



September 24, 2021

Lee's Summit Planning & Development
220 SE Green St,
Lee's Summit, MO 64063

Lot 51 Woodside Ridge, 206 NW Joshua Cr. Lee's Summit, MO

Everstead has been requested to confirm the structural integrity of a retaining wall that has been constructed for the above-mentioned property. 9 block courses of Anchor Wall System's Diamond® 9D retaining wall system as installed or better is structurally sound as built.

Please feel free to contact Everstead with any further questions on this matter.

Sincerely,


Blake Shadid, PE



Project Title:
Engineer:
Project ID:
Project Descr:

Segmental Retaining Wall

LIC# : KW-06013542, Build:20.21.9.14

Residential Engineering Services, LLC

(c) ENERCALC INC 1983-2021

DESCRIPTION: 51 Woodside Ridge Retaining Wall

Criteria

Wall height (retained height)	4.50 ft
Backfill slope	Level
Backfill angle	0.0 deg
Embedment	0.0 ft

Soil data

External Soil, Phi_e	30 deg
External soil density (In situ)	110 pcf
Internal Soil, Phi_i	44 deg
Internal soil density	95 pcf
Wall Soil Friction Angle	0 deg
K_a(Horiz)	0.11

Loading

Dead load	0 psf
Live load	0 psf
Seismic Factor, A	0.00
d_seismic	0.00 in

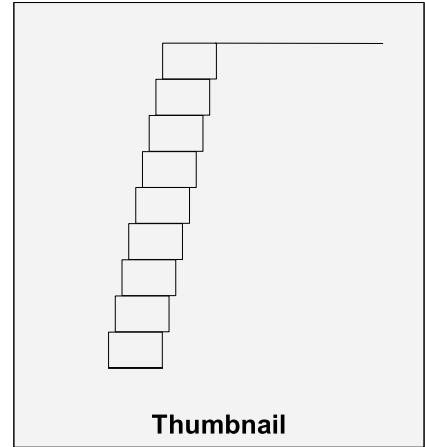
Stability

Base length	0.75 ft
Base Sliding Force (w/o Seismic)	113.48 lb
Base Resisting Force (w/o Seismic)	179.21 lb
Base Sliding (w/o Seismic) FS	1.58

Overturning Moment (w/o Seismic)	170.22 ft lb
Resisting Moment (w/o Seismic)	343.39 ft lb
Overturning (w/o Seismic) FS	2.02

Applied Bearing Pressure (w/o Seismic)	672.50 psf
Allowable Bearing Pressure (w/o Seismic)	1,500.00 psf
Bearing (w/o Seismic) FS	2.23

Eccentricity of Vert. Force (w/o Seismic)	0.24 ft
Effective Base Width (w/o Seismic)	4.49 ft



Thumbnail

Segmental block data

Vendor selection	Anchor Retaining Wall		
Vendor ESR	ICC ESR-1959	Valid through	07/01/18
Block selection type	Diamond 9D		
Block height	6.00 in	alpha(u_1)	2179.00 lb
Block depth	9.00 in	tan(lambda_u1)	0.58
Offset per block	1.13 in	Max_1	3055.00 lb
Batter angle	10.62 deg	alpha(u_2)	2179.00 lb
Wall weight	90.00 psf	tan(lambda_u2)	0.58
		Max_2	3055.00 lb

Factors of Safety

Failure Mode	Static Condition			
	Min			
	Acceptable	Actual	Status	Acceptable
Base Sliding	1.50	1.58	OK	
Overturning	2.00	2.02	OK	
Bearing	2.00	2.23	OK	
Internal Sliding	1.50	26.63	OK	

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Wall Analysis Table:

Layer	Height ft	Depth to Course	Internal Sliding Force (Static)	FS Internal Sliding (Static)	Internal Sliding Force (Seismic)	FS Internal Sliding (Seismic)
9	4.50	0.00	0.0	0.00	0.0	0.00
8	4.00	0.50	1.4	1,573.93	1.4	1,573.93
7	3.50	1.00	5.6	398.14	5.6	398.14
6	3.00	1.50	12.6	179.02	12.6	179.02
5	2.50	2.00	22.4	101.86	22.4	101.86
4	2.00	2.50	35.0	65.94	35.0	65.94
3	1.50	3.00	50.4	46.31	50.4	46.31
2	1.00	3.50	68.6	34.40	68.6	34.40
1	0.50	4.00	89.7	26.63	89.7	26.63

ASSUMPTIONS AND CRITERIA USED

- References used include *Design Manual for Segmental Retaining Walls, 3rd Edition*, by NCMA.
- Blocks are all same size and uniform offsets (batter) for full wall height.
- Coulomb earth pressure theory used for earth pressures and failure plane angle.
- Refer to geotechnical report for backfill material, compaction, and other design data and recommendations.
- Cap blocks if used are above the retained height and neglected in this design.
- Block sizes obtained from vendors' literature and may vary with locality.
- Average weight of block and cell infill assumed to be 120 pcf.
- See vendor web sites (on input screen) for more information and specifications.
- Vendor specifications or project specifications, whichever is more restrictive, to be followed for construction procedures.
- Add notes and details for proper drainage.
- See *User's Manual* Design Example #11 for methodology and sample verification calculations.
- Final design responsibility is with the project Engineer-of-Record.