



June 16, 2025

Rayabarapu, Ridgewood – Retaining Walls / Design & Calculations

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**Re: Retaining Walls Construction Drawings / Design Drawings & Structural Stability Calculations
#370 Upper Boulevard
Lot 3 - Block 1901
Village of Ridgewood
Bergen County, New Jersey**

Enclosures

Item	Description	Date	#
A	Retaining Walls Retaining Walls for Rayabarapu, #370 Upper Boulevard, Lot 3 -- Block 1910, Village of Ridgewood, Bergen County, New Jersey, prepared by Onello Engineering, Angelo Onello PE	June 16, 2025	6

In support of the above referenced residential property improvements project (with home renovation / addition, and overall site work for a driveway widening, grading, & drainage), the enclosed Onello Engineering plan-set includes retaining walls design drawings and construction details for the same, whereas the following structural stability calculations have been prepared for each of the critical cross-sections (ranging from 4' minimum height to 7' maximum design height)

The retaining walls are designed with standard 8" unit manufactured concrete modular blocks and high strength roll-back geogrid. For this application, the proposed wall block is Anchor Wall / Belgard Diamond Pro 8", and geo-grid by Tencate Geosynthetics Mirafi 3XT

Drawing #4 – Retaining Walls, Grading Elevations & Drainage: the highest plan-design retaining wall section is approximately 6'-4" (at both sides of the garage face at the residence foundation) – however, as site grading conditions may vary slightly during actual construction, conservatively, the retaining walls have been assumed with an additional 8" block course, for up to 7 feet maximum exposed face height (abutting the garage foundation, as per plan)

Thick, hearty landscaping is proposed along top the retaining walls; however, due to most of the wall sections along the driveway being 5 feet height (and higher), a 4 feet height fence is specified atop the walls for the purposes of fall protection. As per Village ordinance §190-124 F (3) (d) [5] – the wall height is defined as the exposed face height plus the height of the fence-atop, whereas a maximum height 7 feet wall plus the 4 feet height fence equates to 11 feet total height

Continued on next page

Drawing #5 – Retaining Walls, Section Locations 'A' – 'H'; cross-section location lines 'A-A' through 'H-H' are provided, which relate to the incremental critical cross-sections as provided on Drawing #7 - Retaining Walls, Construction Details & Wall Sections; and the following structural stability retaining walls calculations are directly in-support of the same

We trust all is in order for review



Angelo Onello III PE
201-774-1444
Angelo@OnelloEng.com

Cc: Rayabarapu, Pavan & Rajani Nomula
McClellan Engineering, Sean P McClellan PE
Jordan Rosenberg Architects & Associates

Appendix – Retaining Walls Design Calculations Report

Rayabarapu, #370 Upper Boulevard, Lot 3 - Block 1910, Village of Ridgewood, Bergen County, New Jersey

Section #1 = 'H-H'

Section #4 = 'E-E'

Section #7 = 'B-B'

Section #2 = 'G-G'


Section #5 = 'D-D'

Section #8 = 'A-A'

Section #3 = 'F-F'

Section #6 = 'C-C'

Pages #1 through 31 via AnchorWall Software 7.6.0.6484
Prepared by Onello Engineering, June 16, 2025



Angelo Onello III PE
New Jersey #49284

Client Rayabarapu Ridgewood
 Name Rayabarapu Ridgewood Retaining Walls Number BCRDG2501
 Site #370 Upper Boulevard, Lot 3 - Block 1910, Village of Ridgewood Designer:ountOnello Engineering, Angelo Onello PE
 Revision 1 Created 5/9/2025 Modified 6/16/2025
 Standard National Concrete Masonry Association 3rd Edition

Comments

Rayabarapu, Ridgewood••
 #370 Upper Boulevard••
 Lot 3 - Block 1910••
 Village of Ridgewood••
 Bergen County, New Jersey

Notes:
 This is a preliminary quantity estimate for facing and reinforcement. It does not include additional materials that may or may not be required to construct the wall(s) including but not limited to waste, filter fabric, drain tile, or other materials to address drop structures and other obstructions in the reinforced zone. It is the responsibility of the Contractor to verify these quantities provided through their own estimate. The provider or author of the Software accepts no responsibility for any discrepancies between quantities provided in this estimate and quantities required by the final approved Design Drawings.

Quantities

Wall	Facing	Wall/Cap Length [ft]	Facing Units [#]	TOW Steps [#]	BOW Steps [#]	Facing Area [ft²]	Total Wall Area [ft²]
Wall 1	Diamond Pro	81	471	7	2	471	498
		81	471	7	2	471	498

Wall Unit	Wall 1
Diamond Pro	472

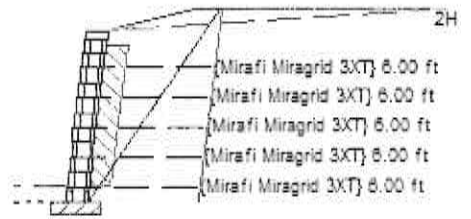
Wall	Leveling Pad [yd³]	Reinforced Fill [yd³]	Drainage Fill [yd³]	Core Fill [yd³]
Wall 1	5	69	14	8
Totals:	5	69	14	8

Reinforcements

Wall	3XT [yd²]
Wall 1	190
Totals:	190

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Section #1 at Station 0.00
 Report Date June 16, 2025
 Designer Onello Engineering, Angelo Onello PE
 Design Standard National Concrete Masonry Association 3rd Edition
 Design Static
 Unit of Measure U.S./Imperial
 Selected Facing Unit
 Licensor/Product Line: Anchor Wall Systems, Inc.
 Name: Diamond Pro
 Seismic As N/A



Soil Parameters		In Situ		
Soil Zone	Soil Type	Friction Angle °	Density •• [lb/ft³]	Cohesion Cf [lb/ft²]
Infill (i)	SM	34°	125.03	n/a
Retained (r)	SM	34°	125.03	n/a
Foundation (f)	SM	34°	125.03	0.00
Base (b)	CP	38°	115.00	n/a
Drainage (d)	GP	38°	115.00	n/a

Section Details							
Section Height	7.67	Back Slope	14.00°	LL Surcharge	0	DL Surcharge	0
Design Height	7.67 ft	Crest Offset	4.00 ft	L.L. Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.76 ft	Wall Batter	7.13°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced

External		Value	Internal		Value	Facing		Value
FSsl	Base Sliding	1.50	FSsl	Internal Sliding	1.50	FSCs	Connection Strength	1.50
FSbc	Bearing Capacity	2.00	FSpO	Pullout	1.50	FSsc	Facing Shear	1.50
FSct	Crest Toppling	1.50	FSto	Tensile Overstress	1.50			
FSot	Overturning	1.50						

Reinforcements

3XT - Mirafi Miragrid 3XT		Supplier: TenCate Geosynthetics, Fill Type: Sands					
Tult	3,500.09 lb/ft	RFcr	1.44	HFd	1.10	LTDS	2,104.43 lb/ft
RFid	1.05	Cds	0.80	Cl	0.80		

Connection/Shear Properties

•cs1	801.02 lb/ft	IP-1	1,000.42 lb/ft	•cs2	1,782.25 lb/ft	IP-2	2,183.79 lb/ft
•cs max	2,085.80 lb/ft	au	1,181.32 lb/ft	•u	45.00 lb/ft	Vu(max)	2,660.70 lb/ft

Analysis Results

- * Analysis includes Vertical Forces
- * Embedment is included in Bearing Capacity
- * Analysis uses Auto- $\tan(kh) < 0$

External Static		FS	
Bearing Capacity	16.60	Bearing Pressure	1095.48 lb/ft²
Overturning	9.81	Max Eccentricity	0.00 ft
Base Sliding	5.11		
Crest Toppling	5.44		
Internal Sliding	6.48		

Internal Static				Internal Sliding	Pullout	Tensile Overstress
Layer	Elevation [ft]	Rein.	Length [ft]	FS	FS	FS
5	107.33	3XT	6.00	26.48	7.93	29.83
4	106.00	3XT	6.00	15.21	11.68	20.30
3	104.67	3XT	6.00	10.53	14.07	14.05
2	103.33	3XT	6.00	8.03	16.61	10.75
1	102.00	3XT	6.00	6.48	19.19	8.70

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Facing Static Layer	Elevation [ft]	Rein.	Length [ft]	Connection	
				Strength	FS
5	107.33	3XT	6.00	14.13	
4	106.00	3XT	6.00	11.13	
3	104.67	3XT	6.00	8.75	
2	103.33	3XT	6.00	7.50	
1	102.00	3XT	6.00	6.72	

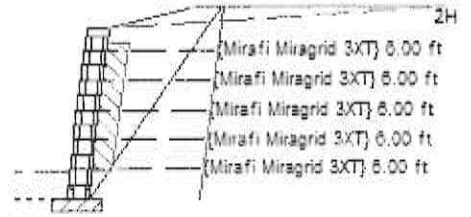
Internal Compound Stability

10 Lowest Static

Radius Point	Entry Point	Exit Point	Result	Status
3	7	2	2.25	Pass
1	10	1	2.46	Pass
2	5	4	2.53	Pass
1	9	3	2.82	Pass
4	5	6	2.99	Pass
1	8	5	3.13	Pass
1	7	7	3.79	Pass
5	4	8	3.83	Pass
1	5	9	5.16	Pass
9	1	10	5.97	Pass

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Section #2 at Station 10.50
 Report Date June 16, 2025
 Designer Onello Engineering, Angelo Onello PE
 Design Standard National Concrete Masonry Association 3rd Edition
 Design Static
 Unit of Measure U.S./Imperial
 Selected Facing Unit
 Licensor/Product Line: Anchor Wall Systems, Inc.
 Name: Diamond Pro
 Seismic As N/A



Soil Parameters		In Situ		
Soil Zone	Soil Type	Friction Angle °	Density ** [lb/ft³]	Cohesion Cf [lb/ft²]
Infill (i)	SM	34°	125.03	n/a
Retained (r)	SM	34°	125.03	n/a
Foundation (f)	SM	34°	125.03	0.00
Base (b)	GP	38°	115.00	n/a
Drainage (d)	GP	38°	115.00	n/a

Section Details							
Section Height	7.67	Back Slope	14.00°	LL Surcharge	0	DL Surcharge	0
Design Height	7.63 ft	Crest Offset	4.00 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	1.23 ft	Wall Batter	7.13°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced

External		Value	Internal		Value	Facing		Value
FSsl	Base Sliding	1.50	FSsl	Internal Sliding	1.50	FScs	Connection Strength	1.50
FSbc	Bearing Capacity	2.00	FSpO	Pullout	1.50	FSSc	Facing Shear	1.50
FSct	Crest Toppling	1.50	FSto	Tensile Overstress	1.50			
FSot	Overturning	1.50						

Reinforcements

3XT - Mirafi Miragrid 3XT		Supplier: TenCate Geosynthetics, Fill Type: Sands					
Tult	3,500.09 lb/ft	RFcr	1.44	RFd	1.10	LTDS	2,104.43 lb/ft
RFid	1.05	Cds	0.80	Cl	0.80		

Connection/Shear Properties

•cs1	801.02 lb/ft	IP-1	1,000.42 lb/ft	•cs2	1,782.25 lb/ft	IP-2	2,183.79 lb/ft
•cs max	2,085.80 lb/ft	au	1,181.32 lb/ft	•u	45.00 lb/ft	Vu(max)	2,660.70 lb/ft

Analysis Results

- * Analysis includes Vertical Forces
- * Embedment is included in Bearing Capacity
- * Analysis uses Auto-Tan(kh) < 0

External Static		FS	
Bearing Capacity	18.27	Bearing Pressure	1090.31 lb/ft²
Overturning	9.88	Max Eccentricity	0.00 ft
Base Sliding	5.13		
Crest Toppling	14.99		
Internal Sliding	7.21		

Internal Static Layer	Elevation [ft]	Rein.	Length [ft]	Internal Sliding		Tensile Overstress	
				FS	Pullout FS	FS	FS
5	107.33	3XT	6.00	41.40	9.02	61.09	
4	106.00	3XT	6.00	19.71	10.65	26.51	
3	104.67	3XT	6.00	12.59	12.87	16.77	
2	103.33	3XT	6.00	9.18	15.34	12.27	
1	102.00	3XT	6.00	7.21	11.34	6.12	

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Facing Static Layer	Elevation [ft]	Rein.	Length [ft]	Connection	
				Strength	FS
5	107.33	3XT	6.00	26.55	
4	106.00	3XT	6.00	13.49	
3	104.67	3XT	6.00	9.79	
2	103.33	3XT	6.00	8.07	
1	102.00	3XT	6.00	4.49	

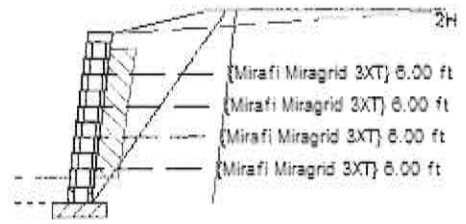
Internal Compound Stability

10 Lowest Static

Radius Point	Entry Point	Exit Point	Result	Status
1	5	1	1.94	Pass
3	6	3	2.36	Pass
1	9	2	2.52	Pass
4	6	5	2.71	Pass
1	8	4	2.95	Pass
3	4	7	3.32	Pass
1	7	6	3.41	Pass
1	6	8	4.34	Pass
4	3	9	4.65	Pass
1	4	10	6.63	Pass

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Section #3 at Station 20.25
 Report Date June 16, 2025
 Designer Onello Engineering, Angelo Onello PE
 Design Standard National Concrete Masonry Association 3rd Edition
 Design Static
 Unit of Measure U.S./Imperial
 Selected Facing Unit
 Licensor/Product Line: Anchor Wall Systems, Inc.
 Name: Diamond Pro
 Seismic As N/A



Soil Zone	Soil Type	Friction Angle °	In Situ	
			Density ** [lb/ft³]	Cohesion Cf [lb/ft²]
Infill (i)	SM	34°	125.03	n/a
Retained (r)	SM	34°	125.03	n/a
Foundation (f)	SM	34°	125.03	0.00
Base (b)	GP	38°	115.00	n/a
Drainage (d)	GP	38°	115.00	n/a

Section Details							
Section Height	7.00	Back Slope	14.00°	LL Surcharge	0	DL Surcharge	0
Design Height	6.99 ft	Crest Offset	4.00 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	1.03 ft	Wall Batter	7.13°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced

External		Value	Internal		Value	Facing		Value
FSsl	Base Sliding	1.50	FSsl	Internal Sliding	1.50	FScs	Connection Strength	1.50
FSbc	Bearing Capacity	2.00	FSpa	Pullout	1.50	FSSc	Facing Shear	1.50
FSct	Crest Toppling	1.50	FSto	Tensile Overstress	1.50			
FSot	Overturning	1.50						

Reinforcements

3XT - Mirafi Miragrid 3XT		Supplier: TenCate Geosynthetics, Fill Type: Sands					
Tult	3,500.09 lb/ft	RFcr	1.44	RFd	1.10	LTDS	2,104.43 lb/ft
RFid	1.05	Cds	0.80	Cl	0.80		

Connection/Shear Properties

•cs1	801.02 lb/ft	IP-1	1,000.42 lb/ft	•cs2	1,782.25 lb/ft	IP-2	2,183.79 lb/ft
•cs max	2,085.80 lb/ft	au	1,181.32 lb/ft	•u	45.00 lb/ft	Vu(max)	2,660.70 lb/ft

Analysis Results

- * Analysis includes Vertical Forces
- * Embedment is included in Bearing Capacity
- * Analysis uses Auto- $\alpha \tan(kh) \leq 0$

External Static		FS	
Bearing Capacity	19.22	Bearing Pressure	999.39 lb/ft²
Overturning	11.29	Max Eccentricity	0.00 ft
Base Sliding	5.49		
Crest Toppling	5.56		
Internal Sliding	8.04		

Internal Static		Rein.	Length [ft]	Internal Sliding	Pullout	Tensile Overstress
Layer	Elevation [ft]			FS	FS	FS
4	106.00	3XT	6.00	26.67	9.70	30.06
3	104.67	3XT	6.00	15.28	13.37	20.31
2	103.33	3XT	6.00	10.56	15.60	14.04
1	102.00	3XT	6.00	8.04	11.36	6.76

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Facing Static Layer	Elevation [ft]	Rein.	Length [ft]	Connection	
				Strength	FS
4	106.00	3XT	6.00	14.22	
3	104.67	3XT	6.00	11.12	
2	103.33	3XT	6.00	8.74	
1	102.00	3XT	6.00	4.71	

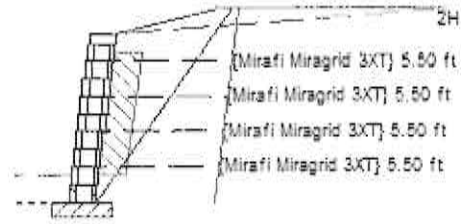
Internal Compound Stability

10 Lowest Static

Radius Point	Entry Point	Exit Point	Result	Status
1	5	1	1.98	Pass
2	6	3	2.51	Pass
1	10	2	2.65	Pass
4	6	5	2.96	Pass
1	9	4	3.17	Pass
1	8	6	3.77	Pass
3	4	7	3.81	Pass
1	6	8	5.14	Pass
8	1	9	5.99	Pass
1	1	10	7.77	Pass

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Section #4 at Station 30.00
 Report Date June 16, 2025
 Designer Onello Engineering, Angelo Onello PE
 Design Standard National Concrete Masonry Association 3rd Edition
 Design Static
 Unit of Measure U.S./Imperial
 Selected Facing Unit
 Licensor/Product Line: Anchor Wall Systems, Inc.
 Name: Diamond Pro
 Seismic As N/A



Soil Parameters		In Situ		
Soil Zone	Soil Type	Friction Angle °	Density γ [lb/ft ³]	Cohesion Cf [lb/ft ²]
Infill (i)	SM	34°	125.03	n/a
Retained (r)	SM	34°	125.03	n/a
Foundation (f)	SM	34°	125.03	0.00
Base (b)	GP	38°	115.00	n/a
Drainage (d)	GP	38°	115.00	n/a

Section Details							
Section Height	6.33	Back Slope	14.00°	LL Surcharge	0	DL Surcharge	0
Design Height	6.33 ft	Crest Offset	4.00 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	1.02 ft	Wall Batter	7.13°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced

External		Value	Internal		Value	Facing		Value
FSsl	Base Sliding	1.50	FSsl	Internal Sliding	1.50	FScs	Connection Strength	1.50
FSbc	Bearing Capacity	2.00	FSp0	Pullout	1.50	FSSc	Facing Shear	1.50
FSct	Crest Toppling	1.50	FSto	Tensile Overstress	1.50			
FSot	Overturning	1.50						

Reinforcements

3XT - Mirafix Miragrid 3XT		Supplier: TenCate Geosynthetics, Fill Type: Sands					
Tult	3,500.09 lb/ft	RFcr	1.44	RFd	1.10	LTDS	2,104.43 lb/ft
RFid	1.05	Cds	0.80	Cl	0.80		

Connection/Shear Properties

•cs1	801.02 lb/ft	IP-1	1,000.42 lb/ft	•cs2	1,782.25 lb/ft	IP-2	2,183.79 lb/ft
•cs max	2,085.80 lb/ft	au	1,181.32 lb/ft	•u	45.00 lb/ft	Vu(max)	2,660.70 lb/ft

Analysis Results

- * Analysis includes Vertical Forces
- * Embedment is included in Bearing Capacity
- * Analysis uses Auto- $\alpha \tan(kh) \leq 0$

External Static		FS	
Bearing Capacity	19.72	Bearing Pressure	907.18 lb/ft ²
Overturning	11.13	Max Eccentricity	0.00 ft
Base Sliding	5.42		
Crest Toppling	13.48		
Internal Sliding	8.62		

Internal Static Layer	Elevation [ft]	Rein.	Length [ft]	Internal Sliding	Pullout	Tensile Overstress
				FS	FS	FS
4	106.00	3XT	5.50	38.82	10.11	57.97
3	104.67	3XT	5.50	18.54	11.30	25.88
2	103.33	3XT	5.50	11.83	13.46	16.47
1	102.00	3XT	5.50	8.62	9.93	7.55

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Facing Static Layer	Elevation [ft]	Rein.	Length [ft]	Connection	
				Strength	FS
4	106.00	3XT	5.50	25.31	
3	104.67	3XT	5.50	13.23	
2	103.33	3XT	5.50	9.65	
1	102.00	3XT	5.50	4.98	

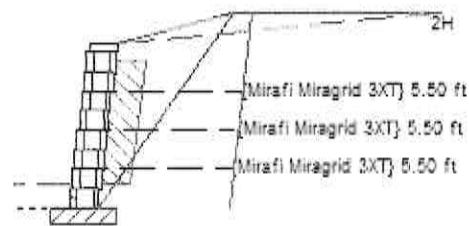
Internal Compound Stability

10 Lowest Static

Radius Point	Entry Point	Exit Point	Result	Status
1	4	1	2.01	Pass
3	6	3	2.61	Pass
1	9	2	2.65	Pass
4	5	5	3.19	Pass
1	8	4	3.29	Pass
1	7	6	4.11	Pass
8	4	7	4.49	Pass
1	5	8	6.26	Pass
1	2	9	9.00	Pass

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Section #5 at Station 40.50
 Report Date June 16, 2025
 Designer Onello Engineering, Angelo Onello PE
 Design Standard National Concrete Masonry Association 3rd Edition
 Design Static
 Unit of Measure U.S./Imperial
 Selected Facing Unit
 Licensor/Product Line: Anchor Wall Systems, Inc.
 Name: Diamond Pro
 Seismic As N/A



Soil Zone	Soil Type	Friction Angle °	In Situ	
			Density •• [lb/ft³]	Cohesion Cf [lb/ft²]
Infill (i)	SM	34°	125.03	n/a
Retained (r)	SM	34°	125.03	n/a
Foundation (f)	SM	34°	125.03	0.00
Base (b)	GP	38°	115.00	n/a
Drainage (d)	GP	38°	115.00	n/a

Section Details							
Section Height	5.67	Back Slope	14.00°	LL Surcharge	0	DL Surcharge	0
Design Height	5.63 ft	Crest Offset	4.00 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.82 ft	Wall Batter	7.13°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced

External		Value	Internal		Value	Facing		Value
FSsl	Base Sliding	1.50	FSsl	Internal Sliding	1.50	FSCs	Connection Strength	1.50
FSbc	Bearing Capacity	2.00	FSpO	Pullout	1.50	FSSc	Facing Shear	1.50
FSct	Crest Toppling	1.50	FSto	Tensile Overstress	1.50			
FSot	Overturning	1.50						

Reinforcements

3XT - Mirafi Miragrid 3XT		Supplier: TenCate Geosynthetics, Fill Type: Sands					
Tult	3,500.09 lb/ft	RFcr	1.44	RFd	1.10	LTDS	2,104.43 lb/ft
RFid	1.05	Cds	0.80	Cl	0.80		

Connection/Shear Properties

•cs1	801.02 lb/ft	IP-1	1,000.42 lb/ft	•cs2	1,782.25 lb/ft	IP-2	2,183.79 lb/ft
•cs max	2,085.80 lb/ft	au	1,181.32 lb/ft	•u	45.00 lb/ft	Vu(max)	2,660.70 lb/ft

Analysis Results

- * Analysis includes Vertical Forces
- * Embedment is included in Bearing Capacity
- * Analysis uses Auto-..... $\alpha \tan(kh) \ll 0$

External Static		FS	
Bearing Capacity	21.19	Bearing Pressure	808.82 lb/ft²
Overturning	13.24	Max Eccentricity	0.00 ft
Base Sliding	5.91		
Crest Toppling	5.78		
Internal Sliding	10.07		

Internal Static Layer	Elevation [ft]	Rein.	Length [ft]	Internal Sliding	Pullout	Tensile Overstress
				FS	FS	FS
3	104.67	3XT	5.50	25.89	10.31	30.34
2	103.33	3XT	5.50	14.66	13.90	20.25
1	102.00	3XT	5.50	10.07	9.95	8.64

Facing Static		Connection Strength		
Layer	Elevation [ft]	Rein.	Length [ft]	FS
3	104.67	3XT	5.50	14.31

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Facing Static Layer	Elevation [ft]	Rein.	Length [ft]	Connection Strength	
					FS
2	103.33	3XT	5.50		11.07
1	102.00	3XT	5.50		5.37

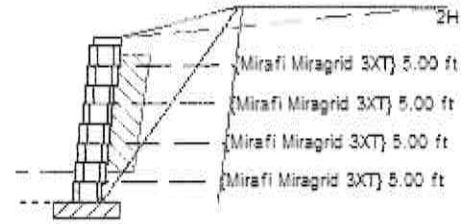
Internal Compound Stability

10 Lowest Static

Radius Point	Entry Point	Exit Point	Result	Status
1	5	1	2.11	Pass
1	9	2	2.86	Pass
5	7	3	2.88	Pass
1	8	4	3.71	Pass
6	5	5	3.74	Pass
1	6	6	5.00	Pass
7	2	7	6.08	Pass
1	2	8	7.91	Pass

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Section #6 at Station 50.25
 Report Date June 16, 2025
 Designer Onello Engineering, Angelo Onello PE
 Design Standard National Concrete Masonry Association 3rd Edition
 Design Static
 Unit of Measure U.S./Imperial
 Selected Facing Unit
 Licensor/Product Line: Anchor Wall Systems, Inc.
 Name: Diamond Pro
 Seismic As N/A



Soil Zone	Soil Type	Friction Angle °	In Situ	
			Density ** [lb/ft³]	Cohesion Cf [lb/ft²]
Infill (i)	SM	34°	125.03	n/a
Retained (r)	SM	34°	125.03	n/a
Foundation (f)	SM	34°	125.03	0.00
Base (b)	GP	38°	115.00	n/a
Drainage (d)	GP	38°	115.00	n/a

Section Details							
Section Height	5.67	Back Slope	14.00°	LL Surcharge	0	DL Surcharge	0
Design Height	5.65 ft	Crest Offset	4.00 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	1.00 ft	Wall Batter	7.13°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced

External		Value	Internal		Value	Facing		Value
FSsl	Base Sliding	1.50	FSsl	Internal Sliding	1.50	FScs	Connection Strength	1.50
FSbc	Bearing Capacity	2.00	FSpO	Pullout	1.50	FSsc	Facing Shear	1.50
FSct	Crest Toppling	1.50	FSto	Tensile Overstress	1.50			
FSot	Overturning	1.50						

Reinforcements

3XT - Mirafi Miragrid 3XT Supplier: TenCate Geosynthetics, Fill Type: Sands

Tult	3,500.09 lb/ft	RFcr	1.44	RFd	1.10	LTDS	2,104.43 lb/ft
RFid	1.05	Cds	0.80	Cl	0.80		

Connection/Shear Properties

•cs1	801.02 lb/ft	IP-1	1,000.42 lb/ft	•cs2	1,782.25 lb/ft	IP-2	2,183.79 lb/ft
•cs max	2,085.80 lb/ft	au	1,181.32 lb/ft	•u	45.00 lb/ft	Vu(max)	2,660.70 lb/ft

Analysis Results

- * Analysis includes Vertical Forces
- * Embedment is included in Bearing Capacity
- * Analysis uses Auto-..... aTan(kh) < 0.....

External Static		FS	
Bearing Capacity	20.39	Bearing Pressure	810.06 lb/ft²
Overturning	10.98	Max Eccentricity	0.00 ft
Base Sliding	5.34		
Crest Toppling	14.01		
Internal Sliding	8.16		

Internal Static Layer	Elevation [ft]	Rein.	Length [ft]	Internal Sliding		
				FS	Pullout FS	Tensile Overstress FS
4	104.67	3XT	5.00	37.75	8.71	58.57
3	103.33	3XT	5.00	17.76	10.25	25.88
2	102.00	3XT	5.00	11.25	12.52	16.43
1	100.67	3XT	5.00	8.16	15.00	12.04

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Facing Static Layer	Elevation [ft]	Rein.	Length [ft]	Connection	
				Strength	FS
4	104.67	3XT	5.00	25.53	
3	103.33	3XT	5.00	13.21	
2	102.00	3XT	5.00	9.61	
1	100.67	3XT	5.00	7.94	

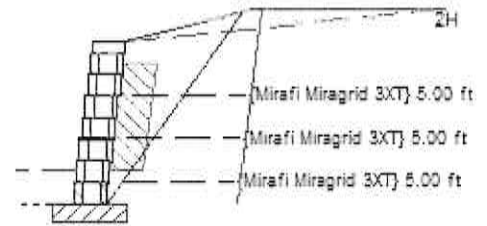
Internal Compound Stability

10 Lowest Static

Radius Point	Entry Point	Exit Point	Result	Status
5	7	2	2.56	Pass
1	8	1	2.61	Pass
7	6	4	3.15	Pass
1	8	3	3.27	Pass
1	6	5	4.02	Pass
9	4	6	4.47	Pass
1	5	7	6.20	Pass
1	3	8	9.13	Pass

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Section #7 at Station 60.00
 Report Date June 16, 2025
 Designer Onello Engineering, Angelo Onello PE
 Design Standard National Concrete Masonry Association 3rd Edition
 Design Static
 Unit of Measure U.S./Imperial
 Selected Facing Unit
 Licensor/Product Line: Anchor Wall Systems, Inc.
 Name: Diamond Pro
 Seismic As N/A



Soil Parameters		In Situ		
Soil Zone	Soil Type	Friction Angle °	Density ** [lb/ft³]	Cohesion Cf [lb/ft²]
Infill (i)	SM	34°	125.03	n/a
Retained (r)	SM	34°	125.03	n/a
Foundation (f)	SM	34°	125.03	0.00
Base (b)	GP	38°	115.00	n/a
Drainage (d)	GP	38°	115.00	n/a

Section Details							
Section Height	5.00	Back Slope	14.00°	LL Surcharge	0	DL Surcharge	0
Design Height	5.00 ft	Crest Offset	4.00 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	1.00 ft	Wall Batter	7.13°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced

External		Value	Internal		Value	Facing		Value
FSsl	Base Sliding	1.50	FSsl	Internal Sliding	1.50	FScs	Connection Strength	1.50
FSbc	Bearing Capacity	2.00	FSpa	Pullout	1.50	FSsc	Facing Shear	1.50
FSct	Crest Toppling	1.50	FSto	Tensile Overstress	1.50			
FSot	Overturning	1.50						

Reinforcements

3XT - Mirafi Miragrid 3XT		Supplier: TenCate Geosynthetics, Fill Type: Sands					
Tult	3,500.09 lb/ft	RFcr	1.44	RFd	1.10	LTDS	2,104.43 lb/ft
RFid	1.05	Cds	0.80	Cl	0.80		

Connection/Shear Properties

•cs1	801.02 lb/ft	IP-1	1,000.42 lb/ft	•cs2	1,782.25 lb/ft	IP-2	2,183.79 lb/ft
•cs max	2,085.80 lb/ft	au	1,181.32 lb/ft	•u	45.00 lb/ft	Vu(max)	2,660.70 lb/ft

Analysis Results

- * Analysis includes Vertical Forces
- * Embedment is included in Bearing Capacity
- * Analysis uses Auto- $\tan(kh) < 0$

External Static		FS	
Bearing Capacity	22.98	Bearing Pressure	718.72 lb/ft²
Overturning	13.09	Max Eccentricity	0.00 ft
Base Sliding	5.83		
Crest Toppling	5.44		
Internal Sliding	9.44		

Internal Static				Internal Sliding	Pullout	Tensile Overstress
Layer	Elevation [ft]	Rein.	Length [ft]	FS	FS	FS
3	103.33	3XT	5.00	24.29	9.07	29.19
2	102.00	3XT	5.00	13.75	12.82	19.87
1	100.67	3XT	5.00	9.44	15.11	13.75

Facing Static		Connection Strength		
Layer	Elevation [ft]	Rein.	Length [ft]	FS
3	103.33	3XT	5.00	13.83

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Facing Static Layer	Elevation [ft]	Rein.	Length [ft]	Connection	
				Strength	FS
2	102.00	3XT	5.00		10.90
1	100.67	3XT	5.00		8.57

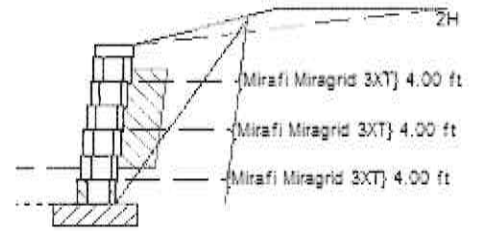
Internal Compound Stability

10 Lowest Static

Radius Point	Entry Point	Exit Point	Result	Status
1	9	1	2.77	Pass
6	7	2	2.81	Pass
1	8	3	3.64	Pass
10	6	4	3.65	Pass
1	6	5	4.79	Pass
9	3	6	6.00	Pass
1	3	7	7.74	Pass

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Section #8 at Station 70.50
 Report Date June 16, 2025
 Designer Onello Engineering, Angelo Onello PE
 Design Standard National Concrete Masonry Association 3rd Edition
 Design Static
 Unit of Measure U.S./Imperial
 Selected Facing Unit
 Licensor/Product Line: Anchor Wall Systems, Inc.
 Name: Diamond Pro
 Seismic As N/A



Soil Parameters		In Situ		
Soil Zone	Soil Type	Friction Angle °	Density •• [lb/ft³]	Cohesion Cf [lb/ft²]
Infill (i)	SM	34°	125.03	n/a
Retained (r)	SM	34°	125.03	n/a
Foundation (f)	SM	34°	125.03	0.00
Base (b)	GP	38°	115.00	n/a
Drainage (d)	GP	38°	115.00	n/a

Section Details							
Section Height	4.33	Back Slope	14.00°	LL Surcharge	0	DL Surcharge	0
Design Height	4.33 ft	Crest Offset	4.00 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	1.00 ft	Wall Batter	7.13°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced

External		Value	Internal		Value	Facing		Value
FSsl	Base Sliding	1.50	FSsl	Internal Sliding	1.50	FScs	Connection Strength	1.50
FSbc	Bearing Capacity	2.00	FSpO	Pullout	1.50	FSSc	Facing Shear	1.50
FSct	Crest Toppling	1.50	FSto	Tensile Overstress	1.50			
FSot	Overturning	1.50						

Reinforcements

3XT - Mirafi Miragrid 3XT		Supplier: TenCate Geosynthetics, Fill Type: Sands					
Tult	3,500.09 lb/ft	RFcr	1.44	RFd	1.10	LTDS	2,104.43 lb/ft
RFid	1.05	Cds	0.80	Cl	0.80		

Connection/Shear Properties

•cs1	801.02 lb/ft	IP-1	1,000.42 lb/ft	•cs2	1,782.25 lb/ft	IP-2	2,183.79 lb/ft
•cs max	2,085.80 lb/ft	au	1,181.32 lb/ft	•u	45.00 lb/ft	Vu(max)	2,660.70 lb/ft

Analysis Results

- * Analysis includes Vertical Forces
- * Embedment is included in Bearing Capacity
- * Analysis uses Auto-..... -aTan(kh) < 0.....

External Static		FS	
Bearing Capacity	22.62	Bearing Pressure	616.73 lb/ft²
Overturning	11.42	Max Eccentricity	0.00 ft
Base Sliding	5.38		
Crest Toppling	13.60		
Internal Sliding	10.72		

Internal Static		Internal Sliding		Tensile Overstress	
Layer	Elevation [ft]	Rein.	Length [ft]	FS	FS
3	103.33	3XT	4.00	42.84	56.87
2	102.00	3XT	4.00	17.87	25.33
1	100.67	3XT	4.00	10.72	16.11

Facing Static		Connection Strength	
Layer	Elevation [ft]	Rein.	Length [ft]
3	103.33	3XT	4.00

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Facing Static Layer	Elevation [ft]	Rein.	Length [ft]	Connection Strength	
					FS
2	102.00	3XT	4.00		12.94
1	100.67	3XT	4.00		9.43

Internal Compound Stability

10 Lowest Static

Radius Point	Entry Point	Exit Point	Result	Status
1	6	1	2.81	Pass
10	7	2	2.99	Pass
4	8	3	3.95	Pass
10	5	4	4.39	Pass
5	6	5	6.03	Pass
1	6	6	9.06	Pass

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Project Information

Client	Rayabarapu Ridgewood	Number	BCRDG2501
Name	Rayabarapu Ridgewood Retaining Walls	Designer	Onello Engineering, Angelc
Site	#370 Upper Boulevard, Lot 3 - Block 1910, Village of Ridgewood, Bergen County, New Jersey	Modified	6/16/2025
Revision	1	Created	5/9/2025
Standard	National Concrete Masonry Association 3rd Edition		
Seismic As	N/A		
Comments	Rayabarapu, Ridgewood•• #370 Upper Boulevard•• Lot 3 - Block 1910•• Village of Ridgewood•• Bergen County, New Jersey		

Selected Facing Unit

Licenser/Product Line: Anchor Wall Systems, Inc.
Name: Diamond Pro

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY
AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Project Design Inputs

Design Standard National Concrete Masonry Association 3rd Edition

Minimum Factors of Safety

Conventional

External		Value	Internal		Value	Facing	Value
FSsl	Base Sliding	1.50	FSsl	Internal Sliding	1.50		
FSbc	Bearing Capacity	2.00	FSsc	Shear Capacity	1.50		
FSot	Overturning	1.50					

MultiDepth

External		Value	Internal		Value	Facing	Value
FSsl	Base Sliding	1.50					
FSbc	Bearing Capacity	2.00					
FSsh	Interface Shear	1.50					
FSot	Overturning	1.50					

No Fines

External		Value	Internal		Value	Facing	Value
FSsl	Base Sliding	1.50					
FSbc	Bearing Capacity	2.00					
FSot	Overturning	1.50					

Reinforced

External		Value	Internal		Value	Facing	Value
FSsl	Base Sliding	1.50	FSsl	Internal Sliding	1.50	FScs	Connection Strength 1.50
FSbc	Bearing Capacity	2.00	FSpO	Pullout	1.50	FSsc	Facing Shear 1.50
FSct	Crest Toppling	1.50	FSto	Tensile Overstress	1.50		
FSot	Overturning	1.50					

Design Factors

Term	Description	Minimum (as appl.)	Maximum (as appl.)
RC	Reinforced coverage ratio	1.00	0.00

Selected Facing Unit

Licenser/Product Line: Anchor Wall Systems, Inc.

Name: Diamond Pro

Facing Height	Hu	0.67 ft
Facing Width	Lu	1.50 ft
Facing Depth	Wu	1.00 ft
Facing Weight	Xu	120 lb/ft ³
Center of Gravity	Gu	0.50 ft
Setback	•u	0.08 ft
Batter	••	7.13 °
Cap Height	Hcu	0.33 ft
Initial Shear Capacity	au	1180.97 lb/ft
Apparent Shear Angle	•u	45.00 °
Maximum Shear Capacity	Vu(max)	2660.97 lb/ft

Selected Reinforcement Types

Reinforcements

3XT - Mirafi Miragrid 3XT		Supplier: TenCate Geosynthetics, Fill Type: Sands					
Tult	3,500.09 lb/ft	RFcr	1.44	RFd	1.10	LTDS	2,104.43 lb/ft
RFid	1.05	Cds	0.80	Cl	0.80		

Connection/Shear Properties

•cs1	801.02 lb/ft	IP-1	1,000.42 lb/ft	•cs2	1,782.25 lb/ft	IP-2	2,183.79 lb/ft
•cs max	2,085.80 lb/ft	au	1,181.32 lb/ft	•u	45.00 lb/ft	Vu(max)	2,660.70 lb/ft

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Selected Soil Types

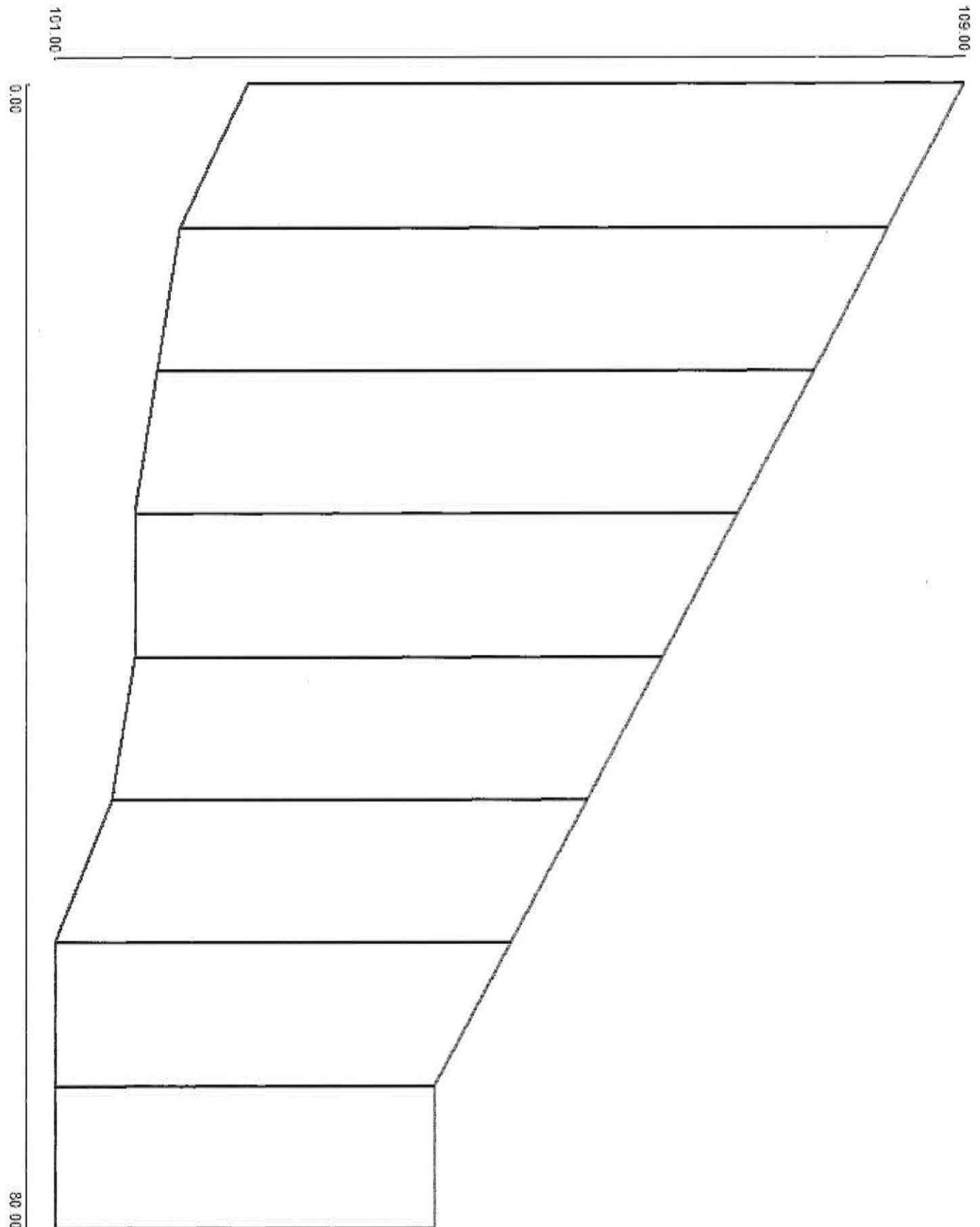
Soil Zone	Soil Type	Friction Angle °	In Situ	
			Density •• [lb/ft³]	Cohesion Cf [lb/ft²]
Infill (i)	SM	34°	125.03	n/a
Retained (r)	SM	34°	125.03	n/a
Foundation (f)	SM	34°	125.03	0.00
Base (b)	GP	38°	115.00	n/a
Drainage (d)	GP	38°	115.00	n/a

Soil Glossary

- CH:** Inorganic clays, high plasticity
- CL:** Inorganic clays, low to medium plasticity, gravelly, sandy, silty, lean clays
- GC:** Clayey gravels, poorly graded gravel-sand-clay mixtures
- GM:** Silty gravels, poorly graded gravel-sand-silt mixtures
- GP:** 1/2"-3/4" clean crushed stone or crushed gravel
- GW:** Well-graded gravels, gravel-sand. Little or no fines.
- MH:** Inorganic clayey silts, elastic silts
- ML:** Inorganic silts, very fine sands, silty or clayey, slight plasticity
- SC:** Clayey sands, poorly graded sand-clay mixtures
- SM:** Silty sands, poorly graded sand-silt mixtures
- SP:** Poorly-graded sands, gravelly sands. Little or no fines.
- SW:** Well-graded sands, gravelly sands. Little or no fines.

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Station Detail



NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Note: Station Layout is the face view of the wall, looking at it from left to right

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY
AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Analysis Summary

Lowest Values - Reinforced

Static Analysis

Test	Description	Section	Layer/ Course	Minimum Requirement	Result	Status
FSsl	Base Sliding	1		1.50	5.11	Pass
FSbc	Bearing Capacity	1		2.00	16.60	Pass
FSct	Crest Toppling	1	9	1.50	5.44	Pass
FSot	Overturning	1		1.50	9.81	Pass
FSsl	Internal Sliding	1	1	1.50	6.48	Pass
FSpO	Pullout	8	3	1.50	6.02	Pass
FSto	Tensile Overstress	2	1	1.50	6.12	Pass
FScs	Connection Strength	2	1	1.50	4.49	Pass
Rs	Max. Reinforcement Separation	7		0.0000	1.3333	Pass
RsBottom	Max. multiple of Hu at bottom	8		0.0000	1.0000	Pass
RsTop	Max. multiple of Hu at top	2		0.0000	1.5000	Pass
La	Min. Anchorage Length	8		1.0000	1.0430	Pass
L/H Ratio	Min. L/H Ratio	1		0.6000	0.7826	Pass
L	Min. Reinforcement Length	8		4.0000	4.0000	Pass

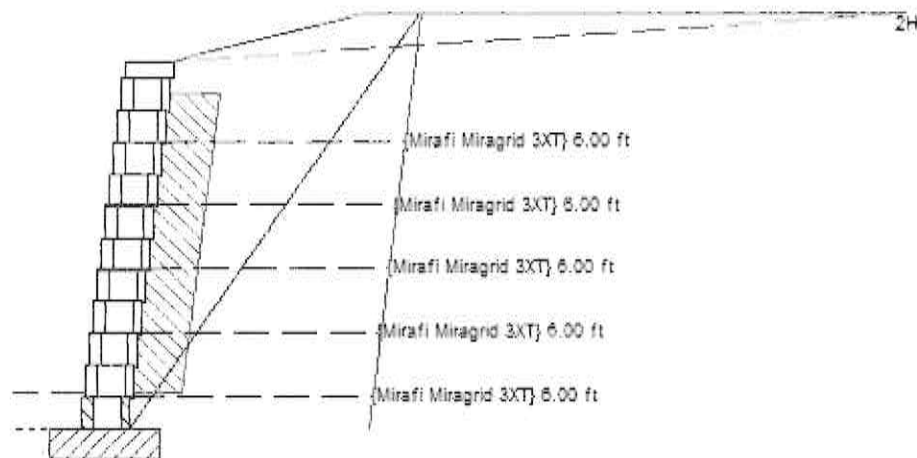
Below Standard Values

None

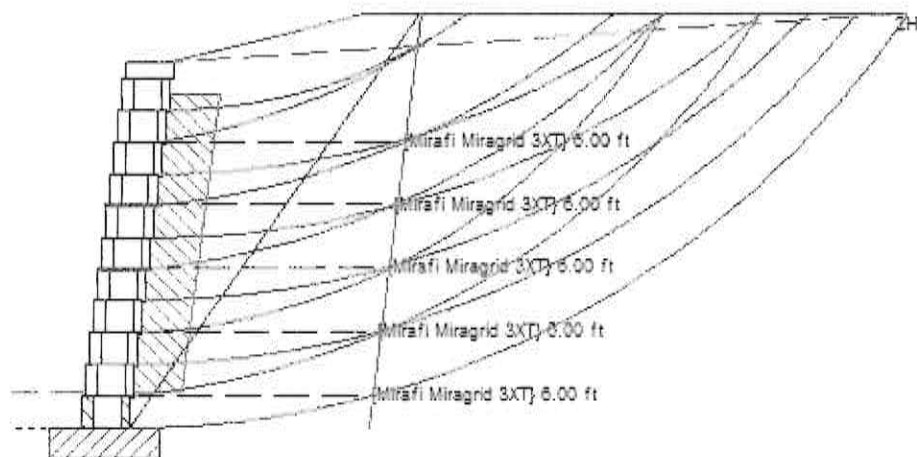
NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY
AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Section 1 Details

Section 1 Cross-section



Section 1 Static ICS Cross-section



Section 1 Cross-section Details

Upper Slope Angle	**	14.00 °
Crest Offset		4.00 ft
Live Load	ql	0 lb/ft ²
Live Offset	qlofs	0.00 ft
Dead Load	qd	0 lb/ft ²
Dead Offset	qdofs	0.00 ft
Top of Section		109.00 ft
Bottom Grade		102.09 ft
Base of Section		101.33 ft
Design Height	H	7.67 ft
Embedment Depth	Hemb	0.76 ft

* Analysis does not use External Horiz.Accel Coeff

* Analysis includes Vertical Forces

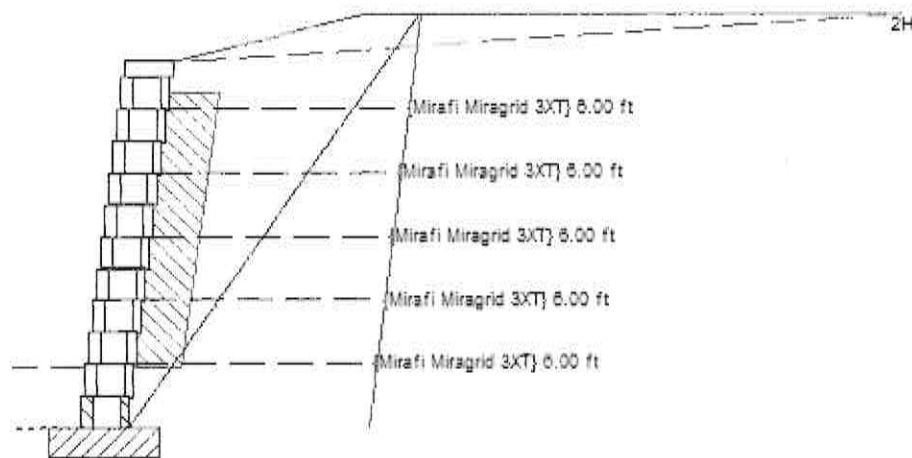
* Embedment is included in Bearing Capacity

* Analysis uses Auto-..... aTan(kh) < 0.....

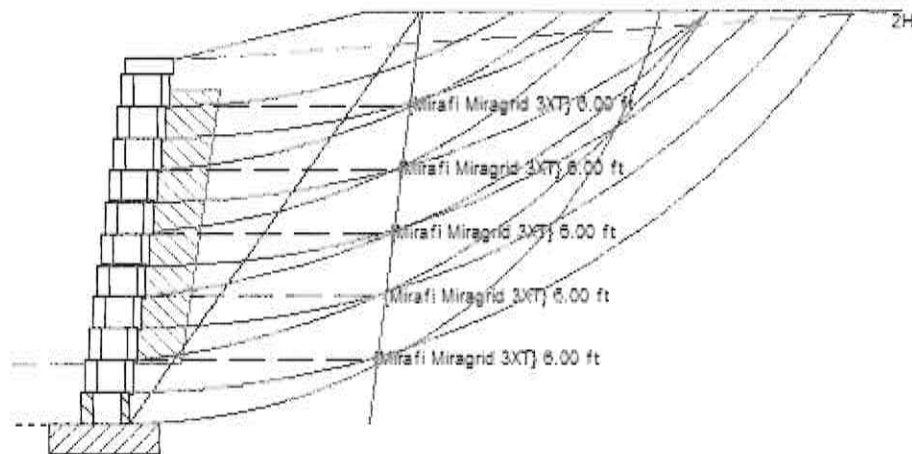
NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY
 AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Section 2 Details

Section 2 Cross-section



Section 2 Static ICS Cross-section



Section 2 Cross-section Details

Upper Slope Angle	••	14.00 °
Crest Offset		4.00 ft
Live Load	ql	0 lb/ft ²
Live Offset	qlofs	0.00 ft
Dead Load	qd	0 lb/ft ²
Dead Offset	qdofs	0.00 ft
Top of Section		108.33 ft
Bottom Grade		101.90 ft
Base of Section		100.67 ft
Design Height	H	7.63 ft
Embedment Depth	Hemb	1.23 ft

* Analysis does not use External Horiz.Accel Coeff

* Analysis includes Vertical Forces

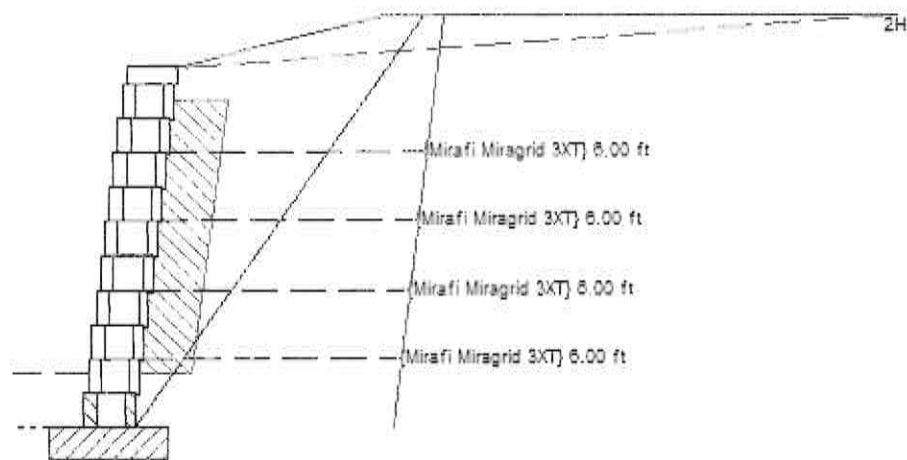
* Embedment is included in Bearing Capacity

* Analysis uses Auto- aTan(kh) ≤ 0

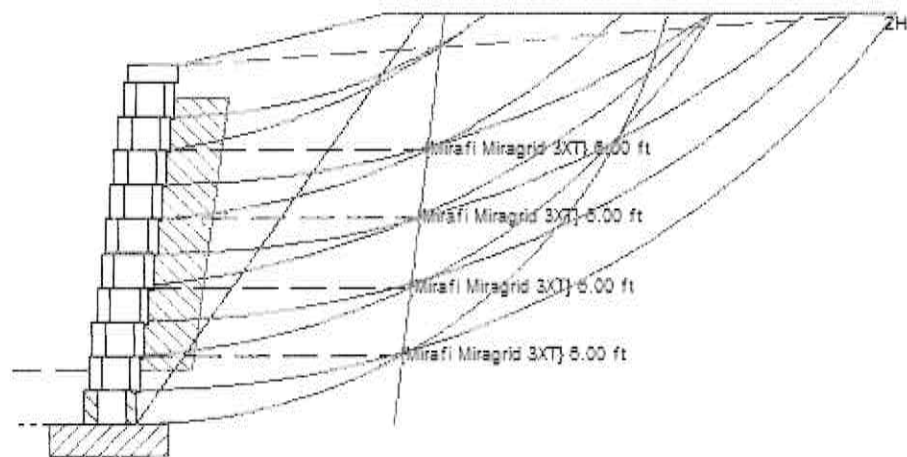
NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Section 3 Details

Section 3 Cross-section



Section 3 Static ICS Cross-section



Section 3 Cross-section Details

Upper Slope Angle	**	14.00 °
Crest Offset		4.00 ft
Live Load	ql	0 lb/ft²
Live Offset	qlofs	0.00 ft
Dead Load	qd	0 lb/ft²
Dead Offset	qdofs	0.00 ft
Top of Section		107.67 ft
Bottom Grade		101.70 ft
Base of Section		100.67 ft
Design Height	H	6.99 ft
Embedment Depth	Hemb	1.03 ft

* Analysis does not use External Horiz.Accel Coeff

* Analysis includes Vertical Forces

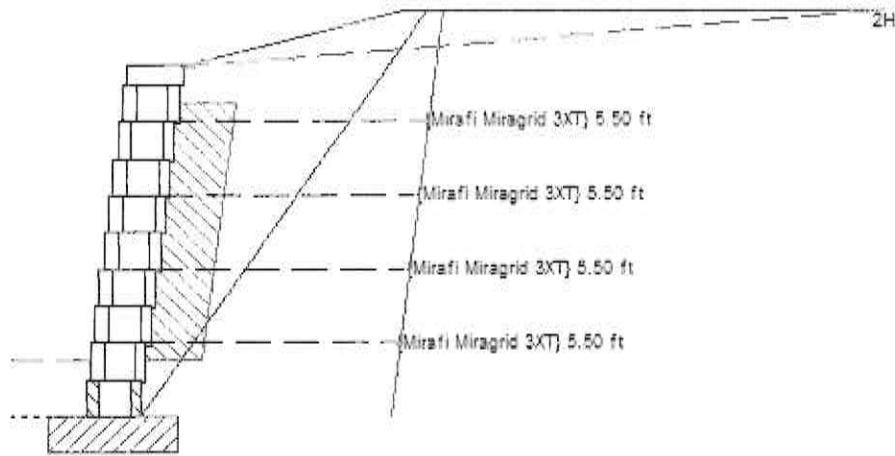
* Embedment is included in Bearing Capacity

* Analysis uses Auto-..... aTan(kh) < 0.....

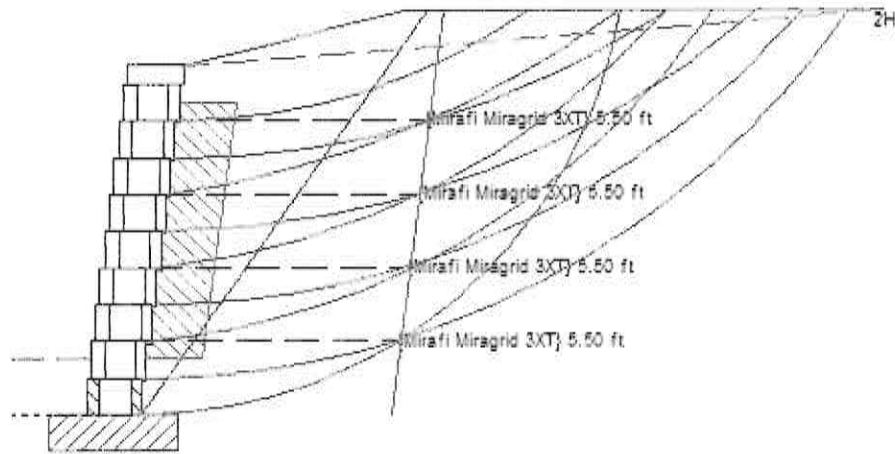
NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY
AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER

Section 4 Details

Section 4 Cross-section



Section 4 Static ICS Cross-section



Section 4 Cross-section Details

Upper Slope Angle	••	14.00 °
Crest Offset		4.00 ft
Live Load	ql	0 lb/ft ²
Live Offset	qlofs	0.00 ft
Dead Load	qd	0 lb/ft ²
Dead Offset	qdofs	0.00 ft
Top of Section		107.00 ft
Bottom Grade		101.69 ft
Base of Section		100.67 ft
Design Height	H	6.33 ft
Embedment Depth	Hemb	1.02 ft

* Analysis does not use External Horiz. Accel Coeff

* Analysis includes Vertical Forces

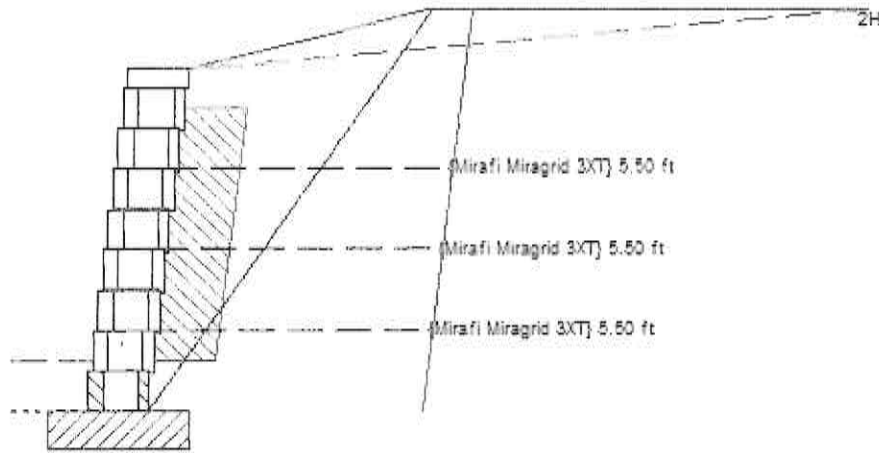
* Embedment is included in Bearing Capacity

* Analysis uses Auto- $\alpha \tan(kh) \leq 0$

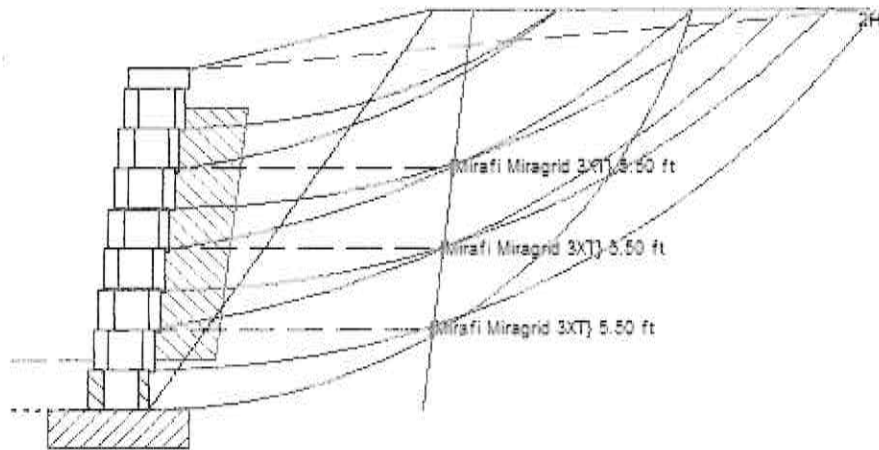
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Section 5 Details

Section 5 Cross-section



Section 5 Static ICS Cross-section



Section 5 Cross-section Details

Upper Slope Angle	••	14.00 °
Crest Offset		4.00 ft
Live Load	ql	0 lb/ft ²
Live Offset	qlofs	0.00 ft
Dead Load	qd	0 lb/ft ²
Dead Offset	qdofs	0.00 ft
Top of Section		106.33 ft
Bottom Grade		101.49 ft
Base of Section		100.67 ft
Design Height	H	5.63 ft
Embedment Depth	Hemb	0.82 ft

* Analysis does not use External Horiz. Accel Coeff

* Analysis includes Vertical Forces

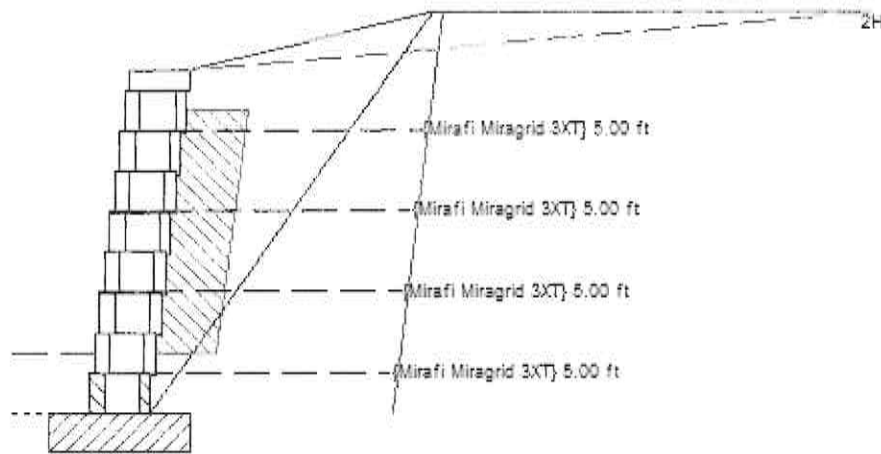
* Embedment is included in Bearing Capacity

* Analysis uses Auto-..... = aTan(kh) < 0.....

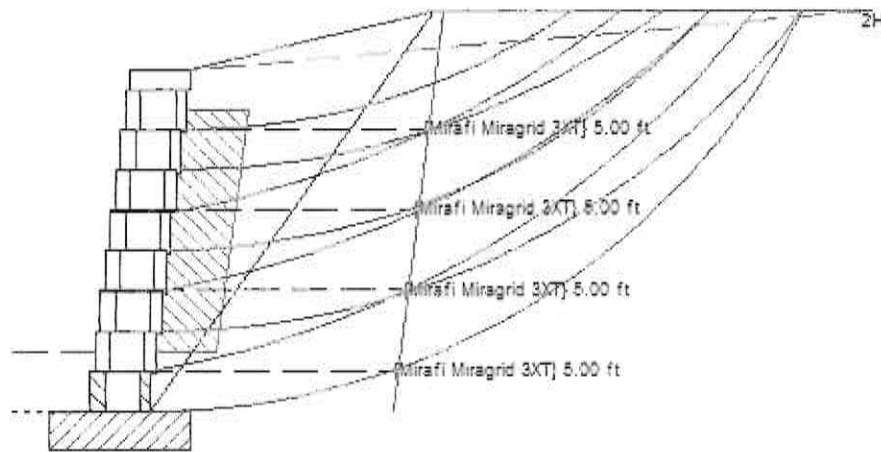
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Section 6 Details

Section 6 Cross-section



Section 6 Static ICS Cross-section



Section 6 Cross-section Details

Upper Slope Angle	••	14.00 °
Crest Offset		4.00 ft
Live Load	ql	0 lb/ft ²
Live Offset	qlofs	0.00 ft
Dead Load	qd	0 lb/ft ²
Dead Offset	qdofs	0.00 ft
Top of Section		105.67 ft
Bottom Grade		101.00 ft
Base of Section		100.00 ft
Design Height	H	5.65 ft
Embedment Depth	Hemb	1.00 ft

* Analysis does not use External Horiz. Accel Coeff

* Analysis includes Vertical Forces

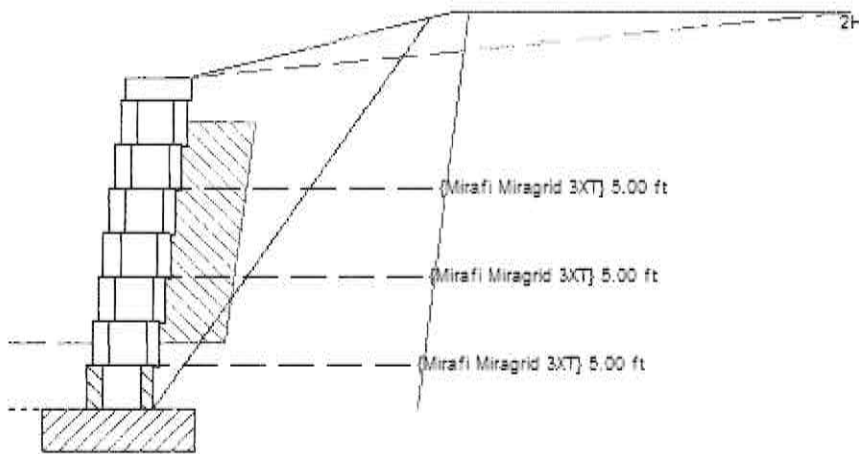
* Embedment is included in Bearing Capacity

* Analysis uses Auto-.....-aTan(kh).....< 0.....

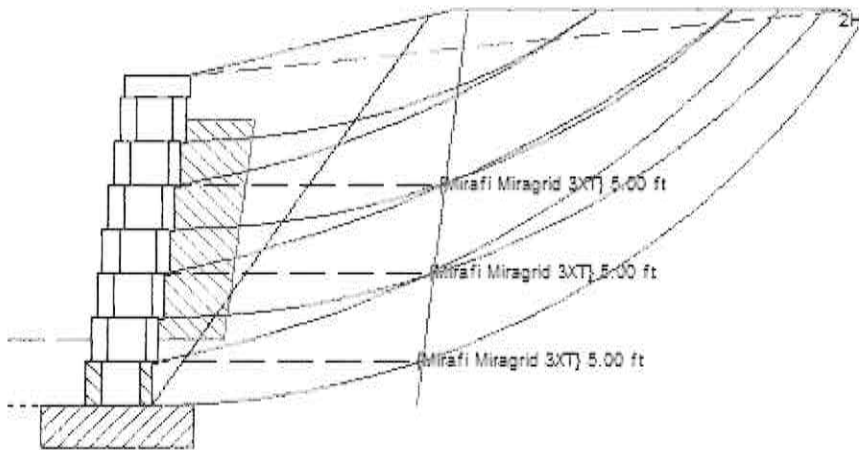
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Section 7 Details

Section 7 Cross-section



Section 7 Static ICS Cross-section



Section 7 Cross-section Details

Upper Slope Angle	**	14.00 °
Crest Offset		4.00 ft
Live Load	ql	0 lb/ft²
Live Offset	qlots	0.00 ft
Dead Load	qd	0 lb/ft²
Dead Offset	qdofs	0.00 ft
Top of Section		105.00 ft
Bottom Grade		101.00 ft
Base of Section		100.00 ft
Design Height	H	5.00 ft
Embedment Depth	Hemb	1.00 ft

* Analysis does not use External Horiz.Accel Coeff

* Analysis includes Vertical Forces

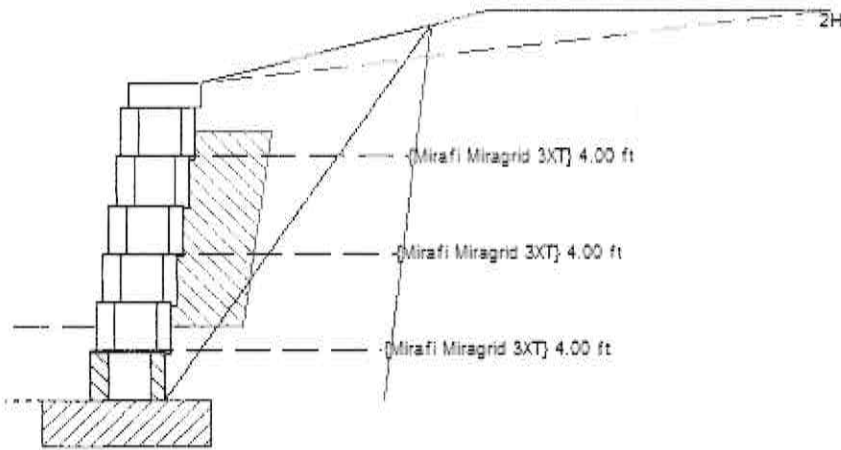
* Embedment is included in Bearing Capacity

* Analysis uses Auto-..... aTan(kh) < 0.....

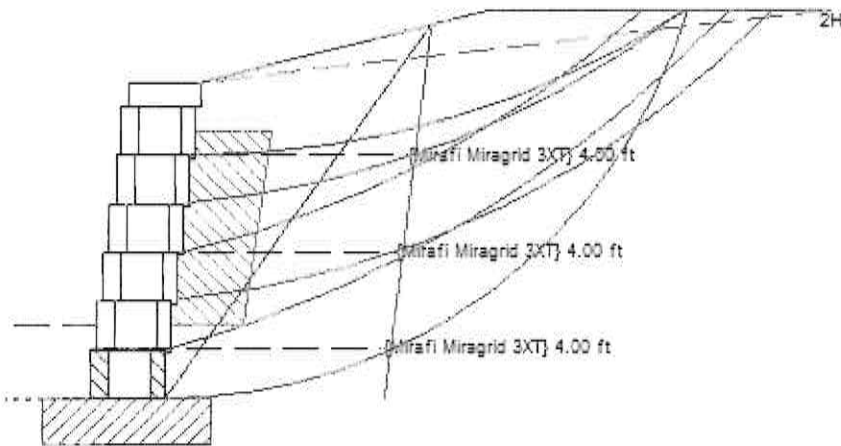
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Section 8 Details

Section 8 Cross-section



Section 8 Static ICS Cross-section



Section 8 Cross-section Details

Upper Slope Angle	••	14.00 °
Crest Offset		4.00 ft
Live Load	ql	0 lb/ft ²
Live Offset	qlofs	0.00 ft
Dead Load	qd	0 lb/ft ²
Dead Offset	qdofs	0.00 ft
Top of Section		104.33 ft
Bottom Grade		101.00 ft
Base of Section		100.00 ft
Design Height	H	4.33 ft
Embedment Depth	Hemb	1.00 ft

* Analysis does not use External Horiz. Accel Coeff

* Analysis includes Vertical Forces

* Embedment is included in Bearing Capacity

* Analysis uses Auto-..... aTan(kh) = < 0.....

NOTE: THESE CALCULATIONS, QUANTITIES, AND LAYOUTS ARE FOR PRELIMINARY DESIGN ONLY
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