

**COST EFFECTIVE RETAINING WALLS  
THAT PERFORM IN ANY LANDSCAPE.**

# **Omega™ Walls**

*Affordable Performance!*

## **OMEGA RETAINING WALL INSTALLATION GUIDE**



**OMEGA STONE**

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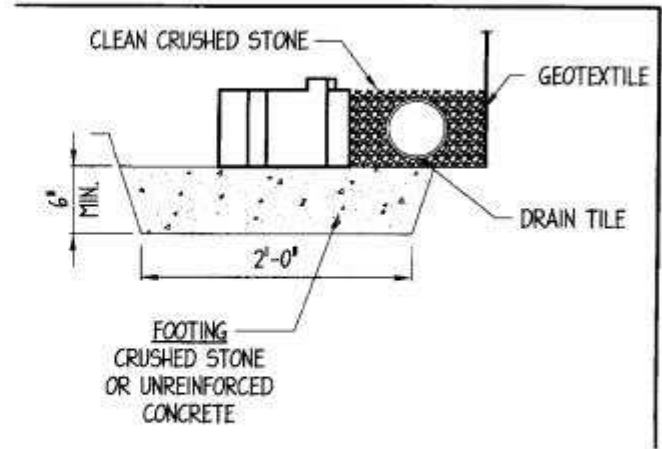
# OMEGA INSTALLATION GUIDE

The information provided in this guide are for preliminary design only and Shaw Technologies, the manufacturer, or dealer take no responsibility for use of designs or information contained herein. Designs should be reviewed and approved by a registered professional engineer.

## 1. PAD SITE DEVELOPMENT

Dig a trench 24" wide and deep enough to allow for a minimum depth 6" of base material plus 1" for each 6" of wall exposed above grade. Base material must consist of crushed stone densely compacted to 95% of proctor, or unreinforced concrete. Do not use pea gravel. Base must be level.

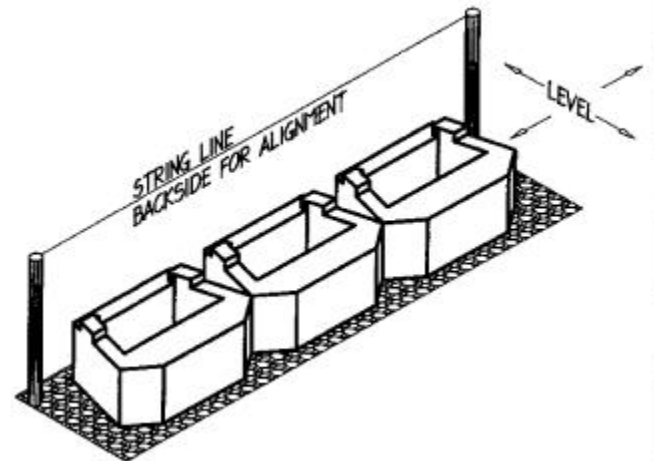
Fill at least one foot behind wall with clean crushed stone to allow for drainage and to prevent build up of hydrostatic pressure. Placing geotextile material between the crushed stone and other fill will help prevent the drainage fill from becoming clogged, and help prevent block staining. Install drainage tile at the rear of the first course to provide gravity flow of water away from the wall and reinforced soil zone.



## 2. INSTALLING COURSES

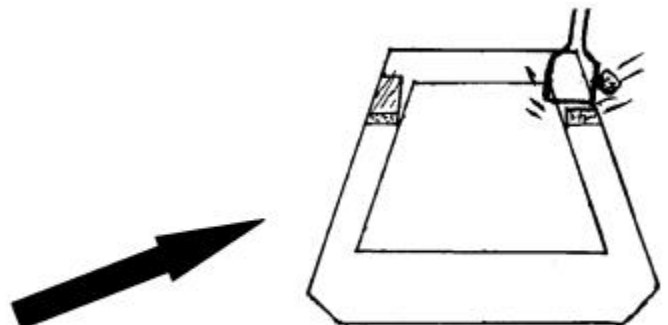
Place first unit at the lowest level of elevation. Each unit must be leveled side to side and back to back. Before installing a straight course, place a string line along the backside to assure alignment and leveling of rear of block.

Add additional rows filling cavities in block with clean crushed stone as each row is installed. Place same type stone behind the wall a minimum of one foot, installing and compacting as installation progresses. Sweep material off top of wall before installing the next course.



## 3. CURVES AND SERPENTINE WALLS

The Omega block has a normal 3/4" setback. As, for example, an outside sharply curved wall progresses in height, succeeding courses form a smaller radius. This causes the vertical edges of the block to misalign. The vertical edge of every other row should vertically align with each other. This can be cured by eliminating the setback through by chiseling off a portion of the



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back of the hubs on the block below the one being set in place. The block being set in place can be set with its face even with the one below, and scoring or marking the hub as to where a portion of it should be removed. The result will be a vertical wall. The beveled block should be utilized on sharp outside curves to eliminate a gap between the blocks on the front of the wall.

A sharp inside curve will also require the elimination of the setback.

Construction adhesive should also be applied where the top and bottom blocks contact each other on these vertical curves.

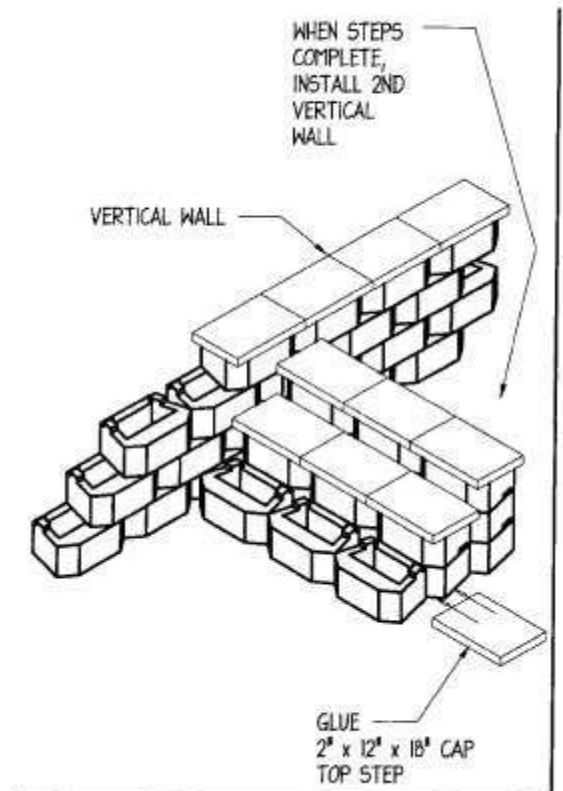
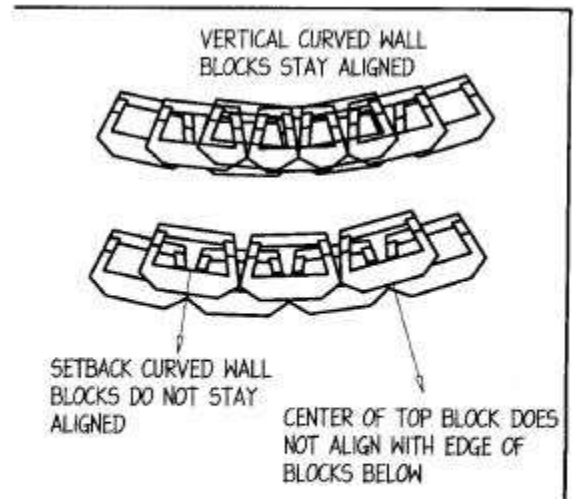
Gentle curves and low walls may not need the setback adjustments.

Walls along side steps should also have the setback eliminated resulting in a vertical face. See the section on Steps.

## 4. STEPS

Lay one wall (either the right or the left) next to where the steps are to be placed. This needs to be a vertical wall (see installing curves and serpentine walls). Place the bottom row of steps perpendicular to the wall and 2" below grade, leveling back to back and side to side. After placing a 2" x 12" x 18" cap on the step, the result will be a 7" step. Crushed stone must be placed under the steps, in block cavaties, and behind the steps. (Note: Omega solid block does not contain cavaties and can be used for the step if desired, but is not necessary). The caps (when steps are complete) should be glued to the block steps with retaining wall or other outside construction adhesive. The next row of steps should be placed behind the the rear of the first row and placed down in the stone 2" below the top surface of the cap on the first row. This will leave 5" of the block exposed above grade and when the 2" thick cap is added, a 7" step will result. Continue in the same manner with succeeding rows.

When all steps are complete, a vertical can the be installed against the other side of the steps.



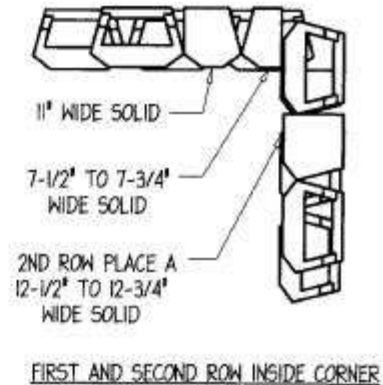
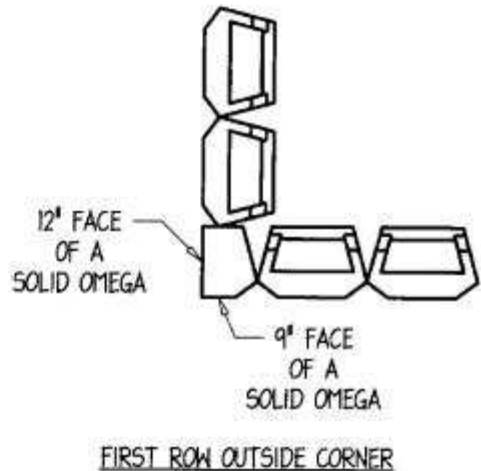
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## 5. INSIDE CORNERS (90 DEGREE) RIGHT ANGLES

Place the first row and overlap one side as shown in the picture.

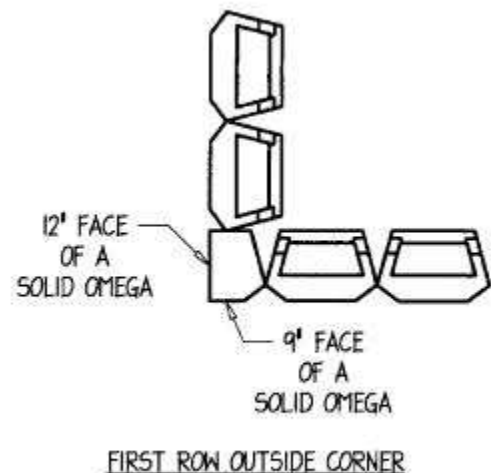
Use a 1/2 solid Omega on the right. Since the block has a normal 3/4" setback, as the wall increases in height, some of the corner block must be cut or split in different sizes in order to have a flush corner without gaps. It will also allow the vertical edges of the block to line up through the wall except in the corner itself on a few of the block. The solid block will also have a larger surface area on which the block above it will be able to sit. Further secure the solid block with those above and below with retaining wall or outside construction adhesive.

Note there are two block in the first & second row pictures suggesting block be split to 7 1/2" to 7 3/4" and 12 1/2" to 12 3/4" respectively. Split block will have a slightly different thickness on their face due to the splitting process. A quick measurement before splitting the block will determine the actual width required.



## 6. OUTSIDE CORNERS(90 DEGREE) RIGHT ANGLE

Align the block as indicated in the picture titled "FIRST ROW, OUTSIDE CORNER" using a solid omega split in dimensions indicated.



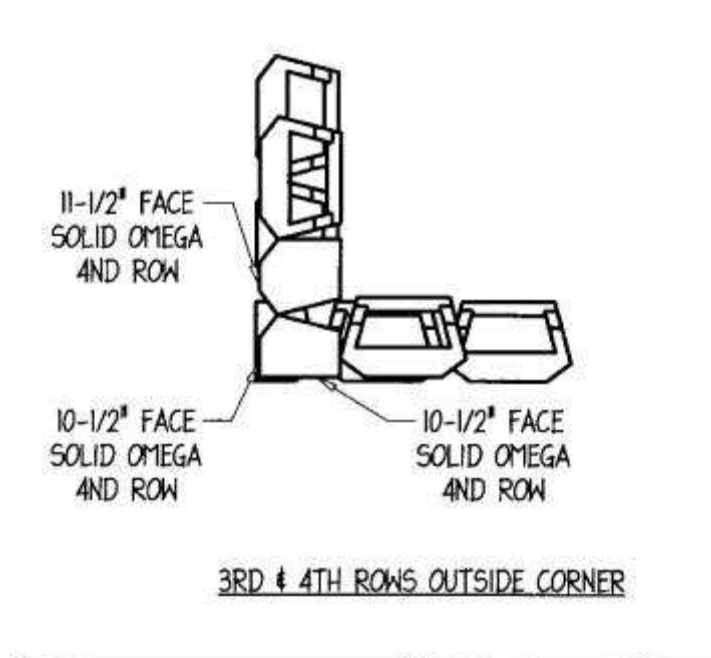
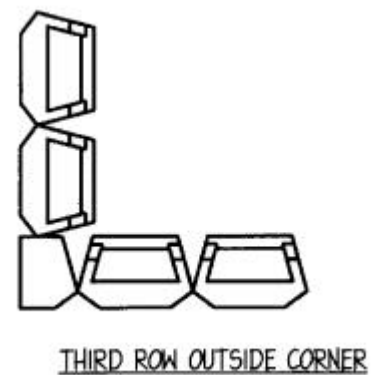
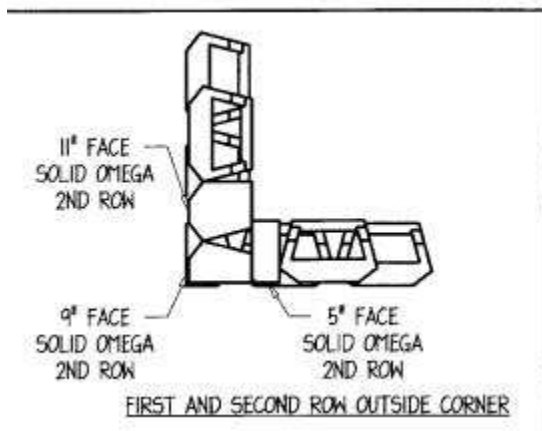
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## 6. CONTINUED--OUTSIDE CORNERS (90 DEGREE) RIGHT

### ANGLE

Align the block for the second row as indicated in the picture to the right (first & second row picture) splitting the solid Omega block according to the dimensions indicated. Secure the solid block utilizing retaining wall or other outside construction adhesive.

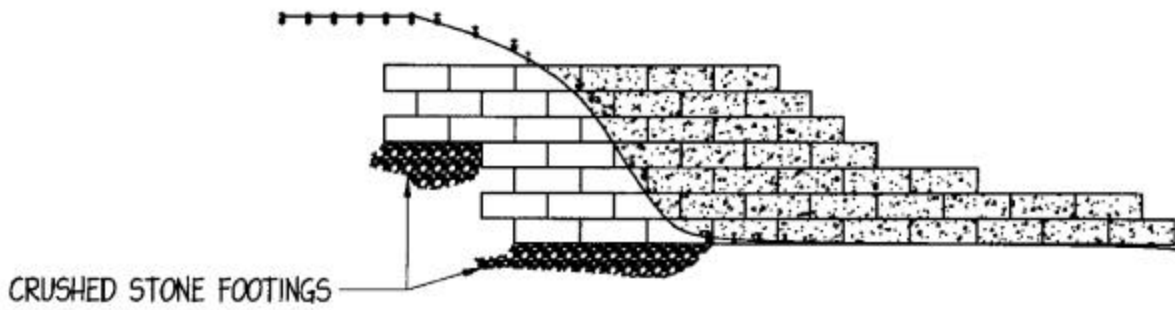
Dimensions of third and fourth rows are shown in the bottom two pictures. Subsequent rows will have different dimensions, but will follow a similar pattern.



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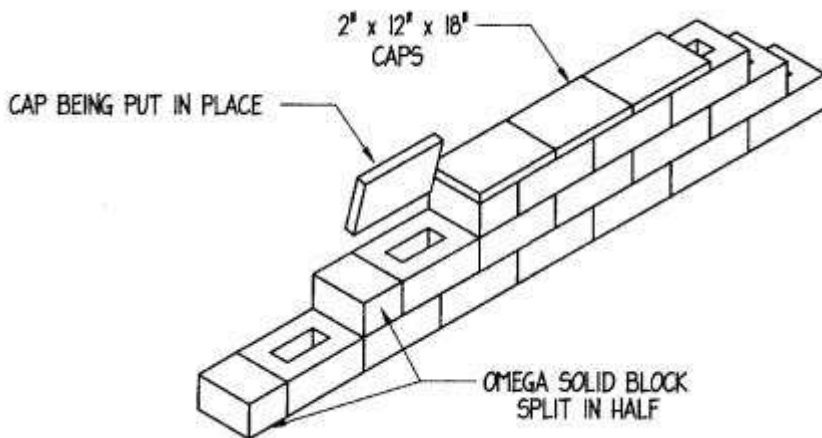
## 7. TERMINATING WALLS INTO BANKS

Terminating a wall into a bank does not require every course to be extended into the bank the full length of the wall. However, there should be an extension of at least two block into the bank and the footing should be prepared as well as a regular wall.



## 8 STEPPED WALLS.

The omega block is normally hollow, but in stepping down a wall, a half block must be utilized. A hollow block split in half would not lend itself to a finished look. Therefore an Omega solid block is manufactured for that purpose. When split in half, the solid block has the rough stone finish to give the wall a handsome finished look. Caps are glued onto the hollow and solid block installed in the wall.



STEPPED WALL BEING TERMINATED INTO BANK

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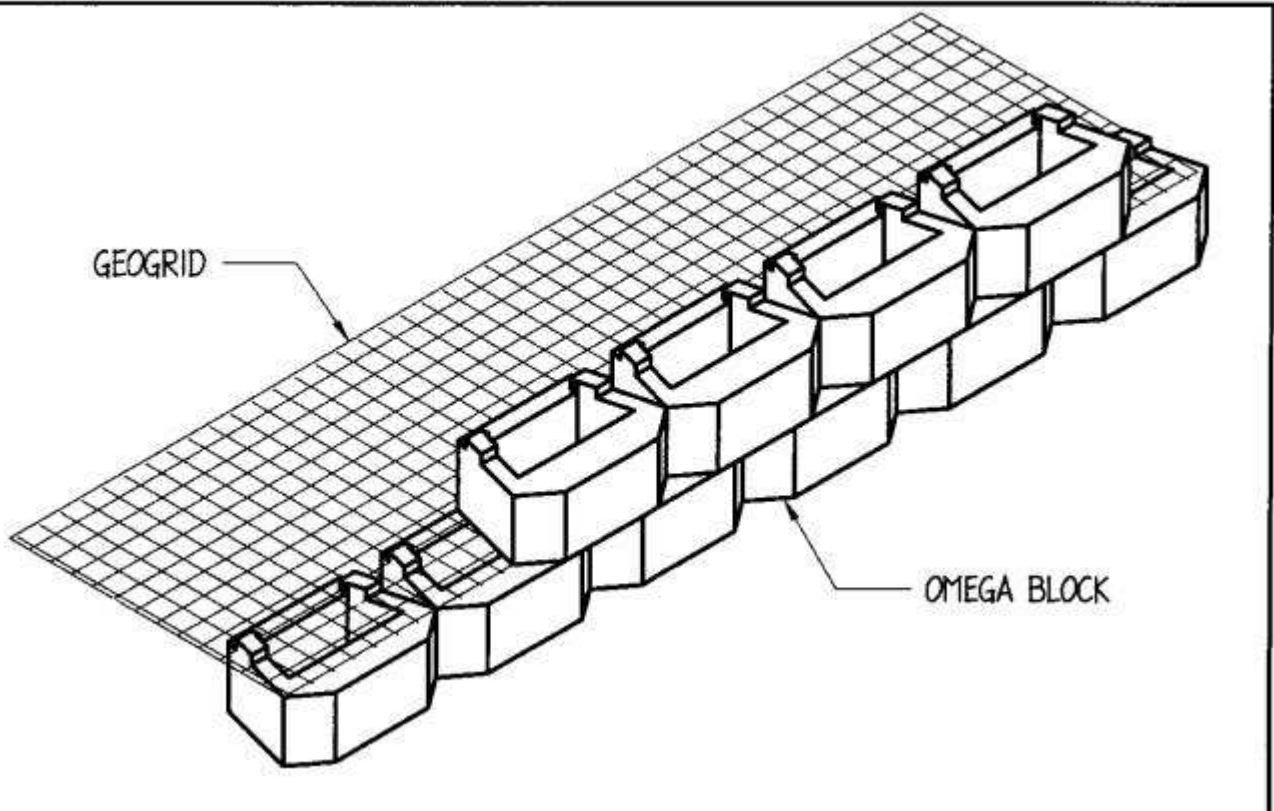
## 9. USE OF GEOGRID

Geogrid is a geosynthetic material formed into a grid like structure used to stabilize a segmental retaining wall (see picture below) that normally is supplied in rolls by the manufacturer.

Walls, requiring geogrid, should be engineered by a licensed engineer, and installation should be directed by an engineer or installed according to construction drawings. Geogrid is placed in layers (see one layer in picture below).

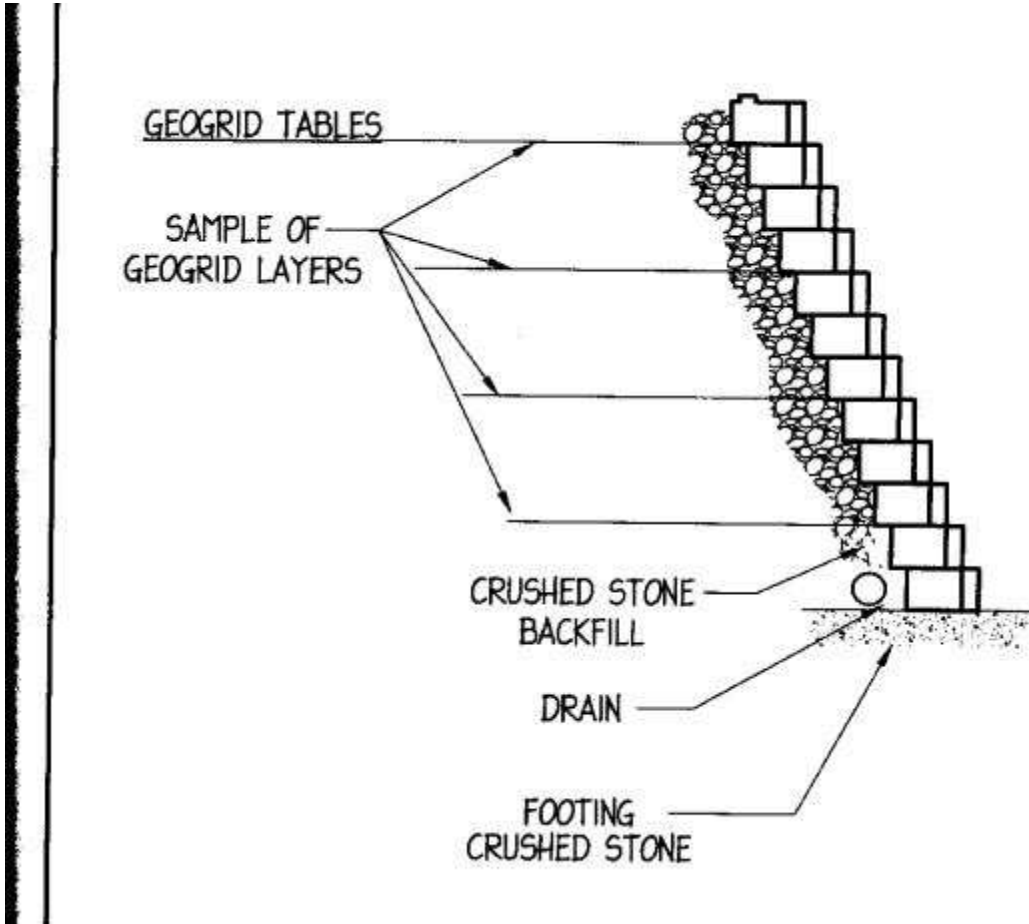
Compaction of crushed stone and other fill must be installed in 5" to 6" layers and then compacted to 95 % of proctor and completed as the wall progresses upward. Equipment other than hand compaction should not be operated within four feet of the wall. Only rubber tires should roll over the geogrid. Direction of installation of the geogrid should be according to the manufacturers instructions. The geogrid must be pulled and remain taut so as to be effective in providing stability to the wall.

At least six inches of back fill material should be placed between layers of geogrid that will overlap.



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## 10. USE OF GEOGRID (CONTINUED)





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## 11. GEOGRID TABLES

### Omega Walls

CASE	TOTAL HEIGHT	EXPOSED HEIGHT	NUMBER OF 7" HIGH COURSES	REINFORCING GEOGRID		PLACEMENT ELEVATION					
	H (FT)	H' (FT)		WIDTH	NUMBER OF LAYERS	E (FT) ABOVE BASE ELEVATION					
				L (FT)		E1	E2	E3	E4	E5	E6
<b>Case 1 level q = 0 psf</b>	13.4	12.8	23	8.05	5	0.58	1.75	4.67	7.58	10.50	
	10.5	10.0	18	6.50	3	1.75	4.67	7.58			
	7.0	6.5	12	4.65	2	1.17	4.08				
	5.25	4.8	9	3.49	1	2.33					
	3.5	3.0	6	2.32	1	0.58					
<b>Case 2 level q = 240 psf</b>	13.4	12.8	23	8.05	6	0.58	2.92	4.08	7.00	9.92	12.83
	10.5	10.0	18	6.30	4	1.17	4.08	7.00	9.92		
	7.0	6.5	12	4.30	3	0.58	3.50	6.42			
	5.25	4.8	9	3.65	2	1.75	4.67				
	3.5	3.0	6	6.91	1	2.92					
<b>Case 3 backslope 2.5H : 1V</b>	13.4	12.8	23	16.15	6	1.17	1.75	4.08	5.25	8.17	11.08
	10.5	10.0	18	11.20	4	1.17	2.33	5.25	8.17		
	7.0	6.5	12	7.20	2	1.75	4.67				
	5.25	4.8	9	5.35	1	2.92					
	3.5	3.0	6	3.40	1	1.17					

**Soil Parameters: Reinforced Soil = 34 degrees**  
**Foundation and Retained Soils = 30 degrees**

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### 11A. GEOGRID TABLES

#### Explanation of Design Terms

**Q** is the nomenclature used to denote the surcharge load on top of the wall. Therefore **0** denotes a flat section on top of the wall with no live load.

**Q=240 psf.** - This denotes a flat surface on top of the wall with a traffic load on top of the wall. The AASHTO standards (American Association of State Highway and Transportation) call for a normal traffic load to be a two foot surcharge, so in the case of the soil weight of 120 used on the design tables the traffic load for a street or parking lot on top of the wall would be 240 pounds per square foot.

**Backslope 2.5H:1V** - This denotes a sloped surface on top of the wall. The angle of the slope is 2.5' in the horizontal direction for every 1' vertical.

**Soil parameters = 34 degrees.** - This the most common friction angle used for a non-cohesive soil such as sand or crushed rock. It is the soil strength most commonly used for the soil used in the reinforced zone of the wall.

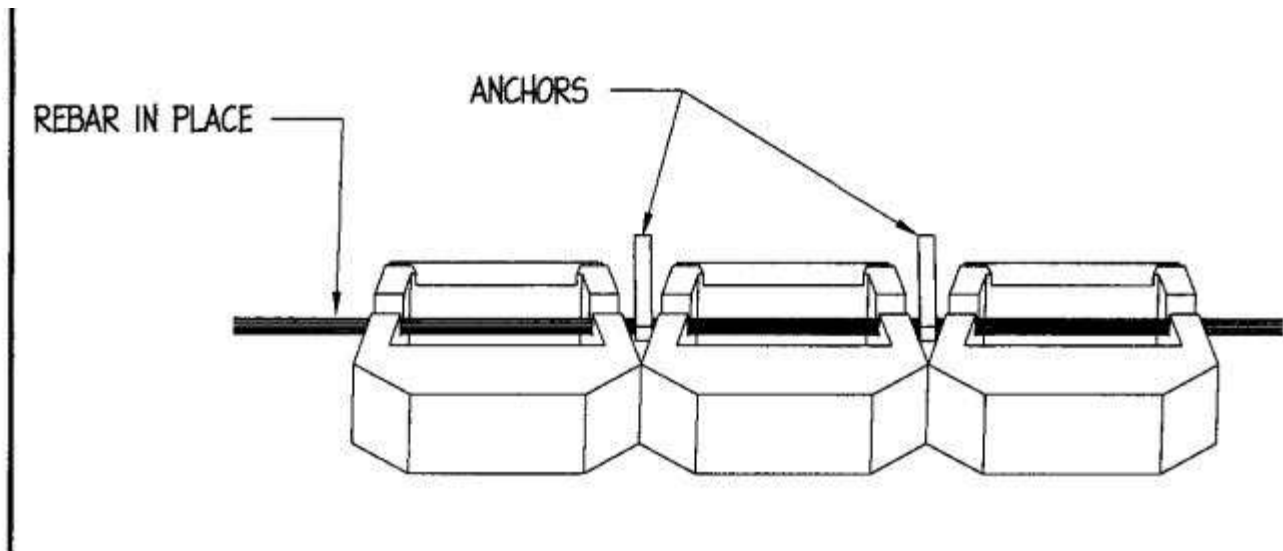
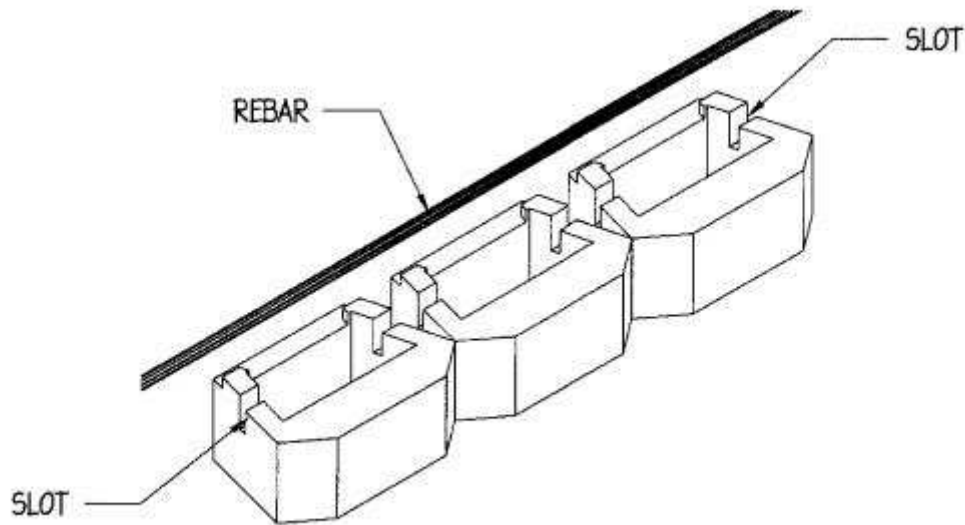
**Foundation and retained soils = 30 degrees.** - The foundation soil is what the retaining wall sits on and the retained soil is the material that is directly behind the reinforced zone where the soil reinforcement member (geogrid or filter cloth) is placed. The use of 30 degrees is an arbitrary number that is used for most common applications.

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## 12. OTHER ANCHORING METHODS

Engineers may designate other means of anchoring a segmental retaining wall over four Ft. in height. The Omega block has been designed to take advantage of some means other than geogrid. There may be instances where the space behind a wall may be insufficient to lay geogrid back far enough to provide the stability needed.

The Omega block has two slots in the top of the block forward of the two hubs. The slots are large enough to accommodate rebar as large as 5/8" in diameter. Anchors can be attached to the rebar at an area between two blocks and anchored back as an engineer would direct. (See pictures below)



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## 13. TERRACED WALLS

Terraced walls can be utilized to construct two or more short walls in lieu of one tall wall. These walls can be pleasing to view and they provide places to plant aesthetically pleasing bushes, flowers, etc.

Generally speaking, a wall can be constructed up to four feet tall without utilizing geogrid or other anchoring methods. Terraced walls, in some cases, can be constructed with short walls thus saving the cost of geogrid or other anchoring materials. It might also save the need to purchase and install additional fill behind the walls. However, when installing these walls, the upper walls must not be constructed too close to the lower ones since it creates an additional surcharge loads on the lower ones. An upper wall should be constructed a horizontal distance behind the lower wall of at least twice the height of the lower wall.

A qualified soils engineer should be consulted before constructing a terraced wall.



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## 14. SEAWALLS

Before constructing a sea wall, it is best to have an engineer review the project since there are many things to consider.

Some of the things to consider are:

1. Undermining caused by waves, scouring by currents, wash caused by boat props, etc.
2. Hydrostatic pressure do to constant wetness.
3. Fine materials attempting to seep behind and through the seawall.

The contractor must remove all silts and unstable material until a solid base is found upon which to place a footing. A concrete reinforced base is recommended for water applications. Clean crushed stone at least 20" in depth should be placed behind the wall and a filter fabric utilized to prevent loss of fine material and to prevent the clogging of the clean crushed stone. Rip rap placed in front of the wall can help prevent under mining of the footing and wall. Drains should also be utilized in appropriate places along the wall. An engineer should be consulted when constructing a sea wall.

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