



Appendix D-1

**Update of Geotechnical Investigation, Proposed Redlands West
Development, Redlands Avenue, South of Rider Street Perris, California,
for Lake Creek Industrial, LLC**

**Southern California Geotechnical
August 6, 2020**

August 6, 2020

Lake Creek Industrial, LLC
1302 Brittany Cross Road
Santa Ana, California 92705



SOUTHERN
CALIFORNIA
GEOTECHNICAL
A California Corporation

Attention: Mr. Bob Kubichek
Senior Vice President

Project No.: **20G179-1**

Subject: **Update of Geotechnical Report and Plan Review**
Proposed Redlands West Development
Redlands Avenue, South of Rider Street
Perris, California

Reference: Geotechnical Investigation, Proposed Warehouse, Redlands Avenue, South of Rider Street, Perris, California, prepared for Black Creek Group by Southern California Geotechnical, Inc. (SCG), SCG Project No. 19G213-1, dated October 25, 2019.

Dear Mr. Kubichek:

In accordance with your request, SCG has prepared this report to update the referenced geotechnical report for the subject site. As a part of this update, we have performed a visual site reconnaissance and reviewed the project geotechnical report, as well as the current site plan for the proposed development. This report was prepared in accordance with our Proposal No. 20P209R, dated June 17, 2020.

Site Description and Background

The subject site is located on the west side of Redlands Avenue, 720± feet south of Rider Street in Perris, California. The site is bounded to the north by an existing warehouse and a vacant lot, to the west by a Southern California Edison easement, to the south by a vacant lot, and to the east by Redlands Avenue.

The subject site consists of eight (8) rectangular to trapezoidal-shaped parcels which total 19.06± acres. Based on our site reconnaissance performed on August 4, 2020, the subject has not significantly changed from the original subsurface exploration presented in the referenced geotechnical report. The site is currently vacant and undeveloped. Ground surface cover consists of exposed soil with moderate native grass and weed growth, and localized areas of scattered debris and trash, such as clothes, tires, and concrete fragments.

Detailed topographic information was not available at the time of this report. However, based on topographic information obtained from Google Earth, the overall site topography slopes gently downward to the southeast at a gradient of less than 1± percent.

Proposed Development

The most current preliminary site plan, prepared by RGA, was provided to our office by the client. The plan indicates that the new development will consist of one (1) new commercial/industrial building, 305,780± ft² in size, located in the eastern region of the subject site. Dock-high doors and a truck court will be constructed on the west side of the proposed building. The new building is expected to be surrounded by asphaltic concrete pavements in the parking and drive areas and Portland cement concrete pavements in the loading dock areas. Several landscaped planters and concrete flatwork are also expected to be included throughout the site.

Detailed structural information has not been provided. However, it is our understanding that the new building will be a single-story structure of tilt-up concrete construction, generally supported on conventional shallow foundations with a concrete slab-on-grade floor. The construction may include second floor mezzanine offices. Based on the assumed construction, maximum column and wall loads are expected to be on the order of 100 kips and 4 to 6 kips per linear foot, respectively.

Grading plans for the proposed development were not available at the time of this report. The proposed development is not expected to include any significant amounts of below-grade construction such as basements or crawl spaces.

Previous Study

Geotechnical Investigation

SCG previously conducted a geotechnical investigation at the subject site. The results of this investigation were presented in the referenced geotechnical report. As part of this investigation, seven (7) borings were advanced to depths of 15 to 25± feet below the existing site grades.

Native alluvial soils were encountered at the ground surface of all boring locations, extending to at least the maximum depth explored of 25± feet. The near-surface alluvium, in the upper 3 to 9± feet, generally consisted of loose to dense silty fine sands and fine sandy silts with variable amounts of medium to coarse sands and clay content. At greater depths, the alluvial soils generally consisted of stiff to hard clayey silts, medium stiff to very stiff silty clays, and medium dense to dense fine sandy silts. Three (3) of the borings encountered soil strata consisting of medium dense fine to coarse sands at depths ranging from 5½ to 9± feet. Groundwater was not encountered during the drilling of any of the borings.

Based on the encountered conditions, SCG recommended that the proposed structure be supported on conventional shallow foundations. Recommendations for foundations, floor slab, and pavement design were also provided.

Plan Review

Based on the proximity of the previous exploratory borings performed in the referenced geotechnical report with respect to the current proposed development, illustrated on the Boring Location Plan included as Plate 1 of this report, no new subsurface exploration is considered warranted. The referenced report is considered applicable to the currently proposed development.

This report should be distributed to all consultants and contractors associated with this project along with a copy of the referenced geotechnical report.

Updated Seismic Design Parameters

The 2019 California Building Code (CBC) provides procedures for earthquake resistant structural design that include considerations for on-site soil conditions, occupancy, and the configuration of the structure including the structural system and height. The seismic design parameters presented below are based on the soil profile and the proximity of known faults with respect to the subject site.

Based on standards in place at the time of this report, the proposed development is expected to be designed in accordance with the requirements of the 2019 edition of the California Building Code (CBC), which was adopted on January 1, 2020.

The 2019 CBC Seismic Design Parameters have been generated using the SEAOC/OSHPD Seismic Design Maps Tool, a web-based software application available at the website www.seismicmaps.org. This software application calculates seismic design parameters in accordance with several building code reference documents, including ASCE 7-16, upon which the 2019 CBC is based. The application utilizes a database of risk-targeted maximum considered earthquake (MCE_R) site accelerations at 0.01-degree intervals for each of the code documents. The tables below were created using data obtained from the application. The output generated from this program is included as Plate E-1 of this report.

The 2019 CBC requires that a site-specific ground motion study be performed in accordance with Section 11.4.8 of ASCE 7-16 for Site Class D sites with a mapped S_1 value greater than 0.2. However, Section 11.4.8 of ASCE 7-16 also indicates an exception to the requirement for a site-specific ground motion hazard analysis for certain structures on Site Class D sites. The commentary for Section 11 of ASCE 7-16 (Page 534 of Section C11 of ASCE 7-16) indicates that "In general, this exception effectively limits the requirements for site-specific hazard analysis to very tall and or flexible structures at Site Class D sites." **Based on our understanding of the proposed development, the seismic design parameters presented below were calculated assuming that the exception in Section 11.4.8 applies to the proposed structure at this site. However, the structural engineer should verify that this exception is applicable to the proposed structure.** Based on the exception, the spectral response accelerations presented below were calculated using the site coefficients (F_a and F_v) from Tables 1613.2.3(1) and 1613.2.3(2) presented in Section 16.4.4 of the 2019 CBC.

2019 CBC SEISMIC DESIGN PARAMETERS

Parameter		Value
Mapped Spectral Acceleration at 0.2 sec Period	S_s	1.500
Mapped Spectral Acceleration at 1.0 sec Period	S_1	0.570
Site Class	---	D
Site Modified Spectral Acceleration at 0.2 sec Period	S_{MS}	1.500
Site Modified Spectral Acceleration at 1.0 sec Period	S_{M1}	0.986
Design Spectral Acceleration at 0.2 sec Period	S_{DS}	1.00
Design Spectral Acceleration at 1.0 sec Period	S_{D1}	0.657

It should be noted that the site coefficient F_v and the parameters S_{M1} and S_{D1} were not included in the SEAOC/OSHPD Seismic Design Maps Tool output for the 2019 CBC. We calculated these parameters-based on Table 1613.2.3(2) in Section 16.4.4 of the 2019 CBC using the value of S_1 obtained from the Seismic Design Maps Tool, assuming that a site-specific ground motion hazards analysis is not required for the proposed building at this site.

Liquefaction

Liquefaction is the loss of strength in generally cohesionless, saturated soils when the pore-water pressure induced in the soil by a seismic event becomes equal to or exceeds the overburden pressure. The primary factors which influence the potential for liquefaction include groundwater table elevation, soil type and plasticity characteristics, relative density of the soil, initial confining pressure, and intensity and duration of ground shaking. The depth within which the occurrence of liquefaction may impact surface improvements is generally identified as the upper 50 feet below the existing ground surface. Liquefaction potential is greater in saturated, loose, poorly graded fine sands with a mean (d_{50}) grain size in the range of 0.075 to 0.2 mm (Seed and Idriss, 1971). Non-sensitive clayey (cohesive) soils which possess a plasticity index of at least 18 (Bray and Sancio, 2006) are generally not considered to be susceptible to liquefaction, nor are those soils which are above the historic static groundwater table.

The Riverside County GIS website indicates that the subject site is located within a zone of low liquefaction susceptibility. In addition, the soil conditions encountered at the boring locations are not considered to be conducive to liquefaction. These conditions consist of well-graded moderate to high strength native alluvial soils and no evidence of a long-term groundwater table within the depths explored by the borings. Based on these considerations, liquefaction is not considered to be a design concern for this project.

Geotechnical Report Update

This letter may serve as an update to the original geotechnical report. The previous geotechnical report is considered valid for the currently proposed development.

Further Plan Reviews

It is recommended that copies of the final grading and foundation plans, when they become available, be provided to our office for review with regard to the conclusions, recommendations, and assumptions contained in the referenced geotechnical report.

Closure

The analysis, conclusions, and recommendations contained within this report have been promulgated in accordance with generally accepted professional geotechnical engineering practice. No other warranty is implied or expressed. This report is provided for the sole use of our client, and any reliance on this report by an unauthorized third party is at such party's sole risk and we accept no responsibility for any resulting damage or loss that may occur.


We sincerely appreciate the opportunity to be of continued service on this project. We look forward to providing additional consulting services during the course of the project. If we may be of further assistance in any manner, please contact our office.

Respectfully Submitted,

SOUTHERN CALIFORNIA GEOTECHNICAL, INC.



Joseph Lozano Leon
Staff Engineer

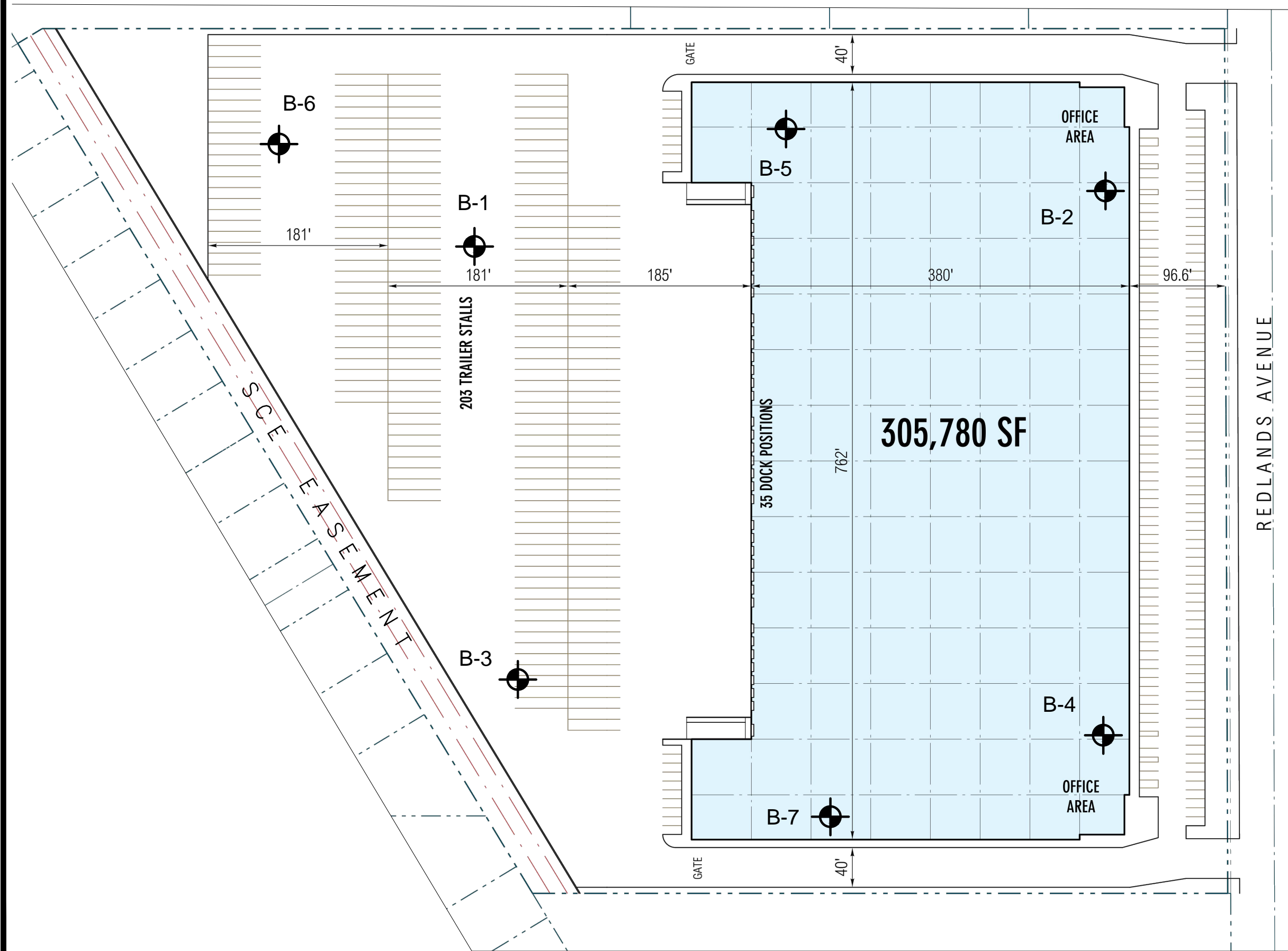


Robert G. Trazo, GE 2655
Principal Engineer




Enclosures: Plate 1: Boring Location Map
Plate E-1: Seismic Design Parameters – 2019 CBC

Distribution: (1) Addressee



GEOTECHNICAL LEGEND

 PREVIOUS BORING LOCATION
(SCG PROJECT NO. 19G213-1)

NOTE: PRELIMINARY SITE PLAN PREPARED BY RGA.

BORING LOCATION PLAN	
PROPOSED REDLANDS WEST DEVELOPMENT	
PERRIS, CALIFORNIA	
SCALE: 1" = 100'	
DRAWN: JLL	
CHKD: RGT	
SCG PROJECT 20G179-1	
PLATE 1	SOUTHERN CALIFORNIA GEOTECHNICAL



Latitude, Longitude: 33.826910, -117.218283



Date	8/3/2020, 11:13:35 AM
Design Code Reference Document	ASCE7-16
Risk Category	III
Site Class	D - Stiff Soil

Type	Value	Description
S_S	1.5	MCE_R ground motion. (for 0.2 second period)
S_1	0.57	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.5	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1	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	0.5	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.55	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
S_{sRT}	1.523	Probabilistic risk-targeted ground motion. (0.2 second)
S_{sUH}	1.633	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
S_{sD}	1.5	Factored deterministic acceleration value. (0.2 second)
S_{1RT}	0.57	Probabilistic risk-targeted ground motion. (1.0 second)
S_{1UH}	0.625	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S_{1D}	0.6	Factored deterministic acceleration value. (1.0 second)
PGA_d	0.5	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.933	Mapped value of the risk coefficient at short periods
C_{R1}	0.912	Mapped value of the risk coefficient at a period of 1 s

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



SEISMIC DESIGN PARAMETERS - 2019 CBC	
PROPOSED REDLANDS WEST DEVELOPMENT	
PERRIS, CALIFORNIA	
DRAWN: JLL CHKD: RGT SCG PROJECT 20G179-1 PLATE E-1	 SOUTHERN CALIFORNIA GEOTECHNICAL