October 16, 2023

Project No. 13521.009

CASC Engineering and Consulting, Inc.
1470 East Cooley Drive
Colton, California 92324

Attention: Ms. Mandi Needle
Project Coordinator

Subject: CEQA-Level Geologic and Geotechnical Peer Review
Proposed Industrial Building
17969 Railroad Street
City of Industry, California

In accordance with your request and authorization, Leighton Consulting, Inc. (Leighton) has conducted a geologic and geotechnical peer review of the Applicant's geotechnical report submitted in preparation of CEQA studies for construction of a new industrial building to be located at 17969 Railroad Street in the City of Industry, California. The Applicant's draft geotechnical report titled *Geotechnical Investigation Report, Proposed Industrial Building, 17969 Railroad Street, City of Industry, California,* dated June 13, 2023, was prepared by Southern California Geotechnical, Inc. (SCG). We have reviewed this report to assess its adequacy in addressing the geologic and geotechnical conditions for the project and comment where additional information should be provided.

In preparation of our peer review of this report, we also reviewed pertinent geotechnical and geologic maps and reports available online and in our in-house library to further study the site geologic and geotechnical conditions and discuss potential geologic and geotechnical impacts associated with the project in accordance with the California Environmental Quality Act (CEQA). We referenced the California Geological Survey's Guidelines for Geologic/Seismic Considerations in EIR's (CGS Note 46) during our work. Documents that you have provided for our review include:

- Southern California Geotechnical, 2023, *Geotechnical Investigation Report, Proposed Industrial Building, 17969 Railroad Street, City of Industry, California*, Project No. 23G157-1, dated June 13, 2023.

- RGA, Office of Architectural Design (Schematic Site Plan*), Industry Development, 17969 Railroad St. Industry, CA,* Project No. 23038.00, dated April 4, 2023.

Our work has included the following:

- Review site geology and potential geologic hazards based on information contained in the geotechnical investigation study by SCG (2023) and other public, readily available publications.

- Review of geotechnical characteristics of the subsurface earth materials based on data in the report by SCG (2023), and other public, readily available publications. to evaluate the potential impacts on the project.

- Review geotechnical findings, conclusion and recommendations for the project as presented in the report by SCG (2023).

- Preparation of this report presenting the results of our review, summarizing the geotechnical and geologic conditions and providing recommendations for additional studies where appropriate. We also discuss the potential impacts at the site and where appropriate, provide preliminary mitigation alternatives for potentially significant geologic hazards.

No subsurface exploration or laboratory testing were conducted as part of our work.

Site Conditions and Proposed Development

The proposed new industrial building is planned for 17969 Railroad Street in the City of Industry, California (see Figure 1, *Site Location Map*). The site is located northwest of Railroad Street and South Lawson Street in the City of Industry, California. Existing commercial buildings are present to the north and west.

Based on the site plan prepared by RGA, dated April 4, 2023 and our discussions with you, we understand the property is being considered for the construction of a 213,500 square-foot industrial building with office spaces and 27 dock-high doors. Ancillary

improvements include standard, compact, EV, and accessible parking stalls, drive aisles, associated flatwork, landscape, drainage, utility, and other associated improvements.

Geotechnical Report

Southern California Geotechnical, Inc. (SCG) conducted a geotechnical investigation of the site and reported their findings and recommendations in a draft report (SCG, 2023). SCG's study included excavating, logging, and sampling 5 hollow-stem auger borings reaching total depths ranging from approximately 20 to 50 feet below the ground surface (bgs) to evaluate the site subsurface soil conditions. SCG also conducted laboratory testing and engineering analysis to evaluate the site conditions. SCG concluded in their study that construction of the proposed industrial building is feasible from a geotechnical standpoint, provided that the recommendations presented in their report are incorporated and implemented during design and construction.

The approximate boring locations from SCG's geotechnical investigation are shown on Figure 2*, Geotechnical Map*.

Earth Units

The site has been regionally mapped (Dibblee and Ehrenspeck, 2001) to be underlain by Holocene-age Young Alluvial Fan Deposits (Qyf) consisting of alluvial gravel, sand and silt and wash deposits (see Figure 3*, Regional Geology Map*).

Based on their field work, SCG described the site as being underlain by artificial fill soils to a depth of approximately 5½ to 6½ feet below ground surface (bgs). Beneath the fill soils, SCG described the native alluvial soils as consisting of stiff to very stiff clays and clayey silts and medium dense to dense sands and silty sands.

Groundwater

SCG encounter groundwater during their 2023 field exploration in Borings B-1 through B-4 at depths ranging from 15 to 32± feet below the existing ground surface. SCG indicated that based on their review of historic groundwater from the California Geological Survey (CGS) Seismic Hazard Zones Report, CGS Open-File Report 97-17, for the La Habra 7.5-Minute Quadrangle, historically high groundwater depth was approximately 20± feet bgs.

Recent groundwater level data taken from the California Department of Water Resources, State Well Number: 02S10W10Q001S, shows a high groundwater level of 15 feet bgs from data taken in April 1993. Additionally, State Well Number: 02S10W13E001S, indicates a high groundwater level ranging from approximately 22 to 34 feet from measurements taken between 1990 and 2012.

GEOLOGIC AND SEISMIC HAZARDS

Fault-Induced Ground Rupture

The site has been mapped to be outside of any Earthquake Fault Zones as designated by the California Geological Survey (CGS, 2023). No known active faults have been mapped onsite nor trending toward the site. The Whittier-Elsinore fault has been mapped approximately 3.5 miles south of the site. The Whittier-Elsinore fault has demonstrated Holocene (<11,700 years) movement and is considered active (see Figure 4, *Regional Faults and Historical Seismicity Map*). Considering the site's location relative to mapped active faulting, the potential for fault-induced ground rupture is considered to be less low. SCG reported that the possibility of significant fault rupture is low at the site.

Seismic Ground Shaking

Figure 4, *Regional Faults and Historical Seismicity Map* depicts recorded historical regional seismic events (those that have been recorded since the mid-1700s) with respect to the site. Based on this map, it appears that the site has been exposed to relatively significant seismic events; however, this site does not appear to have experienced more severe seismicity than compared to much of southern California in general. We are unaware of documentation indicating that past earthquake damage in the site vicinity has been significantly worse than for the majority of southern California. In addition, we are unaware of damage in the site vicinity as the result of liquefaction, lateral spreading, or other related phenomenon. However, the hazard to the site posed by seismic shaking is considered high, due to the proximity of known active faults. Therefore, seismic ground shaking is a potentially significant impact.

There is no realistic way in which the hazard of seismic shaking can be totally avoided. However, the potential for future ground shaking at the site appears no greater than at many other sites in southern California. SCG provided seismic coefficients and spectral response acceleration values in accordance with the 2022 California Building Code,

including ASCE 7-16. Design in accordance with these standards is expected to reduce the impact of ground shaking to less than significant.

Liquefaction and Lateral Spreading

The California Geologic Survey has mapped the site to be within a liquefaction hazard Zone (CGS, 2023a; see Figure 5, *Seismic Hazards Map*). SCG encounter groundwater during their exploration to a depth ranging from 15 to 32 feet below the ground surface. Their liquefaction analysis was performed for Borings B-1 and B-4. However, the historically high groundwater level in a nearby monitoring well was to be 15 feet bgs, which was used in their liquefaction analysis. For SCG's analysis, an acceleration of 0.858g and a magnitude earthquake of 6.72 was used based on a hazard level of 2 percent probability of exceedance in 50 years. Based on their results, potentially liquefiable soils were identified within both borings. For boring B-1 potentially liquefiable strata was present at a depth of 42 to 47± feet, within boring B-4 it was encountered between depths of 15 to 17± feet. The total dynamic settlements due to liquefaction are expected to be on the order of ½ to 2½± inches. The resulting differential settlement is expected to be on the order of 1½± inches. Their estimated differential settlement was assumed to occur across a distance of 100 feet, indicating an angular distortion of approximately 0.002 inches per inch. Thus, SCG concluded that it is feasible to support the proposed structure on shallow foundations.

Leighton performed liquefaction analysis for SCG's borings B-1 through B-4 based on the parameters identified in their report. Based on our analysis we have identified potentially liquefiable layers within borings B-1, B-3, and B-4. For boring B-1 potentially liquefiable strata was present at a depth of 26 to 29 feet, and 41 to 46 feet, within boring B-3 it was encountered between depths of 21 to 25 feet, and within boring B-4 it was identified at a depth of 15 to 16 feet, and 21 to 26 feet bgs. Results from our analysis indicated a maximum estimated seismic settlement value of 2.2 inches. Based on the depth of the liquefiable layers identified with relation to the depth of the anticipated footings, it is unlikely that any hazards associated with liquefaction will be surficially manifested at the site to produce damage to the proposed structures. Thus, we are in agreement that the potential for liquefaction surface manifestations to occur at the site is low.

Liquefaction may also cause lateral spreading. For lateral spreading to occur, the liquefiable zone must be continuous, unconstrained laterally, and free to move along gently sloping ground toward an unconfined area. Based on the conditions presented in

SGC's 2023 report, hazards relating to lateral spreading appear to have a less than significant impact to this project.

Seismically Induced Landslides

The site has been mapped outside an earthquake-induced landslide zone according to the California Geological Survey CGS (see Figure 5, *Seismic Hazards Map*). In addition, the site and immediately surrounding area is relatively flat, with no evidence of past landslides. Thus, we agree with Langan's conclusion that the potential for landslides and slope instability onsite is very low.

Seismically Induced Settlement

SCG conducted analysis of the potential for seismically induced settlement at the site. Their results indicated seismically induced settlement of less than 2.5 inches, based on the design earthquake used in their analysis. We also performed analyses to estimate the potential for seismically induced settlement using the method of Tokimatsu and Seed (1987), and based on Martin and Lew (1999), considering the maximum considered earthquake (MCE) peak ground acceleration (PGAM), and utilizing SCG's subsurface data. Design/historic high groundwater levels of 15 feet below ground surface were used in the analysis. Based on our analysis, a potential for approximately 2.2 inches of seismic settlement is estimated at the site, which agrees with SCG's analysis. Based on the earthwork recommendations presented, the potential for seismic settlement is expected to be very low.

Flooding

The Federal Emergency Management Agency (FEMA, 2008) has mapped this site to be outside of any 100-year or 500-year flood zones (see Figure 6, *Flood Hazard Zone Map*).

Seismically Induced Flooding

Based on SCG's 2023 report it was concluded that the potential for seismically induced flooding is considered low. Earthquake-induced flooding can be caused by failure of dams or other water-retaining structures as a result of an earthquake. The site is not located within a dam breach inundation area as delineated by the California Department of Water Resources (CDWR, 2023). Considering that the site is located outside State delineated

dam inundation zones, the potential for inundation at the site from earthquake-induced dam failure is very low.

Seiches and Tsunamis

SCG indicated that the potential for seiche and tsunami hazards is considered low. The site has been found to be outside an area of seiche and tsunami hazards. A tsunami, or seismically generated sea wave, is generally created by a large, distant earthquake occurring near a deep ocean trough. A seiche is an earthquake-induced wave in a confined body of water, such as a lake or reservoir. Damage from tsunamis is confined to coastal areas that are 20 feet or less above sea level. Since the project is not located near the coast or any confined bodies of water, the risk of inundation from a tsunami or seiche has no impact. Additionally, The State of California has mapped the site outside of any tsunami hazard zones.

Slope Stability and Landslides

SCG indicated that the site should be safe from landslide hazards, provided that the recommendations within their 2023 report are implemented. Due to the relatively flat nature of the site, and the absence of mapped landslides in the area, the potential for landslides is very low.

Soil Expansion

SCG's laboratory testing of one selected soil (B-2) sample within the upper 5 feet bgs indicated soils with Expansion Index of 53. Based on laboratory testing results presented in SCG's report, onsite soils are expected to have medium expansion potential. Considering this, the impact posed by expansive soils is significant. SCG recommends that if these soils are to be used as backfill within the upper 5 feet of the site, they should be mixed with soils that have a lower expansion potential to reduce the risk of heaving and settlement of the pavement and other flatwork. Foundations, flatwork and paving should be constructed in consideration of the expansive nature of the soil. When so constructed, the potential for expansive soils to adversely impact the constructed improvements is low.

Sedimentation and Erosion

The native soils onsite, as well as fill slopes constructed with native soils, will have a high susceptibility to erosion. These materials will be particularly prone to erosion during site development, especially during heavy rains. Therefore, the impact of erosion at the site is potentially significant.

The potential for erosion can typically be reduced by appropriate paving of exposed ground surfaces, landscaping, and installing adequate storm drain systems.

Temporary erosion control measures should be provided during construction, as required by current grading codes. Such measures typically include temporary catchment basins and/or sandbagging to control runoff and contain sediment transport within the project site. Appropriate implementation of these erosion control measures is expected to reduce the potential for damaging impact from erosion to very low. Site drainage is addressed in section 6.4 of SCG's 2023 report.

Regional Subsidence

USGS (2023) has reported the site to be outside a zone of historical regional subsidence from groundwater pumping, peat loss, or oil extraction. We are not aware of any reports of regional subsidence that have been reported in the site vicinity, and a lack of intense removal of significant quantities of water, peat, or oil in the area makes the potential for ground subsidence very low and less than a significant impact. Langan has reported that there is low potential for subsidence at the site due to oil extraction.

Compressible Soils

SCG reports the site is underlain by undocumented artificial fill. Such soil can be compressible and prone to settlement. However, SCG recommends all undocumented fill be removed and the new building be underlain by a compacted fill. With these recommendations the potential for damage to structures associated with compressible soil is low.

Summary of Geologic and Seismic Hazard Review

The results of our geologic and seismic hazard review are summarized below.

GEOLOGIC AND SEISMIC HAZARDS	FINDINGS
• Fault rupture	Less than Significant Impact
• Seismic Ground Shaking	Less than Significant Impact with Mitigation
• Liquefaction	Less than Significant Impact
• Lateral Spreading	Less than Significant Impact
• Seismically Induced Landslides	Less than Significant Impact
• Seismically Induced Settlement	Less than Significant Impact
• Flooding	Less than Significant Impact
• Seismically Induced flooding	Less than Significant Impact
• Seiches and Tsunamis	No Impact
• Slope Stability and Landslides	Less than Significant Impact
• Soil Expansion	Less than Significant Impact with Mitigation
• Sedimentation and Erosion	Less than Significant Impact with Mitigation
• Regional Subsidence	Less than Significant Impact
• Compressible Soils	Less than Significant Impact with Mitigation

Conclusions and Recommendations

SCG (2023) provided geologic and geotechnical constraints related to the proposed development of a 213,500 square-foot industrial building with office spaces and associated improvements. They stated that development of the site is feasible from a geotechnical perspective, provided their recommendations are implemented. We agree, based on our review of the geotechnical data presented in their report. Based on our review of SCG's report and other publications, the most significant constraints at the site include the potential for strong seismic shaking and the presence of potentially compressible soils. These constraints are typical for the area.

Design and construction in accordance with the Los Angeles County Building Code and the recommendations contained in the SCG geotechnical report (2023) should provide the required mitigation for site development.

The geotechnical report should be finalized and technically reviewed in accordance with City of Industry procedures.

We appreciate the opportunity to provide our services for this review. If you have any questions, please contact this office at your convenience.

Respectfully submitted,

LEIGHTON CONSULTING, INC.

Steven G. Okubo, CEG 2706
Associate Geologist

Jason D. Hertzberg, GE 2711
Principal Engineer

Philip A. Buchiarelli, CEG 1715
Principal Geologist

JLP/SGO/JDH/PB/rsm
Attachments: References
Figure 1 - Site Location Map
Figure 2 - Geotechnical Map
Figure 3 - Regional Geology Map
Figure 4 - Regional Faults and Historic Seismicity Map
Figure 5 - Seismic Hazards Map
Figure 6 - Flood Hazard Zone Map
Appendix A - SCG Geotechnical Boring Logs
Appendix B - SCG Laboratory Test Results
Appendix C - SCG Seismic Design Parameters and Liquefaction Analysis (SCG and Leighton)
Distribution: (1) Addressee

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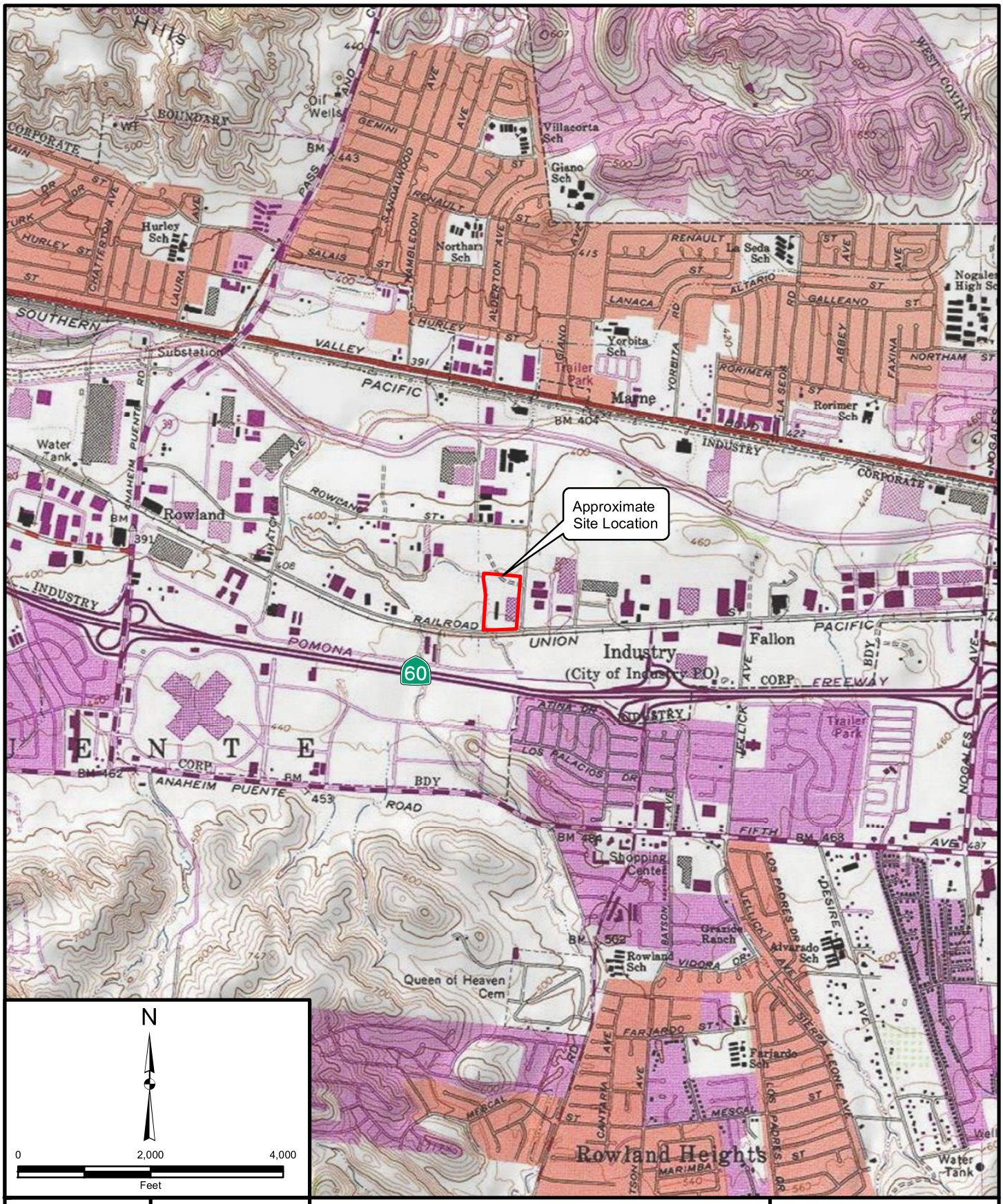

Project: 13521.009	Eng/Geol: JDH/SGO
Scale: 1 " = 2,000 '	Date: October 2023

Reference: Copyright:© 2013 National Geographic Society, i-cubed

SITE LOCATION MAP

Proposed Industrial Building
17969 Railroad Street
City of Industry, Los Angeles County, California

FIGURE 1

Leighton

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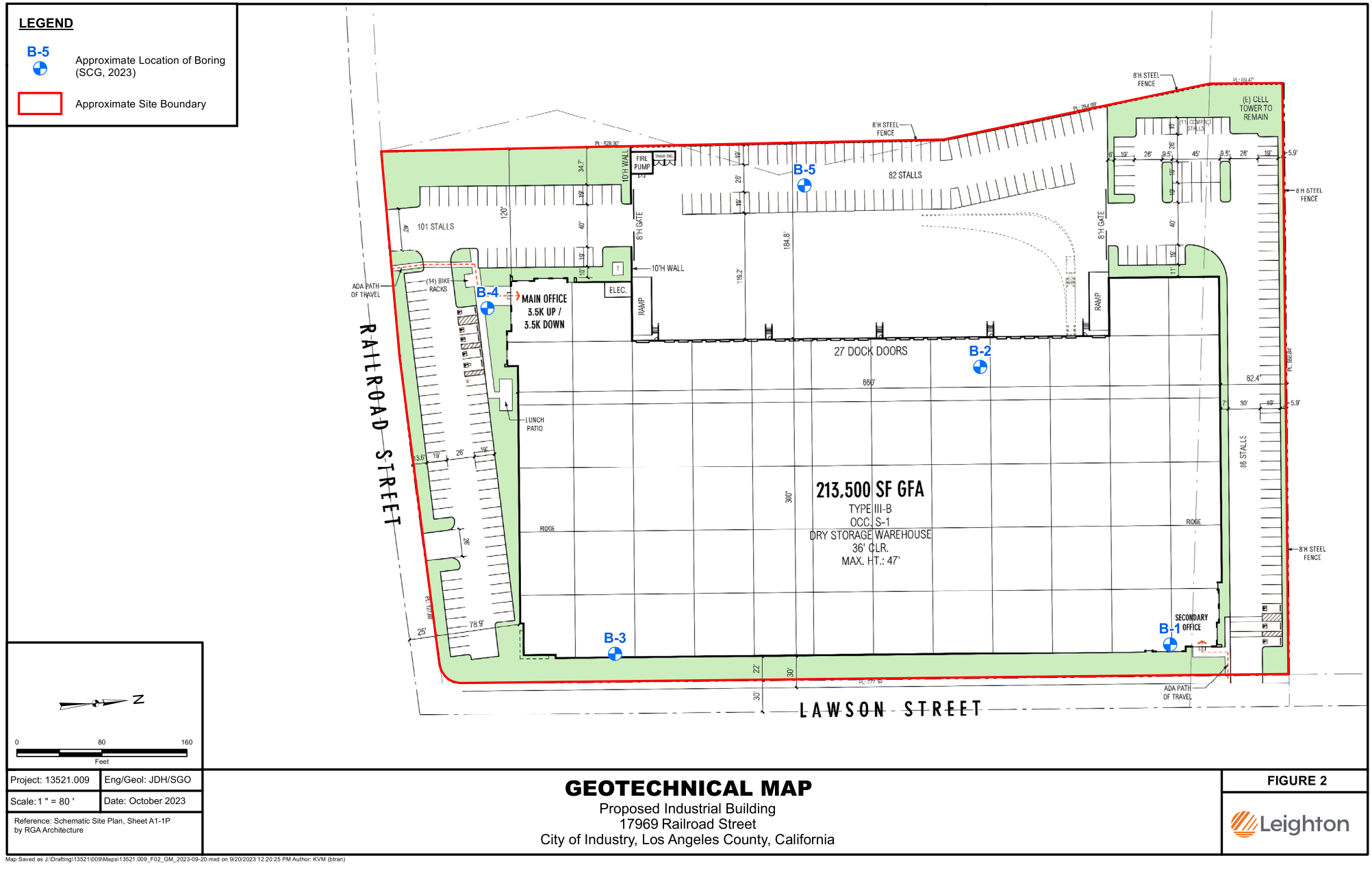

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Scale: 1 " = 80 '	Date: October 2023
Reference: Schematic Site Plan, Sheet A1-1P by RGA Architecture	

GEOTECHNICAL MAP

Proposed Industrial Building
17969 Railroad Street
City of Industry, Los Angeles County, California

FIGURE 2

Leighton

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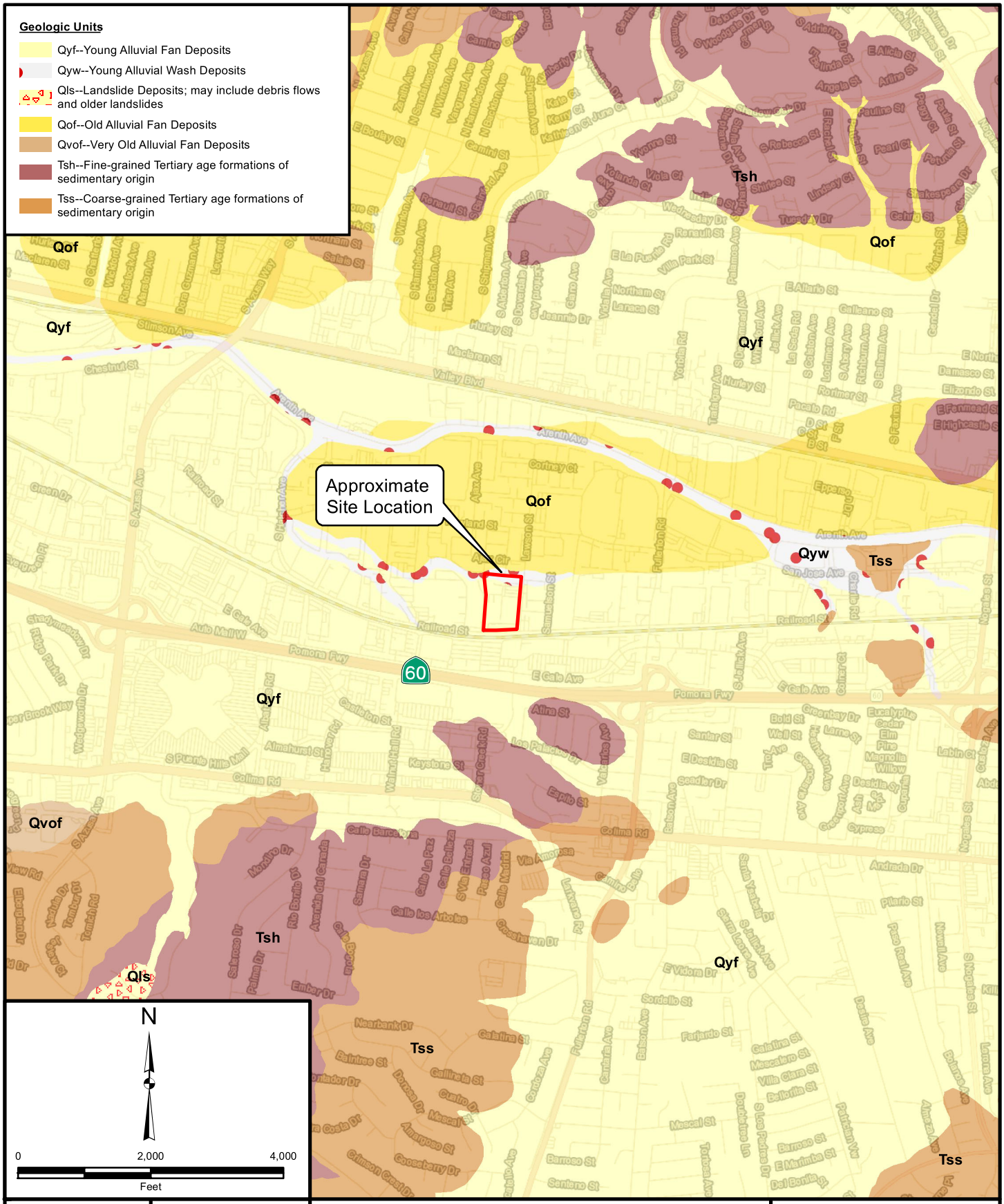

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Scale: 1 " = 2,000 '	Date: October 2023

Reference: Southern California USGS Geology in GIS Format served by California Geological Survey, 2018.

REGIONAL GEOLOGY MAP

Proposed Industrial Building
17969 Railroad Street
City of Industry, Los Angeles County, California

FIGURE 3

Leighton

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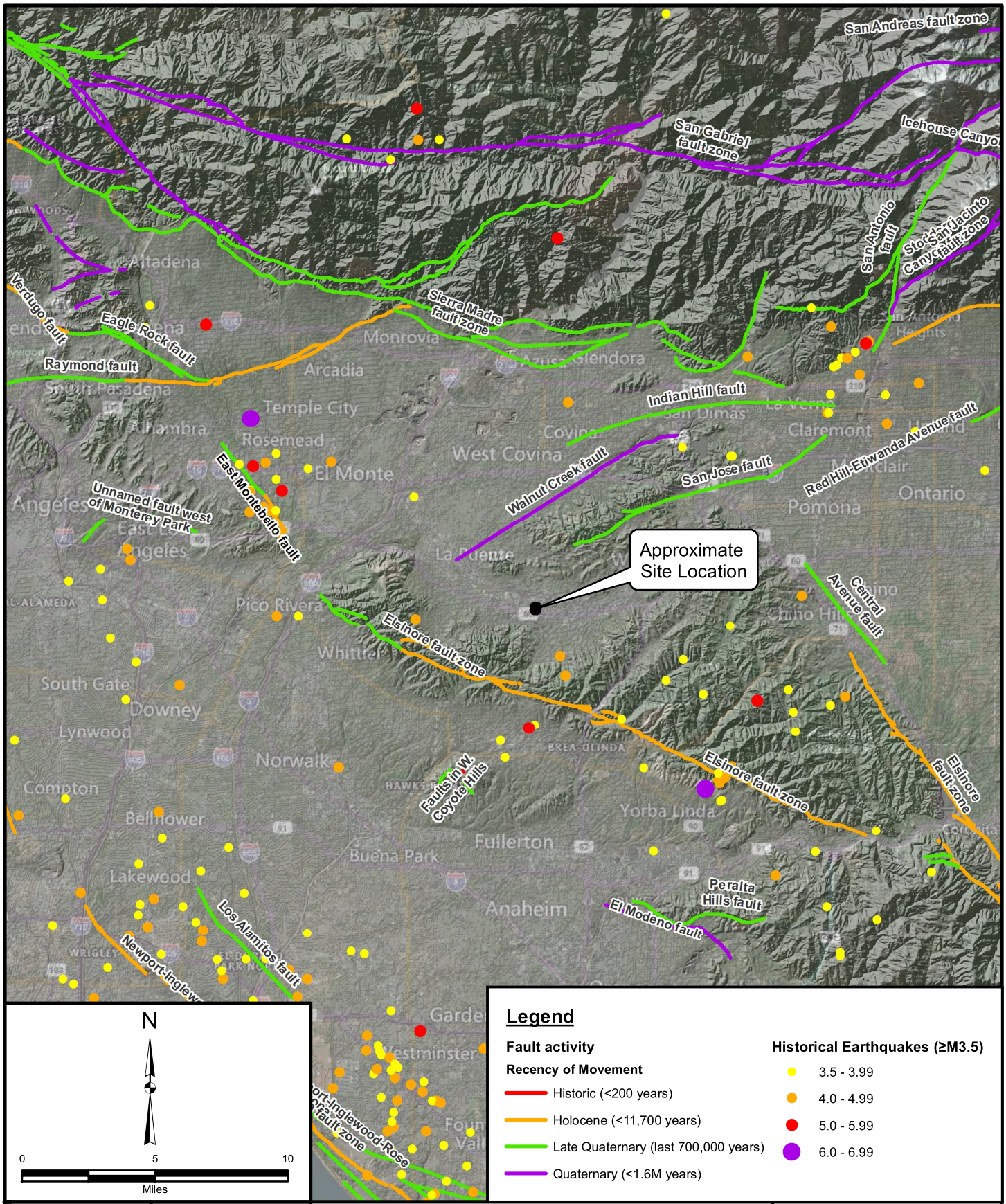

Legend

Fault activity

Recency of Movement

- Historic (<200 years)
- Holocene (<11,700 years)
- Late Quaternary (last 700,000 years)
- Quaternary (<1.6M years)

Historical Earthquakes (≥M3.5)

- 3.5 - 3.99
- 4.0 - 4.99
- 5.0 - 5.99
- 6.0 - 6.99

Project: 13521.009	Eng/Geol: JDH/SGO
Scale: 1 " = 5 miles	Date: October 2023

Basemap Reference: © 2023 Microsoft Corporation Earthstar Geographics SIO © 2023 TomTom
Seismicity Data Reference: maps.conservation.ca.gov

REGIONAL FAULTS AND HISTORIC SEISMICITY MAP

Proposed Industrial Building
17969 Railroad Street
City of Industry, Los Angeles County, California

FIGURE 4

Leighton

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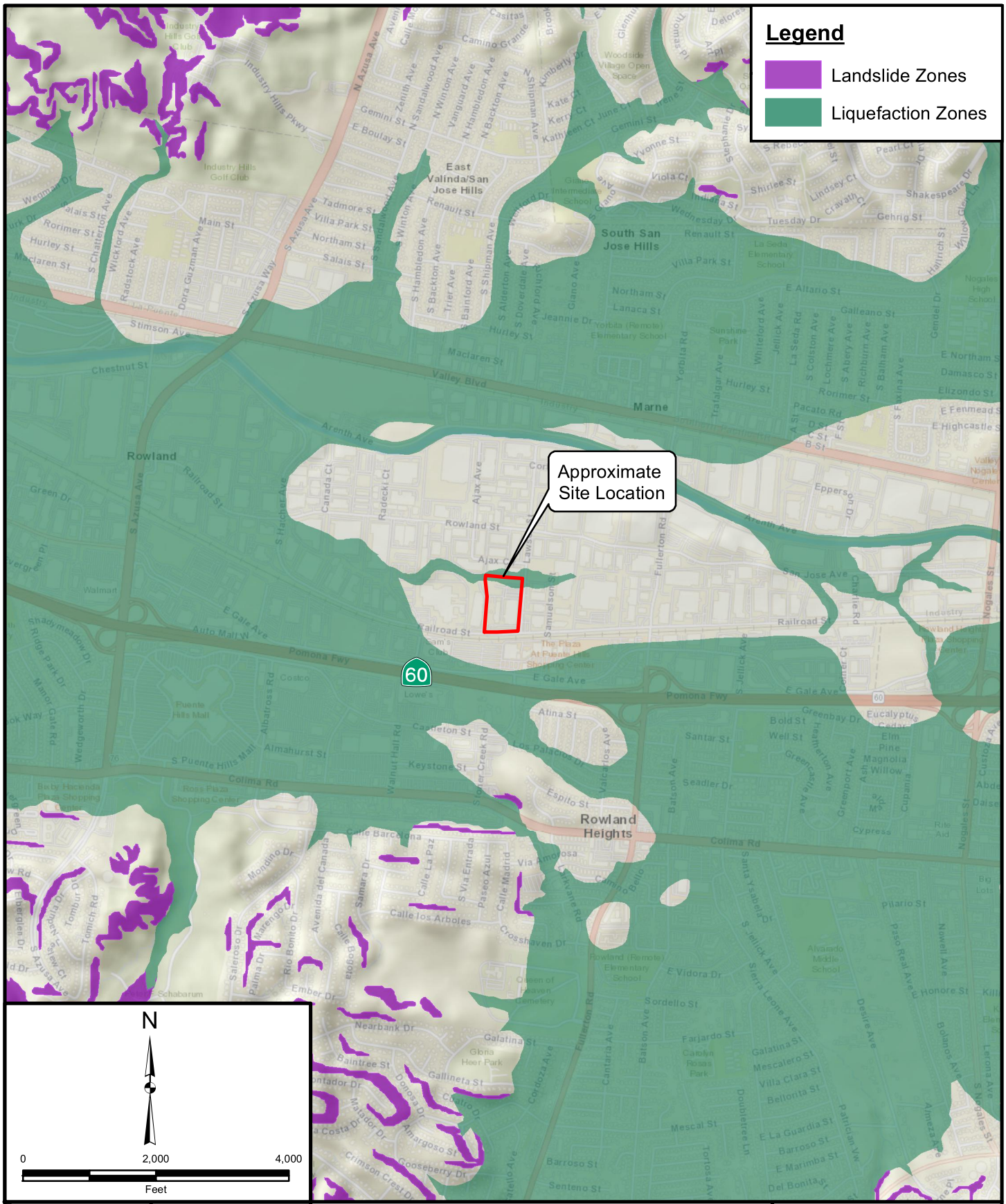

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Seismic Hazards Program, California Geological Survey, California

SEISMIC HAZARDS MAP

Proposed Industrial Building
17969 Railroad Street
City of Industry, Los Angeles County, California

FIGURE 5

Leighton

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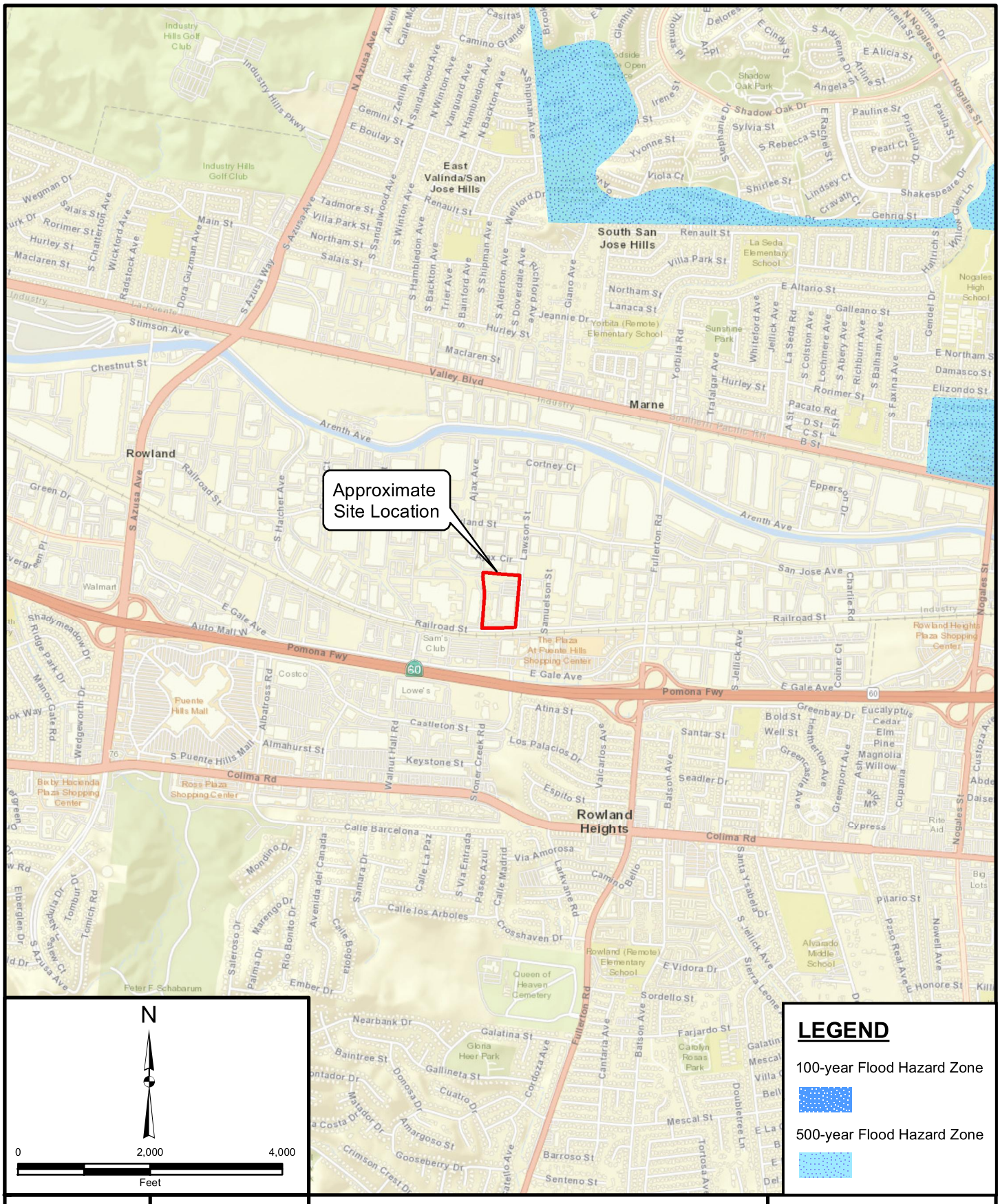

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Scale: 1 " = 2,000 '	Date: October 2023

Reference: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
FEMA (http://www.fema.gov/index.shtm), DWR (http://www.dwr.ca.gov)

FLOOD HAZARD ZONE MAP

Proposed Industrial Building
17969 Railroad Street
City of Industry, Los Angeles County, California

FIGURE 6

Leighton

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APPENDIX A

SCG GEOTECHNICAL BORING LOGS

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-1

JOB NO.: 23G157-1
PROJECT: Proposed Industrial Building
LOCATION: City of Industry, California

DRILLING DATE: 5/17/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: 15 feet
CAVE DEPTH: 22 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					ASPHALT: 3±-inches Asphaltic Concrete with no discernible Aggregate Base							
		11	2.0		FILL: Dark Brown Silty Clay, trace to little fine Sand, trace AC fragments, trace medium to coarse sand, stiff-moist		14					
		8	1.0		@ 3½ feet, no AC, no medium to coarse Sand		14					
5												
		12	2.0		ALLUVIUM: Brown Clayey Silt, trace fine Sand, stiff to very stiff-moist to very moist		14					
		15	2.5				21					
10												
		22			Brown fine to medium Sand, trace coarse Sand, trace fine Gravel, medium dense-very moist to wet		9					
15												
		33			Brown fine to coarse Sand, trace to little fine Gravel, little Silt, dense-wet		10					
20												
		31			@ 23½ feet, trace Clay		8					
25												
		20					13			10		
30					Dark Brown fine Sandy Clay, little Silt, little Iron Oxide staining, very stiff-wet		20			57		
		18					24	28	20	59		

TBL 23G157-1.GPJ SOCALGEO.GDT 6/13/23

TEST BORING LOG

PLATE B-1a

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-1

JOB NO.: 23G157-1
PROJECT: Proposed Industrial Building
LOCATION: City of Industry, California

DRILLING DATE: 5/17/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: 15 feet
CAVE DEPTH: 22 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION (Continued)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					Dark Brown fine Sandy Clay, little Silt, little Iron Oxide staining, very stiff-wet							
					Brown Silty fine Sand, trace medium to coarse Sand, trace fine to coarse Gravel, trace Iron Oxide staining, dense-wet							
40		41					17					
					Brown Silty fine to medium Sand, little Silt, trace fine Gravel, loose to dense-wet							
45		9					19			3		
		32					18					
50					Boring Terminated at 50'							

TBL 23G157-1.GPJ SOCALGEO.GDT 6/13/23

TEST BORING LOG

PLATE B-1b

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-2

JOB NO.: 23G157-1
PROJECT: Proposed Industrial Building
LOCATION: City of Industry, California

DRILLING DATE: 5/17/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: 20 feet
CAVE DEPTH: 22 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					ASPHALT: 3±-inches Asphaltic Concrete with 4±-inches Aggregate Base							
		24	2.0		FILL: Dark Brown Silty Clay, little to some fine Sand, mottled, trace AC fragments, very stiff-very moist	103	19					EI = 53 @ 0-5 feet
		10	1.0		FILL: Gray Brown to Black Clayey Silt, little Iron Oxide staining, medium stiff-very moist	89	29					
5		11	2.5		FILL: Dark Brown Silty Clay, trace Iron Oxide staining, mottled, medium stiff-very moist	93	27					
		17	4.0		ALLUVIUM: Brown Silty Clay, stiff to very stiff-very moist	103	21					
10		22	4.5		@ 9 feet, trace Calcareous veining	101	21					
15		14	1.5		@ 13½ feet, trace fine Gravel, little fine Sand		17					
		16			Brown Silty fine Sand, medium dense-very moist to wet		23					
20												
		41			Brown Silty fine to medium Sand, trace coarse Sand, trace to little Clay, dense-very moist to wet		18					
25					Boring Terminated at 25'							

TBL 23G157-1.GPJ SOCALGEO.GDT 6/13/23

TEST BORING LOG

PLATE B-2

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-3

JOB NO.: 23G157-1
PROJECT: Proposed Industrial Building
LOCATION: City of Industry, California

DRILLING DATE: 5/17/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: 22 feet
CAVE DEPTH: 20 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					ASPHALT: 2±-inches Asphaltic Concrete with no discernible Aggregate Base							
		11	2.5		FILL: Dark Brown Silty Clay, trace AC fragments, trace fine Sand, very stiff-very moist	105	14					
		13	3.5		@ 3 feet, no AC fragments, stiff	106 115	20 17					
5		17	4.5			110	17					
		13			ALLUVIUM: Brown Silty fine Sand, trace Clay, trace medium Sand, loose to medium dense-damp to very moist	103	14					
		14			@ 9 feet, trace medium to coarse Sand, trace fine Gravel	110	8					
10												
		17					18					
15												
					Brown Silty Clay, little to some fine Sand, stiff-very moist to wet							
		14	1.5				22					
20												
		12	2.5		@ 23½ feet, trace to little fine Sand		18					
25												
					Boring Terminated at 25'							

TBL 23G157-1.GPJ SOCALGEO.GDT 6/13/23

TEST BORING LOG **PLATE B-3**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-4

JOB NO.: 23G157-1
PROJECT: Proposed Industrial Building
LOCATION: City of Industry, California

DRILLING DATE: 5/17/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: 32 feet
CAVE DEPTH: 47 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					ASPHALT: 3±-inches Asphaltic Concrete with 4±-inches Aggregate Base							
		6			FILL: Dark Brown Clayey Silt, trace Iron Oxide staining, mottled, medium stiff-moist to very moist		16					
		7	2.5		FiLL: Dark Brown Silty Clay, little to some fine Sand, trace medium to coarse Sand, mottled, medium stiff-moist		13					
5												
		10	4.5		ALLUVIUM: Dark Brown Silty Clay, trace Calcareous veining, stiff to very stiff-moist		14					
		11	4.5				13					
10												
		11			Brown fine Sandy Silt, trace medium Sand, medium dense-very moist		16			58		
15												
		16	2.5		Brown fine Sandy Clay, little Silt, stiff to very stiff-very moist to wet		22	46	14	69		
20												
		15	3.0		@ 23½ feet, little Iron Oxide staining		21			60		
25												
		27	2.5				19					
30												
		24	3.0		@ 33½ feet, trace medium Sand		22					

TBL 23G157-1.GPJ SOCALGEO.GDT 6/13/23

TEST BORING LOG **PLATE B-4a**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-4

JOB NO.: 23G157-1
PROJECT: Proposed Industrial Building
LOCATION: City of Industry, California

DRILLING DATE: 5/17/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: 32 feet
CAVE DEPTH: 47 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION (Continued)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					Brown fine Sandy Clay, little Silt, stiff to very stiff-very moist to wet							
					Gray Brown Clayey fine Sand to fine Sandy Clay, little Silt, very stiff-wet							
		17	4.0				18	51	15	46		
40												
		20	3.0		@ 43½ feet, trace Iron Oxide staining		17			56		
45												
					Gray Brown Clayey fine Sand, little Silt, trace Calcareous veining, little Iron Oxide staining, medium dense-wet							
		26					15	33	13	34		
50					Boring Terminated at 50'							

TBL 23G157-1.GPJ SOCALGEO.GDT 6/13/23

TEST BORING LOG

PLATE B-4b

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-5

JOB NO.: 23G157-1
PROJECT: Proposed Industrial Building
LOCATION: City of Industry, California

DRILLING DATE: 5/17/23
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 9 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
		6	4.0		FILL:Dark Brown Silty Clay, medium stiff to very stiff-very moist		17					
		5	1.0				20					
5		11	4.5		ALLUVIUM: Dark Brown Silty Clay, trace Iron Oxide staining, trace Calcareous veining, stiff to very stiff-very moist		20					
		16	3.0		@ 8½ feet, no Iron Oxide staining, trace fine root fibers		18					
10												
		13			Brown Silty fine Sand to fine Sandy Silt, medium dense-very moist		16					
15												
		14	2.5		Dark Brown fine Sandy Clay, stiff-moist		14					
20					Boring Terminated at 20'							

TBL 23G157-1.GPJ SOCALGEO.GDT 6/13/23

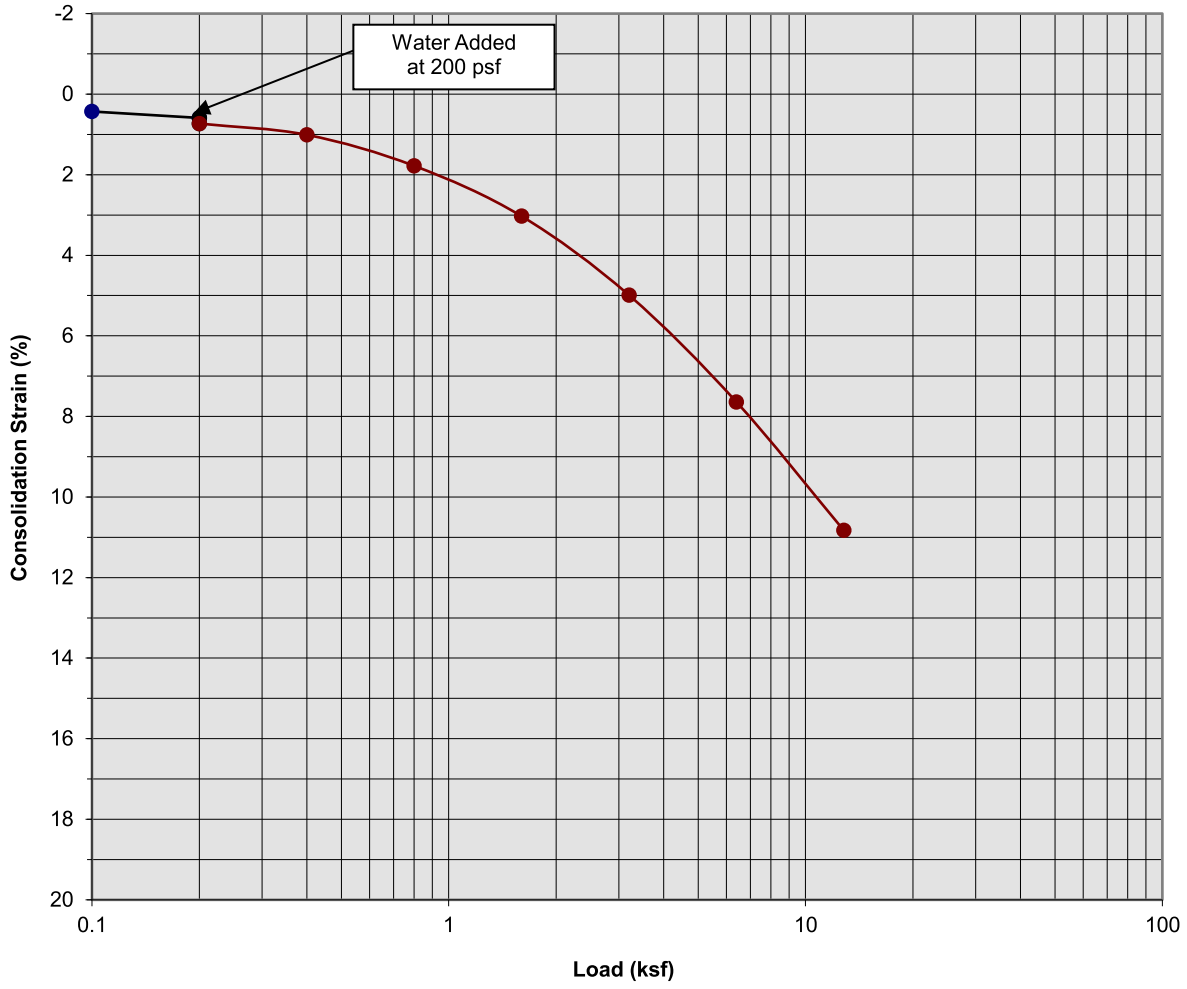
TEST BORING LOG

PLATE B-5

APPENDIX B

SCG LABORATORY TEST RESULTS

Consolidation/Collapse Test Results



Classification: FILL: Dark Brown Silty Clay, trace fine Sand

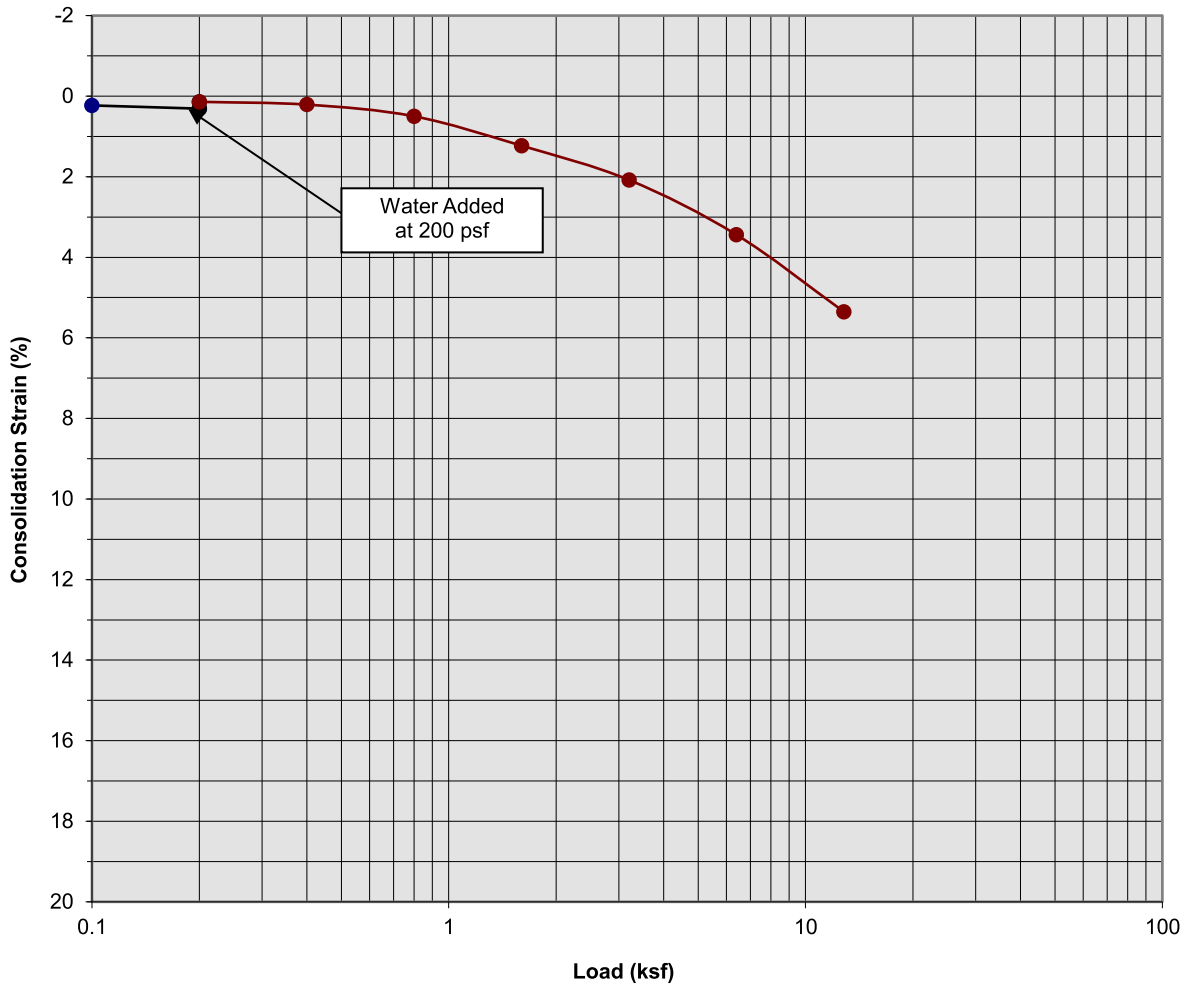
Boring Number:	B-3	Initial Moisture Content (%)	17
Sample Number:	---	Final Moisture Content (%)	18
Depth (ft)	3.5 to 4	Initial Dry Density (pcf)	115.4
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	128.5
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.14

Proposed Industrial Building
City of Industry, California
Project No. 23G157-1

PLATE C- 1

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



Classification: FILL: Dark Brown Silty Clay, trace fine sand

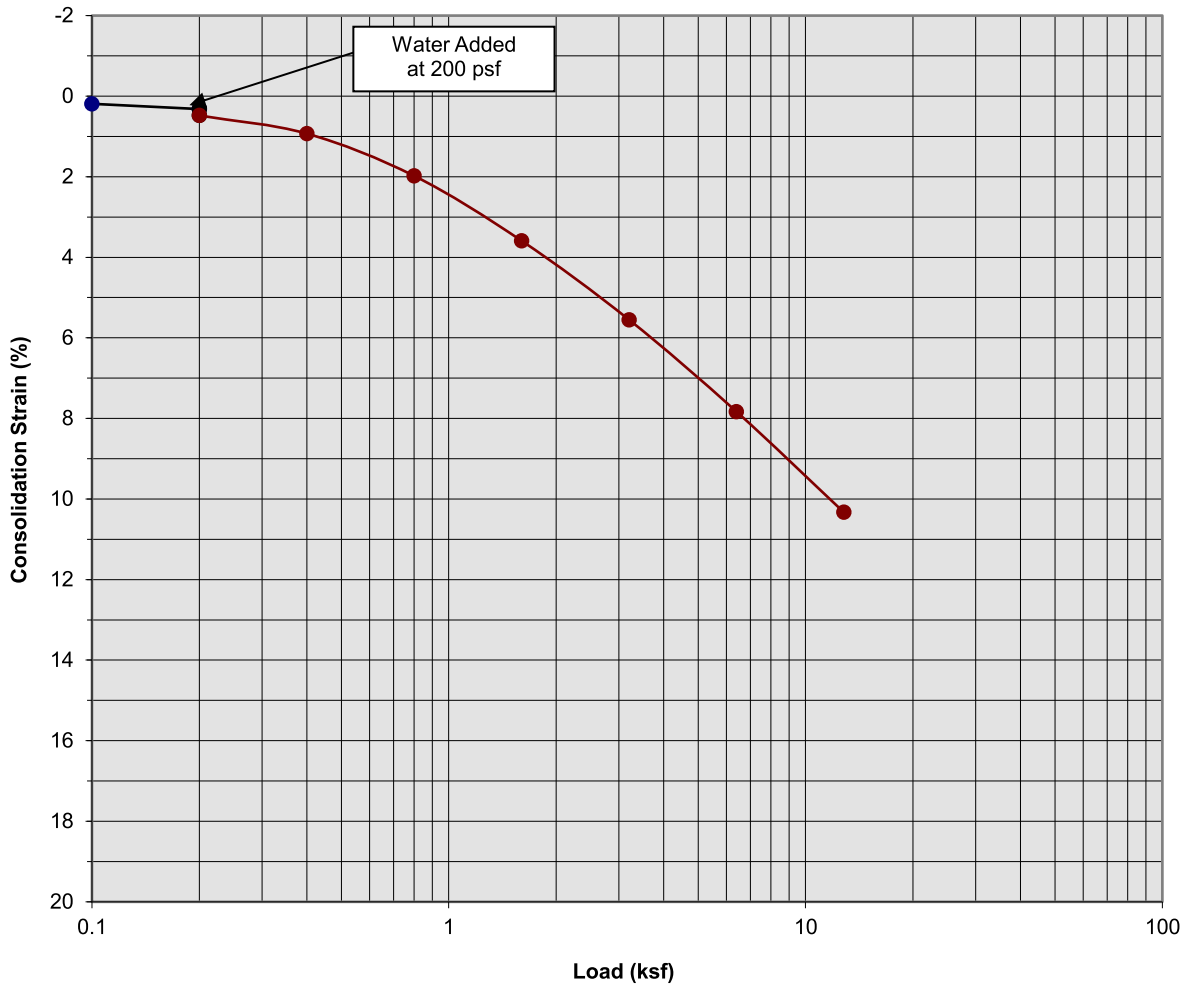
Boring Number:	B-3	Initial Moisture Content (%)	17
Sample Number:	---	Final Moisture Content (%)	18
Depth (ft)	5 to 6	Initial Dry Density (pcf)	110.6
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	116.1
Specimen Thickness (in)	1.0	Percent Collapse (%)	-0.17

Proposed Industrial Building
City of Industry, California
Project No. 23G157-1

PLATE C- 2

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



Classification: Brown Silty fine Sand, trace medium Sand, trace Clay

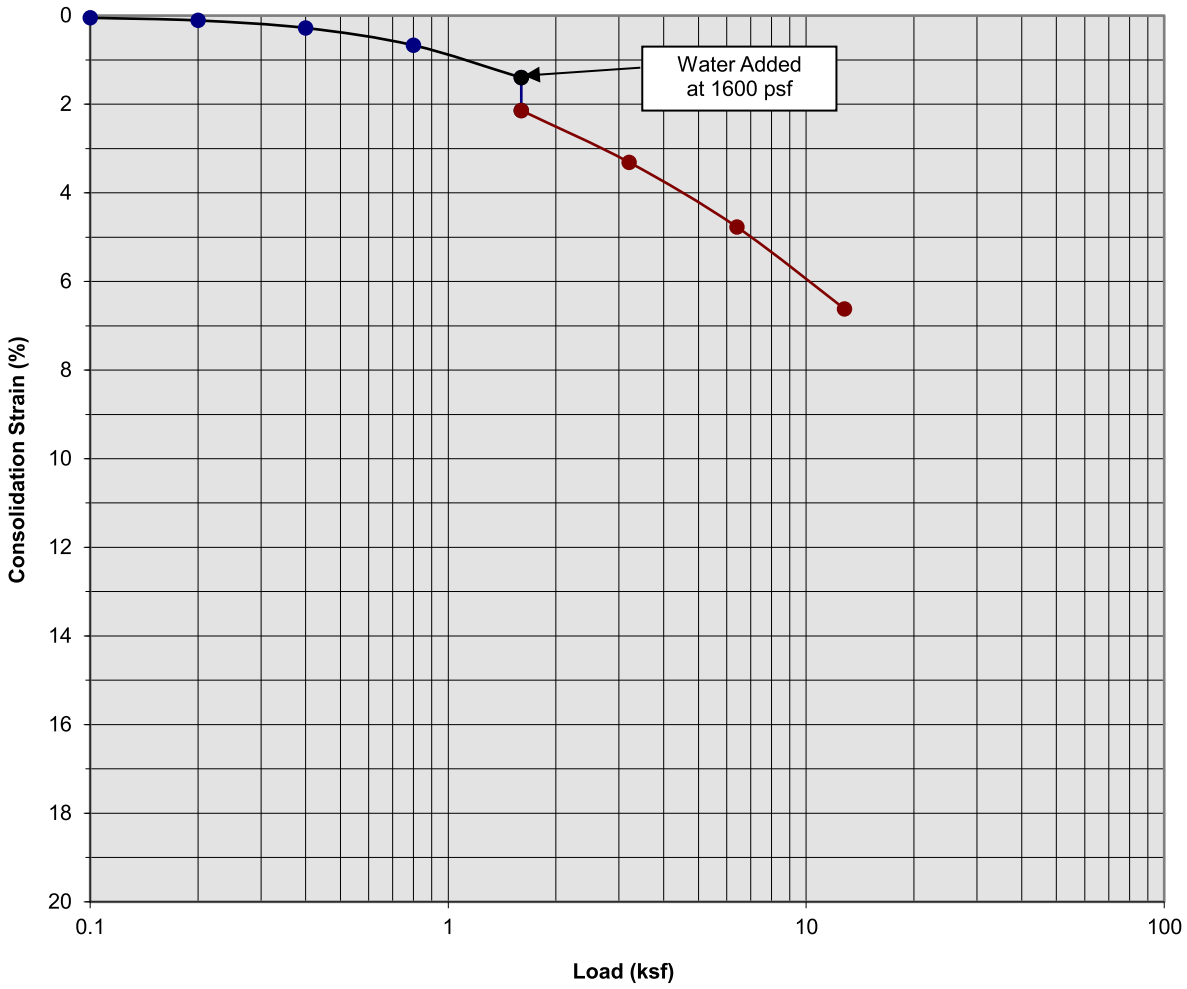
Boring Number:	B-3	Initial Moisture Content (%)	14
Sample Number:	---	Final Moisture Content (%)	17
Depth (ft)	7 to 8	Initial Dry Density (pcf)	103.2
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	115.7
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.16

Proposed Industrial Building
City of Industry, California
Project No. 23G157-1

PLATE C- 3

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



Classification: Brown Silty fine Sand, trace medium to coarse Sand, trace Clay

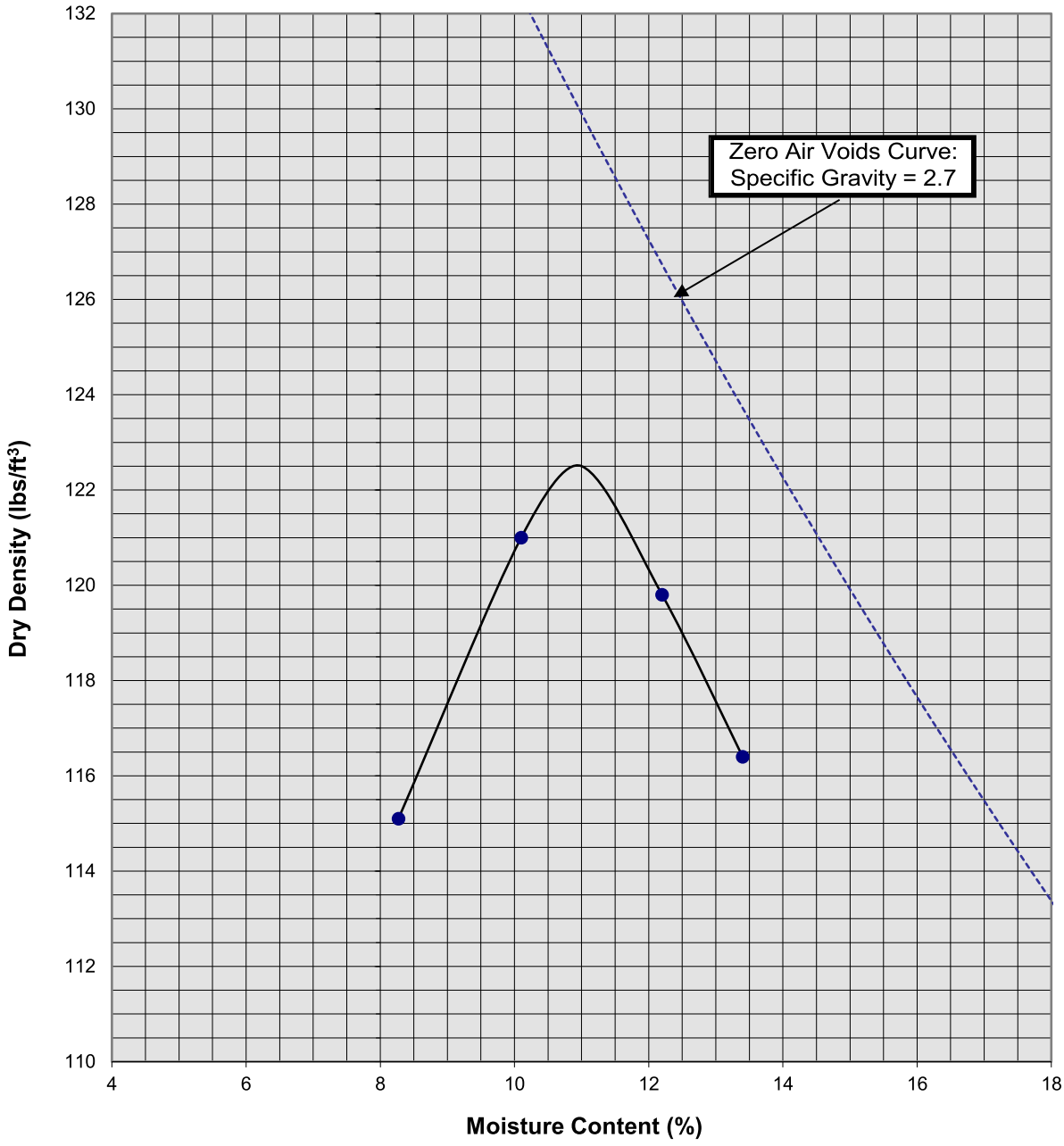
Boring Number:	B-3	Initial Moisture Content (%)	8
Sample Number:	---	Final Moisture Content (%)	17
Depth (ft)	9 to 10	Initial Dry Density (pcf)	110.6
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	117.5
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.74

Proposed Industrial Building
City of Industry, California
Project No. 23G157-1

PLATE C- 4

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Moisture/Density Relationship
ASTM D-1557



Soil ID Number	B-2 @ 0-5'
Optimum Moisture (%)	11
Maximum Dry Density (pcf)	122.5
Soil Classification	Dark Gray Brown Silty Clay, trace fine to medium Sand

Proposed Industrial Building
City of Industry, California
Project No. 23G157-1

PLATE C-5

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

APPENDIX C

SCG SEISMIC DESIGN PARAMETERS AND LIQUEFACTION ANALYSIS
(SCG AND LEIGHTON)

Latitude, Longitude: 33.997104, -117.912656

Date	6/8/2023, 3:53:12 PM
Design Code Reference Document	ASCE7-16
Risk Category	III
Site Class	D - Stiff Soil

Type	Value	Description
S_S	1.815	MCE_R ground motion. (for 0.2 second period)
S_1	0.64	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.815	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.21	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.78	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.858	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.815	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	2.01	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	2.321	Factored deterministic acceleration value. (0.2 second)
S1RT	0.64	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.708	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.824	Factored deterministic acceleration value. (1.0 second)
PGAd	0.933	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	0.78	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.903	Mapped value of the risk coefficient at short periods

SOURCE: SEAOC/OSHPD Seismic Design Maps Tool
<https://seismicmaps.org/>

SEISMIC DESIGN PARAMETERS - 2022 CBC
PROPOSED INDUSTRIAL BUILDING
CITY OF INDUSTRY, CALIFORNIA

DRAWN: JAH
CHKD: GKM
SCG PROJECT 23G157-1
PLATE E-1

SOUTHERN CALIFORNIA GEOTECHNICAL

LIQUEFACTION INDUCED SETTLEMENTS

Project Name	Proposed Industrial Building
Project Location	City of Industry, California
Project Number	23G157-1
Engineer	JLL

Boring No. B-1

Sample Depth (ft)	Depth to Top of Layer (ft)	Depth to Bottom of Layer (ft)	Depth to Midpoint (ft)	$(N_1)_{60}$	DN for fines cont	$(N_1)_{60\text{-}CS}$	Liquefaction Factor of Safety	Limiting Shear Strain γ_{min}	Parameter Fα	Maximum Shear Strain γ_{max}	Height of Layer		Vertical Reconsolidation Strain ε_v		Total Deformation of Layer (in)	Comments
				(1)	(2)	(3)	(4)	(5)	(6)	(7)			(8)			
14.5	0	15	7.5	42.3	0.0	42.3	N/A	0.01	-0.98	0.00	15.00		0.000		0.00	Above Water Table
14.5	15	17	16	34.6	0.0	34.6	2.63	0.02	-0.41	0.00	2.00		0.000		0.00	Nonliquefiable
19.5	17	22	19.5	55.9	0.0	55.9	3.42	0.00	-2.08	0.00	5.00		0.000		0.00	Nonliquefiable
24.5	22	27	24.5	51.0	0.0	51.0	3.20	0.00	-1.67	0.00	5.00		0.000		0.00	Nonliquefiable
29.5	27	29.5	28.25	31.6	1.1	32.7	1.43	0.03	-0.27	0.00	2.50		0.000		0.00	Nonliquefiable
29.5	29.5	32	30.75	31.2	5.6	36.8	3.07	0.02	-0.56	0.00	2.50		0.000		0.00	Nonliquefiable
34.5	32	37	34.5	28.3	5.6	33.9	1.66	0.03	-0.36	0.00	5.00		0.000		0.00	Nonliquefiable
39.5	37	42	39.5	68.4	0.0	68.4	3.02	0.00	-3.15	0.00	5.00		0.000		0.00	Nonliquefiable
44.5	42	47	44.5	10.3	0.0	10.3	0.18	0.46	0.91	0.46	5.00		0.037		2.20	**Liquefiable**
47	49.5	50	48.5	49.5	0.0	49.5	3.07	0.00	-1.54	0.00	0.50		0.000		0.00	Nonliquefiable
											Total Deformation (in)				2.20	

Notes:

(1) $(N_1)_{60}$ calculated previously for the individual layer

(2) Correction for fines content per Equation 76 (Boulanger and Idriss, 2008)

(3) Corrected $(N_1)_{60}$ for fines content

(4) Factor of Safety against Liquefaction, calculated previously for the individual layer

(5) Calcuated by Eq. 86 (Boulanger and Idriss, 2008)

(6) Calcuated by Eq. 89 (Boulanger and Idriss, 2008)

(7) Calcuated by Eqs. 90, 91, and 92 (Boulanger and Idriss, 2008)

(8) Volumetric Strain Induced in a Liquefiable Layer, Calcuated by Eq. 96 (Boulanger and Idriss, 2008)
(Strain N/A if Factor of Safety against Liquefaction > 1.3)

LIQUEFACTION INDUCED SETTLEMENTS

Project Name	Proposed Industrial Building
Project Location	City of Industry, California
Project Number	23G157-1
Engineer	JLL

Boring No. B-4

Sample Depth (ft)	Depth to Top of Layer (ft)	Depth to Bottom of Layer (ft)	Depth to Midpoint (ft)	$(N_1)_{60}$	DN for fines cont	$(N_1)_{60\text{-}CS}$	Liquefaction Factor of Safety	Limiting Shear Strain γ_{min}	Parameter Fα	Maximum Shear Strain γ_{max}	Height of Layer		Vertical Reconsolidation Strain ε_v		Total Deformation of Layer (in)	Comments
				(1)	(2)	(3)	(4)	(5)	(6)	(7)			(8)			
14.5	0	15	7.5	22.4	0.0	22.4	N/A	0.12	0.39	0.00	15.00		0.000		0.00	Above Water Table
14.5	15	17	16	15.4	5.6	21.0	0.47	0.14	0.47	0.14	2.00		0.022		0.53	**Liquefiable**
19.5	17	22	19.5	25.0	5.6	30.6	N/A	0.04	-0.13	0.00	5.00		0.000		0.00	Non-Liq: PI>18
24.5	22	27	24.5	20.6	5.6	26.2	N/A	0.08	0.16	0.00	5.00		0.000		0.00	Non-Liq: PI>18
29.5	27	32	29.5	38.9	0.0	38.9	3.09	0.01	-0.72	0.00	5.00		0.000		0.00	Nonliquefiable
34.5	32	37	34.5	34.5	0.0	34.5	1.87	0.02	-0.40	0.00	5.00		0.000		0.00	Nonliquefiable
39.5	37	42	39.5	21.5	5.6	27.1	N/A	0.07	0.10	0.00	5.00		0.000		0.00	Non-Liq: PI>18
44.5	42	47	44.5	26.4	5.6	32.0	N/A	0.04	-0.22	0.00	5.00		0.000		0.00	Non-Liq: PI>18
49.5	47	50	48.5	36.5	5.5	42.0	3.07	0.01	-0.96	0.00	3.00		0.000		0.00	Nonliquefiable
											Total Deformation (in)				0.53	

Notes:

(1) $(N_1)_{60}$ calculated previously for the individual layer

(2) Correction for fines content per Equation 76 (Boulanger and Idriss, 2008)

(3) Corrected $(N_1)_{60}$ for fines content

(4) Factor of Safety against Liquefaction, calculated previously for the individual layer

(5) Calcuated by Eq. 86 (Boulanger and Idriss, 2008)

(6) Calcuated by Eq. 89 (Boulanger and Idriss, 2008)

(7) Calcuated by Eqs. 90, 91, and 92 (Boulanger and Idriss, 2008)

(8) Volumetric Strain Induced in a Liquefiable Layer, Calcuated by Eq. 96 (Boulanger and Idriss, 2008)
(Strain N/A if Factor of Safety against Liquefaction > 1.3)

Liquefaction Susceptibility Analysis: SPT Method

Leighton

Youd and Idriss (2001), Martin and Lew (1999)

Description: CASC CEQA Review Industrial Warehouse ; Case 1; PGAm 0.858; design GW 15; No overex 0

Project No.: 13521.009

Sep 2023

General Boring Information:

Boring No.	Existing GW Depth (ft)	Design GW Depth (ft)	Design Fill Height (ft)	Overex. depth bgs (ft)	Ground Surface Elev (ft)	design gw elve
B-1	22	15		0		-15
B-2	22	15		0		-15
B-3	22	15		0		-15
B-4	22	15		0		-15
						0
						0
						0
						0
						0
						0
						0
						0
						0
						0
						0
						0

Boring Location Coordinates	
X (ft)	Y (ft)

General Parameters:

a_{max} = 0.86g

M_W = 6.72

MSF eq: 1

MSF = 1.32

Hammer Efficiency = 84

C_E = 1.30

C_B = 1.05

C_S for SPT? TRUE

Unlined, but room for liner

Rod Stickup (feet) = 3

Ring sample correction = 0.65

Summary of Liquefaction Susceptibility Analysis: SPT Method

Leighton

Liquefaction Method: Youd and Idriss (2001). Seismic Settlement Method: Tokimatsu and Seed (1987) and Martin and Lew (1999).

Project: CASC CEQA Review Industrial Warehouse ; Case 1; PGAm 0.858; design GW 15; No overex 0

Project No.: 13521.009

Boring No.	Approx. Layer Depth (ft)	SPT Depth (ft)	Approx Layer Thick-ness (ft)	Plasticity ("n"=non susc. to liq.)	Estimated Fines Cont (%)	γ_t (pcf)	N_m or B (blows/ft)	Sampler Type (enter 2 if mod CA Ring)	Cs	N_m (corrected for Cs and ring->SPT) (blows/ft)	Exist σ_{vo}' (psf)	$(N_1)_{60}$	$(N_1)_{60CS}$	**$CRR_{7.5}$**	Design σ_{vo}' (psf)	$CSR_{7.5}$	CSR_M	**Liquefaction Factor of Safety**	$(N_1)_{60CS}$ (for Settle-ment) (blows/ft)	Dry Sand Strain (%) (Tok/ Seed 87) (%)	Sat Sand Strain (%) (Tok/ Seed 87) (%)	Seismic Sett. of Layer (in.)	**Cummulative Seismic Settlement** (in.)
B-1	0 to 2.3	1	2.3		65	120	11	1	1.24	13.6	120	23.7	33.4	>Range	120	0.56	0.42	**NonLiq**	33.4	0.02		0.01	2.2
B-1	2.3 to 4.8	3.5	2.5		65	120	8	1	1.16	9.3	420	16.2	24.4	0.281	420	0.55	0.42	**NonLiq**	24.4	0.46		0.14	2.2
B-1	4.8 to 7.3	6	2.5		65	120	12	1	1.26	15.2	720	26.4	36.7	>Range	720	0.55	0.42	**NonLiq**	36.7	0.11		0.03	2.0
B-1	7.3 to 11.0	8.5	3.8		65	120	15	1	1.3	19.5	1020	30.5	41.6	>Range	1020	0.55	0.41	**NonLiq**	41.6	0.06		0.03	2.0
B-1	11.0 to 15.0	13.5	4.0		5	120	22	1	1.3	28.6	1620	37.7	37.7	>Range	1620	0.54	0.41	**NonLiq**	37.7	0.12		0.06	2.0
B-1	15.0 to 16.0	13.5	1.0		5	120	22	1	1.3	28.6	1620	37.7	37.7	>Range	1620	0.54	0.41	**NonLiq**	37.7			0.00	1.9
B-1	16.0 to 21.0	18.5	5.0		10	120	33	1	1.3	42.9	2220	54.0	56.0	>Range	2001.6	0.59	0.45	**NonLiq**	56.0			0.00	1.9
B-1	21.0 to 26.0	23.5	5.0		10	120	31	1	1.3	40.3	2726	45.7	47.6	>Range	2289.6	0.65	0.49	**NonLiq**	47.6			0.00	1.9
B-1	26.0 to 29.0	28.5	3.0		**10**	120	20	1	1.27	25.5	3014	27.5	29.0	0.409	2577.6	0.69	0.52	**0.78**	28.5		0.95	0.34	1.9
B-1	29.0 to 31.5	29.5	2.5		**57**	120	18	1	1.24	22.3	3072	23.8	33.6	>Range	2635.2	0.70	0.53	**NonLiq**	33.6			0.00	1.6
B-1	31.5 to 36.0	33.5	4.5		**59**	120	18	1	1.24	22.4	3302	24.3	34.1	>Range	2865.6	0.71	0.53	**NonLiq**	34.1			0.00	1.6
B-1	36.0 to 41.0	38.5	5.0		25	120	41	1	1.3	53.3	3590	55.5	66.2	>Range	3153.6	0.70	0.53	**NonLiq**	66.2			0.00	1.6
B-1	41.0 to 46.0	43.5	5.0		**3**	120	9	1	1.1	9.9	3878	9.9	**9.9**	0.112	3441.6	0.69	0.52	**0.21**	9.9		2.61	1.57	1.6
B-1	46.0 to 50.5	48.5	4.5		5	120	31	1	1.3	40.3	4166	38.9	38.9	>Range	3729.6	0.68	0.51	**NonLiq**	38.9			0.00	0.0
B-2	0 to 2.0	1	2.0		65	120	24	2	1	15.6	120	27.1	37.6	>Range	120	0.56	0.42	**NonLiq**	37.6	0.02		0.00	0.8
B-2	2.0 to 4.0	3	2.0		65	120	10	2	1	6.5	360	11.3	18.6	0.198	360	0.55	0.42	**NonLiq**	18.6	0.79		0.19	0.7
B-2	4.0 to 6.0	5	2.0		65	120	11	2	1	7.2	600	12.4	19.9	0.215	600	0.55	0.42	**NonLiq**	19.9	1.25		0.30	0.6
B-2	6.0 to 8.0	7	2.0		65	120	17	2	1	11.1	840	19.0	27.8	0.364	840	0.55	0.41	**NonLiq**	27.8	0.37		0.09	0.3
B-2	8.0 to 11.3	9	3.3		65	120	22	2	1	14.3	1080	21.7	31.1	>Range	1080	0.55	0.41	**NonLiq**	31.1	0.26		0.10	0.2
B-2	11.3 to 15.0	13.5	3.8		65	120	14	1	1.23	17.2	1620	22.6	32.1	>Range	1620	0.54	0.41	**NonLiq**	32.1	0.16		0.07	0.1
B-2	15.0 to 16.0	13.5	1.0		65	120	14	1	1.23	17.2	1620	22.6	32.1	>Range	1620	0.54	0.41	**NonLiq**	32.1			0.00	0.0
B-2	16.0 to 21.0	18.5	5.0		25	120	16	1	1.25	20.0	2220	25.2	32.3	>Range	2001.6	0.59	0.45	**NonLiq**	32.3			0.00	0.0
B-2	21.0 to 25.5	23.5	4.5		25	120	41	1	1.3	53.3	2726	60.5	71.7	>Range	2289.6	0.65	0.49	**NonLiq**	71.7			0.00	0.0
B-3	0 to 2.0	1	2.0		65	120	11	2	1	7.2	120	12.4	19.9	0.215	120	0.56	0.42	**NonLiq**	19.9	0.08		0.02	1.7
B-3	2.0 to 4.0	3	2.0		65	120	13	2	1	8.5	360	14.7	22.6	0.252	360	0.55	0.42	**NonLiq**	22.6	0.41		0.10	1.7
B-3	4.0 to 6.0	5	2.0		65	120	17	2	1	11.1	600	19.2	28.1	0.372	600	0.55	0.42	**NonLiq**	28.1	0.69		0.17	1.6
B-3	6.0 to 8.0	7	2.0		25	120	13	2	1	8.5	840	14.5	20.5	0.222	840	0.55	0.41	**NonLiq**	20.5	0.48		0.11	1.4
B-3	8.0 to 11.3	9	3.3		25	120	14	2	1	9.1	1080	13.8	19.7	0.212	1080	0.55	0.41	**NonLiq**	19.7	1.03		0.40	1.3
B-3	11.3 to 15.0	13.5	3.8		25	120	17	1	1.29	21.9	1620	28.8	36.4	>Range	1620	0.54	0.41	**NonLiq**	36.4	0.13		0.06	0.9
B-3	15.0 to 16.0	13.5	1.0		25	120	17	1	1.29	21.9	1620	28.8	36.4	>Range	1620	0.54	0.41	**NonLiq**	36.4			0.00	0.8
B-3	16.0 to 21.0	18.5	5.0		65	120	14	1	1.21	17.0	2220	21.4	30.6	>Range	2001.6	0.59	0.45	**NonLiq**	30.6			0.00	0.8
B-3	21.0 to 25.5	23.5	4.5		65	120	12	1	1.16	13.9	2726	15.8	23.9	0.272	2289.6	0.65	0.49	**0.55**	19.8		1.57	0.85	0.8
B-4	0 to 2.3	1	2.3		65	120	6	1	1.12	6.7	120	11.7	19.0	0.203	120	0.56	0.42	**NonLiq**	19.0	0.08		0.02	1.5
B-4	2.3 to 4.8	3.5	2.5		65	120	7	1	1.14	8.0	420	13.9	21.6	0.237	420	0.55	0.42	**NonLiq**	21.6	0.52		0.16	1.5

Boring No.	Approx. Layer Depth (ft)		SPT Depth (ft)	Approx Layer Thick-ness (ft)	Plasticity ("n"=non susc. to liq.)	Estimated Fines Cont (%)	γ_t (pcf)	N_m or B (blows/ft)	Sampler Type (enter 2 if mod CA Ring)	Cs	N_m (corrected for Cs and ring->SPT) (blows/ft)	Exist σ_{vo}' (psf)	$(N_1)_{60}$	$(N_1)_{60CS}$	**$CRR_{7.5}$**	Design σ_{vo}' (psf)	$CSR_{7.5}$	CSR_M	**Liquefaction Factor of Safety**	$(N_1)_{60CS}$ (for Settle-ment) (blows/ft)	Dry Sand Strain (%) (Tok/ Seed 87) (%)	Sat Sand Strain (%) (Tok/ Seed 87) (%)	Seismic Sett. of Layer (in.)	**Cummulative Seismic Settlement** (in.)
B-4	4.8	to 7.3	6	2.5		65	120	10	1	1.21	12.1	720	21.1	30.3	>Range	720	0.55	0.42	**NonLiq**	30.3	0.15		0.04	1.4
B-4	7.3	to 11.0	8.5	3.8		65	120	11	1	1.21	13.3	1020	20.7	29.9	0.460	1020	0.55	0.41	**NonLiq**	29.9	0.44		0.20	1.3
B-4	11.0	to 15.0	13.5	4.0		**58**	120	11	1	1.17	12.9	1620	16.9	25.3	0.299	1620	0.54	0.41	**NonLiq**	25.3	0.39		0.19	1.1
B-4	15.0	to 16.0	13.5	1.0		**58**	120	11	1	1.17	12.9	1620	16.9	25.3	0.299	1620	0.54	0.41	**0.73**	20.9		1.51	0.18	0.9
B-4	16.0	to 21.0	18.5	5.0	n	**69**	120	16	1	1.25	20.0	2220	25.2	35.2	>Range	2001.6	0.59	0.45	**NonLiq**	35.2			0.00	0.8
B-4	21.0	to 26.0	23.5	5.0		**60**	120	15	1	1.2	18.1	2726	20.5	29.6	0.442	2289.6	0.65	0.49	**0.90**	24.5		1.25	0.75	0.8
B-4	26.0	to 31.0	28.5	5.0		60	120	27	1	1.3	35.1	3014	37.9	50.5	>Range	2577.6	0.69	0.52	**NonLiq**	50.5			0.00	0.0
B-4	31.0	to 36.0	33.5	5.0		60	120	24	1	1.3	31.2	3302	33.9	45.6	>Range	2865.6	0.71	0.53	**NonLiq**	45.6			0.00	0.0
B-4	36.0	to 41.0	38.5	5.0	n	**46**	120	17	1	1.21	20.6	3590	21.5	30.8	>Range	3153.6	0.70	0.53	**NonLiq**	30.8			0.00	0.0
B-4	41.0	to 46.0	43.5	5.0		**56**	120	20	1	1.25	25.0	3878	25.0	35.0	>Range	3441.6	0.69	0.52	**NonLiq**	35.0			0.00	0.0
B-4	46.0	to 50.5	48.5	4.5	n	**34**	120	26	1	1.3	33.8	4166	32.7	43.7	>Range	3729.6	0.68	0.51	**NonLiq**	43.7			0.00	0.0