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Geotechnical Engineering Report Update
HIRAM JOHNSON HIGH SCHOOL TRACK AND FOOTBALL FIELD
6879 14TH Avenue
Sacramento, California
WKA No. 11843.01P

As authorized, we have prepared this update to the *Geotechnical Engineering and Geologic Hazards Investigation* report (Wallace-Kuhl & Associates [WKA] No. 11843.01P) dated April 17, 2018 prepared for subject project.

Since completion of the *Geotechnical Engineering and Geologic Hazards Investigation* report, the project team has requested additional information to complete their design. Specifically, the project team has requested additional drilled pier design information and updated seismic design parameters to meet the requirements of the 2019 California Building Code (CBC). The 2018 *Geotechnical Engineering and Geologic Hazards Investigation* report included seismic design parameters meeting the 2016 CBC requirements.

CONCLUSIONS AND RECOMMENDATIONS

Based on review of our previous report and understanding of the proposed construction, we conclude that the recommendations contained in the 2018 *Geotechnical Engineering and Geologic Hazards Investigation* report remain generally applicable for design and construction of the development, with the following amended conclusions and recommendations.

Supplemental Drilled Pier Recommendations

We understand drilled, cast-in-place piers (drilled piers) will be used to support the proposed light poles at the site. Drilled pier design recommendations were provided in the 2018 *Geotechnical Engineering and Geologic Hazards Investigation* report. However, the project team has requested additional design information related to constructing the drilled piers on and/or near sloping ground conditions.

Where drilled piers are constructed on sloping ground, or at the top of a slope within five feet of sloping ground, the passive resistance and skin friction should be computed below a depth where at least five feet soil is present from the outside edge of the drilled pier and the face of the slope. Sloping ground is defined as a slope steeper than four horizontal to one vertical (4:1). Passive resistance and skin friction above the depth where five feet of soil is present from the outside edge of the drilled pier and the slope should be neglected.

2019 California Building Code Seismic Design Parameters

The 2019 edition of the CBC references the *American Society of Civil Engineers (ASCE), Minimum Design Loads and Associated Criteria for Buildings and Other Structures 7-16*. To assist with the structural design of this project, we have provided the following seismic design parameters, which have been determined based on the site location and the web interface developed by the Structural Engineers Association of California (SEAO) and the California Office of Statewide Health Planning and Development (OSHPD) (<https://seismicmaps.org>).

The following seismic design parameters summarized below may be used for seismic design of the planned improvements at the site. Since S_1 is greater than 0.2g, the 2019 CBC coefficient values F_v , S_{M1} , and S_{D1} presented are valid for seismic design, provided the requirements in Exception Note No. 2 in Section 11.4.8 of ASCE 7-16 apply, specifically if $T \leq 1.5T_s$. Based on our experience with similar structures, we anticipate Exception Note No. 2 in Section 11.4.8 of ASCE 7-16 will apply. However, this should be verified by the project structural engineer.

TABLE 1				
2019 CBC/ASCE 7-16 SEISMIC DESIGN PARAMETERS				
Latitude: 38.5424° N Longitude: 121.4270° W	ASCE 7-16 Table/Figure	2019 CBC Figure/Section/Table	Factor/ Coefficient	2019 CBC Values
0.2-second Period MCE _R	Figure 22-1	Figure 1613.2.1(1)	S _s	0.534 g
1.0 second Period MCE _R	Figure 22-2	Figure 1613.2.1(2)	S ₁	0.244 g
Soil Class	Table 20.3-1	Section 1613.2.2	Site Class	D
Site Coefficient	Table 11.4-1	Table 1613.2.3(1)	F _a	1.373
Site Coefficient	Table 11.4-2	Table 1613.2.3(2)	F _v	2.088
Adjusted MCE Spectral Response Parameters	Equation 11.4-1	Equation 16-36	S _{MS}	0.733 g
	Equation 11.4-2	Equation 16-37	S _{M1}	0.509* g
	Equation 11.4-3	Equation 16-38	S _{DS}	0.489 g



TABLE 1 2019 CBC/ASCE 7-16 SEISMIC DESIGN PARAMETERS				
Latitude: 38.5424° N Longitude: 121.4270° W	ASCE 7-16 Table/Figure	2019 CBC Figure/Section/Table	Factor/ Coefficient	2019 CBC Values
Design Spectral Acceleration Parameters	Equation 11.4-4	Equation 16-39	S_{D1}	0.340* g
Seismic Design Category	Table 11.6-1	Table 1613.2.5(1)	Risk Category I to III	C
			Risk Category IV	D
	Table 11.6-2	Table 1613.2.5(2)	Risk Category I to IV	D

Notes: MCE_R = Risk-Targeted Maximum Considered Earthquake; g = gravity

* = The value is valid provided the requirements in Exception Note No. 2 in Section 11.4.8 of ASCE 7-16 are met.

LIMITATIONS

This letter is considered to be an update to the *Geotechnical Engineering and Geologic Hazards Investigation* report for this project, and therefore the conclusions and recommendations contained herein are subject to the limitations stated in that report.

Thank you for this opportunity to be of service. If you have any questions regarding this letter or our previous geotechnical engineering reports, please contact our office at (916) 372-1434.

Wallace-Kuhl & Associates

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