Geotechnical ■ Environmental ■ Special Inspections
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December 6, 2021

Kelly Helmes
New Traditions Homes
11815 NE 113th St #110
Vancouver, Washington 98662

Re: Supplemental Services Letter - Continued Utilization of 2017 Geotechnical Report
Stephens Hillside Estates (Formerly Stephens Property)
34700 Northeast North Fork Avenue
La Center, Washington
CWE W.O. No. 21020

Columbia West is pleased to submit this technical memorandum regarding updated seismic design considerations and continued utilization of the existing project geotechnical report[1], dated October 20, 2017, for the above-referenced residential subdivision located in La Center, Washington. Based upon correspondence with the client, Columbia West understands that the City of La Center Building Department has requested commentary regarding the validity of the existing geotechnical report considering the elapsed time since initial publishing. Reference to Section 6.8 of Columbia West's original report, *Seismic Design Considerations*, indicates that the 2015 edition of the *International Building Code* (*IBC*) was used to obtain probabilistic ground motion values and identify the seismic site class of the Stephens Hillsides Estates Development site. Accordingly, Columbia West reviewed relevant changes between the currently adopted *2018 International Building Code* and the previously adopted *2015 International Building Code* upon which the existing geotechnical report is based. Review indicates that changes between the 2018 and 2015 editions are relatively minor and appear inconsequential as they relate to proposed single-family residential development. Columbia West therefore takes no exception to continued utilization of the existing project geotechnical report for proposed single-family home construction provided that the recommendations contained in the original geotechnical report and updates herein are incorporated throughout the design and construction process.

Updated seismic design considerations for the project as outlined in the 2018 edition of the *IBC* are described below. This letter is subject to the limitations expressed in Appendix D of the referenced report.

Seismic Design Considerations

According to the *American Society of Civil Engineers* (ASCE) *ASCE 7 Hazard Tool,* the anticipated peak ground and maximum considered earthquake spectral response accelerations resulting from seismic activity for the subject site are summarized in Table 1.

Table 1. Approximate Probabilistic Ground Motion Values for 'firm rock' sites based on subject property longitude and latitude

	2% Probability of Exceedance in 50 yrs
Peak Ground Acceleration	0.363 g
0.2 sec Spectral Acceleration	0.802 g
1.0 sec Spectral Acceleration	0.378 g

[1] Columbia West Engineering, Inc., *Geotechnical Site Investigation Report, Stephens Property, La Center, Washington*, October 20, 2017.

The listed probabilistic ground motion values are based upon "firm rock" sites with an assumed shear wave velocity of 2,500 ft/s in the upper 100 feet of soil profile. These values should be adjusted for site class effects by applying site coefficients F_a, F_v, and F_{PGA} as defined in *ASCE 7-16, Tables 11.4-1, 11.4-2, and 11.8-1*. The site coefficients are intended to more accurately characterize estimated peak ground and respective earthquake spectral response accelerations by considering site-specific soil characteristics and index properties.

Based on site-specific testing and literature review during Columbia West's geotechnical site investigation, the site may be represented by Site Class D as defined in *2018 IBC* Section 1613.2.2*, Site Class Definitions.* This site class designation indicates that amplification of seismic energy may occur during a seismic event because of subsurface conditions.

For Site Class D sites with mapped maximum considered earthquake spectral response acceleration parameter S_1 greater than 0.2, a ground motion hazard analysis may be required according to *ASCE 7-16, Section 11.4.8* unless the seismic response coefficient, C_s, is calculated in accordance with *ASCE 7-16 Section 11.4.8 Exception 2.* However, if an alternative method is utilized to determine the seismic response coefficient, the structures are seismically isolated, or structural damping systems are proposed, ASCE 7-16 requires a ground motion hazard analysis be conducted.

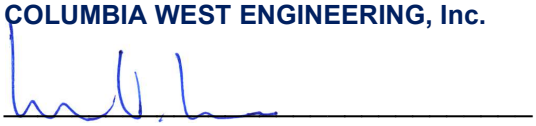
Localized peak ground accelerations exceeding the adjusted values may occur in some areas in direct proximity to an earthquake's origin. This may be a result of amplification of seismic energy due to depth to competent bedrock, compression and shear wave velocity of bedrock, presence and thickness of loose, unconsolidated alluvial deposits, soil plasticity, grain size, and other factors.

Identification of site-specific seismic response spectra is beyond the scope of this investigation. If site structures are designed in accordance with recommendations specified in the *2018 IBC*, the potential for peak ground accelerations in excess of the adjusted and amplified values should be understood.

Please call me at 360-823-2900 if you have any questions or need additional information.

Sincerely,

COLUMBIA WEST ENGINEERING, Inc.



Lance V. Lehto, PE, GE
President

References: ASCE 7-16, *Minimum Design Loads for Buildings and Other Structures*, ASCE, Virginia, 2016.

International Building Code: 2018 International Building Code, 2018 edition, International Code Council, 2018.

Columbia West Engineering, Inc., *Geotechnical Site Investigation, Stephens Property*, La Center, Washington, October 20, 2017.