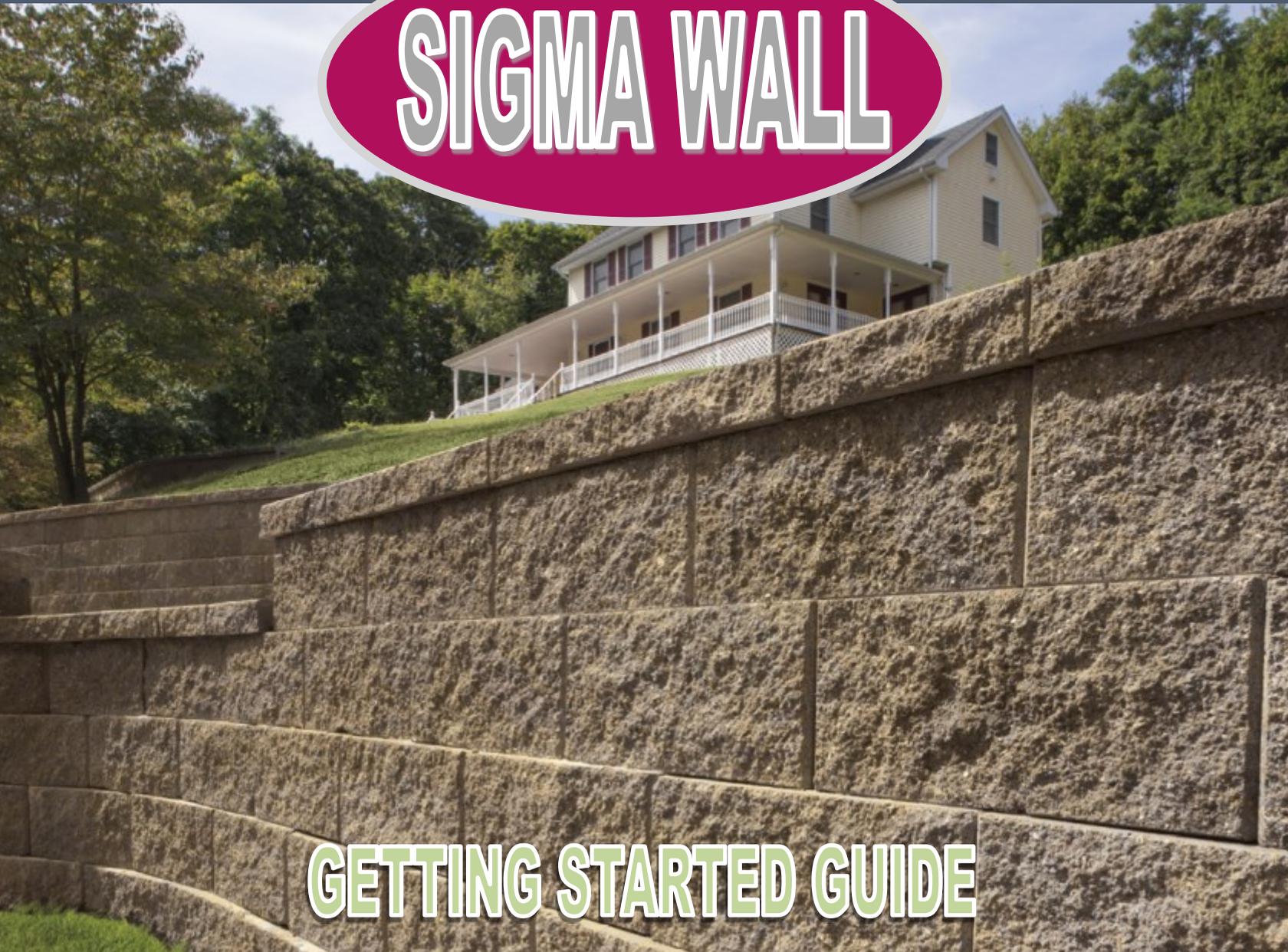


BACKYARD PATIOS & OUTDOOR LIVING ROOMS • PAVINGSTONES • WALL SYSTEMS

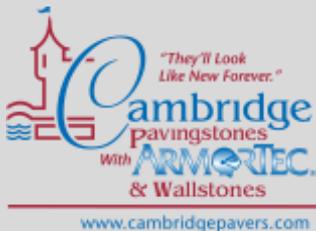
CAMBRIDGE

SIGMA WALL



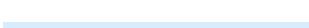
GETTING STARTED GUIDE

RETAINING WALL



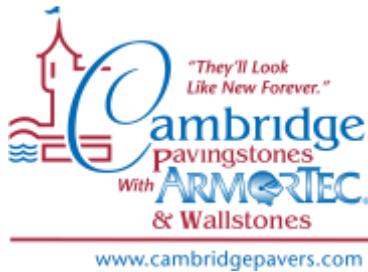
FIND MORE DETAILS AT

cambridgewallsupport.com
cambridgepavers.com

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SIGMA

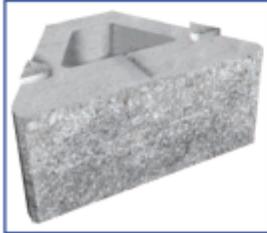
SIGMA RETAINING WALL



The Cambridge Sigma Wall System is built to the highest standards in height, texture, color and ease of use. The Sigma system was designed from contractor feedback. Professional Installers asked for a stone that would not hurt their back, a connection system that was simple to use with no pins, a large wall system that matched our Maytrix and Outdoor Living Kits and a wall that looked good in a residential backyard. The Sigma 6 incorporates our patent pending Double Knob System. It installs as delivered with a 6 degree setback, or by knocking off the front set of "break away" knobs to get "near vertical" alignment. The NEW Sigma line includes large corner stones that create a great looking, strong corner. And as a bonus, every Sigma Stone has the ability to create two "emergency" stub (smaller) corners for that small job.

SIGMA 8

SIGMA 8 STONES



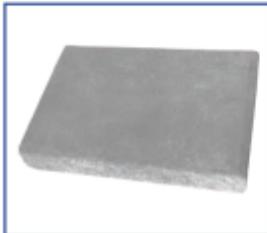
SIGMA 8 WALL STONE

DIMENSIONS	8" H x 16" W x 12" D
coverage	1 sq. ft.
setback (batter)	3/4" (6°)
weight	69 lbs.



SIGMA 8 CORNER UNIT

DIMENSIONS	8" H x 14" W x 12" D
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CAMBRIDGE LARGE CAP

DIMENSIONS	3" H x 18" W x 12" D
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CAMBRIDGE 13" DOUBLE-SIDED CAP

DIMENSIONS	3" H x 12" W x 13" D
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SIGMA 6

SIGMA 6 STONES



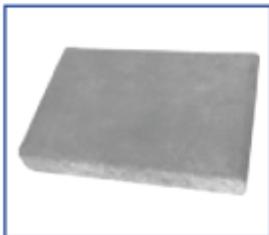
CAMBRIDGE SIGMA 6 WALL STONE

DIMENSIONS	6" H x 16" W x 12" D
coverage	.6667 sq. ft.
setback (batter)	3/16" or 5/8" (1.7° or 6°)
weight	54 lbs.



CAMBRIDGE SIGMA 6 CORNER UNIT

DIMENSIONS	6" H x 14" W x 8" D
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CAMBRIDGE LARGE CAP

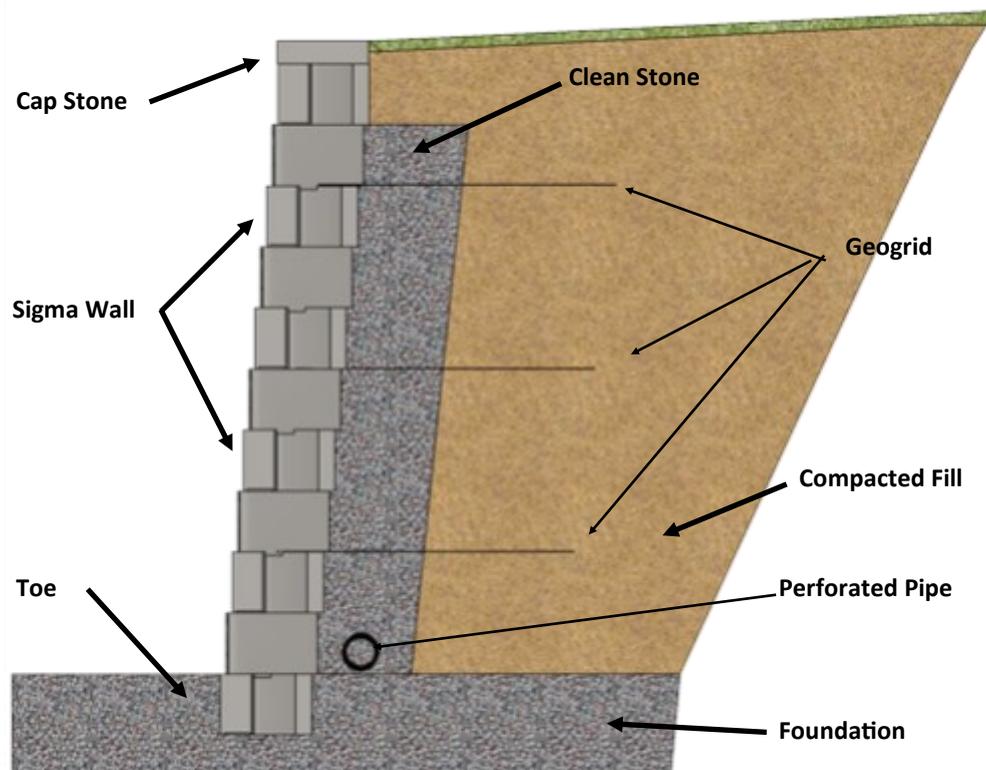
DIMENSIONS	3" H x 18" W x 12" D
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CAMBRIDGE 13" DOUBLE-SIDED CAP

DIMENSIONS	3" H x 12" W x 13" D
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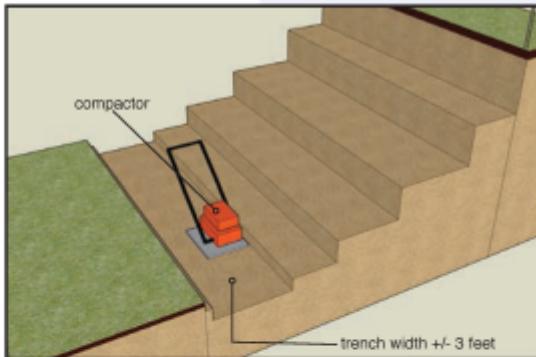
This is a starting guide to the Cambridge Sigma Retaining Wall System. In this book we cover the general points that are important in building a retaining wall. For any wall over 36" you should consult our "Sigma 6 or Sigma 8 Pro-Guide" that is available to download or view at cambridgewallsupport.com or cambridgepavers.com. This will guide you through the factors that influence the strength of the finished wall including load, slope, soil condition, water runoff, geogrid layers, etc. Many municipalities require all retaining walls over a certain height to have a stamp made by a state approved engineer or similar professional that will specify how your wall is built. You will find information on the Cambridge program that allows you to get a free wall design or to receive low cost "stamped" specifications in your state on page 28 of this book. The Sigma stone face and accessories are similar in texture and color to the Cambridge Maytrix line of wall and Outdoor Living Kits. So if you require a tall wall in the rear of your property as well as a double sided wall in your garden and maybe in the future a fire pit or an outdoor fireplace, the finishes will all match.



Retaining Walls are made up of more than the Sigma Wall Stones. Any wall over 36" consists of the pieces in the illustration above. Foundation, drain pipe, drainage stone, geogrid reinforcement, Sigma Wall Stones, Cambridge Cap Stones and select fill are all engineered and installed depending on the site conditions. Consult page 28 of this book for further information.

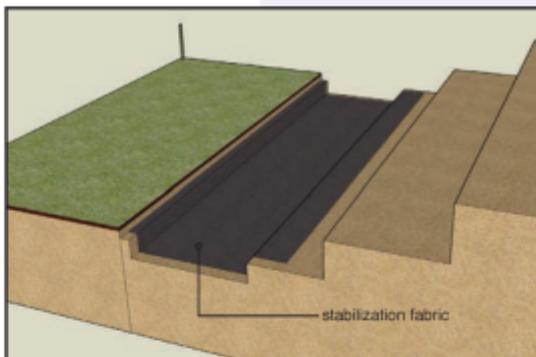
» protection of soils

A proper moisture content is required to achieve proper compaction. Foundation soils and all fill soils should be protected from rain and freezing during construction. Frozen soils must NOT be used in retaining wall construction.



compact sub base

- Compact the soils under the leveling pad to 95% "Standard Proctor Density" or greater.
- If organic soils are encountered they must be removed and replaced with acceptable soils.

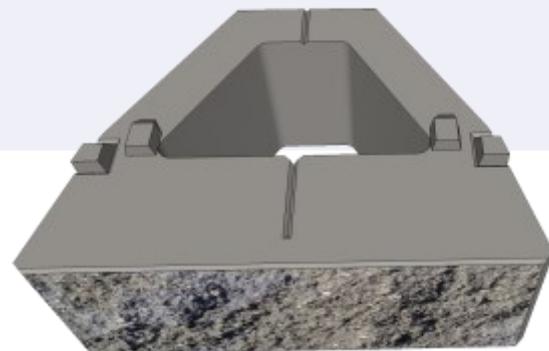


base stabilization

- The purpose of the leveling pad is to provide a level surface to place the first course of units on. More importantly, the leveling pad spreads out the load of the retaining wall units over a larger area. The strength and quality of your retaining wall depends greatly on the strength and quality of your leveling pad materials.
- Over time the sub-base material can migrate into the leveling pad, thus contaminating it and diminishing its structural integrity. Base stabilization fabric (SRW SS5) separates the leveling pad materials from the sub-base materials so that its strength will not be compromised.

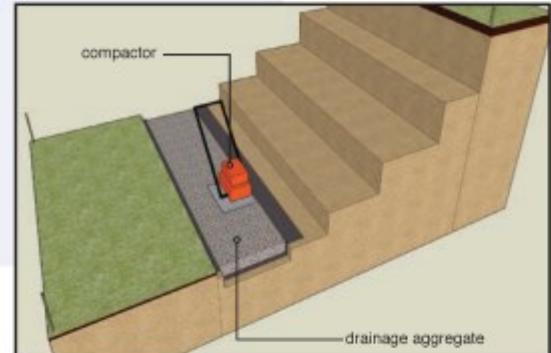
TIP:

This may, or may not, be the proper time to install the drain pipe (see the drain pipe guidelines on page 18)



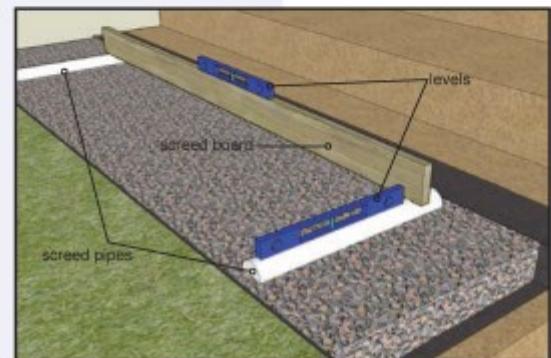
leveling pad

- If possible, start the leveling pad at the lowest elevation of the wall. It is easier to step up than to step down.
- Place well graded gravel or drainage aggregate in the leveling pad trench (see "Excavation" section for minimum leveling pad depths).
- Compact leveling pad to 95% Standard Proctor Density or greater.



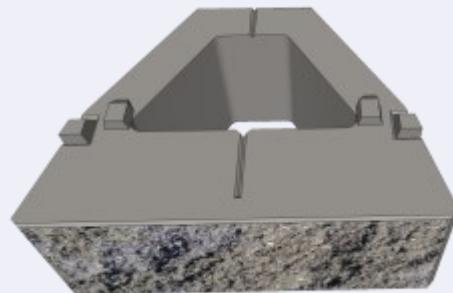
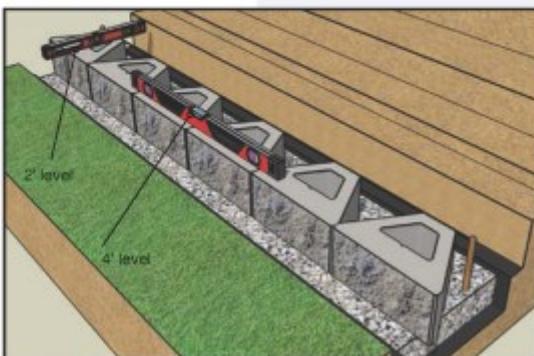
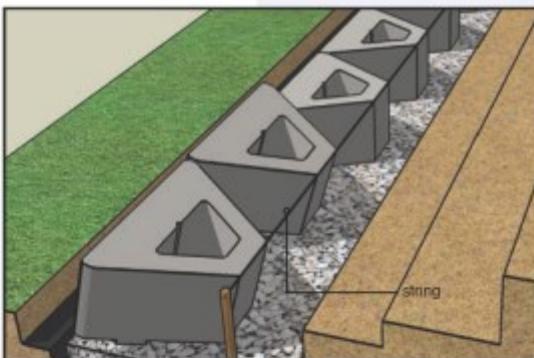
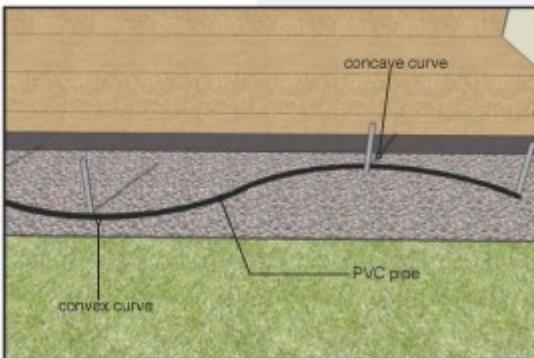
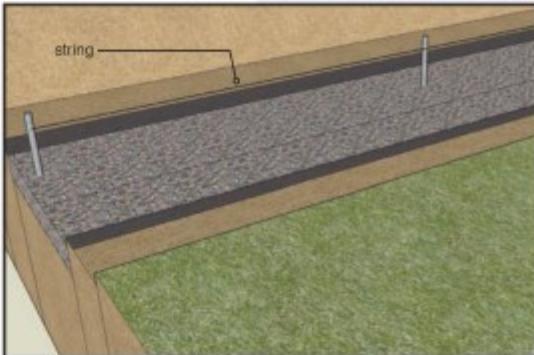
screeding the leveling pad

- Place screed pipes across the compacted leveling pad (see illustration).
- If a 10 foot screed is used, an 8 - 9 foot separation of screed pipes works well on straight walls. Screed pipes may need to be closer on curves or corners.
- Make sure the top of the screed pipes are at the correct bottom of the proposed block elevation and are level.
- Place the finish leveling pad material. (If more than 1 ½" is required, do the compaction again.)
- Screed the leveling pad material smooth, being careful that the screed pipes stay level and at the correct elevation.
- Repeat the screeding operation for the length of the leveling pad or if the wall steps up, to the 1st step of the leveling pad.
- Do not walk on or otherwise disturb the leveling pad prior to laying the first course of retaining wall units.



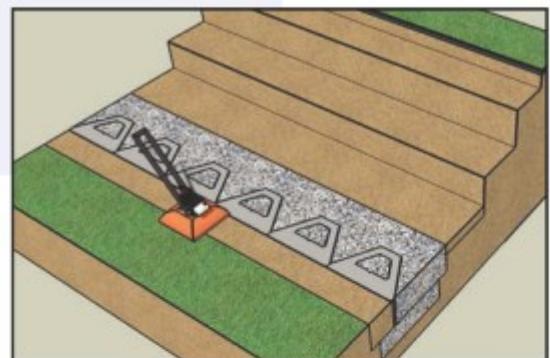
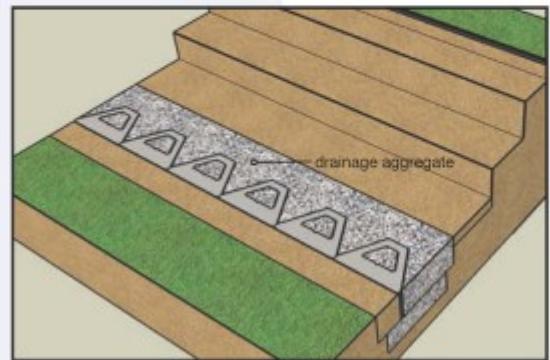
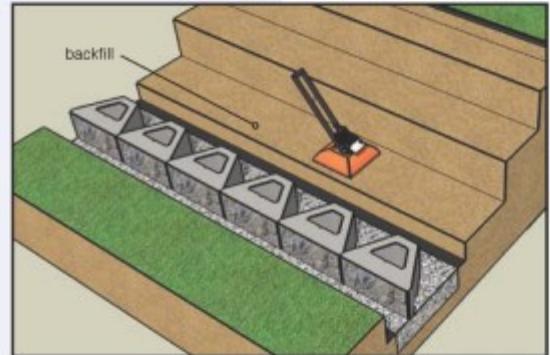
laying first course

- Use steel stakes and a string line to lay out straight sections of the retaining wall.
- String lines should be placed so that they go along the BACK of the block in order to ensure a straight line. As opposed to the rock face surface on many retaining wall units.
- If the string line is placed at the correct elevation it can be used to check elevation and side to side levelness of the retaining wall unit.
- For laying out a retaining wall that curves, flexible 3/4" PVC pipe works well (see illustration for staking) (see curve and corner guidelines beginning on page 14).
- It is very important that the 1st course of block is laid correctly because it will determine the alignment of the rest of the retaining wall. Any deviations will be magnified as the height of the wall increases.
- It is usually best to start at the lowest elevation of the retaining wall. Again, it is easier to step up than to step down.
- If the bottom of the retaining wall unit has lugs, lips, or any other protrusions, use a hammer and chisel to break them off.
- Carefully place the unit on the screeded leveling pad, using the string line (for straight walls) or the flexible PVC pipe (for curved walls) as alignment guides.
- NEVER let the unit touch the string, because if each unit touches the string it will gradually push it out of alignment, which will result in a crooked wall. A good distance from the string is 1/16 - 1/8 inch away.
- For outside or convex curves, if the retaining wall unit has wings at the back of the unit they may be broken off to facilitate tighter curves.
- Always check the level of the retaining wall units, front to back, side to side, and the elevation in relation to the adjacent units.



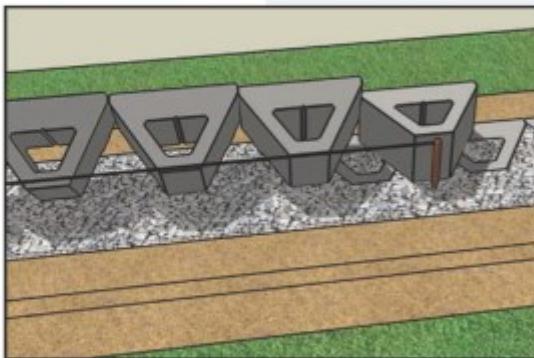
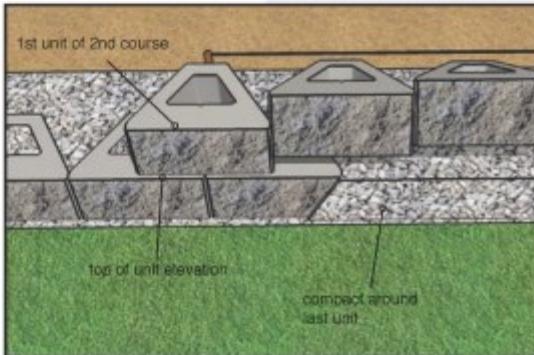
backfill and compacting

- Always backfill and compact in 6 - 8" lifts, as each course of block is installed. Do NOT stack two or more courses and backfill in deeper lifts because it will be difficult, if not impossible, to achieve proper compaction.
- Place the backfill, leaving a minimum of 12 inches of space between the retaining wall unit and the backfill, for the drainage aggregate (1/2" to 3/4" angular gravel with a maximum of 5% fines).
- Compact the backfill to 95% Standard Proctor Density or better.
- Keep heavy compaction equipment at least 3 feet away from the retaining wall units. Lighter, walk-behind compaction equipment can be within the three foot area.
- Compact soil nearest the retaining wall units first, then work toward the back of the excavation.
- Clean out the 12 inch space behind the retaining wall unit with a shovel.
- Place the drainage aggregate behind and in between the retaining wall units and compact. (This sequence minimizes the tendency of units to tip forward during the compaction process)
- Drainage aggregate doesn't take as much force to compact correctly as the backfill material.
- If the retaining wall units have cores or openings, fill them with the drainage aggregate.
- Any backfill placed at the bottom (front) of the retaining wall should be compacted.



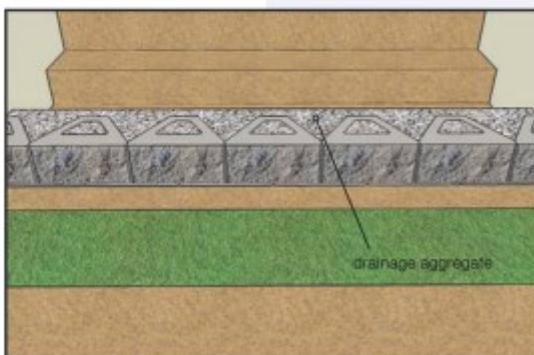
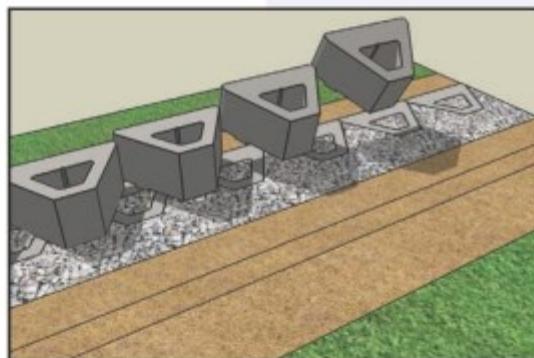
elevation changes (stepping)

- The top of the first course unit will be the elevation of the leveling pad. Add 1/8 - 1/4 inch extra, to allow for a little settlement.
- Make sure the soil is compacted in and around the last couple of units in the first course.
- Prepare the stepped up leveling pad as previously instructed for base leveling pad.
- Place the first unit of the stepped up course upon the last and second to last unit of the first course (straddling in a half bond fashion).
- Place the second unit of the step up on the last unit of the first course, 1/2 on that unit and 1/2 on the stepped up leveling pad.



»If geogrid is NOT going to be used, continue on to Additional Courses below.

»If geogrid IS going to be used, skip to page 13 for installation guidelines before continuing on to additional courses.



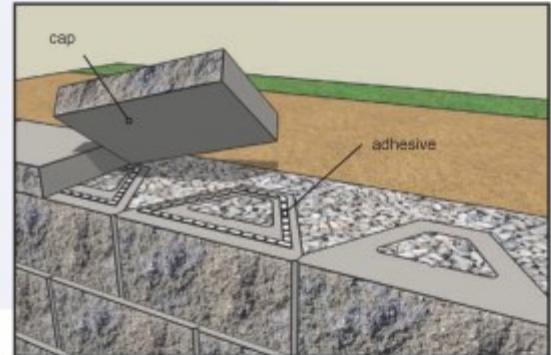
additional courses

- Retaining wall units are connected by knobs, which align the units, provide unit to unit shear connection, and provide the automatic setback (otherwise known as batter).
- Sweep any drainage aggregate or soil off the top of the retaining wall units.
- Place the upper unit by straddling the 2 units below in a “half bond” fashion.
- Slide the unit forward, towards the face of the wall, engaging the connection device.
- Continue to install each course of retaining wall units, backfill and compact, place drainage aggregate, and core fill to the top of wall elevation.



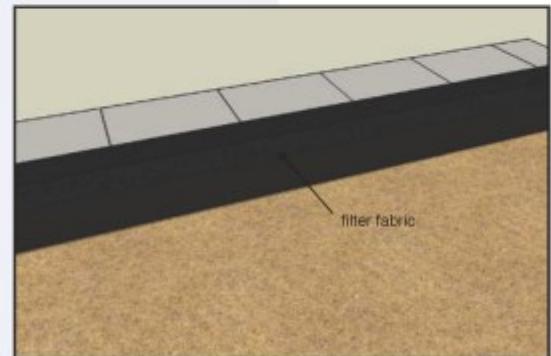
capping

- Clean the top of the retaining wall units of all rock, dirt, and dust.
- Place a bead of retaining wall adhesive around the top of the last retaining wall unit.
- Place the cap on the retaining wall units. Note: A string line can be used to help line up the caps and straighten any waves that may have developed in the retaining wall.
- If a special cap unit is not used, bond the top course to the course just below.



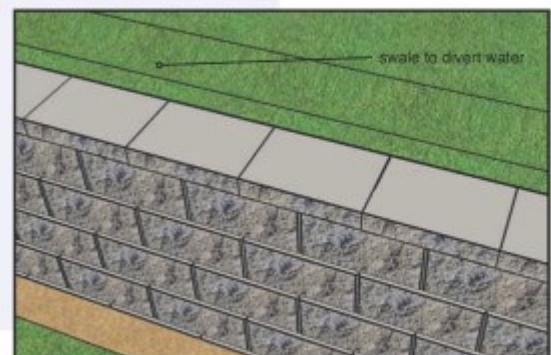
filter fabric

- Place filter fabric on top of the backfill, over the drainage aggregate, and up against the top units or caps before placing the top/planting soils.
- It is recommended that the top/planting soils should be an 8 inch layer of impermeable soils.
- The filter fabric will help prohibit the migration of the fines from the planting soil down into the drainage aggregate and out the face of the retaining wall, thus preventing the plugging of the drainage aggregate and staining of the wall face.



final steps of building the wall

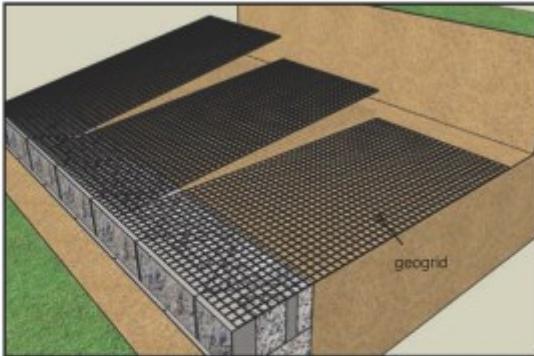
- When finishing the project make sure that the final grade, both the top and bottom of the wall, are shaped so as to divert any water runoff away from the retaining wall. Protect the planting soil from erosion during heavy rains.





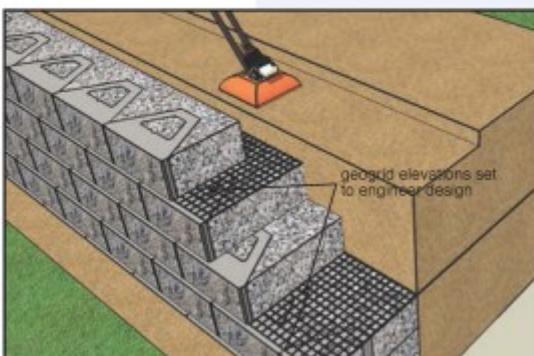
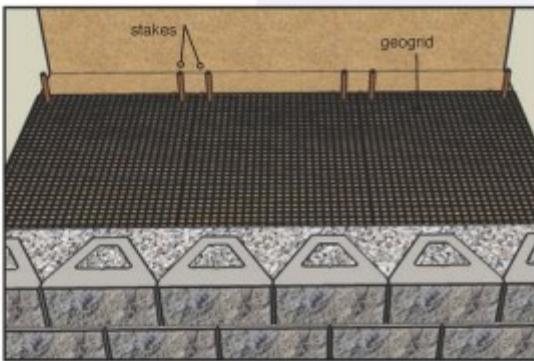
» geogrid

All installation instructions are the same as for gravity retaining walls EXCEPT for the addition of geogrid. Geogrid reinforces the soil, thus allowing taller walls to be constructed. Bi-directional/bi-axial geogrids, means the geogrid is the same strength in both directions. Because of that, this geogrid can be either rolled out parallel to the retaining wall or perpendicular to the retaining wall. If the geogrid depths are the same as the roll width, it may be more efficient to roll out the geogrid parallel to the retaining wall. If the geogrid depths called for are different than the roll width or if the wall curves, it is best to roll out the geogrid perpendicular to the retaining wall. (Not all geogrids are bi-axial, stronger geogrids must be rolled out perpendicular to the retaining wall.)



using geogrid

- Geogrid depth is measured from the face of the retaining wall unit, to the back of the reinforced soil.
- Geogrid coverage should be 100%. However, the edges of the geogrid, should NEVER overlap. (See page 14 for curve and corner geogrid installation procedures.)
- Use your design table(s), found in page 26 of this guide to determine which course(s) of block to install the geogrid on and how deep it extends into the reinforced soil.
- Place the geogrid as far forward on the retaining wall unit as possible without it showing through the front/face of the retaining wall. Make sure that any connecting devices are engaged by the geogrid.
- Lay the geogrid flat from the wall units to the tail of the geogrid. The backfill, drainage aggregate, and core fill should be level with the top of the retaining wall unit and the geogrid should be as smooth as possible, with no pockets that would create voids under the geogrid.
- Place the next course of block on top of the geogrid and fill the cores with drainage aggregate, if applicable.
- Pull the geogrid taught, being careful not to pull the units back away from the connecting device or disturb the alignment of the units. Use landscape staples or stakes to hold the geogrid in place.



» continued on next page

using geogrid (continued)

- Do not drive or compact directly on the geogrid. A minimum of 6 inches of soil is recommended to cushion the geogrid.
- When backfilling over the geogrid, work the soil from near the retaining wall units toward the tail of the geogrid. When compacting over the geogrid, work from near the retaining wall units toward the tail of the geogrid. This procedure helps keep the geogrid taut.
- See the curve and corner instructions starting below, for geogrid placement.

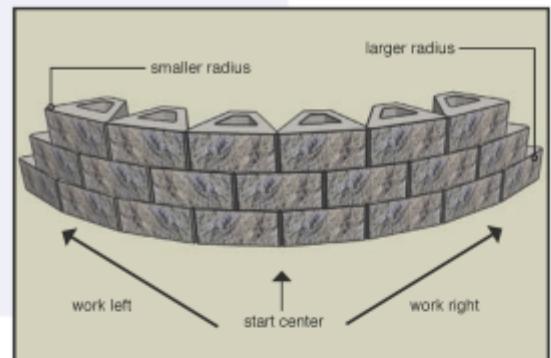
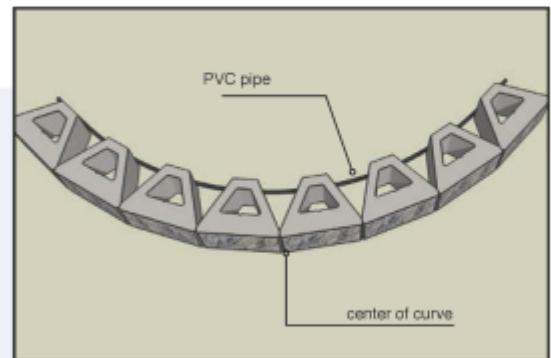
continue building wall

- Continue building the retaining wall by returning to “additional courses” on page 11.



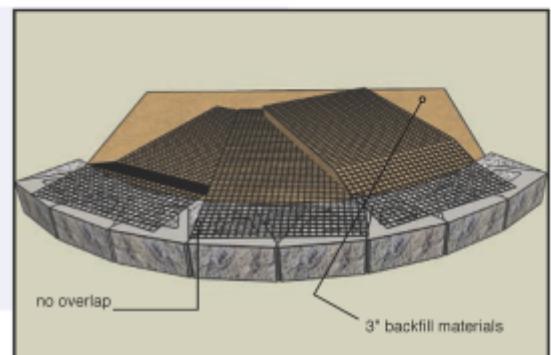
convex • outside • curves

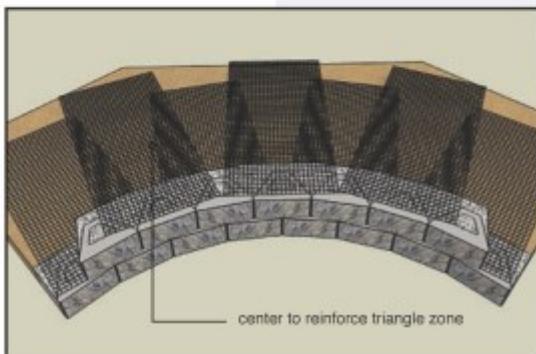
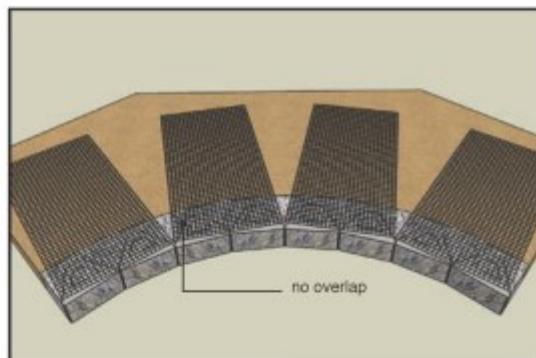
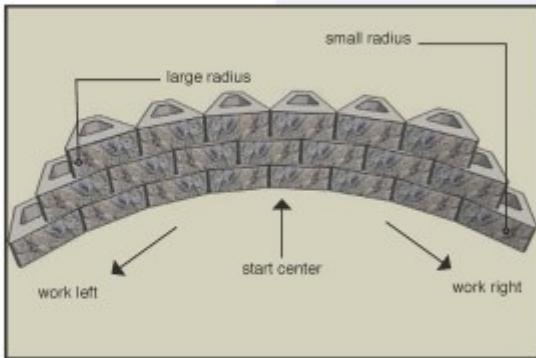
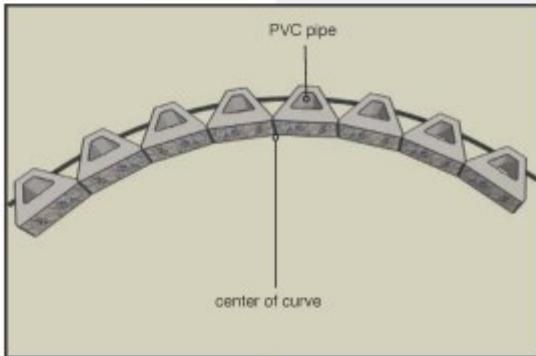
- To achieve desired curve alignment, use 3/4" flexible PVC pipe to outline the back of your retaining wall unit location. This will give you a guideline to help achieve smooth and accurate curves.
- If possible, it is best to start building a curve from the center of the curve and work outward in both directions.
- Start at the same location for all additional courses of retaining wall units.
- If the unit has wings at the back of the block, one or both may be broken off to achieve a tighter radius.
- Because of the batter (unit setback), the bottom course radius will be larger than the radius of the top course. The taller the wall the larger the bottom course radius needs to be in relation to the top course radius.



convex curve geogrid placement

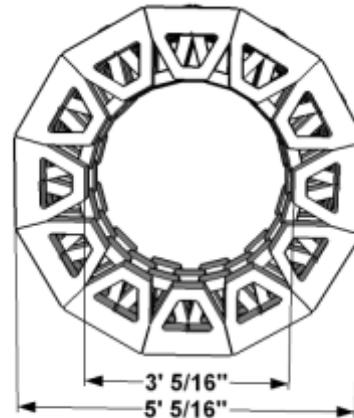
- Geogrid coverage should be 100% butted together, but NOT overlapped on the retaining wall units.
- The geogrid tail, starting just behind the unit will be overlapped. A minimum of 3 inches of soil must be placed between these overlapping geogrid layers.





concave • inside • curves

- To achieve desired curve alignment, use 3/4" flexible PVC pipe to outline the back of your retaining wall unit location. This will give you a guideline to help achieve smooth and accurate curves.
- If possible, it is best to start building a curve from the center of the curve and work outward in both directions.
- Start at the same location for all additional courses of units.
- Because of the batter (unit setback) the bottom course radius will be smaller than the radius of the top course. The taller the wall the smaller the bottom course radius will be in relation to the top course radius.



concave curve

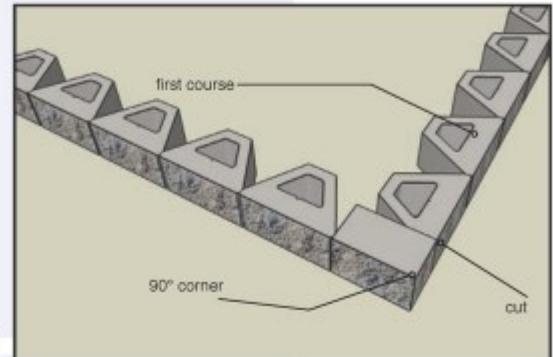
geogrid placement

- Geogrid coverage should be 100% butted together, but NOT overlapped on the retaining wall units.
- There will be a V or pie shaped wedge of soil starting just behind the units which will not be reinforced. To compensate for the unreinforced section, on the next course of retaining wall units, geogrid is placed by centering over the pie shaped wedge of unreinforced soil below.



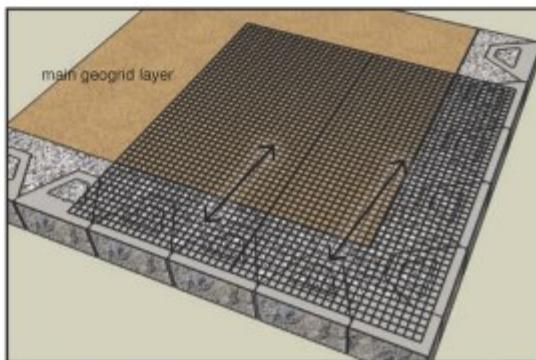
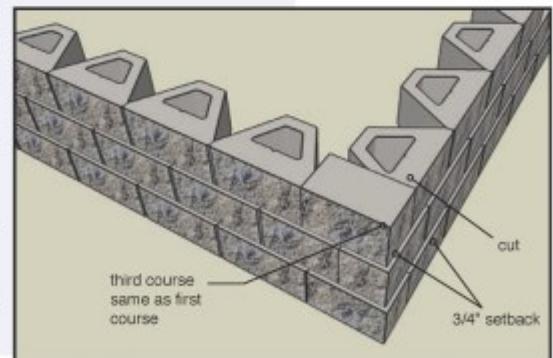
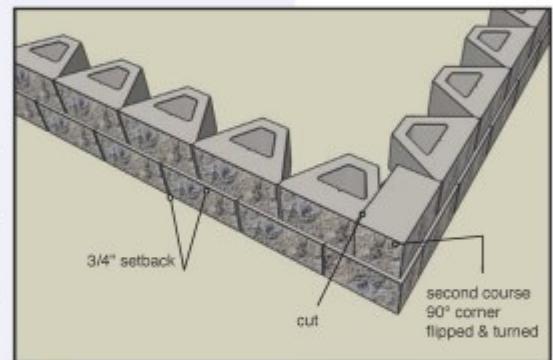
outside 90° corner

- Lay the corner according to the retaining wall system instructions. Some systems will have special corner units, some will have hand splitting lines, and others will require cutting.
- Each course is usually laid opposite of the course below.
- Where connecting devices cannot be used on corner blocks be sure to keep the same batter (setback) as the rest of the retaining wall.
- Outside corners should be bonded with retaining wall adhesive where connecting devices are unable to be used.

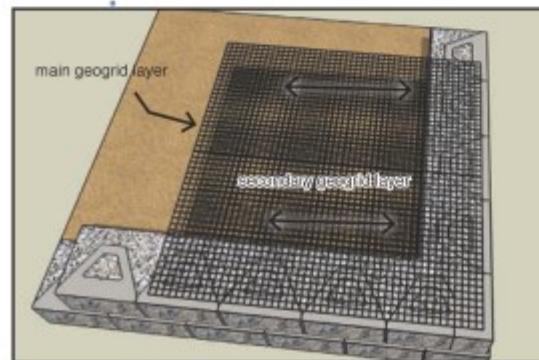


outside corner geogrid placement

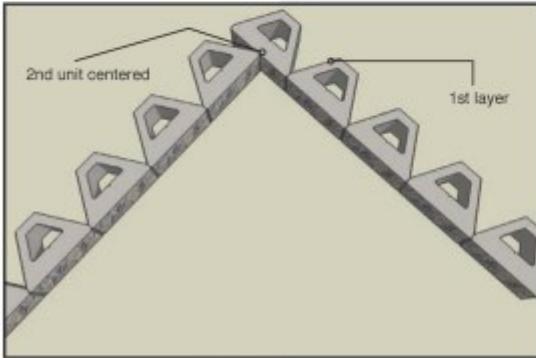
- On the 1st course, place the corner wallstone as shown in the top image.
- Then place a full wallstone next to the long face of the Sigma 8 Corner wallstone.
- Cut the wallstone that is placed next to the small face of the corner wallstone to 15 3/4".
- On the 2nd course the corner wallstone is placed in the opposite direction with a 3/4" setback from the bottom course in both directions.
- Again, place a full wallstone next to the long face of the corner wallstone.
- Then, leaving a space for the wallstone to be cut next to the small face of the corner wallstone, place a full wallstone over two wallstones of the lower course in a half bond fashion. Line up the knobs of the wallstone you are placing with the cores of the wallstones in the lower course.
- Measure between the corner wallstone and the full wallstone. Then cut a full wallstone to that dimension and place in the space that was left for it.
- Continue this process for each additional course.
- Fuller corner instructions are available in an additional sheet from your Sigma supplier.
- Outside corners should be bonded with retaining wall adhesive where connecting devices are unable to be used.



First geogrid layer

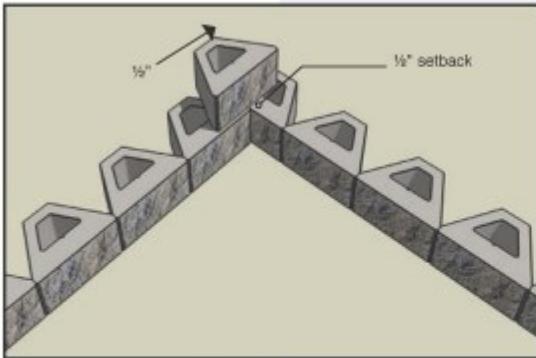


Second geogrid layer



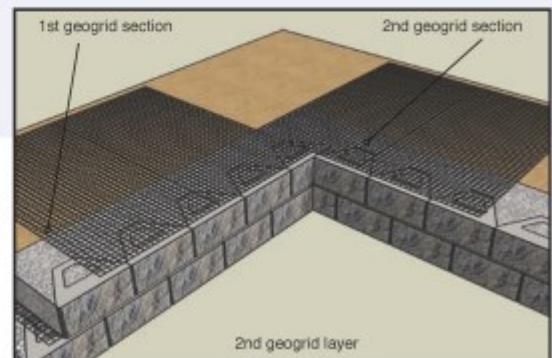
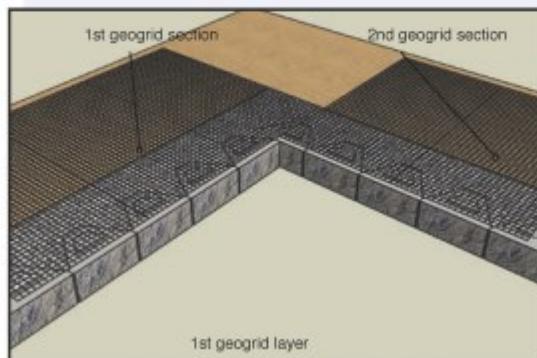
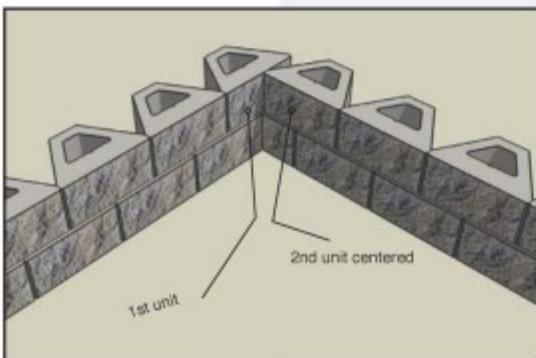
inside 90° corner

- On the first course, place the face of the first unit of the 90 degree corner at the center of and against the last unit of the wall that the corner is turning from (see illustration).
- On the second course, start the corner in the opposite manner with the first unit being laid straddling the 90 degree corner.
- That unit must be set with the same amount of batter (set back) and slid into the corner the same distance as the batter (set back) for each course.
- The 90 degree unit must be placed against the face of the corner unit.
- Repeat the above steps, alternating the corner units so that they are woven together, forming the 90 degree corner.



inside curve geogrid placement

- The first layer of geogrid should extend past the corner a distance which equals the height of the retaining wall divided by 4 ($\text{Height of Wall} \div 4$).
- The second layer of geogrid is laid, butting to the 1st layer.
- Per your design table, when the next layer of geogrid is required, that layer of geogrid, on the other leg of the corner, should extend past the corner a distance which equals the height of the retaining wall divided by 4. ($\text{Height of wall} \div 4$)
- Continue to alternate the geogrid extending past the corner on every other layer.



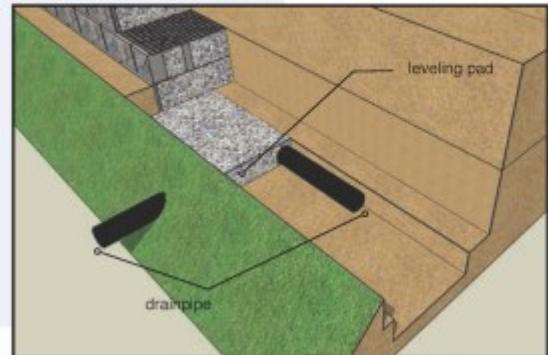
» drainage pipe specifications

- The drain pipe should have a minimum diameter of 4 inches.
- Drain pipe outlets can be under the wall units, through the wall units or out the end of the retaining wall. An outlet must be placed at the lowest point of the retaining wall and a minimum of every 50 feet. The drain pipe must be sloped so water can gravitate out of the pipe.



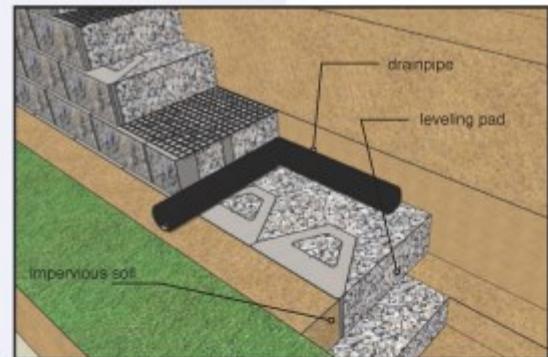
drain pipe outlet (under/out end)

- Drainage aggregate is used for the leveling pad.
- The drainage aggregate chimney extends down to the leveling pad.
- The drain pipe is placed in the leveling pad directly under the drainage aggregate chimney.
- The outlets are either T'd out under the retaining wall units and daylight out of the slope in front of the retaining wall and/or the drain pipe daylights out of the end of the wall.



drain pipe outlet (thru face of wall/out end)

- The leveling pad material can either be well graded gravel or drainage aggregate.
- Impervious soil (soil that water will not pass through) is placed over the leveling pad and extends to the back of the excavation, between the units, in the unit cores (if applicable), and in front of the retaining wall units, up to the finish grade elevation at the bottom (front) of the retaining wall.
- The drain pipe is placed at the bottom of the drainage aggregate chimney. The drain outlets are T'd out the face or out the end of the retaining wall.
- A notch will need to be cut in the bottom of the retaining wall unit for the outlet to exit through.





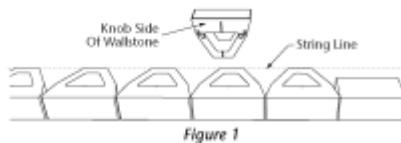
Installation Instructions: Sigma 6-Inch Wall Corner Options



Shown is a Cambridge Sigma 6-Inch raised patio retaining wall in the full setback configuration with Cambridge Large Caps. The Sigma 6-Inch Wallstones can be set almost vertically (1.6 degree) as well as full setback (6 degrees) for additional strength. These instructions cover the following: The corner structure and the adjustment wallstone for bond as the wall is built higher on each layer and adding cap stones.

First Layer

Set the corner first if it is used in the design, and then set a full wallstone starting from the long face of the corner. Cambridge Sigma

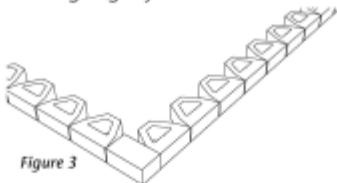
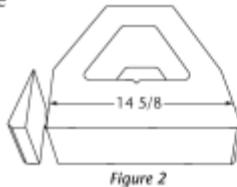


6-Inch Wallstones are set knobs down. Tap the wallstones into the base with a rubber mallet. Use a line on the rear of the wallstones to guide each stone in the layer to be

level and plumb (remove the knobs for the first layer if the base is too hard). It is critical to be level in all directions on the first layer. This is the only layer where adjustment is simple. See Figure 1.

IMPORTANT STEP:

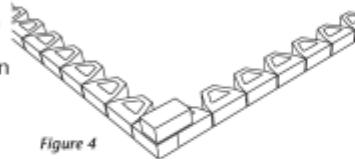
In the first layer, full wallstones are set next to the long face of the Sigma 6-Inch Corner Wallstone. The wallstone next to the small face of the corner is cut to 14 inches plus the setback for a wall that is 14 5/8 inches. For an almost vertical configuration, this stone is cut to 14 3/16 inches. This cut allows full wallstones to be cut as the sides adjust in from the setback, eliminating "slivers". Cut the edge of the adjustment wallstone closest to the corner normally or away from the line of sight so it is not noticeable. If you are using the Renaissance texture, tap the cut edge lightly with a hammer. See Figure 2.



After setting the cut wallstone next to the small face of the corner, continue the first row using the rear of the wallstones as a guide along with a straight edge or string line. See Figure 3.

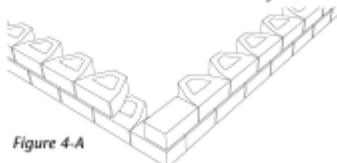
Second Layer

To begin the second layer, position the corner as shown in Figure 4. Set the corner in position (5/8 of an inch for a full setback wall or 3/16 of an inch for an almost vertical wall), in from the two face sides for a 7-degree batter (setback) or 1.6-degree batter (almost vertical).



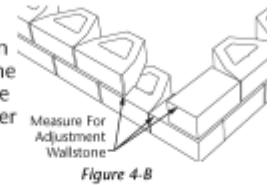
Adding The Full Wallstones

Set the second layer over the first layer, knobs down (following wall installation instructions). Place a full wallstone over the middle of the two wallstones in the layer below. Line up the knob in the open cavities of the two wallstones below and then pull the wallstone forward toward the front face. Recheck to be sure that bond is maintained. Install all full wallstones using this method.



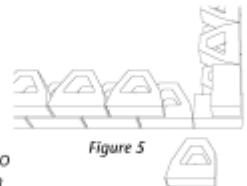
Measure Adjustment Wallstones

Once the wallstones have been set for the second layer, the distance remaining between the last full wallstone in each direction and the corner will be the only cuts needed. These are called adjustment wallstones. The second layer will only require one adjustment wallstone. After this layer, adjustment wallstones will be cut on each side of the corner.



Cut Adjustment Wallstone

Mark and cut the length of the wallstone needed to fill in next to the corner with a masonry saw.

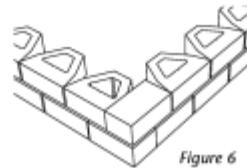


Note: Never cut the corner wallstone.

- If the area for the adjustment wallstone is too small, create two wallstone cuts next to each other.
- Place the "cut" side of the wallstone away from line of sight — similar to best practice in handling the seam when installing vinyl siding. If a knob section will overlap the corner wallstone below, remove those knobs with a hammer and secure with retaining wall adhesive.

Placing the Adjustment Wallstone

Maintain alignment and apply retaining wall adhesive.

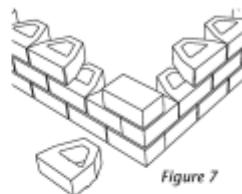


General Information

- Level and use a string line to keep the wall straight.
- Use the line on the rear of the wallstones to guide each layer. If installing on concrete, remove the knobs on the first layer with a hammer and chisel.
- To set the embedment, place and compact soil in front of the wallstones.

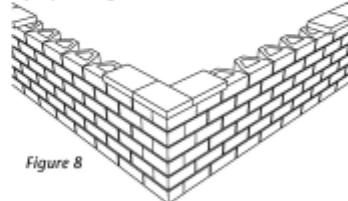
Repeat Layers

The next layer repeats the orientation of the corner on the first layer.
Note: Because the wall is setback, the distance to the corner from a full wallstone gets smaller as the wall gets higher. To allow for this, the wall is adjusted in 5/8 of an inch or 3/16 of an inch from each side for each layer. The adjustment wallstone length will change on every layer to allocate for this. The different lengths represent the amount of setback for full setback or almost vertical configurations.



Cap

MaytRx 6 retaining walls use the Cambridge Large Cap (3-inches high x 12-inches deep x 18-inches wide). See Figure 8. Make a corner cap by splitting 2 inches from the end of a cap and use that wallstone as the corner. If the wall will be retaining soil to the top or is being used for a raised patio, the cap can be pulled forward 1 inch to create a reveal. If the caps are above ground in the back of the wall, the Cambridge 13-inch Double-Sided Cap (3-inches high x 13-inches deep x 12-inches wide) can be used.



The Sigma 6-Inch wallstone features an emergency corner option — one wallstone will yield two (stub) corners in the field for short landscape walls.

SIGMA 6

VERTICAL OR SETBACK

Installation Instructions: Sigma 6-Inch Vertical Or Setback Wall

Sigma 6-Inch wallstones can be set almost vertical (1.6-degree batter) as well as set back (for additional strength) at a 6-degree batter. These instructions cover the almost vertical and the setback features of the wallstone and use of the knobs on the wallstone. The corner and adjustment wallstone for the corner instructions are available in another section of this book titled Sigma 6-Inch Corner.

Knobs

The Sigma 6-Inch has 4 knobs protruding from the top of the wallstone. These knobs are used for alignment of setback and for holding the geogrid in place when it is pulled tight. They are not part of the engineering strength of the wall system. The long textured face is the front of the wallstone and the knobs closest to the front are used to set the wallstone for 6 degrees. If the wall is designed as a 6-degree setback, then no changes to the knobs are required. If the wall desired is to be almost vertical, you will need to remove the two knobs closest to the front face.

The knobs can be removed with a hammer and chisel. Be sure no part of the knob is protruding past the top surface of the wallstone. See Figure 2.

First Layer

The Sigma 6-Inch wallstones are all set with the knobs positioned down. While laying the first course on the base, either remove the knobs or tap the wallstones into the base to insure all wallstones are level and plumb. To keep the wall straight, use a string line along the back of the wallstones on the first layer. The first layer is the most important part of the wall. It is the easiest place to adjust for height. All additional layers will use the first layer to establish overall levelness and the heights of all wallstones. **Note:** Bury the first layer at least 1 inch below finished grade for every foot of wall height.

Following the base guidelines (refer to page 5 in this book), a 4-inch perforated drainpipe needs to be installed behind the first layer to carry water away from the wall. For every layer, place 3/4 of an inch of clean crushed stone 12 inches behind the wall. Use the 3/4-inch clean stone for core fill. The core should be filled to 3/4 of an inch from the top of the wallstone. Place the correct backfill soil as advised by the engineer and compact in 3-inch lifts. Use only lightweight compaction equipment within 3 feet of the back of the wall. Sweep the top of the wallstones, so they are clean before adding the next layer.

Second Layer

If you are creating an almost vertical 1.6-degree wall, remove the two knobs closest to the face of the wallstone for all additional wallstones used. If you desire the 6-degree setback, the knobs are already correct as the wallstones are shipped. The wallstones will be set with knobs protruding down.

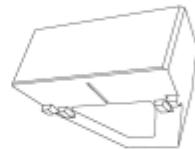


Figure 5

Set all wallstones with knobs protruding down, so that one knob will drop into each core of the wallstone below establishing a bond. Pull the wallstones forward and center on the bond of the two wallstones below. All full-on bond wallstones are set in this way. Corners and cutting a wallstone for adjustment are discussed in the corner section of this handbook titled: Sigma 6-Inch Corner.

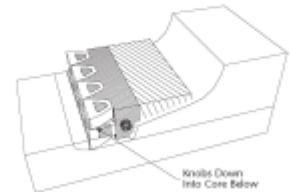


Figure 6

Geogrid Layers

Place the geogrid over the layer of Sigma 6-Inch Wallstones, 3/4-inch drainage stone and the select fill that is designated. Maintain the correct orientation designated by the geogrid manufacturer.



Figure 7

Place the next layer of Sigma 6-Inch wallstones. Be certain that the geogrid openings are hooked by the Sigma

6-Inch knobs and fill the cavities with 3/4-inch clean stone. Pull the geogrid tight and place stakes to hold it taught after filling the cores.



Figure 8

Do not drive heavy equipment directly on the exposed geogrid.

Place the drainage stone and control fill for that layer and compact. Use only lightweight compaction equipment within 3 feet of the back of the Sigma 6-Inch Wall. Place material and compact on every layer in 3-inch lifts. Sweep the top of the wallstones so they are clean before adding the next layer.



Figure 9

Curved Walls

The Sigma 6-Inch Wall System allows for a very tight inside radius. Although the knobs might not provide a gauge for setback, this can be established visually. Lock the geogrid and the wallstones by filling the cores and compacting on every layer. It is simple to remove a knob if it is in the way of the desired radius.



Figure 10

Following Layers

The next layers repeat the orientation of the first or second layer. Follow these directions. For walls higher than 36 inches, refer to your engineer's design.

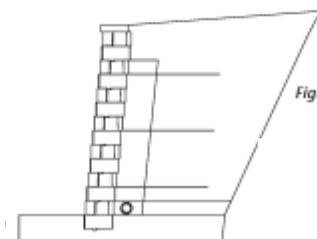
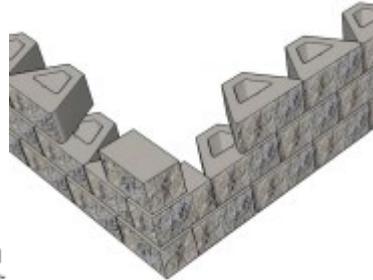


Figure 11

Installation Instructions: Sigma 8-Inch Wall Corner Options



Shown is a Cambridge Sigma 8-Inch raised patio retaining wall with Cambridge Single-Sided Large Caps. Cambridge Sigma 8-Inch shares the same texture, edge and colors with Cambridge Maytix Walls and Kits. The Sigma 8-Inch Wallstones are naturally set back (6 degrees) for additional strength. There are several corner options for a Sigma 8-Inch Wall as described below.

First Layer

Set the Cambridge Sigma 8-Inch Corner first if it is used in the design, and then set a full wallstone starting from the long face of the corner. Cambridge Sigma 8-Inch Wallstones are set knobs down. Tap the wallstones into the base with a rubber mallet using a line on the rear of the wallstones to guide each wallstone in the layer so they are level and plumb. Remove the knobs for the first layer if the base is too hard.

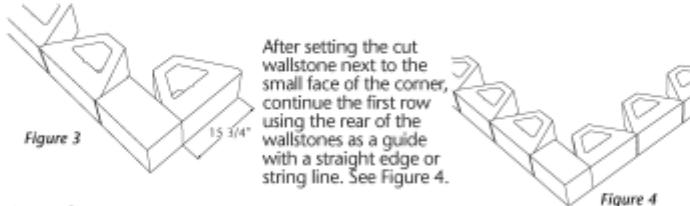
It is critical that the first layer is level in all directions. This is the only layer where adjustment is simple. Refer to the Sigma 8-Inch Setback Wall for details on correct installation. See Figure 1.

IMPORTANT STEP:

In the first layer, the full wallstones are set next to the long face of the Sigma 8-Inch Corner wallstone. The wallstone next to the small face of the corner is cut to 15 3/4 inches. This cut allows full wallstones to be cut because the sides adjust in from the set back, eliminating "slivers". Cut the edge of the adjustment wallstone closest to the corner normally or away from the line of sight so it is not noticeable. If you are using the Renaissance texture, tap the cut edge lightly with a hammer. See Figure 3.

First Layer Cut Wallstone

Place the cut wallstone next to the small face of the corner wallstone.



Second Layer

To begin the second layer, position the corner as shown in Figure 5. Set the corner in a position 3/4 of an inch from the two faces of the wallstone below. This aligns with the natural 6-degree batter (setback). Set the second layer over the first layer, knobs down (Follow wall installation instructions). Place a full wallstone over the middle of two wallstones in the layer below and line up the knob in the open cavities of the two wallstones. Pull the wallstone forward toward the front face and recheck that bond is maintained. Install all full wallstones using this method.

Figure 5

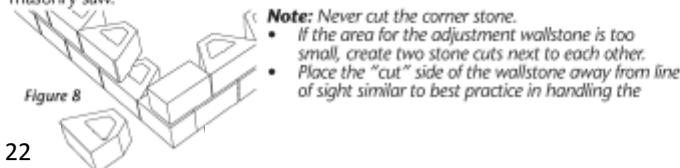
Note: The install page gives instructions on filling cavities, dealing with drainage and compaction.

Measure For Adjustment Wallstones

Once the full wallstones have been set for the second layer, the distance remaining between the last full wallstone in each direction from the corner will be the only cuts needed. These are called adjustment wallstones. The second layer will only require one adjustment wallstone (short face of corner). After this layer, the adjustment wallstones will be cut on each side of the corner because the wall steps are 3/4 of an inch on each layer. **Note: NEVER CUT THE CORNER. Always cut the wallstones next to the corner to keep the wall "on bond". This insures a good interlock at the corner. See Figure 7.**

Cut Adjustment Wallstone

Mark and cut the length of wallstone needed to fill-in next to the corner with a masonry saw.



- Note:** Never cut the corner stone.
- If the area for the adjustment wallstone is too small, create two stone cuts next to each other.
 - Place the "cut" side of the wallstone away from line of sight similar to best practice in handling the

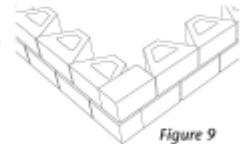
seam when installing vinyl siding. If a knob section will overlap the corner wallstone below, remove those knobs with a hammer and secure with retaining wall adhesive. See Figure 8.

Placing the Adjustment stone

Maintain alignment and apply retaining wall adhesive. See Figure 9.

General Information

- Level and use a string line to keep the wall straight.
- Use the line on the rear of the wallstones to guide each layer. If installing on concrete, remove the knobs on the first layer with a hammer and chisel.
- Place and compacted soil in front of the wallstones to set the embedment.



Repeat Layers

The third layer repeats the orientation of the first layer corner but is set back 3/4 of an inch on each face from the corner below. Note: Because the wall is on a setback, the distance to the corner from a full stone gets smaller as the wall gets higher. To adjust for this, the wall is adjusted 3/4 of an inch for each layer at the stone next to the corner. The adjustment wallstone length will change on every layer to adjust for this. The different lengths represent the amount of setback. See Figure 10.

Figure 10

Cap Layer

The Sigma 8-Inch retaining wall uses the Cambridge Large Cap (3H x 12D x 18W). See Figure 11. Make a corner cap by splitting 2 inches from the end of a cap and use that stone as the cap corner. If the wall will be retaining soil to the top or is being used for a raised patio, the cap can be pulled forward 1 inch to create an overhang. If the caps are above ground in the back of the wall, the Cambridge 13-Inch Double-sided Cap (3H x 13D x 12W) can be used.

Figure 11

The Sigma 8-Inch Wallstone features an emergency corner option in which one stone will yield two (Stub) corners in the field for short landscape walls.

Procedure For Making A Field-Split Corner

Two stub corners can be made from one hollow Sigma 8-Inch Wallstone.

- Break the knobs off the top with a chisel.
- Break away the rear thin portion of the stone (called the web) with a saw or chisel.
- With a splitter or chisel, split the preformed "split line" on the remaining ingot to produce two "stub" corners. See Figure 12.

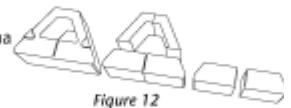


Figure 12

Using A Stub Corner

A corner made from a field split stub corner is utilized on the first layer. In the first layer, full wallstones are set next to the long face of the stub corner wallstone. The wallstone next to the small face of the corner is cut to 14 3/8 inches. This allows full wallstones to be cut as the sides adjust in from the setback, eliminating "slivers". Cut the edge of the adjustment wallstone closest to the corner normally or away from the line of sight so it is not noticeable. If you are using the Renaissance texture, tap the cut edge lightly with a hammer. Apply retaining wall adhesive on all corner wallstones. See Figure 13



Figure 13

Turned Stub Corner

Turn the field split stub corner 90 degrees for the second layer. There are no rights, lefts, tops or bottoms to this stub corner. Apply retaining wall adhesive. Once the wallstones have been set for the second layer, the distances remaining between the last full wallstone in each direction of the corner will be the only cuts needed. These are called adjustment wallstones. The second layer will only require one adjustment wallstone (short face of corner) after this layer, the adjustment wallstones will be cut on each side of the corner as the wall steps in 3/4 of an inch on each layer. **Note: NEVER CUT THE CORNER. Always cut the wallstones next to the corner to keep the wall "on bond". This insures a good interlock at the corner. See Figure 14.**

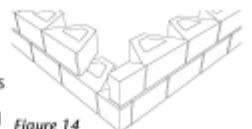


Figure 14

Third Layer

The third layer repeats the orientation of the first layer corner. **Note:** Because the wall is on a setback, the distance to the corner from a full wallstone gets smaller as the wall gets higher. To adjust for this, the wall is adjusted in 3/4 of an inch for each layer at the corner on both faces. The adjustment wallstone length will change on every layer to adjust for this (the different lengths represent the amount of setback. The adjustments should be cut on each side of the corner (The distance needed between the corner and the next full wallstone). Break off the knob on any wallstone for that portion which overlaps the corner and glue that area. **Note:** When using these smaller, corner wallstones that you see in Figure 15, the web might need to be cut as the wallstones next to the corner touch the wallstones behind them.

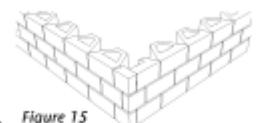


Figure 15

SIGMA 8

SETBACK

Installation Instructions: Sigma 8-Inch Vertical Or Setback Wall

Sigma 8-Inch Wallstones can be set at 6-degree batter. This wallstone system matches the Cambridge MaytRx product line in colors, edge, and texture. The corner and adjustment wallstone instructions are available in another section of this book. Shown is a Sigma 8-Inch raised patio featuring the new Sigma 8-Inch Corner.

Knobs

The Sigma 8-Inch has two knobs protruding from the top of the wallstone. These knobs are used for alignment of setback and for holding the geogrid when it is pulled tight. They are not part of the engineering strength of the wall system. The long textured face is the front of the wallstone. All placements of wallstones require THAT KNOBS FACE DOWN INTO THE CAVITY BELOW. The knobs can be removed with a hammer or hammer and chisel. Be sure that no part of the knob is protruding past the top surface of the wallstone. Knobs are removed when a wallstone overlaps the corner or when a radius is required and the knob will interfere.

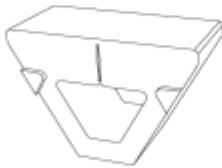


Figure 1

First Layer

The Sigma 8-Inch wallstones are all set with the knobs positioned DOWN, so when laying the first course on the base, either remove the knobs or tap the wallstones into the base to insure all wallstones are level and plumb. To keep the wall straight, use a string line along the back of the wallstones on the first layer. The first layer is the most important part of the wall and is the easiest place to adjust for height. All additional layers will use the first layer to establish overall levelness and heights of all wallstones.

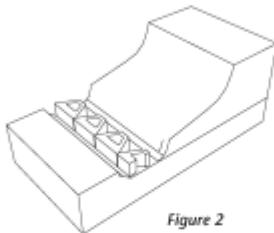


Figure 2

Note: Bury the first layer at least 1 inch below finished grade for every foot of wall height or as instructed by a licensed design professional.

Second Layer

Following the base guidelines (refer to Page 5 in this book), install a 4-inch perforated drainpipe behind the second layer to carry water away from the wall. For every layer, place 3/4-inch clean crushed stone every 12 inches behind the wall. Use the 3/4-inch clean stone for core fill. The core should be filled to 3/4 of an inch from the top of the wallstone. Place the correct backfill soil as advised by an engineer and compact in 3-inch lifts. Use only lightweight compaction equipment within 3 feet of the back of the wall. Sweep the top of the wallstones clean before adding the next layer.

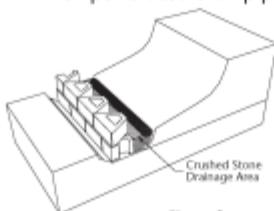


Figure 3

Finish Layer For Geogrid

The wallstones will be set with knobs protruding down so that one knob will go into each core of the wallstone below establishing a bond. Pull the wallstones forward and center on the bond of the two wallstones below. All full on bond wallstones are set in this way. Corners and field cut adjustment wallstones are discussed in the corner section of this handbook. In every layer, place 3/4-inch clean crushed stone every 12 inches behind the wall. Use the 3/4-inch clean stone for core fill.



Figure 4

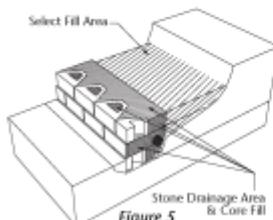


Figure 5



The core should be filled to 3/4 of an inch from the top of the wallstone. Place the correct select backfill soil as advised by engineer and compact. Use only lightweight compaction equipment within 3 feet of the back of the Sigma 8-Inch Wall. Sweep the top of the wallstones clean before adding the next layer.

Geogrid Layers

Place the geogrid over the layer of Sigma 8-Inch wallstones, 3/4-inch drainage stone and the select fill that are designated. Maintain the correct orientation designated by the geogrid manufacturer.

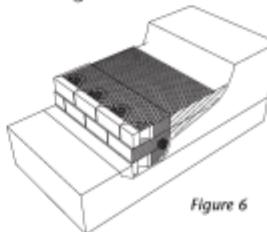


Figure 6

Place the next layer of Sigma 8-Inch wallstones. Be certain that the geogrid openings are hooked by the Sigma

8-Inch knobs and fill the cavities with 3/4-inch clean stone. Pull the geogrid tight and place the stakes to hold it taught after filling the cores.



Do not drive heavy equipment directly on the exposed geogrid.

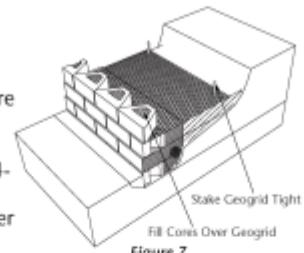


Figure 7

Place the drainage stone and control fill for that layer and compact. Place 3/4-inch of clean crushed stone every 12 inches behind the wall. Use the 3/4-inch clean stone for core fill. The core should be filled to 3/4 of an inch from the top of the wallstone. Place the correct select backfill soil as advised by engineer and compact. Use only lightweight compaction equipment within 3 feet of the back of the Sigma 8-Inch Wall. Sweep the top of the wallstones clean before adding the next layer.

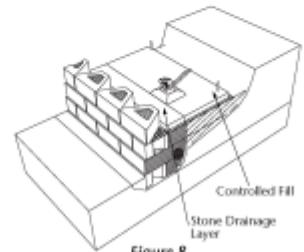


Figure 8

Note: Every layer should be filled and compacted before the next layer of stone is added.

Curved Walls

The Sigma 8-Inch Wall System allows for a radius although the knobs might not provide a gauge for setback in all situations. This can be established visually. Lock in the geogrid by filling the cores. If a knob is in the way of the radius desired, it is simple to remove. Follow the manufacturer's instructions for the geogrid orientation. Geogrid should never go over uncovered geogrid. If you need to change direction, use a universal geogrid or separate the geogrids by placing the second direction on the next layer.

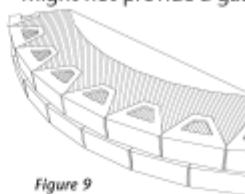


Figure 9

Following Layers

The next layers repeat the orientation of the first or second layer. Follow these directions. For walls higher than 36 inches, refer to your engineer's design.



Figure 10

additional information

- The material quantities are not represented to be exact, but should be close if the finished retaining wall ends up as originally planned.
- When you first start to use this material estimation method, it would be wise to check the quantities against your usual method of estimating materials to check the accuracy of this method.
- There has been no provision for waste, breakage, or other contingencies that would change material quantities in this material estimating procedure.
- Hardscape Technical Services assumes no responsibility for the accuracy of the material quantities resulting from the use of this estimation method. The responsibility for accuracy of quantities is the user's sole responsibility.

HOW TO CALCULATE THE COST OF YOUR RETAINING WALL MATERIAL ESTIMATING

step 1 >> SQUARE FEET OF WALL FACING

- Determine the total height of each end of the wall section using the accompanying design tables. The wall heights are shown directly under the design. Choose the design by picking the exposed wall height that is the same as the height of your proposed retaining wall or, if there is not an exact match choose the next taller design. Then for estimating purposes choose the total height of the design that is indicated below the design. In most cases there will be at least one block buried. Don't forget to include that in your height determination. Again, the total height without the cap is located below the wall in the design tables.
- Add the total heights (1•a above) of the two ends of the wall section together and divide by 2 to determine the average height of the wall section.

$$\frac{\text{beginning total hgt}}{\text{beginning total hgt}} + \frac{\text{end total hgt}}{\text{end total hgt}} = \frac{\text{beginning total hgt} + \text{end total hgt}}{2} = \frac{\text{beginning total hgt} + \text{end total hgt}}{2} = \text{average wall hgt}$$

- Multiply the average height (1•b above) by the lineal footage of the wall section to determine the number of square feet of wall facing.

$$\frac{\text{average hgt}}{\text{average hgt}} \times \frac{\text{lineal footage}}{\text{lineal footage}} = \frac{\text{average hgt} \times \text{lineal footage}}{\text{sq. ft. wall face}}$$

- If the wall section steps at either the top of wall or bottom of wall, add 1/2 course of block. Do this by dividing the length of the wall section by 2. Multiply that result by 1 or .6667 (*see note). Then add that result to the square feet (1•c above) of wall facing.

$$\frac{\text{wall length}}{\text{wall length}} \div 2 \times \text{(*see note)} = \frac{\text{wall length}}{2} \times \text{(*see note)} = \text{additional sq. ft.}$$

$$\frac{\text{sq. ft wall face}}{\text{sq. ft wall face}} + \frac{\text{additional sq. ft.}}{\text{additional sq. ft.}} = \frac{\text{sq. ft wall face} + \text{additional sq. ft.}}{\text{total sq. ft.}}$$

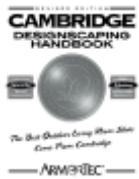
*** NOTE: For Sigma 6" use .6667, For Sigma 8" use 1.00**

SIGMA

LINKS



Separate Sigma 6 & Sigma 8 "Pro Guides" are available for free download at:
cambridgewallssupport.com



Cambridge Designscape Book is available for free download at:
cambridgewallssupport.com



These pages reference the Cambridge Product Line Spec 2014 available for free download at: cambridgewallssupport.com



These pages are available online for Tablet, Smartphone or PC access at:
cambridgewallssupport.com



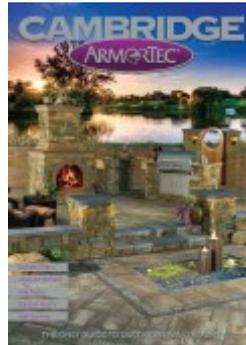
Cambridge Website is available at:
cambridgepavers.com



Cambridge Wall Support Website is available at:
cambridgewallssupport.com



Sigma Wall preloaded for NCMA Software is available at: cambridgewallssupport.com



Many of these pages reference the Cambridge Outdoor Living Brochure 2014. This is an invaluable tool in viewing color and textures as well as the full line of outdoor living products available from Cambridge. available for free download at:

cambridgewallssupport.com
or Viewable at
cambridgepavers.com



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SIGMA 8

GEOGRID

Geogrid tables are for illustration only and should be matched with soil, grade and load to the wall stone size and Geogrid you are using with the full set of tables available in the Pro Guide for walls under 8 feet.

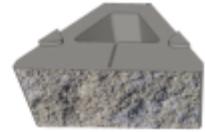


These pages reference the Sigma "Pro Guide" available for free download at:

cambridgewallsupport.com

26 DEGREE SOIL for walls up to 8'

Sigma 8 - SRW Accessories

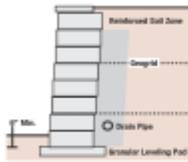


If used without the stamped engineering, the final determination of the suitability of the contemplated use, and its manner of use, are the sole responsibility of the user, and the user expressly releases HTS, SRW, and retaining wall unit supplier of any and all liability that might arise as a result. These designs have been performed with National Concrete Masonry Association (NCMA) software and have been analyzed for the appropriate factors of safety. © 2013 Hardscape Technical Services. Sigma 8™ is a trademark of Cambridge Wall Systems.

Geogrid: SRW Universal 635 LTDS or SRW 3 Series 1093 LTDS • Block Dimensions: 8"(H) x 18"(W) x 12"(D)

CASE A

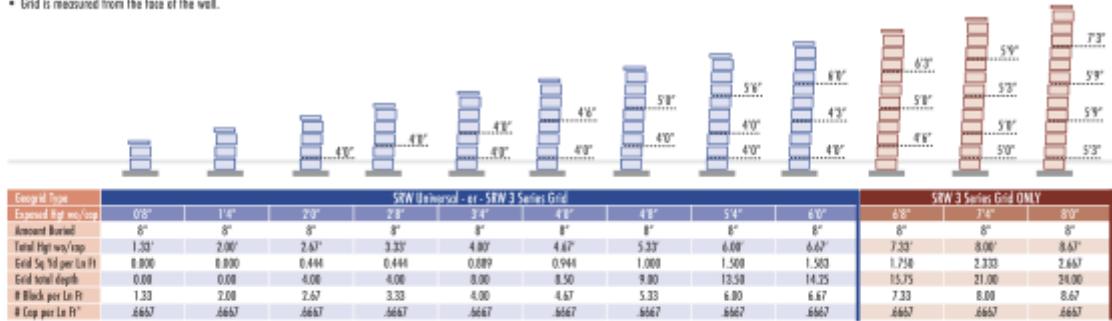
- CASE A Retaining Wall
- Flat Ground at Top of Wall
- Flat Ground at Bottom of Wall
- No Surcharge on Wall



IF STAMPED ENGINEERING IS REQUIRED FOR THIS RETAINING WALL: THIS DESIGN MUST BE STAMPED HERE BY A LICENSED ENGINEER.

GEOGRID PLACEMENT

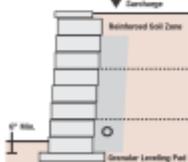
- Grid is measured from the face of the wall.



• See "Material Estimating" for Adhesive estimate.

CASE B

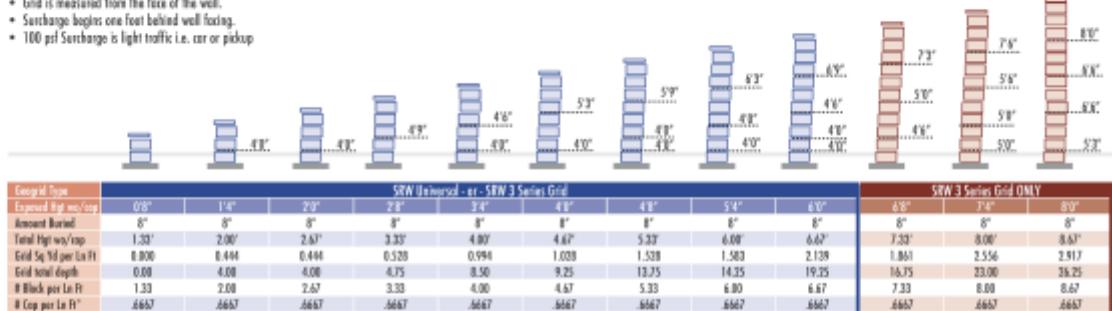
- CASE B Retaining Wall
- Flat Ground at Top of Wall
- Flat Ground at Bottom of Wall
- 100 psf Surcharge on Wall



IF STAMPED ENGINEERING IS REQUIRED FOR THIS RETAINING WALL: THIS DESIGN MUST BE STAMPED HERE BY A LICENSED ENGINEER.

GEOGRID PLACEMENT

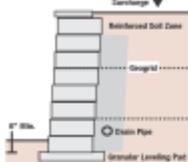
- Grid is measured from the face of the wall.
- Surcharge begins one foot behind wall facing.
- 100 psf Surcharge is light traffic i.e. car or pickup



• See "Material Estimating" for Adhesive estimate.

CASE C

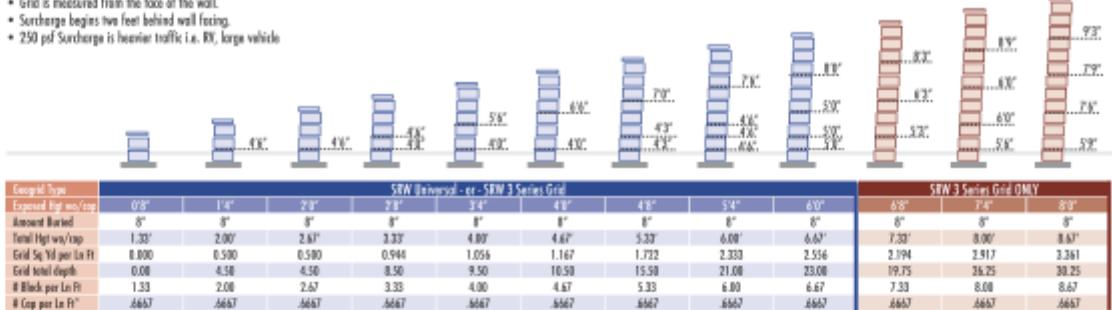
- CASE C Retaining Wall
- Flat Ground at Top of Wall
- Flat Ground at Bottom of Wall
- 250 psf Surcharge on Wall



IF STAMPED ENGINEERING IS REQUIRED FOR THIS RETAINING WALL: THIS DESIGN MUST BE STAMPED HERE BY A LICENSED ENGINEER.

GEOGRID PLACEMENT

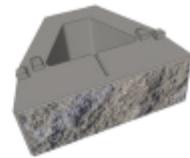
- Grid is measured from the face of the wall.
- Surcharge begins two feet behind wall facing.
- 250 psf Surcharge is heavier traffic i.e. RV, large vehicle



• See "Material Estimating" for Adhesive estimate.

26 DEGREE SOIL for walls up to 8'

Cambridge Sigma 6 • SRW Accessories

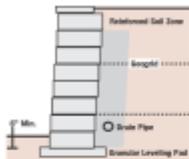


If used without the stamped engineering, the final determination of the suitability of the contemplated use, and its manner of use, are the sole responsibility of the user, and the user expressly releases HTS, SRW, and retaining wall unit supplier of any and all liability that might arise as a result. These designs have been performed with National Concrete Masonry Association (NCMA) software and have been analyzed for the appropriate factors of safety. © 2013 Hardscape Technical Services - Cambridge Sigma 6™ is a trademark of Cambridge Wall Systems

Geogrid: SRW Universal 635 LTDS or SRW 3 Series 1093 LTDS • Block Dimensions: 5'27/32"(H) x 16" (W) x 12"(D)

CASE A

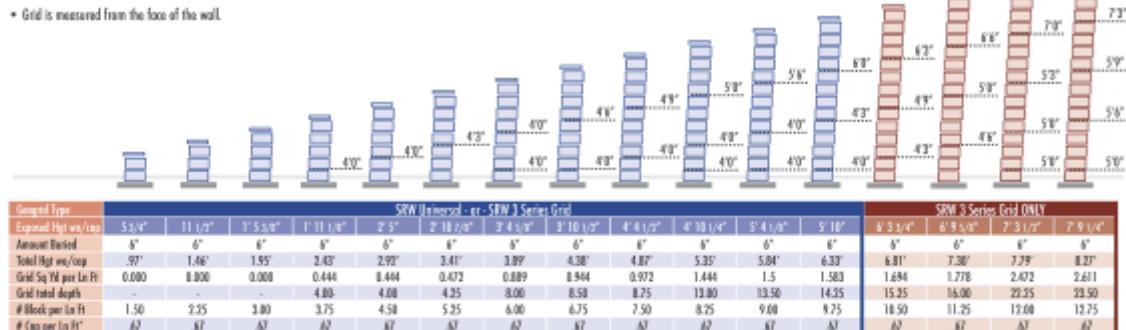
- CASE A Retaining Wall:
- Flat Ground at Top of Wall
- Flat Ground at Bottom of Wall
- No Surcharge on Wall



IF STAMPED ENGINEERING IS REQUIRED FOR THIS RETAINING WALL, THIS DESIGN MUST BE STAMPED HERE BY A LICENSED ENGINEER.

GEOGRID PLACEMENT

- Grid is measured from the face of the wall.



*Caps come in multiple sizes. Check with your local retailer for what size is available in your area. • See "Material Estimating" for Adhesive estimate.

CASE B

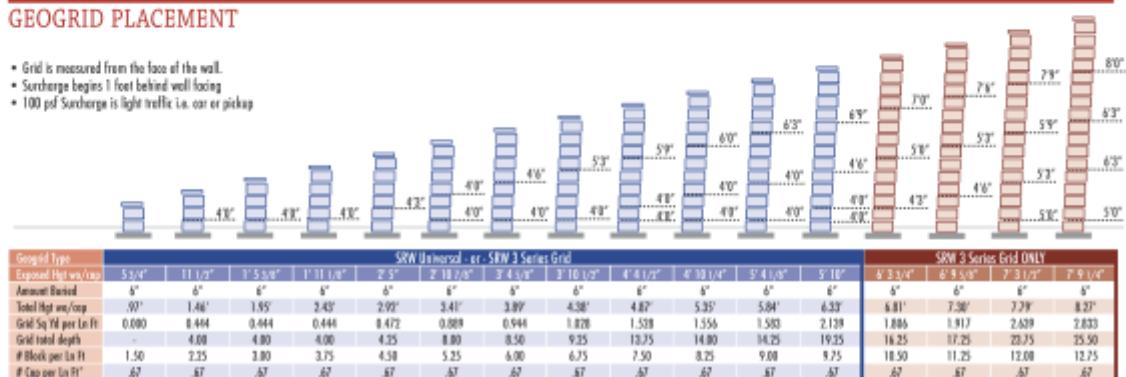
- CASE B Retaining Wall:
- Flat Ground at Top of Wall
- Flat Ground at Bottom of Wall
- 100 pcf Surcharge on Wall



IF STAMPED ENGINEERING IS REQUIRED FOR THIS RETAINING WALL, THIS DESIGN MUST BE STAMPED HERE BY A LICENSED ENGINEER.

GEOGRID PLACEMENT

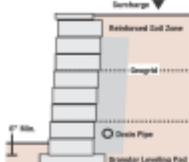
- Grid is measured from the face of the wall.
- Surcharge begins 1 foot behind wall facing
- 100 pcf Surcharge is light traffic i.e. car or pickup



*Caps come in multiple sizes. Check with your local retailer for what size is available in your area. • See "Material Estimating" for Adhesive estimate.

CASE C

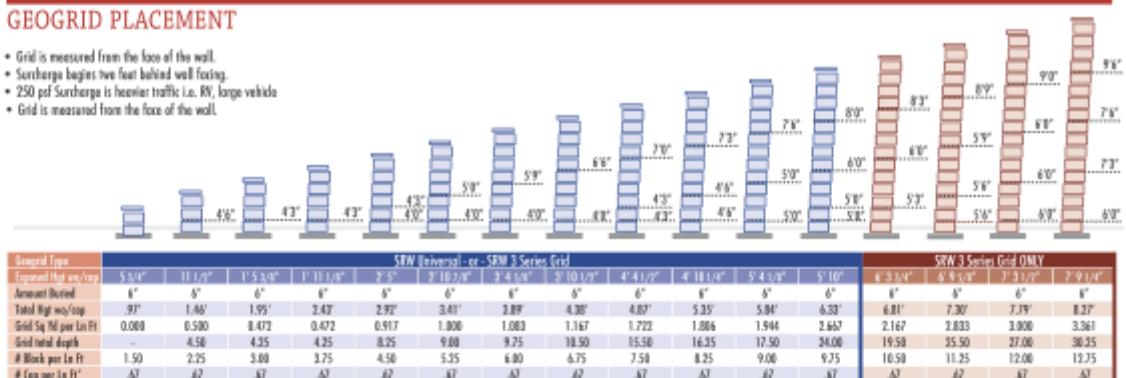
- CASE C Retaining Wall:
- Flat Ground at Top of Wall
- Flat Ground at Bottom of Wall
- 250 pcf Surcharge on Wall



IF STAMPED ENGINEERING IS REQUIRED FOR THIS RETAINING WALL, THIS DESIGN MUST BE STAMPED HERE BY A LICENSED ENGINEER.

GEOGRID PLACEMENT

- Grid is measured from the face of the wall.
- Surcharge begins two feet behind wall facing
- 250 pcf Surcharge is heavier traffic i.e. RV, large vehicle
- Grid is measured from the face of the wall.



*Caps come in multiple sizes. Check with your local retailer for what size is available in your area. • See "Material Estimating" for Adhesive estimate.

How To Build An Engineered Retaining Wall And Obtain A Stamped Drawing For Submittal To A Local Municipality.

The best place to source design information or necessary drawings for MaytRx, VyKing and Sigma Wall Systems is cambridgepavers.com. HTS (Hardscape Technical Services) has created a manual, "Complete Guide to Planning, Bidding, Engineering, and Building the MaytRx Wall", which is an excellent primer for building an engineered wall as well as a stamped drawing program that costs less than \$500 in most cases. Their affiliate company SRW offers free takeoffs and geogrid layouts.

SRW/HTS has an arrangement with Cambridge Pavers to provide MaytRx, VyKing and Sigma engineered wall designs if the geogrid needed for the project is purchased from Cambridge. Cambridge suggests that you consult an engineer, design professional or HTS for MaytRx, VyKing and Sigma Walls higher than 36 inches or that involve loads, poor soil or other design factors such as water runoff. See program information below.

SRW Free Design Request Program

Fill out the design request form on cambridgepavers.com. Within 3 days of receiving your information SRW will provide:

- Geogrid layer drawing
- Wall Takeoff (Sq. Ft., Caps, Pins)
- Adhesive needed

Note: This is not a "Stamped" drawing; it is a calculation based on your information using NCMA design software.

HTS Stamped Drawing Program

Typically, when a homeowner or contractor discovers that their retaining wall project needs a permit by the local building department, it is also learned that to obtain a permit they must provide engineering stamped by an engineer registered in the state of the project. The stamped engineering requirement will vary, from locality to locality. The determining factor for requiring stamped engineering is usually the exposed height of the retaining wall. Some local building departments require stamped engineering on retaining walls as short as 2' in exposed height. Fill out the design request form and prepare a soil sample.

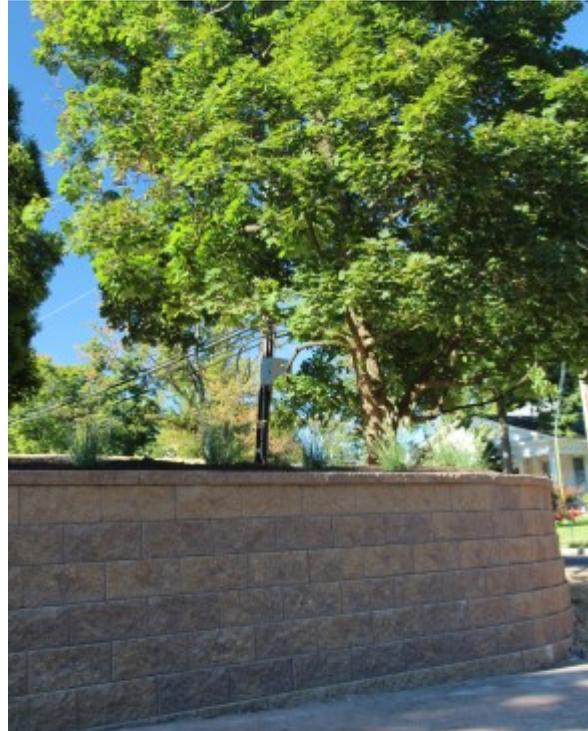
What To Expect

When stamped engineering services are requested, HTS:

- Insures that the project fits the 8' and under program,
- Verifies that all the required information is supplied, and forwards the package to the independently licensed engineer.

The engineer reviews the request and the customer receives:

- A cover letter from Hardscape Technical Services (HTS).
- A stamped cover letter from the engineer indicating the proper design table to use for construction.
- The proper design table stamped on the site configuration (case) to be used.
- Upon receipt of the stamped engineering document, you may proceed in obtaining the building permit from the local building department.



Find all forms requested on this page of the handbook along with processing instructions, and also information on Geogrid in the Professional Contractors Section of the Cambridge website (www.cambridgepavers.com).



Preliminary Design Request Form Date _____

CUSTOMER/PROJECT INFORMATION

1) Customer Name _____ Phone _____ Fax _____
 Address _____ City _____ State _____
 Wall Contractor DIY/Homeowner Arch/Engr Other _____

2) Project Name _____
 Address _____ City _____ State _____
 Type: Residential Commercial Municipal Other _____

DEALER/ENGINEER INFORMATION (IMPORTANT: Design will be coordinated with dealer.)

1) Dealer Name _____ Phone _____
 Contact person _____ Contact email _____

2) Engineer/Designer _____ Phone _____ Fax _____

3) Stamped Engineering Needed? Yes No

WALL INFORMATION

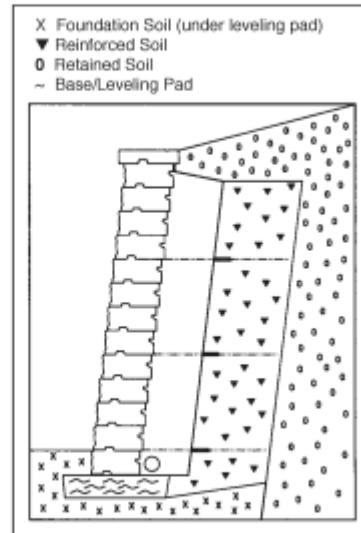
1) Retaining Wall Unit: _____
 2) Exposed Height of Wall: Feet _____ Courses _____
 3) Total Height of Wall: Feet _____ Courses _____
 Is your retaining wall project multi-tiered or terraced? Yes No

SOILS INFORMATION Is a soils report available? Yes No

1) Indicate Type of Soil (See KEY & diagram)
 Reinforced Fill _____
 Retained Soil _____
 Foundation Soil _____

KEY For Soil Types: (a, b or c)
 a: Granular- sand & gravel (gritty)
 b: Clay – plastic silts & clay (slick)
 c: Organic – loam & peat

2) Indicate Type of Base/Leveling Pad
 Sand Processed Gravel/Crusher Run Gap-graded Crushed Stone
 Other (describe) _____



SLOPE & SURCHARGE

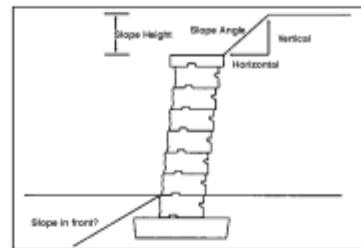
1) Indicate Type of Surcharge or Load at TOP of Wall:
 Lawn or grassy area Auto parking/Light traffic Truck parking/Highway traffic

2) Slope at BOTTOM/FRONT of Wall - see diagram:
 a) Is there a slope in front of the wall? No Yes: Angle of slope (ex. 2 horizontal:1 vertical) Horizontal _____ Vertical _____

3) Slope at TOP of Wall - see diagram:
 a) Is there a slope at top of the wall? No Yes: Angle of slope (ex. 2 horizontal:1 vertical) Horizontal _____ Vertical _____

b) Is the slope height greater than 2 times the height of the wall? Yes No - indicate the slope height (ft) _____

4) Is internal or external water involved? YES NO



Return copies of preliminary designs by: Fax: _____ Email: _____

Name: _____ Phone: _____

Address: _____ City: _____ State: _____ Zip: _____

By submitting this form I acknowledge that the information to be provided is not intended to replace a site specific design performed by a professional engineer and the final determination of the suitability of the information is the user's responsibility.

Information Supplied by (please print): _____
 Signature (required) _____

CAMBRIDGE WALLS

OUTDOOR LIVING



Cambridge Sigma wall shares the shape, textures and colors of the Cambridge Maytrix and Pyzique systems allowing for the use of Sigma Wall with the full line of Cambridge Outdoor Living Products and the double sided Maytrix Walls shown on these pages.



Mortarless Segmental Retaining Walls installed in North America surpass every country world-wide. The Cambridge Sigma engineered wall system is specified for industrial, commercial, municipal and residential applications. Department of Transportations throughout the United States now use this engineered wall system in building tall walls along our highway infrastructure instead of poured in place or stone walls.. The Sigma engineered wall system offers a durable, cost-effective, maintenance free structural wall that has aesthetic characteristics unmatched by any other wall system. Thank you for your continued support and loyalty to Cambridge, who assures you that we will never compromise the quality of our manufactured concrete products.



Premium Quality Pavingstones, Wall Systems & Outdoor Living Room Components

Cambridge Pavers Inc.

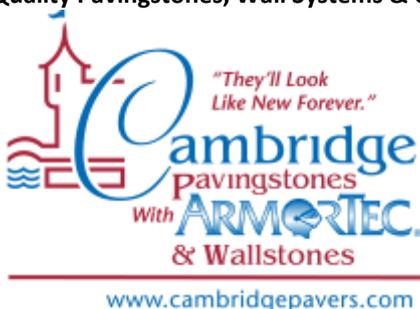
P.O. Box 157
Lyndhurst, NJ 07071-0157

PHONE: 201.993.5000

FAX: 201.993.5532

Cambridge@cambridgepavers.com

www.cambridgepavers.com



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"CREATING COLORS IN YOUR WORLD THAT WILL LAST A LIFETIME"... CAMBRIDGE