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August 17, 2022

Project No. 644-17079
22-08-112

Menifee 18 Holdings, LLC
c/o Corman Leigh Companies
32823 Temecula Parkway
Temecula, California 92592

Project: Proposed Residential Development
Tract Map No. 31831
APN 360-350-004 & 005
SWC Sherman Road & Garbani Road
Menifee, California

Subject: Geotechnical Update

Ref: Geotechnical Investigation report prepared by Sladden Engineering dated December 12, 2017; Project No. 644-17079, Report No. 17-12-115

In accordance with your request, we have reviewed the above referenced Geotechnical Investigation report as it relates to the design and construction of the new residential development (Tract Map No. 31831) proposed for the property located on the southwest corner of Sherman Road and Garbani Road in the City of Menifee, California. It is our understanding that the proposed residential structures will be of relatively lightweight wood-frame construction and will be supported by conventional shallow spread footings and concrete slabs on grade.

The referenced report includes recommendations pertaining to the design and construction of residential structure foundations. Based upon our review of the referenced report and our understanding of the proposed construction, it is our opinion that the structural values and remedial grading recommendations included in this report remain applicable for the design and construction of the remaining phases of the residential development except as amened herein.

The proposed residential structures may be supported upon conventional shallow spread footings. Conventional spread footings should be bottomed into properly compacted engineered fill material a minimum of 18 inches below lowest adjacent grade. Continuous and isolated footings should be at least 12 inches wide and isolated pad footings should be at least 2 feet wide. Continuous footings and isolated pad footings should be designed utilizing allowable bearing pressures of 1800 psf and 2000 psf, respectively. Allowable increases of 250 psf for each additional 1 foot of width and 280 psf for each additional 6 inches of depth may be utilized, if desired. The maximum allowable bearing pressure should be 2500 psf. The recommended allowable bearing pressures may be increased by one-third for wind and seismic loading.

Static settlement resulting from the anticipated foundation loads should be tolerable provided that the recommendations included in this report are considered in foundation design and construction. The ultimate static settlement is expected to be less that 1.0 inch when using the recommended allowable foundation bearing pressures. As a practical matter, differential static settlement between footings can be assumed as one-half of the total static settlement.

Lateral forces may be resisted by friction along the base of the foundations and passive resistance along the sides of the footings. A friction coefficient of 0.40 times the normal dead load forces is recommended for use in design. Passive resistance may be estimated using an equivalent fluid weight of 250 pcf. If used in combination with the passive resistance, the frictional resistance should be reduced by one third.

The bearing soil is moderately expansive and falls within the "low" expansion category in accordance with 2019 California Building Code (CBC) classification criteria. The expansion index of the surface soil should be reevaluated after grading and floor slab thickness and reinforcement should be determined by the structural engineer based upon post-grading test results. Floor slabs on expansive soil should be designed in accordance with Section 1808.6.2 of the 2019 California Building Code (CBC). We recommend a minimum floor slab thickness of 4.0 inches and minimum reinforcement of #3 bars at 18 inches on center in both directions. All slab reinforcement should be supported on concrete chairs to ensure that reinforcement is placed at slab mid-height.

Slabs with moisture sensitive surfaces should be underlain with a moisture vapor retarder consisting of a polyvinyl chloride membrane such as 10-mil Visqueen, or equivalent. All laps within the membrane should be sealed and at least 2 inches of clean sand should be placed over the membrane to promote uniform curing of the concrete. To reduce the potential for punctures, the membrane should be placed on a pad surface that has been graded smooth without any sharp protrusions. If a smooth surface cannot be achieved by grading, consideration should be given to placing a 1-inch thick leveling course of sand across the pad surface prior to placement of the membrane.

Post-tensioned slabs may be considered for the proposed residential structures to mitigate potential expansive soil conditions. We have evaluated the on-site soil for construction of post-tensioned foundation systems in general accordance with design specifications of the Post Tensioning Institute. Final design should be based upon the results of Expansion Index testing performed after rough grading. Post-tensioned slabs should be designed to be rigid and capable of spanning areas of non-uniform support and meet the following criteria:

Design Criteria		Category I Very Low to Low Expansion Potential (EI 0-50)
Center Lift	^{e}m center	9.0
	^{y}m center	0.46
Edge Lift	^{E}m edge	4.8
	^{Y}m edge	1.03
Perimeter Footing Depth (inches)		18
Allowable Bearing Capacity (psf)		2,500

Minor retaining walls may be necessary to accomplish the proposed construction. Lateral pressures for use in retaining wall design may be estimated using an equivalent fluid weight of 40 pcf for level free-draining native backfill conditions. For walls that are to be restrained at the top, the equivalent fluid weight should be increased to 60 pcf for level free-draining native backfill conditions. Back drains should be provided for the full height of the walls. Seismic pressures should be incorporated into any retaining walls greater than 6 feet in height. Seismic deign pressures may be provided once specific wall heights and locations are known.

The seismic design category for a structure may be determined in accordance with Section 1613 of the 2019 CBC or ASCE7-16. According to the 2019 CBC, Site Class C may be used to estimate design seismic loading for the proposed structures. The 2019 CBC seismic design parameters are attached. The project Structural Engineer should verify that all design parameters provided are applicable for the subject project.

In order to provide firm and uniform foundation bearing conditions, the primary foundation bearing soil should be over-excavated and recompacted. Over-excavation should extend to a minimum depth of 3 feet below existing grade or 3 feet below the bottom of the footings, whichever is deeper. Based on the shallow seated bedrock throughout the site, specialized grading equipment may be necessary for deeper removals. Once adequate removals have been verified, the exposed native soil should be moisture conditioned to near optimum moisture content and compacted to at least 90 percent relative compaction. The previously removed material may then be placed in thin lifts at near optimum moisture content and compacted to at least 90 percent relative compaction compacted engineered fill. Removals should extend at least 5 feet laterally beyond the footing limits.

We appreciate the opportunity to provide service to you on this project. If you have any questions regarding this letter or the referenced report, please contact the undersigned.

Respectfully submitted,
SLADDEN ENGINEERING

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SER/cg

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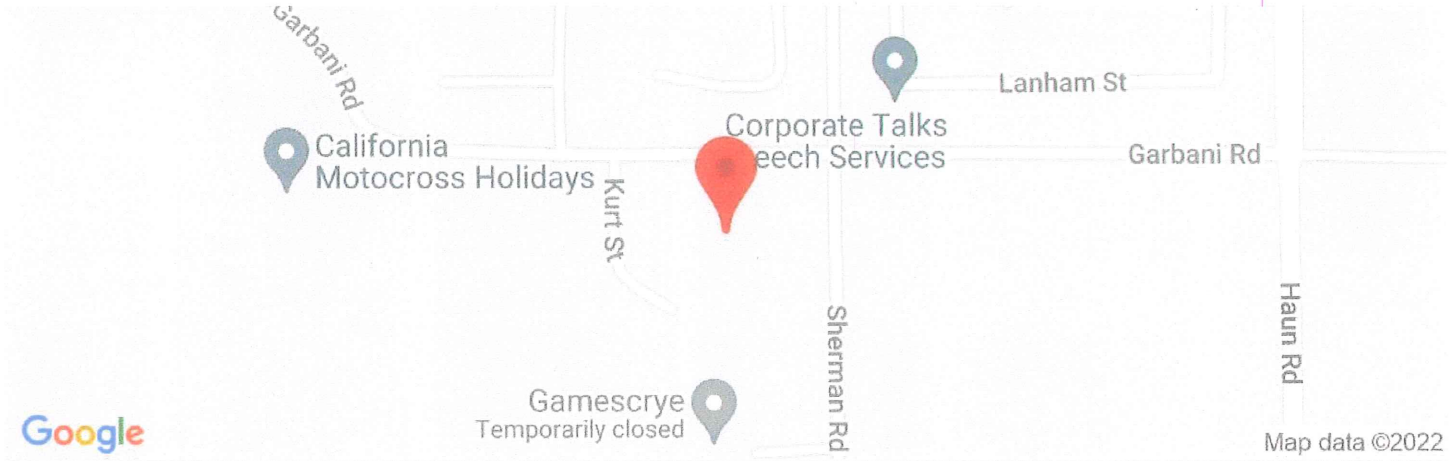
Latitude, Longitude: 33.6554, -117.1811



Date	8/17/2022, 1:36:26 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	C - Very Dense Soil and Soft Rock

Type	Value	Description
S_S	1.397	MCE_R ground motion. (for 0.2 second period)
S_1	0.517	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.677	Site-modified spectral acceleration value
S_{M1}	0.767	Site-modified spectral acceleration value
S_{DS}	1.118	Numeric seismic design value at 0.2 second SA
S_{D1}	0.511	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	D	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	1.483	Site amplification factor at 1.0 second
PGA	0.594	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.713	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.397	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.507	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
S1RT	0.517	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.565	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.6	Factored deterministic acceleration value. (1.0 second)
PGAd	0.623	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	0.594	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.927	Mapped value of the risk coefficient at short periods
C_{R1}	0.916	Mapped value of the risk coefficient at a period of 1 s
C_V	1.179	Vertical coefficient

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