

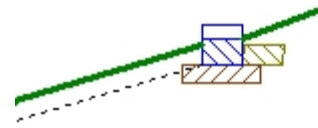
Project: 210816 - Proposed Starbucks

Site: 1360 Walton Boulevard, Rochester Hills Michigan

Date: 1/5/2022

Section Summary Report

Section #1 at Station 0.00
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Friction	
Soil Zone	[degrees]	[lb/ft ²]	[lb/ft ³]	Factor	Description
Retained	29	0.00	115.00	n/a	Loose Sand
Foundation	31	0.00	115.00	n/a	Loose Sand
Leveling Pad	40	n/a	n/a	0.70	
Drainage	38	n/a	115	n/a	

Section Details

Section Height	1.00	Back Slope	21.06°	LL Surcharge	0	DL Surcharge	0
Design Height	0.65 ft	Crest Offset	13.29 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.50 ft	Wall Batter	8.00°	Toe Slope	16.70°	Toe Offset	4.85 ft

Minimum Factors of Safety

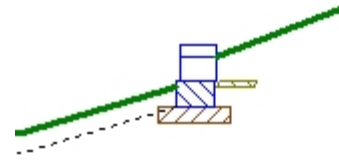
Conventional		Value		Internal		Value		Facing		Value	
External											
FSsl	Base Sliding	1.50	FSsl	Internal Sliding	1.50						
FSbc	Bearing Capacity	2.00	FSsc	Shear Capacity	1.50						
FSot	Overturning	1.50									

Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static	FS		
Bearing Capacity	62.65	Bearing Pressure	53.51 lb/ft ²
Overturning	20.84	Max Eccentricity	0.03 ft
Base Sliding	5.29		

Section #2 at Station 1.50
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Friction	
Soil Zone	[degrees]	[lb/ft ²]	[lb/ft ³]	Factor	Description
Retained	29	0.00	115.00	n/a	Loose Sand
Foundation	31	0.00	115.00	n/a	Loose Sand
Leveling Pad	40	n/a	n/a	0.70	
Drainage	38	n/a	115	n/a	

Section Details

Section Height	1.67	Back Slope	21.16°	LL Surcharge	0	DL Surcharge	0
Design Height	1.31 ft	Crest Offset	14.58 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.50 ft	Wall Batter	8.00°	Toe Slope	16.70°	Toe Offset	4.19 ft

Minimum Factors of Safety

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

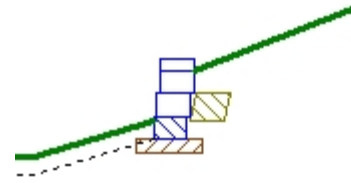
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	29.18	Bearing Pressure	112.41 lb/ft ²
Overturning	5.56	Max Eccentricity	0.05 ft
Base Sliding	2.61		

Internal Static		Shear Capacity	
Course	Elevation [ft]	FS	
1	0.67	42.51	

Section #3 at Station 8.25
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Friction	Description
Soil Zone	[degrees]	[lb/ft²]	[lb/ft³]	Factor	
Retained	29	0.00	115.00	n/a	Loose Sand
Foundation	31	0.00	115.00	n/a	Loose Sand
Leveling Pad	40	n/a	n/a	0.70	
Drainage	38	n/a	115	n/a	

Section Details

Section Height	2.33	Back Slope	21.25°	LL Surcharge	0	DL Surcharge	0
Design Height	1.96 ft	Crest Offset	15.87 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.52 ft	Wall Batter	8.00°	Toe Slope	16.70°	Toe Offset	3.54 ft

Minimum Factors of Safety

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

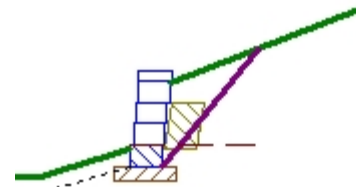
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static	FS		
Bearing Capacity	16.24	Bearing Pressure	190.49 lb/ft²
Overturning	2.66	Max Eccentricity	0.13 ft
Base Sliding	1.73		

Internal Static	Elevation [ft]	Shear Capacity	FS
1	0.67		19.39
2	1.33		42.88

Section #4 at Station 15.00
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Description
Soil Zone	[degrees]	[lb/ft ²]	[lb/ft ³]	
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	3.00	Back Slope	21.32°	LL Surcharge	0	DL Surcharge	0
Design Height	2.62 ft	Crest Offset	17.16 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.54 ft	Wall Batter	8.00°	Toe Slope	16.70°	Toe Offset	2.88 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
FSl	Base Sliding	1.50	FSl	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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		
Connection/Shear Properties							
cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

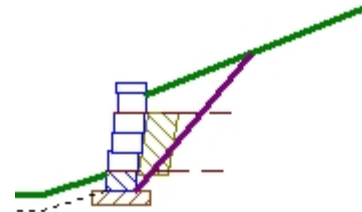
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static	FS		
Bearing Capacity	19.74	Bearing Pressure	368.31 lb/ft ²
Overturning	8.95	Max Eccentricity	0.00 ft
Base Sliding	2.99		
Crest Toppling	4.40		
Internal Sliding	7.67		

Internal Static										
Layer	Elevation	Rein	Length	Load	Tensile Resist.	Tensile FS	Pullout Resist.	Pullout FS	Conn. Resist.	Conn. FS
1	830.17	SG150	4.00	108	939	8.68	831	7.68	817	7.55

Section #5 at Station 21.75
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Description
Soil Zone	[degrees]	[lb/ft²]	[lb/ft³]	
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	3.67	Back Slope	21.38°	LL Surcharge	0	DL Surcharge	0
Design Height	3.28 ft	Crest Offset	18.46 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.56 ft	Wall Batter	8.00°	Toe Slope	16.70°	Toe Offset	2.22 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		
Connection/Shear Properties							
cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

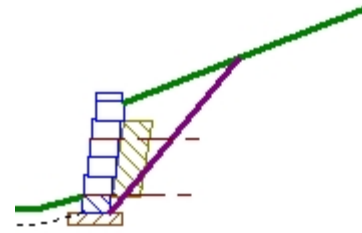
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	16.25	Bearing Pressure	449.00 lb/ft²
Overturning	6.81	Max Eccentricity	0.01 ft
Base Sliding	2.64		
Crest Toppling	51.10		
Internal Sliding	5.86		

Internal Static				Tensile	Tensile	Pullout	Pullout	Conn.	Conn.	
Layer	Elevation	Rein	Length	Load	Resist.	FS	Resist.	FS	Resist.	FS
2	832.17	SG150	4.00	41	939	22.84	231	5.62	771	18.75
1	830.17	SG150	4.00	129	939	7.31	1,037	8.07	840	6.54

Section #6 at Station 28.50
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Description
Soil Zone	[degrees]	[lb/ft ²]	[lb/ft ³]	
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	4.33	Back Slope	21.44°	LL Surcharge	0	DL Surcharge	0
Design Height	3.94 ft	Crest Offset	19.75 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.58 ft	Wall Batter	8.00°	Toe Slope	16.70°	Toe Offset	1.56 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

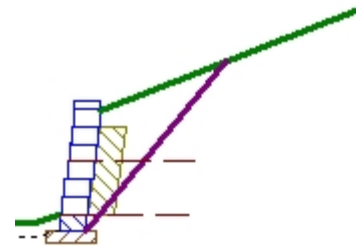
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	13.04	Bearing Pressure	547.30 lb/ft ²
Overturning	5.38	Max Eccentricity	0.07 ft
Base Sliding	2.36		
Crest Toppling	10.46		
Internal Sliding	4.71		

Internal Static				Tensile	Tensile	Pullout	Pullout	Conn.	Conn.	
Layer	Elevation	Rein	Length	Load	Resist.	FS	Resist.	FS	FS	
2	832.17	SG150	4.00	82	939	11.51	326	3.99	794	9.73
1	830.17	SG150	4.00	163	939	5.75	1,242	7.61	863	5.28

Section #7 at Station 35.25
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Zone	Phi Angle [degrees]	Cohesion [lb/ft²]	Unit Weight [lb/ft³]	Description
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	5.00	Back Slope	21.49°	LL Surcharge	0	DL Surcharge	0
Design Height	4.60 ft	Crest Offset	21.04 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.60 ft	Wall Batter	8.00°	Toe Slope	16.69°	Toe Offset	0.90 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	2.00				

Reinforcements

SG150 - StrataGrid 150 Supplier: Strata Systems - Stratagrid, Fill Type: Sands

Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

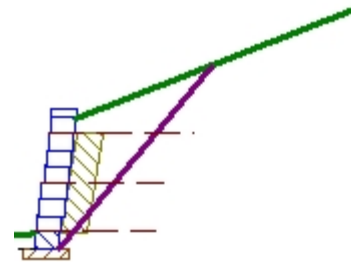
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static	FS		
Bearing Capacity	13.57	Bearing Pressure	643.50 lb/ft²
Overturning	5.69	Max Eccentricity	0.06 ft
Base Sliding	2.41		
Crest Toppling	4.54		
Internal Sliding	3.91		

Internal Static					Tensile Resist.	Tensile FS	Pullout Resist.	Pullout FS	Conn. Resist.	Conn. FS
Layer	Elevation	Rein	Length	Load						
2	832.17	SG150	5.00	136	939	6.91	835	6.14	817	6.01
1	830.17	SG150	5.00	198	939	4.74	2,107	10.64	885	4.47

Section #8 at Station 42.00
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Zone	Phi Angle [degrees]	Cohesion [lb/ft²]	Unit Weight [lb/ft³]	Description
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	5.67	Back Slope	21.53°	LL Surcharge	0	DL Surcharge	0
Design Height	5.26 ft	Crest Offset	22.33 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.62 ft	Wall Batter	8.00°	Toe Slope	16.67°	Toe Offset	0.24 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
FSSl	Base Sliding	1.50	FSSl	Internal Sliding	1.50	FSSc	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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

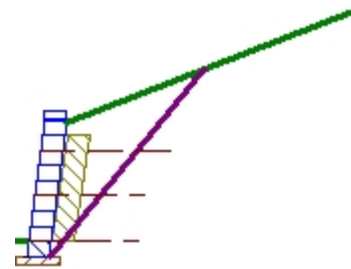
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	11.45	Bearing Pressure	747.43 lb/ft²
Overturning	4.78	Max Eccentricity	0.13 ft
Base Sliding	2.22		
Crest Toppling	56.90		
Internal Sliding	3.41		

Internal Static				Tensile	Tensile	Pullout	Pullout	Conn.	Conn.	
Layer	Elevation	Rein	Length	Load	Resist.	FS	Resist.	FS	Resist.	FS
3	834.17	SG150	6.00	40	939	23.41	505	12.58	770	19.20
2	832.17	SG150	5.00	164	939	5.73	1,009	6.16	839	5.12
1	830.17	SG150	5.00	233	939	4.03	2,393	10.27	908	3.90

Section #9 at Station 48.75
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Description
Soil Zone	[degrees]	[lb/ft²]	[lb/ft³]	
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	6.33	Back Slope	21.28°	LL Surcharge	0	DL Surcharge	0
Design Height	5.92 ft	Crest Offset	24.19 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.64 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
FSSl	Base Sliding	1.50	FSSl	Internal Sliding	1.50	FSSc	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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

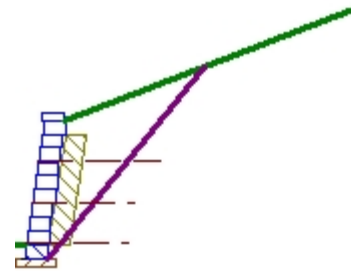
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	9.81	Bearing Pressure	855.81 lb/ft²
Overturning	4.15	Max Eccentricity	0.20 ft
Base Sliding	2.08		
Crest Toppling	11.00		
Internal Sliding	3.06		

Internal Static				Tensile	Tensile	Pullout	Pullout	Conn.	Conn.	
Layer	Elevation	Rein	Length	Load	Resist.	FS	Resist.	FS	Resist.	FS
3	834.17	SG150	6.00	80	939	11.75	649	8.12	793	9.92
2	832.17	SG150	5.00	205	939	4.59	1,185	5.79	862	4.21
1	830.17	SG150	5.00	266	939	3.53	2,678	10.05	931	3.49

Section #10 at Station 54.75
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Zone	Phi Angle [degrees]	Cohesion [lb/ft²]	Unit Weight [lb/ft³]	Description
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	7.00	Back Slope	20.91°	LL Surcharge	0	DL Surcharge	0
Design Height	6.64 ft	Crest Offset	26.53 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.65 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

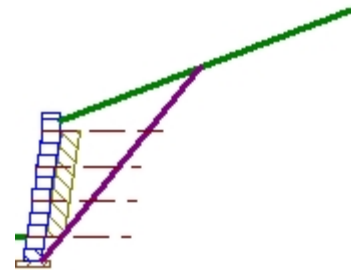
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	8.34	Bearing Pressure	980.31 lb/ft²
Overturning	3.64	Max Eccentricity	0.28 ft
Base Sliding	1.96		
Crest Toppling	4.35		
Internal Sliding	2.78		

Internal Static				Tensile Resist.	Tensile FS	Pullout Resist.	Pullout FS	Conn. Resist.	Conn. FS
Layer	Elevation	Rein	Length	Load					
3	834.17	SG150	6.00	137	939	6.83	808	818	5.95
2	832.17	SG150	5.00	247	939	3.80	1,376	887	3.58
1	830.17	SG150	5.00	301	939	3.12	2,985	955	3.17

Section #11 at Station 60.75
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Zone	Phi Angle [degrees]	Cohesion [lb/ft²]	Unit Weight [lb/ft³]	Description
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	8.33	Back Slope	20.63°	LL Surcharge	0	DL Surcharge	0
Design Height	7.93 ft	Crest Offset	28.58 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	1.32 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
FSSl	Base Sliding	1.50	FSSl	Internal Sliding	1.50	FSSc	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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

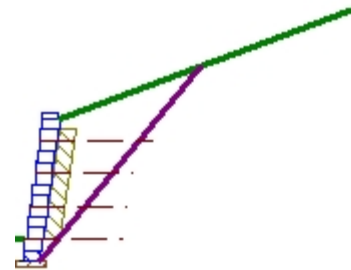
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	9.52	Bearing Pressure	1170.85 lb/ft²
Overturning	3.67	Max Eccentricity	0.32 ft
Base Sliding	1.98		
Crest Toppling	57.70		
Internal Sliding	2.71		

Internal Static				Tensile Resist.	Tensile FS	Pullout Resist.	Pullout FS	Conn. Resist.	Conn. FS
Layer	Elevation	Rein	Length	Load					
4	836.17	SG150	7.00	39	939	23.83	349	770	19.55
3	834.17	SG150	6.00	161	939	5.84	730	839	5.22
2	832.17	SG150	6.00	285	939	3.30	2,028	908	3.19
1	830.17	SG150	6.00	489	939	1.92	3,902	977	2.00

Section #12 at Station 66.00
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Zone	Phi Angle [degrees]	Cohesion [lb/ft²]	Unit Weight [lb/ft³]	Description
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	9.00	Back Slope	20.35°	LL Surcharge	0	DL Surcharge	0
Design Height	8.67 ft	Crest Offset	31.00 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	1.32 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
FSSl	Base Sliding	1.50	FSSl	Internal Sliding	1.50	FSSc	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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

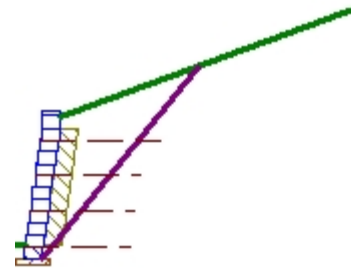
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	8.31	Bearing Pressure	1310.28 lb/ft²
Overturning	3.30	Max Eccentricity	0.40 ft
Base Sliding	1.88		
Crest Toppling	9.37		
Internal Sliding	2.51		

Internal Static				Tensile Resist.	Tensile FS	Pullout Resist.	Pullout FS	Conn. Resist.	Conn. FS
Layer	Elevation	Rein	Length	Load					
4	836.17	SG150	7.00	84	939	11.20	447	796	9.49
3	834.17	SG150	6.00	205	939	4.57	860	865	4.21
2	832.17	SG150	6.00	329	939	2.86	2,278	934	2.84
1	830.17	SG150	6.00	539	939	1.74	4,271	1,002	1.86

Section #13 at Station 72.75
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Zone	Phi Angle [degrees]	Cohesion [lb/ft²]	Unit Weight [lb/ft³]	Description
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	8.33	Back Slope	20.07°	LL Surcharge	0	DL Surcharge	0
Design Height	8.00 ft	Crest Offset	31.63 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.78 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
FSl	Base Sliding	1.50	FSl	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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

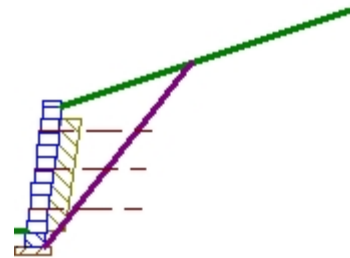
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	8.48	Bearing Pressure	1169.00 lb/ft²
Overturning	3.74	Max Eccentricity	0.30 ft
Base Sliding	2.02		
Crest Toppling	9.43		
Internal Sliding	2.55		

Internal Static				Tensile Resist.	Tensile FS	Pullout Resist.	Pullout FS	Conn. Resist.	Conn. FS	
Layer	Elevation	Rein	Length	Load						
4	836.17	SG150	7.00	83	939	11.26	624	7.49	796	9.55
3	834.17	SG150	6.00	204	939	4.60	1,121	5.49	865	4.24
2	832.17	SG150	6.00	327	939	2.87	2,616	8.01	934	2.86
1	830.17	SG150	6.00	366	939	2.57	4,687	12.81	1,002	2.74

Section #14 at Station 75.75
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Description
Soil Zone	[degrees]	[lb/ft²]	[lb/ft³]	
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	7.67	Back Slope	18.66°	LL Surcharge	0	DL Surcharge	0
Design Height	7.33 ft	Crest Offset	35.07 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.79 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
FSSl	Base Sliding	1.50	FSSl	Internal Sliding	1.50	FSSc	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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

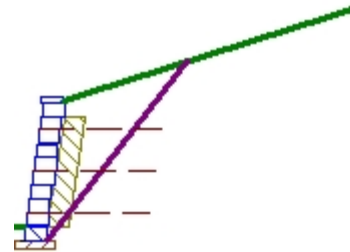
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	10.16	Bearing Pressure	1020.43 lb/ft²
Overturning	4.55	Max Eccentricity	0.16 ft
Base Sliding	2.28		
Crest Toppling	9.68		
Internal Sliding	3.59		

Internal Static				Tensile	Tensile	Pullout	Pullout	Conn.	Conn.	
Layer	Elevation	Rein	Length	Load	Resist.	FS	Resist.	FS	Resist.	FS
3	836.17	SG150	6.00	81	939	11.57	377	4.65	796	9.81
2	834.17	SG150	6.00	199	939	4.72	1,367	6.88	865	4.35
1	832.17	SG150	6.00	522	939	1.80	2,931	5.62	934	1.79

Section #15 at Station 78.00
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Zone	Phi Angle [degrees]	Cohesion [lb/ft²]	Unit Weight [lb/ft³]	Description
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	7.00	Back Slope	17.77°	LL Surcharge	0	DL Surcharge	0
Design Height	6.67 ft	Crest Offset	37.64 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.64 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
FSSl	Base Sliding	1.50	FSSl	Internal Sliding	1.50	FSSc	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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

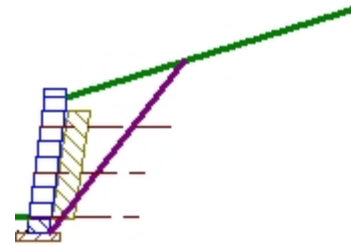
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	11.42	Bearing Pressure	900.77 lb/ft²
Overturning	5.45	Max Eccentricity	0.07 ft
Base Sliding	2.54		
Crest Toppling	9.84		
Internal Sliding	3.76		

Internal Static				Tensile Resist.	Tensile FS	Pullout Resist.	Pullout FS	Conn. Resist.	Conn. FS
Layer	Elevation	Rein	Length	Load					
3	836.17	SG150	6.00	80	939	11.76	521	796	9.97
2	834.17	SG150	6.00	196	939	4.80	1,588	865	4.42
1	832.17	SG150	6.00	376	939	2.49	3,229	934	2.48

Section #16 at Station 81.00
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Zone	Phi Angle [degrees]	Cohesion [lb/ft²]	Unit Weight [lb/ft³]	Description
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	6.33	Back Slope	16.74°	LL Surcharge	0	DL Surcharge	0
Design Height	6.00 ft	Crest Offset	41.08 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.62 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
FSSl	Base Sliding	1.50	FSSl	Internal Sliding	1.50	FSSc	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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

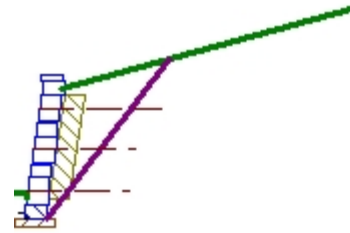
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	10.86	Bearing Pressure	802.68 lb/ft²
Overturning	5.22	Max Eccentricity	0.08 ft
Base Sliding	2.53		
Crest Toppling	10.02		
Internal Sliding	3.77		

Internal Static				Tensile Resist.	Tensile FS	Pullout Resist.	Pullout FS	Conn. Resist.	Conn. FS	
Layer	Elevation	Rein	Length	Load						
3	836.17	SG150	6.00	78	939	11.97	643	8.19	796	10.14
2	834.17	SG150	5.00	192	939	4.89	1,200	6.24	865	4.50
1	832.17	SG150	5.00	248	939	3.78	2,671	10.76	934	3.76

Section #17 at Station 85.50
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Description
Soil Zone	[degrees]	[lb/ft²]	[lb/ft³]	
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	7.00	Back Slope	15.57°	LL Surcharge	0	DL Surcharge	0
Design Height	6.22 ft	Crest Offset	40.55 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	1.00 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

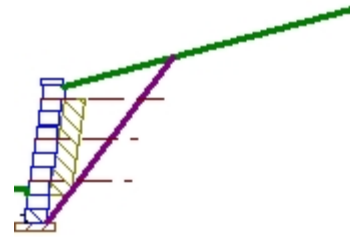
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	11.69	Bearing Pressure	824.01 lb/ft²
Overturning	5.24	Max Eccentricity	0.07 ft
Base Sliding	2.58		
Crest Toppling	34.27		
Internal Sliding	4.33		

Internal Static				Tensile	Tensile	Pullout	Pullout	Conn.	Conn.	
Layer	Elevation	Rein	Length	Load	Resist.	FS	Resist.	FS	Resist.	FS
3	836.17	SG150	6.00	51	939	18.58	425	8.41	781	15.45
2	834.17	SG150	5.00	163	939	5.74	888	5.43	849	5.20
1	832.17	SG150	5.00	334	939	2.81	2,196	6.58	918	2.75

Section #18 at Station 87.75
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Description
Soil Zone	[degrees]	[lb/ft²]	[lb/ft³]	
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	7.00	Back Slope	14.98°	LL Surcharge	0	DL Surcharge	0
Design Height	6.56 ft	Crest Offset	38.86 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	1.29 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
FSSl	Base Sliding	1.50	FSSl	Internal Sliding	1.50	FSSc	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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		
Connection/Shear Properties							
cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

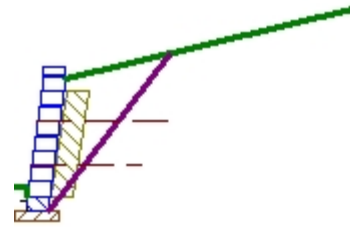
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	11.81	Bearing Pressure	869.17 lb/ft²
Overturning	4.98	Max Eccentricity	0.09 ft
Base Sliding	2.54		
Crest Toppling	77.38		
Internal Sliding	4.77		

Internal Static				Tensile	Tensile	Pullout	Pullout	Conn.	Conn.	
Layer	Elevation	Rein	Length	Load	Resist.	FS	Resist.	FS	Resist.	FS
3	836.17	SG150	6.00	34	939	27.61	272	7.99	769	22.61
2	834.17	SG150	5.00	143	939	6.55	641	4.47	838	5.85
1	832.17	SG150	5.00	425	939	2.21	1,808	4.25	907	2.13

Section #19 at Station 92.25
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Description
Soil Zone	[degrees]	[lb/ft²]	[lb/ft³]	
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	6.33	Back Slope	13.61°	LL Surcharge	0	DL Surcharge	0
Design Height	5.89 ft	Crest Offset	35.48 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.62 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

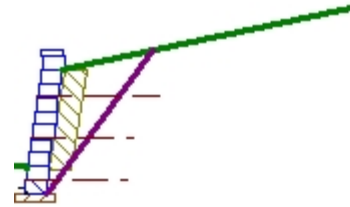
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	11.80	Bearing Pressure	756.25 lb/ft²
Overturning	6.23	Max Eccentricity	0.01 ft
Base Sliding	2.90		
Crest Toppling	5.56		
Internal Sliding	5.96		

Internal Static				Tensile	Tensile	Pullout	Pullout	Conn.	Conn.	
Layer	Elevation	Rein	Length	Load	Resist.	FS	Resist.	FS	FS	
2	834.17	SG150	6.00	115	939	8.17	893	7.77	815	7.09
1	832.17	SG150	5.00	362	939	2.60	1,572	4.34	884	2.44

Section #20 at Station 96.00
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Description
Soil Zone	[degrees]	[lb/ft²]	[lb/ft³]	
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	7.00	Back Slope	12.25°	LL Surcharge	0	DL Surcharge	0
Design Height	6.01 ft	Crest Offset	32.66 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	1.10 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
FSSl	Base Sliding	1.50	FSSl	Internal Sliding	1.50	FSSc	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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

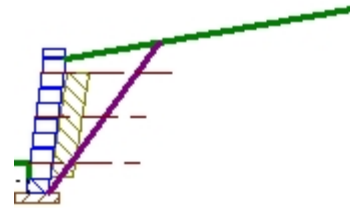
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	13.24	Bearing Pressure	761.94 lb/ft²
Overturning	6.43	Max Eccentricity	0.00 ft
Base Sliding	3.00		
Crest Toppling	16.01		
Internal Sliding	4.54		

Internal Static				Tensile	Tensile	Pullout	Pullout	Conn.	Conn.	
Layer	Elevation	Rein	Length	Load	Resist.	FS	Resist.	FS	Resist.	FS
3	834.17	SG150	6.00	74	939	12.74	599	8.13	796	10.80
2	832.17	SG150	5.00	180	939	5.22	1,182	6.57	865	4.81
1	830.17	SG150	5.00	232	939	4.04	2,631	11.33	934	4.02

Section #21 at Station 101.25
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Description
Soil Zone	[degrees]	[lb/ft ²]	[lb/ft ³]	
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	6.33	Back Slope	9.85°	LL Surcharge	0	DL Surcharge	0
Design Height	5.90 ft	Crest Offset	28.72 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.72 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

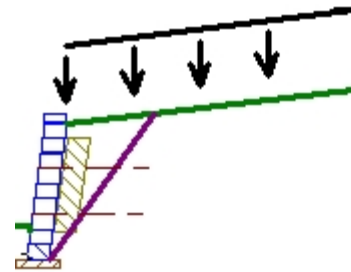
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	12.41	Bearing Pressure	740.45 lb/ft ²
Overturning	7.35	Max Eccentricity	0.00 ft
Base Sliding	3.31		
Crest Toppling	80.37		
Internal Sliding	5.93		

Internal Static				Tensile	Tensile	Pullout	Pullout	Conn.	Conn.	
Layer	Elevation	Rein	Length	Load	Resist.	FS	Resist.	FS	Resist.	FS
3	834.17	SG150	6.00	32	939	29.42	297	9.30	769	24.10
2	832.17	SG150	5.00	134	939	7.02	787	5.88	838	6.26
1	830.17	SG150	5.00	288	939	3.26	2,021	7.02	907	3.15

Section #22 at Station 105.75
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Description
Soil Zone	[degrees]	[lb/ft ²]	[lb/ft ³]	
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	6.33	Back Slope	7.15°	LL Surcharge	40	DL Surcharge	0
Design Height	5.90 ft	Crest Offset	25.34 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	1.20 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

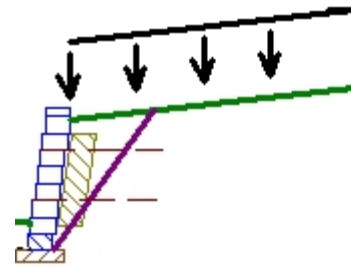
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	13.52	Bearing Pressure	764.08 lb/ft ²
Overturning	7.08	Max Eccentricity	0.00 ft
Base Sliding	3.27		
Crest Toppling	3.92		
Internal Sliding	6.89		

Internal Static				Tensile	Tensile	Pullout	Pullout	Conn.	Conn.	
Layer	Elevation	Rein	Length	Load	Resist.	FS	Resist.	FS	Resist.	FS
2	832.17	SG150	5.00	131	939	7.19	489	3.75	815	6.24
1	830.17	SG150	5.00	359	939	2.62	1,525	4.25	884	2.47

Section #23 at Station 111.75
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Description
Soil Zone	[degrees]	[lb/ft²]	[lb/ft³]	
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	5.67	Back Slope	6.47°	LL Surcharge	40	DL Surcharge	0
Design Height	5.17 ft	Crest Offset	20.03 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	1.01 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

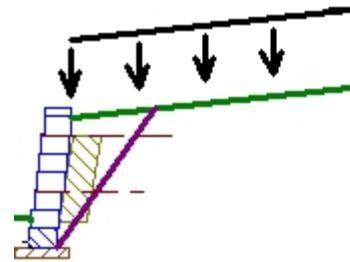
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	14.65	Bearing Pressure	673.81 lb/ft²
Overturning	8.93	Max Eccentricity	0.00 ft
Base Sliding	3.70		
Crest Toppling	9.25		
Internal Sliding	8.87		

Internal Static				Tensile	Tensile	Pullout	Pullout	Conn.	Conn.
Layer	Elevation	Rein	Length	Load	Resist.	FS	Resist.	Resist.	FS
2	832.17	SG150	5.00	77	939	12.20	328	790	10.27
1	830.17	SG150	5.00	301	939	3.12	1,255	859	2.86

Section #24 at Station 116.25
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Description
Soil Zone	[degrees]	[lb/ft²]	[lb/ft³]	
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	5.00	Back Slope	6.00°	LL Surcharge	40	DL Surcharge	0
Design Height	4.63 ft	Crest Offset	16.00 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.84 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

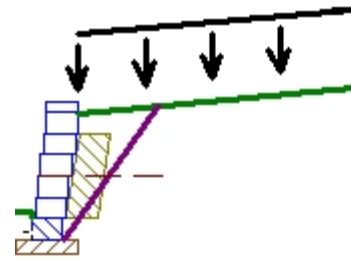
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	13.31	Bearing Pressure	599.60 lb/ft²
Overturning	7.41	Max Eccentricity	0.00 ft
Base Sliding	3.37		
Crest Toppling	23.61		
Internal Sliding	10.60		

Internal Static				Tensile	Tensile	Pullout	Pullout	Conn.	Conn.
Layer	Elevation	Rein	Length	Load	Resist.	FS	Resist.	Resist.	FS
2	832.17	SG150	5.00	47	939	20.18	208	772	16.58
1	830.17	SG150	4.00	259	939	3.63	671	840	3.25

Section #25 at Station 121.50
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Description
Soil Zone	[degrees]	[lb/ft²]	[lb/ft³]	
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	4.33	Back Slope	5.02°	LL Surcharge	40	DL Surcharge	0
Design Height	4.00 ft	Crest Offset	11.29 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.65 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
FSSl	Base Sliding	1.50	FSSl	Internal Sliding	1.50	FSSc	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	2.00						

Reinforcements

SG150 - StrataGrid 150		Supplier: Strata Systems - Stratagrid, Fill Type: Sands					
Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		
Connection/Shear Properties							
cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

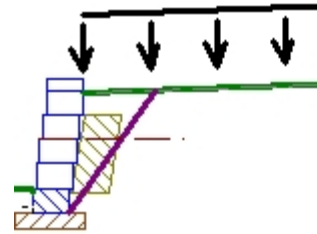
Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static		FS	
Bearing Capacity	14.43	Bearing Pressure	521.58 lb/ft²
Overturning	9.65	Max Eccentricity	0.00 ft
Base Sliding	3.90		
Crest Toppling	3.52		
Internal Sliding	15.35		

Internal Static				Tensile Resist.	Tensile FS	Pullout Resist.	Pullout FS	Conn. Resist.	Conn. FS	
Layer	Elevation	Rein	Length	Load						
1	830.17	SG150	4.00	230	939	4.08	518	2.25	819	3.56

Section #26 at Station 127.50
Report Date January 05, 2022
Designer ETT
Design Standard National Concrete Masonry Association 3rd Edition
Design Static
Unit of Measure U.S./Imperial
Selected Facing Unit Product Line: Keystone Pinned Systems
 Name: Compac III
Seismic As N/A



Soil Parameters	Phi Angle	Cohesion	Unit Weight	Description
Soil Zone	[degrees]	[lb/ft ²]	[lb/ft ³]	
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

Section Details

Section Height	3.67	Back Slope	1.99°	LL Surcharge	40	DL Surcharge	0
Design Height	3.28 ft	Crest Offset	5.92 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.53 ft	Wall Batter	8.00°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Reinforced		Value	Internal	Value	Facing	Value		
External								
FSl	Base Sliding	1.50	FSl	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	2.00						

Reinforcements

SG150 - StrataGrid 150 Supplier: Strata Systems - Stratagrid, Fill Type: Sands

Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

Analysis Results

- * Analysis does not include Vertical Forces
- * Uses External Horiz. Accel Coeff in Seismic Crest Toppling
- * Embedment is included in Bearing Capacity

External Static	FS		
Bearing Capacity	16.93	Bearing Pressure	427.93 lb/ft ²
Overturning	15.09	Max Eccentricity	0.00 ft
Base Sliding	5.05		
Crest Toppling	7.71		
Internal Sliding	31.99		

Internal Static					Tensile Resist.	Tensile FS	Pullout Resist.	Pullout FS	Conn. Resist.	Conn. FS
Layer	Elevation	Rein	Length	Load						
1	830.17	SG150	4.00	154	939	6.09	328	2.13	794	5.15

Project: 210816 - Proposed Starbucks

Site: 1360 Walton Boulevard, Rochester Hills Michigan

Date: 1/5/2022

Wall: WALL A

Project Information

Client Stonefield Engineering & Design
Name Proposed Starbucks
Site 1360 Walton Boulevard, Rochester Hills Michigan
Revision 1 **Created** 1/3/2022
Standard National Concrete Masonry Association 3rd Edition

Number 210816
Designer ETT
Modified 1/5/2022

Seismic As N/A

Comments

Revision

Note

Selected Facing Unit

Product Line: Keystone Pinned Systems
Name: Compac III



Project Summary

Quantities

Wall Length	132.00 ft
Pins	1,154
Steps in Top of Wall	19
Total Wall Area	724 ft ²
Cap Area	59 ft ²
Exposed Area (includes cap area)	623 ft ²
Embedded Area	102 ft ²
Base soil volume	5 yd ³
Infill soil volume ‡	84 yd ³
Face Drain	20 yd ³
Drainage stone within block	10 yd ³
Concrete fill within block	0 yd ³

Reinforcement

SG150 - StrataGrid 150	171 yd ²
SG200 - StrataGrid 200	0 yd ²

Note †: Total Facing Unit quantity is based on using full-sized units only on bottom course and an even mix of defined facing sizes, as identified elsewhere in this report, on remaining courses of each Section. The use of corners, tapered or cut units is not reflected in this quantity.

Note ‡: Reinforced fill values are calculated based on the average geogrid length in each Section. They do not account for anything beyond the reinforced zone (end of the geogrids). Actual infill values may be significantly higher.

Note : Drainage fill does not include the drainage stone within block. Core fill are calculated based on the percentage hollow core of the wall unit selected. If the percentage hollow core is not defined then the Core fill value within block will not be calculated.

Note: The Toe Slope input is only used to establish the basic embedment depth based on the Design Criteria settings and provide a graphical representation of the toe conditions for export. The Toe Slope input does not account for reduced bearing capacity due to the sloping toe condition or the geometrical considerations of bench construction on embedment and wall height. User must perform separate analysis for bearing and stability on slopes and properly interpret grading for bench construction effects on wall height.

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					

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	2.00						

Design Factors

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

Selected Facing Unit

Product Line: Keystone Pinned Systems

Name: Compac III

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	0.09 ft
Batter		8.00 °
Cap Height	Hcu	0.33 ft
Initial Shear Capacity	au	1393.00 lb/ft
Apparent Shear Angle	u	34.00 °
Maximum Shear Capacity	Vu(max)	3245.00 lb/ft

Selected Reinforcement Types

Reinforcements

SG150 - StrataGrid 150

Supplier: Strata Systems - Stratagrid, Fill Type: Sands

Tult	1,875.00 lb/ft	RFcr	1.65	RFd	1.10	LTDS	939.14 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	750.00 lb/ft	IP-1	1,609.00 lb/ft	cs2	1,211.37 lb/ft	IP-2	6,000.00 lb/ft
cs max	1,211.37 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft

SG200 - StrataGrid 200

Supplier: Strata Systems - Stratagrid, Fill Type: Sands

Tult	3,600.00 lb/ft	RFcr	1.55	RFd	1.10	LTDS	1,919.49 lb/ft
RFid	1.10	Cds	0.80	Ci	0.80		

Connection/Shear Properties

cs1	841.00 lb/ft	IP-1	1,050.00 lb/ft	cs2	1,753.75 lb/ft	IP-2	2,245.00 lb/ft
cs max	2,119.10 lb/ft	au	900.00 lb/ft	u	34.00 lb/ft	Vu(max)	2,762.00 lb/ft



Selected Soil Types

Soil Zone	Phi Angle [degrees]	Cohesion [lb/ft ²]	Unit Weight [lb/ft ³]	Description
Reinforced	34	n/a	120.00	Class II Sand
Retained	29	0.00	115.00	Loose Sand
Foundation	31	0.00	115.00	Loose Sand
Leveling Pad	40	n/a	n/a	
Drainage	38	n/a	0.70	

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.

Section Geometry

Section Drawing

