Geotechnologies, Inc.
Consulting Geotechnical Engineers

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July 15, 2016
File No. 21235

Jamison Properties, LP
3470 Wilshire Boulevard, Suite 700
Los Angeles, California 90010

Attention: Garrett Lee

Subject: Preliminary Geotechnical Assessment
Proposed Mixed-Use Development
3600 Wilshire Boulevard, Los Angeles, California

Dear Mr. Lee:

1.0 INTRODUCTION

This document presents the results of the preliminary geotechnical assessment of the subject property. The purpose of this assessment was to perform limited subsurface exploration, identify the general engineering properties of the earth materials underlying the site, and provide preliminary discussion of the geotechnical aspects of the proposed project.

This assessment included one exploratory boring, collection of representative samples, limited laboratory testing, engineering analysis, review of published geologic data, review of available geotechnical engineering information, and the preparation of this report. The site location is shown on the enclosed Vicinity Map, and the exploration location is shown on the enclosed Plot Plan.

This geotechnical assessment is preliminary in nature and is based on limited subsurface exploration and testing. At this time, it is not intended for structural design of the proposed project or submission to the local building official for building permit purposes. A comprehensive geotechnical engineering investigation including additional subsurface exploration and testing will be necessary in order to provide design recommendations for the proposed development and be suitable for permit purposes.

2.0 PROJECT DESCRIPTION

2.1 Proposed Development

At this time, the project is in the preliminary stages of development and entitlement. Preliminarily, the proposed project consists of the construction of a mid to high rise residential structure, with limited retail use at the ground level. The proposed structure is expected to be on the order of 23 stories above grade, with the lower 6 floors consisting of parking (except of potential retail use at the ground level). Currently, the lowest floor of the proposed development has not been established. However, it may include up to 2 subterranean levels.

Wall loads are estimated to range between 8 and 24 kips per lineal foot. Column loads are estimated to range between 800 and 2,500 kips. Grading will consist of excavations on the order of 15 to 25 feet for the construction of subterranean levels and foundation elements.

2.2 Existing Site Conditions

At the time of exploration, the subject property was occupied by a 2-level parking structure. It is the understanding of this firm the lowest floor of the parking structure is on the order of 3 to 5 feet below the surrounding sidewalk elevations. The property is bounded to the north by a 22-story commercial building, to the south by 7th Street, to the east by Kingsley Drive, and to the west by Harvard Boulevard.

The subject site is roughly level with no pronounced topographic highs or lows (with the exception of the partial basement level of the existing parking structure). Drainage appears to occur by sheetflow along existing contours towards the city streets. Vegetation on the site is limited to exterior planters with bushes and trees surround the subject property. The surrounding developments primarily consist of mid to high rise commercial, retail, and high density residential buildings.

3.0 SUBSURFACE EXPLORATION

The site was explored on May 23, 2016, by excavating one exploratory borings to a depth of 70 feet below the ground surface. The boring was excavated with the aid of a limited access drilling machine equipped with 8 inch diameter hollow-stem augers.

Soil samples were collected in the exploratory boring and transported to our office for limited laboratory testing. The boring location is shown on the enclosed Plot Plan, and the soils encountered are logged on Plate A-1.

3.1 Geologic Materials

Soils encountered below the site consist of fill soils underlain by natural alluvial soils. Fill materials encountered in the boring consisted of sandy to clayey silts, which are dark brown in color, moist, and stiff. The boring encountered 3 feet of fill during exploration.

The underlying native soils consist of silty clays, sandy silts, silty sands, and sands. The native soils are generally, dark and grayish brown, moist to wet, dense to very dense, firm to stiff, and fine grained.

The geologic materials consist of detrital sediments deposited by river and stream action typical to this area of Los Angeles County. More detailed descriptions of the earth materials encountered may be obtained from the individual boring log.

3.2 Groundwater

Groundwater was encountered during exploration at a depth of 30 feet below the ground surface. The Seismic Hazard Zone Report (SHZR) for the Hollywood 7½-Minute Quadrangle (CDMG, 1998, Revised 2006) indicates the historic highest groundwater level in the vicinity of the site was on the order of 20 feet below the ground surface. A copy of the Historically Highest Groundwater Levels Map provided in the SHZR is enclosed herein.

Fluctuations in the level of groundwater may occur due to variations in rainfall, temperature, and other factors not evident at the time of the measurements reported herein. Fluctuations also may occur across the site.

3.3 Caving

Caving could not be directly observed during drilling because the borehole was cased during drilling, and caving was not possible. Based on the general experience of this firm, large diameter excavations, excavations that encounter granular cohesionless soils (such as some of those underlying the subject site), and excavations below the groundwater table will most likely experience caving.

4.0 LIMITED LABORATORY TESTING

4.1 Moisture and Density

The field moisture content and dry unit weight were determined for each of the collected soil samples. The dry unit weight is determined in pounds per cubic foot (pcf). The field moisture content is determined as a percentage of the dry unit weight. The moisture and densities for each sample are shown on the enclosed Boring Log (Plate A-1).

4.2 Expansion Character

The onsite materials encountered in the upper 5 feet of the boring are in the critical (highly) expansive range, as determined by ASTM D 4829. The Expansion Index was found to be 130 for a representative sample collected in the boring.

4.3 Water Soluble Sulfates

The water-soluble sulfate content of the soils in the upper 5 feet of the boring was determined to be less than 0.10 percentage by weight. Based on the 2010 CBC and American Concrete Institute - (ACI 318), Table 4.3.1, the sulfate exposure is considered to be negligible for soils with less than 0.10 percentage by weight, and Type I cement may be utilized for all concrete in contact with the site soils.

4.4 Compaction Characteristics

The maximum dry unit weight and optimum moisture content of a soil are determined by use of the most recent revision of ASTM D 1557. The maximum dry density and optimum moisture content for the upper site soils encountered in the boring was determined to be 125.0 pcf at 11.2 percent moisture.

4.5 Grain Size Distribution

Sieve analysis is used to determine the grain size distribution of the soil larger than the Number 200 sieve. ASTM D 422-63 (Reapproved 2007) is used to determine particle sizes smaller than the Number 200 sieve. A hydrometer is used to determine the distribution of particle sizes by a sedimentation process. Hydrometer testing was not performed as part of this investigation. Particle size determination for this investigation utilized the Number 200 sieve. The results are enclosed herein.

4.6 Atterberg Limits

Depending on their moisture content, cohesive soils can be solid, plastic, or liquid. The water contents corresponding to the transitions from solid to plastic or plastic to liquid are known as the Atterberg Limits. The transitions are called the plastic limit and liquid limit. The difference between the liquid and plastic limits is known as the plasticity index. ASTM D 4318 is utilized to determine the Atterberg Limits. The results are shown enclosed herein.

5.0 REGIONAL GEOLOGY AND FAULTING

The subject site is located within the northern portions of the Los Angeles Basin and Peninsular Ranges Geomorphic Province. The Peninsular Ranges are characterized by northwest-trending blocks of mountain ridges and sediment-floored valleys. The dominant geologic structural features are northwest trending fault zones that either die out to the northwest or terminate at east-west trending reverse faults that form the southern margin of the Transverse Ranges.

The Los Angeles Basin is located at the northern end of the Peninsular Ranges Geomorphic Province. The basin is bounded by the east and southeast by the Santa Ana Mountains and San Joaquin Hills, and to the northwest by the Santa Monica Mountains. Over 22 million years ago, the Los Angeles Basin was a deep marine basin formed by tectonic forces between the North American and Pacific plates. Since that time, over 5 miles of marine and non-marine sedimentary rock, as well as intrusive and extrusive igneous rocks, have filled the basin. During the last 2 million years, defined by the Pleistocene and Holocene epochs, the Los Angeles Basin and surrounding mountain ranges have been uplifted to form the present day landscape. Erosion of the surrounding mountains has resulted in deposition of unconsolidated sediments in low-lying areas by rivers such as the Los Angeles River. Areas that have experienced subtle uplift have been eroded with gullies (Yerkes, 1965).

The site is underlain by alluvial sediments deposited by river and stream action, most likely in excess of 150 feet of depth.

5.1 Regional Faulting

The enclosed Southern California Fault Map shows the location of many mapped faults in the Southern California area. Buried thrust faults are faults without a surface expression but are a significant source of seismic activity. They are typically broadly defined based on the analysis of seismic wave recordings of hundreds of small and large earthquakes in the southern California area. Due to the buried nature of these thrust faults, their existence is usually not known until they produce an earthquake. The risk for surface rupture potential of these buried thrust faults is inferred to be low (Leighton, 1990). However, the seismic risk of these buried structures in terms of recurrence and maximum potential magnitude is not well established.

Two major buried thrust fault structures in the Los Angeles area are the Elysian Park fold and thrust belt and the Torrance-Wilmington fold and thrust belt. It is postulated that the Elysian Park structure was responsible for the magnitude 5.9, October 1, 1987 Whittier Narrows earthquake, and that the Torrance-Wilmington structure was responsible for the magnitude 5.0, January 19, 1989 Malibu earthquake. The magnitude 6.7, January 17, 1994 Northridge earthquake was caused by a buried thrust fault located beneath the San Fernando Valley.

6.0 SEISMIC HAZARDS

6.1 Surface Rupture

In 1972, the Alquist-Priolo Special Studies Zones Act (now known as the Alquist-Priolo Earthquake Fault Zoning Act) was passed into law. The Act defines “active” and “potentially active” faults utilizing aging criteria set forth by the California Geological Survey (CGS). However, established state policy has been to zone only those faults which have direct evidence of movement within the last 11,000 years. It is this recency of fault movement that the CGS considers as a characteristic for faults that have a relatively high potential for ground rupture in the future.

CGS policy is to delineate a boundary from 200 to 500 feet wide on each side of the known fault trace based on the location precision, the complexity, or the regional significance of the fault. If a site lies within an Earthquake Fault Zone, a geologic fault rupture investigation must be performed that demonstrates that the proposed building site is not threatened by surface displacement from the fault before development permits may be issued.

Ground rupture is defined as surface displacement which occurs along the surface trace of the causative fault during an earthquake. Review of the Earthquake Zones of Required Investigation Map of the Hollywood Quadrangle (CGS, 2014) indicates the site is not located within an "Earthquake Fault Zone."

Based on research of available literature and results of site reconnaissance, no known active or potentially active faults underlie the subject site. In addition, the subject site is not located within an Alquist-Priolo Earthquake Fault Zone. Based on these considerations, the potential for surface ground rupture at the subject site is considered low.

6.2 Liquefaction

Liquefaction is a phenomenon in which saturated silty to cohesionless soils below the groundwater table are subject to a temporary loss of strength due to the buildup of excess pore pressure during cyclic loading conditions such as those induced by an earthquake. Liquefaction-related effects include loss of bearing strength, amplified ground oscillations, lateral spreading, and flow failures.

The Seismic Hazards Map of the Hollywood Quadrangle by the State of California (CDMG, 1999) does not classify the site as part of a ALiquefiable@ area. This determination is based on groundwater depth records, soil type and distance to a fault capable of producing a substantial earthquake. A copy of this Seismic Hazard Zone Map is enclosed herein.

A site-specific liquefaction analysis was performed following the Recommended Procedures for Implementation of CDMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California (Martin and Lew, 1999). Recommendations provided in CGS Special Publication 117A were also incorporated in to the analysis (CDMG, 2008). The enclosed liquefaction analysis was performed using the spreadsheet template LIQ2_30.WQ1 developed by Thomas F. Blake (Blake, 1996). This program utilizes the 1996 NCEER method of analysis. This semi-empirical method is based on a correlation between measured values of Standard Penetration Test (SPT) resistance and field performance data.

Groundwater was encountered during exploration at a depth of 30 feet below the ground surface. According to the Seismic Hazard Zone Report of the Hollywood 7½-Minute Quadrangle (CDMG, 1998, Revised 2006), the historic high groundwater level for the subject site was 20 feet below the ground surface. The historic high groundwater level of 20 feet has been utilized for the enclosed liquefaction analysis.

Section 11.8.3 of ASCE 7-10 indicates that the potential for liquefaction shall be evaluated utilizing an acceleration consistent with the MCE_G PGA. Utilizing the USGS U.S. Seismic Design Maps tool, this corresponds to a PGA of 0.87g. The USGS Probabilistic Seismic Hazard Deaggregation program (USGS, 2008) indicates a PGA of 0.85g (2 percent in 50 years ground motion) and a mean magnitude of 6.7 for the site. Therefore, the liquefaction potential evaluation was performed by utilizing a magnitude 6.7 earthquake and a peak horizontal acceleration of 0.87g.

The enclosed "Empirical Estimation of Liquefaction Potential" calculations are based on boring B1. Standard Penetration Test (SPT) data were collected at 5-foot intervals. Samples of the collected materials were conveyed to the laboratory for testing and analysis. The percent passing a Number 200 sieve, Atterberg Limits, and the plasticity index (PI) of representative samples of the soils encountered in the exploratory boring are presented on the enclosed E and F Plates.

Utilizing the adjusted blow count data, and the results of laboratory testing, the enclosed liquefaction analysis indicates that the underlying soils would not be prone to liquefaction. Based on these considerations, the potential for liquefaction at the site is considered to be remote.

6.3 Dynamic Dry Settlement

Seismically-induced settlement or compaction of dry or moist, cohesionless soils can be an effect related to earthquake ground motion. Such settlements are typically most damaging when the settlements are differential in nature across the length of structures.

Some seismically-induced settlement of the proposed development should be expected as a result of strong ground-shaking. However, due to the relatively dense and uniform nature of the underlying earth materials, excessive differential settlements would not be expected to occur.

6.4 Tsunamis, Seiches, and Flooding

Tsunamis are large ocean waves generated by sudden water displacement caused by a submarine earthquake, landslide, or volcanic eruption. Review of the County of Los Angeles Flood and Inundation Hazards Map, (Leighton, 1990) indicates the site does not lie within mapped tsunami inundation boundaries.

Seiches are oscillations generated in enclosed bodies of water which can be caused by ground shaking associated with an earthquake. Review of the County of Los Angeles Flood and Inundation Hazards Map, (Leighton, 1990) indicates the site does not lie within mapped inundation boundaries due to a seiche or a breached upgradient reservoir.

6.5 Landsliding

The probability of seismically-induced landslides affecting the subject development is considered to be remote, due to the lack of significant slopes on the site and in surrounding areas.

7.0 PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

Based upon the limited geotechnical exploration, laboratory testing, evaluation and research, it is the preliminary finding of this firm that the proposed development is considered feasible from a geotechnical engineering standpoint. It will be necessary to perform a project specific geotechnical engineering investigation, including additional subsurface exploration and testing, in order to provide design recommendations for the proposed project.

The boring performed on the site encountered 3 feet of existing fill during exploration on the site. The existing fill materials are considered to be unsuitable for support of new foundations, floor slabs, or additional fill.

It is anticipated that excavation of the proposed basement levels would extend to depths on the order of 15 to 25 feet. These excavations would remove the existing fill soils and expose the underlying dense natural soils.

The dense natural soils underlying the subject site are typically suitable for support of floor slabs and conventional spread footings under moderate loading conditions. Under heavy loading conditions (such as those for high rise developments), it may be necessary to utilize alternative foundation systems in order to support high building loads. This could include the use of mat or pile foundations. Site specific testing, analysis, and specific building load information will be necessary in order to develop design recommendations.

Due to the proximity of the property lines and existing offsite structures, it should be anticipated that shoring will be required in order to maintain stable excavations during construction of the proposed basement levels. Soldier piles and lagging should be anticipated for shoring.

Expansion index testing of the upper site soils indicates the soils are in the critical expansion zone, with expansion index of 130. Floor slabs and foundations should be designed to mitigate the potential effects of expansive soils. This would include thickening of floor slabs, utilizing adequate reinforcing steel, and deepening of foundations.

8.0 CLOSURE

This geotechnical assessment is preliminary in nature and is based on limited subsurface exploration and testing. As indicated above, this document is not intended for structural design of the proposed project or submission to the local building official for building permit purposes. A comprehensive geotechnical engineering investigation including additional subsurface exploration and testing will be necessary in order to provide design recommendations for the proposed development and be suitable for permit purposes.

Geotechnologies, Inc. appreciates the opportunity to provide our services on this project. Should you have any questions please contact this office.

Respectfully submitted,
GEOTECHNOLOGIES, INC.

REGISTERED PROFESSIONAL ENGINEER
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MAC:ae

Enclosures: References
Vicinity Map
Plot Plan
Historically Highest Groundwater Levels Map
Southern California Fault Map
Seismic Hazard Zone Map
Plate A-1
Compaction / Expansion / Sulfate Data Sheet – Plate D
Grain Size Distribution Sheet – Plate E
Atterberg Limits Determination – Plate F
Empirical Estimation of Liquefaction Potential (1)

Email to: [Garrett Lee garrettlee@jamisonservices.com]
[Jena Choi jenachoi@jamisonproperties.la]

REFERENCES

Blake, T.F., 1994-1996, LIQ2_30.WQ1 - A QUATTRO-PRO Spreadsheet Computer Program for the determination of liquefaction potential using the NCEER (1996) semi-empirical method.

California Department of Conservation, 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117A, California Geological Survey.

California Department of Conservation, Division of Mines and Geology, 1998 (Revised 2006), Seismic Hazard Zone Report of the Hollywood 7½-Minute Quadrangle, Los Angeles County, California., C.D.M.G. Seismic Hazard Zone Report 026, map scale 1:24,000.

California Department of Conservation, Division of Mines and Geology, 1999, Seismic Hazard Zones Map, Hollywood 7½-minute Quadrangle, CDMG Seismic Hazard Zone Mapping Act of 1990.

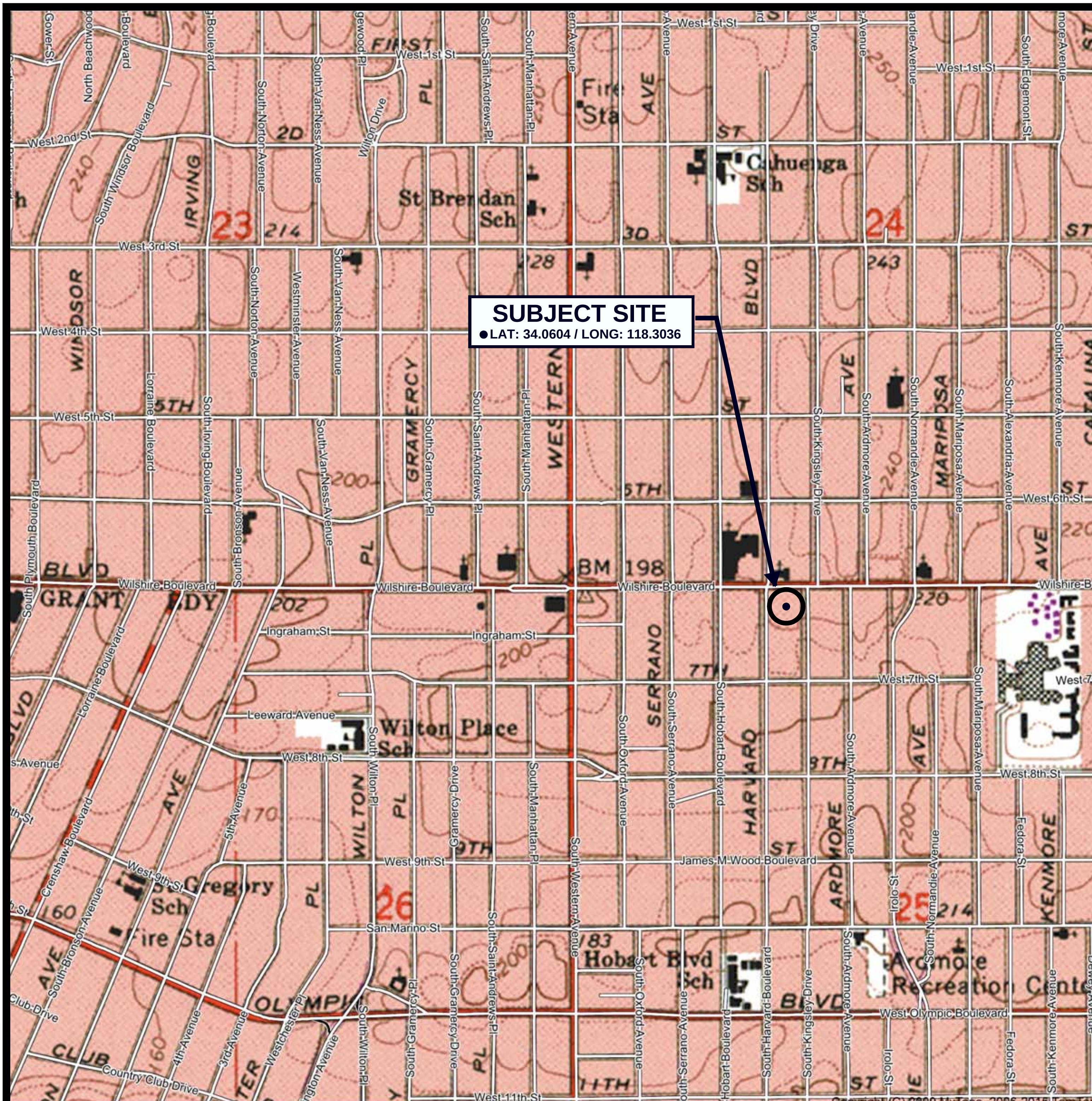
California Geological Survey, 2014, Earthquake Zones of Required Investigation, Hollywood Quadrangle, Released November 6, 2014.

Leighton and Associates, Inc. (1990), Technical Appendix to the Safety Element of the Los Angeles County General Plan: Hazard Reduction in Los Angeles County.

Martin, G.R., and Lew, M., 1999, Co-chairs and Editors of the Implementation Committee, "Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction Hazards in California," Organized through the Southern California Earthquake Center, University of Southern California.

Tinsley, J.C., and Fumal, T.E., 1985, Mapping quaternary Sedimentary Deposits for Areal Variations in Shaking Response, in Evaluation Earthquake Hazards in the Los Angeles Region- An Earth Science Perspective, U.S. Geological Survey Professional Paper 1360, Ziony, J.I. ed., pp 101-125.

United States Geological Survey, 2008, U.S.G.S. Interactive Deaggregation Program. http://eqint.cr.usgs.gov/deaggint/2008/index.php.



SCALE 1:12000

0.0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6

MILES

0 | 1000 | 2000 | 3000

FEET

N

REFERENCE: U.S.G.S. TOPOGRAPHIC MAPS, 7.5 MINUTE SERIES, HOLLYWOOD, CA QUADRANGLE

VICINITY MAP

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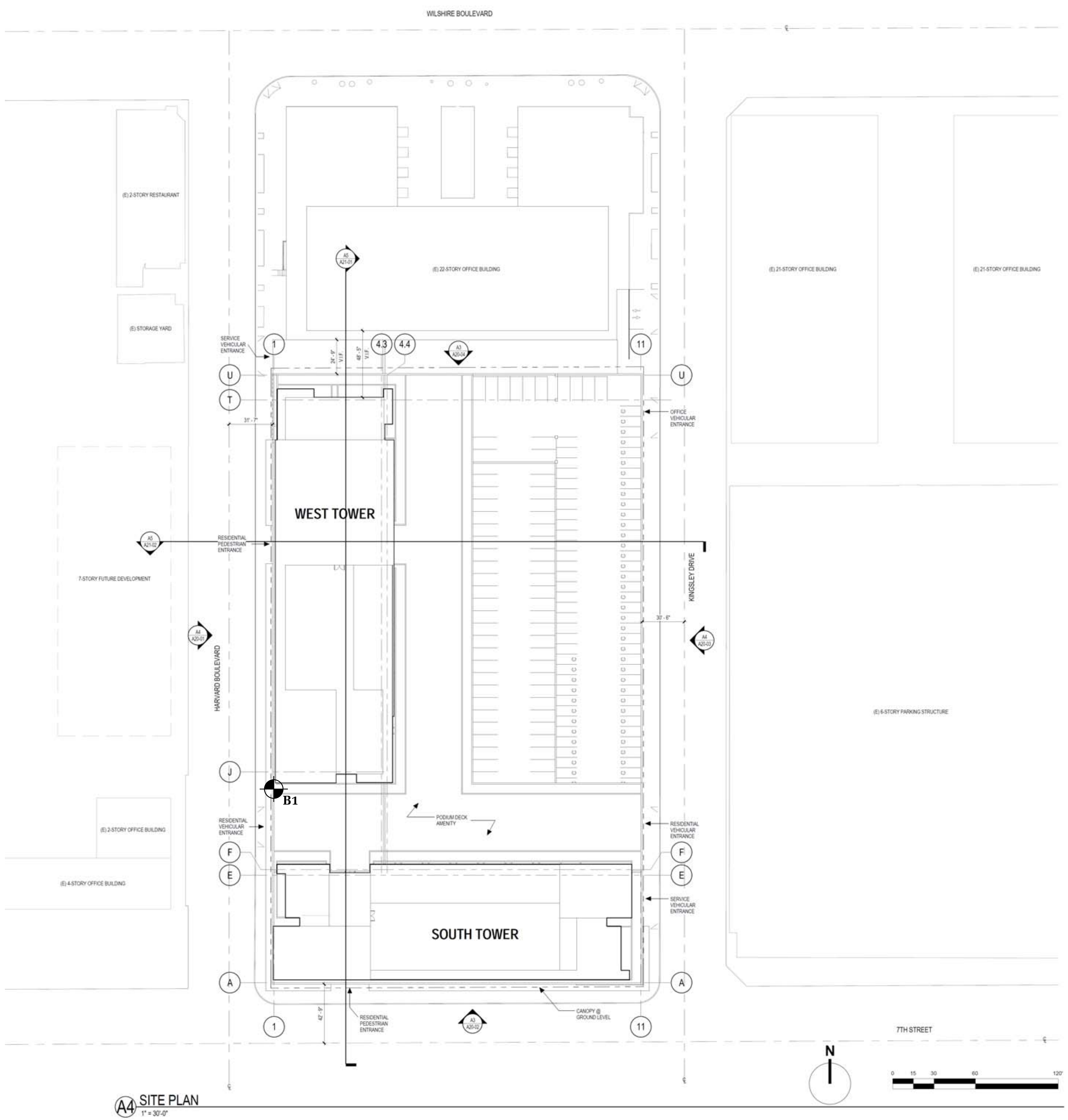

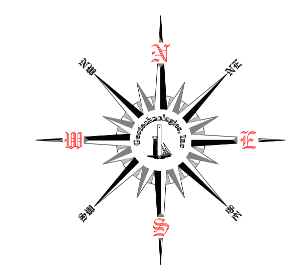

SCALE IN FEET

0 80 160

REFERENCE: Site Plan, by Perkins + Will, Not dated.

LEGEND

B1 LOCATION & NUMBER OF BORING

PLOT PLAN

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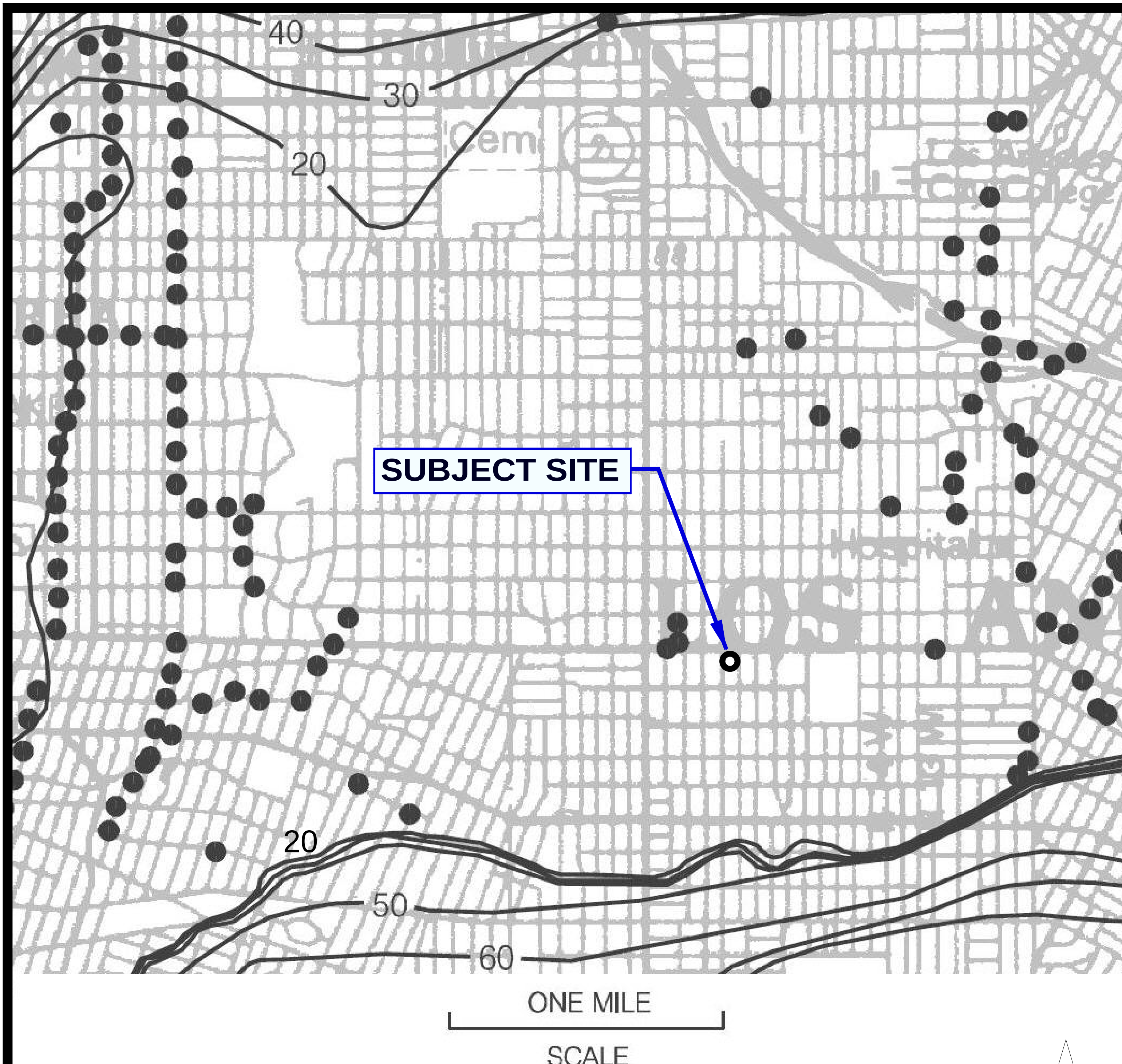
JAMISON PROPERTIES LP

FILE No. 21235



20 Depth to groundwater in feet

REFERENCE: CDMG, SEISMIC HAZARD ZONE REPORT, 026
HOLLYWOOD 7.5 - MINUTE QUADRANGLE, LOS ANGELES COUNTY, CALIFORNIA (1998, REVISED 2006)

HISTORICALLY HIGHEST GROUNDWATER LEVELS

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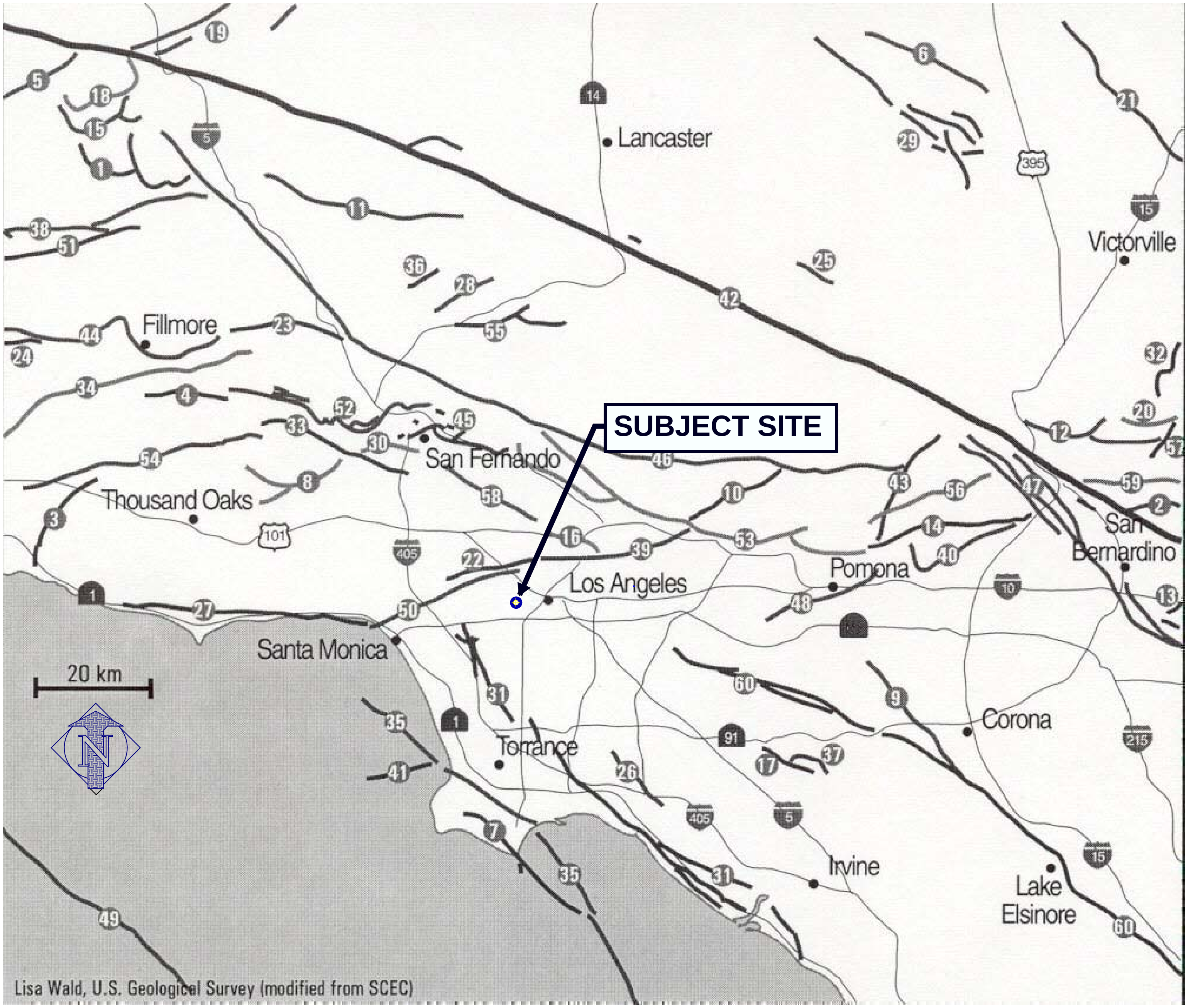

1 Alamo thrust
2 Arrowhead fault
3 Bailey fault
4 Big Mountain fault
5 Big Pine fault
6 Blake Ranch fault
7 Cabrillo fault
8 Chatsworth fault
9 Chino fault
10 Clamshell-Sawpit fault
11 Clearwater fault
12 Cleghorn fault
13 Crafton Hills fault zone
14 Cucamonga fault zone
15 Dry Creek fault
16 Eagle Rock fault
17 El Modeno fault
18 Frazier Mountain thrust
19 Garlock fault zone
20 Grass Valley fault
21 Helendale fault
22 Hollywood fault
23 Holser fault
24 Lion Canyon fault
25 Llano fault
26 Los Alamitos fault
27 Malibu Coast fault
28 Mint Canyon fault
29 Mirage Valley fault zone
30 Mission Hills fault
31 Newport Inglewood fault zone
32 North Frontal fault zone
33 Northridge Hills fault
34 Oak Ridge fault
35 Palos Verdes fault zone
36 Pelona fault
37 Peralta Hills fault
38 Pine Mountain fault
39 Raymond fault
40 Red Hill (Etiwanda Ave) fault
41 Redondo Canyon fault
42 San Andreas Fault
43 San Antonio fault
44 San Cayetano fault
45 San Fernando fault zone
46 San Gabriel fault zone
47 San Jacinto fault
48 San Jose fault
49 Santa Cruz-Santa Catalina Ridge f.z.
50 Santa Monica fault
51 Santa Ynez fault
52 Santa Susana fault zone
53 Sierra Madre fault zone
54 Simi fault
55 Soledad Canyon fault
56 Stoddard Canyon fault
57 Tunnel Ridge fault
58 Verdugo fault
59 Waterman Canyon fault
60 Whittier fault

REFERENCE: http://pasadena.wr.usgs.gov/info/images/LA%20Faults.pdf

SOUTHERN CALIFORNIA FAULT MAP

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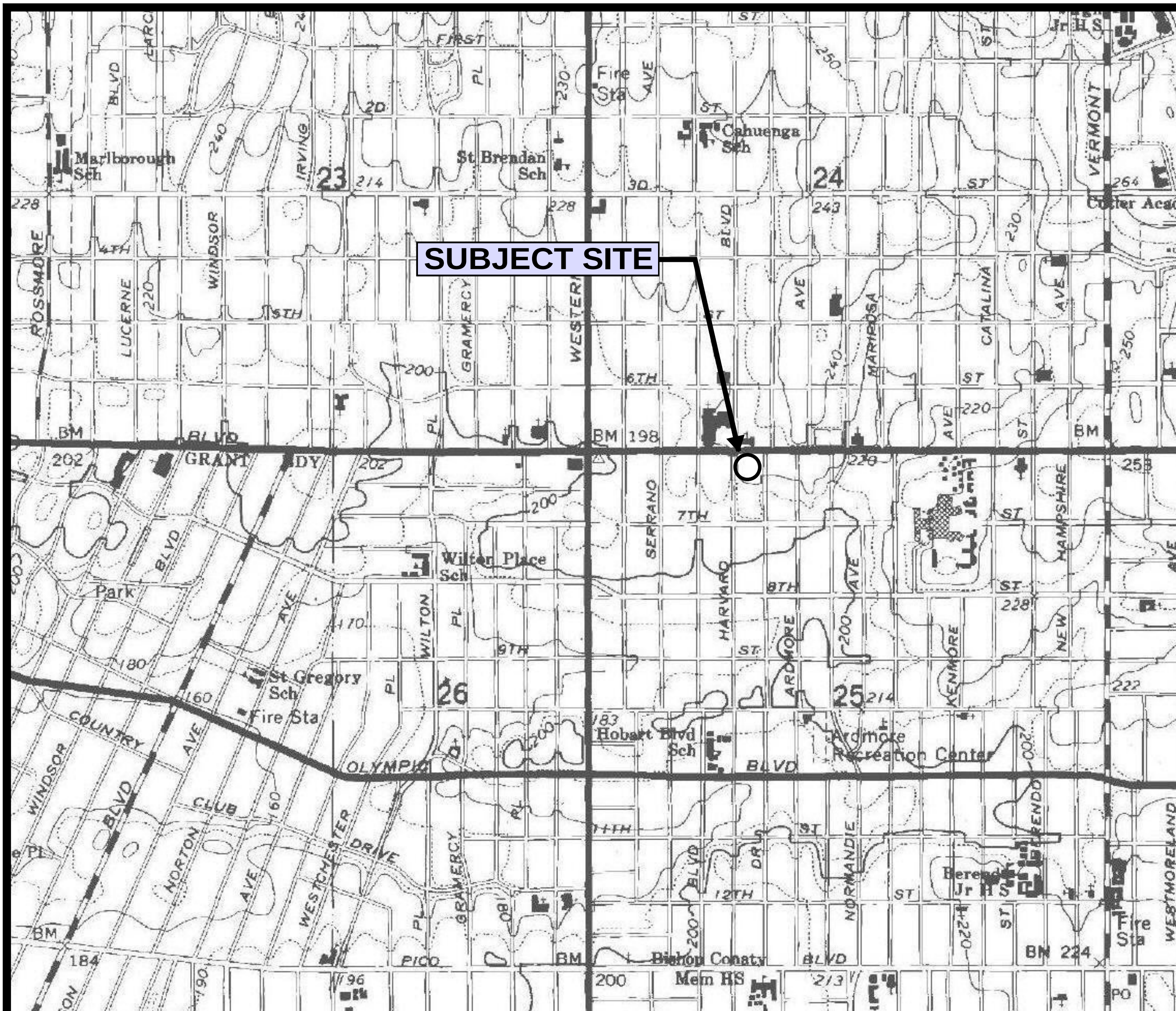

SCALE 1:24,000

1 .5 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

N

LIQUEFACTION AREA

REFERENCE: SEISMIC HAZARD ZONES, HOLLYWOOD QUADRANGLE OFFICIAL MAP (CDMG, 1999)

SEISMIC HAZARD ZONE MAP

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FILE NO. 21235

BORING LOG NUMBER 1

Jamison Properties, LP | **Date: 05/23/16**

File No. 21235 | **Method: 8-inch Diameter Hollow Stem Auger**

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Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Concrete
				0 --		4.5-inch Concrete over 2-inch Base
				-		
				1 --		FILL: Sandy to Clayey Silt, dark brown, moist, stiff
				-		
				2 --		
2.5	27	12.7	99.1	-		
				3 --		
				-	ML	ALLUVIUM: Sandy to Clayey Silt, dark brown, moist, stiff
				4 --		
				-		
5	43	6.9	SPT	5 --		
				-	SM	Silty Sand, dark brown, moist, dense, fine grained
				6 --		
				-		
				7 --		
7.5	50/5"	8.0	121.4	-		
				8 --		
				-		
				9 --		
				-		
10	62	6.5	SPT	10 --		
				-		
				11 --		
				-		
				12 --		
12.5	50/5"	10.7	120.8	-		
				13 --		dark grayish brown
				-		
				14 --		
				-		
15	58	16.3	SPT	15 --		
				-	ML	Sandy Silt, dark grayish brown, moist, stiff
				16 --		
				-		
				17 --		
17.5	82	10.3	117.0	-		
				18 --		
				-		
				19 --		
				-		
20	28	10.4	SPT	20 --		
				-	SM/ML	Silty Sand to Sandy Silt, dark brown to dark grayish brown, moist, dense to firm, fine grained
				21 --		
				-		
				22 --		
22.5	77	4.9	112.7	-		
				23 --		
				-		
				24 --		
				-		
25	23	21.8	SPT	25 --		
				-	CL	Silty Clay, dark brown, moist, stiff

BORING LOG NUMBER 1

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Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				26 --		
				-		
				27 --		
27.5	65	13.4	113.7	-		
				28 --		
				-		
				29 --		
				-		
30	25	22.3	SPT	30 --		
				-		
				31 --		
				-		
				32 --		
32.5	72	17.5	114.5	-		
				33 --	ML	Sandy to Clayey Silt, dark grayish brown, moist, stiff
				-		
				34 --		
				-		
35	45	14.6	SPT	35 --		
				-		
				36 --		
				-		
				37 --		
37.5	50/5"	11.3	121.9	-		
				38 --	SP	Sand, gray, wet, dense to very dense, fine to medium grained
				-		
				39 --		
				-		
40	48	12.7	SPT	40 --		
				-		
				41 --		
				-		
				42 --		
42.5	50/5"	16.6	115.3	-		
				43 --		
				-		
				44 --		
				-		
45	41	17.7	SPT	45 --		
				-		
				46 --		
				-		
				47 --		
47.5	50/5"	20.8	109.0	-		
				48 --		
				-		
				49 --		
				-		
50	23	23.3	SPT	50 --		
				-	CL	Silty Clay, dark brown, moist, firm to stiff

BORING LOG NUMBER 1

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Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				51 --		
				-		
				52 --		
52.5	61	18.6	104.8	-		
				53 --		
				-		
				54 --		
				-		
55	24	22.4	SPT	55 --		
				-		
				56 --		
				-		
				57 --		
57.5	35	16.2	114.1	-		
				58 --		
				-		
				59 --		
				-		
60	29	22.3	SPT	60 --		
				-	CH	Clay, gray to dark gray, moist, firm
				61 --		
				-		
				62 --		
62.5	50	22.5	103.9	-		
				63 --		
				-		
				64 --		
				-		
65	27	28.0	SPT	65 --		
				-	ML	Sandy Silt, gray to dark gray, moist, firm to stiff
				66 --		
				-		
				67 --		
67.5	77	30.8	95.6	-		
				68 --	CL	Silty Clay, dark gray to gray, moist, stiff
				-		
				69 --		
				-		
70	28	20.6	SPT	70 --		
				-		Total Depth 70 feet
				71 --		Water at 30 feet
				-		Fill to 3 feet
				72 --		
				-		NOTE: The stratification lines represent the approximate
				73 --		boundary between earth types; the transition may be gradual.
				-		
				74 --		Used 8-inch diameter Hollow-Stem Auger
				-		140-lb. Automatic Hammer, 30-inch drop
				75 --		Modified California Sampler used unless otherwise noted
				-		
						SPT=Standard Penetration Test

ASTM D-1557

SAMPLE	B1 @ 1- 5'
SOIL TYPE:	ML
MAXIMUM DENSITY pcf.	125.0
OPTIMUM MOISTURE %	11.2

ASTM D 4829

SAMPLE	B1 @ 1- 5'
SOIL TYPE:	ML
EXPANSION INDEX UBC STANDARD 18-2	130
EXPANSION CHARACTER	CRITICAL

SULFATE CONTENT

SAMPLE	B1 @ 1-5'
SULFATE CONTENT: (percentage by weight)	< 0.1 %

COMPACTION/EXPANSION/SULFATE DATA SHEET

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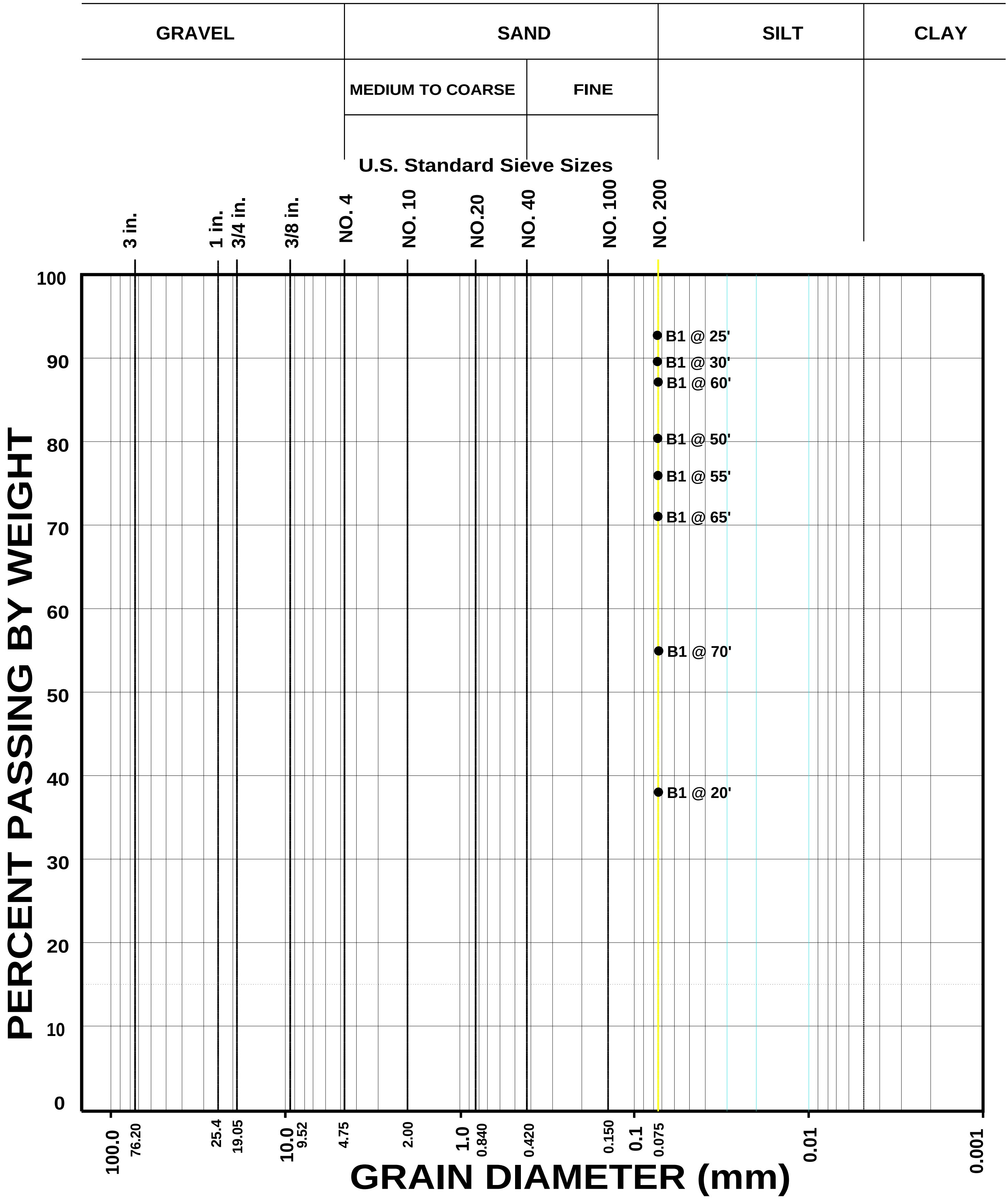
Consulting Geotechnical Engineers

JAMISON PROPERTIES, LP

FILE NO. 21235 | PLATE: D



GRAIN SIZE DISTRIBUTION

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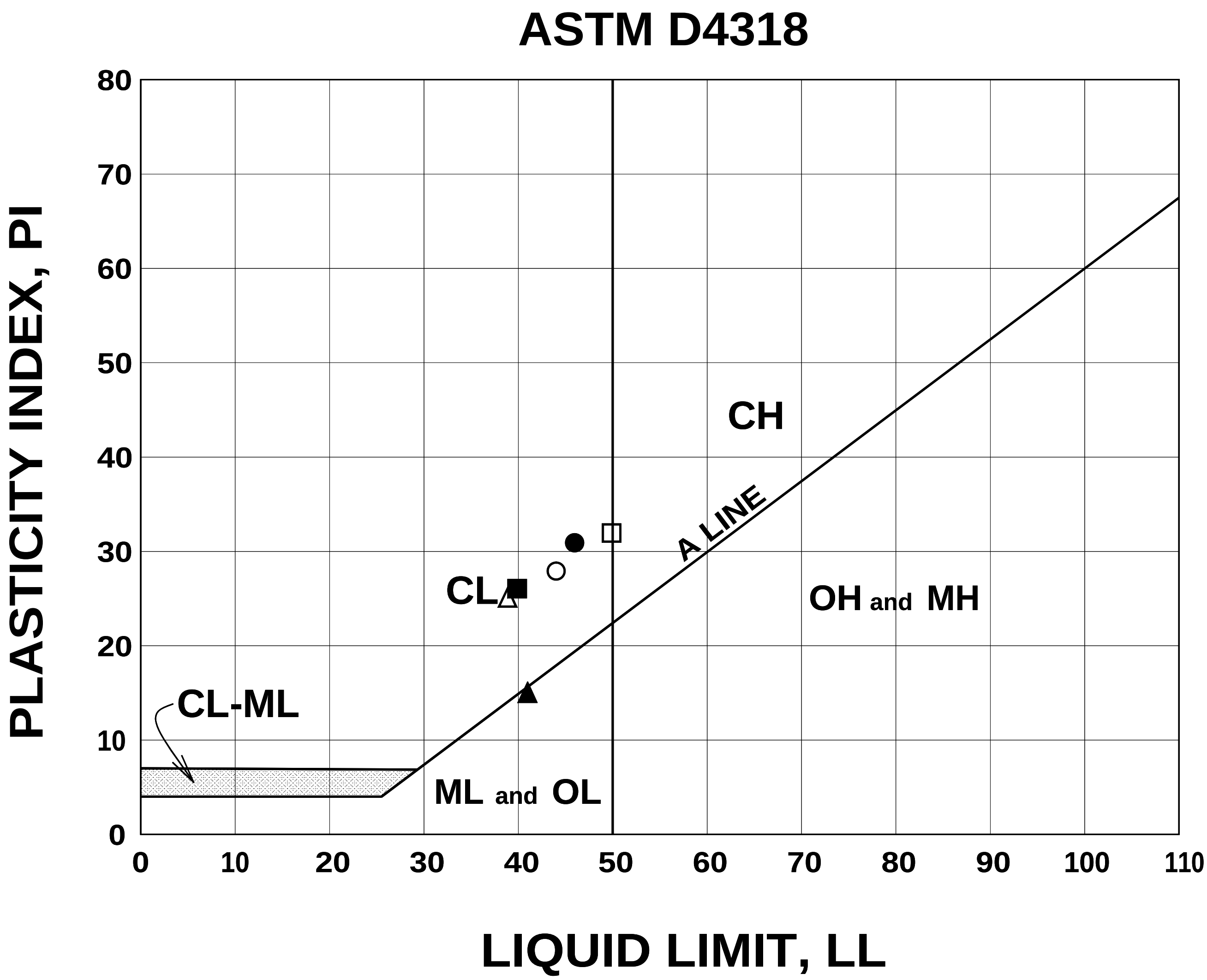
JAMISON PROPERTIES, LP	
FILE NO. 21235	PLATE: E



BORING NUMBER	DEPTH (FEET)	TEST SYMBOL	LL	PL	PI	DESCRIPTION
B1	30	○	44	16	28	CL
B1	50	●	46	15	31	CL
B1	55	△	39	14	25	CL
B1	65	▲	41	26	15	ML
B1	60	□	50	18	32	CH
B1	70	■	40	14	26	CL

ATTERBERG LIMITS DETERMINATION

Geotechnologies, Inc.
Consulting Geotechnical Engineers

JAMISON PROPERTIES, LP

FILE NO. 21235 | PLATE: F

Geotechnologies, Inc.

Project: Jamison Properties, LP
File No.: 21235
Description: Liquefaction Analysis
Boring Number: 1

EMPIRICAL ESTIMATION OF LIQUEFACTION POTENTIAL

NCEER (1996) METHOD — By Thomas F. Blake (1994-1996) — LIQ2_30.WQ1

EARTHQUAKE INFORMATION:

Earthquake Magnitude:	6.7
Peak Horiz. Acceleration (g):	0.87
Calculated Mag.Wtg.Factor:	0.753

GROUNDWATER INFORMATION:

Current Groundwater Level (ft):	30.0
Historic Highest Groundwater Level* (ft):	20.0
Unit Wt. Water (pcf):	62.4

* Based on California Geological Survey Seismic Hazard Evaluation Report

ENERGY & ROD CORRECTIONS:

Energy Correction (CE) for N60:	1.30
Rod Len.Corr.(CR)(0-no or 1-yes):	1.0
Bore Dia. Corr. (CB):	1.00
Sampler Corr. (CS):	1.20
Use Ksigma (0 or 1):	1.0

LIQUEFACTION CALCULATIONS:

Depth to Base (ft)	Total Unit Wt. (pcf)	Current Water Level (0 or 1)	Historical Water Level (0 or 1)	FIELD SPT (N)	Depth of SPT (ft)	Liq.Sus. (0 or 1)	-200 (%)	Est. Dr (%)	CN Factor	Corrected $(N_1)_{60}$	Eff. Unit Wt. HW Level (psf)	Resist. CRR	rd Factor	Induced CSR	Norm.Cons. Sett. (ft)	Over.Con. Sett. (ft)	Liquefac. Safe.Fact.
1.0	111.6	0	0	43.0	5.0	0	0.0		2.000	100.6	111.6	~	0.998	0.425	6.624	#NUM!	~
2.0	111.6	0	0	43.0	5.0	0	0.0		2.000	100.6	111.6	~	0.993	0.423	6.624	#NUM!	~
3.0	111.6	0	0	43.0	5.0	0	0.0		2.000	100.6	111.6	~	0.989	0.421	6.624	#NUM!	~
4.0	111.6	0	0	43.0	5.0	0	0.0		2.000	100.6	111.6	~	0.984	0.419	6.624	#NUM!	~
5.0	111.6	0	0	43.0	5.0	0	0.0		2.000	100.6	111.6	~	0.979	0.417	6.624	#NUM!	~
6.0	131.1	0	0	43.0	5.0	0	0.0		2.000	100.6	131.1	~	0.975	0.415	6.624	#NUM!	~
7.0	131.1	0	0	43.0	5.0	0	0.0		2.000	100.6	131.1	~	0.970	0.413	6.624	#NUM!	~
8.0	131.1	0	0	43.0	5.0	0	0.0		2.000	100.6	131.1	~	0.966	0.411	6.624	#NUM!	~
9.0	131.1	0	0	43.0	5.0	0	0.0		2.000	100.6	131.1	~	0.961	0.409	6.624	#NUM!	~
10.0	131.1	0	0	43.0	5.0	0	0.0		2.000	100.6	131.1	~	0.957	0.407	6.624	#NUM!	~
11.0	131.1	0	0	62.0	10.0	0	0.0		1.358	98.5	131.1	~	0.952	0.405	9.550	#NUM!	~
12.0	131.1	0	0	62.0	10.0	0	0.0		1.358	98.5	131.1	~	0.947	0.403	9.550	#NUM!	~
13.0	133.8	0	0	62.0	10.0	0	0.0		1.358	98.5	133.8	~	0.943	0.401	9.550	#NUM!	~
14.0	133.8	0	0	62.0	10.0	0	0.0		1.358	98.5	133.8	~	0.938	0.399	9.550	#NUM!	~
15.0	133.8	0	0	62.0	10.0	0	0.0		1.358	98.5	133.8	~	0.934	0.398	9.550	#NUM!	~
16.0	129.0	0	0	58.0	15.0	0	0.0		1.081	78.9	129.0	~	0.929	0.396	8.934	#NUM!	~
17.0	129.0	0	0	58.0	15.0	0	0.0		1.081	78.9	129.0	~	0.925	0.394	8.934	#NUM!	~
18.0	129.0	0	0	58.0	15.0	0	0.0		1.081	78.9	129.0	~	0.920	0.392	8.934	#NUM!	~
19.0	129.0	0	0	58.0	15.0	0	0.0		1.081	78.9	129.0	~	0.915	0.390	8.934	#NUM!	~
20.0	129.0	0	0	58.0	15.0	0	0.0		1.081	78.9	129.0	~	0.911	0.388	8.934	#NUM!	~
21.0	118.2	0	1	28.0	20.0	1	48.0	89	0.928	43.3	55.8	Infin.	0.906	0.391	4.357	0.156	Non-Liq.
22.0	118.2	0	1	28.0	20.0	1	48.0	89	0.928	43.3	55.8	Infin.	0.902	0.398	4.443	0.159	Non-Liq.
23.0	118.2	0	1	28.0	20.0	1	48.0	89	0.928	43.3	55.8	Infin.	0.897	0.404	4.524	0.162	Non-Liq.
24.0	118.2	0	1	28.0	20.0	1	48.0	89	0.928	43.3	55.8	Infin.	0.893	0.411	4.601	0.164	Non-Liq.
25.0	118.2	0	1	28.0	20.0	1	48.0	89	0.928	43.3	55.8	Infin.	0.888	0.416	4.675	0.167	Non-Liq.
26.0	128.9	0	1	23.0	25.0	1	92.7	78	0.874	36.9	66.5	Infin.	0.883	0.422	3.898	0.169	Non-Liq.
27.0	128.9	0	1	23.0	25.0	1	92.7	78	0.874	36.9	66.5	Infin.	0.879	0.426	3.951	0.172	Non-Liq.
28.0	128.9	0	1	23.0	25.0	1	92.7	78	0.874	36.9	66.5	Infin.	0.874	0.431	4.003	0.174	Non-Liq.
29.0	128.9	0	1	23.0	25.0	1	92.7	78	0.874	36.9	66.5	Infin.	0.870	0.435	4.051	0.176	Non-Liq.
30.0	128.9	0	1	23.0	25.0	1	92.7	78	0.874	36.9	66.5	Infin.	0.865	0.439	4.098	0.178	Non-Liq.
31.0	128.9	1	1	25.0	30.0	1	89.6	78	0.826	39.2	66.5	Infin.	0.861	0.442	4.502	0.180	Non-Liq.
32.0	128.9	1	1	25.0	30.0	1	89.6	78	0.826	39.2	66.5	Infin.	0.856	0.445	4.548	0.182	Non-Liq.
33.0	134.5	1	1	45.0	35.0	1	0.0	102	0.784	55.0	72.1	Infin.	0.851	0.448	8.264	0.184	Non-Liq.
34.0	134.5	1	1	45.0	35.0	1	0.0	102	0.784	55.0	72.1	Infin.	0.847	0.451	8.337	0.185	Non-Liq.
35.0	134.5	1	1	45.0	35.0	1	0.0	102	0.784	55.0	72.1	Infin.	0.842	0.453	8.407	0.187	Non-Liq.
36.0	134.5	1	1	45.0	35.0	1	0.0	102	0.784	55.0	72.1	Infin.	0.838	0.455	8.473	0.188	Non-Liq.
37.0	134.5	1	1	45.0	35.0	1	0.0	102	0.784	55.0	72.1	Infin.	0.833	0.456	8.537	0.190	Non-Liq.
38.0	135.6	1	1	48.0	40.0	1	0.0	102	0.745	55.8	73.2	Infin.	0.829	0.458	9.171	0.191	Non-Liq.
39.0	135.6	1	1	48.0	40.0	1	0.0	102	0.745	55.8	73.2	Infin.	0.824	0.459	9.233	0.192	Non-Liq.
40.0	135.6	1	1	48.0	40.0	1	0.0	102	0.745	55.8	73.2	Infin.	0.819	0.460	9.293	0.194	Non-Liq.
41.0	135.6	1	1	48.0	40.0	1	0.0	102	0.745	55.8	73.2	Infin.	0.815	0.461	9.350	0.195	Non-Liq.
42.0	135.6	1	1	48.0	40.0	1	0.0	102	0.745	55.8	73.2	Infin.	0.810	0.462	9.404	0.196	Non-Liq.
43.0	134.4	1	1	48.0	40.0	1	0.0	102	0.745	55.8	72.0	Infin.	0.806	0.463	9.457	0.197	Non-Liq.
44.0	134.4	1	1	48.0	40.0	1	0.0	102	0.745	55.8	72.0	Infin.	0.801	0.463	9.509	0.198	Non-Liq.
45.0	134.4	1	1	48.0	40.0	1	0.0	102	0.745	55.8	72.0	Infin.	0.797	0.463	9.558	0.199	Non-Liq.
46.0	134.4	1	1	41.0	45.0	1	0.0	91	0.712	45.5	72.0	Infin.	0.792	0.464	8.205	0.200	Non-Liq.
47.0	134.4	1	1	41.0	45.0	1	0.0	91	0.712	45.5	72.0	Infin.	0.787	0.464	8.244	0.201	Non-Liq.
48.0	131.6	1	1	41.0	45.0	1	0.0	91	0.712	45.5	69.2	Infin.	0.783	0.464	8.282	0.202	Non-Liq.
49.0	131.6	1	1	41.0	45.0	1	0.0	91	0.712	45.5	69.2	Infin.	0.778	0.464	8.320	0.203	Non-Liq.
50.0	131.6	1	1	41.0	45.0	1	0.0	91	0.712	45.5	69.2	Infin.	0.774	0.463	8.356	0.204	Non-Liq.
51.0	124.3	1	1	23.0	50.0	1	80.4	67	0.684	31.5	61.9	Infin.	0.769	0.463	4.708	0.205	Non-Liq.
52.0	124.3	1	1	23.0	50.0	1	80.4	67	0.684	31.5	61.9	Infin.	0.765	0.463	4.729	0.206	Non-Liq.
53.0	124.3	1	1	23.0	50.0	1	80.4	67	0.684	31.5	61.9	Infin.	0.760	0.463	4.750	0.207	Non-Liq.
54.0	124.3	1	1	23.0	50.0	1	80.4	67	0.684	31.5	61.9	Infin.	0.755	0.462	4.770	0.207	Non-Liq.
55.0	124.3	1	1	23.0	50.0	1	80.4	67	0.684	31.5	61.9	Infin.	0.751	0.462	4.789	0.208	Non-Liq.
56.0	124.3	1	1	24.0	55.0	1	75.9	66	0.661	31.8	61.9	Infin.	0.746	0.461	5.016	0.209	Non-Liq.
57.0	124.3	1	1	24.0	55.0	1	75.9	66	0.661	31.8	61.9	Infin.	0.742	0.461	5.035	0.210	Non-Liq.
58.0	132.5	1	1	24.0	55.0	1	75.9	66	0.661	31.8	70.1	Infin.	0.737	0.460	5.053	0.211	Non-Liq.
59.0	132.5	1	1	24.0	55.0	1	75.9	66	0.661	31.8	70.1	Infin.	0.733	0.459	5.069	0.211	Non-Liq.
60.0	132.5	1	1	24.0	55.0	1	75.9	66	0.661	31.8	70.1	Infin.	0.728	0.458	5.084	0.212	Non-Liq.
61.0	127.3	1	1	29.0	60.0	1	87.1	71	0.640	35.9	64.9	Infin.	0.723	0.457	6.163	0.213	Non-Liq.
62.0	127.3	1	1	29.0	60.0	1	87.1	71	0.640	35.9	64.9	Infin.	0.719	0.456	6.182	0.213	Non-Liq.
63.0	127.3	1	1	29.0	60.0	1	87.1	71	0.640	35.9	64.9	Infin.	0.714	0.454	6.201	0.214	Non-Liq.
64.0	127.3	1	1	29.0	60.0	1	87.1	71	0.640	35.9	64.9	Infin.	0.710	0.453	6.219	0.214	Non-Liq.
65.0	127.3	1	1	29.0	60.0	1	87.1	71	0.640	35.9	64.9	Infin.	0.705	0.452	6.237	0.215	Non-Liq.
66.0	127.3	1	1	27.0	65.0	1	71.0	67	0.620	33.1	64.9	Infin.	0.701	0.451	5.823	0.216	Non-Liq.
67.0	127.3	1	1	27.0	65.0	1	71.0	67	0.620	33.1	64.9	Infin.	0.696	0.449	5.839	0.216	Non-Liq.
68.0	125.0	1	1	28.0	70.0	1	54.9	67	0.603	33.3	62.6	Infin.	0.691	0.448	6.071	0.217	Non-Liq.
69.0	125.0	1	1	28.0	70.0	1	54.9	67	0.603	33.3	62.6	Infin.	0.687	0.446	6.087	0.217	Non-Liq.
70.0	125.0	1	1	28.0	70.0	1	54.9	67	0.603	33.3	62.6	Infin.	0.682	0.445	6.103	0.218	Non-Liq.