Appendix F
Geotechnical Report

ESA

Geotechnologies, Inc.
Consulting Geotechnical Engineers

439 Western Avenue
Glendale, California 91201-2837
818.240.9600 • Fax 818.240.9675

Celebrating 50 Years of Service 1971-2021

August 26, 2021
Updated February 2, 2022
File No. 22151-01

Culver Crossings Properties LLC
c/o HOK
One Bush Street, Suite 200
San Francisco, California 94104

Attention: Anton Foss

Subject: Evaluation of Soils and Geology Issues
Proposed Commercial Office Development
8825 National Boulevard and 8771 Washington Boulevard
Culver City, California;
8876, 8884, 8886 and 8888 Venice Boulevard and
8827 and 8829 National Boulevard, Los Angeles, California.

Dear Mr. Foss:

1.0 INTRODUCTION

This document is intended to discuss potential soils and geological issues for the proposed development, as required by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. This report is based on collection of representative samples, laboratory testing, engineering analysis, review of published geologic data, review of available geotechnical engineering information and the preparation of this report.

2.0 SITE CONDITIONS

The project site is located at 8825 National Boulevard and 8771 Washington Boulevard, in Culver City, California; and 8876, 8884, 8886 and 8888 Venice Boulevard and 8827 and 8829 National Boulevard, in the City of Los Angeles, California. The project site is currently improved with low-rise warehouses that have been converted into retail, office, and surface and enclosed parking lots serving the existing uses on the site.

The project site is bounded by Venice Boulevard to the north, Washington Boulevard to the south, National Boulevard to the west, and existing commercial uses to the east. The site is shown relative to nearby topographic features in the enclosed Vicinity Map.

3.0 PROJECT SCOPE

Information concerning the proposed development was furnished by Trammell Crow Company. The site is proposed to be developed with two office buildings. Building 1 will be four stories in height, and will be built over three subterranean parking levels. Building 2 will be four to five stories in height, and will also be built over three subterranean parking levels. The location and alignment of the proposed development is shown in the enclosed Plot Plan.

Structural information for the proposed development is not available at this time. Grading is expected to consist of excavations up to a maximum depth of 50 feet for construction of the proposed three-level subterranean garage, including foundation elements. The proposed structures will be designed in accordance with the provisions of the applicable California Building Code.

4.0 FIELD EXPLORATION

This firm conducted exploration at the site on June 1, 2 and 15, and August 26 and 27, 2021. The exploration consisted of drilling a total of four borings and excavating three test pits. The borings were drilled to a depth of 80 to 90 feet below the existing grade, with the aid of a truck-mounted drilling machine using 8-inch diameter hollowstem augers. The test pits were excavated to depths between 10 and 20 feet below the existing grade, with the aid of hand tools and a 4-inch diameter hand auger. The exploration locations are shown on the Plot Plan and the geologic materials encountered are logged on Plates A-1 through A-5.

A previous exploration was conducted at the site in 2014 by Environmental Managers & Auditors, Inc. This previous exploration consisted of five borings, which were excavated to depths ranging between 5 and 51½ feet below the existing site grade. The location of these previous borings is shown in the enclosed Plot Plan, and their logs have been enclosed to this report.

5.0 GEOLOGIC MATERIALS

Fill:

Fill materials were encountered in the previous exploratory excavations, to depths ranging between 3 and 11½ feet below the existing grade. The fill consists of silty sand, sandy and clayey silt, and sandy and silty clay, which are dark brown and gray in color, moist, medium dense or stiff and fine grained.

Alluvium:

The fill is in turn underlain by native alluvial soils, consisting of interlayered mixtures of sand, silt and clay. The native alluvial soils range from yellowish brown to grayish brown to dark gray

in color, and are moist to wet, medium dense to very dense, or stiff to very stiff, and fine to coarse grained, with occasional gravel, pebbles and cobbles.
More detailed descriptions of the earth materials encountered may be obtained from the enclosed log of the subsurface excavation.

6.0 GROUNDWATER

According to groundwater data provided in the Seismic Hazard Zone Report of the Beverly Hills 7½-Minute Quadrangle, the historically highest groundwater level for the site was on the order of 20 feet below the ground surface (CDMG, 1998). A copy of the historic high-water map is enclosed herein. Based on review of the topographic survey prepared by JRN Civil Engineers, dated February 8, 2018, it is the opinion of this firm that the historically highest groundwater level corresponds to elevation 84 feet for the site.

Groundwater was observed in the four borings excavated by this firm. Additionally, groundwater was encountered in a boring previously excavated at the site by Environmental Managers & Auditors, Inc. (EMA) in 2014. A copy of the boring log prepared by EMA may be found in the Appendix of this report. The table below summarizes the depth at which groundwater was observed.

Boring No.	Geotechnical Consultant	Depth to Water Below G.S (feet)	Groundwater Elevation
B1	Geotechnologies, Inc.	31½	74.1
B2	Geotechnologies, Inc.	29½	75.0
B3	Geotechnologies, Inc.	33.0	74.4
B4	Geotechnologies, Inc.	29.0	75.1
B1	EMA	28.8	76.2

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. High groundwater levels can result in changed conditions.

7.0 LOCAL GEOLOGY

The site is located in the Los Angeles Basin. 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, 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.

8.0 REGIONAL GEOLOGIC SETTINGS

The subject site is located in the Los Angeles Basin of the northern portion of the 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-trending reverse faults that form the southern margin of the Transverse Ranges.

9.0 SOIL AND GEOLOGY ISSUES

a) Regional Faulting

Based on criteria established by the California Division of Mines and Geology (CDMG) now called California Geologic Survey (CGS), faults may be categorized as Holocene-active, Pre-Holocene faults, and Age-undetermined faults. Holocene-active faults are those which show evidence of surface displacement within the last 11,700 years. Pre-Holocene faults are those that have not moved in the past 11,700 years. Age-undetermined faults are faults where the recency of fault movement has not been determined.

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. Therefore, the potential for surface rupture on these surface-verging splays at magnitudes higher than 6.0 cannot be precluded.

A list of faults located within 60 miles (100 kilometers) from the project sites has been provided in the enclosed table titled: Seismic Source Summary Table. A Southern California Fault Map has also been enclosed. The following sections describe some of the regional active faults, potentially active faults, and blind thrust faults.

i) Holocene Active Faults

Newport-Inglewood Fault System

The Newport-Inglewood Fault System is located 0.21 miles to the east of the site. The Newport-Inglewood Fault Zone is a broad zone of discontinuous north to northwestern echelon faults and northwest to west trending folds. The fault zone extends southeastward from West Los Angeles, across the Los Angeles Basin, to Newport Beach and possibly offshore beyond San Diego (Barrows, 1974; Weber, 1982; Ziony, 1985).

The onshore segment of the Newport-Inglewood Fault Zone extends for about 37 miles from the Santa Ana River to the Santa Monica Mountains. Here it is overridden by, or merges with, the east-west trending Santa Monica zone of reverse faults.

The surface expression of the Newport-Inglewood Fault Zone is made up of a strikingly linear alignment of domal hills and mesas that rise on the order of 400 feet above the surrounding plains. From the northern end to its southernmost onshore expression, the Newport-Inglewood fault zone is made up of: Cheviot Hills, Baldwin Hills, Rosecrans Hills, Dominguez Hills, Signal Hill-Reservoir Hill, Alamitos Heights, Landing Hill, Bolsa Chica Mesa, Huntington Beach Mesa, and Newport Mesa. Several single and multiple fault strands, arranged in a roughly left stepping en echelon arrangement, make up the fault zone and account for the uplifted mesas.

The most significant earthquake associated with the Newport-Inglewood Fault System was the Long Beach earthquake of 1933 with a magnitude of 6.3 on the Richter scale. It is believed that the Newport-Inglewood Fault Zone is capable of producing a 7.5 magnitude earthquake.

Santa Monica Fault

The Santa Monica Fault, located approximately 2.66 miles to the north of the site, is a part of the Transverse Ranges Southern Boundary fault system. The Santa Monica Fault extends east from the coastline in Pacific Palisades through Santa Monica and West Los Angeles and merges with the Hollywood fault at the West Beverly Hills Lineament in Beverly Hills where its strike is northeast. It is believed that at least six surface ruptures have occurred in the past 50 thousand years. In addition, a well-documented surface rupture occurred between 10 and 17 thousand years ago, although a more recent earthquake probably occurred 1 to 3 thousand years ago. This leads to an average earthquake recurrence interval of 7 to 8 thousand years.[a] It is thought that the Santa Monica Fault System may produce earthquakes with a maximum magnitude of 7.4.

The California Geological Survey has recently established an Earthquake Fault Zone for the Santa Monica Fault, as shown in the Earthquake Zones of Required Investigation for the Beverly Hills Quadrangle, dated January 11, 2018.

[a] *Southern California Earthquake Center, a National Science Foundation and U.S. Geological Survey Center. Active Faults in the Los Angeles Metropolitan Region, www.scec.org/research/special/SCEC001activefaultsLA.pdf; accessed May 24, 2012.*

Hollywood Fault

The Hollywood Fault is part of the Transverse Ranges Southern Boundary fault system. The Hollywood Fault is located approximately 3.96 miles northeast of the site. This fault trends east-west along the base of the Santa Monica Mountains from the West Beverly Hills Lineament in the West Hollywood–Beverly Hills area to the Los Feliz area of Los Angeles. The Hollywood Fault is the eastern segment of the reverse oblique Santa Monica–Hollywood fault. Based on geomorphic evidence, stratigraphic correlation between exploratory borings, and fault trenching studies, this fault is classified as active.

Until recently, the approximately 9.3-mile-long Hollywood Fault was considered to be expressed as a series of linear ground-surface geomorphic expressions and south-facing ridges along the south margin of the eastern Santa Monica Mountains and the Hollywood Hills. Multiple recent fault rupture hazard investigations have shown that the Hollywood Fault is located south of the ridges and bedrock outcroppings along portions of Sunset Boulevard. The Hollywood Fault has not produced any damaging earthquakes during the historical period and has had relatively minor micro-seismic activity. It is estimated that the Hollywood Fault is capable of producing a maximum 6.7 magnitude earthquake. In 2014, the California Geological Survey established an Earthquake Fault Zone for the Hollywood Fault.

Malibu Coast Fault

The Malibu Coast Fault is part of the Transverse Ranges Southern Boundary fault system, a west-trending system of reverse, oblique-slip, and strike-slip faults that extends for more than approximately 124 miles along the southern edge of the Transverse Ranges and includes the Hollywood, Raymond, Anacapa–Dume, Malibu Coast, Santa Cruz Island, and Santa Rosa Island Faults.

The Malibu Coast Fault Zone runs in an east-west orientation onshore subparallel to and along the shoreline for a linear distance of about 17 miles through the Malibu City limits, but also extends offshore to the east and west for a total length of approximately 37.5 miles. The onshore Malibu Coast Fault Zone involves a broad, wide zone of faulting and shearing as much as 1 mile in width. While the Malibu Coast Fault Zone has not been officially designated as an active fault zone by the State of California and no Special Studies Zones have been delineated along any part of the fault zone under the Alquist-Priolo Act of 1972, evidence for Holocene activity (movement in the last 11,000 years) has been established in several locations along individual fault splays within the fault zone. Due to such evidence, several fault splays within the onshore portion of the fault zone are identified as active.[b]

[b] *City of Malibu Planning Department, Malibu General Plan, Chapter 5.0, Safety and Health Element, http://qcode.us/codes/malibu-general-plan/; accessed October 25, 2012.*

Large historic earthquakes along the Malibu Coast Fault include the 1979, 5.2 magnitude earthquake and the 1989, 5.0 magnitude earthquake.[c] The Malibu Coast Fault Zone is approximately 7.99 miles northwest of the site and is believed to be capable of producing a maximum 7.0 magnitude earthquake.

Palos Verdes Fault

Studies indicate that there are several active on-shore extensions of the strike-slip Palos Verdes Fault, which is located approximately 10.31 miles southwest of the site. Geophysical data also indicate the off-shore extensions of the fault are active, offsetting Holocene age deposits. No historic large magnitude earthquakes are associated with this fault. However, the fault is considered active by the California Geological Survey. It is estimated that the Palos Verdes Fault is capable of producing a maximum 7.7 magnitude earthquake.

Raymond Fault

The Raymond Fault is located approximately 11.30 miles to the northeast of the site. The Raymond fault is an effective groundwater barrier which divides the San Gabriel Valley into groundwater sub-basins. Much of the geomorphic evidence for the Raymond Fault has been obliterated by urbanization of the San Gabriel Valley. However, a discontinuous escarpment can be traced from Monrovia to the Arroyo Seco in South Pasadena. The very bold, "knife edge" escarpment in Monrovia parallel to Scenic Drive is believed to be a fault scarp of the Raymond Fault. Trenching of the Raymond Fault is reported to have revealed Holocene movement (Weaver and Dolan, 1997).

The recurrence interval for the Raymond Fault is probably slightly less than 3,000 years, with the most recent documented event occurring approximately 1,600 years ago (Crook, et al, 1978). However, historical accounts of an earthquake that occurred in July 1855 as reported by Toppozada and others, 1981, place the epicenter of a Richter Magnitude 6 earthquake within the Raymond Fault. It is believed that the Raymond Fault is capable of producing a 6.8 magnitude earthquake. The Raymond Fault is considered active by the California Geological Survey.

Verdugo Fault

The Verdugo Fault is located approximately 12.42 miles to the northeast of the site. The Verdugo Fault runs along the southwest edge of the Verdugo Mountains. The fault displays a reverse motion. According to Weber, et. al., (1980) 2 to 3 meter high scarps were identified in alluvial fan deposits in the Burbank and

[c] *California Institute of Technology, Southern California Data Center. Chronological Earthquake Index, www.data.scec.org/significant/malibu1979.html; accessed October 25, 2012.*

Glendale areas. Further to the northeast, in Sun Valley, a fault was reportedly identified at a depth of 40 feet in a sand and gravel pit. Although considered active by the County of Los Angeles, Department of Public Works (Leighton, 1990), and the United States Geological Survey, the fault is not designated with an Earthquake Fault Zone by the California Geological Survey. It is estimated that the Verdugo Fault is capable of producing a maximum 6.9 magnitude earthquake.

Sierra Madre Fault System

The Sierra Madre Fault alone forms the southern tectonic boundary of the San Gabriel Mountains in the northern San Fernando Valley. It consists of a system of faults approximately 75 miles in length. The individual segments of the Sierra Madre Fault System range up to 16 miles in length and display a reverse sense of displacement and dip to the north. The most recently active portions of the zone include the Mission Hills, Sylmar and Lakeview segments, which produced an earthquake in 1971 of magnitude 6.4. Tectonic rupture along the Lakeview Segment during the San Fernando Earthquake of 1971 produced displacements of approximately 2½ to 4 feet upward and southwestward.

It is believed that the Sierra Madre Fault Zone is capable of producing an earthquake of magnitude 7.3. The closest trace of the fault is located approximately 16.75 miles northeast of the site.

Whittier-Elsinore Fault System

The Whittier Fault is located approximately 19.54 miles to the southeast of the site. The Whittier Fault together with the Chino Fault comprises the northernmost extension of the northwest trending Elsinore Fault System. The mapped surface of the Whittier Fault extends in a west-northwest direction for a distance of 20 miles from the Santa Ana River to the terminus of the Puente Hills. The Whittier Fault is essentially a strike-slip, northeast dipping fault zone which also exhibits evidence of reverse movement along with en echelon[d] fault segments, en echelon folds and anatomizing (braided) fault segments. Right lateral offsets of stream drainages of up to 8,800 feet (Durham and Yerkes, 1964) and vertical separation of the basement complex of 6,000 to 12,000 feet (Yerkes, 1972), have been documented. It is believed that the Whittier Fault is capable of producing a 7.8 magnitude earthquake.

The Whittier Narrows earthquakes of October 1, 1987, and October 4, 1987, occurred in the area between the westernmost terminus of the mapped trace of the Whittier Fault and the frontal fault system. The main 5.9 magnitude shock of October 1, 1987 was not caused by slip on the Whittier Fault. The quake ruptured a gently dipping thrust fault with an east-west strike (Haukson, Jones, Davis and

[d] *En echelon refers to closely-spaced, parallel or subparallel, overlapping or step-like minor structural features.*

others, 1988). In contrast, the earthquake of October 4, 1987, is assumed to have occurred on the Whittier Fault as focal mechanisms show mostly strike-slip movement with a small reverse component on a steeply dipping northwest striking plane (Haukson, Jones, Davis and others, 1988).

Santa Susana Fault

The Santa Susana Fault extends approximately 17 miles west-northwest from the northwest edge of the San Fernando Valley into Ventura County and is at the surface high on the south flank of the Santa Susana Mountains. The fault ends near the point where it overrides the south-side-up South strand of the Oak Ridge Fault. The Santa Susana Fault strikes northeast at the Fernando lateral ramp and turns east at the northern margin of the Sylmar Basin to become the Sierra Madre Fault. This fault is exposed near the base of the San Gabriel Mountains for approximately 46 miles from the San Fernando Pass at the Fernando lateral ramp east to its intersection with the San Antonio Canyon fault in the eastern San Gabriel Mountains, east of which the range front is formed by the Cucamonga fault. The Santa Susana Fault has not experienced any recent major ruptures except for a slight rupture during the 6.5 magnitude 1971 Sylmar earthquake.[e] The Santa Susana Fault is considered to be active by the County of Los Angeles. It is believed that the Santa Susana Fault has the potential to produce a 6.9 magnitude earthquake. The closest trace of the fault is located approximately 20.59 miles north of the site.

San Gabriel Fault System

The San Gabriel Fault System is located approximately 20.79 miles northeast of the site. The San Gabriel Fault System comprises a series of subparallel, steeply north-dipping faults trending approximately north 40 degrees west with a right-lateral sense of displacement. There is also a small component of vertical dip-slip separation. The fault system exhibits a strong topographic expression and extends approximately 90 miles from San Antonio Canyon on the southeast to Frazier Mountain on the northwest. The estimated right lateral displacement on the fault varies from 34 miles (Crowell, 1982) to 40 miles (Ehlig, 1986), to 10 miles (Weber, 1982). Most scholars accept the larger displacement values and place the majority of activity between the Late Miocene and Late Pliocene Epochs of the Tertiary Era (65 to 1.8 million years before present).

Portions of the San Gabriel Fault System are considered active by California Geological Survey. Recent seismic exploration in the Valencia area (Cotton and others, 1983; Cotton, 1985) has established Holocene offset. Radiocarbon data acquired by Cotton (1985) indicate that faulting in the Valencia area occurred between 3,500 and 1,500 years before present.

[e] *California Institute of Technology, Southern California Data Center. Chronological Earthquake Index, www.data.scec.org/significant/santasusana.html; accessed May 24, 2012.*

It is hypothesized by Ehlig (1986) and Stitt (1986) that the Holocene offset on the San Gabriel Fault System is due to sympathetic (passive) movement as a result of north-south compression of the upper Santa Susana thrust sheet. Seismic evidence indicates that the San Gabriel Fault System is truncated at depth by the younger, north-dipping Santa Susana-Sierra Madre Faults (Oakeshott, 1975; Namson and Davis, 1988).

San Andreas Fault System

The San Andreas Fault System forms a major plate tectonic boundary along the western portion of North America. The system is predominantly a series of northwest trending faults characterized by a predominant right lateral sense of movement. At its closest point, the San Andreas Fault System is located approximately 39.19 miles to the northeast of the site.

The San Andreas and associated faults have had a long history of inferred and historic earthquakes. Cumulative displacement along the system exceeds 150 miles in the past 25 million years (Jahns, 1973). Large historic earthquakes have occurred at Fort Tejon in 1857, at Point Reyes in 1906, and at Loma Prieta in 1989. Based on single-event rupture length, the maximum Richter magnitude earthquake is expected to be approximately 8.25 (Allen, 1968). The recurrence interval for large earthquakes on the southern portion of the fault system is on the order of 100 to 200 years.

ii) Pre-Holocene Faults

Anacapa-Dume Fault

The Anacapa–Dume Fault, located approximately 9.56 miles to the northwest of the site, is a near-vertical offshore escarpment exceeding 600 meters locally, with a total length exceeding 62 miles. This fault is also part of the Transverse Ranges Southern Boundary Fault System. It occurs as close as 3.6 miles offshore south of Malibu at its western end, but trends northeast where it merges with the offshore segments of the Santa Monica Fault Zone. It is believed that the Anacapa–Dume fault is responsible for generating the historic 1930 magnitude 5.2 Santa Monica earthquake, the 1973 magnitude 5.3 Point Mugu earthquake, and the 1979 and 1989 Malibu earthquakes, each of which possessed a magnitude of 5.0.[f] The Anacapa–Dume Fault is thought to be capable of producing a maximum magnitude 7.2 earthquake.

[f] *City of Malibu Planning Department. Malibu General Plan, Chapter 5.0, Safety and Health Element, http://qcode.us/codes/malibu-general-plan/; accessed May 24, 2012.*

iii) Blind Thrusts Faults

Blind or buried thrust faults are faults without a surface expression but are a significant source of seismic activity. By definition, these faults have no surface trace, therefore the potential for ground surface rupture is considered remote. 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 sometimes not known until they produce an earthquake. Two blind thrust faults in the Los Angeles metropolitan area are the Puente Hills Blind Thrust and the Elysian Park Blind Thrust. Another blind thrust fault of note is the Northridge Fault located in the northwestern portion of the San Fernando Valley.

The Puente Hills Blind Thrust Fault extends eastward from Downtown Los Angeles to the City of Brea in northern Orange County. The Puente Hills Blind Thrust Fault includes three north-dipping segments, named from east to west as the Coyote Hills segment, the Santa Fe Springs segment, and the Los Angeles segment. These segments are overlain by folds expressed at the surface as the Coyote Hills, Santa Fe Springs Anticline, and the Montebello Hills. The Los Angeles segment of the Puente Hills Blind Thrust is located approximately 2.93 miles to the east of the site.

The Santa Fe Springs segment of the Puente Hills Blind Thrust Fault is believed to be the cause of the October 1, 1987, Whittier Narrows Earthquake. Based on deformation of late Quaternary age sediments above this fault system and the occurrence of the Whittier Narrows earthquake, the Puente Hills Blind Thrust Fault is considered an active fault capable of generating future earthquakes beneath the Los Angeles Basin. A maximum moment magnitude of 7.0 is estimated by researchers for the Puente Hills Blind Thrust Fault.

The Elysian Park Anticline is thought to overlie the Elysian Park Blind Thrust Fault. This fault has been estimated to cause an earthquake every 500 to 1,300 years in the magnitude range 6.2 to 6.7. The Elysian Park Anticline is approximately 7.69 miles to the northeast of the site.

The Mw 6.7 Northridge earthquake was caused by the sudden rupture of a previously unknown, blind thrust fault. This fault has since been named the Northridge Thrust, however it is also known in some of the literature as the Pico Thrust. It has been assigned a maximum magnitude of 6.9 and a 1,500 to 1,800 year recurrence interval. The Northridge Thrust is located 19.33 miles to the northwest of the site.

b) Surface Ground Rupture

In 1972, the Alquist-Priolo Special Studies Zones Act (now known as the Alquist-Priolo Earthquake Fault Zoning Act) was passed into law. As revised in 2018, The Act defines "Holocene-active" Faults utilizing the same aging criteria as that used by California Geological Survey (CGS). However, established state policy has been to zone only those faults which have direct evidence of movement within the last 11,700 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 Holocene-Active 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.

Review of the Earthquake Zones of Required Investigation Map of the Beverly Hills Quadrangle (CGS, 2018) indicates that the subject site is not located within an Alquist-Priolo Earthquake Fault Zone. The closest zone is the Inglewood Fault Zone, which is located approximately 500 feet to the east of the subject site. A copy of this map is enclosed herein as "Seismic Hazard Zones Map".

Ground rupture is defined as surface displacement which occurs along the surface trace of the causative fault during an earthquake. 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.

c) Seismicity

As with all of Southern California, the project site is subject to potential strong ground motion, should a moderate to strong earthquake occur on a local or regional fault. Design of any proposed structures on the site in accordance with the provisions of the applicable California Building Code will mitigate the potential effects of strong ground shaking.

d) Deaggregated Seismic Source Parameters

The peak ground acceleration (PGA) and modal magnitude were obtained from the USGS Probabilistic Seismic Hazard Deaggregation program (USGS, 2014). The results are based on a 2 percent in 50 years ground motion (2,475 year return period). A shear wave velocity of 259 meters per second was utilized for Vs30. The deaggregation program indicates a PGA of 0.89g and a mean magnitude of 6.72 for the site.

e) California Building Code Seismic Parameters

Based on information derived from the neighboring subsurface investigation, the subject site is classified as Site Class D, which corresponds to a "Stiff Soil" Profile, according to Table 20.3-1 of ASCE 7-16. This information and the site coordinates were input into the SEAOC/OSHPD U.S. Seismic Design Maps tool to calculate the ground motions for the site.

2019 CALIFORNIA BUILDING CODE SEISMIC PARAMETERS	
Site Class	D
Mapped Spectral Acceleration at Short Periods (S_S)	2.016g
Site Coefficient (F_a)	1.0
Maximum Considered Earthquake Spectral Response for Short Periods (S_{MS})	2.016g
Five-Percent Damped Design Spectral Response Acceleration at Short Periods (S_{DS})	1.344g
Mapped Spectral Acceleration at One-Second Period (S_1)	0.715g
Site Coefficient (F_v)	1.7*
Maximum Considered Earthquake Spectral Response for One-Second Period (S_{M1})	1.216g*
Five-Percent Damped Design Spectral Response Acceleration for One-Second Period (S_{D1})	0.810g*

* *According to ASCE 7-16, a Long Period Site Coefficient (F_v) of 1.7 may be utilized provided that the value of the Seismic Response Coefficient (C_s) is determined by Equation 12.8-2 for values of $T \leq 1.5T_s$ and taken as equal to 1.5 times the value computed in accordance with either Equation 12.8-3 for $T_L \geq T > 1.5T_s$ or equation 12.8-4 for $T > T_L$. Alternatively, a site-specific ground motion hazard analysis may be performed in accordance with ASCE 7-16 Section 21.1 and/or a ground motion hazard analysis in accordance with ASCE 7-16 Section 21.2 to determine ground motions for any structure.*

f) 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 Beverly Hills Quadrangle by the State of California (CDMG, 2018) classifies the site as part of a "Liquefiable" 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 map is enclosed.

Four site-specific liquefaction analyses were performed following the Recommended Procedures for Implementation of the California Geologic Survey Special Publication 117A, Guidelines for Analyzing and Mitigating Seismic Hazards in California (CGS, 2008), and the EERI Monograph (MNO-12) by Idriss and Boulanger (2008). 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 our exploration, at depths ranging between 29 and 33 feet below the existing grade. Based on review of the seismic hazard zone report of the Beverly Hills 7½-minute quadrangle (CDMG, 2005), the historically highest groundwater level for the site was 20 feet below the ground surface. Both the historically highest groundwater level and the current groundwater level were utilized for the enclosed liquefaction analyses.

Section 11.8.3 of ASCE 7-16 indicates that the potential for liquefaction shall be evaluated utilizing an acceleration consistent with the MCE_G PGA. Utilizing the OSHPD seismic utility program, this corresponds to a PGA_M of 0.95g. The USGS Probabilistic Seismic Hazard Deaggregation program (USGS, 2014) indicates a PGA of 0.89g (2 percent in 50 years ground motion) and a mean magnitude of 6.72 for the site. The liquefaction potential evaluation was performed by utilizing a magnitude 6.72 earthquake, and a peak horizontal acceleration of 0.95g.

The enclosed "Empirical Estimations of Liquefaction Potential" are based on Borings B1, B2, B3 and B4. 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 soil samples encountered during exploratory are presented on the enclosed E-Plate and F-Plate.

The procedure presented in the SP117A guidelines was followed in analyzing the liquefaction potential of the subject site in combination with the most recent Los Angeles Building Code requirements. The SP117A guidelines were developed based on a document titled, "Assessment of the Liquefaction Susceptibility of Fine-Grained Soils", by Bray and Sancio (2006). According to the SP117A and City of Los Angeles criteria, soils having a Plastic Index (PI) greater than 18 exhibit clay-like behavior, and the liquefaction potential of these soils are considered to be low.

The enclosed site-specific liquefaction analyses indicate that the site soils would not be susceptible to liquefaction during the ground motion expected during the design basis earthquake.

g) Dynamic 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.

It is anticipated that the bottom of the proposed structure will extend into the current groundwater level. Therefore the structure will not be subject to dynamic dry settlement. As mentioned in the previous section, the site is not susceptible to dynamic settlement produced by liquefaction.

h) Regional Subsidence

The site is not located within a zone of known subsidence due to oil or other fluid withdrawal.

i) Landsliding

The probability of seismically-induced landslides occurring on the site is considered to be negligible due to the general lack of substantive elevation difference across or adjacent to the site. Therefore, potential impacts related to landsliding would be less than significant.

j) Collapsible Soils

Based on review of the enclosed consolidation curves, the soils to underlain the proposed structure are not considered prone to hydroconsolidation.

k) 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 the mapped tsunami inundation boundaries.

Review of the County of Los Angeles Flood and Inundation Hazards Map, (Leighton, 1990), indicates the site lies within the mapped inundation boundaries of the Mulholland Dam. A determination of whether a higher site elevation would remove the site from the potential inundation zones is beyond the scope of this assessment.

Review of the enclosed Flood Insurance Rate Map indicates the site lies within an area of minimal flood hazard (Zone X).

l) City of Los Angeles Methane Zone

Based on review of the NavigateLA Website, developed by the City of Los Angeles, Bureau of Engineering, Department of Public Works, the subject site is not located within the limits of a City of Los Angeles Methane Zone or Methane Buffer Zone.

m) Oil Fields and Oil Wells

Based on review of the California State Division of Oil, Gas and Geothermal Resources (DOGGR) On-line Mapping System, the site is not located within the limits of an oil field, and no oil or gas wells were drilled within the subject site.

n) Temporary Excavations

All required excavations are expected to be conducted in accordance with the provisions of the applicable California Building Code. Therefore, the project would not result in any on-site or off-site landslide.

o) Ground Failure

The proposed construction will not cause, or increase the potential for any seismic related ground failure on the project site or adjacent sites.

p) Expansive Soils

The onsite geologic materials are in the Very Low to High expansion range. The Expansion Index was found to be between 17 and 127 for representative bulk samples.

q) Sedimentation and Erosion

Grading, excavation and other earth moving activities could potentially result in erosion and sedimentation. For any grading proposed in the site from November to April (generally considered the rainy season) an erosion control plan consistent with the City of Los Angeles requirements would need to be prepared. Compliance with minimum code requirements will render project impacts related to sedimentation and erosion less than significant.

r) Landform Alterations

There are no significant hills, canyons, ravines, outcrops or other geologic or topographic features on the site. Therefore, any proposed project would not adversely affect any prominent geologic or topographic features.

s) Septic Tanks

It is the understanding of this firm that sewers are available at the site for wastewater disposal. No septic tanks or alternative disposal systems are necessary or anticipated for any future site projects.

t) Stormwater Infiltration

On-site stormwater infiltration is not considered to be feasible at the subject site. Based on review of the exploration logs, the upper 20 feet soils strata consist primarily of clays and silts. These fine soils are considered to be relatively impervious. More granular materials, which are adequate for infiltration, were found below a depth of 20 feet. However, groundwater has been observed at the site to a depth as shallow as 28.8 feet below grade. Current regulations require that a minimum 10 feet vertical separation is maintained between the bottom of stormwater infiltration systems and the groundwater level. This required separation would not permit infiltration within the granular soils strata.

10.0 GENERAL PRELIMINARY CONCLUSIONS

Based upon the exploration, laboratory testing, and research, it is the preliminary finding of Geotechnologies, Inc. that construction of the proposed development is considered feasible from a geotechnical engineering standpoint.

Previous geotechnical investigations conducted at the site encountered groundwater at depths ranging between 28.8 and 33 feet below the natural grade. It is the opinion of this firm that these groundwater levels would generally reflect the groundwater conditions that should be anticipated at the site. Historical groundwater data provided in the Seismic Hazard Zone Report of the Beverly Hills and Hollywood 7½-Minute Quadrangles indicates the historically highest groundwater level at the site was 20 feet below the ground surface.

The proposed structures will be underlain by three subterranean parking levels. For the purpose of this document, it has been assumed that the subterranean levels will extend to an approximate depth of 45 feet below the ground level. Due to the depth of the proposed structures relative to the historically highest groundwater level (depth of 20 feet), the portions of the structure to be found below the historically highest groundwater level will need to be designed to resist hydrostatic pressures.

Due to the potential hydrostatic uplift, it is anticipated that the proposed structures will be supported on a mat foundation bearing in the undisturbed alluvial soils expected at the subgrade of the proposed excavation. If necessary, uplift anchors may be incorporated into the design to provide resistance against the anticipated hydrostatic uplift acting on the recommended mat foundations.

Excavation of the proposed subterranean levels will require shoring and temporary dewatering in order to achieve a dry and stable excavation. Once the desired subterranean subgrade elevation is reached, it is anticipated that this subgrade will be saturated and may be required to be stabilized with the aid of a gravel blanket.

As with all of Southern California, the site is subject to potential strong ground motion should a moderate to strong earthquake occur on a local or regional fault. The proposed project should be completed in accordance with the provisions of the most current California Building Code, and requirements of the local building official. In either case, design of the project in accordance with the current building code provisions will be intended to mitigate the potential effects of strong ground shaking.

11.0 CLOSURE

The conditions identified in this document are typical of sites within this area of the cities of Los Angeles and Culver City, and of a type that are routinely addressed through regulatory measures. 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.

GREGORIO VARELA
R.C.E. 81201

GV:km

Enclosures: References
Vicinity Map
Plot Plan
Local Geologic Map
Historically Highest Groundwater Levels Plate
Seismic Source Summary Table
Southern California Fault Map
Earthquake Zones Of Required Investigation Map

Enclosures - continued

Flood Insurance Rate Map
Plates A-1 through A-7
Plate C-1 and C-2
Plate D
Plate E
Plate F
Liquefaction Analyses (4 pages)
Boring Logs by Environmental Managers & Auditors, Inc. (6 pages)

E-mail to: [AWallace@trammellcrow.com]

REFERENCES

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, 2008, Guidelines for Evaluation and Mitigation of Seismic Hazards in California, Special Publication 117A.

Department of Water Resources, 1961, Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County, Bulletin 104, Appendix A, 181 pages.

Division of Oil, Gas, and Geothermal Resources, 2013, DOGGER Online Mapping system, http://maps.conservation.ca.gov/doms/doms-app.html

Dibblee, T.W. Jr. 1991, Geologic Map of the Hollywood and Burbank (South ½) Quadrangles, DMG Map #DF-30, map scale 1: 24,000.

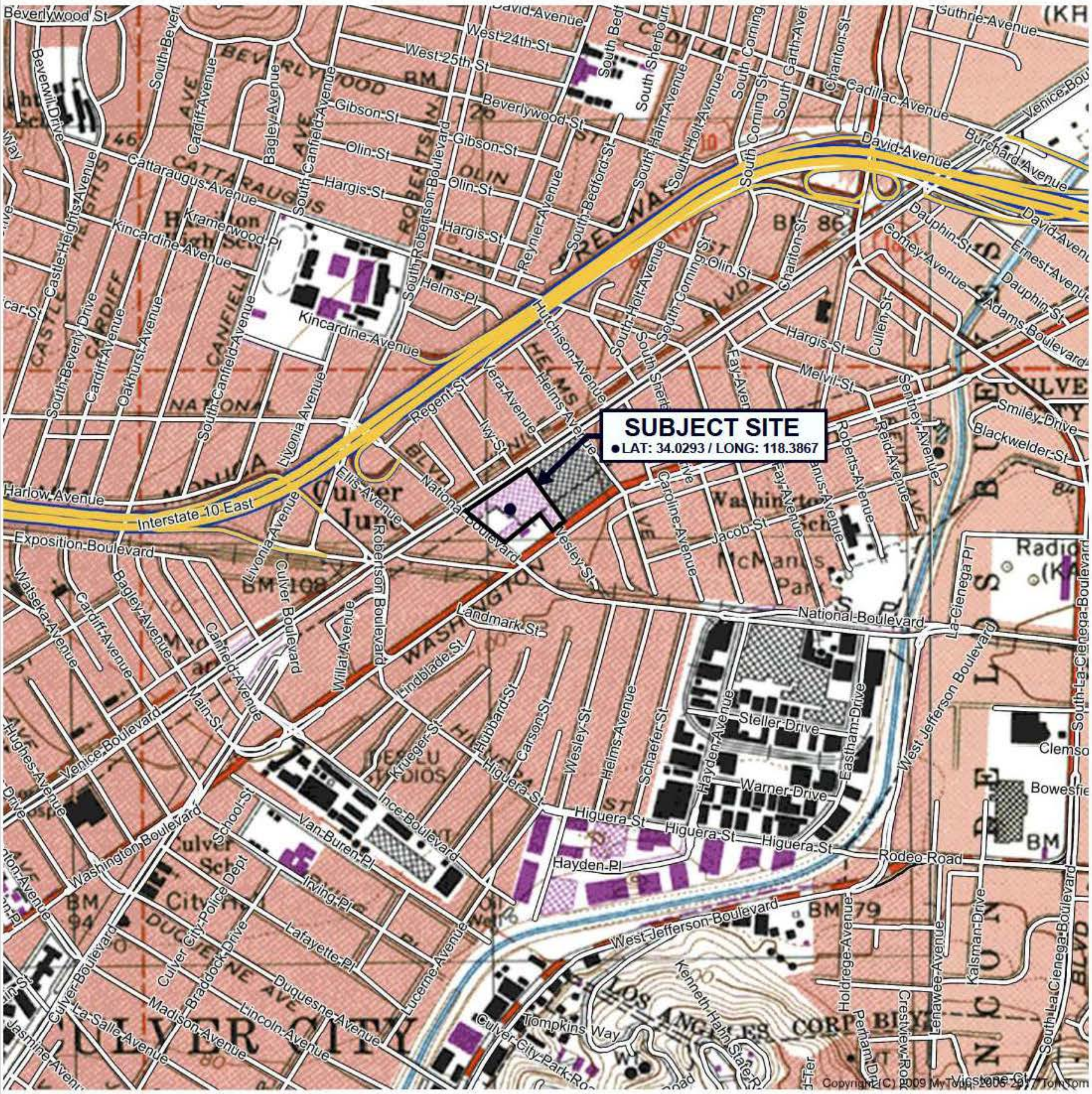
Environmental Managers & Auditors, Inc., October 15, 2014, Geotechnical Investigation and Infiltration Testing, Proposed Commercial Improvements, 8888 Venice Boulevard, Culver City, California, Project Number 6031-04.

FEMA, Flood Insurance Rate Map No. 06037C1618G, dated December 21, 2018.

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

SEAOC/OSHPD U.S. Seismic Design Maps tool.

Yerkes, R.F., McCulloh, T.H., Schoellhamer, J.E., Vedder, J.G., 1965, Geology of the Los Angeles Basin, Southern California-An Introduction, U.S. Geological Professional Paper 420-A.



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,
BEVERLY HILLS, CA QUADRANGLE

VICINITY MAP

Geotechnologies, Inc.
Consulting Geotechnical Engineers

CULVER CROSSINGS PROPERTIES LLC

FILE NO. 22151-01

SCALE IN FEET

0 20 40 60 120

LEGEND

B4 LOCATION & NUMBER OF BORING (Previous Investigation by Geotechnologies, Inc.)

TP3 LOCATION & NUMBER OF TEST PIT (Previous Investigation by Geotechnologies, Inc.)

B4 LOCATION & NUMBER OF BORING (Previous Investigation by Environmental Managers & Auditors, Inc.)

P1 LOCATION & NUMBER OF PERCOLATION BOREHOLE (Previous Investigation by Environmental Managers & Auditors, Inc.)

PROJECT LIMITS

REFERENCE: SITE PLAN BY HOK DATED 08/11/21

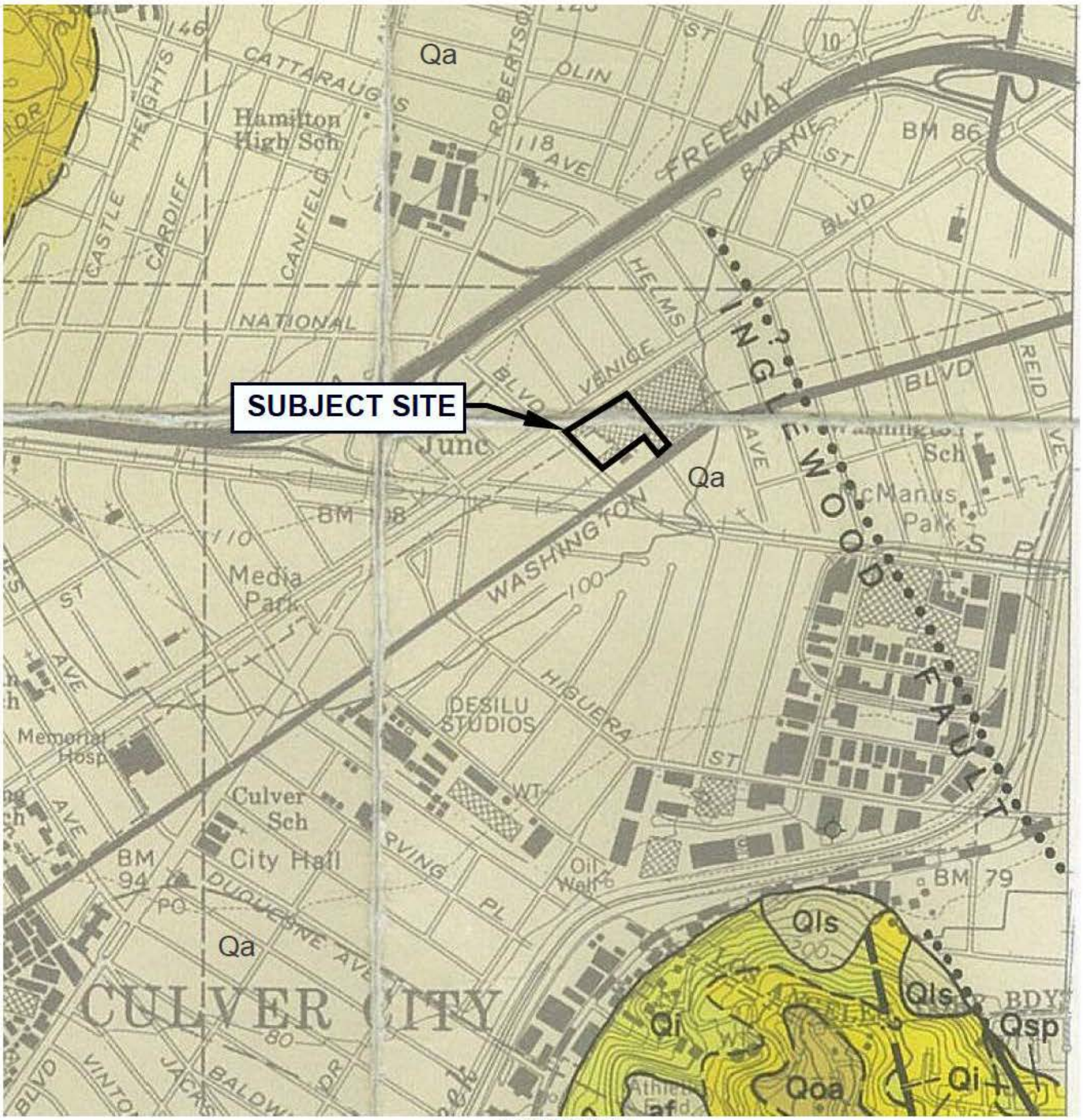
PLOT PLAN

Geotechnologies, Inc.
Consulting Geotechnical Engineers

CULVER CROSSINGS PROPERTIES LLC

FILE No. 22151-01

DATE: January 2022



LEGEND

- Qls: Landslide Debris
- Qa: Alluvial gravel, sand and silt-clay
- Qoa: Older alluvium: gravel, sand and silt-clay
- Qsp: San Pedro Sand
- Qi: Inglewood Formation: Fine grained sandstone and interbedded siltstone
- —···? Fault - dashed where indefinite or inferred, dotted where concealed, queried where existence is doubtful

SCALE IN FEET

0 500 1000 2000

N

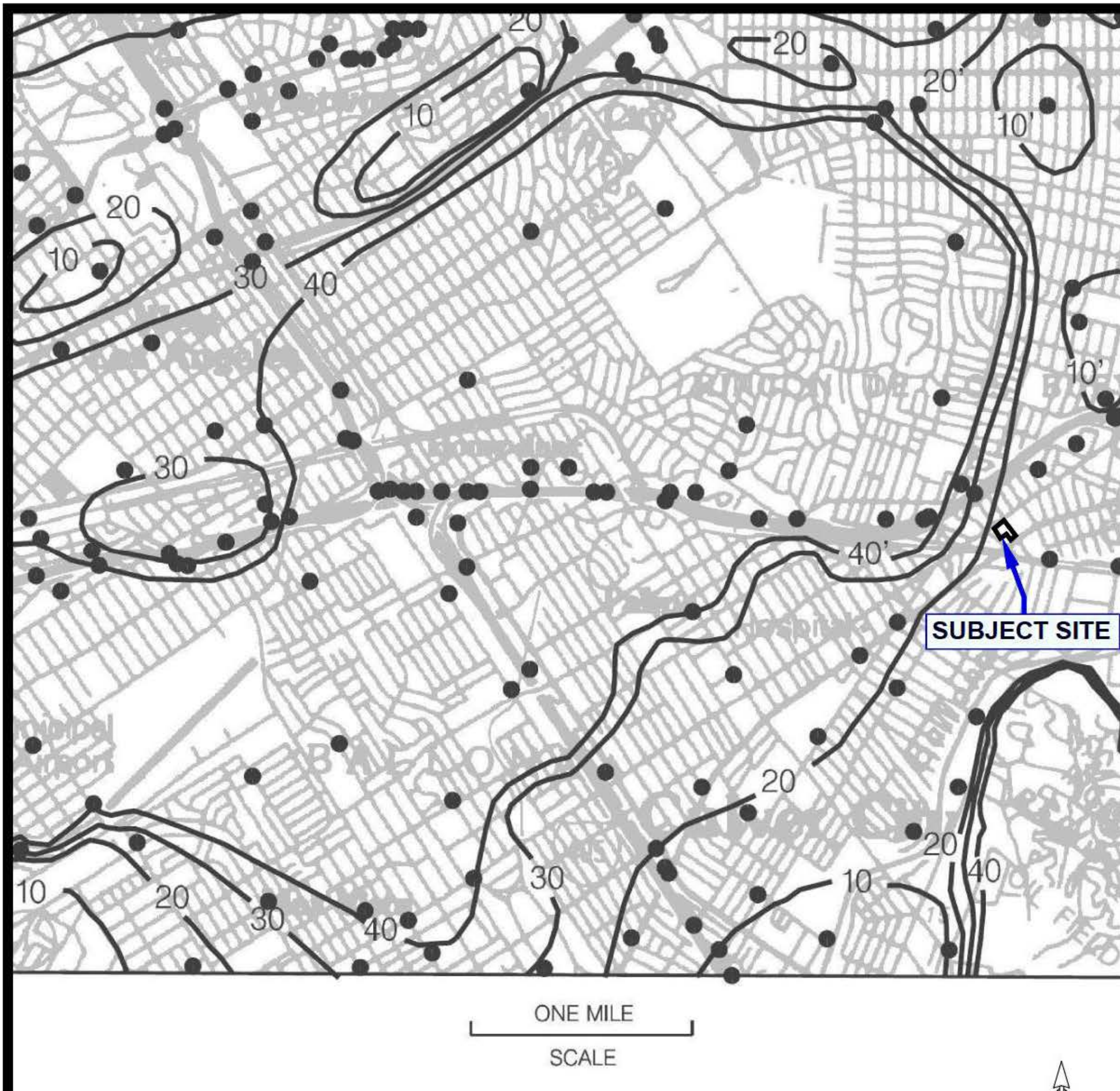
REFERENCE: DIBBLEE, T.W., (1991), GEOLOGIC MAP OF THE BEVERLY HILLS AND VAN NUYS (SOUTH 1/2) QUADRANGLES, MAP #DF-31

LOCAL GEOLOGIC MAP

Geotechnologies, Inc.
Consulting Geotechnical Engineers

CULVER CROSSINGS PROPERTIES LLC

FILE NO. 22151-01



20 Depth to groundwater in feet

REFERENCE: CDMG, SEISMIC HAZARD ZONE REPORT, 023
BEVERLY HILLS 7.5 - MINUTE QUADRANGLE, LOS ANGELES COUNTY, CALIFORNIA (1998, REVISED 2005)

HISTORICALLY HIGHEST GROUNDWATER LEVELS

Geotechnologies, Inc.
Consulting Geotechnical Engineers

CULVER CROSSINGS PROPERTIES LLC

FILE No. 22151-01

SEISMIC SOURCE SUMMARY TABLE

Geotechnologies, Inc.

Culver Crossings Properties LLC

File No.: 22151-01

Based on USGS 2008 National Seismic Hazard Maps

Fault Name	Distance (Miles)	Preferred Dip (degrees)	Dip Direction	Slip Sense	Activity	Reference
Newport-Inglewood	0.21	88		strike slip	A (EFZ)	2
Santa Monica	2.66	44		strike slip	A (EFZ)	2
Puente Hills (LA)	2.93	27	N	thrust	-	1
Hollywood	3.96	70	N	strike slip	A (EFZ)	2
Elysian Park (Upper)	7.69	50	NE	reverse	-	1
Malibu Coast	7.99	75	N	strike slip	A (EFZ)	2
Anacapa-Dume	9.56	41	N	thrust	PH	3
Palos Verdes	10.31	90	V	strike slip	A	2
Raymond	11.30	79	N	strike slip	A (EFZ)	2
Verdugo	12.42	55	NE	reverse	A	1,3
Sierra Madre	16.75	53	N	reverse	A	3
Sierra Madre (San Fernando)	17.32	45	N	reverse	A (EFZ)	2
Northridge	19.33	35	S	thrust	A	3
Elsinore (Whittier)	19.54	81	NE	strike slip	A (EFZ)	2
Santa Susana	20.59	55	N	reverse	A	3
San Gabriel	20.79	61	N	strike slip	A (EFZ)	2
Clamshell-Sawpit	24.42	50	NW	reverse	PH	3
Simi-Santa Rosa	25.95	60		strike slip	A (EFZ)	2
Holser	28.32	58	S	reverse	-	1
San Jose	29.10	74	NW	strike slip	-	1
Oak Ridge	31.90	53		reverse	.	1
San Joaquin Hills	34.76	23	SW	thrust	-	1
San Cayetano	35.36	42	N	thrust	A (EFZ)	2
Chino	36.75	65	SW	strike slip		2
Cucamonga	38.26	45	N	reverse	A (EFZ)	2
San Andreas	39.19	90	V	strike slip	A (EFZ)	2
Santa Ynez	48.37	70		strike slip	A	2
Pitas Point	48.38	55		reverse	A (EFZ)	2
Ventura-Pitas Point	48.38	64	N	reverse	A (EFZ)	2
Santa Cruz Island	50.28	90	V	strike slip	A	2
Channel Islands Thrust	50.34	20	N	thrust	-	1
San Jacinto	50.44	90	V	strike slip	-	1
Mission Ridge-Arroyo Parida	54.00	70	S	reverse	-	1
Cleghorn	56.25	90	V	Strike Slip	-	1
Red Mountain	56.76	56	N	reverse	A (EFZ)	2
Coronado Bank	58.29	90	V	Strike Slip	A	2

Reference:

1 = United States Geological Survey

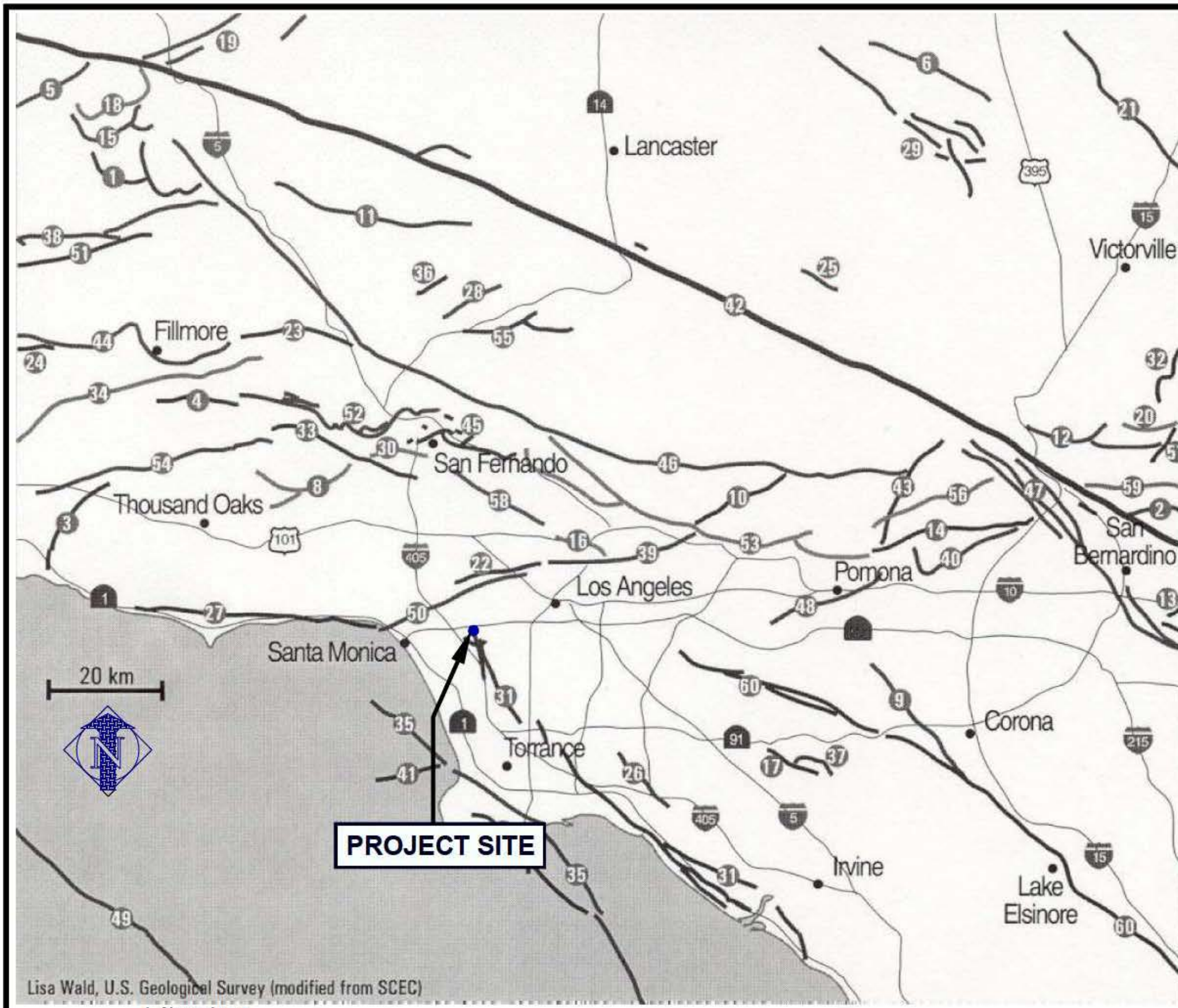
2 = California Geological Survey

3 = County of Los Angeles, Dept. of Public Works, 1990

A = Holocene Active

PH = Pre Holocene

A (EFZ) = Holocene Active (Earthquake Fault Zone)



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
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
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

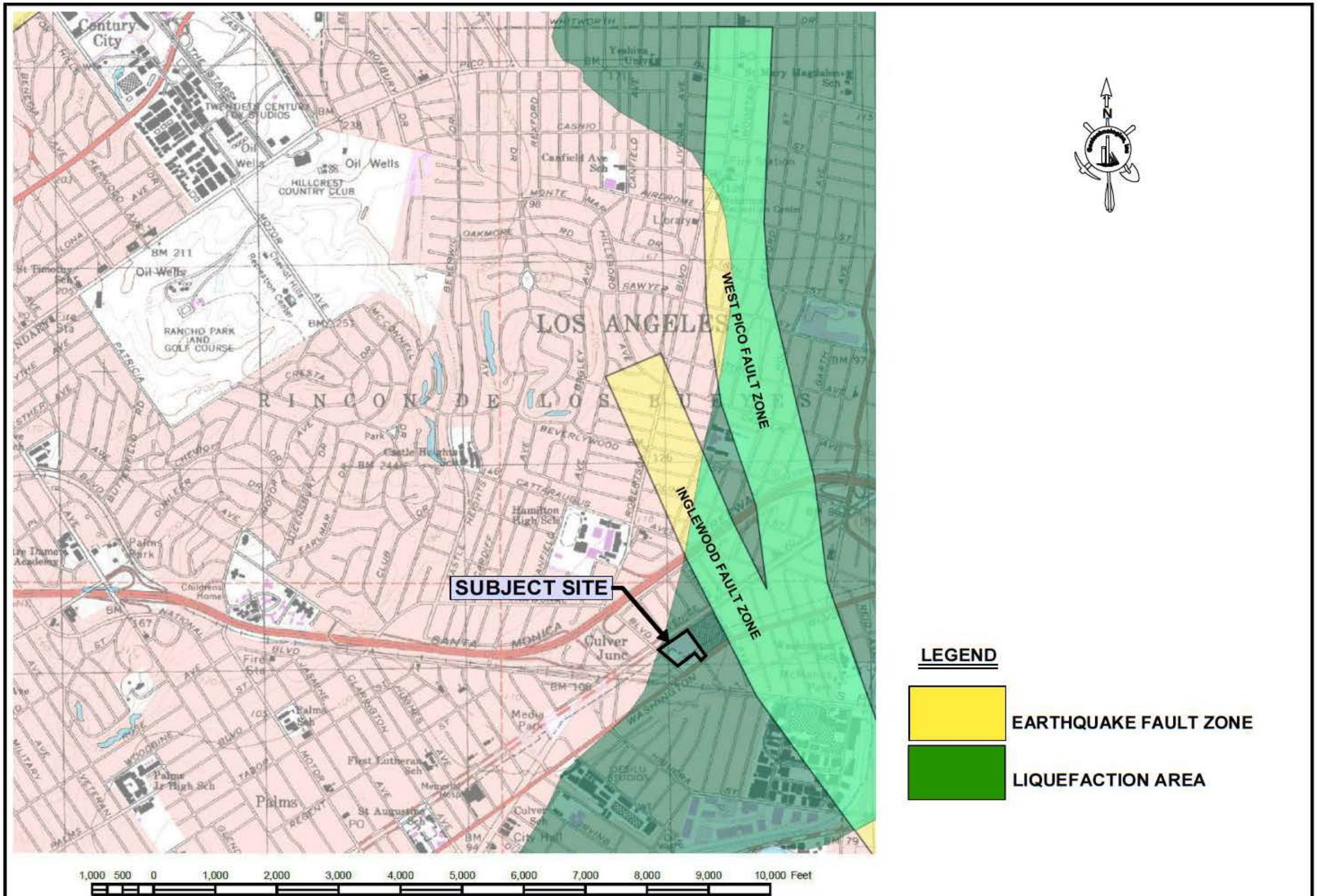
REFERENCE: http://pasadena.wr.usgs.gov/info/images/LA%20Faults.pdf

SOUTHERN CALIFORNIA FAULT MAP

Geotechnologies, Inc.
Consulting Geotechnical Engineers

CULVER CROSSINGS PROPERTIES LLC

FILE NO. 22151-01



EARTHQUAKE ZONES OF REQUIRED INVESTIGATION MAP

Geotechnologies, Inc.
Consulting Geotechnical Engineers

CULVER CROSSINGS PROPERTIES LLC

FILE NO. 22151-01

REFERENCE: EARTHQUAKE ZONES OF REQUIRED INVESTIGATION - BEVERLY HILLS QUADRANGLE (CGS, 1/11/18)

REFERENCE: F.I.R.M. 06037C1595G
DATED 12/21/18

FLOOD INSURANCE RATE MAP

Geotechnologies, Inc.
Consulting Geotechnical Engineers

CULVER CROSSINGS PROPERTIES LLC

FILE NO. 22151-01

BORING LOG NUMBER 1

Culver Crossings Properties LLC | **Date: 06/01/21**

File No. 22151-01 | **Method: 8-inch diameter Hollow Stem Auger**

dy

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt for parking
				0 --		5-inch Asphalt over 7.5-inch Base
				-		
				1 --		
				-		FILL: Silty Sand, dark brown, moist, medium dense, fine grained
				2 --		
2.5	25	20.5	104.2	-		
				3 --		
				-	CL	NATIVE SOILS: Silty Clay, dark gray, moist, stiff
				4 --		
				-		
5	6	22.6	SPT	5 --		
				-	ML/CL	Sandy Silt to Silty Clay, dark brown, moist, stiff
				6 --		
				-		
				7 --		
7.5	26	21.4	106.1	-		
				8 --		
				-		
				9 --		
				-		
10	9	15.9	SPT	10 --		
				-	SM/ML	Silty Sand to Sandy Silt, dark and grayish brown, moist, medium dense, stiff, fine grained
				11 --		
				-		
				12 --		
12.5	25	19.1	110.9	-		
				13 --	ML	Sandy to Clayey Silt, dark and grayish brown, moist, stiff
				-		
				14 --		
				-		
15	11	18.5	SPT	15 --		
				-	SM/ML	Silty Sand to Sandy Silt, dark brown, moist, medium dense, stiff, fine grained
				16 --		
				-		
				17 --		
17.5	55	7.3	125.3	-		
				18 --	SM/SP	Silty Sand to Sand, yellowish brown to grayish brown, moist, medium dense, fine grained with slate fragments
				-		
				19 --		
				-		
20	32	7.6	SPT	20 --		
				-		
				21 --		
				-		
				22 --		
22.5	58	8.2	116.9	-		
				23 --	SP/SW	Sand to Gravelly Sand, yellow and grayish brown, moist, dense, fine to coarse grained
				-		
				24 --		
				-		
25	55	6.1	SPT	25 --		
				-		

BORING LOG NUMBER 1

Culver Crossings Properties LLC
File No. 22151-01
dy

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	77	5.3	100.6			
				28	SP	Sand, gray, moist, dense, fine grained
				29		
30	56 50/4"	13.6	SPT	30		
						gray to dark gray, very dense, fine to medium grained
				31		
				32		
32.5	35 50/4"	17.4	110.3			
				33		
				34		
35	68	15.5	SPT	35		
				36		
				37		
37.5	28 50/4"	12.1	118.9			
				38	SM/SP	Silty Sand to Sand, gray to dark gray, very moist, very dense, fine grained, minor pebbles
				39		
40	26 50/4"	17.8	SPT	40		
				41		
				42		
42.5	45 50/2"	14.8	114.1			
				43	SP	Sand, gray to dark gray, moist, very dense, fine to medium grained
				44		
45	34	30.7	SPT	45		
					SM/SP	Silty Sand to Sand, gray to dark gray, wet, medium dense, fine to medium grained
				46		
				47		
47.5	73	27.6	97.9			
				48		
				49		
50	53	21.5	SPT	50		
					SP	Sand, gray, wet, fine grained

BORING LOG NUMBER 1

Culver Crossings Properties LLC
File No. 22151-01
dy

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
52.5	35 50/4"	20.3	104.6	53		- - - - - - - - - - very dense
				54		
55	40 50/5"	19.1	SPT	55		
				56		
				57		
57.5	88	15.2	114.9	58		
				59		
60	38 50/4"	16.8	SPT	60		
				61		
				62		
62.5	67	23.4	102.5	63		
				64		
65	35 50/4"	21.3	SPT	65		
				66		
				67		
67.5	40 50/2"	16.8	109.9	68		
				69		
70	38 50/5"	18.4	SPT	70		
				71		
				72		
72.5	45 50/3"	21.4	103.6	73		- - - - - - - - - - gray to dark gray, fine to medium grained
				74		
75	78	19.6	SPT	75		

BORING LOG NUMBER 1

Culver Crossings Properties LLC
File No. 22151-01
dy

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				76		
				77		
77.5	40 50/3"	22.1	99.3	78	SM/SP	Silty Sand to Sand, gray to dark gray, wet, very dense, fine grained
				79		
80	71	21.4	SPT	80		
				81	SM/ML	Silty Sand to Sandy Silt, gray to dark gray, moist to wet, very dense, very stiff, fine grained
				82		
82.5	40 50/5"	21.1	105.6	83	SM/SP	Silty Sand to Sand, dark gray and gray, wet, very dense, fine grained
				84		
85	85	18.8	SPT	85		
				86		
				87		
87.5	45	15.8	113.2	88		
				89		
90	93	19.5	SPT	90		
				91		Total Depth: 90 feet Water at 31.5 feet Fill to 3 feet
				92		
				93		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				94		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				95		
				96		SPT=Standard Penetration Test
				97		
				98		
				99		
				100		

BORING LOG NUMBER 2

Culver Crossings Properties LLC | **Date: 06/02/21**
File No. 22151-01 | **Method: 8-inch diameter Hollow Stem Auger**

dy

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt for parking
				0		5.5-inch Asphalt, No Base
				1		FILL: Sandy Silt to Silty Sand, dark brown, moist, medium dense, stiff, fine grained
				2		
				3		
				4		
5	38	3.4	110.1	5		
				6		rock fragments
				7		
				8		
				9		
10	48	8.4	119.0	10		
				11		dark brown and gray
				12	SM	NATIVE SOILS: dark and grayish brown, moist, medium dense, fine grained with slate fragments
				13		
				14		
15	51	11.3	SPT	15		
				16		
				17		
17.5	35 50/5"	7.0	115.6	18	SP/SW	Sand to Gravelly Sand, dark and yellowish brown, moist, very dense, fine to coarse grained
				19		
20	72	5.1	SPT	20		
				21	SW	Gravelly Sand, gray to dark gray, moist, dense, fine to coarse grained
				22		
22.5	42 50/4"	3.8	122.9	23	SP	Sand, gray to dark gray, moist, very dense, fine to medium grained, minor cobbles
				24		
25	30 50/3"	3.1	SPT	25		

BORING LOG NUMBER 2

Culver Crossings Properties LLC
File No. 22151-01

dy

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	45 50/4"	8.8	115.1			
				28		
				29		
30	75	21.6	SPT	30		
					SM/SP	Silty Sand to Sand, gray to dark gray, wet, dense, fine to medium grained, minor cobbles
				31		
				32		
32.5	88	14.3	117.1			
				33		
				34		
35	32 50/4"	12.8	SPT	35		
				36		
				37		
37.5	45 50/5"	20.1	107.1			
				38		
				39		
40	76	21.0	SPT	40		
				41		
				42		
42.5	89	18.1	109.0			
				43	SP	Sand, grayish brown to dark gray, moist, very dense, fine grained
				44		
45	61	20.2	SPT	45		
				46		
				47		
47.5	40 50/4"	19.4	98.3			
				48		
				49		
50	79	22.5	SPT	50		

BORING LOG NUMBER 2

Culver Crossings Properties LLC
File No. 22151-01
dy

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
52.5	45 50/3"	22.3	103.9	53		
				54		
55	77	23.4	SPT	55		
				56		
				57		
57.5	45 50/4"	23.5	102.7	58		
				59		
60	54	17.3	SPT	60		
				61		
				62		
62.5	39 50/5"	23.8	104.7	63	SM/SP	Silty Sand to Sand, gray to dark gray, moist, very dense, fine to medium grained
				64		
65	81	25.8	SPT	65		
				66		
				67		
67.5	36 50/3"	21.3	108.4	68	SP	Sand, gray to dark gray, wet, very dense, fine to medium grained
				69		
70	79	15.5	SPT	70	SM/SP	Silty Sand to Sand, gray to dark gray, wet, dense, fine to medium grained
				71		
				72		
72.5	42 50/5"	17.1	107.6	73	SM/SP	Silty Sand, grayish brown, moist, very dense, fine grained
				74		
75	89	24.8	SPT	75	SP	Sand, gray to dark gray, wet, very dense, fine to medium grained

BORING LOG NUMBER 2

Culver Crossings Properties LLC
File No. 22151-01
dy

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				76		
				77		
77.5	43 50/5"	25.4	98.5	78		
				79		
80	39 50/5"	27.3	SPT	80		
				81		
				82		
82.5	45 50/3"	28.5	95.9	83	SP/SM	Sand to Silty Sand, dark gray to gray, moist, very dense, fine grained
				84		
85	84	24.8	SPT	85		
				86		
				87		
87.5	45 50/3"	17.1	110.5	88		
				89	SM/ML	Silty Sand to Sandy Silt, gray, moist, very dense, very stiff fine grained
90	38 50/4"	24.2	SPT	90		
				91		Total Depth: 90 feet Water at 29.5 feet Fill to 12 feet
				92		
				93		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				94		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				95		
				96		SPT=Standard Penetration Test
				97		
				98		
				99		
				100		

BORING LOG NUMBER 3

Culver Crossings Properties LLC — **Date: 08/26/21** — **Elevation: 107.4'**

File No. 22151-01 — **Method: 8-Inch Diameter Hollow Stem Auger**

In

Reference: Topographic Survey by JRN, dated 2/8/18

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions:
				0 --		3 Inch Asphalt, 7 Inch Base
				-		FILL: Sandy Silt to Silty Sand, dark brown, moist, medium dense, stiff, fine grained
				1 --		
				-		
				2 --		
2.5	25	15.8	109.7	-		- - - - - - - - - - - -
				3 --		Sandy Silt, dark brown, moist, stiff
				-		
				4 --		
				-		
5	11	15.0	SPT	5 --		
				-	ML/CL	NATIVE SOILS: Clayey Silt to Silty Clay, dark brown, moist, stiff
				6 --		
				-		
				7 --		
7.5	29	22.7	98.7	-		
				8 --		
				-		
				9 --		
				-		
10	12	21.1	SPT	10 --		
				-	ML	Sandy to Clayey Silt, dark brown, moist, stiff
				11 --		
				-		
				12 --		
12.5	60	6.8	119.7	-		
				13 --	SM/SP	Silty Sand to Sand, dark brown, moist, medium dense to dense, fine to medium grained, minor pebbles
				-		
				14 --		
				-		
15	28	5.3	SPT	15 --		
				-	SP	Sand, dark gray and yellowish brown, moist, medium dense, fine to medium grained, minor pebbles
				16 --		
				-		
				17 --		
17.5	77	10.9	118.5	-		- - - - - - - - - - - -
				18 --		Sand with Slate Fragments, dense
				-		
				19 --		
				-		
20	31	9.9	SPT	20 --		
				-	SP/SM	Sand to Silty Sand with Slate Fragments, yellowish and grayish brown, moist, medium dense, fine to medium grained
				21 --		
				-		
				22 --		
22.5	45 50/4"	6.5	116.1	-		
				23 --	SP	Sand with Cobbles, dark gray, moist, very dense, fine to medium grained
				-		
				24 --		
				-		
25	40 50/5"	9.0	SPT	25 --		
				-	SP/SW	Sand to Gravelly Sand, gray to dark gray, moist, very dense, fine to coarse grained

BORING LOG NUMBER 3

Culver Crossings Properties LLC
File No. 22151-01

ln

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	46 50/4"	2.8	125.3	28		
				29		
30	74	3.4	SPT	30		
				31		
				32		
32.5	44 50/4"	9.7	126.0	33		- - - - - - - - - - - - - - gray, wet
				34		
35	89	13.9	SPT	35		
				36		
				37		
37.5	46 50/3"	27.9	97.4	38	SP	Sand, gray to dark gray, moist, very dense, fine grained
				39		
40	82	24.3	SPT	40		- - - - - - - - - - - - - - gray, wet
				41		
				42		
42.5	40 50/2"	19.1	111.1	43		
				44		
45	95	15.6	SPT	45		
				46		
				47		
47.5	32 50/4"	20.2	106.5	48		
				49		
50	88	18.4	SPT	50		

BORING LOG NUMBER 3

Culver Crossings Properties LLC
File No. 22151-01

In

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
52.5	45 50/3"	19.0	111.4			
				53		
				54		
55	36 50/5"	20.6	SPT	55		
				56		
				57		
57.5	100/9"	18.7	108.8			
				58		
				59		
60	39 50/4"	18.1	SPT	60	SM/SP	Silty Sand to Sand, gray to dark gray, moist, very dense, fine grained
				61		
				62		
62.5	100/9"	25.0	100.1			
				63		
				64		
65	58 50/5"	18.2	SPT	65		
				66		
				67		
67.5	40 50/5"	20.3	106.6			
				68		
				69		
70	45 50/3"	14.7	SPT	70		
				71		
				72		
72.5	100/9"	17.9	122.1			
				73	SP	Sand, gray, wet, very dense, fine grained
				74		
75	88	16.9	SPT	75		

BORING LOG NUMBER 3

Culver Crossings Properties LLC
File No. 22151-01

In

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				76		
				77		
77.5	100/9"	15.0	113.1			
				78		
				79		
80	98	18.0	SPT	80		
				81		Total Depth: 80 Feet Water at 33 Feet Fill To 5 Feet
				82		
				83		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				84		Used 8-inch diameter Hollow-Stem Auger
				85		140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				86		SPT=Standard Penetration Test
				87		
				88		
				89		
				90		
				91		
				92		
				93		
				94		
				95		
				96		
				97		
				98		
				99		
				100		

BORING LOG NUMBER 4

Culver Crossings Properties LLC — **Date: 08/27/21** — **Elevation: 104.1'**

File No. 22151-01 — **Method: 8-Inch Diameter Hollow Stem Auger**

ln

Reference: Topographic Survey by JRN, dated 2/8/18

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Concrete For Parking
				0		9 Inch Concrete, 5 Inch Base
				1		FILL: Sandy Silt to Silty Sand, dark brown, moist, medium dense, stiff, fine grained
				2		
3	62	14.6	120.5	3		
				4	ML	NATIVE SOILS: Sandy Silt, dark brown, moist, stiff
5	16	12.8	SPT	5		
				6		
				7		
7.5	52	6.8	120.4	8	SM/SP	Silty Sand to Sand with Pebbles, dark brown, moist, medium dense, fine to coarse grained
				9		
10	17	4.0	SPT	10		
				11		
				12		
12.5	71	8.4	117.2	13	SP	Sand, dark and yellowish brown, moist, dense, fine to medium grained
				14		
15	25	5.6	SPT	15		- - - - - - - - - - - -
				16		medium dense
				17		
17.5	49	24.4	98.5	18	ML/CL	Clayey Silt to Silty Clay, dark gray to gray, moist, stiff
				19		
20	21	28.5	SPT	20		
				21	SM/CL	Silty Sand to Silty Clay, gray to dark gray, moist, stiff, medium dense, fine grained
				22		
22.5	84	5.7	119.5	23	SP	Sand with Cobbles, gray to dark gray, moist, very dense, fine to medium grained
				24		
25	30 50/4"	4.2	SPT	25		

BORING LOG NUMBER 4

Culver Crossings Properties LLC
File No. 22151-01

ln

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	100/9"	6.5	122.3			- - - - - - - - - - - - -
				28		Sand, gray, very moist
				29		
30	72	7.7	SPT	30		- - - - - - - - - - - - -
						Sand with Cobbles, wet
				31		
				32		
32.5	100/9"	16.0	110.7			
				33		
				34		
35	88	19.8	SPT	35		
					SM/SP	Silty Sand to Sand, gray, wet, very dense, fine grained
				36		
				37		
37.5	45 50/4"	27.7	97.7			
				38	SM	Silty Sand, dark gray, wet, very dense, fine grained
				39		
40	84	26.5	SPT	40		
					SM/SP	Silty Sand to Sand, gray to dark gray, wet, very dense, fine grained
				41		
				42		
42.5	46 50/3"	19.9	107.4			
				43	SP	Sand, gray, wet, very dense, fine grained
				44		
45	82	20.7	SPT	45		
				46		
				47		
47.5	100/8"	18.3	108.6			
				48		
				49		
50	89	17.0	SPT	50		

BORING LOG NUMBER 4

Culver Crossings Properties LLC
File No. 22151-01

ln

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
52.5	100/9"	21.5	104.4			
				53	SM/SP	Silty Sand to Sand, dark gray to gray, moist to wet, very dense, fine grained
				54		
55	86	21.2	SPT	55		
					SP	Sand, gray, wet, very dense, fine grained
				56		
				57		
57.5	46 50/4"	24.5	97.9			
				58		
				59		
60	88	25.3	SPT	60		
					SM/SP	Silty Sand to Sand, dark gray to gray, wet, very dense, fine grained
				61		
				62		
62.5	100/9"	19.0	105.5			
				63		
				64		
65	88	24.5	SPT	65		
				66		
				67		
67.5	100/8"	26.1	95.2			
				68		
				69		
70	40 50/5"	21.2	SPT	70		
				71		
				72		
72.5	100/8"	25.3	103.7			
				73	SM/ML	Silty Sand to Sandy Silt, gray to dark gray, moist, very dense, very stiff, fine grained
				74		
75	38 50/5"	21.2	SPT	75		

BORING LOG NUMBER 4

Culver Crossings Properties LLC
File No. 22151-01
In

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				76		
				77		
77.5	100/8"	24.7	100.9			- - - - - - - - - - - -
				78		minor shell fragments
				79		
80	35 50/5"	24.4	SPT	80		
				81		Total Depth: 80 Feet Water at 29 Feet Fill To 3 Feet
				82		
				83		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				84		
				85		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				86		SPT=Standard Penetration Test
				87		
				88		
				89		
				90		
				91		
				92		
				93		
				94		
				95		
				96		
				97		
				98		
				99		
				100		

LOG OF TEST PIT NUMBER 1

Culver Crossings Properties LLC | **Drilling Date: 06/15/21**

File No.: 22151-01 | **Method: Test Pit & Auger**

dy

Sample Depth ft.	Moisture Content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions:
			0		4-inch Concrete Slab, No Base
			1		FILL: Silty Clay, grayish-brown, moist, stiff, minor construction debris
2	19.5	111.0	2		dark to grayish brown, minor sands
			3		brick and concrete fragments
4	13.2	119.0	4	CL	NATIVE SOILS: Silty Clay, dark brown, moist, stiff, with Sand
			5		
			6		
			7		
			8		
			9		
10	22.4	106.4	10		olive brown
			11		
			12		
			13		
			14		
15	11.5	123.7	15		Sandy Clay, gray, moist, very stiff
			16		
			17		
			18		
			19	SP/SW	Sand with slate fragments, light brown to black, moist, dense, medium to coarse grained
20	9.8	106.1	20		Total Depth 20 feet No Water Fill to 4 feet
			21		
			22		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
			23		
			24		Used 4-inch diameter Hand-Augering Equipment; Hand Sampler
			25		

LOG OF TEST PIT NUMBER 2

Culver Crossings Properties LLC — **Drilling Date: 06/15/21**

File No.: 22151-01 — **Method: Test Pit & Auger**

dy

Sample Depth ft.	Moisture Content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions:
			0		6-inch Concrete Slab, No Base
			1		FILL: Silty Clay, dark to grayish brown, moist, stiff, construction debris fragments
			2		
2.5	13.4	120.7			
			3		Silty Sand, yellowish brown, moist, medium dense, fine to coarse grained, minor gravel
3.5	12.7	107.6			
			4	ML/CL	NATIVE SOILS: Clayey Silt to Silty Clay, dark brown, moist, stiff
5	11.4	95.0	5		
			6		
			7		
			8		
			9		
				ML/SM	Sandy Silt to Silty Sand, dark brown, moist, stiff, dense, fine grained
10	17.2	103.5	10		
					Total Depth: 10 feet No Water Fill to 3.5 feet
			11		
			12		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
			13		
			14		Used 4-inch diameter Hand-Augering Equipment; Hand Sampler
			15		
			16		
			17		
			18		
			19		
			20		
			21		
			22		
			23		
			24		
			25		

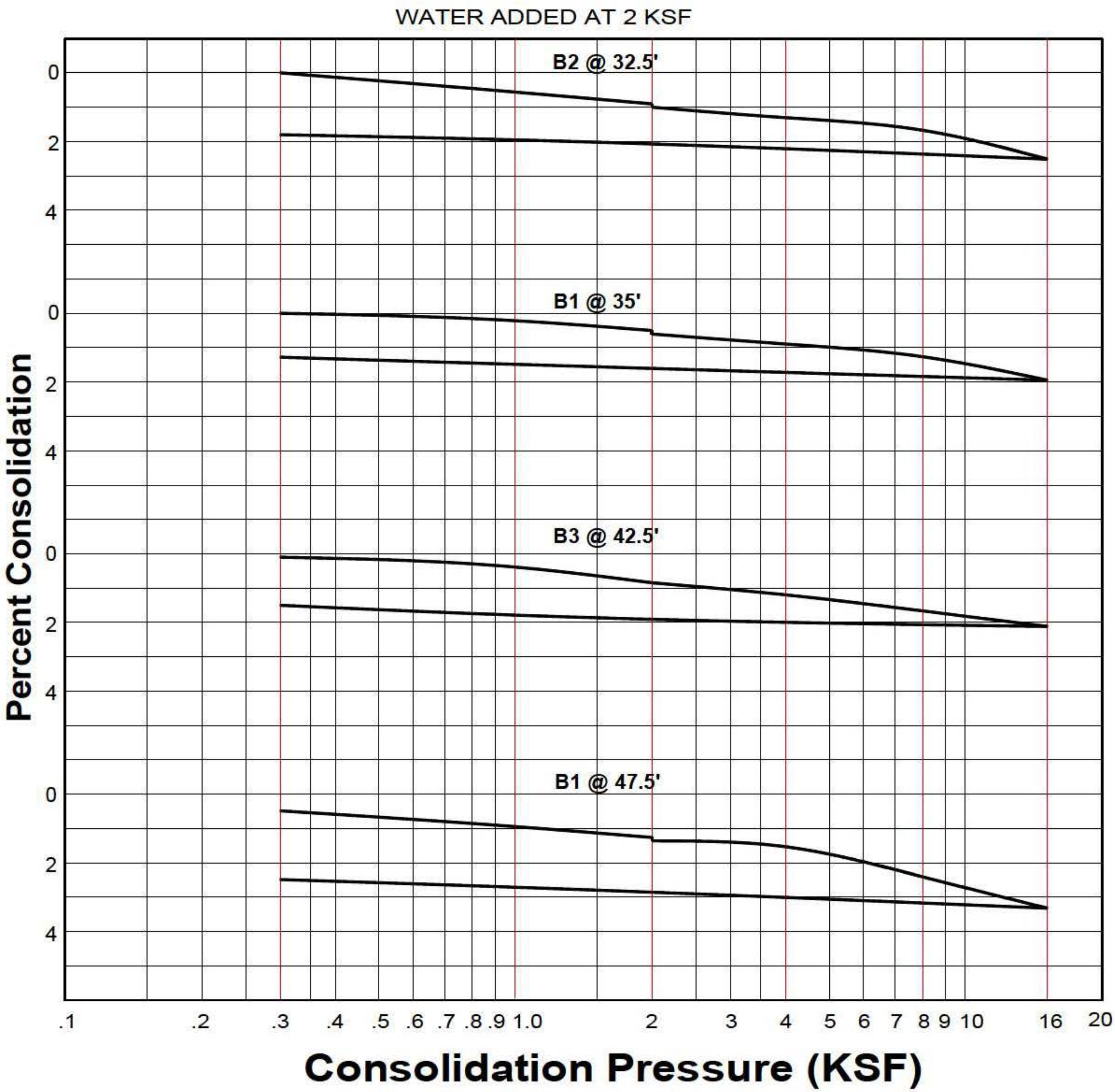
LOG OF TEST PIT NUMBER 3

Culver Crossings Properties LLC | **Drilling Date: 06/15/21**

File No.: 22151-01 | **Method: Test Pit & Auger**

dy

Sample Depth ft.	Moisture Content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions:
			0		4.5-inch Concrete Slab, No Base
			1		FILL: Sandy to Clayey Silt, light to dark brown, moist, stiff, minor construction debris fragments
2	15.5	114.5	2		Silty Clay with Sand, light to dark brown, moist, stiff
			3		
			4	ML	NATIVE SOILS: Clayey Silt, dark brown, moist, stiff
5	17.5	101.0	5		
			6		
			7		
			8		
			9		
10	18.9	109.6	10	ML	Sandy Silt with Clay, dark brown, moist, very stiff
			11		
			12		
13	4.1	125.2	13	SM	Silty Sand, gray to brown, moist, dense, fine to coarse grained, minor slate fragments
			14		
			15		
			16	SP/GW	Sand and Gravel, dark gray, moist, very dense, medium to coarse grained, gravel up to 1"
			17		
17.5	4.3	123.0			Total Depth: 17.5 feet by refusal No Water Fill to 4 feet
			18		
			19		
			20		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
			21		Used 4-inch diameter Hand-Augering Equipment; Hand Sampler
			22		
			23		
			24		
			25		

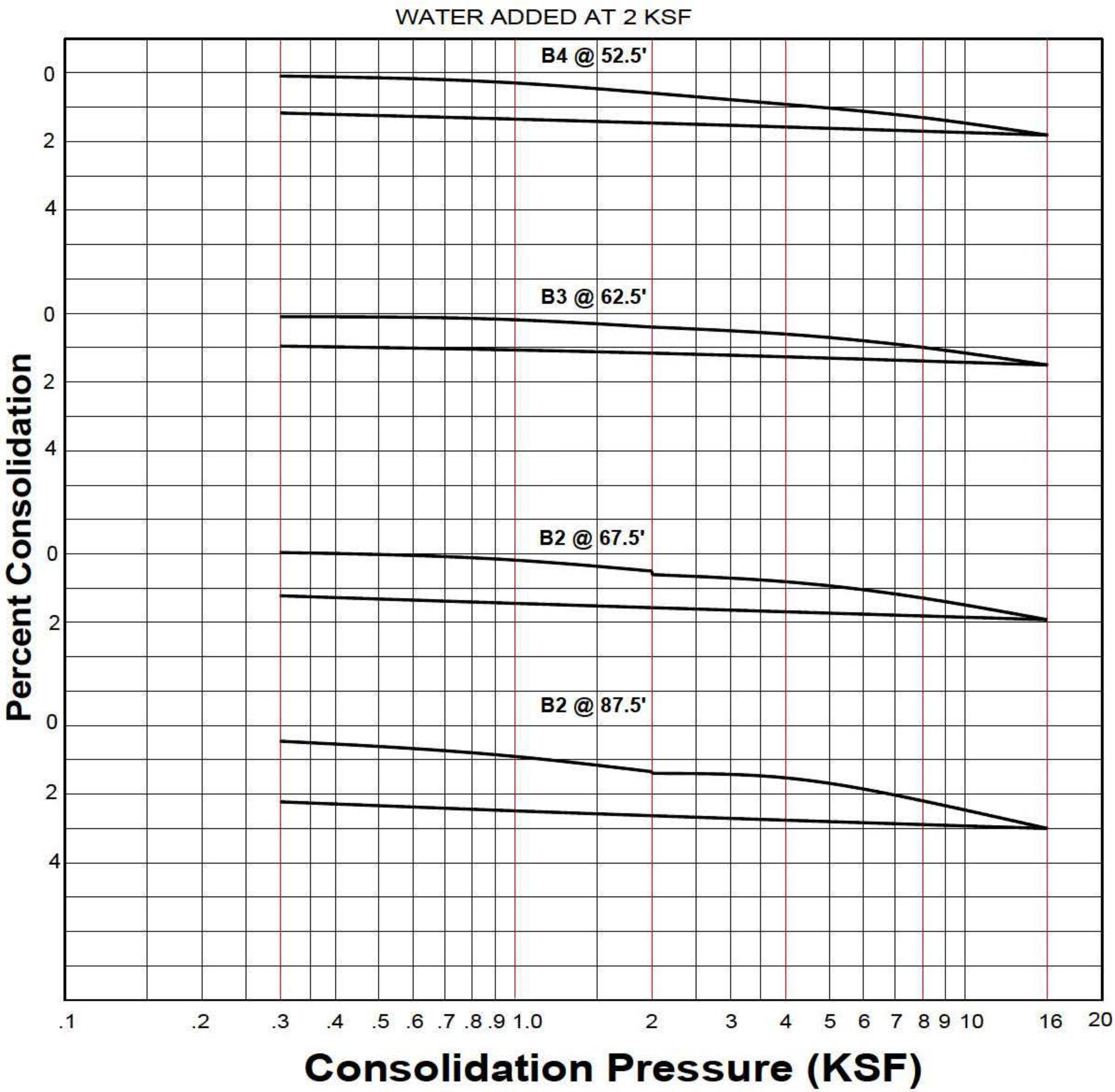


CONSOLIDATION TEST

Geotechnologies, Inc.
Consulting Geotechnical Engineers

CULVER CROSSINGS PROPERTIES LLC

FILE NO. 22151-01 | **PLATE: C-1**



CONSOLIDATION TEST

Geotechnologies, Inc.
Consulting Geotechnical Engineers

CULVER CROSSINGS PROPERTIES LLC	
FILE NO. 22151-01	PLATE: C-2

ASTM D-1557

SAMPLE	B1 @ 1- 5'	B2 @ 1-5'	TP2 @ 1- 5'
SOIL TYPE:	SM/CL	SM/ML	ML/CL
MAXIMUM DENSITY pcf.	120.3	128.3	122.6
OPTIMUM MOISTURE %	13.8	10.4	11.8

SAMPLE	B3 @ 1- 5'	B4 @ 1-5'
SOIL TYPE:	ML/SM	ML/SM
MAXIMUM DENSITY pcf.	123.4	131.5
OPTIMUM MOISTURE %	11.6	8.8

ASTM D 4829-03

SAMPLE	B1 @ 1- 5'	B2 @ 1-5'	TP2 @ 1- 5'
SOIL TYPE:	SM/CL	SM/ML	ML/CL
EXPANSION INDEX UBC STANDARD 18-2	127	92	82
EXPANSION CHARACTER	HIGH	HIGH	MODERATE

SAMPLE	B3 @ 1- 5'	B4 @ 1-5'
SOIL TYPE:	ML/SM	ML/SM
EXPANSION INDEX UBC STANDARD 18-2	70	17
EXPANSION CHARACTER	MODERATE	VERY LOW

SULFATE CONTENT

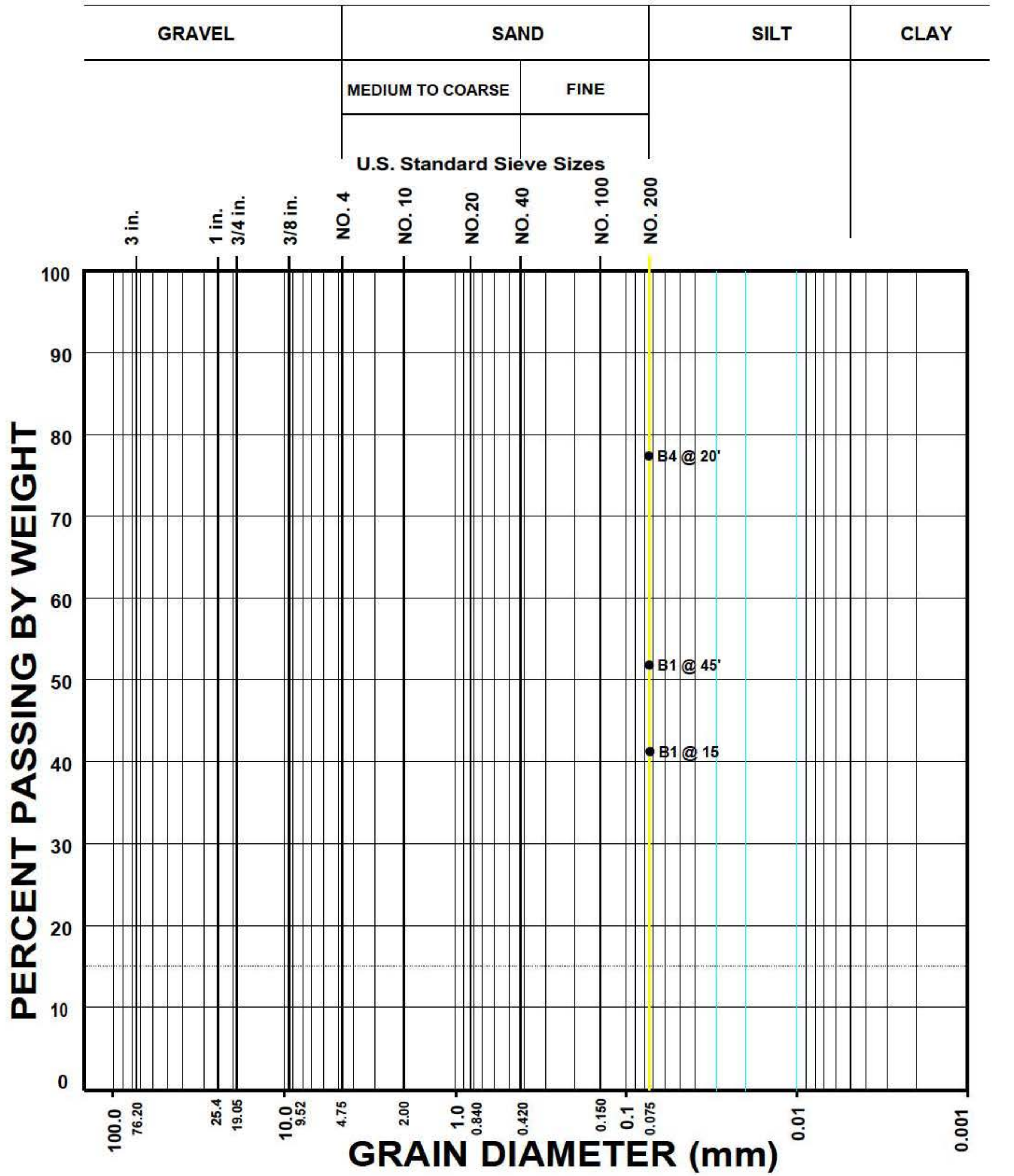
SAMPLE	B1 @ 1-5'	B2 @ 1-5'	B1 @ 10'	B2 @ 20'	B1 @ 30'	TP2 @ 1-5'
SULFATE CONTENT: (percentage by weight)	< 0.1 %	< 0.2 %	< 0.1 %	< 0.2 %	< 0.2 %	< 0.2 %

COMPACTION/EXPANSION/SULFATE DATA SHEET

Geotechnologies, Inc.
Consulting Geotechnical Engineers

CULVER CROSSINGS PROPERTIES LLC

FILE NO. 22151-01 | PLATE: D



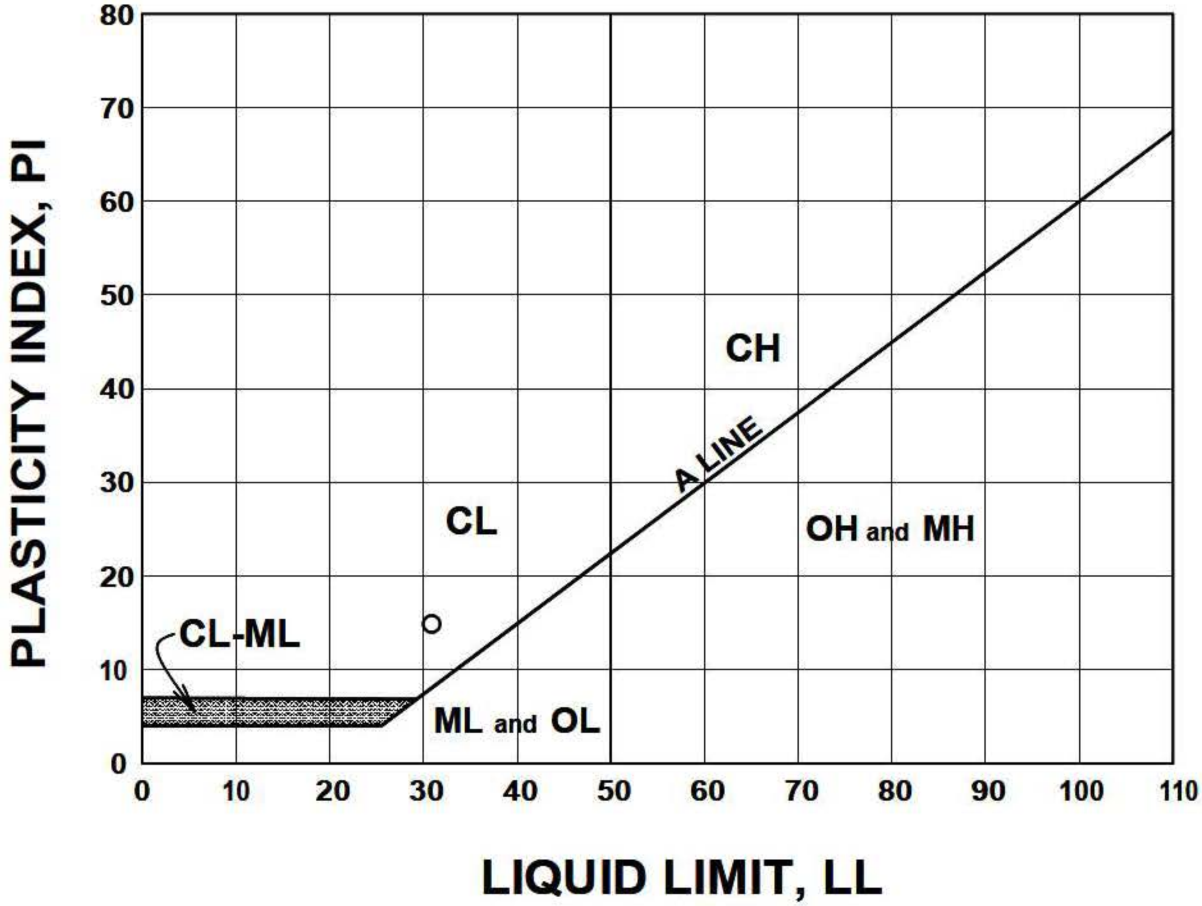
GRAIN SIZE DISTRIBUTION

Geotechnologies, Inc.
Consulting Geotechnical Engineers

CULVER CROSSINGS PROPERTIES LLC

FILE NO. 22151-01 | PLATE: E

ASTM D4318



BORING NUMBER	DEPTH (FEET)	TEST SYMBOL	LL	PL	PI	DESCRIPTION
B1	15	O	31	17	14	CL

ATTERBERG LIMITS DETERMINATION

Geotechnologies, Inc.
Consulting Geotechnical Engineers

CULVER CROSSINGS PROPERTIES LLC

FILE NO. 22151-01 | PLATE: F

Geotechnologies, Inc.

Project: Culver Crossings
File No.: 22151-01
Description: Liquefaction Analysis
Boring No: B1

LIQUEFACTION EVALUATION (Idriss & Boulanger, EERI NO 12)

EARTHQUAKE INFORMATION:

Earthquake Magnitude (M):	6.7
Peak Ground Horizontal Acceleration, PGA (g):	0.95
Calculated Mag.Wtg.Factor:	1.234

GROUNDWATER INFORMATION:

Current Groundwater Level (ft):	31.5
Historically Highest Groundwater Level* (ft):	20.0
Unit Weight of Water (pcf):	62.4

* Based on California Geological Survey Seismic Hazard Evaluation Report

BOREHOLE AND SAMPLER INFORMATION:

Borehole Diameter (inches):	8
SPT Sampler with room for Liner (Y/N):	Y

LIQUEFACTION BOUNDARY:

Plastic Index Cut Off (PI):	18
Minimum Liquefaction FS:	1.3

Depth to Base Layer (feet)	Total Unit Weight (pcf)	Current Water Level (feet)	Historical Water Level (feet)	Field SPT Blowcount N	Depth of SPT Blowcount (feet)	Fines Content #200 Sieve (%)	Plastic Index (PI)	Vertical Stress σ_{vc} (psf)	Effective Vert. Stress σ_{vc}' (psf)	Fines Corrected $(N_1)_{60-cs}$	Stress Reduction Coeff, r_d	Cyclic Shear Ratio CSR	Mag. Scaling Factor (Sand) MSF	Overburden Corr. Factor K_σ	Cyclic Resist. Ratio $CRR_{M7.5}$	Cyclic Resistance Ratio (CRR)	Factor of Safety CRR/CSR (F.S.)	Liquefaction Settlement ΔS_i (inches)
1	125.5	Unsaturated	Unsaturated	6	5	0.0	0	125.5	125.5	12.2	1.00	0.620	1.23	1.10	0.134	0.182	Non-Liq.	0.00
2	125.5	Unsaturated	Unsaturated	6	5	0.0	0	251.0	251.0	12.2	1.00	0.618	1.23	1.10	0.134	0.182	Non-Liq.	0.00
3	125.5	Unsaturated	Unsaturated	6	5	0.0	0	376.5	376.5	12.2	1.00	0.616	1.23	1.10	0.134	0.182	Non-Liq.	0.00
4	125.5	Unsaturated	Unsaturated	6	5	0.0	0	502.0	502.0	12.2	0.99	0.614	1.23	1.10	0.134	0.182	Non-Liq.	0.00
5	125.5	Unsaturated	Unsaturated	6	5	0.0	0	627.5	627.5	13.1	0.99	0.611	1.23	1.10	0.141	0.191	Non-Liq.	0.00
6	125.5	Unsaturated	Unsaturated	6	5	0.0	0	753.0	753.0	13.0	0.99	0.609	1.23	1.10	0.140	0.190	Non-Liq.	0.00
7	125.5	Unsaturated	Unsaturated	6	5	0.0	0	878.5	878.5	12.1	0.98	0.606	1.23	1.09	0.133	0.179	Non-Liq.	0.00
8	128.8	Unsaturated	Unsaturated	6	5	0.0	0	1007.3	1007.3	11.3	0.98	0.604	1.23	1.07	0.127	0.168	Non-Liq.	0.00
9	128.8	Unsaturated	Unsaturated	6	5	0.0	0	1136.1	1136.1	11.2	0.97	0.601	1.23	1.06	0.127	0.166	Non-Liq.	0.00
10	128.8	Unsaturated	Unsaturated	6	5	0.0	0	1264.9	1264.9	10.6	0.97	0.598	1.23	1.05	0.122	0.158	Non-Liq.	0.00
11	128.8	Unsaturated	Unsaturated	9	10	0.0	0	1393.7	1393.7	15.3	0.96	0.596	1.23	1.05	0.159	0.205	Non-Liq.	0.00
12	128.8	Unsaturated	Unsaturated	9	10	0.0	0	1522.5	1522.5	14.6	0.96	0.593	1.23	1.04	0.153	0.195	Non-Liq.	0.00
13	132.2	Unsaturated	Unsaturated	9	10	0.0	0	1654.7	1654.7	14.0	0.96	0.590	1.23	1.03	0.148	0.187	Non-Liq.	0.00
14	132.2	Unsaturated	Unsaturated	9	10	0.0	0	1786.9	1786.9	13.4	0.95	0.587	1.23	1.02	0.143	0.180	Non-Liq.	0.00
15	132.2	Unsaturated	Unsaturated	9	10	0.0	0	1919.1	1919.1	14.5	0.95	0.584	1.23	1.01	0.153	0.190	Non-Liq.	0.00
16	132.2	Unsaturated	Unsaturated	11	15	0.0	0	2051.3	2051.3	17.5	0.94	0.580	1.23	1.00	0.179	0.222	Non-Liq.	0.00
17	132.2	Unsaturated	Unsaturated	11	15	0.0	0	2183.5	2183.5	17.0	0.93	0.577	1.23	1.00	0.174	0.213	Non-Liq.	0.00
18	134.4	Unsaturated	Unsaturated	32	20	0.0	0	2317.9	2317.9	55.4	0.93	0.574	1.23	0.97	2.000	2.000	Non-Liq.	0.00
19	134.4	Unsaturated	Unsaturated	32	20	0.0	0	2452.3	2452.3	54.6	0.92	0.571	1.23	0.96	2.000	2.000	Non-Liq.	0.00
20	134.4	Unsaturated	Unsaturated	32	20	0.0	0	2586.7	2586.7	53.8	0.92	0.567	1.23	0.94	2.000	2.000	Non-Liq.	0.00
21	134.4	Unsaturated	Saturated	32	20	0.0	0	2721.1	2658.7	53.1	0.91	0.577	1.23	0.92	2.000	2.000	3.5	0.00
22	134.4	Unsaturated	Saturated	32	20	0.0	0	2855.5	2730.7	52.5	0.91	0.586	1.23	0.91	2.000	2.000	3.4	0.00
23	126.5	Unsaturated	Saturated	55	25	0.0	0	2982.0	2794.8	89.1	0.90	0.594	1.23	0.90	2.000	2.000	3.4	0.00
24	126.5	Unsaturated	Saturated	55	25	0.0	0	3108.5	2858.9	88.2	0.90	0.602	1.23	0.89	2.000	2.000	3.3	0.00
25	126.5	Unsaturated	Saturated	55	25	0.0	0	3235.0	2923.0	87.3	0.89	0.608	1.23	0.87	2.000	2.000	3.3	0.00
26	126.5	Unsaturated	Saturated	55	25	0.0	0	3361.5	2987.1	86.4	0.88	0.614	1.23	0.86	2.000	2.000	3.3	0.00
27	126.5	Unsaturated	Saturated	55	25	0.0	0	3488.0	3051.2	85.5	0.88	0.620	1.23	0.85	2.000	2.000	3.2	0.00
28	105.9	Unsaturated	Saturated	100	30	0.0	0	3593.9	3094.7	162.4	0.87	0.626	1.23	0.84	2.000	2.000	3.2	0.00
29	105.9	Unsaturated	Saturated	100	30	0.0	0	3699.8	3138.2	161.2	0.87	0.631	1.23	0.83	2.000	2.000	3.2	0.00
30	105.9	Unsaturated	Saturated	100	30	0.0	0	3805.7	3181.7	160.0	0.86	0.635	1.23	0.83	2.000	2.000	3.1	0.00
31	105.9	Unsaturated	Saturated	100	30	0.0	0	3911.6	3225.2	158.8	0.85	0.640	1.23	0.82	2.000	2.000	3.1	0.00
32	105.9	Saturated	Saturated	100	30	0.0	0	4017.5	3268.7	158.1	0.85	0.644	1.23	0.81	2.000	2.000	3.1	0.00
33	129.5	Saturated	Saturated	68	35	0.0	0	4147.0	3335.8	107.0	0.84	0.646	1.23	0.81	2.000	1.993	3.1	0.00
34	129.5	Saturated	Saturated	68	35	0.0	0	4276.5	3402.9	106.5	0.84	0.649	1.23	0.80	2.000	1.981	3.1	0.00
35	129.5	Saturated	Saturated	68	35	0.0	0	4406.0	3470.0	106.1	0.83	0.650	1.23	0.80	2.000	1.969	3.0	0.00
36	129.5	Saturated	Saturated	68	35	0.0	0	4535.5	3537.1	105.7	0.82	0.652	1.23	0.79	2.000	1.958	3.0	0.00
37	129.5	Saturated	Saturated	68	35	0.0	0	4665.0	3604.2	105.2	0.82	0.653	1.23	0.79	2.000	1.946	3.0	0.00
38	133.3	Saturated	Saturated	100	40	0.0	0	4798.3	3675.1	154.1	0.81	0.654	1.23	0.78	2.000	1.934	3.0	0.00
39	133.3	Saturated	Saturated	100	40	0.0	0	4931.6	3746.0	153.4	0.80	0.654	1.23	0.78	2.000	1.923	2.9	0.00
40	133.3	Saturated	Saturated	100	40	0.0	0	5064.9	3816.9	152.8	0.80	0.654	1.23	0.77	2.000	1.911	2.9	0.00
41	133.3	Saturated	Saturated	100	40	0.0	0	5198.2	3887.8	152.2	0.79	0.654	1.23	0.77	2.000	1.900	2.9	0.00
42	133.3	Saturated	Saturated	100	40	0.0	0	5331.5	3958.7	151.6	0.79	0.654	1.23	0.77	2.000	1.889	2.9	0.00
43	131.0	Saturated	Saturated	100	40	0.0	0	5462.5	4027.3	151.0	0.78	0.653	1.23	0.76	2.000	1.878	2.9	0.00
44	131.0	Saturated	Saturated	100	40	0.0	0	5593.5	4095.9	150.4	0.77	0.653	1.23	0.76	2.000	1.868	2.9	0.00
45	131.0	Saturated	Saturated	100	40	0.0	0	5724.5	4164.5	149.9	0.77	0.652	1.23	0.75	2.000	1.858	2.9	0.00
46	131.0	Saturated	Saturated	34	45	0.0	0	5855.5	4233.1	50.8	0.76	0.651	1.23	0.75	2.000	1.847	2.8	0.00
47	131.0	Saturated	Saturated	34	45	0.0	0	5986.5	4301.7	50.6	0.76	0.649	1.23	0.74	2.000	1.837	2.8	0.00
48	125.0	Saturated	Saturated	34	45	0.0	0	6111.5	4364.3	50.4	0.75	0.648	1.23	0.74	2.000	1.828	2.8	0.00
49	125.0	Saturated	Saturated	34	45	0.0	0	6236.5	4426.9	50.3	0.74	0.647	1.23	0.74	2.000	1.819	2.8	0.00
50	125.0	Saturated	Saturated	34	45	0.0	0	6361.5	4489.5	50.1	0.74	0.645	1.23	0.73	2.000	1.811	2.8	0.00
51	125.0	Saturated	Saturated	53	50	0.0	0	6486.5	4552.1	77.8	0.73	0.644	1.23	0.73	2.000	1.802	2.8	0.00
52	125.0	Saturated	Saturated	53	50	0.0	0	6611.5	4614.7	77.6	0.73	0.642	1.23	0.73	2.000	1.793	2.8	0.00
53	125.9	Saturated	Saturated	53	50	0.0	0	6737.4	4678.2	77.4	0.72	0.640	1.23	0.72	2.000	1.785	2.8	0.00
54	125.9	Saturated	Saturated	53	50	0.0	0	6863.3	4741.7	77.1	0.71	0.638	1.23	0.72	2.000	1.776	2.8	0.00
55	125.9	Saturated	Saturated	53	50	0.0	0	6989.2	4805.2	76.9	0.71	0.636	1.23	0.72	2.000	1.768	2.8	0.00
56	125.9	Saturated	Saturated	100	55	0.0	0	7115.1	4868.7	144.6	0.70	0.634	1.23	0.71	2.000	1.759	2.8	0.00
57	125.9	Saturated	Saturated	100	55	0.0	0	7241.0	4932.2	144.2	0.70	0.632	1.23	0.71	2.000	1.751	2.8	0.00
58	132.4	Saturated	Saturated	100	55	0.0	0	7373.4	5002.2	143.7	0.69	0.630	1.23	0.71	2.000	1.742	2.8	0.00
59	132.4	Saturated	Saturated	100	55	0.0	0	7505.8	5072.2	143.3	0.69	0.627	1.23	0.70	2.000	1.733	2.8	0.00
60	132.4	Saturated	Saturated	100	55	0.0	0	7638.2	5142.2	142.8	0.68	0.625	1.23	0.70	2.000	1.725	2.8	0.00
61	132.4	Saturated	Saturated	100	60	0.0	0	7770.6	5212.2	142.4	0.68	0.622	1.23	0.70	2.000	1.716	2.8	0.00
62	132.4	Saturated	Saturated	100	60	0.0	0	7903.0	5282.2	141.9	0.67	0.619	1.23	0.69	2.000	1.707	2.8	0.00
63	126.4	Saturated	Saturated	100	60	0.0	0	8029.4	5346.2	141.5	0.67	0.617	1.23	0.69	2.000	1.700	2.8	0.00
64	126.4	Saturated	Saturated	100	60	0.0	0	8155.8	5410.2	141.2	0.66	0.614	1.23	0.69	2.000	1.692	2.8	0.00
65	126.4	Saturated	Saturated	100	60	0.0	0	8282.2	5474.2	140.8	0.65	0.612	1.23	0.68	2.000	1.684	2.8	0.00
66	126.4	Saturated	Saturated	100	65	0.0	0	8408.6	5538.2	140.4	0.65	0.609	1.23	0.68	2.000	1.677	2.8	0.00
67	126.4	Saturated	Saturated	100	65	0.0	0	8535.0	5602.2	140.0	0.64	0.607	1.23	0.68	2.000	1.669	2.8	0.00
68	128.4	Saturated	Saturated	100	65	0.0	0	8663.4	5668.2	139.6	0.64	0.604	1.23	0.67	2.000	1.662	2.8	0.00
69	128.4	Saturated	Saturated	100	65	0.0	0	8791.8	5734.2	139.3	0.64	0.602	1.23	0.67	2.000	1.654	2.8	0.00
70	128.4	Saturated	Saturated	100	65	0.0	0	8920.2	5800.2	138.9	0.63	0.599	1.23	0.67	2.000	1.647	2.7	0.00
71	128.4	Saturated	Saturated	98	70	0.0	0	9048.6	5866.2	135.7	0.63	0.596	1.23	0.66	2.000	1.640	2.7	0.00
72	128.4	Saturated	Saturated	98	70	0.0	0	9177.0	5932.2	135.4	0.62	0.594	1.23	0.66	2.000	1.632	2.7	0.00
73	125.8	Saturated	Saturated	98	70	0.0	0	9302.8	5995.6	135.0	0.62	0.591	1.23	0.66	2.000	1.625	2.7	0.00
74	125.8	Saturated	Saturated	98	70	0.0	0	9428.6	6059.0	134.7	0.61	0.589	1.23	0.66	2.000	1.619	2.7	0.00
75	125.8	Saturated	Saturated	98	70	0.0	0	9554.4	6122.4	134.4	0.61	0.587	1.23	0.65	2.000	1.612	2.7	0.00
76	125.8	Saturated	Saturated	78	75	0.0	0	9680.2	6185.8	106.7	0.60	0.584	1.23	0.65	2.000	1.605	2.7	0.00
77	125.8	Saturated	Saturated	78	75	0.0	0	9806.0	6249.2	106.4	0.60	0.582	1.23	0.65	2.000	1.598	2.7	0.00
78	121.1	Saturated	Saturated	78	75	0.0	0	9927.1	6307.9	106.2	0.60	0.580	1.23	0.64	2.000	1.592	2.7	0.00
79	121.1	Saturated	Saturated	78	75	0.0	0	10048.2	6366.6	106.0	0.59	0.578	1.23	0.64	2.000	1.586	2.7	0.00
80	121.1	Saturated	Saturated	78	75	0.0	0	10169.3	6425.3	105.7	0.59	0.575	1.23	0.64	2.000	1.580	2.7	0.00
81	121.1	Saturated	Saturated	71	80	0.0	0	10290.4	6484.0	96.1	0.59	0.573	1.23	0.64	2.000	1.574	2.7	0.00
82	121.1	Saturated	Saturated	71	80	0.0	0	10411.5	6542.7	95.8	0.58	0.571	1.23	0.64	2.000	1.568	2.7	0.00
83	127.9	Saturated	Saturated	85	85	0.0	0	10539.4	6608.2	114.5	0.58	0.569	1.23	0.63	2.000	1.562	2.7	0.00
84	127.9	Saturated	Saturated	85	85	0.0	0	10667.3	6673.7	114.2	0.57	0.567	1.23	0.63	2.000	1.555	2.7	0.00
85	127.9	Saturated	Saturated	85	85	0.0	0	10795.2	6739.2	113.9	0.57	0.565	1.23	0.63	2.000	1.549	2.7	0.00
86	127.9	Saturated	Saturated	85	85	0.0	0	10923.1	6804.7	113.7	0.57	0.563	1.23	0.62	2.000	1.543	2.7	0.00
87	127.9	Saturated	Saturated	85	85	0.0	0	11051.0	6870.2	113.4	0.56	0.561	1.23	0.62	2.000	1.536	2.7	0.00
88	131.2	Saturated	Saturated	85	85	0.0	0	11182.2	6939.0	113.2	0.56	0.559	1.23	0.62	2.000	1.530	2.7	0.00
89	131.2	Saturated	Saturated	85	85	0.0	0	11313.4	7007.8	112.9	0.56	0.557	1.23	0.62	2.000	1.523	2.7	0.00
90	131.2	Saturated	Saturated	93	90	0.0	0	11444.6	7076.6	123.2	0.56	0.555	1.23	0.61	2.000	1.517	2.7	0.00

Geotechnologies, Inc.

Project: Culver Crossing, LLC
File No.: 22151-01
Description: Liquefaction Analysis
Boring No: B2

LIQUEFACTION EVALUATION (Idriss & Boulanger, EERI NO 12)

EARTHQUAKE INFORMATION:

Earthquake Magnitude (M):	6.7
Peak Ground Horizontal Acceleration, PGA (g):	0.95
Calculated Mag.Wtg.Factor:	1.234
GROUNDWATER INFORMATION:	
Current Groundwater Level (ft):	29.5
Historically Highest Groundwater Level* (ft):	20.0
Unit Weight of Water (pcf):	62.4

* Based on California Geological Survey Seismic Hazard Evaluation Report

BOREHOLE AND SAMPLER INFORMATION:

Borehole Diameter (inches):	8
SPT Sampler with room for Liner (Y/N):	Y
LIQUEFACTION BOUNDARY:	
Plastic Index Cut Off (PI):	18
Minimum Liquefaction FS:	1.3

Depth to Base Layer (feet)	Total Unit Weight (pcf)	Current Water Level (feet)	Historical Water Level (feet)	Field SPT Blowcount N	Depth of SPT Blowcount (feet)	Fines Content #200 Sieve (%)	Plastic Index (PI)	Vetical Stress σ_{vo} (psf)	Effective Vert. Stress σ_{vo}' (psf)	Fines Corrected $(N_1)_{60-cs}$	Stress Reduction Coeff, r_d	Cyclic Shear Ratio CSR	Mag. Scaling Factor (Sand) MSF	Overburden Corr. Factor K_σ	Cyclic Resist. Ratio $CRR_{M7.5}$	Cyclic Resistance Ratio (CRR)	Factor of Safety CRR/CSR (F.S.)	Liquefaction Settlment ΔS_i (inches)
1	113.9	Unsaturated	Unsaturated	51	15	0.0	0	113.9	113.9	121.5	1.00	0.620	1.23	1.10	2.000	2.000	Non-Liq.	0.00
2	113.9	Unsaturated	Unsaturated	51	15	0.0	0	227.8	227.8	121.5	1.00	0.618	1.23	1.10	2.000	2.000	Non-Liq.	0.00
3	113.9	Unsaturated	Unsaturated	51	15	0.0	0	341.7	341.7	115.4	1.00	0.616	1.23	1.10	2.000	2.000	Non-Liq.	0.00
4	113.9	Unsaturated	Unsaturated	51	15	0.0	0	455.6	455.6	107.0	0.99	0.614	1.23	1.10	2.000	2.000	Non-Liq.	0.00
5	113.9	Unsaturated	Unsaturated	51	15	0.0	0	569.5	569.5	107.6	0.99	0.611	1.23	1.10	2.000	2.000	Non-Liq.	0.00
6	113.9	Unsaturated	Unsaturated	51	15	0.0	0	683.4	683.4	102.6	0.99	0.609	1.23	1.10	2.000	2.000	Non-Liq.	0.00
7	113.9	Unsaturated	Unsaturated	51	15	0.0	0	797.3	797.3	98.5	0.98	0.606	1.23	1.10	2.000	2.000	Non-Liq.	0.00
8	113.9	Unsaturated	Unsaturated	51	15	0.0	0	911.2	911.2	95.1	0.98	0.604	1.23	1.10	2.000	2.000	Non-Liq.	0.00
9	113.9	Unsaturated	Unsaturated	51	15	0.0	0	1025.1	1025.1	97.9	0.97	0.601	1.23	1.10	2.000	2.000	Non-Liq.	0.00
10	113.9	Unsaturated	Unsaturated	51	15	0.0	0	1139.0	1139.0	95.3	0.97	0.598	1.23	1.10	2.000	2.000	Non-Liq.	0.00
11	129.0	Unsaturated	Unsaturated	51	15	0.0	0	1268.0	1268.0	92.6	0.96	0.596	1.23	1.10	2.000	2.000	Non-Liq.	0.00
12	129.0	Unsaturated	Unsaturated	51	15	0.0	0	1397.0	1397.0	90.3	0.96	0.593	1.23	1.10	2.000	2.000	Non-Liq.	0.00
13	129.0	Unsaturated	Unsaturated	51	15	0.0	0	1526.0	1526.0	88.2	0.96	0.590	1.23	1.10	2.000	2.000	Non-Liq.	0.00
14	129.0	Unsaturated	Unsaturated	51	15	0.0	0	1655.0	1655.0	86.4	0.95	0.587	1.23	1.07	2.000	2.000	Non-Liq.	0.00
15	129.0	Unsaturated	Unsaturated	51	15	0.0	0	1784.0	1784.0	94.6	0.95	0.584	1.23	1.05	2.000	2.000	Non-Liq.	0.00
16	129.0	Unsaturated	Unsaturated	51	15	0.0	0	1913.0	1913.0	92.9	0.94	0.580	1.23	1.03	2.000	2.000	Non-Liq.	0.00
17	129.0	Unsaturated	Unsaturated	51	15	0.0	0	2042.0	2042.0	91.3	0.93	0.577	1.23	1.01	2.000	2.000	Non-Liq.	0.00
18	123.7	Unsaturated	Unsaturated	51	15	0.0	0	2165.7	2165.7	89.9	0.93	0.574	1.23	0.99	2.000	2.000	Non-Liq.	0.00
19	123.7	Unsaturated	Unsaturated	51	15	0.0	0	2289.4	2289.4	88.6	0.92	0.571	1.23	0.98	2.000	2.000	Non-Liq.	0.00
20	123.7	Unsaturated	Unsaturated	51	15	0.0	0	2413.1	2413.1	87.4	0.92	0.567	1.23	0.96	2.000	2.000	Non-Liq.	0.00
21	123.7	Unsaturated	Saturated	72	20	0.0	0	2536.8	2474.4	121.8	0.91	0.578	1.23	0.95	2.000	2.000	3.5	0.00
22	123.7	Unsaturated	Saturated	72	20	0.0	0	2660.5	2535.7	120.3	0.91	0.588	1.23	0.93	2.000	2.000	3.4	0.00
23	127.6	Unsaturated	Saturated	100	25	0.0	0	2788.1	2600.9	165.0	0.90	0.597	1.23	0.92	2.000	2.000	3.4	0.00
24	127.6	Unsaturated	Saturated	100	25	0.0	0	2915.7	2666.1	163.0	0.90	0.605	1.23	0.90	2.000	2.000	3.3	0.00
25	127.6	Unsaturated	Saturated	100	25	0.0	0	3043.3	2731.3	161.2	0.89	0.612	1.23	0.89	2.000	2.000	3.3	0.00
26	127.6	Unsaturated	Saturated	100	25	0.0	0	3170.9	2796.5	159.5	0.88	0.619	1.23	0.88	2.000	2.000	3.2	0.00
27	127.6	Unsaturated	Saturated	100	25	0.0	0	3298.5	2861.7	157.8	0.88	0.625	1.23	0.87	2.000	2.000	3.2	0.00
28	125.3	Unsaturated	Saturated	100	25	0.0	0	3423.8	2924.6	164.5	0.87	0.631	1.23	0.86	2.000	2.000	3.2	0.00
29	125.3	Unsaturated	Saturated	100	25	0.0	0	3549.1	2987.5	163.0	0.87	0.636	1.23	0.85	2.000	2.000	3.1	0.00
30	125.3	Saturated	Saturated	100	25	0.0	0	3674.4	3050.4	161.8	0.86	0.640	1.23	0.84	2.000	2.000	3.1	0.00
31	125.3	Saturated	Saturated	75	30	0.0	0	3799.7	3113.3	120.8	0.85	0.644	1.23	0.83	2.000	2.000	3.1	0.00
32	125.3	Saturated	Saturated	75	30	0.0	0	3925.0	3176.2	120.3	0.85	0.647	1.23	0.83	2.000	2.000	3.1	0.00
33	133.9	Saturated	Saturated	75	30	0.0	0	4058.9	3247.7	119.7	0.84	0.650	1.23	0.82	2.000	2.000	3.1	0.00
34	133.9	Saturated	Saturated	75	30	0.0	0	4192.8	3319.2	119.1	0.84	0.652	1.23	0.82	2.000	2.000	3.1	0.00
35	133.9	Saturated	Saturated	75	30	0.0	0	4326.7	3390.7	118.6	0.83	0.654	1.23	0.81	2.000	2.000	3.1	0.00
36	133.9	Saturated	Saturated	100	35	0.0	0	4460.6	3462.2	157.4	0.82	0.655	1.23	0.81	2.000	1.993	3.0	0.00
37	133.9	Saturated	Saturated	100	35	0.0	0	4594.5	3533.7	156.6	0.82	0.656	1.23	0.80	2.000	1.980	3.0	0.00
38	128.6	Saturated	Saturated	100	35	0.0	0	4723.1	3599.9	156.0	0.81	0.657	1.23	0.80	2.000	1.968	3.0	0.00
39	128.6	Saturated	Saturated	100	35	0.0	0	4851.7	3666.1	155.3	0.80	0.658	1.23	0.79	2.000	1.957	3.0	0.00
40	128.6	Saturated	Saturated	100	35	0.0	0	4980.3	3732.3	154.7	0.80	0.658	1.23	0.79	2.000	1.946	3.0	0.00
41	128.6	Saturated	Saturated	76	40	0.0	0	5108.9	3798.5	117.1	0.79	0.658	1.23	0.78	2.000	1.935	2.9	0.00
42	128.6	Saturated	Saturated	76	40	0.0	0	5237.5	3864.7	116.6	0.79	0.658	1.23	0.78	2.000	1.924	2.9	0.00
43	128.7	Saturated	Saturated	61	45	0.0	0	5366.2	3931.0	93.3	0.78	0.658	1.23	0.77	2.000	1.913	2.9	0.00
44	128.7	Saturated	Saturated	61	45	0.0	0	5494.9	3997.3	92.9	0.77	0.657	1.23	0.77	2.000	1.902	2.9	0.00
45	128.7	Saturated	Saturated	61	45	0.0	0	5623.6	4063.6	92.6	0.77	0.656	1.23	0.77	2.000	1.892	2.9	0.00
46	128.7	Saturated	Saturated	61	45	0.0	0	5752.3	4129.9	92.2	0.76	0.655	1.23	0.76	2.000	1.882	2.9	0.00
47	128.7	Saturated	Saturated	61	45	0.0	0	5881.0	4196.2	91.9	0.76	0.654	1.23	0.76	2.000	1.872	2.9	0.00
48	117.3	Saturated	Saturated	61	45	0.0	0	5998.3	4251.1	91.6	0.75	0.653	1.23	0.75	2.000	1.863	2.9	0.00
49	117.3	Saturated	Saturated	61	45	0.0	0	6115.6	4306.0	91.3	0.74	0.652	1.23	0.75	2.000	1.855	2.8	0.00
50	117.3	Saturated	Saturated	61	45	0.0	0	6232.9	4360.9	91.1	0.74	0.651	1.23	0.75	2.000	1.847	2.8	0.00
51	117.3	Saturated	Saturated	79	50	0.0	0	6350.2	4415.8	117.6	0.73	0.650	1.23	0.74	2.000	1.839	2.8	0.00
52	117.3	Saturated	Saturated	79	50	0.0	0	6467.5	4470.7	117.3	0.73	0.648	1.23	0.74	2.000	1.831	2.8	0.00
53	127.1	Saturated	Saturated	79	50	0.0	0	6594.6	4535.4	116.9	0.72	0.647	1.23	0.74	2.000	1.822	2.8	0.00
54	127.1	Saturated	Saturated	79	50	0.0	0	6721.7	4600.1	116.5	0.71	0.645	1.23	0.73	2.000	1.813	2.8	0.00
55	127.1	Saturated	Saturated	79	50	0.0	0	6848.8	4664.8	116.1	0.71	0.642	1.23	0.73	2.000	1.804	2.8	0.00
56	127.1	Saturated	Saturated	77	55	0.0	0	6975.9	4729.5	112.8	0.70	0.640	1.23	0.73	2.000	1.795	2.8	0.00
57	127.1	Saturated	Saturated	77	55	0.0	0	7103.0	4794.2	112.4	0.70	0.638	1.23	0.72	2.000	1.786	2.8	0.00
58	126.8	Saturated	Saturated	77	55	0.0	0	7229.8	4858.6	112.1	0.69	0.636	1.23	0.72	2.000	1.777	2.8	0.00
59	126.8	Saturated	Saturated	77	55	0.0	0	7356.6	4923.0	111.7	0.69	0.633	1.23	0.72	2.000	1.769	2.8	0.00
60	126.8	Saturated	Saturated	77	55	0.0	0	7483.4	4987.4	111.4	0.68	0.631	1.23	0.71	2.000	1.760	2.8	0.00
61	126.8	Saturated	Saturated	54	60	0.0	0	7610.2	5051.8	77.9	0.68	0.628	1.23	0.71	2.000	1.752	2.8	0.00
62	126.8	Saturated	Saturated	54	60	0.0	0	7737.0	5116.2	77.7	0.67	0.626	1.23	0.71	2.000	1.744	2.8	0.00
63	129.5	Saturated	Saturated	81	65	0.0	0	7866.5	5183.3	116.1	0.67	0.623	1.23	0.70	2.000	1.735	2.8	0.00
64	129.5	Saturated	Saturated	81	65	0.0	0	7996.0	5250.4	115.8	0.66	0.621	1.23	0.70	2.000	1.727	2.8	0.00
65	129.5	Saturated	Saturated	81	65	0.0	0	8125.5	5317.5	115.4	0.65	0.618	1.23	0.70	2.000	1.718	2.8	0.00
66	129.5	Saturated	Saturated	81	65	0.0	0	8255.0	5384.6	115.1	0.65	0.615	1.23	0.69	2.000	1.710	2.8	0.00
67	129.5	Saturated	Saturated	81	65	0.0	0	8384.5	5451.7	114.7	0.64	0.613	1.23	0.69	2.000	1.702	2.8	0.00
68	131.5	Saturated	Saturated	81	65	0.0	0	8516.0	5520.8	114.4	0.64	0.610	1.23	0.69	2.000	1.694	2.8	0.00
69	131.5	Saturated	Saturated	81	65	0.0	0	8647.5	5589.9	114.1	0.64	0.607	1.23	0.68	2.000	1.685	2.8	0.00
70	131.5	Saturated	Saturated	81	65	0.0	0	8779.0	5659.0	113.7	0.63	0.604	1.23	0.68	2.000	1.677	2.8	0.00
71	131.5	Saturated	Saturated	79	70	0.0	0	8910.5	5728.1	110.6	0.63	0.601	1.23	0.68	2.000	1.669	2.8	0.00
72	131.5	Saturated	Saturated	79	70	0.0	0	9042.0	5797.2	110.3	0.62	0.599	1.23	0.67	2.000	1.661	2.8	0.00
73	125.9	Saturated	Saturated	79	70	0.0	0	9167.9	5860.7	110.0	0.62	0.596	1.23	0.67	2.000	1.654	2.8	0.00
74	125.9	Saturated	Saturated	79	70	0.0	0	9293.8	5924.2	109.7	0.61	0.594	1.23	0.67	2.000	1.647	2.8	0.00
75	125.9	Saturated	Saturated	79	70	0.0	0	9419.7	5987.7	109.4	0.61	0.591	1.23	0.66	2.000	1.640	2.8	0.00
76	125.9	Saturated	Saturated	89	75	0.0	0	9545.6	6051.2	123.0	0.60	0.589	1.23	0.66	2.000	1.633	2.8	0.00
77	125.9	Saturated	Saturated	89	75	0.0	0	9671.5	6114.7	122.7	0.60	0.586	1.23	0.66	2.000	1.626	2.8	0.00
78	123.5	Saturated	Saturated	89	75	0.0	0	9795.0	6175.8	122.4	0.60	0.584	1.23	0.66	2.000	1.620	2.8	0.00
79	123.5	Saturated	Saturated	89	75	0.0	0	9918.5	6236.9	122.1	0.59	0.582	1.23	0.65	2.000	1.613	2.8	0.00
80	123.5	Saturated	Saturated	89	75	0.0	0	10042.0	6298.0	121.8	0.59	0.580	1.23	0.65	2.000	1.606	2.8	0.00
81	123.5	Saturated	Saturated	100	80	0.0	0	10165.5	6359.1	136.5	0.59	0.578	1.23	0.65	2.000	1.600	2.8	0.00
82	123.5	Saturated	Saturated	100	80	0.0	0	10289.0	6420.2	136.2	0.58	0.576	1.23	0.65	2.000	1.594	2.8	0.00
83	123.2	Saturated	Saturated	84	85	0.0	0	10412.2	6481.0	114.2	0.58	0.573	1.23	0.64	2.000	1.587	2.8	0.00
84	123.2	Saturated	Saturated	84	85	0.0	0	10535.4	6541.8	113.9	0.57	0.571	1.23	0.64	2.000	1.581	2.8	0.00
85	123.2	Saturated	Saturated	84	85	0.0	0	10658.6	6602.6	113.7	0.57	0.570	1.23	0.64	2.000	1.575	2.8	0.00
86	123.2	Saturated	Saturated	84	85	0.0	0	10781.8	6663.4	113.4	0.57	0.568	1.23	0.64	2.000	1.569	2.8	0.00
87	123.2	Saturated	Saturated	84	85	0.0	0	10905.0	6724.2	113.2	0.56	0.566	1.23	0.63	2.000	1.563	2.8	0.00
88	129.4	Saturated	Saturated	84	85	0.0	0	11034.4	6791.2	112.9	0.56	0.564	1.23	0.63	2.000	1.556	2.8	0.00
89	129.4	Saturated	Saturated	84	85	0.0	0	11163.8	6858.2	112.6	0.56	0.562	1.23	0.63	2.000	1.550	2.8	0.00
90	129.4	Saturated	Saturated	100	90	0.0	0	11293.2	6925.2	133.8	0.56	0.560	1.23	0.62	2.000	1.543	2.8	0.00

Geotechnologies, Inc.

Project: Culver Crossings, LLC
File No.: 22151-01
Description: Liquefaction Analysis
Boring No: B3

LIQUEFACTION EVALUATION (Idriss & Boulanger, EERI NO 12)

EARTHQUAKE INFORMATION:

Earthquake Magnitude (M):	6.7
Peak Ground Horizontal Acceleration, PGA (g):	0.95
Calculated Mag.Wtg.Factor:	1.234
GROUNDWATER INFORMATION:	
Current Groundwater Level (ft):	33.0
Historically Highest Groundwater Level* (ft):	20.0
Unit Weight of Water (pcf):	62.4

* Based on California Geological Survey Seismic Hazard Evaluation Report

BOREHOLE AND SAMPLER INFORMATION:

Borehole Diameter (inches):	8
SPT Sampler with room for Liner (Y/N):	Y
LIQUEFACTION BOUNDARY:	
Plastic Index Cut Off (PI):	18
Minimum Liquefaction FS:	1.3

Depth to Base Layer (feet)	Total Unit Weight (pcf)	Current Water Level (feet)	Historical Water Level (feet)	Field SPT Blowcount N	Depth of SPT Blowcount (feet)	Fines Content #200 Sieve (%)	Plastic Index (PI)	Vetical Stress σ_{vc}, (psf)	Effective Vert. Stress σ_{vc}', (psf)	Fines Corrected $(N_1)_{60-cs}$	Stress Reduction Coeff, r_d	Cyclic Shear Ratio CSR	Mag. Scaling Factor (Sand) MSF	Overburden Corr. Factor K_σ	Cyclic Resist. Ratio $CRR_{M7.5,\sigma vc'=1}$	Cyclic Resistance Ratio (CRR)	Factor of Safety CRR/CSR (F.S.)	Liquefaction Settlment ΔS_i (inches)
1	127.0	Unsaturated	Unsaturated	11	5	0.0	0	127.0	127.0	24.2	1.00	0.620	1.23	1.10	0.273	0.370	Non-Liq.	0.00
2	127.0	Unsaturated	Unsaturated	11	5	0.0	0	254.0	254.0	24.2	1.00	0.618	1.23	1.10	0.273	0.370	Non-Liq.	0.00
3	127.0	Unsaturated	Unsaturated	11	5	0.0	0	381.0	381.0	24.2	1.00	0.616	1.23	1.10	0.273	0.370	Non-Liq.	0.00
4	127.0	Unsaturated	Unsaturated	11	5	0.0	0	508.0	508.0	24.2	0.99	0.614	1.23	1.10	0.273	0.370	Non-Liq.	0.00
5	127.0	Unsaturated	Unsaturated	11	5	0.0	0	635.0	635.0	24.9	0.99	0.611	1.23	1.10	0.287	0.390	Non-Liq.	0.00
6	127.0	Unsaturated	Unsaturated	11	5	0.0	0	762.0	762.0	23.4	0.99	0.609	1.23	1.10	0.256	0.348	Non-Liq.	0.00
7	127.0	Unsaturated	Unsaturated	11	5	0.0	0	889.0	889.0	21.9	0.98	0.606	1.23	1.10	0.233	0.314	Non-Liq.	0.00
8	121.1	Unsaturated	Unsaturated	11	5	0.0	0	1010.1	1010.1	20.7	0.98	0.604	1.23	1.10	0.214	0.291	Non-Liq.	0.00
9	121.1	Unsaturated	Unsaturated	11	5	0.0	0	1131.2	1131.2	20.9	0.97	0.601	1.23	1.09	0.217	0.291	Non-Liq.	0.00
10	121.1	Unsaturated	Unsaturated	11	5	0.0	0	1252.3	1252.3	19.9	0.97	0.598	1.23	1.07	0.205	0.270	Non-Liq.	0.00
11	121.1	Unsaturated	Unsaturated	12	10	0.0	0	1373.4	1373.4	20.9	0.96	0.596	1.23	1.06	0.217	0.284	Non-Liq.	0.00
12	121.1	Unsaturated	Unsaturated	12	10	0.0	0	1494.5	1494.5	20.1	0.96	0.593	1.23	1.05	0.207	0.267	Non-Liq.	0.00
13	127.8	Unsaturated	Unsaturated	28	15	0.0	0	1622.3	1622.3	47.7	0.96	0.590	1.23	1.08	2.000	2.000	Non-Liq.	0.00
14	127.8	Unsaturated	Unsaturated	28	15	0.0	0	1750.1	1750.1	46.7	0.95	0.587	1.23	1.06	2.000	2.000	Non-Liq.	0.00
15	127.8	Unsaturated	Unsaturated	28	15	0.0	0	1877.9	1877.9	51.3	0.95	0.584	1.23	1.03	2.000	2.000	Non-Liq.	0.00
16	127.8	Unsaturated	Unsaturated	28	15	0.0	0	2005.7	2005.7	50.4	0.94	0.580	1.23	1.01	2.000	2.000	Non-Liq.	0.00
17	127.8	Unsaturated	Unsaturated	28	15	0.0	0	2133.5	2133.5	49.6	0.93	0.577	1.23	1.00	2.000	2.000	Non-Liq.	0.00
18	131.2	Unsaturated	Unsaturated	28	15	0.0	0	2264.7	2264.7	48.8	0.93	0.574	1.23	0.98	2.000	2.000	Non-Liq.	0.00
19	131.2	Unsaturated	Unsaturated	28	15	0.0	0	2395.9	2395.9	48.1	0.92	0.571	1.23	0.96	2.000	2.000	Non-Liq.	0.00
20	131.2	Unsaturated	Unsaturated	28	15	0.0	0	2527.1	2527.1	47.4	0.92	0.567	1.23	0.95	2.000	2.000	Non-Liq.	0.00
21	131.2	Unsaturated	Saturated	31	20	0.0	0	2658.3	2595.9	51.8	0.91	0.577	1.23	0.93	2.000	2.000	3.5	0.00
22	131.2	Unsaturated	Saturated	31	20	0.0	0	2789.5	2664.7	51.1	0.91	0.587	1.23	0.92	2.000	2.000	3.4	0.00
23	123.7	Unsaturated	Saturated	31	20	0.0	0	2913.2	2726.0	50.6	0.90	0.595	1.23	0.90	2.000	2.000	3.4	0.00
24	123.7	Unsaturated	Saturated	31	20	0.0	0	3036.9	2787.3	50.0	0.90	0.603	1.23	0.89	2.000	2.000	3.3	0.00
25	123.7	Unsaturated	Saturated	31	20	0.0	0	3160.6	2848.6	49.5	0.89	0.610	1.23	0.88	2.000	2.000	3.3	0.00
26	123.7	Unsaturated	Saturated	100	25	0.0	0	3284.3	2909.9	158.0	0.88	0.616	1.23	0.87	2.000	2.000	3.2	0.00
27	123.7	Unsaturated	Saturated	100	25	0.0	0	3408.0	2971.2	156.5	0.88	0.622	1.23	0.86	2.000	2.000	3.2	0.00
28	128.9	Unsaturated	Saturated	100	25	0.0	0	3536.9	3037.7	163.1	0.87	0.627	1.23	0.85	2.000	2.000	3.2	0.00
29	128.9	Unsaturated	Saturated	100	25	0.0	0	3665.8	3104.2	161.6	0.87	0.632	1.23	0.84	2.000	2.000	3.2	0.00
30	128.9	Unsaturated	Saturated	100	25	0.0	0	3794.7	3170.7	160.1	0.86	0.636	1.23	0.83	2.000	2.000	3.1	0.00
31	128.9	Unsaturated	Saturated	74	30	0.0	0	3923.6	3237.2	117.5	0.85	0.639	1.23	0.82	2.000	2.000	3.1	0.00
32	128.9	Unsaturated	Saturated	74	30	0.0	0	4052.5	3303.7	116.5	0.85	0.642	1.23	0.81	2.000	1.993	3.1	0.00
33	138.2	Unsaturated	Saturated	89	35	0.0	0	4190.7	3379.5	138.8	0.84	0.645	1.23	0.80	2.000	1.969	3.1	0.00
34	138.2	Saturated	Saturated	89	35	0.0	0	4328.9	3455.3	138.2	0.84	0.647	1.23	0.79	2.000	1.956	3.0	0.00
35	138.2	Saturated	Saturated	89	35	0.0	0	4467.1	3531.1	137.5	0.83	0.648	1.23	0.79	2.000	1.943	3.0	0.00
36	138.2	Saturated	Saturated	89	35	0.0	0	4605.3	3606.9	136.9	0.82	0.649	1.23	0.78	2.000	1.930	3.0	0.00
37	138.2	Saturated	Saturated	89	35	0.0	0	4743.5	3682.7	136.3	0.82	0.650	1.23	0.78	2.000	1.918	3.0	0.00
38	120.5	Saturated	Saturated	82	40	0.0	0	4864.0	3740.8	125.2	0.81	0.651	1.23	0.77	2.000	1.909	2.9	0.00
39	120.5	Saturated	Saturated	82	40	0.0	0	4984.5	3798.9	124.7	0.80	0.652	1.23	0.77	2.000	1.899	2.9	0.00
40	120.5	Saturated	Saturated	82	40	0.0	0	5105.0	3857.0	124.3	0.80	0.653	1.23	0.77	2.000	1.890	2.9	0.00
41	120.5	Saturated	Saturated	82	40	0.0	0	5225.5	3915.1	123.9	0.79	0.653	1.23	0.76	2.000	1.881	2.9	0.00
42	120.5	Saturated	Saturated	82	40	0.0	0	5346.0	3973.2	123.5	0.79	0.653	1.23	0.76	2.000	1.872	2.9	0.00
43	132.3	Saturated	Saturated	82	40	0.0	0	5478.3	4043.1	123.1	0.78	0.653	1.23	0.75	2.000	1.862	2.9	0.00
44	132.3	Saturated	Saturated	82	40	0.0	0	5610.6	4113.0	122.6	0.77	0.652	1.23	0.75	2.000	1.851	2.8	0.00
45	132.3	Saturated	Saturated	82	40	0.0	0	5742.9	4182.9	122.1	0.77	0.651	1.23	0.75	2.000	1.841	2.8	0.00
46	132.3	Saturated	Saturated	95	45	0.0	0	5875.2	4252.8	141.0	0.76	0.650	1.23	0.74	2.000	1.831	2.8	0.00
47	132.3	Saturated	Saturated	95	45	0.0	0	6007.5	4322.7	140.5	0.76	0.648	1.23	0.74	2.000	1.821	2.8	0.00
48	128.0	Saturated	Saturated	95	45	0.0	0	6135.5	4388.3	140.0	0.75	0.647	1.23	0.73	2.000	1.812	2.8	0.00
49	128.0	Saturated	Saturated	95	45	0.0	0	6263.5	4453.9	139.6	0.74	0.646	1.23	0.73	2.000	1.803	2.8	0.00
50	128.0	Saturated	Saturated	95	45	0.0	0	6391.5	4519.5	139.1	0.74	0.644	1.23	0.73	2.000	1.793	2.8	0.00
51	128.0	Saturated	Saturated	88	50	0.0	0	6519.5	4585.1	128.4	0.73	0.642	1.23	0.72	2.000	1.785	2.8	0.00
52	128.0	Saturated	Saturated	88	50	0.0	0	6647.5	4650.7	128.0	0.73	0.641	1.23	0.72	2.000	1.776	2.8	0.00
53	132.6	Saturated	Saturated	88	50	0.0	0	6780.1	4720.9	127.6	0.72	0.639	1.23	0.72	2.000	1.766	2.8	0.00
54	132.6	Saturated	Saturated	88	50	0.0	0	6912.7	4791.1	127.2	0.71	0.636	1.23	0.71	2.000	1.757	2.8	0.00
55	132.6	Saturated	Saturated	88	50	0.0	0	7045.3	4861.3	126.8	0.71	0.634	1.23	0.71	2.000	1.748	2.8	0.00
56	132.6	Saturated	Saturated	96	55	0.0	0	7177.9	4931.5	137.8	0.70	0.632	1.23	0.70	2.000	1.739	2.8	0.00
57	132.6	Saturated	Saturated	96	55	0.0	0	7310.5	5001.7	137.4	0.70	0.629	1.23	0.70	2.000	1.730	2.7	0.00
58	129.2	Saturated	Saturated	96	55	0.0	0	7439.7	5068.5	137.0	0.69	0.627	1.23	0.70	2.000	1.722	2.7	0.00
59	129.2	Saturated	Saturated	96	55	0.0	0	7568.9	5135.3	136.6	0.69	0.625	1.23	0.69	2.000	1.714	2.7	0.00
60	129.2	Saturated	Saturated	96	55	0.0	0	7698.1	5202.1	136.2	0.68	0.622	1.23	0.69	2.000	1.706	2.7	0.00
61	129.2	Saturated	Saturated	100	60	0.0	0	7827.3	5268.9	141.4	0.68	0.620	1.23	0.69	2.000	1.698	2.7	0.00
62	129.2	Saturated	Saturated	100	60	0.0	0	7956.5	5335.7	141.0	0.67	0.617	1.23	0.68	2.000	1.690	2.7	0.00
63	125.1	Saturated	Saturated	100	60	0.0	0	8081.6	5398.4	140.7	0.67	0.615	1.23	0.68	2.000	1.682	2.7	0.00
64	125.1	Saturated	Saturated	100	60	0.0	0	8206.7	5461.1	140.3	0.66	0.612	1.23	0.68	2.000	1.675	2.7	0.00
65	125.1	Saturated	Saturated	100	60	0.0	0	8331.8	5523.8	139.9	0.65	0.610	1.23	0.68	2.000	1.668	2.7	0.00
66	125.1	Saturated	Saturated	100	65	0.0	0	8456.9	5586.5	139.6	0.65	0.608	1.23	0.67	2.000	1.661	2.7	0.00
67	125.1	Saturated	Saturated	100	65	0.0	0	8582.0	5649.2	139.2	0.64	0.605	1.23	0.67	2.000	1.653	2.7	0.00
68	128.2	Saturated	Saturated	100	65	0.0	0	8710.2	5715.0	138.8	0.64	0.602	1.23	0.67	2.000	1.646	2.7	0.00
69	128.2	Saturated	Saturated	100	65	0.0	0	8838.4	5780.8	138.5	0.64	0.600	1.23	0.66	2.000	1.639	2.7	0.00
70	128.2	Saturated	Saturated	100	65	0.0	0	8966.6	5846.6	138.1	0.63	0.597	1.23	0.66	2.000	1.632	2.7	0.00
71	128.2	Saturated	Saturated	100	70	0.0	0	9094.8	5912.4	137.7	0.63	0.595	1.23	0.66	2.000	1.624	2.7	0.00
72	128.2	Saturated	Saturated	100	70	0.0	0	9223.0	5978.2	137.4	0.62	0.592	1.23	0.66	2.000	1.617	2.7	0.00
73	144.0	Saturated	Saturated	100	70	0.0	0	9367.0	6059.8	137.0	0.62	0.589	1.23	0.65	2.000	1.609	2.7	0.00
74	144.0	Saturated	Saturated	100	70	0.0	0	9511.0	6141.4	136.5	0.61	0.586	1.23	0.65	2.000	1.600	2.7	0.00
75	144.0	Saturated	Saturated	100	70	0.0	0	9655.0	6223.0	136.1	0.61	0.583	1.23	0.64	2.000	1.591	2.7	0.00
76	144.0	Saturated	Saturated	88	75	0.0	0	9799.0	6304.6	119.4	0.60	0.580	1.23	0.64	2.000	1.583	2.7	0.00
77	144.0	Saturated	Saturated	88	75	0.0	0	9943.0	6386.2	119.1	0.60	0.577	1.23	0.64	2.000	1.575	2.7	0.00
78	130.2	Saturated	Saturated	88	75	0.0	0	10073.2	6454.0	118.8	0.60	0.575	1.23	0.64	2.000	1.568	2.7	0.00
79	130.2	Saturated	Saturated	88	75	0.0	0	10203.4	6521.8	118.5	0.59	0.573	1.23	0.63	2.000	1.561	2.7	0.00
80	130.2	Saturated	Saturated	98	80	0.0	0	10333.6	6589.6	131.6	0.59	0.570	1.23	0.63	2.000	1.554	2.7	0.00

Geotechnologies, Inc.

Project: Culver Crossings, LLC
File No.: 22151-01
Description: Liquefaction Analysis
Boring No: B4

LIQUEFACTION EVALUATION (Idriss & Boulanger, EERI NO 12)

EARTHQUAKE INFORMATION:

Earthquake Magnitude (M):	6.7
Peak Ground Horizontal Acceleration, PGA (g):	0.95
Calculated Mag.Wtg.Factor:	1.234

GROUNDWATER INFORMATION:

Current Groundwater Level (ft):	29.0
Historically Highest Groundwater Level* (ft):	20.0
Unit Weight of Water (pcf):	62.4

* Based on California Geological Survey Seismic Hazard Evaluation Report

BOREHOLE AND SAMPLER INFORMATION:

Borehole Diameter (inches):	8
SPT Sampler with room for Liner (Y/N):	Y

LIQUEFACTION BOUNDARY:

Plastic Index Cut Off (PI):	18
Minimum Liquefaction FS:	1.3

Depth to Base Layer (feet)	Total Unit Weight (pcf)	Current Water Level (feet)	Historical Water Level (feet)	Field SPT Blowcount N	Depth of SPT Blowcount (feet)	Fines Content #200 Sieve (%)	Plastic Index (PI)	Vetical Stress σ_{vc}, (psf)	Effective Vert. Stress σ_{vc}', (psf)	Fines Corrected $(N_1)_{60\text{-}cs}$	Stress Reduction Coeff, r_d	Cyclic Shear Ratio CSR	Mag. Scaling Factor (Sand) MSF	Overburden Corr. Factor K_σ	Cyclic Resist. Ratio $CRR_{M7.5,\sigma'v=1}$	Cyclic Resistance Ratio (CRR)	Factor of Safety CRR/CSR (F.S.)	Liquefaction Settlment ΔS_i (inches)
1	138.1	Unsaturated	Unsaturated	16	5	0.0	0	138.1	138.1	37.9	1.00	0.620	1.23	1.10	2.000	2.000	Non-Liq.	0.00
2	138.1	Unsaturated	Unsaturated	16	5	0.0	0	276.2	276.2	37.9	1.00	0.618	1.23	1.10	2.000	2.000	Non-Liq.	0.00
3	138.1	Unsaturated	Unsaturated	16	5	0.0	0	414.3	414.3	37.3	1.00	0.616	1.23	1.10	1.869	2.000	Non-Liq.	0.00
4	138.1	Unsaturated	Unsaturated	16	5	0.0	0	552.4	552.4	34.8	0.99	0.614	1.23	1.10	1.057	1.435	Non-Liq.	0.00
5	138.1	Unsaturated	Unsaturated	16	5	0.0	0	690.5	690.5	34.7	0.99	0.611	1.23	1.10	1.032	1.402	Non-Liq.	0.00
6	138.1	Unsaturated	Unsaturated	16	5	0.0	0	828.6	828.6	32.7	0.99	0.609	1.23	1.10	0.730	0.978	Non-Liq.	0.00
7	138.1	Unsaturated	Unsaturated	16	5	0.0	0	966.7	966.7	30.8	0.98	0.606	1.23	1.10	0.541	0.735	Non-Liq.	0.00
8	128.6	Unsaturated	Unsaturated	17	10	0.0	0	1095.3	1095.3	31.2	0.98	0.604	1.23	1.10	0.573	0.778	Non-Liq.	0.00
9	128.6	Unsaturated	Unsaturated	17	10	0.0	0	1223.9	1223.9	31.9	0.97	0.601	1.23	1.10	0.633	0.858	Non-Liq.	0.00
10	128.6	Unsaturated	Unsaturated	17	10	0.0	0	1352.5	1352.5	30.6	0.97	0.598	1.23	1.09	0.525	0.708	Non-Liq.	0.00
11	128.6	Unsaturated	Unsaturated	17	10	0.0	0	1481.1	1481.1	29.4	0.96	0.596	1.23	1.07	0.453	0.598	Non-Liq.	0.00
12	128.6	Unsaturated	Unsaturated	17	10	0.0	0	1609.7	1609.7	28.4	0.96	0.593	1.23	1.05	0.401	0.520	Non-Liq.	0.00
13	127.0	Unsaturated	Unsaturated	25	15	0.0	0	1736.7	1736.7	42.0	0.96	0.590	1.23	1.06	2.000	2.000	Non-Liq.	0.00
14	127.0	Unsaturated	Unsaturated	25	15	0.0	0	1863.7	1863.7	41.2	0.95	0.587	1.23	1.04	2.000	2.000	Non-Liq.	0.00
15	127.0	Unsaturated	Unsaturated	25	15	0.0	0	1990.7	1990.7	45.1	0.95	0.584	1.23	1.02	2.000	2.000	Non-Liq.	0.00
16	127.0	Unsaturated	Unsaturated	25	15	0.0	0	2117.7	2117.7	44.3	0.94	0.580	1.23	1.00	2.000	2.000	Non-Liq.	0.00
17	127.0	Unsaturated	Unsaturated	25	15	0.0	0	2244.7	2244.7	43.6	0.93	0.577	1.23	0.98	2.000	2.000	Non-Liq.	0.00
18	122.5	Unsaturated	Unsaturated	21	20	77.4	0	2367.2	2367.2	40.7	0.93	0.574	1.23	0.97	2.000	2.000	Non-Liq.	0.00
19	122.5	Unsaturated	Unsaturated	21	20	77.4	0	2489.7	2489.7	39.9	0.92	0.571	1.23	0.95	2.000	2.000	Non-Liq.	0.00
20	122.5	Unsaturated	Unsaturated	21	20	77.4	0	2612.2	2612.2	39.2	0.92	0.567	1.23	0.94	2.000	2.000	Non-Liq.	0.00
21	122.5	Unsaturated	Saturated	21	20	77.4	0	2734.7	2672.3	38.5	0.91	0.577	1.23	0.92	2.000	2.000	3.5	0.00
22	122.5	Unsaturated	Saturated	21	20	77.4	0	2857.2	2732.4	37.9	0.91	0.586	1.23	0.91	2.000	2.000	3.4	0.00
23	126.3	Unsaturated	Saturated	90	25	0.0	0	2983.5	2796.3	145.8	0.90	0.594	1.23	0.90	2.000	2.000	3.4	0.00
24	126.3	Unsaturated	Saturated	90	25	0.0	0	3109.8	2860.2	144.3	0.90	0.602	1.23	0.89	2.000	2.000	3.3	0.00
25	126.3	Unsaturated	Saturated	90	25	0.0	0	3236.1	2924.1	142.8	0.89	0.608	1.23	0.87	2.000	2.000	3.3	0.00
26	126.3	Unsaturated	Saturated	90	25	0.0	0	3362.4	2988.0	141.3	0.88	0.614	1.23	0.86	2.000	2.000	3.3	0.00
27	126.3	Unsaturated	Saturated	90	25	0.0	0	3488.7	3051.9	140.0	0.88	0.620	1.23	0.85	2.000	2.000	3.2	0.00
28	130.2	Unsaturated	Saturated	90	25	0.0	0	3618.9	3119.7	145.9	0.87	0.625	1.23	0.84	2.000	2.000	3.2	0.00
29	130.2	Unsaturated	Saturated	90	25	0.0	0	3749.1	3187.5	144.6	0.87	0.629	1.23	0.83	2.000	2.000	3.2	0.00
30	130.2	Saturated	Saturated	90	25	0.0	0	3879.3	3255.3	143.9	0.86	0.633	1.23	0.83	2.000	2.000	3.2	0.00
31	130.2	Saturated	Saturated	72	30	0.0	0	4009.5	3323.1	114.6	0.85	0.636	1.23	0.82	2.000	2.000	3.1	0.00
32	130.2	Saturated	Saturated	72	30	0.0	0	4139.7	3390.9	114.1	0.85	0.639	1.23	0.81	2.000	2.000	3.1	0.00
33	128.4	Saturated	Saturated	72	30	0.0	0	4268.1	3456.9	113.6	0.84	0.642	1.23	0.81	2.000	1.999	3.1	0.00
34	128.4	Saturated	Saturated	72	30	0.0	0	4396.5	3522.9	113.1	0.84	0.644	1.23	0.81	2.000	1.987	3.1	0.00
35	128.4	Saturated	Saturated	72	30	0.0	0	4524.9	3588.9	112.6	0.83	0.646	1.23	0.80	2.000	1.976	3.1	0.00
36	128.4	Saturated	Saturated	88	35	0.0	0	4653.3	3654.9	137.1	0.82	0.647	1.23	0.80	2.000	1.964	3.0	0.00
37	128.4	Saturated	Saturated	88	35	0.0	0	4781.7	3720.9	136.5	0.82	0.648	1.23	0.79	2.000	1.953	3.0	0.00
38	118.4	Saturated	Saturated	88	35	0.0	0	4900.1	3776.9	136.0	0.81	0.650	1.23	0.79	2.000	1.944	3.0	0.00
39	118.4	Saturated	Saturated	88	35	0.0	0	5018.5	3832.9	135.6	0.80	0.651	1.23	0.78	2.000	1.934	3.0	0.00
40	118.4	Saturated	Saturated	88	35	0.0	0	5136.9	3888.9	135.1	0.80	0.651	1.23	0.78	2.000	1.925	3.0	0.00
41	118.4	Saturated	Saturated	84	40	0.0	0	5255.3	3944.9	128.6	0.79	0.652	1.23	0.78	2.000	1.916	2.9	0.00
42	118.4	Saturated	Saturated	84	40	0.0	0	5373.7	4000.9	128.1	0.79	0.652	1.23	0.77	2.000	1.907	2.9	0.00
43	128.8	Saturated	Saturated	84	40	0.0	0	5502.5	4067.3	127.7	0.78	0.652	1.23	0.77	2.000	1.896	2.9	0.00
44	128.8	Saturated	Saturated	84	40	0.0	0	5631.3	4133.7	127.2	0.77	0.651	1.23	0.76	2.000	1.886	2.9	0.00
45	128.8	Saturated	Saturated	84	40	0.0	0	5760.1	4200.1	126.7	0.77	0.650	1.23	0.76	2.000	1.876	2.9	0.00
46	128.8	Saturated	Saturated	82	45	0.0	0	5888.9	4266.5	123.2	0.76	0.649	1.23	0.76	2.000	1.866	2.9	0.00
47	128.8	Saturated	Saturated	82	45	0.0	0	6017.7	4332.9	122.8	0.76	0.648	1.23	0.75	2.000	1.856	2.9	0.00
48	128.4	Saturated	Saturated	82	45	0.0	0	6146.1	4398.9	122.4	0.75	0.647	1.23	0.75	2.000	1.846	2.9	0.00
49	128.4	Saturated	Saturated	82	45	0.0	0	6274.5	4464.9	121.9	0.74	0.645	1.23	0.74	2.000	1.836	2.8	0.00
50	128.4	Saturated	Saturated	82	45	0.0	0	6402.9	4530.9	121.5	0.74	0.644	1.23	0.74	2.000	1.827	2.8	0.00
51	128.4	Saturated	Saturated	89	50	0.0	0	6531.3	4596.9	131.4	0.73	0.642	1.23	0.74	2.000	1.817	2.8	0.00
52	128.4	Saturated	Saturated	89	50	0.0	0	6659.7	4662.9	131.0	0.73	0.640	1.23	0.73	2.000	1.808	2.8	0.00
53	126.8	Saturated	Saturated	89	50	0.0	0	6786.5	4727.3	130.6	0.72	0.638	1.23	0.73	2.000	1.799	2.8	0.00
54	126.8	Saturated	Saturated	89	50	0.0	0	6913.3	4791.7	130.2	0.71	0.636	1.23	0.73	2.000	1.790	2.8	0.00
55	126.8	Saturated	Saturated	89	50	0.0	0	7040.1	4856.1	129.8	0.71	0.634	1.23	0.72	2.000	1.782	2.8	0.00
56	126.8	Saturated	Saturated	86	55	0.0	0	7166.9	4920.5	125.0	0.70	0.632	1.23	0.72	2.000	1.773	2.8	0.00
57	126.8	Saturated	Saturated	86	55	0.0	0	7293.7	4984.9	124.6	0.70	0.630	1.23	0.71	2.000	1.765	2.8	0.00
58	121.9	Saturated	Saturated	86	55	0.0	0	7415.6	5044.4	124.3	0.69	0.628	1.23	0.71	2.000	1.757	2.8	0.00
59	121.9	Saturated	Saturated	86	55	0.0	0	7537.5	5103.9	123.9	0.69	0.626	1.23	0.71	2.000	1.749	2.8	0.00
60	121.9	Saturated	Saturated	86	55	0.0	0	7659.4	5163.4	123.6	0.68	0.624	1.23	0.71	2.000	1.742	2.8	0.00
61	121.9	Saturated	Saturated	88	60	0.0	0	7781.3	5222.9	126.1	0.68	0.621	1.23	0.70	2.000	1.734	2.8	0.00
62	121.9	Saturated	Saturated	88	60	0.0	0	7903.2	5282.4	125.8	0.67	0.619	1.23	0.70	2.000	1.727	2.8	0.00
63	125.6	Saturated	Saturated	88	60	0.0	0	8028.8	5345.6	125.4	0.67	0.617	1.23	0.70	2.000	1.719	2.8	0.00
64	125.6	Saturated	Saturated	88	60	0.0	0	8154.4	5408.8	125.1	0.66	0.614	1.23	0.69	2.000	1.711	2.8	0.00
65	125.6	Saturated	Saturated	88	60	0.0	0	8280.0	5472.0	124.7	0.65	0.612	1.23	0.69	2.000	1.703	2.8	0.00
66	125.6	Saturated	Saturated	88	65	0.0	0	8405.6	5535.2	124.4	0.65	0.609	1.23	0.69	2.000	1.696	2.8	0.00
67	125.6	Saturated	Saturated	88	65	0.0	0	8531.2	5598.4	124.0	0.64	0.607	1.23	0.68	2.000	1.688	2.8	0.00
68	120.0	Saturated	Saturated	88	65	0.0	0	8651.2	5656.0	123.7	0.64	0.605	1.23	0.68	2.000	1.681	2.8	0.00
69	120.0	Saturated	Saturated	88	65	0.0	0	8771.2	5713.6	123.4	0.64	0.602	1.23	0.68	2.000	1.675	2.8	0.00
70	120.0	Saturated	Saturated	88	65	0.0	0	8891.2	5771.2	123.1	0.63	0.600	1.23	0.68	2.000	1.668	2.8	0.00
71	120.0	Saturated	Saturated	100	70	0.0	0	9011.2	5828.8	139.6	0.63	0.598	1.23	0.67	2.000	1.661	2.8	0.00
72	120.0	Saturated	Saturated	100	70	0.0	0	9131.2	5886.4	139.3	0.62	0.595	1.23	0.67	2.000	1.655	2.8	0.00
73	130.0	Saturated	Saturated	98	75	0.0	0	9261.2	5954.0	136.1	0.62	0.593	1.23	0.67	2.000	1.647	2.8	0.00
74	130.0	Saturated	Saturated	98	75	0.0	0	9391.2	6021.6	135.7	0.61	0.590	1.23	0.66	2.000	1.640	2.8	0.00
75	130.0	Saturated	Saturated	98	75	0.0	0	9521.2	6089.2	135.4	0.61	0.588	1.23	0.66	2.000	1.632	2.8	0.00
76	130.0	Saturated	Saturated	98	75	0.0	0	9651.2	6156.8	135.0	0.60	0.585	1.23	0.66	2.000	1.625	2.8	0.00
77	130.0	Saturated	Saturated	98	75	0.0	0	9781.2	6224.4	134.7	0.60	0.583	1.23	0.66	2.000	1.618	2.8	0.00
78	125.8	Saturated	Saturated	98	75	0.0	0	9907.0	6287.8	134.3	0.60	0.580	1.23	0.65	2.000	1.611	2.8	0.00
79	125.8	Saturated	Saturated	98	75	0.0	0	10032.8	6351.2	134.0	0.59	0.578	1.23	0.65	2.000	1.604	2.8	0.00
80	125.8	Saturated	Saturated	95	80	0.0	0	10158.6	6414.6	129.6	0.59	0.576	1.23	0.65	2.000	1.598	2.8	0.00

BORING LOGS BY ENVIRONMENTAL MANAGERS & AUDITORS, INC.

(6 PAGES)

Environmental Managers & Auditors, Inc.
GEOLOGIC AND SOILS TESTING
Calabassas, California

8888 Venice Boulevard
Culver City, California

Project: 6031-04

LOG OF BORING B-1

Date : September 17, 2014
Logged By : KBY
Diameter of Boring : 8"
Drilling Company : 2R Drilling
Drilling Rig : CME 55

Drilling Method : Hollow Stem
Sampling Method : California Modified/spt
Hammer Weight (lbs) : 140
Hammer Drop (In) : 30

Sample Type: Ring; Bulk; Standard Penetration Test

Water Levels: ▼ Groundwater Encountered; ▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Counts	Water Level	USCS	DESCRIPTION
0							Asphalt Concrete: 6 inches
						SM	Silty SAND: fine to medium grained, yellow brown, moist, loose to medium dense FILL
	Bulk/Ring	18.8	107.8	29		CL	Silty CLAY: dark olive brown, moist, medium stiff
5	SPT			N=20		CL	@5' olive brown with fine sized gravels
	Ring	6.5	123.6	32		CL	
10	Bulk/SPT			N=17		SM	Gravelly Silty SAND: fine to medium grained, olive brown, moist, medium dense
	Bulk/Ring	9.3	120.2	19		SM/ML	@12' more Silty, fine grained, olive brown with Sandy SILT interbeds
15	SPT			N=12		SM/ML	
	Bulk/Ring	2.7	120.0	>100		SP	Gravelly SAND: fine to medium grained, olive gray moist, medium dense to dense
20	SPT			N=47		SP	
	Ring	4.4	116.1	>100		SP	
25	SPT			N=40		SP	
	Ring	5.5	Disturbed	62	▽	SP	@27.5' moist to very moist @28.8 Groundwater encountered
30						SP	@30' very moist

10-16-2014 C:\Program Files (x86)\Vntech2010\Boring Logs 2002 Edition\6031-04 EMA Venice Blvd B-1.1.bor

Figure B-2.1

Environmental Managers & Auditors, Inc. GEOLOGIC AND SOILS TESTING Calabassas, California	LOG OF BORING B-1	Drilling Method : Hollow Stem Sampling Method : California Modified/spt Hammer Weight (lbs) : 140 Hammer Drop (in) : 30
8888 Venice Boulevard Culver City, California	Date : September 17, 2014 Logged By : KBY Diameter of Boring : 8" Drilling Company : 2R Drilling Drilling Rig : CME 55	
Project: 6031-04		

Sample Type: Ring; Bulk; Standard Penetration Test

Water Levels: ▼ Groundwater Encountered; ▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Counts	Water Level	USCS	GRAPHIC	DESCRIPTION
30	SPT			N=57		SP		
	Ring	18.1	108.4	>100				@32.5' fine grained, gray to light gray
35	SPT			N=84		SP/SM		@35' contains Silty SAND interbeds
	Ring	22.2	102.4	58				@37.5' more Silty
40	SPT			N=64				
	Ring	NR	NR	8				
45	SPT			N=70				@45' fine to medium grained
	Ring	16.2	112.5	80				@47.5' fine grained
50	SPT			N=97				ALLUVIUM
55								
60								

Bottom of Boring at 51.5 feet

NOTES:
1. Caving to 26 feet
2. Groundwater encountered at 28.8 feet
3. Boring backfilled and capped with AC Patch

NR - No Recovery

Figure B-2.2

Environmental Managers & Auditors, Inc. GEOLOGIC AND SOILS TESTING Calabassas, California	LOG OF BORING B-2	Drilling Method : Hollow Stem Sampling Method : California Modified/spt Hammer Weight (lbs) : 140 Hammer Drop (in) : 30
8888 Venice Boulevard Culver City, California Project: 6031-04	Date : September 17, 2014 Logged By : KBY Diameter of Boring : 8" Drilling Company : 2R Drilling Drilling Rig : CME 55	

Sample Type: Ring; Bulk; Standard Penetration Test

Water Levels: Groundwater Encountered; Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Counts	Water Level	USCS	GRAPHIC	DESCRIPTION
0								Asphalt Concrete: 6 inches
	Bulk / Ring	18.2	107.6	16		SP/SM		SAND/Silty SAND: fine to coarse grained, orange brown, moist, loose to medium dense FILL
						CL		Silty CLAY: olive brown to grayish brown, moist, medium stiff
5	Ring	18.9	109.0	20				ALLUVIUM
								Bottom of Boring at 5 feet
10								
15								
20								
25								
30								

NOTES:
1. No significant caving
2. No groundwater encountered
3. Boring backfilled and capped with AC Patch

Environmental Managers & Auditors, Inc.
GEOLOGIC AND SOILS TESTING
Calabassas, California

8888 Venice Boulevard
Culver City, California

Project: 6031-04

LOG OF BORING B-3

Date : September 17, 2014
Logged By : KBY
Diameter of Boring : 8"
Drilling Company : 2R Drilling
Drilling Rig : CME 55

Drilling Method : Hollow Stem
Sampling Method : California Modified/spt
Hammer Weight (lbs) : 140
Hammer Drop (In) : 30

Sample Type: Ring; Bulk; Standard Penetration Test

Water Levels: ▼ Groundwater Encountered; ▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Counts	Water Level	USCS	GRAPHIC	DESCRIPTION
0								Asphalt Concrete: 6 inches
	⊠	18.3	109.0	16		SP/SM		SAND/Silty SAND: fine to coarse grained, orange brown, loose to medium dense FILL
						CL		Silty CLAY: olive brown to brown, moist, medium stiff
5	⊠	16.3	109.0	18				ALLUVIUM

Bottom of Boring at 5 feet

NOTES:
1. No significant caving
2. No groundwater encountered
3. Boring backfilled and capped with AC Patch

Depth scale: 0, 5, 10, 15, 20, 25, 30

10-16-2014 C:\Program Files (x86)\rnttech2010\Boring Logs 2002 Edition\6031-04 EMA Venice Blvd B-3.bor

Environmental Managers & Auditors, Inc.
GEOLOGIC AND SOILS TESTING
Calabassas, California

8888 Venice Boulevard
Culver City, California

Project: 6031-04

LOG OF BORING B-4

Date : September 17, 2014
Logged By : KBY
Diameter of Boring : 8"
Drilling Company : 2R Drilling
Drilling Rig : CME 55

Drilling Method : Hollow Stem
Sampling Method : California Modified/spt
Hammer Weight (lbs) : 140
Hammer Drop (in) : 30

Sample Type
⊠ Ring
▨ Bulk
■ Standard Penetration Test

Water Levels
▼ Groundwater Encountered
▽ Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Counts	Water Level	USCS	GRAPHIC	DESCRIPTION
0								Asphalt Concrete: 8 inches
	⊠	NR	NR	37		CL	▨	Sandy CLAY: grayish brown to orange brown, moist, soft to medium stiff with detected abundant pieces of wood encountered, hydrocarbon odor
	▨							
5	⊠	13.8	Disturbed	24				FILL
								Bottom of Boring at 5 feet
10								
15								
20								
25								
30								

NOTES:
1. No significant caving
2. No groundwater encountered
3. Boring backfilled and capped with AC Patch

NR - No Recovery

10-16-2014 C:\Program Files (x86)\mtech2010\Boring Logs 2002 Edition\6031-04 EMA Venice Blvd B-4.bor

Environmental Managers & Auditors, Inc. GEOLOGIC AND SOILS TESTING Calabassas, California	LOG OF BORING P-1	Drilling Method : Hollow Stem Sampling Method : California Modified/spt Hammer Weight (lbs) : 140 Hammer Drop (in) : 30
8888 Venice Boulevard Culver City, California Project: 6031-04	Date : September 17, 2014 Logged By : KBY Diameter of Boring : 8" Drilling Company : 2R Drilling Drilling Rig : CME 55	

Sample Type: Ring; Bulk; Standard Penetration Test

Water Levels: Groundwater Encountered; Seepage Encountered

Depth in Feet	Sample	Field Moisture % Dry Weight	Dry Density lb./cubic ft.	Blow Counts	Water Level	USCS	GRAPHIC	DESCRIPTION
0								Asphalt Concrete: 6 inches
						SM		Silty SAND: fine to coarse grained, orange brown, moist, loose to medium dense FILL
5						CL		Silty CLAY: olive brown, moist
10						SM		Silty SAND: fine grained, olive brown, moist ALLUVIUM
15								Bottom of Boring at 12.75 feet
20								
25								
30								

Bottom of Boring at 12.75 feet

NOTES:
1. No groundwater or seepage encountered
2. 3-inch diameter pipe installed; Pipe incased with gravel rock
3. Percolation testing conducted for infiltration rate

10-16-2014 C:\Program Files (x86)\mcch2010\Boring Logs 2002 Edition\6031-04 EMA Venice Blvd P-1.bor