Leighton and Associates, Inc.
A LEIGHTON GROUP COMPANY

August 29, 2016

Project No. 11427.001

Mission Pacific Land Company
4100 Newport Place, Suite 480
Newport Beach, California 92660

Attention: Mr. Jason Keller, P.E.

Subject: Geotechnical Update Report
Residential Development, Tentative Tract Map 36760
APNs: 485-220-023, 485-220-032, 485-220-040
Moreno Valley, California

In accordance with your request, Leighton & Associates Inc. (Leighton) is pleased to present herewith a geotechnical update for the subject project. We understand that you are requesting this update letter to confirm that the soils conditions and the recommendations included in our referenced reports still apply to the proposed development. Our previous investigation evaluated approximately 104 acres, of which the subject 53 acre property is a part. We include herein updated CBC seismic design coefficients for foundation design. Percolation testing for the proposed 1.2 Acre water quality bioretention basin in the southeast corner will be performed later and the results presented in a separate report.

SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The subject site generally consists of approximately 53 acres located southeast of the intersection of Indian Street and Gentian Avenue (See Figure 1). The site is bounded on the west by Indian Street, on the north by the eastward extension of Gentian Avenue, on the east by the California Aqueduct easement, and on the south by the westward extension of Santiago Drive. The attached Geotechnical Map (Figure 2) depicts the planned development area. Based on our past history on this site and recent site observations this site was used for agricultural purposes within the period of at least 1953 to 1980, and was otherwise vacant. At the time of our observation on August 25, 2016, the site is vacant with some local debris and concrete rubble. The property has been disced and some weeds and grasses exist throughout the property.

Based on the project Tentative Tract Map (Rick, 2016) we understand that the overall site will be developed to host 221 typical one- and two-story residential structures similar to those anticipated during our original site evaluation. Additionally, two bioretention basins are proposed in the southwest and southeast corners and approximately 2.8 acres in the center of the southern boundary are reserved for a park site. Grading will consist of cut and fill typically on the order of 2 to 3 feet. Remedial removal and recompaction will increase the fill thickness by approximately 3 feet. The maximum depth of excavation is approximately 9 feet for the southwest water quality Basin.

SUMMARY OF OBSERVATIONS AND UPDATED RECOMMENDATIONS

Based on the above, it is our opinion that the proposed development is feasible from a geotechnical/geologic standpoint and may be constructed as planned provided the recommendations included the referenced soils report (Leighton, 2004) and those provided below are incorporated into the design and construction phases of development.

In case of conflict the recommendations presented below should superseded those previously included in the referenced soils report. However, if new rough grading plans become available, additional reviews and/or geotechnical evaluations will be required to confirm that the as-graded site conditions remain suitable for the proposed improvements.

Seismic Design Parameters

For the purpose of structural design and based on current codes (2013 CBC) and utilizing a software program published by United States Geological Survey (USGS, 2016), the seismic design coefficients for this site are presented in table below:

CBC Categorization/Coefficient	Value
Site Latitude	**33.893976**
Site Longitude	**-117.232060**
Site Class Definition	**D**
Mapped Spectral Response Acceleration at 0.2s Period, S_s	**1.500 g**
Mapped Spectral Response Acceleration at 1s Period, S_1	**0.605 g**
Short Period Site Coefficient at 0.2s Period, F_a	***1.00***
Long Period Site Coefficient at 1s Period, F_v `	***1.50***
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS}	**1.500 g**
Adjusted Spectral Response Acceleration at 1s Period, S_{M1}	**0.907 g**
Design Spectral Response Acceleration at 0.2s Period, S_{DS}	**1.000 g**
Design Spectral Response Acceleration at 1s Period, S_{D1}	**0.605 g**

g=Gravity acceleration

PLANS AND SPECIFICATIONS

We recommend that the project rough grading plans and specifications be reviewed by the geotechnical consultant to determine whether the geotechnical recommendations in this and previous reports have been effectively implemented in the project design and remain applicable to the proposed development. Additional recommendations may be provided based on that review.

LIMITATIONS

This report was prepared solely for the use of our client and his design consulting team, for the design of the proposed improvements described in this report, in accordance with generally accepted geotechnical engineering practices at this time in California. No warranty is expressed or implied.

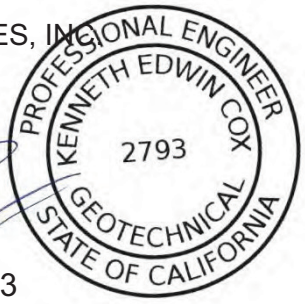
This report was necessarily based in part upon data obtained from a limited number of observations and existing reports. Such information is necessarily incomplete. It should be understood that additional subsurface verification is necessary for the completion of the geotechnical evaluation of this site during construction. The nature of many sites is such that differing characteristics can be experienced within small distances and under various climatic conditions. Changes in subsurface conditions can, and do, occur over time.

This report is not authorized for use by, and is not to be relied upon by any party except, our client and/or his design team, with whom Leighton & Associates, Inc. has contracted for the work. In addition, this report is subject to review and approval by the City of Moreno Valley. Use of or reliance on this report by any other party prior to approval is at that party's risk. Unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify Leighton & Associates, Inc. from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, or strict liability of Leighton & Associates, Inc.

If you have any questions regarding this report, please do not hesitate to contact this office. We appreciate the opportunity to be of service.

Respectfully submitted,

LEIGHTON & ASSOCIATES, INC.



Kenneth E. Cox, GE 2793
Senior Project Engineer

Robert F. Riha, CEG 1921
Sr. Principal Geologist

Attachments: References
Site Location Map (Figure 1)
Geotechnical Map (Figure 2)

Distribution: (1) Addressee (pdf via email)

REFERENCES

ASCE, 2010, ASCE Standard 7-10, Minimum Design Loads for Buildings and Other Structures by Structural Engineering Institute, ISBN 0-7844-0809-2, Second Printing.

California Building Code, 2013, California Code of Regulations Title 24, Part 2, Volume 2 of 2.

Leighton & Associates, Inc., 2004, Preliminary Geotechnical Investigation, Proposed 104-Acre Residential Development, Northwest of Perris Boulevard and Iris Avenue, City of Moreno Valley, California

Public Works Standard, Inc., 2015, Greenbook, Standard Specifications for Public Works Construction: 2015 Edition, BNI Building News, Anaheim, California.

Rick Engineering Company, 2016, Tentative Tract 36760, Planned Unit Development, dated March 8, 2016, revised July 26, 2016, 60-scale, 1 sheet.

USGS, 2016, A Web Based Computer Program Published by USGS to calculate Seismic Hazard Curves and Response and Design Parameters based on ASCE 7-10 seismic procedures.

Project: 11427.001	Eng/Geol: KC/RFR
Scale: 1 " = 2,000 '	Date: August 2016

Base Map: ESRI ArcGIS Online 2016
Thematic Information: Leighton
Author: Leighton Geomatics (mmurphy)

SITE LOCATION MAP

Residential Development, Tentative Tract Map 36760
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Moreno Valley, California

Figure 1

Leighton

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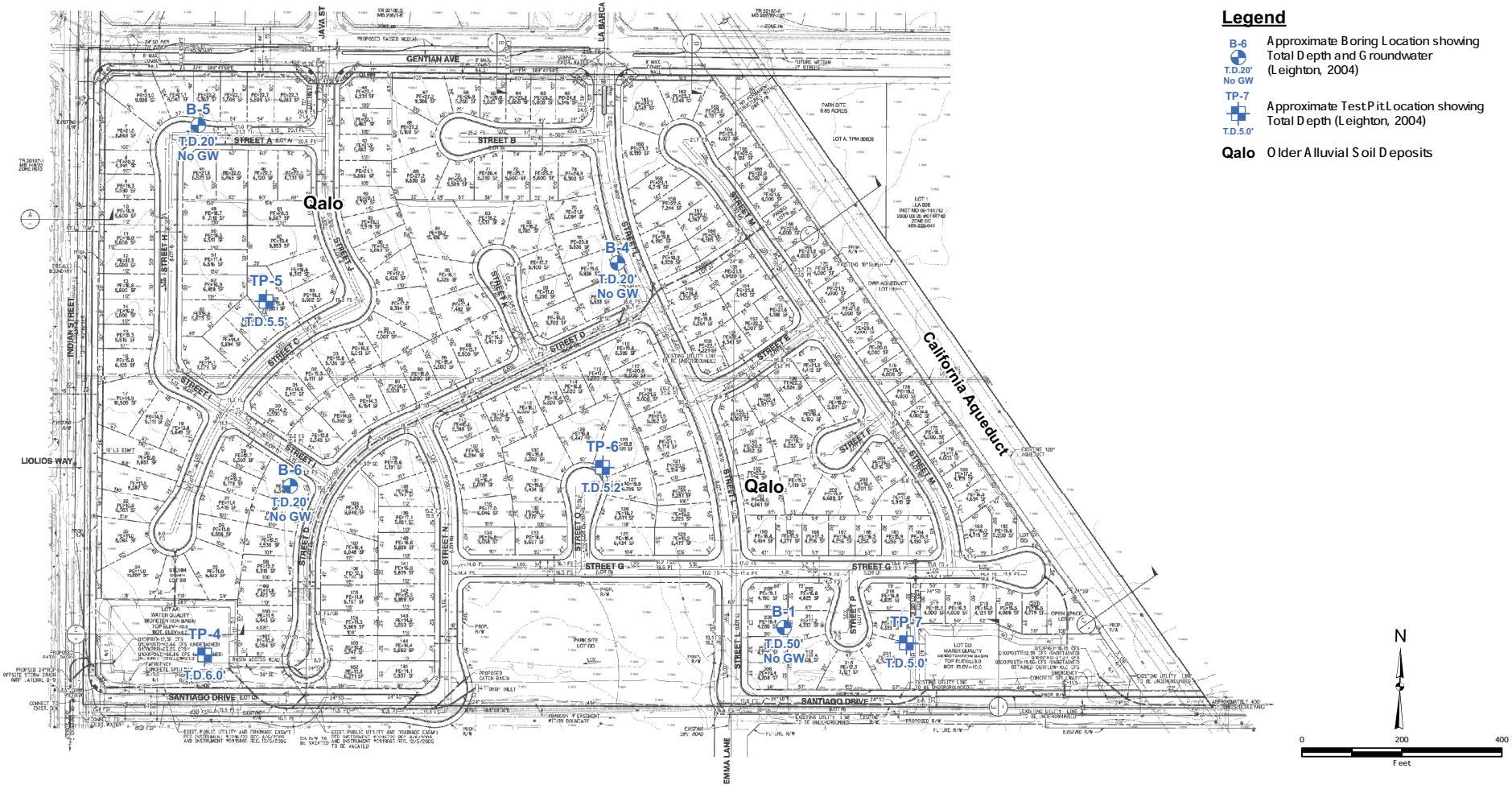

Legend

- **B-6** / T.D.20' / No GW — Approximate Boring Location showing Total Depth and Groundwater (Leighton, 2004)
- **TP-7** / T.D.5.0' — Approximate Test Pit Location showing Total Depth (Leighton, 2004)
- **Qalo** — Older Alluvial Soil Deposits

Project: 11427.001	Eng/Geol: KC/RFR
Scale: 1 " = 200 '	Date: August 2016
Base Map: Tentative Tract 36760 Planned Unit Development, by Rick Engineering Company, dated March 8, 2016.	
Author: Leighton Geomatics (mmurphy)	

GEOTECHNICAL MAP

Residential Development, Tentative Tract Map 36760
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Moreno Valley, California

Figure 2

Leighton

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