October 11, 2021 Project No. 16118-01

Mr. Shaun Bowen
Brookfield Residential
3200 Park Center Drive, Suite 1000
Costa Mesa, California 92626

Subject: ***Addendum Report Regarding Geotechnical Recommendations for the Proposed Approximately 580-Acre "Menifee Valley" Residential and Commercial Development, City of Menifee, California***

Introduction

In accordance with your request and authorization, LGC Geotechnical, Inc. has prepared a geotechnical review of the updated site plan for the proposed approximate 580-acre "Menifee Valley" residential and commercial development located in the City of Menifee, California. This report presents updated seismic design parameters along with an updated geotechnical map. Recommendations provided in the previous geotechnical reports (LGC Geotechnical, 2018 and 2020) remain applicable unless superseded herein.

The conceptual plan prepared by The Galloway Group (2021) was utilized as a base map for our Geotechnical Map (Sheet 1).

Project Description

Based on our review of the provided conceptual plan, the proposed development has been changed from only residential products to a mixture of residential and commercial. The proposed commercial products appear to incorporate large warehouse buildings. Additionally, the concept plan shows recreational buildings with sports fields and open space areas for the community.

The irregular shaped site is approximately 580-acres with minor relief throughout the majority of the site. The site is bound to the north by Highway 74, the Southern California Edison (SCE) San Jacinto Valley Service Center and the Heritage Highschool, to the east by Briggs Road and Heritage Highschool, to the south by Case Road and to the west by Menifee Road and the SCE San Jacinto Valley Service Center. Review of topography maps suggests the site slopes gently from east to west with the lowest point at approximately 1,465 feet in the southwestern corner of the site (near the intersection of Menifee Road and Case Road) and highest point at approximately 1,625 feet in the southeast corner of the site (near the intersection of Case Road and Briggs Road). The southeastern corner of the site contains a granitic hill measuring approximately 120 feet in height with relation to the surrounding gently sloped grades. With exception of the granitic hill in the southeastern corner, the highest point of the gently sloping site is along the eastern edge of the site (near Briggs Road) at approximately 1,520 feet. The site currently

contains no noticeable structures and is being used for agricultural farming. The site contains areas of tilled soil, low lying agricultural vegetation, telephone poles, watering equipment, dirt roads and surface water drainage swales. A water holding pond was observed along the southern edge of the site adjacent to Case Road. An existing EMWD sewer line runs east west along the dirt road described as McLaughlin Road (future "Green Belt").

We understand that the project plans and grading plans are not available at this time; therefore, LGC Geotechnical should be provided with any updated project information, plans and/or any structural loads when they become available, in order to either confirm or modify the recommendations provided herein and within the referenced reports.

Seismic Design Parameters

The site seismic characteristics were evaluated per the guidelines set forth in Chapter 16, Section 1613 of the 2019 California Building Code (CBC) and applicable portions of ASCE 7-16 which has been adopted by the CBC. Please note that the following seismic parameters are only applicable for code-based acceleration response spectra and are not applicable for where site-specific ground motion procedures are required by ASCE 7-16. Representative site coordinates of latitude 33.734795 degrees north and longitude -117.144687 degrees west were utilized in our analyses. The maximum considered earthquake (MCE) spectral response accelerations (S_{MS} and S_{M1}) and adjusted design spectral response acceleration parameters (S_{DS} and S_{D1}) for Site Class D are provided in Table 1 on the following page. Since site soils are Site Class D, additional adjustments are required to code acceleration response spectrums as outlined below and provided in ASCE 7-16. The structural designer should contact the geotechnical consultant if structural conditions (e.g., number of stories, seismically isolated structures, etc.) require site-specific ground motions.

A deaggregation of the PGA based on a 2,475-year average return period (MCE) indicates that an earthquake magnitude of 6.98 at a distance of approximately 15.65 km from the site would contribute the most to this ground motion. A deaggregation of the PGA based on a 475-year average return period (Design Earthquake) indicates that an earthquake magnitude of 6.85 at a distance of approximately 19.1 km from the site would contribute the most to this ground motion (USGS, 2014).

Section 1803.5.12 of the 2019 CBC (per Section 11.8.3 of ASCE 7) states that the maximum considered earthquake geometric mean (MCE_G) Peak Ground Acceleration (PGA) should be used for liquefaction potential. The PGA_M for the site is equal to 0.55g (SEAOC, 2021). The design PGA is equal to 0.367g (2/3 of PGA_M).

TABLE 1

Seismic Design Parameters

Selected Parameters from 2019 CBC, Section 1613 - Earthquake Loads	Seismic Design Values	Notes/Exceptions
Distance to applicable faults classifies the site as a "Near-Fault" site.		Section 11.4.1 of ASCE 7
Site Class	D*	Chapter 20 of ASCE 7
Ss (Risk-Targeted Spectral Acceleration for Short Periods)	1.433g	From SEAOC, 2021
S_1 (Risk-Targeted Spectral Accelerations for 1-Second Periods)	0.535g	From SEAOC, 2021
F_a (per Table 1613.2.3(1))	1.000	For Simplified Design Procedure of Section 12.14 of ASCE 7, F_a shall be taken as 1.4 (Section 12.14.8.1)
F_v (per Table 1613.2.3(2))	1.765	Value is only applicable per requirements/exceptions per Section 11.4.8 of ASCE 7
S_{MS} for Site Class D [Note: $S_{MS} = F_aS_S$]	1.433g	-
S_{M1} for Site Class D [Note: $S_{M1} = F_vS_1$]	0.944g	Value is only applicable per requirements/exceptions per Section 11.4.8 of ASCE 7
S_{DS} for Site Class D [Note: $S_{DS} = (^2/_3)S_{MS}$]	0.955g	-
S_{D1} for Site Class D [Note: $S_{D1} = (^2/_3)S_{M1}$]	0.629g	Value is only applicable per requirements/exceptions per Section 11.4.8 of ASCE 7
C_{RS} (Mapped Risk Coefficient at 0.2 sec)	0.930	ASCE 7 Chapter 22
C_{R1} (Mapped Risk Coefficient at 1 sec)	0.913	ASCE 7 Chapter 22
*Since site soils are Site Class D and S_1 is greater than or equal to 0.2, the seismic response coefficient Cs is determined by Eq. 12.8-2 for values of $T \leq 1.5T_s$ and taken equal to 1.5 times the value calculated in accordance with either Eq. 12.8-3 for $T_L \geq T > T_s$, or Eq. 12.8-4 for $T > T_L$. Refer to ASCE 7-16.		

Closure

This report was prepared to the general standard of care of geotechnical consulting in Southern California; no other warranty is expressed or implied.

Should you have any questions regarding this letter, please do not hesitate to contact our office. We appreciate this opportunity to be of service.

Sincerely,

LGC Geotechnical, Inc.





Blake Elliott, RCE 70705
Project Engineer

BJE/BPP/amm

Attachments: Appendix A – References
Sheet 1 – Geotechnical Map

Distribution: (1) Addressee (electronic copy)

Appendix A
References

APPENDIX A

References

American Society of Civil Engineers (ASCE), 2017, Minimum Design Loads for Buildings and Other Structures, ASCE/SEI 7-16, 2017

_____, 2018, Standard 7-16, Minimum Design Loads for Buildings and Associated Criteria for Buildings and Other Structures, Supplement 1, effective: December 12, 2018

California Building Standards Commission, 2019, California Building Code, California Code of Regulations Title 24, Volumes 1 and 2, dated July 2019

Hunsaker & Associates, 2020, Briggs Road Study for Menifee Valley, TTM 37575, City of Menefee, California, dated January 6, 2020

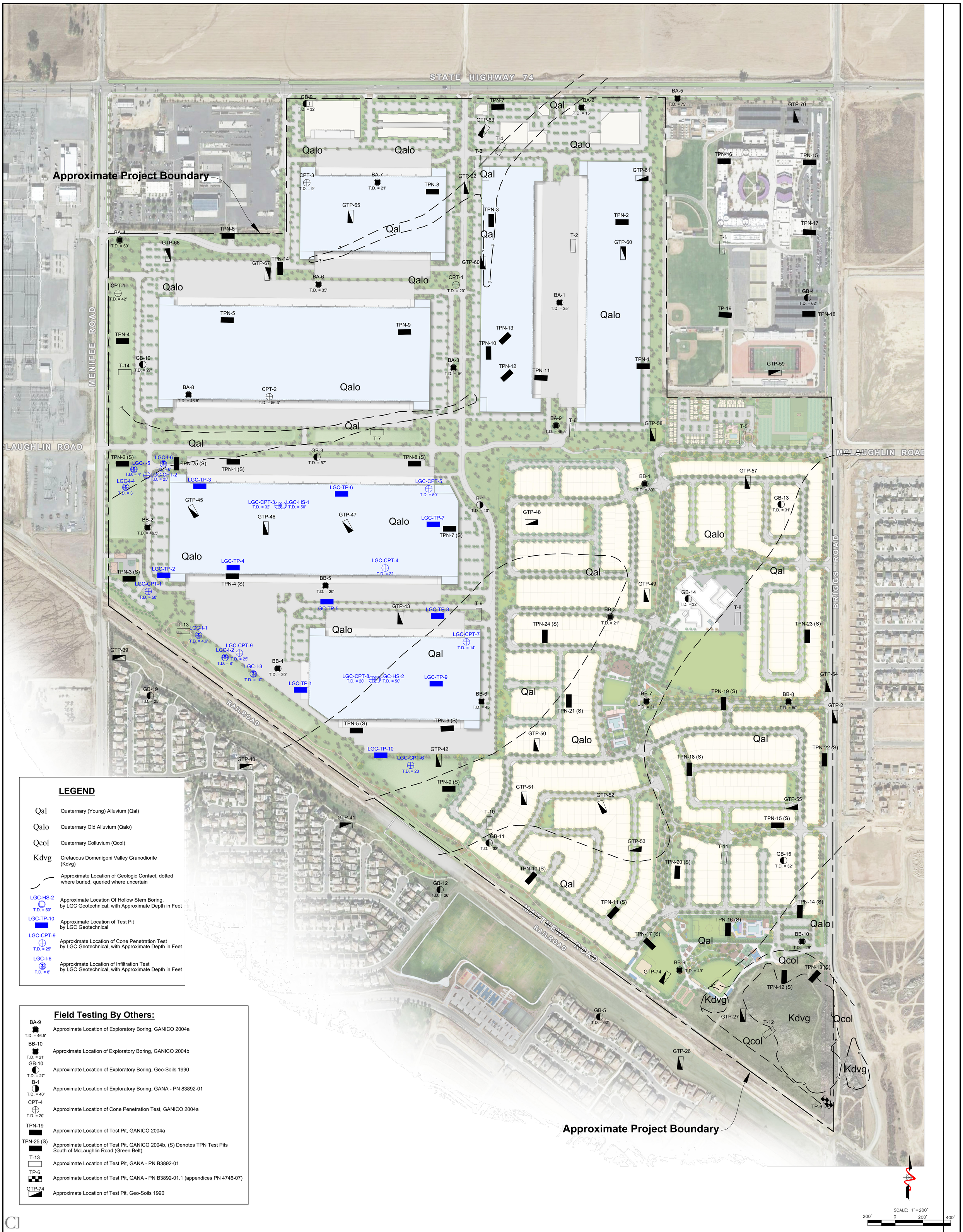
LGC Geotechnical, Inc., 2018, Preliminary Geotechnical Evaluation and Design Recommendations for the Proposed Approximately 580-Acre "Menifee Valley" Residential Development, City of Menifee, California, Project No. 16118-01, dated May 25, 2018

_____, 2020, Geotechnical Evaluation for the Proposed Southerly Briggs Road Realignment, Menifee Valley, Tentative Tract Map 37575, City of Menifee, California, Project No. 16118-01, dated April 8, 2020

Structural Engineers Association of California (SEAOC), 2021, Seismic Design Maps, Retrieved October 7, 2021, from https://seismicmaps.org/

The Galloway Group, 2021, Conceptual Site Plan, Menifee Valley Specific Plan, Menifee, CA, dated September 17, 2021

United States Geological Survey (USGS), 2014, Unified Hazard Tool, Dynamic: Conterminous U.S. 2014 (update) (v4.2.0), Retrieved October 7, 2021, from: https://earthquake.usgs.gov/hazards/interactive/



LEGEND

Qal	Quaternary (Young) Alluvium (Qal)
Qalo	Quaternary Old Alluvium (Qalo)
Qcol	Quaternary Colluvium (Qcol)
Kdvg	Cretacous Domenigoni Valley Granodiorite (Kdvg)
	Approximate Location of Geologic Contact, dotted where buried, queried where uncertain
LGC-HS-2 T.D. = 50'	Approximate Location Of Hollow Stem Boring, by LGC Geotechnical, with Approximate Depth in Feet
LGC-TP-10	Approximate Location of Test Pit by LGC Geotechnical
LGC-CPT-9 T.D. = 25'	Approximate Location of Cone Penetration Test by LGC Geotechnical, with Approximate Depth in Feet
LGC-I-6 T.D. = 8'	Approximate Location of Infiltration Test by LGC Geotechnical, with Approximate Depth in Feet

Field Testing By Others:

BA-9 T.D. = 46.5'	Approximate Location of Exploratory Boring, GANICO 2004a
BB-10 T.D. = 21'	Approximate Location of Exploratory Boring, GANICO 2004b
GB-10 T.D. = 27'	Approximate Location of Exploratory Boring, Geo-Soils 1990
B-1 T.D. = 40'	Approximate Location of Exploratory Boring, GANA - PN 83892-01
CPT-4 T.D. = 20'	Approximate Location of Cone Penetration Test, GANICO 2004a
TPN-19	Approximate Location of Test Pit, GANICO 2004a
TPN-25 (S)	Approximate Location of Test Pit, GANICO 2004b, (S) Denotes TPN Test Pits South of McLaughlin Road (Green Belt)
T-13	Approximate Location of Test Pit, GANA - PN B3892-01
TP-6	Approximate Location of Test Pit, GANA - PN B3892-01.1 (appendices PN 4746-07)
GTP-74	Approximate Location of Test Pit, Geo-Soils 1990

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Geotechnical Map

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PROJECT NAME	Brookfield - Minor Ranch
PROJECT NO.	16118-01
ENG. / GEOL.	BJE/KTM
SCALE	1" = 200'
DATE	October 2021

SHEET 1 of 1