Appendix C

Geotechnical Investigation

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

SOILS REPORT APPROVAL LETTER

May 29, 2018

LOG # 98396-02
SOILS/GEOLOGY FILE – 2
LIQ

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

TRACT:	Rafael and Andres Machado Tract (MR 84-33/34)
LOT(S):	PT "Unnumbered LT" (Arb 261)
LOCATION:	3233 - 3321 S. Thatcher Avenue

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE(S) OF DOCUMENT	PREPARED BY
Addendum Report (Resp.)	1925-74	10/12/2017	FEFFER
Oversized Document	""	""	""

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE(S) OF DOCUMENT	PREPARED BY
Dept. Review Letter	98396-01	09/19/2017	LADBS
Addendum Report (Resp.)	1925-74	07/27/2017	FEFFER
Dept. Review Letter	98396	06/16/2017	LADBS
Soils Report	1925-74	05/18/2017	FEFFER
Dept. Correction Letter	58858	08/01/2007	LADBS
Soils Report	06-098	05/30/2007	GED

The Grading Division of the Department of Building and Safety has reviewed the current referenced reports providing recommendations for the proposed five-story building with one level of basement.

The earth materials at the subsurface exploration locations consist of up to 12 feet of uncertified fill underlain by silty sand, sandy silt, and silty clay.

The consultants recommend to support the proposed structures on conventional, mat-type and/or drilled-pile foundations bearing on native undisturbed soils or a blanket of properly placed fill a minimum of 3 feet thick.

The site is 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 reports demonstrates that the earthquake induced total and differential settlements are within acceptable levels. 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. 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).

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

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

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

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

6. 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).

7. Compacted fill shall extend beyond the footings a minimum distance equal to the depth of the fill below the bottom of footings or a minimum of five feet whichever is greater (7011.3).

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

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

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

11. Temporary excavations that remove lateral support to the public way, adjacent property, or adjacent structures shall be supported by shoring or constructed using ABC slot cuts. Note: Lateral support shall be considered to be removed when the excavation extends below a plane projected downward at an angle of 45 degrees from the bottom of a footing of an existing structure, from the edge of the public way or an adjacent property. (3307.3.1)

12. Prior to the issuance of any permit that 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).

13. The soils engineer shall review and approve the shoring and/or underpinning plans prior to issuance of the permit (3307.3.2).

14. 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.

15. Unsurcharged temporary excavations over 5 feet exposing soil shall be trimmed back at a gradient not exceeding 1:1, as recommended.

16. Shoring shall be designed for the lateral earth pressures specified in the section titled "Shoring" starting on page 6 of the 10/12/2017 report; all surcharge loads shall be included into the design.

17. Shoring shall be designed for a maximum lateral deflection of 1 inch, provided there are no structures within a 1:1 plane projected up from the base of the excavation. Where a structure is within a 1:1 plane projected up from the base of the excavation, shoring shall be designed for a maximum lateral deflection of ½ inch, or to a lower deflection determined by the consultant that does not present any potential hazard to the adjacent structure.

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

19. ABC slot-cut method may be used for unsurcharged temporary excavations with each slot not exceeding 8 feet in height and not exceeding 8 feet in width, as recommended. The soils engineer shall verify in the field if the existing earth materials are stable in the slot-cut excavation. Each slot shall be inspected by the soils engineer and approved in writing prior to any worker access.

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

21. The proposed structure shall be designed to resist hydrostatic and uplift pressures that would develop due to the historic high groundwater level conditions or the current groundwater level, whichever is higher.

22. In the event a hydrostatic pressure head is applied at the bottom of the retaining walls for that portion below the design groundwater level, a subdrain system shall be located above the design groundwater level.

23. Footings supported on approved compacted fill or expansive soil shall be reinforced with a minimum of four (4), ½-inch diameter (#4) deformed reinforcing bars. Two (2) bars shall be placed near the bottom and two (2) bars placed near the top of the footing.

24. The foundation/slab design shall satisfy all requirements of the Information Bulletin P/BC 2014-116 "Foundation Design for Expansive Soils" (1803.5.3).

25. Pile caisson and/or isolated foundation ties are required by LAMC Sections 91.1809.13 and/or 91.1810.3.13. Exceptions and modification to this requirement are provided in Information Bulletin P/BC 2014-030.

26. When water is present in drilled pile holes, the concrete shall be tremied from the bottom up to ensure minimum segregation of the mix and negligible turbulence of the water (1808.8.3).

27. Existing uncertified fill shall not be used for lateral support of deep foundations (1810.2.1).

28. Slabs placed on approved compacted fill shall be at least 3½ inches thick and shall be reinforced with ½-inch diameter (#4) reinforcing bars spaced a maximum of 16 inches on center each way.

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

30. 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.

31. Retaining walls shall be designed for the lateral earth pressures specified in the section titled "Retaining Wall" starting on page 4 of the 10/12/2017 report. All surcharge loads shall be included into the design.

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

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

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

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

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

37. All roof, pad and deck drainage shall be conducted to the street in an acceptable manner in non-erosive devices or other approved location in a manner that is acceptable to the LADBS and the Department of Public Works[; water shall not be dispersed on to descending slopes without specific approval from the Grading Division and the consulting geologist and soils engineer] (7013.10).

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

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

40. Groundwater conditions shall be assessed prior to construction by the installation of wells, as recommended on page 2 of the 10/12/2017 report. In the event that temporary dewatering is planned, a supplemental report addressing the impact of dewatering on adjacent structures / properties shall be submitted to the Department for review and approval.

41. Prior to issuance of a permit involving de-watering, clearance shall be obtained from the Department of Public Works and from the California Regional Water Quality Control Board.

1828 Sawtelle Blvd., 3rd Floor, West LA (310) 575-8388
320 W. 4th Street, Suite 200 (213) 576-6600 (LARWQB)

42. 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 use in the field (7008.2, 7008.3).

43. 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).

44. All friction pile or caisson drilling and installation shall be performed under the inspection and approval of the geologist and soils engineer. The geologist shall indicate the distance that friction piles or caissons penetrate into competent material in a written field memorandum. (1803.5.5, 1704.9)

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

46. Prior to excavation an initial inspection shall be called with the LADBS Inspector. During the initial inspection, the sequence of construction; [shoring; ABC slot cuts; underpinning;

pile installation;] protection fences; and, dust and traffic control will be scheduled (108.9.1).

47. 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).

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

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

YING LIU
Geotechnical Engineer II

YL/yl
Log No. 98396-02
213-482-0480

cc: Applicant
FEFFER, Project Consultant
WL District Office

CITY OF LOS ANGELES

CALIFORNIA

ERIC GARCETTI
MAYOR

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201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

FRANK M. BUSH
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SUPERINTENDENT OF BUILDING

OSAMA YOUNAN, P.E.
EXECUTIVE OFFICER

SOILS REPORT APPROVAL LETTER

August 24, 2018

LOG # 104622
SOILS/GEOLOGY FILE – 2

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

TRACT:	Rafael and Andres Machado Tract (MR 84-33/34)
LOT(S):	PT "Unnumbered LT" (Arb 261)
LOCATION:	3233 - 3321 S. Thatcher Avenue

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE(S) OF DOCUMENT	PREPARED BY
Addendum Report	1925-74	05/30/2018	FEFFER

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE(S) OF DOCUMENT	PREPARED BY
Dept. Approval Letter	98396-02	05/29/2018	LADBS
Addendum Report (Resp.)	1925-74	10/12/2017	FEFFER
Dept. Review Letter	98396-01	09/19/2017	LADBS
Addendum Report (Resp.)	1925-74	07/27/2017	FEFFER
Dept. Review Letter	98396	06/16/2017	LADBS
Soils Report	1925-74	05/18/2017	FEFFER
Dept. Correction Letter	58858	08/01/2007	LADBS
Soils Report	06-098	05/30/2007	GED

The Grading Division of the Department of Building and Safety has reviewed the current referenced report concerning project description. According to the 05/31/2018 report, the proposed development consists of "Three story buildings over a semi-subterranean basement and one, two, and three story detached on-grade buildings."

The Department reviewed and conditionally approved the previous referenced reports in a letter dated 05/29/2018, Log # 98396-02.

The earth materials at the subsurface exploration locations consist of up to 12 feet of uncertified fill underlain by silty sand, sandy silt, and silty clay.

The consultants recommend to support the proposed structures on conventional, mat-type and/or drilled-pile foundations bearing on native undisturbed soils or a blanket of properly placed fill a minimum of 3 feet thick.

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

1. All conditions of Department approval letter dated 05/29/2018, Log # 98396-02, shall be complied with.

YING LIU
Geotechnical Engineer II

Log No. 104622
213-482-0480

cc: Applicant
FEFFER, Project Consultant
WL District Office

May 31, 2018 File No: 1925-74

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

Subject: **REQUEST FOR MODIFICATION OF APPROVAL LETTER**
Proposed Three Story Buildings Over A Semi Subterranean Basement,
One, Two, and Three Story On Grade Detached Buildings
3233-3321 S Thatcher Avenue, Los Angeles, CA 90292
TRACT: Rafael and Andres Machado Tract (MR 84-33/34)
LOT(S): PT "Unnumbered L T" (Arb 261)

Subject: **GEOTECHNICAL INVESTIGATION**
Proposed Five Story Building
3233-3321 S Thatcher Avenue, Los Angeles, CA 90292
By Feffer Geological Consulting, Inc. dated May 18, 2017

RESPONSE TO CITY OF LOS ANGELES SOILS REPORT REVIEW LETTER
City Letter dated June 16, 2017, Log #98396
By Feffer Geological Consulting, Inc. dated July 27, 2017

RESPONSE TO CITY OF LOS ANGELES SOILS REPORT REVIEW LETTER
City Letter dated September 19, 2017, Log #98396-01
By Feffer Geological Consulting, Inc. dated October 12, 2017

CITY OF LOS ANGELES SOILS REPORT APPROVAL LETTER
City Letter dated May 29, 2018, Log #98396-02

Dear Mr. Coddington,

The project description in the referenced Geotechnical Investigation and Response Letter I dated May 18, 2017 and October 12, 2017 was for the construction of a *"Proposed Five Story Building"*.

The Response Letter II dated July 27, 2017 also included a change in scope of the proposed development to be modified to Proposed Three Story Buildings over a Basement. The remaining buildings will consist of one, two, and Three Story On Grade Detached Buildings.

The City of Los Angeles soils approval letter, dated May 29, 2018 was issued with project description of "*The Grading Division of the Department of Building and Safety has reviewed the current referenced reports providing recommendations for the proposed five-story building with one level of basement."*

We would like to request that the project description be modified to state "Proposed Three Story Buildings over a Semi-Subterranean Basement and One, Two, and Three Story Detached On Grade Buildings".

All of our previous recommendations remain applicable.

We appreciate the opportunity to be of continued 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 Engineering Geologist
C.E.G. 2138

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

CITY OF LOS ANGELES

CALIFORNIA

ERIC GARCETTI
MAYOR

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OSAMA YOUNAN, P.E.
EXECUTIVE OFFICER

SOILS REPORT APPROVAL LETTER

May 29, 2018

LOG # 98396-02
SOILS/GEOLOGY FILE – 2
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11812 San Vicente Boulevard, Suite 600
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(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.)

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

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

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

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

6. 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).

7. Compacted fill shall extend beyond the footings a minimum distance equal to the depth of the fill below the bottom of footings or a minimum of five feet whichever is greater (7011.3).

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

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

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

11. Temporary excavations that remove lateral support to the public way, adjacent property, or adjacent structures shall be supported by shoring or constructed using ABC slot cuts. 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)

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14. 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.

15. Unsurcharged temporary excavations over 5 feet exposing soil shall be trimmed back at a gradient not exceeding 1:1, as recommended.

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22. In the event a hydrostatic pressure head is applied at the bottom of the retaining walls for that portion below the design groundwater level, a subdrain system shall be located above the design groundwater level.

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31. Retaining walls shall be designed for the lateral earth pressures specified in the section titled "Retaining Wall" starting on page 4 of the 10/12/2017 report. All surcharge loads shall be included into the design.

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

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

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320 W. 4th Street, Suite 200	(213) 576-6600 (LARWQB)

42. 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 use in the field (7008.2, 7008.3).

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pile installation;] protection fences; and, dust and traffic control will be scheduled (108.9.1).

47. 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).

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

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

YING LIU
Geotechnical Engineer II

YL/yl
Log No. 98396-02
213-482-0480

cc: Applicant
FEFFER, Project Consultant
WL District Office

THATCHER YARD

VENICE, CALIFORNIA

ENTITLEMENT SUBMITTAL: 8-15-2018

SHEET INDEX

#	NAME
G-000	Coversheet, Sheet Index and Vicinity Map
GENERAL	
G-001	General Notes and Project Info
G-002	Abbreviation
G-003	Cal Green Standard
ARCHITECTURE	
A-001	Site Plan
A-100	Basement Level Floor Plan
A-101	Level 1 Floor Plan
A-102	Level 2 Floor Plan
A-103	Level 3 Floor Plan
A-104	Roof Level
A-201	Senior Housing Elevation
A-202	Family Housing Elevation
LANDSCAPE	
L1	Landscape Site Plan
L2	Landscape Plan Enlargement
L3	Plant Palette and Notes
CIVIL	
C1.00	Offsite improvements Exhibit
C1.10	Conceptual Rough Grading Plan
C1.20	Conceptual Utility and Lid Plan

3233 THATCHER AVENUE, LOS ANGELES, CA 90292

ZONING:		**(Q)PF-1XL R-3 (C.U.P.)**
GROSS LOT AREA (Density Calcs):		**93,278 SF (2.14 Acres)**
NET LOT AREA (minus setback for FAR...		**75,386 SF (1.73 Acres)**
HEIGHT LIMIT:		
PROPOSED ZONING CODE HEIGHT:		**SEE SITE PLAN**
ALLOWABLE FAR	**3**	
PROPOSED FAR:	**3**	
ALLOWABLE BUILDING AREA (FAR):		226,158 S.F.
PROPOSED BUILDING AREA (FAR):		**91,751 S.F.**
ALLOWABLE DENSITY:	117 UNITS	(R3 = 1 per 800 SF)
PROPOSED DENSITY:	**98 UNITS**	
ALLOWED BUILIDNGS STORIES:	4	
PROPOSED BUILDING STORIES:	**3**	

R3 SETBACKS *	**MIN.**	**PROVIDED**
ALL YARDS:	10'-0"	10'-0"

*ALL BUILDINGS BORDER STREET FRONTAGE ON ALL SIDES AT KEY LOT

VICINITY MAP

THOMAS SAFRAN & ASSOCIATES
DEVELOPER

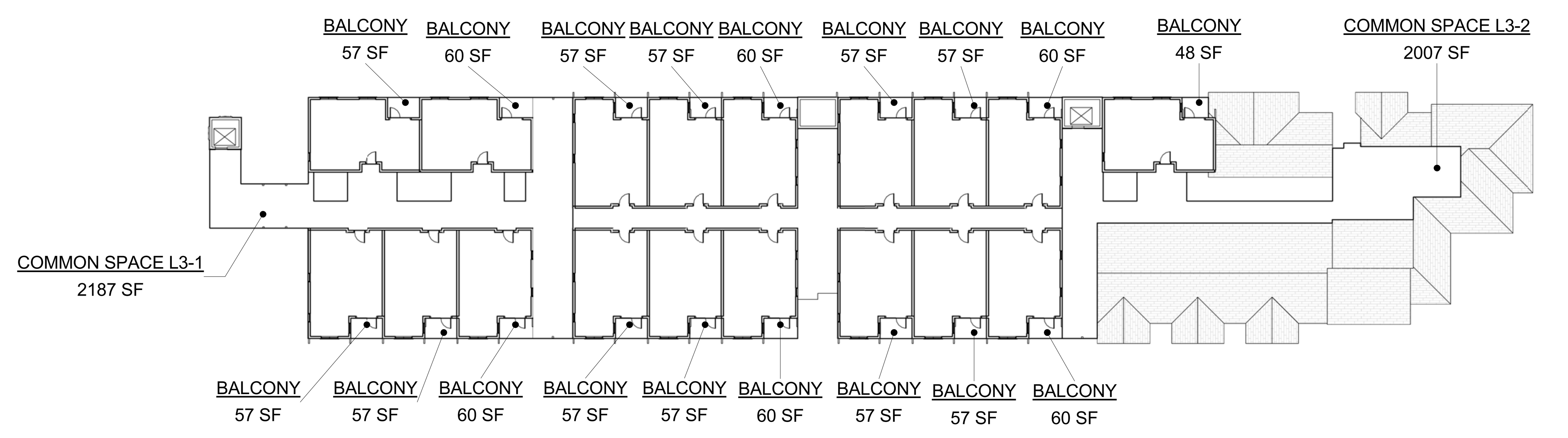
HED
EXCECUTIVE ARCHITECT

GIANNETTI
DESIGN ARCHITECT

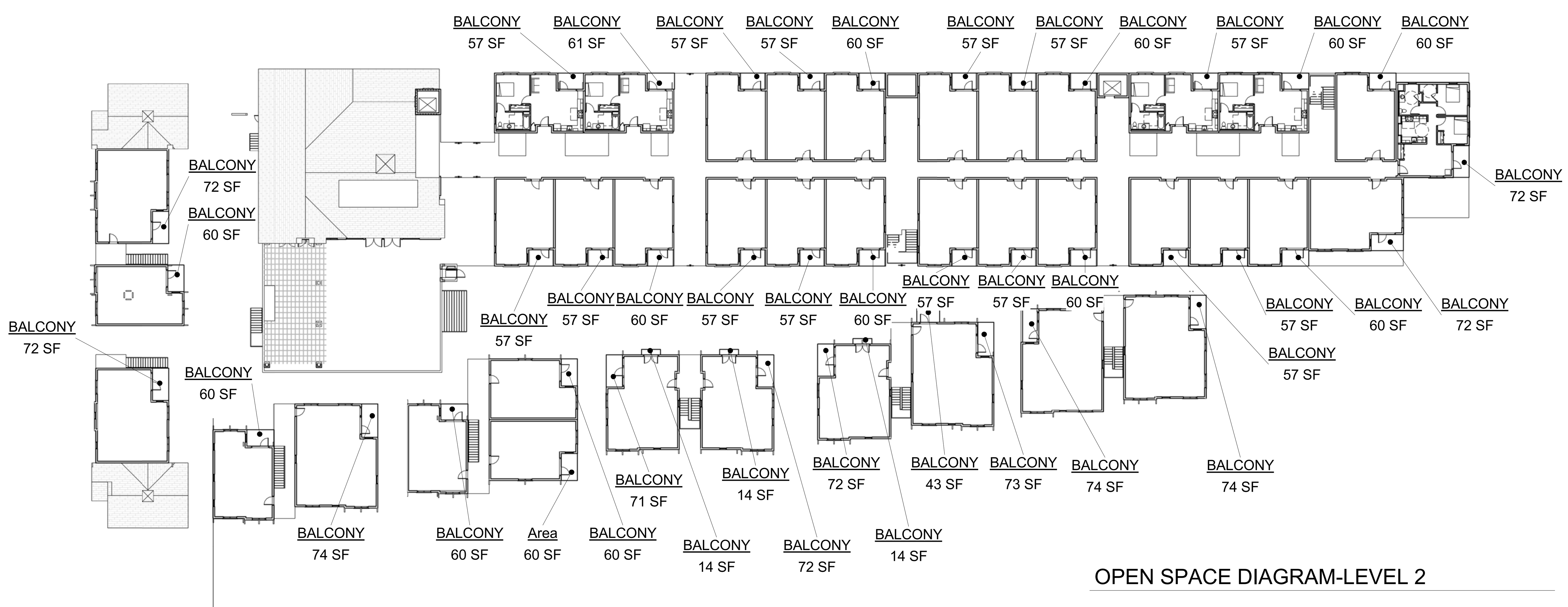
DKE
DK ENGINEER, CORP
CIVIL ENGINEER

three6ixty
ENTITLEMENT CONSULTANT

SEGAL SHUART LANDSCAPE ARCHITECTS
LANDSCAPE



OPEN SPACE DIAGRAM-LEVEL 3



OPEN SPACE DIAGRAM-LEVEL 2

OPEN SPACE DIAGRAM-LEVEL 1

PROJECT INFORMATION:

AREA BY UNITS

SENIOR UNITS	QUANTITY	AREA (GSF)	TOTAL (GSF)
1A (1BEDROOM + 1BATH W/PATIO)	53	660	34,980
1B (1BEDROOM + 1BATH W/PATIO)	11	665	7,315
1BEDROOM TOTAL:	**64**		**42,295**
2A (2BEDROOM + 1BATH W/PATIO)	2	869	1,738
2B (2BEDROOM + 1BATH W/PATIO)	1	868	868
2B:MANAGER'S UNIT (2BEDROOM, 1BATH, PATIO)	1	868	868
2BEDROOM TOTAL:	**4**		**3,474**
TOTAL SENIOR UNITS:	**68**		**45,769**

FAMILY UNITS	QUANTITY	AREA (GSF)	TOTAL (GSF)
1A (1BEDROOM + 1BATH W/PATIO)	12	685	8,220
2A (2BEDROOM + 1BATH W/PATIO)	10	882	8,820
3A (3BEDROOM + 3BATH W/PATIO)	8	1,101	8,808
TOTAL FAMILY UNITS:	**30**		**25,848**
TOTAL UNIT FLOOR AREA:	**98**		**71,617**

AREA BY BUILDING

SENIOR BUILDING UNITS (FROM ABOVE):	**45,769**
COMMON AREA:	
VERTICAL CIRCULATION:	
ELEVATOR 1-2	186
STAIR 1-7	1,032
LIFT	35
CIRCULATION SUB TOTAL:	**1,253**
ROOMS AND SPACES:	
COMMUNITY ROOM	1,994
EXERCISE ROOM	485
JANITOR	40
LANDRY ROOM	164
MAIL ROOM	428
MEETING ROOM 1	300
MEETING ROOM 2	145
MEETING ROOM 3	145
UNISEX BATH 1	65
UNISEX BATH 2	65
CORRIDOR LEVEL 1	6,428
CORRIDOR LEVEL 2	5,467
CORRIDOR LEVEL 3	1,420
ROOM AND SPACES SUB TOTAL:	**17,146**

FAMILY BUILDING UNITS:	UNITS	COMMON	TOTAL SF
BLDG 1 AREA			
FIRST FLOOR	679	0	679
BLDG 2 AREA			
FIRST FLOOR	1,577	0	1,577
SECOND FLOOR	1,572	211	1,783
BLDG 3 AREA			
FIRST FLOOR	887	0	887
SECOND FLOOR	881	126	1,007
BLDG 4 AREA			
FIRST FLOOR	679	0	679
BLDG 5 AREA			
FIRST FLOOR	1,791	0	1,791
SECOND FLOOR	1,786	329	2,115
BLDG 6 AREA			
FIRST FLOOR	2,050	0	2,050
SECOND FLOOR	2,043	377	2,420
BLDG 7 AREA			
FIRST FLOOR	1,764	0	1,764
SECOND FLOOR	1,764	215	1,979
BLDG 8 AREA			
FIRST FLOOR	1,977	0	1,977
SECOND FLOOR	1,983	266	2,249
BLDG 9 AREA			
FIRST FLOOR	2,208	0	2,208
SECOND FLOOR	2,208	210	2,418
TOTAL FAMILY UNIT AREA:			**27,583**
TOTAL PROJECT AREA:			**91,751**

GARAGE	
Bike Room	601
Boiler Room 1	380
Boiler Room 2	357
Electrical Room 1	308
Electrical Room 2	330
Elevator Vestibule 1	84
Elevator Vestibule 2	117
Garage	30,450
Machine Room	94
Trash Room	204
TOTAL	**32,925**

OPEN SPACE:

REQUIRED OPEN SPACE:				
< 3 HABITABLE ROOMS (1-BED)	100	SF	76	7,600
= 3 HABITABLE ROOMS (2-BED)	124	SF	14	14
> 3 HEBITABLE ROOMS (3-BED)	175	SF	8	7,614
REQUIRED OPEN SPACE:				**15,228**

PROVIDED OPEN SPACE:		
TOTAL COMMON OPEN SPACE:		31,872 SF
TOTAL PRIVATE (BALCONIES) OPEN SPACE:	100 Balconies	6,710 SF
TOTAL PROPOSED USABLE OPEN SPACE:		**38,624 SF**

SEE SHEET A-100. FOR PARKING DATA

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General Notes, Project Info and Sheet Index

G-P-001

NOTE: SEE CIVIL DRAWINGS FOR STREET DEDICATION

LEGEND:

SENIOR BUILDING
MAX. HT: 45', PROVIDED HT: 42'-1 1/2"

SENIOR/COMMUNITY AMENITY
MAX. HT: 33', PROVIDED HT: 21'-1"

FAMILY UNITS
BLDG 1: MAX HT: 18', PROVIDED HT: 13'-6"
BLDG 2&3: MAX HT: 25', PROVIDED HT: 23'-4"
BLDG 4: MAX HT: 18', PROVIDED HT: 13'-6"
BLDG 5-9: MAX HT: 25', PROVIDED HT: 24'-7 7/8"

SITE PLAN
3/64" = 1'-0"

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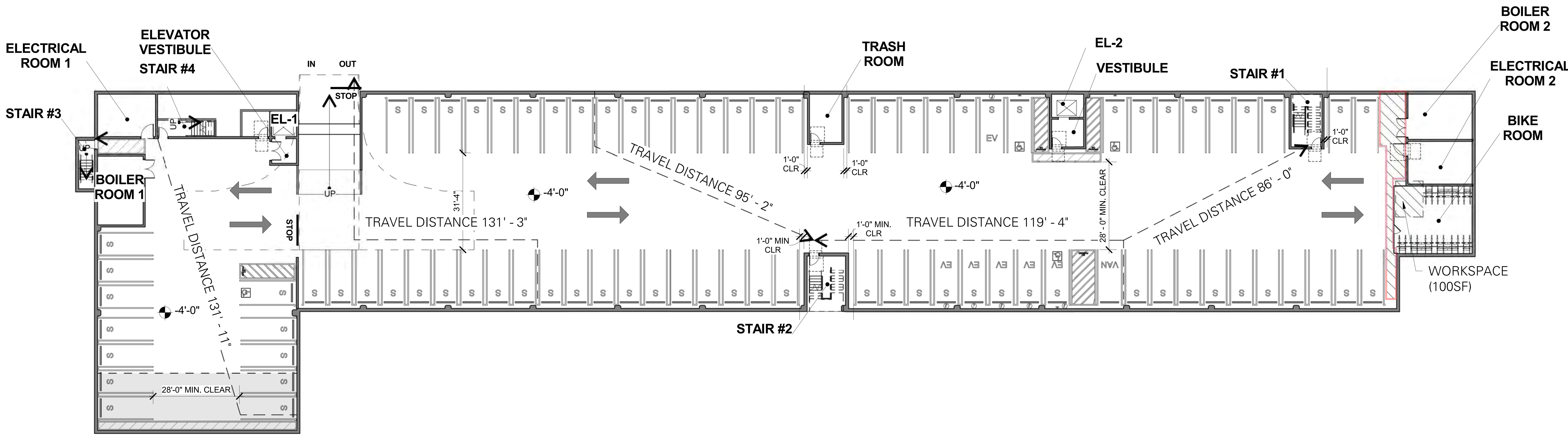
Site Plan

A-001.



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BASEMENT LEVEL FLOOR PLAN

1" = 20'-0"

PARKING:			
CITY REQUIREMENTS:			
SENIOR UNITS:	**QUANTITY**	**CITY PARKING RATIOS**	**PARKING REQ'D.**
1 BEDROOM	64	X 0.5 SPACES PER UNIT	32
2 BEDROOMS	4	X 0.5 SPACES PER UNIT	2
TOTAL:	**68**		**34**
FAMILY UNITS:	**QUANTITY**	**CITY PARKING RATIOS**	**PARKING REQ'D.**
1 BEDROOM	12	X 1.0 SPACES PER UNIT	12
2 BEDROOMS	10	X 2.0 SPACES PER UNIT	20
3 BEDROOMS	8	X 2.0 SPACES PER UNIT	16
TOTAL:	**30**		**48**
TOTAL REQUIRED PARKING PER CITY:			**82**
TOTAL PARKNG PROVIDED:			**82**
ELECTRICAL VEHICLE CHARGING STATIONS:			
TOTAL REQUIRED (85 PARKING SPACES X 5%):			5
TOTAL PROVIDED:			**5**
BICYCLE PARKING:			
BICYCLE REQUIRED:			
LONG TERM:			
SENIOR BUIDLING (47,361S.F./5,000S.F)			10
FAMILY BUILDING (30 UNIT)			29
TOTAL ENCLOSED BICYCLE SPACE REQUIRED:			**39**
SHORT TERM:			
SENIOR BUILDING (47,361S.F./10,000S.F.)			5
FAMILY BUILDING (30 UNIT)			3
TOTAL SITE BICYCLE SPACES REQUIRED:			**8**
BICYCLE PROVIDED:			
TOTAL ENCLOSED BICYCLE SPACE PROVIDED:			**40**
TOTAL SITE BICYCLE SPACES PROVIDED:			**8**

PARKING COUNT		
STALL TYPE	COUNT	COMMENTS
STANDARD	72	
STANDARD ADA	4	
STANDARD EV	5	
VAN	1	

Grand total: 82

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Basement Level Floor Plan

A-100.

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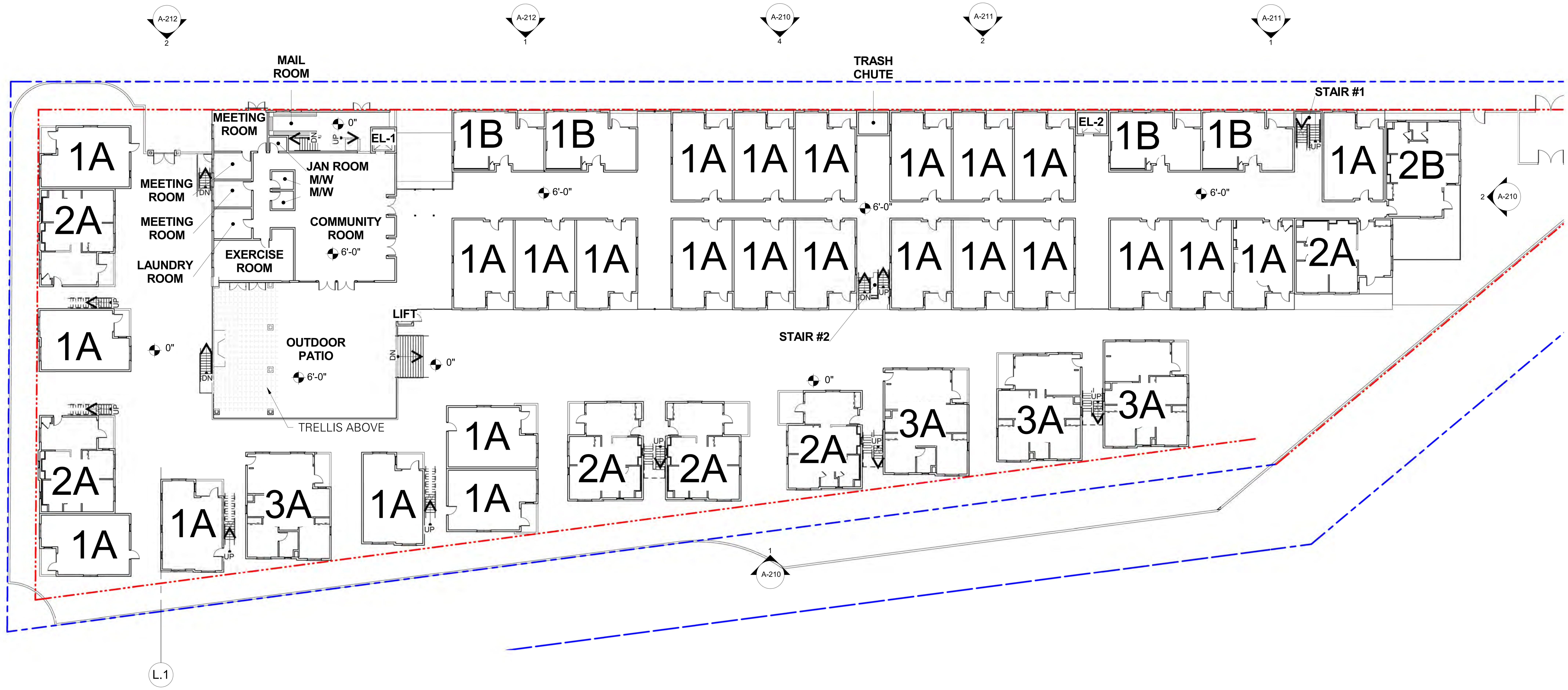

LEVEL 1 FLOOR PLAN
1" = 20'-0"

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Level 1 Floor Plan

A-101.

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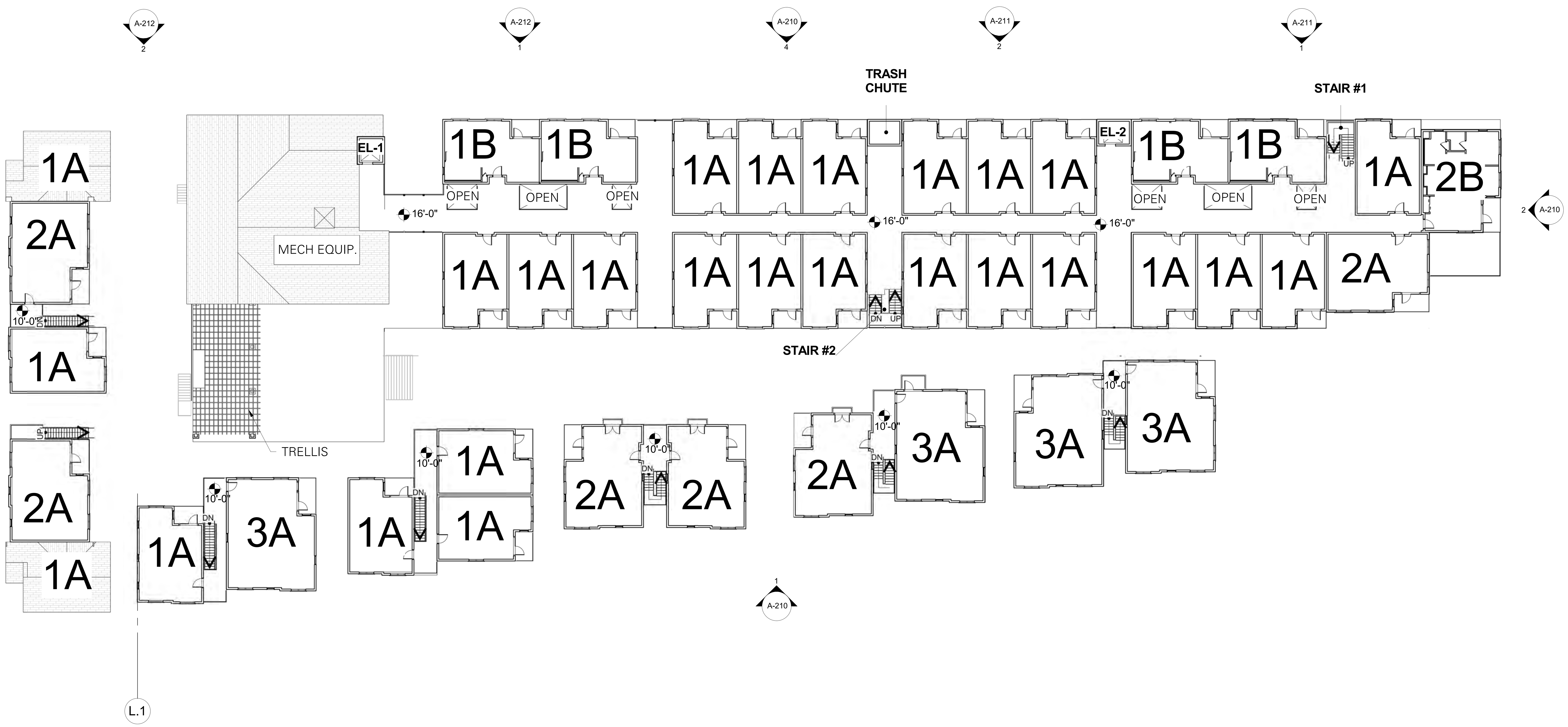

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LEVEL 2 FLOOR PLAN

1" = 20'-0"

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Level 2 Floor Plan

A-102.

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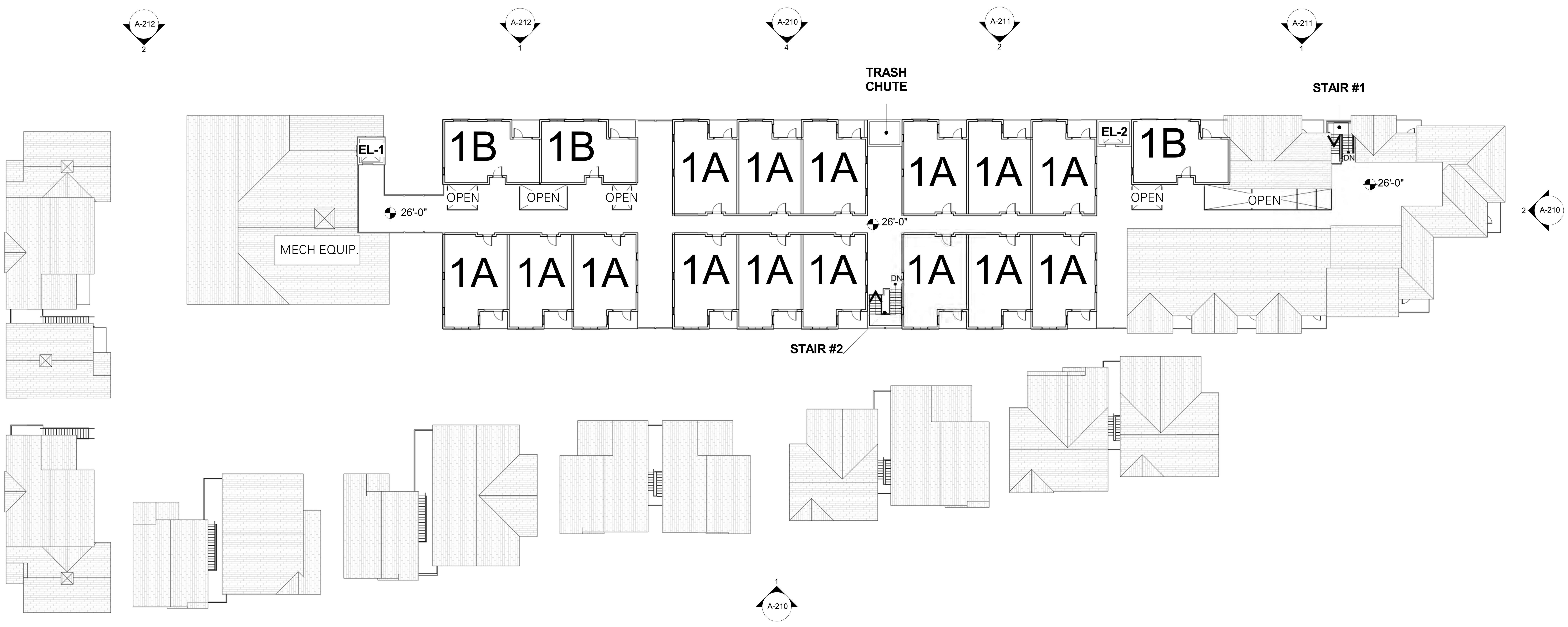

N

LEVEL 3 FLOOR PLAN

1" = 20'-0"

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Level 3 Floor Plan

A-103.

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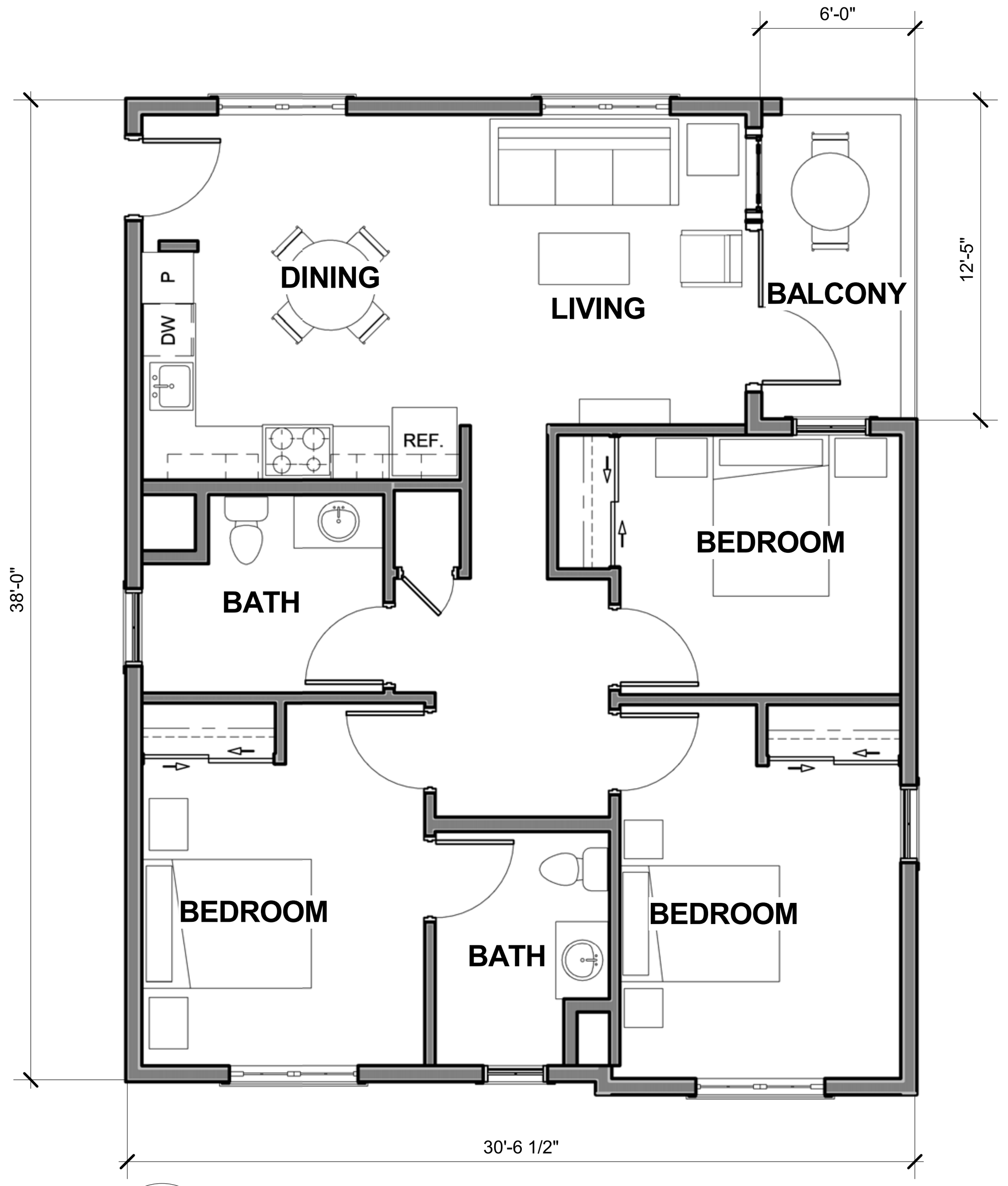
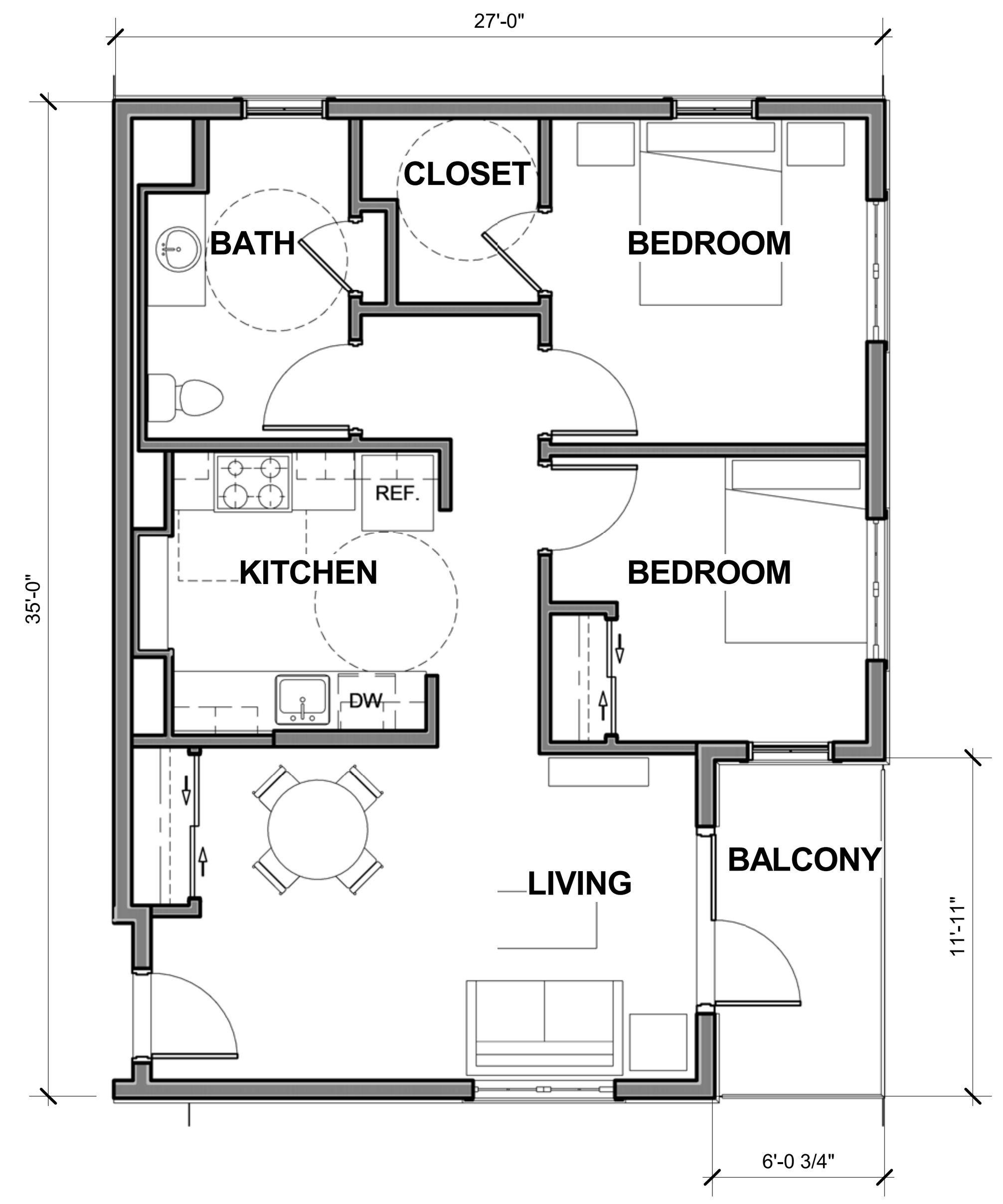
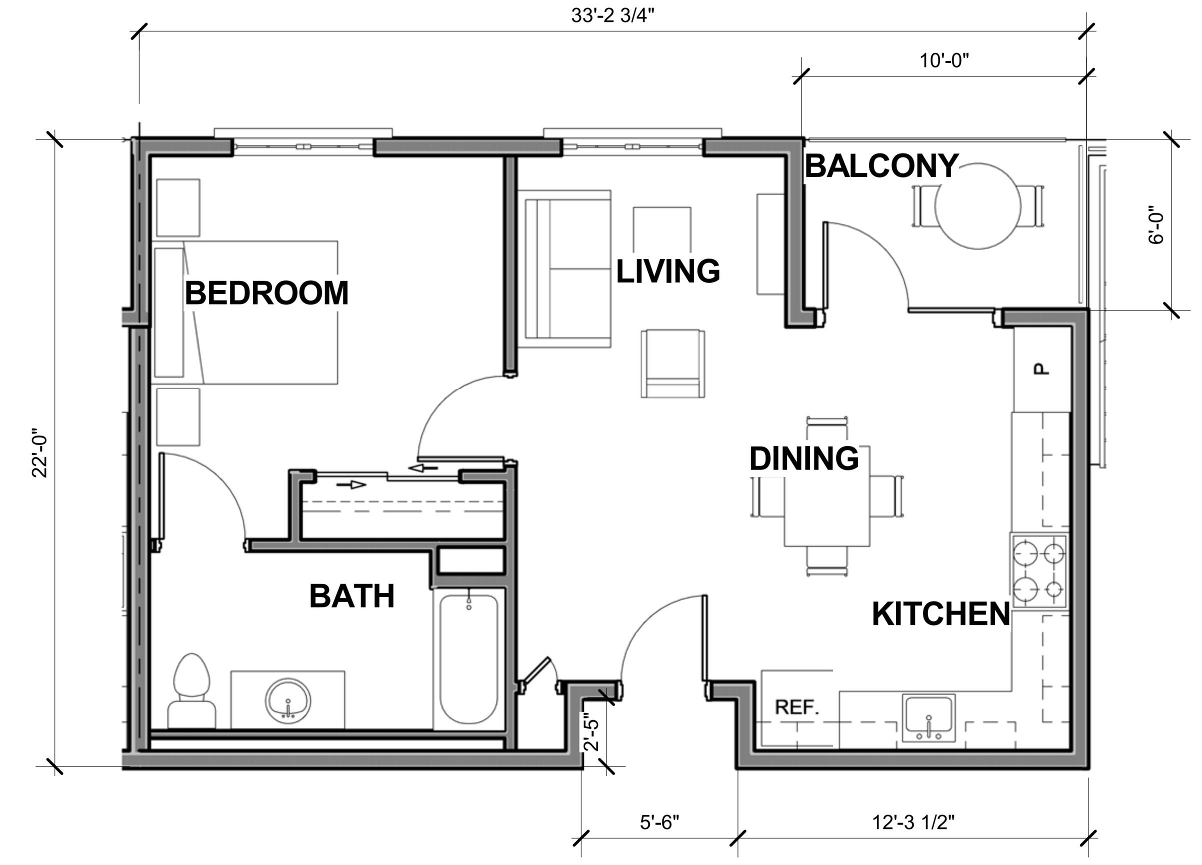


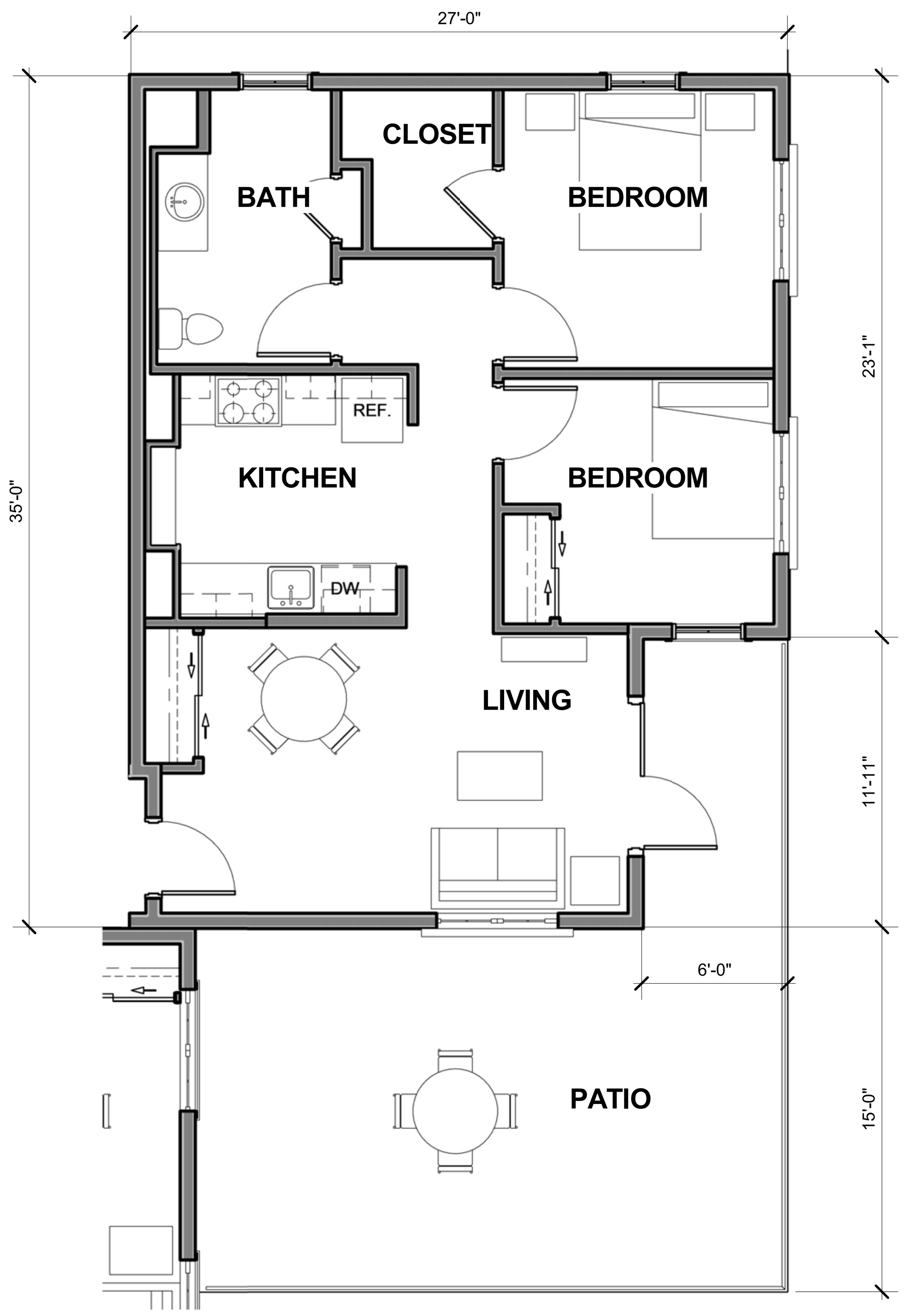
6 UNIT 3A UNIT PLAN
NOT TO SCALE



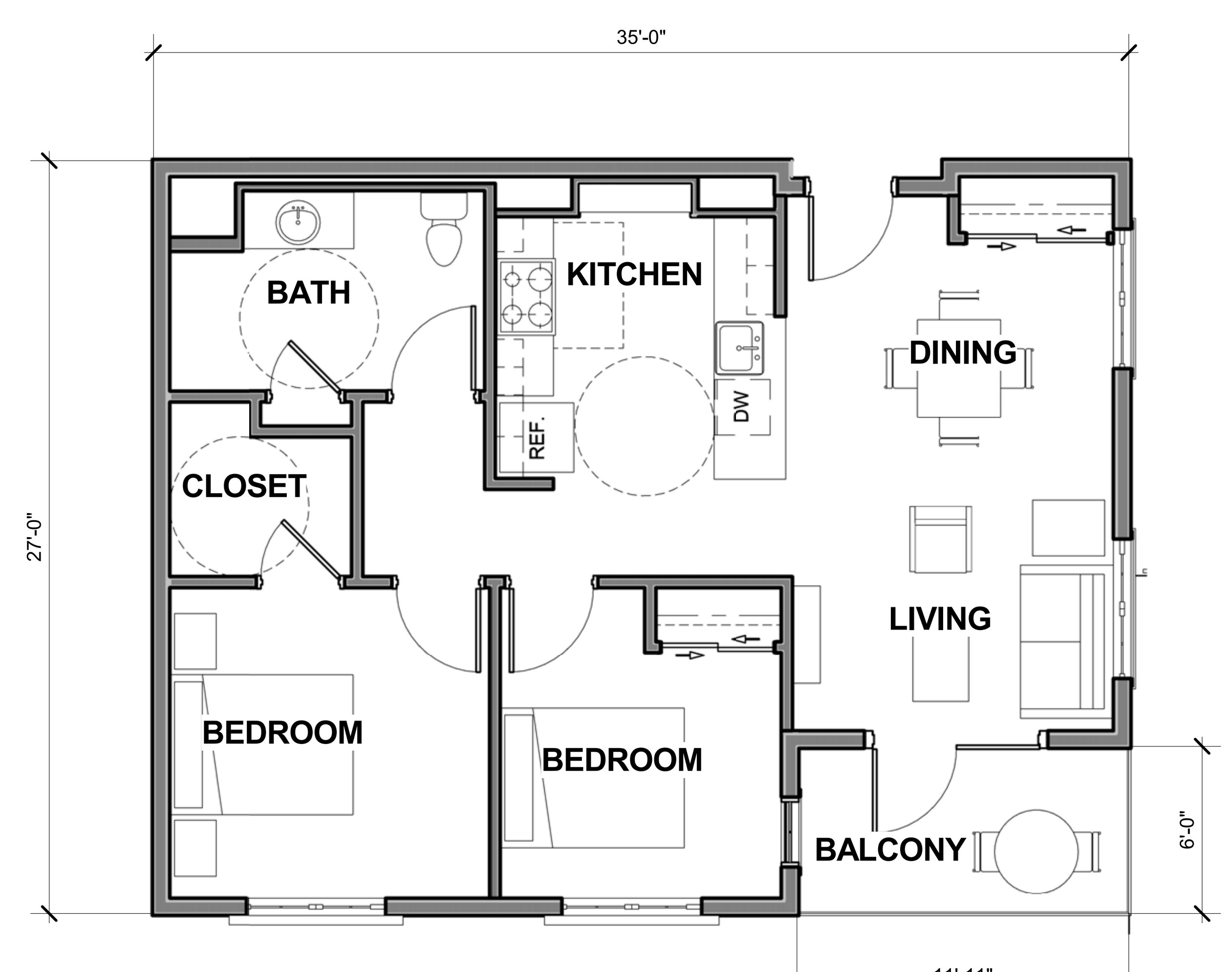
4 LEVEL 2B FLOOR PLAN
NOT TO SCALE



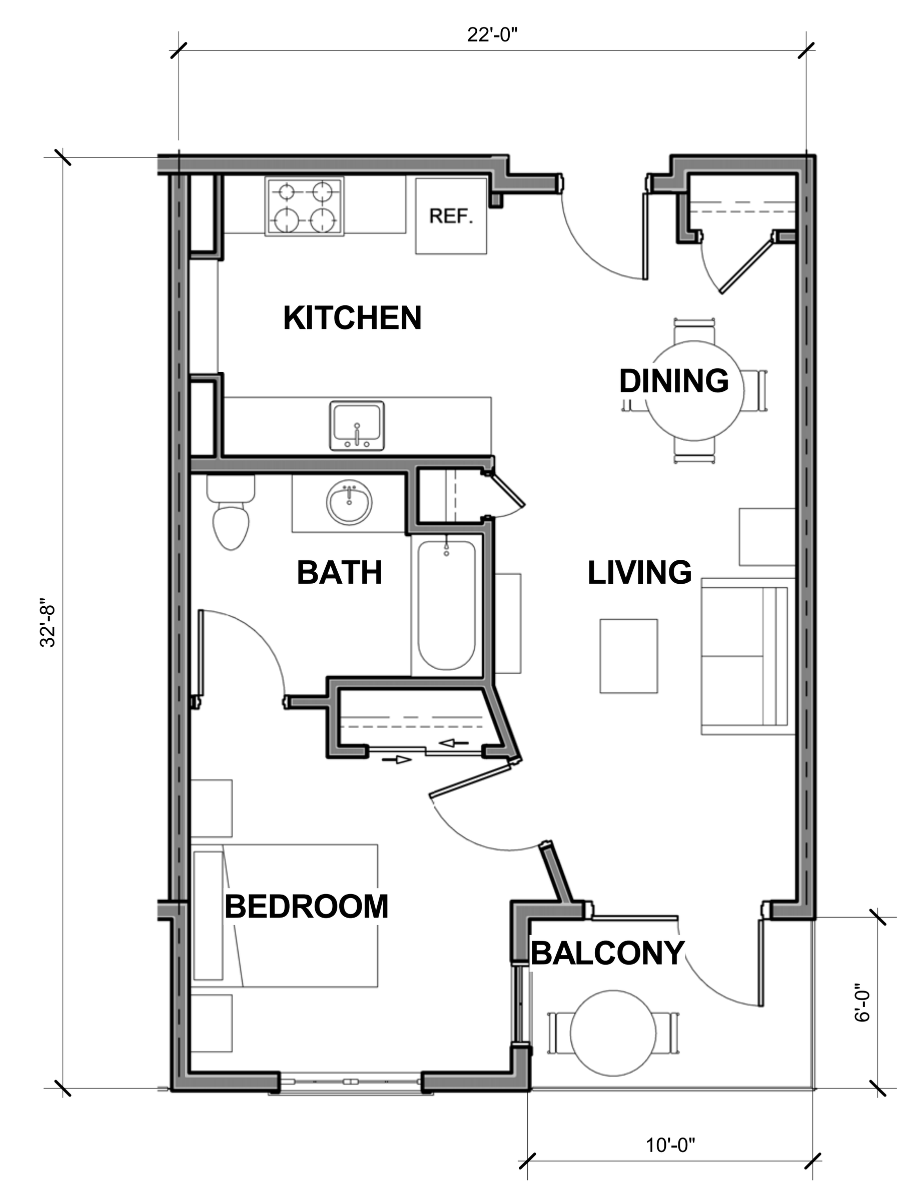
2 UNIT 1B FLOOR PLAN
NOT TO SCALE



5 UNIT 2B MANAGER FLOOR PLAN
NOT TO SCALE



3 UNIT 2A FLOOR PLAN
NOT TO SCALE



1 UNIT 1A FLOOR PLAN
NOT TO SCALE

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Unit Plan

A-105.

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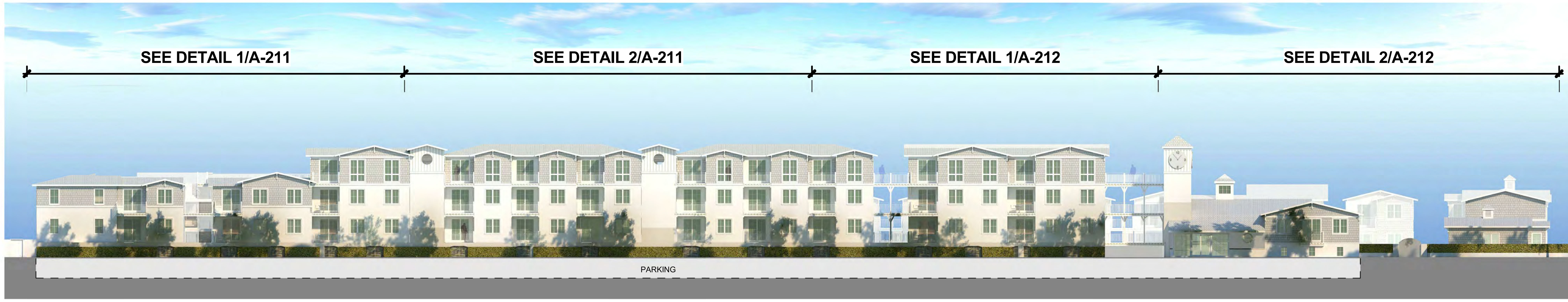

4 SENIOR BUILDING NORTH ELEVATION | THATCHER AVENUE

1" = 20'-0"

3 FAMILY BUILDING WEST ELEVATION | PRINCETON AVENUE

1" = 20'-0"

2 SENIOR BUILDING EAST ELEVATION | HARBOR CROSSING

1" = 20'-0"

1 FAMILY BUILDING SOUTH ELEVATION | OXFORD AVENUE

1" = 20'-0"

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Overall Color Elevations

A-210

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2 SENIOR BUILDING NORTH ELEVATION
3/16" = 1'-0"

1 SENIOR BUILDING NORTH ELEVATION
3/16" = 1'-0"

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Senior Building
Color Elevations

A-211

2 SENIOR BUILDING NORTH ELEVATION

3/16" = 1'-0"

1 SENIOR BUILDING NORTH ELEVATION

3/16" = 1'-0"

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Senior Building
Color Elevations

A-212

KEY NOTES

1. (E) LIGHT POLE / POWER POLE
2. (E) SIDEWALK TO REMAIN/REPAIR
3. (E) PRIVACY WALL AT PROP LINE TO REMAIN
4. (E) STREET TREE TO REMAIN
5. PEDESTRIAN WALKWAY (4' MIN WIDTH)
6. NEW CONCRETE SIDEWALK PER CITY STD
7. COMMUNITY ROOM PATIO, REFER TO ENLARGEMENT
8. ROAD CLOSURE, SPECIAL PAVING TBD
9. REMOVABLE BOLLARDS AT ROAD CLOSURE
10. COLUMNS, FENCE, AND GATE AT ROAD CLOSURE
11. PLAYGROUND AREA w/ BENCHES + SHADE CANOPY
12. TRASH ENCLOSURE
13. ELECTRICAL TRANSFORMER
14. COURTYARD 1: FIRE PIT w/ LOUNGE FURNITURE
15. COURTYARD 2: LOUNGE FURNITURE
16. COURTYARD 3: BENCHES
17. SEATING NOOK
18. PEDESTRIAN GATE (6'H) w/ ACCESS CONTROL
19. 3'H WALL w/ 3'H METAL PICKET FENCE ABOVE
20. 6'H WALL
21. BICYCLE RACK (SHORT-TERM) – 10 SPACES TOTAL
22. CENTRAL LAWN (APPROX. 21'x100')
23. RAISED PLANTERS (ON PODIUM) – MIN. 30" SOIL DEPTH

F FAMILY UNIT(S) – REFER TO ARCH PLANS

S SENIOR UNITS – REFER TO ARCH PLANS

PLANTING (REFER TO PALETTE ON SHEET L3)

GEIJERA PARVIFLORA
AUSTRALIAN WILLOW
or similar from VCZSP plant list
(Street trees subject to LA UFD verification)

CERCIS OCCIDENTALIS
WESTERN REDBUD
or similar from VCZSP plant list

MELALEUCA QUINQUENERVIA
PAPERBARK TREE
or similar from VCZSP plant list

SCHINUS MOLLE
CALIFORNIA PEPPER

EXISTING TREE TO BE REMOVED
No protected trees to be removed

ASSORTED SHRUBS
Refer to plant palette

HEDGE PLANTING
Refer to plant palette

LANDSCAPE AREA

COMMON OPEN SPACE PROVIDED (REFER TO SHEET G-001):	31,872 SF
REQUIRED LANDSCAPE AREA (25% OF COMMON OPEN SPACE):	7,968 SF
PROVIDED LANDSCAPE AREA:	16,636 SF

TREE QUANTITIES

NON-PROTECTED TREES TO BE REMOVED:	45
PROTECTED TREES TO BE REMOVED:	0
STREE TREES TO BE REMOVED:	0
REQUIRED TREES (1 TREE PER 4 UNITS):	25
PROVIDED TREES – 24" BOX MIN. (ON-SITE):	115
PROVIDED TREES – 24" BOX MIN. (PARKWAYS):	24
TOTAL TREES PROVIDED IN EXCESS OF REQUIREMENT:	114

PROTECTED TREE NOTE:

The Landscape Architect has reviewed the existing trees on site and has determined that there are no trees of "Protected" status.

Thomas Safran & Associates

THATCHER YARD

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www.segalshuart.com

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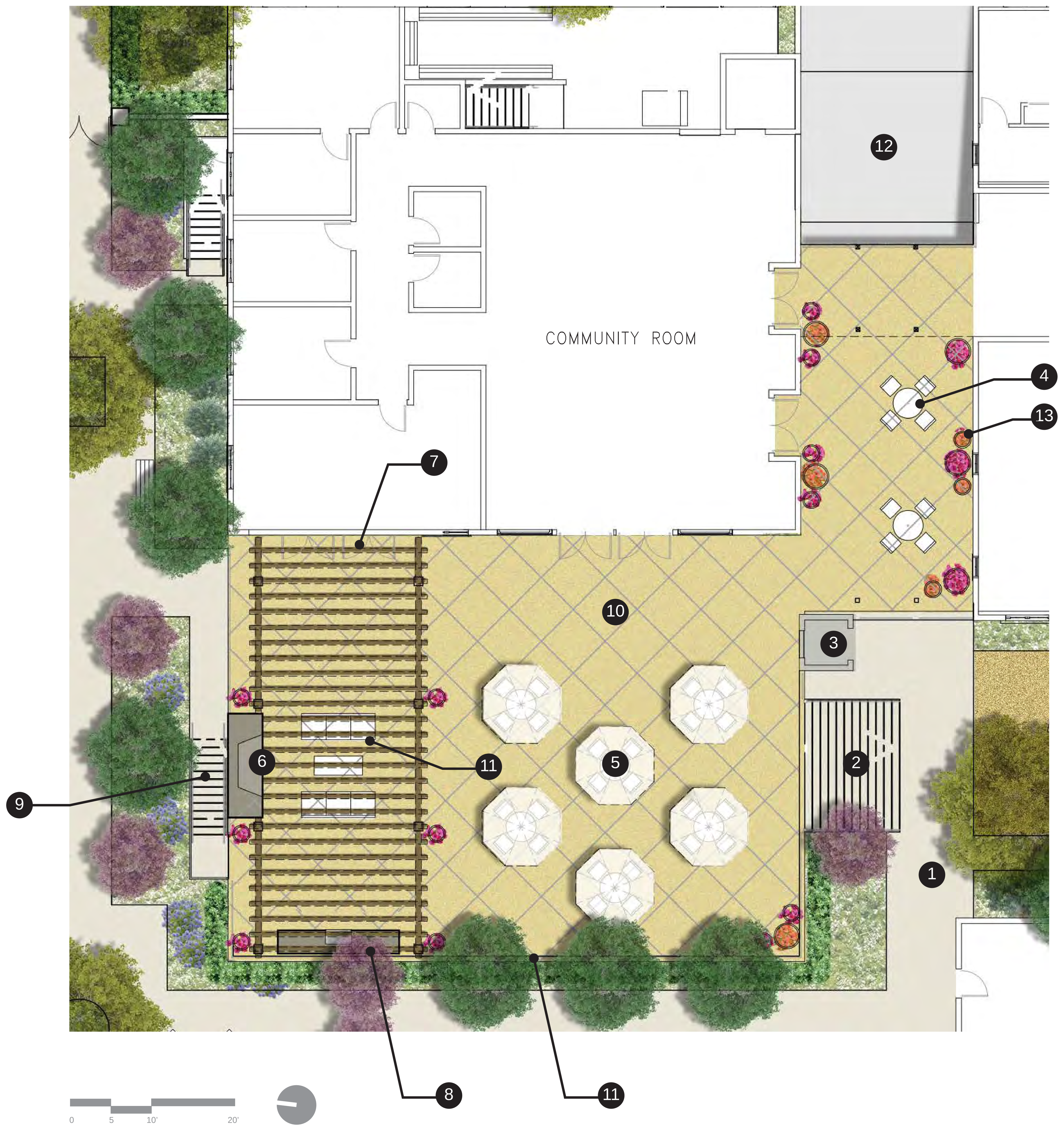
LANDSCAPE SITE PLAN

ENLARGEMENT – COMMUNITY ROOM PATIO



KEY MAP

KEY NOTES

1. PEDESTRIAN WALKWAY (4' MIN WIDTH)
2. STEPS
3. ADA LIFT
4. DINING TABLE/CHAIRS
5. DINING TABLE/CHAIRS + UMBRELLAS
6. GAS FIREPLACE
7. SHADE PERGOLA
8. BUILT-IN GRILLING ISLAND
9. STEPS TO GROUND LEVEL
10. PAVING – COLORED CONCRETE OR SIMILAR
11. GUARDRAIL AROUND PERIPHERY OF PATIO
12. RAMP TO GARAGE BELOW
13. POTTED PLANTS, TYP
14. LOUNGE FURNITURE

NOTE:
Refer to Sheet L1 for landscape area and tree calculations.
Refer to Sheet G-001 for open space calculations.

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THATCHER YARD

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08/15/2018	Entitlement Set

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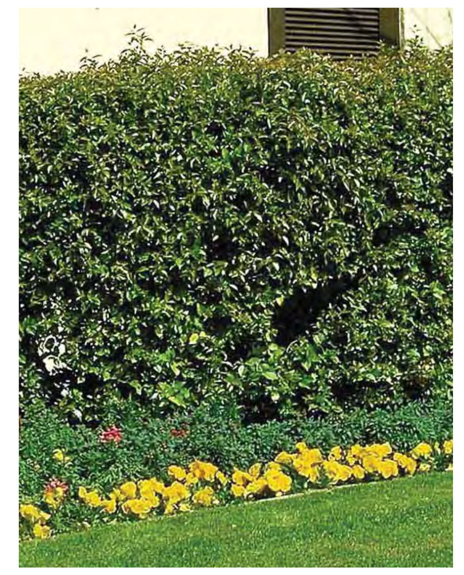
LANDSCAPE PLAN ENLARGEMENT

TREES + HEDGES


Cupressus arizonica
ARIZONA CYPRESS


Cercis occidentalis
WESTERN REDBUD


Dodonaea viscosa
HOPSEED BUSH


Xylosma congestum
SHINY XYLOSMA


Geijera parviflora
AUSTRALIAN WILLOW


Melaleuca quinquenervia
PAPERBARK TREE


Rhus lancea
AFRICAN SUMAC


Schinus molle
CALIFORNIA PEPPER TREE

SHRUBS + GROUNDCOVER + VINES


Arbutus unedo compacta
DWARF STRAWBERRY TREE


Baccharis pilularis
COYOTE BRUSH


Bougainvillea spp.
BOUGAINVILLEA


Ceanothus spp.
CALIFORNIA LILAC


Cistus spp.
ROCKROSE


Escallonia spp.
ESCALLONIA


Ipomoea leptophylla
BUSH MORNING GLORY


Lantana montevidensis
TRAILING LANTANA


Olea europaea 'Little Ollie'
LITTLE OLLIE DWARF OLIVE


Plumbago auriculata
CAPE PLUMBAGO


Rosmarinus officinalis 'prostratus'
CREEPING ROSEMARY


Sarureja montana
WINTER SAVORY


Senna artemesiodes
SILVER SENNA


Solanum laxum
POTATO VINE


Teucrium fruticans
TREE GERMANDER

PRELIMINARY PLANT PALETTE

THE PROJECT'S PLANT PALETTE HAS BEEN ASSEMBLED TO SUPPORT THE CHARACTER OF THE PROPOSED BUILDINGS WHILE BEING COMPLIANT WITH THE 'VENICE COASTAL ZONE SPECIFIC PLAN' LIST OF PLANT MATERIALS.

ALL PLANTING AREAS WILL BE IRRIGATED (SEE IRRIGATION DESCRIPTION BELOW) AND COVERED WITH A 3" LAYER OF MULCH. ALL TREES WILL BE STAKED, AND ROOT BARRIERS WILL BE USED FOR TREES WITHIN 5' OF HARDSCAPE.

TREES + HEDGES

BOTANICAL NAME	COMMON NAME	SIZE	LOCATION*
Cupressus arizonica	ARIZONA CYPRESS	24" box	P, I
Cercis occidentalis	WESTERN REDBUD	24" box	I
Dodonaea viscosa	HOPSEED BUSH	5 gal	P, I
Geijera parviflora	AUSTRALIAN WILLOW	24" box	C, P, I
Melaleuca quinquenervia	PAPERBARK TREE	24" box	P, I
Rhus lancea	AFRICAN SUMAC	24" box	C, P, I
Schinus molle	CALIFORNIA PEPPER TREE	36" box	P, I
Xylosma congestum	SHINY XYLOSMA	5 gal	P

SHRUBS + GROUNDCOVER + VINES

BOTANICAL NAME	COMMON NAME	SIZE + SPACING	LOCATION*
Arbutus unedo 'Compacta'	DWARF STRAWBERRY TREE	15 gal	P, I
Baccharis pilularis	COYOTE BUSH	5 gal @ 4' O.C.	C, P
Bougainvillea spp.	BOUGAINVILLEA	5 gal @ 4' O.C.	P, I
Ceanothus spp.	CALIFORNIA LILAC	15 gal	P, I
Cistus spp.	ROCKROSE	5 gal @ 3' O.C.	I
Escallonia spp.	ESCALLONIA	5 gal @ 4' O.C.	I
Ipomoea leptophylla	BUSH MORNING GLORY	5 gal @ 3' O.C.	P, I
Lantana montevidensis	TRAILING LANTANA	5 gal @ 4' O.C.	C, P
Olea europaea 'Little Ollie'	LITTLE OLLIE DWARF OLIVE	5 gal @ 3' O.C.	P, I
Plumbago auriculata	CAPE PLUMBAGO	5 gal @ 4' O.C.	P, I
Rosmarinus officinalis 'Prostratus'	CREEPING ROSEMARY	1 gal @ 2' O.C.	C, P, I
Sarureja montana	WINTER SAVORY	1 gal @ 2' O.C.	I
Senna artemesiodes	SILVER SENNA	5 gal @ 4' O.C.	P, I
Solanum laxum	POTATO VINE	5 gal	P, I
Teucrium fruticans	BUSH GERMANDER	5 gal @ 3' O.C.	P, I
Lawn	MARATHON II OR SIMILAR	N/A	C, I

* C = CITY PARKWAY, P = PROJECT PERIPHERY, I = PROJECT INTERIOR

IRRIGATION SYSTEM GENERAL DESCRIPTION

LANDSCAPE SHRUB AREAS ARE TO BE IRRIGATED BY SUBTERRANEAN DRIPLINE EMITTER TUBING. VINES AND LARGE SHRUB PLANT MATERIAL ARE TO BE IRRIGATED WITH SUPPLEMENTAL EMITTERS CONNECTED TO RELATED DRIPLINE SYSTEM(S). TURF AREAS ARE TO BE IRRIGATED WITH SPRAY HEADS. TREES ARE IRRIGATED WITH LOW-FLOW DRIP BASIN SYSTEMS AND ARE ASSIGNED TO DEDICATED CONTROL VALVES.

THE GROUND LEVEL IRRIGATION SYSTEM IS SUPPLIED BY DOMESTIC WATER WITH A CUT-IN CONNECTION NEAR THE BUILDING WATER METER. A NEW SUB-METER IS INSTALLED WITH THE IRRIGATION SYSTEM, AND A REDUCED PRESSURE-TYPE (RP) BACKFLOW PREVENTER PROTECTS THE DOMESTIC SUPPLY FROM CONTAMINATION.

ON-STRUCTURE IRRIGATION SYSTEM(S) ARE SERVED BY THE BUILDING COLD WATER SUPPLY LINE AND WILL OPERATE WITH ITS OWN DEDICATED BACKFLOW PREVENTER UNIT TO PROTECT THE BUILDING WATER SUPPLY FROM CONTAMINATION.

A WEATHER-DRIVEN IRRIGATION SMART CONTROLLER IS TO BE USED, WHICH INCLUDES AN ON-SITE "SOLAR SYNC" SENSOR UNIT THAT AUTOMATICALLY ADJUSTS THE IRRIGATION WATERING SCHEDULE ON A DAILY BASIS BASED ON WEATHER CONDITIONS. THE SOLAR SENSOR ALSO INCLUDES A RAIN SENSOR.

THE IRRIGATION CONTROLLER OPERATES A MASTER VALVE AND FLOW SENSOR TO SHUT DOWN THE WATER PRESSURE IN THE MAIN LINE DURING NON-OPERATIONAL HOURS, AND TO PROVIDE HIGH-FLOW SHUT DOWN CAPABILITY BASED ON "LEARNED" FLOWS OF EVERY VALVE STATION.

QUICK COUPLING VALVE CONNECTORS ARE TO BE INSTALLED THROUGHOUT THE LANDSCAPE FOR INCIDENTAL WATERING OF TREES AND SHRUBS.

IRRIGATION WILL BE DESIGNED TO CONFORM TO CITY OF LOS ANGELES WATER CONSERVATION REQUIREMENTS.

Thomas Safran & Associates

THATCHER YARD

Date	Issued For
08/15/2018	Entitlement Set

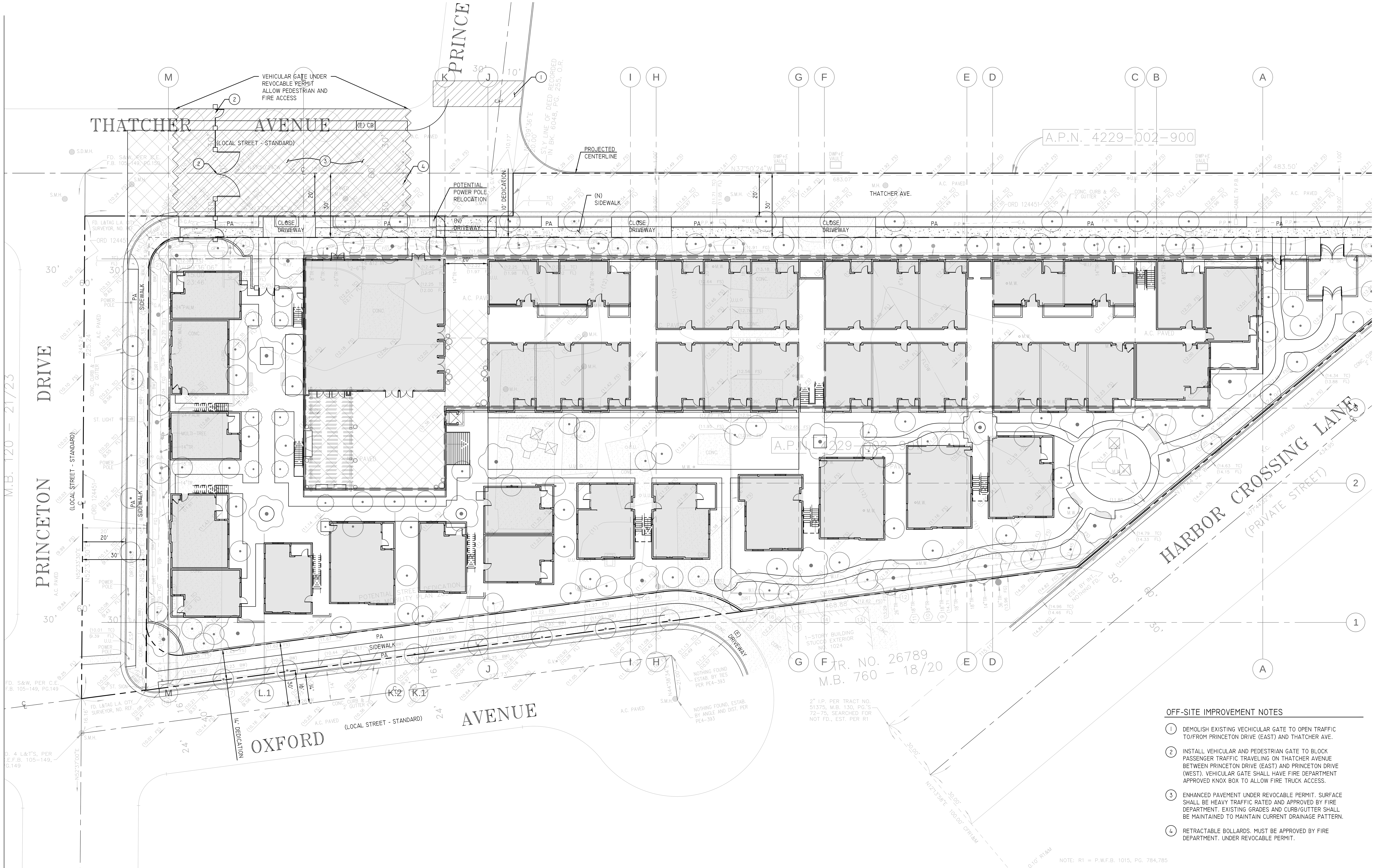
SEGAL | SHUART
4329 Woodman Avenue, Suite 1
Sherman Oaks, CA 91423
818.584.2070
www.segalshuart.com

HED
601 South Figueroa Street
Suite 500
Los Angeles, California
90017 USA
(213) 542-4500
WWW.HED.DESIGN

2018-04016-000

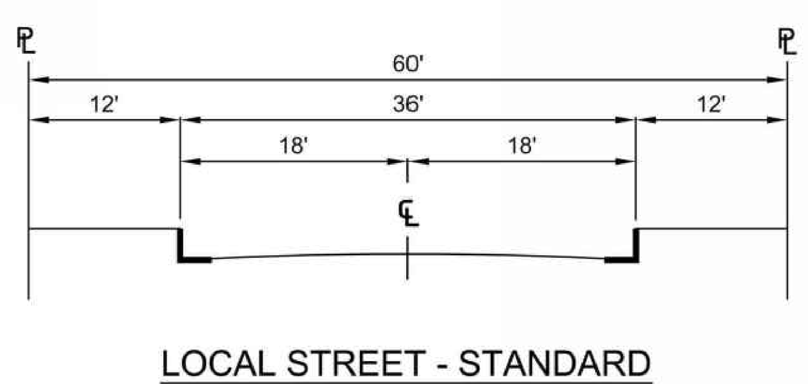
PLANT PALETTE AND NOTES

L3



OFF-SITE IMPROVEMENT NOTES

1. DEMOLISH EXISTING VECHICULAR GATE TO OPEN TRAFFIC TO/FROM PRINCETON DRIVE (EAST) AND THATCHER AVE.
2. INSTALL VEHICULAR AND PEDESTRIAN GATE TO BLOCK PASSENGER TRAFFIC TRAVELING ON THATCHER AVENUE BETWEEN PRINCETON DRIVE (EAST) AND PRINCETON DRIVE (WEST). VEHICULAR GATE SHALL HAVE FIRE DEPARTMENT APPROVED KNOX BOX TO ALLOW FIRE TRUCK ACCESS.
3. ENHANCED PAVEMENT UNDER REVOCABLE PERMIT. SURFACE SHALL BE HEAVY TRAFFIC RATED AND APPROVED BY FIRE DEPARTMENT. EXISTING GRADES AND CURB/GUTTER SHALL BE MAINTAINED TO MAINTAIN CURRENT DRAINAGE PATTERN.
4. RETRACTABLE BOLLARDS. MUST BE APPROVED BY FIRE DEPARTMENT. UNDER REVOCABLE PERMIT.



LOCAL STREET - STANDARD

SCALE: 1"=20'

CLIENT LOGO GOES HERE SCALED TO FIT 180 PIXELS

Thomas Safran & Associates

THOMAS SAFRAN ASSOCIATES

Date	Issued For
08/15/2018	Entitlement Set

DKE
DK ENGINEER, CORP
8383 WILSHIRE BLVD. #745
BEVERLY HILLS, CA 90211
310.926.0248

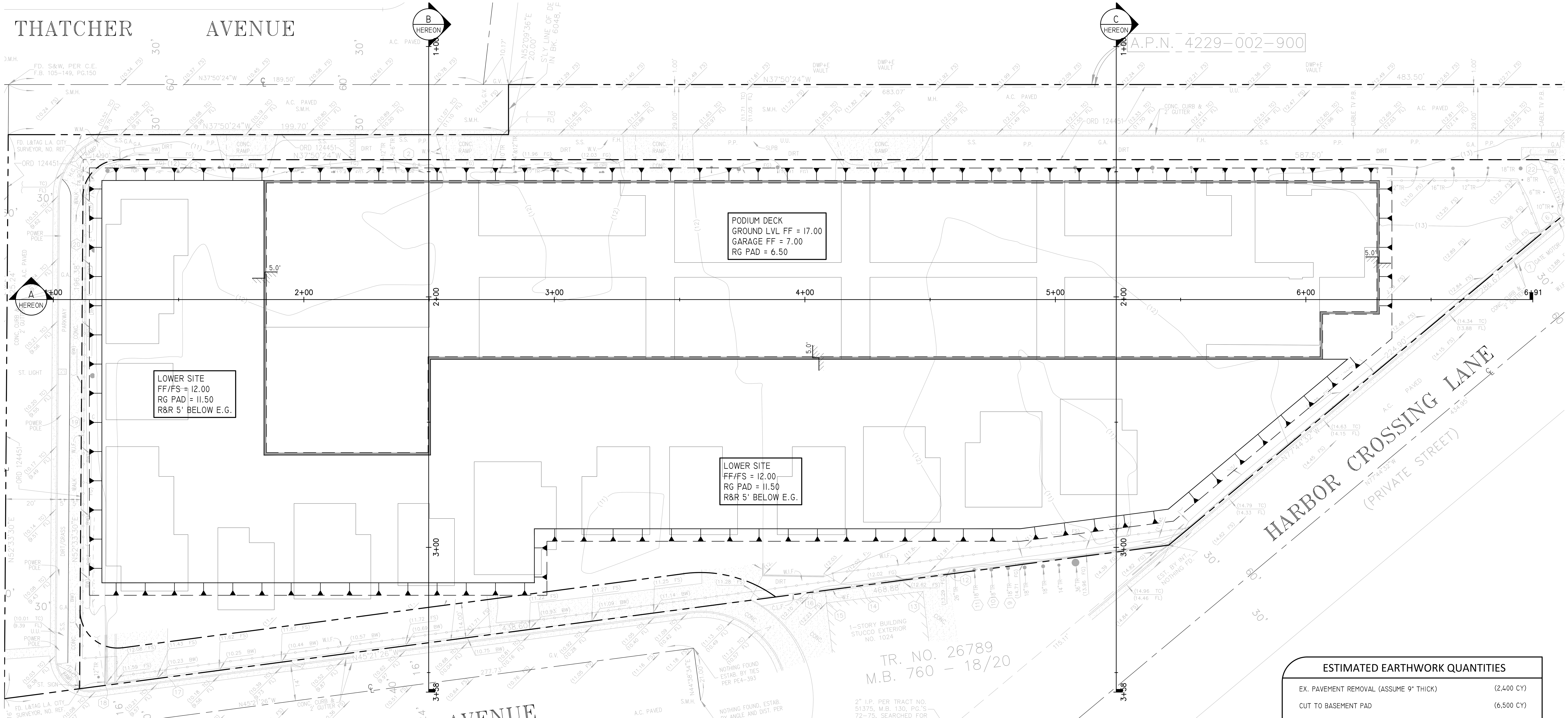
HED
601 South Figueroa Street
Suite 500
Los Angeles, California
90017 USA
(213) 542-4500
WWW.HED.DESIGN

REGISTERED PROFESSIONAL ENGINEER DAN DOV KR... No. 76041 CIVIL STATE OF CALIFORNIA

2018-04016-000

OFFSITE IMPROVEMENTS EXHIBIT

C1.00



ESTIMATED EARTHWORK QUANTITIES

EX. PAVEMENT REMOVAL (ASSUME 9" THICK)	(2,400 CY)
CUT TO BASEMENT PAD	(6,500 CY)
CUT FOR REMOVAL & RECOMPACTION	(6,000 CY)
FILL TO SITE PAD	7,000 CY
SHRINKAGE (10%)	700 CY
NET PAVEMENT EXPORT	(2,400 CY)
NET SOIL EXPORT	4,800 CY

NOTES:
1. QUANTITIES SHOWN ON HERE ARE FOR PLAN CHECK PURPOSES ONLY. CONTRACTOR TO GENERATE OWN QUANTITIES FOR BIDDING PURPOSES.

LEGEND:

- BASEMENT BUILDING WALL PER STRUCTURAL
- SHORING BY OTHERS
- FD(S) — FOUNDATION DRAINAGE FOR SHORED CONDITION PER DETAIL 1, HEREON. SEE PLUMBING DRAWINGS FOR CONNECTION TO BASEMENT SUMP PUMP.
- FD — FOUNDATION DRAINAGE FOR NON-SHORED CONDITION PER DETAIL 2, HEREON. SEE PLUMBING DRAWINGS FOR CONNECTION TO BASEMENT SUMP PUMP.
- TOE/TOP OF SLOPE

0 10' 20'
SCALE: 1"=20'

CLIENT LOGO GOES HERE SCALED TO FIT 180 PIXELS

Thomas Safran & Associates

THOMAS SAFRAN ASSOCIATES

Date	Issued For
08/15/2018	Entitlement Set

DKE
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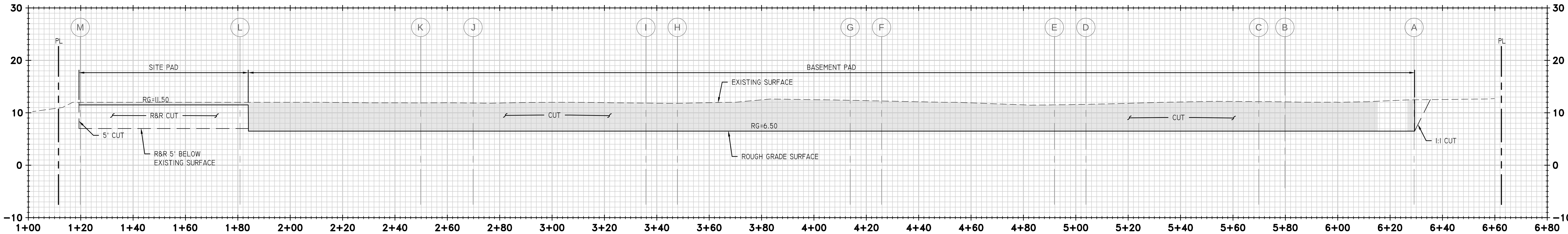
2018-04016-000

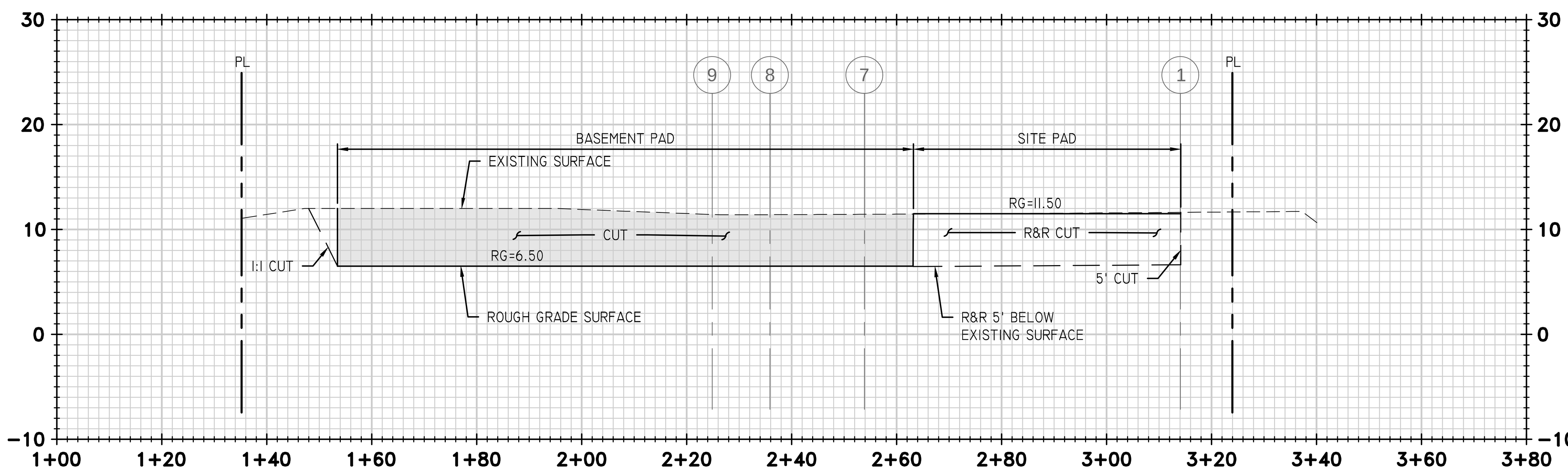
CONCEPTUAL ROUGH GRADING PLAN

C1.10

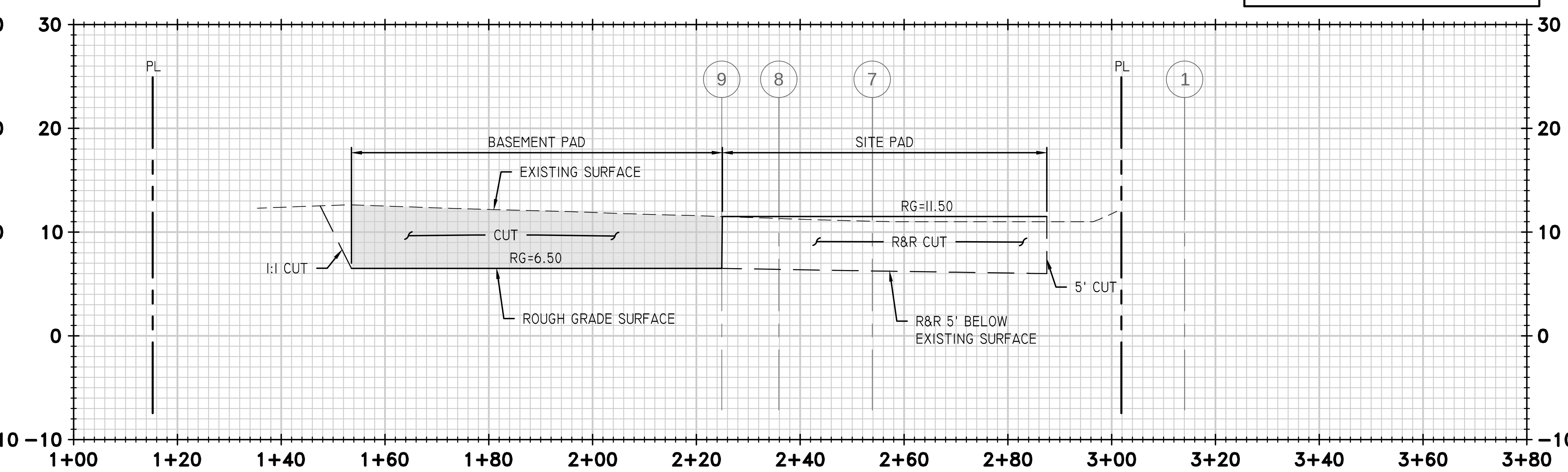
7/27/2018 8:32:37 AM



SECTION A
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=10'



SECTION B
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=10'



SECTION C
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=10'

CLIENT LOGO GOES HERE
SCALED TO FIT
180 PIXELS

Thomas Safran & Associates

THOMAS SAFRAN ASSOCIATES

Date	Issued For
08/15/2018	Entitlement Set

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REGISTERED PROFESSIONAL ENGINEER
DAN DOV KR...
N.F.C.
No. 76047
CIVIL
STATE OF CALIFORNIA

2018-04016-000

ROUGH GRADING SECTIONS

C1.11

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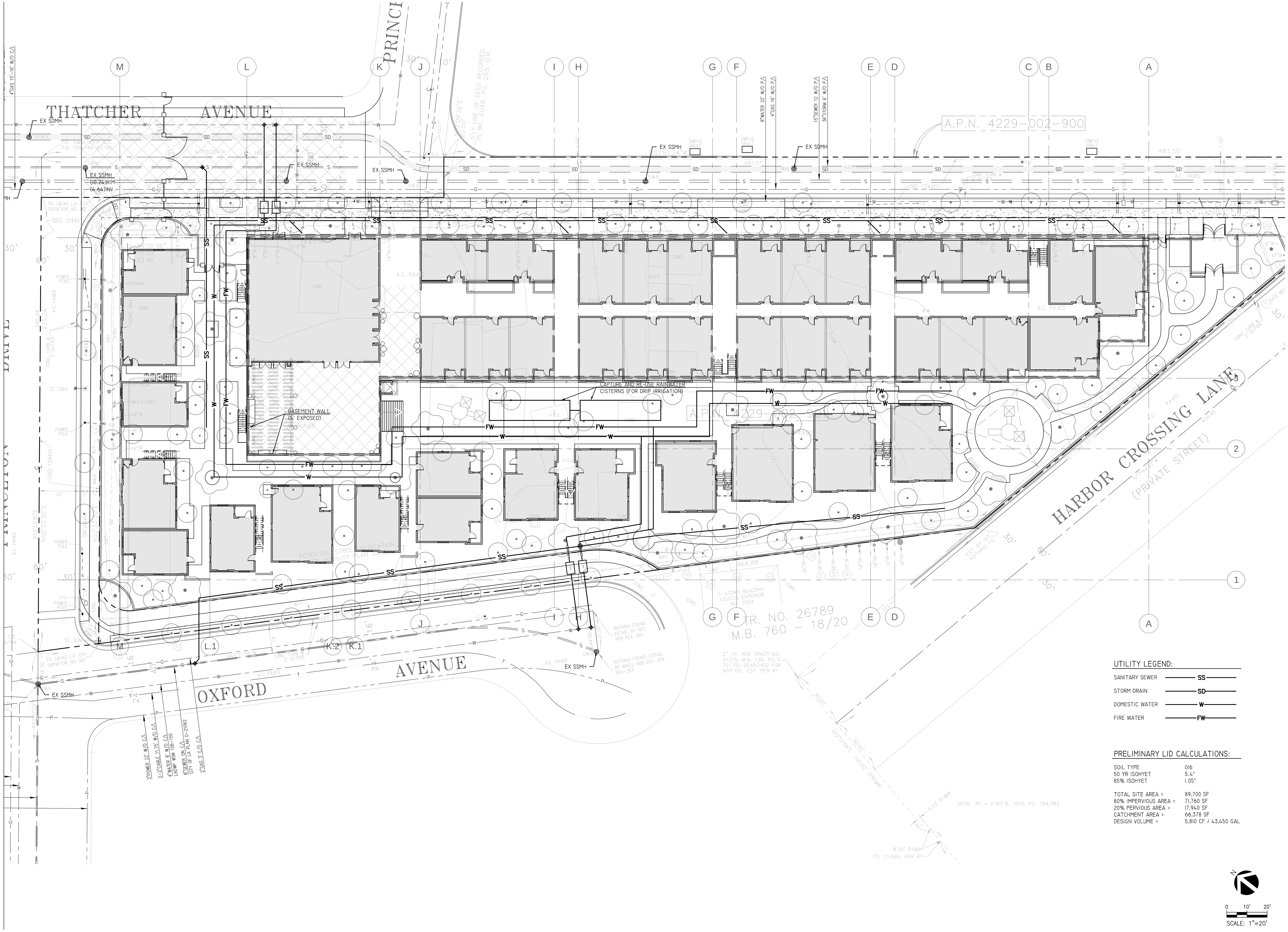

UTILITY LEGEND:

SANITARY SEWER	SS
STORM DRAIN	SD
DOMESTIC WATER	W
FIRE WATER	FW

PRELIMINARY LID CALCULATIONS:

SOIL TYPE	016
50 YR ISOHYET	5.4"
85% ISOHYET	1.05"
TOTAL SITE AREA =	89,700 SF
80% IMPERVIOUS AREA =	71,760 SF
20% PERVIOUS AREA =	17,940 SF
CATCHMENT AREA =	66,378 SF
DESIGN VOLUME =	5,810 CF / 43,450 GAL

CLIENT LOGO GOES HERE
SCALED TO FIT
180 PIXELS

Thomas Safran & Associates

THOMAS SAFRAN ASSOCIATES

Date	Issued For
08/15/2018	Entitlement Set

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REGISTERED PROFESSIONAL ENGINEER
DAN DOV KR...
No. 76041
CIVIL
STATE OF CALIFORNIA

2018-04016-000

CONCEPTUAL UTILITY AND LID PLAN

C1.20

FEFFER
GEOLOGICAL CONSULTING

May 18, 2017 File No. 1925-74

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

Subject: **GEOTECHNICAL INVESTIGATION**
Proposed Five Story Building
3233-3321 S Thatcher Avenue, Los Angeles, CA 90292

Dear Mr. Coddington,

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.

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

Joshua R. Feffer
Principal Engineering Geologist

Dan Daneshfar
Principal Engineer
P.E. 68377

Distribution: Addressee– (1)

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 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 drilling of six borings (B1, B2, B3, B4, B5, B6);
- Sampling and logging of the subsurface soils;
- Laboratory testing of selected soil samples collected from the subsurface exploration to determine the engineering properties of the underlying earth materials;
- Engineering and geologic analysis of the field and laboratory data; and
- Preparation of this report presenting our findings, conclusions, and recommendations for the proposed construction.

1.3 SITE DESCRIPTION

The project site is located on south side of Thatcher Avenue and is bordered to the north by Princeton Drive, to the south by Harbor Crossing Lane, and to the west by Oxford Avenue in the Marina Del Rey area of the City Los Angeles (Figure 1). The site is relatively level and is currently occupied by asphalt covered parking lot and remnant building foundations (Figure 2). The subject site is surrounded by small businesses and residential developments. A recent aerial photograph of the site is shown as Figure 3. Surface drainage is by sheet flow to the north of the property.

1.4 PROPOSED CONSTRUCTION

Based on the information provided to us, the project will consist of demolishing the existing structures and the construction of a five-story building. A Site Plan and Cross Sections showing the proposed development are included in Appendix C.

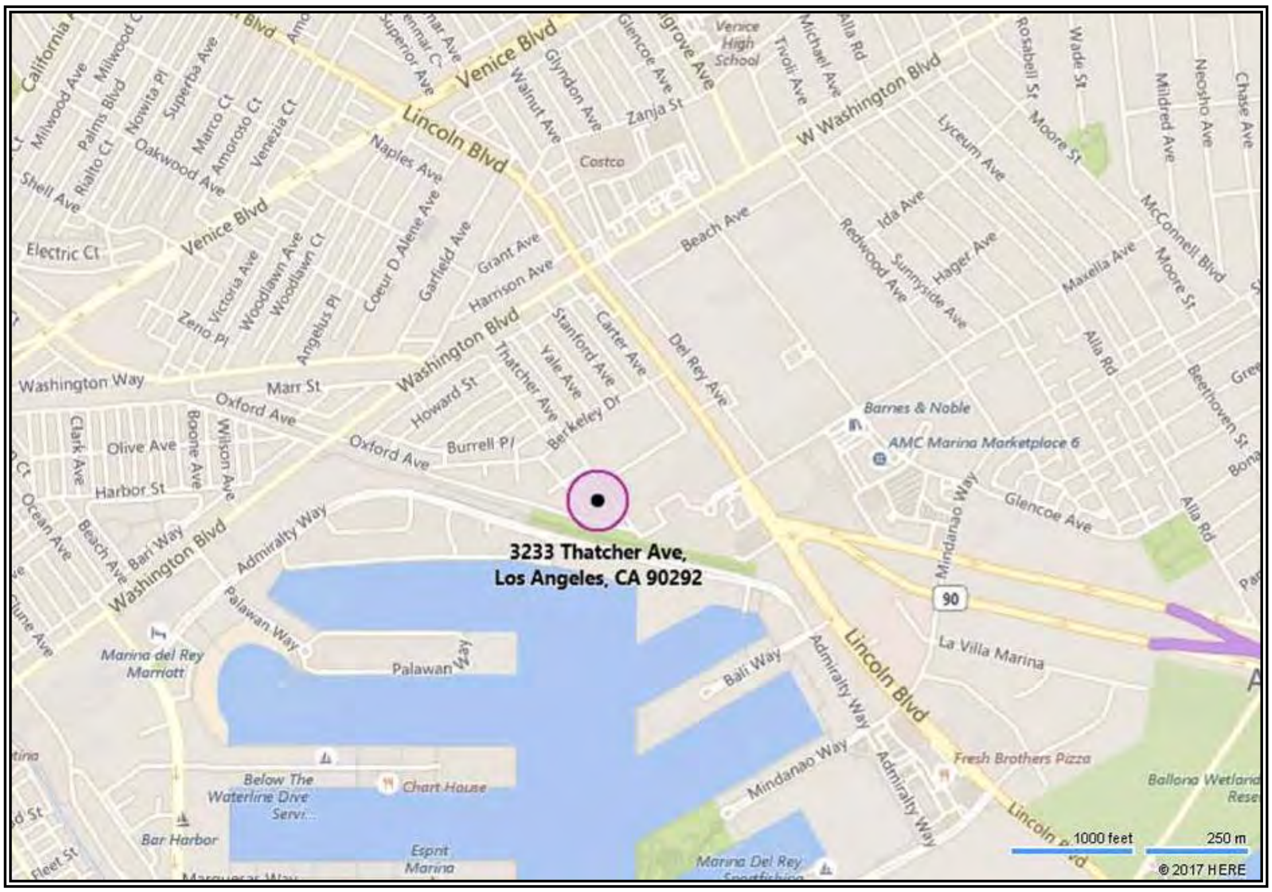


Figure 1. Location map of the subject site.

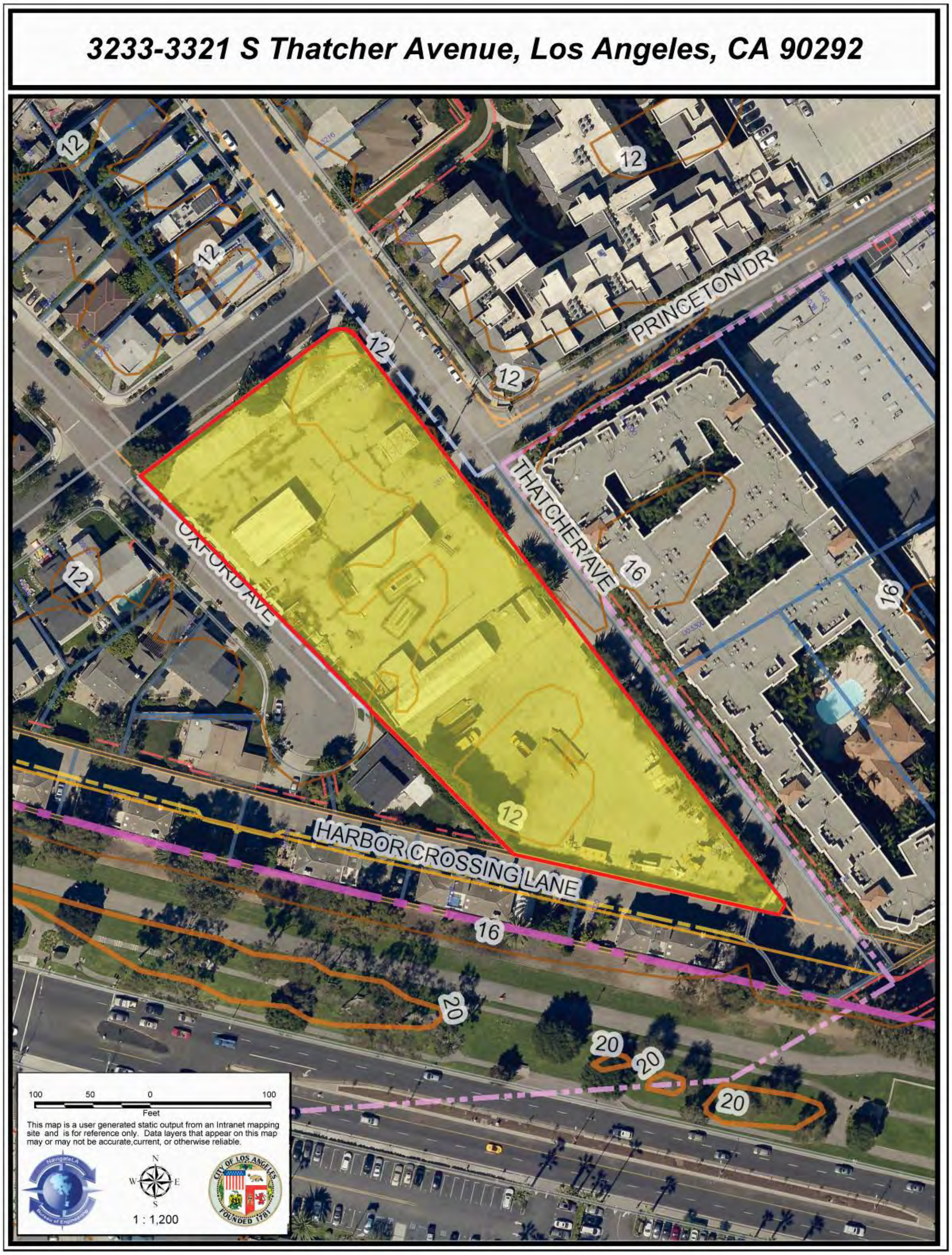


Figure 2. Aerial photograph with topographic overlay from Navigate LA. Subject site is highlighted.

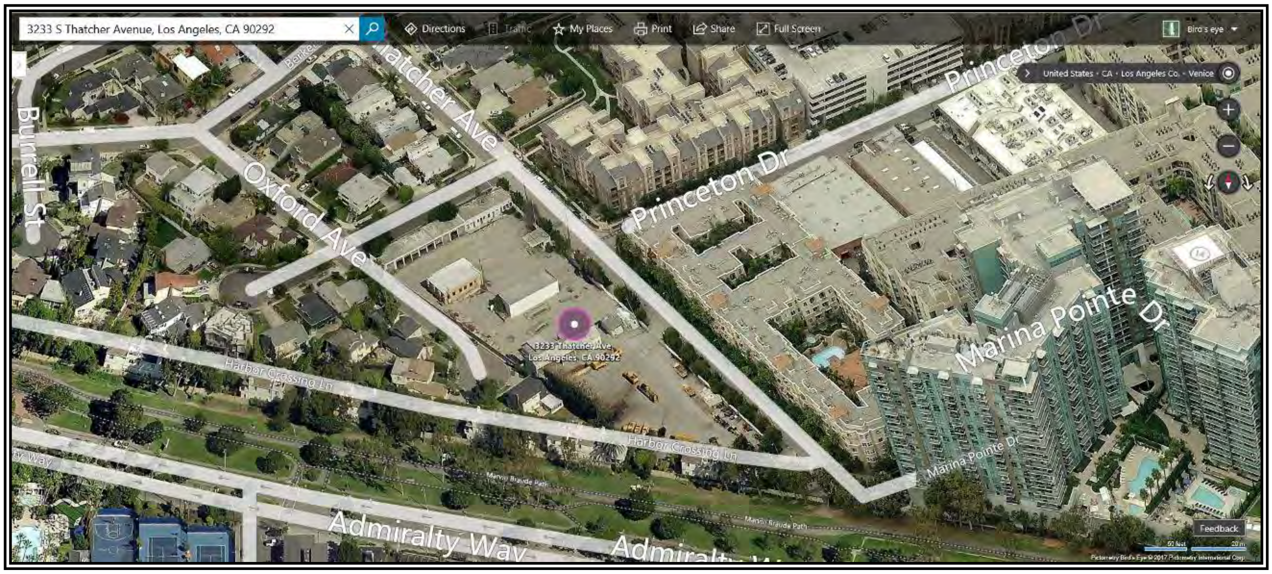


Figure 3. Aerial Photograph of subject lot and surrounding area.

1.5 <u>DOCUMENT REVIEW</u>

The City of Los Angeles Building Department records were researched. The records contained the following Geologic and Soils Engineering Reports for the subject property in addition to reports located for nearby properties.

3233-3321 S. Thatcher Avenue, Jobsite
City of Los Angeles Soils Correction Letter, Log #58858 dated 2007 1 August

Geotechnical Engineering Division (GED), City of Los Angeles, Geotechnical and Soils Engineering Report for, Unnumbered Lot, Tract Rafael and Andres Machado, 3311 S. Thatcher Avenue, Los Angeles, California dated 2007 30 May, Soils Field & Lab Report, dated 2007 12 February

Geomatrix Consultants, Inc, Newport Beach, Geotechnical Data Report for Unnumbered Lot, Tract Rafael and Andres Machado, 3311 S. Thatcher Avenue, Los Angeles, California dated 2007 3 March

3226 Thatcher Avenue, Across The Street, East From Jobsite
Leighton and Associates, Inc, Irvine, Revised Compaction Report for Lot 17-20, Tract 20660, 3224-26 Thatcher Avenue, Los Angeles, California dated 2007 11 January

City of Los Angeles Approval Letter, Log #56367 dated 2007 11 January

Leighton and Associates, Inc, Irvine, Compaction Report for Lot 17, Tract 20660, 3224-26 S. Thatcher Avenue, Los Angeles, California dated 2006 27 December

Leighton and Associates, Inc, Irvine, Soils Report for Lot 17-20, Tract 20660, 3224-26 S. Thatcher Avenue, Los Angeles, California dated 2006 22 November

City of Los Angeles Approval Letter, Log #51886-01 dated 2006 10 July

Leighton and Associates, Inc, Irvine, Soils Report for Lot 17-20, Tract 20660, 3224-26 S. Thatcher Avenue, Los Angeles, California dated 2006 24 May

City of Los Angeles Correction Letter, Log #51886 dated 2006 16 March

Leighton and Associates, Inc, Irvine, Geotechnical Investigation for Lot 17, Tract 20660, 3224-26 S. Thatcher Avenue, Los Angeles, California dated 2005 28 December

Kehoe Testing & Engineering, Huntington Beach, Cone Penetration Test Data for Lot 17-20, Tract 20660, 3224-26 S. Thatcher Avenue, Los Angeles, California dated 2005 21 September

Rybak Geotechnical, Inc, Van Nuys, Soil Report for Lot 17-20, Tract 20660, 3224-26 S. Thatcher Avenue, Los Angeles, California dated 2002 10 September

13700 West Marina Pointe Drive, South East Of Jobsite
LAW Engineering and Environmental Services, Inc, Los Angeles, Final Report for Geotechnical Inspection Services for Lot 2, Tract 52139, 13700 Marina Pointe Dr, Los Angeles, California dated 2001 21 November

City of Los Angeles Department Letter, Log #32838 dated 2001 22 February

LAW Engineering and Environmental Services, Inc, Los Angeles, Geotechnical Investigation for Lot 2, Tract 52139, 13700 Marina Pointe Dr, Los Angeles, California dated 2001 30 January

City of Los Angeles Department Letter, Log #32368-01 dated 2001 30 January

LAW Engineering and Environmental Services, Inc, Los Angeles, Supplemental Shoring Design Recommendation for Lot 2, Tract Rancho La Ballona, 13700 Marina Pointe Dr, Los Angeles, California dated 2001 23 January

13600 West Marina Pointe Drive, South East Of Jobsite
LAW Engineering and Environmental Services, Inc, Los Angeles, Supplemental Geotechnical Recommendation for Lot FR LT 1, Tract 52139, 13600 Marina Pointe Dr, Los Angeles, California dated 2001 31 May

LAW Engineering and Environmental Services, Inc, Los Angeles, Geotechnical Investigation for Lot FR LT 1, Tract 52139, 13600 Marina Pointe Dr, Los Angeles, California dated 2000 8 May

3300 Thatcher Avenue, Directly Across From The Jobsite
Chang & Associates, Inc, Los Angeles, Foundation Report Addendum for Lot arb 349 and arb 350, Tract 4, 3300-3324 Thatcher Avenue, Los Angeles, California dated 1997 6 November

City of Los Angeles Department Letter, Log# 22693 dated 1997 6 November

Chang & Associates, Inc, Los Angeles, Geotechnical Investigation for Proposed Residential Development for Lot arb 349 and arb 350, Tract 4, 3300-3324 Thatcher Avenue, Los Angeles, California dated 1997 10 October

City of Los Angeles Department Letter, Tentative Tract Termination for Tract 59080 dated 1993 18 March

2.0 INVESTIGATION

2.1 GENERAL

Our field investigation was performed on March 1-2, 2017 and consisted of a review of site conditions and exploration involving the excavation of test pits, drilling of borings and soil sampling. Our investigation also included laboratory testing of selected soil samples. A brief summary of these various tasks are provided below.

2.2 FIELD EXPLORATION

The subsurface investigation performed at the site consisted of the drilling of six borings by use of a hollow-stem auger drill rig.

The purpose of the exploratory test pits and borings 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 fill over alluvium.

A review of Regional Geologic Maps[1] indicates that the material underlying the subject site is comprised of Alluvium (Qa) of Quaternary age (Figure 4).

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

The approximate locations of the Borings 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 exploration. 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, maximum density and shear strength testing. A summary of the laboratory test results is included in Appendix B.

The physical properties of the soils were tested at Soil Labworks, LLC. Chemical testing was performed at HDR Schiff. The undersigned geologist and engineer have reviewed the data, concur, and accept responsibility for the data therein.

---

[1] Dibblee, T.W. and Minch, J.A., ed., 2007, Geologic Map of the Venice and Inglewood (south ½) quadrangles, Los Angeles County, California, Dibblee Foundation Map, DF #322, scale 1:24,000.

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 (Qa) overlain by a veneer of fill. Descriptions of the materials encountered in our exploratory borings are described below.

3.1.1 Fill

The fill consists of silty clay and gravelly silty sand. The color varies from orange-brown to brown, black, and dark gray. The fill is moist and medium dense to dense. The fill encountered varies between two to twelve feet below the ground surface.

3.1.2 Alluvium

The Alluvium consists of admixtures of gravelly-sands, sandy-clays and silty-sands, which vary from brown to medium-brown, orange brown, blue-gray, and charcoal-gray. The Alluvium was moist to slightly moist, and dense. The Alluvium is generally weakly horizontally layered with no significant structural planes. Generally, the Alluvium becomes more granular with depth.

3.1.3 Groundwater

Ground water was encountered during the recent excavations at depths ranging from eight to fifteen feet below the ground surface. Historically highest groundwater in this area of Los Angeles is estimated to be five feet below the ground surface (Plate 1.2, *Historically Highest Groundwater Contours and Borehole Log Data Locations, Venice 7½ Minute Quadrangle in Seismic Hazard Zone Report for the Venice Quadrangle,* SHZR-036).

[2] Dibblee, T.W. and Minch, J.A., ed., 2007, Geologic Map of the Venice and Inglewood (south ½) quadrangles, Los Angeles County, California, Dibblee Foundation Map, DF #322, scale 1:24,000.

Figure 4. Portion of Dibblee Geologic Map. Site is designated by a diamond.

3.2 SUSMP/LID

Ground water was encountered at depths ranging from eight to fifteen feet below the ground surface. The proposed building will extend into the underlying alluvium and it is our opinion that there is not sufficient rates of infiltration in the alluvium to percolate collected rainwater into the subsurface. An alternative to infiltration should be designed for the subject site in order to comply with SUSMP/LID requirements.

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. Although we are not aware of 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.

The closest known potentially active faults to the site are the Santa Monica-Hollywood, and Newport Inglewood located within about 5 kilometers. Since no active faults cross the property, the surface rupture hazard at the site is very low.

Due to the distance from the coastline, the site may be susceptible to the effects of tsunamis and seiches.

3.4 2016 CALIFORNIA BUILDING CODE CONSIDERATIONS

The proposed development may be designed in accordance with seismic considerations contained in the 2016 California Building Code, Section 1613, the following parameters may be considered for design:

Mapped Spectral Response Acceleration Parameters:			
	S_S	:	1.697g
	S_1	:	0.663g
Site Class:	D	:	Stiff Soil
Site Coefficients:	F_a	:	1.0
	F_v	:	1.5
Maximum Considered Earthquake Spectral Response Acceleration Parameters:			
	S_{MS}	:	1.697g
	S_{M1}	:	0.994g
Design Spectral Response Acceleration Parameters:			
	S_{DS}	:	1.131g
	S_{D1}	:	0.663g
	PGA_M	:	0.649 g

3.5 LIQUEFACTION

3.5.1 Ground Motion

The subject site is located in an area designated being within an area that is potentially affected by earthquake-induced liquefaction (*Seismic Hazard Zone Report for the Venice 7.5-minute Quadrangle, Los Angeles County, California*, *Seismic Hazard Zone Report 036*).

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. Pursuant to the memo the PGA corresponding to 2/3 of the PGA_M should be used to determine seismically induced settlements. The Predominant Earthquake Magnitude should be based on a 10% probability of exceedance in 50 years (475-year return interval) and 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 for a 475-year return interval is 6.6 and the PGA_M is 0.649g. Two thirds of the PGA_M is 0.43g.

Additionally, the City Bulletin/Memo requires that the full PGA of 0.649g and a Predominant Earthquake Magnitude 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 Predominant Earthquake Magnitude for a 2475-year return interval is 6.77. These ground motions, while unlikely to occur, have been adopted for the liquefaction study pursuant to the new requirements.

3.5.2 Liquefaction

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) 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 0.45g ($2/3^{rd}$ of PGA for 10% exceedance) and 0.677 (PGA 2% exceedance) and a design magnitude earthquake of 6.6 (475-year) and 6.77 (2475-yr) were used for the analyses. For conservatism two analyses were performed; one assumed that groundwater was at the historical high of 5 feet and the other assumed that the groundwater will be at a depth of 8 feet of the ground surface where ground water was encountered.

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 hollow-stem borings B-1 and B-2 advanced within the project site. Using site SPT blow counts, laboratory data, and our engineering judgment, site-specific soil parameters were utilized in our settlement analyses.

The raw SPT blow counts were converted to equivalent clean sand blow counts following the procedures in the publications referenced above. 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 a groundwater level of 5 feet with the PGA of 10% probability of exceedance in 50 years (475-year return interval) indicates that total settlement of 0.24" may occur. The associated differential settlement of 0.16" was determined by assuming $2/3^{rd}$ of the total settlement. 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 0.45" may occur. The associated differential settlement of 0.30" was determined by assuming $2/3^{rd}$ of the total settlement). Based upon our review, the project site settlement for a return interval of 475-or 2475 years does exceed the total combined or differential settlement (seismic plus static) of 1-1/2 inch total or 3/4-inch differential specified by the City of Los Angeles.

3.5.3 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.

3.5.4 Secondary Ground Effects

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

4.0 GEOTECHNICAL CONSIDERATIONS

4.1 SUBSURFACE SOIL CONDITIONS

Subsurface materials at the site consist of alluvium below a layer of fill observed to vary between two to twelve feet below the ground surface. Laboratory testing indicates that the Alluvium at a shallow depth has a low potential for consolidation and hydrocollapse. The Alluvium at the subject site is 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 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 soils have a very low potential for consolidation. Recommendations are presented below to mitigate the settlement hazard associated with consolidation of the near surface soils.

4.3 EXPANSIVE SOIL

The on-site, near surface soil was found to possess medium expansive characteristics based upon field soil classifications and testing.

4.4 SLOPE STABILITY

The property has less than five feet of overall elevation change at a gradient of approximately 12:1 or gentler (horizontal to vertical) gradient. A slope stability analysis is not required for the property per City of Los Angeles Department of Building and Safety Information Bulletin P/BC 2011-49.

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 over-consolidated nature of the alluvial deposits and the depth of groundwater at the subject site, the potential for liquefaction at the site during earthquake shaking is considered to be nil. Foundations will be founded in alluvium.

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

Where fill is intended for structural support, a compacted fill cap should extend at least three feet below the bottom of footings or five feet below finished grade whichever is greater. 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

Based on our understanding of the proposed development, we recommend that footings for the development be founded in firm alluvium or within a new compacted fill cap that extends a minimum of three feet below footings or five feet below finished grade whichever is greater and five feet outside of the building footprint.

If removal is locally deeper due to the local depth of fill or due to remediation of contaminated soil, a sharp transition between the deeper and shallower fill areas should not occur. Transitions from deeper to shallow areas should not exceed a 1.5:1 gradient; fill should not vary by more than five feet in depth below a building footprint.

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 test pits did not encounter hard earth materials. 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.

Ground water was encountered at depths ranging from eight to fifteen feet below the ground surface. The contractor should be aware that if groundwater or heavy seepage is encountered during construction excavations, dewatering may be required.

[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.

5.4 FOUNDATION SUPPORT

5.4.1 New Structures

All proposed footings shall be embedded within the competent alluvium or new compacted fill, in accordance with the recommendations below.

Foundation support for the new structures could be derived by utilizing a conventional, shallow foundation system embedded within the competent alluvium or newly compacted fill. Allowable design parameters for foundations are provided below.

Minimum depth for interior and exterior footing
(Measured from lowest adjacent grade)..2 feet
Minimum embedment into approved alluvium............................. 12 inches
Minimum embedment into new fill .... 18 inches
Minimum width ....1.25 feet

Bearing pressure
a. Sustained loads (lbs. per square foot) ....2, 000 psf

Resistance to lateral loads
a. Passive soil resistance (lbs. per cubic ft.)
Within alluvium or compacted fill....................................... 300 pcf
Maximum allowable for alluvium ....3,500 psf

b. Coefficient of sliding friction...0.35

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. When combining passive and friction for lateral resistance, the passive component should be reduced by one third.

Increases in the bearing value of the alluvium are allowable at a rate of 300 pounds per square foot for each additional foot of footing width to a maximum of 4,000 pounds per square foot. For bearing calculations, the weight of the concrete in the footing may be neglected.

All continuous footings should be reinforced with a minimum of four #4 steel bars; two placed near the top and two near the bottom of the footings. Footing excavations should be cleaned of all loose soil, moistened, free of shrinkage cracks and approved by the geologist and geotechnical engineer prior to placing forms, steel or concrete.

Based on the anticipated building loads footings designed and constructed in accordance with the soil criteria included within the referenced report are expected to settle less than ¼ to ½ inch in a distance of 20 feet. Differential settlement is expected to be less than ¼ inch. The total and differential settlements are within acceptable and allowable tolerances for conventional foundations.

5.4.2 Deepened Foundations - Friction Piles

If required to achieve embedment into competent alluvium drilled, cast-in-place concrete friction piles may be used for support of structures.

Piles should be a minimum of 24 inches in diameter and a minimum of 8 feet into alluvium. Piles may be assumed fixed at three feet into alluvium. The piles may be designed for a skin friction of 400 pounds per square foot for that portion of pile in contact with the alluvium.

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. Passive earth pressure in alluvium may be computed as an equivalent fluid having a density of 400 pounds per cubic foot.

The maximum allowable earth pressure is 4,500 pounds per square foot. 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.

5.4.3 Mat Foundation

For purposes of waterproofing and for resisting design hydrostatic uplift due to the ground water encountered at eight to fifteen feet below the ground surface, a mat foundation may be appropriate. The mat will extend below the highest historical groundwater level and into over-consolidated soils. 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 125 kips/ft^3 may be assumed. For aesthetic reasons, the deflection should not exceed ½ inch in 30 feet. The mat is not expected to experience any differential settlement.

A rise in the groundwater table will not reduce the bearing capacity of the soils supporting the mat.

5.5 RETAINING WALLS

5.5.1 Retaining Wall

Although not part of the proposed project, if constructed, cantilevered retaining walls up to 6 feet high that support fill, older alluvium, and approved retaining wall backfill, may be designed for an equivalent fluid pressure of 30 pounds per cubic foot for level backslopes.

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.

Since the proposed retaining wall is less than 6 feet in height, a seismic surcharge from a Design Earthquake need not be considered.

5.5.2 Retaining Wall Backfill

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.

5.5.3 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.

As aforementioned, the architect, structural engineer, or other qualified waterproofing consultant should develop the actual waterproofing details.

5.6 TEMPORARY EXCAVATIONS

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

Un-shored vertical cuts to a height of five (5') may be made in earth 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.

Shoring, if required for the project should be designed to retain an equivalent fluid pressure of 30 PCF.

5.6.1 Shoring

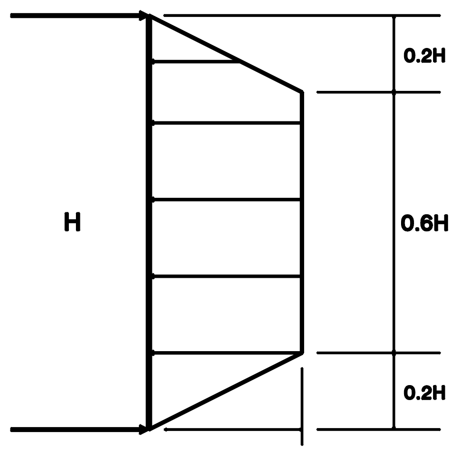
Shoring may consist of cast-in-place concrete piles with wood-lagging. Shoring piles should be a minimum of 18 inches in diameter and a minimum of 8 feet into alluvium below the base of the excavation. Piles may be assumed fixed 3 feet below the base of the excavation. For the vertical forces, piles may be designed for a skin friction of 400 pounds per square foot for that portion of pile in contact with the alluvium. and 500 pounds per square foot for portion of the pile in contact with alluvium.(take out the previous paragraph in red) . 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 or alluvium 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. The maximum allowable earth pressure is 4,000 pounds per square foot. 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.

Restrained braced shoring should be designed for the trapezoidal pressure distribution noted in the figure below. 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



5.6.2 Earth Anchors

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. For preliminary design purposes, it is estimated that pressure grouted anchors will develop an average value of 2500 pounds per square foot. 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.

5.6.3 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.

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.

5.6.4 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.

5.6.5 Monitoring

Because of the depth of the excavation, some mean of monitoring the performance of the shoring system is 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.

5.7 SLOT CUTS

If required, slot cuts 8 feet wide and 8 feet in height are stable. The slot cuts should be excavated by the ABC method. The “A” slots are first excavated and backfilled while the “B” and “C” slots are left in place as buttresses; the same procedures are used for the “B” and “C” slots.

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.

5.8 SWIMMING POOL

If a pool is constructed it should derive support entirely from the alluvium or a compacted fill cap that extends a minimum of three feet below the pool shell. The pool shell should be founded entirely in one material. Pool walls supporting soil should be designed for an inward pressure given as an equivalent fluid weight of 45 pcf. A hydrostatic relief valve is recommended. If a spa is to be attached to the pool, the spa should be founded at the same depth as the portion of the pool it adjoins.

5.9 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 2 feet of compacted fill.

A structural slab may be required along the east side of the building where piles will be used for support of the building. The structural engineer should design the slab.

The existing seepage is located at a depth of 18 feet and is at the level of the proposed basement and associated foundation. Wet conditions may be encountered. If groundwater is encountered, dewatering may be required and should be designed by a dewatering contractor and engineer.

Slabs below a depth of 18 feet should be designed to resist hydrostatic uplift forces. A mat foundation may be required.

The existing groundwater seepage is located at a depth of 18 feet and is below the level of the proposed basement and associated foundation. Wet conditions and actual groundwater may be encountered. If groundwater is encountered, temporary dewatering may be required and should be designed by a dewatering contractor and engineer.

The foundation and lower five feet of the retaining walls should be designed to resist a full hydrostatic pressure equal to 15 feet of head. Slab subdrainage and associated pumps are not required for this project.

A mat foundation may be required to provide appropriate waterproofing and resistance to uplift.

5.10 EXTERIOR FLATWORK AND AUXILIARY STRUCTURES

Whenever planned, exterior flatwork should be placed directly on alluvium 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 or on a two foot blanket of compacted fill.

5.11 CONCRETE/SULFATE/CORROSIVITY

Testing of the sulfate content of the soil indicates that only low levels of sulfate concentrations were encountered in the soil and therefore specialized concrete is not required for the project. We recommend that the low permeable concrete be utilized at the site to limit moisture transmission through slab and foundation. The structural engineer should specify appropriate compressive strength and water-cement ratio. 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.

5.12 SOIL CORROSIVITY

According to testing of the site soils, the soils should be expected to be only slightly corrosive to ferrous metals. It is recommended that a consulting corrosion engineer be retained in order to determine the most appropriate protection measures for the project site.

Recommendations that the corrosion engineer may require include the following:

- All steel and wire concrete reinforcement should have at least 3 inches of concrete cover where cast against soil.

- Below-grade ferrous metals should be given a high-quality protective coating, such as plastic tape, extruded polyethylene, hot-applied coal tar enamel, or fusion-bonded epoxy.

- On any type of pipe, coat all bare metal appurtenances such as bolts, valves, joint harnesses, or flexible couplings with a coal tar or rubber-based mastic, coal tar epoxy, moldable sealant, wax tape, or equivalent, after assembly.

- Bond below-grade ferrous metals with non-conductive type joints for electrical continuity.

- Below-grade metals should be electrically insulated (isolated) from dissimilar metals, cement-mortar coated and concrete-encased metals, and above-grade metals, by means of insulated joints.

- Metal pipes penetrating concrete structures such as floors and walls should be provided with plastic sleeves, rubber seals, or other dielectric material to prevent pipe contact with the concrete and reinforcing steel.

- Bare copper tubing should be bedded and backfilled in clean sand at least 3 inches thick surrounding the tubing. The best corrosion control for hot-water copper tubing is placement above-grade. Below-grade hot-water copper tubing should be encased in impermeable, unstretched, non-shrink insulation with the joints and seams sealed.

5.13 PAVEMENT DESIGN

The following pavement sections are recommended as minimums:

TRAFFIC INDEX	ASPHALT THICKNESS	BASE THICKNESS
Light Traffic (T.I.=5) for parking stalls and driveways	3 inches	4 inches
Heavy Traffic (T.I.= 6.5) for loading docs and large truck traffic	4 inches	6 inches

Concrete pavement sections should be a minimum of 6 inches thick and reinforced with #4 bars at 18” on center. A base of 6 inches is required below concrete pavement areas. Control joints should be planned at not more than twelve foot spacing.

All pavement should be placed on a minimum one-foot thick fill cap that is compacted to a minimum of 95% relative compaction.

5.14 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.

5.15 PLAN REVIEW

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

5.16 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.

5.17 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.

5.18 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: 1925-74
Project:Thatcher Avenue (Thomas Safran & Associates)

Date Performed: 3/1/17-3/2/17

Boring No:1
Boring Location: A/C Parking Lot
3233-3321 S Thatcher Avenue, Los Angeles
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				0-8" Asphalt, 8-9" Base Artificial Fill (Af) Silty clay, contains scattered rootlets	Dark gray black	Firm	Moist
2.5				Quaternary Alluvium (Qa)			
5	6/9	R		Silty clay	Gray, brown gray, orange gray	Firm	Moist
7.5	5/6/8		SPT	Silty sand Ground Water At 8"bgs	Brown, orange brown	Medium dense	Very moist
10	12/16	R		Silty sand	Brown, orange brown	Medium dense	Very moist
12.5	10/16/25		SPT	Silty sand, contains scattered gravel	Brown, orange brown	Medium dense to dense	Wet
15	14/29	R		Silty sand, contains scattered gravel	Brown, orange brown	Medium dense to dense	Wet
17.5	12/16/20		SPT	Silty sand, contains scattered gravel	Brown, orange brown	Medium dense to dense	Wet
20	5/9	R		Gravelly silty sand and sandy silt	Brown, blue gray	Medium dense	Moist to wet
22.5	6/7/8		SPT	Silty clay, silty sand and sandysilt	Blue gray, gray	Medium dense	Moist
25	8/11	R		Silty clay	Blue gray	Firm	Moist
27.5	5/7/9		SPT	Silty clay	Brown, blue gray	Firm	Moist
30	9/14	R		Silty clay	Blue gray	Firm	Moist
32.5	10/15/16		SPT	Sandy silt, silty sand	Charcoal gray	Medium dense to dense	Moist
35	20/32	R		Sandy silt, silty sand	Charcoal gray	Medium dense to dense	Moist
37.5	3/5/10		SPT	Sandy silt, silty sand	Charcoal gray	Medium dense to dense	Moist
40							

LOG OF EXPLORATORY BORING

Job Number: 1925-74
Project:Thatcher Avenue (Thomas Safran & Associates)

Date Performed: 3/1/17-3/2/17

Boring No:1
Boring Location: A/C Parking Lot
3233-3321 S Thatcher Avenue, Los Angeles
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	14/28	R		Silty sand, silty sand	Charcoal gray	Medium dense to dense	Moist
42.5	6/7/9		SPT	Silty sand, silty clay	Blue gray, black	Medium dense	Moist
45	9/24	R		Silty clay, contains wood shards	Dark brown, blue gray,	Dense	Moist
47.5	14/23/31		SPT	Silty sand, poorly sorted, grades from coarse to fine	Blue gray	Dense	Moist
50	25/42	R		Silty sand	Blue gray	Dense	Moist
52.5	15/18/30		SPT	Silty sand	Blue gray	Dense	Moist
55	30/45	R		Silty sand	Blue gray	Dense	Moist
57.5	19/20/29		SPT	Silty sand	Blue gray	Dense	Moist
60	17/25	R		Silty sand	Blue gray	Dense	Moist
65				End At 61.5', Artificial Fill To 2.5', Ground Water At 8', No Caving			
70							
75							
80							

LOG OF EXPLORATORY BORING

Job Number: 1925-74
Project:Thatcher Avenue (Thomas Safran & Associates)

Date Performed: 3/1/17-3/2/17

Boring No:2
Boring Location: A/C Parking Lot
3233-3321 S Thatcher Avenue, Los Angeles
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				0-5" Asphalt, 5-18" Base Artificial Fill (Af)			
2.5				Gravelly silty sand	Black	Medium dense	Moist
5	7/6/2	R		Gravelly silty sand, contains glass shards, scattered gravel, springs, concrete debris, asphalt debris	Orange brown	Medium dense	Moist
7.5	15/21		SPT	Gravelly silty sand	Black, brown	Medium dense	Moist
10	5/6/9	R		Ground Water At 9'bgs Silty sand Quaternary Alluvium (Qa)	Dark gray	Medium dense	Wet
12.5	9/13		SPT	Silty sand	Gray, blue gray	Medium dense	Wet
15	5/5/6	R		Silty sand, gravelly silty sand, poorly sortrd	Dark gray, blue gray	Medium dense	Wet
17.5	19/25		SPT	Gravelly silty sand	Dark gray, blue gray	Medium dense	Wet
20	10/15/18	R		Gravelly silty sand	Dark gray, blue gray	Medium dense	Wet
22.5	20/50 For 6"		SPT	Gravelly silty sand	Orange brown	Dense	Wet
25	15/2/24	R		Gravelly silty sand	Orange brown	Dense	Wet
27.5	26/40		SPT	Silty sand and gravelly silty sand	Orange brown	Dense	Moist
30	19/26/30	R		Silty sand and gravelly silty sand	Orange brown, gray brown	Dense	Moist
32.5	39		SPT	Silty sand	Brown, gray brown	Dense	Moist
35	29/50 For 6"	R		Silty sand and gravelly silty sand	Gray, orange brown	Dense	Moist
37.5	40/50 For 6"		SPT	Silty sand	Gray brown	Dense	Moist
40							

LOG OF EXPLORATORY BORING

Job Number: 1925-74
Project:Thatcher Avenue (Thomas Safran & Associates)

Date Performed: 3/1/17-3/2/17

Boring No:2
Boring Location: A/C Parking Lot
3233-3321 S Thatcher Avenue, Los Angeles
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	15/19/24	R		Silty sand	Gray brown, orange brown	Dense	Moist
42.5	36/48		SPT	Silty sand	Gray	Dense	Moist
45	20/40/50 For 6"	R		Silty sand	Blue gray,	Dense	Moist
47.5	28/42		SPT	Silty sand	Blue gray	Dense	Moist
50	17/25/32	R		Silty sand	Blue gray	Dense	Moist
52.5	30/45		SPT	Silty sand-no recovery	Blue gray	Dense	Moist
55	20/50 For 6"	R		Silty sand	Blue gray	Dense	Moist
57.5	39/50 For 6"		SPT	Silty sand, poorly sorted sand grains are coarser	Blue gray	Dense	Moist
60	18/29/40	R		Silty sand, poorly sorted sand grains are coarser	Blue gray	Dense	Moist
				End At 61.5', Artificial Fill To 12.0', Ground Water At 8', No Caving			
65							
70							
75							
80							

LOG OF EXPLORATORY BORING

Job Number: 1925-74
Project:Thatcher Avenue (Thomas Safran & Associates)

Date Performed: 3/1/17-3/2/17

Boring No:3
Boring Location: A/C Parking Lot
3233-3321 S Thatcher Avenue, Los Angeles
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				0-8” Asphalt, 8-11” Base Artificial Fill (Af)			
2.5				Gravelly silty sand, contains asphalt debris, strong hydrocarbon odor	Black	Medium dense	Moist
5	5/8	R		Silty sand, contains wood fragments	Black, dark gray	Medium dense	Moist
7.5							
10	6/10	R		Ground Water At 9’bgs Silty sand, contains scattered debris, metal fragments	Black, dark gray	Medium dense	Wet
12.5				Quaternary Alluvium (Qa)			
15				No recovery			
17.5							
20	16/25	R		Gravelly silty sand	Brown, black	Medium dense	Wet
22.5							
25	19/30	R		Gravelly silty sand	Gray, orange brown	Medium dense	Very moist
27.5							
30	25/48	R		Gravelly silty sand, silty sand	Tan, yellow brown	Medium dense	Moist
32.5				End 31.5’, Artificial Fill To 12’, Ground Water At 9’, No Caving			
35							
37.5							
40							

LOG OF EXPLORATORY BORING

Job Number: 1925-74
Project:Thatcher Avenue (Thomas Safran & Associates)

Date Performed: 3/1/17-3/2/17

Boring No:4
Boring Location: A/C Parking Lot
3233-3321 S Thatcher Avenue, Los Angeles
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				0-3" Asphalt, 3-6" Base Artificial Fill (Af):Sandy silt	Dark brown	Medium dense	Moist
2.5				Quaternary Alluvium (Qa):			
5	7/9	R		Clayey sandy silt, contains scattered gravel	Orange brown	Dense	Very moist
7.5							
10	8/12	R		Ground Water At 9'bgs Gravelly silty sand	Orange brown	Medium dense	Wet
12.5							
15	9/14	R		Gravelly silty sand	Orange brown	Medium dense	Wet
17.5							
20	20/35	R		Gravelly silty sand and silty sand	Orange brown, gray	Medium dense	Very moist
22.5							
25	25/40	R		Silty sand, sandy silt	Gray, orange brown	Dense	Moist
27.5							
30	28/50 For 6"	R		Gravelly silty sand	Tan, gray	Dense	Very moist
32.5				End 31.5', Artificial Fill To 2', Ground Water At 9', No Caving			
35							
37.5							
40							

LOG OF EXPLORATORY BORING

Job Number: 1925-74
Project:Thatcher Avenue (Thomas Safran & Associates)

Date Performed: 3/1/17-3/2/17

Boring No:5
Boring Location: A/C Parking Lot
3233-3321 S Thatcher Avenue, Los Angeles
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				0-9" Asphalt, No Base Artificial Fill (Af): Gravelly silty sand	Dark brown, black	Medium dense	Moist
2.5				Quaternary Alluvium (Qa):			
5	9/12	R		Silty clay, silty sand, contains scattered gravel	Gray brown, orange brown	Firm, medium dense	Moist
7.5							
10	6/10	R		Ground Water At 9'bgs Gravelly silty sand, silty sand	Orange brown, gray brown	Medium dense	Wet
12.5							
15	16/30	R		Gravelly silt	Orange brown	Medium dense	Wet
17.5							
20	16/25	R		Silty sand, sandy silt	Tan, gray	Medium dense	Very moist
22.5							
25	10/29	R		Silty sand, sandy silt	Tan, gray	Medium dense	Very moist
27.5							
30	25/38	R		Silty sand	Tan, gray	Medium dense	Moist
32.5				End 31.5', Artificial Fill To 2', Ground Water At 9', No Caving			
35							
37.5							
40							

LOG OF EXPLORATORY BORING

Job Number: 1925-74
Project:Thatcher Avenue (Thomas Safran & Associates)

Date Performed: 3/1/17-3/2/17

Boring No:6
Boring Location: A/C Parking Lot
3233-3321 S Thatcher Avenue, Los Angeles
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				0-5" Asphalt, 5-8"Base Artificial Fill (Af) Gravelly silty sand	Dark brown, black	Medium dense	Moist
2.5				Quaternary Alluvium (Qa)			
5	9/12	R		Clayey sandy silt and gravelly silty sand	Gray brown	Medium dense	Moist
7.5							
10	6/10	R		Silty clay, silty sand	Orange brown, dark gray	Medium dense	Moist to very moist
12.5							
15	16/30	R		Gravelly silty sand	Gray brown, orange brown	Medium dense	Very moist
17.5							
20	16/25	R		Sandy silt, silty clay	Gray brown, orange brown	Dense	Moist
22.5							
25	10/29	R		Silty sand	Orange brown, gray brown	Dense	Moist
27.5							
30	25/38	R		Gravelly silty sand	Tan, gray brown	Dense	Woist
32.5				End 31.5', Artificial Fill To 2', Ground Water At 15', No Caving			
35							
37.5							
40							

Feffer Geological Consulting

Figure

APPENDIX 'B'

Laboratory Testing

TRANSMITTAL LETTER

DATE: March 29, 2017

ATTENTION: **Josh Feffer**

TO: Feffer Geological Consulting
1990 S. Bundy Drive, 4th Floor
Los Angeles, CA 90025

SUBJECT: Laboratory Test Data
Thatcher Avenue (TSA)
Your #2392, HDR Lab #17-0205LAB

COMMENTS: Enclosed are the results for the subject project.

James T. Keegan, MD
Laboratory Services Manager

Table 1 - Laboratory Tests on Soil Samples

Feffer Geological Consulting
Thatcher Avenue (TSA)
Your #2392, HDR Lab #17-0205LAB
29-Mar-17

Sample ID			
			B5 @ 4' Fill
Resistivity		**Units**	
as-received		ohm-cm	3,680,000
minimum		ohm-cm	1,880
pH			7.7
Electrical Conductivity		mS/cm	0.15
Chemical Analyses			
Cations			
calcium	Ca^{2+}	mg/kg	20
magnesium	Mg^{2+}	mg/kg	8.1
sodium	Na^{1+}	mg/kg	129
potassium	K^{1+}	mg/kg	7.1
Anions			
carbonate	CO_3^{2-}	mg/kg	14
bicarbonate	HCO_3^{1-}	mg/kg	308
fluoride	F^{1-}	mg/kg	4.7
chloride	Cl^{1-}	mg/kg	4.9
sulfate	SO_4^{2-}	mg/kg	58
phosphate	PO_4^{3-}	mg/kg	5.0
Other Tests			
ammonium	NH_4^{1+}	mg/kg	1.6
nitrate	NO_3^{1-}	mg/kg	6.2
sulfide	S^{2-}	qual	na
Redox		mV	na

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

SOIL LABWORKS LLC

SL17.2392
March 27, 2017

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

Attn: Joshua R. Feffer

Subject: Laboratory Testing

Site: 3233-3321 Thatcher Avenue
Los Angeles, California

Job: FEFFER/THATCHER AVE -1925-74

Laboratory testing for the subject property was performed by Soil Labworks, LLC., under the supervision of the undersigned Engineer. 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

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

JON A. IRVINE
G.E. 2891

Enc: Appendix

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

SOIL LABWORKS LLC

SL17.2392
March 27, 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. 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)
B1	5	Alluvium	114.1	16.6	98
B1	10	Alluvium	119.2	13.9	95
B1	15	Alluvium	124.2	10.6	84
B1	20	Alluvium	97.3	26.9	100
B1	25	Alluvium	94.8	28.6	100
B1	30	Alluvium	101.5	25.9	100
B1	35	Alluvium	103.3	23.8	100
B1	40	Alluvium	104.8	21.2	97
B1	45	Alluvium	90.4	31.0	99
B1	50	Alluvium	100.8	24.9	100
B1	55	Alluvium	100.9	24.8	100
B1	60	Alluvium	97.3	27.1	100

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

Moisture Density (continued)

Test Pit/Boring No.	Sample Depth (Feet)	Soil Type	Dry Density (pcf)	Moisture Content (percent)	Percent Saturation (G_s=2.65)
B2	7½	Fill	99.8	21.4	86
B2	12½	Fill	115.1	15.8	96
B2	17½	Fill	123.2	10.3	80
B2	22½	Alluvium	138.1	6.6	89
B2	27½	Alluvium	109.3	21.3	100
B2	30	Alluvium	122.3	12.0	90
B2	32½	Alluvium	107.0	19.7	96
B2	37½	Alluvium	121.4	13.3	97
B2	42½	Alluvium	95.2	28.8	100
B2	27½	Alluvium	104.5	19.9	91
B2	57½	Alluvium	122.9	13.4	100
B3	5	Fill	93.8	8.5	30
B3	10	Fill	104.7	20.0	91
B3	25	Alluvium	122.3	13.8	77
B3	30	Alluvium	110.7	19.0	100
B4	5	Alluvium	108.3	17.1	86
B4	10	Alluvium	113.9	10.6	62
B4	15	Alluvium	118.6	15.3	100
B4	20	Alluvium	110.1	17.5	96
B4	25	Alluvium	104.2	23.5	100
B4	30	Alluvium	123.8	10.6	84
B5	5	Alluvium	110.0	12.2	64
B5	10	Alluvium	104.4	20.6	94
B5	15	Alluvium	127.2	10.3	91
B5	20	Alluvium	100.3	24.1	99
B5	25	Alluvium	95.9	27.9	100
B6	5	Alluvium	117.1	4.4	28
B6	10	Alluvium	110.9	17.7	95
B6	15	Alluvium	125.7	9.0	76
B6	20	Alluvium	96.5	26.6	99
B6	25	Alluvium	105.7	22.2	100
B6	30	Alluvium	119.5	13.5	93

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 was estimated from the compaction curves.

Test Pit/Boring No.	Sample Depth (Feet)	Soil Type	Maximum Dry Density (pcf)	Optimum Moisture Content (Percent)
B5	4	Fill	124.5	9.5

Shear Strength

The peak and ultimate shear strengths of the 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. 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)
B6	5	117.1	20.1
B1	10	119.2	16.9

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.

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
B1	25	Alluvium	56	23	33

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 D1140-14. 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.

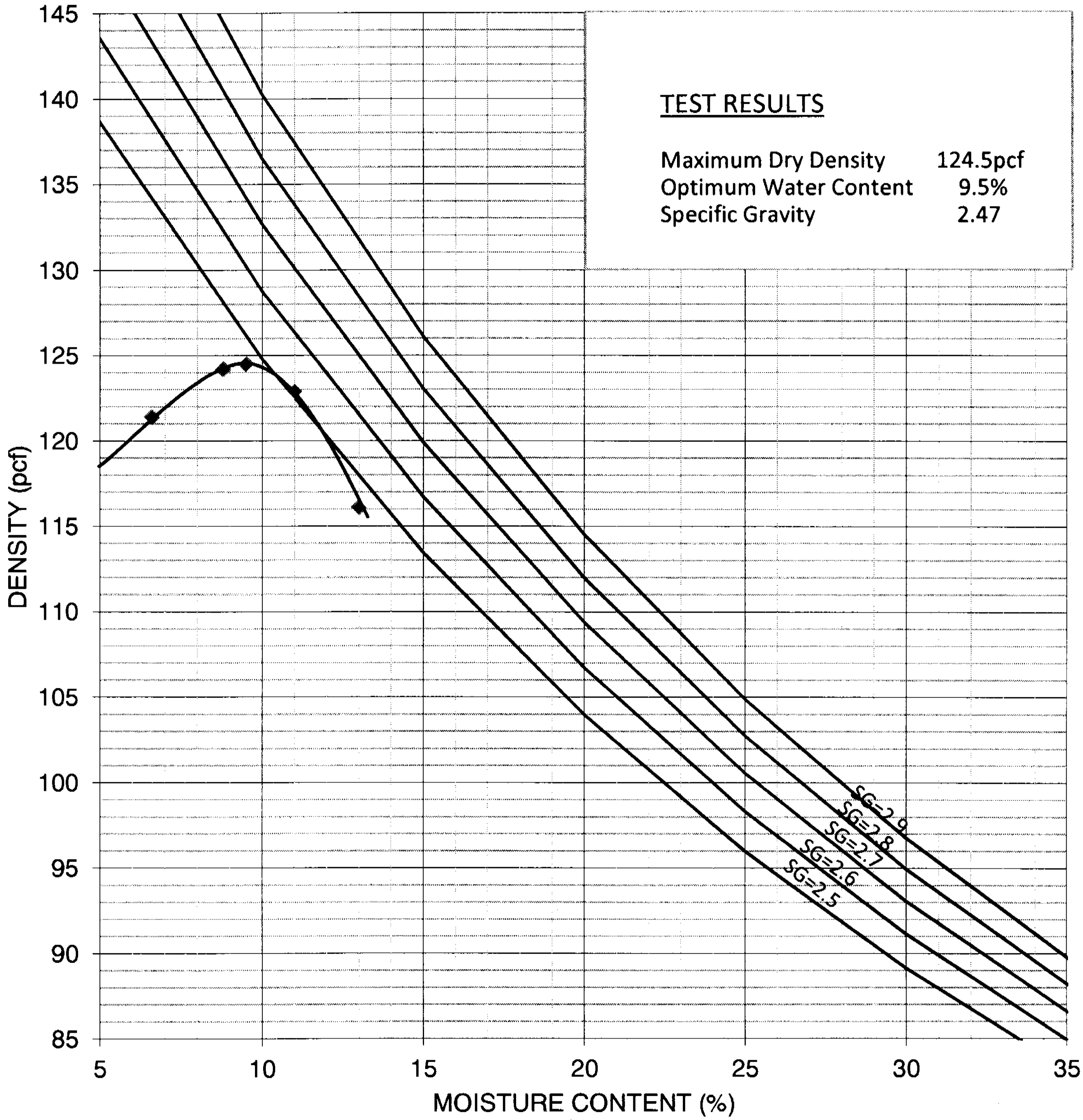
Boring No	Depth	Soil Type	(%) Passing 200 Sieve
B1	7½	Alluvium	17.5
B2	15	Alluvium	40.7
B2	35	Alluvium	7.1
B1	40	Alluvium	15.3

SOIL LABWORKS LLC

MOISTURE-DENSITY RELATIONSHIP A-1

JN: **SL17.2392** CONSULTANT: **JAI**
CLIENT: **Feffer/3233-3321 Thatcher Avenue**
B5 @ 4'
EARTH MATERIAL: **FILL**

NOTE: ASTM Test Method D-1557-12



TEST RESULTS

Maximum Dry Density	124.5pcf
Optimum Water Content	9.5%
Specific Gravity	2.47

SHEAR DIAGRAM B-1

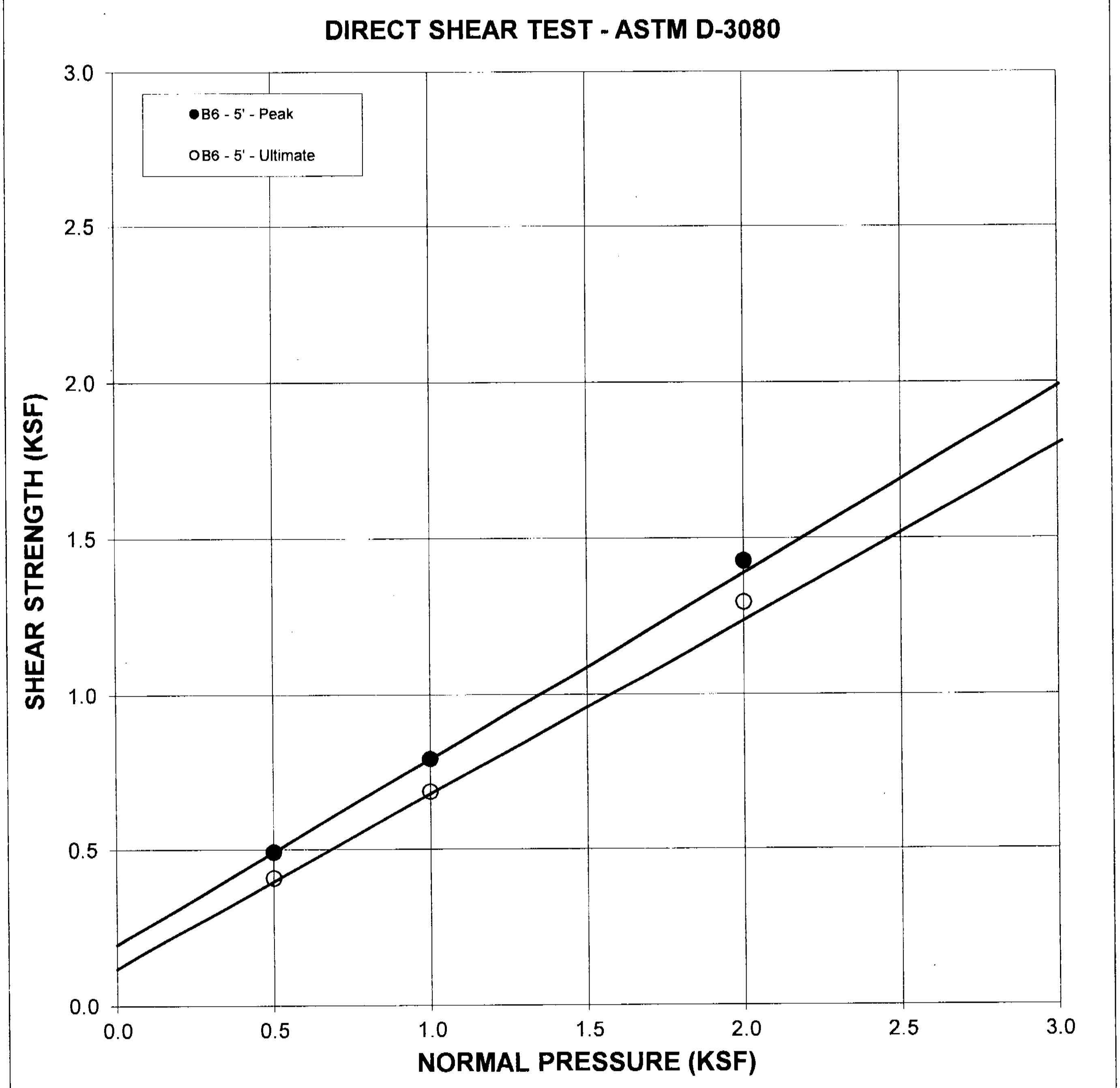
SOIL LABWORKS LLC

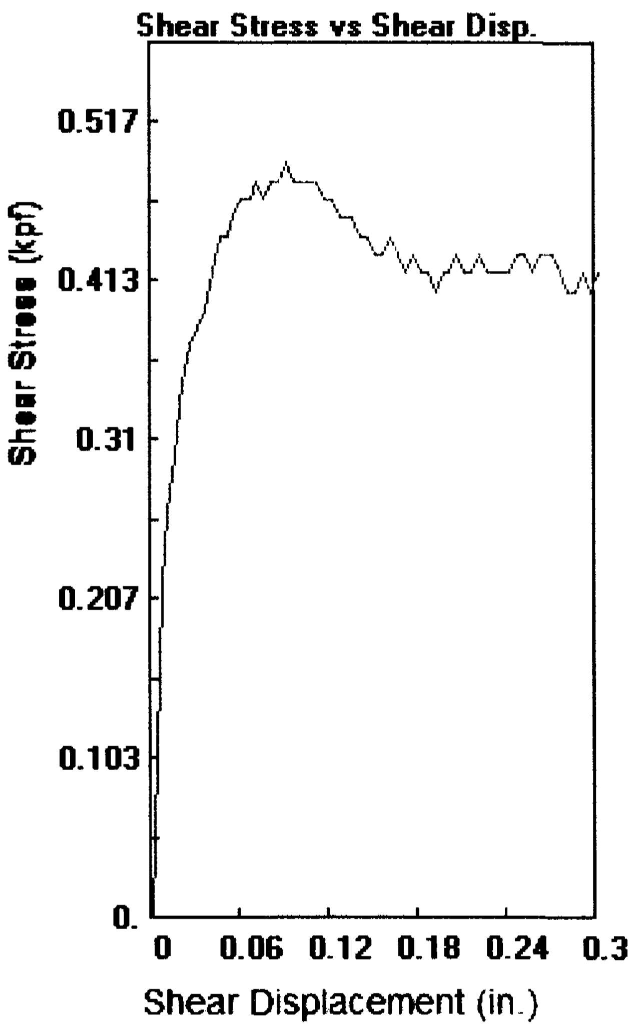
JN: **SL17.2392** CONSULTANT **JAI**
CLIENT: **Feffer/3233-3321 Thatcher Avenue**

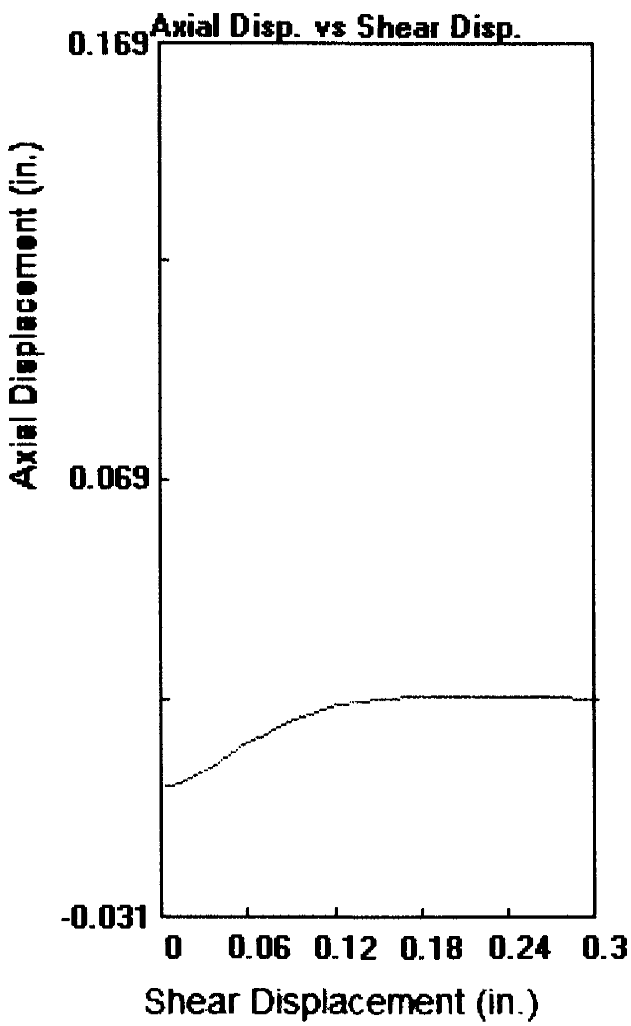
EARTH MATERIAL: **ALLLUVIUM**

	PEAK	ULTIMATE	
Phi Angle	30.5	28	degrees
Cohesion	190	135	psf

Average Moisture Content	20.1%
Average Dry Density (pcf)	117.1
Percent Saturation	100.0%







Parameters

Client: FEFFER/THATCHER

Location: 3233-3321 S THATCHER AVE

Job # 2392

Sample: 1

Boring: B6

Depth: 5 ft.

File: 2392B655.dat

Stress at Max Def
492 0.091

Soil Type:QA

Technician: BF

Axial Load: 500 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 408

Maximum Load

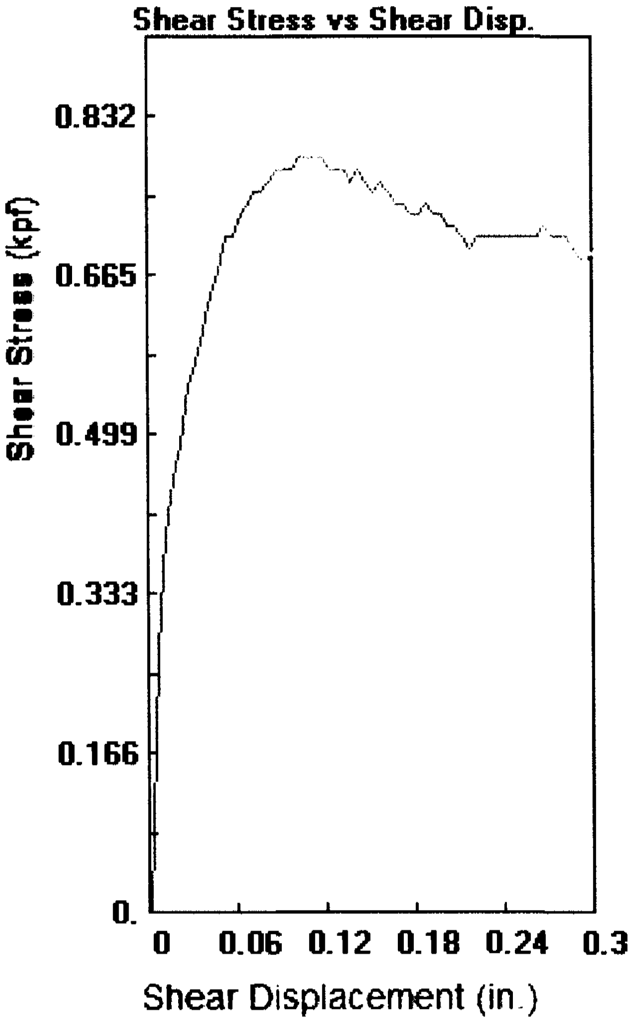
492 psf

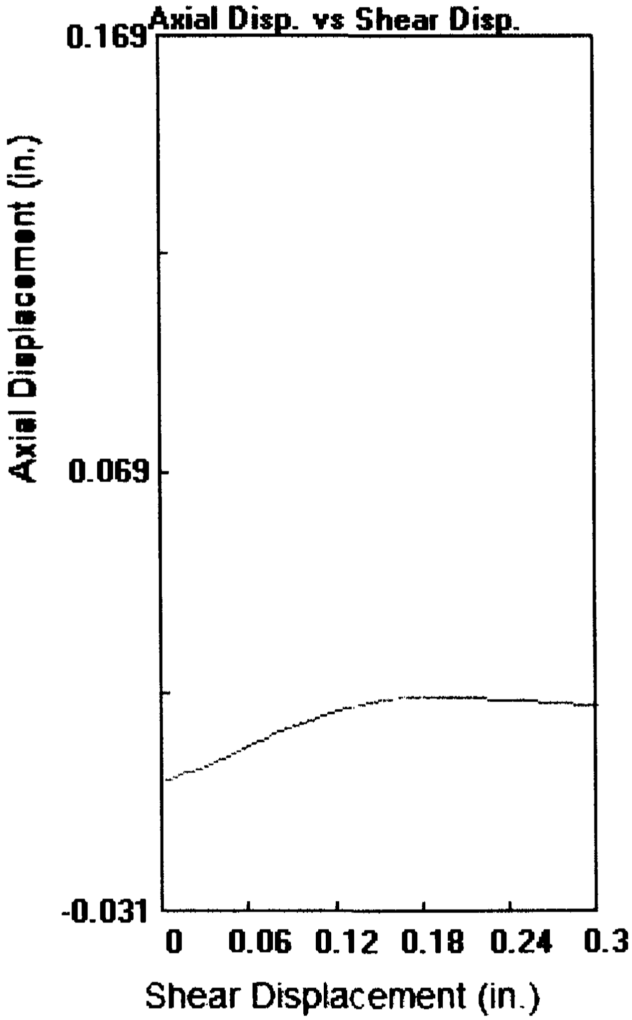
Shear Displacement at maximum Load

0.0906 in.

Date
3/22/2017

Soil Labworks





Parameters

Client: FEFFER/THATCHER

Location: 3233-3321 S THATCHER AVE

Job # 2392

Sample: 2

Boring: B6

Depth: 5 ft.

File: 2392B651.dat

Stress at Max Def
792 0.101

Soil Type:QA

Technician: BF

Axial Load: 500 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 684

Maximum Load

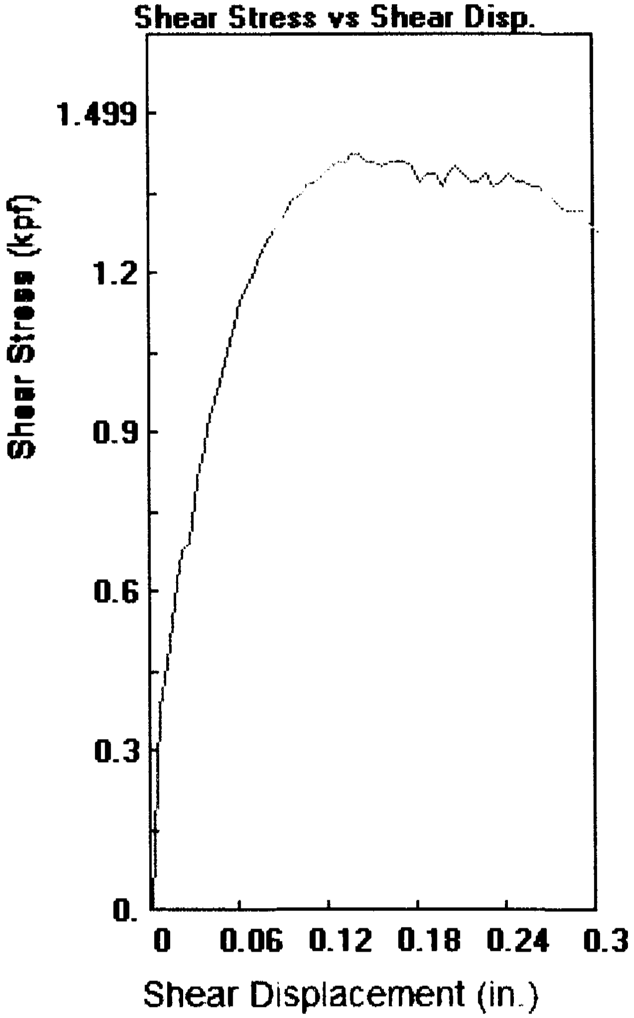
792 psf

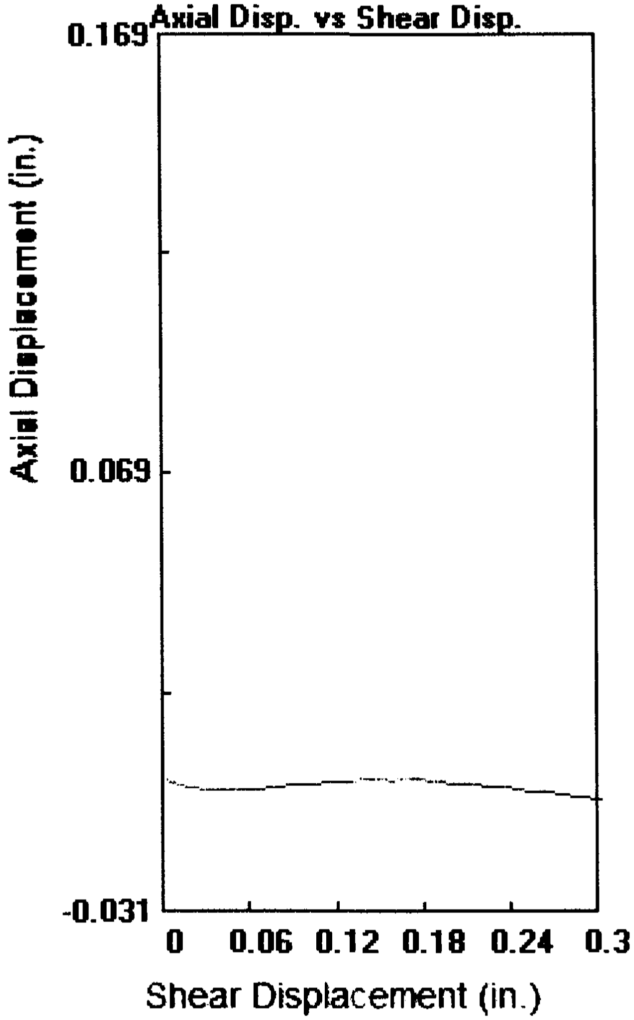
Shear Displacement at maximum Load

0.1005 in.

Date
3/22/2017

Soil Labworks





Parameters

Client: FEFFER/THATCHER

Location: 3233-3321 S THATCHER AVE

Job # 2392

Sample: 3

Boring: B6

Depth: 5 ft.

File: 2392B652.dat

Stress at Max Def
1428 0.136

Soil Type:QA

Technician: BF

Axial Load: 2000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 1296

Maximum Load

1428 psf

Shear Displacement at maximum Load

0.1357 in.

Date
3/22/2017

Soil Labworks

SOIL LABWORKS LLC

SHEAR DIAGRAM B-2

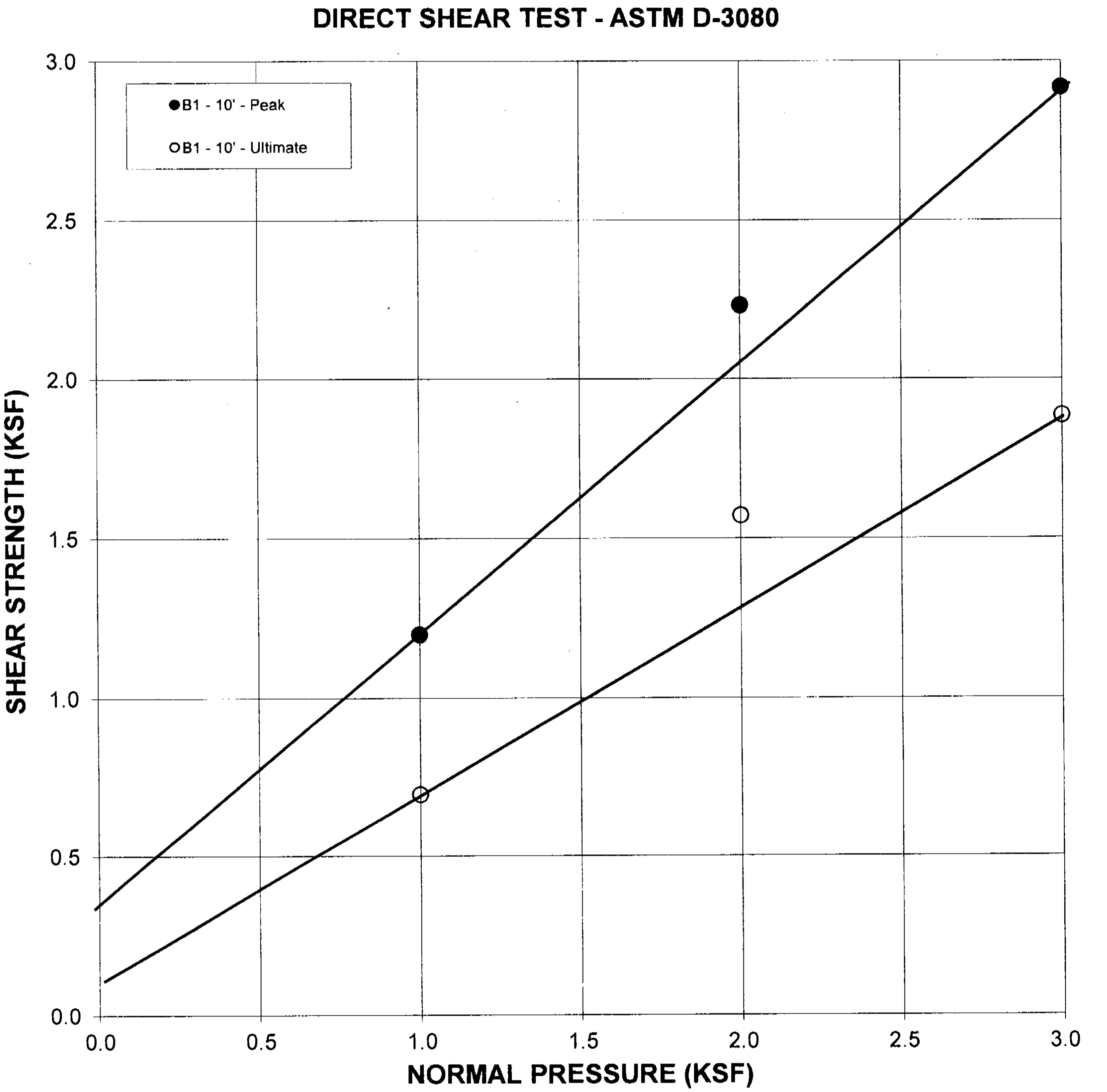
JN: SL17.2392 CONSULTANT JAI

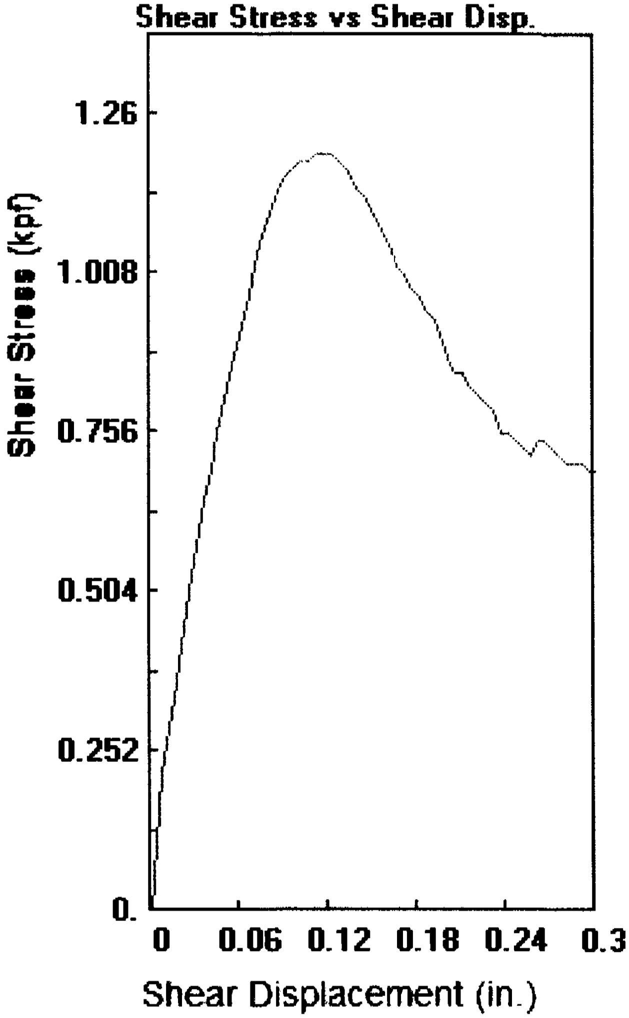
CLIENT: Feffer/3233-3321 Thatcher Avenue

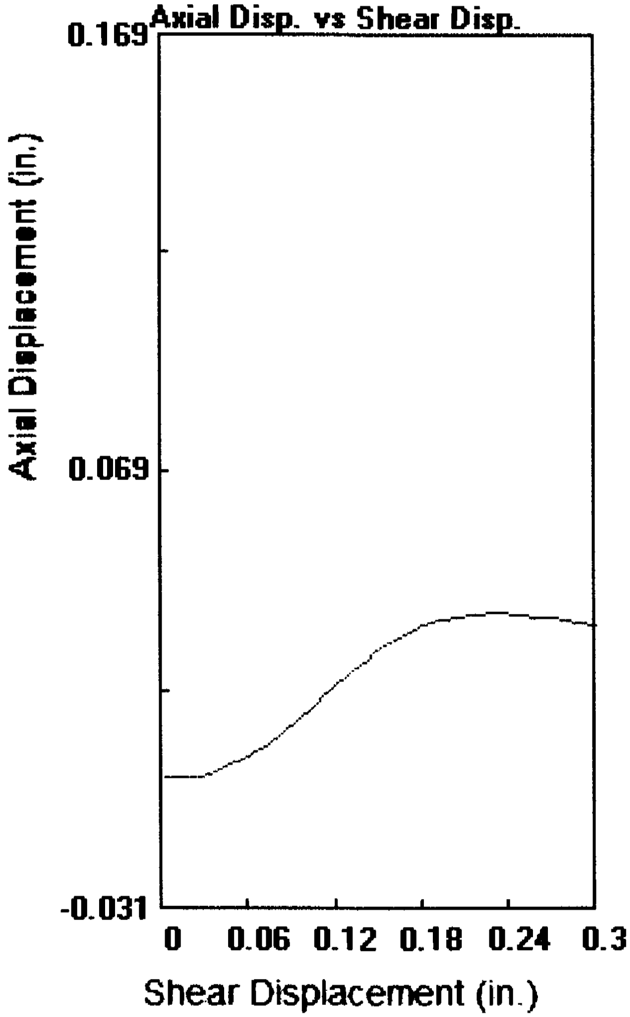
EARTH MATERIAL: ALLLUVIUM

	PEAK	ULTIMATE	
Phi Angle	40	30	degrees
Cohesion	340	195	psf

Average Moisture Content	16.9%
Average Dry Density (pcf)	119.2
Percent Saturation	100.0%







Parameters

Client: FEFFER/THATCHER

Location: 3233-3321 S THATCHER AVE

Job # 2392

Sample: 1

Boring: B1

Depth: 10 ft.

File: 2392B1101.dat

Stress at Max Def
1200 0.111

Soil Type:QA

Technician: BF

Axial Load: 1000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 696

Maximum Load

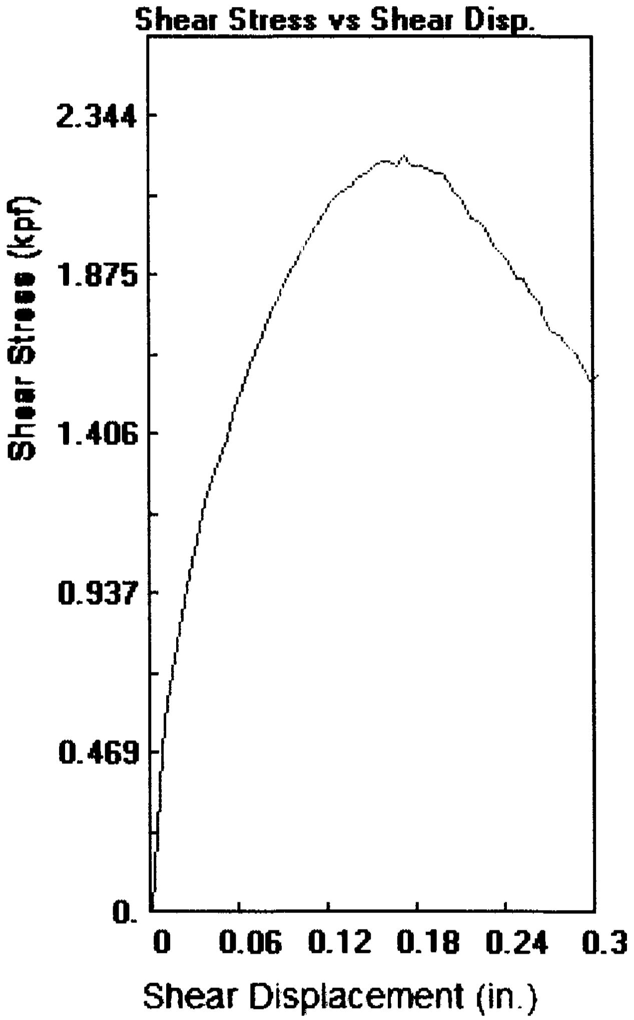
1200 psf

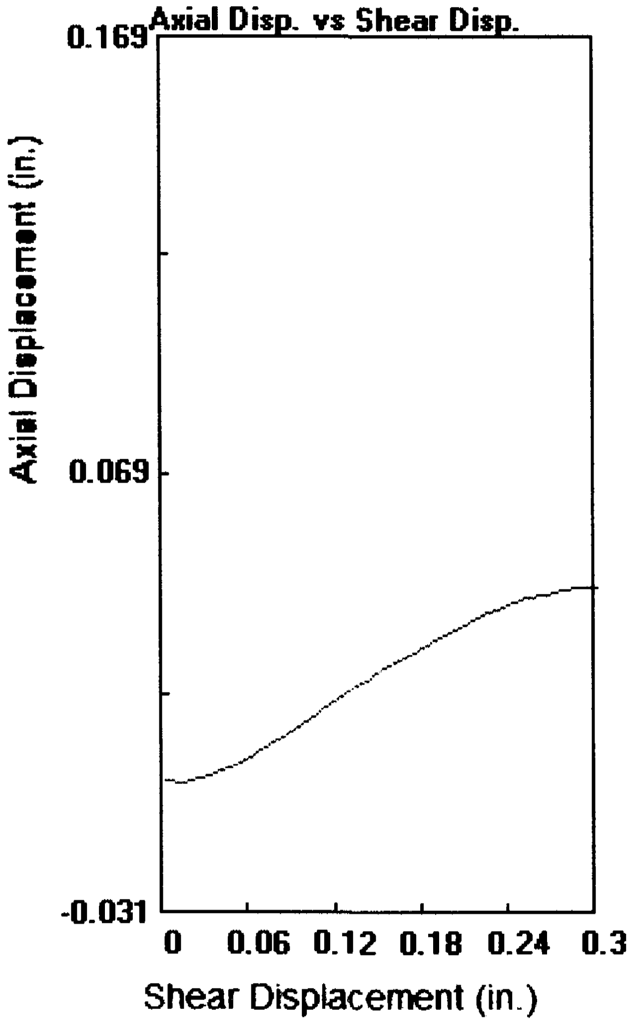
Shear Displacement at maximum Load

0.1105 in.

Date
3/22/2017

Soil Labworks





Parameters

Client: FEFFER/THATCHER

Location: 3233-3321 S THATCHER AVE

Job # 2392

Sample: 2

Boring: B1

Depth: 10 ft.

File: 2392B1102.dat

Stress at Max Def
2232 0.171

Soil Type:QA

Technician: BF

Axial Load: 2000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 1572

Maximum Load

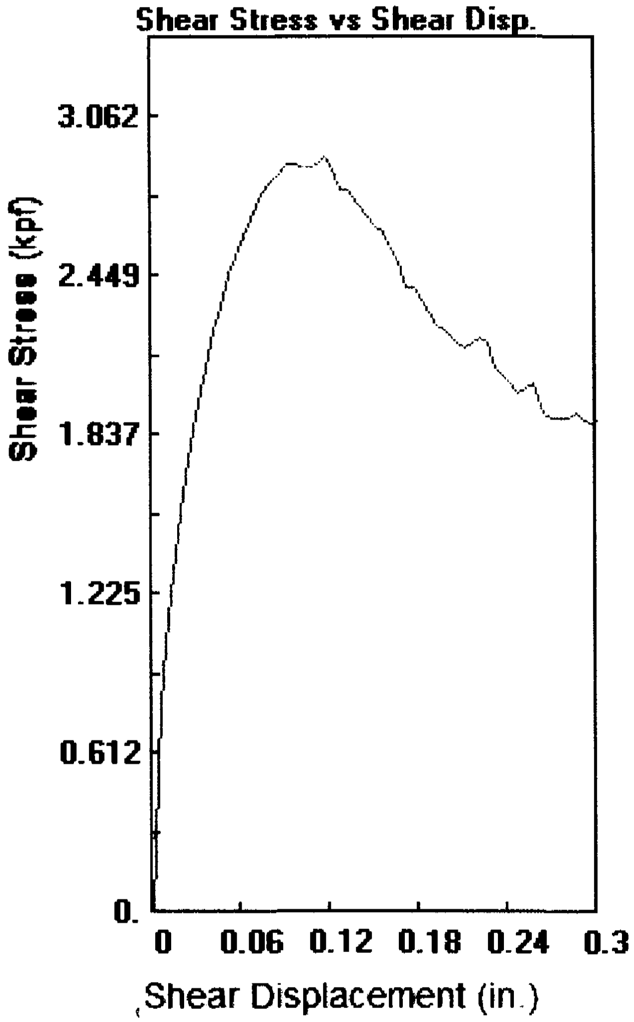
2232 psf

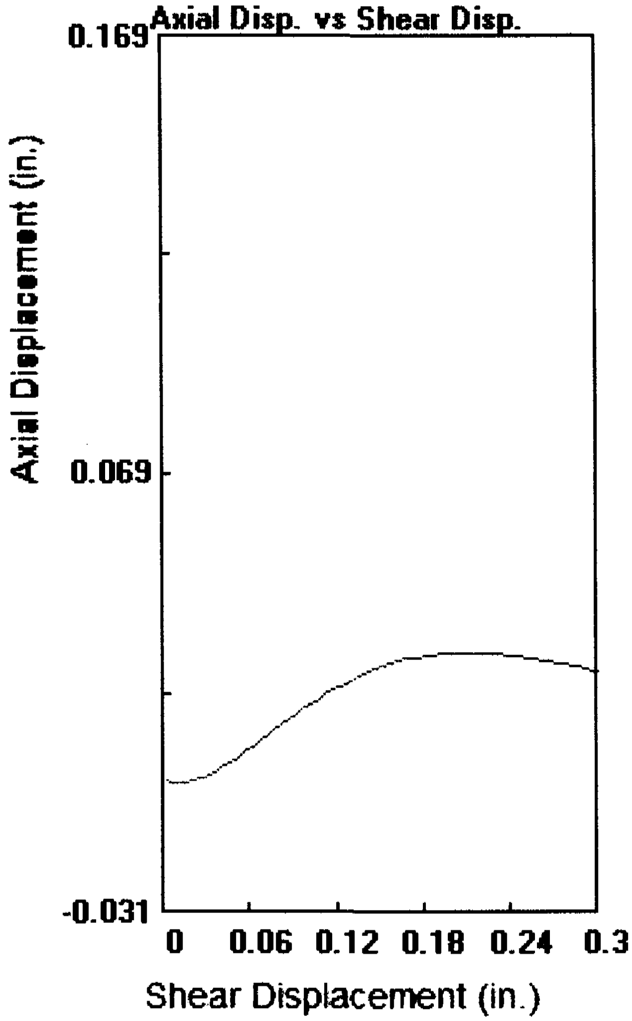
Shear Displacement at maximum Load

0.1708 in.

Date
3/22/2017

Soil Labworks





Parameters

Client: FEFFER/THATCHER

Location: 3233-3321 S THATCHER AVE

Job # 2392

Sample: 3

Boring: B1

Depth: 10 ft.

File: 2392B1103.dat

Stress at Max Def
2916 0.116

Soil Type:QA

Technician: BF

Axial Load: 3000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 1884

Maximum Load

2916 psf

Shear Displacement at maximum Load

0.1157 in.

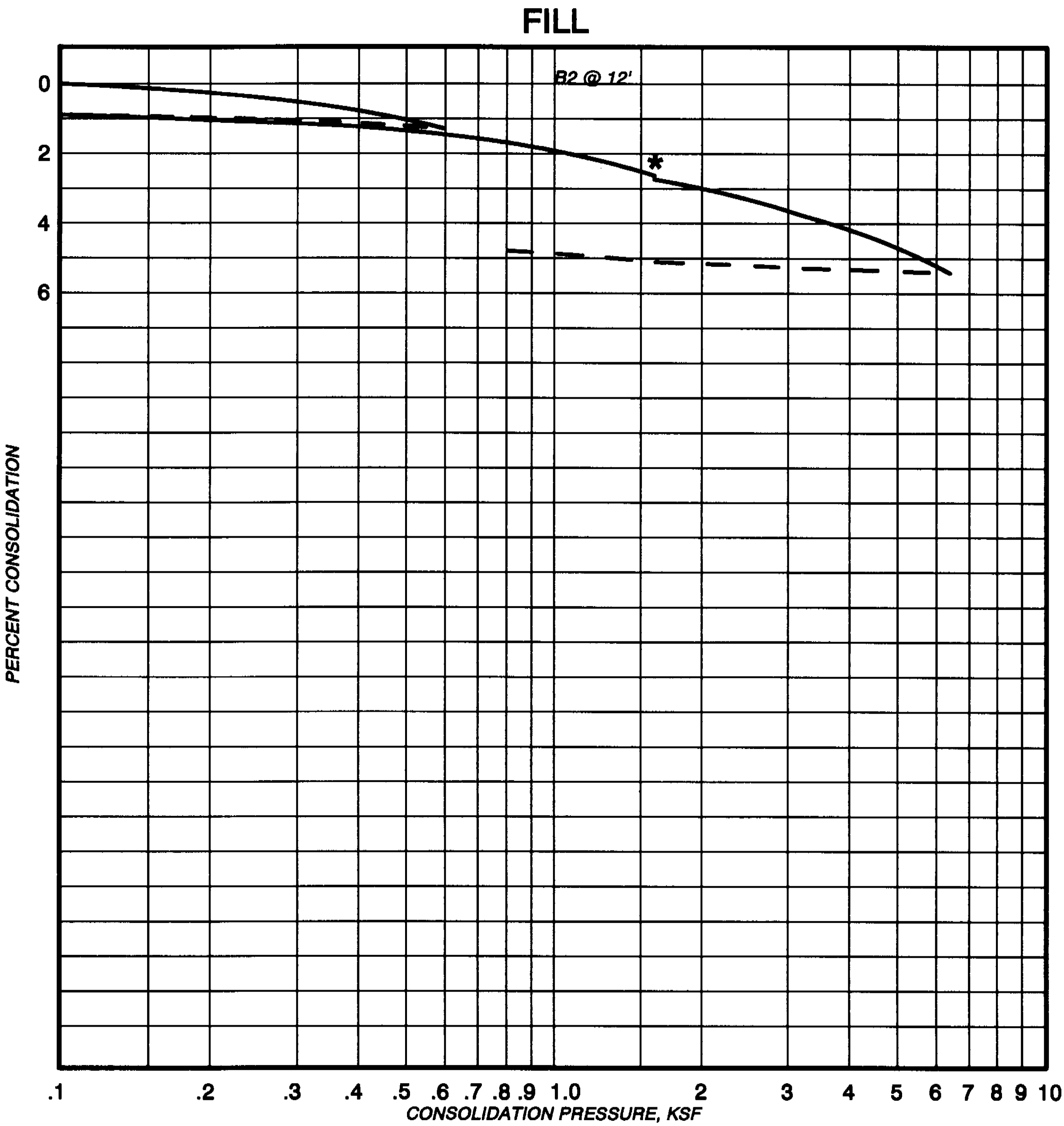
Date
3/22/2017

Soil Labworks

CONSOLIDATION TEST

PROJECT: 2392 FEFFER/3233-3321 S THATCHER AVENUE

SAMPLE: B2 @ 12'



* Water Added

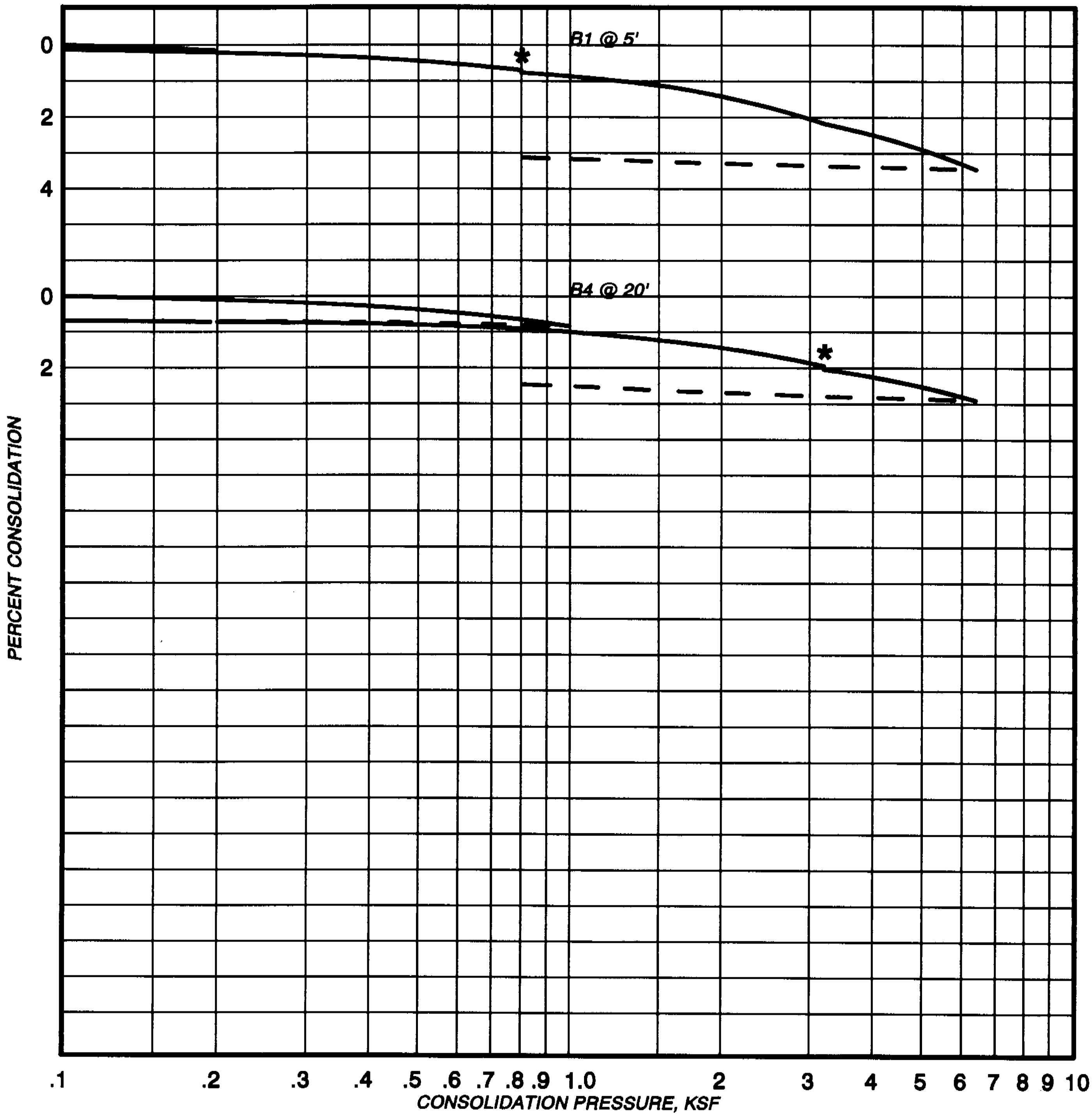
PLATE:

CONSOLIDATION TEST

PROJECT: 2392 FEFFER/3233-3321 S THATCHER AVENUE

SAMPLES: B1 @ 5'; B4 @ 20'

ALLUVIUM



✱ Water Added

PLATE:

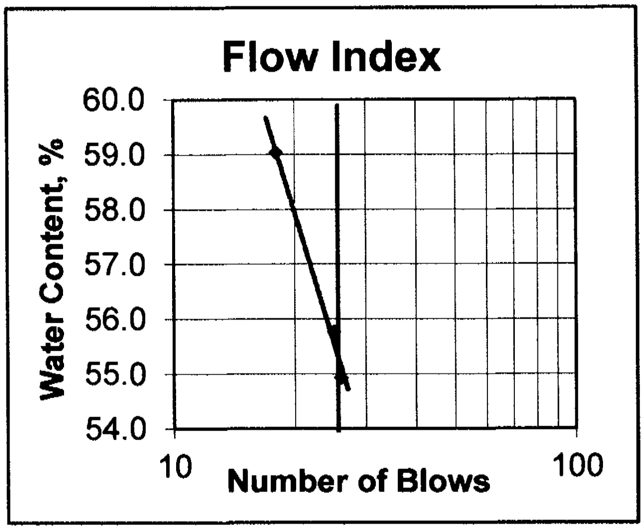
File No.: SL17.2392 April 6, 2017

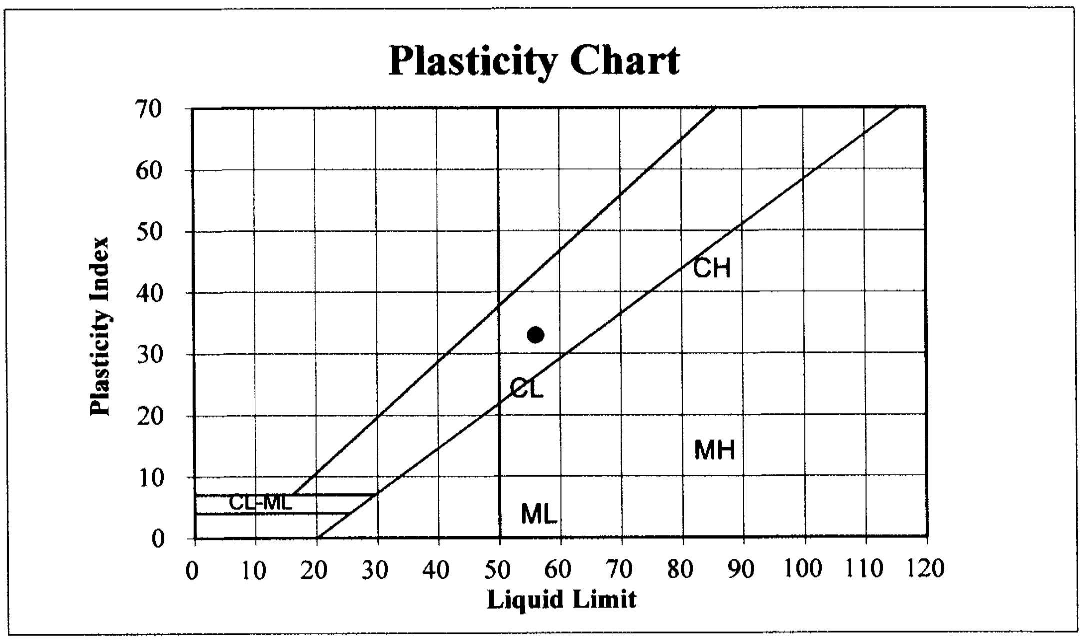
PLASTICITY INDEX

ASTM D-4318

Job Name: Feffer/3233-3321 Thatcher Ave
Sample ID: B1 @ 25
Soil Description: CL

DATA SUMMARY				TEST RESULTS	
Number of Blows:	18	25	26	**LIQUID LIMIT**	**56**
Water Content, %	59.0	55.8	54.9	**PLASTIC LIMIT**	**23**
Plastic Limit:	23.0	23.5		**PLASTICITY INDEX**	**33**





APPENDIX ‘C’

Site Plan
&
Cross Sections

A.L.T.A. / N.S.P.S.
LAND TITLE SURVEY

LEGAL DESCRIPTION:

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

THAT PORTION OF THE 14 ACRE TRACT OF LAND IN THE RANCHO LA BALLONA, IN THE CITY OF LOS ANGELES, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, ALLOTTED TO ANDRES MACHADO BY THE FINAL DECREE OF PARTITION HAD IN CASE NO. 2000 OF THE DISTRICT COURT OF SAID COUNTY, LYING SOUTHEASTERLY OF TRACT NO. 9096, AS PER MAP RECORDED IN BOOK 120 PAGES 21 TO 23 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

EXCEPT THEREFROM THAT PORTION THEREOF CONVEYED TO THE CITY OF VENICE, BY DEED RECORDED IN BOOK 6048 PAGE 255 OF DEEDS.

ALSO EXCEPT THEREFROM THAT PORTION THEREOF LYING SOUTHERLY OF THE NORTHERLY LINE OF TRACT NO. 51374, IN SAID CITY, COUNTY AND STATE, AS PER MAP RECORDED IN BOOK 1215 PAGES 84 THROUGH 86 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

ASSESSOR'S PARCEL NUMBERS: 4229-002-901 & 4229-002-900

SURVEYOR'S NOTES:

1. DATE OF SURVEY: MARCH 2017
2. THIS SURVEY WAS PERFORMED IN ACCORDANCE WITH THE PRELIMINARY REPORT PREPARED BY COMMONWEALTH LAND TITLE COMPANY, FILE NO. 09192286-919-KRC-KRE, DATED DECEMBER 13, 2016.

   EASEMENTS PER SAID TITLE REPORT:

   ITEM 2

   PURPOSE: PUBLIC STREET
   RECORDING DATE: FEBRUARY 23, 1999
   RECORDING NO: 99-293589, OF OFFICIAL RECORDS
   AFFECTS: THAT PORTION OF SAID LAND AS DESCRIBED IN THE DOCUMENT ATTACHED HERETO.

   NOTE: ORDINANCE 124541, STREET DEDICATION FOR THATCHER AVENUE, WAS OMITTED FROM ABOVE SAID TITLE REPORT.
3. PROJECT ADDRESS:
   3233 THATCHER AVE., MARINA DEL REY, CA 90292
4. SITE AREA: 115,759.83 SQ. FT., 2.6575 ACRES (GROSS)
   93,278.13 SQ. FT., 2.2.1414 ACRES (AFTER STREET DEDICATIONS)
5. BENCHMARK:
   B.M. NO.: 17-08578
   SPK W CURB THATCHER AVE, 1FT S/O BCR S/O WASHINGTON ST, 2FT N/O CB
   ELEV.= 11.982 (2000 ADJ.) (NAVD 1988)
6. UTILITY INFORMATION SHOWN HEREON IS PER RECORD DATA AND IS ONLY AS ACCURATE AS SAID DATA.
7. BASED ON THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, FEDERAL INSURANCE ADMINISTRATION FLOOD HAZARD BOUNDARY MAP, COMMUNITY NUMBER 060137, SHEET NUMBER 06037C1752F REVISED SEPTEMBER 26, 2008. THE SUBJECT PROPERTY IS LOCATED IN ZONE X, WHICH IS NOT LOCATED IN A DESIGNATED FLOOD ZONE AREA.
8. THERE IS NO EVIDENCE OF RECENT STREET AND SIDEWALK CONSTRUCTION OR REPAIRS.
9. THERE IS NO EVIDENCE OF RECENT ONSITE CONSTRUCTION
10. THERE ARE NO WETLANDS AS DEFINED BY APPROPRIATE AUTHORITIES.
11. THERE ARE NO CEMETERIES WITHIN 100 FEET OF THE PROPERTY.

CERTIFICATION:

TO:
THOMAS SAFRAN & ASSOCIATES, THE CITY OF LOS ANGELES, A MUNICIPAL CORP., AND COMMONWEALTH LAND TITLE COMPANY:

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA AND NSPS, LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS. THE FIELD WORK WAS COMPLETED ON MARCH 15, 2017.

CHRISTOPHER CHAN, R.C.E. 30282 — 4/3/17 DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER C. CHAN 30282 EXP. DATE 3-31-18 CIVIL STATE OF CALIFORNIA

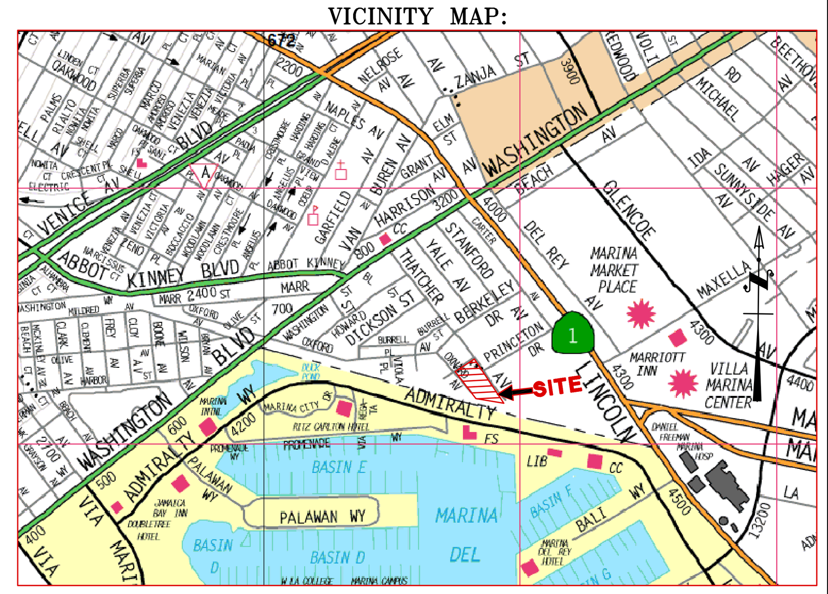
ENCROACHMENT NOTES

1	GUY ANCHOR 3.3' OVER ORD W'LY	12	FENCE 0.07' OVER P/L E'LY
2	GUY ANCHOR 0.1' OVER ORD W'LY	13	BLDG. 5.49' CLEAR OF P/L W'LY
3	STREET LIGHT ON P/L	14	W.F. CROSSES P/L
4	SLPB 0.24' OVER P/L N'LY	15	BLDG. 4.99' CLEAR OF P/L W'LY
5	SLPB 0.79' OVER P/L N'LY	16	W.F. 0.06' CLEAR OF P/L W'LY
6	PILLAR 0.71' OVER P/L N'LY	17	WALL 0.10' CLEAR OF P/L E'LY
7	GATE MOTOR 0.2' OVER P/L N'LY	18	WALL 0.06' CLEAR OF P/L E'LY
8	WALL 0.73' MAX. OVER P/L N'LY	19	GUY ANCHOR 2.3' OVER ORD S'LY
9	TREE 0.1' OVER P/L E'LY	20	GUY ANCHOR 1.6' OVER URD S'LY
10	TREE 0.3' OVER P/L E'LY	21	CURB 0.5' (MAX.) OVER ORD S'LY
11	TREE 1.0' OVER P/L E'LY	22	CONC. WALK, HANDICAP RAMP AND STREET IMPROVEMENTS CONSTRUCTED ON P.I.Q.

FEFFER GEOLOGICAL CONSULTING	SITE MAP
JB: 1925-74	NAME: THATCHER AVENUE BY:YMH
DATE: 5/18/17 SCALE: 1"=30'	3233-3321 S SITE: THATCHER AVE
REF:	BASE MAP FROM SURVEY

LEGEND
B-6 LOCATION OF BORING FEFFER GEOLOGICAL
A A' SECTION LINE

VICINITY MAP:



ABBREVIATION LEGEND:

A.C. = ASPHALT CONCRETE	E/O = EAST OF	N'LY = NORTHERLY	S.S. = STREET SIGN
A.L. = AREA LIGHT	ESTAB. = ESTABLISHED	N/O = NORTH OF	S/O = SOUTH OF
BLDG. = BUILDING	F.H. = FIRE HYDRANT	O.H. = OVER HEAD	TC = TOP OF CURB
BW = BACK OF WALK	FL = FLOW LINE	ORD = ORDINANCE	TR = TREE
C.B.W. = CONCRETE BLOCK WALL	FS = FINISHED SURFACE	P.B. = PULL BOX	TSPB = TRAFFIC SIGNAL PULL BOX
C.D. = CURB DRAIN	G.A. = GUY ANCHOR	P.P. = POWER POLE	U.U. = UNKNOWN UTILITY
℄ = CENTERLINE	G.M. = GAS METER	S = SOUTH	W = WEST
C/L = CENTERLINE	G.V. = GAS VALVE	S.C.O. = SEWER CLEAN OUT	W.I.F. = WROUGHT IRON FENCE
C.L.F. = CHAIN LINK FENCE	H.C.R. = HANDICAPPED RAMP	S.D.M.H. = STORM DRAIN MANHOLE	W.F. = WOOD FENCE
CONC. = CONCRETE	M.B. = MAP BOOK	S.L. = STREET LIGHT	W'LY = WESTERLY
E = EAST	M.H. = MANHOLE	SLPB = STREET LIGHT PULL BOX	W.M. = WATER METER
E'LY = EASTERLY	M.W. = MONITORING WELL	S'LY = SOUTHERLY	W/O = WEST OF
ELECT. = ELECTRIC	N = NORTH	S.M.H. = SEWER MANHOLE	W.V. = WATER VALVE

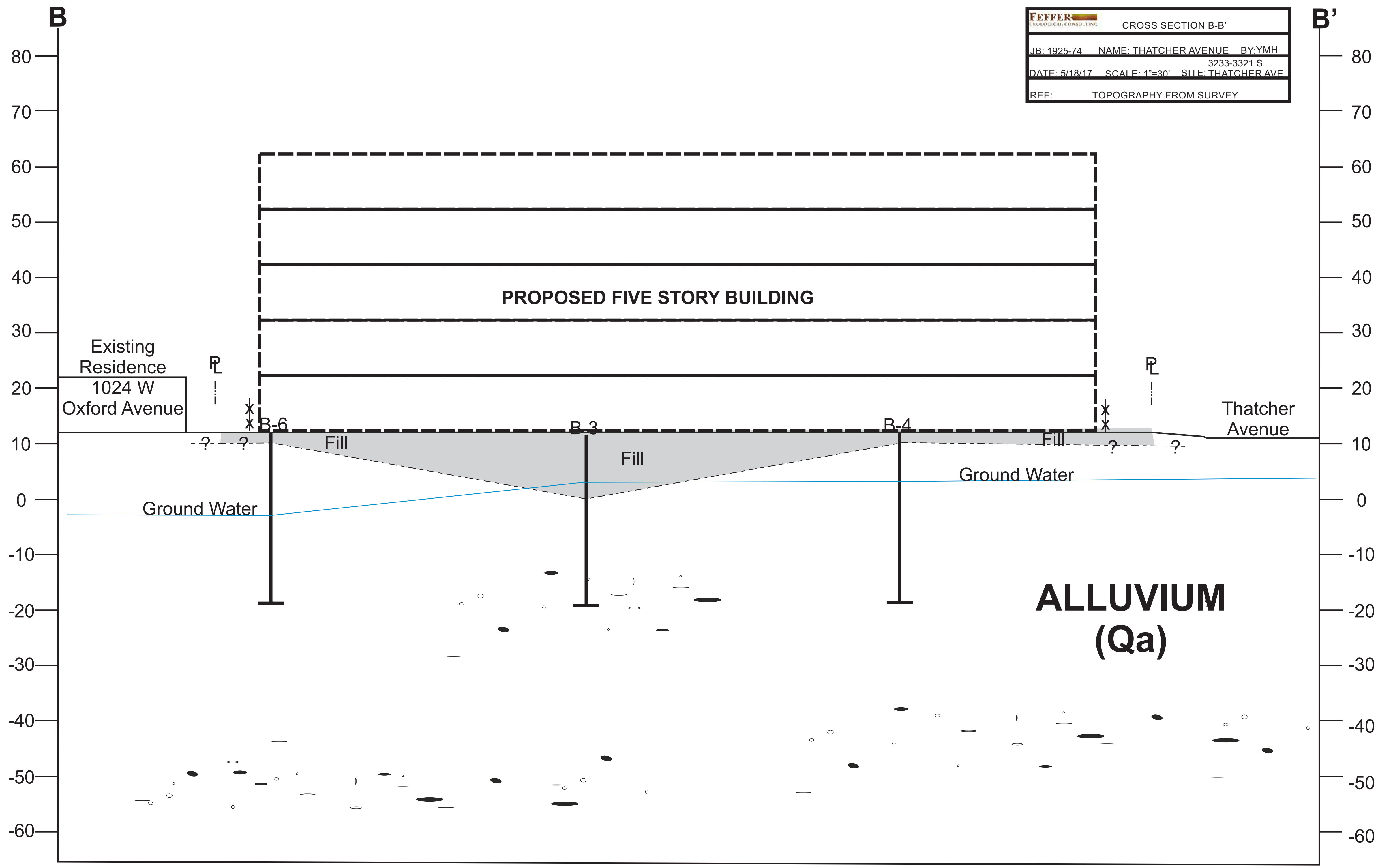
FINE LINE SYSTEMS
CONSULTING CIVIL ENGINEERS
1443 WEST BEVERLY BLVD., MONTEBELLO, CA 90640 (323) 726-3388

SHEET TITLE : A.L.T.A. / N.S.P.S. LAND TITLE SURVEY

PREPARED EXCLUSIVELY FOR : THOMAS SAFRAN AND ASSOCIATES & THE CITY OF LOS ANGELES

JOB NO. : 1618	
DATE : APRIL 2017	
SCALE : 1" = 20'	
DESIGNED BY : CCC	
DRAWN BY : BG & JG	
SHEET 1 OF 1	

A
A'
FEFFER
GEOLOGICAL CONSULTING
CROSS SECTION A-A'
JB: 1925-74 NAME: THATCHER AVENUE BY:YMH
DATE: 5/18/17 SCALE: 1"=30' SITE: 3233-3321 S THATCHER AVE
REF: TOPOGRAPHY FROM SURVEY
PROPOSED FIVE STORY BUILDING
Princeton Drive
Harbor Crossing Lane
Fill
Ground Water
B-1
B-5
B-6
B-4
B-3
B-2
ALLUVIUM
(Qa)
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60


FEFFER GEOLOGICAL CONSULTING
CROSS SECTION B-B'
JB: 1925-74
NAME: THATCHER AVENUE
BY:YMH
DATE: 5/18/17
SCALE: 1"=30'
SITE: 3233-3321 S THATCHER AVE
REF: TOPOGRAPHY FROM SURVEY
B
B'
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
PROPOSED FIVE STORY BUILDING
Existing Residence
1024 W Oxford Avenue
PL
Thatcher Avenue
B-6
B-3
B-4
Fill
Ground Water
ALLUVIUM
(Qa)

APPENDIX 'D'

Grading Specifications

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

THATCHER YARD:

ADDRESS:	3233-3311-3321 THACHER AVE.
APN NUMBER:	4229002901
PROJECT TYPE:	MIXED INCOME- MARKET RATE AND AFFORDABLE HOUSING, PODIUM
TYPE OF CONSTRUCTION:	2 / 4 STORY TYPE V OVER 1 STORY TYPE I AT GRADE PODIUM
CURRENT ZONE:	QPF-1XL
PROPOSED ZONE BASED:	R3
LOT AREA:	93,470 SF
ALLOWABLE AREA PER DU:	800 SF
ALLOWABLE NUMBER OF DU:	117 DU
ALLOWABLE W/DENSITY BONUS:	158 DU
PROPOSED NUMBER OF DU:	152 DU (61-40% AFFORDABLE AND 91-60% MARKET RATE) 102 1 BEDROOM (67%) 50 2 BEDROOM FLATS (33%)
MAXIMUM ALLOWABLE HEIGHT:	45'+1 STORY (10')=55'
PROPOSED HEIGHT:	55'

FRONT SETBACK: REQUIRED:15' PROPOSED:15'
REAR SETBACK: REQUIRED:15' PROPOSED:15'
SIDE SETBACK: REQUIRED:7' PROPOSED:7'

PARKING REQUIRED-MARKET RATE 153 SPACES REQUIRED
(92 ONE BDR-60 TWO BDR): 1.5 SPACE 1 BDR 2.0 SPACE / 2 BDR 1.59 CAR/DU
PARKING REQUIRED-AFFORDABLE: 61 SPACES
(61 UNITS): 1 SPACE / DU
TOTAL PARKING REQUIRED : 214 SPACES

PARKING PROVIDED (1.34 CAR /DU) : 228 SPACES (175 STANDARD+53 TANDEM)

OPEN SPACE REQUIRED:125 SF FOR 1 BDR, 175 SF FOR 2 BDR (102X125)+(50X175)=21,500 SF REQUIRED
OPEN SPACE PROVIDED:29,601 SF AT PODIUM
OPEN SPACE AT GRADE: 7,209 SF
TOTAL OPEN SPACE PROVIDED: 36,810 SF

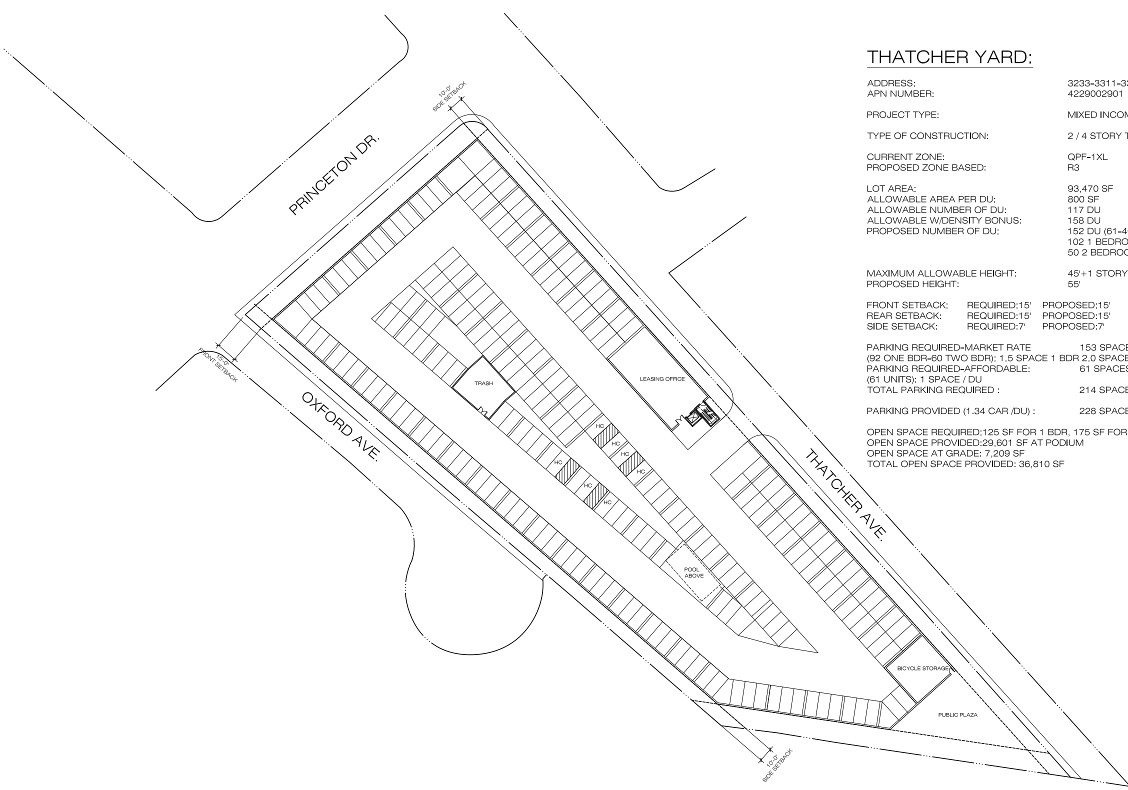
ILLUSTRATIVE SITE PLAN - INITIAL CONCEPT

THATCHER YARD

THOMAS SAFRAN & ASSOCIATES | 11812 SAN VINCENTE BLVD., SUITE 600 | LOS ANGELES CA 90049-5063 | P.310.420.4888 F.310.207.6986

scale: 1" = 30'-0"
0 30 60 90 120

WITHEE MALCOLM ARCHITECTS
2251 west 190th street torrance || ca 90504 | 310.217.8885 | witheemalcolm.com
Job No. 86070
Date.09.15.2016



THATCHER YARD:

ADDRESS: 3233-3311-3321 THACHER AVE.
APN NUMBER: 4229002901
PROJECT TYPE: MIXED INCOME- MARKET RATE AND AFFORDABLE HOUSING, PODIUM
TYPE OF CONSTRUCTION: 2 / 4 STORY TYPE V OVER 1 STORY TYPE I AT GRADE PODIUM
CURRENT ZONE: QPF-1XL
PROPOSED ZONE BASED: R3
LOT AREA: 93,470 SF
ALLOWABLE AREA PER DU: 800 SF
ALLOWABLE NUMBER OF DU: 117 DU
ALLOWABLE W/DENSITY BONUS: 158 DU
PROPOSED NUMBER OF DU: 152 DU (61-40% AFFORDABLE AND 91-60% MARKET RATE)
102 1 BEDROOM (67%)
50 2 BEDROOM FLATS (33%)
MAXIMUM ALLOWABLE HEIGHT: 45'+1 STORY (10')=55'
PROPOSED HEIGHT: 55'
FRONT SETBACK: REQUIRED:15' PROPOSED:15'
REAR SETBACK: REQUIRED:15' PROPOSED:15'
SIDE SETBACK: REQUIRED:7' PROPOSED:7'
PARKING REQUIRED-MARKET RATE 153 SPACES REQUIRED
(92 ONE BDR-60 TWO BDR): 1.5 SPACE 1 BDR 2.0 SPACE / 2 BDR 1.59 CAR/DU
PARKING REQUIRED-AFFORDABLE: 61 SPACES
(61 UNITS): 1 SPACE / DU
TOTAL PARKING REQUIRED : 214 SPACES
PARKING PROVIDED (1.34 CAR /DU) : 228 SPACES (175 STANDARD+53 TANDEM)
OPEN SPACE REQUIRED:125 SF FOR 1 BDR, 175 SF FOR 2 BDR (102X125)+(50X175)=21,500 SF REQUIRED
OPEN SPACE PROVIDED:29,601 SF AT PODIUM
OPEN SPACE AT GRADE: 7,209 SF
TOTAL OPEN SPACE PROVIDED: 36,810 SF

GROUND LEVEL PLAN - INITIAL CONCEPT

THATCHER YARD

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scale: 1" = 30'-0"
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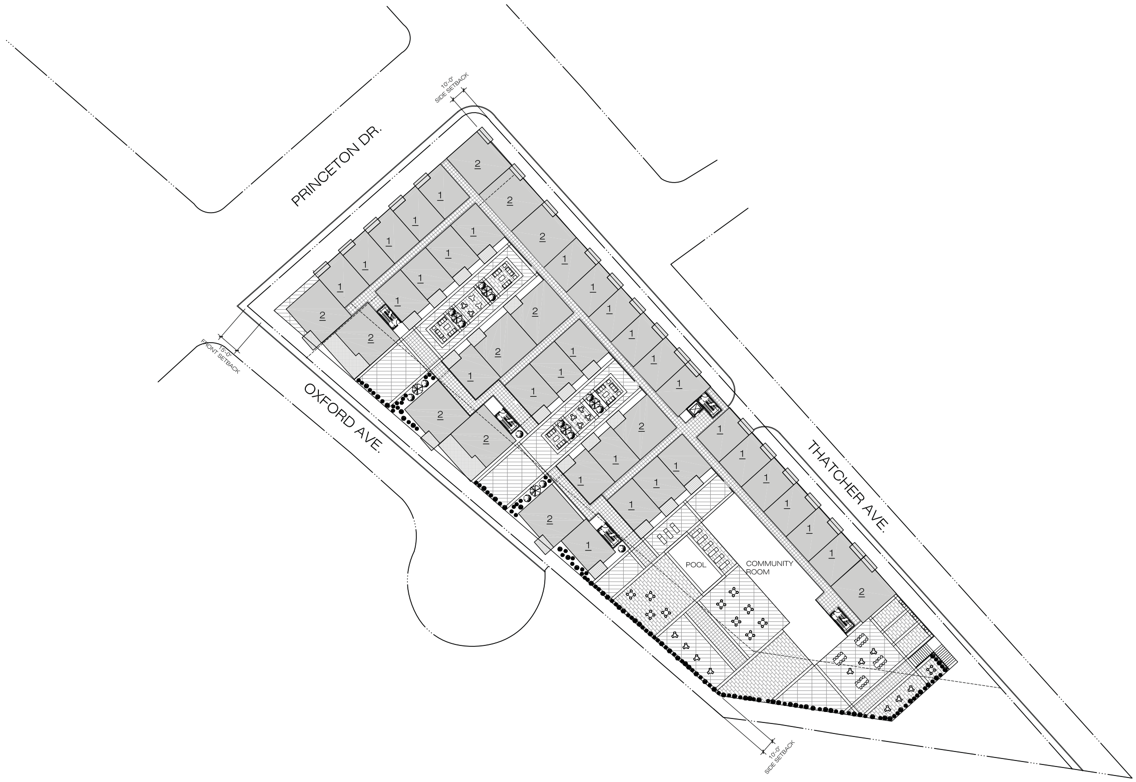
WITHEE MALCOLM ARCHITECTS
2251 west 190th street torrance || ca 90504 | 310.217.8885 | witheemalcolm.com
Job No. 86070
Date.09.15.2016



2ND LEVEL - 1ST LEVEL RESIDENTIAL OVER PODIUM
INITIAL CONCEPT

THATCHER YARD

THOMAS SAFRAN & ASSOCIATES | 11812 SAN VINCENTE BLVD., SUITE 600 | LOS ANGELES CA 90049-5063 | P.310.420.4888 F.310.207.6986

scale: 1" = 30'-0"
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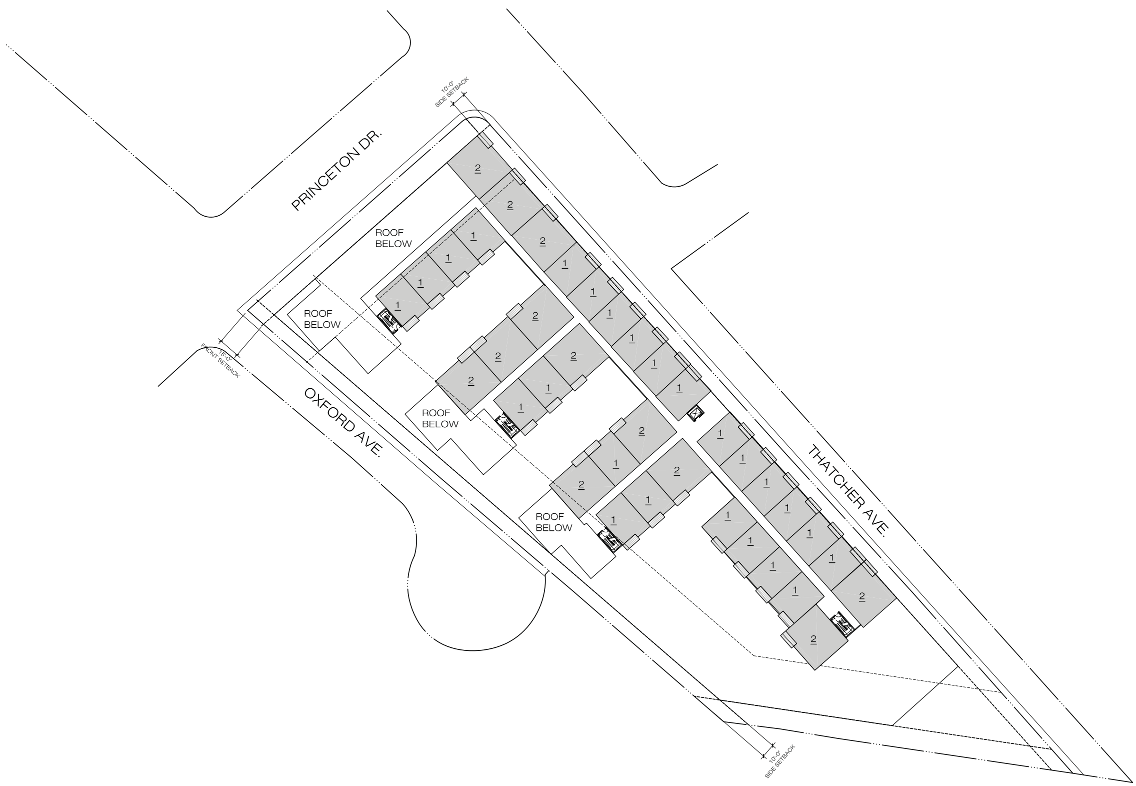
Date.09.15.2016



3RD LEVEL - 2ND LEVEL RESIDENTIAL OVER PODIUM
INITIAL CONCEPT

THATCHER YARD

THOMAS SAFRAN & ASSOCIATES | 11812 SAN VINCENTE BLVD., SUITE 600 | LOS ANGELES CA 90049-5063 | P.310.420.4888 F.310.207.6986

scale: 1" = 30'-0"
0 30 60 90 120

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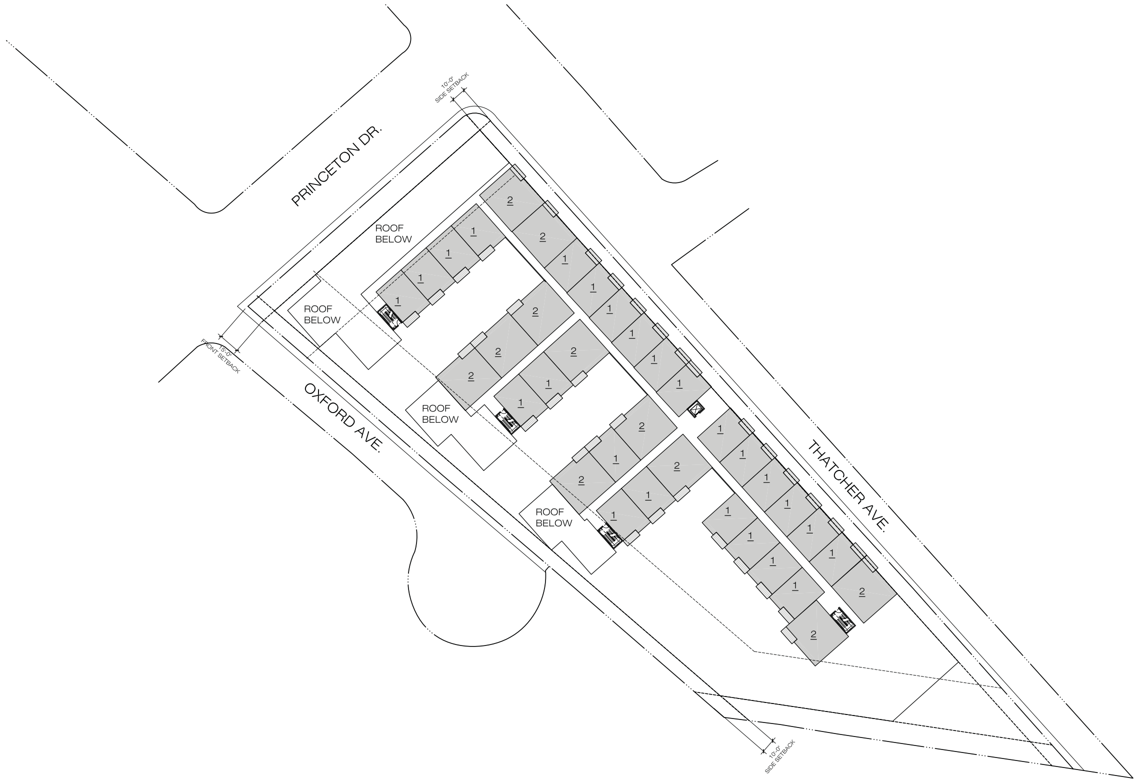


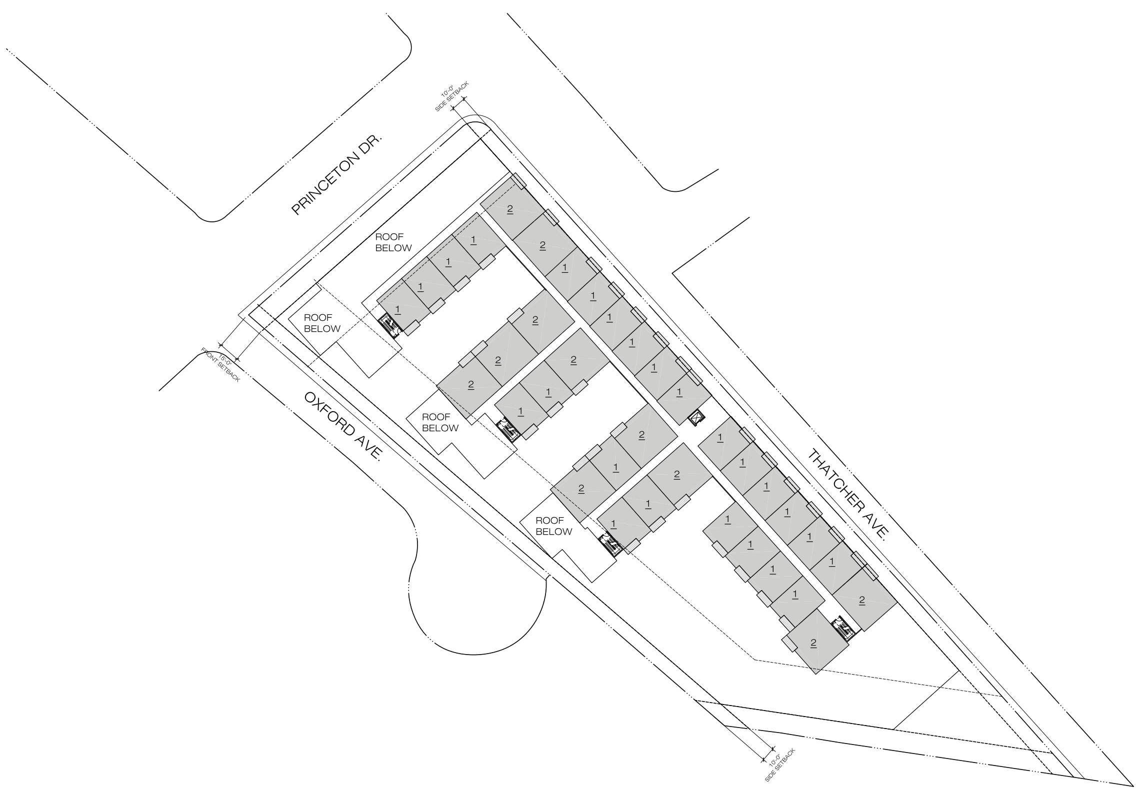
4TH LEVEL - 3RD LEVEL RESIDENTIAL OVER PODIUM
INITIAL CONCEPT

scale: 1" = 30'-0"

WITHEE MALCOLM
ARCHITECTS
2251 west 190th street torrance | ca 90504 | 310.217.8885 | witheemalcolm.com
Job No. 86070
Date 09.15.2016

THATCHER YARD

THOMAS SAFRAN & ASSOCIATES | 11812 SAN VINCENTE BLVD., SUITE 600 | LOS ANGELES CA 90049-5063 | P.310.420.4888 F.310.207.6986



5TH LEVEL - 4TH LEVEL RESIDENTIAL OVER PODIUM
INITIAL CONCEPT

scale: 1" = 30'-0"

WITHEE MALCOLM
ARCHITECTS
2251 west 190th street torrance | ca 90504 | 310.217.8885 | witheemalcolm.com
Job No. 86070
Date 09.15.2016

THATCHER YARD

THOMAS SAFRAN & ASSOCIATES | 11812 SAN VINCENTE BLVD., SUITE 600 | LOS ANGELES CA 90049-5063 | P.310.420.4888 F.310.207.6986

APPENDIX ‘F’

Engineering Analysis

SLOT CUT ANALYSIS

IC: **1925-74** CONSULT: **YMH**
CLIENT: **Thatcher Avenue**

CALCULATION SHEET #

CALCULATE THE FACTOR OF SAFETY OF SLOT CUT EXCAVATIONS. ASSUME COHESIVE AND FRICTIONAL RESISTANCE ALONG THE SIDES OF SLOTS AS WELL AS THE FAILURE SURFACE. THE HORIZONTAL PRESSURE ON THE SIDES OF THE SLOTS IS THE AT-REST PRESSURE (1-SIN(phi)).

CALCULATION PARAMETERS

EARTH MATERIAL:	Alluvium	EXCAVATION HEIGHT:	8 feet
SHEAR DIAGRAM:		BACKSLOPE ANGLE:	45 degrees
COHESION:	190 psf	SURCHARGE:	0 pounds
PHI ANGLE:	30.5 degrees	SURCHARGE TYPE:	U Uniform
DENSITY:	122 pcf	INITIAL FAILURE ANGLE:	17 degrees
SLOT BOUNDARY CONDITIONS		FINAL FAILURE ANGLE:	70 degrees
SLOT CUT WIDTH:	8 feet	INITIAL TENSION CRACK:	2 feet
COHESION:	190 psf	FINAL TENSION CRACK:	20 feet
PHI ANGLE:	30.5 degrees		

CALCULATED RESULTS

CRITICAL FAILURE ANGLE	62 degrees
HORIZONTAL DISTANCE TO UPSLOPE TENSION CRACK	2.0 feet
DEPTH OF TENSION CRACK	6.2 feet
TOTAL EXTERNAL SURCHARGE	0.0 pounds
VOLUME OF FAILURE WEDGE	113.9 ft^3
WEIGHT OF FAILURE WEDGE	13896.8 pounds
LENGTH OF FAILURE PLANE	4.3 feet
SURFACE AREA OF FAILURE PLANE	34 ft^2
SURFACE AREA OF SIDES OF SLOTS	14.2 ft^2
NUMBER OF TRIAL WEDGES ANALYZED	17892 trials
TOTAL RESISTING FORCE ALONG WEDGE BASE (FrB)	4981.1 pounds
TOTAL RESISTING FORCE ALONG WEDGE SIDES (FrS)	4393.2 pounds
RESULTANT HORIZONTAL COMPONENT OF FORCE	**-69.3 pounds**
CALCULATED FACTOR OF SAFETY	**1.30**

CONCLUSIONS:

THE CALCULATION INDICATES THAT SLOTS CUTS UP TO 8 FEET WIDE AND 8 FEET HIGH HAVE A SAFETY FACTOR GREATER THAN 1.25 AND ARE TEMPORARILY STABLE.

SHORING PILE

IC: **1925-74** CONSULT: **YMH**
CLIENT: **Thatcher Avenue**

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:	Alluvium	RETAINED LENGTH	15 feet
SHEAR DIAGRAM:		BACKSLOPE ANGLE:	0 degrees
COHESION:	190 psf	SURCHARGE:	0 pounds
PHI ANGLE:	30.5 degrees	SURCHARGE TYPE:	U Uniform
DENSITY	122 pcf	INITIAL FAILURE ANGLE:	10 degrees
SAFETY FACTOR:	1.25	FINAL FAILURE ANGLE:	70 degrees
PILE FRICTION	0 degrees	INITIAL TENSION CRACK:	2 feet
CD (C/FS):	152.0 psf	FINAL TENSION CRACK:	20 feet

PHID = ATAN(TAN(PHI)/FS) = 25.2 degrees

HORIZONTAL PSEUDO STATIC SEISMIC COEFFICIENT (k_h) 0 %g

VERTICAL PSEUDO STATIC SEISMIC COEFFICIENT (k_v) 0 %g

CALCULATED RESULTS

CRITICAL FAILURE ANGLE	58 degrees
AREA OF TRIAL FAILURE WEDGE	65.8 square feet
TOTAL EXTERNAL SURCHARGE	0.0 pounds
WEIGHT OF TRIAL FAILURE WEDGE	8026.6 pounds
NUMBER OF TRIAL WEDGES ANALYZED	1159 trials
LENGTH OF FAILURE PLANE	13.2 feet
DEPTH OF TENSION CRACK	3.8 feet
HORIZONTAL DISTANCE TO UPSLOPE TENSION CRACK	7.0 feet
CALCULATED THRUST ON PILE	**3006.5 pounds**
CALCULATED EQUIVALENT FLUID PRESSURE	**26.7 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 15 POUNDS PER CUBIC FOOT. THE FLUID PRESSURE SHOULD BE MULTIPLIED BY THE PILE SPACING.

SHORING PILE

IC: **1925-74** CONSULT: **YMH**
CLIENT: **Thatcher Avenue**

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:	Alluvium	RETAINED LENGTH	12 feet
SHEAR DIAGRAM:		BACKSLOPE ANGLE:	0 degrees
COHESION:	190 psf	SURCHARGE:	0 pounds
PHI ANGLE:	30.5 degrees	SURCHARGE TYPE:	U Uniform
DENSITY	122 pcf	INITIAL FAILURE ANGLE:	10 degrees
SAFETY FACTOR:	1.25	FINAL FAILURE ANGLE:	70 degrees
PILE FRICTION	0 degrees	INITIAL TENSION CRACK:	2 feet
CD (C/FS):	152.0 psf	FINAL TENSION CRACK:	20 feet

PHID = ATAN(TAN(PHI)/FS) = 25.2 degrees

HORIZONTAL PSEUDO STATIC SEISMIC COEFFICIENT (k_h) 0 %g

VERTICAL PSEUDO STATIC SEISMIC COEFFICIENT (k_v) 0 %g

CALCULATED RESULTS

CRITICAL FAILURE ANGLE	58 degrees
AREA OF TRIAL FAILURE WEDGE	40.0 square feet
TOTAL EXTERNAL SURCHARGE	0.0 pounds
WEIGHT OF TRIAL FAILURE WEDGE	4879.5 pounds
NUMBER OF TRIAL WEDGES ANALYZED	1159 trials
LENGTH OF FAILURE PLANE	9.4 feet
DEPTH OF TENSION CRACK	4.0 feet
HORIZONTAL DISTANCE TO UPSLOPE TENSION CRACK	5.0 feet
CALCULATED THRUST ON PILE	**1597.9 pounds**
CALCULATED EQUIVALENT FLUID PRESSURE	**22.2 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.

APPENDIX ‘G’

Research

See CD

May 18, 2017 File No. 1925-74

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

Subject: **<u>GEOTECHNICAL INVESTIGATION</u>**
Proposed Five Story Building
3233-3321 S Thatcher Avenue, Los Angeles, CA 90292

Dear Mr. Coddington,

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 Engineering Geologist

Dan Daneshfar
Principal Engineer
P.E. 68377

Distribution: Addressee– (1)

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 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 drilling of six borings (B1, B2, B3, B4, B5, B6);
- Sampling and logging of the subsurface soils;
- Laboratory testing of selected soil samples collected from the subsurface exploration to determine the engineering properties of the underlying earth materials;
- Engineering and geologic analysis of the field and laboratory data; and
- Preparation of this report presenting our findings, conclusions, and recommendations for the proposed construction.

1.3 SITE DESCRIPTION

The project site is located on south side of Thatcher Avenue and is bordered to the north by Princeton Drive, to the south by Harbor Crossing Lane, and to the west by Oxford Avenue in the Marina Del Rey area of the City Los Angeles (Figure 1). The site is relatively level and is currently occupied by asphalt covered parking lot and remnant building foundations (Figure 2). The subject site is surrounded by small businesses and residential developments. A recent aerial photograph of the site is shown as Figure 3. Surface drainage is by sheet flow to the north of the property.

1.4 PROPOSED CONSTRUCTION

Based on the information provided to us, the project will consist of demolishing the existing structures and the construction of a five-story building. A Site Plan and Cross Sections showing the proposed development are included in Appendix C.

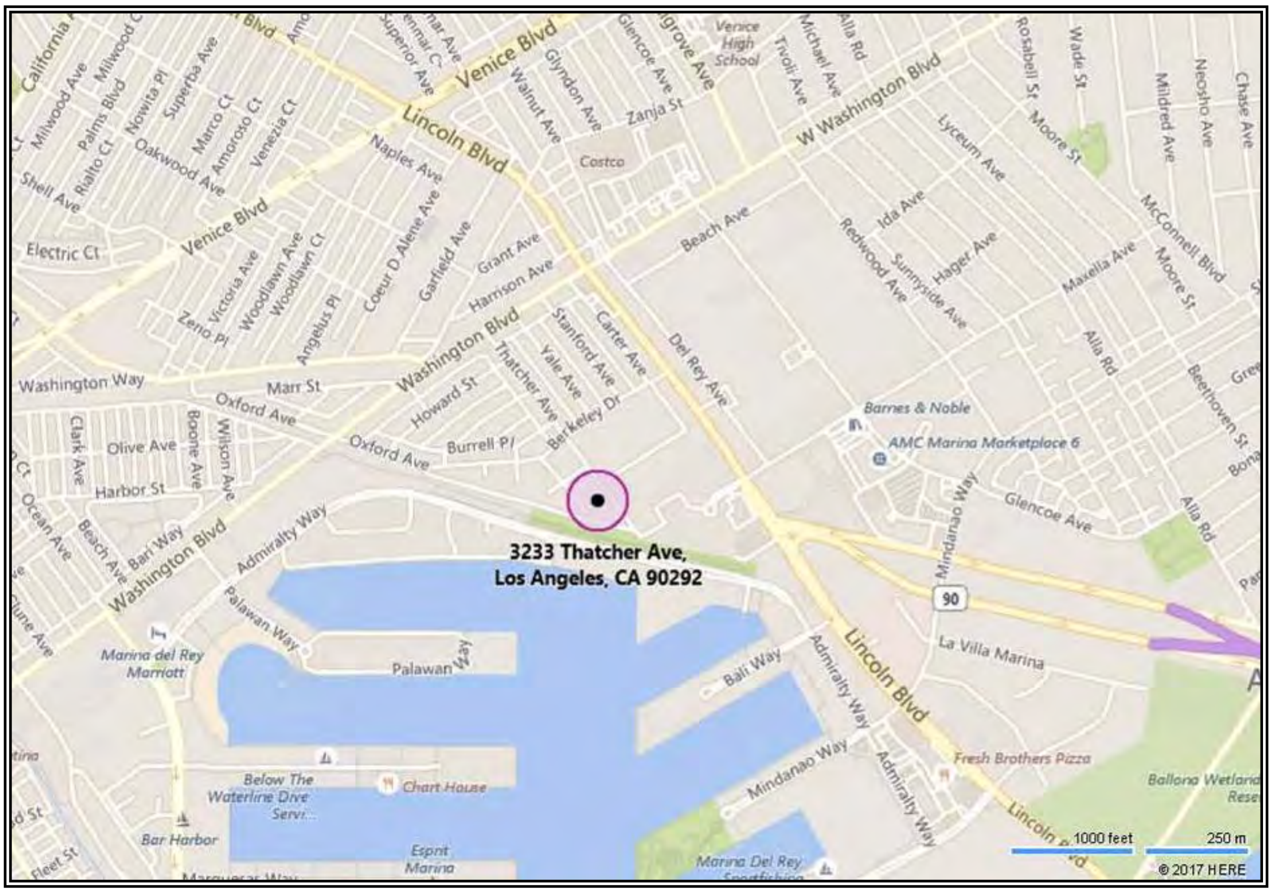


Figure 1. Location map of the subject site.

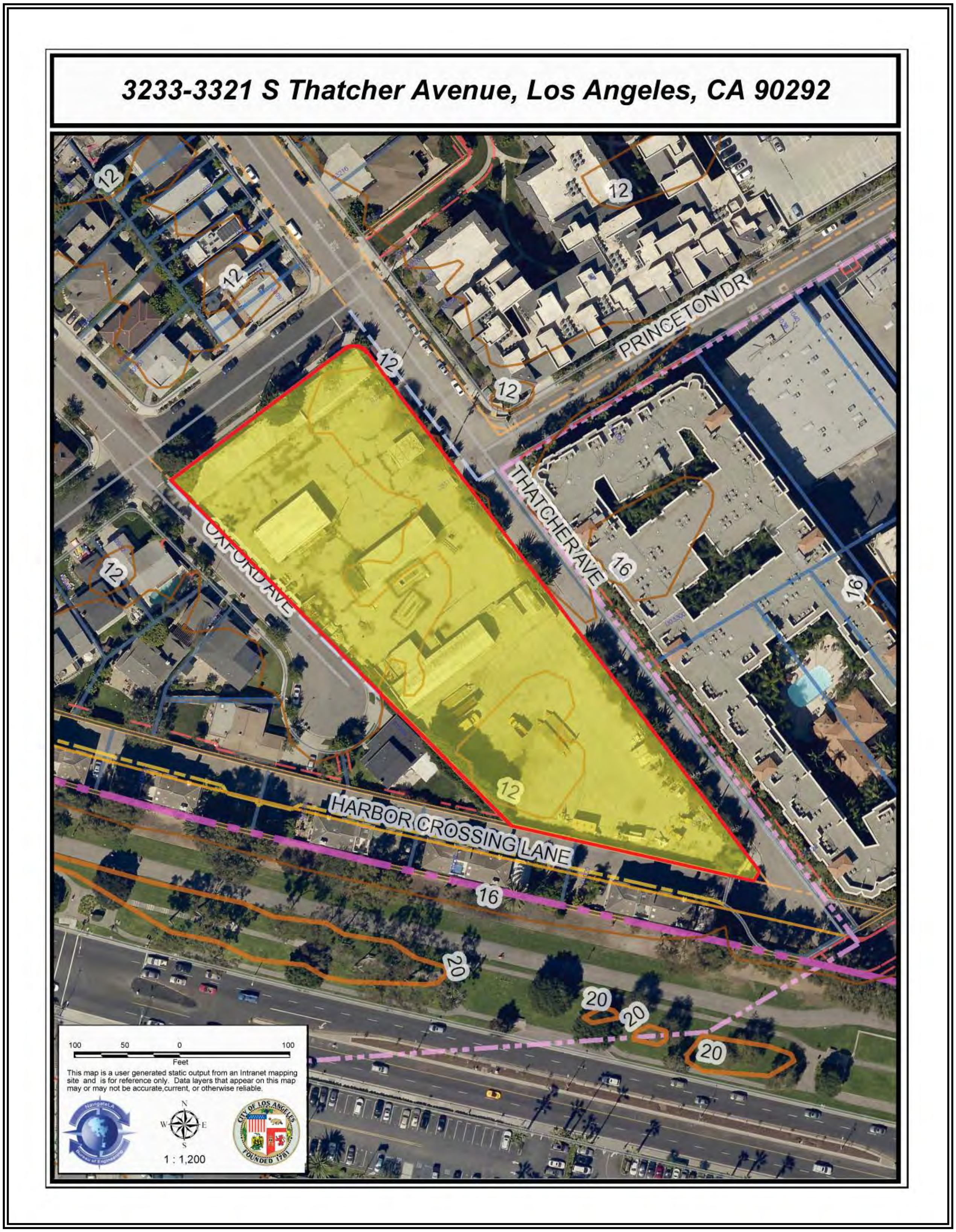


Figure 2. Aerial photograph with topographic overlay from Navigate LA. Subject site is highlighted.

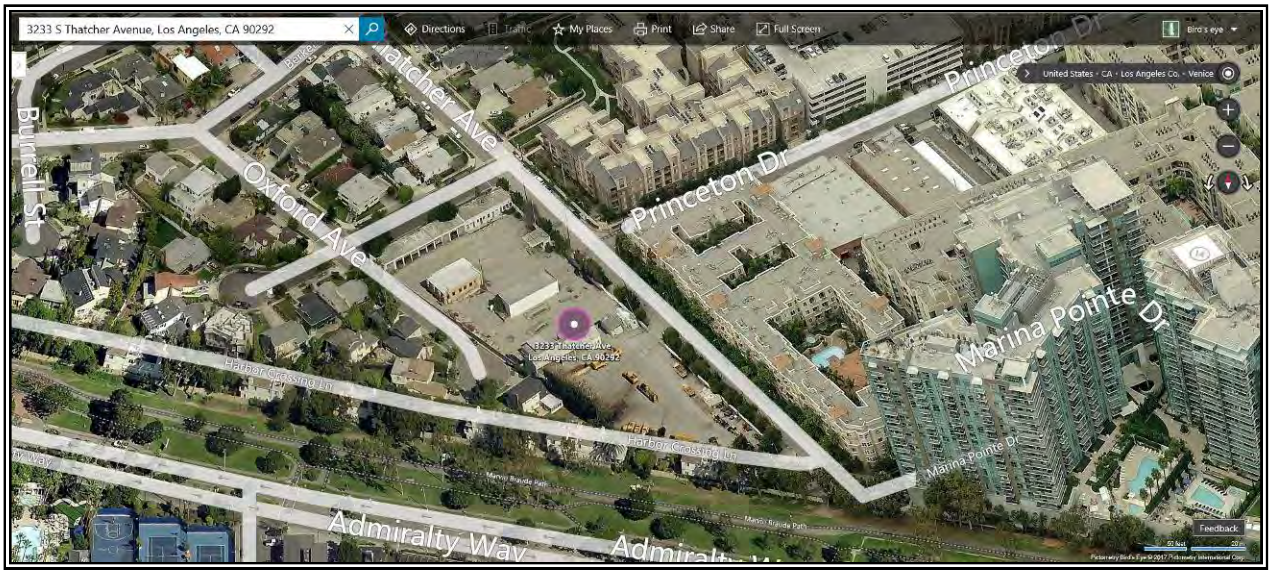


Figure 3. Aerial Photograph of subject lot and surrounding area.

1.5 DOCUMENT REVIEW

The City of Los Angeles Building Department records were researched. The records contained the following Geologic and Soils Engineering Reports for the subject property in addition to reports located for nearby properties.

3233-3321 S. Thatcher Avenue, Jobsite
City of Los Angeles Soils Correction Letter, Log #58858 dated 2007 1 August

Geotechnical Engineering Division (GED), City of Los Angeles, Geotechnical and Soils Engineering Report for, Unnumbered Lot, Tract Rafael and Andres Machado, 3311 S. Thatcher Avenue, Los Angeles, California dated 2007 30 May, Soils Field & Lab Report, dated 2007 12 February

Geomatrix Consultants, Inc, Newport Beach, Geotechnical Data Report for Unnumbered Lot, Tract Rafael and Andres Machado, 3311 S. Thatcher Avenue, Los Angeles, California dated 2007 3 March

3226 Thatcher Avenue, Across The Street, East From Jobsite
Leighton and Associates, Inc, Irvine, Revised Compaction Report for Lot 17-20, Tract 20660, 3224-26 Thatcher Avenue, Los Angeles, California dated 2007 11 January

City of Los Angeles Approval Letter, Log #56367 dated 2007 11 January

Leighton and Associates, Inc, Irvine, Compaction Report for Lot 17, Tract 20660, 3224-26 S. Thatcher Avenue, Los Angeles, California dated 2006 27 December

Leighton and Associates, Inc, Irvine, Soils Report for Lot 17-20, Tract 20660, 3224-26 S. Thatcher Avenue, Los Angeles, California dated 2006 22 November

City of Los Angeles Approval Letter, Log #51886-01 dated 2006 10 July

Leighton and Associates, Inc, Irvine, Soils Report for Lot 17-20, Tract 20660, 3224-26 S. Thatcher Avenue, Los Angeles, California dated 2006 24 May

City of Los Angeles Correction Letter, Log #51886 dated 2006 16 March

Leighton and Associates, Inc, Irvine, Geotechnical Investigation for Lot 17, Tract 20660, 3224-26 S. Thatcher Avenue, Los Angeles, California dated 2005 28 December

Kehoe Testing & Engineering, Huntington Beach, Cone Penetration Test Data for Lot 17-20, Tract 20660, 3224-26 S. Thatcher Avenue, Los Angeles, California dated 2005 21 September

Rybak Geotechnical, Inc, Van Nuys, Soil Report for Lot 17-20, Tract 20660, 3224-26 S. Thatcher Avenue, Los Angeles, California dated 2002 10 September

13700 West Marina Pointe Drive, South East Of Jobsite
LAW Engineering and Environmental Services, Inc, Los Angeles, Final Report for Geotechnical Inspection Services for Lot 2, Tract 52139, 13700 Marina Pointe Dr, Los Angeles, California dated 2001 21 November

City of Los Angeles Department Letter, Log #32838 dated 2001 22 February

LAW Engineering and Environmental Services, Inc, Los Angeles, Geotechnical Investigation for Lot 2, Tract 52139, 13700 Marina Pointe Dr, Los Angeles, California dated 2001 30 January

City of Los Angeles Department Letter, Log #32368-01 dated 2001 30 January

LAW Engineering and Environmental Services, Inc, Los Angeles, Supplemental Shoring Design Recommendation for Lot 2, Tract Rancho La Ballona, 13700 Marina Pointe Dr, Los Angeles, California dated 2001 23 January

13600 West Marina Pointe Drive, South East Of Jobsite
LAW Engineering and Environmental Services, Inc, Los Angeles, Supplemental Geotechnical Recommendation for Lot FR LT 1, Tract 52139, 13600 Marina Pointe Dr, Los Angeles, California dated 2001 31 May

LAW Engineering and Environmental Services, Inc, Los Angeles, Geotechnical Investigation for Lot FR LT 1, Tract 52139, 13600 Marina Pointe Dr, Los Angeles, California dated 2000 8 May

3300 Thatcher Avenue, Directly Across From The Jobsite
Chang & Associates, Inc, Los Angeles, Foundation Report Addendum for Lot arb 349 and arb 350, Tract 4, 3300-3324 Thatcher Avenue, Los Angeles, California dated 1997 6 November

City of Los Angeles Department Letter, Log# 22693 dated 1997 6 November

Chang & Associates, Inc, Los Angeles, Geotechnical Investigation for Proposed Residential Development for Lot arb 349 and arb 350, Tract 4, 3300-3324 Thatcher Avenue, Los Angeles, California dated 1997 10 October

City of Los Angeles Department Letter, Tentative Tract Termination for Tract 59080 dated 1993 18 March

2.0 INVESTIGATION

2.1 GENERAL

Our field investigation was performed on March 1-2, 2017 and consisted of a review of site conditions and exploration involving the excavation of test pits, drilling of borings and soil sampling. Our investigation also included laboratory testing of selected soil samples. A brief summary of these various tasks are provided below.

2.2 FIELD EXPLORATION

The subsurface investigation performed at the site consisted of the drilling of six borings by use of a hollow-stem auger drill rig.

The purpose of the exploratory test pits and borings 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 fill over alluvium.

A review of Regional Geologic Maps[1] indicates that the material underlying the subject site is comprised of Alluvium (Qa) of Quaternary age (Figure 4).

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

The approximate locations of the Borings 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 exploration. 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, maximum density and shear strength testing. A summary of the laboratory test results is included in Appendix B.

The physical properties of the soils were tested at Soil Labworks, LLC. Chemical testing was performed at HDR Schiff. The undersigned geologist and engineer have reviewed the data, concur, and accept responsibility for the data therein.

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[1] Dibblee, T.W. and Minch, J.A., ed., 2007, Geologic Map of the Venice and Inglewood (south ½) quadrangles, Los Angeles County, California, Dibblee Foundation Map, DF #322, scale 1:24,000.

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 (Qa) overlain by a veneer of fill. Descriptions of the materials encountered in our exploratory borings are described below.

3.1.1 Fill

The fill consists of silty clay and gravelly silty sand. The color varies from orange-brown to brown, black, and dark gray. The fill is moist and medium dense to dense. The fill encountered varies between two to twelve feet below the ground surface.

3.1.2 Alluvium

The Alluvium consists of admixtures of gravelly-sands, sandy-clays and silty-sands, which vary from brown to medium-brown, orange brown, blue-gray, and charcoal-gray. The Alluvium was moist to slightly moist, and dense. The Alluvium is generally weakly horizontally layered with no significant structural planes. Generally, the Alluvium becomes more granular with depth.

3.1.3 Groundwater

Ground water was encountered during the recent excavations at depths ranging from eight to fifteen feet below the ground surface. Historically highest groundwater in this area of Los Angeles is estimated to be five feet below the ground surface (Plate 1.2, *Historically Highest Groundwater Contours and Borehole Log Data Locations, Venice 7½ Minute Quadrangle in Seismic Hazard Zone Report for the Venice Quadrangle,* SHZR-036).

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[2] Dibblee, T.W. and Minch, J.A., ed., 2007, Geologic Map of the Venice and Inglewood (south ½) quadrangles, Los Angeles County, California, Dibblee Foundation Map, DF #322, scale 1:24,000.

Figure 4. Portion of Dibblee Geologic Map. Site is designated by a diamond.

3.2 SUSMP/LID

Ground water was encountered at depths ranging from eight to fifteen feet below the ground surface. The proposed building will extend into the underlying alluvium and it is our opinion that there is not sufficient rates of infiltration in the alluvium to percolate collected rainwater into the subsurface. An alternative to infiltration should be designed for the subject site in order to comply with SUSMP/LID requirements.

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. Although we are not aware of 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.

The closest known potentially active faults to the site are the Santa Monica-Hollywood, and Newport Inglewood located within about 5 kilometers. Since no active faults cross the property, the surface rupture hazard at the site is very low.

Due to the distance from the coastline, the site may be susceptible to the effects of tsunamis and seiches.

3.4 2016 CALIFORNIA BUILDING CODE CONSIDERATIONS

The proposed development may be designed in accordance with seismic considerations contained in the 2016 California Building Code, Section 1613, the following parameters may be considered for design:

Mapped Spectral Response Acceleration Parameters:			
	S_S	:	1.697g
	S_1	:	0.663g
Site Class:	D	:	Stiff Soil
Site Coefficients:	F_a	:	1.0
	F_v	:	1.5
Maximum Considered Earthquake Spectral Response Acceleration Parameters:			
	S_{MS}	:	1.697g
	S_{M1}	:	0.994g
Design Spectral Response Acceleration Parameters:			
	S_{DS}	:	1.131g
	S_{D1}	:	0.663g
	PGA_M	:	0.649 g

3.5 LIQUEFACTION

3.5.1 Ground Motion

The subject site is located in an area designated being within an area that is potentially affected by earthquake-induced liquefaction (*Seismic Hazard Zone Report for the Venice 7.5-minute Quadrangle, Los Angeles County, California*, *Seismic Hazard Zone Report 036*).

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. Pursuant to the memo the PGA corresponding to 2/3 of the PGA_M should be used to determine seismically induced settlements. The Predominant Earthquake Magnitude should be based on a 10% probability of exceedance in 50 years (475-year return interval) and 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 for a 475-year return interval is 6.6 and the PGA_M is 0.649g. Two thirds of the PGA_M is 0.43g.

Additionally, the City Bulletin/Memo requires that the full PGA of 0.649g and a Predominant Earthquake Magnitude 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 Predominant Earthquake Magnitude for a 2475-year return interval is 6.77. These ground motions, while unlikely to occur, have been adopted for the liquefaction study pursuant to the new requirements.

3.5.2 Liquefaction

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) 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 0.45g ($2/3^{rd}$ of PGA for 10% exceedance) and 0.677 (PGA 2% exceedance) and a design magnitude earthquake of 6.6 (475-year) and 6.77 (2475-yr) were used for the analyses. For conservatism two analyses were performed; one assumed that groundwater was at the historical high of 5 feet and the other assumed that the groundwater will be at a depth of 8 feet of the ground surface where ground water was encountered.

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 hollow-stem borings B-1 and B-2 advanced within the project site. Using site SPT blow counts, laboratory data, and our engineering judgment, site-specific soil parameters were utilized in our settlement analyses.

The raw SPT blow counts were converted to equivalent clean sand blow counts following the procedures in the publications referenced above. 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 a groundwater level of 5 feet with the PGA of 10% probability of exceedance in 50 years (475-year return interval) indicates that total settlement of 0.24" may occur. The associated differential settlement of 0.16" was determined by assuming 2/3rd of the total settlement. 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 0.45" may occur. The associated differential settlement of 0.30" was determined by assuming 2/3rd of the total settlement). Based upon our review, the project site settlement for a return interval of 475-or 2475 years does exceed the total combined or differential settlement (seismic plus static) of 1-1/2 inch total or 3/4-inch differential specified by the City of Los Angeles.

3.5.3 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.

3.5.4 Secondary Ground Effects

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

4.0 GEOTECHNICAL CONSIDERATIONS

4.1 SUBSURFACE SOIL CONDITIONS

Subsurface materials at the site consist of alluvium below a layer of fill observed to vary between two to twelve feet below the ground surface. Laboratory testing indicates that the Alluvium at a shallow depth has a low potential for consolidation and hydrocollapse. The Alluvium at the subject site is 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 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 soils have a very low potential for consolidation. Recommendations are presented below to mitigate the settlement hazard associated with consolidation of the near surface soils.

4.3 EXPANSIVE SOIL

The on-site, near surface soil was found to possess medium expansive characteristics based upon field soil classifications and testing.

4.4 SLOPE STABILITY

The property has less than five feet of overall elevation change at a gradient of approximately 12:1 or gentler (horizontal to vertical) gradient. A slope stability analysis is not required for the property per City of Los Angeles Department of Building and Safety Information Bulletin P/BC 2011-49.

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 over-consolidated nature of the alluvial deposits and the depth of groundwater at the subject site, the potential for liquefaction at the site during earthquake shaking is considered to be nil. Foundations will be founded in alluvium.

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

Where fill is intended for structural support, a compacted fill cap should extend at least three feet below the bottom of footings or five feet below finished grade whichever is greater. 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

Based on our understanding of the proposed development, we recommend that footings for the development be founded in firm alluvium or within a new compacted fill cap that extends a minimum of three feet below footings or five feet below finished grade whichever is greater and five feet outside of the building footprint.

If removal is locally deeper due to the local depth of fill or due to remediation of contaminated soil, a sharp transition between the deeper and shallower fill areas should not occur. Transitions from deeper to shallow areas should not exceed a 1.5:1 gradient; fill should not vary by more than five feet in depth below a building footprint.

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 test pits did not encounter hard earth materials. 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.

Ground water was encountered at depths ranging from eight to fifteen feet below the ground surface. The contractor should be aware that if groundwater or heavy seepage is encountered during construction excavations, dewatering may be required.

[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.

5.4 FOUNDATION SUPPORT

5.4.1 New Structures

All proposed footings shall be embedded within the competent alluvium or new compacted fill, in accordance with the recommendations below.

Foundation support for the new structures could be derived by utilizing a conventional, shallow foundation system embedded within the competent alluvium or newly compacted fill. Allowable design parameters for foundations are provided below.

Minimum depth for interior and exterior footing
(Measured from lowest adjacent grade)..2 feet
Minimum embedment into approved alluvium.............................. 12 inches
Minimum embedment into new fill .... 18 inches
Minimum width ....1.25 feet

Bearing pressure
a. Sustained loads (lbs. per square foot) ....2, 000 psf

Resistance to lateral loads
a. Passive soil resistance (lbs. per cubic ft.)
Within alluvium or compacted fill....................................... 300 pcf
Maximum allowable for alluvium ....3,500 psf

b. Coefficient of sliding friction..0.35

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. When combining passive and friction for lateral resistance, the passive component should be reduced by one third.

Increases in the bearing value of the alluvium are allowable at a rate of 300 pounds per square foot for each additional foot of footing width to a maximum of 4,000 pounds per square foot. For bearing calculations, the weight of the concrete in the footing may be neglected.

All continuous footings should be reinforced with a minimum of four #4 steel bars; two placed near the top and two near the bottom of the footings. Footing excavations should be cleaned of all loose soil, moistened, free of shrinkage cracks and approved by the geologist and geotechnical engineer prior to placing forms, steel or concrete.

Based on the anticipated building loads footings designed and constructed in accordance with the soil criteria included within the referenced report are expected to settle less than ¼ to ½ inch in a distance of 20 feet. Differential settlement is expected to be less than ¼ inch. The total and differential settlements are within acceptable and allowable tolerances for conventional foundations.

5.4.2 Deepened Foundations - Friction Piles

If required to achieve embedment into competent alluvium drilled, cast-in-place concrete friction piles may be used for support of structures.

Piles should be a minimum of 24 inches in diameter and a minimum of 8 feet into alluvium. Piles may be assumed fixed at three feet into alluvium. The piles may be designed for a skin friction of 400 pounds per square foot for that portion of pile in contact with the alluvium.

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. Passive earth pressure in alluvium may be computed as an equivalent fluid having a density of 400 pounds per cubic foot.

The maximum allowable earth pressure is 4,500 pounds per square foot. 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.

5.4.3 Mat Foundation

For purposes of waterproofing and for resisting design hydrostatic uplift due to the ground water encountered at eight to fifteen feet below the ground surface, a mat foundation may be appropriate. The mat will extend below the highest historical groundwater level and into over-consolidated soils. 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 125 kips/ft^3 may be assumed. For aesthetic reasons, the deflection should not exceed ½ inch in 30 feet. The mat is not expected to experience any differential settlement.

A rise in the groundwater table will not reduce the bearing capacity of the soils supporting the mat.

5.5 RETAINING WALLS

5.5.1 Retaining Wall

Although not part of the proposed project, if constructed, cantilevered retaining walls up to 6 feet high that support fill, older alluvium, and approved retaining wall backfill, may be designed for an equivalent fluid pressure of 30 pounds per cubic foot for level backslopes.

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.

Since the proposed retaining wall is less than 6 feet in height, a seismic surcharge from a Design Earthquake need not be considered.

5.5.2 Retaining Wall Backfill

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.

5.5.3 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.

As aforementioned, the architect, structural engineer, or other qualified waterproofing consultant should develop the actual waterproofing details.

5.6 TEMPORARY EXCAVATIONS

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

Un-shored vertical cuts to a height of five (5') may be made in earth 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.

Shoring, if required for the project should be designed to retain an equivalent fluid pressure of 30 PCF.

5.6.1 Shoring

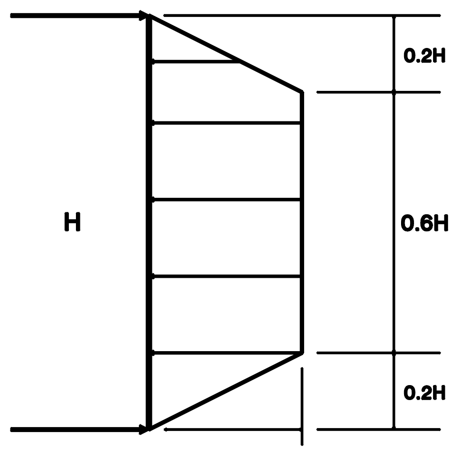
Shoring may consist of cast-in-place concrete piles with wood-lagging. Shoring piles should be a minimum of 18 inches in diameter and a minimum of 8 feet into alluvium below the base of the excavation. Piles may be assumed fixed 3 feet below the base of the excavation. For the vertical forces, piles may be designed for a skin friction of 400 pounds per square foot for that portion of pile in contact with the alluvium. and 500 pounds per square foot for portion of the pile in contact with alluvium.(take out the previous paragraph in red) . 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 or alluvium 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. The maximum allowable earth pressure is 4,000 pounds per square foot. 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.

Restrained braced shoring should be designed for the trapezoidal pressure distribution noted in the figure below. 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



5.6.2 Earth Anchors

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. For preliminary design purposes, it is estimated that pressure grouted anchors will develop an average value of 2500 pounds per square foot. 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.

5.6.3 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.

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.

5.6.4 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.

5.6.5 Monitoring

Because of the depth of the excavation, some mean of monitoring the performance of the shoring system is 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.

5.7 SLOT CUTS

If required, slot cuts 8 feet wide and 8 feet in height are stable. The slot cuts should be excavated by the ABC method. The “A” slots are first excavated and backfilled while the “B” and “C” slots are left in place as buttresses; the same procedures are used for the “B” and “C” slots.

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.

5.8 SWIMMING POOL

If a pool is constructed it should derive support entirely from the alluvium or a compacted fill cap that extends a minimum of three feet below the pool shell. The pool shell should be founded entirely in one material. Pool walls supporting soil should be designed for an inward pressure given as an equivalent fluid weight of 45 pcf. A hydrostatic relief valve is recommended. If a spa is to be attached to the pool, the spa should be founded at the same depth as the portion of the pool it adjoins.

5.9 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 2 feet of compacted fill.

A structural slab may be required along the east side of the building where piles will be used for support of the building. The structural engineer should design the slab.

The existing seepage is located at a depth of 18 feet and is at the level of the proposed basement and associated foundation. Wet conditions may be encountered. If groundwater is encountered, dewatering may be required and should be designed by a dewatering contractor and engineer.

Slabs below a depth of 18 feet should be designed to resist hydrostatic uplift forces. A mat foundation may be required.

The existing groundwater seepage is located at a depth of 18 feet and is below the level of the proposed basement and associated foundation. Wet conditions and actual groundwater may be encountered. If groundwater is encountered, temporary dewatering may be required and should be designed by a dewatering contractor and engineer.

The foundation and lower five feet of the retaining walls should be designed to resist a full hydrostatic pressure equal to 15 feet of head. Slab subdrainage and associated pumps are not required for this project.

A mat foundation may be required to provide appropriate waterproofing and resistance to uplift.

5.10 EXTERIOR FLATWORK AND AUXILIARY STRUCTURES

Whenever planned, exterior flatwork should be placed directly on alluvium 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 or on a two foot blanket of compacted fill.

5.11 CONCRETE/SULFATE/CORROSIVITY

Testing of the sulfate content of the soil indicates that only low levels of sulfate concentrations were encountered in the soil and therefore specialized concrete is not required for the project. We recommend that the low permeable concrete be utilized at the site to limit moisture transmission through slab and foundation. The structural engineer should specify appropriate compressive strength and water-cement ratio. 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.

5.12 SOIL CORROSIVITY

According to testing of the site soils, the soils should be expected to be only slightly corrosive to ferrous metals. It is recommended that a consulting corrosion engineer be retained in order to determine the most appropriate protection measures for the project site.

Recommendations that the corrosion engineer may require include the following:

- All steel and wire concrete reinforcement should have at least 3 inches of concrete cover where cast against soil.
- Below-grade ferrous metals should be given a high-quality protective coating, such as plastic tape, extruded polyethylene, hot-applied coal tar enamel, or fusion-bonded epoxy.
- On any type of pipe, coat all bare metal appurtenances such as bolts, valves, joint harnesses, or flexible couplings with a coal tar or rubber-based mastic, coal tar epoxy, moldable sealant, wax tape, or equivalent, after assembly.
- Bond below-grade ferrous metals with non-conductive type joints for electrical continuity.
- Below-grade metals should be electrically insulated (isolated) from dissimilar metals, cement-mortar coated and concrete-encased metals, and above-grade metals, by means of insulated joints.
- Metal pipes penetrating concrete structures such as floors and walls should be provided with plastic sleeves, rubber seals, or other dielectric material to prevent pipe contact with the concrete and reinforcing steel.

- Bare copper tubing should be bedded and backfilled in clean sand at least 3 inches thick surrounding the tubing. The best corrosion control for hot-water copper tubing is placement above-grade. Below-grade hot-water copper tubing should be encased in impermeable, unstretched, non-shrink insulation with the joints and seams sealed.

5.13 PAVEMENT DESIGN

The following pavement sections are recommended as minimums:

TRAFFIC INDEX	ASPHALT THICKNESS	BASE THICKNESS
Light Traffic (T.I.=5) for parking stalls and driveways	3 inches	4 inches
Heavy Traffic (T.I.= 6.5) for loading docs and large truck traffic	4 inches	6 inches

Concrete pavement sections should be a minimum of 6 inches thick and reinforced with #4 bars at 18" on center. A base of 6 inches is required below concrete pavement areas. Control joints should be planned at not more than twelve foot spacing.

All pavement should be placed on a minimum one-foot thick fill cap that is compacted to a minimum of 95% relative compaction.

5.14 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.

5.15 PLAN REVIEW

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

5.16 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.

5.17 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.

5.18 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: 1925-74
Project:Thatcher Avenue (Thomas Safran & Associates)

Date Performed: 3/1/17-3/2/17

Boring No:1
Boring Location: A/C Parking Lot
3233-3321 S Thatcher Avenue, Los Angeles
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				0-8” Asphalt, 8-9” Base Artificial Fill (Af) Silty clay, contains scattered rootlets	Dark gray black	Firm	Moist
2.5				Quaternary Alluvium (Qa)			
5	6/9	R		Silty clay	Gray, brown gray, orange gray	Firm	Moist
7.5	5/6/8		SPT	Silty sand Ground Water At 8”bgs	Brown, orange brown	Medium dense	Very moist
10	12/16	R		Silty sand	Brown, orange brown	Medium dense	Very moist
12.5	10/16/25		SPT	Silty sand, contains scattered gravel	Brown, orange brown	Medium dense to dense	Wet
15	14/29	R		Silty sand, contains scattered gravel	Brown, orange brown	Medium dense to dense	Wet
17.5	12/16/20		SPT	Silty sand, contains scattered gravel	Brown, orange brown	Medium dense to dense	Wet
20	5/9	R		Gravelly silty sand and sandy silt	Brown, blue gray	Medium dense	Moist to wet
22.5	6/7/8		SPT	Silty clay, silty sand and sandysilt	Blue gray, gray	Medium dense	Moist
25	8/11	R		Silty clay	Blue gray	Firm	Moist
27.5	5/7/9		SPT	Silty clay	Brown, blue gray	Firm	Moist
30	9/14	R		Silty clay	Blue gray	Firm	Moist
32.5	10/15/16		SPT	Sandy silt, silty sand	Charcoal gray	Medium dense to dense	Moist
35	20/32	R		Sandy silt, silty sand	Charcoal gray	Medium dense to dense	Moist
37.5	3/5/10		SPT	Sandy silt, silty sand	Charcoal gray	Medium dense to dense	Moist
40							

LOG OF EXPLORATORY BORING

Job Number: 1925-74
Project:Thatcher Avenue (Thomas Safran & Associates)

Date Performed: 3/1/17-3/2/17

Boring No:1
Boring Location: A/C Parking Lot
3233-3321 S Thatcher Avenue, Los Angeles
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	14/28	R		Silty sand, silty sand	Charcoal gray	Medium dense to dense	Moist
42.5	6/7/9		SPT	Silty sand, silty clay	Blue gray, black	Medium dense	Moist
45	9/24	R		Silty clay, contains wood shards	Dark brown, blue gray,	Dense	Moist
47.5	14/23/31		SPT	Silty sand, poorly sorted, grades from coarse to fine	Blue gray	Dense	Moist
50	25/42	R		Silty sand	Blue gray	Dense	Moist
52.5	15/18/30		SPT	Silty sand	Blue gray	Dense	Moist
55	30/45	R		Silty sand	Blue gray	Dense	Moist
57.5	19/20/29		SPT	Silty sand	Blue gray	Dense	Moist
60	17/25	R		Silty sand	Blue gray	Dense	Moist
				End At 61.5', Artificial Fill To 2.5', Ground Water At 8', No Caving			
65							
70							
75							
80							

Figure

LOG OF EXPLORATORY BORING

Job Number: 1925-74
Project:Thatcher Avenue (Thomas Safran & Associates)

Date Performed: 3/1/17-3/2/17

Boring No:2
Boring Location: A/C Parking Lot
3233-3321 S Thatcher Avenue, Los Angeles
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				0-5" Asphalt, 5-18" Base Artificial Fill (Af)			
2.5				Gravelly silty sand	Black	Medium dense	Moist
5	7/6/2	R		Gravelly silty sand, contains glass shards, scattered gravel, springs, concrete debris, asphalt debris	Orange brown	Medium dense	Moist
7.5	15/21		SPT	Gravelly silty sand	Black, brown	Medium dense	Moist
10	5/6/9	R		Ground Water At 9'bgs Silty sand Quaternary Alluvium (Qa)	Dark gray	Medium dense	Wet
12.5	9/13		SPT	Silty sand	Gray, blue gray	Medium dense	Wet
15	5/5/6	R		Silty sand, gravelly silty sand, poorly sortrd	Dark gray, blue gray	Medium dense	Wet
17.5	19/25		SPT	Gravelly silty sand	Dark gray, blue gray	Medium dense	Wet
20	10/15/18	R		Gravelly silty sand	Dark gray, blue gray	Medium dense	Wet
22.5	20/50 For 6"		SPT	Gravelly silty sand	Orange brown	Dense	Wet
25	15/2/24	R		Gravelly silty sand	Orange brown	Dense	Wet
27.5	26/40		SPT	Silty sand and gravelly silty sand	Orange brown	Dense	Moist
30	19/26/30	R		Silty sand and gravelly silty sand	Orange brown, gray brown	Dense	Moist
32.5	39		SPT	Silty sand	Brown, gray brown	Dense	Moist
35	29/50 For 6"	R		Silty sand and gravelly silty sand	Gray, orange brown	Dense	Moist
37.5	40/50 For 6"		SPT	Silty sand	Gray brown	Dense	Moist
40							

LOG OF EXPLORATORY BORING

Job Number: 1925-74
Project:Thatcher Avenue (Thomas Safran & Associates)

Date Performed: 3/1/17-3/2/17

Boring No:2
Boring Location: A/C Parking Lot
3233-3321 S Thatcher Avenue, Los Angeles
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	15/19/24	R		Silty sand	Gray brown, orange brown	Dense	Moist
42.5	36/48		SPT	Silty sand	Gray	Dense	Moist
45	20/40/50 For 6”	R		Silty sand	Blue gray,	Dense	Moist
47.5	28/42		SPT	Silty sand	Blue gray	Dense	Moist
50	17/25/32	R		Silty sand	Blue gray	Dense	Moist
52.5	30/45		SPT	Silty sand-no recovery	Blue gray	Dense	Moist
55	20/50 For 6”	R		Silty sand	Blue gray	Dense	Moist
57.5	39/50 For 6”		SPT	Silty sand, poorly sorted sand grains are coarser	Blue gray	Dense	Moist
60	18/29/40	R		Silty sand, poorly sorted sand grains are coarser	Blue gray	Dense	Moist
				End At 61.5’, Artificial Fill To 12.0’, Ground Water At 8’, No Caving			
65							
70							
75							
80							

LOG OF EXPLORATORY BORING

Job Number: 1925-74
Project:Thatcher Avenue (Thomas Safran & Associates)

Date Performed: 3/1/17-3/2/17

Boring No:3
Boring Location: A/C Parking Lot
3233-3321 S Thatcher Avenue, Los Angeles
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				0-8" Asphalt, 8-11" Base Artificial Fill (Af)			
2.5				Gravelly silty sand, contains asphalt debris, strong hydrocarbon odor	Black	Medium dense	Moist
5	5/8	R		Silty sand, contains wood fragments	Black, dark gray	Medium dense	Moist
7.5							
10	6/10	R		Ground Water At 9'bgs Silty sand, contains scattered debris, metal fragments	Black, dark gray	Medium dense	Wet
12.5				Quaternary Alluvium (Qa)			
15				No recovery			
17.5							
20	16/25	R		Gravelly silty sand	Brown, black	Medium dense	Wet
22.5							
25	19/30	R		Gravelly silty sand	Gray, orange brown	Medium dense	Very moist
27.5							
30	25/48	R		Gravelly silty sand, silty sand	Tan, yellow brown	Medium dense	Moist
32.5				End 31.5', Artificial Fill To 12', Ground Water At 9', No Caving			
35							
37.5							
40							

LOG OF EXPLORATORY BORING

Job Number: 1925-74
Project:Thatcher Avenue (Thomas Safran & Associates)

Date Performed: 3/1/17-3/2/17

Boring No:4
Boring Location: A/C Parking Lot
3233-3321 S Thatcher Avenue, Los Angeles
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				0-3" Asphalt, 3-6" Base Artificial Fill (Af):Sandy silt	Dark brown	Medium dense	Moist
2.5				Quaternary Alluvium (Qa):			
5	7/9	R		Clayey sandy silt, contains scattered gravel	Orange brown	Dense	Very moist
7.5							
10	8/12	R		Ground Water At 9'bgs Gravelly silty sand	Orange brown	Medium dense	Wet
12.5							
15	9/14	R		Gravelly silty sand	Orange brown	Medium dense	Wet
17.5							
20	20/35	R		Gravelly silty sand and silty sand	Orange brown, gray	Medium dense	Very moist
22.5							
25	25/40	R		Silty sand, sandy silt	Gray, orange brown	Dense	Moist
27.5							
30	28/50 For 6"	R		Gravelly silty sand	Tan, gray	Dense	Very moist
32.5				End 31.5', Artificial Fill To 2', Ground Water At 9', No Caving			
35							
37.5							
40							

Feffer Geological Consulting

Figure

LOG OF EXPLORATORY BORING

Job Number: 1925-74
Project:Thatcher Avenue (Thomas Safran & Associates)

Date Performed: 3/1/17-3/2/17

Boring No:5
Boring Location: A/C Parking Lot
3233-3321 S Thatcher Avenue, Los Angeles
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				0-9" Asphalt, No Base Artificial Fill (Af): Gravelly silty sand	Dark brown, black	Medium dense	Moist
2.5				Quaternary Alluvium (Qa):			
5	9/12	R		Silty clay, silty sand, contains scattered gravel	Gray brown, orange brown	Firm, medium dense	Moist
7.5							
10	6/10	R		Ground Water At 9'bgs Gravelly silty sand, silty sand	Orange brown, gray brown	Medium dense	Wet
12.5							
15	16/30	R		Gravelly silt	Orange brown	Medium dense	Wet
17.5							
20	16/25	R		Silty sand, sandy silt	Tan, gray	Medium dense	Very moist
22.5							
25	10/29	R		Silty sand, sandy silt	Tan, gray	Medium dense	Very moist
27.5							
30	25/38	R		Silty sand	Tan, gray	Medium dense	Moist
32.5				End 31.5', Artificial Fill To 2', Ground Water At 9', No Caving			
35							
37.5							
40							

LOG OF EXPLORATORY BORING

Job Number: 1925-74
Project:Thatcher Avenue (Thomas Safran & Associates)

Date Performed: 3/1/17-3/2/17

Boring No:6
Boring Location: A/C Parking Lot
3233-3321 S Thatcher Avenue, Los Angeles
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				0-5" Asphalt, 5-8"Base Artificial Fill (Af) Gravelly silty sand	Dark brown, black	Medium dense	Moist
2.5				Quaternary Alluvium (Qa)			
5	9/12	R		Clayey sandy silt and gravelly silty sand	Gray brown	Medium dense	Moist
7.5							
10	6/10	R		Silty clay, silty sand	Orange brown, dark gray	Medium dense	Moist to very moist
12.5							
15	16/30	R		Gravelly silty sand	Gray brown, orange brown	Medium dense	Very moist
17.5							
20	16/25	R		Sandy silt, silty clay	Gray brown, orange brown	Dense	Moist
22.5							
25	10/29	R		Silty sand	Orange brown, gray brown	Dense	Moist
27.5							
30	25/38	R		Gravelly silty sand	Tan, gray brown	Dense	Woist
32.5				End 31.5', Artificial Fill To 2', Ground Water At 15', No Caving			
35							
37.5							
40							

APPENDIX 'B'

Laboratory Testing

TRANSMITTAL LETTER

DATE: March 29, 2017

ATTENTION: **Josh Feffer**

TO: Feffer Geological Consulting
1990 S. Bundy Drive, 4th Floor
Los Angeles, CA 90025

SUBJECT: Laboratory Test Data
Thatcher Avenue (TSA)
Your #2392, HDR Lab #17-0205LAB

COMMENTS: Enclosed are the results for the subject project.

James T. Keegan, MD
Laboratory Services Manager

Table 1 - Laboratory Tests on Soil Samples

Feffer Geological Consulting
Thatcher Avenue (TSA)
Your #2392, HDR Lab #17-0205LAB
29-Mar-17

Sample ID			
			B5 @ 4' Fill
Resistivity		**Units**	
as-received		ohm-cm	3,680,000
minimum		ohm-cm	1,880
pH			7.7
Electrical Conductivity		mS/cm	0.15
Chemical Analyses			
Cations			
calcium	Ca^{2+}	mg/kg	20
magnesium	Mg^{2+}	mg/kg	8.1
sodium	Na^{1+}	mg/kg	129
potassium	K^{1+}	mg/kg	7.1
Anions			
carbonate	CO_3^{2-}	mg/kg	14
bicarbonate	HCO_3^{1-}	mg/kg	308
fluoride	F^{1-}	mg/kg	4.7
chloride	Cl^{1-}	mg/kg	4.9
sulfate	SO_4^{2-}	mg/kg	58
phosphate	PO_4^{3-}	mg/kg	5.0
Other Tests			
ammonium	NH_4^{1+}	mg/kg	1.6
nitrate	NO_3^{1-}	mg/kg	6.2
sulfide	S^{2-}	qual	na
Redox		mV	na

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

431 West Baseline Road · Claremont, CA 91711
Phone: 909.962.5485 · Fax: 909.626.3316

SOIL LABWORKS LLC

SL17.2392
March 27, 2017

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

Attn: Joshua R. Feffer

Subject: Laboratory Testing

Site: 3233-3321 Thatcher Avenue
Los Angeles, California

Job: FEFFER/THATCHER AVE -1925-74

Laboratory testing for the subject property was performed by Soil Labworks, LLC., under the supervision of the undersigned Engineer. 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

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 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. 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)
B1	5	Alluvium	114.1	16.6	98
B1	10	Alluvium	119.2	13.9	95
B1	15	Alluvium	124.2	10.6	84
B1	20	Alluvium	97.3	26.9	100
B1	25	Alluvium	94.8	28.6	100
B1	30	Alluvium	101.5	25.9	100
B1	35	Alluvium	103.3	23.8	100
B1	40	Alluvium	104.8	21.2	97
B1	45	Alluvium	90.4	31.0	99
B1	50	Alluvium	100.8	24.9	100
B1	55	Alluvium	100.9	24.8	100
B1	60	Alluvium	97.3	27.1	100

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

Moisture Density (continued)

Test Pit/Boring No.	Sample Depth (Feet)	Soil Type	Dry Density (pcf)	Moisture Content (percent)	Percent Saturation (G_s=2.65)
B2	7½	Fill	99.8	21.4	86
B2	12½	Fill	115.1	15.8	96
B2	17½	Fill	123.2	10.3	80
B2	22½	Alluvium	138.1	6.6	89
B2	27½	Alluvium	109.3	21.3	100
B2	30	Alluvium	122.3	12.0	90
B2	32½	Alluvium	107.0	19.7	96
B2	37½	Alluvium	121.4	13.3	97
B2	42½	Alluvium	95.2	28.8	100
B2	27½	Alluvium	104.5	19.9	91
B2	57½	Alluvium	122.9	13.4	100
B3	5	Fill	93.8	8.5	30
B3	10	Fill	104.7	20.0	91
B3	25	Alluvium	122.3	13.8	77
B3	30	Alluvium	110.7	19.0	100
B4	5	Alluvium	108.3	17.1	86
B4	10	Alluvium	113.9	10.6	62
B4	15	Alluvium	118.6	15.3	100
B4	20	Alluvium	110.1	17.5	96
B4	25	Alluvium	104.2	23.5	100
B4	30	Alluvium	123.8	10.6	84
B5	5	Alluvium	110.0	12.2	64
B5	10	Alluvium	104.4	20.6	94
B5	15	Alluvium	127.2	10.3	91
B5	20	Alluvium	100.3	24.1	99
B5	25	Alluvium	95.9	27.9	100
B6	5	Alluvium	117.1	4.4	28
B6	10	Alluvium	110.9	17.7	95
B6	15	Alluvium	125.7	9.0	76
B6	20	Alluvium	96.5	26.6	99
B6	25	Alluvium	105.7	22.2	100
B6	30	Alluvium	119.5	13.5	93

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 was estimated from the compaction curves.

Test Pit/Boring No.	Sample Depth (Feet)	Soil Type	Maximum Dry Density (pcf)	Optimum Moisture Content (Percent)
B5	4	Fill	124.5	9.5

Shear Strength

The peak and ultimate shear strengths of the 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. 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)
B6	5	117.1	20.1
B1	10	119.2	16.9

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.

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
B1	25	Alluvium	56	23	33

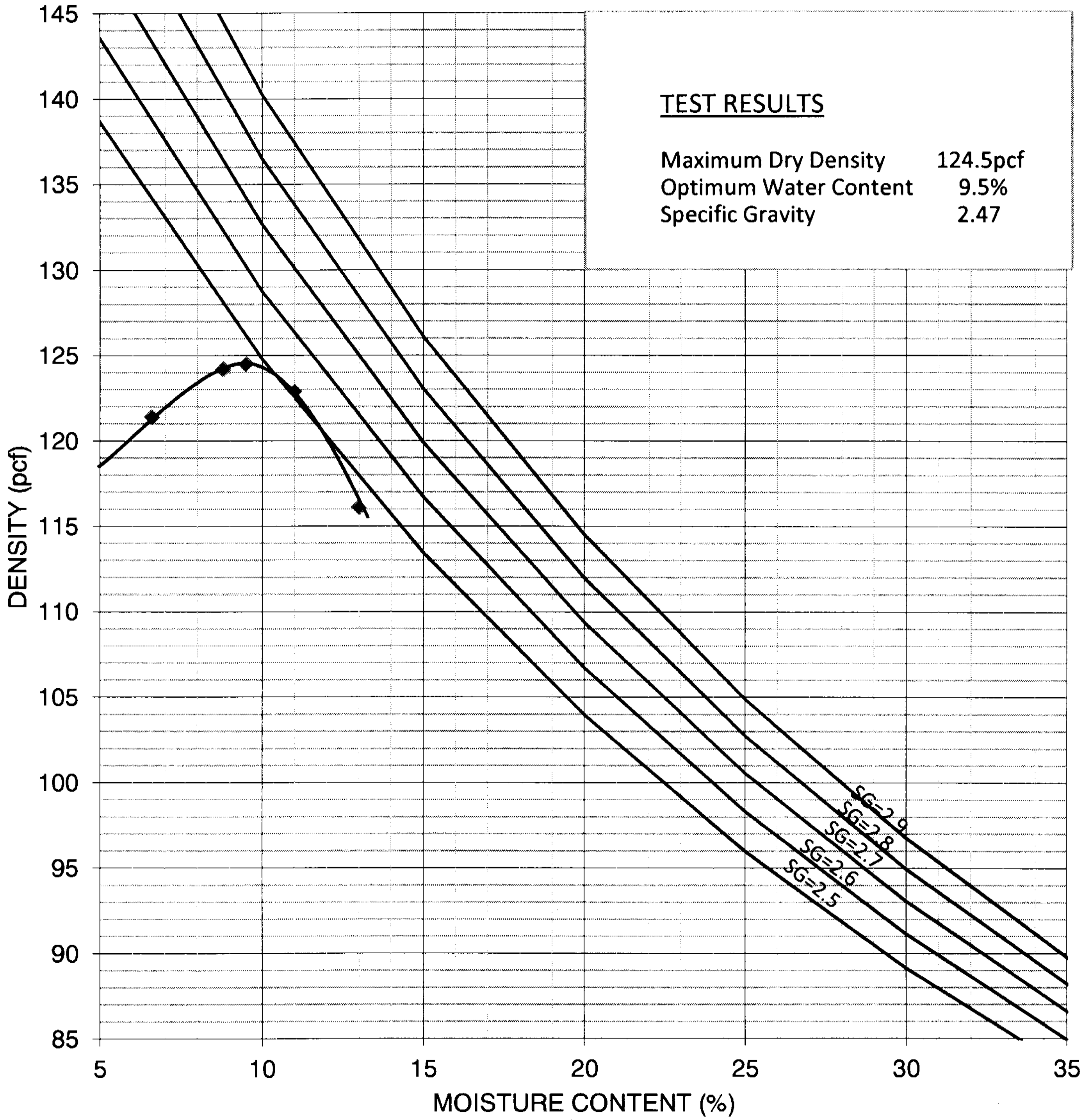
Grain Size Distribution

The amount of material in the soil finer than 1 No. 200 sieve was determined on selected samples in conformance with ASTM D1140-14. 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
B1	7½	Alluvium	17.5
B2	15	Alluvium	40.7
B2	35	Alluvium	7.1
B1	40	Alluvium	15.3

SOIL LABWORKS LLC	**MOISTURE-DENSITY RELATIONSHIP A-1**
	JN: **SL17.2392** CONSULTANT: **JAI** CLIENT: **Feffer/3233-3321 Thatcher Avenue** **B5 @ 4'** EARTH MATERIAL: **FILL**

NOTE: ASTM Test Method D-1557-12



TEST RESULTS

Maximum Dry Density	124.5pcf
Optimum Water Content	9.5%
Specific Gravity	2.47

SHEAR DIAGRAM B-1

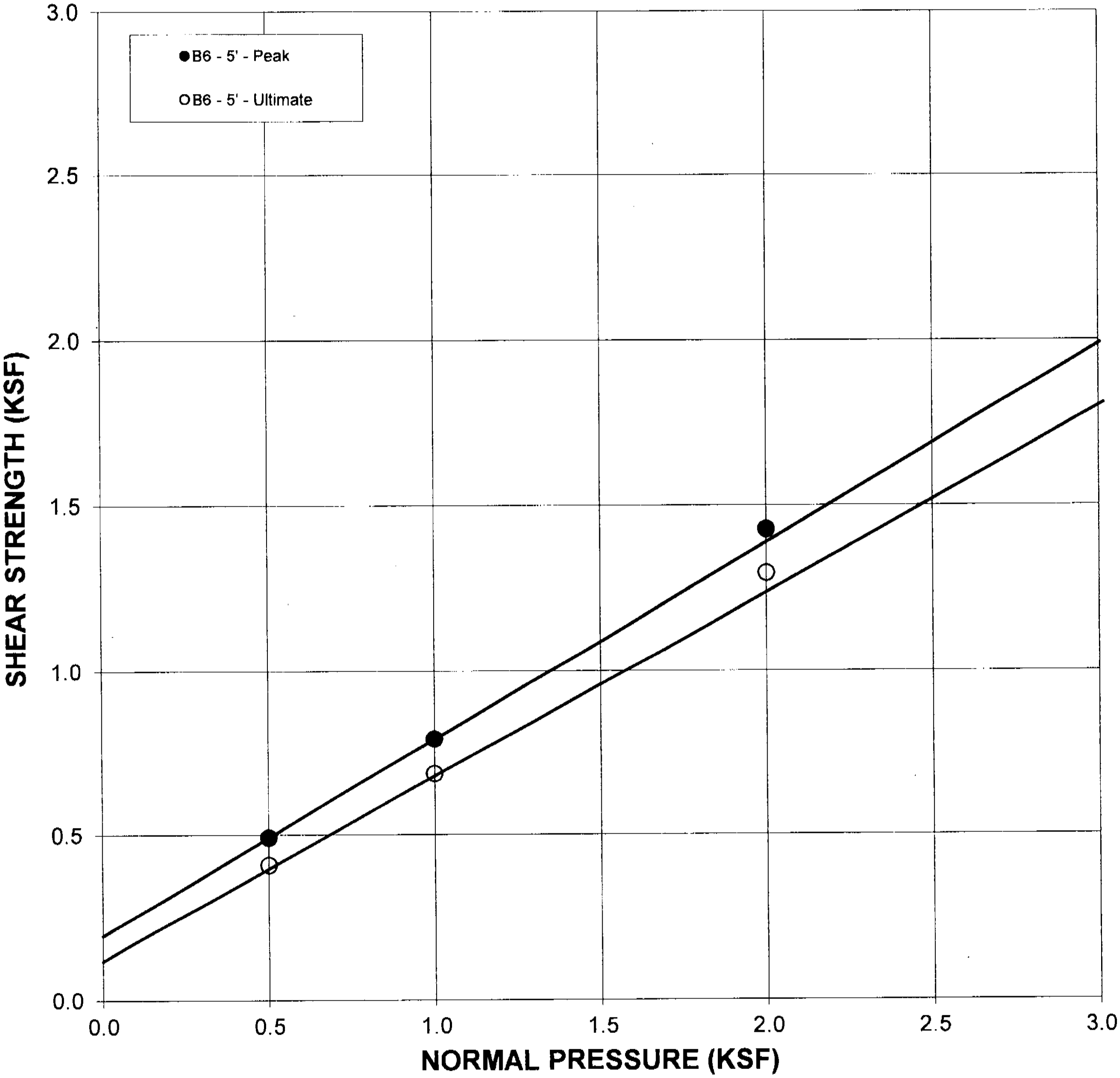
JN: **SL17.2392** CONSULTANT **JAI**
CLIENT: **Feffer/3233-3321 Thatcher Avenue**

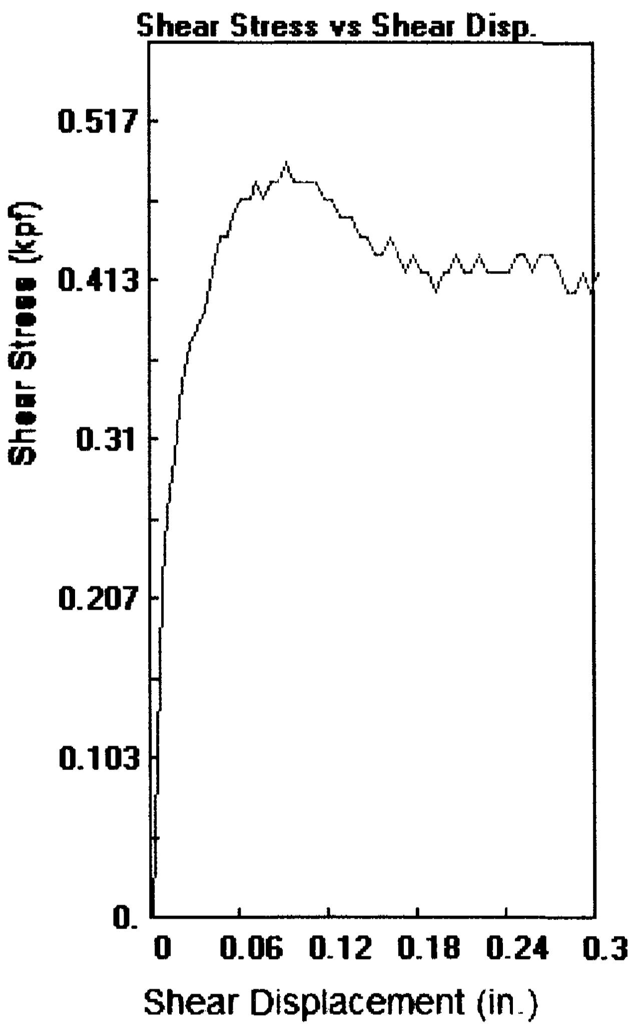
EARTH MATERIAL: **ALLLUVIUM**

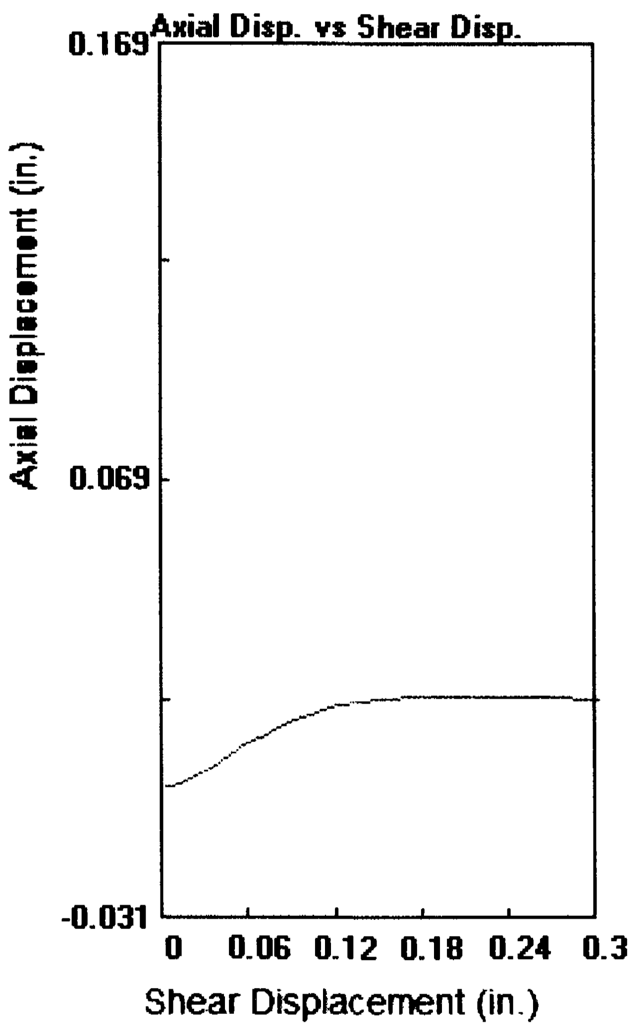
	PEAK	ULTIMATE	
Phi Angle	30.5	28	degrees
Cohesion	190	135	psf

Average Moisture Content	20.1%
Average Dry Density (pcf)	117.1
Percent Saturation	100.0%

DIRECT SHEAR TEST - ASTM D-3080







Parameters

Client: FEFFER/THATCHER

Location: 3233-3321 S THATCHER AVE

Job # 2392

Sample: 1

Boring: B6

Depth: 5 ft.

File: 2392B655.dat

Stress at Max Def
492 0.091

Soil Type:QA

Technician: BF

Axial Load: 500 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 408

Maximum Load

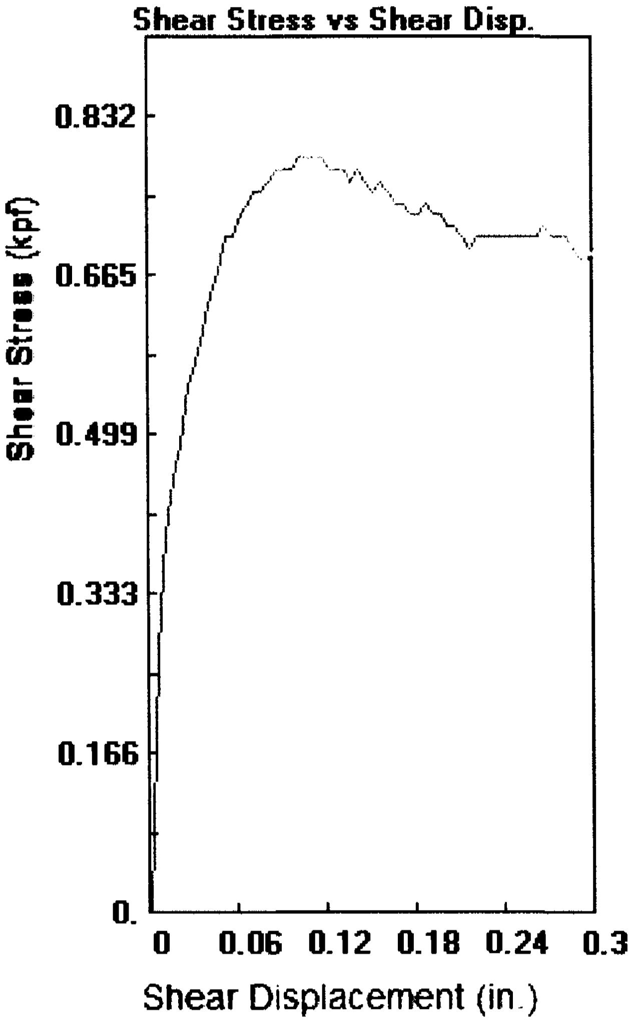
492 psf

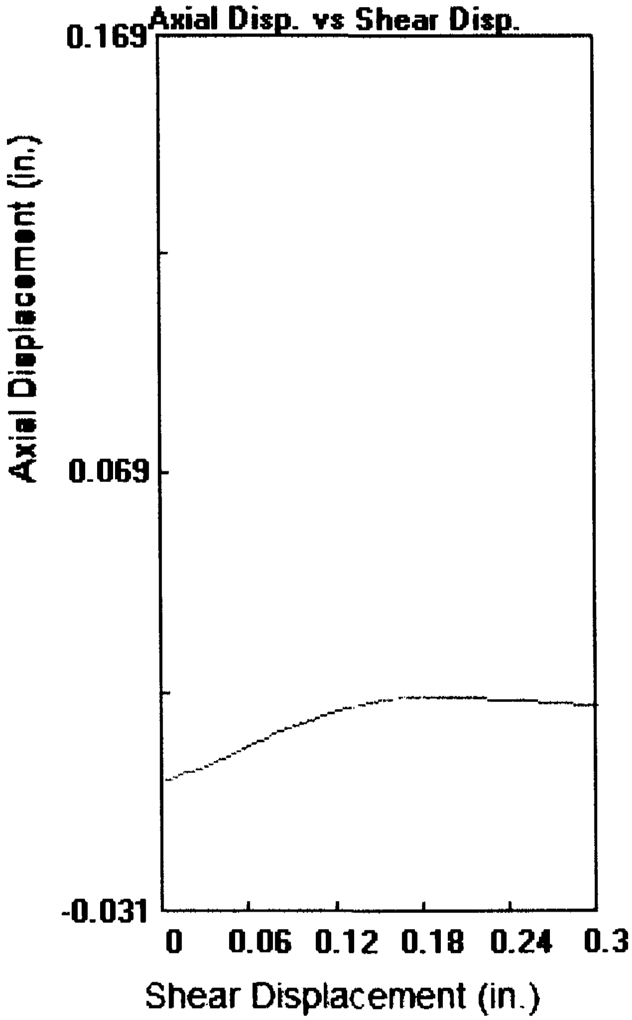
Shear Displacement at maximum Load

0.0906 in.

Date
3/22/2017

Soil Labworks





Parameters

Client: FEFFER/THATCHER

Location: 3233-3321 S THATCHER AVE

Job # 2392

Sample: 2

Boring: B6

Depth: 5 ft.

File: 2392B651.dat

Stress at Max Def
792 0.101

Soil Type:QA

Technician: BF

Axial Load: 500 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 684

Maximum Load

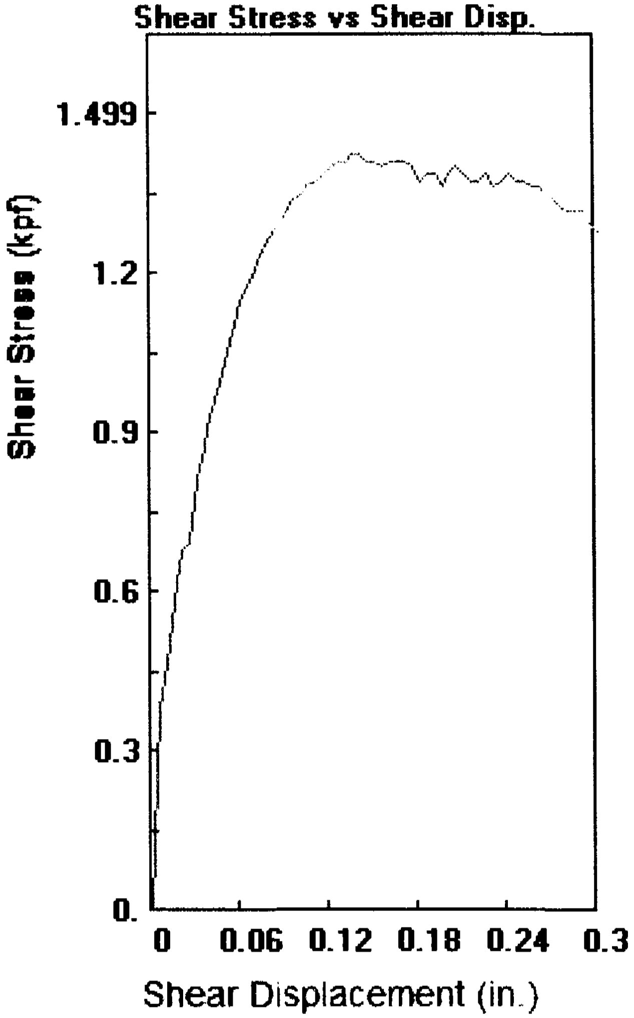
792 psf

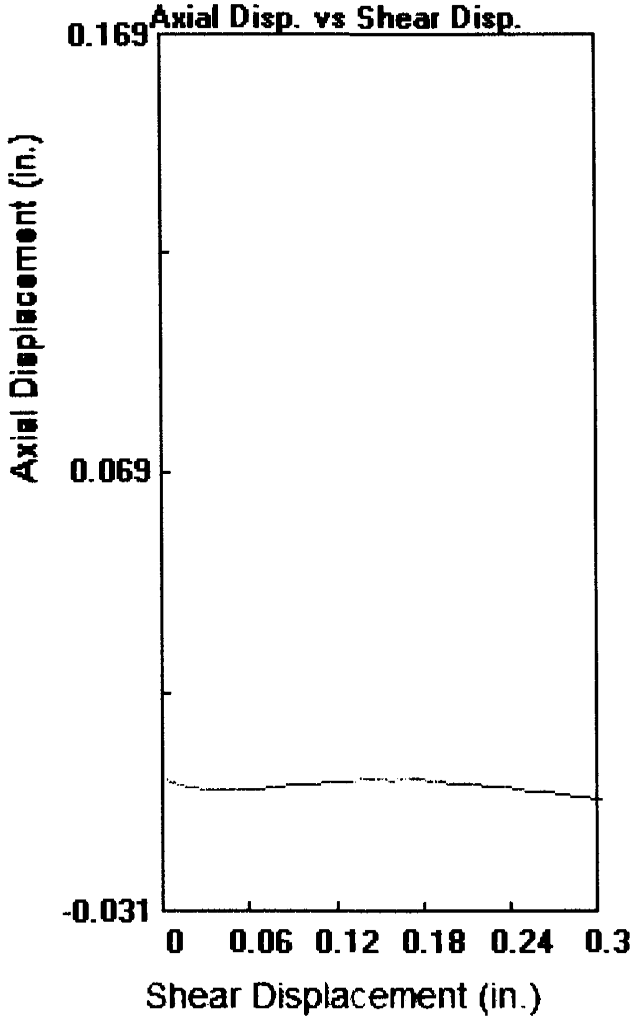
Shear Displacement at maximum Load

0.1005 in.

Date
3/22/2017

Soil Labworks





Parameters

Client: FEFFER/THATCHER

Location: 3233-3321 S THATCHER AVE

Job # 2392

Sample: 3

Boring: B6

Depth: 5 ft.

File: 2392B652.dat

Stress at Max Def
1428 0.136

Soil Type:QA

Technician: BF

Axial Load: 2000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 1296

Maximum Load

1428 psf

Shear Displacement at maximum Load

0.1357 in.

Date
3/22/2017

Soil Labworks

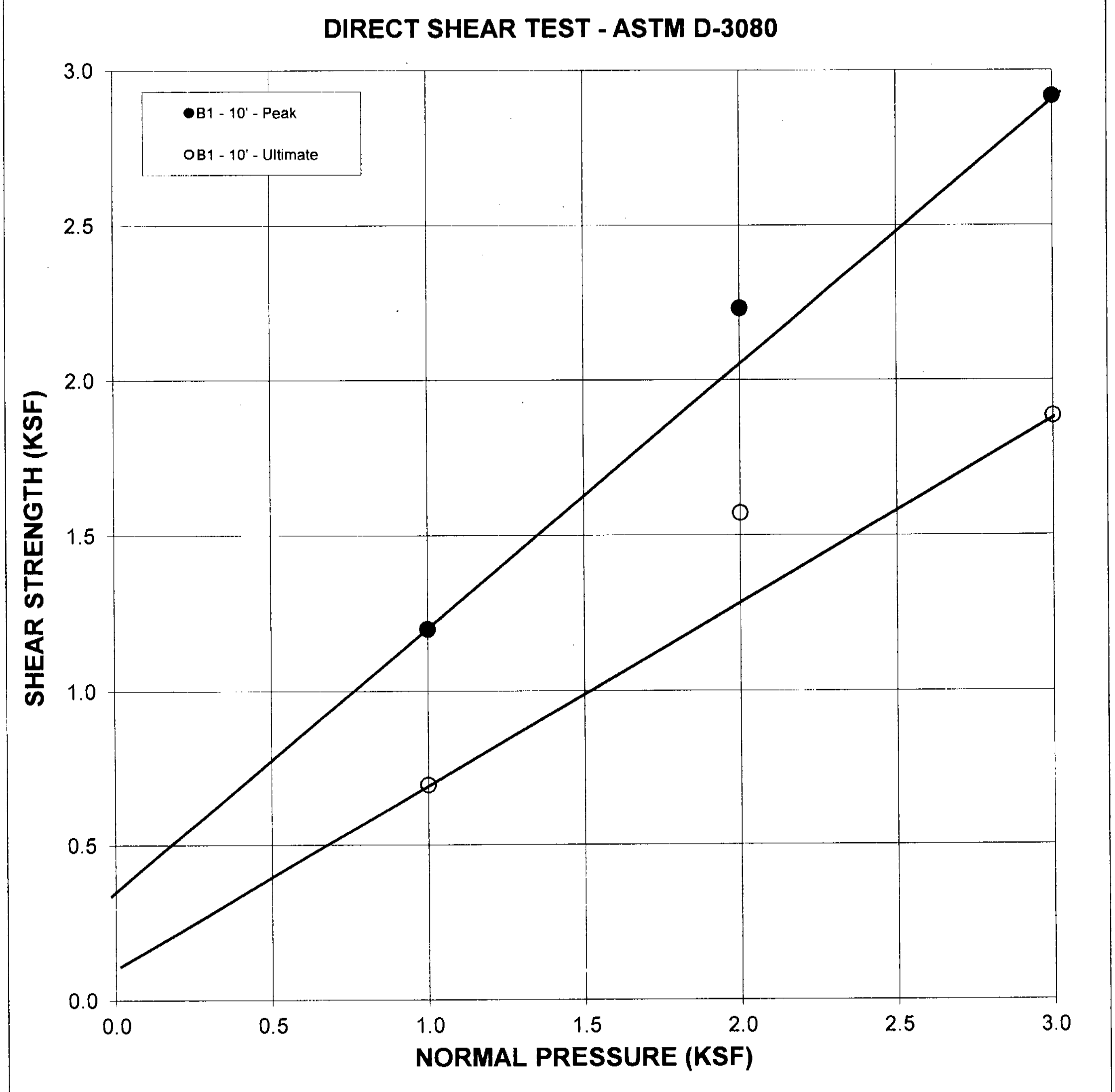
SHEAR DIAGRAM B-2

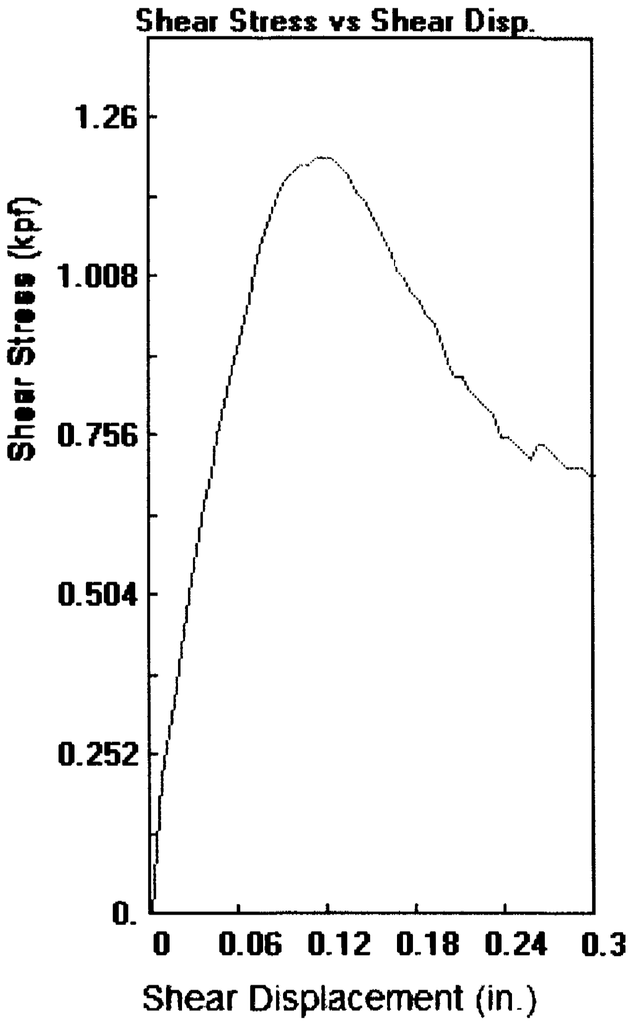
JN: **SL17.2392** CONSULTANT **JAI**
CLIENT: **Feffer/3233-3321 Thatcher Avenue**

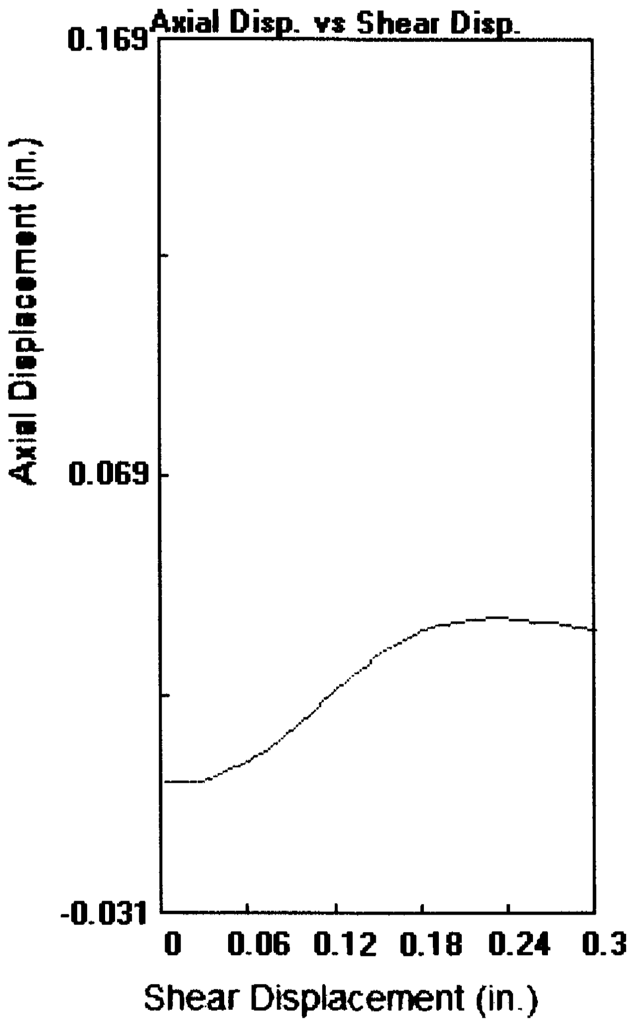
EARTH MATERIAL: **ALLLUVIUM**

	PEAK	ULTIMATE	
Phi Angle	40	30	degrees
Cohesion	340	195	psf

Average Moisture Content	16.9%
Average Dry Density (pcf)	119.2
Percent Saturation	100.0%







Parameters

Client: FEFFER/THATCHER

Location: 3233-3321 S THATCHER AVE

Job # 2392

Sample: 1

Boring: B1

Depth: 10 ft.

File: 2392B1101.dat

Stress at Max Def
1200 0.111

Soil Type:QA

Technician: BF

Axial Load: 1000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 696

Maximum Load

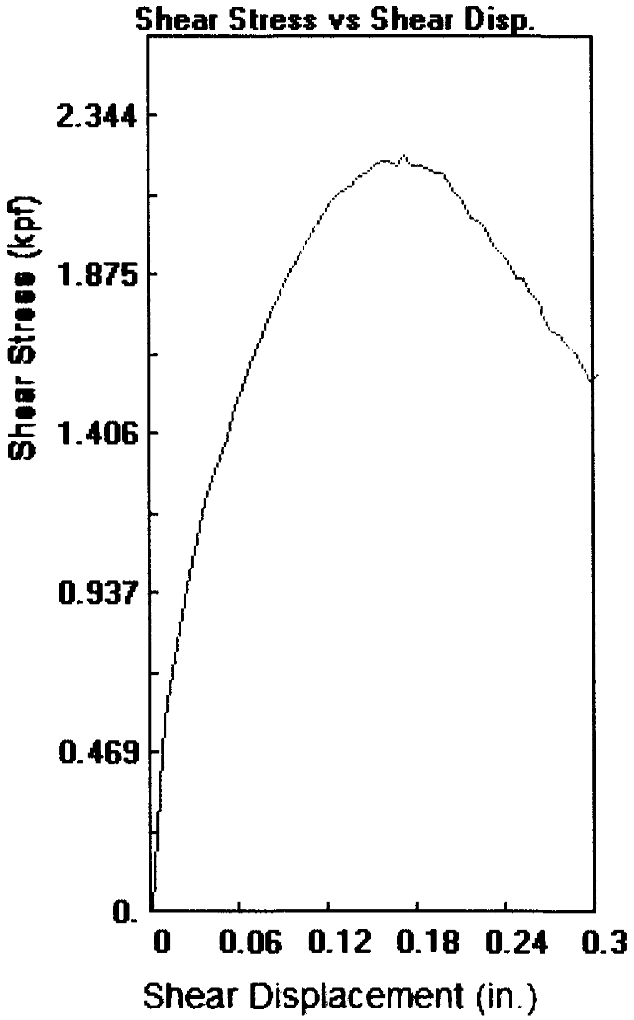
1200 psf

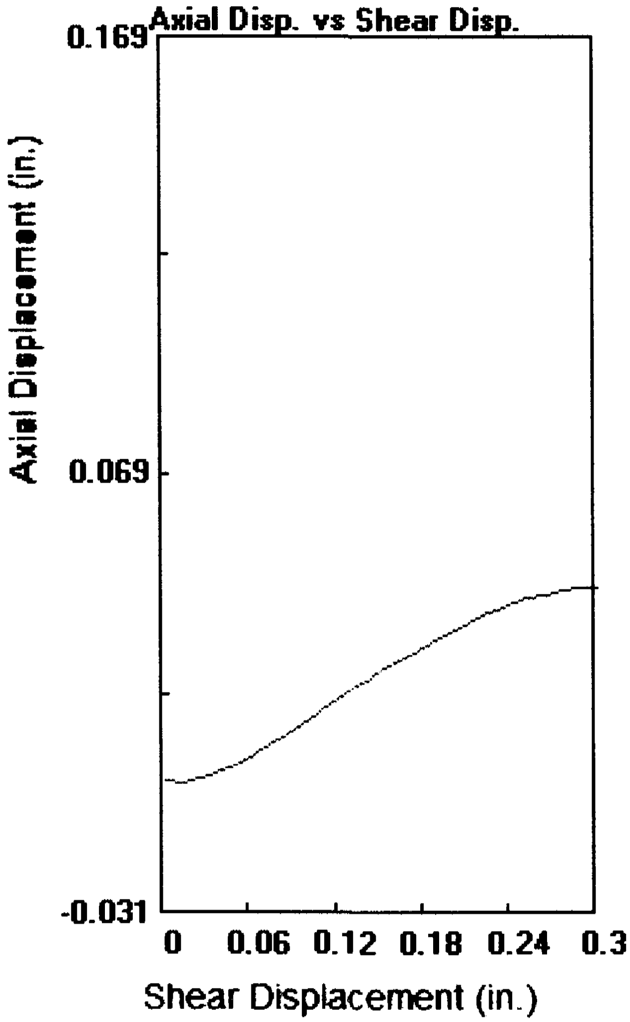
Shear Displacement at maximum Load

0.1105 in.

Date
3/22/2017

Soil Labworks





Parameters

Client: FEFFER/THATCHER

Location: 3233-3321 S THATCHER AVE

Job # 2392

Sample: 2

Boring: B1

Depth: 10 ft.

File: 2392B1102.dat

Stress at Max Def
2232 0.171

Soil Type:QA

Technician: BF

Axial Load: 2000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 1572

Maximum Load

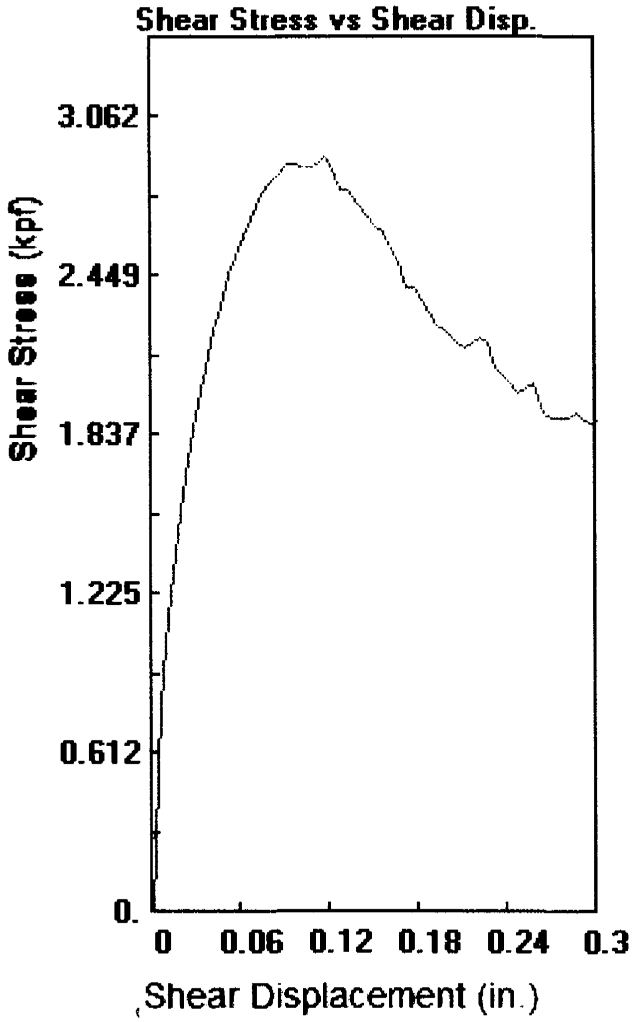
2232 psf

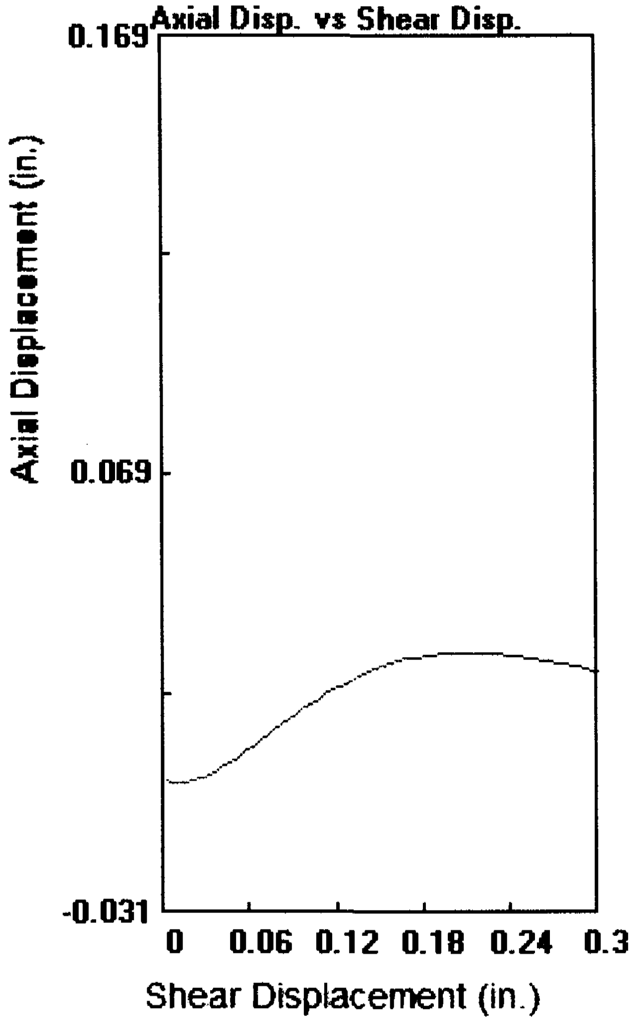
Shear Displacement at maximum Load

0.1708 in.

Date
3/22/2017

Soil Labworks





Parameters

Client: FEFFER/THATCHER

Location: 3233-3321 S THATCHER AVE

Job # 2392

Sample: 3

Boring: B1

Depth: 10 ft.

File: 2392B1103.dat

Stress at Max Def
2916 0.116

Soil Type:QA

Technician: BF

Axial Load: 3000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Disp
0.296 1884

Maximum Load

2916 psf

Shear Displacement at maximum Load

0.1157 in.

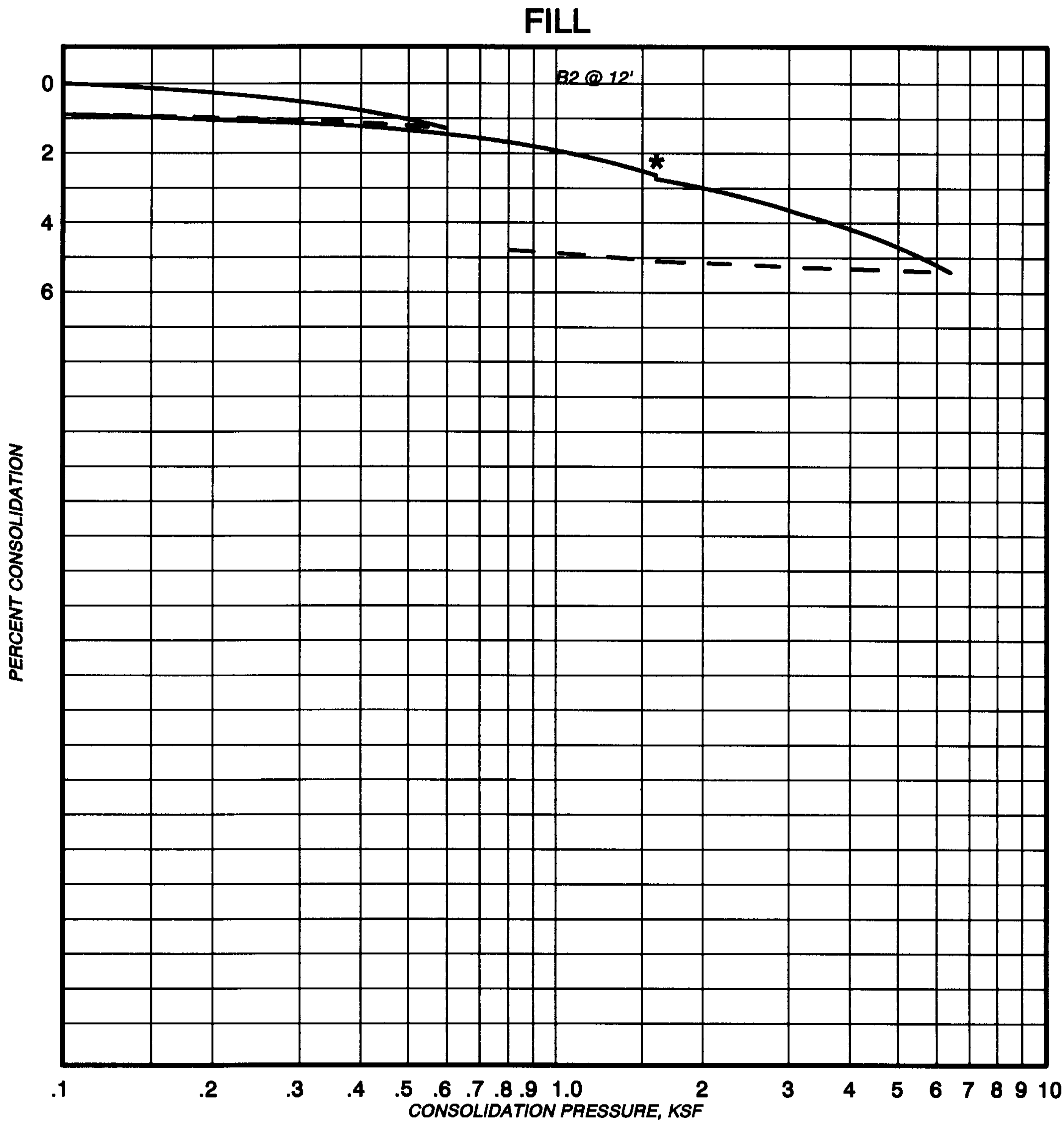
Date
3/22/2017

Soil Labworks

CONSOLIDATION TEST

PROJECT: 2392 FEFFER/3233-3321 S THATCHER AVENUE

SAMPLE: B2 @ 12'



* Water Added

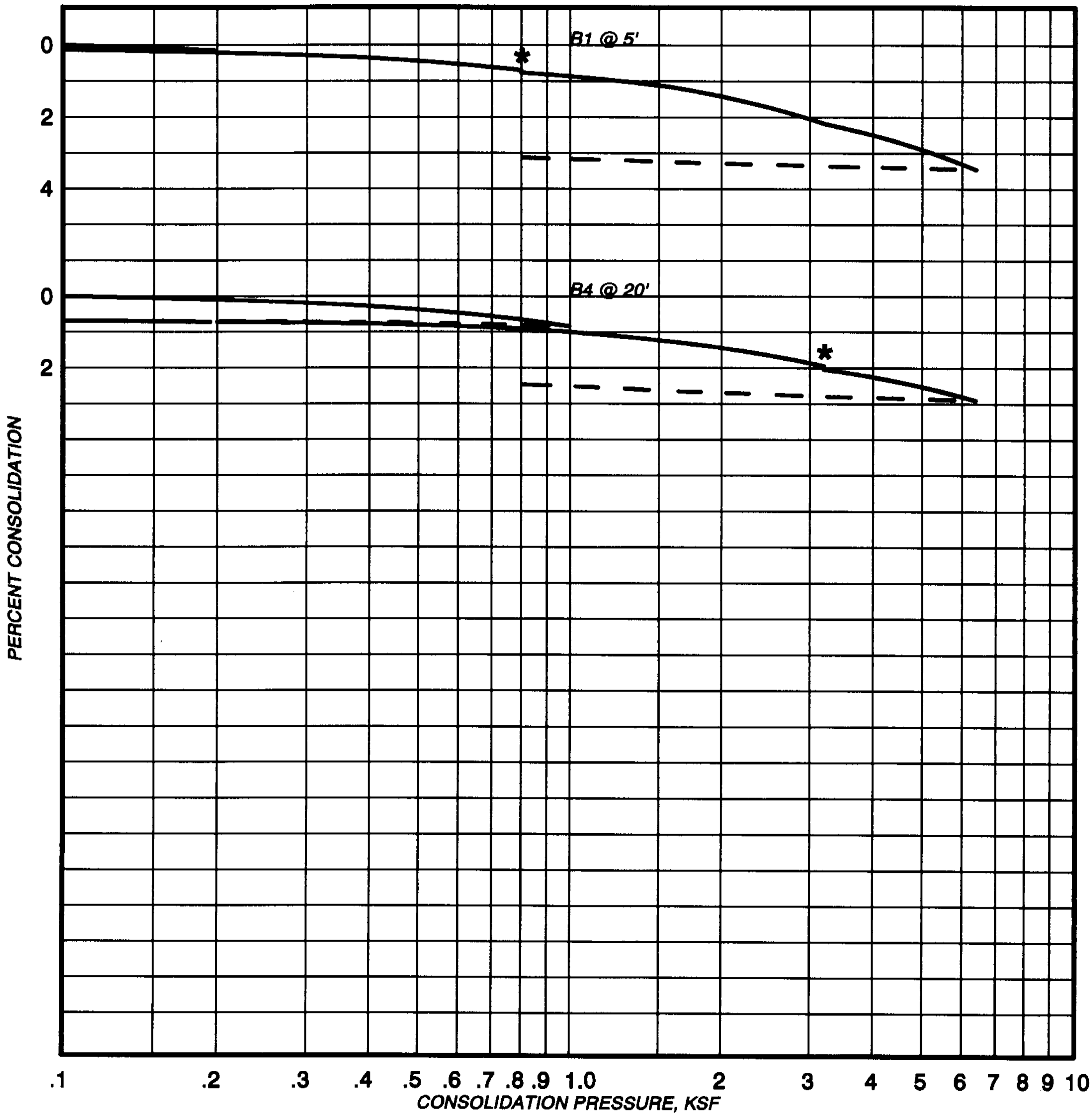
PLATE:

CONSOLIDATION TEST

PROJECT: 2392 FEFFER/3233-3321 S THATCHER AVENUE

SAMPLES: B1 @ 5'; B4 @ 20'

ALLUVIUM



* Water Added

PLATE:

File No.: SL17.2392 April 6, 2017

PLASTICITY INDEX

ASTM D-4318

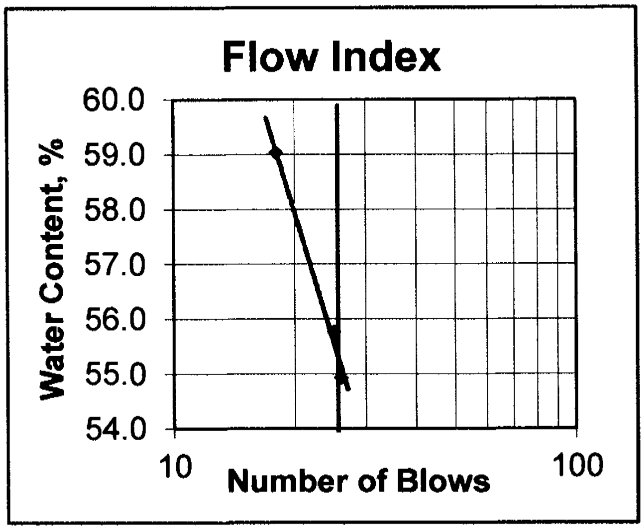
Job Name: Feffer/3233-3321 Thatcher Ave
Sample ID: B1 @ 25
Soil Description: CL

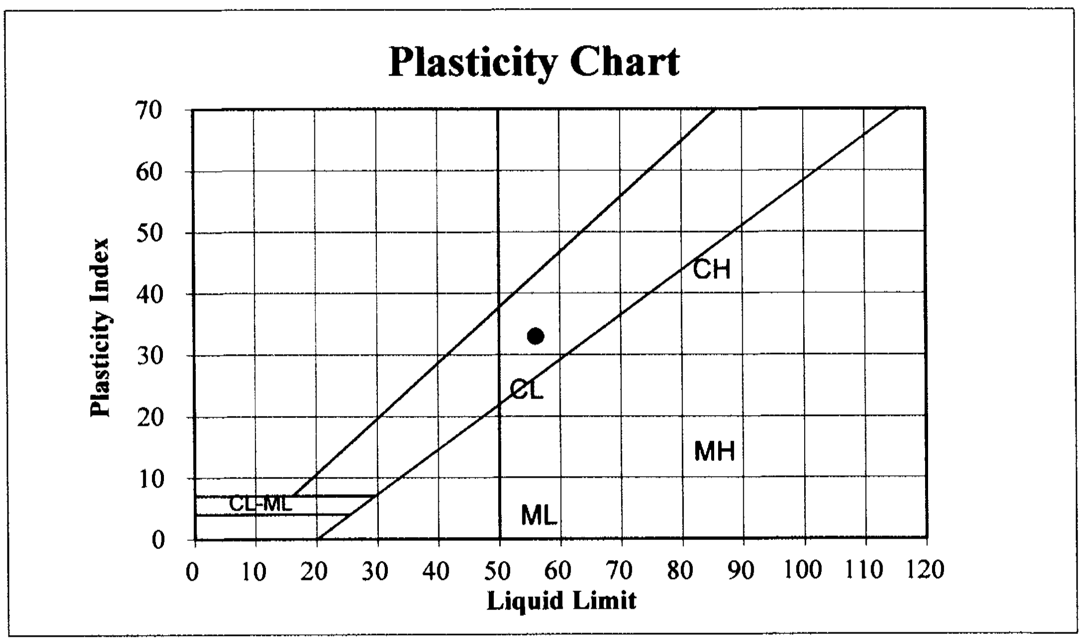
DATA SUMMARY

Number of Blows:	18	25	26
Water Content, %	59.0	55.8	54.9
Plastic Limit:	23.0	23.5	

TEST RESULTS

LIQUID LIMIT	**56**
PLASTIC LIMIT	**23**
PLASTICITY INDEX	**33**





APPENDIX ‘C’

Site Plan
&
Cross Sections

A.L.T.A. / N.S.P.S. LAND TITLE SURVEY

LEGAL DESCRIPTION:

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

THAT PORTION OF THE 14 ACRE TRACT OF LAND IN THE RANCHO LA BALLONA, IN THE CITY OF LOS ANGELES, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, ALLOTTED TO ANDRES MACHADO BY THE FINAL DECREE OF PARTITION HAD IN CASE NO. 2000 OF THE DISTRICT COURT OF SAID COUNTY, LYING SOUTHEASTERLY OF TRACT NO. 9096, AS PER MAP RECORDED IN BOOK 120 PAGES 21 TO 23 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

EXCEPT THEREFROM THAT PORTION THEREOF CONVEYED TO THE CITY OF VENICE, BY DEED RECORDED IN BOOK 6048 PAGE 255 OF DEEDS.

ALSO EXCEPT THEREFROM THAT PORTION THEREOF LYING SOUTHERLY OF THE NORTHERLY LINE OF TRACT NO. 51374, IN SAID CITY, COUNTY AND STATE, AS PER MAP RECORDED IN BOOK 1215 PAGES 84 THROUGH 86 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

ASSESSOR'S PARCEL NUMBERS: 4229-002-901 & 4229-002-900

SURVEYOR'S NOTES:

1. DATE OF SURVEY: MARCH 2017
2. THIS SURVEY WAS PERFORMED IN ACCORDANCE WITH THE PRELIMINARY REPORT PREPARED BY COMMONWEALTH LAND TITLE COMPANY, FILE NO. 09192286-919-KRC-KRE, DATED DECEMBER 13, 2016.

   EASEMENTS PER SAID TITLE REPORT:

   ITEM 2

   PURPOSE: PUBLIC STREET
   RECORDING DATE: FEBRUARY 23, 1999
   RECORDING NO: 99-293589, OF OFFICIAL RECORDS
   AFFECTS: THAT PORTION OF SAID LAND AS DESCRIBED IN THE DOCUMENT ATTACHED HERETO.

   NOTE: ORDINANCE 124541, STREET DEDICATION FOR THATCHER AVENUE, WAS OMITTED FROM ABOVE SAID TITLE REPORT.
3. PROJECT ADDRESS: 3233 THATCHER AVE., MARINA DEL REY, CA 90292
4. SITE AREA: 115,759.83 SQ. FT., 2.6575 ACRES (GROSS)
   93,278.13 SQ. FT., 2.2.1414 ACRES (AFTER STREET DEDICATIONS)
5. BENCHMARK:
   B.M. NO.: 17-08578
   SPK W CURB THATCHER AVE, 1FT S/O BCR S/O WASHINGTON ST, 2FT N/O CB
   ELEV.= 11.982 (2000 ADJ.) (NAVD 1988)
6. UTILITY INFORMATION SHOWN HEREON IS PER RECORD DATA AND IS ONLY AS ACCURATE AS SAID DATA.
7. BASED ON THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, FEDERAL INSURANCE ADMINISTRATION FLOOD HAZARD BOUNDARY MAP, COMMUNITY NUMBER 060137, SHEET NUMBER 06037C1752F REVISED SEPTEMBER 26, 2008. THE SUBJECT PROPERTY IS LOCATED IN ZONE X, WHICH IS NOT LOCATED IN A DESIGNATED FLOOD ZONE AREA.
8. THERE IS NO EVIDENCE OF RECENT STREET AND SIDEWALK CONSTRUCTION OR REPAIRS.
9. THERE IS NO EVIDENCE OF RECENT ONSITE CONSTRUCTION
10. THERE ARE NO WETLANDS AS DEFINED BY APPROPRIATE AUTHORITIES.
11. THERE ARE NO CEMETERIES WITHIN 100 FEET OF THE PROPERTY.

CERTIFICATION:

TO:
THOMAS SAFRAN & ASSOCIATES, THE CITY OF LOS ANGELES, A MUNICIPAL CORP., AND COMMONWEALTH LAND TITLE COMPANY:

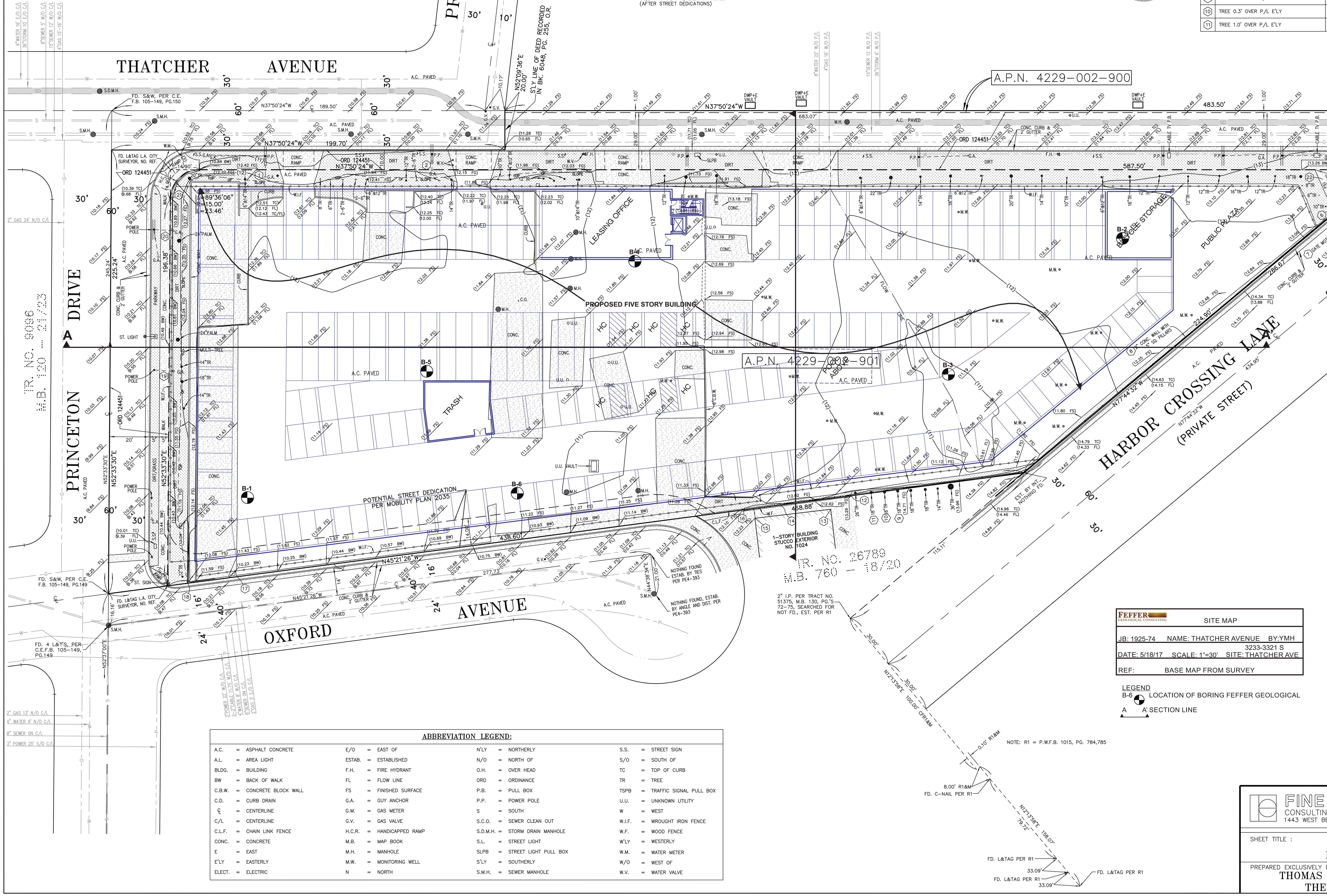
THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA AND NSPS, LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS. THE FIELD WORK WAS COMPLETED ON MARCH 15, 2017.

CHRISTOPHER CHAN, R.C.E. 30282 — DATE 4/3/17

REGISTERED PROFESSIONAL ENGINEER — CHRISTOPHER C. CHAN — 30282 — EXP. DATE 3-31-18 — CIVIL — STATE OF CALIFORNIA

ENCROACHMENT NOTES

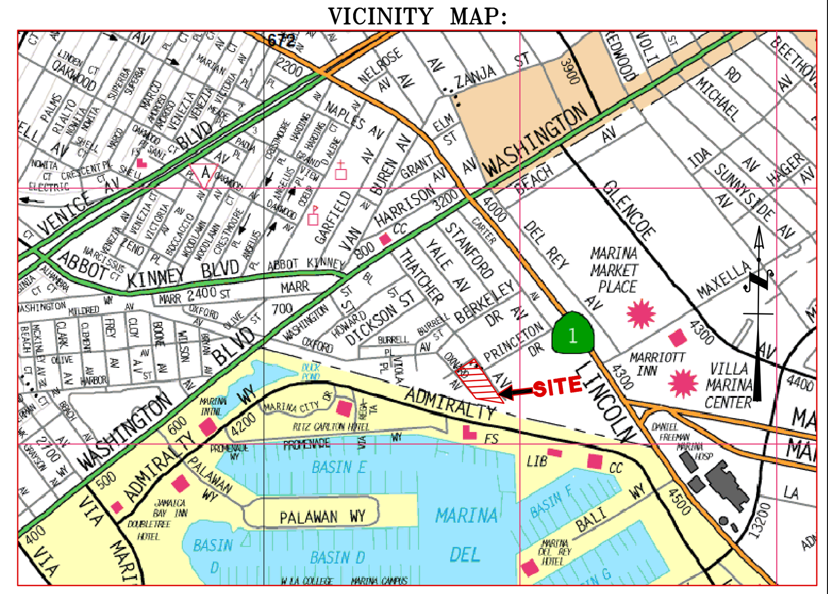
1	GUY ANCHOR 3.3' OVER ORD W'LY	12	FENCE 0.07' OVER P/L E'LY
2	GUY ANCHOR 0.1' OVER ORD W'LY	13	BLDG. 5.49' CLEAR OF P/L W'LY
3	STREET LIGHT ON P/L	14	W.F. CROSSES P/L
4	SLPB 0.24' OVER P/L N'LY	15	BLDG. 4.99' CLEAR OF P/L W'LY
5	SLPB 0.79' OVER P/L N'LY	16	W.F. 0.06' CLEAR OF P/L W'LY
6	PILLAR 0.71' OVER P/L N'LY	17	WALL 0.10' CLEAR OF P/L E'LY
7	GATE MOTOR 0.2' OVER P/L N'LY	18	WALL 0.06' CLEAR OF P/L E'LY
8	WALL 0.73' MAX. OVER P/L N'LY	19	GUY ANCHOR 2.3' OVER ORD S'LY
9	TREE 0.1' OVER P/L E'LY	20	GUY ANCHOR 1.6' OVER URD S'LY
10	TREE 0.3' OVER P/L E'LY	21	CURB 0.5' (MAX.) OVER ORD S'LY
11	TREE 1.0' OVER P/L E'LY	22	CONC. WALK, HANDICAP RAMP AND STREET IMPROVEMENTS CONSTRUCTED ON P.I.Q.



FEFFER GEOLOGICAL CONSULTING	SITE MAP	
JB: 1925-74	NAME: THATCHER AVENUE	BY:YMH
DATE: 5/18/17	SCALE: 1"=30'	SITE: 3233-3321 S THATCHER AVE
REF:	BASE MAP FROM SURVEY	

LEGEND
B-6 LOCATION OF BORING FEFFER GEOLOGICAL
A A' SECTION LINE

VICINITY MAP:



ABBREVIATION LEGEND:

A.C.	ASPHALT CONCRETE	E/O	EAST OF	N'LY	NORTHERLY	S.S.	STREET SIGN
A.L.	AREA LIGHT	ESTAB.	ESTABLISHED	N/O	NORTH OF	S/O	SOUTH OF
BLDG.	BUILDING	F.H.	FIRE HYDRANT	O.H.	OVER HEAD	TC	TOP OF CURB
BW	BACK OF WALK	FL	FLOW LINE	ORD	ORDINANCE	TR	TREE
C.B.W.	CONCRETE BLOCK WALL	FS	FINISHED SURFACE	P.B.	PULL BOX	TSPB	TRAFFIC SIGNAL PULL BOX
C.D.	CURB DRAIN	G.A.	GUY ANCHOR	P.P.	POWER POLE	U.U.	UNKNOWN UTILITY
℄	CENTERLINE	G.M.	GAS METER	S	SOUTH	W	WEST
C/L	CENTERLINE	G.V.	GAS VALVE	S.C.O.	SEWER CLEAN OUT	W.I.F.	WROUGHT IRON FENCE
C.L.F.	CHAIN LINK FENCE	H.C.R.	HANDICAPPED RAMP	S.D.M.H.	STORM DRAIN MANHOLE	W.F.	WOOD FENCE
CONC.	CONCRETE	M.B.	MAP BOOK	S.L.	STREET LIGHT	W'LY	WESTERLY
E	EAST	M.H.	MANHOLE	SLPB	STREET LIGHT PULL BOX	W.M.	WATER METER
E'LY	EASTERLY	M.W.	MONITORING WELL	S'LY	SOUTHERLY	W/O	WEST OF
ELECT.	ELECTRIC	N	NORTH	S.M.H.	SEWER MANHOLE	W.V.	WATER VALVE

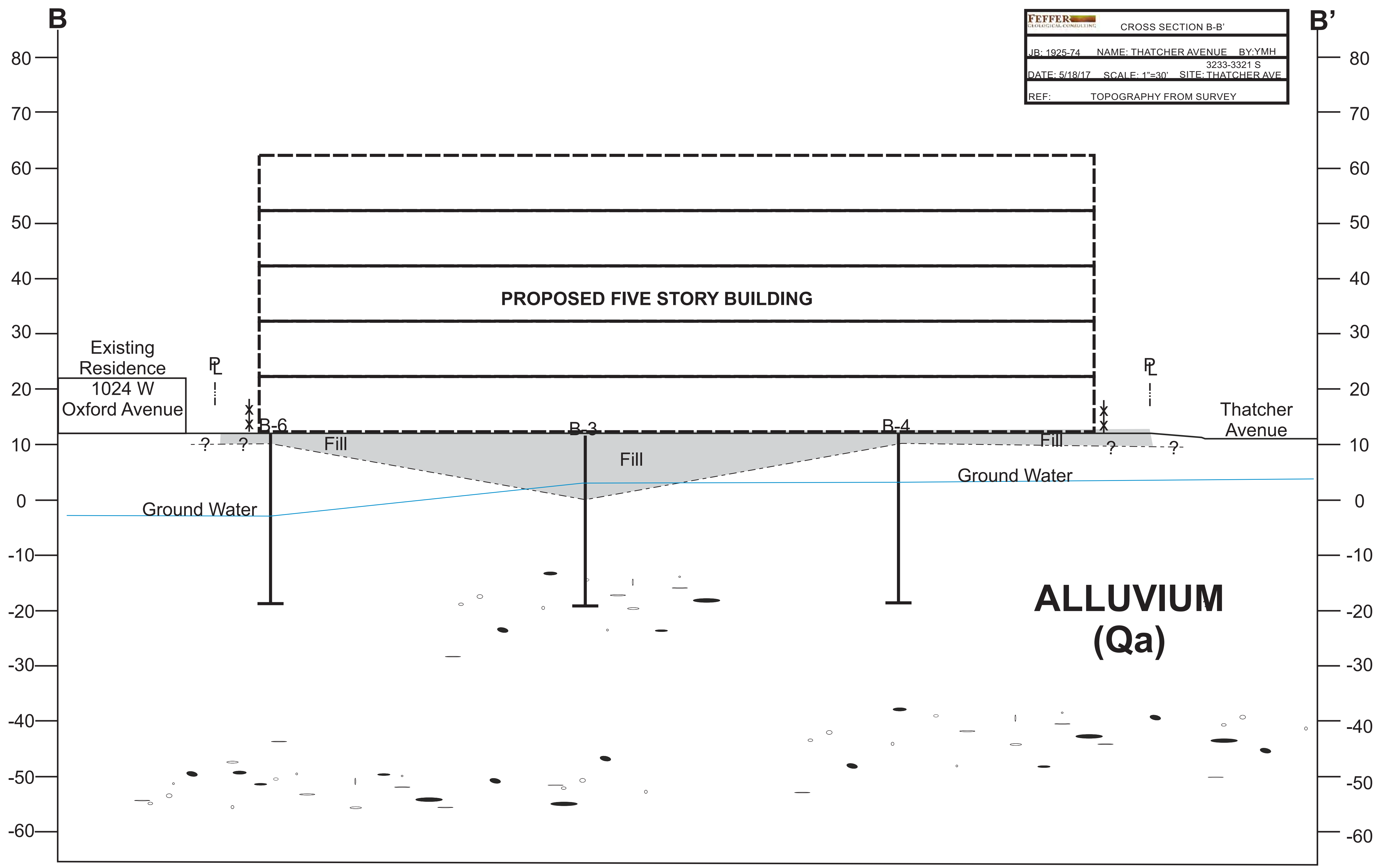
FINE LINE SYSTEMS
CONSULTING CIVIL ENGINEERS
1443 WEST BEVERLY BLVD., MONTEBELLO, CA 90640 (323) 726-3388

SHEET TITLE : A.L.T.A. / N.S.P.S. LAND TITLE SURVEY

PREPARED EXCLUSIVELY FOR : THOMAS SAFRAN AND ASSOCIATES & THE CITY OF LOS ANGELES

JOB NO. : 1618
DATE : APRIL 2017
SCALE : 1" = 20'
DESIGNED BY : CCC
DRAWN BY : BG & JG
SHEET 1 OF 1

A
A'
FEFFER GEOLOGICAL CONSULTING
CROSS SECTION A-A'
JB: 1925-74 NAME: THATCHER AVENUE BY:YMH
DATE: 5/18/17 SCALE: 1"=30' SITE: 3233-3321 S THATCHER AVE
REF: TOPOGRAPHY FROM SURVEY
PROPOSED FIVE STORY BUILDING
Princeton Drive
Harbor Crossing Lane
Fill
Ground Water
B-1
B-5
B-6
B-4
B-3
B-2
ALLUVIUM
(Qa)
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60



FEFFER GEOLOGICAL CONSULTING
CROSS SECTION B-B'
JB: 1925-74
NAME: THATCHER AVENUE
BY:YMH
DATE: 5/18/17
SCALE: 1"=30'
SITE: 3233-3321 S THATCHER AVE
REF: TOPOGRAPHY FROM SURVEY
B
B'
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
PROPOSED FIVE STORY BUILDING
Existing Residence
1024 W Oxford Avenue
PL
Thatcher Avenue
B-6
B-3
B-4
Fill
Fill
Fill
Ground Water
Ground Water
ALLUVIUM (Qa)

APPENDIX 'D'

Grading Specifications

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

THATCHER YARD:

ADDRESS:	3233-3311-3321 THACHER AVE.
APN NUMBER:	4229002901
PROJECT TYPE:	MIXED INCOME- MARKET RATE AND AFFORDABLE HOUSING, PODIUM
TYPE OF CONSTRUCTION:	2 / 4 STORY TYPE V OVER 1 STORY TYPE I AT GRADE PODIUM
CURRENT ZONE:	QPF-1XL
PROPOSED ZONE BASED:	R3
LOT AREA:	93,470 SF
ALLOWABLE AREA PER DU:	800 SF
ALLOWABLE NUMBER OF DU:	117 DU
ALLOWABLE W/DENSITY BONUS:	158 DU
PROPOSED NUMBER OF DU:	152 DU (61-40% AFFORDABLE AND 91-60% MARKET RATE) 102 1 BEDROOM (67%) 50 2 BEDROOM FLATS (33%)
MAXIMUM ALLOWABLE HEIGHT:	45'+1 STORY (10')=55'
PROPOSED HEIGHT:	55'
FRONT SETBACK: REQUIRED:15'	PROPOSED:15'
REAR SETBACK: REQUIRED:15'	PROPOSED:15'
SIDE SETBACK: REQUIRED:7'	PROPOSED:7'

PARKING REQUIRED-MARKET RATE 153 SPACES REQUIRED
(92 ONE BDR-60 TWO BDR): 1.5 SPACE 1 BDR 2.0 SPACE / 2 BDR 1.59 CAR/DU
PARKING REQUIRED-AFFORDABLE: 61 SPACES
(61 UNITS): 1 SPACE / DU
TOTAL PARKING REQUIRED : 214 SPACES

PARKING PROVIDED (1.34 CAR /DU) : 228 SPACES (175 STANDARD+53 TANDEM)

OPEN SPACE REQUIRED:125 SF FOR 1 BDR, 175 SF FOR 2 BDR (102X125)+(50X175)=21,500 SF REQUIRED
OPEN SPACE PROVIDED:29,601 SF AT PODIUM
OPEN SPACE AT GRADE: 7,209 SF
TOTAL OPEN SPACE PROVIDED: 36,810 SF

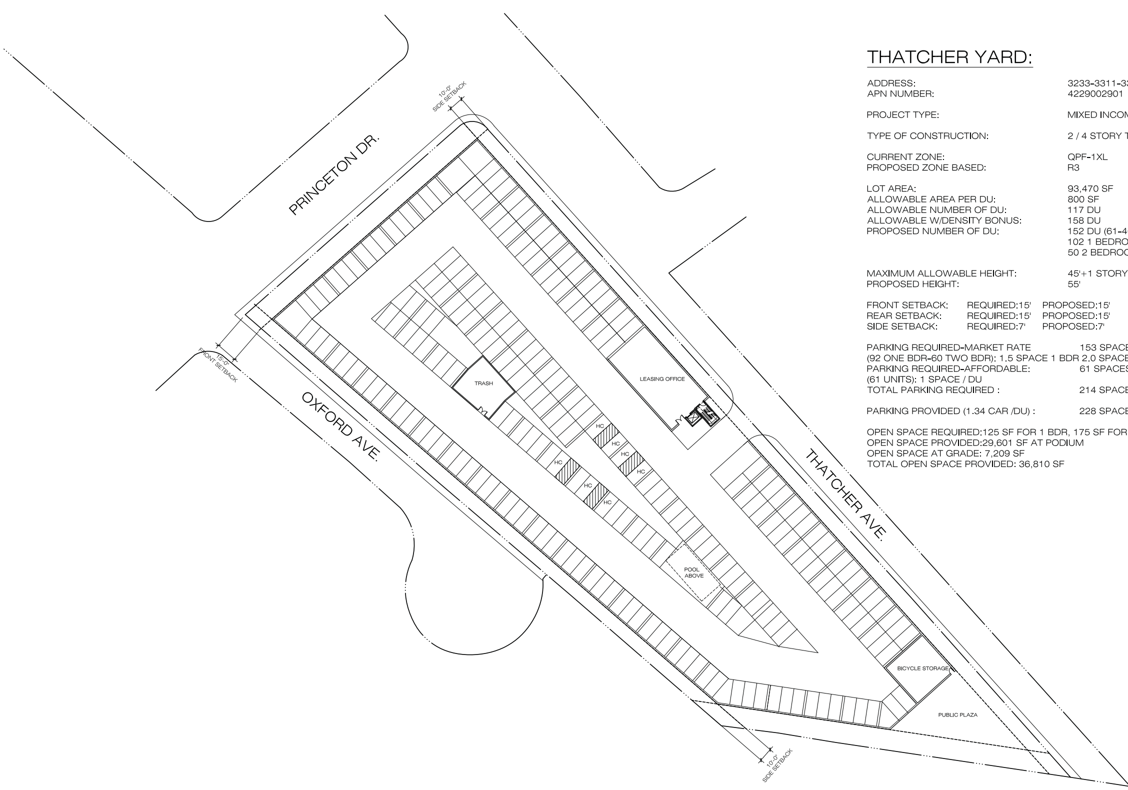
ILLUSTRATIVE SITE PLAN - INITIAL CONCEPT

THATCHER YARD

THOMAS SAFRAN & ASSOCIATES | 11812 SAN VINCENTE BLVD., SUITE 600 | LOS ANGELES CA 90049-5063 | P.310.420.4888 F.310.207.6986

scale: 1" = 30'-0"
0 30 60 90 120

WITHEE MALCOLM ARCHITECTS
2251 west 190th street torrance | ca 90504 | 310.217.8885 | witheemalcolm.com
Job No. 86070
Date.09.15.2016



THATCHER YARD:

ADDRESS:	3233-3311-3321 THACHER AVE.
APN NUMBER:	4229002901
PROJECT TYPE:	MIXED INCOME- MARKET RATE AND AFFORDABLE HOUSING, PODIUM
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ALLOWABLE W/DENSITY BONUS:	158 DU
PROPOSED NUMBER OF DU:	152 DU (61-40% AFFORDABLE AND 91-60% MARKET RATE) 102 1 BEDROOM (67%) 50 2 BEDROOM FLATS (33%)
MAXIMUM ALLOWABLE HEIGHT:	45'+1 STORY (10')=55'
PROPOSED HEIGHT:	55'
FRONT SETBACK: REQUIRED:15'	PROPOSED:15'
REAR SETBACK: REQUIRED:15'	PROPOSED:15'
SIDE SETBACK: REQUIRED:7'	PROPOSED:7'

PARKING REQUIRED-MARKET RATE 153 SPACES REQUIRED
(92 ONE BDR-60 TWO BDR): 1.5 SPACE 1 BDR 2.0 SPACE / 2 BDR 1.59 CAR/DU
PARKING REQUIRED-AFFORDABLE: 61 SPACES
(61 UNITS): 1 SPACE / DU
TOTAL PARKING REQUIRED : 214 SPACES

PARKING PROVIDED (1.34 CAR /DU) : 228 SPACES (175 STANDARD+53 TANDEM)

OPEN SPACE REQUIRED:125 SF FOR 1 BDR, 175 SF FOR 2 BDR (102X125)+(50X175)=21,500 SF REQUIRED
OPEN SPACE PROVIDED:29,601 SF AT PODIUM
OPEN SPACE AT GRADE: 7,209 SF
TOTAL OPEN SPACE PROVIDED: 36,810 SF

GROUND LEVEL PLAN - INITIAL CONCEPT

THATCHER YARD

THOMAS SAFRAN & ASSOCIATES | 11812 SAN VINCENTE BLVD., SUITE 600 | LOS ANGELES CA 90049-5063 | P.310.420.4888 F.310.207.6986

scale: 1" = 30'-0"
0 30 60 90 120

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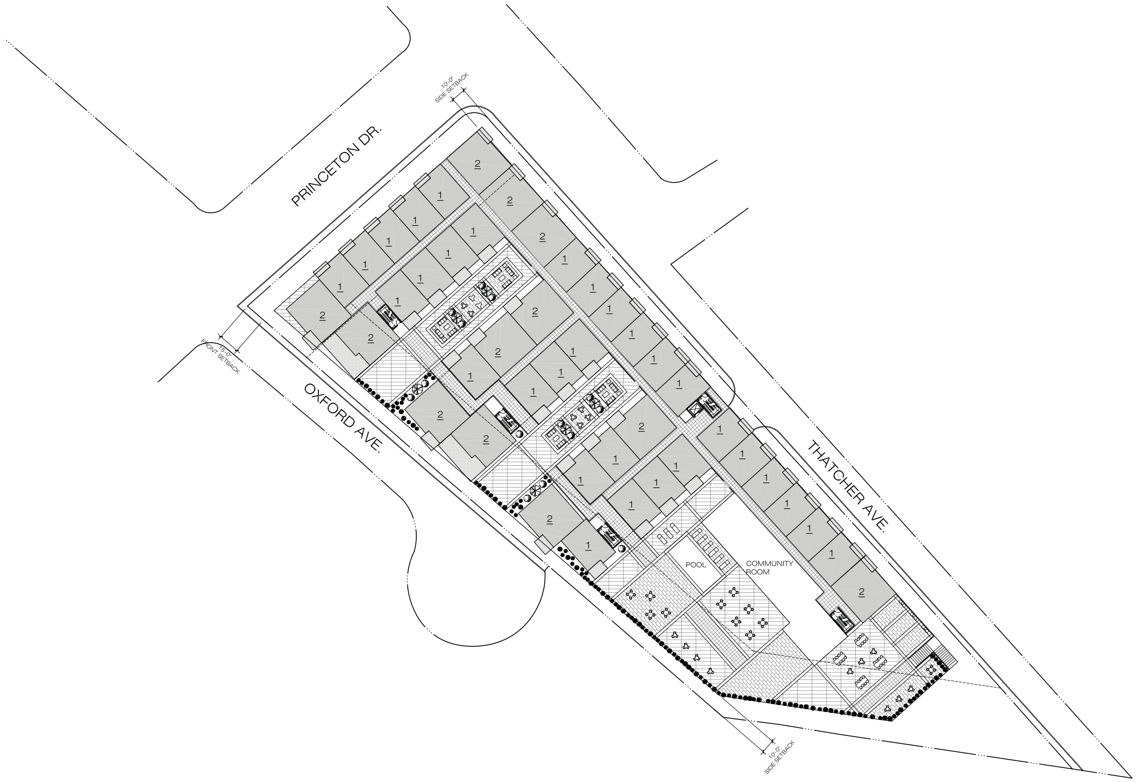

2ND LEVEL - 1ST LEVEL RESIDENTIAL OVER PODIUM
INITIAL CONCEPT

scale: 1" = 30'-0"
0 30 60 90 120

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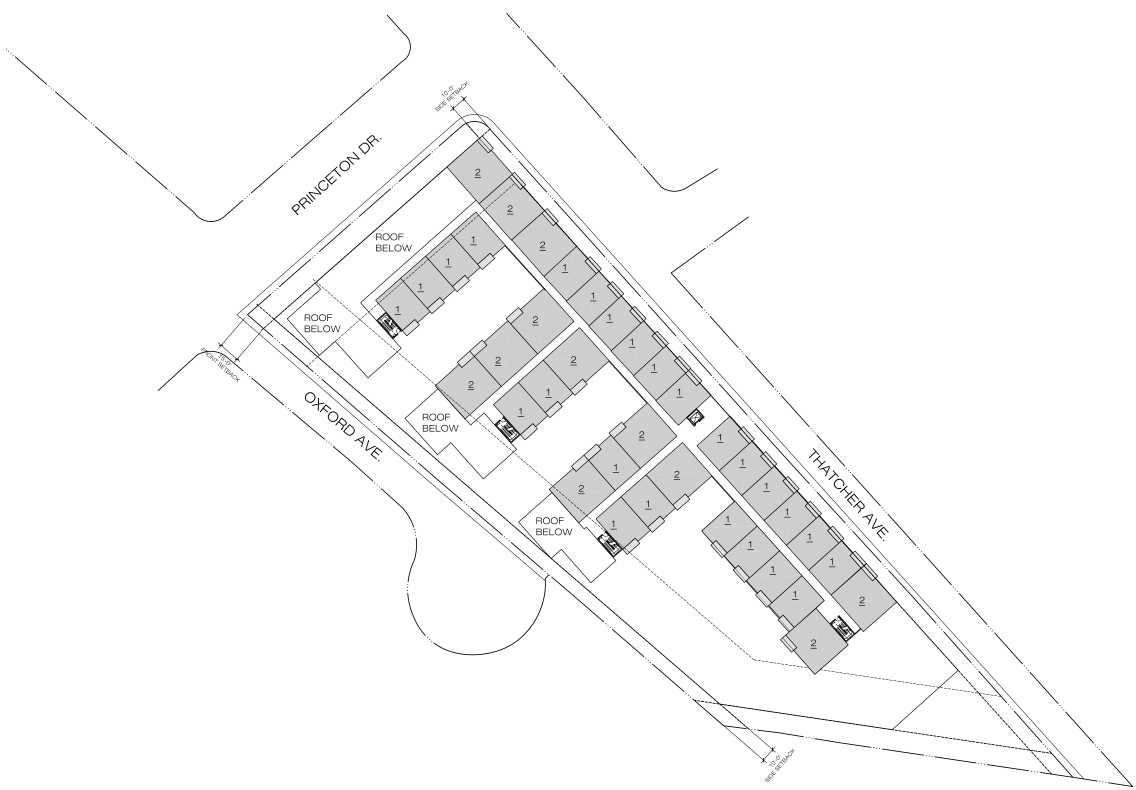

3RD LEVEL - 2ND LEVEL RESIDENTIAL OVER PODIUM
INITIAL CONCEPT

scale: 1" = 30'-0"
0 30 60 90 120

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ARCHITECTS
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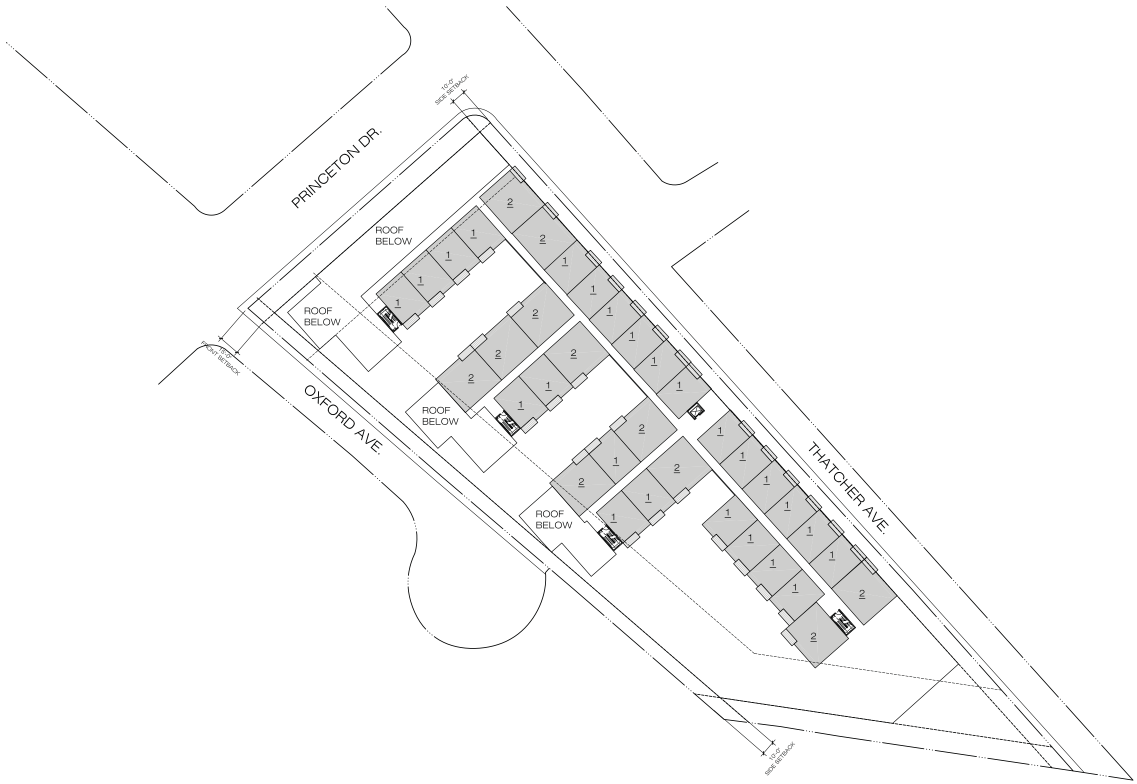

4TH LEVEL - 3RD LEVEL RESIDENTIAL OVER PODIUM
INITIAL CONCEPT

scale: 1" = 30'-0"
0 30 60 90 120

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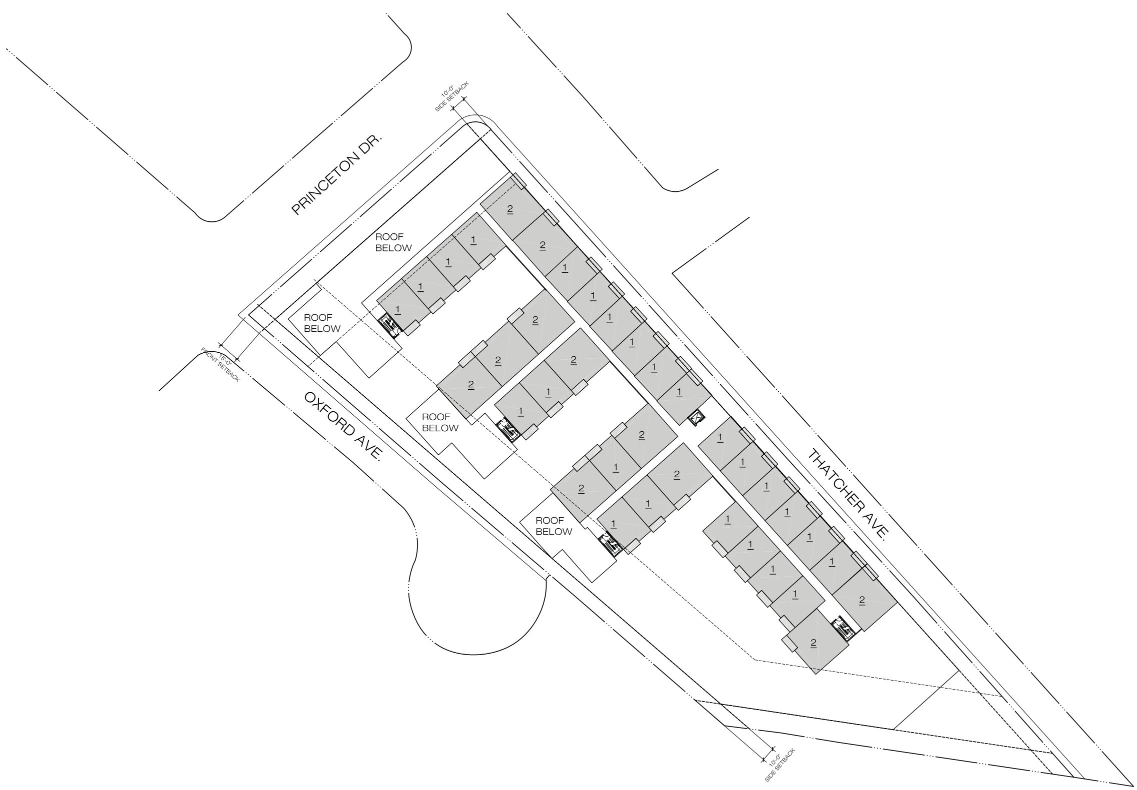

5TH LEVEL - 4TH LEVEL RESIDENTIAL OVER PODIUM
INITIAL CONCEPT

scale: 1" = 30'-0"
0 30 60 90 120

WITHEE MALCOLM ARCHITECTS
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Job No. 86070
Date.09.15.2016

THATCHER YARD
THOMAS SAFRAN & ASSOCIATES | 11812 SAN VINCENTE BLVD., SUITE 600 | LOS ANGELES CA 90049-5063 | P.310.420.4888 F.310.207.6986

APPENDIX ‘F’

Engineering Analysis

SLOT CUT ANALYSIS

IC: **1925-74** CONSULT: **YMH**
CLIENT: **Thatcher Avenue**

CALCULATION SHEET #

CALCULATE THE FACTOR OF SAFETY OF SLOT CUT EXCAVATIONS. ASSUME COHESIVE AND FRICTIONAL RESISTANCE ALONG THE SIDES OF SLOTS AS WELL AS THE FAILURE SURFACE. THE HORIZONTAL PRESSURE ON THE SIDES OF THE SLOTS IS THE AT-REST PRESSURE (1-SIN(phi)).

CALCULATION PARAMETERS

EARTH MATERIAL:	Alluvium		EXCAVATION HEIGHT:	8	feet
SHEAR DIAGRAM:			BACKSLOPE ANGLE:	45	degrees
COHESION:	190	psf	SURCHARGE:	0	pounds
PHI ANGLE:	30.5	degrees	SURCHARGE TYPE:	U	Uniform
DENSITY:	122	pcf	INITIAL FAILURE ANGLE:	17	degrees
SLOT BOUNDARY CONDITIONS			FINAL FAILURE ANGLE:	70	degrees
SLOT CUT WIDTH:	8	feet	INITIAL TENSION CRACK:	2	feet
COHESION:	190	psf	FINAL TENSION CRACK:	20	feet
PHI ANGLE:	30.5	degrees			

CALCULATED RESULTS

CRITICAL FAILURE ANGLE	62	degrees
HORIZONTAL DISTANCE TO UPSLOPE TENSION CRACK	2.0	feet
DEPTH OF TENSION CRACK	6.2	feet
TOTAL EXTERNAL SURCHARGE	0.0	pounds
VOLUME OF FAILURE WEDGE	113.9	ft^3
WEIGHT OF FAILURE WEDGE	13896.8	pounds
LENGTH OF FAILURE PLANE	4.3	feet
SURFACE AREA OF FAILURE PLANE	34	ft^2
SURFACE AREA OF SIDES OF SLOTS	14.2	ft^2
NUMBER OF TRIAL WEDGES ANALYZED	17892	trials
TOTAL RESISTING FORCE ALONG WEDGE BASE (FrB)	4981.1	pounds
TOTAL RESISTING FORCE ALONG WEDGE SIDES (FrS)	4393.2	pounds
RESULTANT HORIZONTAL COMPONENT OF FORCE	**-69.3**	**pounds**
CALCULATED FACTOR OF SAFETY	**1.30**	

CONCLUSIONS:

THE CALCULATION INDICATES THAT SLOTS CUTS UP TO 8 FEET WIDE AND 8 FEET HIGH HAVE A SAFETY FACTOR GREATER THAN 1.25 AND ARE TEMPORARILY STABLE.

SHORING PILE

IC: **1925-74** CONSULT: **YMH**
CLIENT: **Thatcher Avenue**

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:	Alluvium		RETAINED LENGTH	15 feet
SHEAR DIAGRAM:			BACKSLOPE ANGLE:	0 degrees
COHESION:	190 psf		SURCHARGE:	0 pounds
PHI ANGLE:	30.5 degrees		SURCHARGE TYPE:	U Uniform
DENSITY	122 pcf		INITIAL FAILURE ANGLE:	10 degrees
SAFETY FACTOR:	1.25		FINAL FAILURE ANGLE:	70 degrees
PILE FRICTION	0 degrees		INITIAL TENSION CRACK:	2 feet
CD (C/FS):	152.0 psf		FINAL TENSION CRACK:	20 feet
PHID = ATAN(TAN(PHI)/FS) =		25.2 degrees		

HORIZONTAL PSEUDO STATIC SEISMIC COEFFICIENT (k_h) 0 %g

VERTICAL PSEUDO STATIC SEISMIC COEFFICIENT (k_v) 0 %g

CALCULATED RESULTS

CRITICAL FAILURE ANGLE	58 degrees
AREA OF TRIAL FAILURE WEDGE	65.8 square feet
TOTAL EXTERNAL SURCHARGE	0.0 pounds
WEIGHT OF TRIAL FAILURE WEDGE	8026.6 pounds
NUMBER OF TRIAL WEDGES ANALYZED	1159 trials
LENGTH OF FAILURE PLANE	13.2 feet
DEPTH OF TENSION CRACK	3.8 feet
HORIZONTAL DISTANCE TO UPSLOPE TENSION CRACK	7.0 feet
CALCULATED THRUST ON PILE	**3006.5 pounds**
CALCULATED EQUIVALENT FLUID PRESSURE	**26.7 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 15 POUNDS PER CUBIC FOOT. THE FLUID PRESSURE SHOULD BE MULTIPLIED BY THE PILE SPACING.

SHORING PILE

IC: **1925-74** CONSULT: **YMH**
CLIENT: **Thatcher Avenue**

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:	Alluvium		RETAINED LENGTH	12	feet
SHEAR DIAGRAM:			BACKSLOPE ANGLE:	0	degrees
COHESION:	190	psf	SURCHARGE:	0	pounds
PHI ANGLE:	30.5	degrees	SURCHARGE TYPE:	U	Uniform
DENSITY	122	pcf	INITIAL FAILURE ANGLE:	10	degrees
SAFETY FACTOR:	1.25		FINAL FAILURE ANGLE:	70	degrees
PILE FRICTION	0	degrees	INITIAL TENSION CRACK:	2	feet
CD (C/FS):	152.0	psf	FINAL TENSION CRACK:	20	feet

PHID = ATAN(TAN(PHI)/FS) = 25.2 degrees

HORIZONTAL PSEUDO STATIC SEISMIC COEFFICIENT (k_h) 0 %g

VERTICAL PSEUDO STATIC SEISMIC COEFFICIENT (k_v) 0 %g

CALCULATED RESULTS

CRITICAL FAILURE ANGLE	58	degrees
AREA OF TRIAL FAILURE WEDGE	40.0	square feet
TOTAL EXTERNAL SURCHARGE	0.0	pounds
WEIGHT OF TRIAL FAILURE WEDGE	4879.5	pounds
NUMBER OF TRIAL WEDGES ANALYZED	1159	trials
LENGTH OF FAILURE PLANE	9.4	feet
DEPTH OF TENSION CRACK	4.0	feet
HORIZONTAL DISTANCE TO UPSLOPE TENSION CRACK	5.0	feet
CALCULATED THRUST ON PILE	**1597.9**	**pounds**
CALCULATED EQUIVALENT FLUID PRESSURE	**22.2**	**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.

APPENDIX ‘G’

Research

See CD