Appendix IS-6

Geologic-Seismic Hazard Evaluation

GEOLOGIC-SEISMIC HAZARD EVALUATION FOR ENVIRONMENTAL IMPACT REPORT

713-717 EAST 5TH STREET
LOS ANGELES, CALIFORNIA
TRACT: WOLFSKILL ORCHARD, BLOCK: 10, LOTS: 3 & 4

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MATERIALS

PREPARED FOR

713 5TH STREET LP
LOS ANGELES, CALIFORNIA

PROJECT NO. A9674-06-01

NOVEMBER 16, 2017

Project No. A9674-06-01
November 16, 2017

713 5th Street LP
1317 E 7th Street
Los Angeles, California 90021

Attention: Mr. John Means

Subject: GEOLOGIC-SEISMIC HAZARD EVALUATION
FOR ENVIRONMENTAL IMPACT REPORT
713-717 EAST 5TH STREET
LOS ANGELES, CALIFORNIA
TRACT: WOLFSKILL ORCHARD, BLOCK: 10, LOTS: 3 & 4

Dear Mr. Means:

In accordance with your authorization of our proposal dated September 22, 2017, we have prepared this geologic-seismic hazard evaluation report for the subject site located at 713 East 5th Street in the City of Los Angeles, California. The purpose of this evaluation was to address potential soils and geologic-seismic hazards that could impact the project. It is our understanding that this report will be used in preparation of the Environmental Impact Report for the project.

We recommend that a comprehensive, design level geotechnical study be performed prior to finalizing grading or structural plans. We also recommend that the results of the comprehensive geotechnical investigation be included in preparation of future environmental documents for the proposed development.

We appreciate the opportunity to be of service to you. Please contact us if you have any questions regarding this report, or if we may be of further service.

Very truly yours,

GEOCON WEST, INC.

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GEOLOGIC SEISMIC HAZARD EVALUATION

1. INTRODUCTION AND SCOPE

This report presents the results of geologic-seismic hazard evaluation for the proposed development located at 713 East 5th Street in the City of Los Angeles, California. The location of the subject site shown on Figure 1, Vicinity Map. The purpose of this evaluation was to address potential soils and geologic-seismic hazards that could impact the project. It is our understanding that this report will be used in preparation of the Environmental Impact Report for the project.

The scope of our evaluation included a review of available published and unpublished literature and maps pertinent to the geologic and seismic conditions at the subject site and surrounding area, and a review of in-house geotechnical reports for nearby sites (see Figure 2, Site Plan). The Safety Element of the City of Los Angeles General Plan (1996) and the County of Los Angeles General Plan (1990) were also reviewed as part of this evaluation.

2. SITE AND PROJECT DESCRIPTION

The subject site is located at 713-717 East 5th Street in the City of Los Angeles, California. The site consists of one rectangular-shaped parcel and is currently occupied by a three-story hotel structure. The site is bounded by a three-story residential structure to the southeast, by East 5th Street to the southwest, and by single-story commercial structures to the northeast and northwest. The site is relatively level, with no pronounced highs or lows. Surface water drainage at the site appears to be by sheet flow along the existing ground contours to the city streets.

Based on the information provided by the Client, it is our understanding that the proposed development will include demolishing the existing structure and constructing a seven- to eight-story structure at or near present grade. Due to the preliminary nature of the project, formal plans depicting the proposed development are not available for inclusion in this report. The existing site conditions are depicted on the Site Plan (see Figure 2).

This report is intended to provide geologic seismic hazard information to be used in development planning and the preparation of an Environmental Impact Report and is not intended for design purposes. A comprehensive geotechnical investigation will be required for development of the site. The future comprehensive geotechnical investigation should include subsurface investigation, laboratory testing, engineering analyses, and preparation of a written report summarizing findings and presenting conclusions and recommendations for design and construction of the proposed site development.

3. GEOLOGIC SETTING

3.1 Regional Geology

The site is located in the northern portion of the Los Angeles Basin, within the limits of the ancestral flood plain of the Los Angeles River (located approximately 0.7 mile to the east). The Los Angeles Basin is a coastal plain, bounded by the Santa Monica Mountains, the Elysian Hills, and the Repetto Hills to the north, the Puente Hills to the northeast, the Whittier Fault to the east, the Palos Verdes Peninsula and Pacific Ocean to the south and west, and the Santa Ana Mountains and San Joaquin Hills to the southeast.

Regionally, the site is located within the Peninsular Ranges geomorphic province, near the northern boundary of the Transverse Ranges geomorphic province. The Peninsular Ranges is characterized by northwest-trending geologic structures in contrast to the Transverse Ranges, characterized by east-west geologic structures. The boundary between the two geomorphic provinces in the vicinity of the site is the Hollywood Fault located approximately 5.2 miles to the north (CGS, 2017a).

3.2 Soil Conditions

Based on published geologic maps (Dibblee, 1989; California Geological Survey, 2012) and previous geotechnical investigations for various projects in the immediate vicinity (see Site Plan, Figure 2), the geologic materials at the site are anticipated to consist of unconsolidated Holocene age alluvial fan deposits comprised of poorly graded sand and silty sand with varying amounts of gravel and cobbles derived primarily from the Los Angeles River to the east. These materials are anticipated to range in density from loose to dense.

3.3 Groundwater Conditions

The historic high groundwater level in the project area is approximately 90 feet below the ground surface (CDMG, 1998). Groundwater level information in the CDMG publication is based on data collected from the early 1900's to the late 1990's. Based on current groundwater basin management practices, it is unlikely that the groundwater levels will ever exceed the historic high levels.

The Los Angeles County Department of Public Works (LACDPW) maintains various groundwater monitoring wells in the vicinity of the site. The closest monitoring wells to the site are LACDPW Well Nos. 2765A, 2765 and 2756N located approximately 1,300 feet north, 1,350 feet north, and 2,000 feet southwest of the site, respectively. All of these wells are currently inactive and specific details about each are shown in the table below.

SUMMARY OF GROUNDWATER MONITORING WELL INFORMATION

LACPDW Well No.	Monitoring Period		Most Recent Groundwater Level		Historic High Groundwater Level	
	Date	Groundwater Level Fluctuation (feet)	Depth to Water (feet)	Date	Depth to Water (feet)	Date
2756A	1934 – 1969	85.4 – 100.0	93.5	06/03/69	85.4	11/15/35
2765	1934 – 1979	87.0 – 117.5	108.7	03/13/79	87.0	06/23/38
2756N	1934 – 1941	112.9 – 124.6	122.0	10/21/41	112.9	10/11/40

Based on the reported historic high groundwater levels (CDMG, 1998) and the groundwater levels observed in nearby monitoring wells (LACDPW, 2107a), groundwater is not anticipated to adversely impact the proposed development. However, it is not uncommon for groundwater levels to vary seasonally or for perched groundwater conditions to develop where none previously existed, especially in impermeable fine-grained soils which are heavily irrigated or after seasonal rainfall. In addition, recent requirements for stormwater infiltration could result in shallower seepage conditions in the immediate site vicinity. Proper surface drainage of irrigation and precipitation should be incorporated into the project design.

4. GEOLOGIC HAZARDS

4.1 Surface Fault Rupture

The numerous faults in Southern California include active, potentially active, and inactive faults. The criteria for these major groups are based on criteria developed by the California Geological Survey (CGS, formerly known as CDMG) for the Alquist-Priolo Earthquake Fault Zone Program (CGS Special Publication 42 [Bryant and Hart, 2007]). By definition, an active fault is one that has had surface displacement within Holocene time (about the last 11,000 years). A potentially active fault has demonstrated surface displacement during Quaternary time (approximately the last 1.6 million years), but has had no known Holocene movement. Faults that have not moved in the last 1.6 million years are considered inactive.

The site is not within a state-designated Alquist-Priolo Earthquake Fault Zone (CGS, 2017a, 2017b) or a city-designated Preliminary Fault Rupture Study Area (City of Los Angeles, 2017) for surface fault rupture hazards. No active or potentially active faults with the potential for surface fault rupture are known to pass directly beneath the site. Therefore, the potential for surface rupture due to faulting occurring beneath the site during the design life of the proposed development is considered low. However, the site is located in the seismically active Southern California region and could be subjected to moderate to strong ground shaking in the event of an earthquake on one of the many active Southern California faults. The faults in the vicinity of the site are shown in Figure 3, Regional Fault Map.

The closest surface trace of an active fault to the site is the Hollywood Fault located approximately 5.2 miles to the north (CGS, 2017; Ziony and Jones, 1989). Other nearby active faults are the Raymond Fault, the Newport-Inglewood Fault Zone, the Verdugo Fault, the Eagle Rock Fault, and the Whittier Fault located approximately 5.6 miles north-northeast, 6.9 miles southwest, 7.0 miles north, 7.6 miles north-northeast, and 7.9 miles east-northeast of the site, respectively (Ziony and Jones, 1989). The active San Andreas Fault Zone is located approximately 34 miles northeast of the site.

Several buried thrust faults, commonly referred to as blind thrusts, underlie the Los Angeles Basin at depth. These faults are not exposed at the ground surface and are typically identified at depths greater than 3.0 kilometers. The October 1, 1987 M_w 5.9 Whittier Narrows earthquake and the January 17, 1994, M_w 6.7 Northridge earthquake were a result of movement on the Puente Hills Blind Thrust and the Northridge Thrust, respectively. The site is underlain at depth by the Upper Elysian Park Thrust and the Puente Hills Blind Thrust. However, these thrust faults and others in the Los Angeles area are not exposed at the surface and do not present a potential surface fault rupture hazard at the site; however, these deep thrust faults are considered active features capable of generating future earthquakes that could result in moderate to significant ground shaking at the site.

4.2 Seismicity

As with all of Southern California, the site has experienced historic earthquakes from various regional faults. The seismicity of the region surrounding the site was formulated based on research of an electronic database of earthquake data. The epicenters of recorded earthquakes with magnitudes equal to or greater than 5.0 in the site vicinity are depicted on Figure 4, Regional Seismicity. A partial list of moderate to major magnitude earthquakes that have occurred in the Southern California area within the last 100 years 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
San Jacinto-Hemet area	April 21, 1918	6.8	74	ESE
Near Redlands	July 23, 1923	6.3	57	E
Long Beach	March 10, 1933	6.4	33	SE
Tehachapi	July 21, 1952	7.5	79	NW
San Fernando	February 9, 1971	6.6	27	NNW
Whittier Narrows	October 1, 1987	5.9	9	E
Sierra Madre	June 28, 1991	5.8	20	NE
Landers	June 28, 1992	7.3	104	E
Big Bear	June 28, 1992	6.4	81	E
Northridge	January 17, 1994	6.7	21	WNW

Based on the historical seismicity of the Los Angeles area and the location of nearby faults, the Site could be subjected to significant ground shaking in the event of an earthquake. This hazard is common in Southern California and the effects of ground shaking can be mitigated if the proposed structures are designed and constructed in conformance with current building codes and engineering practices

4.3 Liquefaction

Liquefaction is a phenomenon in which loose, saturated, relatively cohesionless soil deposits lose shear strength during strong ground motions. Primary factors controlling liquefaction include intensity and duration of ground motion, gradation characteristics of the subsurface soils, in-situ stress conditions, and the depth to groundwater. Liquefaction is typified by a loss of shear strength in the liquefied layers due to rapid increases in pore water pressure generated by earthquake accelerations.

The current standard of practice, as outlined in the "Recommended Procedures for Implementation of CDMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California" and "Special Publication 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California" requires liquefaction analysis to a depth of 50 feet below the lowest portion of the proposed structure. Liquefaction typically occurs in areas where the soils below the water table are composed of poorly consolidated, fine to medium-grained, primarily sandy soil. In addition to the requisite soil conditions, the ground acceleration and duration of the earthquake must also be of a sufficient level to induce liquefaction.

A review of the State of California Seismic Hazard Zone Map for the Los Angeles Quadrangle (CDMG, 1999, revised 2017) indicates that the site is not located in an area designated as having a potential for liquefaction. Also, the historic high groundwater level beneath the site is reported to be approximately 90 feet beneath the existing ground surface (CDMG, 1998). Based on these considerations, the potential for liquefaction and associated ground deformations beneath the site, including lateral spread, is considered to be low.

4.4 Seismically-Induced Settlement

Dynamic compaction of dry and loose sands may occur during a major earthquake. Typically, settlements occur in thick beds of such soils. There may be a potential for seismically-induced settlements in the upper Holocene age alluvial soils. The potential for seismically-induced settlement should be addressed during the comprehensive, design level geotechnical study. Based on our local experience, seismically-induced settlements are not anticipated to be significant and, if any, can be mitigated through the foundation design.

4.5 Slope Stability

The topography at the site is relatively level and the topography in the immediate site vicinity slopes gently to the south-southwest. The site is not located within a City of Los Angeles Hillside Grading Area or a Hillside Ordinance Area (City of Los Angeles, 2017). Also, the site is not located within an area identified as a "hillside" area (Leighton, 1990) or an area identified as having a potential for seismic slope instability (CDMG, 1999). There are no known landslides near the site, nor is the site in the path of any known or potential landslides (CGS, 2012; Dibblee, 1989). Therefore, the potential for slope stability hazards to adversely affect the proposed development is considered low.

4.6 Earthquake-Induced Flooding

Earthquake-induced flooding is inundation caused by failure of dams or other water-retaining structures due to earthquakes. The County of Los Angeles Safety Element (Leighton, 1990) and the City of Los Angeles Safety Element (1996) indicate that the site is located within the Hansen Dam inundation area. However, this reservoir, 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. Current design, construction practices, and ongoing programs of review, modification, or total reconstruction of existing dams are intended to ensure that all dams are capable of withstanding the maximum considered earthquake (MCE) for the site. Therefore, the potential for inundation at the site as a result of an earthquake-induced dam failure is considered low.

4.7 Tsunamis, Seiches, and Flooding

The site is not located within a coastal area. Therefore, tsunamis, seismic sea waves, are not considered a significant hazard at the site.

Seiches are large waves generated in enclosed bodies of water in response to ground shaking. No major water-retaining structures are located immediately up gradient from the project site. Therefore, flooding resulting from a seismically induced seiche is considered unlikely.

The site is within an area of minimal flooding (Zone X) as defined by the Federal Emergency Management Agency (FEMA, 2017; LACDPW, 2017b).

4.8 Erosion and Runoff

The site is located within a highly urban and developed area and, therefore, large scale erosion is not anticipated. There is a potential for erosion to occur during the grading process during periods of heavy rainfall. Provided the engineering recommendations are followed to mitigate erosion, and the grading plans are prepared to generally-accepted regional standards, erosion is not expected to be a major impact to development. Runoff at the site should not be allowed to flow in an uncontrolled manner, especially over any permanent or temporary slopes.

4.9 Oil Fields & Methane Potential

Based on a review of the California Division of Oil, Gas and Geothermal Resources (DOGGR) Well Finder website (DOGGR, 2017), the site is not located within the limits of a known oil field and oil wells are not located in the immediate site vicinity. However, the site is located approximately 500 feet west of the Union Station Oil Field. Although no wells are shown on DOGGR well location maps to be on the site, there is at least one active oil and gas well within 1,000 feet of the site (DOGGR, 2017). Due to the voluntary nature of record reporting by the oil well drilling companies, wells may be improperly located or not shown on the location map and undocumented wells could be encountered during construction. Any wells encountered will need to be properly abandoned in accordance with the current requirements of the DOGGR.

The site is located within a City of Los Angeles Methane Buffer Zone. Therefore, there is a potential for methane and other volatile gases to occur at the site (City of Los Angeles, 2017). A methane study will be required for the proposed development and it is recommended that a qualified methane consultant be retained to perform the study and provide mitigation measures as necessary.

4.10 Expansive Soils

Expansive soils are soils that swell when subjected to moisture and shrink when dried, and are typically associated with clayey soils. The effects of expansive soils are most severe when found near the ground surface, where changes in moisture content can be frequent with little to no confinement. The effects of expansive soils can typically be mitigated by construction in accordance with current building codes and engineering practices. Based on the anticipated geologic conditions, the potential for expansive soils is considered to be low. If expansive soils are found to be present at the site, the potential impacts of expansive soils can be mitigated through implementation of proper design considerations.

4.11 Regional Subsidence and Peat Oxidation

Regional subsidence occurs when a large portion of land is displaced vertically, usually due to the withdrawal of groundwater, oil, or natural gas. Soils that are particularly subject to subsidence include those with high silt or clay content. The site is not located within an area of known ground subsidence. No large-scale extraction of groundwater, gas, oil, or geothermal energy is occurring or planned at the site or in the general site vicinity. There appears to be little or no potential for regional ground subsidence to occur at the site as a result of withdrawal of fluids or gases.

Oxidation of peat deposits can result in a corresponding loss of volume, creating a potential for settlement in areas where structures or compacted fill are planned. Considering the local geologic conditions at the site and the surrounding area and the local geomorphology, peat is not anticipated to be present at the site. The probability of hazards associated with peat oxidation impacting the site is considered to be very low.

4.12 Volcanic Hazards

The site is not subject to any known volcanic hazards. The nearest Quaternary age volcanic fields are located about 120 miles to the north near Little Lake and the Coso Mountains. Another area of recent volcanic activity is located about 150 miles to the northeast at Amboy and Pisgah Craters. The potential for the site to be impacted by volcanic hazards is considered very low.

4.13 Stormwater and Wastewater Infiltration

There are no known geologic or groundwater conditions that would preclude the use of stormwater or wastewater infiltration at the site. Site-specific testing should be performed as a part of the comprehensive geotechnical investigation to confirm the site-specific conditions. Furthermore, the site is located within a community served by existing sewage infrastructure; we do not anticipate the use septic tanks or alternative wastewater disposal systems.

5. CONCLUSIONS

5.1 General

5.1.1 It is our opinion that no geologic conditions are known to exist at the site that would preclude the construction of the proposed development. A comprehensive geotechnical investigation will be required to provide conclusions and recommendations for the design and construction of the site. This report is intended to provide geologic-seismic hazard and soils information to be used in development planning and preparation of an Environmental Impact Report and is not intended for design purposes.

5.1.2 Potential geologic hazards at the site include seismic shaking and compressibility of the young alluvial sediments. A comprehensive geotechnical investigation, including subsurface exploration, laboratory testing, and engineering analyses should be performed for the proposed project. The geotechnical report should include a site-specific analysis of the potential for seismic shaking and the compressibility of the young alluvial sediments, as well as provide recommendations for the mitigation of the potential consequences, if any, including structure design considerations.

5.1.3 There is a potential for methane gas to occur at the site. A methane study will be required for the proposed development and it is recommended that a qualified methane consultant be retained to perform the study and provide mitigation measures as necessary.

5.1.4 The potential for other geologic hazards such as liquefaction, landsliding, seismic slope instability and other slope stability hazards, subsidence, flooding, seiches, inundation, tsunamis, and volcanic hazards to impact the proposed development is considered very low.

5.1.5 Groundwater is neither expected to be encountered during construction, nor have a detrimental effect on the project. Neither temporary nor permanent dewatering is anticipated to be required. However, it is not uncommon for groundwater seepage to develop where none previously existed, especially in impermeable fine-grained soils which are heavily irrigated or after seasonal rainfall. Proper design considerations for should be incorporated into the project design.

5.1.6 There is a low potential for expansive soils, as defined by Section 1803.5.3 of the 2016 California Building Code, to be present at the site as the on-site soils are anticipated to be granular in nature. However, if expansive soils are found to be present at the site, the potential impacts of expansive soils can be mitigated through implementation of proper design considerations. A comprehensive geotechnical investigation, including subsurface exploration, laboratory testing, and engineering analyses should be performed for the proposed project. The project geotechnical report should include an evaluation of the presence of expansive soils, as well as provide recommendations for the mitigation of the potential consequences of expansive soils, if any, including structure design considerations.

5.1.7 There is a potential for erosion of soils during site preparation and construction activities; however, the potential for erosion can be reduced by implementation of erosion control measures. The potential for erosion subsequent to construction is considered low due to the general level topography of the site and based on consideration that the majority of the Site will be developed with little soil exposed.

5.1.8 It is anticipated that the proposed project will be able to utilize typical design and construction techniques. It is anticipated that soils at the proposed foundation level will consist of artificial fill and Holocene age young alluvial soils, which are generally unconsolidated to moderately consolidated, medium dense, and are anticipated to be subject to some settlement. It is also anticipated that the building footprint may extend close or to the property line, limiting the ability to perform excavation and recompaction of the soil laterally beyond proposed foundations. Based on these considerations, it is anticipated that the proposed foundations and related improvements should derive support in newly placed engineered fill and competent alluvium, if project conditions warrant such an occurrence. It is anticipated that a conventional foundation system or a reinforced concrete mat foundation system will be suitable for support of the proposed structures. However, the determination of the appropriate foundation system will depend on the results of the comprehensive geotechnical investigation, including laboratory testing to evaluate the soil compressibility. The Client should be aware that a deepened foundation system may be required by the City of Los Angeles if total combined seismically and statically induced settlements exceed 4 inches.

5.2 Additional Future Geotechnical Investigation

5.2.1 The primary intent of this study was to address potential geologic hazards that could impact the project. It is our understanding that the report will be utilized for the Environmental Impact Report for the project. While it is our opinion that geologic hazards were not encountered during the investigation that would preclude the construction of the proposed development, a comprehensive geotechnical report will be required to provide conclusions and recommendations for the design and construction of the proposed structure.

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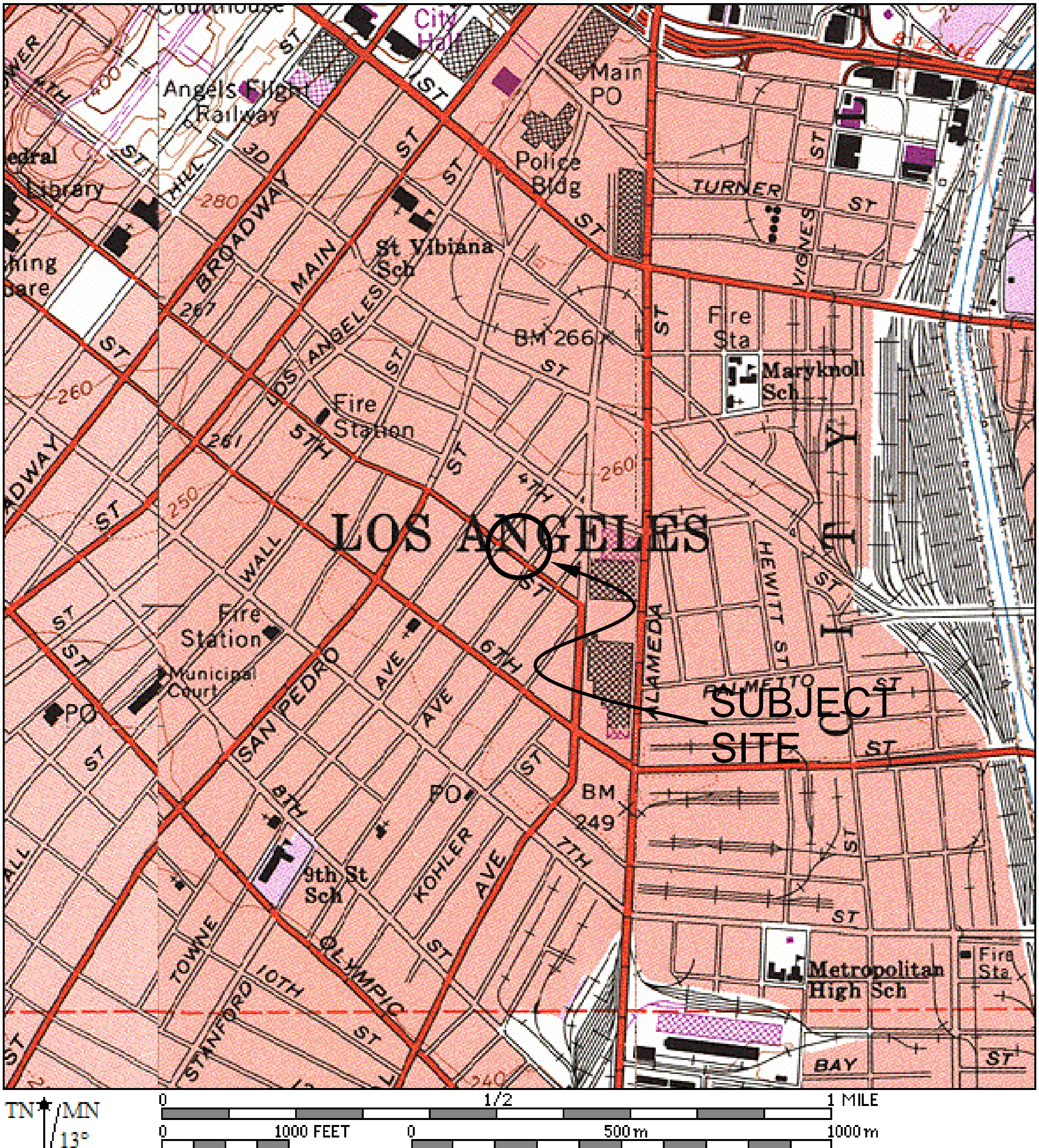

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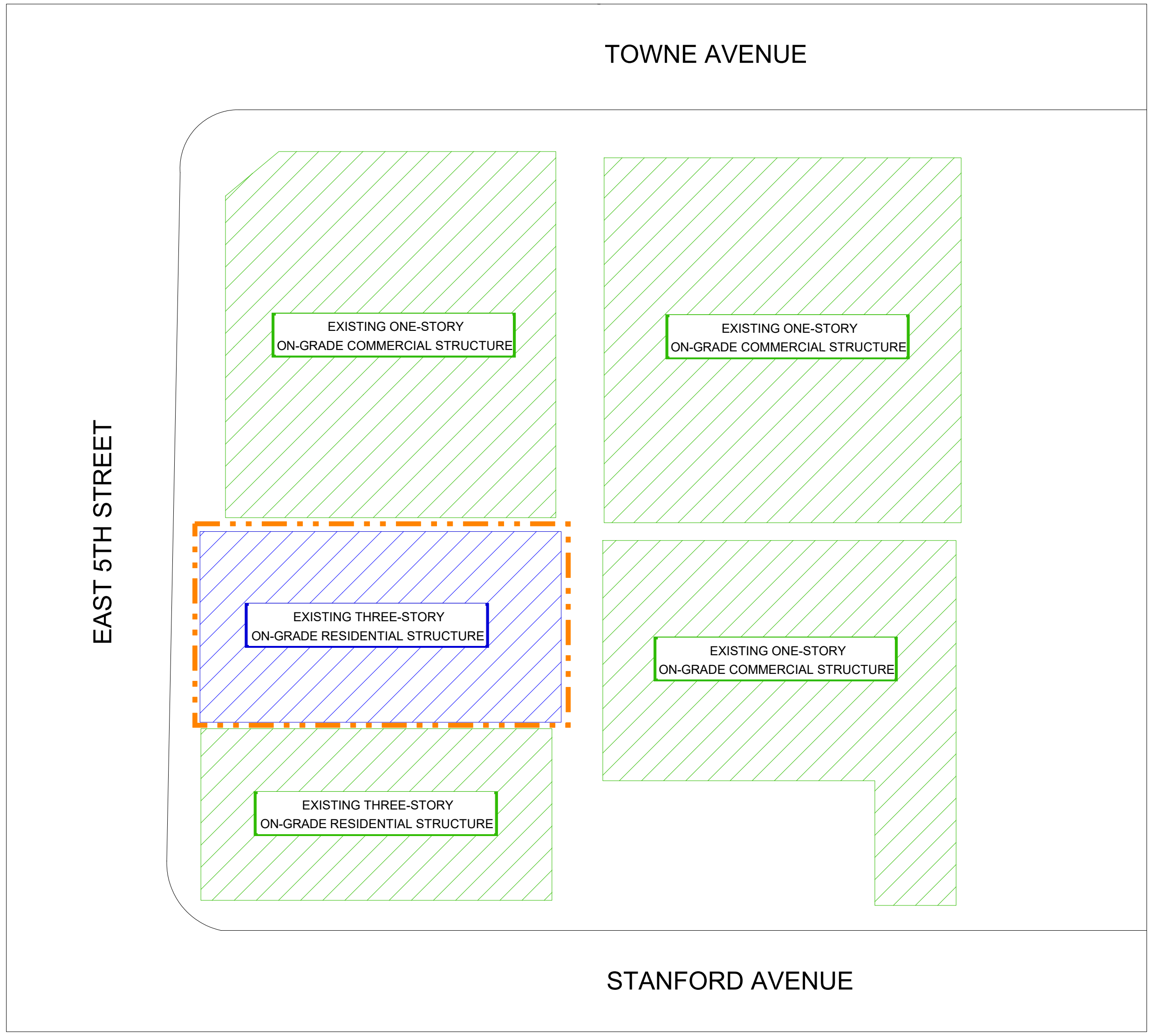
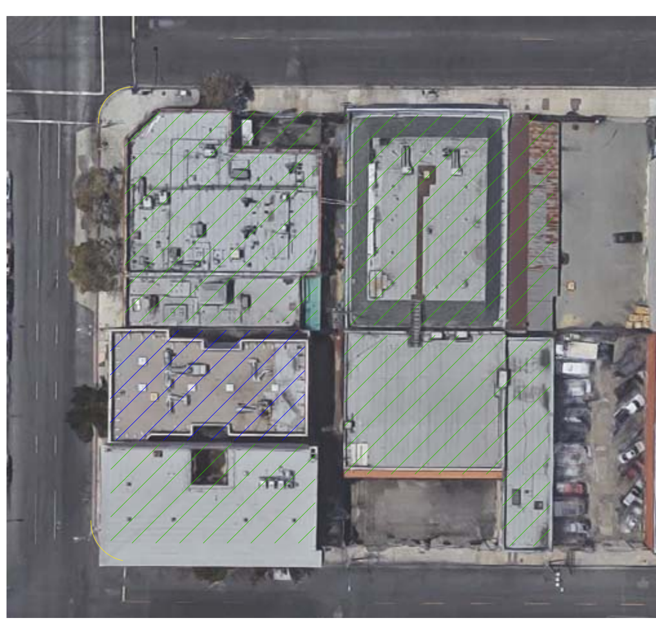
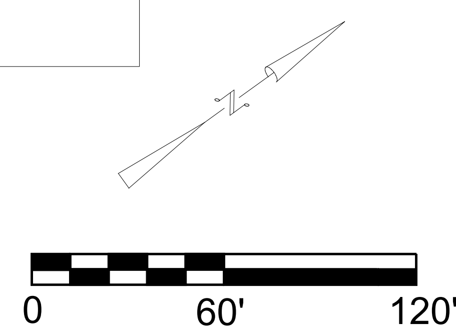
VICINITY MAP

713 5TH STREET LP
713 EAST 5TH STREET
LOS ANGELES, CALIFORNIA

NOV 2017 | PROJECT NO. A9674-06-01 | FIG. 1







GEOCON PROJECTS WITHIN 0.5 MILE RADIUS OF SUBJECT SITE

NO SCALE

LEGEND

- Property Line
- Location of Existing Offsite Structures
- Location of Existing Onsite Structures

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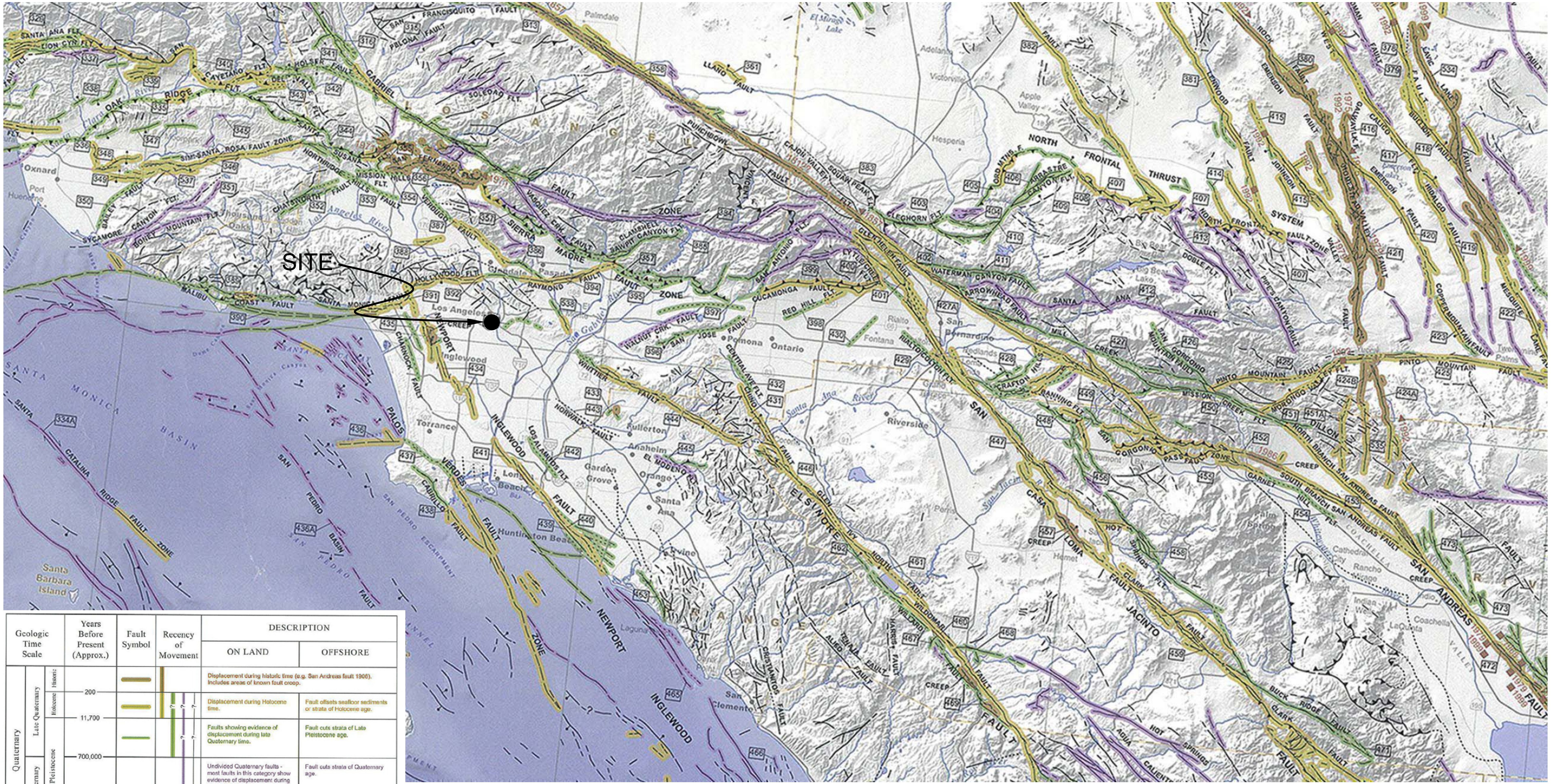
DRAFTED BY: SH	CHECKED BY: GAK/SFK

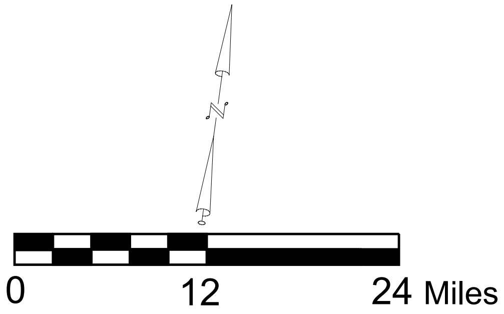
SITE PLAN		
713 5TH STREET LP 713 EAST 5TH STREET LOS ANGELES, CALIFORNIA		
NOV 2017	PROJECT NO. A9674-06-01	FIG. 2

Reference: Jennings, C.W. and Bryant, W. A., 2010, Fault Activity Map of California, California Geological Survey Geologic Data Map No. 6.



Geologic Time Scale			Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION ON LAND	DESCRIPTION OFFSHORE
Quaternary	Late Quaternary	Historic				Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
		Holocene	200			Displacement during Holocene time.	Fault offsets seafloor sediments or strata of Holocene age.
		Pleistocene	11,700			Faults showing evidence of displacement during late Quaternary time.	Fault cuts strata of Late Pleistocene age.
	Early Quaternary		700,000			Undivided Quaternary faults - most faults in this category show evidence of displacement during the last 1,600,000 years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age.	Fault cuts strata of Quaternary age.
Pre-Quaternary			1,600,000* – 4.5 billion (Age of Earth)			Faults without recognized Quaternary displacement or showing evidence of no displacement during Quaternary time. Not necessarily inactive.	Fault cuts strata of Pliocene or older age.

* Quaternary now recognized as extending to 2.6 Ma (Walker and Geissman, 2009). Quaternary faults in this map were established using the previous 1.6 Ma criterion.



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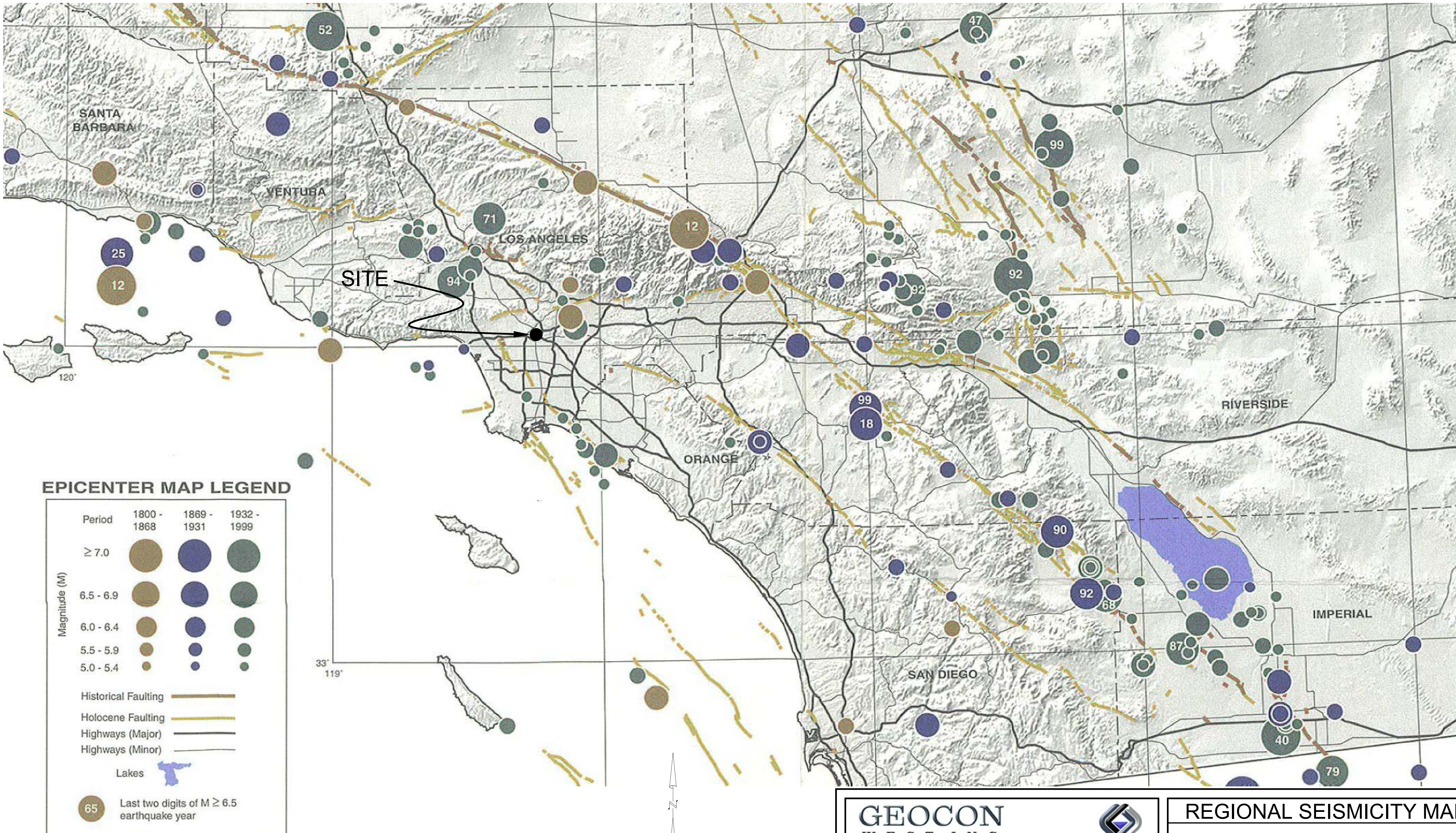
REGIONAL FAULT MAP

713 5TH STREET LP
713 EAST 5TH STREET
LOS ANGELES, CALIFORNIA

NOV 2017	PROJECT NO. A9674-06-01	FIG. 3



Reference: Toppozada, T., Branum, D., Petersen, M., Hallstrom, C., Cramer, C., and Reichle, M., 2000, Epicenters and Areas Damaged by M≥5 California Earthquakes, 1800 - 1999, California Geological Survey, Map Sheet 49.

N

0 20 40 Miles

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REGIONAL SEISMICITY MAP

713 5TH STREET LP
713 EAST 5TH STREET
LOS ANGELES, CALIFORNIA

NOV 2017 | PROJECT NO. A9674-06-01 | FIG. 4