

CK Engineering LLC

July 23, 2022

Matthew Mawer Residential Design
www.mmrtd.net

Re: City of Mercer Island building official comments review for Helix Homes
residence located at 6922 SE 33rd St., Mercer Island, WA 98040

CK Engineering LLC Ref. # 22-021

Dear Mr. Mawer:

CK Engineering LLC reviewed the City of Mercer Island plan review comments to address the retaining walls design based on provided Geotechnical report by Cobalt Geosciences, dated March 12, 2022.

For the design of the cantilevered retaining walls at this project following parameters were used in our calculations as provided in the Geotechnical report above:

"Active" Conditions 35pcf

Soil Data

Allow Soil Bearing	=	3,000.0 psf
Equivalent Fluid Pressure Method		
Active Heel Pressure	=	35.0 psf/ft
	=	
Passive Pressure	=	275.0 psf/ft
Soil Density, Heel	=	110.00 pcf
Soil Density, Toe	=	110.00 pcf
Footing Soil Friction	=	0.400
Soil height to ignore for passive pressure	=	12.00 in

Seismic Increase for "Active" Conditions 14H (therefore conservative design)

Earth Pressure Seismic Load

Method : Uniform
Multiplier Used = 14.000
(Multiplier used on soil density)

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Wall Design Criteria	
"At-rest" Conditions (Lateral Earth Pressure – EFD ⁺)	55 pcf (Equivalent Fluid Density)
"Active" Conditions (Lateral Earth Pressure – EFD ⁺)	35 pcf (Equivalent Fluid Density)
Seismic Increase for "At-rest" Conditions (Lateral Earth Pressure)	21H* (Uniform Distribution) 1 in 2,500 year event
Seismic Increase for "At-rest" Conditions (Lateral Earth Pressure)	14H* (Uniform Distribution) 1 in 500 year event
Seismic Increase for "Active" Conditions (Lateral Earth Pressure)	7H* (Uniform Distribution)
Passive Earth Pressure on Low Side of Wall (Allowable, includes F.S. = 1.5)	Neglect upper 2 feet, then 275 pcf EFD ⁺
Soil-Footing Coefficient of Sliding Friction (Allowable; includes F.S. = 1.5)	0.40

CK Engineering LLC appreciates your business. Please contact this office if you have any questions or concerns.

Sincerely,

Pasko Kesovija

Pasko Kesovija
Project Engineer
CK Engineering LLC



11/9/2022