GEOTECH
CONSULTANTS, INC.

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February 11, 2026

JN 25340

Wishwas Mohan
2441 – 66th Avenue S.E.
Mercer Island, Washington 98040
via email: gmwishwas@gmail.com

Subject: **Revised SLAMMER Analysis (Newmark Deflection) for West Steep Slope**
Proposed Property Redevelopment
8203 Avalon Drive
Mercer Island, Washington

Dear Mr. Mohan:

As requested by Mercer Island's geotechnical reviewer, we have re-assessed the Critical (Yield) Acceleration to be used for the SLAMMER analysis. The SLAMMER computer program has been used to compute the potential lateral movement of the steep western slope in the event of the Maximum Considered Earthquake (MCE), which has a probability of occurring once in 2,475 years. In our previous analysis, presented in our October 11, 2025 *Addendum,* we used a Critical Yield Acceleration based on an infinite slope. This was done for simplicity.

We have now completed a parametric slope stability analysis using SlopeW to determine the Critical Yield Acceleration at which incipient failure will occur (i.e. a seismic safety factor equal to approximately 1.0). We utilized the previously-assessed failure surface that resulted for a static safety factor of 1.5. This failure surface, which is depicted on the attached slope stability analysis, is a deep-seated failure plane that extends from the approximate center of West Mercer Way to the toe of the steep slope.

From the SlopeW analysis, we determined a horizontal acceleration of 0.15g would be necessary to result in a seismic safety factor of 1.0 for the critical failure surface. This 0.15g value is the Critical Yield Acceleration, and is lower than the 0.287g value used in our previous SLAMMER analysis.

We then computed the potential lateral ground movement of the failure mass using a Critical Yield Acceleration of 0.15g and a slightly reduced peak ground acceleration of 0.652g for the MCE when considering Wave Attenuation in the steep slope. The SLAMMER results for this analysis show an approximate horizontal deflection of 20 inches.

The computed potential lateral ground movement is more than the 4.4 inches computed previously using the Critical Yield Acceleration of 0.287g. Even so, in our professional opinion this potential slope movement does not pose a hazard to the planned new residence. If the entire soil mass moves 20 inches, the toe may move far enough to push against the eastern foundation and framed wall of the detached garage. This garage is separated from the house by at least 8 feet. The toe of the slide mass could be deflected or resisted by the eastern garage foundation. If the toe of the slide mass does push the garage sideways, it would still not reach the western, uphill, wall of the new house.

Based on the above-discussed revised calculations, no changes to our previous geotechnical recommendations for foundations and landslide protection for the proposed new residence are warranted.

Please contact us if you have any questions regarding this letter.

Respectfully submitted,

GEOTECH CONSULTANTS, INC.

2/11/2026

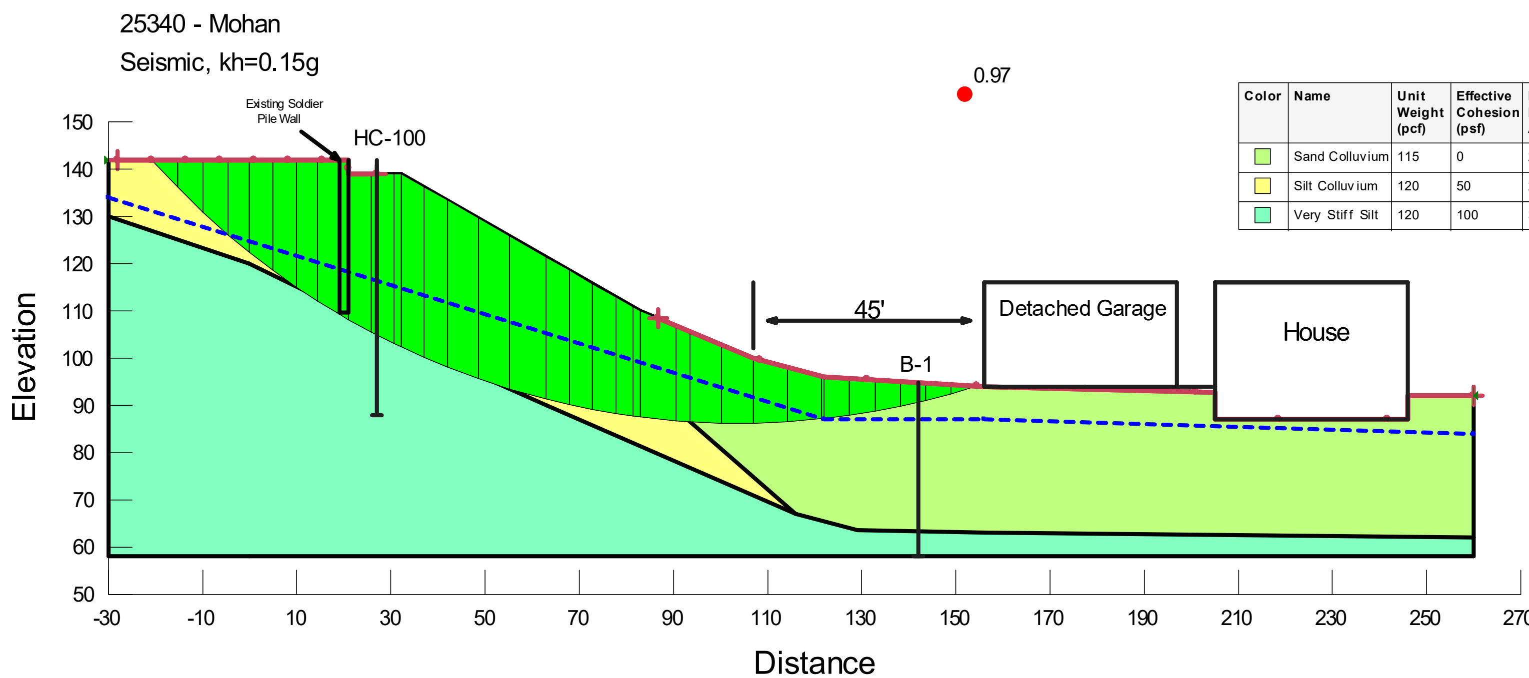
Marc R. McGinnis, P.E.
Principal

Attachments:

- Slope W Analysis
- SLAMMER Results

cc: **Atera Homes** – Paul Monsef
via email: paul@aterahomes.com

MRM:kg



Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)	Piezometric Surface
	Sand Colluvium	115	0	25	1
	Silt Colluvium	120	50	20	1
	Very Stiff Silt	120	100	30	

Seismic AA' (2)

File Information

File Version: 11.11
Product Version: 25.2.0.700
Title: 25340 Mohan
Created By: Matt McGinnis
Last Edited By: Matt McGinnis
Revision Number: 27
Date: 02/10/2026
Time: 02:47:27 PM
File Name: 25340 Slope Stability slip 112 Seism FS 1.gsz
Directory: C:\Users\mcgin\Geotech Consultants\Shared Documents - Documents\2025 Jobs\25340 Mohan (Atera Homes) (MRM)\25340 Slope Stability\
Last Solved Date: 02/10/2026
Last Solved Time: 02:47:34 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

Seismic AA' (2)

- Kind: SLOPE/W
- Analysis Type: Limit Equilibrium
- Settings
  - Method: Morgenstern-Price
  - Side Function Settings
    - Side Function: Half-Sine
  - PWP Conditions from: Piezometric Surfaces
  - Apply Phreatic Correction: Yes
  - Staged Rapid Drawdown Analysis: No
  - Unit Weight of Water: 62.430189 pcf
- Slip Surface
  - Slip Surface Settings
    - Search Method: Entry and Exit
    - Specify Radius Tangent Lines: No
    - Direction of Movement: Left to Right
    - Use Passive Mode: No
    - No. of Critical Slip Surfaces to Store: 1
  - Geometry Settings
    - Minimum Slip Surface Depth: 0.1 ft
    - Minimum Slip Surface Volume: 35.314667 ft^3
    - Number of Columns: 30
  - Tension Crack Option: (none)
- Optimization
  - Optimize Critical Slip Surface: No

Convergence
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable Difference in F of S: 0.001
- Under-Relaxation Criteria
  - Initial Rate: 1
  - Minimum Rate: 0.1
  - Rate Reduction Factor: 0.65
  - Reduction Frequency (iterations): 50
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Maximum Absolute Lambda: 2

Materials

Silt Colluvium

- Slope Stability Material Model: Mohr-Coulomb
- Unit Weight: 120 pcf
- Effective Cohesion: 50 psf
- Effective Friction Angle: 20 °
- Phi-B: 0 °
- Pore Water Pressure
  - Piezometric Surface: 1

Sand Colluvium

- Slope Stability Material Model: Mohr-Coulomb
- Unit Weight: 115 pcf
- Effective Cohesion: 0 psf
- Effective Friction Angle: 25 °
- Phi-B: 0 °
- Pore Water Pressure
  - Piezometric Surface: 1

Very Stiff Silt

- Slope Stability Material Model: Mohr-Coulomb
- Unit Weight: 120 pcf
- Effective Cohesion: 100 psf
- Effective Friction Angle: 30 °
- Phi-B: 0 °

Slip Surface Entry and Exit

- Left Type: Range
- Left-Zone Left Coordinate: (-28, 142) ft
- Left-Zone Right Coordinate: (27, 139) ft
- Left-Zone Increment: 8
- Right Type: Range
- Right-Zone Left Coordinate: (86.85488, 108.3938) ft
- Right-Zone Right Coordinate: (260, 92) ft
- Right-Zone Increment: 8

Radius Increments: 8

Slip Surface Limits

Left Coordinate: (-30, 142) ft
Right Coordinate: (260, 92) ft

Piezometric Surfaces

Piezometric Surface 1

Coordinates

	X	Y
Coordinate 1	-30 ft	134 ft
Coordinate 2	122 ft	87 ft
Coordinate 3	156 ft	87 ft
Coordinate 4	260 ft	84 ft

Seismic Coefficients

Horz Seismic Coef.: 0.15

Geometry

Name: AA'

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	0 ft	142 ft
Point 2	27 ft	142 ft
Point 3	83 ft	110 ft
Point 4	107 ft	100 ft
Point 5	122 ft	96 ft
Point 6	156 ft	94 ft
Point 7	236 ft	92 ft
Point 8	156 ft	87 ft
Point 9	156 ft	63 ft
Point 10	260 ft	92 ft
Point 11	260 ft	58 ft
Point 12	0 ft	58 ft
Point 13	260 ft	84 ft
Point 14	260 ft	62 ft
Point 15	63 ft	113 ft
Point 16	116 ft	67 ft

Point 17	81.40153 ft	97.66387 ft
Point 18	90.52547 ft	89.09854 ft
Point 19	129 ft	63.5 ft
Point 20	0 ft	120 ft
Point 21	42 ft	99.27869 ft
Point 22	63.11378 ft	89.97712 ft
Point 23	205 ft	92.775 ft
Point 24	205 ft	87 ft
Point 25	246 ft	87 ft
Point 26	246 ft	92 ft
Point 27	-30 ft	142 ft
Point 28	-30 ft	58 ft
Point 29	-30 ft	130 ft
Point 30	21 ft	142 ft
Point 31	21 ft	109.63934 ft
Point 32	19 ft	142 ft
Point 33	19 ft	110.62607 ft
Point 34	21 ft	139 ft
Point 35	32.25 ft	139 ft
Point 36	30.72414 ft	139 ft

Regions

	Material	Points	Area
Region 1	Sand Colluvium	10,26,25,24,23,6,5,4,3,35,36,15,17,18,16,19,9,14,13	5,280.2 ft²
Region 2	Very Stiff Silt	33,20,29,28,12,11,14,9,19,16,22,21,31	6,739.8 ft²
Region 3	Silt Colluvium	30,32,1,27,29,20,33,31,21,22,16,18,17,15,36,34	2,935.2 ft²

Slip Results

Slip Surfaces Analysed: 574 of 729 converged

Current Slip Surface

Slip Surface: 112
Factor of Safety: 0.97
Volume: 3,507.5761 ft³
Weight: 415,424.99 lbf
Resisting Moment: 29,295,234 lbf·ft
Activating Moment: 30,191,733 lbf·ft
Resisting Force: 162,113.9 lbf
Activating Force: 167,028.45 lbf
Slip Rank: 251 of 729 slip surfaces
Exit: (154.41983, 94.092951) ft
Entry: (-20.75, 142) ft
Radius: 166.93597 ft
Center: (103.78851, 253.16554) ft

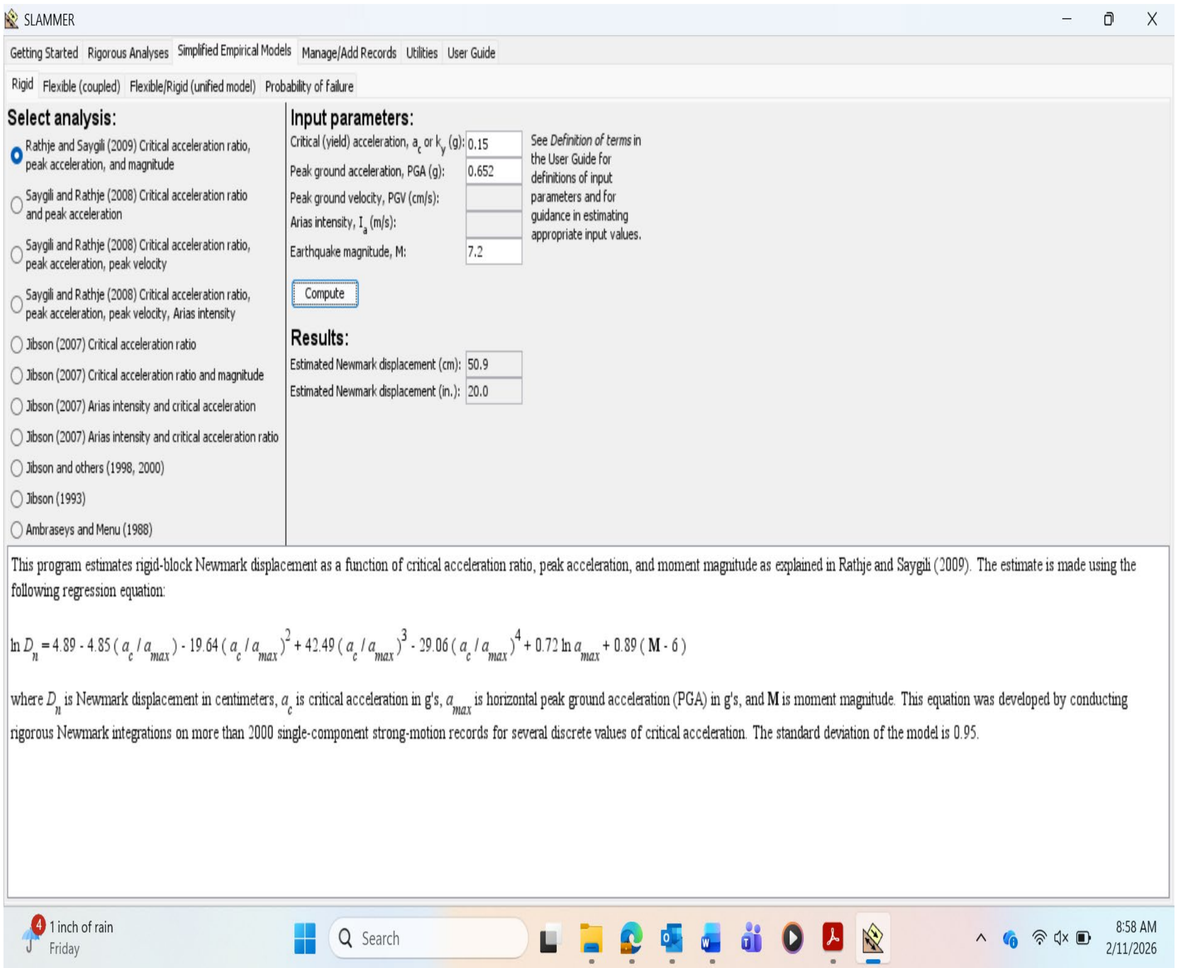
Slip Columns

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Column Base Material

Column 1	-18.04095 ft	139.10640 ft	-501.68507 psf	202.58216 psf	73.733875 psf	50 psf	0 psf	Silt Colluvium
Column 2	-12.62286 ft	133.57575 ft	-282.00123 psf	654.61495 psf	238.26036 psf	50 psf	0 psf	Silt Colluvium
Column 3	-7.20477 ft	128.52626 ft	-89.734409 psf	1,052.214 psf	382.97456 psf	50 psf	0 psf	Silt Colluvium
Column 4	-2.24786 ft	124.26467 ft	65.761492 psf	1,392.7928 psf	482.99989 psf	50 psf	0 psf	Silt Colluvium
Column 5	2.50025 ft	120.50654 ft	196.24877 psf	1,698.3192 psf	546.70892 psf	50 psf	0 psf	Silt Colluvium
Column 6	7.50076 ft	116.83169 ft	317.54269 psf	1,993.537 psf	610.01203 psf	50 psf	0 psf	Silt Colluvium
Column 7	12.25076 ft	113.59040 ft	0 psf	2,111.6275 psf	1,219.1487 psf	100 psf	0 psf	Very Stiff Silt
Column 8	16.75025 ft	110.74009 ft	0 psf	2,396.5068 psf	1,383.6239 psf	100 psf	0 psf	Very Stiff Silt
Column 9	20.00000 ft	108.78491 ft	0 psf	2,606.7803 psf	1,505.0253 psf	100 psf	0 psf	Very Stiff Silt
Column 10	23.43104 ft	106.86926 ft	0 psf	2,572.9854 psf	1,485.5138 psf	100 psf	0 psf	Very Stiff Silt
Column 11	28.29310 ft	104.30106 ft	0 psf	2,893.501 psf	1,670.5636 psf	100 psf	0 psf	Very Stiff Silt
Column 12	31.48707 ft	102.70158 ft	0 psf	3,109.7739 psf	1,795.4288 psf	100 psf	0 psf	Very Stiff Silt
Column 13	34.68750 ft	101.22641 ft	0 psf	3,197.935 psf	1,846.3286 psf	100 psf	0 psf	Very Stiff Silt
Column 14	39.56250 ft	99.10171 ft	0 psf	3,273.6551 psf	1,890.0456 psf	100 psf	0 psf	Very Stiff Silt
Column 15	45.31166 ft	96.84672 ft	0 psf	3,352.6165 psf	1,935.634 psf	100 psf	0 psf	Very Stiff Silt
Column 16	51.93497 ft	94.52541 ft	0 psf	3,426.7098 psf	1,978.4118 psf	100 psf	0 psf	Very Stiff Silt
Column 17	59.12331 ft	92.36613 ft	802.07983 psf	3,107.4408 psf	839.08278 psf	50 psf	0 psf	Silt Colluvium
Column 18	65.46614 ft	90.70756 ft	784.83122 psf	3,040.8741 psf	821.13246 psf	50 psf	0 psf	Silt Colluvium
Column 19	70.39841 ft	89.62232 ft	759.76661 psf	2,969.198 psf	804.16726 psf	50 psf	0 psf	Silt Colluvium
Column 20	75.33069 ft	88.69212 ft	725.86755 psf	2,877.1009 psf	782.9849 psf	50 psf	0 psf	Silt Colluvium
Column 21	79.59918 ft	88.00145 ft	690.01471 psf	2,778.1367 psf	760.01424 psf	50 psf	0 psf	Silt Colluvium
Column 22	82.20076 ft	87.63325 ft	665.15683 psf	2,707.039 psf	743.18432 psf	50 psf	0 psf	Silt Colluvium
Column 23	86.76273 ft	87.14315 ft	612.70455 psf	2,620.19 psf	730.66495 psf	50 psf	0 psf	Silt Colluvium
Column 24	91.99492 ft	86.65320 ft	548.43469 psf	2,514.9852 psf	715.76583 psf	50 psf	0 psf	Silt Colluvium
Column 25	96.84827 ft	86.40829 ft	476.87675 psf	2,476.0154 psf	932.21366 psf	0 psf	0 psf	Sand Colluvium
Column 26	103.61609 ft	86.26396 ft	365.8557 psf	2,231.8359 psf	870.12084 psf	0 psf	0 psf	Sand Colluvium

Column 27	110.61466 ft	86.40843 ft	234.31254 psf	1,962.5527 psf	805.89162 psf	0 psf	0 psf	Sand Colluvium
Column 28	117.84399 ft	86.86189 ft	81.096403 psf	1,665.7352 psf	738.92922 psf	0 psf	0 psf	Sand Colluvium
Column 29	121.72932 ft	87.19665 ft	-6.4364238 psf	1,473.2291 psf	686.97803 psf	0 psf	0 psf	Sand Colluvium
Column 30	124.70165 ft	87.56710 ft	-35.404005 psf	1,366.3121 psf	637.12179 psf	0 psf	0 psf	Sand Colluvium
Column 31	130.10496 ft	88.33964 ft	-83.633726 psf	1,164.4336 psf	542.98431 psf	0 psf	0 psf	Sand Colluvium
Column 32	135.50826 ft	89.29393 ft	-143.2106 psf	932.36627 psf	434.76953 psf	0 psf	0 psf	Sand Colluvium
Column 33	140.91157 ft	90.43319 ft	-214.33447 psf	678.54154 psf	316.40911 psf	0 psf	0 psf	Sand Colluvium
Column 34	146.31487 ft	91.76132 ft	-297.25016 psf	410.97417 psf	191.6404 psf	0 psf	0 psf	Sand Colluvium
Column 35	151.71818 ft	93.28305 ft	-392.25188 psf	136.43493 psf	63.620651 psf	0 psf	0 psf	Sand Colluvium

SLAMMER RESULTS (Feb. 2026)
8203 Avalon Drive
Mercer Island, Washington



Peak Acceleration Reduction Due to Wave Scattering Near Slope Face
8203 Avalon Drive
Mercer Island, Washington

$$k_{av} = \alpha \cdot k_{max} \qquad 6\text{-}2$$

where α = a slope height reduction factor and k_{av} is the average peak acceleration in the potential failure mass, taking into account spatial incoherence (or wave scattering).

The following relationship is presented in NCHRP Report 611 for the value of α for slopes and embankments of up to 100 ft in height founded upon Site Class C, D, and E soil conditions:

$$\alpha = 1 + 0.01 \cdot H \cdot (0.5 \cdot \beta - 1) \qquad 6\text{-}3$$

where H = slope height (feet) and β is a function of the shape of the acceleration response spectrum and is given by:

$$\beta = F_v \cdot S_1 / k_{max} \qquad 6\text{-}4$$

where F_v = AASHTO site factor for the spectral acceleration at 1 second and S_1 = the spectral acceleration at 1 second for Site Class B.

(Source¿LRFD.Seismic.Analysis.and.Design.of.Transportation.Geotechnical.Features.and. Structural.Foundations?NHI.Course.No¡.796650; Federal Highway Administration; August 2011.)

Calculation: For Site Class E, k_{max} (MCEg) = 0.687g under ASCE 7-16 (2018 IBC)

H= 42 feet

S1 = 0.503 (ASCE 7-16)

Fv – The silt comprising the slope is non-liquefiable, and could be classified as Site Class D. However, use Fv for Site Class E to be most conservative = 2.4 (From Table 3-8)

Table 3-8 of FHWA NHI-11-032:

TABLE 3-8 VALUES OF F_v AS A FUNCTION OF SITE CLASS AND THE SITE CLASS B LONG PERIOD (1 SECOND) SPECTRAL ACCELERATION

Site Class	Mapped Spectral Response Acceleration at 1 Second Periods				
	$S_1 \leq 0.1$ g	$S_1 = 0.2$ g	$S_1 = 0.3$ g	$S_1 = 0.4$ g	$S_1 \geq 0.5$ g
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	a	a	a	a	a

Table notes: Use straight interpolation for intermediate values of S_S, where S_S is the spectral acceleration and 0.2 second obtained from the ground motion maps.

a Site-specific geotechnical investigation and dynamic site response analyses shall be performed (Article 3.4.3)

β = 2.4 * 0.503 / 0.687 = 1.757

α = 1+0.01 * 42’ * (0.5*1.757-1) =0.949

Kav = α * Kmax = 0.949 * 0.687 = **0.652g** Use this as peak ground acceleration for SLAMMER analysis

Note, Kav would be 0.556g if Site Class D was assumed for the silt soil comprising the slope.