Appendix IS-2

Geotechnical Evaluation

Appendix IS-2.1

Geotechnical Evaluation

Report of Geotechnical Evaluation for Entitlement Documents

Proposed High-Rise Development Project

1520 North Cahuenga Boulevard
Hollywood District
Los Angeles, California

Prepared for:

Walton Street Capital, LLC
Santa Monica, California

Project 4953-17-1121

June 19, 2019
Revised June 11, 2020

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June 19, 2019, Revised June 11, 2020
Wood Project 4953-17-1121

Walton Street Capital, LLC
c/o Artisan Realty Advisors
Mr. Collin Komae
3000 Olympic Boulevard #1255
Santa Monica, California 90404

Subject: Letter of Transmittal
Report of Geotechnical Evaluation for Entitlement Documents
Proposed High-Rise Development Project
1520 North Cahuenga Boulevard
Hollywood District
Los Angeles, California

Dear Mr. Komae:

We are pleased to submit the results of our geotechnical evaluation to be used in the preparation of entitlement documents for the proposed high-rise development at 1520 North Cahuenga Boulevard in the Hollywood district of Los Angeles, California. We previously performed a geotechnical feasibility study for the project and submitted the results in a report dated September 8, 2017 under the name of our predecessor company Amec Foster Wheeler. This evaluation was conducted in general accordance with our change order proposal dated May 28, 2019, as authorized by you on June 3, 2019, and the Agreement between Walton Street Capital, L.L.C. and our firm, dated September 1, 2017. This report has been revised based on comments provided by Mr. Robert Revzan of Artisan Realty Advisors and to reflect the Artisan Hollywood Entitlement Submittal plans prepared by Gensler dated April 30, ,2020.

The scope of our services was planned based on discussions with you and Mr. Revzan. Mr. Joe Tarr of Gensler has provided us with project progress set drawings and you have provided comments for our geotechnical feasibility report dated September 8, 2017 and for report of geotechnical evaluation for entitlement documents dated June 19, 2019 by Mr. Todd Nelson of Armbruster Goldsmith & Delvac LLP. We received structural estimates of building loads from Mr. Michail Mavrogiannis of Thornton Tomasetti.

The results of our study are presented in this report. A geotechnical engineering and geologic report will need to be prepared for design of the structure and approval of the City of Los Angeles Department of Building and Safety.

It has been a pleasure to be of professional service to you. Please contact us if you have any questions or if we can be of further assistance.

Sincerely,

Wood Environment & Infrastructure Solutions, Inc.

Kenneth S. Hudson
Staff Geologist

Eung Jin Jeon, Ph.D.
Associate Engineer
Project Manager

Reviewed by:

Rosalind Munro
Principal Engineering Geologist

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(Electronic copies submitted)

cc: Artisan Realty Advisors
Attn: Mr. Robert Revzan

Gensler
Attn: Mr. Joe Tarr

Thornton Tomasetti
Attn: Mr. Ola Johansson

Report of Geotechnical Evaluation for Entitlement Package
Proposed High-Rise Building Development

1520 North Cahuenga Boulevard
Hollywood District
Los Angeles, California

Prepared for:

Walton Street Capital, LLC

Santa Monica, California

Wood Environment & Infrastructure Solutions, Inc.

Los Angeles, California

June 19, 2019
Revised June 11, 2020

Project 4953-17-1121

Table of Contents

Executive Summary

This report provides geotechnical evaluation for entitlement documents for a proposed high-rise building development at 1520 North Cahuenga Boulevard in the Hollywood district of Los Angeles, California. It is our understanding that the project is to consist of constructing a new high-rise building at the location of a current surface parking lot; Selma Avenue is adjacent to the north edge of the project site and Ivar Avenue is adjacent to the east edge of the project site. The project is proposed to consist of a 25-story (or 24 story with mezzanine) building underlain by four subterranean levels. The topography at the site is generally flat, and sloping gently in a southerly direction, descending from Selma Avenue on the north. The Elevation of the site adjacent to Selma Avenue is approximately 369 (feet MSL) and the south end of the site is at approximately Elevation 365.

Exploratory borings were drilled by our predecessor firms across Ivar Avenue, at the southeast corner of Selma and Ivar Avenues, at the location of the office building to the southeast of the site at the northeast corner of Sunset Boulevard and Ivar Avenue and southwest of the site on the south side of Sunset Boulevard between Cole Avenue and Cahuenga Boulevard. Geologic conditions are expected to be similar at the project site. At the property east of Ivar Avenue, the borings encountered artificial fill ranging from 4.5 to greater than 16 feet below ground surface (bgs). At the location of our prior project at the northeast corner of Ivar Avenue and Sunset Boulevard, artificial fill was encountered in the exploratory borings prior to site development to depths ranging from approximately 3 to 14 feet bgs. Artificial fill may be present at the project site as the result of prior grading and construction. Alluvial deposits were encountered in the nearby borings beneath the artificial fill. The alluvium consisted of variably thick, interbedded layers of medium dense to dense silty sand, poorly-graded sand, and well-graded sand with gravel, sandy silt, and stiff to very stiff sandy clay and lean clay to the maximum depth explored, which was 63 feet bgs. According to the California Geological Survey, historical groundwater levels are approximately 60 to 80 feet bgs. Groundwater was encountered in our prior exploratory borings at the northeast corner of Ivar Avenue and Sunset Boulevard at depths of 61 and 63 feet bgs in June, 1962.

Based on the available geologic data, active or potentially active faults with the potential for surface fault rupture are not known to be located directly beneath or projecting toward the site. Therefore, the potential for surface rupture due to fault plane displacement propagating to the surface at the site during the design life of the proposed project is considered low. The site could be subjected to strong ground shaking in the event of an earthquake. This hazard is common in Southern California and the effects of ground shaking can be mitigated by proper engineering design and construction in conformance with current building codes and engineering practices. The relatively flat-lying topography at the site precludes both stability problems and the potential for lurching (earth movement at right angles to a cliff or steep slope during ground shaking). The potential for other geologic hazards such as liquefaction, seismically-induced settlement, lateral spreading, subsidence, flooding, tsunamis, inundation, seiches, oil wells, or methane affecting the site is considered low.

The excavation for the planned basement levels is anticipated to automatically remove existing fill soils. However, outside of the basement limits, it may be necessary to excavate and replace existing fill as properly compacted fill for support of foundations, floor slabs, hardscape, or paving.

We understand that the basement levels for the proposed high-rise development may extend approximately 42 feet below existing grade plus an additional 8 feet for mat foundation resulting in a 50 feet maximum excavation . Based on preliminary loading information provided by Mr. Mavrogiannis of Thornton Tomasetti and soil properties from nearby projects, the proposed high-rise building may be able to be supported on conventional spread footings or mat foundations established in the undisturbed natural soils. If the building loads are greater than can be supported on the currently anticipated mat or spread footing foundations, drilled pile foundations could be used as an alternative.

Conventional shoring consisting of soldier piles with tied-back anchors or raker bracing could be used for support of excavation for construction of subterranean levels.

1.0 Scope

This report presents the results of our geotechnical evaluation for the proposed high-rise development located at 1520 North Cahuenga Boulevard in the Hollywood district of Los Angeles, California. The location of the project site is shown on Figure 1, Site Vicinity Map. The scope of our work was performed in accordance with our change order proposal dated May 28, 2019, as authorized by you on June 3, 2019, and the Agreement between Walton Street Capital, L.L.C. and our firm, dated September 1, 2017.

The primary purpose of this study is to provide geotechnical information for incorporation into the entitlement documents planned to be filed for the proposed project. The results of our study are presented in this report. Our report is based on a review of previous geotechnical reports in the vicinity of the project site, and available published and unpublished geologic and seismic literature pertinent to the project site. The City of Los Angeles Safety Element of the General Plan (1996) and the Safety Element of the County of Los Angeles General Plan (1990) and County of Los Angeles General Plan (2015) were reviewed as part of our scope. The reports reviewed as part of our evaluation are listed in Section 6.0, References. No site-specific field work or testing of soil samples were performed as part of this work to verify site conditions or acquire data to be used for final engineering design; data from prior subsurface investigations in the vicinity of the site were used in this evaluation.

Our professional services have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional advice included in this report. This report has been prepared for Walton Street Capital, LLC to be used solely in the preparation of entitlement documents for the proposed high-rise development. This report has not been prepared for use by other parties, and may not contain sufficient information for purposes of other parties or other uses. Subsurface explorations were not conducted as part of this assessment. The assessment of general site environmental conditions for the presence of pollutants in the soils and ground water of the site was beyond the scope of this report. This report does not contain geotechnical recommendations for final design of the proposed facilities; a site-specific geotechnical investigation will be required in accordance with the requirements of the City of Los Angeles Department of Building and Safety and the Los Angeles Building Code.

2.0 Site Conditions

The proposed high-rise development is planned to be located at 1520 North Cahuenga Boulevard in the Hollywood District of Los Angeles, California, as shown on Figure 1. Additional addresses include 6350 West Selma Avenue, 1539 through 1549 North Ivar Avenue, and 1534 through 1544 North Cahuenga Boulevard. Currently, the site is developed as a surface parking lot. The overall property extending west and south of the site contains short commercial buildings that at this time are planned to remain in place. The topography at the site is generally flat, gently sloping from Selma Avenue on the north towards the south. The Elevation of the site adjacent to Selma Avenue is approximately 369 feet above mean sea level (MSL) and 365 feet MSL at the south edge.

The existing office building to the southeast of the site at the northeast corner of Sunset Boulevard and Ivar Avenue, which consists of a 9-story tower and a 1-story podium, is supported by conventional spread footings and drilled-and-belled caissons extending to a depth at least 10 feet below grade (LeRoy Crandall & Associates, 1962). The existing buildings located southwest of the site at the south side of Sunset Boulevard between Cole Avenue and Cahuenga Boulevard (LeRoy Crandall & Associates, 1967) consist of a 14-story office tower and a 5-story parking structure without basement levels; in our original geotechnical report, we recommended both of those structures be supported on drilled piles.

3.0 Proposed Development

Walton Street Capital, LLC is proposing to demolish an existing surface parking lot and develop a 25-story (or 24 story with mezzanine) high-rise residential building. Based on our review of project entitlement submittal drawings dated April 30, 2020 and received June 10, 2020, the project will include a common 4 level parking/retail podium structure, with four subterranean levels across the entire project site. The existing property also contains short commercial buildings to the west and south of the site that are planned to remain in place. The proposed development is shown on Figure 2, Site Plan. Mr. Michail Mavrogiannis of Thornton Tomasetti provided the building loads and representative column loads.

4.0 Geologic and Seismic Conditions

4.1 Geologic Setting

The site is located in the northern portion of the Los Angeles Basin. The basin is a major elongated northwest-trending structural depression that has been filled with sediments up to 13,000 feet thick since middle Miocene time (Poland, 1959). On a regional scale, the site lies within the northernmost portion of the Peninsular Ranges Geomorphic Province near its boundary with the Transverse Ranges Geomorphic Province. The southern margin of the Transverse Ranges Geomorphic Province is bounded by the Malibu Coast, Santa Monica, Hollywood, Raymond, Sierra Madre, and Cucamonga faults. The Peninsular Ranges Geomorphic Province is characterized by northwest/southeast trending alignments of mountains and hills and intervening basins, reflecting the influence of northwest trending major faults and folds controlling the general geologic structural fabric of the region.

Locally, the project site is situated on a gently sloping alluvial plain approximately ½ mile south of the Santa Monica Mountains and underlain by late Pleistocene- to Holocene-age alluvial deposits (Campbell et al., 2014; Dibblee and Ehrenspeck, 1991; Yerkes, 1997). The alluvial fan sediments beneath the site are derived from the Santa Monica Mountains to the north. The Hollywood fault zone is the major structural feature in the vicinity of the site. This east-west trending fault zone is generally considered to be the boundary between the Transverse Ranges Geomorphic Province to the north and the Peninsular Ranges Geomorphic Province to the south.

The site is situated in Los Angeles at an approximate elevation of 367 feet above mean sea level (AMSL) (NAVD 88). The location of the site in relation to the regional topography is shown on Figure 1, Site Vicinity Map. The limits of the project site are shown on Figure 2. Local geology is shown on Figure 3, Local Geologic Map. The regional geologic conditions around the project site, including the distribution of geologic units, are shown in Figure 4, Regional Geologic Map. The project site in relation to major regional faults and earthquake epicentres is shown on Figure 5, Regional Fault and Seismicity Map.

4.2 Geologic Materials

According to published geologic maps and reports, the site is underlain by late Pleistocene-age alluvial fan deposits (Campbell et al., 2014; Dibblee and Ehrenspeck, 1991; Yerkes, 1997). Exploratory borings were drilled by our predecessor firms on a property to the southeast of the site at the northeast corner of Sunset Boulevard and Ivar Avenue (LeRoy Crandall & Associates, 1962), on a property located southwest of the site south of Sunset Boulevard between Cole Avenue and Cahuenga Boulevard (LeRoy Crandall & Associates, 1967), and at a property across Ivar Avenue, at the southeast corner of Selma Avenue and Ivar Avenue (Law/Crandall, 1998). At the southeast corner at Selma Avenue and Ivar Avenue, the borings encountered artificial fill ranging from 4½ to 15 feet below ground surface (bgs). At the northeast corner of Ivar Avenue and Sunset Boulevard, artificial fill was encountered in the exploratory borings prior to construction of the existing structure to a depth ranging from approximately 3 feet to 14 feet bgs. Artificial fill may be present at the project site as the result of prior grading and construction. Alluvial deposits were encountered in the prior borings beneath the artificial fill. The alluvium consisted of variably thick, interbedded layers of medium dense to dense silty sand, poorly-graded sand, well-graded sand with gravel, and stiff sandy silt, sandy clay, and lean clay to the maximum depth explored, which was 63 feet bgs.

4.3 Groundwater

The site is located in the Hollywood Subbasin of the Coastal Plain of the Los Angeles Groundwater Basin. The Pleistocene-age sediments beneath the site are part of the upper water-bearing deposits of the basin (California Department of Water Resources (DWR), 2003.) Groundwater was encountered in the prior exploratory borings on the property to the east at depths of 61 and 63 feet bgs in June 1962 (LeRoy Crandall & Associates, 1962).

According to the California Geological Survey, formerly the California Division of Mines and Geology (CDMG), the historic-high groundwater level was between 60 and 80 feet bgs (CDMG, 1998).

4.4 Faults

Numerous faults in Southern California have been previously characterized as active or potentially active. The criteria for these major groups were based on criteria developed by the California Geological Survey (CGS), for the Alquist-Priolo (A-P) Earthquake Fault Zoning Program (Bryant and Hart, 2007). According to Bryant and Hart, an active fault is one with surface displacement within Holocene time (about the last 11,000 years); and a potentially active fault is a fault that has demonstrated surface displacement of Quaternary age deposits (last 1.6 million years) (Jennings and Bryant, 2010, Bryant and Hart, 2007). More recently the CGS has revised fault activity designations for the purpose of the A-P Earthquake Fault Zoning Program (CGS, 2018a). A Holocene-active fault is one that has had surface displacement within Holocene time (about the last 11,700 years). A pre-Holocene fault is a fault that has been demonstrated to not have Holocene surface displacement. An age-undetermined fault is one where the recency of fault movement has not been determined.

Many fault systems in Southern California are considered to be active with Holocene activity (Field et al., 2013; USGS-CGS, 2006) but are not included in an A-P Zone. Many late Quaternary faults are also included in Field et al. 2013 and USGS-CGS 2006. The faults in the vicinity of the site are shown in Figure 5.

Major Holocene and Late Quaternary Faults

Hollywood Fault

The active Hollywood fault, located 0.3 mile north of the site, trends approximately east-west near the base of the Santa Monica Mountains from the West Hollywood-Beverly Hills area (Dolan and Sieh, 1992) to the Los Feliz area of Los Angeles. The fault is a groundwater barrier within Holocene sediments (Converse et al., 1981). Studies by many investigators (Dolan et al., 2000a; Dolan et al., 1997; Dolan and Sieh, 1992; and Crook and Proctor, 1992) have indicated that the fault is active, based on geomorphic evidence, stratigraphic correlation between exploratory borings, and fault trenching studies. As of November 6, 2014, the Hollywood fault zone has been included in an A-P Earthquake Fault Zone within the Hollywood 7.5-minute quadrangle by the CGS (CGS, 2014).

Until recently, the approximately 15-kilometer-long Hollywood fault zone was considered to be expressed as a series of linear scarps and faceted 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 zone is located south of the faceted ridges and bedrock outcrops along Sunset Boulevard (Harza, 1998, William Lettis & Associates, 1998). Active deposition of numerous small alluvial fans at the mountain front and a lack of fan incision suggest late Quaternary uplift of the Santa Monica Mountains along the Hollywood fault zone (Dolan et al., 2000a, Dolan et al., 1997, Dolan and Seih, 1992). The fault dips steeply to the north and has juxtaposed Tertiary and Cretaceous age rocks over young sedimentary deposits of the northern Los Angeles basin. The Hollywood fault zone has not produced any damaging earthquakes during the historical period and has had relatively minor micro-seismic activity. An average slip rate of 0.9 millimeters per year and a maximum magnitude of 6.4 (Mw) are estimated by the CGS (Cao et al., 2003; Field et al., 2013) for the Hollywood fault.

Compton Thrust

The Compton blind thrust has been defined from seismic reflection profiles and borehole data (Leon et al., 2009) as a northeast-dipping structure. The vertical surface projection of the Compton thrust upper limb is approximately 0.9 mile southwest of the site. This blind thrust fault system extends approximately 28 miles from southwest Los Angeles County to northern Orange County in a southeastern direction. Leon et al. (2009) has correlated blind faulting at depth to near-surface folding. Several uplift events have been observed by investigating deformed Holocene layers along buried fold scarps. The cumulative uplift from the observed events ranged from 2 to 6 feet or approximately 4 to 14 feet of thrust displacement (Leon et al., 2009). Although the CGS (Cao et al., 2003) estimates a moment magnitude 7.6 earthquake, Leon et al. (2009) estimates moment magnitudes of 7.0 to 7.4 (Leon et al., 2009). Slip rate is estimated to be 0.9 mm/yr (Field et al., 2013). Like other blind thrust faults in the Los Angeles area, the Compton blind thrust is not exposed at the surface and does not present a potential surface rupture hazard; however, the Compton thrust should be considered an active feature capable of generating future earthquakes.

Puente Hills Blind Thrust

The active Puente Hills Blind Thrust (PHBT) is defined based on seismic reflection profiles, petroleum well data, and precisely located seismicity (Shaw et al., 2002). The site is approximately 1.2 mile east-southeast of the surface projection of the Puente Hills Blind Thrust (USGS-CGS, 2006). This blind thrust extends eastward from downtown Los Angeles to Brea in northern Orange County. The PHBT includes three north-dipping segments, named from east to west 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 Santa Fe Springs segment of the PHBT was the causative fault of the October 1, 1987 Whittier Narrows (Shaw et al., 2002) and March 29, 2014 La Habra earthquakes. The PHBT is not exposed at the ground surface and does not present a potential for surface fault rupture. However, based on deformation of late Quaternary age sediments above this fault system and the occurrence of the Whittier Narrows earthquake, the PHBT is considered an active fault capable of generating future earthquakes beneath the Los Angeles Basin. An average slip rate of 0.9 millimeters per year and a moment magnitude of 7.1 are estimated by the CGS (Cao et al., 2003; Field et al., 2013), for a multiple segment fault rupture of the Puente Hills Blind Thrust; a single segment fault rupture may produce an earthquake of moment magnitude 6.5 to 6.6.

Upper Elysian Park Thrust

The Upper Elysian Park fault is a blind thrust fault that overlies the Los Angeles and Santa Fe Springs sections of the Puente Hills Thrust (Oskin et al., 2000 and Shaw et al., 2002). The eastern edge of the Upper Elysian Park fault is defined by the northwest-trending Whittier fault zone. The vertical surface projection of the Upper Elysian Park fault upper limb is approximately 2.1 miles east-northeast of the site (USGS-CGS, 2006). Like other blind thrust faults in the Los Angeles area, the Upper Elysian Park fault is not exposed at the surface and does not present a potential surface rupture hazard; however, the Upper Elysian Park fault should be considered an active feature capable of generating future earthquakes. An average slip rate of 1.9 millimeters per year and a maximum moment magnitude of 6.4 are estimated by Cao et al. (2003) and Field et al. (2013) for the Upper Elysian Park fault.

Raymond Fault

The Raymond fault is located approximately 3.7 miles east-northeast of the site. The fault is primarily a left-lateral strike-slip fault with a minor component of high-angle reverse offset, placing basement rocks north of the fault over alluvial sediments south of the fault. The Raymond fault has long been recognized as a ground-water barrier in the vicinity of the cities of Pasadena and San Marino and numerous geomorphic features along its entire length (such as fault scarps, sag ponds, springs, and pressure ridges) attest to the fault's activity during the Holocene epoch (last 11,700 years). Within the last 36,000 to 41,000 years, five to eight separate earthquake events have been recognized along the Raymond fault (Crook et al., 1987, Weaver and Dolan, 2000). The most recent fault movement, based on radiocarbon ages from materials collected in an excavation exposing the fault, occurred sometime between 2,160 ± 105 and 1,630 ± 100 years before present (LeRoy Crandall and Associates, 1978; Crook et al., 1987; Weaver and Dolan, 2000). An Alquist-Priolo Earthquake Fault Zone has been established for this fault. An average slip rate of 1.5 millimeters per year and a maximum moment magnitude of 6.5 are estimated by the California Geological Survey (2008) for the Raymond fault.

Santa Monica Fault

The active Santa Monica fault, a left lateral, reverse oblique slip fault, is located approximately 4.2 miles west-southwest of the project site. The Santa Monica and Hollywood fault zones form a portion of the Transverse Ranges Southern Boundary fault system. The Transverse Ranges Southern Boundary fault system also includes the Malibu Coast-Anacapa-Dume faults to the west of the Santa Monica fault and the Raymond and Cucamonga faults to the east of the Hollywood fault (Dolan et al., 2000b). The Santa Monica fault zone is the western segment of the Santa Monica-Hollywood fault zone. The fault zone trends east-west from the Santa Monica coastline on the west to the Hollywood area on the east. Urbanization and development within the greater Los Angeles area has resulted in a poor understanding of the lateral extent, location, and rupture history of the Santa Monica fault zone. However, the surface expression of the Santa Monica fault zone includes fault-related geomorphic features, offset stratigraphy, and ground water barriers within late Quaternary deposits (Hill et al., 1979, and Dolan et al., 2000b).

As of January 11, 2018, the Santa Monica fault zone has been included in an Alquist-Priolo Earthquake Fault Zone within the Beverly Hills 7.5-minute quadrangle by the CGS (CGS, 2018b). An average slip rate of 1.0 millimeters per year and a maximum moment magnitude of 6.6 are estimated by the CGS (Cao et al., 2003; Field et al., 2013) for the Santa Monica fault.

Newport-Inglewood Fault Zone

The active South Los Angeles Basin section of the Newport-Inglewood fault zone is located approximately 4.4 miles to the west-southwest of the site. The Newport-Inglewood fault zone is composed of a series of discontinuous northwest-trending en echelon faults extending from the Ballona Gap south-eastward past the Santa Ana River in Newport Beach, where it extends off-shore. This zone is reflected at the surface by a line of geomorphically young anticlinal hills and mesas formed by the folding and faulting of a thick sequence of Pleistocene-age sediments and Tertiary-age sedimentary rocks (Barrows, 1974). Fault-plane solutions for 39 small earthquakes (between 1977 and 1985) show mostly strike-slip faulting with some reverse faulting along the north section (north of Dominguez Hills) and some normal faulting along the south section (south of Dominguez Hills to Newport Beach) (Treiman, 1993: Hauksson, 1987). Prior fault investigations by Law/Crandall (1993) in the Huntington Beach area indicate that the on-shore South Los Angeles Basin section of the Newport-Inglewood fault zone offsets Holocene age alluvial deposits in the vicinity of the Santa Ana River. An average slip rate of 1.0 millimeters per year and a maximum moment magnitude of 7.1 are estimated by the CGS (Cao et al., 2003; Field et al., 2013) for the Newport-Inglewood fault.

Verdugo Fault

The active Verdugo fault zone, located approximately 6.2 miles northeast of the project site, is composed of several reverse oblique faults including the Verdugo fault, the San Rafael fault, and the Eagle Rock fault. The most recent documented activity along this fault occurs in the Holocene age alluvial deposits along the western flank of the Verdugo Mountains in the Burbank area (County of Los Angeles, 1990). Additionally, this portion of the fault is considered active by the State (Jennings and Bryant, 2010). An Alquist-Priolo Earthquake Fault Zone has not currently been established for the Verdugo fault by the State. According to the CGS (Cao et al., 2003;

Field et al., 2013), the Verdugo fault is capable of a moment magnitude 6.9 earthquake and has a slip rate of 0.4 millimeters per year.

Anacapa-Dume Fault

The Anacapa-Dume fault, located approximately 9.9 miles west-southwest of the project site, is considered part of the structural front of the Western Transverse Ranges and a continuation of the Raymond, Hollywood, and Santa Monica fault system (Sorlien et al., 2006). According to the USGS and CGS (2006), the Anacapa-Dume fault extends from the City of Santa Monica westward towards a point offshore 40 km south of Point Dume. Beyond Point Dume, the fault continues west into a complex zone of faulting where the Malibu Coast and Santa Cruz Island faults intersect (Dolan et al., 2000b). Seismicity data from the past 50 years suggest the Anacapa-Dume fault has an oblique-slip geometry with a left-lateral component associated with the clockwise rotation of the Santa Monica Mountains (Sorlien et al., 2006; Dolan et al., 2000b). An average slip rate of 0.4 millimeters per year and a maximum moment magnitude of 7.5 are estimated by the CGS (Cao et al., 2003; Field et al., 2013).

Sierra Madre Fault Zone

The active Sierra Madre fault is located 11 miles northeast of the site. This fault zone borders the southern front of the San Gabriel Mountains and consists of a series of discontinuous reverse faults that separate pre-Tertiary crystalline rocks on the north from Tertiary and Quaternary sedimentary deposits on the south. The various faults exhibit northerly dips from 15 degrees to vertical, with the crystalline rocks thrust upward toward the south over sediments as young as upper-Pleistocene age. The Sierra Madre fault zone extends approximately 80 kilometers along the southern flank of the San Gabriel Mountains from Big Tujunga Canyon on the west to Cajon Pass on the east. The fault zone, which includes the active Cucamonga fault, consists of a series of reverse fault segments that are believed to have been active at different times in the geologic past (Crook et al., 1987). The moderate magnitude 5.8 1991 Sierra Madre earthquake is believed to be a result of movement on a small portion of the Sierra Madre fault zone. Recent paleoseismic investigations in Altadena (Rubin et al., 1998) have shown that the Sierra Madre fault fails in large, infrequent earthquakes. The past two ruptures in Altadena produced about 4.5 to 5 m of slip at the ground surface and occurred within the past ~18,000 years. Farther east in San Dimas, Tucker and Dolan (2001) documented the occurrence of two large-slip earthquakes during the period between ~8,000 and ~24,000 years ago. The most recent event on the eastern portion of the Sierra Madre fault zone occurred prior to ~8,000 years ago and a minimum slip rate of 0.6 to 0.9 millimeters per year was estimated (Tucker and Dolan, 2001). The CGS considers the Sierra Madre fault to be capable of a moment magnitude 7.2 earthquake and estimates an annual slip rate of 2 millimeters per year (Cao et al. 2003; Field et al. 2013).

San Gabriel Fault

The active San Gabriel fault zone is located approximately 14 miles to the north-northeast of the project site. This fault zone extends southeasterly approximately 130 kilometers from near Bear Mountain in Ventura County to San Antonio Canyon in San Bernardino County (Weber, 1982). Estimates of the amount of total offset along the fault zone range from approximately 9.5 kilometers (6 miles) of right lateral displacement (Weber, 1982) to approximately 40 kilometers of right lateral displacement since the Pliocene age, as hypothesized by Crowell (1952), however Yeats (1983) estimate that less than a kilometer of displacement has occurred along the San Gabriel fault zone during late Quaternary time. Work by Cotton et al. (1983), Yeats (1983), and Cotton and Seward (1984) indicates that this fault has been active within the Holocene epoch (last 11,000 years). The CGS estimates an average slip rate of 0.39 millimeters per year and maximum moment magnitude of 7.2 (Cao et al., 2003; Field et al., 2013).

Whittier Fault

The active Whittier fault is located approximately 17 miles east-southeast of the site. The northwest-trending Whittier fault extends along the south flank of the Puente Hills from the Santa Ana River on the southeast to Whittier Narrows on the northwest. According to Yeats, 2004, and Treiman, 1991, the Whittier fault turns more northwesterly at Whittier Narrows becoming the East Montebello fault beneath the Whittier Narrows towards the Alhambra Wash. The East Montebello fault is approximately 5.2 miles east of the site. The main Whittier fault trace is a high-angle reverse fault, with the north side uplifted over the south side at an angle of approximately 70 degrees, although late Quaternary movement has been nearly pure strike slip and total right displacement may be around 8 to 9 kilometers (Yeats, 2004). In the Brea-Olinda Oil Field, the Whittier fault displaces Pleistocene age alluvium, and Carbon Canyon Creek is offset in a right lateral sense by the Whittier fault. The CGS considers the Whittier fault to be capable of a moment magnitude 6.8 earthquake and estimates an annual slip rate of 2.5 millimeters per year (Cao et al. 2003; Field et al. 2013).

San Andreas Fault Zone

The active Mojave section of the San Andreas fault zone is located about 33 miles north-northeast of the site. This fault zone is California's most prominent structural feature, trending in a general northwest direction for almost the entire length of the state. The southern section of the fault is approximately 450 kilometers long and extends from the Transverse Ranges west of Tejon Pass on the north to the Mexican border and beyond on the south. The last major earthquake along the San Andreas fault zone in Southern California was the 1857 Magnitude 8.3 Fort Tejon earthquake. The CGS considers the Mojave section to be capable of a moment magnitude 7.5 earthquake and estimates an annual slip rate of 19 millimeters per year (Cao et al., 2003; Field et al., 2013).

4.5 Geologic-Seismic Hazards

Surface Fault Rupture

The site is not within a currently established Alquist-Priolo Earthquake Fault Zone (A-P Zone) for surface fault rupture hazard (CGS 2019a, 2002). An A-P Zone is an area which requires investigation to evaluate whether the potential for surface fault rupture is present near an active fault (CGS, 2018a; Bryant and Hart, 2007). An active fault is defined as a fault with surface displacement within the last 11,700 years (Holocene). The closest active fault is located 0.3 mile north of the site for a section of the Hollywood fault (CGS, 2002; Jennings and Bryant, 2010). The closest A-P Zone is associated with a section of the Hollywood fault and is approximately 0.2 mile north of the site (CGS, 2014).

Based on the available geologic data, active faults with the potential for surface fault rupture are not known to be located directly beneath or projecting toward the project site. Therefore, the potential for surface rupture due to fault plane displacement propagating to the surface at the project site during the design life of the proposed development is considered low.

Seismicity and Ground Shaking

Earthquake Catalog Data

The seismicity of the region surrounding the site was determined from research of an electronic database of seismic data (Southern California Seismographic Network, 2019). This database includes earthquake data compiled by the California Institute of Technology from 1932 through 2019 and data for 1769 to 1931 compiled by the CGS (CDMG, 2001). The search for earthquakes that have occurred within 100 kilometers of the site indicates that 442 earthquakes of magnitude 4.0 and greater occurred from 1932 through 2019 and 34 earthquakes of magnitude 4.0 or greater occurred between 1769 and 1931. Epicenters of moderate and major earthquakes (greater than magnitude 5.0) are shown in Figure 5.

A number of earthquakes of moderate to major magnitude have occurred in the Southern California area within about the last 115 years. A partial list of these earthquakes is included in the following table.

List of Historic Earthquakes

Earthquake (Oldest to Youngest)	Date of Earthquake	Magnitude	Distance to Epicenter (miles)	Direction to Epicenter
Long Beach	March 11, 1933	6.4	39	SE
San Clemente Island	December 26, 1951	5.9	89	S
Tehachapi	July 21, 1952	7.5	74	NW
San Fernando	February 9, 1971	6.6	22	NNW
Whittier Narrows	October 1, 1987	5.9	15	ESE
Sierra Madre	June 28, 1991	5.8	23	NE
Landers	June 28, 1992	7.3	108	E
Big Bear	June 28, 1992	6.4	86	ENE
Northridge	January 17, 1994	6.7	14	NW
Hector Mine	October 16, 1999	7.1	122	NE
Sierra El Mayor	April 4, 2010	7.2	232	SE
La Habra	March 28, 2014	5.1	26	SE
Borrego Springs	June 10, 2016	5.2	118	SE
Channel Islands	April 5, 2018	5.3	82	WSW

The proximity of the site relative to known active faults indicates the site could be subjected to significant ground shaking caused by earthquakes. This hazard is common in Southern California and the effects of ground shaking can be mitigated by proper engineering design and construction in conformance with current building codes and engineering practices.

Liquefaction and Seismic-Induced Settlement

Liquefaction potential is greatest where the groundwater level is shallow, and submerged loose, fine sands occur within a depth of about 50 feet or less. Liquefaction potential decreases as grain size and clay and gravel content increase. As ground acceleration and shaking duration increase during an earthquake, liquefaction potential increases. The site is not located within an area identified by the City of Los Angeles, County of Los Angeles, or CGS (previously the California Division of Mines and Geology, CDMG) as having a potential for liquefaction (City of Los Angeles, 2017; County of Los Angeles, 2014, and CDMG, 1999). Groundwater was encountered in prior exploratory borings on adjacent property to the east at depths of 61 and 63 feet as seepage in 1962. The deposits at these depths are late Pleistocene age and are dense. Therefore, the liquefaction potential for the site is considered low.

Seismically-induced settlement is often caused by loose to medium-dense granular soils densified during ground shaking. Dry and partially saturated soils as well as saturated granular soils are subject to seismic-induced settlement. Generally, differential settlements due to seismically-settlement could have adverse effects on structures. Based on our prior borings in the vicinity of the site, the site is underlain by Pleistocene age sediments composed of medium dense to very dense silty sands, clayey sand and sandy clay. These soils at the site are not anticipated to be susceptible to seismically-induced settlement, therefore, the potential for seismically induced settlement is considered low.

Slope Stability

The relatively flat-lying topography at the site precludes both stability problems and the potential for lurching (earth movement at right angles to a cliff or steep slope during ground shaking). According to the County of Los Angeles General Plan (2017) and the CGS (CGS, 2014), the site is not within an area identified as having a potential for landslide susceptibility. Additionally, the site is not within an area identified as having a potential for earthquake-induced landslides (CGS, 2019b).

Tsunamis, Inundation, Seiches, Flooding and Subsidence

The site is not in a coastal area and at an approximate mean elevation of 360 feet AMSL. The site is not in a Tsunami Inundation Area. Therefore, tsunamis (seismic sea waves) are not considered a hazard at the site.

According to the Los Angeles County Safety Element (1990), the site is located within a potential inundation area for an earthquake-induced dam failure or seiches (oscillating waves that form in an enclosed or semi-enclosed body of water) in the event of a breach from the Mullholland Dam/Hollywood Reservoir. However, this dam, as well as others in California, are continually monitored by various governmental agencies (such as the State of California Division of Safety of Dams and the U.S. Army Corps of Engineers) to guard against the threat of dam failure. Therefore, the potential for inundation at the site as a result of an earthquake-induced dam failure is considered low.

The site is located outside the area of minimal flooding potential (Zone X). Zone X, as defined by the Federal Emergency Management Agency (FEMA, 2008), is an area within the 0.2% annual chance flood. Therefore, the potential for flooding at the site is considered low.

The site is not within an area of known subsidence associated with fluid withdrawal (groundwater or petroleum), peat oxidation, or hydrocompaction.

Expansive and Corrosive Soils

Expansive soils shrink and swell significantly as they lose and gain moisture. The resulting volumetric changes can heave and crack lightly loaded foundations and structures. Soils are generally classified as having low, moderate, and high expansive potentials, where the type and percentage of clay particles present in the soil are indicative of the soil's expansion potential. Predominantly fine-grained soils containing a high percentage of clays are potentially expansive, whereas predominantly coarse-grained soils such as sands and gravels are generally non-expansive. The alluvial soils at the project site are anticipated to be predominantly sands with lesser silts and clays and, hence, to be primarily of low expansion potential. However, moderately expansive soils could be locally present.

If expansive soils are identified during geotechnical design reports, their impact can be mitigated using standard geotechnical design practices, i.e., removal and replacement with nonexpansive engineered fill, the use of soil improvement techniques, such as lime treatment, or by obtaining foundation support below the zone of seasonal moisture variation.

Soil corrosivity involves the measure of the potential of corrosion for steel and concrete caused by contact with some types of soil. Knowledge of potential soil corrosivity is often critical for the effective design parameters associated with cathodic protection of buried steel and concrete mix design for plain or reinforced concrete buried project elements. Factors—including soil composition, soil and pore water chemistry, moisture content, and pH—affect the response of steel and concrete to soil corrosion. Soils with high moisture content, high electrical conductivity, high acidity, high sulfates, and high dissolved salts content are most corrosive. Generally, sands and silty sands do not present a corrosive environment. Clay soils, including those that contain interstitial salt water, can be highly corrosive. Localized areas of corrosive soils may be present at the project site, which could react adversely to buried steel and concrete.

Oil Wells and Methane Gas

According to the California Division of Oil, Gas, and Geothermal Resources (DOGGR) Well Finder System, the site is not situated in an oil field and there are no known oil wells at the site (DOGGR, 2019). However, there is a remote possibility that undocumented wells could be encountered during construction. Any well encountered would need to be properly abandoned in accordance with the current requirements of DOGGR.

The site is not in a City of Los Angeles Methane or Methane Buffer Zone (City of Los Angeles, 2019). Because there are no nearby active oil/gas wells or fields, the potential for methane hazard at the site is considered to be low.

Volcanic Hazards

Due to the distance between the project site and known active volcanic areas, there are no significant potential impacts related to volcanic hazards. The proposed development will not result in or expose people to significant impacts related to volcanic hazards.

Radon

The project site is in a Low Potential for Indoor Radon Levels above 4.0 Picocuries per Liter zone, defined as all areas that are not designated as High Potential or Moderate Potential (CGS, 2019c).

Soil Erosion

The project site is in an area of low relief and generally covered with impermeable surfaces that protect local soils from erosion. During construction, all applicable City regulations regulating erosion control would be complied with. Therefore, the potential for erosion at the project site is considered low.

4.6 Geologic Conclusions

Based on the available geologic data, active faults with the potential for surface fault rupture are not known to be located directly beneath or projecting toward the site. Therefore, the potential for surface rupture due to fault plane displacement propagating to the surface at the site during the design life of the building is considered low.

Although the site could be subjected to strong ground shaking in the event of an earthquake, this hazard is common in Southern California and the effects of ground shaking can be mitigated by proper engineering design and construction in conformance with current building codes and engineering practices.

The expansion potential of soils at the project site is expected to range from low to medium. Corrosivity testing of onsite soils will need to be performed to determine the potential of the soils. Structures and project site improvements will need to be designed to resist the effects of expansive and corrosive soils.

The potential for other geologic hazards such as methane, stability problems, lurching, dam inundation, tsunamis, seiches, flooding, liquefaction, seismically induced settlement, lateral spreading, subsidence, volcanic hazards, and radon affecting the site is considered low.

5.0 Summary of Potential Geologic-Seismic Impacts and Mitigation Measures

5.1 General

As part of the standard conditions of approval for the development as a whole, the proposed project will be designed and built in compliance with City of Los Angeles Building Code requirements. The City of Los Angeles will require that the results of a comprehensive geotechnical investigation, including subsurface explorations and appropriate soil testing, be submitted as part of the permitting process for the project. The City of Los Angeles will require that the specific design recommendations presented in the comprehensive geotechnical report be incorporated into the design and construction of the proposed project, including recommendations for excavation wall stabilization, foundation support, grading, excavation, shoring, and seismic design parameters.

Proper engineering design and conformance with recommendations presented in the comprehensive geotechnical report for the proposed project, in compliance with current building codes as required by the City of Los Angeles, will ensure the identified potential geotechnical impacts are less than significant.

We understand that the basement levels for the proposed high-rise development may extend approximately 42 feet below existing grade plus an additional 8 feet for mat foundation resulting in a 50 feet maximum excavation. Based on preliminary loading information provided by Mr. Mavrogiannis and soil properties from nearby projects, the proposed high-rise building may be able to be supported on spread footings and a mat foundation established in the undisturbed natural soils. If the building loads are greater than can be supported on the currently anticipated mat or spread footing foundations, drilled pile foundations could be used as an alternative.

5.2 Seismicity and Ground Shaking

The location of the project site relative to known active or potentially active faults indicates the project site could be subjected to significant ground shaking caused by earthquakes. This hazard is common in Southern California and the effects of ground shaking can be mitigated by proper engineering design and construction in conformance with current building codes and engineering practices.

5.3 Settlement

Building settlements will depend on the magnitude of the structural loads. Building foundations will be designed to result in settlement of less than the following amounts in accordance with guidelines of the City of Los Angeles Department of Building and Safety:

- Mat Foundations – 4 inches
- Spread Footing Foundations – 1.5 inches
- Pile Foundations – 0.5 inch

5.4 Slope Stability

The project site is not within an area identified to have a potential for seismic slope instability. There are no known landslides near the project site, nor is the project site in the path of any known or potential landslides. Topographically, the project site is relatively level. In order to excavate for basement levels, the sides of the excavation should be sloped back at 1:1 (horizontal to vertical) or shored for safety; unshored excavations should not extend below a plane drawn at 1½:1 (horizontal to vertical) extending downward from adjacent existing footings. Where space is not available, shoring will be required. If shoring is required, excavation walls may be supported during construction of basement using conventional soldier beams with lagging and tied-back with anchors. As an alternative to tie-back anchors, rakers or cross-lot bracing could be used. The shoring should be designed to allow up to 0.5 inch movement at the top of shoring or less as necessary to protect adjacent structures or utilities in streets adjacent to the site.

5.5 Expansive and Corrosive Soils

The expansion potential of soils at the project site is expected to range from low to medium. Corrosivity testing of onsite soils will need to be performed to determine the potential of the soils. Structures and project site improvements will need to be designed to resist the effects of expansive and corrosive soils. The mitigations for expansive soils could include excavation and replacement of upper soils, deepening of foundations, cement treatment, and/or moisture conditioning of the upper soils. The mitigations for corrosive soils could include isolation of utilities from soils with barriers or wrappings, cathodic isolation, and/or cathodic protection.

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Tables

Table 1
Major Late Quaternary and Holocene Faults in Southern California

Fault (in increasing distance)	Maximum Magnitude (Mw)	Fault Geometry	Slip Rate (mm/yr.)	Sources	Distance From Site (miles)	Direction From Site
Hollywood	6.4	RO	0.9	(a)	0.3	N
Compton Thrust	7.6	BT	0.6	(a)	0.9**	SW
Puente Hills Blind Thrust	7.1	BT	0.9	(a)	1.2**	ESE
Upper Elysian Park Thrust	6.4	BT	1.9	(a)	2.1**	ENE
Raymond	6.5	RO	2.0	(a)	3.7	ENE
Santa Monica	6.6	RO	1.0	(a)	4.2	WSW
Newport-Inglewood	7.1	SS	1.0	(a)	4.4	WSW
Verdugo	6.9	RO	0.4	(a)	6.2	NE
Northridge Thrust	7.0	BT	1.5	(a)	9.2**	NW
Anacapa-Dume	7.5	RO	0.4	(a)	9.9	WSW
Sierra Madre	7.2	RO	2.0	(a)	10.8	NE
San Fernando	6.7	RO	2.0	(a)	11.9	N
San Gabriel	7.2	SS	0.4	(a)	13.9	NNE
Santa Susana	6.7	RO	6.0	(a)	16.4	NNW
Whittier	6.8	RO	2.5	(a)	17.1	ESE
Clamshell Canyon	6.5	RO	0.4	(a)	17.9	E
Palos Verdes	7.3	SS	3.0	(a)	17.9	WSW
Upper Duarte	7.2	RO	2.0	(a)	18.5	E
Malibu Coast	6.7	RO	0.3	(a)	19.1	W
Santa Rosa	7.0	RO	0.7	(a)	20.0	NW
Holser	6.5	RO	0.4	(a)	24.8	NNW
San Jose	6.4	RO	0.4	(a)	25.8	ESE
Oak Ridge	7.1	RO	4.0	(a)	31.0	NW
San Cayetano	7.0	RO	6.0	(a)	31.4	NW
San Andreas FZ, Mojave section	7.4	SS	34.0	(a)	32.8	NNE

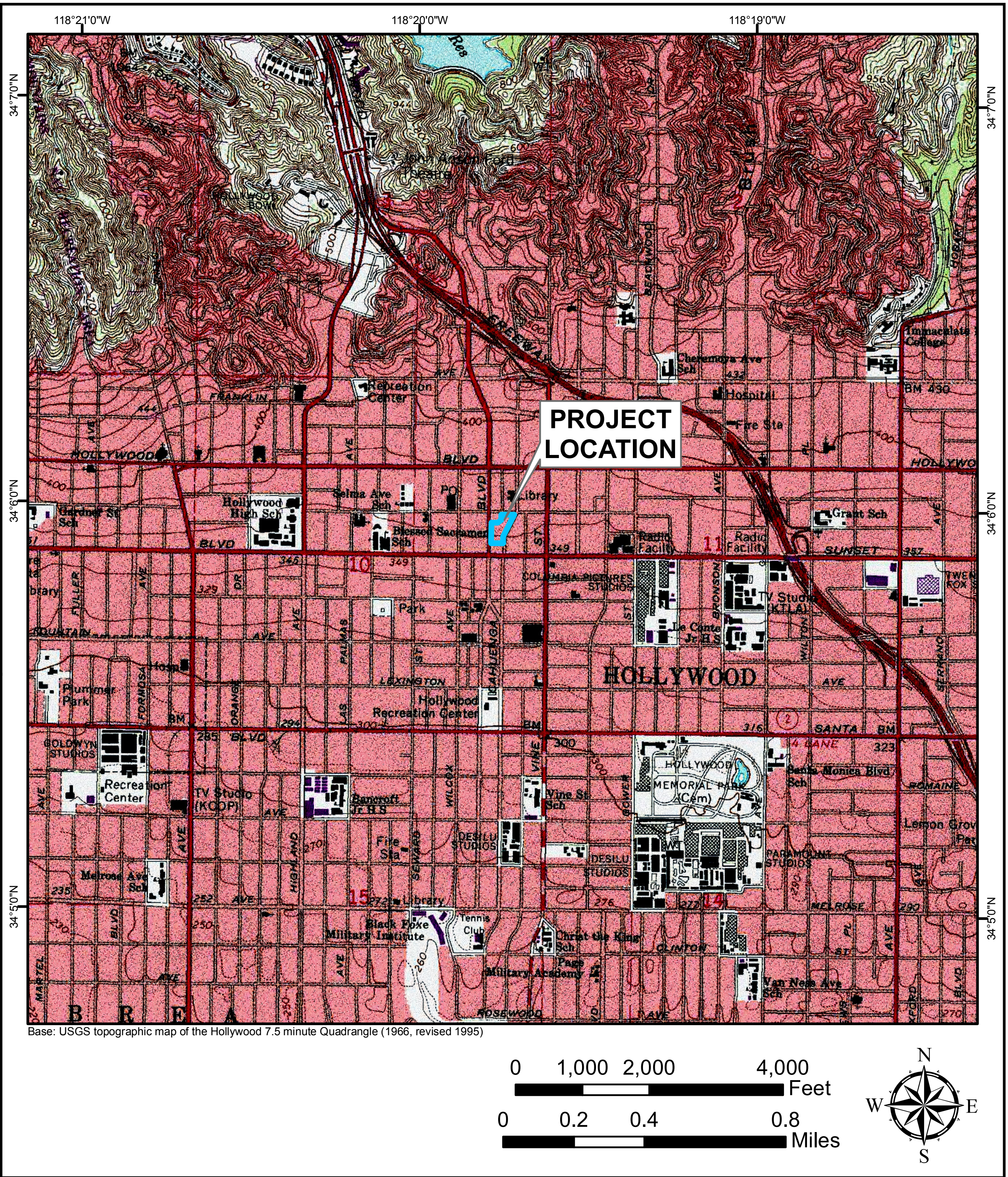
(a) Cao et al., 2003; Field et al., 2013

Prepared by: KSH 6/07/2019
Checked by: RM 6/14/2019

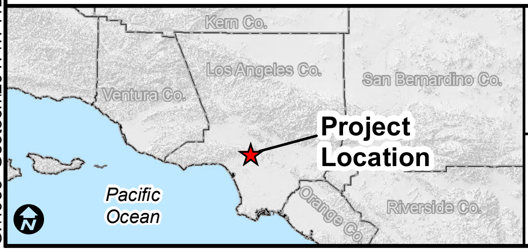
SS Strike Slip
NO Normal Oblique
RO Reverse Oblique
R Reverse
BT Blind Thrust
(*) Distance from site to thrust upper limb
(**) Distance from thrust surface projection (upper limb)

Figure 1

Site Vicinity Map



Base: USGS topographic map of the Hollywood 7.5 minute Quadrangle (1966, revised 1995)



wood.

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Proposed High-Rise Development
1520 North Cahuenga Boulevard
Los Angeles, California

LAT: LON:	34.0992 -118.3290	SITE VICINITY MAP	FIGURE: 1
SCALE:	1:24,000		
DRAWN:	KSH		
CHECK:	RM		PROJECT: 4953-17-1121
DATE:	6/18/2019		

G:\4953_Geotech\2017\171121 1520 Cahuenga\GIS\2019\4953171121_Figure_1_Site_Vicinity_Map.mxd

Figure 2

Plot Plan

LEGEND

- **B-6** ⌖ Prior Boring Location (Leroy Crandall and Associates, Project No. A-67219)
- **4** ◐ Prior Boring Location (Leroy Crandall and Associates, Project No. 62383)
- **H-1** ⌖ Prior Boring Location (Law/Crandall, Project No. 7012-8-0504)

Reference:
Urban Site Plan prepared by Gensler, dated May 2019, Page 5

0 65' 130' 260'
APPROXIMATE SCALE: 1" = 130'

wood.

Wood
Environment & Infrastructure Solutions, Inc.,
6001 Rickenbacker Rd, Los Angeles, CA 90040
Phone (323) 889-5300 Fax (323) 721-6700

Proposed High-rise Development Project
1520 North Cahuenga Boulevard
Los Angeles, California

LT,LNG:	
PREPARED BY:	VMN
SCALE:	1" = 130'
BY:	EJJ
CHKD:	EJJ
DATE:	06/19/2019

Plot Plan

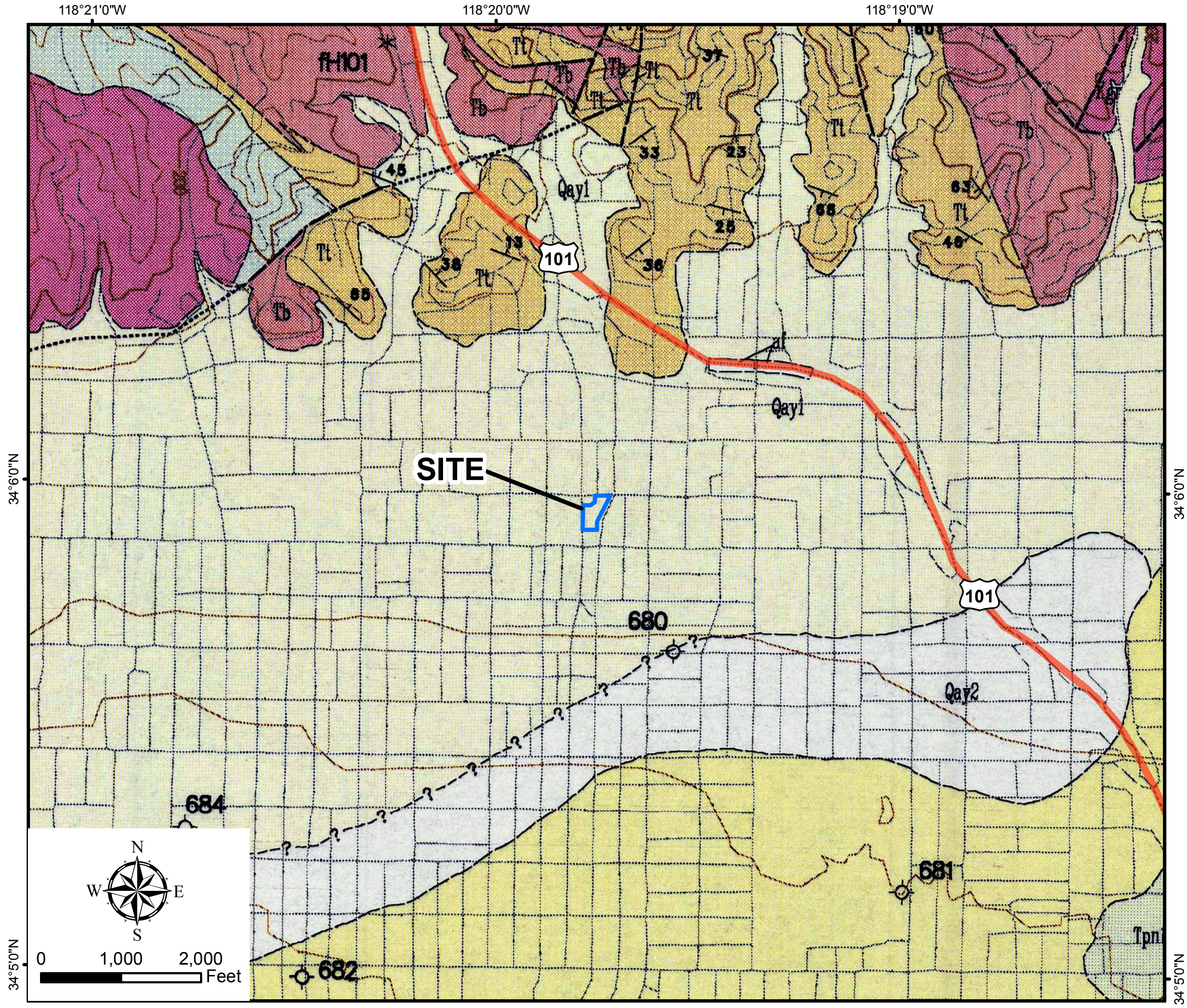
FIGURE NO. 2

PROJECT NO. 4953-17-1121

Path: G:\4953_Geotech\2017\171121 1520 Cahuenga\CAD\DWG\4953-17-1121_Fig-2_Plot-Plan.dwg [B-17x11]
Date: June 19, 2019 - 3:18pm By: vo.nguyen

Figure 3

Local Geology Map



Geologic Units

Unit - Description (Age)

Qay (Qay1, Qay2)- Alluvium of Gravel, sand, silt, and clay in active drainages; unconsolidated and uncemented (late Holocene)

Qao- Older alluvium of gravel, sand, silt, and clay; moderatley to well consolidated, slightly to well cemented (late Pleistocene)

Tpn- Puente Formation - sandstone, siltstone, shale, and conglomerate (late Miocene)

Tb- Basalt - dark gray to black, generally fine grained, locally vesicular (middle Miocene)

Tt- Topanga Formation - Sandstone, shale, and congolomerate (middle Miocene)

TK - Unnamed conglomerates (middle Miocene)

Kgr - Granitic rocks - granodirorite to quartz diorite (Cretaceous)

Contacts:

- contact, location accurate
- contact, location approximate
- contact, location concealed
- contact, location inferred
- fault, location accurate
- fault, location approximate
- fault, location concealed
- fault, location inferred

Symbols:

- 23 Inclined Bedding
- 18 Inclined Bedding approx.
- 21 Overturned Bedding
- Vertical Bedding
- Horizontal Bedding
- 39 Inclined Foliation
- Foliation approx.
- Vertical Foliation

Folds:

- Anticline
- Syncline

Reference:
Yerkes, R. F., 1997, Preliminary geologic map of the Hollywood 7.5' qaudrangle Southern California, USGS OFR 97-255, scale 1:24,000

wood.

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Proposed High-Rise Development
1520 North Cahuenga Boulevard
Los Angeles, California

LAT:	34.0992
LON:	-118.3290
SCALE:	1:24,000
DRAWN:	KSH
CHECK:	RM
DATE:	6/18/2019

LOCAL GEOLOGIC MAP

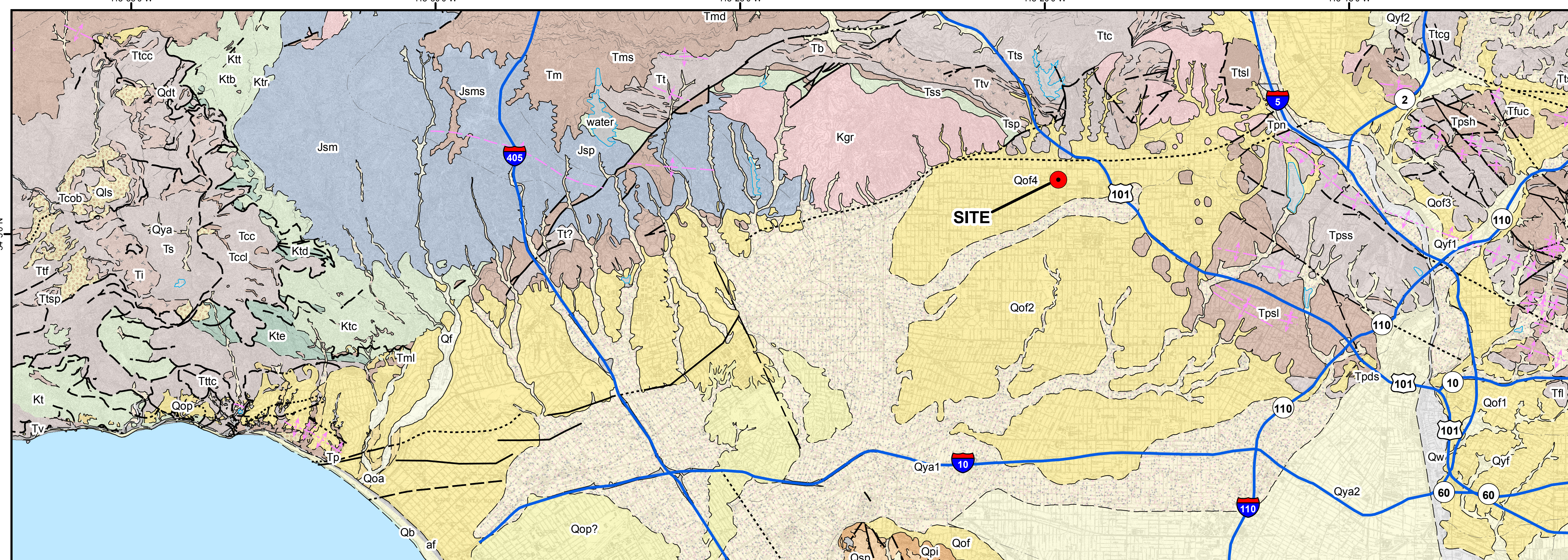
3

PROJECT:
4953-17-1121

Path: G:\4953_Geotech\2017\171121_1520 Cahuenga\GIS\2019\4953171121_Figure_3_Local_Geologic_Map.mxd

Figure 4

Regional Geologic Map

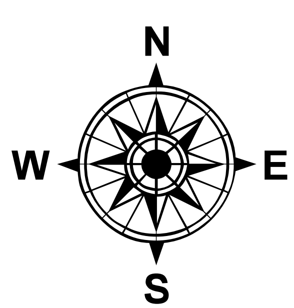


Geologic Units

af - Artificial fill (latest Holocene)
Qa - Alluvial flood-plain deposits (late Holocene)
Qb - Beach Deposits (late Holocene)
Qe - Eolian deposits (late Holocene)
Qf - Alluvial fan deposits (late Holocene, Holocene)
Qls - Landslide deposits (Holocene, late Pleistocene)
Qw - Wash deposits (late Holocene)
Qdt - Debris trains and talus (Holocene, late Pleistocene)
Qya - Young alluvium, undivided (Holocene to late Pleistocene)
Qyf - Young alluvial fan and valley deposits, undivided (Holocene and late Pleistocene)
Qoa - Old alluvium, undivided (late to middle Pleistocene)
Qof - Old alluvial fan deposits, undivided (late to middle Pleistocene)
Qom - Old marine deposits, undivided (late to middle Pleistocene)
Qop - Old paralic deposits, undivided (late to middle Pleistocene)
Qvoa - Very old alluvium, undivided (middle to early Pleistocene)
Qi - Inglewood Formation, siltstone (early Pleistocene)
Qpi - Inglewood Formation, siltstone, fine sandstone (early Pleistocene)
Qsp - San Pedro Formation, unconsolidated sandy unit (early Pleistocene)
Tfu - Fernando Formation, upper member, silty sandstone (Pliocene)
Tfuc - Fernando Formation, sandstone and conglomerate (Pliocene)
Tfl - Fernando Formation, lower member (Pliocene)
Tp - Pico Formation, clayey siltstone, sandy siltstone (Pliocene)
Tpn - Puente Formation, undivided, siltstone (early Pliocene and late Miocene)
Tpss - Puente Formation, sandstone, (Late Miocene)
Tpds - Puente Formation, diatomaceous shale (Late Miocene)
Tpsl - Puente Formation, siltstone and very fine sandstone (Late Miocene)
Tpsh - Puente Formation, La Vida Member, shale (Miocene)
Tm - Modelo Formation, mudstone, siltstone, shale (late Miocene)
Tms - Modelo Formation, siltstone, shale, clay shale (Late Miocene)
Tmd - Modelo Formation, diatomaceous shale (Late Miocene)
Tc - Conejo Volcanics, undifferentiated (middle Miocene)
Tb - Basalt dikes, flows and breccias (Miocene)
Tcob - Conejo Volcanics, basaltic lower zone (middle Miocene)
Ti - Intrusive rocks, undivided (middle Miocene)
Tt - Topanga Group, undivided, sedimentary and volcanic rocks (middle Miocene)
Ttcg - Topanga Group, conglomerate (middle Miocene)
Ttsp - Topanga Canyon Formation, Saddle Peak Member, sandstone and congolmerate (middle Miocene)
Ttss - Topanga Canyon Formation, sandstone (middle Miocene)
Ttsl - Topanga Canyon Formation, siltstone, sandstone, and siliceous shale (middle Miocene)
Tttc - Topanga Canyon Formation, Colc Creek Member, sandstone, siltstone (middle Miocene)
Ttc - Topanga Canyon Formation, sandstone (early middle Miocene)
Ttcc - Topanga Canyon Formation, Cold Creek Member (early middle Miocene)
Ttf - Topanga Canyon Formation, Fernwood Member (early middle Miocene)
Tts - Topanga Canyon Formation, Saddle Peak Member (middle to early Miocene)
Ttv - Topanga Canyon Formation, interbedded andesite and basalt flows (middle and early Miocene)
Tml - Monterey Formation, mudstone (middle to early Miocene)
Tv - Vaqueros Formation, undivided, sandstone with interbedded siltstone and mudstone (early Miocene)
Ts - Sespe Formation, undivided (late Eocene, Oligocene, early Miocene)
Tsp - Sespe Formation, Piuma Member (early Miocene to late Eocene)
Tcc - Coal Canyon Formation, sandstone (Eocene and Paleocene)
Tccl - Coal Canyon Formation, algal limestone (Eocene and Paleocene)
Tss - Santa Susana Formation, mudrock (early to late Paleocene)
Kgr - Granitic rocks (late Cretaceous)
Kt - Tuna Canyon Formation, marine sandstone (late Cretaceous)
Jsm - Santa Monica Slate (late Jurassic)
Jsp - Santa Monica Slate, phyllite (late Jurassic)
Note: Some geologic units may have sub-units shown on map

Geologic Contacts

contact, identity and existence certain, location accurate
contact, identity and existence certain, location approximate
contact, identity and existence certain, location concealed
contact, identity and existence certain, location inferred
fault, identity and existence certain, location accurate
fault, identity and existence certain, location approximate
fault, identity and existence certain, location concealed
fault, identity and existence certain, location inferred
fault, identity or existence questionable, location accurate
fault, identity or existence questionable, location concealed
(Queried where contacts are questionable)



Graphic Scale

0 0.5 1 2 3 4 Miles

0 0.75 1.5 3 4.5 6 Kilometers

Reference:
Bedrossian, T.L., Roffers, P., Hayhurst, C.A., 2012, "Geologic Compilation of Quaternary Surficial Deposits in Southern California", California Geological Survey, vector spatial data, Special Report 217, December 2012.

wood.

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Proposed High-Rise Development
1520 North Cahuenga Boulevard
Los Angeles, California

LAT:	34.0992
LON:	-118.3290
SCALE:	1:100,000
DRAWN:	KSH
CHECK:	RM
DATE:	6/18/2019

REGIONAL GEOLOGIC MAP

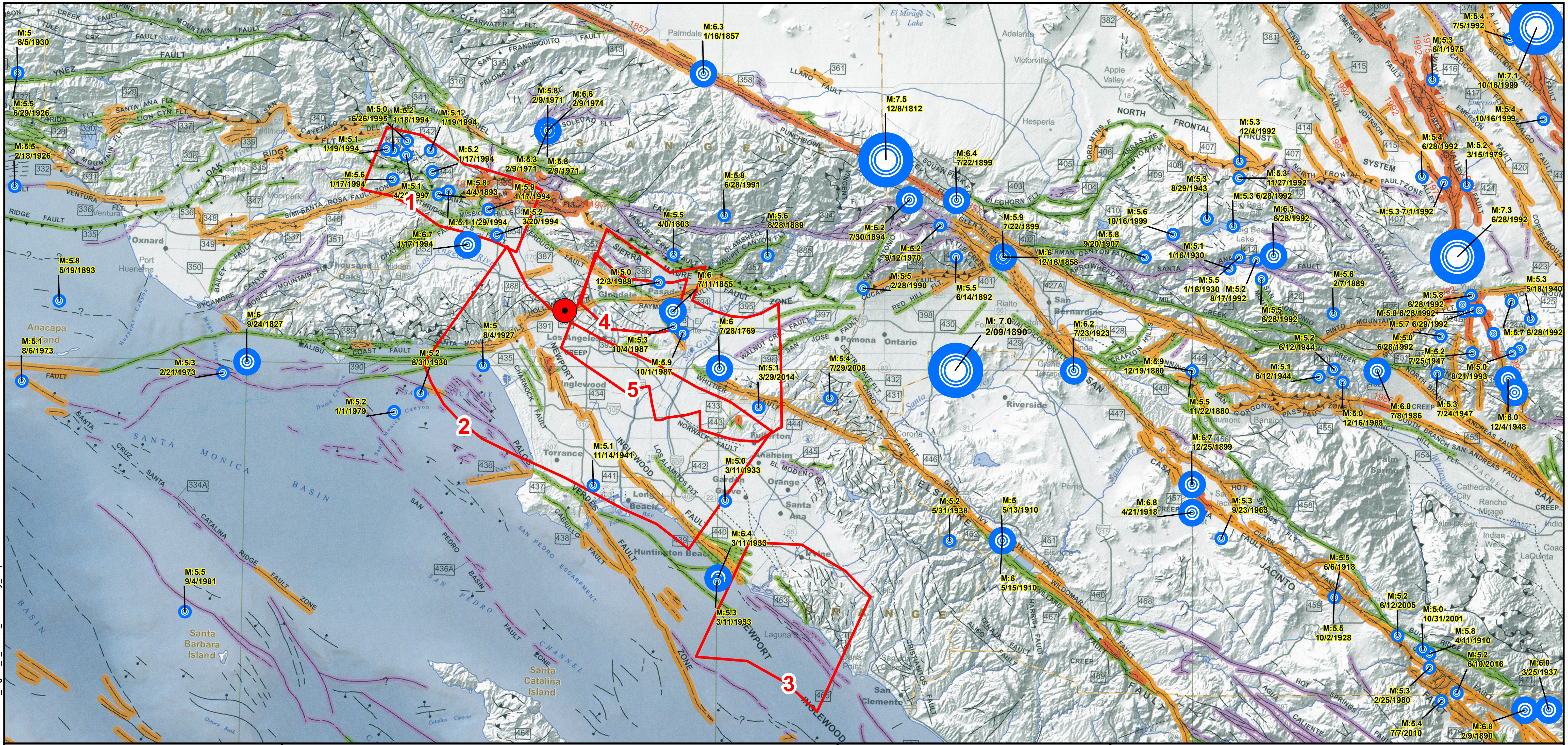
FIGURE: 4

PROJECT: 4953-17-1121

Path: G:\4953_Geotech\2017\171121 1520 Cahuenga\GIS\2019\4953171121_Figure_4_Regional_Geologic_Map1.mxd

Figure 5

Regional Fault and Seismicity Map



Earthquakes

Approximate Epicentral Area of Earthquake

Events ≥ 7.0

Events 6.0 - 6.9

Events 5.0 - 5.9

Faults

Historic Fault Displacement

Holocene Fault Displacement

Evidence of Late Quaternary Fault Displacement

Undifferentiated Quaternary Faults

Bar and ball on downthrown side (relative or apparent)

Arrows along fault indicate relative or apparent direction of lateral movement

Arrows on fault indicate direction of dip

Low angle fault with barbs on upper plate. Fault surface generally dips less than 45 but locally may have been subsequently steepened.

Blind Thrust Faults (surface projection)

Blind Thrust Index:

1 Northridge Thrust

2 Compton Thrust

3 San Joaquin Hills Thrust

4 Upper Elysian Park Thrust

5 Puente Hills Thrust

SITE

N
W E
S

0 4 8 16 24 32 Kilometers

0 3 6 12 18 24 Miles

REFERENCES:
Jennings, C.W. and Bryant, W.A., 2010,"Fault Activity Map of California," California Geological Survey, GDM-006, May 2010
Earthquake Catalogs: California Geological Survey, 1769-1932; Southern California Earthquake Center, 1932-2017.
Working Group on California Earthquake Probabilities (WGCEP), 2016, Fault Database Tools, <http://www.wgcep.org/tools-fault_db>

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Fax: 323.721.6700

Proposed High-Rise Development
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Los Angeles, California

LAT:	34.0992
LON:	-118.3290
SCALE:	1:750,000
DRAWN:	KSH
CHECK:	RM
DATE:	6/18/2019

REGIONAL FAULT AND SEISMICITY MAP

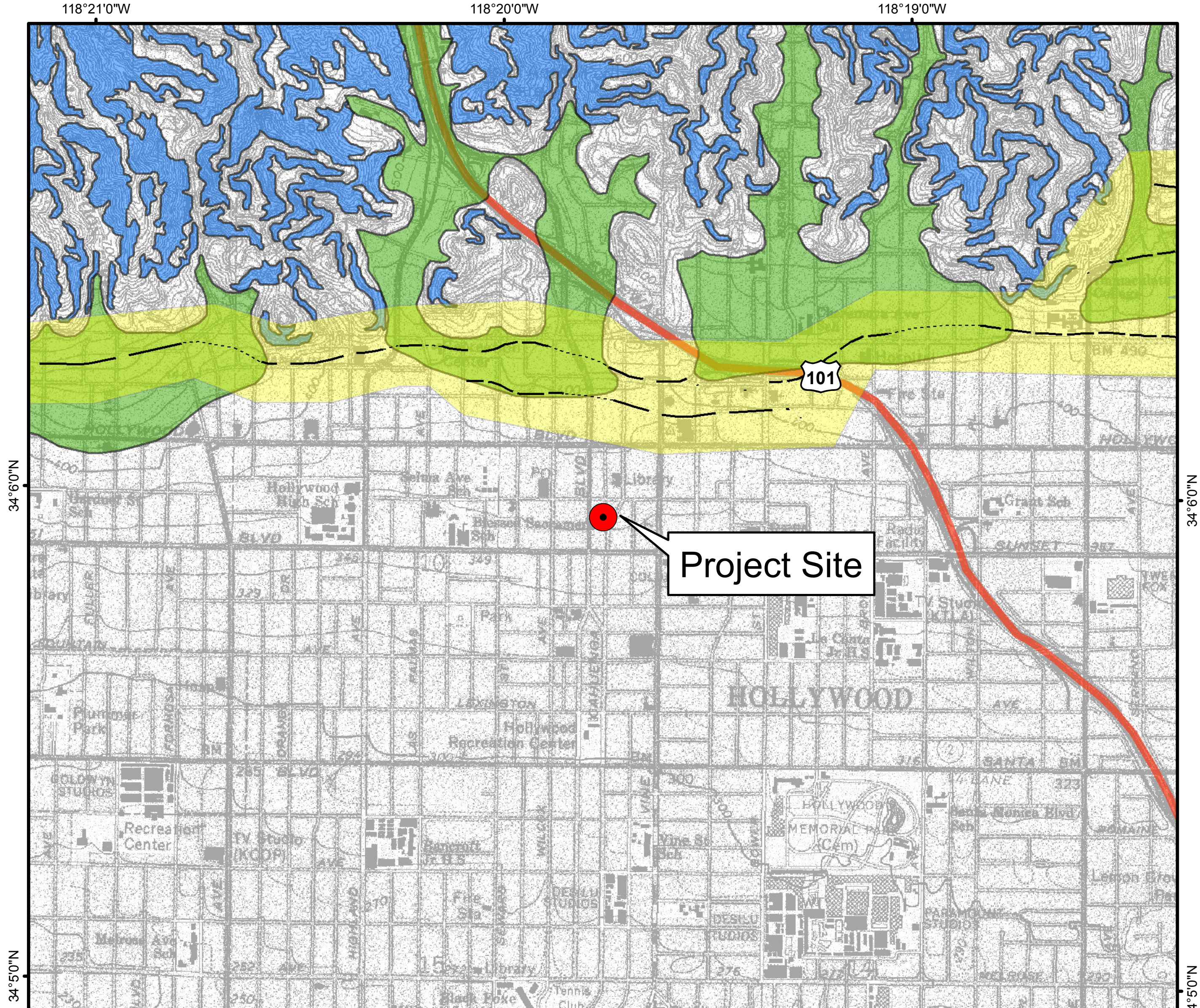
FIGURE: 5

PROJECT: 4953-17-1121

Path: G:\4953_Geotech\2017\171121 1520 Cahuenga\GIS\2019\4953171121_Figure_5_Faults_Seismicity_Map.mxd

Figure 6

Seismic Hazards Map



Base: USGS 7.5 minute quadrangles, various years

Seismic Hazards

Earthquake-induced landslide Zones
Areas where Holocene occurrence of landslide movement, or local slope of terrain, and geological, geotechnical and ground moisture conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Liquefaction Zone
Areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Fault Zones

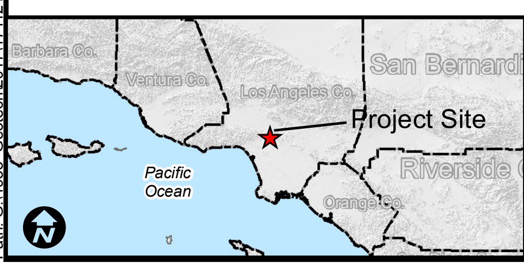
- Accurately Located Fault Traces
- Approximately Located Fault Traces
- Inferred Fault Traces
- Concealed Fault Traces
- Aerial Photo Lineament
- Alquist Priolo EFZ Boundary

N W E S

0 1,000 2,000 4,000 Feet

CGS, GIS Files of Official Map of Alquist-Priolo Earthquake Fault Zones, Hollywood Quadrangle," November 6, 2014.
CGS, 2002, "GIS Files of Official Alquist Priolo Earthquake Fault Zones, Southern Region," May 31, 2002, CGS CD 2001-05.

Path: G:\4953_Geotech\2017\171121 1520 Cahuenga\GIS\2019\Figure_X_Seismic_Hazards_AP_v6.mxd



wood.

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Proposed High-Rise Development
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Los Angeles, California

LAT:	34.0992
LON:	-118.3290
SCALE:	1:24,000
DRAWN:	KSH
CHECK:	RM
DATE:	06/10/2019

SEISMIC HAZARDS MAP

FIGURE: 6

PROJECT: 4953-17-1121

Appendix IS-2.2

Geotechnical Addendum

Wood Environment & Infrastructure Solutions, Inc.
6001 Rickenbacker Road
Los Angeles, CA 90040-3031
USA

T: +1 323.889.5300

www.woodplc.com

September 14, 2020
Project 4953-17-1121

Walton Street Capital, LLC
c/o Artisan Realty Advisors
Mr. Collin Komae
3000 Olympic Boulevard #1255
Santa Monica, California 90404

Subject: **Addendum Letter Regarding Potential Hazard of Collapsible Soils**
Proposed High-Rise Development Project
1520 North Cahuenga Boulevard
Hollywood District
Los Angeles, California

Dear Mr. Komae:

This addendum letter has been prepared to address the potential hazard of collapsible soils at the site of the proposed high-rise development project at 1520 North Cahuenga Boulevard in the Hollywood district of Los Angeles, California. We performed a geotechnical evaluation for entitlement package for the project and submitted the results in a report dated June 19, 2019 and revised June 11, 2020, which was approved by the City of Los Angeles Department of Building and Safety Grading Division (LADBS) in their Geology and Soils Report Approval Letter dated July 28, 2020. This addendum letter was prepared per the request of Mr. Todd Nelson of Armbruster Goldsmith & Delvac LLP to address a comment from the City of Los Angeles Planning Department.

Collapsible soils are dry, low density, high porosity soils that can spontaneously compact when they become wet. Based on our geotechnical evaluation, the soils underlying the project site are medium dense to very dense silty sands, clayey sand and sandy clay. Due to the type and density of the soils underlying the Project Site, the project site soils would not be considered collapsible soils. Therefore, the project site is not located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in collapse.

Our professional services have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, express or implied, is made as to the professional advice included in this letter.

We trust that this addendum letter satisfies your current needs. If you have any questions, please contact us.

Sincerely,

Wood Environment & Infrastructure Solutions, Inc.

Eung Jin Jeon, Ph.D.
Associate Engineer

Reviewed by.

Rosalind Munro
Principal Engineering Geologist

P:\4953 Geotech\2017-proj\171121 1520 N Cahuenga Blvd Development\4.0 Project Deliverables\4.1 Reports\Final Report\4953-17-1121l01_collapsible soils.doc\EJJ:RM

(submitted electronically)

Appendix IS-2.3

Geology and Soils Approval Letter

CITY OF LOS ANGELES
CALIFORNIA

ERIC GARCETTI
MAYOR

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

OSAMA YOUNAN, P.E.
GENERAL MANAGER
SUPERINTENDENT OF BUILDING

JOHN WEIGHT
EXECUTIVE OFFICER

GEOLOGY AND SOILS REPORT APPROVAL LETTER

July 28, 2020

LOG # 113776R
SOILS/GEOLOGY FILE - 2

Walton Street Capital, LLC
3000 Olympic Boulevard, Suite 1255
Santa Monica, CA 90404

This letter supersedes the Department letter dated 07/22/2020.

TRACT: 2129 // Hollywood (MR 28-59/60)
BLOCK: -- // 4
LOT(S): PT A (Arb. 1) // FR 2 (Arb. 2), FR 3 (Arbs. 1 & 2), FR 4 (Arbs. 1 & 2), FR 5, PT 12 (Arb. 1), PT 13 (Arbs. 1 & 2), PT 14 (Arb. 1), PT 15 (Arb. 1), & FR 16
LOCATION: 1520-1544 N. Cahuenga Boulevard, 1523-1549 N. Ivar Avenue, & 6350 W. Selma Avenue

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Geology/Soils Report	4953-17-1121	06/11/2020	Wood

The Grading Division of the Department of Building and Safety has reviewed the referenced report that provides a preliminary discussion of potential geologic hazards affecting the proposed twenty-five story residential building, four story retail building, and four levels of subterranean parking. Retaining walls ranging up to 42 feet in height are proposed for the subterranean parking levels.

The subject property is relatively flat and is developed with several one-story retail/commercial buildings and a paved parking lot. The existing structures will remain. The new development will occupy the parking lot area. No subsurface exploration or laboratory testing of the earth materials had been performed. The consultants recommend to support the proposed structures on conventional and/or mat-type foundations bearing on native undisturbed soils.

The subject site is not located within a State of City defined seismic hazard zone. The consultants conclude that the proposed development is feasible from a geotechnical standpoint and that the site is not adversely affected by significant geotechnical issues of hazards.

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

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2020 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. This approval is limited for EIR/CEQA purposes only.

2. Prior to the issuance of grading/building permits, a design-level engineering geology and geotechnical engineering report shall be provided per the Department requirements and Los Angeles Building Code with appropriate design recommendations and supporting engineering analyses. (P/BC 2020-044, P/BC 2020-049, P/BC 2014-068, P/BC 2020-083, P/BC 2020-113, P/BC 2020-118)

EDMOND LEE
Engineering Geologist Associate III

For:
DAN RYAN EVANGELISTA
Structural Engineering Associate III

Log No. 113776R
213-482-0480

cc: Wood, Project Consultant
LA District Office