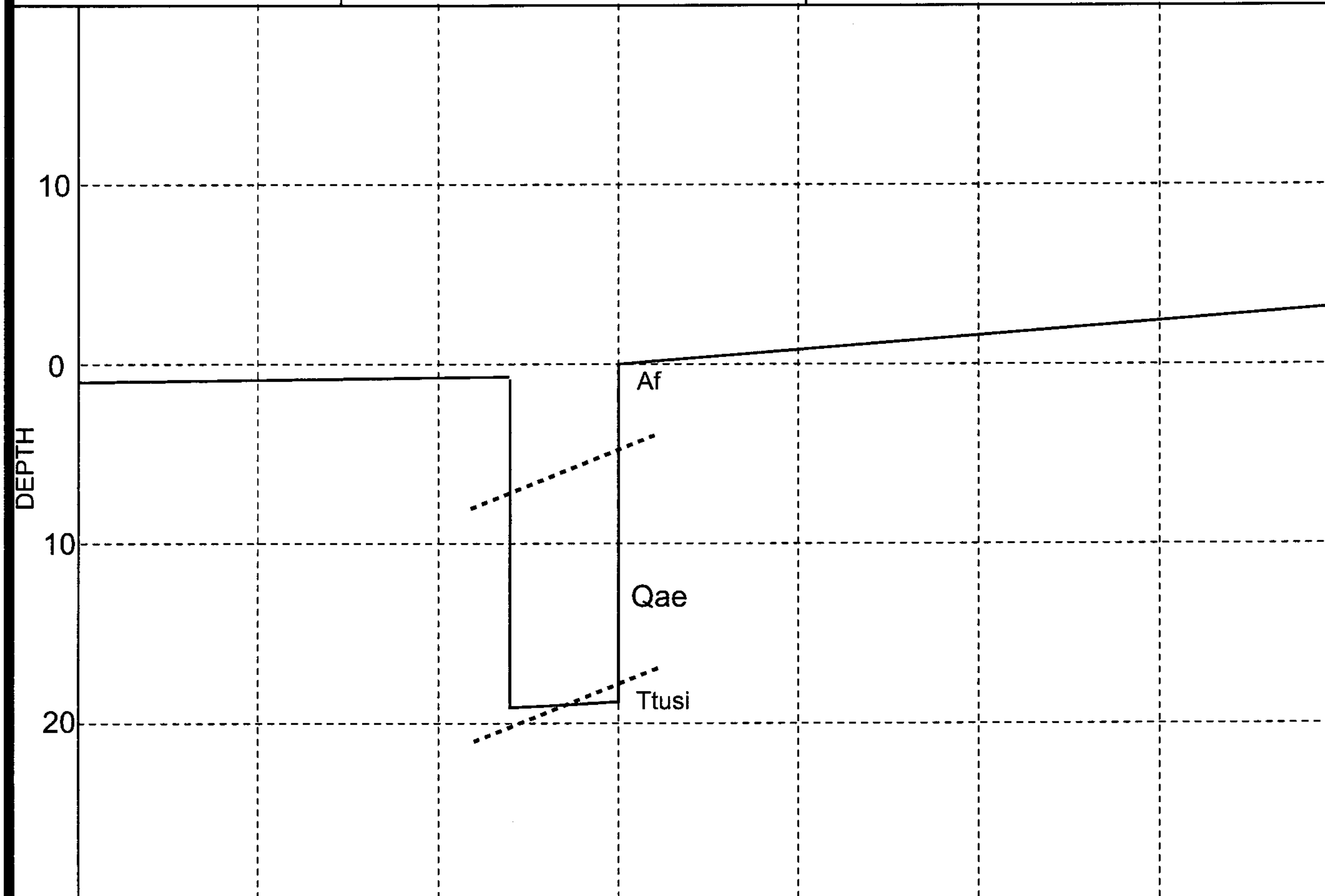


RING	BULK	SAMPLE DEPTH	Blows	LOCATION : See Site Map DESCRIPTION: Classification (USCS), color, moisture, consistency etc.
		1 2 3 4 5 6 7 8 9 10 11 12 13 14		0-6' Fill (Af): 0-2' Sandy silt, dark brown, moist, dense, contains scattered roots, rock fragments and debris 2-4' Silty sand, mottled brown, yellow brown, moist, dense, contains scattered rootlets, roots, rock fragments and concrete debris 4-6' Silty sand, mottled brown, dark brown, moist, medium dense, contains scattered rootlets and rock fragments 6-7' Quaternary Soil (Qs): Sandy silt, dark brown, mottled brown, moist, medium dense 7-9' Bedrock (Ttusi): Topanga Formation siltstone, yellow brown, tan, moist, hard, weathered End At 9', Fill To 6', No Water, No Caving

FEFFER GEO CONSULTING	F.N. 1584-54	Montecito Apartments (TSA)	PLATE

1 6 5 0 9 1 5 2 0 1 7 4 2 3 7 1

GRAPHIC LOG	APPROXIMATE SCALE : 1"=5'	TEST EXCAVATION : 3
	DATE LOGGED : 7/10/15 BY : RAM	ADDRESS: 6650 W. Franklin Avenue



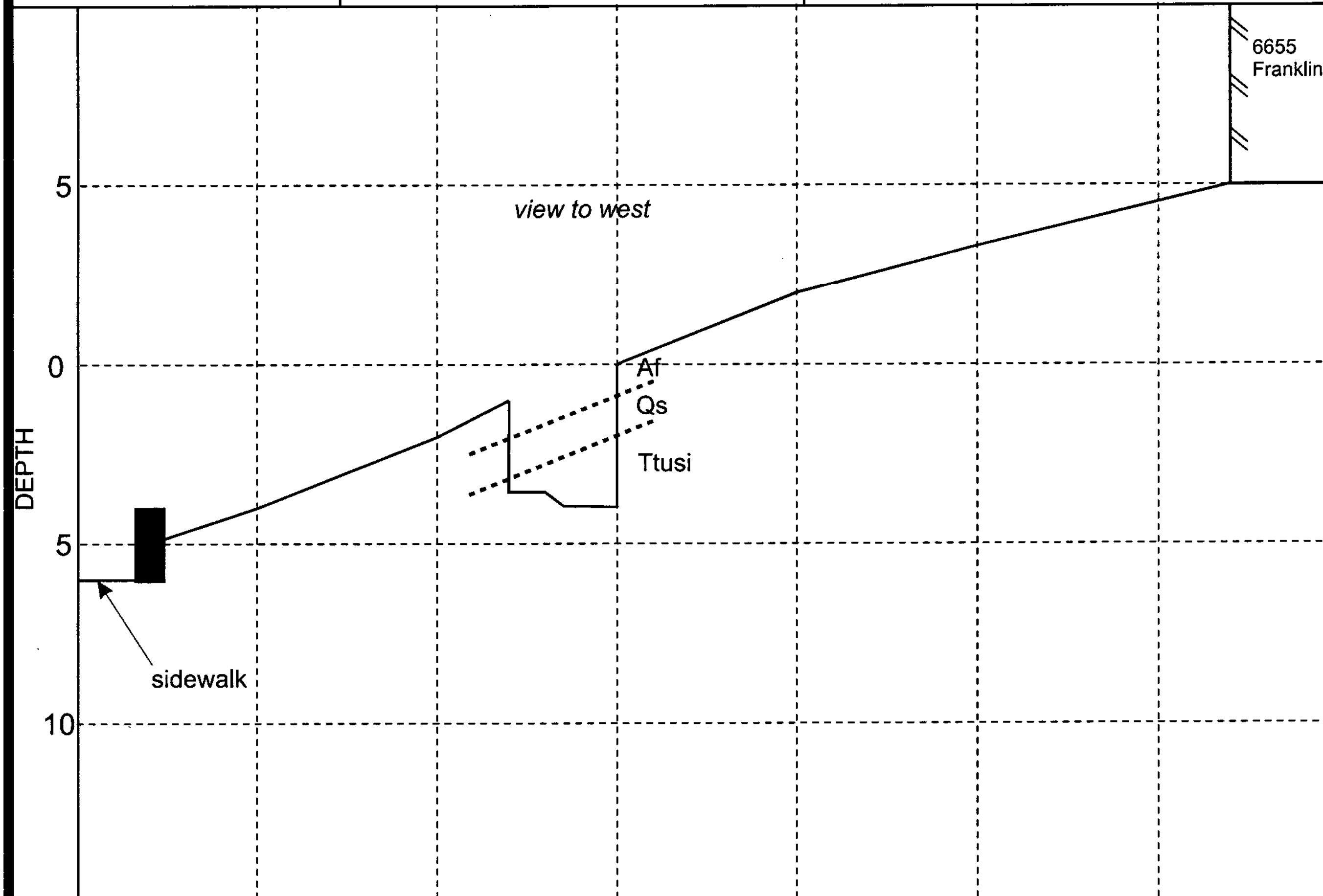
RING	BULK	SAMPLE DEPTH	Blows	LOCATION : See Site Map DESCRIPTION: Classification (USCS), color, moisture, consistency etc.
		2 4 6 8 10 12 14 16 20 18 22 24 26 29		0-6' Fill (Af): 0-2' Silty sand, dark brown, brown, moist, dense, contains scatter rootletts, roots and concrete debris 2-6' Silty sand, orange brown, yellow brown, moist, dense, contains scattered rootlets and debris 6-19' Alluvium (Qae): @6'Sandy silt, clayey sandy silt, dark brown, mottled brown, moist, dense @13'Silty sand, yellow brown, tan, moist, dense @16' Gravelly silty sand, tan, yellow brown, mottled brown, moist, contains scattered rock fragments Bedrock (Ttusi): Topanga Formation interbedded siltstone and sandstone, yellow brown, tan, mottled brown, moist, very hard, highly weathered End At 19', Fill To 6', No Water, No Caving

FEFFER GEO CONSULTING	F.N. 1584-54	Montecito Apartments (TSA)	PLATE

1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1

GRAPHIC LOG

APPROXIMATE SCALE : 1"=5'		TEST EXCAVATION : 4
DATE LOGGED : 3/18/16	BY : PB	ADDRESS: 6655 W. Franklin Avenue



RING	BULK	SAMPLE DEPTH	Blows	LOCATION : See Site Map DESCRIPTION: Classification (USCS), color, moisture, consistency etc.
		1 2 3 4 5 6 7 8 9 10 11 12 13 14		0-1' Fill (Af): Silty sand, brown, slightly moist to moist, medium dense, contains scattered rootlets, roots 1-2' Quaternary Soil (Qs): Silty sand, tan brown, moist, medium dense, contains scattered subangular pebbles, slightly gradational contact with underlying bedrock 2-4' Bedrock (Ttusi): Topanga Formation interbedded shale and sandstone, gray-tan-yellow-brown, moist, hard End At 4', Fill To 1', No Water, No Caving

FEFFER GEO CONSULTING	F.N. 1584-54	Montecito Apartments (TSA)	PLATE

1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1

APPENDIX ‘B’

Laboratory Testing

SOIL LABWORKS LLC

SL15.1966
July 20, 2015
Revised January 15, 2016

Feffer Geological Consulting
1990 S. Bundy Drive
4th Floor
Los Angeles, California 90025

Attn: Joshua R. Feffer

Subject: Laboratory Testing

Site: 6650 W Franklin
Los Angeles, California

Job: FEFFER/SAFRON/MONTECITO APARTMENTS

Laboratory testing for the subject property was performed by Soil Labworks, LLC., under the supervision of the undersigned Engineer in conjunction with a geotechnical investigation. Samples of the earth materials were obtained from the subject property by personnel of Feffer Geological Consulting and transported to the laboratory of Soil Labworks for testing and analysis. The laboratory tests performed are described and results are attached.

Services performed by this facility for the subject property were conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions.

Respectfully Submitted:

SOIL LABWORKS, LLC

JON A. IRVINE
G.E. 2891

REGISTERED PROFESSIONAL ENGINEER
JON ALAN IRVINE
GE 2891
Exp. 6-30-16
GEOTECHNICAL
STATE OF CALIFORNIA

Enc: Appendix

2500 Townsgate Road, Suite E, Westlake Village, California 91361
(805) 370-1338 FAX (805) 371-4693

SOIL LABWORKS LLC

APPENDIX

Laboratory Testing

Sample Retrieval - Drill Rig

Samples of earth materials were obtained at frequent intervals by driving a thick-walled steel sampler conforming to the most recent version of ASTM D 3550-01 (2007) with successive drops of a 140 pound hammer falling 30". The earth material was retained in brass rings of 2.416 inches inside diameter and 1.00 inch height. The central portion of the sample was stored in close-fitting, water-tight containers for transportation to the laboratory. Standard Penetration Tests (SPT) were performed at discrete intervals within the 8 inch diameter, hollow stem auger borings drilled on the site. The tests were performed using the 1-3/8 inch inside diameter, split-barrel sampler in accordance with ASTMD1586-11. Standard penetration test samples were retained in air-tight bags.

Moisture Density

The field moisture content and dry density were determined for each of the soil samples. The dry density was determined in pounds per cubic foot following ASTM 2937-10. The moisture content was determined as a percentage of the dry soil weight conforming to ASTM 2216-10. The results are presented below in the following table. The percent saturation was calculated on the basis of an estimated specific gravity. Description of earth materials used in this report and shown on the attached Plates were provided by the client.

Test Pit/Boring No.	Sample Depth (Feet)	Soil Type	Dry Density (pcf)	Moisture Content (percent)	Percent Saturation (G_s=2.65)
B2	5	Fill	100.5	12.9	53
B2	10	Alluvium	116.4	9.4	59
B2	15	Alluvium	101.8	16.3	69
B2	20	Alluvium	118.3	6.8	46
B2	25	Alluvium	116.1	14.4	90
B2	30	Alluvium	110.3	18.9	100
B2	35	Alluvium	111.1	13.5	73
B2	40	Alluvium	114.5	16.6	99
B2	45	Alluvium	110.5	18.4	98
B2	50	Alluvium	110.4	16.9	90
TP1	4	Bedrock	81.6	22.9	59
TP2	8	Bedrock	117.8	7.9	52
TP3	5	Alluvium	92.1	14.8	49
TP3	10	Alluvium	105.3	12.4	58
TP3	15	Alluvium	111.0	10.0	54
TP3	19	Weathered Bedrock	111.1	9.2	50

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(805) 370-1338 FAX (805) 371-4693

Shear Strength

The peak and ultimate shear strengths of the bedrock were determined by performing consolidated and drained direct shear tests in conformance with ASTM D3080/D3080M-11. The tests were performed in a strain-controlled machine manufactured by GeoMatic. The rate of deformation was 0.01 inches per minute. Samples were sheared under varying confining pressures, as shown on the "Shear Test Diagrams," B-Plates. The moisture conditions during testing are shown on the following table and on the B-Plates. The samples indicated as saturated were artificially saturated in the laboratory. All saturated samples were sheared under submerged conditions.

Test Pit/ Boring No.	Sample Depth (Feet)	Dry Density (pcf)	As-Tested Moisture Content (percent)
TP1	4	81.6	35.3
TP2	8	117.8	23.6

SOIL LABWORKS LLC

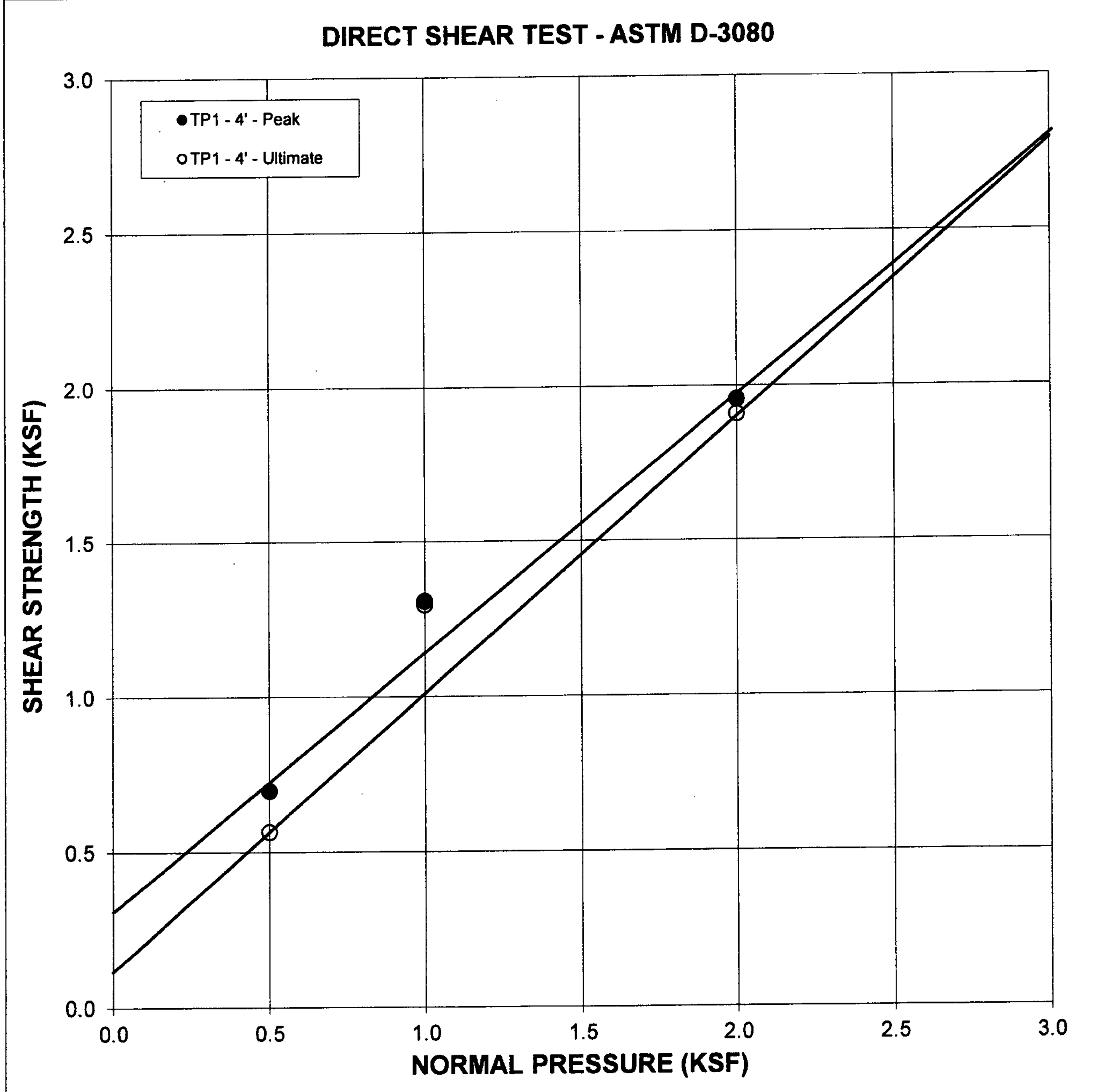
SHEAR DIAGRAM B-1

JN: SL15.1966 CONSULTANT JAI
CLIENT: Feffer/Safran Montecito Apts-6650 W Franklin

EARTH MATERIAL: BEDROCK

	PEAK	ULTIMATE	
Phi Angle	39.5	41.5	degrees
Cohesion	305	120	psf

Average Moisture Content	35.3%
Average Dry Density (pcf)	81.6
Percent Saturation	91.1%



1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1

SOIL LABWORKS LLC

SHEAR DIAGRAM B-2

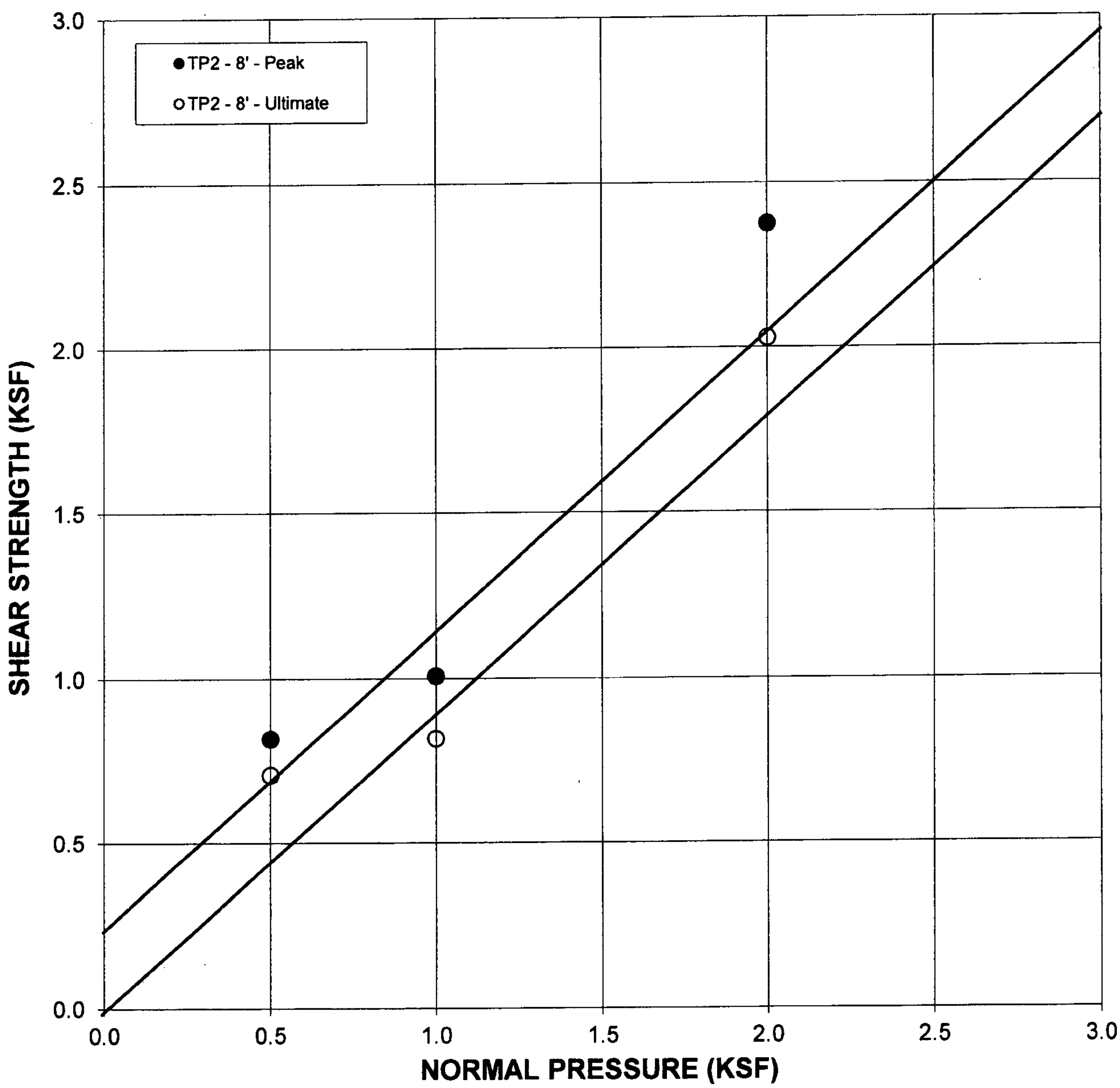
JN: SL15.1966 CONSULTANT JAI
CLIENT: Feffer/Safran Montecito Apts-6650 W Franklin

EARTH MATERIAL: BEDROCK

	PEAK	ULTIMATE	
Phi Angle	42	41	degrees
Cohesion	235	0	psf

Average Moisture Content	23.6%
Average Dry Density (pcf)	117.8
Percent Saturation	100.0%

DIRECT SHEAR TEST - ASTM D-3080



10509152017423771

SOIL LABWORKS LLC

SL15.1966
June 19, 2017

Feffer Geological Consulting
1990 S. Bundy Drive
4th Floor
Los Angeles, California 90025

Attn: Joshua R. Feffer

Subject: Laboratory Testing

Subject: Laboratory Testing

Site: 6650 W Franklin
Los Angeles, California

Job: FEFFER/SAFRON/MONTECITO APARTMENTS

Reference: Laboratory Testing, Soil Labworks, LLC., June 20, 2015 (Revised January 15, 2016)

Laboratory testing for the subject property was performed by Soil Labworks, LLC., under the supervision of the undersigned Engineer. Previous work is presented in the referenced report. Samples of the earth materials were obtained from the subject property by personnel of Feffer Geological and transported to the laboratory of Soil Labworks for testing and analysis. The laboratory tests performed are described and results are attached.

Services performed by this facility for the subject property were conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions.

Respectfully Submitted:

SOIL LABWORKS, LLC

JON A. IRVINE
G.E. 2891

REGISTERED PROFESSIONAL ENGINEER
JON ALAN IRVINE
GE 2891
Exp. 6-30-18
GEOTECHNICAL
STATE OF CALIFORNIA

Enc: Appendix

J Townsgate Road, Suite E, Westlake Village, California 91361
(805) 370-1338 FAX (805) 371-4693

SOIL LABWORKS LLC

SL15.1966
June 19, 2017

APPENDIX

Laboratory Testing

Sample Retrieval - Drill Rig

Samples of earth materials were obtained at frequent intervals by driving a thick-walled steel sampler conforming to the most recent 2016 version of ASTM D 3550-01 (2007)(withdrawn 2016) with successive drops of a 140 pound hammer falling 30". The earth material was retained in brass rings of 2.416 inches inside diameter and 1.00 inch height. The central portion of the sample was stored in close-fitting, water-tight containers for transportation to the laboratory.

Moisture Density

The field moisture content and dry density were determined for each of the soil samples. The dry density was determined in pounds per cubic foot following ASTM 2937-17. The moisture content was determined as a percentage of the dry soil weight conforming to ASTM 2216-10. The results are presented below in the following table. The percent saturation was calculated on the basis of an estimated specific gravity. Description of earth materials used in this report and shown on the attached Plates were provided by the client.

Test Pit/Boring No.	Sample Depth (Feet)	Soil Type	Dry Density (pcf)	Moisture Content (percent)	Percent Saturation (G_s=2.65)
B3	7	Fill	97.3	10.1	38
B3	10	Alluvium	112.4	9.1	51
B3	15	Alluvium	113.9	13.6	79
B3	20	Alluvium	114.3	10.2	60
B3	25	Alluvium	121.6	11.9	88
B3	30	Alluvium	110.0	13.3	70
B3	35	Alluvium	112.2	15.7	88
B3	40	Alluvium	116.3	13.4	84
B3	45	Alluvium	119.9	12.6	88
B3	50	Alluvium	114.2	16.1	95

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(805) 370-1338 FAX (805) 371-4693

Compaction Character

Compaction tests were performed on bulk samples of the earth materials in accordance with ASTM D1557-12ei. The results of the tests are provided on the table below and on the "Moisture-Density Relationship", A-Plates. The specific gravity of the fill/alluvium was estimated from the compaction curves.

Test Pit/Boring No.	Sample Depth (Feet)	Soil Type	Maximum Dry Density (pcf)	Optimum Moisture Content (Percent)
B3	0-50	Remolded Compacted fill	122.6	12.5

Shear Strength

The peak and ultimate shear strengths of the remolded compacted fill and alluvium were determined by performing consolidated and drained direct shear tests in conformance with ASTM D3080/D3080M-11. The tests were performed in a strain-controlled machine manufactured by GeoMatic. The rate of deformation was 0.01 inches per minute. Samples were sheared under varying confining pressures, as shown on the "Shear Test Diagrams," B-Plates. Remolded samples were prepared at 90 percent of the maximum density for shear tests. The remolding procedure consists of selecting a representative sample from a bulk bag and sieving it through a No. 4 sieve. The moisture content of the material is then determined. A formula is then used to calculate the weight of the material that must fit in a ring when compacted to 90 percent of the maximum density. This calculated amount of material is then weighed out and pounded into a ring until all the material is used and the ring is full. The moisture conditions during testing are shown on the following table and on the B-Plates. The samples indicated as saturated were artificially saturated in the laboratory. All saturated samples were sheared under submerged conditions.

Test Pit/ Boring No.	Sample Depth (Feet)	Dry Density (pcf)	As-Tested Moisture Content (percent)
B3	10	112.4	20.7
B3*	0-50	110.3	20.4

* Sample remolded to 90 % of the laboratory maximum density.

Consolidation

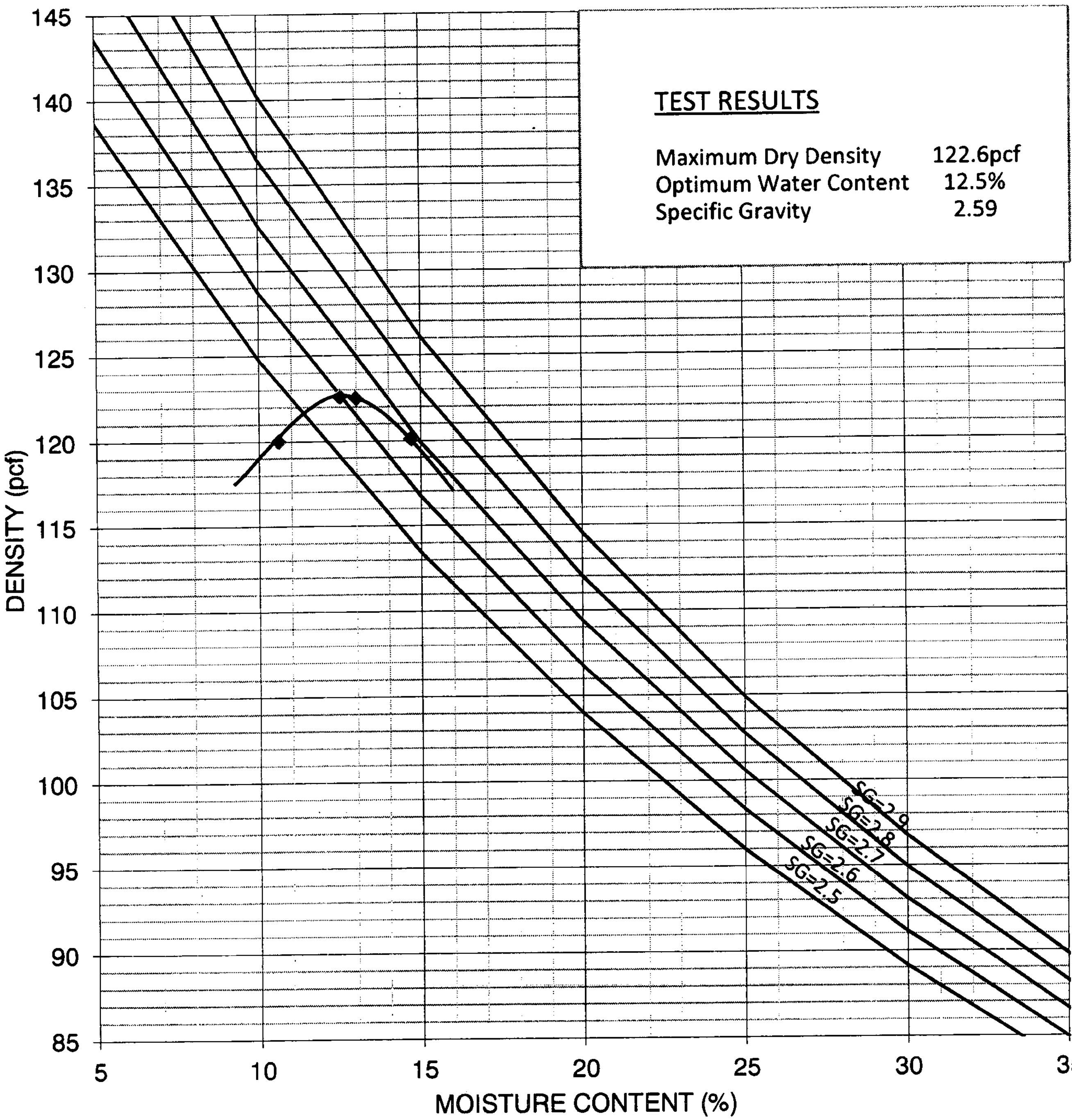
One-dimensional consolidation tests were performed on samples of the alluvium in a consolidometer manufactured by GeoMatic in conformance with ASTM D2435/D2435M-11. The tests were performed on 1-inch high samples retained in brass rings. The samples were initially loaded to approximately ½ of the field over-burden pressure and then unloaded to compensate for the effects of possible disturbance during sampling. Loads were then applied in a geometric progression and resulting deformation recorded. Water was added at a specific load to determine the effect of saturation. The results are plotted on the "Consolidation Test," C-Plates. Remolded sample was prepared at 90 percent of the maximum density for shear tests. The remolding procedure consists of selecting a representative sample from a bulk bag and sieving it through a No. 4 sieve. The moisture content of the material is then determined. A formula is then used to calculate the weight of the material that must fit in a ring when compacted to 90 percent of the maximum density. This calculated amount of material is then weighed out and pounded into a ring until all the material is used and the ring is full

SOIL LABWORKS LLC

MOISTURE-DENSITY RELATIONSHIP A-1

JN: SL15.1966 CONSULTANT: JAI
CLIENT: Feffer/Montecito AptsS-6650 W Franklin
B3 @ 0-50'
EARTH MATERIAL: Remolded Compacted Fill

NOTE: ASTM Test Method D-1557-12



TEST RESULTS

Maximum Dry Density	122.6pcf
Optimum Water Content	12.5%
Specific Gravity	2.59

1050915201742371

SHEAR DIAGRAM B-3

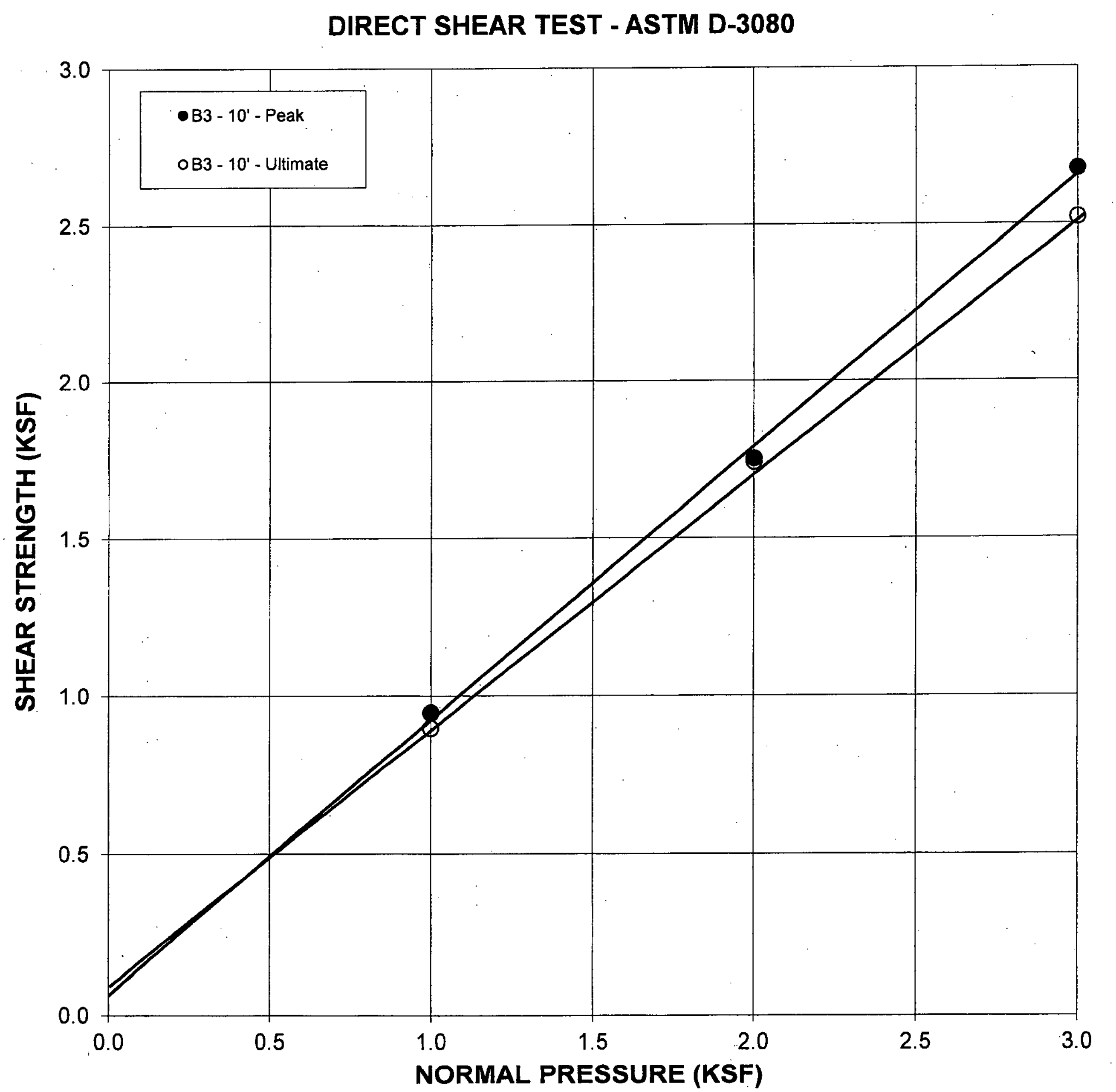
SOIL LABWORKS LLC

JN: SL15.1966 CONSULTANT JAI
CLIENT: Feffer/Montecito Apartments-6650 W Franklin

EARTH MATERIAL: ALLUVIUM

	PEAK	ULTIMATE	
Phi Angle	41	39	degrees
Cohesion	70	90	psf

Average Moisture Content	20.7%
Average Dry Density (pcf)	112.4
Percent Saturation	100.0%



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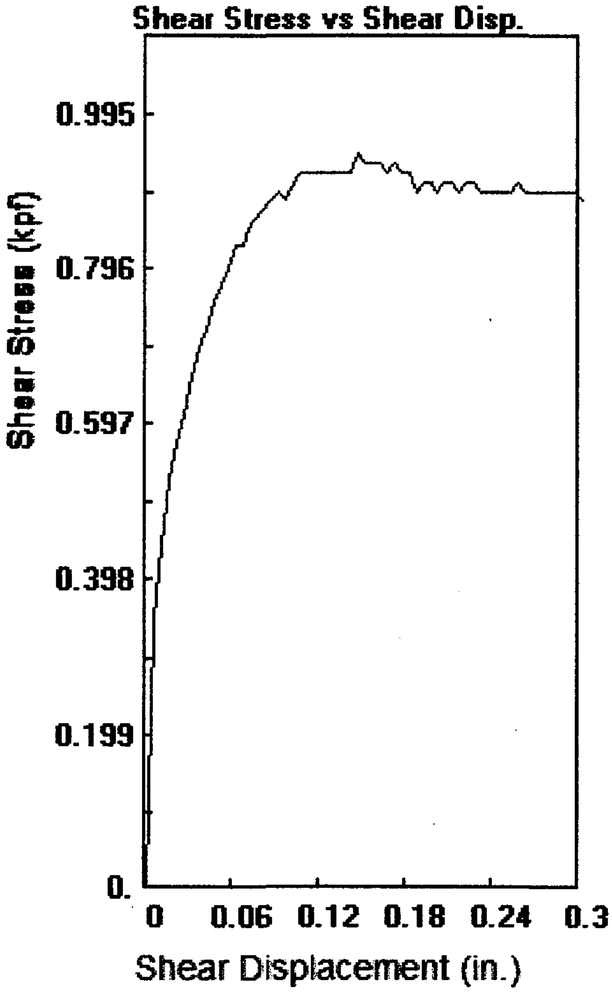
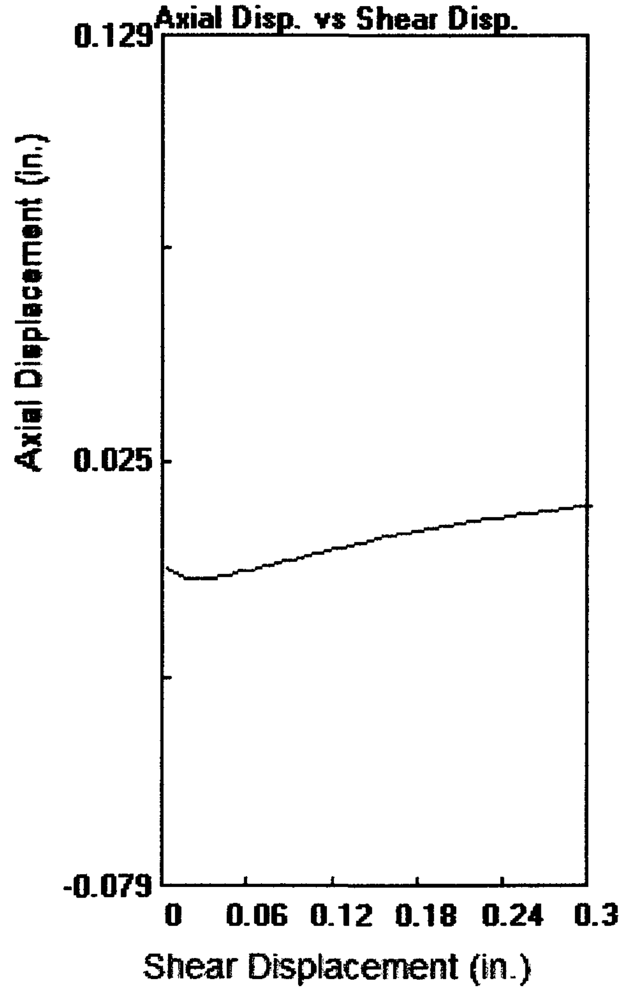




Parameters

Client: FEFFER/MONTECITO APT

Location: 6650 W FRANKLIN

Job # 1966

Soil Type:ALLUVIUM

Sample: 1

Technician: BF

Boring: B3

Axial Load: 1000 psf

Depth: 10 ft.

Shear Rate: 0.010 in./sec.

File: 1966B3101.dat

Distance: 0.30 in.

Stress at Max Def
948 0.146

Stress at Max Disp
0.296 900

Maximum Load

948 psf

Shear Displacement at maximum Load

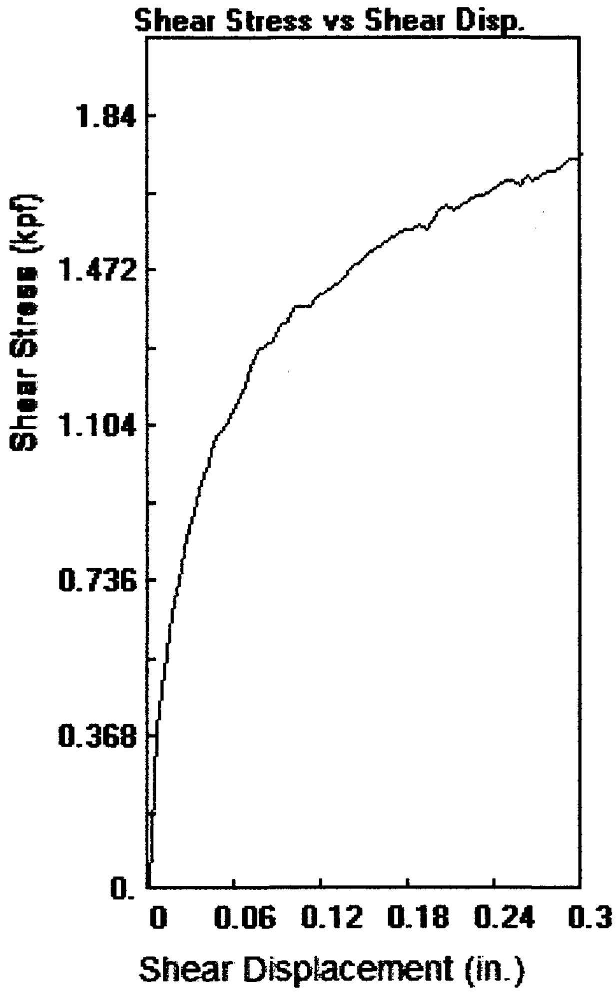
0.1456 in.

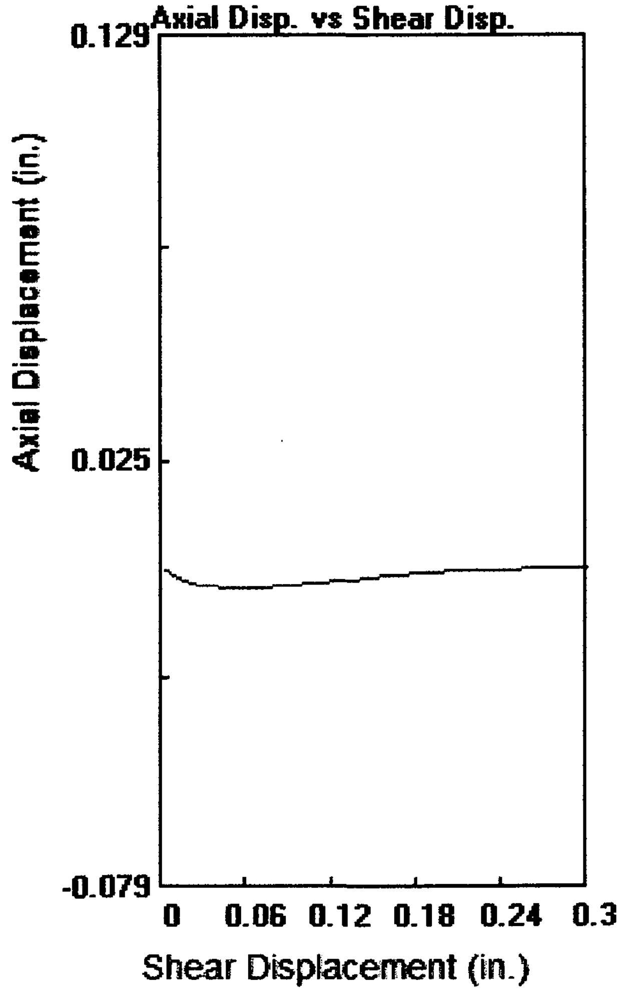
Date

6/6/2017

Robertson Geotechnical

1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1





Parameters

Client: FEFFER/MONTECITO APT

Location: 6650 W FRANKLIN

Job # 1966

Soil Type:ALLUVIUM

Sample: 2

Technician: BF

Boring: B3

Axial Load: 2000 psf

Depth: 10 ft.

Shear Rate: 0.010 in./sec.

File: 1966B3102.dat

Distance: 0.30 in.

Stress at Max Def
1752 0.3

Stress at Max Disp
0.296 1740

Maximum Load

1752 psf

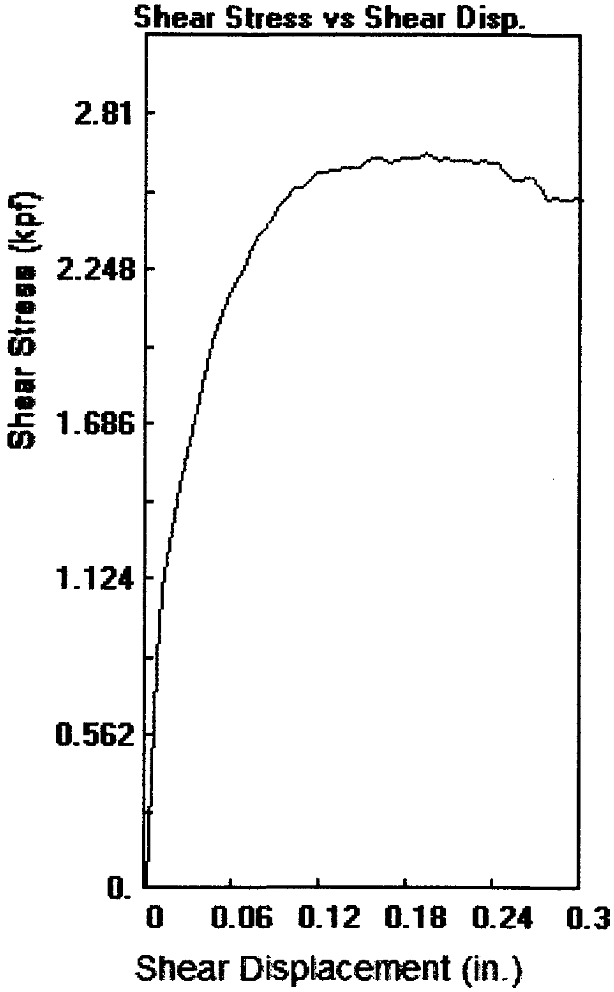
Shear Displacement at maximum Load

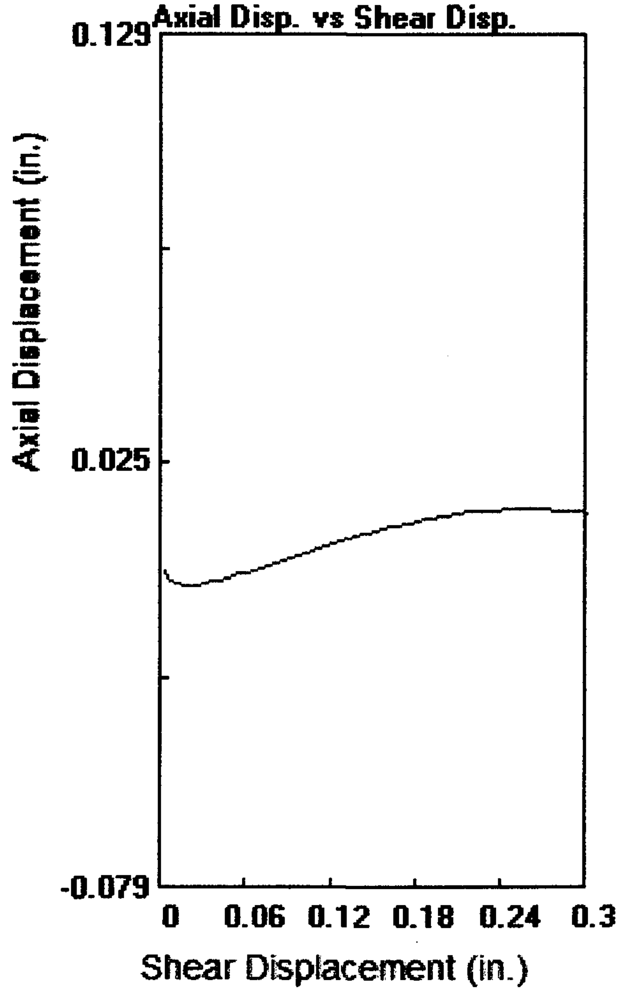
0.3004 in.

Date
6/6/2017

Robertson Geotechnical

1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1





Parameters

Client: FEFFER/MONTECITO APT

Location: 6650 W FRANKLIN

Job # 1966

Soil Type:ALLUVIUM

Sample: 3

Technician: BF

Boring: B3

Axial Load: 3000 psf

Depth: 10 ft.

Shear Rate: 0.010 in./sec.

File: 1966B3103.dat

Distance: 0.30 in.

Stress at Max Def
2676 0.191

Stress at Max Disp
0.296 2520

Maximum Load

2676 psf

Shear Displacement at maximum Load

0.1907 in.

Date

6/6/2017

Robertson Geotechnical

1050915201742371

SHEAR DIAGRAM B-4

SOIL LABWORKS LLC

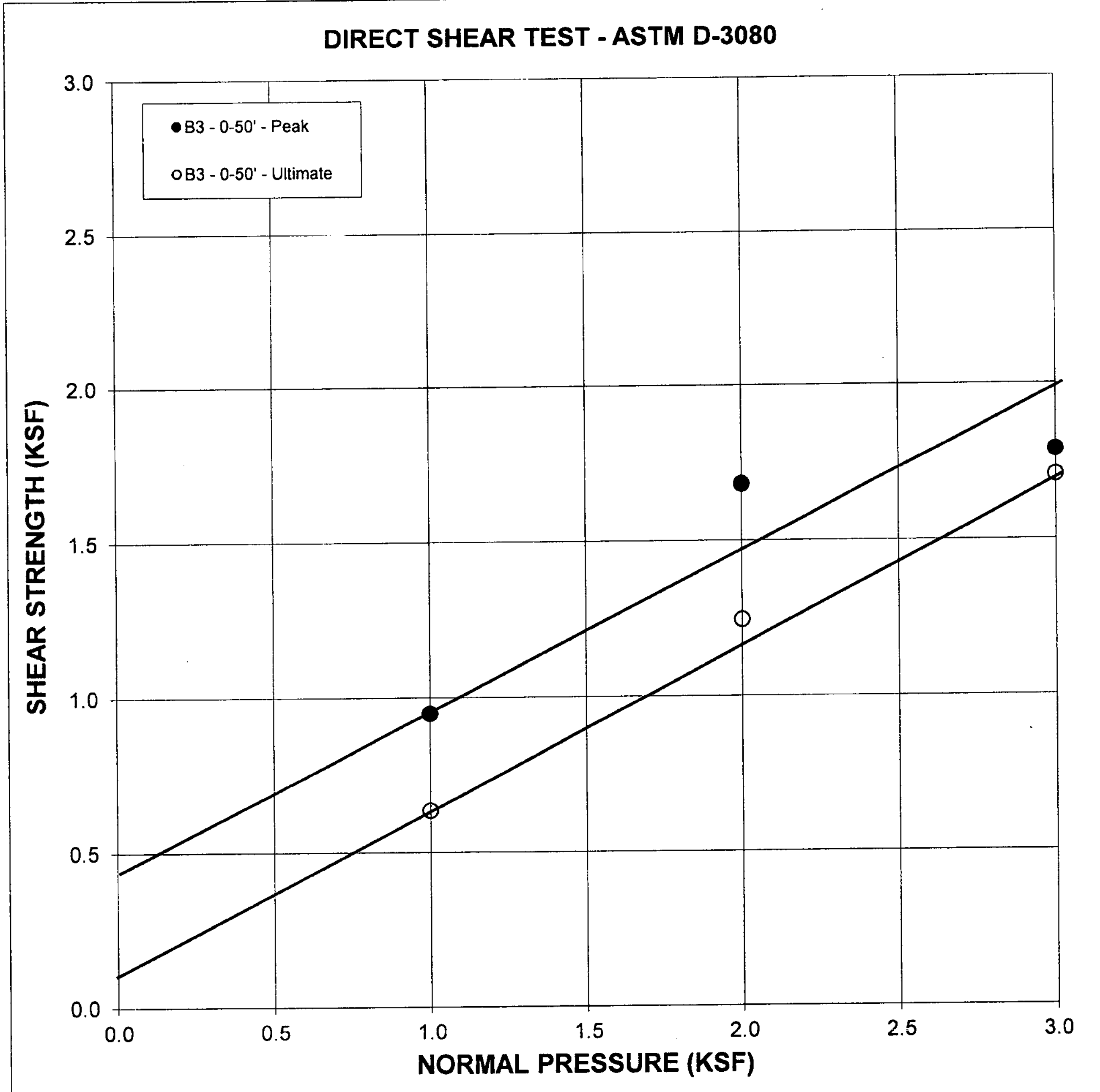
JN: SL15.1966 CONSULTANT JAI
CLIENT: Feffer/Montecito Apartments-6650 W Franklin

EARTH MATERIAL: REMOLDED COMPACTED FILL

Sample remolded to 90 % of the laboratory maximum density

	PEAK	ULTIMATE	
Phi Angle	27	27.5	degrees
Cohesion	430	105	psf

Average Moisture Content	20.4%
Average Dry Density (pcf)	110.3
Percent Saturation	100.0%



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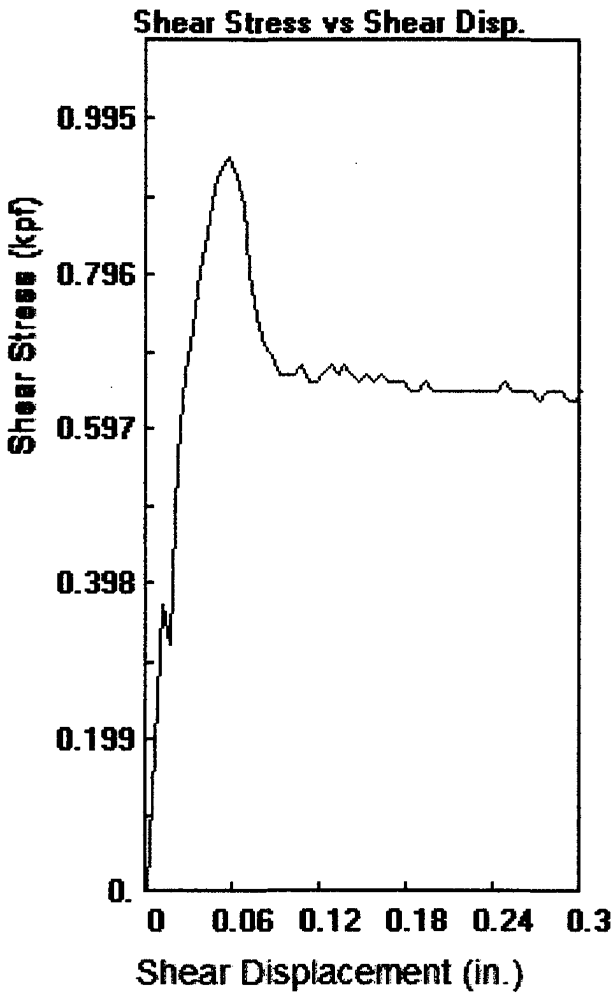
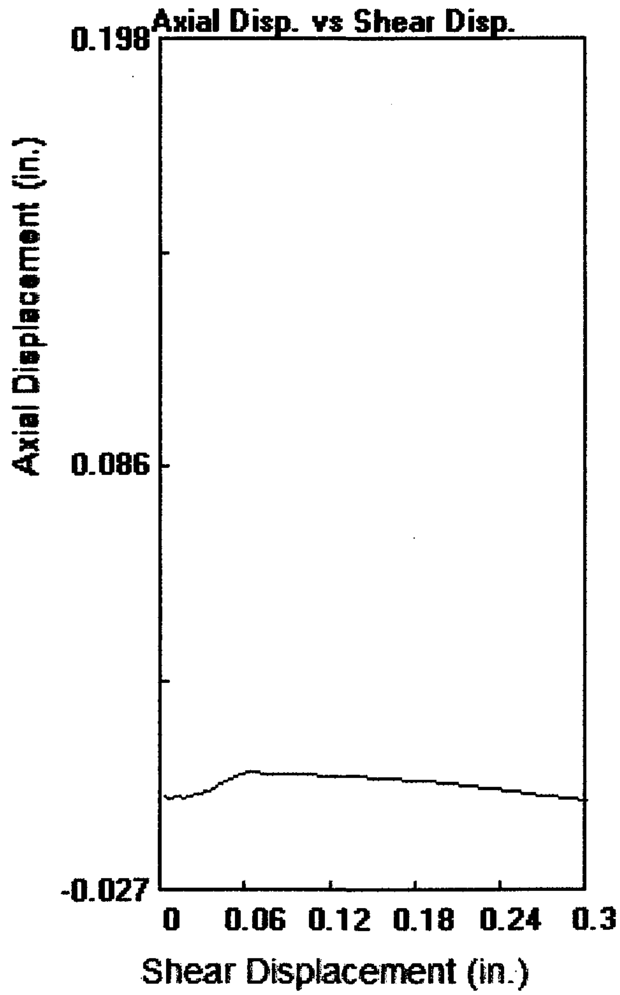




Parameters

Client: FEFFER/MONTECITO APTS

Location: 6650 W FRANKLLIN

Job # 1966

Sample: 1

Boring: B3

Depth: 0-50 ft.

File: 1966B30-501 RMLD.dat

Stress at Max Def
948 0.056

Soil Type:FILL/ALLUVIUM

Technician: BF

Axial Load: 1000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 636

Maximum Load

948 psf

Shear Displacement at maximum Load

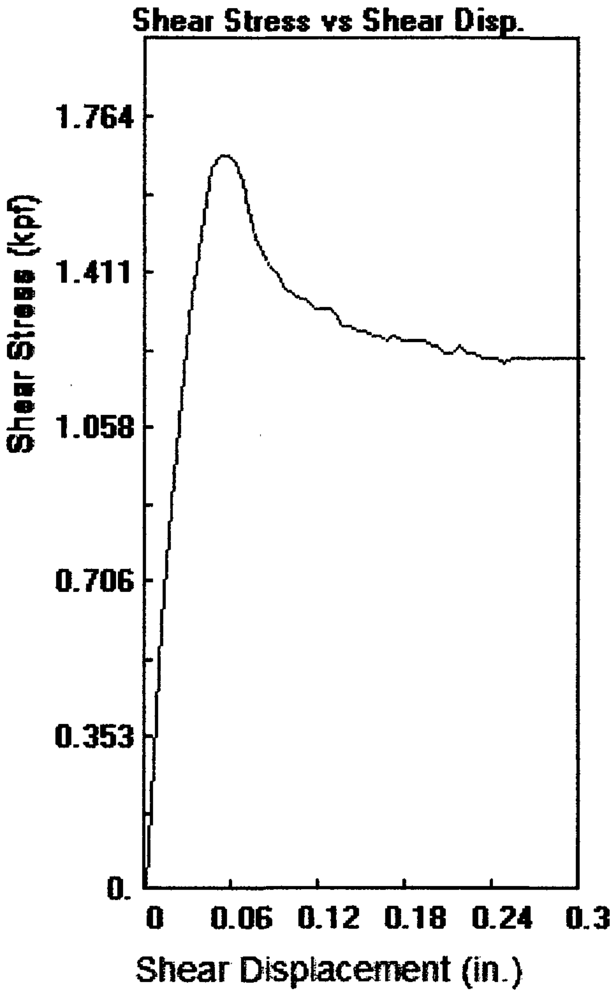
0.0556 in.

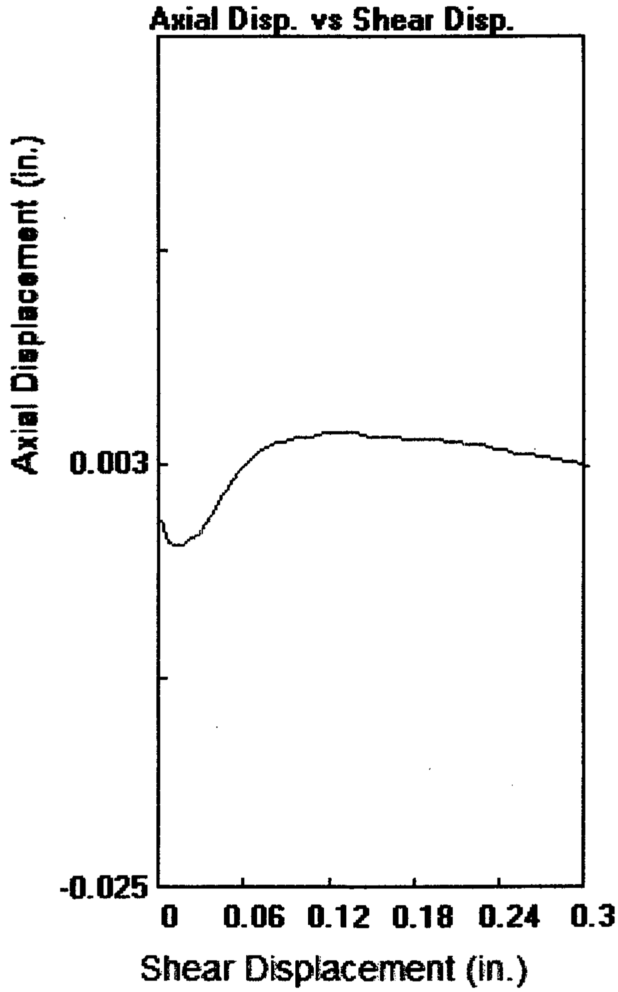
Date

6/16/2017

Soil Labworks

1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1





Parameters

Client: FEFFER/MONTECITO

Location: 6650 W FRANKLIN

Job # 1966

Sample: 2

Boring: B3

Depth: 0-50 ft.

File: 1966B30-502 RMLD.dat

Stress at Max Def
1680 0.051

Soil Type:FILL/ALLUVIUM

Technician: BF

Axial Load: 2000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 1224

Maximum Load

1680 psf

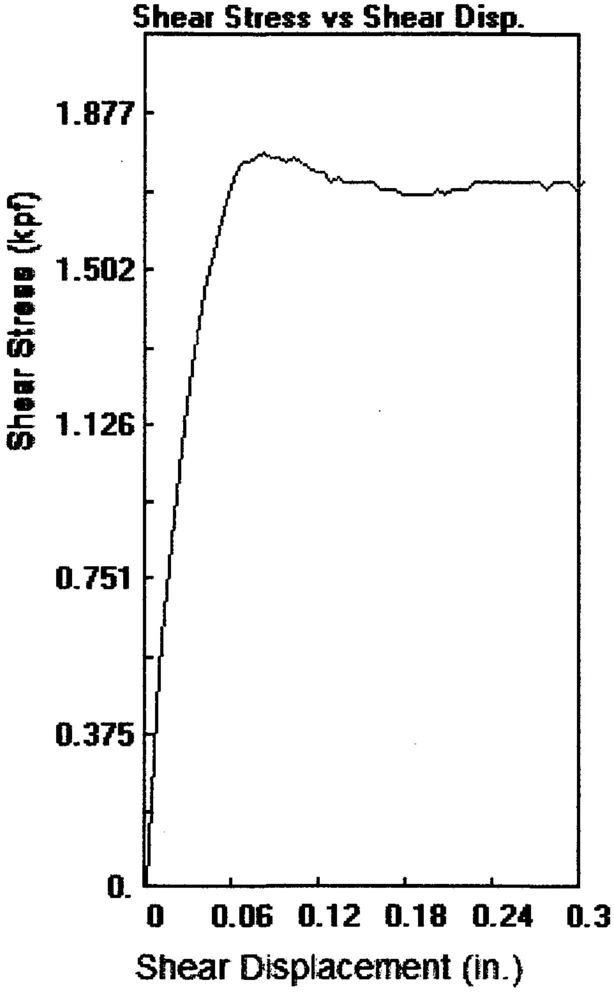
Shear Displacement at maximum Load

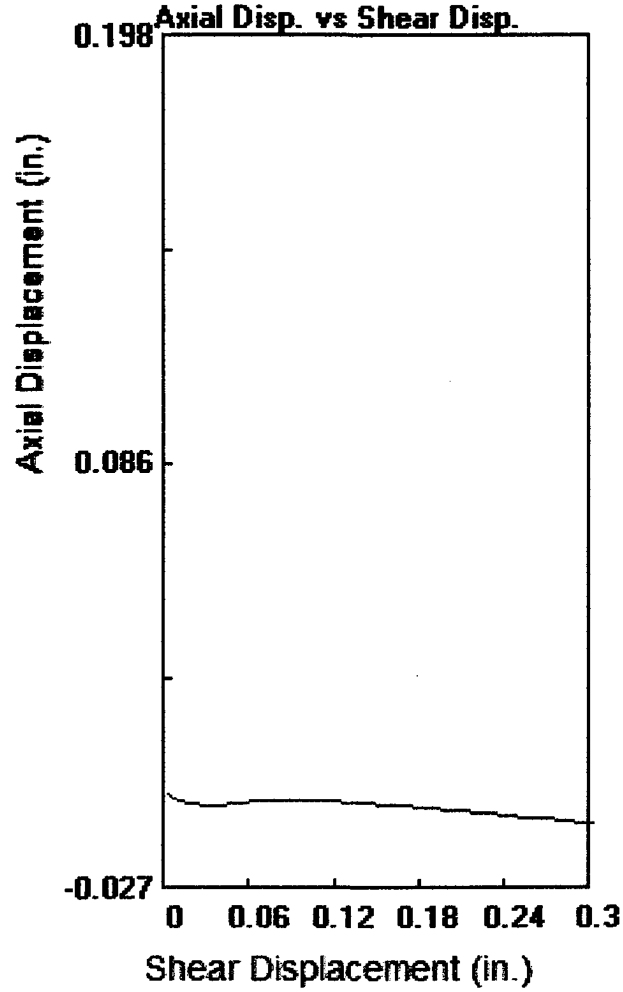
0.0506 in.

Date
6/16/2017

Robertson Geotechnical

1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1





Parameters

Client: FEFFER/MONTECITO APTS

Location: 6650 W FRANKLLIN

Job # 1966

Sample: 3.

Boring: B3

Depth: 0-50 ft.

File: 1966B30-503 RMLD.dat

Stress at Max Def
1788 0.081

Soil Type:FILL/ALLUVIUM

Technician: BF

Axial Load: 3000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 1704

Maximum Load

1788 psf

Shear Displacement at maximum Load

0.0807 in.

Date

6/16/2017

Soil Labworks

SHEAR DIAGRAM B-5

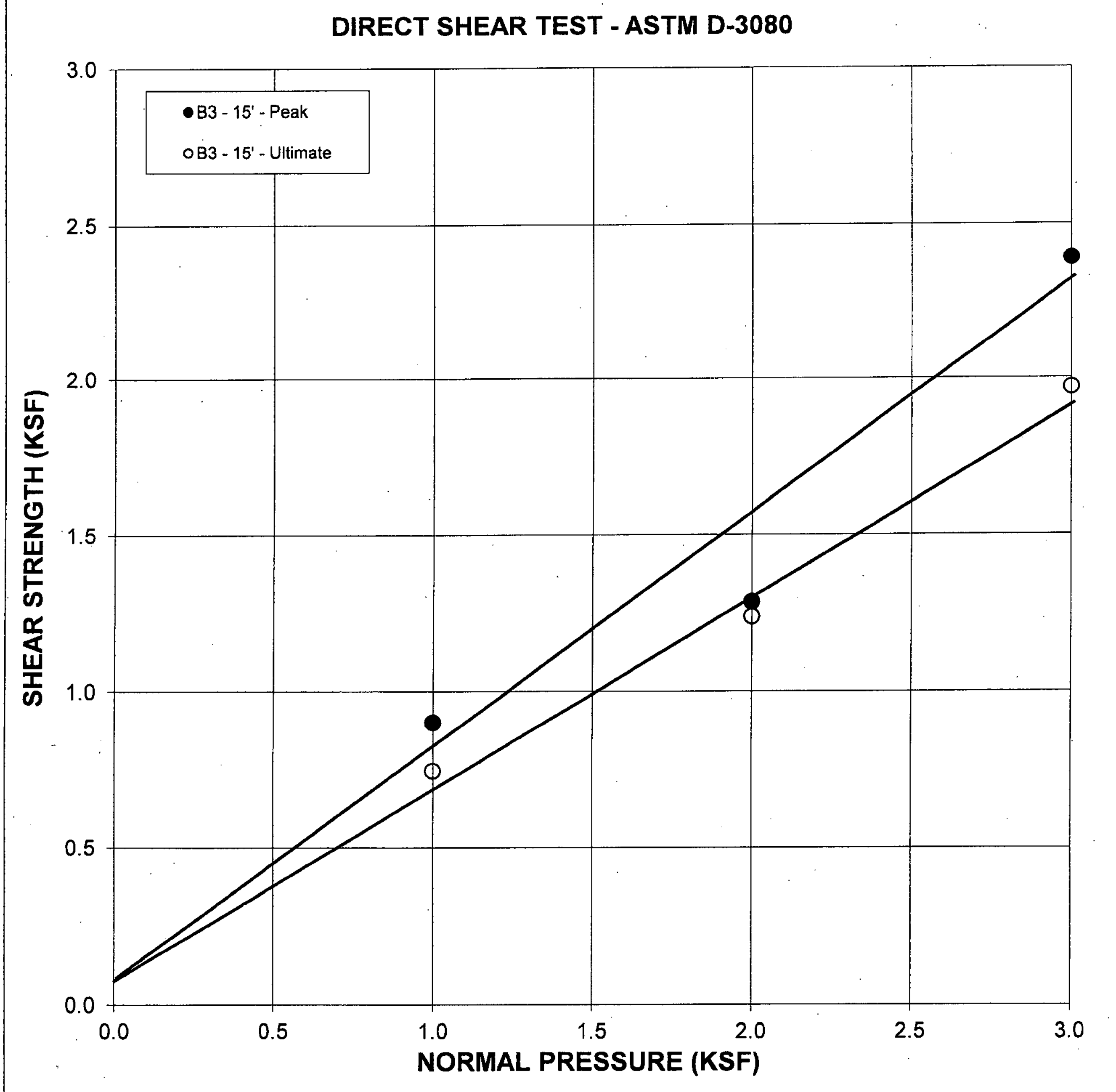
SOIL LABWORKS LLC

JN: SL15.1966 CONSULTANT JAI
CLIENT: Feffer/Montecito Apts-6650 W Franklin

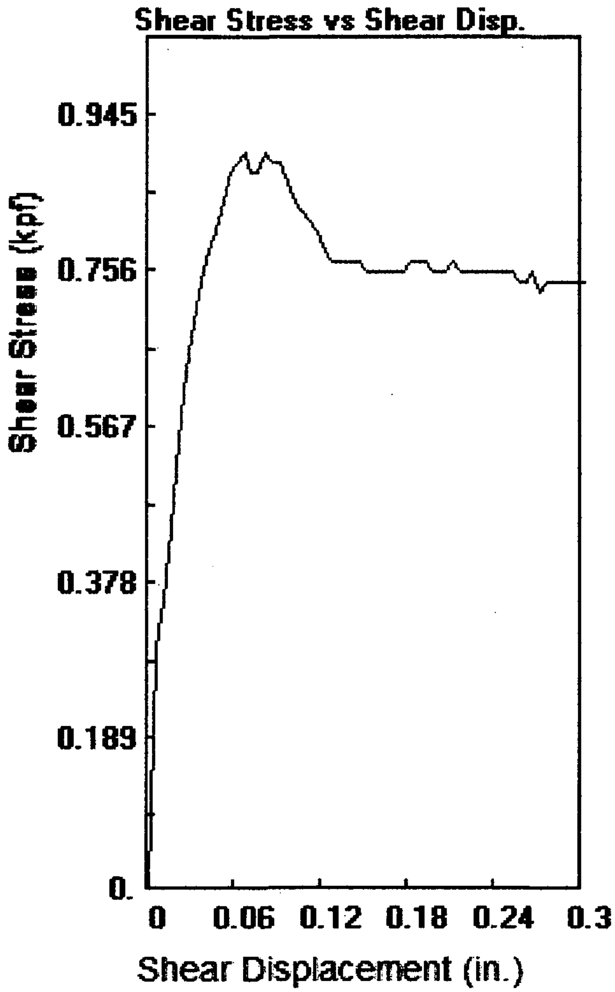
EARTH MATERIAL: ALLUVIUM

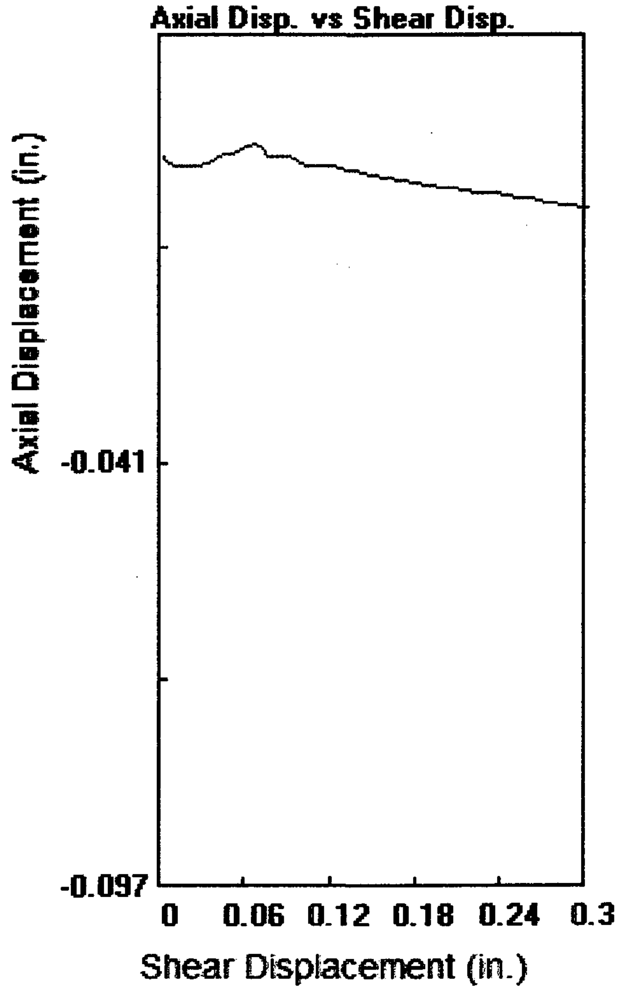
	PEAK	ULTIMATE	
Phi Angle	36.5	31	degrees
Cohesion	75	75	psf

Average Moisture Content	23.7%
Average Dry Density (pcf)	113.9
Percent Saturation	100.0%



1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1





Parameters

Client: FEFFER/MONTECITO APTS

Location: 6650 W FRANKLIN

Job # 1966

Soil Type:ALLUVIUM

Sample: 1

Technician: BF

Boring: B3

Axial Load: 1000 psf

Depth: 15 ft.

Shear Rate: 0.010 in./sec.

File: 1966B3151.dat

Distance: 0.30 in.

Stress at Max Def
900 0.066

Stress at Max Disp
0.296 744

Maximum Load

900 psf

Shear Displacement at maximum Load

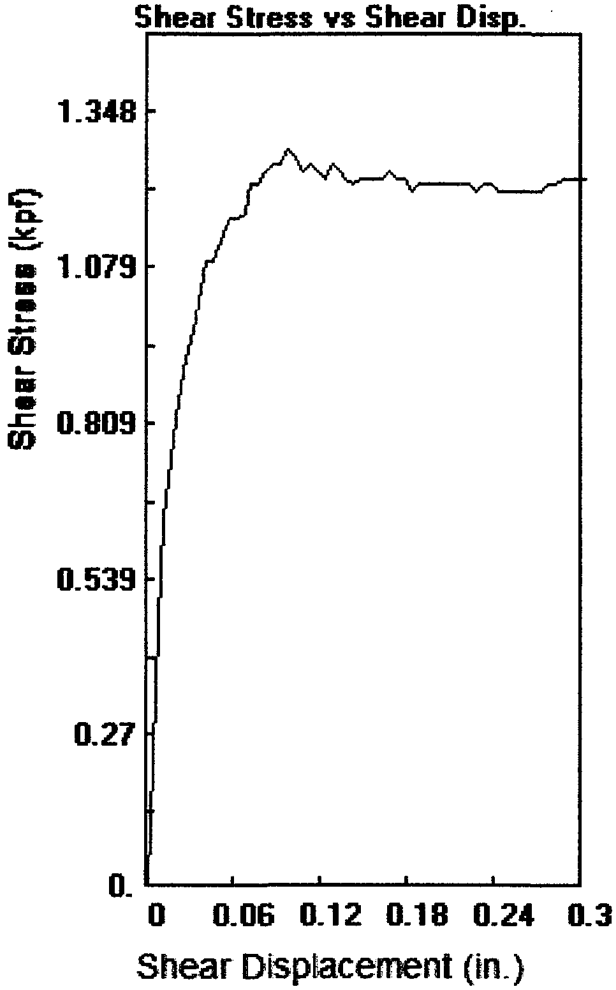
0.0656 in.

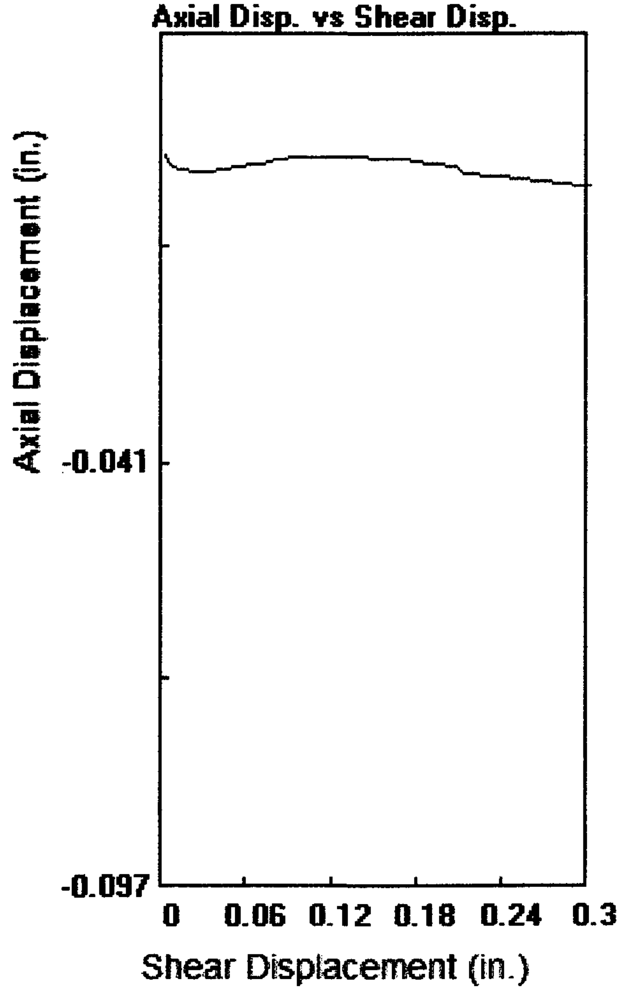
Date

6/30/2017

Robertson Geotechnical

1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1





Parameters

Client: FEFFER/MONTECITO APTS

Location: 6650 W FRANKLIN

Job # 1966

Soil Type:ALLUVIUM

Sample: 2

Technician: BF

Boring: B3

Axial Load: 2000 psf

Depth: 15 ft.

Shear Rate: 0.010 in./sec.

File: 1966B3152.dat

Distance: 0.30 in.

Stress at Max Def
1284 0.096

Stress at Max Disp
0.296 1236

Maximum Load

1284 psf

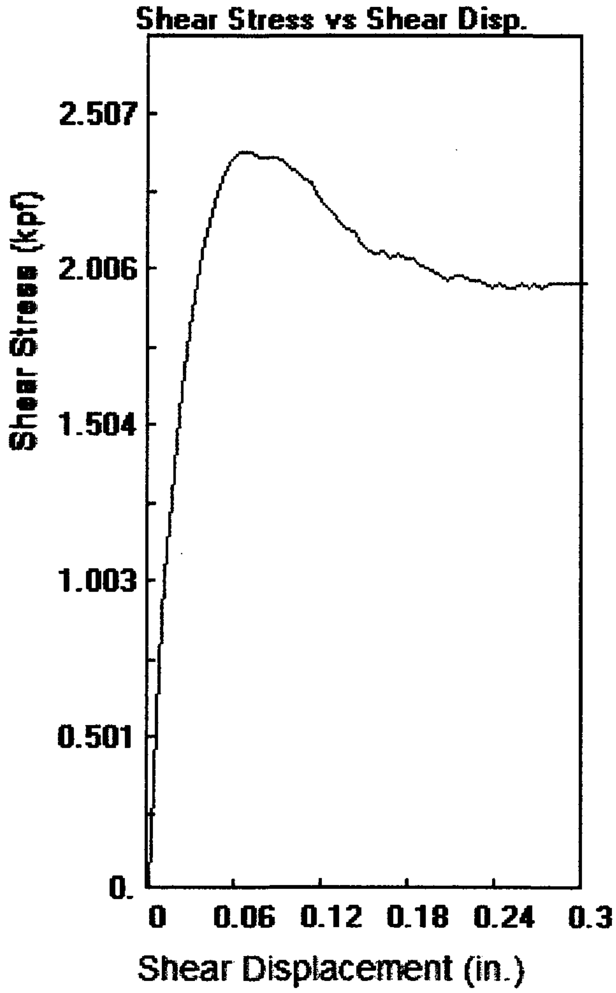
Shear Displacement at maximum Load

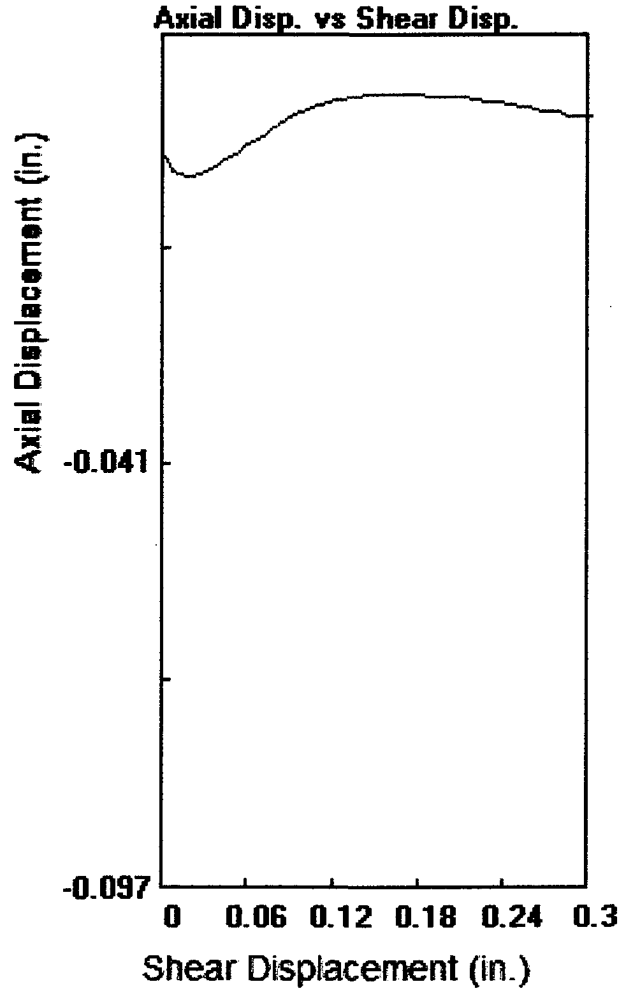
0.0955 in.

Date

6/30/2017

Robertson Geotechnical





Parameters

Client: FEFFER/MONTECITO APTS

Location: 6650 W FRANKLIN

Job # 1966

Sample: 3

Boring: B3

Depth: 15 ft.

File: 1966B3153.dat

Stress at Max Def
2388 0.061

Soil Type:ALLUVIUM

Technician: BF

Axial Load: 3000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 1968

Maximum Load

2388 psf

Shear Displacement at maximum Load

0.0606 in.

Date
6/30/2017

Robertson Geotechnical

1050915201742371

SOIL LABWORKS LLC

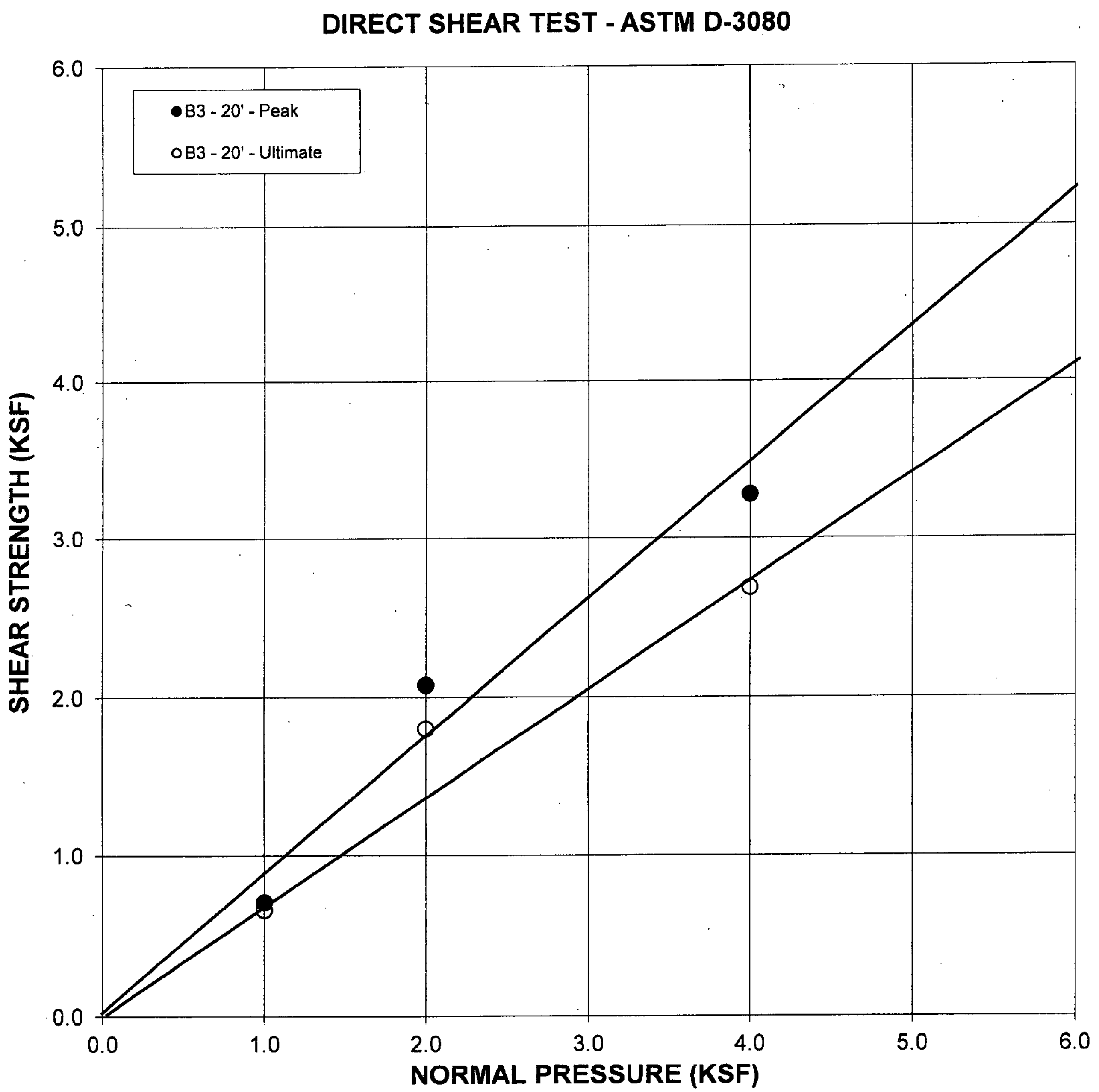
SHEAR DIAGRAM B-6

JN: SL15.1966 CONSULTANT JAI
CLIENT: Feffer/Montecito Apts-6650 W Franklin

EARTH MATERIAL: ALLUVIUM

	PEAK	ULTIMATE	
Phi Angle	40.5	34	degrees
Cohesion	15	5	psf

Average Moisture Content	21.7%
Average Dry Density (pcf)	114.3
Percent Saturation	100.0%



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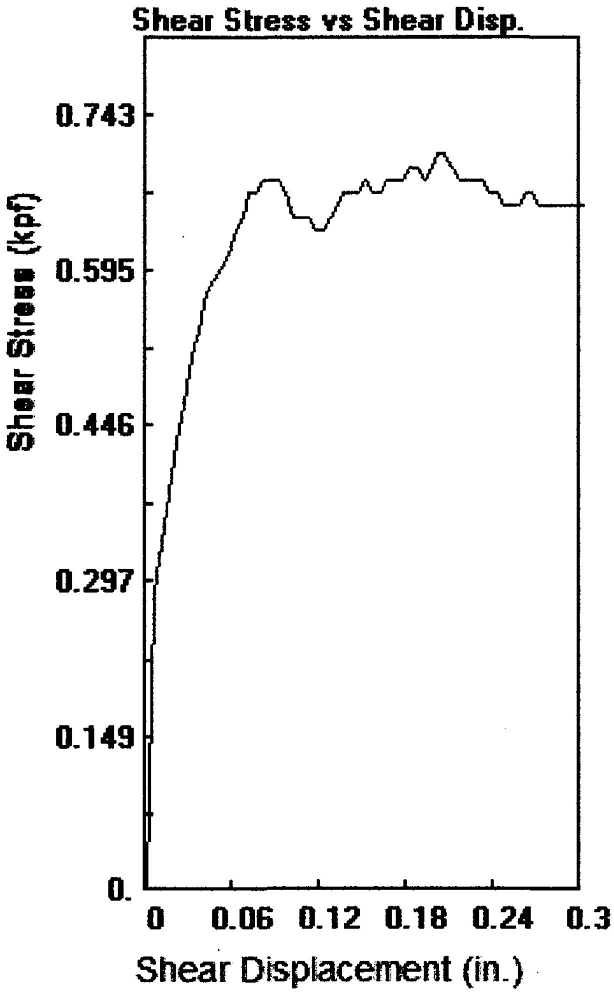
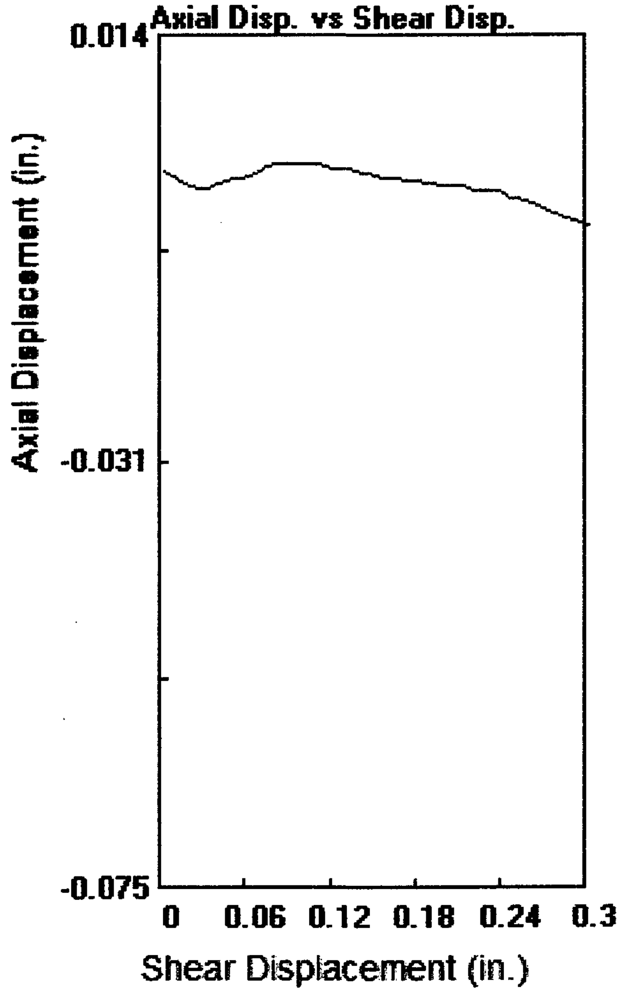




Parameters

Client: FEFFER/MONTECITO APTS

Location: 6650 W FRANKLIN

Job # 1966

Sample: 1

Boring: B3

Depth: 20 ft.

File: 1966B3201.dat

Stress at Max Def
708 0.201

Soil Type:ALLUVIUM

Technician: BF

Axial Load: 1000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 660

Maximum Load

708 psf

Shear Displacement at maximum Load

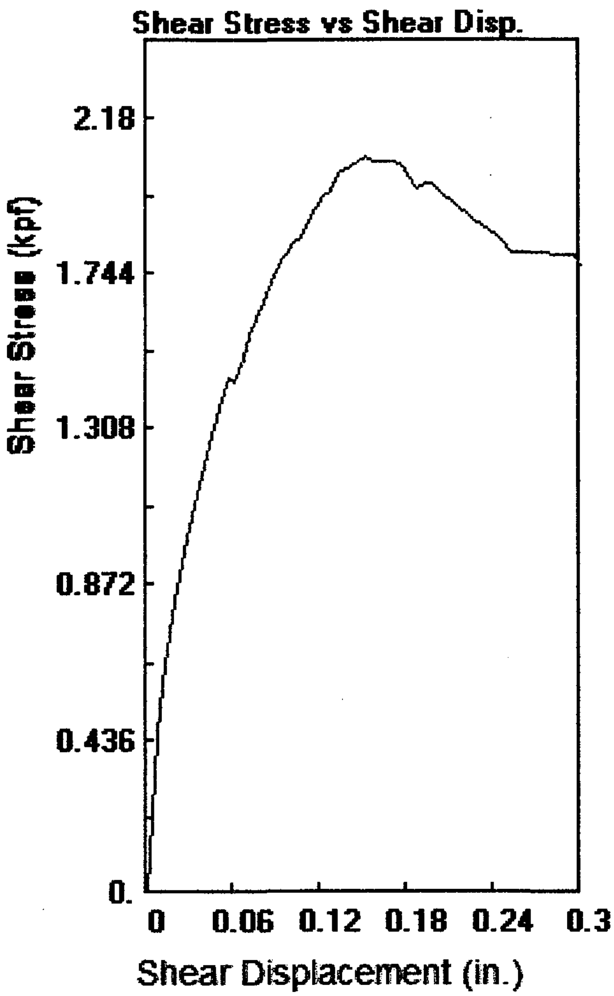
0.2005 in.

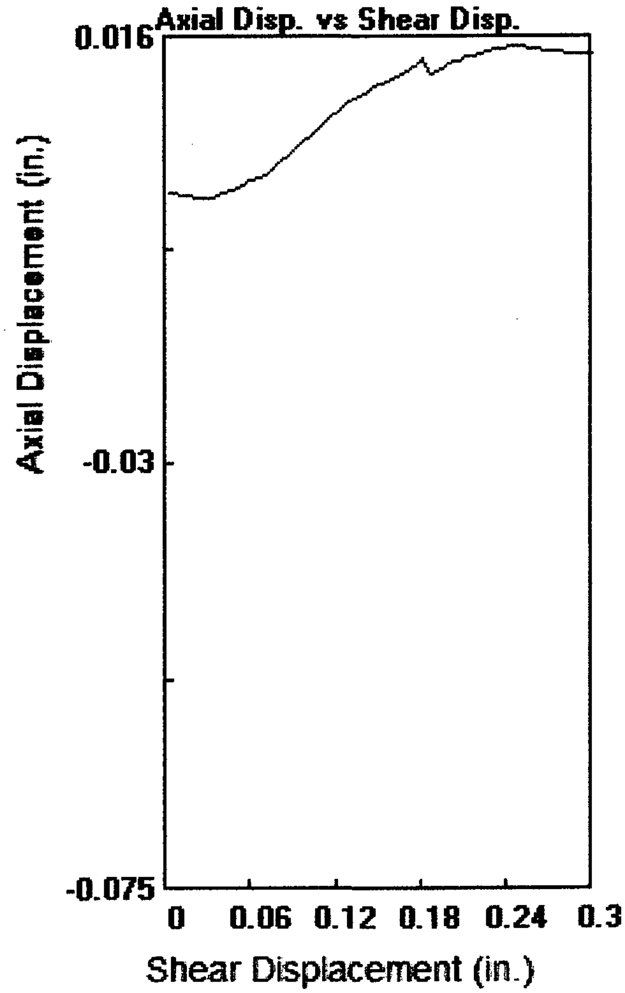
Date

6/30/2017

Soil Labworks

1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1





Parameters

Client: FEFFER/MONTECITO APTS

Location: 6650 W FRANKLIN

Job # 1966	Soil Type:ALLUVIUM
Sample: 2	Technician: BF
Boring: B3	Axial Load: 2000 psf
Depth: 20 ft.	Shear Rate: 0.010 in./sec.
File: 1966B3202.dat	Distance: 0.30 in.
Stress at Max Def 2076 0.151	Stress at Max Disp 0.296 1800

Maximum Load

2076 psf

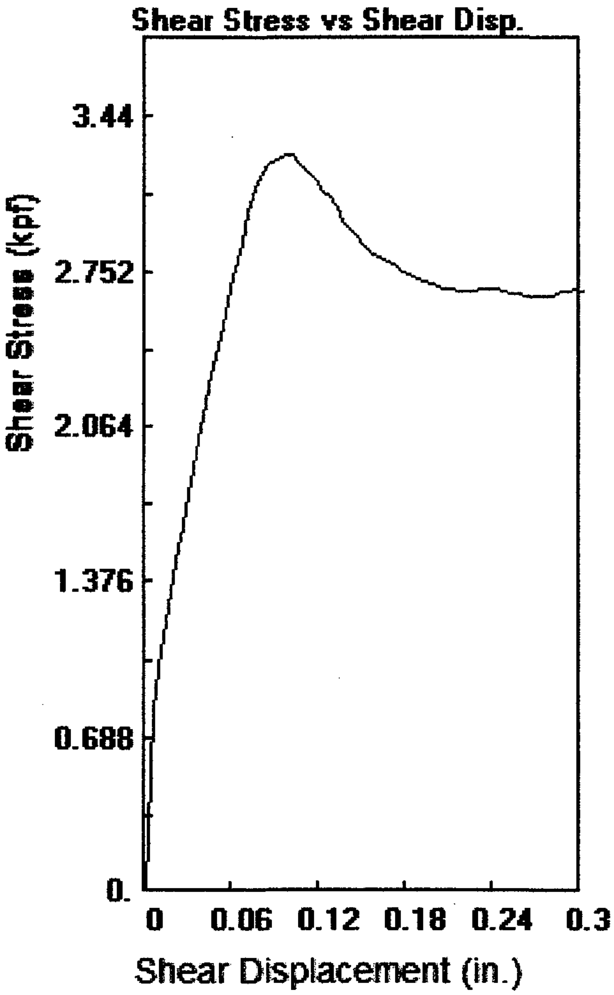
Shear Displacement at maximum Load

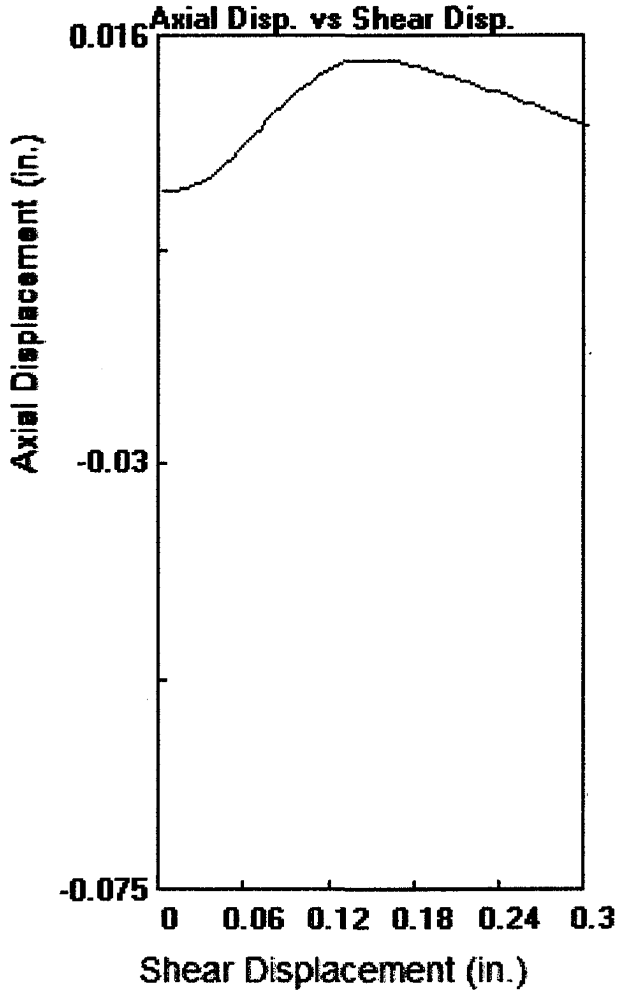
0.1507 in.

Date

6/30/2017

Soil Labworks





Parameters

Client: FEFFER/MONTECITO APTS

Location: 6650 W FRANKLIN

Job # 1966

Sample: 3

Boring: B3

Depth: 20 ft.

File: 1966B3204.dat

Stress at Max Def
3276 0.096

Soil Type:ALLUVIUM

Technician: BF

Axial Load: 4000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 2688

Maximum Load

3276 psf

Shear Displacement at maximum Load

0.0956 in.

Date

6/30/2017

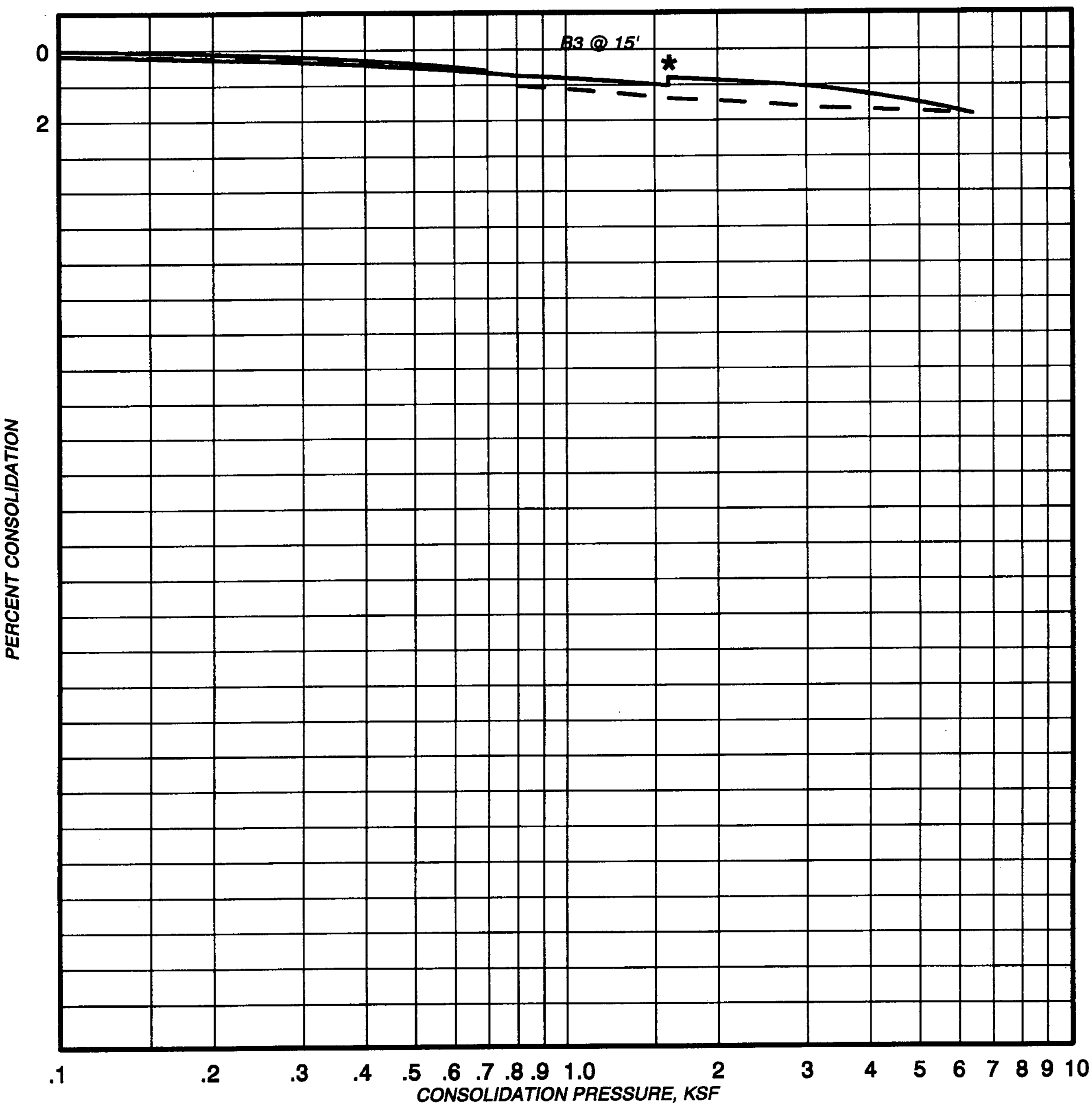
Soil Labworks

1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1

CONSOLIDATION TEST

PROJECT: 1966 FEFFER MONTECITO APARTMENTS-6650 W FRANKLIN
SAMPLE: B3 @ 15'

ALLUVIUM



* Water Added

PLATE:

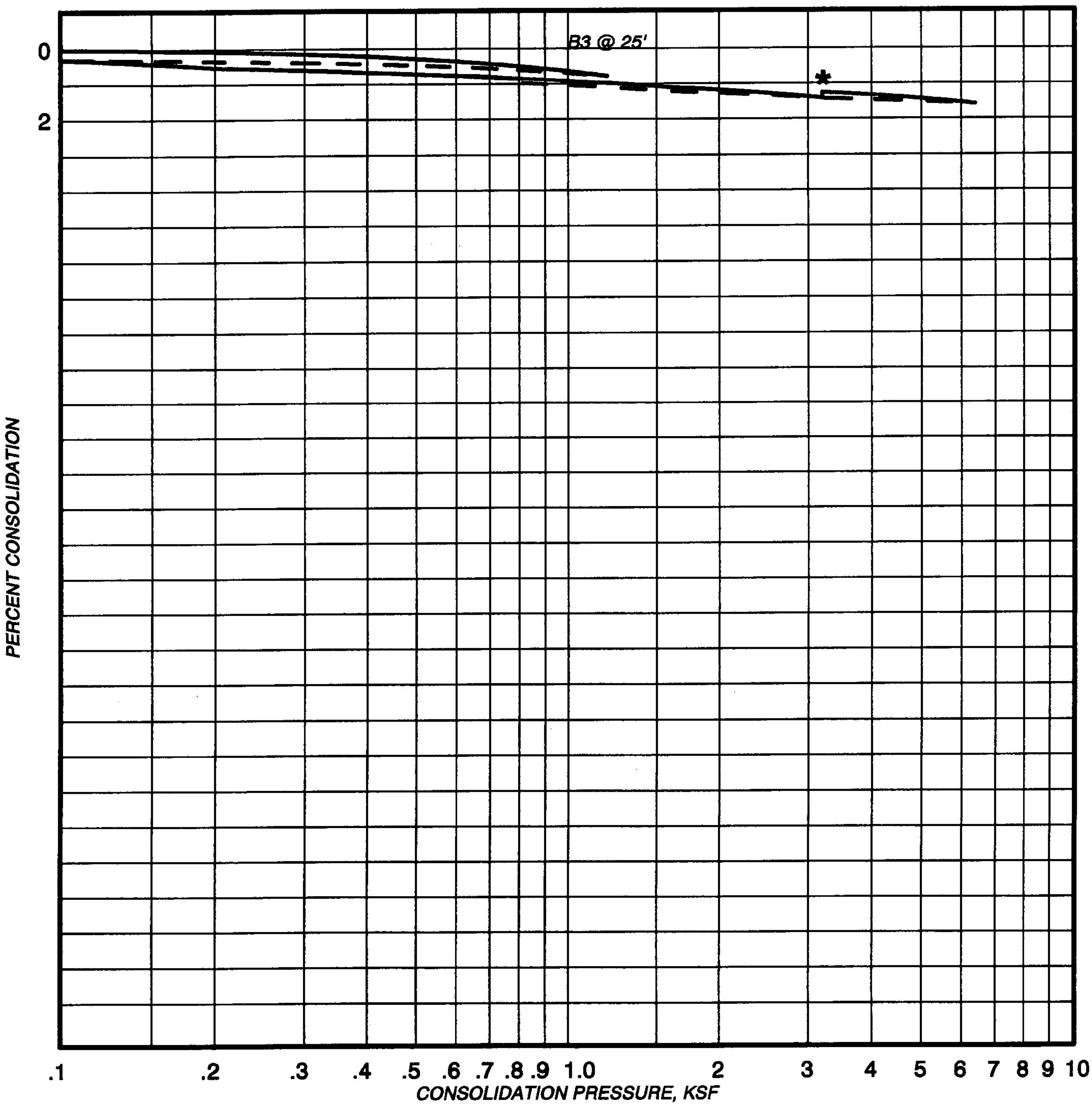
1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1

CONSOLIDATION TEST

PROJECT: 1966 FEFFER MONTECITO APARTMENTS-6650 W FRANKLIN

SAMPLE: B3 @ 25'

ALLUVIUM



* Water Added

PLATE:

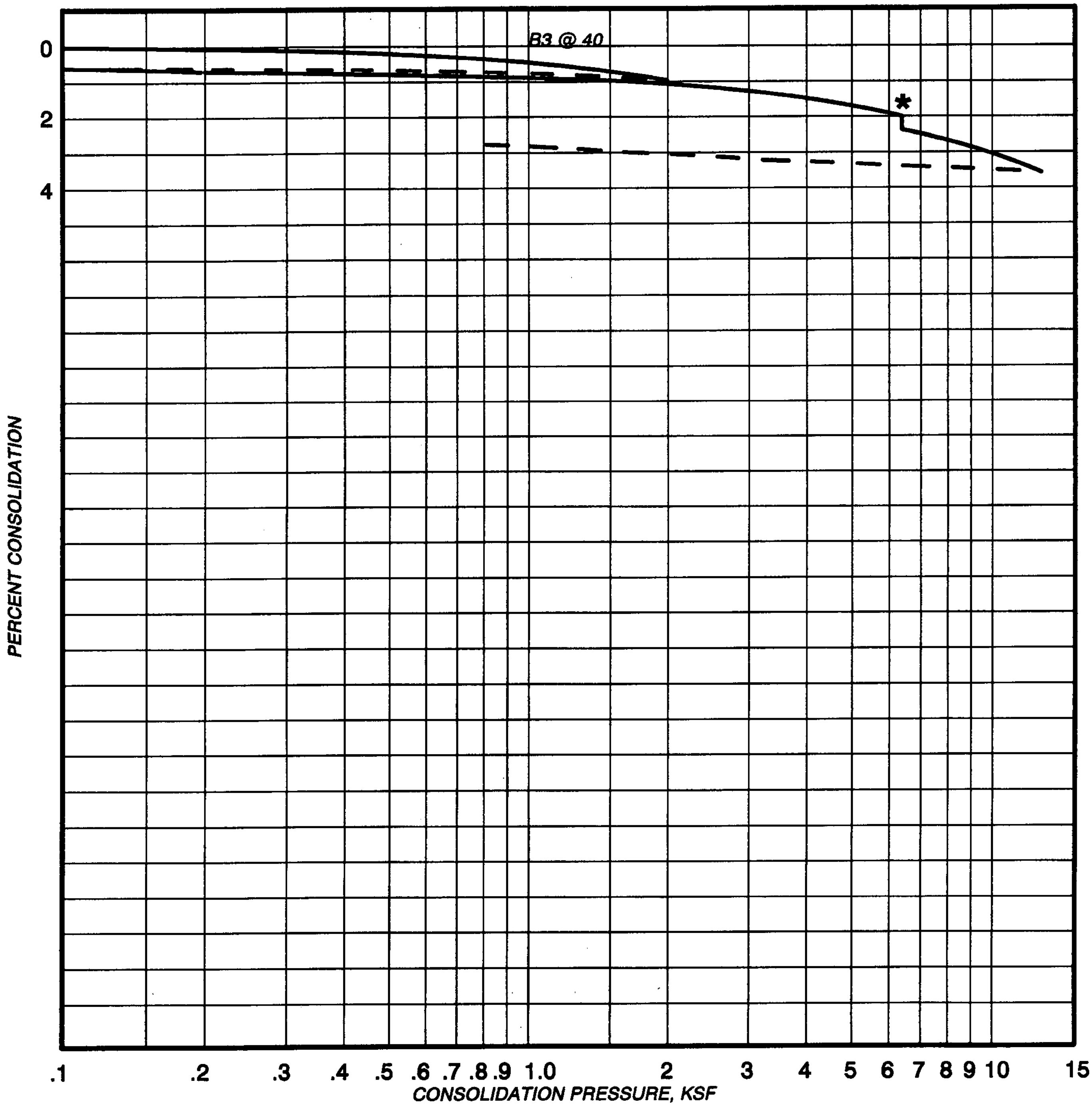
1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1

CONSOLIDATION TEST

PROJECT: 1966 FEFFER MONTECITO APARTMENTS-6650 W FRANKLIN

SAMPLE: B3 @ 40

ALLUVIUM



* Water Added

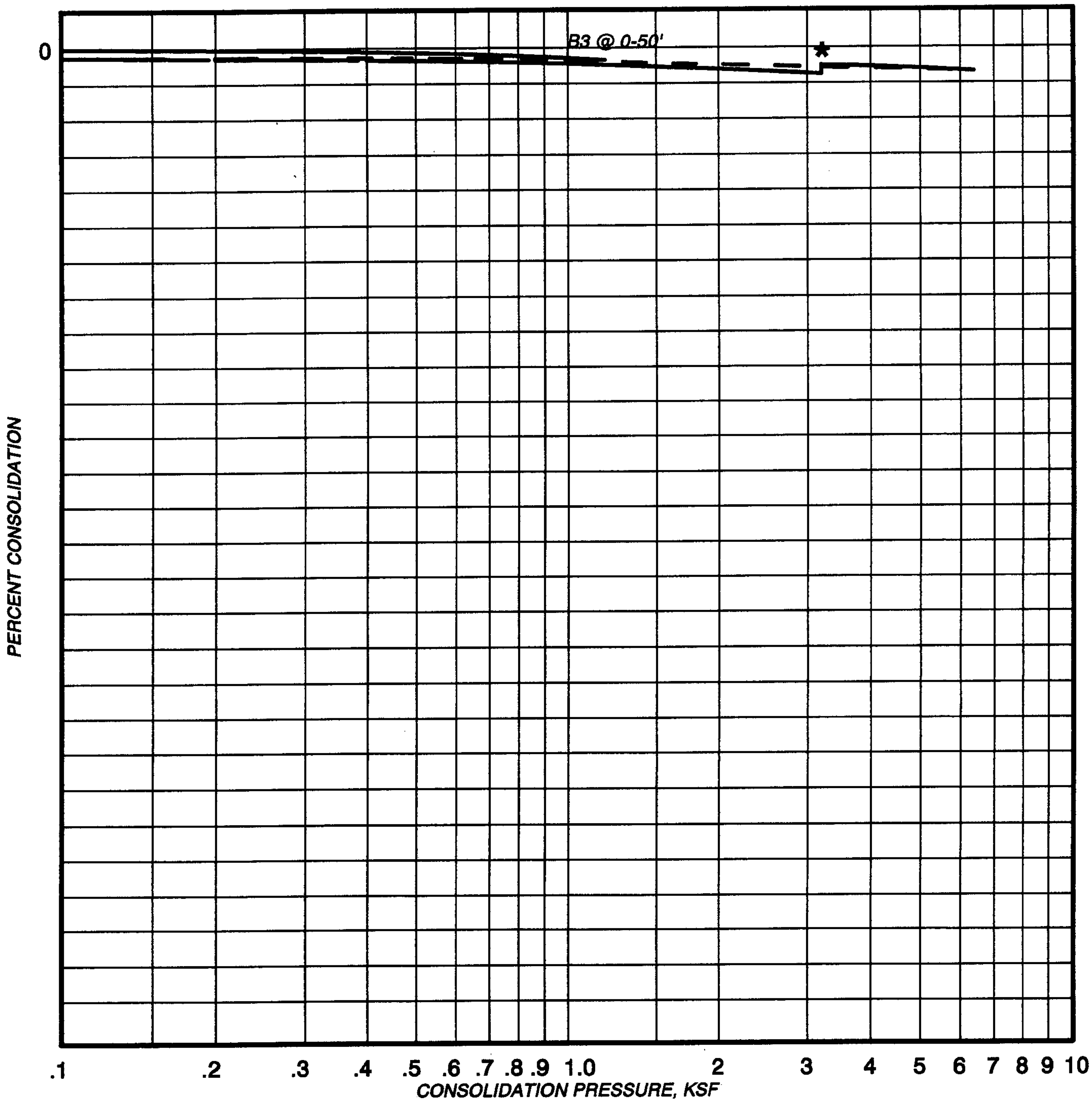
PLATE:

CONSOLIDATION TEST

PROJECT: 1966 FEFFER MONTECITO APARTMENTS-6650 W FRANKLIN - REMOLDED TO 90% MAX DENSITY

SAMPLE: B3 @ 0-50'

FILL/ALLUVIUM



* Water Added

PLATE:

1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1

APPENDIX 'C'

Site Plan
&
Cross Sections

GRADING
OVERSIZE DOCUMENT

To view the Grading
oversize document for:

Tract: Hollywood Ocean View Tract (MP 1-62)
Block: 2 Lot: 11(Arb. 1-4) & 12(Arb. 1)
Job Address: 6650 & 6668 W. Franklin Ave. & 1855 N. Cherokee Ave.
X-Ref: 2x Date: 7-6-17

Look for the document type called "Grading Oversize Document" dated 7-6-17 from the Document Type list in IDIS Retrieval; copy the corresponding Reel/Batch/Doc numbers (document location on microfilm); and request assistance from the Records Counter staff to view the film and/or print a copy of the images.

1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1

SHEET 1 OF 2 SHEETS

HUD Project Name: Montecito Apartments
HUD Project Number: 122-11360
HUD Project Location: Los Angeles, California

Date of Survey Map / Plat:

Date of Field Survey:

Address:

Adjoining Addresses:

Assessor's Parcel Number (A.P.N.):

General:

Bench Mark:

Basis of Bearings:

Boundary:

Area:

Flood Zone:

Zoning Information:

Total Existing Parking:

Existing Upper Garage Parking:

Existing Lower Garage Parking:

Existing Ground Level Parking:

Utilities:

Proforma ALTA Policy Report (PROFORMA):

Legal Description Per PROFORMA:

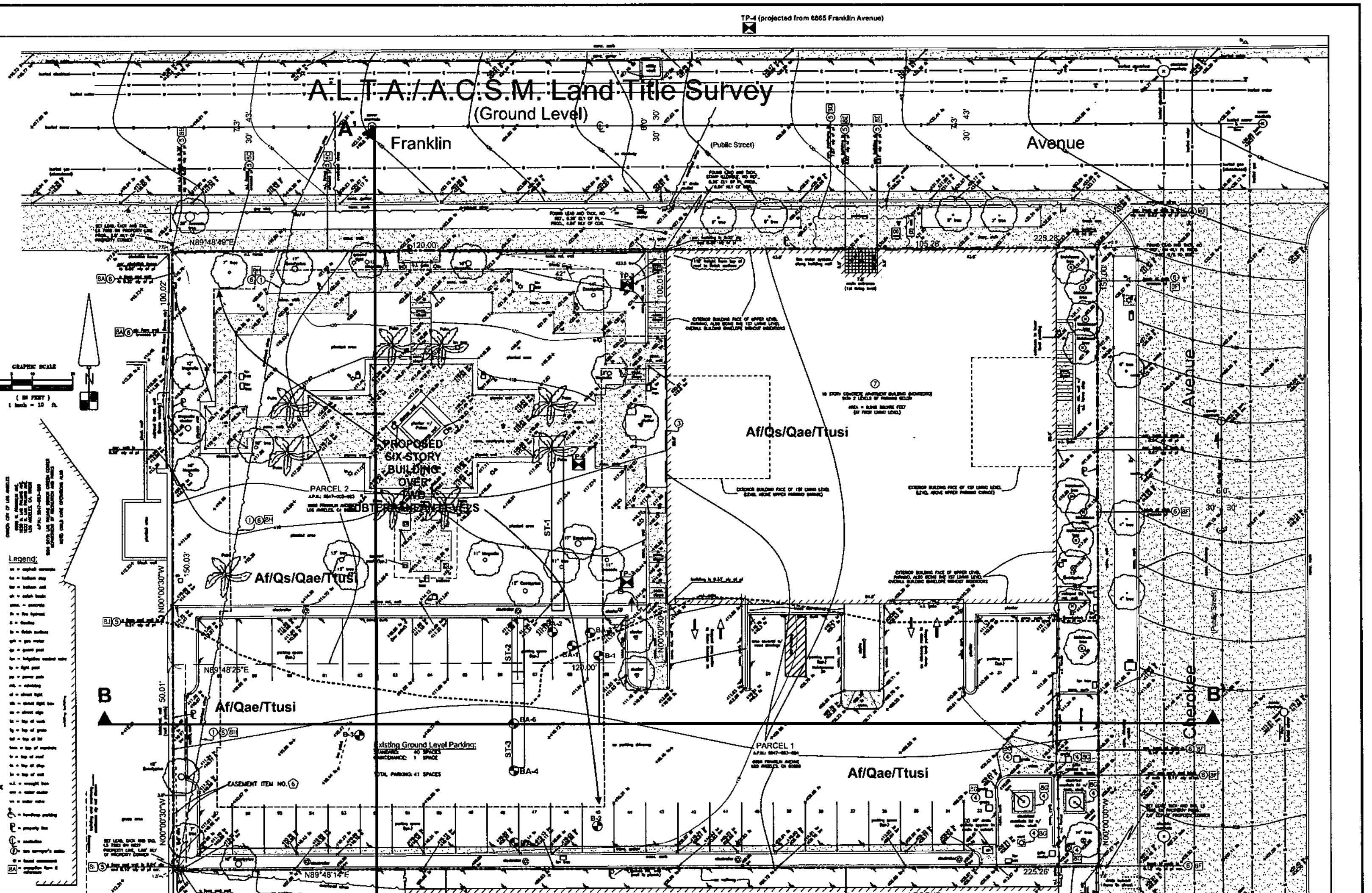
Parcel 1:

Parcel 2:

Schedule B - Part 1 - Exceptions per PROFORMA:

Schedule B - Part 2 - Exceptions per PROFORMA:

Exceptions Legend:



SITE MAP	
1584-54	MONTECITO APARTMENTS-PB
DATE: 7/6/17	SCALE: 1"=10' SITE: 6550 W. FRANKLIN AVENUE
REF:	BASE MAP FROM SURVEY

LEGEND

- TP-4 LOCATION OF HAND DUG TEST PITS
- B-3 LOCATION OF GEOTECHNICAL BORING
- BA-6 LOCATION OF BUCKET AUGER
- B — B' SECTION LINE
- LOCATION OF FAULT TRENCH
- GEOLOGIC CONTACT
- SUBJECT PROPERTY LINE
- STRIKE AND DIP OF BEDDING

Surveyor's Notice:

1. NO EASEMENT STATED ON TITLE REPORT FOR OVERHEAD WIRES.
2. INTENTIONALLY DELETED.
5. ENCROACHMENT BY SUBJECT PROPERTY ONTO OTHERS.
6. ENCROACHMENT ONTO SUBJECT PROPERTY BY OTHERS.

Survey Prepared For:

Thomas Safran & Associates
11812 San Vicente Blvd., Suite 600
Los Angeles, CA 90049
(310) 820-4888

Survey Prepared By:

Hahn and Associates, Inc.
26074 Avenue Hall, Suite 2
Valencia, CA 91355
(661) 775-9500

HAHN AND ASSOCIATES, INC.

Surveyor's Certificate:

SHEET 1 OF 2 SHEETS

HUD Project Name: Montecito Apartments
HUD Project Number: 122-1 360
HUD Project Location: Los Angeles, California

Date of Survey Map / Plat:
JUNE 11, 2015 (UPDATED PER TEAM COMMENTS, NOT FIELD VERIFIED)
MAY 29, 2015 (UPDATED PER TEAM COMMENTS, NOT FIELD VERIFIED)
MAY 28, 2015 (UPDATED PER PROFORMA AND TEAM COMMENTS, NOT FIELD VERIFIED)
APRIL 6, 2015 (UPDATED PER NEW PTR AND TEAM COMMENTS, FIELD VERIFIED)
DECEMBER 3, 2014 (UPDATED PER NEW PTR AND TEAM COMMENTS)
SEPTEMBER 29, 2014 (ORIGINAL)

Date of Field Survey:
APRIL 3, 2015 (FIELD VERIFIED)
SEPTEMBER 22, 2014 (ORIGINAL)

Address:
6650 & 6660 FRANKLIN AVE., LOS ANGELES, CA 90028

Adjoining Addresses:
THE ADJOINING ADDRESSES SHOWN ON THIS MAP ARE PER THE CITY OF LOS ANGELES NAVIGATE LA DATABASE.

Assessor's Parcel Number (A.P.N.):
5547-003-023 (PARCEL 2), 5547-003-024 (PARCEL 1)

General:
ALL EASEMENT DESCRIPTIONS SHOWN HEREON ARE PER PRELIMINARY REPORTS STATED HEREON AND MAY BE SHORTENED/ABBREVIATED. ORIGINAL DOCUMENT MUST BE USED FOR COMPLETE VERBIAGE AND INTERPRETATION. OTHER EASEMENTS MAY EXIST WITHIN SUBJECT PROPERTY, NOT INCLUDED WITHIN SAID PRELIMINARY REPORTS. HAHN AND ASSOCIATES, INC. DID NOT PERFORM A TITLE SEARCH FOR THIS PROJECT. PROPERTY LINE CLEARS ARE ORIENTED IN PLAN VIEW PERPENDICULAR TO PROPERTY LINE.

NO OBSERVED EVIDENCE OF THE SITE BEING USED AS A SOLID WASTE DUMP, SUMP OR SANITARY LANDFILL.
NO OBSERVED EVIDENCE OF CURRENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS.
NO OBSERVED EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS.
THIS PROPERTY IS NOT SITUATED WITHIN A WETLAND AREA.

BUILDING AREA CALCULATIONS SHOWN HEREON INCLUDE SQUARE FOOTAGE TO THE OUTERMOST BUILDING FACADE AT FIRST LIVING LEVEL. ACTUAL LIVING SPACE WILL BE SMALLER.

Bench Mark:
THE ELEVATION OF 418.204 ON BENCH MARK NO. 12-20810 (CUT SPK IN EAST CURB LAS PALMAS AVE. NORTH 2 FEET NORTH OF FRANKLIN AVE. SOUTH END CATCH BASIN) NAVD 1988 DATUM, 2000 ADJUSTMENT, AS SHOWN IN CITY OF LOS ANGELES NAVIGATE L.A. DATABASE WAS USED AS ELEVATION DATUM FOR THIS SURVEY.

Basis of Bearings:
THE BEARING OF NORTH ALONG THE CENTERLINE OF CHEROKEE AVE. (FORMERLY MAGNOLIA AVE.) AS SHOWN ON HOLLYWOOD OCEAN VIEW TRACT, MAP BOOK 1, PAGE 63 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER, WAS USED AS THE BASIS OF BEARINGS FOR THIS SURVEY.

Boundary:
ESTABLISHED PER PTR, ADJUSTED TO FOUND CITY CENTERLINE MONUMENTS, USING STANDARD SURV...

Area:
GROSS AREA OF BOTH PARCELS: 33,763 SQUARE FEET, 0.78 ACRES
PARCEL 1: 21,782 SQUARE FEET, 0.50 ACRES
PARCEL 2: 12,002 SQUARE FEET, 0.28 ACRES

Flood Zone:
THIS PROPERTY LIES WITHIN ZONE "X" AS SHOWN ON FIRM MAP NUMBER OF 06037C1605F DATED ... AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

Zoning Information:
REFERENCE: ZIMAS.LACITY.ORG
AMLEGAL.COM(CALIFORNIA/LOS ANGELES PLANNING AND ZONING/MUNICIPAL CODE)
CITY OF LOS ANGELES DEPARTMENT OF CITY PLANNING(CITYPLANNING.LACITY.ORG)

ZONE: [Q]R4-2 "QUALIFIED MULTIPLE DWELLING ZONE"

ZONE INFORMATION: D-2433 HOLLYWOOD COMMUNITY PLAN INJUNCTION
D-2436 PRELIMINARY HOLLYWOOD FAULT STUDY AREA
D-2374 LOS ANGELES STATE ENTERPRISE ZONE
D-1352 HOLLYWOOD REDEVELOPMENT PROJECT
D-2277 HOLLYWOOD REDEVELOPMENT PROJECT

MINIMUM BUILDING SETBACKS:

FRONT SETBACK: 15 FEET (BUILDING IS NOT IN COMPLIANCE) (7)

SIDE YARD SETBACK: 13 FEET (BUILDING IS NOT IN COMPLIANCE) (7)

REAR SETBACK: 20 FEET

REQUIRED PARKING: TO BE DETERMINED BY CITY PLANNING OFFICIAL (7)
(SPECIAL NOTE: INSTRUMENT NO. 86-1300889, REDUCES PARKING REQU...

Total Existing Parking:
STANDARD: 58 SPACES
COMPACT: 7 SPACES
HANDICAPPED: 1 SPACE
RESERVED: 1 SPACE
MAINTENANCE: 1 SPACE

TOTAL PARKING: 69 SPACES

Existing Ground Level Parking:
STANDARD: 40 SPACES
MAINTENANCE: 1 SPACE

TOTAL PARKING: 41 SPACES

Existing Upper Garage Parking:
STANDARD: 10 SPACES
COMPACT: 2 SPACE
RESERVED: 1 SPACE

TOTAL PARKING: 13 SPACES (SEE SHEET 2)

Existing Lower Garage Parking:
STANDARD: 9 SPACES
HANDICAPPED: 1 SPACE
COMPACT: 5 SPACES

TOTAL PARKING: 15 SPACES (SEE SHEET 2)

Utilities:
IF UNDERGROUND PUBLIC UTILITIES, OTHER SUBSTRUCTURES OR ZONE, SETBACK AND STREET WIDENING ... ARE SHOWN HEREON, IT IS FOR INFORMATION ONLY, HAVING BEEN OBTAINED FROM THE BEST AVAILABLE SOURCE ... FROM OTHERS NOT CONNECTED WITH THIS COMPANY. THEREFORE, NO GUARANTEE IS MADE AS TO THE ACCURACY ... SAID INFORMATION. IT IS ADVISED TO CALL UNDERGROUND SERVICE ALERT, (800) 227-2600, BEFORE ...

BURIED UTILITIES SHOWN HEREON PER L.A. CITY SUBSTRUCTURE MAPS 219-3C, 363-14, D-2227-... SEWER WYE MAPS 150A185 AND 4801-1.

Proforma ALTA Policy Report (PROFORMA):
PREPARED BY COMMONWEALTH LAND TITLE COMPANY, ORDER NO.: 08012507-919-JMH.
DATED MAY 27, 2015.

Legal Description Per PROFORMA:
ALL THAT CERTAIN REAL PROPERTY SITUATED IN THE COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

Parcel 1:
THE EAST 105 FEET OF LOT 11 AND THE NORTH HALF OF LOT 12 IN BLOCK 2 OF THE HOLLYWOOD OCEAN VIEW TRACT, IN THE CITY OF LOS ANGELES, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 1, PAGE 63 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

Parcel 2:
THE WEST 120 FEET OF LOT 11 IN BLOCK 2 OF THE HOLLYWOOD OCEAN VIEW TRACT, IN THE CITY OF LOS ANGELES, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 1, PAGE 63 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

Schedule B - Part 1 - Exceptions per PROFORMA:
△ A. NOT A SURVEY MATTER.
△ B. NOT A SURVEY MATTER.
△ C. NOT A SURVEY MATTER.
△ 1. WATER RIGHTS, CLAIMS OR TITLE TO WATER, WHETHER OR NOT SHOWN BY THE PUBLIC RECORDS.
△ 2. NOT A SURVEY MATTER.
△ 3. NOT A SURVEY MATTER.
△ 4. A COVENANT AND AGREEMENT WHEREIN THE OWNERS OF SAID LAND COVENANT AND AGREE THAT SAID LAND SHALL BE HELD AS ONE PARCEL, AND NO PORTION SHALL BE SOLD SEPARATELY, WHICH COVENANT IS EXPRESSED TO RUN WITH THE LAND AND BE BINDING UPON FUTURE OWNERS.
RECORDED JUNE 11, 1984, AS INSTRUMENT NO. 84-693771, OFFICIAL RECORDS
△ 5. A DOCUMENT SUBJECT TO ALL TERMS, PROVISIONS AND CONDITIONS THEREIN CONTAINED.
ENTITLED: PERPETUAL PRESERVATION AND CONSERVATION RESTRICTION AND AGREEMENT
BY AND BETWEEN: MONTECITO APARTMENTS LIMITED, A CALIFORNIA LIMITED PARTNERSHIP (GRANTOR) AND UNITED COMMUNITY HOUSING AND DEVELOPMENT CORP., A CALIFORNIA NON-PROFIT PUBLIC BENEFIT CORPORATION (GRANTEE)
RECORDED: DECEMBER 31, 1984, AS INSTRUMENT NO. 84-1523595, OFFICIAL RECORDS
REFERENCE IS MADE TO SAID DOCUMENT FOR FULL PARTICULARS.
○ 6. AN EASEMENT FOR THE PURPOSE SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT
PURPOSE: PUBLIC UTILITIES
RECORDED: JULY 22, 1985, AS INSTRUMENT NO. 85-838854, OFFICIAL RECORDS
AFFECTS: THE WESTERLY 3 FEET OF THE NORTH 50 FEET OF LOT 12.
△ 7. THE MATTERS CONTAINED IN A DOCUMENT ENTITLED "COVENANT AND AGREEMENT" RECORDED OCTOBER 15, 1986, AS INSTRUMENT NO. 86-1300889, OF OFFICIAL RECORDS.
REFERENCE IS MADE TO SAID DOCUMENT FOR FULL PARTICULARS.
AMONG OTHER THINGS, SAID DOCUMENT PROVIDES FOR:
WE DO HEREBY COVENANT AND AGREE TO AND WITH SAID CITY TO DEVELOP THE ADDITIONAL PARKING SPACES REQUIRED IN THE EVENT THE DEVELOPMENT CEASES TO QUALIFY UNDER 12 21A(U)(1).
○ 8. ANY RIGHTS, INTEREST, OR CLAIMS WHICH MAY EXIST OR ARISE BY REASON OF THE FOLLOWING FACTS SHOWN ON A SURVEY PLAT
ENTITLED: A.L.T.A./A.C.S.M. LAND TITLE SURVEY
DATED: SEPTEMBER 29, 2014 AND LAST REVISED__________ 2015
PREPARED BY: HAHN AND ASSOCIATES, INC.
PROJECT NO.: 0109-11-001
[8A] A) A 0.32' ENCROACHMENT OF A WALL ONTO THE PROPERTY FROM THE LAND ADJOINING TO THE WEST. SAID ENCROACHMENT IS NEAR THE NORTHWEST CORNER OF SAID PROPERTY.
[8B] B) A 0.05' ENCROACHMENT OF A WROUGHT IRON FENCE ONTO THE LAND ADJOINING TO THE WEST. SAID ENCROACHMENT IS NEAR THE NORTHWEST CORNER OF SAID PROPERTY.
[8C] C) AN ENCROACHMENT OF A WROUGHT IRON FENCE INTO THE STREET RIGHT OF WAY OF FRANKLIN AVENUE BY UNDISCLOSED AMOUNTS.
[8D] D) A 7.67' ENCROACHMENT OF A BUILDING OVERHANG INTO THE STREET RIGHT OF WAY OF FRANKLIN AVENUE BY UNDISCLOSED AMOUNTS.
[8E] E) A 0.01' TO 0.02' ENCROACHMENT OF A AN EXISTING 10-STORY BUILDING INTO THE STREET RIGHT OF WAY OF FRANKLIN AVENUE.
[8F] F) A 0.04' TO 0.13' ENCROACHMENT OF A CONCRETE SIDEWALK ONTO THE PROPERTY FROM THE STREET RIGHT OF WAY OF CHEROKEE AVENUE.
[8G] G) AN UNRECORDED EASEMENT OR LESSER RIGHT FOR TWO CONCRETE ELECTRICAL VAULTS WITH MANHOLES AND VENTS LOCATED AT THE SOUTHEAST CORNER OF THE PROPERTY.

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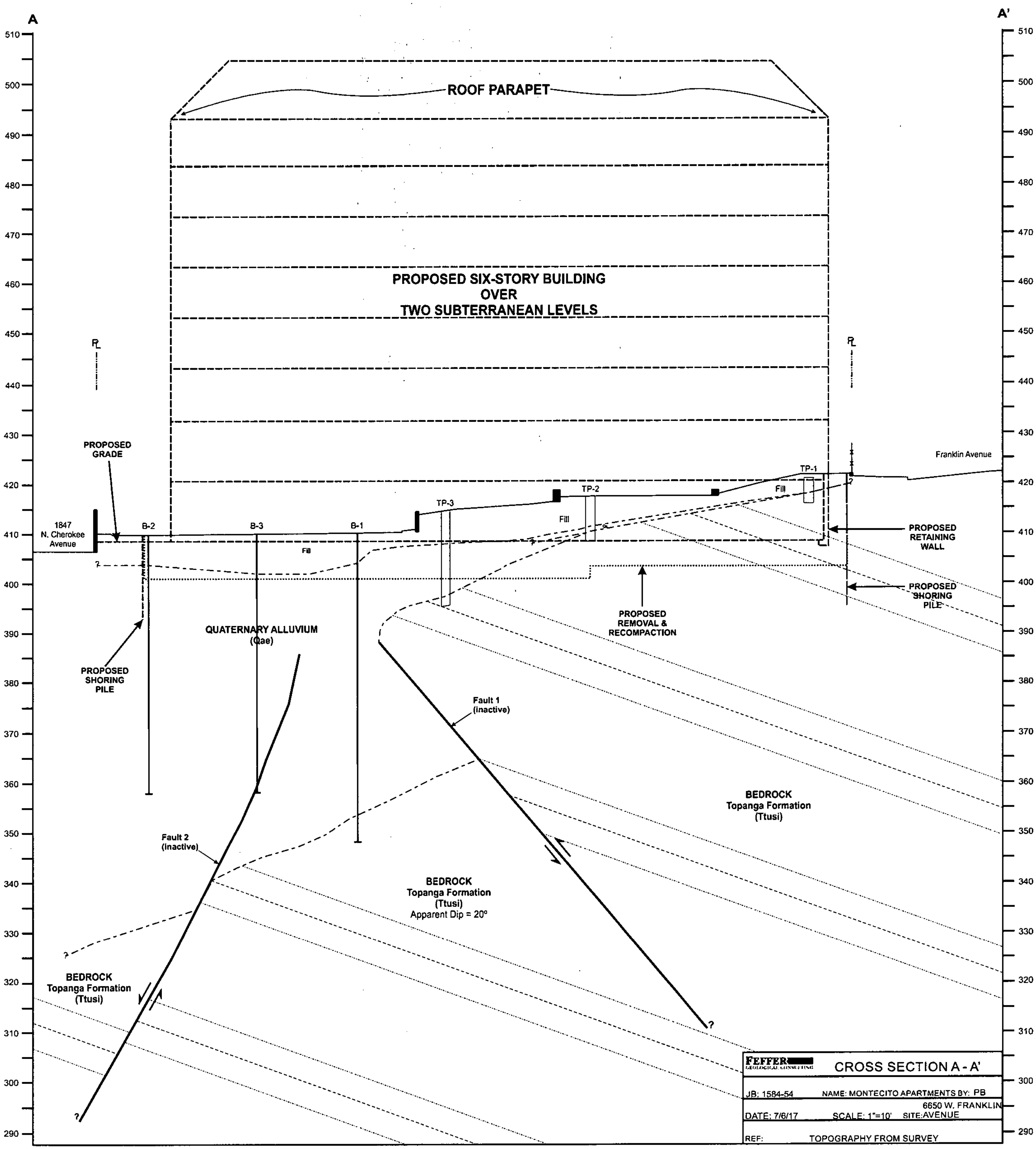
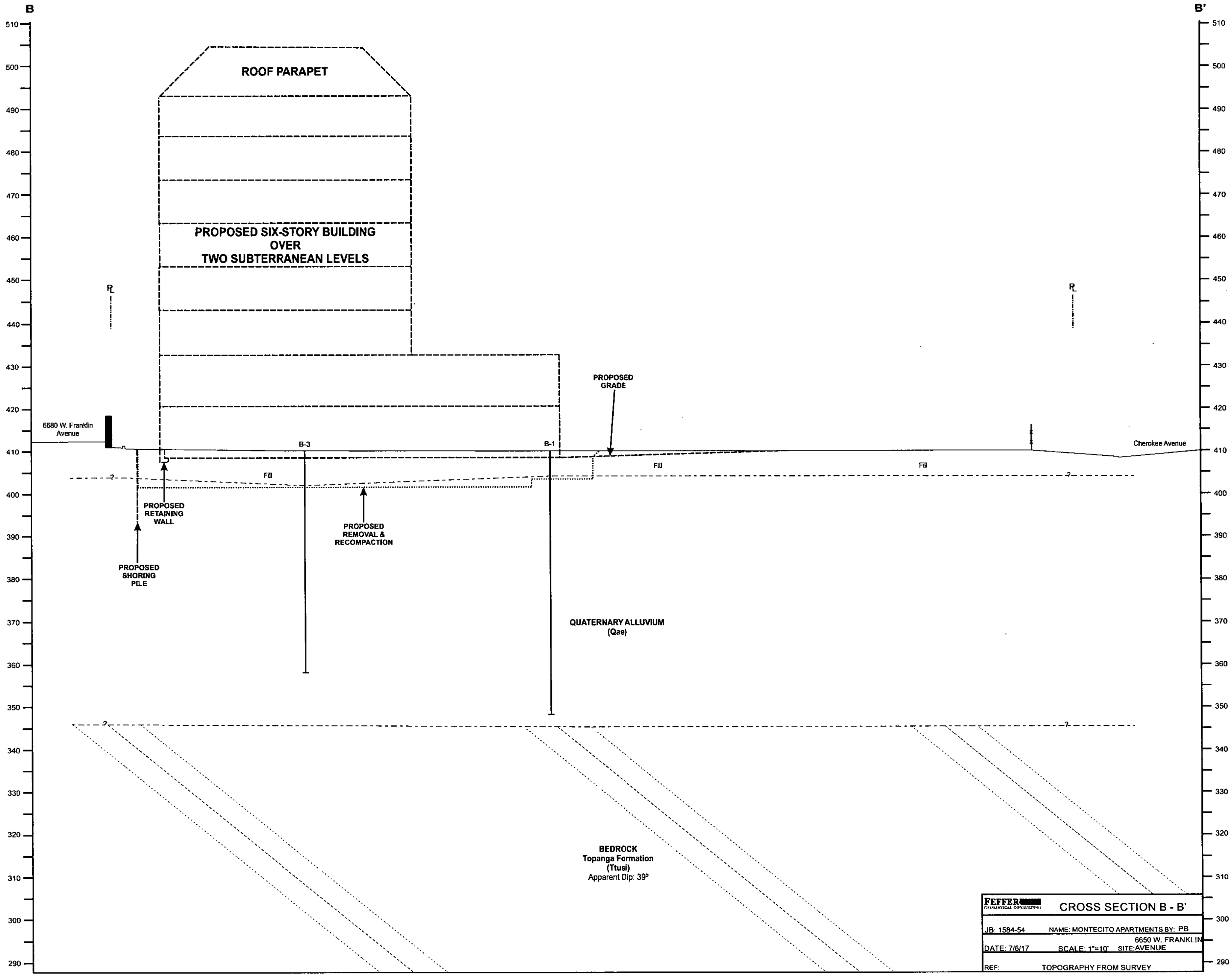


1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1

1050915201742371



APPENDIX 'D'

Grading Specifications

1 0 5 0 9 1 5 2 0 1 7 4 2 3 7 1

STANDARD GRADING SPECIFICATIONS

These specifications present the usual and minimum requirements for grading operations performed under our supervision.

GENERAL

1) The Geotechnical Engineer and Engineering Geologist are the developer's representative on the project.

2) All clearing, site preparation or earth work performed on the project shall be conducted by the contractor under the supervision of the Geotechnical Engineer.

3) It is the contractor's responsibility to prepare the ground surface to receive the fills to the satisfaction of the Geotechnical Engineer and to place, spread, mix, water, and compact the fill in accordance with the specifications of the Geotechnical Engineer. The contractor shall also remove all material considered unsatisfactory by the Geotechnical Engineer.

4) It is the contractor's responsibility to have suitable and sufficient compaction equipment on the job site to handle the amount of fill being placed. If necessary, excavation equipment will be shut down to permit completion of compaction. Sufficient watering apparatus will also be provided by the contractor, with due consideration for the fill material, rate of placement and time of year.

5) A final report shall be issued by our firm outlining the contractor's conformance with these specifications.

SITE PREPARATION

1) All vegetation and deleterious materials such as rubbish shall be disposed of off-site. Soil, alluvium or rock materials determined by the Geotechnical Engineer as being unsuitable for placement in compacted fills shall be removed and wasted from the site. Any material incorporated as a part of a compacted fill must be approved by the Geotechnical Engineer.

2) The Engineer shall locate all houses, sheds, sewage disposal systems, large trees or structures on the site or on the grading plan to the best of his knowledge prior to preparing the ground surface.

Any underground structures such as cesspools, cisterns, mining shafts, tunnels, septic tanks, wells, pipe lines, or others not located prior to grading are to be removed or treated in a manner prescribed by the Geotechnical Engineer.

3) After the ground surface to receive fill has been cleared, it shall be scarified, disced or bladed by the contractor until it is uniform and free from ruts, hollows, hummocks or other uneven features which may prevent uniform compaction.

The scarified ground surface shall then be brought to optimum moisture, mixed as required, and compacted as specified. If the scarified zone is greater than twelve inches (12") in depth, the excess shall be removed and placed in lifts restricted to six inches (6").

Prior to placing fill, the ground surface to receive fill shall be inspected, tested and approved by the Geotechnical Engineer.

PLACING, SPREADING AND COMPACTION OF FILL MATERIALS

1) The selected fill material shall be placed in layers which when compacted shall not exceed six inches (6") in thickness. Each layer shall be spread evenly and shall be thoroughly mixed during the spreading to insure uniformity of material and moisture of each layer.

2) Where the moisture content of the fill material is below the limits specified by the Geotechnical Engineer, water shall be added until the moisture content is as required to assure thorough bonding and thorough compaction.

3) Where the moisture content of the fill material is above the limits specified by the Geotechnical Engineer, the fill materials shall be aerated by blading or other satisfactory methods until the moisture content is adequate.

COMPACTED FILLS

1) Any material imported or excavated on the property may be utilized in the fill, provided each material has been determined to be suitable by the Geotechnical Engineer. Roots, tree branches or other matter missed during clearing shall be removed from the fill as directed by the Geotechnical Engineer.

2) Rock fragments less than six inches (6") in diameter may be utilized in the fill, provided:

a) They are not placed in concentrated pockets.

b) There is a sufficient percentage of fine-grained material to surround the rocks.

c) The distribution of the rocks is supervised by the Geotechnical Engineer.

3) Rocks greater than six inches (6") in diameter shall be taken off-site, or placed in accordance with the recommendations of the Geotechnical Engineer in areas designated as suitable for rock disposal. Details for rock disposal such as location, moisture control, percentage of rock placed, will be referred to in the "Conclusions and Recommendations" section of the geotechnical report.

If the rocks greater than six inches (6") in diameter were not anticipated in the preliminary geotechnical and geology report, rock disposal recommendations may not have been made in the "Conclusions and Recommendations" section. In this case, the contractor shall notify the Geotechnical Engineer if rocks greater than six inches (6') in diameter are encountered. The Geotechnical Engineer will than prepare a rock disposal recommendation or request that such rocks be taken off-site.

4) Representative samples of materials to be utilized as compacted fill shall be analyzed in the laboratory by the Geotechnical Engineer to determine their physical properties. If any materials other than that previously tested is encountered during grading, the appropriate analysis of this material shall be conducted by the Geotechnical Engineer as soon as possible.

Material that is spongy, subject to decay or otherwise considered unsuitable shall not be used in the compacted fill.

5) Each layer shall be compacted to a minimum of ninety percent (90%) of the maximum density in compliance with the testing method specified by the controlling governmental agency (ASTM D-1557).

If compaction to a lesser percentage is authorized by the controlling governmental agency because of a specific land use or expansive soil conditions, the area to receive fill compacted to less than ninety percent (90%) shall either be delineated on the grading plan or appropriate reference made to the area in the geotechnical report.

6) Compaction shall be by sheeps foot roller, multi-wheeled pneumatic tire roller, or other types of acceptable rollers. Rollers shall be of such design that they will be able to compact the fill to the specified density. Rolling shall be accomplished while the fill material is at the specified moisture content. The final surface of the lot areas to receive slabs-on-grade should be rolled to a smooth, firm surface.

7) Field density tests shall be made by the Geotechnical Engineer of the compaction of each layer of fill. Density tests shall be made at intervals not to exceed two feet (2') of fill height provided all layers are tested. Where the sheeps foot rollers are used, the soil may be disturbed to a depth of several inches and density readings shall be taken in the compacted material below the disturbed surface. When these readings indicate the density of any layer of fill or portion thereof is below the required ninety percent (90%) density, the particular layer or portion shall be reworked until the required density has been obtained.

8) Buildings shall not span from cut to fill. Cut areas shall be over excavated and compacted to provide a fill mat of three feet (3').

FILL SLOPES

1) All fills shall be keyed and benched through all top soil, colluvium, alluvium, or creep material into sound bedrock or firm material where the slope receiving fill exceeds a ratio of five (5) horizontal to one (1) vertical, in accordance with the recommendations of the Geotechnical Engineer.

2) The key for side hill fills shall be a minimum of fifteen feet (15') within bedrock or firm materials, unless otherwise specified in the geotechnical report.

3) Drainage terraces and subdrainage devices shall be constructed in compliance with the ordinances of the controlling governmental agency, or with the recommendations of the Geotechnical Engineer.

4) The Contractor will be required to obtain a minimum relative compaction of ninety percent (90%) out to the finish slope face of fill slopes, buttresses, and stabilization fills. This may be achieved by either over-building

the slope and cutting back to the compacted core, or by direct compaction of the slope face with suitable equipment, or by any other procedure which produces the required compaction.

5) All fill slopes should be planted or protected from erosion by methods specified in the geotechnical report and by the governing agency.

6) Fill-over-cut slopes shall be properly keyed through topsoil, colluvium, or creep material into rock or firm materials. The transition zone shall be stripped of all soil prior to placing fill.

CUT SLOPES

1) The Engineering Geologist shall inspect all cut slopes excavated in rock, lithified, or formation material at vertical intervals not exceeding ten feet (10').

2) If any conditions not anticipated in the preliminary report such as perched water, seepage, lenticular or confined strata of a potentially adverse nature, unfavorably inclined bedding, joints, or fault planes, are encountered during grading, these conditions shall be analyzed by the Engineering Geologist and Geotechnical Engineer; and recommendations shall be made to treat these problems.

3) Cut slope that face in the same direction as the prevailing drainage shall be protected from slope wash by a non-erosive interceptor swale placed at the top of the slope.

4) Unless otherwise specified in the geological and geotechnical report, no cut slopes shall be excavated higher or steeper than that allowed by the ordinances of the controlling governmental agencies.

5) Drainage terraces shall be constructed in compliance with the ordinances of controlling governmental agencies, or with the recommendations of the Geotechnical Engineer or Engineering Geologist.

GRADING CONTROL

1) Inspection of the fill placement shall be provided by the Geotechnical Engineer during the progress of grading.

2) In general, density tests should be made at intervals not exceeding two feet (2') of fill height or every five hundred (500) cubic yards of fill placed. These criteria will vary depending on soil conditions and the size of the job. In any event, an adequate number of field density tests shall be made to verify that the required compaction is being achieved.

3) Density tests should also be made on the surface materials to receive fill as required by the Geotechnical Engineer.

4) All clean-out, processed ground to receive fill, key excavations, subdrains, and rock disposal must be inspected and approved by the Geotechnical Engineer prior to placing any fill. It shall be the Contractor's responsibility to notify the Geotechnical Engineer when such areas are ready for inspection.

CONSTRUCTION CONSIDERATIONS

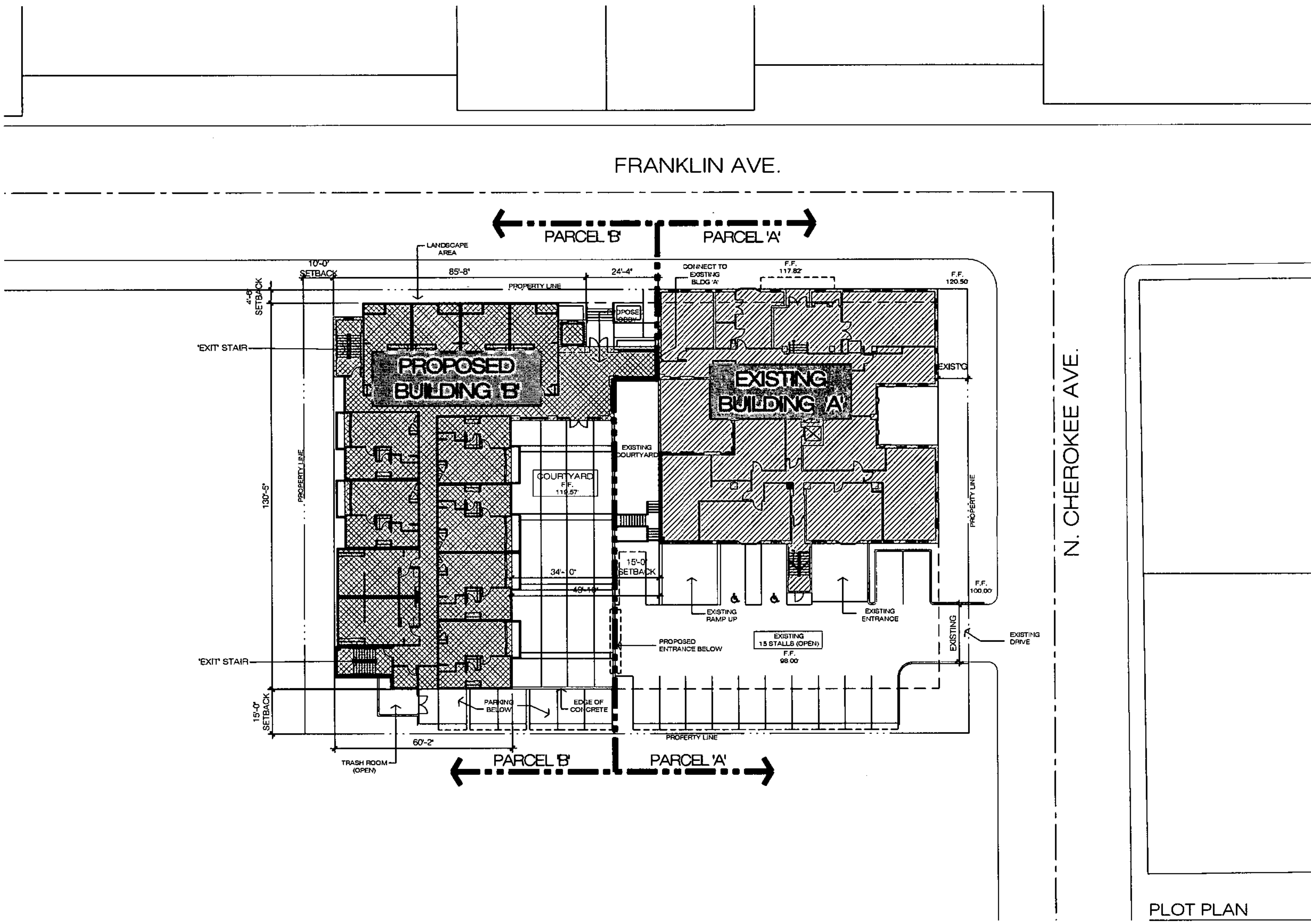
1) Erosion control measures, when necessary, shall be provided by the Contractor during grading and prior to the completion and construction of permanent drainage controls.

2) Upon completion of grading and termination of inspections by the Geotechnical Engineer, no further filling or excavating, including that necessary for footings, foundations, large tree wells, retaining walls, or other features shall be performed without the approval of the Geotechnical Engineer or Engineering Geologist.

3) Care shall be taken by the contractor during final grading to preserve any berms, drainage terraces, interceptor swales, or other devices of a permanent nature on or adjacent to the property.

APPENDIX 'E'

Architectural Development Plans



PLOT PLAN

MONTECITO SENIOR HOUSING

Hollywood - California

THOMAS SAFRAN & ASSOCIATES

scale: 1" = 16'

WITHEE MALCOLM ARCHITECTS

2251 west 190th street | torrance | ca 90504 | 310.217.8885 | witheemalcolm.com

Job No. B3003
Date 02.03.2017

SHEET 02

1050915201742371

APPENDIX 'F'

Engineering Analysis

SHORING PILE

IC: **1584-54** CONSULT: **JF**
CLIENT: **Montecito Apartments (TSA)**

CALCULATION SHEET #

CALCULATE THE DESIGN MINIMUM EQUIVALENT FLUID PRESSURE (EFP) FOR PROPOSED RETAINING WALLS. THE WALL HEIGHT AND BACKSLOPE AND SURCHARGE CONDITIONS ARE LISTED BELOW. ASSUME THE BACKFILL IS SATURATED WITH NO EXCESS HYDROSTATIC PRESSURE. USE THE MONONOBE-OKABE METHOD FOR SEISMIC FORCES.

CALCULATION PARAMETERS

EARTH MATERIAL:	BEDROCK	RETAINED LENGTH	24 feet
SHEAR DIAGRAM:	B-1	BACKSLOPE ANGLE:	0 degrees
COHESION:	305 psf	SURCHARGE:	250 pounds
PHI ANGLE:	39.5 degrees	SURCHARGE TYPE:	U Uniform
DENSITY	132 pcf	INITIAL FAILURE ANGLE:	10 degrees
SAFETY FACTOR:	1.25	FINAL FAILURE ANGLE:	70 degrees
PILE FRICTION	10 degrees	INITIAL TENSION CRACK:	2 feet
CD (C/FS):	244.0 psf	FINAL TENSION CRACK:	40 feet

PHID = ATAN(TAN(PHI)/FS) = 33.4 degrees

HORIZONTAL PSEUDO STATIC SEISMIC COEFFICIENT (k_h) 0 %g

VERTICAL PSEUDO STATIC SEISMIC COEFFICIENT (k_v) 0 %g

CALCULATED RESULTS

CRITICAL FAILURE ANGLE	60 degrees
AREA OF TRIAL FAILURE WEDGE	159.2 square feet
TOTAL EXTERNAL SURCHARGE	2250.0 pounds
WEIGHT OF TRIAL FAILURE WEDGE	23265.8 pounds
NUMBER OF TRIAL WEDGES ANALYZED	2379 trials
LENGTH OF FAILURE PLANE	22.0 feet
DEPTH OF TENSION CRACK	4.9 feet
HORIZONTAL DISTANCE TO UPSLOPE TENSION CRACK	11.0 feet
CALCULATED THRUST ON PILE	**6105.2 pounds**
CALCULATED EQUIVALENT FLUID PRESSURE	**21.2 pcf**
DESIGN EQUIVALENT FLUID PRESSURE	**30.0 pcf**

THE CALCULATION INDICATES THAT THE PROPOSED SHORING PILES MAY MAY BE DESIGNED FOR AN EQUIVALENT FLUID PRESSURE OF 30 POUNDS PER CUBIC FOOT. THE FLUID PRESSURE SHOULD BE MULTIPLIED BY THE PILE SPACING.

RETAINING WALL

IC: **1584-54** CONSULT: **JF**
CLIENT: **Montecito Apartments (TSA)**

CALCULATION SHEET #

CALCULATE THE DESIGN MINIMUM EQUIVALENT FLUID PRESSURE (EFP) FOR PROPOSED RETAINING WALLS. THE WALL HEIGHT AND BACKSLOPE AND SURCHARGE CONDITIONS ARE LISTED BELOW. ASSUME THE BACKFILL IS SATURATED WITH NO EXCESS HYDROSTATIC PRESSURE. USE THE MONONOBE-OKABE METHOD FOR SEISMIC FORCES.

CALCULATION PARAMETERS

EARTH MATERIAL:	FUTURE COMPACTED FI	WALL HEIGHT	20 feet
SHEAR DIAGRAM:	B-4	BACKSLOPE ANGLE:	0 degrees
COHESION:	430 psf	SURCHARGE:	0 pounds
PHI ANGLE:	27 degrees	SURCHARGE TYPE:	U Uniform
DENSITY	128 pcf	INITIAL FAILURE ANGLE:	10 degrees
SAFETY FACTOR:	1	FINAL FAILURE ANGLE:	70 degrees
WALL FRICTION	10 degrees	INITIAL TENSION CRACK:	2 feet
CD (C/FS):	430.0 psf	FINAL TENSION CRACK:	40 feet

PHID = ATAN(TAN(PHI)/FS) = 27.0 degrees

HORIZONTAL PSEUDO STATIC SEISMIC COEFFICIENT (k_h) 0.333 %g

VERTICAL PSEUDO STATIC SEISMIC COEFFICIENT (k_v) 0 %g

CALCULATED RESULTS

CRITICAL FAILURE ANGLE	44 degrees
AREA OF TRIAL FAILURE WEDGE	185.4 square feet
TOTAL EXTERNAL SURCHARGE	0.0 pounds
WEIGHT OF TRIAL FAILURE WEDGE	23726.4 pounds
NUMBER OF TRIAL WEDGES ANALYZED	2379 trials
LENGTH OF FAILURE PLANE	19.5 feet
DEPTH OF TENSION CRACK	6.5 feet
HORIZONTAL DISTANCE TO UPSLOPE TENSION CRACK	14.0 feet
CALCULATED HORIZONTAL THRUST ON WALL	**7273.0 pounds**

THE CALCULATION INDICATES THAT THE SEISMIC FORCE IS 7.27 KIPS WHICH IS LESS THAN THE RETAINING WALL PRESSURE. NO ADDITIONAL SEISMIC FORCE IS NEEDED.

RETAINING WALL

IC: **1584-54** CONSULT: **JF**
CLIENT: **Montecito Apartments (TSA)**

CALCULATION SHEET #

CALCULATE THE DESIGN MINIMUM EQUIVALENT FLUID PRESSURE (EFP) FOR PROPOSED RETAINING WALLS. THE WALL HEIGHT AND BACKSLOPE AND SURCHARGE CONDITIONS ARE LISTED BELOW. ASSUME THE BACKFILL IS SATURATED WITH NO EXCESS HYDROSTATIC PRESSURE. USE THE MONONOBE-OKABE METHOD FOR SEISMIC FORCES.

CALCULATION PARAMETERS

EARTH MATERIAL:	FUTURE COMPACTED FI	WALL HEIGHT	20 feet
SHEAR DIAGRAM:	B-4	BACKSLOPE ANGLE:	0 degrees
COHESION:	430 psf	SURCHARGE:	250 pounds
PHI ANGLE:	27 degrees	SURCHARGE TYPE:	U Uniform
DENSITY	128 pcf	INITIAL FAILURE ANGLE:	10 degrees
SAFETY FACTOR:	1.5	FINAL FAILURE ANGLE:	70 degrees
WALL FRICTION	10 degrees	INITIAL TENSION CRACK:	2 feet
CD (C/FS):	286.7 psf	FINAL TENSION CRACK:	40 feet

PHID = ATAN(TAN(PHI)/FS) = 18.8 degrees

HORIZONTAL PSEUDO STATIC SEISMIC COEFFICIENT (k_h) 0 %g

VERTICAL PSEUDO STATIC SEISMIC COEFFICIENT (k_v) 0 %g

CALCULATED RESULTS

CRITICAL FAILURE ANGLE	53 degrees
AREA OF TRIAL FAILURE WEDGE	144.5 square feet
TOTAL EXTERNAL SURCHARGE	2500.0 pounds
WEIGHT OF TRIAL FAILURE WEDGE	20990.0 pounds
NUMBER OF TRIAL WEDGES ANALYZED	2379 trials
LENGTH OF FAILURE PLANE	19.9 feet
DEPTH OF TENSION CRACK	4.1 feet
HORIZONTAL DISTANCE TO UPSLOPE TENSION CRACK	12.0 feet
CALCULATED HORIZONTAL THRUST ON WALL	**7056.3 pounds**
CALCULATED EQUIVALENT FLUID PRESSURE	**35.3 pcf**
DESIGN EQUIVALENT FLUID PRESSURE	**37.0 pcf**

THE CALCULATION INDICATES THAT THE PROPOSED RETAINING WALL MAY BE DESIGNED FOR AN EQUIVALENT FLUID PRESSURE OF 37 POUNDS PER CUBIC FOOT.

CITY OF LOS ANGELES
CALIFORNIA

ERIC GARCETTI
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

FRANK BUSH
GENERAL MANAGER

OSAMA YOUNAN, P.E.
EXECUTIVE OFFICER

GEOLOGY REPORT APPROVAL LETTER

October 3, 2016

LOG # 92628-01
SOILS/GEOLOGY FILE - 2
LIQ/AP

Thomas Safran and Associates
11812 San Vicente Boulevard, Suite 600
Los Angeles, CA 90049

TRACT:	HOLLYWOOD OCEAN VIEW TRACT (MP 1-62)
BLOCK:	2
LOTS:	11 (Arbs. 4, 3, 2 & 1) and 12 (Arb. 1)
LOCATION:	6650 & 6668 W. Franklin Avenue and 1855 N. Cherokee Avenue

CURRENT REFERENCE REPORT/LETTER	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Response Fault Study Report	1584-54	09/08/2016	Feffer Geological Consulting
Oversized Documents	"	"	"

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Correction Letter	92628	05/04/2016	LADBS
Geology Report (Fault Study)	1584-54	03/23/2016	Feffer Geological Consulting

The Grading Division of the Department of Building and Safety has reviewed the referenced reports that provide a surface fault rupture hazard evaluation for the subject site. According to the reports, the site is occupied by an apartment building at the northeast corner and an open space/courtyard area at the northwest corner. The southern half of the property consists of a parking lot. It is the understanding of the Department that detailed development plans have not yet been prepared.

The property is located within an Official Alquist-Priolo Earthquake Fault Zone that was established (November 6, 2014) by the California Geological Survey (CGS) for the Hollywood fault. The site is also located in a designated liquefaction hazard zone as shown on the "Seismic Hazard Zones" map issued by the CGS; however, the potential liquefaction hazard would be addressed by subsequent geotechnical investigation.

The fault investigation by Feffer Geological Consulting included 4 test pits (TP-1 to TP-4), 8 bucket auger borings (B-1, B-2, BA-1 through BA-6), 2 continuous core borings (B1 and B2), 4 cone-penetration tests (C1 to C4) and 3 trenches (ST-1, ST-2 and ST-3). The exploration identified artificial fill and several alluvial and colluvial units of various age on the site. Bedrock was identified at the northerly part of the site. The consultants identified two faults crossing the subject site, which they interpret as inactive.

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

(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. Prior to issuance of any permit, a geology/soils report shall be submitted to the Grading Division to provide design recommendations for the proposed grading/construction along with an evaluation by the project geologist to confirm that the proposed habitable structures are located within the shadow zone of the fault study exploration.

2. During construction, the project engineering geologist shall observe all excavations that expose the natural alluvial soils and bedrock to verify the conclusions of the fault investigation and that no Holocene faults or ground deformation are exposed. The project engineering geologist shall post a notice on the job site for the City Inspector and the Contractor stating that the excavation (or portion thereof) has been observed, documented and meets the conditions of the report. No fill or lagging shall be placed until the LADBS Inspector has verified the documentation.

3. A supplemental report that summarizes the geologist's observations (including photographs and simple logs of excavations) shall be submitted to the Grading Division of the Department upon completion of the excavations. If evidence of active faulting is observed, the Grading Division shall be notified immediately. (7009)

CASEY LEE JENSEN
Engineering Geologist Associate II

CLJ/clj
Log No. 92628-01
213-482-0480

cc: Feffer Geological Consulting, Project Consultant
LA District Office

BOARD OF
BUILDING AND SAFETY
COMMISSIONERS

VAN AMBATIELOS
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E. FELICIA BRANNON
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JOSELYN GEAGA-ROSENTHAL
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CITY OF LOS ANGELES
CALIFORNIA

ERIC GARCETTI
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

RAYMOND S. CHAN, C.E., S.E.
GENERAL MANAGER

FRANK BUSH
EXECUTIVE OFFICER

GEOLOGY REPORT CORRECTION LETTER

May 4, 2016

LOG # 92628
SOILS/GEOLOGY FILE - 2
LIQ/AP

Thomas Safran and Associates
11812 San Vicente Boulevard, Suite 600
Los Angeles, CA 90049

TRACT:	HOLLYWOOD OCEAN VIEW TRACT (MP 1-62)
BLOCK:	2
LOTS:	11 (Arbs. 4, 3, 2 & 1) and 12 (Arb. 1)
LOCATION:	6650 & 6668 W. Franklin Avenue and 1855 N. Cherokee Avenue

CURRENT REFERENCE REPORT/LETTER	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Geology Report (Fault Study)	1584-54	03/23/2016	Feffer Geological Consulting
Oversized Documents	"	"	"

The Grading Division of the Department of Building and Safety has reviewed the referenced report that provides a surface fault rupture hazard evaluation for the subject site. According to the report, the site is occupied by an apartment building at the northeast corner and an open space/courtyard area at the northwest corner. The southern half of the property consists of a parking lot. It is the understanding of the Department that detailed development plans have not yet been prepared.

The property is located within an Official Alquist-Priolo Earthquake Fault Zone that was established (November 6, 2014) by the California Geological Survey (CGS) for the Hollywood fault. The site is also located in a designated liquefaction hazard zone as shown on the "Seismic Hazard Zones" map issued by the CGS, however the potential liquefaction hazard would be addressed by subsequent geotechnical investigation.

The fault investigation by Feffer Geological Consulting included 3 test pits (TP-1 to TP-3), 8 bucket auger borings (B-1, B-2, BA-1 through BA-6) and 2 trenches (ST-1 and ST-2). The exploration identified artificial fill and several alluvial and colluvial units of various age on the site. Bedrock was identified at the northerly part of the site. The consultants identified two faults crossing the subject site, which they interpret as inactive.

The review of the subject report cannot be completed at this time will be continued upon submittal of an addendum to the reports which includes, but need not be limited to, the following:

(Note: P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. Verify and correct the current legal description and addresses for all lots part of the project site.

2. Provide a more detailed description of the site's geomorphic setting, including a geomorphic map requested in Section 8 c of P/BC 2014-129. The topographic discussion on page 10 of the report is not clear.

3. Where the two faults are converging toward the surface, as shown on Cross Section A-A', the overlying colluvial and alluvial units do not correlate very well as significant subsurface variations exist between ST-2, BA-6 and BA-4. Provide additional exploration and analysis to rule out the presence of active faulting at the site. It seems that extending ST-2 to the south would be very helpful.

4. Discuss the significance of sandstone of the Monterey formation identified in BA-2. Correct Cross Section A-A' to show this formation.

5. It is not clear how faulting is ruled out 50 feet north and south of the subject property along all fault orientations. It appears that further exploration is required to arrive at this conclusion.

6. It does not appear that fault trench ST-2 and bucket auger borings BA-4, BA-6 were plotted correctly on the cross section as the log contact depths do not appear to match. Provide revised cross sections and analysis of the subsurface materials accordingly.

7. Provide a geologic map that shows the location of the previous fault studies in the area of the site discussed in the report. Include the previous trench excavations observed by the California Geological Survey identified a "major fault break" through the north half of 1850 N. Cherokee Avenue just east of the subject lot. Note: The trench logs and report discussing fault activity were never published.

8. Provide detailed graphic logs similar to ST-1, ST-2 and BA-4 through BA-6 for the test pits and all bucket auger borings. Also, provide boring logs for B-1 and B-2.

9. Provide deeper exploration to determine the groundwater level south of fault 2. Note: The consultants did not discuss groundwater conditions in bucket augers BA-4 to BA-6 in the groundwater section of the referenced report.

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.

CASEY LEE JENSEN
Engineering Geologist Associate II

DANIEL C. SCHNEIDEREIT
Engineering Geologist II

CLJ/DCS:clj/dcs
Log No. 92628
213-482-0480

cc: Feffer Geological Consulting, Project Consultant
LA District Office

FEFFER
GEOLOGICAL CONSULTING

March 23, 2016 File No. 1584-54

Thomas Safran and Associates
11812 San Vicente Blvd. #600
Los Angeles, CA 90049

SUBJECT: **EVALUATION OF POTENTIAL FAULTING**
New Development at Southwest Corner of Cherokee and Franklin
Montecito Apartments 6650 and 6668 Franklin Avenue and 1850 Cherokee Court
Hollywood, CA 90028

Dear Mr. Frandsen:

We are pleased to submit this report summarizing our fault rupture hazard investigation for the subject site at 6650 Franklin Avenue in Hollywood, California. The purpose of this investigation was to assess the potential for surface fault rupture at the site and determine if the area of the planned development is suitable for the construction of human-occupied structures. The mapped trace of the Hollywood Fault Zone was not found on the subject site and is presumed to be located to the south of the project site.

This study consisted of a review of published and unpublished data, geomorphic analysis, and subsurface exploration. The subsurface exploration program consisted of two overlapping trench exposures totaling 57 lineal feet and 6 large diameter (BA-1 to BA-6) borings, in which a total of 250 vertical feet of borehole was drilled and logged. Additionally, exploratory test pits on the subject site were excavated. This fault rupture evaluation has found no active faults traversing the parcel. The combination of nearly continuous, unbroken Late Pleistocene soil horizons and stratigraphy provides compelling evidence to demonstrate the absence of active faulting beneath the entire project site area. Thus the project site is not exposed to the hazard of surface fault rupture. Accordingly, no fault setback distances or "no-build" zones have been established across the entire project site area, and there should be no limit on future development. The subsurface exploration extended a minimum of 50 feet to the south and north of the proposed building on the subject site including data from adjacent geological studies that shadow and overlap this current investigation.

Joshua R. Feffer
Principal Geologist
C.E.G. 2138

PROFESSIONAL GEOLOGIST JOSHUA FEFFER No. 2138 Certified Engineering Geologist STATE OF CALIFORNIA

John Helms
Project Geologist
C.E.G. 2272

REGISTERED GEOLOGIST JOHN G. HELMS No. 2272 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

INTRODUCTION AND BACKGROUND

The project site is located at 6650 Franklin Avenue, within a developed portion of the City of Los Angeles (Figure 1). The project site consists of an on-grade parking lot on the southern half of the lot, open space in the northwest quadrant, and a high rise residential building in the northeast quadrant. The site is bounded to the north by Franklin Avenue and to the east by Cherokee Avenue. Existing apartment buildings surround the site. Southern portions of the project site have been graded flat with less than about three feet of overall elevation difference, and the northern portion of the site area slopes gently to the south from Franklin Avenue with less than about seven feet of overall elevation difference (Figure 2).

The original structure on this parcel was constructed prior to the development of the Earthquake Fault Zone (EFZ). Thus, this property had not previously been investigated for the hazard of surface fault rupture. The Hollywood Fault Zone is mapped to the south of the site (Figure 3). In the vicinity of the project site area, the location of the Hollywood Fault Zone is poorly constrained and is mapped as being concealed or buried and approximately located (CGS, 2014).

The mapped location of the Hollywood Fault was also obtained from the City of Los Angeles NavigateLA.lacity.org website and is shown as Figure 4. It should be pointed out that the subject site is located over 300 feet north of the fault location shown in Figure 4.

Development of the site is subject to the conditions of the Alquist-Priolo Special Studies Zone Act of 1972 (California Public Resources Code, Chapter 7.5, Division 2). The Act is designed specifically to mitigate the hazard of surface fault rupture in future earthquakes and defines a fault as active if it has demonstrated movement in Holocene time (past 11,000 years). The Alquist-Priolo Act mandates that sites located within "special studies zones", which are delineated by the California Geologic Survey (CGS) along active faults, require detailed geologic investigation to preclude the construction of human-occupied structures astride active fault strands. The 1994 Seismic Hazards Mapping Act changed the name of the zones from Special Studies Zones to Earthquake Fault Zones (EFZ). The purpose of this investigation, therefore, was to assess the potential for surface fault rupture at the site and determine if the area of the proposed residential development is suitable for construction of human-occupied structures.

SCOPE OF WORK

Typically, trenching is the preferred method for evaluating the presence or absence of faults because it offers a continuous, direct exposure of the fault zone or near surface stratigraphy. However, the Hollywood fault zone has been difficult to expose in trenches due to the dense urban cover and thick accumulation of young Holocene aged alluvium that has been deposited across the fault since the last rupture. Therefore, trenching and exploratory test pits were utilized across the northern portion of the site area and a series of strategically placed Bucket Auger (BA) borings were drilled to resolve the issue of surface faulting hazard across the southern half of the site area.

The scope of work for this fault rupture hazard investigation consisted of the following tasks:

- Review of published and unpublished geotechnical data in the site vicinity;
- Analysis of topographic maps of the site vicinity;

- Geologic reconnaissance of the site;
- Excavate, clean, describe, and log 57 linear feet of trench exposure (ST-1 and ST-2);
- Excavation of Exploratory Test Pits on the subject site.
- Describe the soil profile exposed in the southern trench exposure (ST-2) and estimate stratigraphic unit ages
- Drill, clean, describe, and log a total of 250 vertical feet of material in six 2-foot diameter Bucket Auger (BA) borings across the site;
- Preparation of this report.

This study conforms to the provisions of the Alquist-Priolo Act and Title 24 of the California Code of Regulations.

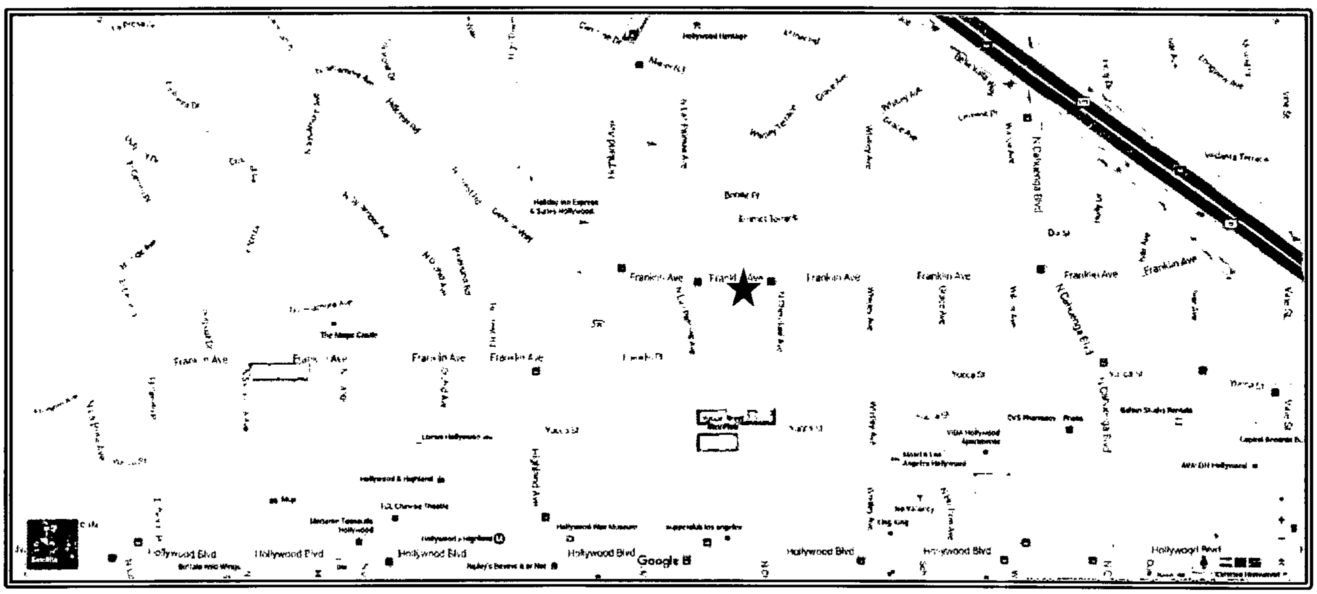

Figure 1. Location of the subject site. A red star is placed on the site location.

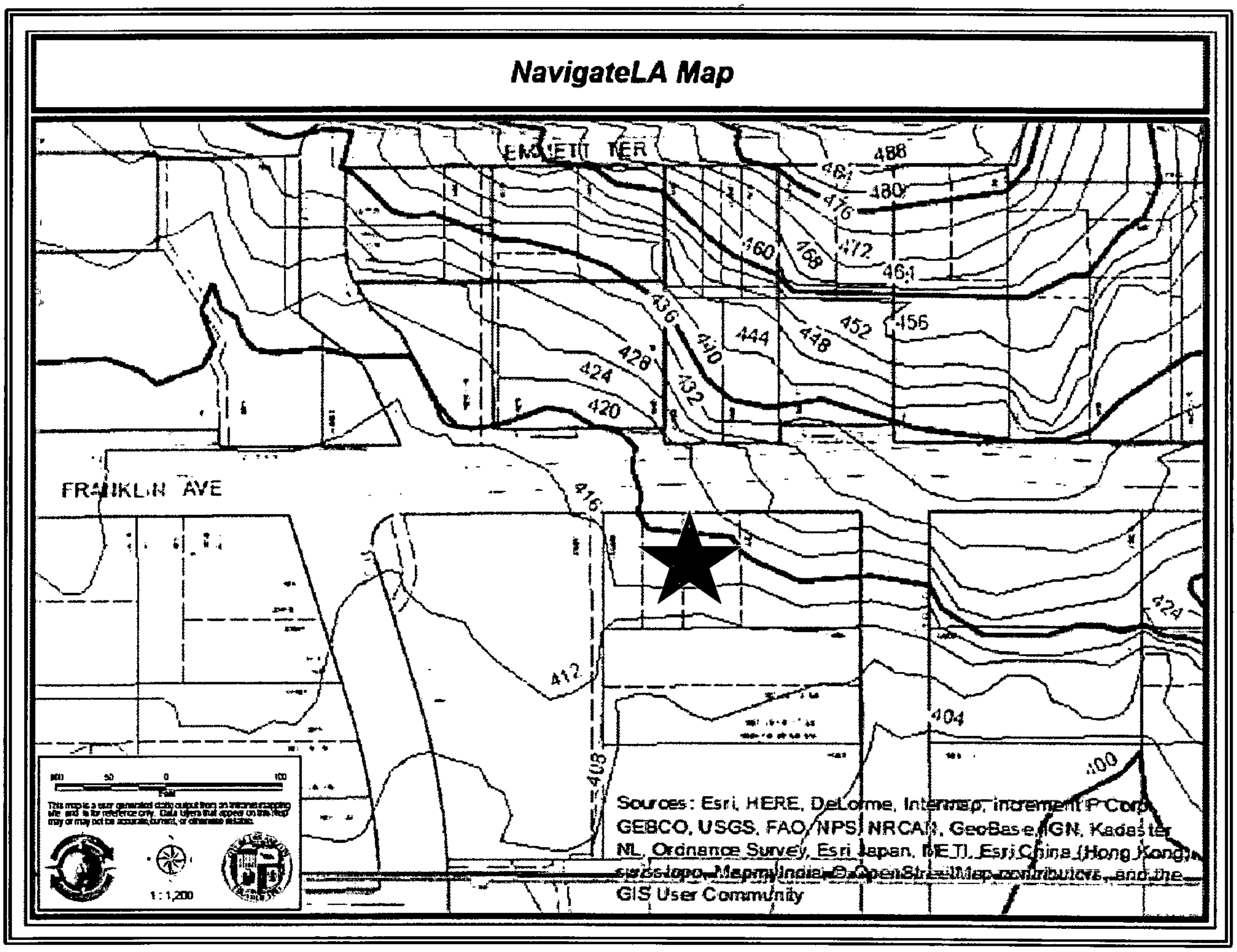

Figure 2. Topographic Map of the Subject Site from NavigateLA website. A red star is placed on the site location.

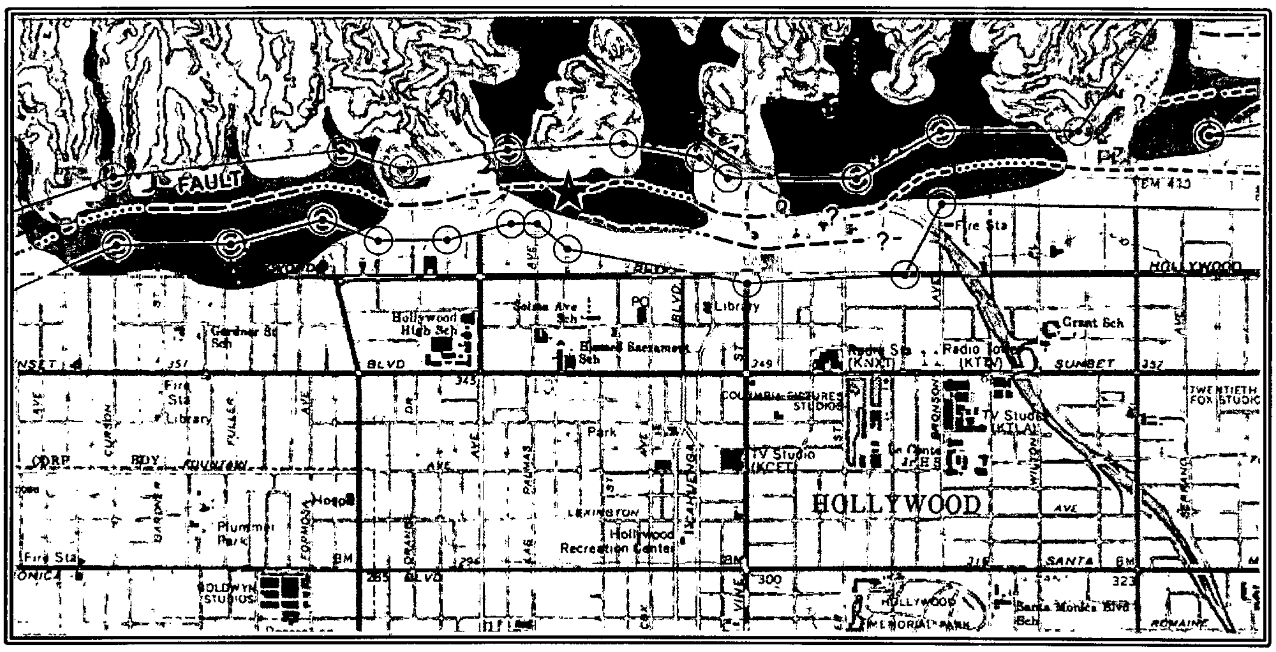

Figure 3. Portion of CGS Hollywood Quadrangle Earthquake Fault Zone Map. Official Map issued November 6, 2014. Subject site designated with a red star.

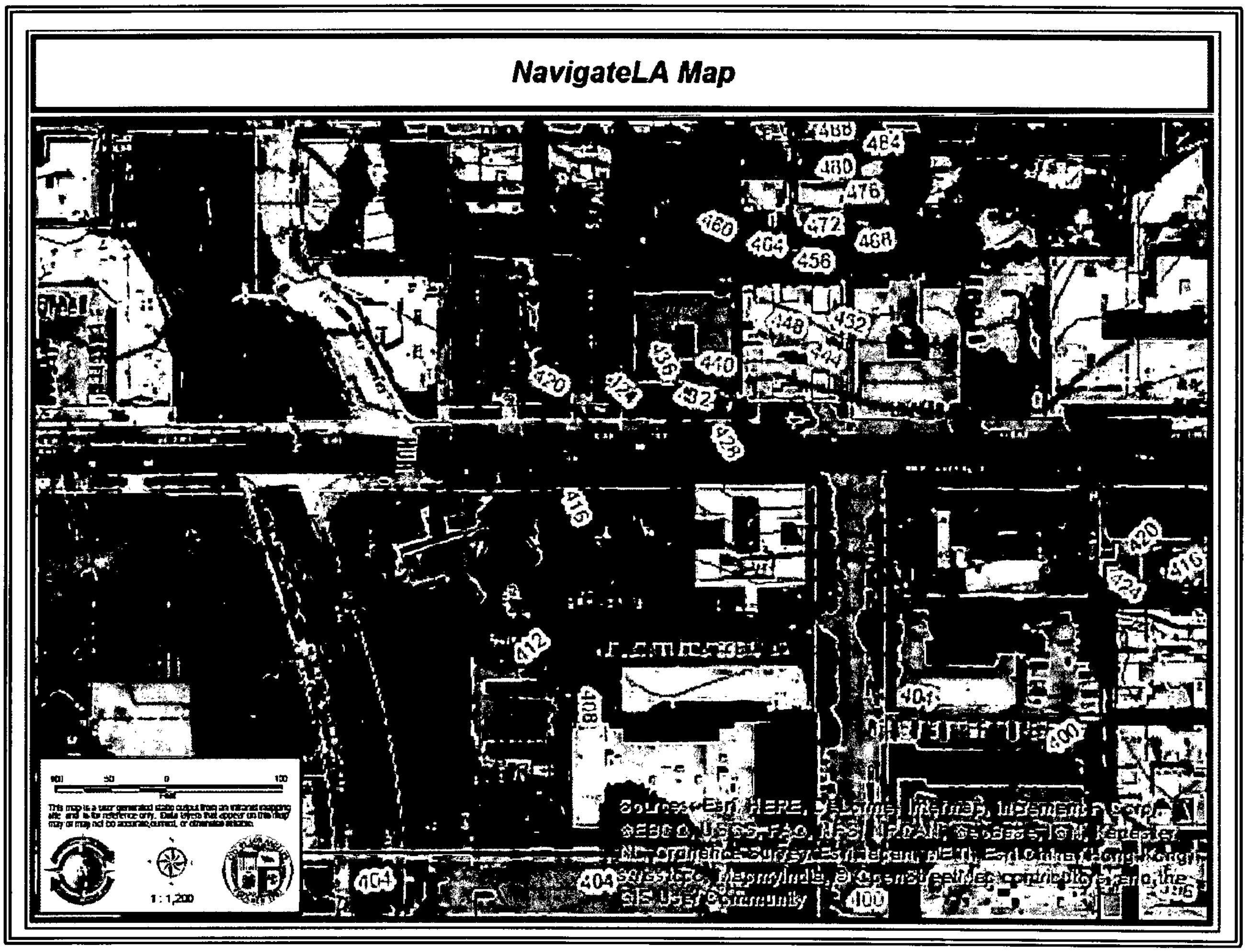

Figure 4. Map from NavigateLA website. Subject site is designated with a red star. The orange/red line is the mapped location of the Hollywood Fault.

FAULT ACTIVITY CRITERIA

The criteria used in our investigation to evaluate fault activity is the same criteria used by the California Geological Survey (CGS) that defines an active fault as those that have had surface displacement within Holocene time (about the last 11,000 years). This criteria for defining an active fault is based on standards developed by the CGS for the Alquist-Priolo Earthquake Fault Zoning Program (Bryant and Hart, 2007). Faults that have not moved in the last 11,000 years are not considered active.

In general, the activity rating of a fault is determined by establishing the age of the youngest materials displaced by the fault. If datable material is present, a numerical absolute age can sometimes be established; if no datable material exists, then only a relative age can be assigned to movement on the fault. For faults that have evidence of movement in the last 11,000 years, to be included in an Alquist-Priolo fault hazard zone, these faults must prove to be "sufficiently active and well-defined".

As indicated in CGS SP 42:

- A fault is deemed "sufficiently active" if there is evidence of Holocene surface displacement along one or more of its segments or branches. Holocene surface displacement may be directly observable or inferred and does not need to be present everywhere along a fault to qualify a fault for zoning.

- A fault is considered "well-defined" if its trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The fault may be identified by direct observation or by indirect method. The critical consideration is that the fault or some part of it can be located in the field with sufficient precision and confidence to indicate that the required site-specific investigations would meet with some success.

REGIONAL AND LOCAL GEOLOGY

The project site is located in the north central Hollywood Basin, which makes up part of the Transverse Ranges Geomorphic province. The Hollywood Basin lies at the southern edge of the Transverse Ranges geomorphic province and near the northern boundary of the Peninsular Ranges geomorphic provinces (Yerkes et al. 1965). The basin is bounded on the north by the Santa Monica Mountains and the Hollywood fault, on the east by the Elysian Hills, the west by the Newport-Inglewood Uplift and the south by the La Brea high, an area of shallow bedrock (DWR, 2004).

The most predominate structures near the project site is the east-west trending Hollywood Fault Zone that separates older surficial deposits to the south from the bedrock units found in the Santa Monica Mountains to the north. In the project site area, alluvial fans have been created by sediments carried by water flowing out of area canyons, and colluvium shed from the bedrock slopes to the north blanket the site area. The adjacent area of the Santa Monica Mountains are composed primarily of Miocene Aged Sedimentary Rock. Figure 5 is a portion of the Dibblee Geologic Map of the site area.

Hollywood Fault Zone

The ~15-km long Hollywood fault is expressed as a series of linear, ~N70°E to ~N78°E trending scarps and faceted south-facing ridges along the southern margin of the eastern Santa Monica Mountains. Active deposition of numerous small alluvial fans at the mountain front and a lack of fan incision suggest late Quaternary uplift of the Santa Monica Mountains along the Hollywood fault (Dolan and others, 1997; Dolan and Sieh, 1992; Crook and others, 1983). The fault dips steeply to the north and has juxtaposed pre-Tertiary granite, metamorphic, and Tertiary sedimentary rocks over young sedimentary deposits of the northern Los Angeles basin. The Hollywood fault has not produced any damaging earthquakes during the historical period and has had relatively minor micro seismic activity.

The linear trace of the Hollywood fault and steep dips found in exposures and borings (65 to 90 degrees) suggest that motion along the fault may be largely strike-slip (Dolan and Sieh, 1993). Other westerly trending faults in the Transverse Ranges exhibit a left-lateral component of slip such as the Santa Ynez, San Fernando, Raymond, and Malibu Coast faults. The orientation of the Hollywood fault suggests that the horizontal component of slip also would be left-lateral. If the entire 15-km-long Hollywood fault ruptured by itself, it could produce an Mw ~6.6 earthquake (Dolan and others, 1997). However, if the fault ruptures together with other faults to the west (Santa Monica, Malibu Coast) or to the east (Raymond), then earthquakes much larger than Mw ~6.6 could result. Assuming a minimum slip rate of 0.35 mm/yr for the Hollywood fault, Dolan and others (1997) estimate a recurrence interval of ~4,000 years for an Mw 6.6 event. Dolan and others, 2000, also documented an early to mid-Holocene earthquake on the Hollywood fault zone. The timing of the most recent earthquake is constrained between 6 and 11 ka.

The precise location of the Hollywood fault currently is poorly defined along much of its length. Large scale geomorphic features such as the southern margin of the Hollywood Hills and the over-steepened alluvial fans along this range front have provided the basis for identifying the fault's approximate location. However, the precise locations of individual fault strands within the Hollywood fault zone have been documented only at a few sites. The Hollywood fault has been difficult to study due primarily to (1) the dense urbanization that covers nearly the entire fault trace; and (2) the accumulation of young alluvium at the base of the mountain front which locally buries the fault.

Because the city was developed primarily in the first quarter of this century before the widespread use of mechanized grading equipment, development was draped over the existing landscape with minimal modification to the natural ground surface (Dolan and others, 1997). Therefore, fault scarps and other topographic features are preserved locally beneath the pavement and can be observed along some streets of Hollywood, West Hollywood and Beverly Hills. Many of the scarps, however, are broad features of significant width (>50-200 ft) that preclude one from precisely locating a particular fault trace on geomorphic evidence alone.

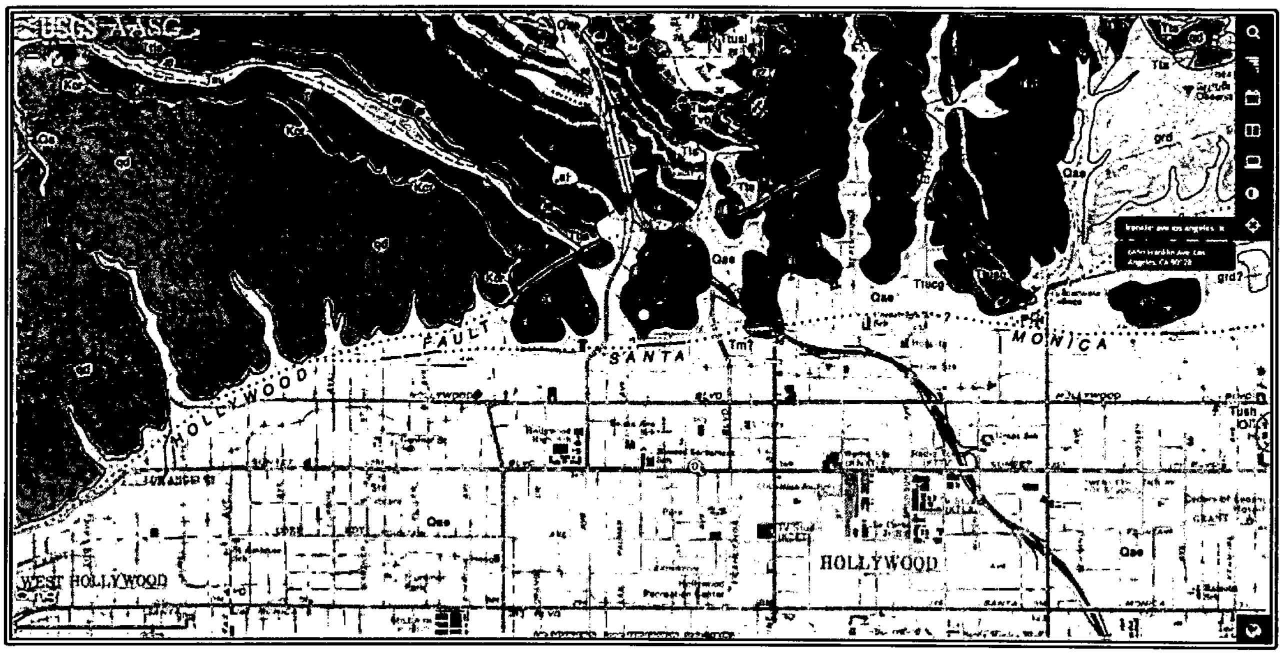

Figure 5. Portion of Dibblee Geologic Map of the Hollywood Quadrangle. The subject site location is at the base of the red diamond.

TOPOGRAPHIC REVIEW

A combined review of previous geomorphic analyses (ECI, 2016, and Dolan and others, 1997) with a review of detailed topographic maps ((Figure 2) with a 4 foot contour interval was performed. The topographic maps show a rough alignment of steep slopes across and south of Franklin Avenue and across the southwestern portion of the project site area. The maps and previous analyses show a wide and degraded fault scarp with several minor slope inflections that occur approximately 30 feet south of the site area (ECI, 2016). This strand aligns roughly with the previously mapped trace of the Franklin Fault strand of the Hollywood Fault zone (Figure 2). Farther south a sharp break in slope occurs over 250 feet south of the site along Argyle Street. This strand aligns with the previously mapped trace of the Yucca Fault strand of the Hollywood Fault zone (Figure 3). These recognizable scarps or breaks in slope may suggest the location of a left step within or parallel discontinuous fault strands of the Hollywood Fault zone south of the project site.

No other significant topographic features suggestive of surface faulting were found projecting towards or in the vicinity of the project site. The breaks in slope located south of Franklin Avenue can be observed in the field and are illustrated in the 2016 ECI report along Cherokee Avenue.

PREVIOUS INVESTIGATION

A review of previous geotechnical and fault rupture hazard investigations that have been completed in the project site's vicinity was conducted for any information that may be pertinent to the project site area. The reports reviewed are summarized below.

The closest completed and most recent study to the project site area was by Advanced Geotechniques (2015) and Earth Consultants International (2016), for a proposed development located on the east side of North Cherokee Avenue (1846 North Cherokee Avenue) approximately 50 feet southeast of the project site. They identified a northeast-trending north dipping fault across the center of the property, and the fault appeared to juxtapose Topanga formation bedrock over older alluvium. This fault was determined to be inactive based on the pedogenic development of the alluvial units that overly this fault zone. Based on discussion with Earth Consultants International, it is our understanding that the soil that overlies the reported fault is unaffected bv rupture and since the soil is older than Holocene age the identified fault is not active. A boring and CPT transect conducted for this study found no faulting in the area that shadows the area south of this project site's southern property line.

To the west of the project site area the closest study to recognize faulting was located at 1840 Highland Avenue (locality 13) where LAW/Crandall (2000) and GeoPentech (2001a, b; 2013c) found evidence of several well-constrained fault strands crossing the northern portion of the site. The faults in the northern and central portion of the site were identified as active. Faulting at this locality consisted of steeply north-dipping faults (about 80°) for the northern strands, and a building setback zone was established. The southern portion of the site contains continuous Holocene and Pleistocene soils and stratigraphic units which are unaffected by faulting.

South of the project site area, a study for the Los Angeles MetroRail project (Converse *et al;* 1981, 1983) found evidence that the Hollywood Fault is located south of Yucca Street at Cahuenga Boulevard (locality 14). The location for this fault corresponds well with differences in groundwater reported at locality 15 to the east, and a groundwater barrier just south of Yucca Street to the west (Dolan *et al.*, 1997).

To the northwest of the site, a study at Franklin and Sierra Bonita Avenues (Crook et al., 1983 and Crook and Proctor, 1992) found several thin shallowly north-dipping gouge layers and a thicker (60+ cm) gouge mass that they assumed to be part of the Hollywood Fault Zone located at the base of the Santa Monica mountains north of Franklin Avenue. Their investigation extended south of Franklin, further down the fan surface, and found no faulting south of Franklin Avenue.

Farther to the northwest, an additional study for the La Brea Avenue Metro Red Line Transect (Dolan *et al.*, 1997; Earth Technology Corporation, 1993) was performed. Evidence for faulting was found north of Franklin Avenue and includes quartz diorite apparently thrust over Quaternary alluvium and shallow groundwater was encountered north of the fault at depths between about 10 feet to 43 feet. South of the fault and south of Franklin Avenue, groundwater was not encountered within the upper 200 feet of borings. The study reported that the fault dip steepens with depth, ranging from 25° to 60° to the north.

Similarly, Dolan *et al.* (1997) and Earth Technology Corporation (1993) completed a fault study along the Camino Palmero-Martel Avenue Metro Red Line transect. They found evidence for faulting north of Highland Avenue which included groundwater barriers and quartz diorite bedrock faulted over alluvium, with average dips of ~77° to the north. They reported up to four fault strands with apparent north side-up displacement of the granitic bedrock at depth. Groundwater elevation changes were reported on the order of 40 or 50 feet across the fault zone.

East of the project site, a study was completed by Feffer Geological Consulting (2014), for a proposed development located on the southeast corner of Franklin and Western Avenues. The study encountered older alluvial fan deposits that are common along the southern margin of the range front. All of the alluvial deposits observed on this site were observed to be unfaulted. The City of Los Angeles approved the findings on March 16, 2015 Log #86433-01.

Fault Evaluation Report (FER) 253 was recently published by the California Geological Survey on February 14, 2014. As can be seen on Figure 6 (Figure 12 of FER-253) the subject site is located at the eastern end of Segment 2 and is north of the mapped location of the mapped fault traces. Both fault traces are mapped south of the site area in this publication. As described in FER-253 the Franklin Avenue fault strand in this area is marked by a subtle scarp mapped east of Cherokee Ave. and south of Franklin Ave. The subject site is located on a steep alluvial apron and along the western margin of a buried bedrock spur and according to the FER-253 report is north of the area of reported faulting.

Supplement #1 to FER-253 was issued on November 5, 2014 and as can be seen on Figure 7 this supplement revised the locations of the Franklin and Yucca strands of the Hollywood fault in the project site area based on comments from the public and from the ongoing accumulation of new data from geological consultants. The Franklin strand of the Hollywood fault shifted north and straightened on the maps presented in the supplemental report (Figures 6 and 7) and now the Franklin strand of the Hollywood fault clips the southern boundary of the project site area. To the south, the Yucca strand of the Hollywood fault is no longer mapped as a through going feature in the project site area.

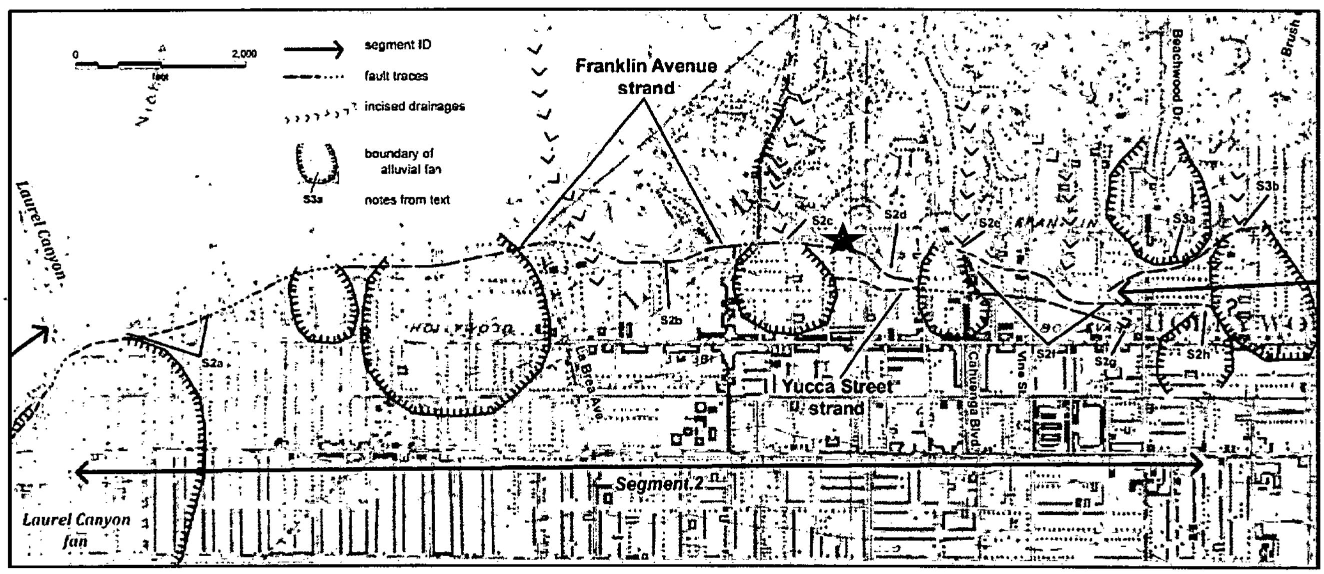

Figure 12 - Geomorphic features along Segment 2. Base map from 1926 Hollywood and Burbank 6' quadrangles.

Figure 6. Figure 12 from FER-253. The approximately location of the subject site is designated with a red star.

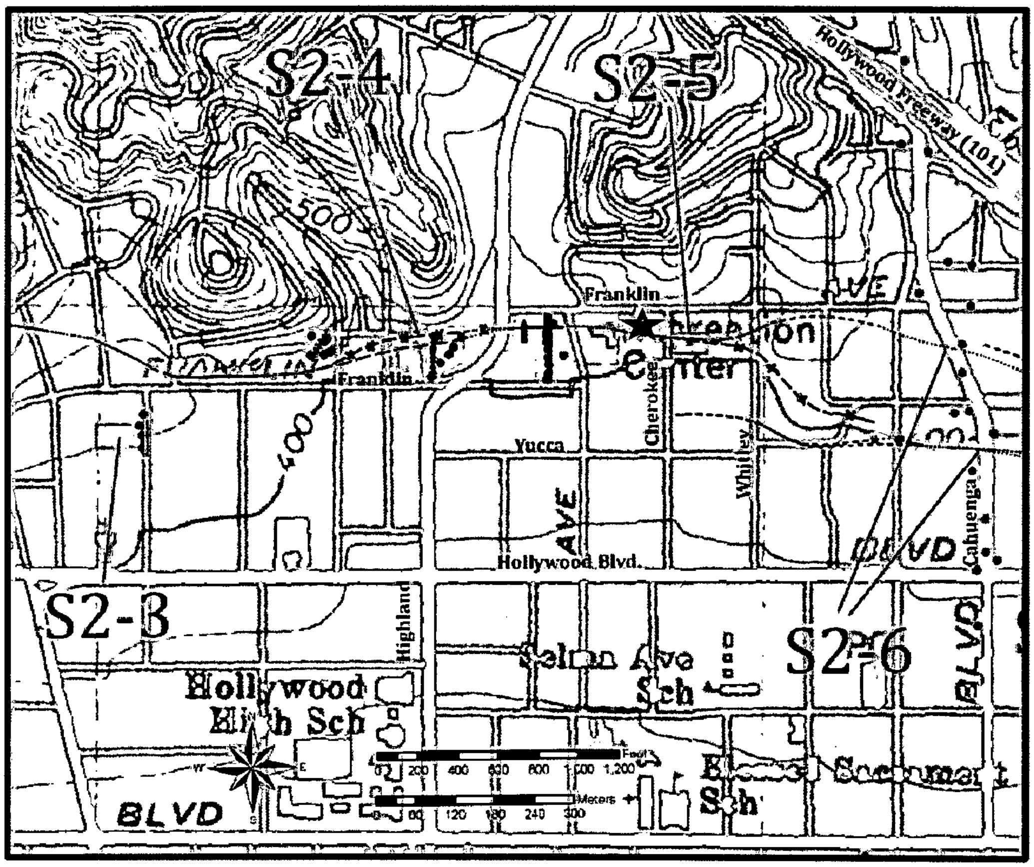

Figure 5 – Localities within Segment 2; S2-3 through S2-6. Red lines indicate mapped fault trace locations for the Official Zone Map. Black fault traces with purple hachures indicate where the fault trace was modified from the preliminary zoned trace. Green and black symbols are boring/CPT locations or transects. Orange lines are trench locations. Light blue shaded areas indicate reports received subsequent to the issuance of the FER.

Figure 7. Figure 5 from FER-253 supplement. The approximately location of the subject site is designated with a red star.

METHODOLOGY

Approach

The subsurface investigation was designed to investigate across the entire subject parcel (see Geological Map in Appendix A). Typically, trenching is the preferred method for evaluating the presence or absence of faults because it offers a continuous, direct exposure of the fault zone or near surface stratigraphy. However, the Hollywood fault zone has been difficult to expose in trenches due to the dense urban cover and thick accumulation of young Holocene aged alluvium that has been deposited across the fault since the last rupture. At the subject site however, due to the proximity of bedrock to the ground surface a trench was able to be excavated along the north side of the property that was supplemented with a series of strategically placed, bucket auger (BA) borings across the southern portion of the site area. In addition, exploratory test pits located along the northern portion of the site and on the adjacent lots to the north indicate that bedrock is located near the ground surface below a few feet of soil.

The boreholes are located on a 1 inch = 20 foot scale base map (Appendix A). The transect was approximately 95 feet long and was designed to capture any east northeast striking fault strands of the Hollywood Fault zone that might traverse the site (Figure 3). The north-south trending trench and BA transect was located across the central portion of the property, starting at the southern property boundary and extending to the north. The northern end of the transect is anchored by a test pit exposure located on the north side of the subject property and by testing at 6651 Franklin Avenue approximately 40 feet from the northern property line.

Field Exploration

Prior to beginning the subsurface field exploration, a literature review, topographic analysis, and geologic reconnaissance of the site was performed. Following this general review, Underground Service Alert (USA) was notified to identify buried utilities in the vicinity of the proposed excavations, as required by law.

Subsurface conditions at the site were explored in four phases along a single north-south oriented transect of subsurface explorations. The first phase was performed on September 10, 2015 and included a forty foot long trench (ST-1) exposure located approximately 45 feet from the center of the northern property line. Phase 2 was performed on November 3 and 4, 2015 and consisted of a nesting of 3 BA borings (BA-1, BA-2, and BA-3) near the center of the site area. Phase 3 was performed on December 9, 2015 and included a fifteen foot long trench (ST-2) exposure located to the south of Trench ST-1 and shadowing the nested BA borings (BA-1, BA-2, and BA-3). Phase 4 was performed from January 27 to 29, 2016 and consisted of 3 evenly spaced BA borings (BA-4, BA-5, and BA-6) across the southern portion of the site area.

Field explorations were located on a 1 inch = 10 foot scale base map provided by the landowners (Appendix A). Horizontal stationing (in feet) along the trench explorations were established with a tape measure and by assuming Station 0 was coincident with the northwestern corner of each trench. This allowed for consistent stationing across the entire project site area.

Trench (ST-1) was excavated using a 3-foot-wide bucket on an extenda-hoe backhoe and was approximately 20 feet-deep. Trench (ST-2) was excavated using a 3-foot-wide bucket on a track mounted excavator and was approximately 22 feet-deep (Appendix A). The entire eastern wall of each trench was scraped clean to obtain a fresh and continuous exposure prior to logging the geologic and pedogenic contacts. A level line was constructed on the wall of each trench to establish horizontal and vertical stationing. The eastern trench walls were logged in the field at a scale of 1 inch = 5 feet. The trench logs are presented in Appendix A. Upon completion of logging and describing each of the trench exposures, field trench inspection meetings were conducted with the City of Los Angeles and California Geological Survey Geologists. These meetings concluded with all parties in concurrence over the presented trench logs and trench log interpretation. A soil description was completed nearest station 4 feet in trench ST-2, and Appendix B presents the soil relative dates and stratigraphic unit correlations. Upon completion of logging, both trenches were backfilled.

The BA borings were drilled using a truck mounted 2-foot diameter bucket auger. The bucket auger excavations were logged and reviewed in the field. Upon completion of logging, all boreholes were backfilled with cuttings. Upon completion of logging and describing each of the borings, field inspection meetings were conducted with the City of Los Angeles and California Geological Survey Geologists. These meetings concluded with all parties in concurrence over the BA boring log interpretations.

RESULTS

This investigation shows that there are no active faults in the area explored. No lineaments or geomorphic features suggestive of active faulting traverse the project site. Two inactive faults were found to be deeply buried across the central portion of the project site area. The transect (Appendix A) found two in-active faults that project across the central portion of the project site area. The faults are numbered 1 and 2 in order of occurrence from north to south. Across this area studied, the section of Holocene- and Pleistocene-aged Alluvium and Colluvium encountered thickens to the south across faults 1 and 2.

Groundwater

An important indicator for the presence or absence of faulting is the depth to groundwater. Past studies have shown that both inactive and active fault strands along the Hollywood Fault zone act as groundwater barriers and produce abrupt steps in the groundwater surface.

Along the attached cross section (Appendix A), groundwater was encountered at the base of trenches ST-1 and 2 in the northern and central portions of the site and in the northern most BA borings (BA-1, BA-2, and BA-3). This data generally indicates that the Hollywood Fault Zone should be located south of the area explored where an abrupt larger step in the groundwater surface is present. Depths to groundwater in the project site area step downward over 25 feet to the south across the buried zone of inactive faults identified. Groundwater was observed at a depth of 20 feet below the ground surface in the northern portion of the site in trench ST-1, and groundwater was observed at a depth of 30 feet below the ground surface in the northern most BA borings (BA-1, BA-2, and BA-3).

Faults

Fault 1, the northern most fault along the transect is an inactive steeply north dipping reverse fault. Fault 1 was observed in borings BA-2 and BA-3 as a bifurcating, undulatory, and wavy zone of shearing. The fault strikes north 65 – 73 west and dips vertically to 80 degrees north, and juxtaposes bedrock on the northeast against stratigraphic units Qoc2 on the southwest. A secondary thin and wavy fault or fracture found in BA-2 strikes north 32 west and dips 69 degrees south. A zone of water seeps was observed along the northern margin of this fault zone at depths between 23 and 27 feet below the ground surface. The tip of Fault 1 was not exposed in the BA borings, so the Phase 3 portion of this study was initiated. Trench ST-2 exposed the tip of fault 1 at a depth of 19 to 20 feet below the ground surface. The fault juxtaposes Monterey formation bedrock against stratigraphic unit Qoc2. A thick section of stratigraphic unit Qoc1 was observed to directly overly this fault zone. The fault as observed in trench exposure ST-2 was orientated north 76 west and dips 53 degrees north. The Qoc1 stratigraphic unit was deposited over a highly degraded (eroded) scarp in this area. The overlying stratigraphic unit Qoc1 unit shows advanced degrees of pedogensis and has a soil relative age date estimate of 29 - 56 ka (Appendix C). Fault 1 is inactive.

Fault 2, the southernmost fault encountered along the transect, lies between trench ST-2 and boring BA-6. Fault 2 was observed in boring BA-6 as a bifurcating, thin, and wavy zone of shearing. The fault strikes north 75 east and dips 63 degrees south, and juxtaposes stratigraphic unit Qoa3 on the north against stratigraphic unit Qoc3 on the south. No water seeps was observed along this fault zone. The tip of a splay of Fault 2 was exposed in boring BA-6, at a depth of 24.5 feet below the ground surface. A thick section of stratigraphic unit Qoc1 was observed to directly overly this fault zone and the Qoc1 unit in BA-6 projects well or straight into Qoc1 unit as observed in the southern end of trench ST-2. The Qoc1 stratigraphic unit was deposited over a short or highly degraded south facing scarp in this area. The Qoc1 unit shows advanced degrees of pedogensis and overlies Fault 2 in this area. Unit Qoc1 has a soil relative age date estimate of 29 - 56 ka (Appendix C). Fault 2 is inactive and discontinuous. Fault 2 is a normal fault, most likely related to hanging wall deformation related to the north dipping off-site faulting and deformation to the south of the project site area.

Alluvium and Soil Horizons

The continuity of soil horizons and primary stratigraphic contacts provides essential data to evaluate the presence or absence of faulting. Several continuous and conformable stratigraphic units within the colluvium and alluvium were encountered in each of the trench exposures and borings along the transect (Appendix A and B).

The youngest unit (Qal1) encountered on site is interpreted as an Holocene aged alluvial sheet wash or braided stream channel deposit and appears continuous and unbroken across the southern portion of the transect (Appendix A). A thin to moderately thick layer of artificial fill and pavement overlies this unit. The Qal1 material typically consists of slightly oxidized, soft, dry, silty SAND with gravel that is coarse-grained with 10 YR soil color hues. Stratigraphic unit Qal1 is massive and abruptly overlies unit Qc across the central and southern portions of the project site area. The Qal material has scoured into unit Qc across the southern portion of the site as observed in BA boring exposures BA-4, BA-5, and BA-6. To the north, the Qal1 material thins and laps onto the underlying colluvium (Qc). The Qal1 stratigraphic unit contains a truncated and weakly developed soil profile. Stratigraphic unit Qal1 does not have an estimated soil relative age date, but geomorphic and stratigraphic relationships with adjacent dated units indicate an age of 4 – 8 ka for this unit (Appendix C).

The uppermost continuous unit (Qc) encountered on site is interpreted as a Early Holocene to Latest Pleistocene aged colluvial / alluvial apron deposit and appears continuous and unbroken across the entire length of the transect (Appendix A). A moderately thick layer of artificial fill overlies this unit across the northern half of the site. The Qc material typically consists of organic rich, slightly hard, dry, silty SAND with clay and gravel that is coarse-grained with 7.5YR color hues. Stratigraphic unit Qc is massive to crudely stratified with diffuse cobble lines, and this unit directly overlies Monterey Formation sandstone bedrock across the northern portion of the site as observed in trench exposure ST-1. To the south, the Qc material directly overlies unit Qoc1 and then overlays a thin alluvial sheet wash / braided stream channel deposit (Qoa1). The Qc stratigraphic unit contains a truncated soil profile with at least 3 stacked and buried weakly developed argillic soil horizons. Stratigraphic unit Qc has an estimated soil relative age date of 8 to 13 ka (Appendix C).

Unit Qoa1 directly underlies unit Qc and is interpreted as latest Pleistocene alluvial sheet flow or braided stream channel deposit and appears continuous and unbroken across the southern half of the transect(Appendix A). The Qoa1 material typically consists of slightly well oxidized, slightly hard, dry, silty SAND with gravel that is coarse-grained with 7.5YR color hues. Stratigraphic unit Qoa1 is well stratified consisting of a fining upwards sequence. This unit abruptly overlies unit Qoc1 and has differentially scoured lower boundary across the central and southern portions of the site as observed in the trench ST-2 exposure and in boring exposures BA-1 through BA-6. To the north, the Qoa1 material thins and laps onto the Qoc1 stratigraphic unit as observed in trench exposure ST-2. The Qoa1 stratigraphic unit contains a highly truncated soil profile with 2 thinly stacked, buried, and weakly developed transitional (BC) argillic soil horizons. Stratigraphic unit Qoa1 has an estimated soil relative age date of 16 to 26 ka (Appendix C).

Unit (Qoc1) encountered on site is interpreted as a Late Pleistocene aged colluvial / alluvial apron deposit and appears continuous and unbroken across the majority of the length of the transect (Appendix A). The Qoc1 material typically consists of moderately well oxidized, hard, slightly moist, silty SAND with clay and gravel to clayey SAND with gravel that is coarse-grained with 7.5YR color hues. Stratigraphic unit Qoc1 is massive to crudely stratified with diffuse cobble lines, and directly overlies and laps onto the Monterey Formation sandstone bedrock across the northern portion of the site as observed in trench exposure ST-1. In the central portion of the site and south of Fault 1, the Qoc1 material directly overlies unit Qoc2 as observed in trench exposure ST-2. To the south, the Qoc1 material directly overlies a thin alluvial fan deposit (Qoa2). To the east stratigraphic unit Qoc1 interfingers with alluvial fan unit Qoa2, and farther east at adjacent study sites to the east along Cherokee Avenue the Qoc1 unit pinches out and unit Qoa2 is exhumed at the ground surface. The Qoc1 stratigraphic unit contains a highly truncated and well developed soil profile with at least 2 stacked and buried argillic soil horizons. Stratigraphic unit Qoc1 has an estimated soil relative age date of 29 to 56 ka (Appendix C).

Unit (Qoa2) encountered on site is interpreted as a Late Pleistocene aged alluvial fan deposit and appears continuous and unbroken across the southern portion of the transect (Appendix A). The Qoa1 material typically consists of moderately well oxidized, hard, moist, clayey SAND that is coarse-grained with 7.5YR color hues. Stratigraphic unit Qoa1 is well to crudely stratified, and directly overlies and laps onto stratigraphic unit Qoc2 in the central portion of the site. South of the trench ST-2 exposure, this unit thickens as observed in boring exposures BA-4, -BA-5, and BA-6. In the central and southern portions of the site and south of Fault 2, the Qoa2 material directly overlies a thin and truncated Qoc2 deposit. To the west stratigraphic unit Qoa2 is exhumed at the ground surface at adjacent study sites to the east along Cherokee Avenue. The Qoa2 stratigraphic unit contains a highly truncated and well developed soil profile with at least 2 stacked and buried argillic soil horizons. Stratigraphic unit Qoa2 does not have an estimated soil relative age date, but geomorphic and stratigraphic relationships with adjacent dated units indicate that the Qoa2 and Qoc2 deposits are chronostratigraphic equivalents and an age date of > 29 to 56 ka has been assigned to this unit (Appendix C).

Unit Qoc2 is the lowest unfaulted stratigraphic unit observed across the transect (Appendix A), and is interpreted as a Pleistocene aged colluvial / alluvial apron deposit. The Qoc2 material typically consists of well oxidized, hard, wet, silty SAND with clay and gravel to clayey SAND that is coarse-grained with 7.5YR color hues. Stratigraphic unit Qoc2 is massive to crudely stratified with diffuse cobble lines, and directly overlies and is faulted against the Monterey Formation sandstone bedrock across the central portion of the site as observed in trench exposure ST-2. In the central and southern portions of the site and over Fault 2, the Qoc2 material directly overlies unit Qoc3 as observed in borings BA-4, BA-5, and BA-6. The Qoc2 stratigraphic unit contains a highly truncated and well developed soil profile with at least 2 stacked and buried argillic soil horizons. Stratigraphic unit Qoc2 does not have an estimated soil relative age date, but geomorphic and stratigraphic relationships with adjacent dated units indicate that the Qoc2 deposit must be > 29 to 56 ka in age (Appendix C).

Unit Qoc3 is the youngest faulted stratigraphic unit observed across the transect (Appendix A), and is interpreted as a Pleistocene aged colluvial / alluvial apron deposit. The Qoc3 material typically consists of well oxidized, hard, wet, clayey SAND with gravel that is coarse-grained with 7.5YR color hues. Stratigraphic unit Qoc3 is massive to crudely stratified with diffuse cobble lines. This unit has been faulted under the Monterey Formation sandstone bedrock across Fault 1 in the central portion of the site. Over Fault 2, the base of the Qoc3 material is juxtaposed against stratigraphic unit Qoa3 to the north as observed in boring BA-6. The Qoc3 unit thickens across the site to the south as observed in borings BA-4 and BA-5. The Qoc3 stratigraphic unit contains a stacked and well developed soil profile with at least 2 stacked and buried argillic soil horizons. Stratigraphic unit Qoc3 does not have an estimated soil relative age date, but geomorphic and stratigraphic relationships with adjacent dated units indicate that the Qoc3 deposit must be > 29 to 56 ka in age (Appendix C).

Unit Qoc4 is a localized stratigraphic unit observed in the southern portion of the transect (Appendix A), and is interpreted as a Pleistocene aged colluvial / alluvial apron deposit. The Qoc4 material typically consists of well oxidized, hard, wet, clayey SAND that is coarse-grained with 7.5YR color hues. Stratigraphic unit Qoc4 is massive to crudely stratified. This unit was observed near the base of boring BA-5. Stratigraphic unit Qoc4 laps onto the surface of the underlying Qoa3 deposit to the north near the central portion of the site. The Qoc4 stratigraphic unit contains a highly truncated and well developed soil profile with one remnant argillic soil horizon. Stratigraphic unit Qoc4 does not have an estimated soil relative age date, but geomorphic and stratigraphic relationships with adjacent dated units indicate that the Qoc4 deposit must be in > 29 to 56 ka in age (Appendix C).

Qoa3 is the lowest and oldest alluvial stratigraphic unit encountered on site and is interpreted as Pleistocene aged alluvial fan deposit. This unit appears unbroken across the southern portion of the transect (Appendix A), and is truncated against Fault 1 to the north. The Qoa3 material typically consists of well oxidized, very hard, wet, sandy CLAY that is coarse-grained with 7.5 to 5 YR color hues. Stratigraphic unit Qoa3 is massive, and is faulted beneath bedrock in the central portion of the site. This unit is steeply inclined to the south as observed in boring exposure BA-5. The Qoa3 stratigraphic unit contains a highly truncated and very mature soil profile with at multiple stacked and buried argillic soil horizons that are plugged with alluvial clay. Stratigraphic unit Qoa3 does not have an estimated soil relative age date, but geomorphic, stratigraphic relationships, and comparisons to adjacent sites with dated units indicate that the Qoa3 deposit is in excess of 100 ka in age (Appendix C).

No features characteristic of faulting, such as shear zones or high angle contacts between units were observed above stratigraphic unit Qoc2 in the two trench exposures or six borings observed. The stratigraphic units described provide visually and texturally distinct, mapable contacts that are overlapping along the entire length of transect A (Appendix A).

EVIDENCE FOR THE ABSENCE OF FAULTING

Several subsurface geologic relationships at the project site provide direct evidence to preclude the presence of Holocene faulting. The topographic analysis also provides indirect evidence that the site is not traversed by active faults. When these relationships are considered together, there is compelling evidence for the absence of faulting beneath the subject site. The primary lines of evidence that support the interpretation that no active faults traverse the site are:

• **Continuous, unfaulted Pleistocene aged soil horizons and primary stratigraphy across the site.** The transect exhibits multiple continuous stratigraphic horizons across the trench and BA boring transect. The conclusion that the upper units are not faulted is based on the assumption that any faults would exhibit a vertical slip component that, over repeated seismic events, would produce recognizable, vertical separations of the units. It would be more difficult to make this case for a pure strike-slip fault. However, even strike-slip faults would likely produce an apparent dip-slip component or truncation of units due to the juxtaposition of different Pleistocene strata or pedogenic horizons.

• **No active faults were encountered in the subsurface exploration.** No features characteristic of active faulting, such as shear zones or high angle contacts between Holocene aged units were observed within the trench and BA boring transect. This line of evidence by itself is not considered compelling enough to preclude the presence of faulting, but it is consistent with and corroborates the other lines of evidence.

• **No irregularities or topographic features indicative of faulting were observed in the project site area.** The topographic maps show a rough alignment of steep slopes south of Franklin Avenue, clipping the southern boundary of the project site area. This feature has been shown to be in active in this study and in adjacent studies (ECI, 2016). Farther south a sharp break in slope occurs over 250 feet south of the site along Argyle Street. This recognizable scarp or break in slope may suggest the location of an active fault strand of the Hollywood Fault zone in the vicinity of the project site.

CONCLUSIONS AND RECOMMENDATIONS

This fault rupture evaluation at 6650 and 6668 Franklin Avenue and 1850 Cherokee Court has found no active faults traversing the subject property. The presence of multiple continuous Pleistocene stratigraphic horizons provide compelling evidence to demonstrate the absence of active faulting beneath the site.

Because no active faults were found to traverse the site within 50 feet beyond the northern and southern site boundaries, the project site is not exposed to the hazard of surface fault rupture. Accordingly, there are no fault setback distances or "no-build" zones recommended for the project site area. These setback zones do not impact the current plans for the new development.

The main trace of the Hollywood fault zone is likely located over 200 feet south of the project site. While the area explored in our study is not subject to the hazard of surface faulting, a future earthquake on the Hollywood or Santa Monica fault zones will likely produce very strong, near-field ground motions at the project site that could possibly exceed the provisions set forth in the current building codes.

LIMITATIONS

The conclusions and recommendations presented herein are the results of an inherently limited scope. Specifically, the scope of services consisted of an assessment of whether or not active faults are present within the area explored at the site. The conclusions and recommendations contained in this report are professional opinions derived in accordance with current standards of professional practice. No warranty is expressed or implied.

This report has been prepared for the exclusive use of CLIENT and applies only to the proposed construction located at 6650 and 6668 Franklin Avenue and 1850 Cherokee Court in the City of Los Angeles, California. In the event that significant changes in the construction plans should occur, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed by Feffer Geological Consulting, and the conclusions and recommendations of this report are verified in writing.

REFERENCES

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US Geological Survey, 1894, Los Angeles Sheet 100,000 scale topographic map.

APPENDIX 'A'

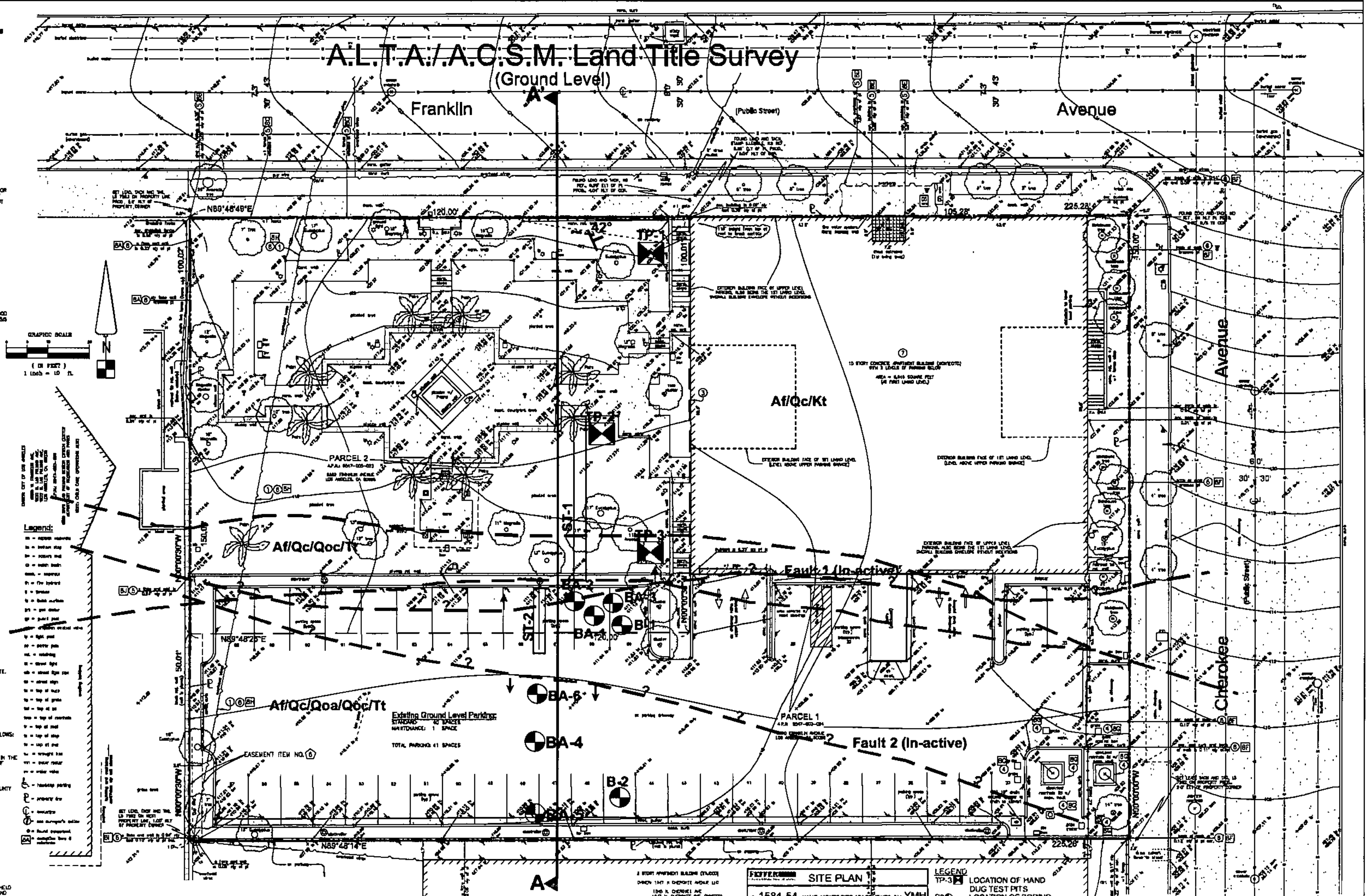
Geologic Map
&
Cross Sections

NavigateLA Map

SHEET 1 OF 2 SHEETS

HUD Project Name: Montecito Apartments
HUD Project Number: 122-11360
HUD Project Location: Los Angeles, California

A.L.T.A./A.C.S.M. Land Title Survey
(Ground Level)



Date of Survey Map / Plat:

JUNE 11, 2015 (UPDATED PER TEAM COMMENTS, NOT FIELD VERIFIED)
MAY 29, 2015 (UPDATED PER TEAM COMMENTS, NOT FIELD VERIFIED)
MAY 26, 2015 (UPDATED PER PROFORMA AND TEAM COMMENTS, NOT FIELD VERIFIED)
APRIL 8, 2015 (UPDATED PER NEW PTR AND TEAM COMMENTS, FIELD VERIFIED)
DECEMBER 3, 2014 (UPDATED PER NEW PTR AND TEAM COMMENTS)
SEPTEMBER 29, 2014 (ORIGINAL)

Date of Field Survey:

APRIL 3, 2015 (FIELD VERIFIED)
SEPTEMBER 22, 2014 (ORIGINAL)

Address:

6657 & 6660 FRANKLIN AVE., LOS ANGELES, CA 90028

Adjoining Addresses:

THE ADJOINING ADDRESSES SHOWN ON THIS MAP ARE PER THE CITY OF LOS ANGELES NAVIGATE L.A. DATABASE

Assessor's Parcel Number (A.P.N.):

5547-003-033 (PARCEL 2), 5547-003-024 (PARCEL 1)

General:

ALL EASEMENT DESCRIPTIONS SHOWN HEREON ARE PER PRELIMINARY REPORTS STATED HEREON AND MAY BE SHORTENED OR ABBREVIATED. ORIGINAL DOCUMENT MUST BE USED FOR COMPLETE VERBIAGE AND INTERPRETATION. OTHER EASEMENTS MAY EXIST WITHIN SUBJECT PROPERTY, NOT INCLUDED WITHIN SAID PRELIMINARY REPORTS. HAHN AND ASSOCIATES, INC. DID NOT PERFORM A TITLE SEARCH FOR THIS PROJECT. PROPERTY LINE CLEARS ARE ORIENTED IN PLAN VIEW, PERPENDICULAR TO PROPERTY LINE.

NO OBSERVED EVIDENCE OF THE SITE BEING USED AS A SOLID WASTE DUMP, SUMP OR SANITARY LANDFILL.
NO OBSERVED EVIDENCE OF CURRENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS.
NO OBSERVED EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS.
THIS PROPERTY IS NOT SITUATED WITHIN A WETLAND AREA.

BUILDING AREA CALCULATIONS SHOWN HEREON INCLUDE SQUARE FOOTAGE TO THE OUTERMOST BUILDING FASCIA AT FIRST LIVING LEVEL. ACTUAL LIVING SPACE WILL BE SMALLER.

Bench Mark:

THE ELEVATION OF 418.204 ON BENCH MARK NO. 12-20810 (CUT SPK IN EAST CURB LAS PALMAS AVE. NORTH 2 FEET NORTH OF FRANKLIN AVE. SOUTH END CATCH BASIN) NAVD 1988 DATUM, 2000 ADJUSTMENT, AS SHOWN IN CITY OF LOS ANGELES NAVIGATE L.A. DATABASE WAS USED AS ELEVATION DATUM FOR THIS SURVEY.

Basis of Bearings:

THE BEARING OF NORTH ALONG THE CENTERLINE OF CHEROKEE AVE. (FORMERLY MAGNOLIA AVE.) AS SHOWN ON HOLLYWOOD OCEAN VIEW TRACT, MAP BOOK 1, PAGE 62 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER, WAS USED AS THE BASIS OF BEARINGS FOR THIS SURVEY.

Boundary:

ESTABLISHED PER PTR, ADJUSTED TO FOUND CITY CENTERLINE MONUMENTS, USING STANDARD SURVEYING PROCEDURES.

Area:

GROSS AREA OF BOTH PARCELS: 33,793 SQUARE FEET, 0.78 ACRES
PARCEL 1: 21,792 SQUARE FEET, 0.50 ACRES
PARCEL 2: 12,002 SQUARE FEET, 0.28 ACRES

Flood Zone:

THIS PROPERTY LIES WITHIN ZONE "X" AS SHOWN ON FIRM MAP NUMBER OF 06037C1605F DATED SEPTEMBER 26, 2008. AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN

Zoning Information:

REFERENCE: ZIMAS.LACITY.ORG
AMLEGAL.COM(CALIFORNIA/LOS ANGELES PLANNING AND ZONING/MUNICIPAL CODE.)
CITY OF LOS ANGELES DEPARTMENT OF CITY PLANNING(CITYPLANNING.LACITY.ORG)

ZONE: (Q)R4-2 'QUALIFIED MULTIPLE DWELLING ZONE'

ZONE INFORMATION: ZI-2433 HOLLYWOOD COMMUNITY PLAN INJUNCTION
ZI-2436 PRELIMINARY HOLLYWOOD FAULT STUDY AREA
ZI-2374 LOS ANGELES STATE ENTERPRISE ZONE
ZI-1352 HOLLYWOOD REDEVELOPMENT PROJECT
ZI-2277 HOLLYWOOD REDEVELOPMENT PROJECT

MINIMUM BUILDING SETBACKS:

FRONT SETBACK: 15 FEET (BUILDING IS NOT IN COMPLIANCE) (7)

SIDE YARD SETBACK: 15 FEET (BUILDING IS NOT IN COMPLIANCE) (7)

REAR SETBACK: 20 FEET

REQUIRED PARKING: TO BE DETERMINED BY CITY PLANNING OFFICIAL (7)
(SPECIAL NOTE: INSTRUMENT NO. 88-1358800, REDUCES PARKING REQUIREMENT BY 40%)

Total Existing Parking:

STANDARD:	59 SPACES
COMPACT:	7 SPACES
HANDICAPPED:	1 SPACE
RESERVED:	1 SPACE
MAINTENANCE:	1 SPACE

TOTAL PARKING: 69 SPACES

Existing Upper Garage Parking:

STANDARD:	10 SPACES
COMPACT:	2 SPACE
RESERVED:	1 SPACE

TOTAL PARKING: 13 SPACES (SEE SHEET 2)

Existing Ground Level Parking:

STANDARD:	40 SPACES
MAINTENANCE:	1 SPACE

TOTAL PARKING: 41 SPACES

Existing Lower Garage Parking:

STANDARD:	8 SPACES
HANDICAPPED:	1 SPACE
COMPACT:	5 SPACES

TOTAL PARKING: 15 SPACES (SEE SHEET 2)

Utilities:

IF UNDERGROUND PUBLIC UTILITIES, OTHER SUBSTRUCTURES OR ZONE, SETBACK AND STREET WIDENING DATA ARE SHOWN HEREON, IT IS FOR INFORMATION ONLY, HAVING BEEN OBTAINED FROM THE BEST AVAILABLE SOURCES BUT FROM OTHERS NOT CONNECTED WITH THIS COMPANY. THEREFORE, NO GUARANTEE IS MADE AS TO THE ACCURACY OR COMPLETENESS OF SAID INFORMATION. IT IS ADVISED TO CALL UNDERGROUND SERVICE ALERT, (800) 227-2600, BEFORE DIGGING ON THIS SITE.

BURIED UTILITIES SHOWN HEREON PER L.A. CITY SUBSTRUCTURE MAPS 219-3C, 363-14, D-2227-1 & SEWER WYE MAPS 150A189 AND 4901-1.

Proforma ALTA Policy Report (PROFORMA):

PREPARED BY COMMONWEALTH LAND TITLE COMPANY, ORDER NO.: 06019507-918-JMH, DATED MAY 27, 2015.

Legal Description Per PROFORMA:

ALL THAT CERTAIN REAL PROPERTY SITUATED IN THE COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

Parcel 1:

THE EAST 105 FEET OF LOT 11 AND THE NORTH HALF OF LOT 12 IN BLOCK 2 OF THE HOLLYWOOD OCEAN VIEW TRACT, IN THE CITY OF LOS ANGELES, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 1, PAGE 62 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

Parcel 2:

THE WEST 120 FEET OF LOT 11 IN BLOCK 2 OF THE HOLLYWOOD OCEAN VIEW TRACT, IN THE CITY OF LOS ANGELES, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 1, PAGE 62 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

Schedule B - Part 1 - Exceptions per PROFORMA:

△ A. NOT A SURVEY MATTER.

△ B. NOT A SURVEY MATTER.

△ C. NOT A SURVEY MATTER.

△ 1. WATER RIGHTS, CLAIMS OR TITLE TO WATER, WHETHER OR NOT SHOWN BY THE PUBLIC RECORDS.

△ 2. NOT A SURVEY MATTER.

△ 3. NOT A SURVEY MATTER.

△ 4. A COVENANT AND AGREEMENT WHEREIN THE OWNERS OF SAID LAND COVENANT AND AGREE THAT SAID LAND SHALL BE HELD AS ONE PARCEL AND NO PORTION SHALL BE SOLD SEPARATELY, WHICH COVENANT IS EXPRESSED TO RUN WITH THE LAND AND BE BINDING UPON FUTURE OWNERS.
RECORDED JUNE 11, 1984, AS INSTRUMENT NO. 84-683771, OFFICIAL RECORDS

△ 5. A DOCUMENT SUBJECT TO ALL TERMS, PROVISIONS AND CONDITIONS THEREIN CONTAINED.

ENTITLED: PERPETUAL PRESERVATION AND CONSERVATION RESTRICTION AND AGREEMENT
BY AND BETWEEN: MONTECITO APARTMENTS LIMITED, A CALIFORNIA LIMITED PARTNERSHIP (GRANTOR) AND UNITED COMMUNITY HOUSING AND DEVELOPMENT CORP., A CALIFORNIA NON-PROFIT PUBLIC BENEFIT CORPORATION (GRANTEE)
RECORDED: DECEMBER 31, 1984, AS INSTRUMENT NO. 84-1523085, OFFICIAL RECORDS

REFERENCE IS MADE TO SAID DOCUMENT FOR FULL PARTICULARS.

⬠ 6. AN EASEMENT FOR THE PURPOSE SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT
PURPOSE: PUBLIC UTILITIES
RECORDED: JULY 22, 1985, AS INSTRUMENT NO. 85-839954, OFFICIAL RECORDS
AFFECTS: THE WESTERLY 3 FEET OF THE NORTH 50 FEET OF LOT 12.

△ 7. THE MATTERS CONTAINED IN A DOCUMENT ENTITLED "COVENANT AND AGREEMENT" RECORDED OCTOBER 15, 1988, AS INSTRUMENT NO. 88-1358800, OF OFFICIAL RECORDS.

REFERENCE IS MADE TO SAID DOCUMENT FOR FULL PARTICULARS.

AMONG OTHER THINGS, SAID DOCUMENT PROVIDES FOR:

WE DO HEREBY COVENANT AND AGREE TO AND WITH SAID CITY TO DEVELOP THE ADDITIONAL PARKING SPACES REQUIRED IN THE EVENT THE DEVELOPMENT CEASES TO QUALITY UNDER 12.21A(U)(1).

⬠ 8. ANY RIGHTS, INTEREST, OR CLAIMS WHICH MAY EXIST OR ARISE BY REASON OF THE FOLLOWING FACTS SHOWN ON A SURVEY PLAT

ENTITLED: ALTA/ACSM LAND TITLE SURVEY
DATED: SEPTEMBER 29, 2014 AND LAST REVISED________, 2015
PREPARED BY: HAHN AND ASSOCIATES, INC.
PROJECT NO.: 0109-11-001

8A A) A 0.52' ENCROACHMENT OF A WALL ONTO THE PROPERTY FROM THE LAND ADJOINING TO THE WEST. SAID ENCROACHMENT IS NEAR THE NORTHWEST CORNER OF SAID PROPERTY.
8B B) A 0.05' ENCROACHMENT OF A WROUGHT IRON FENCE ONTO THE LAND ADJOINING TO THE WEST. SAID ENCROACHMENT IS NEAR THE NORTHWEST CORNER OF SAID PROPERTY.
8C C) AN ENCROACHMENT OF A WROUGHT IRON FENCE INTO THE STREET RIGHT OF WAY OF FRANKLIN AVENUE, TO UNDISCLOSED AMOUNTS.
8D D) A 7.87' ENCROACHMENT OF A BUILDING OVERHANG INTO THE STREET RIGHT OF WAY OF FRANKLIN AVENUE, TO UNDISCLOSED AMOUNTS.
8E E) A 0.01' TO 0.02' ENCROACHMENT OF A AN EXISTING 10-STORY BUILDING INTO THE STREET RIGHT OF WAY OF FRANKLIN AVENUE
8F F) A 0.04' TO 0.15' ENCROACHMENT OF A CONCRETE SIDEWALK ONTO THE PROPERTY FROM THE STREET RIGHT OF WAY OF CHEROKEE AVENUE.
8G G) AN UNRECORDED EASEMENT OR LESSER RIGHT FOR TWO CONCRETE ELECTRICAL VAULTS WITH MANHOLES AND VENTS LOCATED AT THE SOUTHEAST CORNER OF THE PROPERTY.
8H H) AN ENCROACHMENT OF OVERHEAD UTILITY WIRES RUNNING NORTH-SOUTH ACROSS THE WESTERLY PORTION OF THE PROPERTY ACROSS THE NORTH AND SOUTH BOUNDARIES.
8I I) A 0.1' ENCROACHMENT OF A WALL ONTO THE LAND ADJOINING THE PROPERTY TO THE WEST. SAID ENCROACHMENT IS AT THE SOUTHWEST CORNER OF SAID PROPERTY.
8J J) AN 0.24' ENCROACHMENT OF A WALL ONTO THE LAND ADJOINING THE PROPERTY TO THE WEST. SAID ENCROACHMENT IS NEAR THE MID-POINT OF THE WEST BOUNDARY OF SAID PROPERTY.

△ 9. INTENTIONALLY DELETED

△ 10. INTENTIONALLY DELETED.

△ 11. INTENTIONALLY DELETED

△ 12. INTENTIONALLY DELETED.

△ 13. INTENTIONALLY DELETED.

△ 14. MATTERS CONTAINED IN THAT CERTAIN DOCUMENT

ENTITLED: EASEMENT AND MEMORANDUM OF AGREEMENT
RECORDING DATE: APRIL 3, 2012
RECORDING NO: AS INSTRUMENT NO. 20120500484, OFFICIAL RECORDS

REFERENCE IS HEREBY MADE TO SAID DOCUMENT FOR FULL PARTICULARS.

(BLANKET IN NATURE)

△ 15. INTENTIONALLY DELETED

△ 16. INTENTIONALLY DELETED.

△ 17. INTENTIONALLY DELETED.

△ 18. INTENTIONALLY DELETED

△ 19. INTENTIONALLY DELETED.

Schedule B - Part 2 - Exceptions per PROFORMA:

△ 1. NOT A SURVEY MATTER.

△ 2. NOT A SURVEY MATTER

△ 3. A DOCUMENT SUBJECT TO ALL THE TERMS, PROVISIONS AND CONDITIONS THEREIN CONTAINED.
ENTITLED: AGREEMENT CONTAINING COVENANTS AFFECTING REAL PROPERTY
DATED: OCTOBER 22, 1986
BY AND BETWEEN: THOMAS L. SAFRAN, AN UNMARRIED MAN, AND THE COMMUNITY REDEVELOPMENT AGENCY OF THE CITY OF LOS ANGELES, CALIFORNIA, A PUBLIC BODY, CORPORATE AND POLITIC
RECORDED: OCTOBER 31, 1986, AS INSTRUMENT NO. 86-1770325, OFFICIAL RECORDS

REFERENCE IS MADE TO SAID DOCUMENT FOR FULL PARTICULARS.

BY THE PROVISION OF AN AGREEMENT:
DATED: JUNE 1, 2011
EXECUTED BY: MONTECITO APARTMENTS HOUSING, LP, A CALIFORNIA LIMITED PARTNERSHIP; THE COMMUNITY REDEVELOPMENT AGENCY OF THE CITY OF LOS ANGELES, CALIFORNIA, A PUBLIC BODY CORPORATE AND POLITIC; WELLS FARGO BANK, NATIONAL ASSOCIATION, ITS SUCCESSORS AND ASSIGNS
RECORDED: JUNE 27, 2011 AS INSTRUMENT NO. 20110867647 OF OFFICIAL RECORDS

SAID INSTRUMENT WAS MADE SUBORDINATE TO THE REGULATORY AGREEMENT RECORDED JUNE 27, 2011 AS INSTRUMENT NOS. 20110867642 OF OFFICIAL RECORDS

AN AGREEMENT RECORDED RECORDING DATE OF SUBORDINATION AGREEMENT AS INSTRUMENT NO. RECORDING NO. OF SUBORDINATION AGREEMENT WHICH STATES THAT THIS INSTRUMENT WAS SUBORDINATED TO THE DOCUMENT OR INTEREST DESCRIBED IN THE INSTRUMENT

RECORDING DATE:
RECORDING NO:

△ 4. NOT A SURVEY MATTER.

△ 5. NOT A SURVEY MATTER

△ 6. NOT A SURVEY MATTER.

△ 7. NOT A SURVEY MATTER.

Exceptions Legend:

△ = NOT PLOTTABLE
(SEE TITLE REPORT AND ACTUAL DOCUMENTS FOR DETAILS)

⬠ = PLOTTED HEREON
(SEE TITLE REPORT AND ACTUAL DOCUMENTS FOR DETAILS)

SITE PLAN	
JOB: 1584-54	NAME: MONTECITO APARTMENTS BY: YMH
DATE: 3/23/16 SCALE: 1"=16'	SITE: 6650 W FRANKLIN AVENUE
REF:	BASE MAP FROM SURVEY

LEGEND

TP-3 LOCATION OF HAND DUG TEST PITS
B2 LOCATION OF BORING
BA-6 LOCATION OF BUCKET AUGER
A—A' SECTION LINE
ST-1 LOCATION OF FAULT TRENCH
GEOLOGIC CONTACT

Surveyor's Notice:

(1) = NO EASEMENT STATED ON TITLE REPORT FOR OVERHEAD WIRES
(2) = INTENTIONALLY DELETED.
(3) = THE PLACEMENT OF THE DIVIDING LINE BETWEEN PARCELS 1 & 2 OF PTR HAS BEEN DETERMINED BY CHAIN OF TITLE DOCUMENTS. SENIOR DEED RIGHTS BELONG TO PARCEL 2 OF PTR, GIVING IT THE DEED SPECIFIED "WEST 120 FEET OF LOT 11". ALL EXCESS (APPROXIMATELY 3") HAS BEEN ALLOCATED TO PARCEL 1 OF PTR
(4) = NO EASEMENT STATED ON TITLE REPORT FOR ELECTRICAL UTILITY STRUCTURES OR POSSIBLE BURIED ELECTRICAL
(5) = ENCROACHMENT BY SUBJECT PROPERTY ONTO OTHERS.
(6) = ENCROACHMENT ONTO SUBJECT PROPERTY BY OTHERS.
(7) = SUBJECT PROPERTY IS LISTED AS A CALIFORNIA HISTORICAL RESOURCE (N1383) REFERENCE NO.: 5370-19-0168 & REFERENCE NO.: 0053-0799-0000

Surveyor's Certificate:

TO MONTECITO HOUSING APARTMENTS LP; WELLS FARGO BANK, NATIONAL ASSOCIATION; CALIFORNIA COMMUNITY REINVESTMENT CORPORATION; LAWYERS TITLE COMPANY; COMMONWEALTH LAND TITLE COMPANY; DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD); AND TO THEIR SUCCESSORS AND ASSIGNS.

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2011 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA NSPS, AND INCLUDES ITEMS 1, 2, 3, 4, 6(a), 6(b), 7(a), 7(b)(1), 7(c), 8, 9, 10(a), 10(b), 11(b), 12, 13, 14, 16, 17, 18, 19, 20(a) OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON APRIL 3, 2015.

DATE OF PLAT OR MAP: JUNE 11, 2015

NAME: BRANDON M. HAHN

DATE OF SIGNATURE: JUNE 11, 2015

REGISTRATION NO.: PLS 7582

LICENSED LAND SURVEYOR · BRANDON M. HAHN · NO. LS 7582 · STATE OF CALIFORNIA

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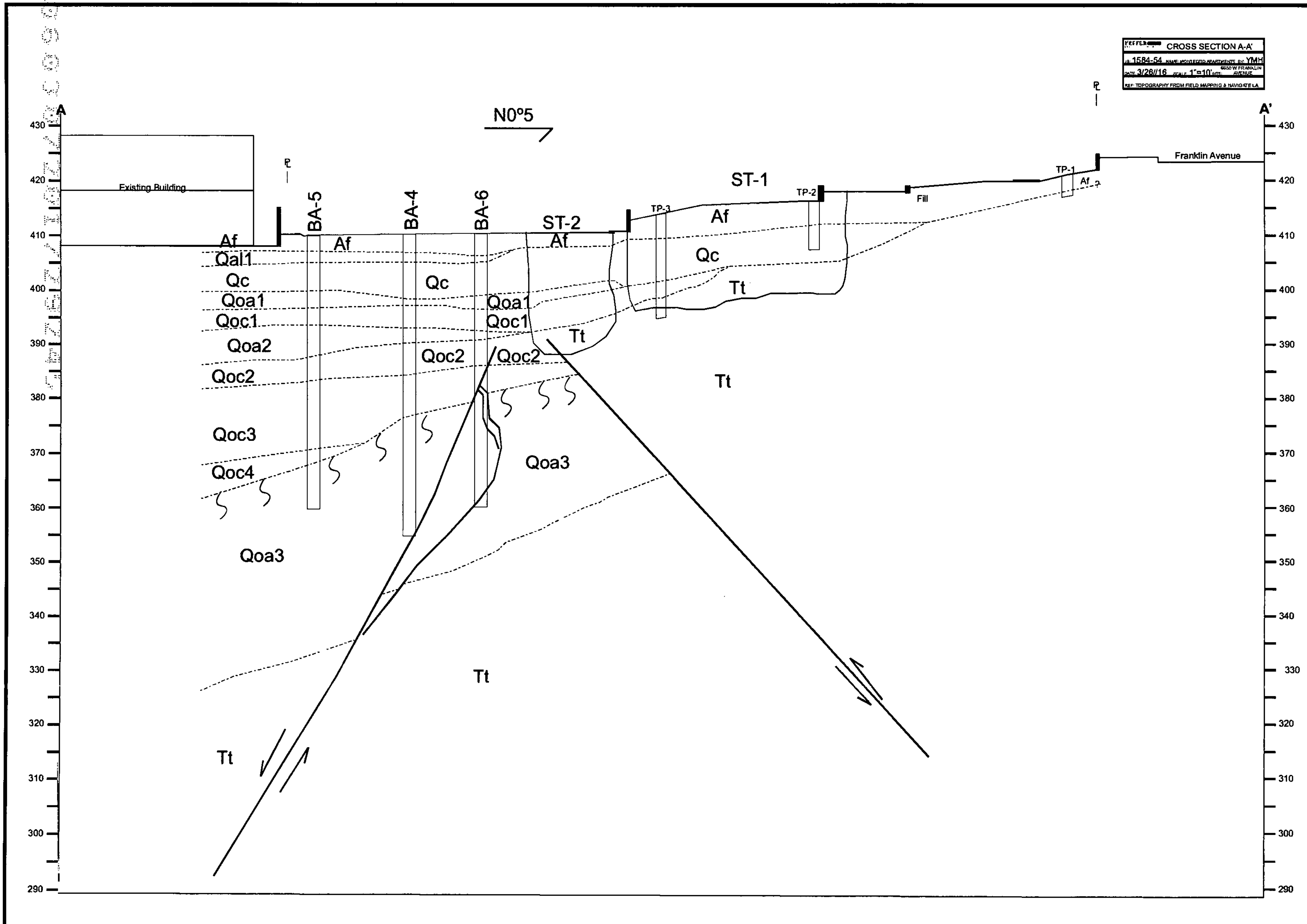
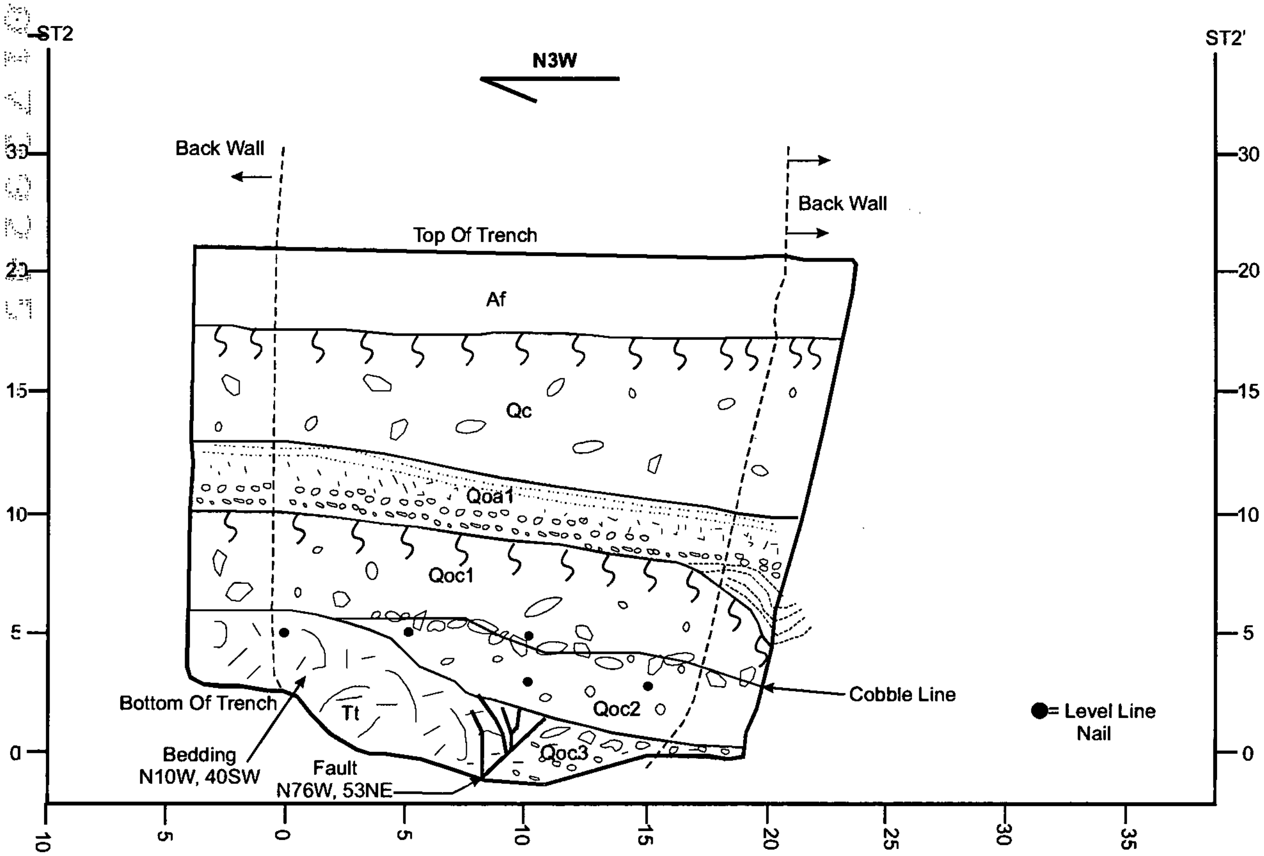
HAHN JOB NO. 0109-11-001 B


CROSS SECTION A-A'
1584-54
YMH
3/26/16
1"=10'
6650 W FRANKLIN AVENUE
TOPOGRAPHY FROM FIELD MAPPING & NAVIGATE LA
A
A'
N0º5
Existing Building
Franklin Avenue
BA-5
BA-4
BA-6
ST-1
ST-2
TP-1
TP-2
TP-3
Fill
Af
Qal1
Qc
Qoa1
Qoc1
Qoa2
Qoc2
Qoc3
Qoc4
Qoa3
Tt
430
420
410
400
390
380
370
360
350
340
330
320
310
300
290

APPENDIX 'B'

Test Pit
&
Boring
&
Trench Logs

Montecito AP-Trench ST-2 12/9/15



Scale 1"=5'

Trench ST-2

Af-Artificial Fill, surficial layer, dark brown, silty SAND, with concrete debris, clear planar boundary to unit Qc;

Qc-Holocene Colluvium, colluvial apron deposit, continuous across entire trench exposure. Brown (7.5YR 4/4m), silty SAND with clay, massive, slightly hard, moderately sticky, slightly plastic, friable, coarse-grained poorly sorted sand, slight organics, with common fine and medium slate and sandstone sub angular gravel, few fine and medium pores, few fine and medium roots, clear smooth lower boundary to unit Qoa1 across entire trench exposure.

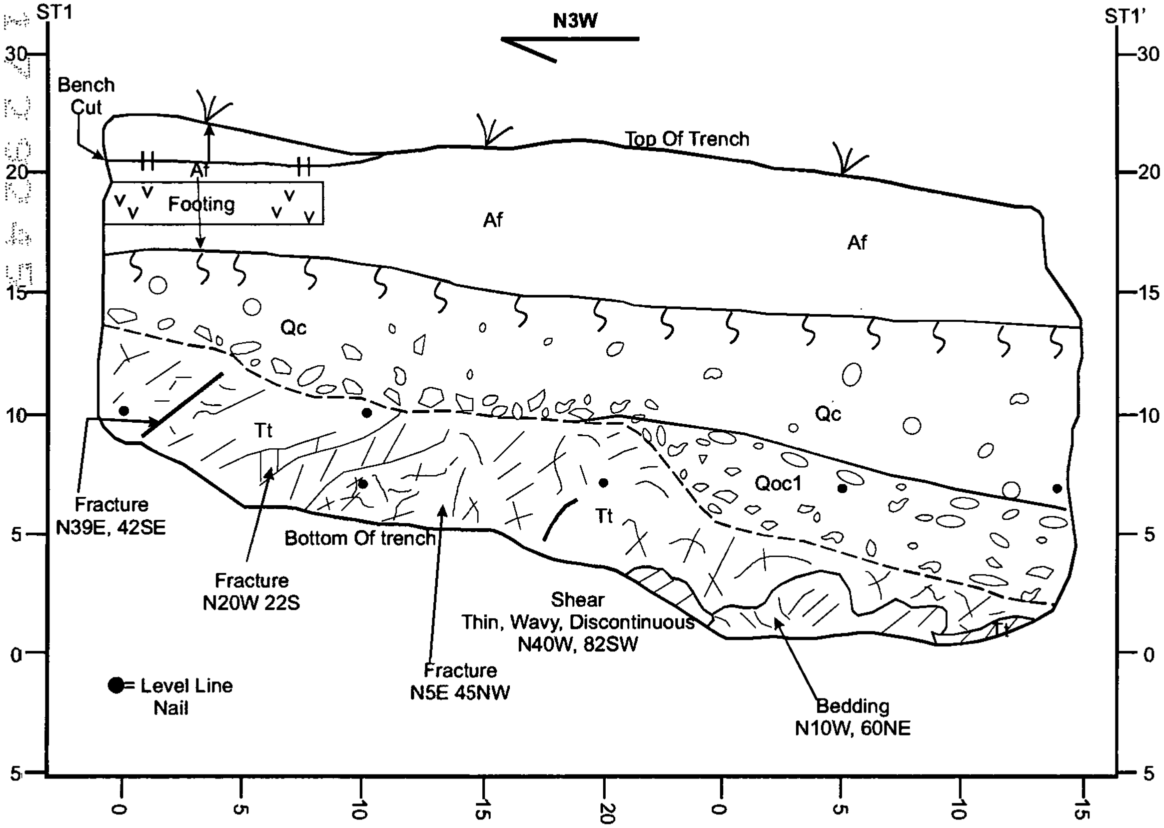
Qoa1-Late Pleistocene Alluvium, sheet wash / channel scour deposit, continuous across entire trench exposure. Strong brown (7.5YR 5/4m), silty SAND, stratified, slightly hard, slightly sticky, slightly plastic, friable, medium-to coarse-grained poorly sorted sand, slightly well oxidized, with localized beds of common to many fine and medium sub angular gravel, abrupt smooth lower boundary to unit Qoc1 across entire trench exposure.

Qoc1-Late Pleistocene Colluvium, colluvial apron deposit, continuous across entire trench exposure. Brown (7.5YR 5/4m), clayey SAND, crudely stratified to massive, hard, moderately sticky, moderately plastic, friable to firm, coarse-grained poorly sorted sand, slightly well oxidized, with common to many fine and medium sandstone sub angular gravel, clear wavy lower boundary to unit Tt across northern half of trench, and gradational smooth lower boundary to unit Qoc2 across southern half of trench.

Qoc2-Late Pleistocene Colluvium, colluvial apron deposit, continuous across southern half of trench exposure. Strong Brown (7.5YR 5/6m), sandy CLAY, crudely stratified to massive, hard, moderately to very sticky, moderately plastic, friable to firm, coarse-grained poorly sorted sand, moderately well oxidized, with common fine and medium highly weathered sandstone sub angular gravel, clear wavy lower boundary to unit Tt to unit Qoc3 across southern half of trench.

Qoc3-Pleistocene Colluvium, colluvial apron deposit, continuous across southern half of trench exposure. Strong Brown (7.5YR 5/8m), sandy CLAY, massive, hard, very sticky, very plastic, firm, coarse-grained poorly sorted sand, moderately well oxidized, with common fine and medium highly weathered sandstone sub angular gravel, abrupt faulted northern boundary to unit Tt, and undetermined lower boundary across southern half of trench.
Tt-Tertiary Topanga Formation, Sandstone (yellowish brown) with interbedded Shale (gray), continuous across northern half of trench exposure. Highly weathered, weak to moderately strong rock strength, blocky rock structure, highly fractured (randomly orientated, tight to slightly open, and discontinuous), localized mottling, abrupt faulted southern boundary to unit Qoc3, and undetermined lower boundary across northern half of trench.

Montecito AP-Trench ST-1 9/1/15



Scale 1"=5'

Montecito Trench Log Unit Descriptions

Trench ST-1
Af-Artificial Fill, surficial layer, dark brown, silty SAND, with abandoned footing and concrete debris, clear planar boundary to unit Qc;

Qc-Holocene Colluvium, colluvial apron deposit, continuous across entire trench exposure. Brown (10YR 5-4/3m), silty SAND with clay, massive, slightly hard, moderately sticky, slightly plastic, friable, coarse-grained poorly sorted sand, slight organics, with common fine and medium slate and sandstone sub angular gravel, few fine and medium pores, few fine and medium roots, clear wavy lower boundary to unit Tt across northern half of trench, and gradational smooth lower boundary to unit Qoc1 across southern half of trench exposure.

Qoc1-Late Pleistocene Colluvium, colluvial apron deposit, continuous across southern half of trench exposure. Brown (10YR 5/4m), clayey SAND, crudely stratified to massive, hard, moderately sticky, moderately plastic, friable to firm, coarse-grained poorly sorted sand, slightly well oxidized, with common to many fine and medium slate and sandstone sub angular gravel, few fine and medium pores, few fine and medium roots, clear wavy lower boundary to unit Tt across northern half of trench, and gradational smooth lower boundary to unit Qoc2 across southern half of trench exposure.

Tt-Tertiary Topanga Formation, Sandstone (yellowish brown) with interbedded Shale (gray), continuous across entire trench exposure. Highly weathered, weak to moderately strong rock strength, blocky rock structure, highly fractured (randomly orientated, tight to slightly open, and discontinuous), localized MnO coatings, undetermined lower boundary.

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments

Date Performed: 11/3/15

Boring No: BA-1
Boring Location:
Groundwater Level: 32.0'
Drill Type: Bucket Auger

Depth in Feet	Soil Type	Bedrock/ Soil Description	Color	Density	Soil Type
2.5		**Artifical (Af):** Mixed soil and debris. Silty SAND, dry. **Note:** slight organics		Hard	Af
5		**Colluvium (Qc):** Surface soil. Silty SAND with clay, massive, medium to coarse grained poorly sorted sand with few fine and medium subangular gravel Note: organic rich **Gradational smooth lower boundary.**	Brown 10YR 4/3d, 3/2m	Hard	Qc (AB)
7.5		**Colluvium (Qc):** Weak subsoil. Silty SAND with gravel, massive, friable, coarse grained poorly sorted sand with common to many fine, medium, and large subangular and angular gravel, slightly moist. **Clear smooth gently north dipping boundary..**	Brown Slightly oxidized 10YR 5/4d, 4/3m	Slightly Hard	Qc (Btj/BC)
10		**Old Alluvium (Qoc_1):** Terrace deposits,-truncated. Silty SAND to silty sand with gravel, fined upwards, stratified, slightly hard- hard, medium to coarse grained moderately-well to poorly sorted sand with many fine and medium gravels at base.	Yellowish Brown 10YR 6/4d, 5/3m	Slightly Hard to Hard	Qoc_1 (Qt)(2C)
12.5					
15		**Old Colluvium (Qoc_1):** Old colluvium, truncated argillic. Silty SAND with clay, massive, coarse grained poorly sorted sand with few to common subangular gravel, few to common fine clay films, slightly moist.	Brown Moderately well oxidized 10YR 4/4d, 3/3m	Hard	Qoc_1 (3Btjb)
17.5					
20					

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments

Date Performed: 11/3/15

Boring No: BA-1
Boring Location:
Groundwater Level: 32.0'
Drill Type: Bucket Auger

Depth in Feet	Soil Type	Bedrock/ Soil Description	Color	Density	Soil Type
22.5		**Wavy gradational lower boundary.** **Old Colluvium (Qoc_1):** Stacked subsoil, weak argillic. Silty SAND with clay and gravel, massive, coarse grained poorly sorted sand with common to many fine, medium, and large subangular and angular gravel-sandstone, moist. **Note:** gradational loss of clay with depth.	Yellowish Brown Slightly oxidized 10YR 6/4d, 4/3m	Hard	Qoc_1 (4BCb)
25					
27.5		**Clear Planar south dipping contact.** **Old Colluvium (Qoc_2):** Stacked, truncated argillic. Silty SAND with gravel, massive, friable, common fine, medium, and large subangular gravel, highly weathered	Strong Brown 7.5YR 4/6d, 3/4m	Hard	Qoc_2 (5Btjb)
30					
32.5		Groundwater encountered at 32'			
35		END at 35'			
37.5					
40					

1 0 0 0 3 0 7 2 0 1 7 2 9 2 4 5

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments

Date Performed: 11/3/15

Boring No: BA-2
Boring Location:
Groundwater Level: 32.0'
Drill Type: Bucket Auger

Depth in Feet	Soil Type	Bedrock/ Soil Description	Color	Density	Soil Type
2.5		**Artificial Fill (Af):** West and South walls contain mixed soil and brick debris. Silty SAND. **Note:** slight organics. North and East walls contain bricked wall no motor. Filled with soil debris, dry to slightly moist.		Hard	Af +Wall
5					
7.5					
10					
12.5					
15					
17.5					
20					

1 0 6 0 3 0 7 2 0 1 7 2 9 2 4 5

LOG OF EXPLORATORY BORING

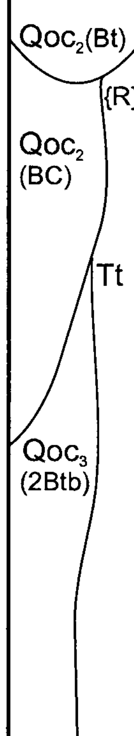
Job Number: 1584-54
Project: Montecito Apartments

Date Performed: 11/3/15

Boring No: BA-2
Boring Location:
Groundwater Level: 32.0'
Drill Type: Bucket Auger

Depth in Feet	Soil Type	Bedrock/ Soil Description	Color	Density
		Artificial Fill (Af): Described above		
22.5		**Old Alluvium (Qoc_2):** Truncated argillic, Clayey SAND, massive, slightly moist, basal contact north dipping and clear and irregular. **Note:** slight organics	Brown 10YR 4/3d, 3/3m	Slightly Hard toHard
25		**Old Colluvium (Qoc_2):** Stacked soil. Silty SAND with gravel, massive, coarse grained poorly sorted sand with gravel, fine to large subangular, moist to wet, exposed on North and West wall.	Brown 10YR 5/4d, 4/3m	Hard
27.5		**Old Colluvium (Qoc_3):** Truncated argillic. Sandy CLAY with gravel, massive, coarse grained poorly sorted sand with common highly weathered subangular gravel exposed on North and West walls, faulted to South and East against –	Strong Brown Moderately well oxidized 7.5YR 4/6d, 3/4m	Very Hard
30		**Monterey Formation (Tt):** Sandstone Bedrock, medium grained, locally mottled, highly weathered, intensely fractured, weak to moderately strong rock strength, massive rock structure, wet.	Tan	
32.5		Groundwater encountered at 32' @ Fault ~1" thick, white clay gouge zone, plaster, N32W, 695? @ Fault 2 - ~0.25 to 1" thick, white clay gouge zone and shear wavy and biforcately, N73E, 80N-90		
35		END at 35'		
37.5				
40				

Soil Type



1 06 03 07 2 01 7 2 9 2 4 5

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments

Date Performed: 11/3/15

Boring No: BA-3
Boring Location:
Groundwater Level: 30.0'
Drill Type: Bucket Auger

Depth in Feet	Soil Type	Bedrock/ Soil Description	Color	Density	Soil Type
		Asphalt and Base			
2.5		**Artificial Fill (Af):** Mixed soil, rock, concrete, and brick. Massive, slightly moist. Note: slight organics.			Af
5		**Colluvial Top Soil (Qc):** Silty SAND, massive, friable, medium to coarse grained poorly sorted sand with few pores and roots, few fine subangular gravel. Note: organic rich.	Dark Brown 10YR 3/3d, 2/2m	Slightly Hard	Qc (AB)
7.5 10		**Colluvium (Qc):** Weak subsoil. Silty SAND with gravel, massive, friable, medium to coarse grained poorly sorted sand with common to many fine, medium, and large subangular and angular gravel, poorly sorted sand, few roots, slightly moist.	Brown Slightly oxidized 10YR 4/4d, 3/2m	Slightly Hard to Hard	QC (Btj/BC)
		Old Alluvium (Qoa_1): Terrace deposit. Silty SAND with gravel, stratified, fined upwards, medium to coarse grained poorly sorted sand with common small subangular gravel at base, sl. moist	Yellowish Brown , Slightly oxidized 10YR 6/4d, 4/3m	Slightly Hard	Qoa_1/ +(2c)
12.5 15		**Old Colluvium (Qoc_1):** Truncated argillic. Silty SAND with clay, massive, medium to coarse grained poorly sorted sand with few and fine subangular gravel, few to common fine clay films on red faces with weak subangular block structure, slightly moist.	Brown, slightly oxidized 10YR 4/4d, 3/3m	Hard	Qoc_1 (3Btjb)
17.5 20		**Old Colluvium (Qoc_1):** Stacked soil. Silty SAND with gravel, massive, coarse grained poorly sorted sand with many fine, medium, and large subangular and angular gravel sandstone, moist to wet.	Brown 10YR 5/4d, 4/3m	Slightly Hard to Hard	Qoc_1 (3BCb)

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments

Date Performed: 11/3/15

Boring No: BA-3
Boring Location:
Groundwater Level: 30.0'
Drill Type: Bucket Auger

Depth in Feet	Soil Type	Bedrock/ Soil Description	Color	Density	Soil Type
		Old Colluvium (Qoc1): Described above.	Brown 10YR 5/4d, 4/3m	Slightly Hard to Hard	Qoc1 (3BCb)
22.5 25		**Old Colluvium (Qoc_3):** Truncated and Faulted, argillic. Sandy CLAY with gravel, massive, coarse grained poorly sorted sand with common subangular highly weathered sandstone, fine, medium, and large gravel.	Strong Brown Moderately well oxidized 7.5YR, 4/6d, 3/4m	Hard to Very Hard	Qoc_3 (5Btb)
27.5		**Old Colluvium (Qoc_2):** Silty SAND with gravel, coarse grained, poorly sorted sand, many subangular fine, medium, and large sandstone gravel, massive, wet.. NOTE: Fault- 0.25 TO 0.50" thick white gouge, wavy N65°-73°W,90° ~4" vertical seperation on unit Qoc_2 Groundwater encountered at 30'.	Brown 10YR, 5/4d, 4/3m	Slightly Hard to Hard	Qoc_2 (4BCb)
30 32.5 35 37.5 40		END at 30' Logged to 27' Groundwater encountered at 30'			

1 0 6 0 3 0 7 2 0 1 7 2 9 2 4 5

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments

Date Performed: 1/27/16

Boring No: BA-4
Boring Location: See Site Map
Groundwater Level: N/A
Drill Type: Bucket Auger

Depth in Feet	Soil Type	Bedrock/ Soil Description	Color	Density	Soil Type
0–3	Af	**Artificial Fill (Af)**: Clayey sand with gravel, massive with concrete and construction debris, abrupt planer lower boundary	Brown		Af
3–5		**(Qal) Alluvium**, sheet wash deposit, massive, silty sand,very friable, coarse grained, poorly sorted sand, slightly oxidized, with few fine gravel, clear smooth lower boundary	Yellowish brown	Loose	Qal
5–7		**Qc (AB) Colluvium**, truncated AB soil horizon, silty sand with clay, organic rich, massive, medium grained moderately well sorted sand with few fine and medium subrounded gravel, gradational wavy lower boundary	Brown	Slightly hard	Qc (AB)
7–11		**Qc (Bt) Colluvium (Base)**, argilic horizon, silty sand, massive to crudely stratified, slightly well oxidized, gradational loss of clay with depth, coarse grained, poorly sorted sand with common fine, medium and large gravel, abrupt planar lower boundary	Yellowish brown	Slightly hard	Qc (Bt)
11–12		**Qoa1 Old Alluvium**, thin sheet wash deposit, crudely stratified, sand with silt, friable, medium grained, moderately well sorted sand with few common fine and medium gravel, clear planer lower boundary	Light brown	Soft	Qoa1
12–17		**Qoc1 (Bt) Old Colluvium**, truncated argillic soil horizon, silty sand with clay, massive, moderately well oxidized, plugged with clay, coarse grained poorly sorted sand with common fine and medium gravel, slightly moist, abrupt wavy lower boundary	Reddish brown	Hard	Qoc1 (Bt)
17–20		**Qoa2 (BC) Old Alluvium**, well stratified beds of silty sand and sand with silt and gravel, very friable, abrupt wavy lower boundary	Yellowish brown	Soft	Qoa2 (BC)

1 0 6 0 3 0 7 2 0 1 7 2 9 2 4 5

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments

Date Performed: 1/27/16

Boring No: BA-4
Boring Location: See Site Map
Groundwater Level: N/A
Drill Type: Bucket Auger

Depth in Feet	Soil Type	Bedrock/ Soil Description	Color	Density	Soil Type
20					
21–26		**Qoc2 (Bt) Old Colluvium**, truncated argillic horizon, massive, silty sand with clay to clayey sand, medium grained moderately well sorted sand with few fine and medium completely weathered gravel, plugged with clay, gradational wavy lower boundary	Brown	Hard	Qoc2 (Bt)
26–39		**Qoc3 (Bt) Old Colluvium** argillc subsurface soil horizon massive, clayey sand, , medium grained moderately well sorted sand with few to common completely weathered fine and medium gravel, gradational increase in clay with depth, clear wavy lower boundary	Yellow brown	Hard	Qoc3 (Bt)
39–40					

Feffer Geological Consulting

Figure

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments

Date Performed: 1/27/16

Boring No: BA-4
Boring Location: See Site Map
Groundwater Level: N/A
Drill Type: Bucket Auger

Depth in Feet	Soil Type	Bedrock/ Soil Description	Color	Density	Soil Type
40–50		**Qoa3 (Bt) Old Alluvium**, truncated mature argillic, sandy clay, massive, , plugged with clay, well oxidized, strong soil structure, undetermined lower boundary	Reddish brown	Very hard, firm	Qoa3 (Bt)
50–55	SLUFF				
55–60		Logged To 50', Drilled To 55'			

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Figure

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LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments

Date Performed: 1/27/16

Boring No: BA-5
Boring Location: See Site Map
Groundwater Level: N/A
Drill Type: Bucket Auger

Depth in Feet	Soil Type	Bedrock/ Soil Description	Color	Density	Soil Type
0–3.5	Af	**Artificial Fill (Af)** silty sand with gravel and concrete debris, massive	Brown		Af
3.5–6		**Qal (Btj / BC) Alluvium**, sheet wash/channel deposit, juvenile argillic to transitional soil horizon, silty sand to sandy silt, massive, friable, coarse grained poorly sorted sand with common fine slate and sandstone gravel, abrupt smooth lower boundary	Olive brown	Soft	Qal (Btj / BC)
6–8.5		**Qc (AB) Colluvium**, near surface truncated and buried transitional soil horizon, silty sand, massive, organic rich, coarse grained poorly sorted sand with few to common fine and medium subangular gravel, gradational wavy lower boundary	Dark brown	Soft to slightly hard	Qc (AB)
8.5–11		**Qc (Bt /BC) Colluvium**, argillic to transitional soil horizon, silty sand, massive, slight organics, coarse grained poorly sorted sand, with few fine sub angular gravel, clear smooth lower boundary	Yellowish brown	Slightly hard	Qc (Bt /BC)
11–13.5		**Qoa1 (Bt) Old Alluvium**, sheet wash/channel deposit, crudely stratified, fining upwards, silty sand to sandy with silt and gravel, soft, fine to coarse grained well to poorly sorted and with few to common fine medium sub rounded gravel, abrupt smooth lower boundary	Light yellowish brown		Qoa1 (Bt)
13.5–17.5		**Qoc1 (Bt) Old Colluvium**, truncated argillic soil horizon, massive, silty sand with clay, slightly well oxidized, coarse grained poorly sorted sand with few fine and medium sub angular gravel, clear smooth lower boundary	Brown	Hard	Qoc1 (Bt)
17.5–20		**Qoa2 (Bt) Old Alluvium**, sheet wash / channel deposit, massive to crudely stratified, silty sand with gravel, coarse grained poorly sorted sand with common fine and medium sub angular highly weathered gravel, slightly moist, localized sand lenses, gradational boundary to;	Yellowish brown	Slightly hard	Qoa2 (Bt)

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments

Date Performed: 1/27/16

Boring No: BA-5
Boring Location: See Site Map
Groundwater Level: N/A
Drill Type: Bucket Auger

Depth in Feet	Soil Type	Bedrock/ Soil Description	Color	Density	Soil Type
20					
21–23		**Qoa2 (BC) Old Alluvium**, channel deposit, well stratified, silty sand to sandy silt, fine grained well sorted sand, localized pocket scours with many small and medium sub rounded gravel, few common wavy CaCo3 lined fractures (randomly orientated and discontinuous), clear wavy lower boundary	Yellowish brown		Qoa2 (BC)
23–27		**Qoc2 (Bt1) Old Colluvium**, truncated argillic soil horizon, massive, clayey sand to sandy clay, coarse grained poorly sorted sand with few fine and medium highly weathered gravel, slightly well oxidized, few CaC03 lined fractures on NW wall (discontinuous and wavy to planer), gradational lower boundary	Strong brown	Hard	Qoc2 (Bt1)
27–36		**Qoc3 (Bt2) Old Colluvium**, argillic subsurface soil horizon, silty sand with clay, massive, coarse grained poorly sorted sand with few fine and medium highly weathered sub angular gravel, (@28'- localized zone of many highly weathered gravel), gradational lower boundary	Brown	Slightly hard to hard	Qoc3 (Bt2)
37–40		**Qoc3 (BC) Old Colluvium**, transitional soil horizon, silty sand with clay, massive, coarse grained poorly sorted sand common fine and medium sub angular highly weathered gravel, clear smooth lower boundary	Dark yellowish brown	Slightly hard	Qoc3 (BC)

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Figure

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments

Date Performed: 1/27/16

Boring No: BA-5
Boring Location: See Site Map
Groundwater Level: N/A
Drill Type: Bucket Auger

Depth in Feet	Soil Type	Bedrock/ Soil Description	Color	Density	Soil Type
40 41 42		**Qoc4 (Bt) Old Colluvium**, truncated and stacked strong argillic horizon, massive, clayey sand, hard, coarse grains poorly sorted sand with few fine and medium completely weathered gravel, abrupt wavy lower boundary	Brown	Hard	Qoc4 (Bt) Old Colluvium
43 44		**Qoa3 (Bt) Old Alluvium**, truncated strongly developed argillic soil, massive, well oxidized, plugged with clay, , sandy clay, , coarse grained poorly sorted sand, undetermined lower boundary	Reddish brown	Very hard	Qoa3 (Bt)
45 46 47 48 49	SLUFF	Sluff			
50 51 52 53 54 55 56 57 58 59 60		Logged To 45', Drilled To 50'			

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Figure

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments

Date Performed: 1/27/16

Boring No: BA-6
Boring Location: See Site Map
Groundwater Level: N/A
Drill Type: Bucket Auger

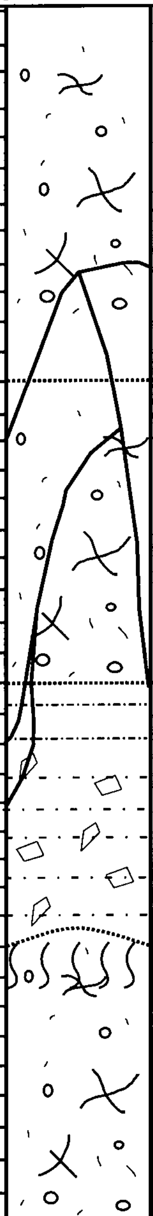
Depth in Feet	Soil Type	Bedrock/ Soil Description	Color	Density	Soil Type
0 1 2 3	Af	**Artificial Fill (Af)**, silty sand with gravel and construction debris, massive, abrupt wavy lower boundary	Dark brown		Af
4		**Qal -Alluvium**, channel scour deposit, silty sand with gravel, massive, coarse grained and poorly sorted sand with common fine sub rounded gravel, irregular south dipping lower boundary	Olive brown	Slightly hard	Qal
5 6 7		**Qc (AB) Colluvium**, truncated transitional soil horizon, silty sand, massive, slight organics,coarse grained poorly sorted sand with few sub angular gravel, gradational wavy lower boundary	Dark brown	Slightly hard to hard	Qc (AB)
8		**Qc (Btj/BC) Colluvium**, juvenile argillic soil horizon, silty sand, massive, coarse grained poorly sorted sand with few subangular gravel, gradational smooth lower boundary			Qc (Btj/BC)
9		**Qoc1 (Bt) Old Colluvium**, truncated argillic soil horizon, massive, , silty sand with gravel, coarse grained poorly sorted sand, common to many fine and medium sub angular gravel, clear wavy south dipping lower boundary	Yellowish brown		Qoc1 (Bt)
10		**Qoa2 (Btj) Old Alluvium**, truncated juvenile argillic soil horizon, sheet wash/channel deposit, sand with silt and gravel, massive,friable, many fine and medium sub rounded gravel, abrupt wavy lower boundary	Light brown	Loose	Qoa2 (Btj)
11		**Qoa2 (BC) Old Alluvium**, transitional soil horizon, channel deposit, silty sand, well-stratified, few fine and medium sub rounded gravel, medium grained moderately well sorted sand, abrupt smooth lower boundary	Light brown	Soft	Qoa2 (BC)
12		**Qoa2 (BC) Old Alluvium**, transitional soil horizon, channel deposit, silty sand, well-stratified, soft, few fine and medium sub rounded gravel, medium grained moderately well sorted sand, abrupt smooth lower boundary	Light brown		Qoa2 (BC)
13 14 15 16 17		**Qoc2 (Bt) Old Colluvium**, truncated argillic Horizon, silty sand with clay, slight organics, slightly oxidized, massive, coarse grained poorly sorted sand with few fine sub angular gravel, gradational wavy, north dipping lower boundary	Brown		Qoc2 (Bt)
18		**Qoc2 (BC) Old Colluvium**, transitional soil horizon, silty sand, slightly medium grained moderately well sorted sand, massive, clear wavy west sloping lower boundary	Light brown	Slightly hard	Qoc2 (BC)
19 20					

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments

Date Performed: 1/27/16

Boring No: BA-6
Boring Location: See Site Map
Groundwater Level: N/A
Drill Type: Bucket Auger



Depth in Feet	Bedrock/ Soil Description	Color	Density	Soil Type
20–26	**Qoc2 (BC) Old Colluvium**, transitional soil horizon,silty sand, medium grained moderately well sorted sand, massive, clear wavy west sloping lower boundary	Light brown	Slightly hard	Qoc2 (BC)
26–31	**Qoc3 (Bt) Old colluvium**, truncated, strong argillic horizon, , clayey sand with gravel, massive, slightly well oxidized, coarse grained poorly sorted sand with common fine and medium highly weathered gravel Fault-Thin wavy shear N75E 63S irregular west dipping contact	Strong brown	Hard	Qoc3 (Bt)
31–35.5	**Qoa3 (Bt1) Old Alluvium**, stacked and truncated argillic soil horizon, , sandy clay, , massive, moderately well oxidized coarse grained poorly sorted sand with few fine highly weathered gravel Fault on west wall, thin wavy shear N85W, 65S	Reddish brown	Very hard	Qoa3 (Bt1)
35.5–40	**Qoa3 (Bt2 gley) Old alluvium**, argillic subsurface soil horizon, clayey sand with gravel, massive, coarse grained with few fine medium and large completely weathered gravel, wet, clear wavy north sloping boundary;	Partially gleyed gray, pale brown	Hard	Qoa3 (Bt2 gley)

LOG OF EXPLORATORY BORING

Job Number: 1584-54
Project: Montecito Apartments

Date Performed: 1/27/16

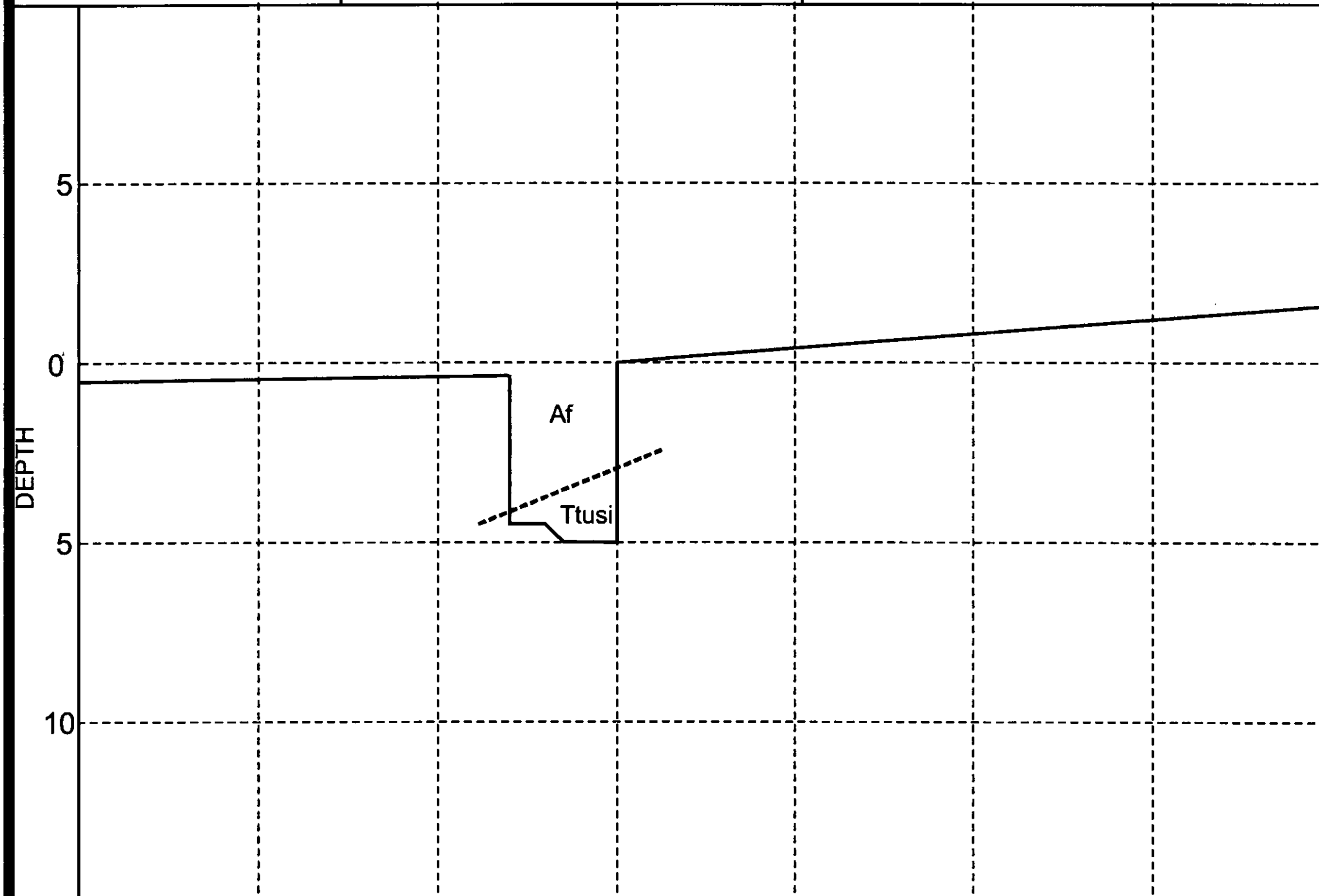
Boring No: BA-6
Boring Location: See Site Map
Groundwater Level: N/A
Drill Type: Bucket Auger

Depth in Feet	Soil Type	Bedrock/ Soil Description	Color	Density	Soil Type
40–45	SLUFF	**Qoa3 (Bt3) Old alluvium**, argillic subsurface soil horizon, , sandy clay, massive, , plugged with clay, well oxidized, medium grained moderately well sorted sand with few pea gravel, wet, undetermined lower boundary	Reddish brown	Very hard	Qoa3 (Bt3)
45		Drilled to 45'			
46–60					

Feffer Geological Consulting

Figure

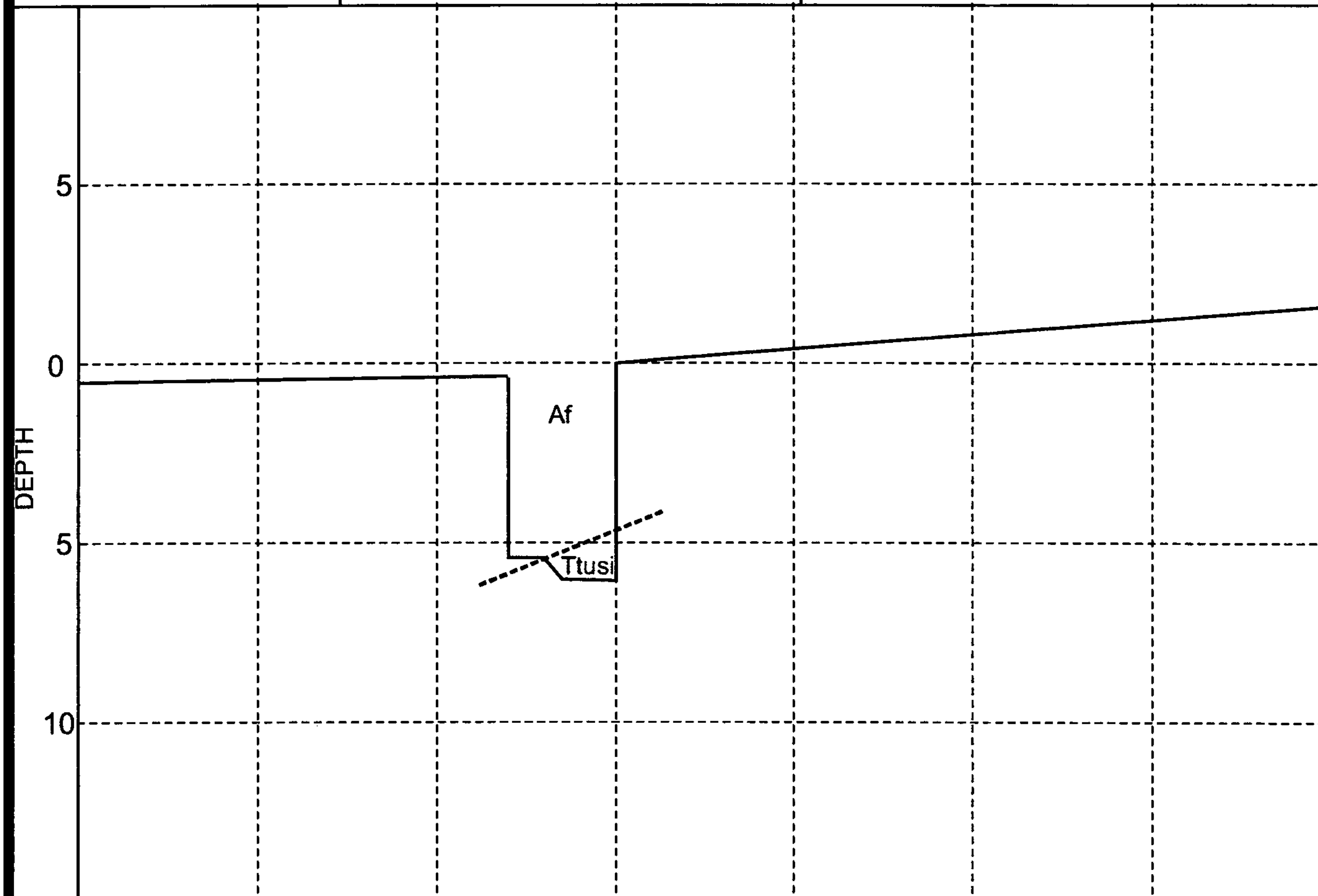
GRAPHIC LOG	APPROXIMATE SCALE : 1"=5'	TEST EXCAVATION : 1
	DATE LOGGED : 7/10/15 BY : RAM	ADDRESS: 6650 W. Franklin Avenue



RING	BULK	SAMPLE DEPTH	Blows	LOCATION : See Site Map DESCRIPTION: Classification (USCS), color, moisture, consistency etc.
		1 2 3 4 5 6 7 8 9 10 11 12 13 14		0-3' Fill (Af): Clayey sandy silt, tan, yellow brown, moist, dense, contains scattered rootlets, roots and rock fragments 3-5' Bedrock (Ttusi): Topanga Formation siltstone, orange brown, gray, moist, hard, thinly bedded moist, hard @4' Bedding Observed N24W 42NE End At 4', Fill To 1', No Water, No Caving

FEFFER GEO CONSULTING	F.N. 1584-54	Montecito Apartments (TSA)	PLATE

GRAPHIC LOG	APPROXIMATE SCALE : 1"=5'	TEST EXCAVATION : 2
	DATE LOGGED : 7/10/15 BY : RAM	ADDRESS: 6650 W. Franklin Avenue



RING	BULK	SAMPLE DEPTH	Blows	LOCATION : See Site Map
				DESCRIPTION: Classification (USCS), color, moisture, consistency etc.

SAMPLE DEPTH: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14

0-6' Fill (Af):
0-2' Sandy silt, dark brown, moist, dense, contains scattered roots, rock fragments and debris

2-4' Silty sand, mottled brown, yellow brown, moist, dense, contains scattered rootlets, roots, rock fragments and concrete debris

4-6' Silty sand, mottled brown, dark brown, moist, medium dense, contains scattered rootlets and rock fragments

6-7' Quaternary Soil (Qs):
Sandy silt, dark brown, mottled brown, moist, medium dense

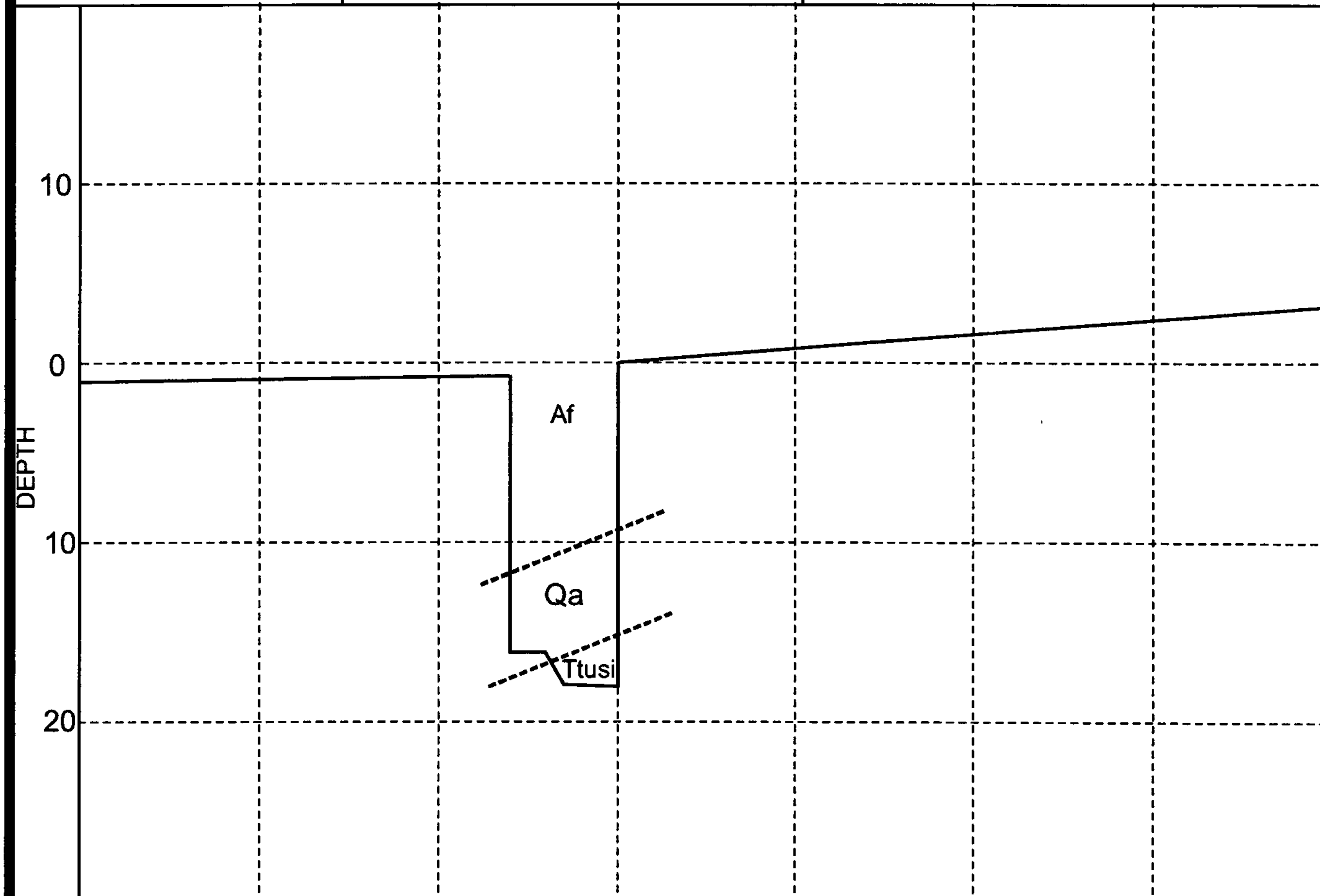
7-9' Bedrock (Ttusi):
Topanga Formation siltstone, yellow brown, tan, moist, hard, weathered

End At 9', Fill To 6', No Water, No Caving

FEFFER GEO CONSULTING	F.N. 1584-54	Montecito Apartments (TSA)	PLATE

1060307201720245

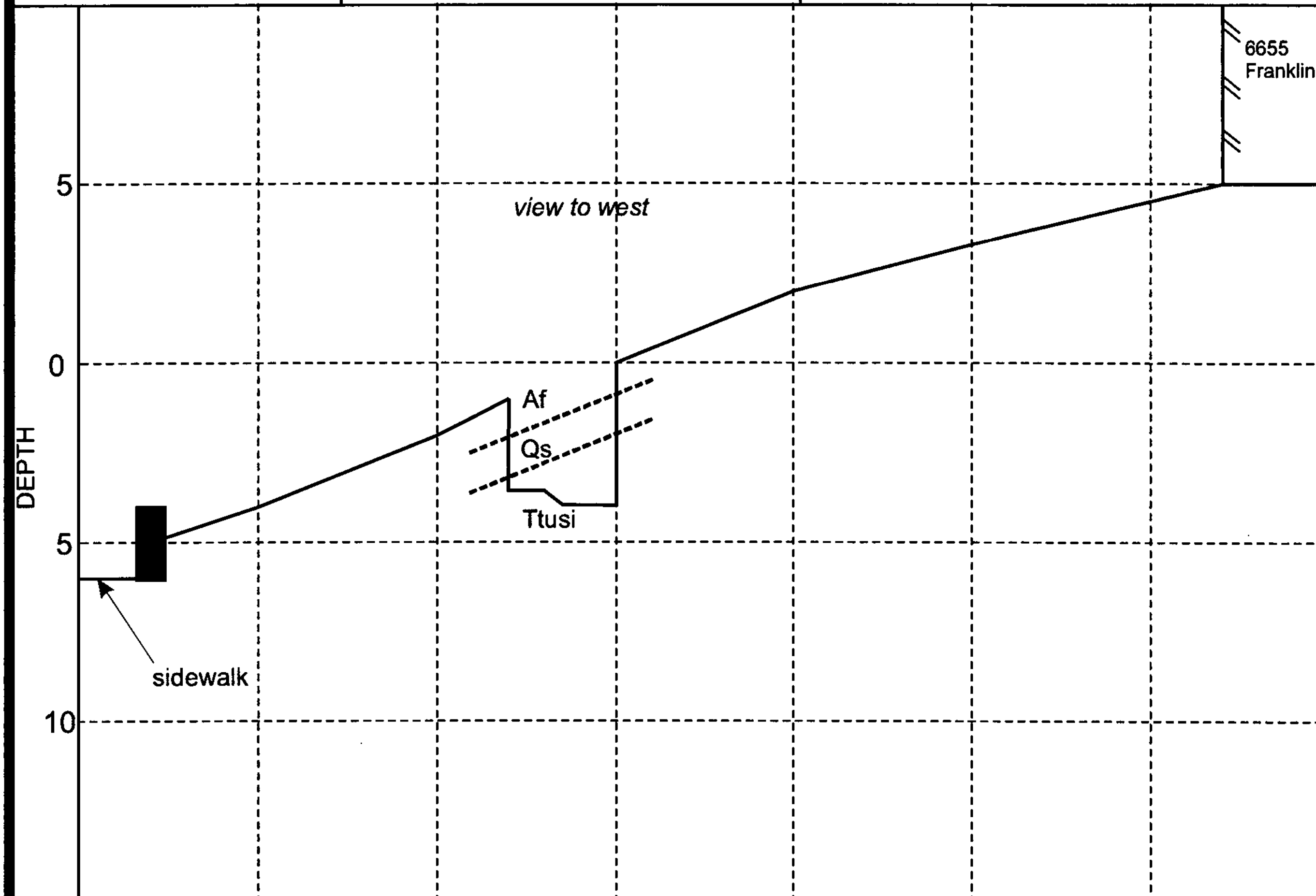
GRAPHIC LOG	APPROXIMATE SCALE : 1"=5'	TEST EXCAVATION : 3
	DATE LOGGED : 7/10/15 BY : RAM	ADDRESS: 6650 W. Franklin Avenue



RING	BULK	SAMPLE DEPTH	Blows	LOCATION : See Site Map DESCRIPTION: Classification (USCS), color, moisture, consistency etc.
		2 4 6 8 10 12 14 16 20 18 22 24 26 29		0-6' Fill (Af): 0-2' Silty sand, dark brown, brown, moist, dense, contains scatter rootletts, roots and concrete debris 2-6' Silty sand, orange brown, yellow brown, moist, dense, contains scattered rootlets and debris 6-19' Alluvium (Qa): @6'Sandy silt, clayey sandy silt, dark brown, mottled brown, moist, dense @13'Silty sand, yellow brown, tan, moist, dense @16' Gravelly silty sand, tan, yellow brown, mottled brown, moist, contains scattered rock fragments Bedrock (Ttusi): Topanga Formation interbedded siltstone and sandstone, yellow brown, tan, mottled brown, moist, very hard, highly weathered End At 19', Fill To 6', No Water, No Caving

FEFFER GEO CONSULTING	F.N. 1584-54	Montecito Apartments (TSA)	PLATE

GRAPHIC LOG	APPROXIMATE SCALE : 1"=5'	TEST EXCAVATION : 4
	DATE LOGGED : 3/18/16 BY : PB	ADDRESS: 6655 W. Franklin Avenue



RING	BULK	SAMPLE DEPTH	Blows	LOCATION : See Site Map DESCRIPTION: Classification (USCS), color, moisture, consistency etc.
		1 2 3 4 5 6 7 8 9 10 11 12 13 14		0-1' Fill (Af): Silty sand, brown, slightly moist to moist, medium dense, contains scattered rootlets, roots 1-2' Quaternary Soil (Qs): Silty sand, tan brown, moist, medium dense, contains scattered subangular pebbles, slightly gradational contact with underlying bedrock 2-4' Bedrock (Ttusi): Topanga Formation interbedded shale and sandstone, gray-tan-yellow-brown, moist, hard End At 4', Fill To 1', No Water, No Caving

FEFFER GEO CONSULTING	F.N. 1584-54	Montecito Apartments (TSA)	PLATE

1 0 6 0 3 0 7 2 0 1 7 2 9 2 4 5

Soil Stratigraphy Study And Relative Age Estimates
For A Fault Rupture Hazard Assessment At
6650 Franklin Avenue, City Of Los Angeles, California

Prepared by:

John Helms, CEG
40344 Wood Court, Palmdale, California 93551
Voice & FAX (661) 206-5860

Submitted to:

Mr. Josh Feffer, CEG
Feffer Geological Consulting, Inc.
1990 South Bundy Drive, 4th Floor
Los Angeles, CA 90025

March 29, 2016

John Helms, CEG
40344 Wood Court, Palmdale, CA 93551; (661) 206-5860

Mr. Josh Feffer, CEG
Feffer Geological Consulting, Inc.
1990 South Bundy Drive, 4th Floor
Los Angeles, CA 91025

March 29, 2016

Subject: **Soil Stratigraphy Study And Relative Age Estimates For A Fault Rupture Hazard Study At 6650 Franklin Avenue, City of Los Angeles, California.**

Dear Mr. Feffer:

I am pleased to present to you this soil stratigraphic study and relative-age determinations to be used with your fault rupture hazard assessment at 6650 Franklin Avenue, City of Los Angeles, California. This information presents the relative age estimate for a deposit in a single trench (T-2) exposure.

Feffer Geological Consulting, Inc. (FGC) retained John Helms CEG to describe the exposed soil stratigraphy and to assign relative age dates for the deposits identified. Soil descriptions are used to calculate various soil development indices (or SDIs). The SDI values were then compared to the SDI values from similar described soils with known ages to estimate age ranges for the soils understudy.

The attached report classifies and describes a soil profile, identifies stratigraphic relationships, defines soil chronosequences, and estimates relative age for the deposit under study. Calculated SDI's show strong correlations to the SDI values of other published, described, and dated soil profiles with similar parent materials. Age estimates range from 33 to 64 ka for the entire stratigraphic section under study. The youngest member of the stratigraphic section ranges in relative age from approximately 8 to 13 ka. Please see Table 2 in the attached report for a summary listing of the determined relative ages at the study site.

Thank you for this opportunity to be of service. Should you have any questions or require additional information, please do not hesitate to contact me.

Sincerely,

John Helms, CEG 2272

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Soil Stratigraphy Study And Relative Age Estimates For A Fault Rupture Hazard Investigation At 6650 Franklin Avenue, City of Los Angeles, California.

INTRODUCTION

One soil profile has been studied for geomorphic characteristics and relative degrees of weathering to estimate a deposit's relative-ages. The relative age estimates are based on index value comparisons with other published and dated soil profile descriptions. The comparative soils are from areas with a similar climate and similar parent material to this study area. The estimated relative ages in this report will be used by Feffer Geological Consulting Inc. (FGC) to assess the recency and recurrence of faulting across the study area. Alluvial units are assessed chronostratigraphically across a single trench exposure that is located in the central portion of the project site area. In this study, the soil stratigraphy is defined with soil field description data, and no laboratory data. This study identifies the soil stratigraphy and estimates the relative age of a single soil profile. The trench exposure is located across a graded alluvial apron surface that buries a short bedrock spur.

For the Quaternary geologist, a soil can be defined as a natural body that consists of horizons of organic and/or mineral constituents which differ from it's parent material in some way (Birkland, 1984). A chronosequence is a group of soils for which all soil forming factors (such as topography, parent material, vegetation, and climate) except time is relatively equal (Jenny, 1941). Recent geologic studies in the coastal region of southern California provide age constraints for several deposits and geomorphic surfaces ranging in age from middle Pleistocene to recent (McFadden, 1982; Rockwell, 1988; and WLA, 1998). Often it has proven difficult to date older deposits due to changes in past climatic regimes. Studies on the impacts of glacial to interglacial climatic changes on soil development in specific regions (McFadden, 1982; Birkland, 1984; McFadden, 1988) indicate that soil development has occurred throughout the Quaternary.

This study is concerned with a section of alluvium along the southern range front of the Santa Monica Mountains, which is within the Transverse Ranges Geomorphic Province. A series of stacked and truncated soil subsurface horizons within the stratigraphic section studied indicates that the modified ground surface across the entire study area is moderately old. Ages range from 8 to 13 ka for the thick surficial colluvial soil that underlies artificial fill across the project site area. The colluvium is characterized as a massive to crudely bedded, clayey, and gravel-rich deposit that is hard, coarse-grained with weak to moderately strong sub angular and angular blocky ped structure. The stacked and buried soils encountered in this study classify as alfisols that relative age estimates range from 8 to 13 ka for the surface soil in soil profile 1 to 33 to 64 ka for the third and lowest buried soil. Soil relative age estimates have broad ranges, dependant upon the pool of comparative data used. The soils across the study area fall into a great group classification (Soil Conservation Service, 2000) of Typic Haploxeralfs. Soil profile locations are indicated on the geologic map and trench log of trench ST-2 that has been provided with the FGI fault rupture hazard investigation report.

MATERIALS AND METHODS

One soil profile from station 4 feet in trench exposure ST-2 was described, sampled, classified, and quantified within the study area. The soil was described in the field, using guidelines set by the Soil Survey Staff (1991 and 1999). Soil horizons were sampled as to prevent contamination from adjacent horizons (Soil Survey Staff, 1991). Sample sizes varied according to the gravel content of the soil horizon. Soil horizons thicker than 2 feet were sampled on a 1-foot interval.

Soil profile field description values quantify soil properties that are used to develop a soil development index (SDI) value as outlined by Harden (1982). Points are assigned to descriptive data for each of several observed soil properties, such as dry color, moist color, texture, structure, dry, moist, and wet consistence, clay film content, and calcium carbonate stage level, for every horizon in a profile relative to the horizon's thickness, and normalized to a common depth. The maturity of a soil profile is gauged through data collected from active wash deposits (or raw alluvium).

Table 1.1 lists the soil description for each studied surface in longhand format. Table 1.2 lists the soil description in soil conservation service notation and shows the SDI calculations. This table shows the calculated SDI values, the soil profile description, and the normalization values for raw alluvium. SDI values are calculated by assigning point values to described soil properties. The points are summed for each soil horizon and divided by the total number of descriptive properties used. This equals the mean horizon index value (HI). HI values are multiplied by the corresponding soil horizon thickness. The SDI value equals the sum of the normalized horizon indices. The maximum horizon index (MHI) is the value of the horizon with the largest summed descriptive value. MHI is independent of horizon thickness, and is usually the diagnostic subsurface soil horizon for most soil profiles. Table 1.2 lists all of the determined HI, SDI, and MHI values for the soil under study.

SDI values have shown significant correlations to soil age in many recent studies (Harden, 1981; Rockwell *et al.*, 1985; Reheis *et al.*, 1990; Rockwell *et al.*, 1994). The soils described in this study are compared to soils described and dated by McFadden (1982 and 1987) in San Bernardino County near Mission Creek, by Rockwell (1988) in the Ventura River basin, and by William Lettis and Associates, Inc. (1998) in the Hollywood Basin. SDI values are calibrated to a common depth of 7 feet.

The changes in the subsurface pedogenic properties of the alfisol soil order allows for relative age determinations by emphasizing specific soil properties (such as color and clay film content) that are most diagnostic. Soil properties that express themselves well through time are most often used in the assessment of soil relative ages through a specific soil property index such as the color or clay film index. MHI is a comparison of a soil pedons master (or diagnostic) subsurface horizon (typically an argillic or cambic horizon). Independent of horizon thickness, the MHI directly compares the properties of the soil profiles strongest soil horizon. The color index (Rockwell *et al.*, 1985, 1994) is used to quantify observed colors (in Mussel notation) of each profile in order to compare relative degrees of reddening. The color index is simply the summation of an entire profile's horizon index values for dry colors. The clay film index (Rockwell *et al.*, 1985, 1994) is used to quantify field descriptions of this soil property in order to compare relative profile maturity. The clay film index is simply the summation of an entire soil profile's horizon index values for clay films.

SOIL RELATIVE AGE METHODS

Soil relative ages are calculated and compared independently for each soil profile described. The soil profile under study is located across a colluvial surface that may laterally differ in relative age, facies of deposition, and degrees of preservation. A sequence of stacked, buried, and truncated gravelly soils with illuvial clays characterizes the soil profile described on the project site.

The soil profile described has a surface age implied by estimating the time of inception for the exposed surficial soil. The soil within this study area also contains a series of stacked or buried soils. In this case, a deposit age assessment is obtained by identifying and isolating the different parent materials (or deposits). Then comparing a set of abridged calculated indices to an additional suite of similar soils that have been radiometrically dated yields the equivalent to a surface age estimate. Such burial relationships are common along the southern Santa Monica Mountains range front; especially where soils have developed into alluvial fan and apron deposits that buries or locally truncates older soils that have developed previously in older sediments. A cumulic soil profile estimated age can assess landform age, and has potential to assess rates of erosion, rates of landform evolution, and rates of tectonic activity across the study area.

Each described soil member has an SDI value, which is used to estimate the soil relative age. Cumuli relative age estimates for a stacked or buried soil profile are specifically referred to as "deposit ages". The relative age estimate for the surface profile or modern soil is referred to as the "surface age". All of the relative age estimates given are considered minimum ages given that an unknown amount of erosion has occurred after the formation of and before the burial of each truncated soil studied.

DISCUSSION AND RESULTS

The attached Table 1.1 presents the soil profile descriptions in longhand format. Figure 1 is the soil profile illustration that shows the nature of the described soil horizon boundaries, physical characteristics of the soil, and views of the related surface morphology. Table 1.2 presents the results of the calculated SDI values. Table 2 is a summary of the soil relative age estimates the soil profile under study. Table 3 is a compilation of the comparative data in a format that compares to the data generated for this study. Table 4 is a soil abbreviation key to be used in conjunction with the SDI calculation sheets. Table 5 lists the stratigraphic unit correlations and relative ages for the project site area.

The soil description, SDI calculations, and relative age determinations follow for the soil profile studied.

Soil Profile 1
Test Pit Exposure

Soil profile 1 is located nearest station 4 feet in trench exposure ST-2 excavated near the center of the project site area. The soil profile lies across a graded surface that is geomorphically inactive. This soil profile consists of a series of stacked, truncated, and buried argillic soil horizons. Most of the diagnostic soil horizons observed are moderately well developed and the individual soil members are classified as Alfisol soils. The surface soil member has developed within an alluvial apron deposit that has draped over and buried a bedrock spur and truncated the lower soil members described. The soil profile described contains a surface soil and one buried soil to a depth of approximately 16.2 feet below the ground surface. A detailed soil description for this profile is listed in table 1.1, the calculated soil development indices for this soil profile and relative age estimates are listed in table 1.2, and the individual soil profile members are briefly described below.

The surface soil profile is classified as a thick and truncated remnant Haploxeralf. This soil is slightly well oxidized and displays 10YR and 7.5YR mixed soil color hues. The deposit is massive to crudely bedded and coarse-grained, and has a scoured contact with the underlying buried soil. Diagnostic properties observed within this soil are an organic rich transitional (ABt) horizon over a series of argillic Bt subsurface soil horizons that contain very few moderately thick and common fine clay films on ped faces and common moderately thick coating clasts. This soil horizon is slightly hard to hard with weak sub angular and angular blocky structure. This deposit forms a scoured and clear contact with the underlying buried soil. A relative age estimate of 8 to 13 ka for the surface soil remnant in profile 1 was obtained by comparing the observed clay film development and soil development index values to the more mature soil profile Qt3 in the Ventura Basin soil chronosequence (Rockwell, 1988) and the less mature soil profile S-4 in the Mission Creek soil chronosequence (McFadden, 1988).

Buried soil 1 is classified as a truncated Haploxeralf. The horizonation is characterized by a 2Btb argillic horizon. This deposit is well stratified and fine- to medium-grained. Diagnostic properties observed within this soil's argillic Bt subsurface horizon contains common fine clay films on ped faces and common moderately thick coating clasts. This soil has weak to moderately strong sub angular and angular blocky structure. A relative age estimate of 8 to 13 ka for buried soil 1 in soil profile 1 was obtained by comparing the observed clay film development and soil development index values to the more mature soil profile Qt3 in the Ventura Basin soil chronosequence (Rockwell, 1988). and the less mature soil profile S-4 in the Mission Creek soil chronosequence (McFadden, 1988).

Buried soil 2 is classified as a truncated Paleoxeralf. The horizonation is characterized by a mature 3Btb argillic horizon. This deposit is massive to crudely stratified and coarse-grained. Diagnostic properties observed within this soil's argillic Bt subsurface horizon contains common fine and few moderately thick clay films on ped faces and common moderately thick coating clasts. This soil has moderately strong sub angular and angular blocky structure. A relative age estimate of 13 to 30 ka for buried soil 2 in soil profile 1 was obtained by comparing the observed clay film development and soil development index values to the more mature soil profile Qt5a in the Ventura Basin soil chronosequence (Rockwell, 1988) and the less mature soil profile S-4 in the Mission Creek soil chronosequence (McFadden, 1988).

Buried soil 3 is classified as a truncated Inceptisol. The horizonation is characterized by a remnant residual 4Crb weathered bedrock horizon. This deposit is massive and medium- to coarse-grained. Diagnostic properties observed within this soil's residual C basal soil horizon contains very fine clay films on ped faces. This soil has a massive structure. A relative age estimate of 4 to 8 ka for buried soil 3 in soil profile 1 was obtained by comparing the observed clay film development and soil development index values to the more mature soil profile S-4 in the Mission Creek soil chronosequence (McFadden, 1988) and the less mature soil profile Qt3 in the Ventura Basin soil chronosequence (Rockwell, 1988).

In conclusion, the entire stratigraphic section for soil profile 1 is estimated to be 33 to 64 ka. Most of this age resides within the lowest (or buried) soil in this exposure. The materials described in this test pit exposure for soil profile 1 appear similar to the materials exposed across the trench exposure.

TABLE 1.1 Soil Profile – 1, Trench T-2, Station 4 feet.
Fault Rupture Hazard Study at 6650 Franklin Avenue, City of Los Angeles, California.

Soil Classification: Series of stacked and truncated Alfisols
Geomorphic Surface: Alluvial / Colluvial Apron
Parent Material: Santa Monica Range Front Alluvium
Vegetation: Urban
Described By: John Helms
Date Described: 12/10/15
Exposure Type: Trench Exposure

Horizon	Depth (ft.)	Thickness (ft.)	Description of T-2, Sta. 4 ft.
Af	0 – 1.9	1.9	Artificial Fill – Dark Brown, loam, coarse-grained with construction debris and buried footing, abrupt smooth lower boundary to;
AB / Bt1	1.9 – 3.7	1.8	Yellowish brown (10YR 5/4 d; 10YR 4/3 m); clay loam to loam; massive to weak medium and coarse sub angular blocky; slightly hard, firm, moderately sticky, moderately to very plastic; dark yellowish brown (10YR 4/4 d; 10YR 3/3 m) clay and humus films few to common thin and very few moderately thick on ped faces, few to common thin common fine coating clasts; slight organics, slightly oxidized, fine-grained well sorted sand; 0 - 5% fine sub rounded gravel; few to common fine and medium pores, no roots, dry; massive truncated transitional to argillic horizon; gradational wavy lower boundary to:
Bt2	3.7 – 5.4	1.7	Brown (7.5YR 4/4 d; 7.5YR 3/3 m); clay loam; moderately strong fine and medium angular blocky; hard, firm, moderately to very sticky, very plastic; dark brown (7.5YR 3/3 d; 7.5YR 2.5/2 m) clay films common thin and few moderately thick on ped faces, common few thin coating clasts, and common few thin lining pores; trace organics, slightly well oxidized, fine-grained well sorted sand; 0 - 5% fine sub rounded sandstone gravel; no roots, few fine and medium pores, dry to slightly moist; sub soil argillic horizon, massive scour deposit; gradational wavy lower boundary to:

Horizon	Depth (ft.)	Thickness (ft.)	Description of T-2, Sta. 4 ft. (Cont.)
Bt3	5.4 – 7.4	2.0	Brown (7.5YR 4/3 d; 7.5YR 3/3 m); sandy loam to loam; weak to moderately strong fine and medium sub angular blocky; slightly hard, friable, moderately to slightly sticky, slightly plastic; brown (7.5YR 4/3d; 7.5YR 2.5/3 m) clay films few thin on ped faces, and few thin coating clasts; slightly well oxidized, fine to medium-grained moderately well sorted sand; 5 - 10% fine and medium sub rounded and sub angular highly weathered sandstone gravel; no roots, no pores, slightly moist; massive, sub soil argillic horizon, scour deposit; clear smooth lower boundary to:
2Bt1b / 2BCb1	7.4 – 8.9	1.5	Brown (7.5YR 4/4 d; 7.5YR 3/3 m); clay loam to loam; weak to moderately strong fine and medium angular blocky; hard, friable, moderately to very sticky, very plastic; slightly well oxidized, medium-grained moderately well sorted sand; 10 - 15% fine and medium rounded gravel; dark brown (7.5YR 3/4 d; 7.5YR 3/2 m) clay films common thin on ped faces and common moderately thick coating clasts; no roots, no pores, slightly moist; truncated transitional or sub surface argillic horizon, crudely stratified stacked scour / sheet wash deposit, gradational wavy lower boundary to:
2Bt2b / 2BCb2	8.9 – 10.0	1.1	Strong brown (7.5YR 5/4 d; 7.5YR 4/3 m); sandy loam to loam; massive to weak fine sub angular blocky; soft to slightly hard, friable, slightly sticky, slightly plastic; moderately well oxidized, medium-grained moderately well sorted sand; 10 - 25% fine and medium sub rounded and rounded gravel; brown (7.5YR 4/3d; 7.5YR 2.5/3 m) clay films few thin on ped faces, and few thin coating clasts; no roots, no pores, slightly moist; transitional or sub surface argillic horizon, well stratified fining upwards scour deposit, abrupt wavy lower boundary to:

Horizon	Depth (ft.)	Thickness (ft.)	Description of T-2, Sta. 4 ft. (Cont.)
3Btb1	10.0 – 12.9	2.9	Strong brown (7.5YR 5/6 d; 7.5YR 4/4 m); clay loam; moderately strong medium and coarse angular blocky; hard, firm, very sticky, very plastic; brown (7.5YR 4/3 d; 7.5YR 3/2 m) clay films common thin, few moderately thick, and very few thick on ped faces, and common moderately thick coating clasts; moderately well oxidized, medium-grained moderately well sorted sand; 5 - 10% fine and medium sub rounded and sub angular highly weathered sandstone gravel; no roots, few fine pores, slightly moist; truncated argillic horizon, massive colluvial deposit; gradational wavy lower boundary to:
3Btb2 / 3BCb1	12.9 – 14.2	1.3	Brown (7.5YR 5/4 d; 7.5YR 4/3 m); sandy loam; single grained to weak medium and coarse sub angular blocky; hard, friable, slightly to moderately sticky, slightly plastic; brown (7.5YR 4/3 d; 7.5YR 3/2 m) clay films common thin, few moderately thick, on ped faces, and few moderately thick coating clasts; moderately well oxidized, MnO webbing on ped faces, fine to medium-grained moderately well sorted sand; 25 - 50% fine, medium, and coarse sub angular highly weathered sandstone gravel; no roots, no pores, moist; transitional to sub soil argillic horizon, base of massive colluvial deposit; gradational clear irregular lower boundary to:
4Crb	14.2 – 16.2+	2.0+	Grayish brown (10YR 5/2 d; 10YR 3/1 m); Topanga Formation sandstone bedrock; highly weathered, moderate rock strength, massive to blocky rock structure, crudely bedded, completely fractured, fractures are tight to slightly open, stepped, randomly orientated, and closely spaced, moist; breaks to loamy sand; single grained; hard, friable, slightly to non-sticky, non-plastic; localized moderately well oxidized beds, medium-grained moderately well sorted sand; 0 - 3% fine rounded gravel; no roots, no pores; undetermined lower boundary.

TABLE 1.2 - Soil Development Index Calculation Sheet
Soil Profile - 1, Trench Exposure

Unit	Thickness (Feet)	Color Dry		Color Moist		Texture		Structure		Consistence Dry		Consistence Wet		Clay Films		Horizon Values	Mean Hor. Values
Raw Alluvium	*3*	*2.5Y 7/2*	*X/10*	*10YR 6/3*	*X/10*	*s*	*X/6*	*sg*	*X/6*	*lo*	*X/5*	*so, po*	*X/6*	*0*	*X/15*		
Profile 1																	
ABt1	1.8	10YR 5/4	0.3	10YR 4/3	0	l-cl	0.58	1 sbk	0.33	sh	0.33	s, p-vp	0.75	1-2tpf, v1mkpf, 2fcl	0.47	0.39	0.71
Bt2	1.7	7.5YR 4/4	0.4	7.5YR 3/3	0.1	cl	0.67	2 abk	0.67	h	0.6	s-vs, vp	0.92	1mkpf, 2fpf, 1dpo, 1dcl	0.63	0.57	0.97
Bt3	2	7.5YR 4/3	0.3	7.5YR 3/3	0.1	sl-l	0.42	1 sbk	0.33	sh	0.33	ss-s, ps	0.42	1fpf, 1fcl	0.32	0.32	0.63
2Bt1b / 2BC1b	1.5	7.5YR 4/4	0.4	7.5YR 3/3	0.1	l-cl	0.58	1-2 abk	0.58	h	0.6	s-vs, vp	0.92	2fpf, 2dcl	0.43	0.52	0.77
2Bt2b / 2BC2b	1.1	7.5YR 5/4	0.4	7.5YR 4/3	0.1	sl-l	0.42	1 sbk	0.33	so-sh	0.25	ss, ps	0.33	v1-1fpf	0.18	0.29	0.32
3Bt1b	2.9	7.5YR 5/6	0.6	7.5YR 4/4	0.2	cl	0.67	2 abk	0.67	h	0.6	vs, vp	1.00	2fpf, 1dpf, 2dcl	0.63	0.62	1.81
3Bt2b/ 3BCb	1.3	7.5YR 5/4	0.4	7.5YR 4/3	0.1	l	0.5	1 sbk	0.33	h	0.6	s-ss, ps	0.42	2fpf, v1dpf, 2dcl	0.48	0.40	0.53
4Crb	2	10YR 5/2	0.3	10YR 3/1	0	ls	0.17	m	0.00	h	0.6	ss, po	0.17		0	0.18	0.35

INDEX VALUES AND ESTIMATED AGES (ka)

Soil Member	MHI	Mean Soil Index	SDI @ 7 feet	Color Index	Clay Film Index	Soil Age Estimate ka	Section Age Estimate ka	Stratigraphic Unit
Surface Soil	**0.57**	**2.31**	**2.94**	**1.2**	**1.42**	**8 - 13**	**8 - 13**	**Qc**
Buried Soil 1	**0.52**	**1.09**	**2.94**	**1**	**0.61**	**8 - 13**	**16 - 26**	**Qoa1**
Buried Soil 2	**0.62**	**2.34**	**3.89**	**1.3**	**1.11**	**13 - 30**	**29 - 56**	**Qoc1**
Buried Soil 3	**0.18**	**0.35**	**1.24**	**0.3**	**0.00**	**4 - 8**	**33 - 64**	**Tt**

Table 2. Soil Surface Relative-Age Estimates

Summary Table

Profile Number	Soil Member	MHI Value	SDI Value	Clay Film	Age (ka)
1	Surface Soil	0.57	2.94	1.42	**8 - 13**
	Buried Soil 1	0.52	2.94	0.61	**16 - 26**
	Buried Soil 2	0.62	3.89	1.11	**29 - 56**
	Buried Soil 3	0.18	1.24	0	**33 - 64**

Table 3. Comparison Soil Data Indices Value Summary

(McFadden) Mission Creek Soils	SDI At 7'	MHI	Reddening Index	Clay Film Index
S7 0-1000 yrbp	5.9	0.12	0	0
S5 4-13 ka	10.2	0.3	0.1	0
S4 13-70 ka	31.4	0.37	3.94	7.37
S2 70-250 ka	56.10	0.61	4.80	6.24
S1 250-700 ka	25.70	0.39	6.20	10.31

(Rockwell) Ventura River Basin Soils	SDI At 7'	MHI	Reddening Index	Clay Film Index
Qt3 4 - 8 ka	17	0.17	0.5	0
Qt4 10 -15 ka	27	0.43	2	4
Qt5a 15 – 20 ka	28	0.37	3.5	4.2
Qt5b 30 ka	32	0.46	5	7

(WLA) West Hollywood Buried Soils	SDI At 7'	MHI	Reddening Index	Clay Film Index
Qol1 100 ka	21.4	0.42	1.05	1.99
Qol2 100-300 ka	73.5	0.8	8.2	13.2

TABLE 4. Soil Field Description Abbreviation Key

Texture		Structure		Consistence: Dry		Consistence: Moist		Consistence: Wet		Clay Films		Calcium Carbonate (Pedogenic CaCO3)	
S	- sand	m	- massive	l	- loose	vfr	-very friable	so	non stickey	v1	veryfew	sl dis	slightly dissemenated
LS	- loamy sand	sg	- single grained	so	-soft	fr	-friable	ss	slightly stickey	1	few	I	slight coatings common on clast bottoms
SL	- sandy loam		OR	sh	-slightly hard	fi	-firm	s	moderately siteckey	2	common	II	moderately thick coatings on clast bottoms; few medium common fine nooduses
L	- loam	1	- weak	h	-hard	vfi	-very firm	vs	very stickey	3	continuous	III	thick coatings common on clast bottoms, common medium nodules, common fine pendants, many fine nodules
CL	- clay loam	2	- moderate	vh	-very hard				AND		AND	VI	many thick coatings on clasts bottoms common coarse pendants few clasts completely enveloped
SCL	- sandy clay loam	3	- strong	eh	-extremely hard			po	non plastci	vn	stains	V	many thick coatings on clasts bottoms, many coarse pendants common clasts completely enveloped- petrocalcic
C	- clay		AND					ps	slightly plastic	n	thin	V+	many thick coatings on clasts bottoms, many coarse pendants many clasts completely enveloped, completely disseminated in matrix - petrocalcic
Si	- silt	vf	- very fine					p	moderately plastic	mk	moderately thick		
SiL	- silt loam	f	- fine					vp	very plastic	k	thick		
SiCL	- silt clay loam	m	- medium								AND		
SiC	- silty clay	c	- coarse							cl	coating clasts		
		vc	- very coarse							pf	ped faces		
			AND							br	brodgeing sand grains		
		gr	- granular							po	lining pores		
		pl	- platty										
		pr	-prismatic										
		abk	-angular blockey										
		sbk	- sub angular blockey										

Table 5. Stratigraphic Unit Correlation

Strat. Unit	Locality	Deposit Type	Age (ka)
Qal	BA4 - BA6	Surficial channel or sheet flow deposit	< 8.0 - 13.0
Qc	FT-2	Surficial alluvial apron deposit	8.0 - 13.0
Qoa1	FT-2	Buried channel or sheet flow deposit	16.0 - 26.0
Qoc1	FT-2	Buried alluvial apron deposit	29.0 - 56.0
Qoa2	BA4 - BA6	Buried channel or sheet flow deposit	> 29.0 - 56.0
Qoc2	BA4 - BA6	Buried alluvial apron deposit	> 29.0 - 56.0
Qoc3	BA4 - BA6	Buried alluvial apron deposit	> 29.0 - 56.0
Qoc4	BA4 - BA6	Buried alluvial apron deposit	> 29.0 - 56.0
Qoa3	BA4 - BA6	Buried alluvial fan remnant	~ 150.0

CONCLUSIONS

The soils observed across the study area are alfisols that have developed in alluvial environments. The soil profile described consists of a series of stacked, truncated, and buried soil horizons. The soil profile appears laterally continuous across the project site area area. In this sedimentological environment surfaces that have been stable long enough to form a soil, can suddenly be buried by a new deposit, or scoured out (truncated) and possibly in-filled with younger material. The amount of erosion that has occurred with each truncated soil under study is unknown. Thus the relative age estimates given in this study are minimum ages.

The soil relative age estimates given are consistent with the general geologic and pedogenic observations of soils in southern California. Strongly developed, well horizonated, thick, and oxidized alfisols can be as much as 200 ka in age. Erosion tends to act as a rejuvenating aspect in soil development, by decreasing the strength of the soil development properties consequent age estimates are younger. In that past magnitudes and rates of erosion is difficult to assess the soil relative age estimates should be utilized as minimum ages.

The truncated and buried soil with an argillic sub surface soil horizon is moderately well developed. The buried alfisol soil typically has 7.5YR colors with a moderate amount of secondary (pedogenic) clay. Structure is typically moderately strong angular blocky and hard. Clay films are moderately abundant and moderately thick.

The soils exposed in the trench ST-2 exposure are Late Pleistocene in age. The stacked soils display soil horizons that have moderately strong argillic horizon development. The stratigraphic section for profile 1 is estimated to be 33 to 64 ka. Most of this age resides within the second buried soil in this exposure.

LIMITATIONS

The conclusions and recommendations presented herein are the results of an inherently limited scope. Specifically, the scope of services consisted of an assessment of relative age at the site. The conclusions and recommendations contained in this report are professional opinions derived in accordance with current standards of professional practice. No warranty is expressed or implied.

This report has been prepared for the exclusive use of Feffer Geological Consulting, Inc. and applies only to the Fault Rupture Hazard Study located at 6650 Franklin Avenue. In the event that significant changes in the interpretations of this study are to be made, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed by John Helms, CEG, and the conclusions and recommendations of this report are verified in writing.

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6650 Franklin Avenue

Soil Profile 1, Trench ST-2, Station 4 feet

Soil Classifications
(Stratigraphic Unit)

Artificial Fill
Af

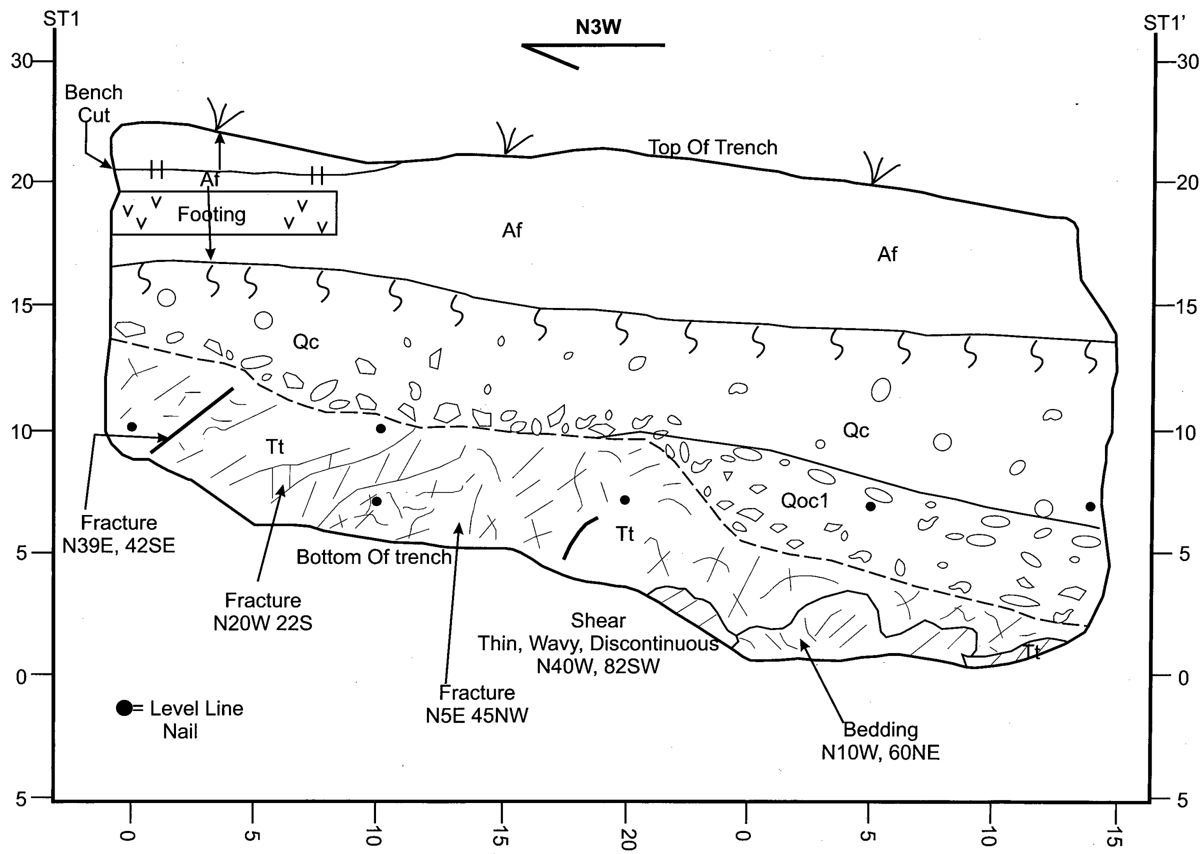
Haploxeralf
Qc

Haploxeralf
Qoa1

Haploxeralf
Qoc1

Bedrock
Tt

Montecito AP-Trench ST-1 9/1/15



Scale 1"=5"

Montecito Trench Log Unit Descriptions

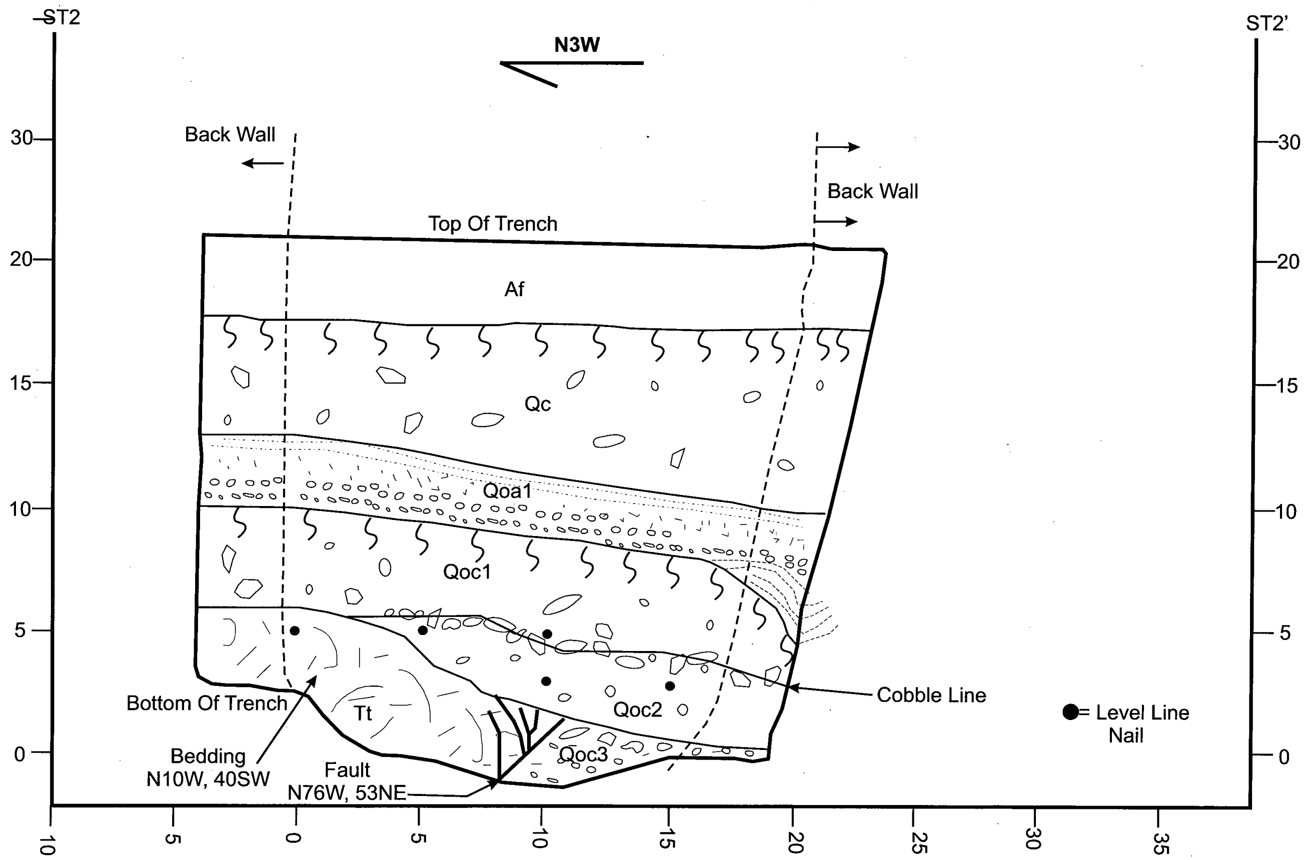
Trench ST-1
Af-Artificial Fill, surficial layer, dark brown, silty SAND, with abandoned footing and concrete debris, clear planar boundary to unit Qc;

Qc-Holocene Colluvium, colluvial apron deposit, continuous across entire trench exposure. Brown (10YR 5-4/3m), silty SAND with clay, massive, slightly hard, moderately sticky, slightly plastic, friable, coarse-grained poorly sorted sand, slight organics, with common fine and medium slate and sandstone sub angular gravel, few fine and medium pores, few fine and medium roots, clear wavy lower boundary to unit Tt across northern half of trench, and gradational smooth lower boundary to unit Qoc1 across southern half of trench exposure.

Qoc1-Late Pleistocene Colluvium, colluvial apron deposit, continuous across southern half of trench exposure. Brown (10YR 5/4m), clayey SAND, crudely stratified to massive, hard, moderately sticky, moderately plastic, friable to firm, coarse-grained poorly sorted sand, slightly well oxidized, with common to many fine and medium slate and sandstone sub angular gravel, few fine and medium pores, few fine and medium roots, clear wavy lower boundary to unit Tt across northern half of trench, and gradational smooth lower boundary to unit Qoc2 across southern half of trench exposure.

Tt-Tertiary Topanga Formation, Sandstone (yellowish brown) with interbedded Shale (gray), continuous across entire trench exposure. Highly weathered, weak to moderately strong rock strength, blocky rock structure, highly fractured (randomly orientated, tight to slightly open, and discontinuous), localized MnO coatings, undetermined lower boundary.

Montecito AP-Trench ST-2 12/9/15



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Trench ST-2
Af-Artificial Fill, surficial layer, dark brown, silty SAND, with concrete debris, clear planar boundary to unit Qc;

Qc-Holocene Colluvium, colluvial apron deposit, continuous across entire trench exposure. Brown (7.5YR 4/4m), silty SAND with clay, massive, slightly hard, moderately sticky, slightly plastic, friable, coarse-grained poorly sorted sand, slight organics, with common fine and medium slate and sandstone sub angular gravel, few fine and medium pores, few fine and medium roots, clear smooth lower boundary to unit Qoa1 across entire trench exposure.

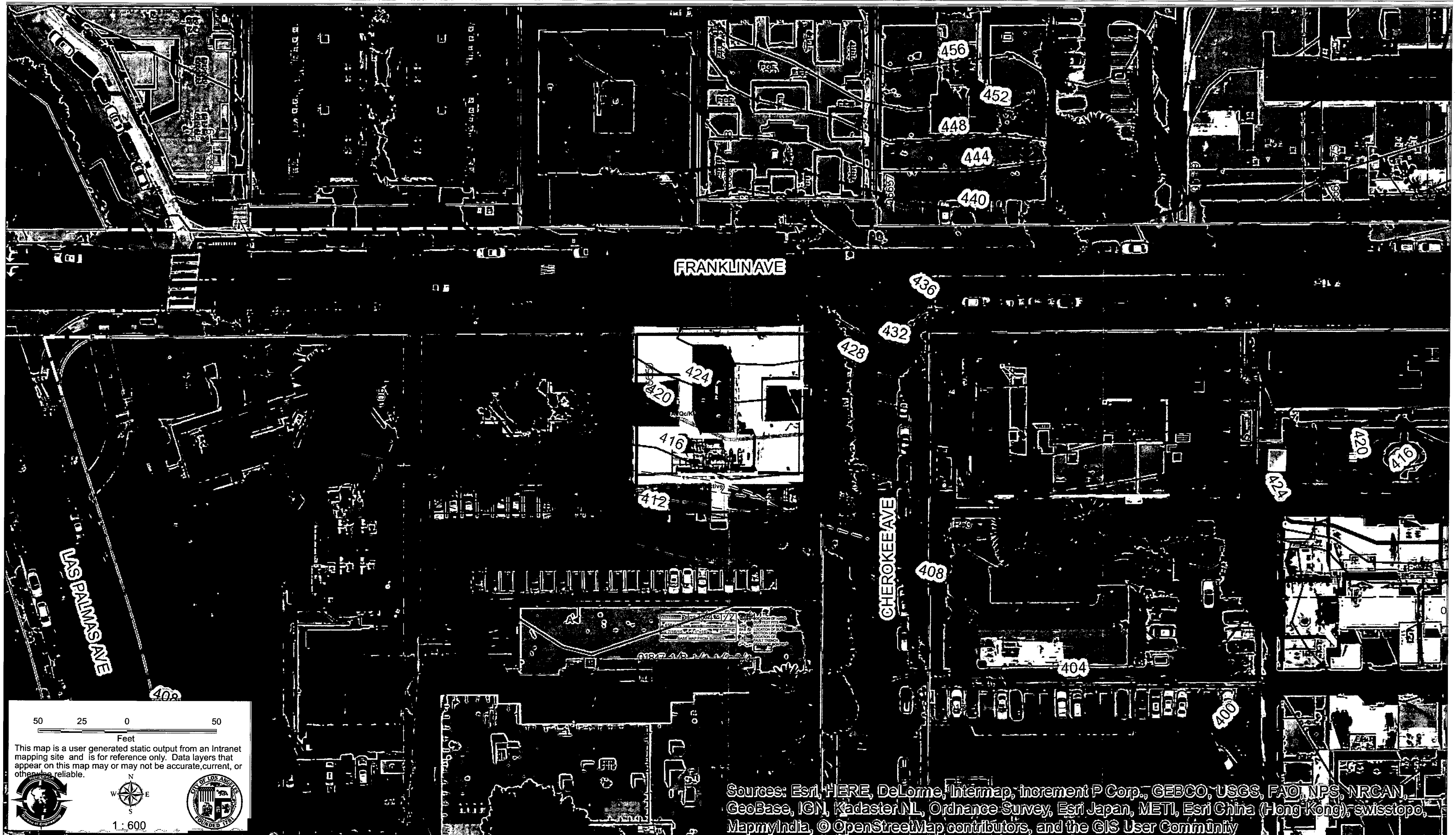
Qoa1-Late Pleistocene Alluvium, sheet wash / channel scour deposit, continuous across entire trench exposure. Strong brown (7.5YR 5/4m), silty SAND, stratified, slightly hard, slightly sticky, slightly plastic, friable, medium-to coarse-grained poorly sorted sand, slightly well oxidized, with localized beds of common to many fine and medium sub angular gravel, abrupt smooth lower boundary to unit Qoc1 across entire trench exposure.

Qoc1-Late Pleistocene Colluvium, colluvial apron deposit, continuous across entire trench exposure. Brown (7.5YR 5/4m), clayey SAND, crudely stratified to massive, hard, moderately sticky, moderately plastic, friable to firm, coarse-grained poorly sorted sand, slightly well oxidized, with common to many fine and medium sandstone sub angular gravel, clear wavy lower boundary to unit Tt across northern half of trench, and gradational smooth lower boundary t unit Qoc2 across southern half of trench.

Qoc2-Late Pleistocene Colluvium, colluvial apron deposit, continuous across southern half of trench exposure. Strong Brown (7.5YR 5/6m), sandy CLAY, crudely stratified to massive, hard, moderately to very sticky, moderately plasti friable to firm, coarse-grained poorly sorted sand, moderately well oxidized, wi common fine and medium highly weathered sandstone sub angular gravel, cle wavy lower boundary to unit Tt to unit Qoc3 across southern half of trench.

Qoc3-Pleistocene Colluvium, colluvial apron deposit, continuous across southern half of trench exposure. Strong Brown (7.5YR 5/8m), sandy CLAY, massive, hard, very sticky, very plastic, firm, coarse-grained poorly sorted sanc moderately well oxidized, with common fine and medium highly weathered sandstone sub angular gravel, abrupt faulted northern boundary to unit Tt, and undetermined lower boundary across southern half of trench.
Tt-Tertiary Topanga Formation, Sandstone (yellowish brown) with interbedded Shale (gray), continuous across northern half of trench exposure. Highly weathered, weak to moderately strong rock strength, blocky rock structure, highly fractured (randomly orientated, tight to slightly open, and discontinuous), localized mottling, abrupt faulted southern boundary to unit Qoc3, and undetermined lower boundary across northern half of trench.

NavigateLA Map



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