

**barkman**<sup>™</sup>

# MagnumStone<sup>™</sup>

## Product Guide





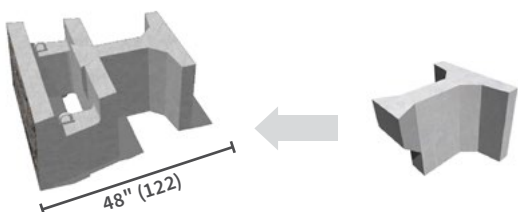
# MagnumStone™

## Innovative design... easy on the environment

While still sharing the same hollow core that our dry cast products have, our MagnumStone™ product is perfect for MOT/DOT (Ministry / Department of Transportation) industrial and commercial retaining walls that require a more aesthetic look.

Ideal for gravity and geogrid retaining walls, soil nailing, cantilevered, plantable and mechanical geogrids, the flexibility MagnumStone™ retaining wall units are endless. Incredibly realistic looking, your MagnumStone™ retaining system brings the same stability of other industry products, but with less cost and greater visual appeal!

## Gravity Extenders



### 24" EXTENDER UNIT

(Attached to the back of a block to make it 48" deep)

**Height:** 24" (61 cm)

**Depth:** 48" (122 cm)

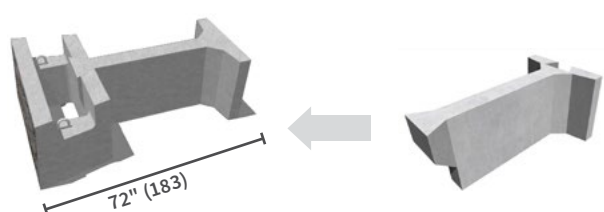
**Face Width:** 48"

**Back Width:** 39"

**Weight:** 1920 lbs (870 kgs)

**Volume of Voids:** 18.2 ft<sup>3</sup> (.511 m<sup>3</sup>)

**Gravel Filled Weight:** 3925 lbs (1780 kgs)



### 48" EXTENDER UNIT

(Attached to the back of a block to make it 72" deep)

**Height:** 24" (61 cm)

**Depth:** 72" (183 cm)

**Face Width:** 48"

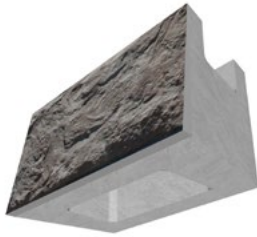
**Back Width:** 39"

**Weight:** 2220 lbs (1006 kgs)

**Volume of Voids:** 31.9 ft<sup>3</sup> (.894 m<sup>3</sup>)

**Gravel Filled Weight:** 5732 lbs (2600 kgs)

# Standard Unit Specifications



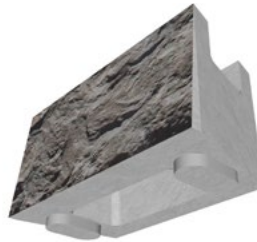
## STANDARD BASE UNIT

1450 lbs (659 kgs)

24" Height x 48" Width x 24" Depth (61 H x 122 W x 61 cm D)

**Face Area:** 8 sq ft (0.745 m<sup>2</sup>)

**Volume of Voids:** 6.35 ft<sup>3</sup> (.180 m<sup>3</sup>)



## STANDARD UNIT

1450 lbs (659 kgs)

**Faces:** Varies

**Gravel Filled Weight:** 2150 lbs (975 kgs)

**Batter/Setback:** 2.5°-4.5°(depending on face type) 2"/Unit (5 cm / Unit)



## STANDARD TOP UNIT

1350 lbs (614 kgs)

*Drainage hole for weeping tile connection available upon request. Cut out to attach extender units available upon request.*



## HALF HIGH BASE UNIT

700 lbs (318 kgs)

12" Height x 48" Width x 24" Depth (30.5 H x 122 W x 61 cm D)

**Face Area:** 4 sq ft (0.37 m<sup>2</sup>)

**Volume of Voids:** 3.15 ft<sup>3</sup> (0.09 m<sup>3</sup>)



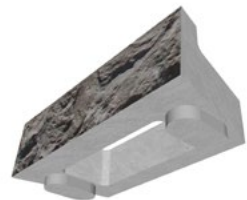
## HALF HIGH UNIT

700 lbs (318 kgs)

**Faces:** Varies

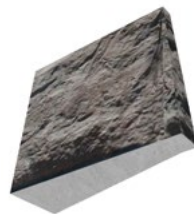
**Gravel Filled Weight:** 1080 lbs (490 kgs)

**Batter/Setback:** 2.5°-4.5°(depending on face type) 1"/Unit (2.5 cm / Unit)



## HALF HIGH TOP UNIT

680 lbs (308 kgs)



## STANDARD CORNER/ END UNIT

180 lbs (82 kgs)

24" Height x 26" Top Face Width x  
28" Bottom Face Width x 2" Top Narrow  
Face x 4" Bottom Narrow Face

(61 H x 66 TFW x 71 BFW x 5 TNF x 10 BNF cm)

**Face Area:** 4.66 sq ft (0.434 m<sup>2</sup>)

**Faces:** Varies



## HALF HIGH CORNER/END UNIT

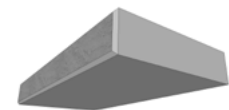
100 lbs (46 kgs)

12" Height x 27" Top Face Width x  
28" Bottom Face Width x 3" Top Narrow  
Face x 4" Bottom Narrow Face

(61 H x 69 TFW x 71 BFW x 8 TNF x 10 BNF cm)

**Face Area:** 2.33 sq ft (0.217 m<sup>2</sup>)

**Faces:** Varies



## STEP/CAP

600 lbs (273 kgs)

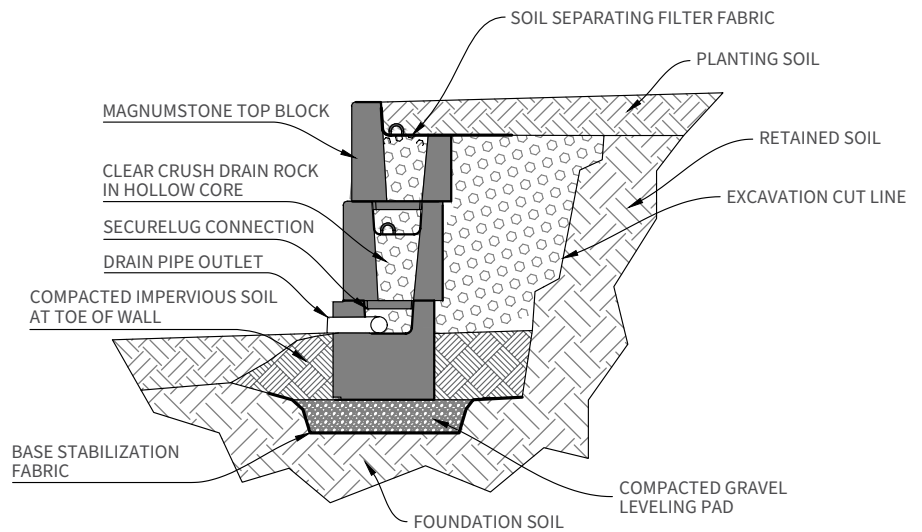
6" Height x 48" Width x 24" Depth  
(15.25 H x 122 W x 61 cm D)

**Face Area:** 2 sq ft (.186 m<sup>2</sup>)

# Gravity Wall

Gravity (PMB) Precast Modular Block retaining wall systems are structures lower in height that use the MagnumStone™ unit weight combined with gravel core infill to resist earth pressures behind and on top of the wall. The 2"/unit (4.5 degree or 1"/vertical foot) batter or setback of the MagnumStone™ wall along with proper soil conditions below and behind the wall provide the stability of the structure. For walls 4.0ft (1.2m) and taller a qualified engineer should be consulted.

For more information, refer to Gravity wall charts starting on page 17.



- ▶ Superior drainage, design and engineering capabilities for large gravity walls.
- ▶ Better quality installation and cost savings.





# Gravity Wall

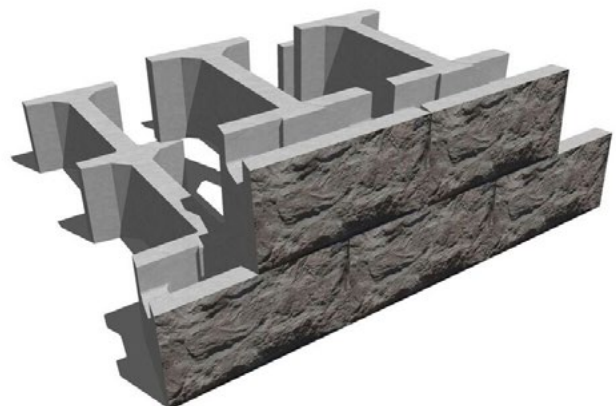
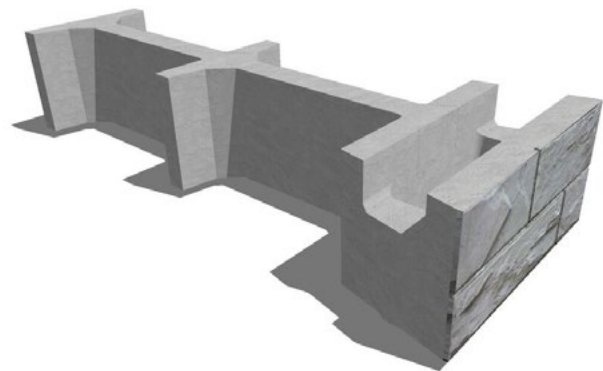


BOULDER FACE

## Use the Force of Gravity Extenders

MagnumStone's gravity retaining wall extenders offer retaining wall designers the ability to build taller gravity retaining walls by increasing the wall depth in 2 ft. or 4 ft. increments. These gravity retaining wall extenders deliver an impactful performance by allowing taller gravity retaining wall designs.

The tongue-and-groove connection between the extenders and the back of standard MagnumStone blocks provides extra mass and versatility to enhance the strength of gravity retaining walls from the base up. MagnumStone's gravity retaining wall extenders come in 2 ft. and 4 ft. units. This means that designers are never limited by the units used for construction. The base-to-height ratio of the gravity retaining wall's excavation area can be as low as 40%, which is significant compared to geogrid retaining wall designs which typically require an excavation area of 70%. With two different sizes of gravity extenders, this allows landowners to effectively use their property to its fullest extent with gravity retaining walls maximizing space closer to their property lines.





# Geogrid Wall



Geogrids are used to reinforce the soil mass behind the MagnumStone™ units to create tall retaining wall systems. Wall structures that may require geogrid reinforcement to resist the increased pressures behind the wall are parking lots, roadways, water applications or positive slopes above. Geogrid used with the appropriate lengths, layers, and compacted backfill materials will resist these active forces above and behind the wall. The use of Geogrid reinforcements with the MagnumStone™ system is very cost effective for very tall wall structures.

For more information, refer to Geogrid wall charts starting on page 21.

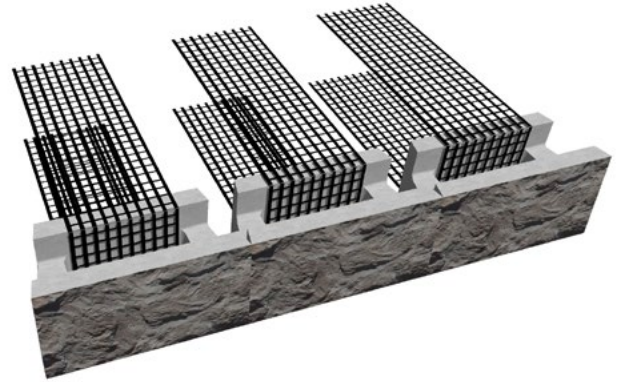




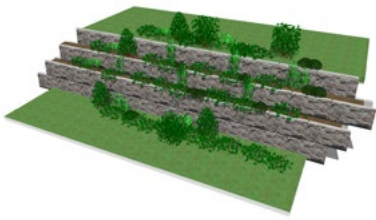
# Positive Connection

To create a positive or mechanical connection between the MagnumStone™ units and geogrids, a single length of geogrid is wrapped through the hollow core providing equal length reinforcement at the bottom and top of a single unit. The geogrid wrapped hollow core is then filled with gravel making this the ultimate geogrid positive connection. This unique positive or mechanical connection provides the system with a greater safety factor for connection when designing for heavy loads such as (DOT) roads, bridges and railways.

For more information, refer to Geogrid wall charts starting on page 21.



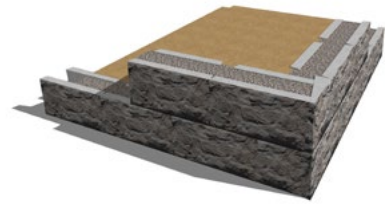
# Design Advantages



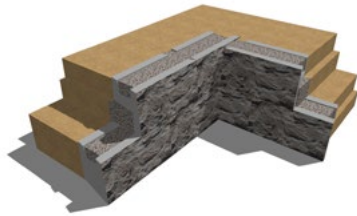
GREEN PLANTABLE WALL



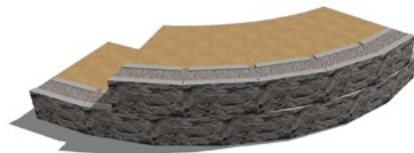
FENCE POSTS



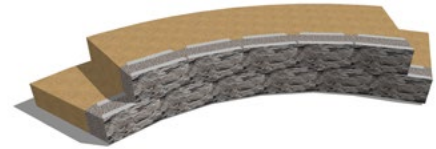
OUTSIDE CORNER



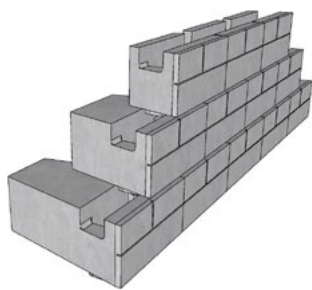
INSIDE CORNER



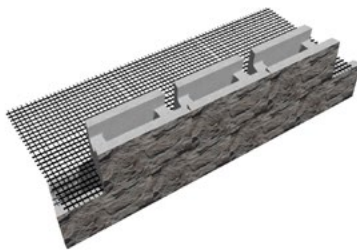
OUTSIDE CURVE



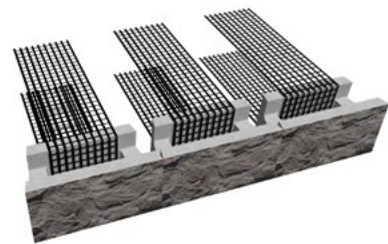
INSIDE CURVE



GRAVITY WALL



GEOGRID WALL



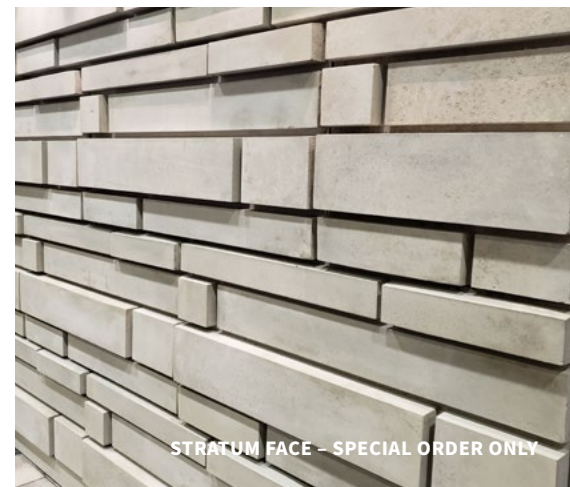
POSITIVE CONNECTION

**More:** Steel/Concrete Wall, Soil Anchoring, Steel Grid, Wall Step-Up

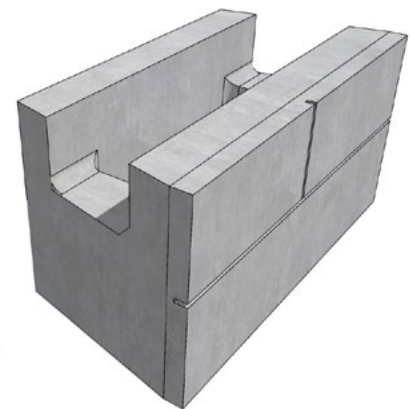


STRATUM FACE – SPECIAL ORDER ONLY



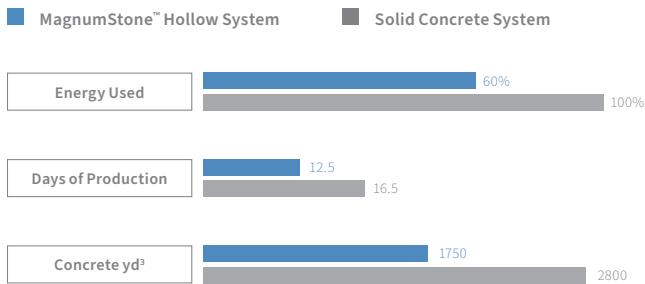


The MagnumStone™ retaining wall system was developed with the engineer, designer and installer in mind. MagnumStone's durable, high strength concrete SecureLugs fit into the lower unit's hollow core, allowing significant lateral movement without losing the unit interlock. The wet-cast manufacturing process provides the units with high strength, low absorption and great freeze/thaw results. Tapered sides make it easy to build tight curves and straight walls with complete accuracy. The MagnumStone's vertical and horizontal hollow core, filled with clear crushed gravel, provides added weight, an excellent wall drainage system and a superb connection with the geosynthetic reinforcements.





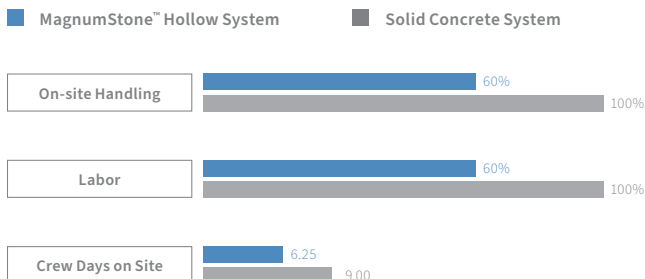
# Environmental Benefits



Graph is based on a 5000 square foot retaining wall project.

## PRODUCTION

MagnumStone's hollow core allows production facilities to maximize their output and reduce their carbon footprint. Its unique hollow core design means less concrete to pour, making the units lighter for handling purposes and reducing the amount of cement required per block. Both of these factors translate into cost savings and a significant reduction in harmful greenhouse gas emissions (nearly 40%) when compared to solid concrete systems.



Graph is based on a 5000 square foot retaining wall project.

## INSTALLATION

The MagnumStone™ 8 sq face ft is light enough to be moved on site in pairs of 16 sq ft with a standard bobcat. The large light weight hollow core MagnumStone™ units can be installed quickly, to create curves and turn corners, with smaller equipment and less labor. MagnumStone™ was designed for the end user by providing many options for solving nearly any contractor wall problem.

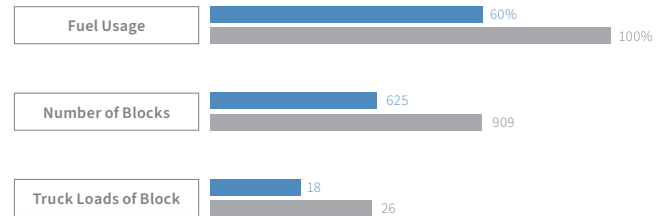


## TRANSPORTATION

MagnumStone's light weight design maximizes each truck load to the site, reducing the number of trucks on the road, and their carbon footprint. A typical truck can transport nearly 520 sq ft of MagnumStone™ units, reducing the number of loads to ship to each job. Plus, each unit can be loaded and unloaded quickly and easily two at a time, reducing time and labor on the job site.

### ■ MagnumStone™ Hollow System

### ■ Solid Concrete System



*Graph is based on a 5000 square foot retaining wall project.*

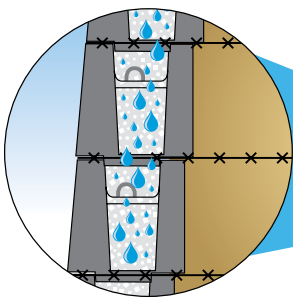
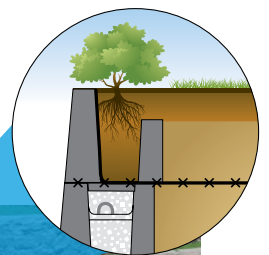


## DESIGN

The MagnumStone's large vertical and horizontal cores allow wall designers the flexibility of creating many solutions without environmentally costly side-effects. The aesthetically pleasing plantable terraces maximize green area, which reduce the "heat island" effect common among concrete surfaces. MagnumStone™ works in harmony with the environment. Its unique internal drainage system, and ease of incorporating both through wall, and top of wall details makes it the prime choice for environmentally friendly wall solutions.

### Plantable Terrace

MagnumStone's hollow cores provide the perfect planting pocket for a variety of plants and shrubs.



### Permeability

The ability for water to flow freely through MagnumStone's vertical and horizontal hollow cores.

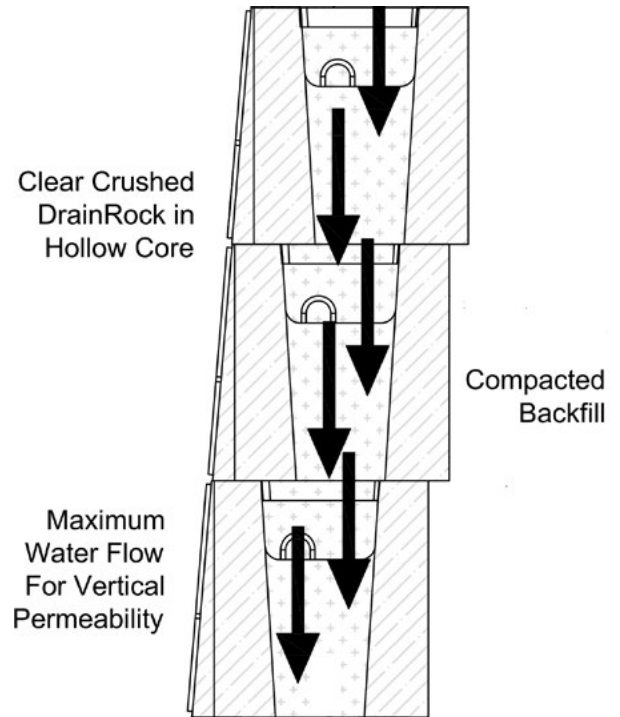


All graphs and charts used in this brochure are estimations, and should be used only for comparisons.



# Drainage Design

MagnumStone wall's feature an integrated and protected drain chimney in the hollow core of the block, allowing fill materials to be compacted up to the back of the block. It is the only system on the market to allow the drain tile to rest in the hollow core at any level of the wall as well as allowing the drain tile to daylight from the face of the block.







# General Benefits

The environmental and economical advantages of MagnumStone are unprecedented in the retaining wall industry. Benefits and advantages include fast installation with 8 square feet of face per block, inexpensive corner and end units and lighter blocks compared to other block systems. Multiple face textures and styles are available and MagnumStone can be custom colored on site after installation.







## Software Products:

# Wall Designer

The easy way to design your Magnumstone™ Wall

Designed with the engineer in mind, the MagnumStone™ Wall Designer provides you easy access to a variety of scenarios to design your project in. Powerful and easy to use, this program saves you time and money in the design process.





# Wall Designer Advantages

Pre-programmed in the software are multiple methodologies, MagnumStone™ products, and geogrid reinforcement options, all of which are there to help you “visualize” what your wall will look like at the click of a few buttons.

## FEATURES & BENEFITS

To help you with your design solutions, some additional benefits to using the MagnumStone™ Wall Designer include its utilization of NCMA, AASHTO, and AASHTO LRFD methods, a plethora of options for design inputs – such as geometry of wall, soil types, block specs, compound stability, etc., and preprogramming of Magnumstone™ products themselves.

## TRAINING & TECHNICAL SUPPORT

When learning the software, enjoy our easy to understand (and use!) training videos. Broken into small segments, you can focus on a specific section for guidance, rather than having to go through the whole course.



For more information please visit: [magnumstone.com/magnumstone-wall-designer](http://magnumstone.com/magnumstone-wall-designer)



LEDGESTONE FACE



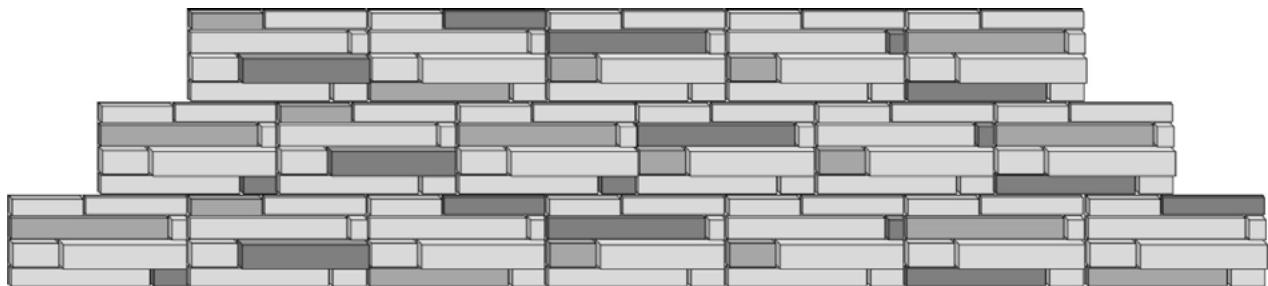
STRATUM FACE – SPECIAL ORDER ONLY



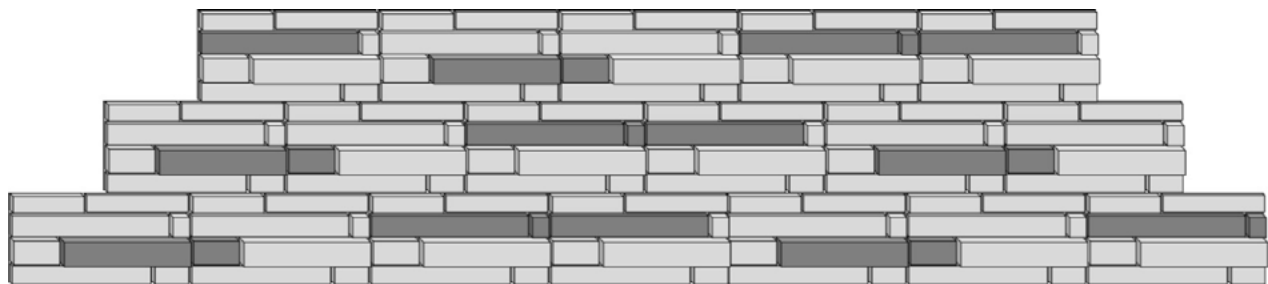
# Face Pattern Samples

The new MagnumStone™ Stratum face offers sleek and modern three dimensional definition to even the simplest retaining wall. Coloring random or select profiles on the block face with different tones of greys after installation offers design uniqueness like no other.

**PATTERN 1** – NATURAL GREY BLOCK WITH DARK GREY AND CHARCOAL ACCENTS

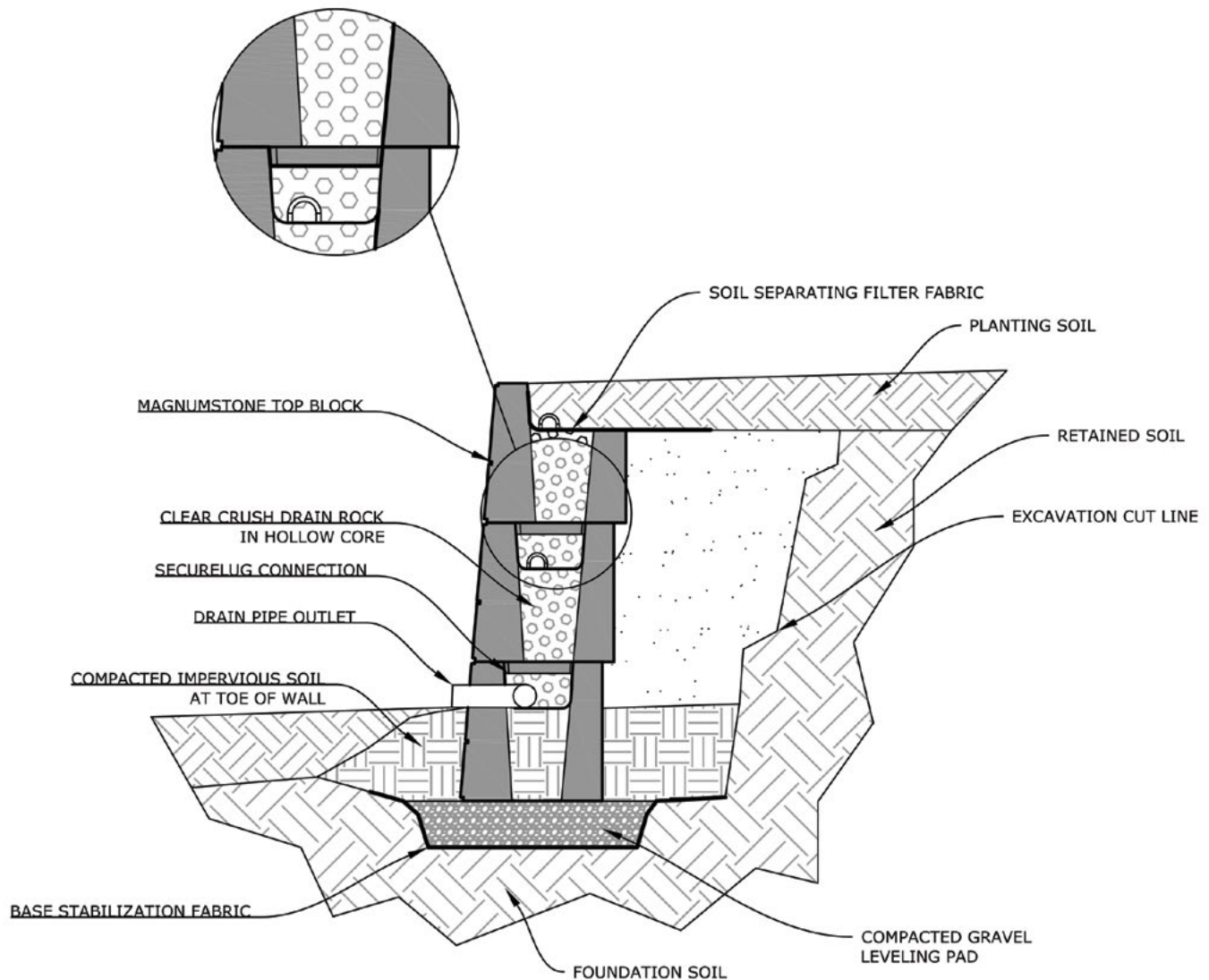


**PATTERN 2** – NATURAL GREY BLOCK WITH PRESET CHARCOAL ACCENTS





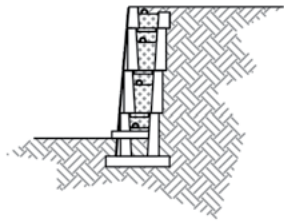
# Gravity Wall



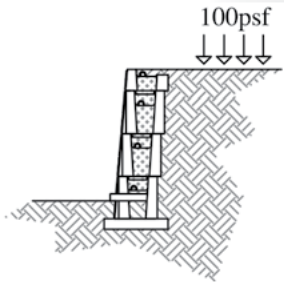
DISCLAIMER: This chart is for initial estimation purposes only. Do not use for final design or construction. Retain a licensed professional engineer to design every wall on a case-by-case basis using site specific criteria. The accuracy and use of this document are the sole responsibility of the user. All calculations were performed based on NCMA methodology using factors of safety of 1.5 for sliding and overturning. The bearing capacity of base soils will be no less than 3,000 pounds per square foot (psf). All soils have been assumed to be less than 125 pounds per cubic foot (pcf). Global Stability Analysis has not been performed.



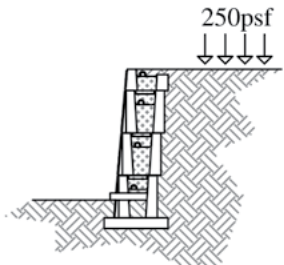
# Gravity Wall Charts



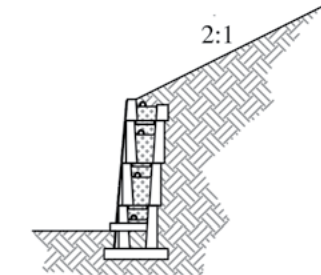
Soil Type	Height Exposed	Height Embedded	Total
AASHTO #57	8.1' (2469mm)	0.5' (152mm)	8.6' (2621mm)
34° Soil	6.6' (2012mm)	0.5' (152mm)	7.1' (2164mm)
30° Soil	5.9' (1798mm)	0.5' (152mm)	6.4' (1951mm)
26° Soil	4.9' (1494mm)	0.5' (152mm)	5.4' (1646mm)



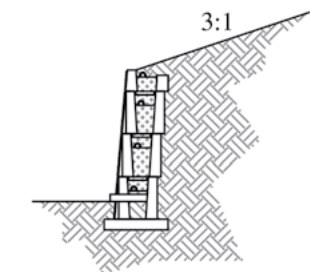
Soil Type	Height Exposed	Height Embedded	Total
AASHTO #57	6.6' (2012mm)	0.5' (152mm)	7.1' (2164mm)
34° Soil	5.4' (1646mm)	0.5' (152mm)	5.9' (1798mm)
30° Soil	4.4' (1341mm)	0.5' (152mm)	4.9' (1494mm)
26° Soil	3.3' (1006mm)	0.5' (152mm)	3.8' (1158mm)



Soil Type	Height Exposed	Height Embedded	Total
AASHTO #57	4.9' (1494mm)	0.5' (152mm)	5.4' (1646mm)
34° Soil	3.3' (1006mm)	0.5' (152mm)	3.8' (1158mm)
30° Soil	2.0' (610mm)	0.5' (152mm)	2.5' (762mm)
26° Soil	0.9' (274mm)	0.5' (152mm)	1.4' (427mm)



Soil Type	Height Exposed	Height Embedded	Total
AASHTO #57	6.5' (1981mm)	0.5' (152mm)	7.0' (2134mm)
34° Soil	4.5' (1372mm)	0.5' (152mm)	5.0' (1524mm)
30° Soil	3.2' (975mm)	0.5' (152mm)	3.7' (1128mm)
26° Soil			

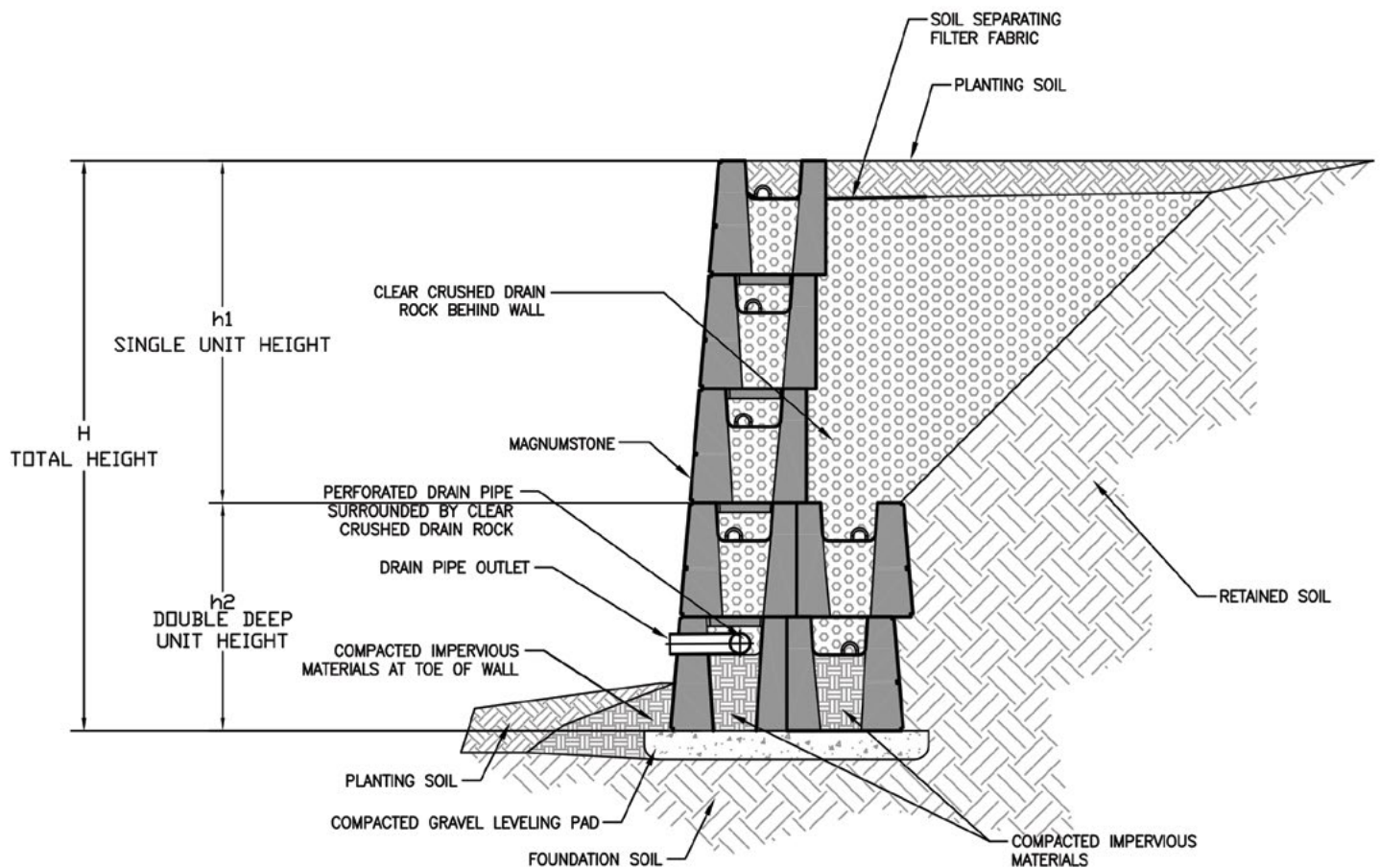


Soil Type	Height Exposed	Height Embedded	Total
AASHTO #57	7.1' (2164mm)	0.5' (152mm)	7.6' (2316mm)
34° Soil	5.6' (1707mm)	0.5' (152mm)	6.1' (1859mm)
30° Soil	4.4' (1341mm)	0.5' (152mm)	4.9' (1494mm)
26° Soil	3.3' (1006mm)	0.5' (152mm)	3.8' (1158mm)

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# Double Deep Gravity Wall



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# Double Deep Gravity Wall Charts

Lower Tier (AASHTO #57)  $\phi_{\text{soil}} = 38^\circ$  (min.)  $\gamma_{\text{soil}} = 110\text{pcf}$  (max.)  
Upper Tier (AASHTO #57)  $\phi_{\text{soil}} = 38^\circ$  (min.)  $\gamma_{\text{soil}} = 110\text{pcf}$  (max.)

No Slope, No Load		
H	h1	h2
16' (4877mm)	0' (0mm)	16' (4877mm)
14' (4267mm)	2' (610mm)	12' (3658mm)
12' (3658mm)	5' (1524mm)	7' (2134mm)
10' (3048mm)	8' (2438mm)	3' (914mm)
9' (2134mm)	9' (2134mm)	0' (0mm)

2:1 Slope, No Load		
H	h1	h2
14' (4267mm)	0' (0mm)	14' (4267mm)
12' (3658mm)	1' (305mm)	11' (3353mm)
10' (3048mm)	4' (1219mm)	6' (1829mm)
8' (2438mm)	6' (1829mm)	2' (610mm)
7' (2134mm)	7' (2134mm)	0' (0mm)

3:1 Slope, No Load		
H	h1	h2
15' (4572mm)	0' (0mm)	15' (4572mm)
14' (4267mm)	0' (0mm)	14' (4267mm)
12' (3658mm)	3' (914mm)	9' (2743mm)
10' (3048mm)	5' (1524mm)	5' (1524mm)
8' (2438mm)	7' (2134mm)	1' (305mm)
8' (2438mm)	8' (2438mm)	0' (0mm)

No Slope, 100psf Load		
H	h1	h2
16' (4877mm)	0' (0mm)	16' (4877mm)
14' (4267mm)	1' (305mm)	13' (3962mm)
12' (3658mm)	3' (914mm)	9' (2743mm)
10' (3048mm)	6' (1829mm)	5' (1524mm)
8' (2438mm)	7' (2134mm)	1' (305mm)
7' (2134mm)	7' (2134mm)	0' (0mm)

No Slope, 250psf Load		
H	h1	h2
14' (4267mm)	0' (0mm)	14' (4267mm)
12' (3658mm)	1' (305mm)	11' (3353mm)
10' (3048mm)	3' (914mm)	7' (2134mm)
8' (2438mm)	5' (1524mm)	3' (914mm)
6' (1829mm)	6' (1829mm)	0' (0mm)
5' (1524mm)	5' (1524mm)	0' (0mm)

Lower Tier  $\phi_{\text{soil}} = 30^\circ$  (min.)  $\gamma_{\text{soil}} = 125\text{pcf}$  (max.)  
Upper Tier (AASHTO #57)  $\phi_{\text{soil}} = 38^\circ$  (min.)  $\gamma_{\text{soil}} = 110\text{pcf}$  (max.)

No Slope, No Load		
H	h1	h2
13' (3962mm)	0' (0mm)	13' (3962mm)
12' (3658mm)	2' (610mm)	10' (3048mm)
10' (3048mm)	4' (1219mm)	6' (1829mm)
8' (2438mm)	6' (1829mm)	3' (914mm)
6' (1829mm)	6' (1829mm)	0' (0mm)

2:1 Slope, No Load		
H	h1	h2
7' (2134mm)	0' (0mm)	7' (2134mm)
7' (2134mm)	3' (914mm)	4' (1219mm)
6' (1829mm)	4' (1219mm)	2' (610mm)
4' (1219mm)	4' (1219mm)	1' (305mm)
4' (1219mm)	4' (1219mm)	0' (mm)

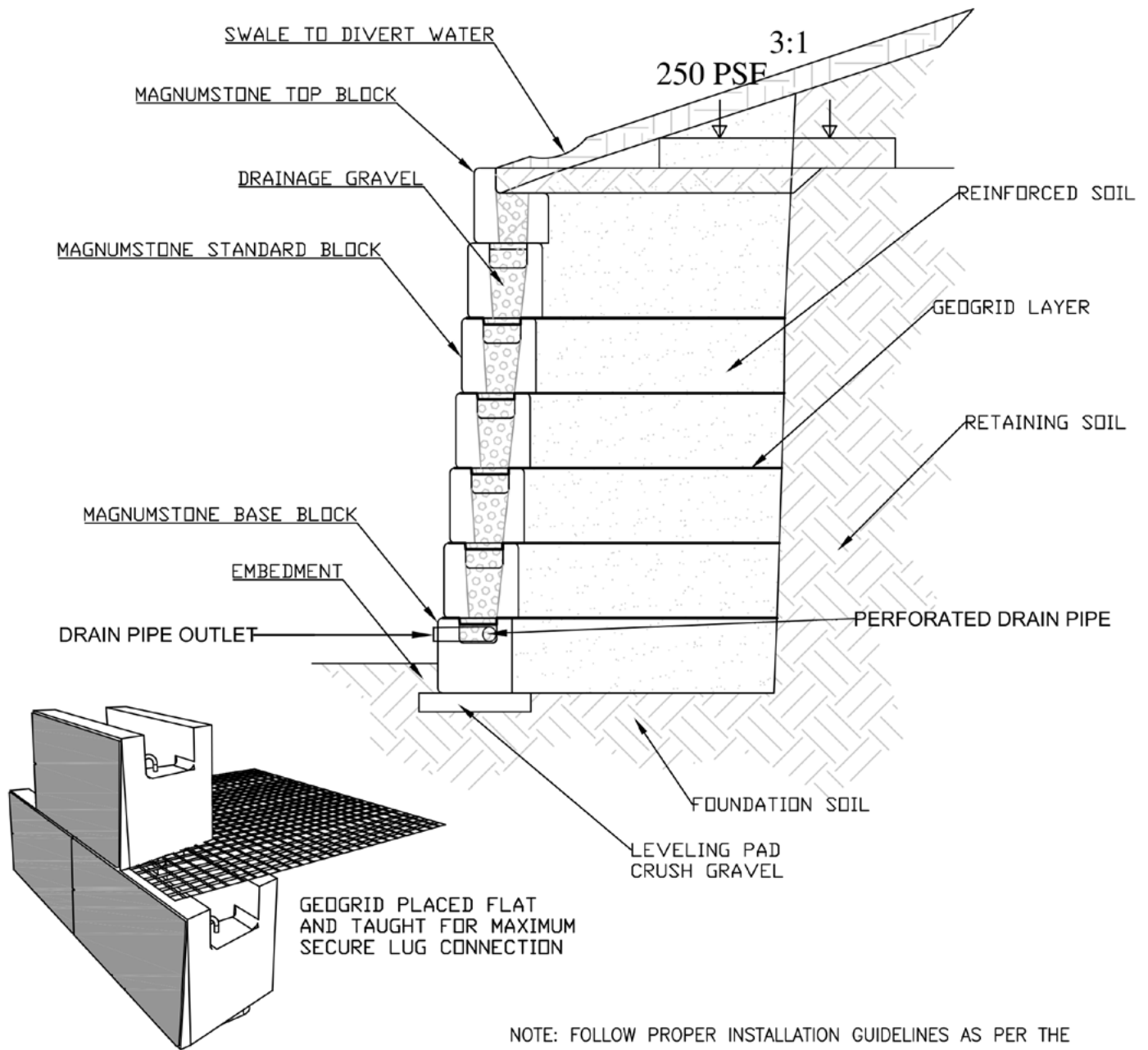
3:1 Slope, No Load		
H	h1	h2
10' (3048mm)	0' (0mm)	10' (3048mm)
8' (2438mm)	4' (1219mm)	4' (1219mm)
6' (1829mm)	5' (1524mm)	1' (305mm)
5' (1524mm)	5' (1524mm)	0' (0mm)

No Slope, 100psf Load		
H	h1	h2
11' (3353mm)	0' (0mm)	11' (3353mm)
10' (3048mm)	1' (305mm)	9' (2743mm)
8' (2438mm)	4' (1219mm)	4' (1219mm)
6' (1829mm)	5' (1524mm)	1' (305mm)
5' (1524mm)	5' (1524mm)	0' (0mm)

No Slope, 250psf Load		
H	h1	h2
9' (2743mm)	0' (0mm)	9' (2743mm)
8' (2438mm)	3' (914mm)	5' (1524mm)
6' (1829mm)	4' (1219mm)	2' (610mm)
4' (1219mm)	3' (914mm)	1' (305mm)
3' (914mm)	3' (914mm)	0' (0mm)



# Geogrid Retaining Wall Charts

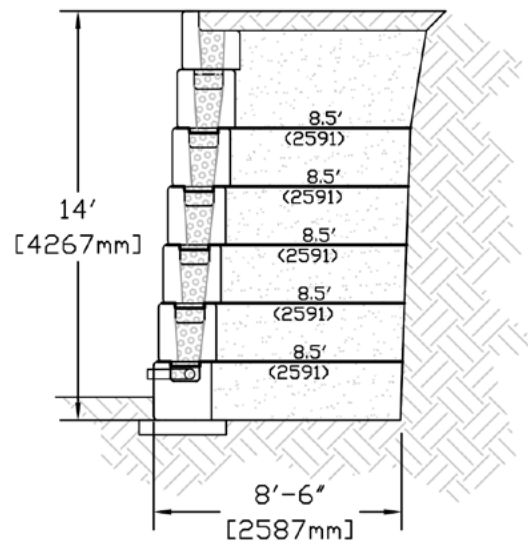
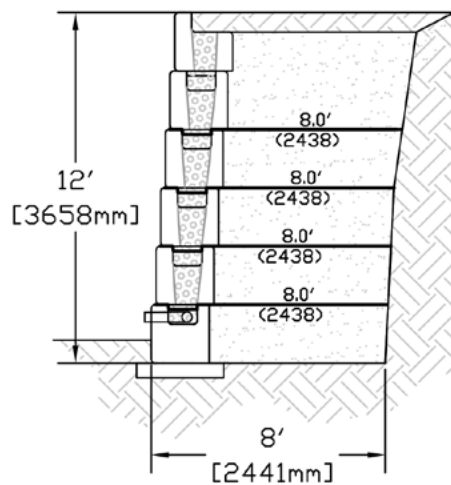
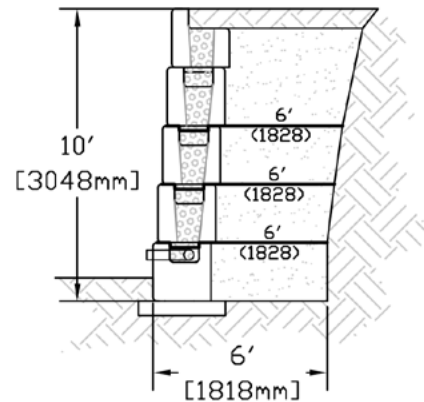
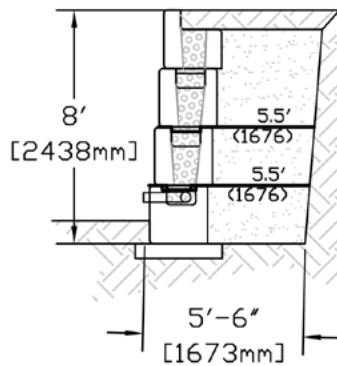
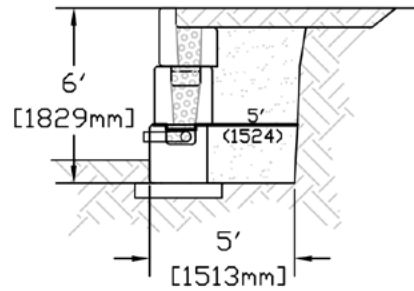


NOTE: FOLLOW PROPER INSTALLATION GUIDELINES AS PER THE MAGNUMSTONE INSTALLATION MANUAL. ENSURE LOCAL CODES AND GUIDELINES ARE ALWAYS BEING FOLLOWED.

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# 26° | No Load

Slope Angle	0°
Live Load	0 PSF
Retained Soil	26°
Foundation	26°
Reinforced	26°
Leveling Pad	Crushed Gravel

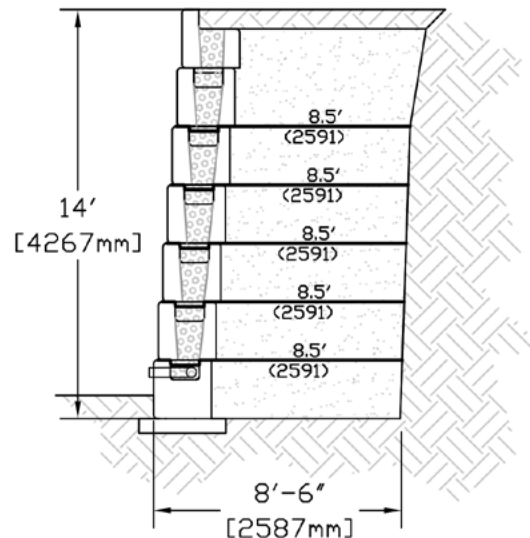
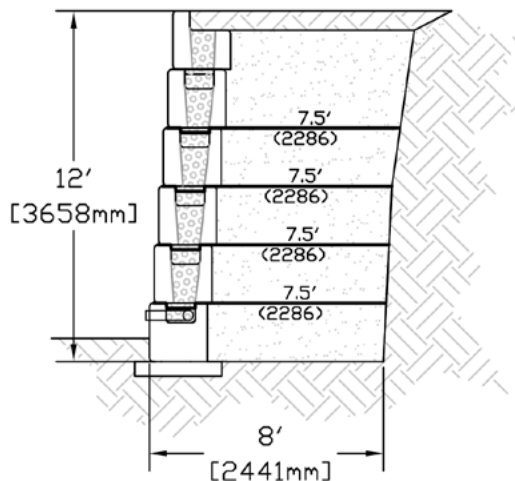
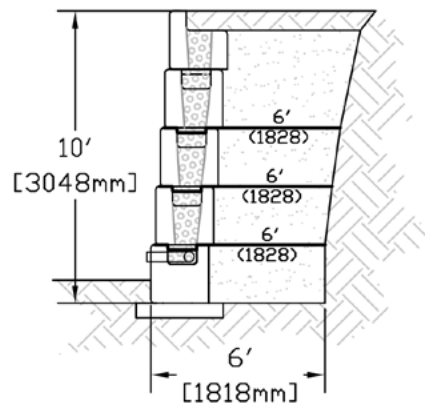
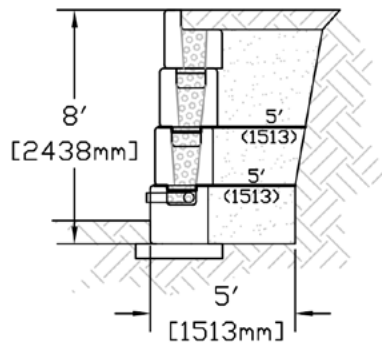
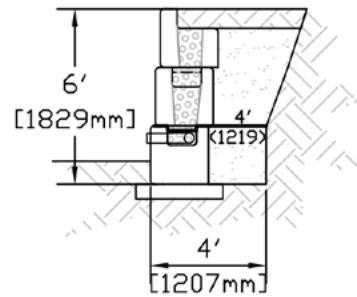


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# 28° | No Load

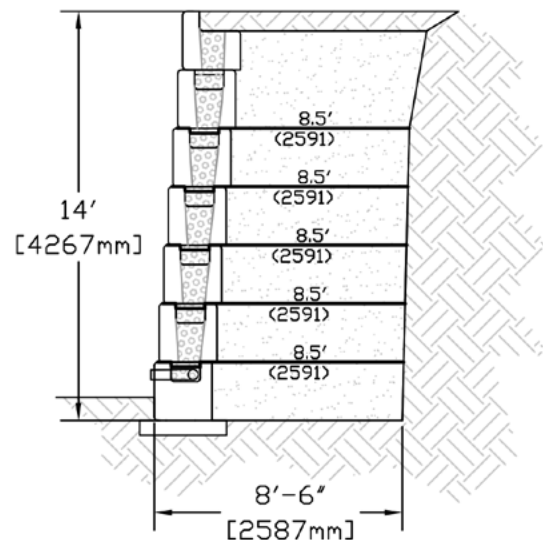
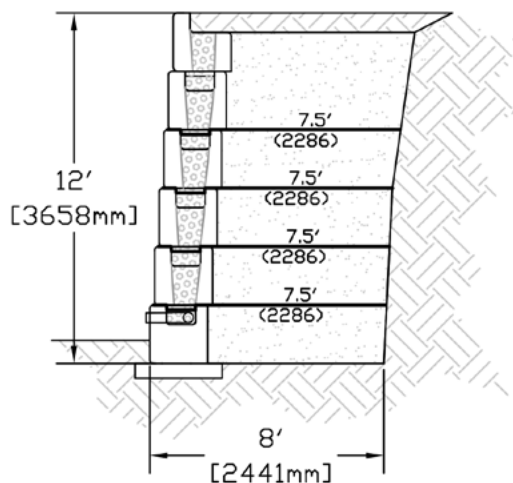
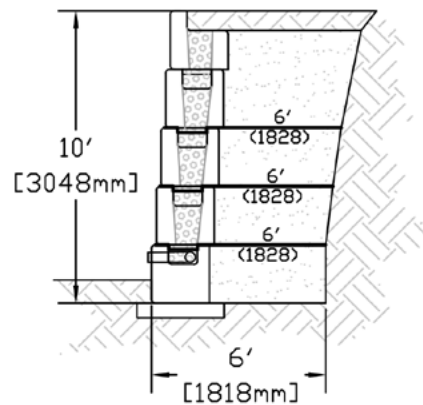
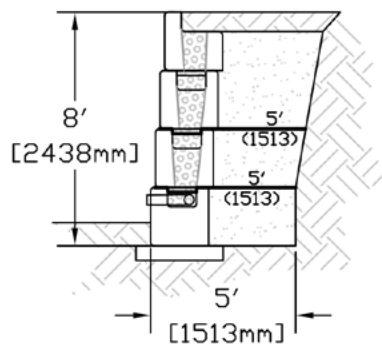
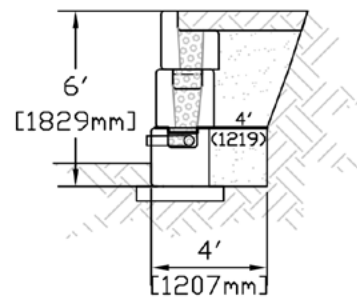
Slope Angle	0°
Live Load	0 PSF
Retained Soil	28°
Foundation	28°
Reinforced	28°
Leveling Pad	Crushed Gravel



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# 30° | No Load

Slope Angle	0°
Live Load	0 PSF
Retained Soil	30°
Foundation	30°
Reinforced	30°
Leveling Pad	Crushed Gravel

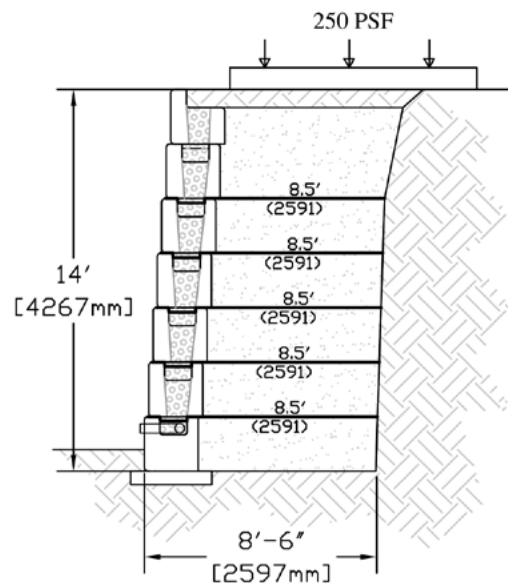
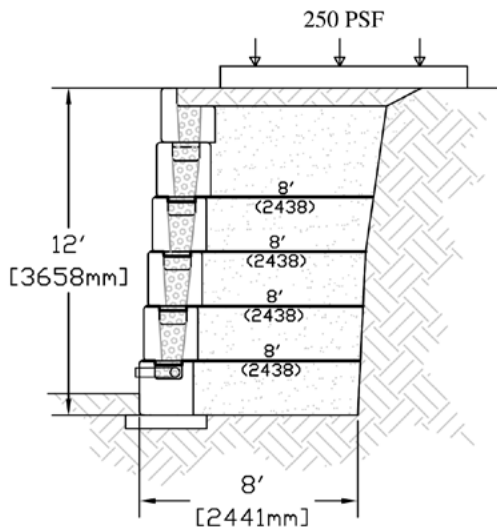
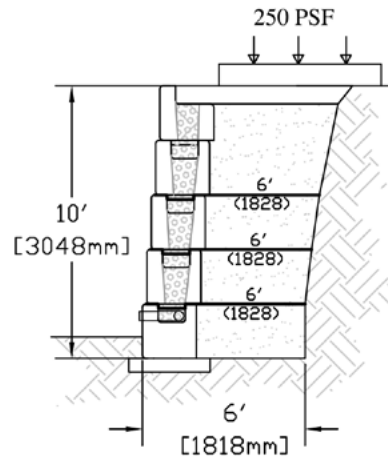
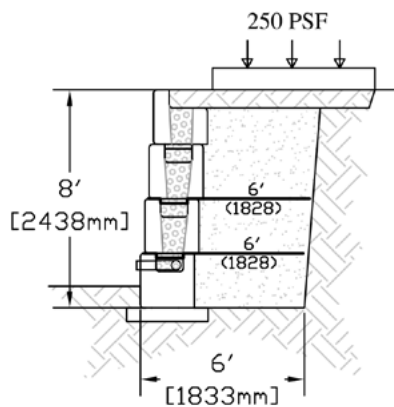
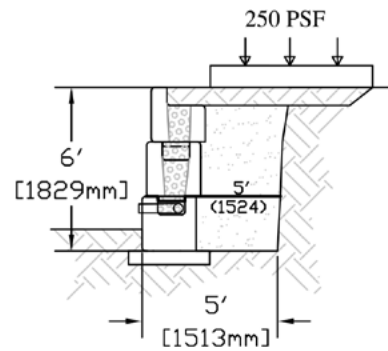


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# 26° | 250 PSF

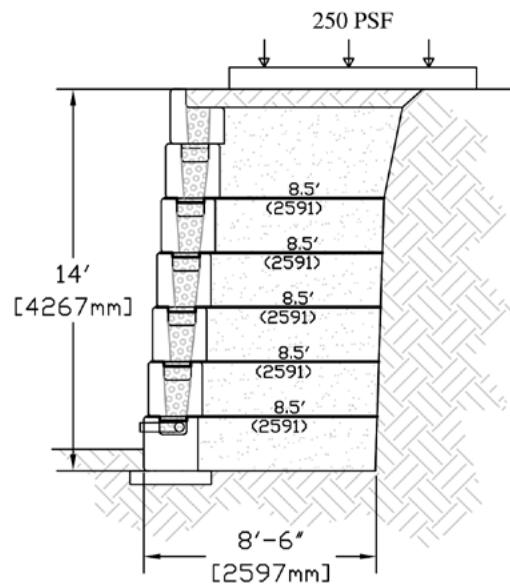
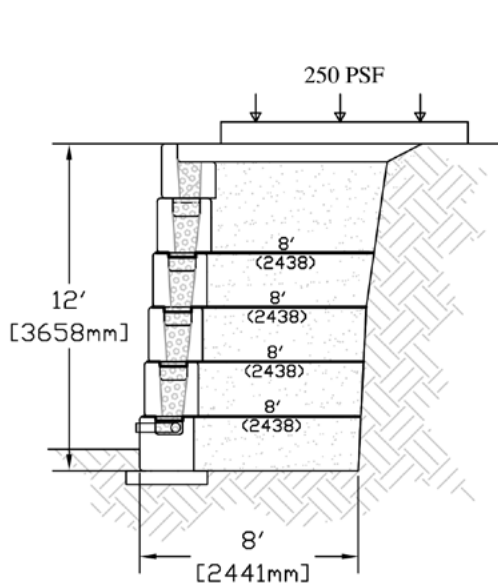
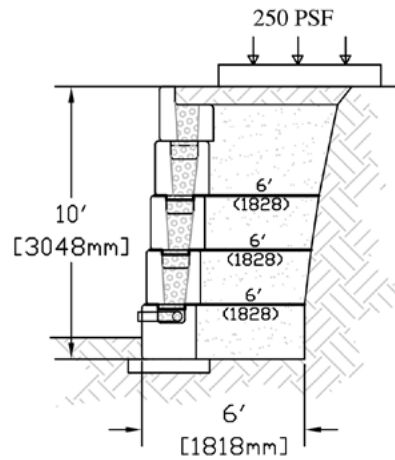
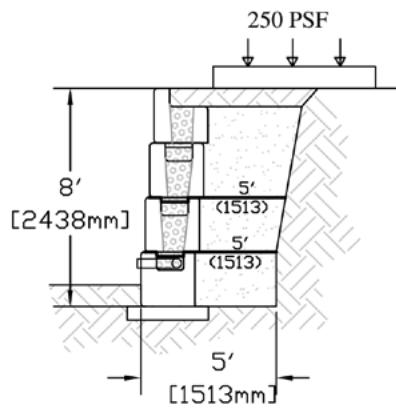
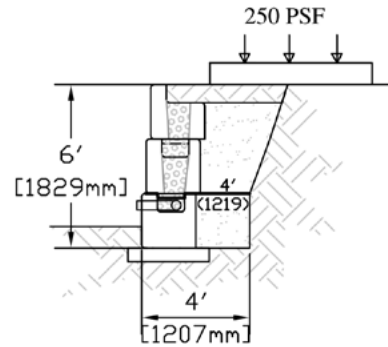
Slope Angle	0°
Live Load	250 PSF
Retained Soil	26°
Foundation	26°
Reinforced	26°
Leveling Pad	Crushed Gravel



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# 28° | 250 PSF

Slope Angle	0°
Live Load	250 PSF
Retained Soil	28°
Foundation	28°
Reinforced	28°
Leveling Pad	Crushed Gravel

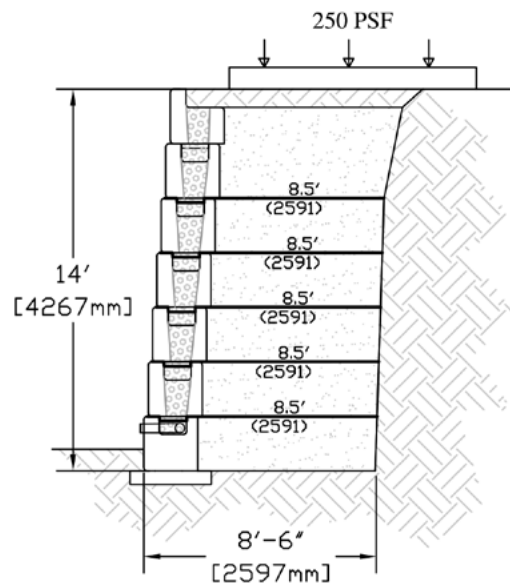
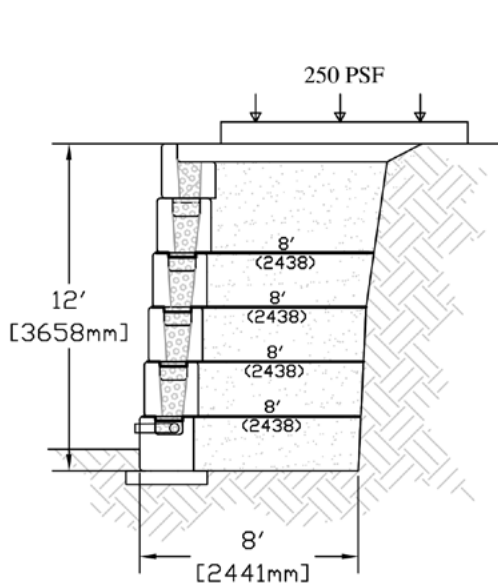
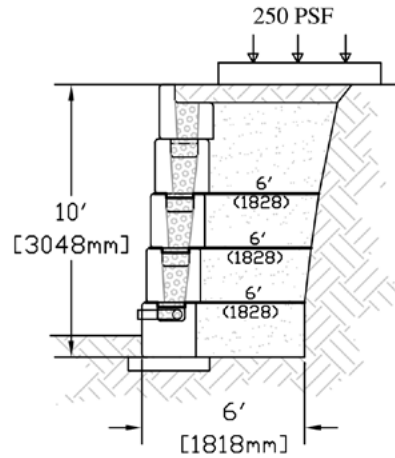
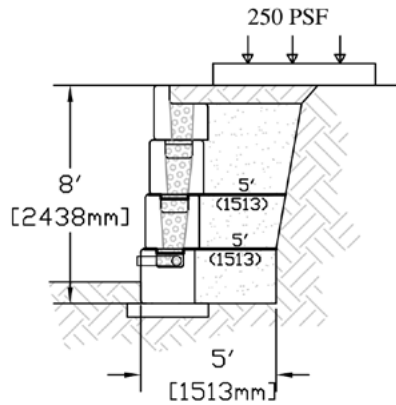
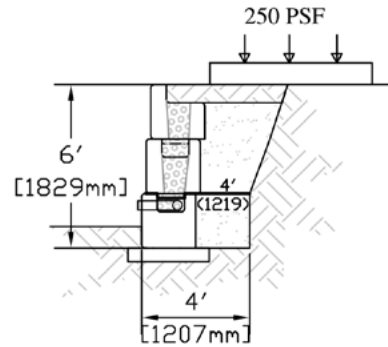


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# 30° | 250 PSF

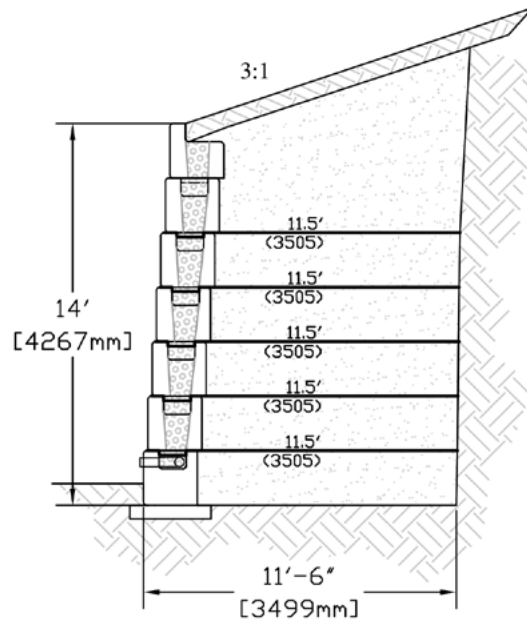
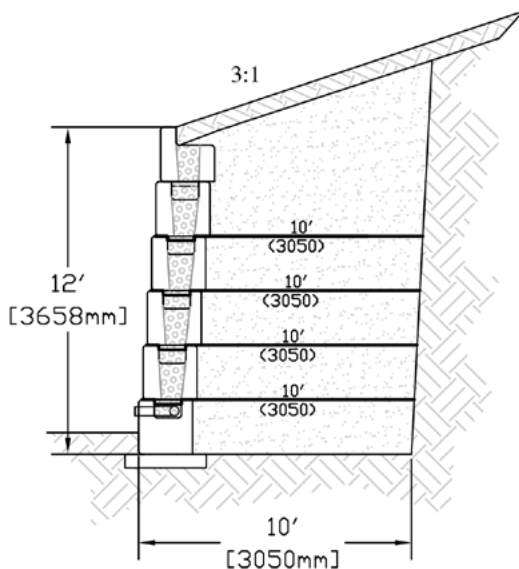
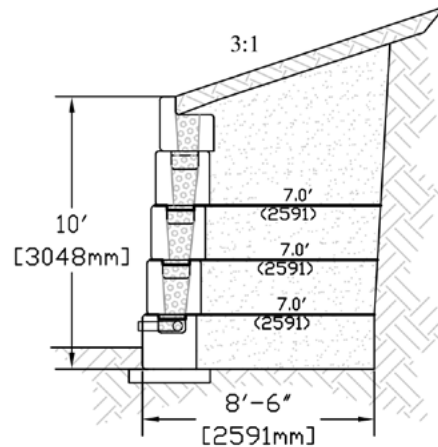
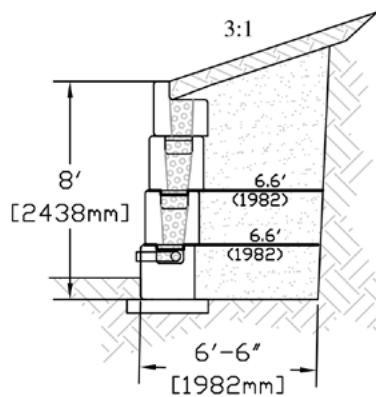
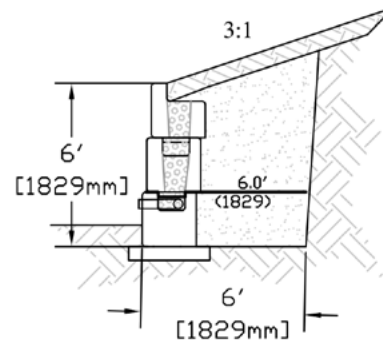
Slope Angle	0°
Live Load	250 PSF
Retained Soil	30°
Foundation	30°
Reinforced	30°
Leveling Pad	Crushed Gravel



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# 26° | 3:1 Slope

Slope Angle	18.4° 3:1
Live Load	0 PSF
Retained Soil	26°
Foundation	26°
Reinforced	26°
Leveling Pad	Crushed Gravel

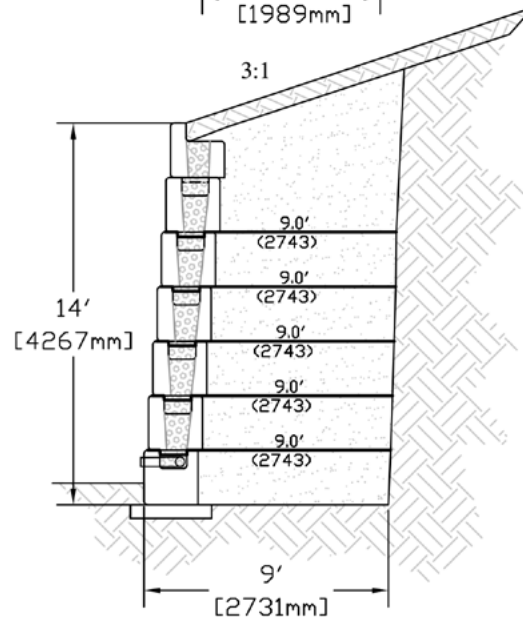
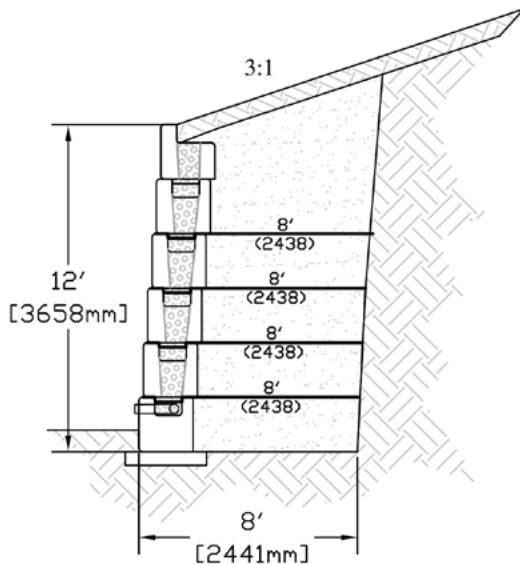
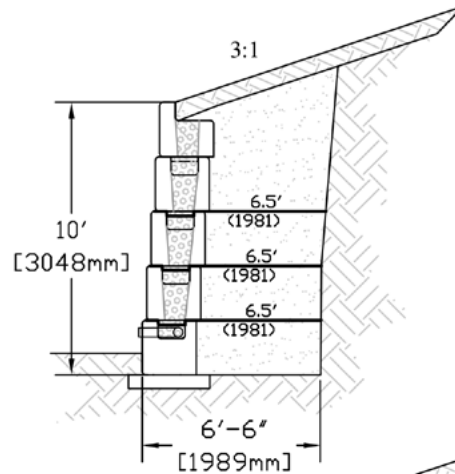
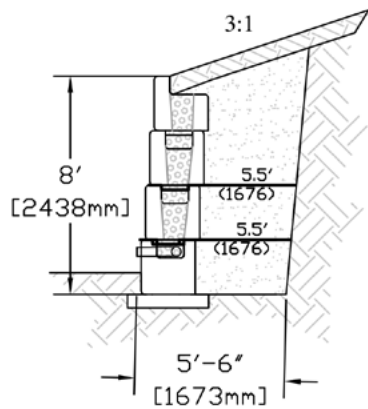
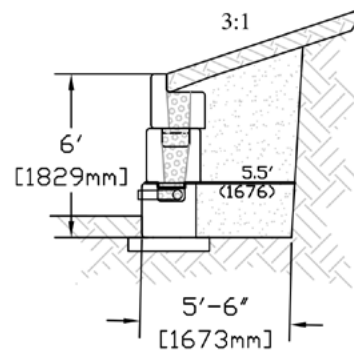


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# 28° | 3:1 Slope

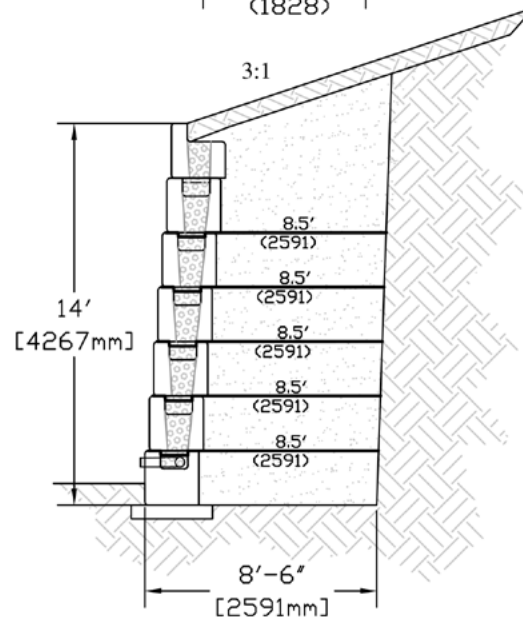
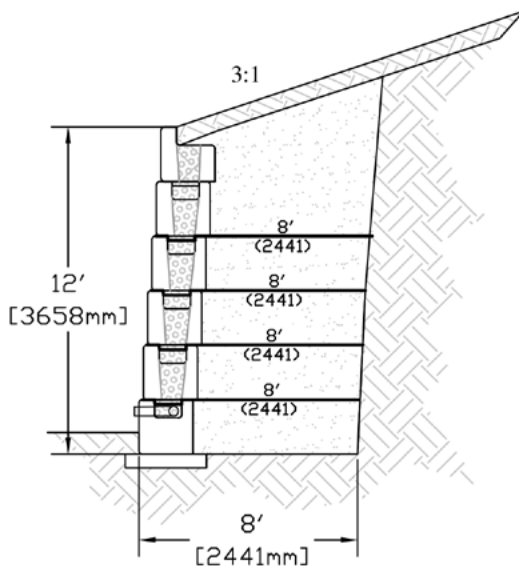
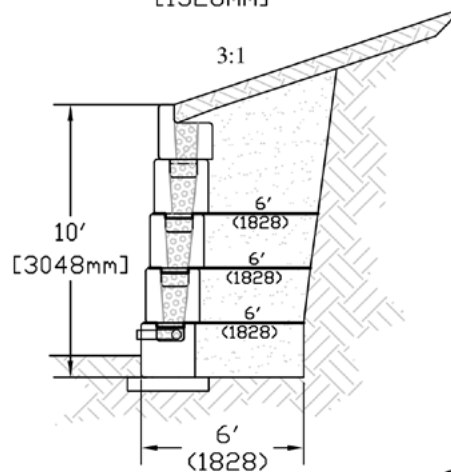
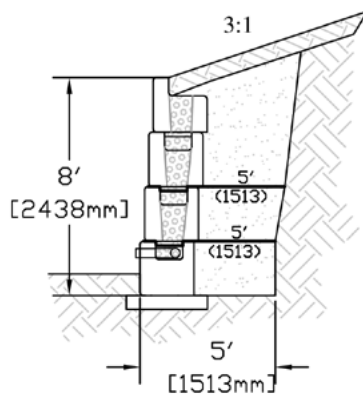
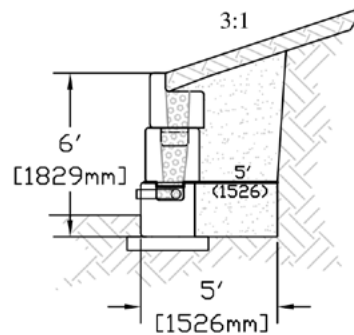
Slope Angle	18.4° 3:1
Live Load	0 PSF
Retained Soil	28°
Foundation	28°
Reinforced	28°
Leveling Pad	Crushed Gravel



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# 30° | 3:1 Slope

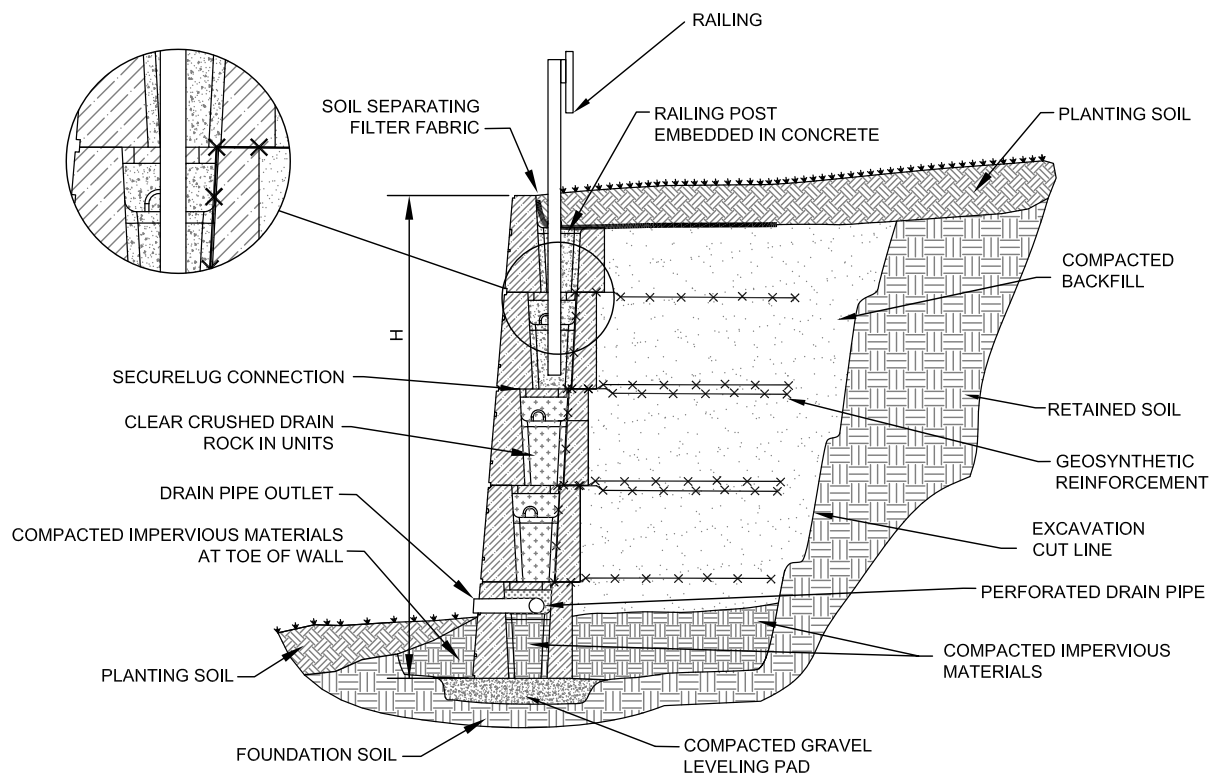
Slope Angle	18.4° 3:1
Live Load	0 PSF
Retained Soil	30°
Foundation	30°
Reinforced	30°
Leveling Pad	Crushed Gravel



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# Railing In Core



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