SHELTON WALL
INSTALLATION GUIDE

BELGARD
PAVES THE WAY

ENGINEERED SOLUTIONS BY ANCHOR™ WALL SYSTEMS

HERITAGE COLLECTION

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How to Use This Guide

HOW TO USE THIS GUIDE

This guide is designed to provide you with ideas as well as information on product use and installation procedures. While this guide provides general guidelines, installation contractors should refer to construction drawings for final specifications.

BEFORE YOU BEGIN

Advanced planning and careful layout at the job site help ensure a successful wall project.

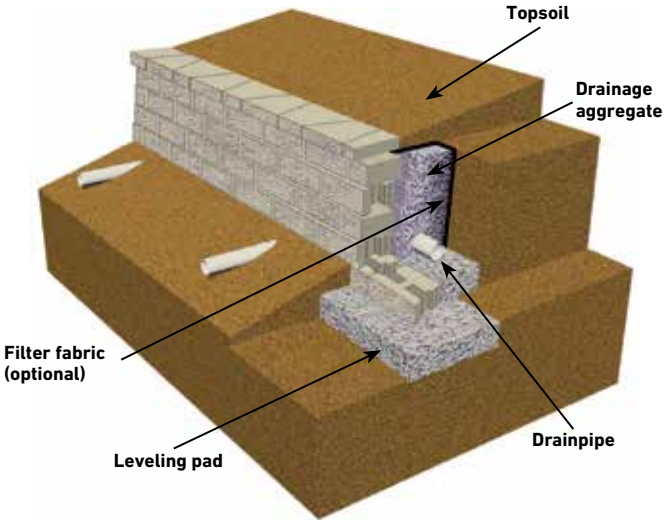
- **Consult a professional engineer to design walls over 3 feet high, and have compaction tested by a qualified geotechnical engineer.**
- Review the site plan to confirm lot lines, wall location, length and elevations.
- Confirm the location of underground utilities.
- Seek all necessary building permits.
- Prepare a drawing of the site with the wall location, lengths and elevations.
- Check the block delivered to ensure it is the correct color.
- Be sure to use the right tools. Hand tools include a shovel, 4-foot level, dead-blow hammer, 2- or 3-pound hammer, chisel, hand tamper, hydraulic splitter and string line. Power tools include a circular saw with a masonry blade and a compactor.
- Be sure to use an exterior grade concrete adhesive to glue units in place where noted.
- Always wear protective eyewear.

SAFETY NOTE: Always use appropriate equipment, including safety glasses or goggles and respirators, when splitting, cutting or hammering units.

Retaining Wall Basics

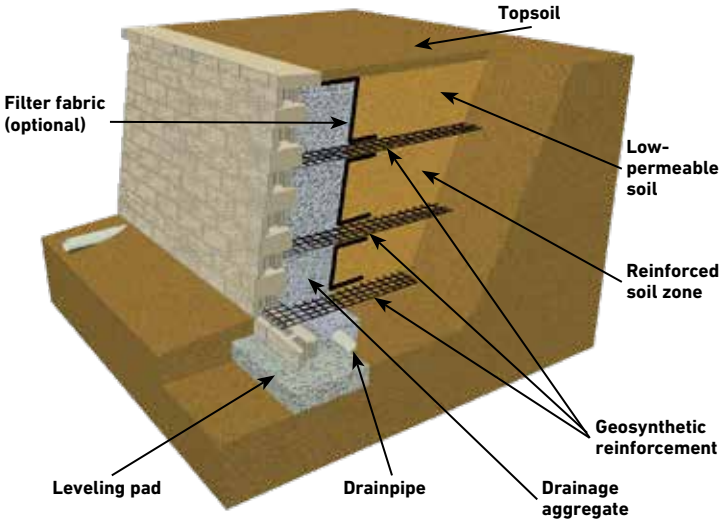
Segmental retaining walls typically fall into one of three categories.

GRAVITY RETAINING WALL



The first category – a gravity wall – is a retaining wall that does not use soil reinforcement. A gravity wall has height limitations specific to each product. An advantage of this type of retaining wall is that it requires a smaller work area behind the wall. A gravity wall relies on the weight and setback of the block to resist the soil forces being exerted on the wall.

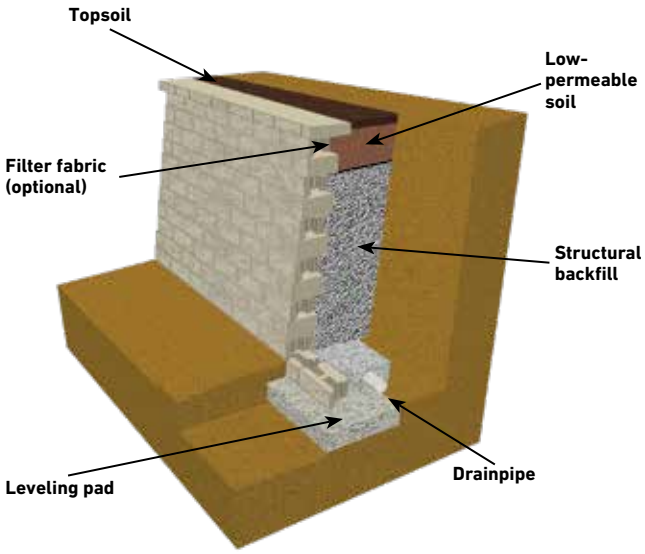
GEOSYNTHETIC-REINFORCED RETAINING WALL



The second category is a geosynthetic-reinforced wall, which needs to be designed by a qualified engineer. There are (theoretically) no height limitations with reinforced retaining walls, and they are used in larger applications. They require more work area behind the structure. The block of soil is stabilized by introducing reinforcement layers into the soil mass behind the facing units. The larger the stabilized soil mass, the more soil can be retained or held back. The geosynthetic reinforcement in the soil extends past the theoretical failure plane and serves to create a large, rectangular mass of block and soil, restraining the retained soil.

ANCHORPLEX® SYSTEM

The third category is the Anchorplex® system, which offers a unique, non-conventional solution to problematic wall construction sites. It is a retaining wall built with Anchor™ products and self-compacting structural backfill specified by Anchor Wall Systems, and backed by engineering support tools developed by Anchor.



Use of the Anchorplex system completely eliminates the need for the construction of a mechanically stabilized earth zone behind the wall facing and requires substantially less excavation than is usually necessary in grid-reinforced wall construction.

For more information about the Anchorplex system, go to **Anchorwall.com**.

Retaining Wall Installation Instructions – Best Practices

STAKE OUT THE WALL

- A surveyor shall locate the proposed base of wall location. Verify the wall location with the project supervisor.

EXCAVATION

- Excavate for the leveling pad to the lines and grades shown on the approved plans and excavate enough soil behind the wall for the geosynthetic reinforcement material *(if required)*.
- The trench for the leveling pad should be at least 21 inches wide and a minimum of 1 foot deep, enough to bury the first course below grade, plus 6 inches for the leveling pad. ***See diagram 1.***

Diagram 1—Excavation

LEVELING PAD

- An aggregate leveling pad is made of compactable base material of ¾-inch minus with fines.
- If the planned grade along the wall front will change elevation, the leveling pad may be stepped up by the height of the block to match the grade change. Always start at the lowest level and work upward.
- Compact the 6 inch (minimum thickness) aggregate leveling pad, using ordinary compaction methods, to provide a level hard surface on which to place the base course. Mist lightly with water before compaction, if needed. ***See Diagram 2.***
- For walls with step-up in the base course, extra care should be given to properly compact the aggregate leveling pad at the step-up locations.

Diagram 2—Leveling Pad

BASE COURSE

- This is the most important step in the installation process.
- Begin laying block at the lowest elevation of the wall, whenever possible.
- Place first block with the wide side to the front and level, front to back and side to side; lay subsequent blocks in the same manner. When using the center pin channel, units should be pitched back 1/16 inch for each foot of wall height.
- Align string line with the center channel to check for proper alignment. ***See Diagram 3.***
- Place the blocks side by side, with wide side to the front and make sure the blocks are in full contact with the leveling pad. Level front to back and side to side. ***See Diagram 4.***
- If the wall is on an incline, don't slope the blocks. Step them up so they remain consistently level. **See page 9 for more information about stepping up the base.**
- Place soil in front of the base course and compact. Base course should be buried. Continue to fill and compact after each course is laid.
- Clean any debris off the top of the blocks.

Diagram 3—Base Course and String Line*

Diagram 4—level each unit*

**Blocks used in diagrams are for install reference only does not depict the face of Shelton Wall.*

Retaining Wall Installation Instructions – Best Practices

CONSTRUCTION OF NEXT COURSE AND PIN PLACEMENT

- For a battered wall, place the next course of blocks and align the pin hole with the battered channel of the block on the course below. *See Diagram 5.*
- For a vertical wall, place the next course of blocks and align with the vertical channel of the block on the below course.
- Insert pins into the pin core of the block. *See Diagram 6.*
- Maintain running bond with the course below.
- Place 12 inches (minimum) of backfill aggregate behind the wall units and fill voids between the wall units. Place backfill soil and compact. Only lightweight hand operated compaction equipment is allowed within 3 feet from the back of the wall.
- Clean any debris off the top of the blocks before placement of the next course.

Diagram 5—Pin Placement (Battered Channel)*

DRAINAGE DESIGN (PER DESIGN)

- Each project is unique. The grades on the site will determine at what level to install the drainpipe. Place the drainpipe (4-inch perforated piping) so water drains down and away from the wall into a storm drain, or daylight just above grade.
- Fill in the area behind the blocks with clean drainage aggregate, at least 1 foot from the wall. You may need to place and backfill several courses to achieve the proper drainage level. *See Diagram 7.*
- The outlet pipes should be spaced not more than every 50 feet and at low points of the wall. In order for the drainage aggregate to function properly, it must keep clear of regular soil fill.

Diagram 6—Pin Placement (Vertical Channel)*

REINFORCED BACKFILL PLACEMENT AND COMPACTION (PER PLAN)

- Place reinforced backfill in 6 to 8 inch loose lifts and compact to the densities specified on the approved wall constructions plans.
- Only hand operated compaction equipment is allowed within 3 feet from the back of the wall.
- If the compaction equipment is too small to achieve the required compaction, thinner lifts should be used.
- Install each subsequent course in a similar manner. Repeat procedure to the extent of the wall height.

Diagram 7—Drain Pipe Placement*

WALL UNITS*

6 inch Small Unit

6 inch Medium Unit

6 inch Large Unit

6 inch Small Column Unit

6 inch Medium Column Unit

6 inch Large Column Unit

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Retaining Wall Installation Instructions – Best Practices

REINFORCEMENT PLACEMENT (PER PLAN)

- Refer to the approved wall construction plans for the reinforcement type, strength, and placement location. Measure and cut the reinforcement to the lengths shown on the plans.
- Ensure the reinforced backfill is placed and compacted flush with the top of the units and is graded reasonably flat prior to reinforcement placement. Clean any debris off the top layer of blocks prior to reinforcement placement.
- The reinforcement has a primary strength direction, which must be laid perpendicular to the wall face.
- Place the reinforcement within 1 inch of the front of the units. *See Diagram 9.*
- Apply the next course of blocks to secure the reinforcement in place. Insert pins through the pin core. Pull the reinforcement hand taut and place staples, stakes, or fill at the back of the reinforcement tension during placement of drainage aggregate and reinforced backfill.
- Place a minimum of 6 inches of reinforced backfill prior to operating equipment above the reinforcement. Avoid sudden braking or turning on fill placed over the reinforcement.

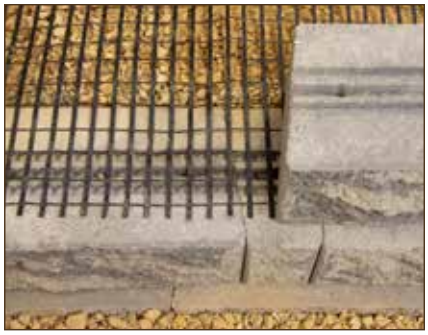

Diagram 9—Reinforcement*

CAPPING A WALL

See page 9 for more information about capping a wall.

FINISH GRADE AND SURFACE DRAINAGE

- Protect the wall with a finished grade at the top and bottom. To ensure proper water drainage away from the wall, use 6 inches of soil with low permeability and seed or plant to stabilize the surface.
- Consult the wall design engineer if water may be directed behind the wall. If needed, create a swale to divert water away from the wall. This will minimize water seeping into the soil and drainage aggregate behind the wall.

SITE CLEANING AND RESTORATION

- Brush off the wall and pick up any debris left from the construction process. Notify the job superintendent in writing of the completion and that it is ready for final inspection and acceptance.
- Planting vegetation in front and on top of the wall will help reduce the chance of erosion.
- Following these best practices for construction will ensure the success of your retaining wall system. These instructions are meant as general guidelines. Site-specific conditions may warrant additional installation requirements.

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Wall Patterns

WHEN TO USE A PATTERN

You can install the multipiece retaining wall system in a random pattern using any combination of units. Just avoid vertical lines that span more than 1 foot in height. If you are building a wall without geosynthetic reinforcement, use a pattern for inspiration or follow the pattern exactly. These patterns are based on using an equal number of blocks of each size in each height.

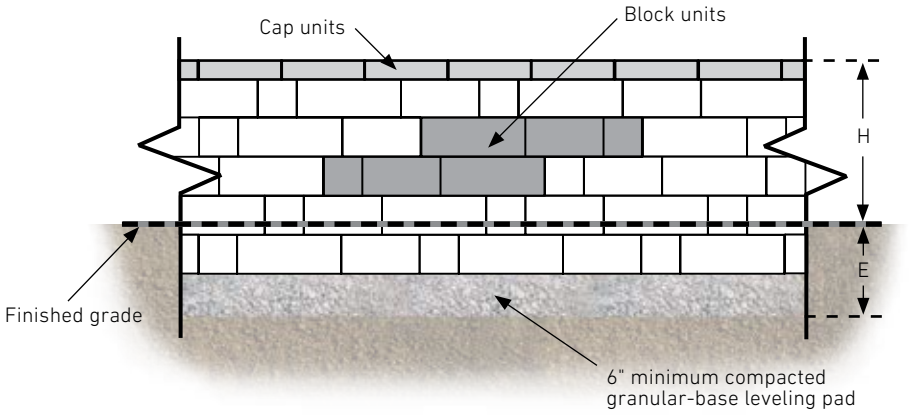
When building a wall that includes geosynthetic reinforcement, using a pattern at the appropriate spacing eliminates the need to cut the geogrid. When using a pattern, begin at one edge laying the blocks as indicated. Install at least one repeat of the pattern to establish the pattern before proceeding to the next course.

SEQUENT™ PANEL INSTALLATION PATTERN

This 12-inch high by 32-inch long installation pattern uses an equal number of units of each face size to make the panel. This installation pattern is one of many possible options. Others can be used for different appearances.

WALL PATTERN

Shown here is the Sequent™ pattern. This is one of many possible pattern options. Others can be used for different appearances.

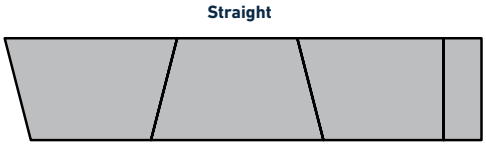


Capping a Wall & Stepping Up the Base

CAPPING A WALL

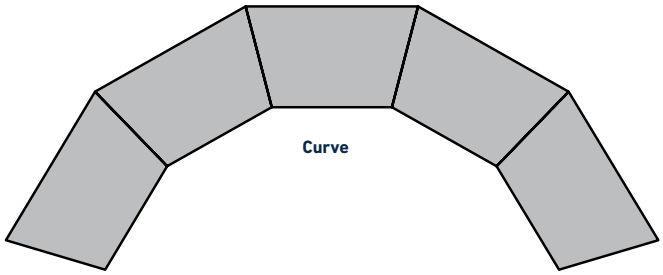
STRAIGHT WALL

The cap must be laid alternately, short and long faces for a straight line. Always start capping from the lowest elevation. Once caps are aligned, caps should be glued in place using a concrete adhesive.



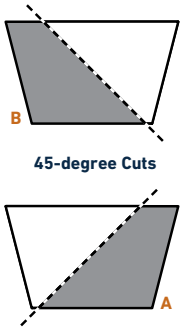
CURVES

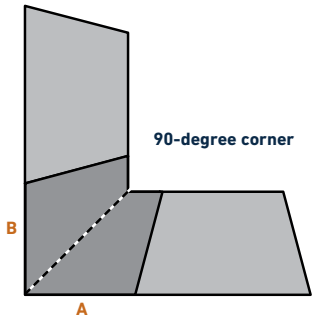
- Lay out the cap units side by side with the same face facing out (long faces for outside curves; short face to inside curves). If there's a need to adjust for project's radius, make cuts at least every other cap as needed for the most pleasing aesthetic.
- Minimum radius with cap: 2 feet 2 inches



90-DEGREE CORNERS

Saw-cut two caps to achieve a 45-degree mitered corner.





STEPPING UP THE BASE

LOWEST POINT

Walls built on a sloping grade require a stepped base. Begin excavation at the lowest point and dig a level trench into the slope until it is deep enough to accommodate the base material and one entire block.

STEP-UP

At this point, step up the height of one block and begin a new section of base trench. Continue to step-up as needed to top of slope. Always bury at least one full unit at each step.

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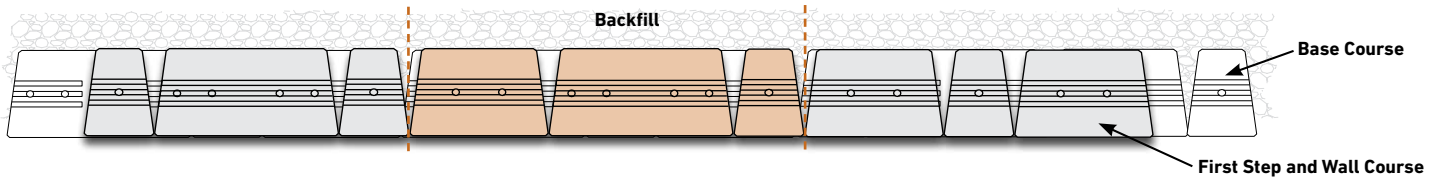
Steps in a 90-Degree Wall

BASE COURSE

Thoroughly compact the leveling pad. Lay out the base course according to the wall design. It is very important to backfill and compact behind and along the sides of each course of units.

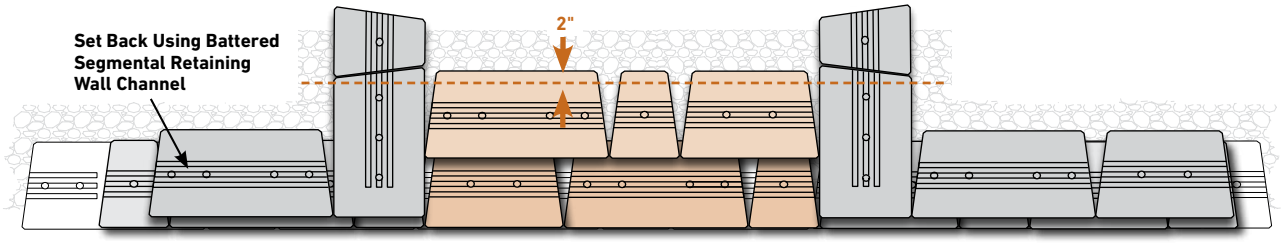
FIRST STEP AND WALL COURSE

Place the first course of units directly on top of the base course. Stagger them from the previous course, backfill and compact. Place the chosen stair tread material onto the first step and glue into place. Make sure to allow at least 2 inches for the second riser to rest on the first step. Wall caps make a good tread option.



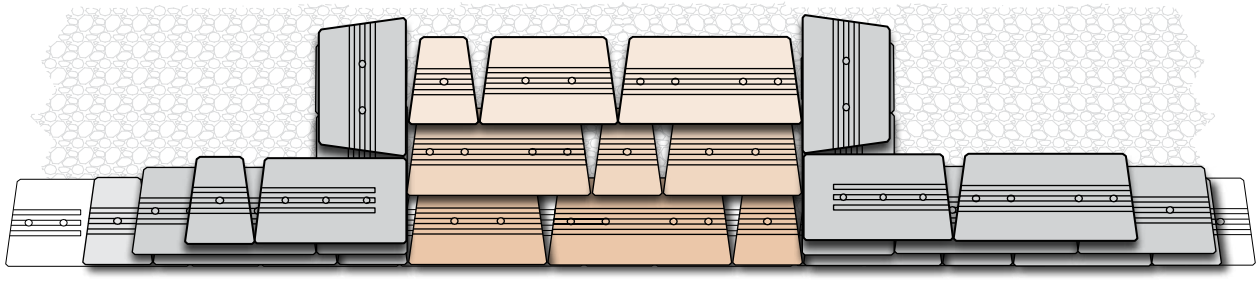
SECOND STEP COURSE

Add the second course of units behind the tread material staggering them over the previous course to maintain running bond. Place and compact gravel fill prior to installing the next course.



SECOND WALL COURSE

Build the second course of the wall. Corner units are used at the end of the stair treads tied into the wall and glued into place.
See building an outside 90-degree corner on page 13



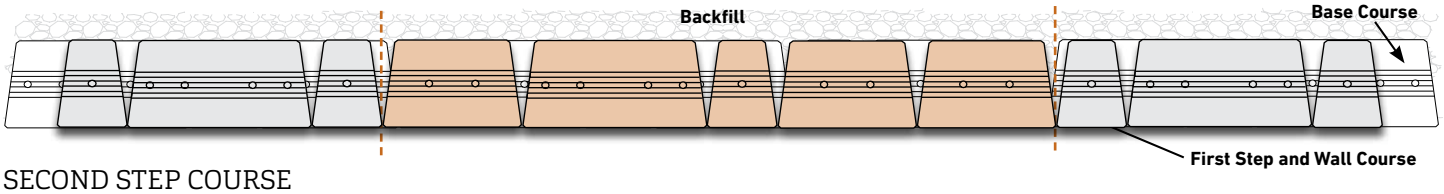
ADDITIONAL COURSES

Build the additional courses in the same manner. Repeat wall and step courses until the wall is finished.

Steps in a Curved Wall

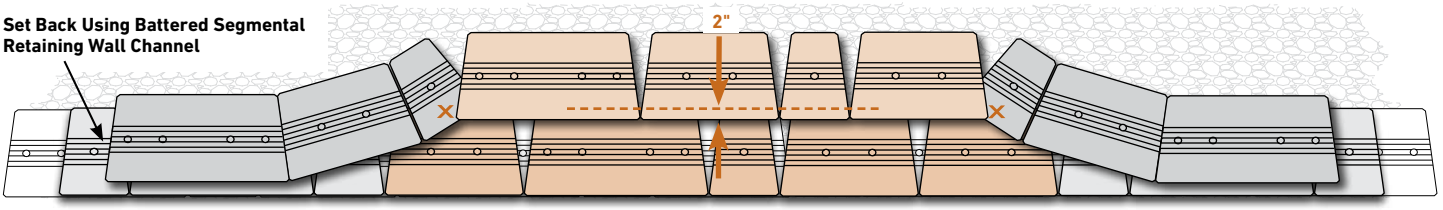
FIRST STEP AND WALL COURSE

Place the first course of units directly on top of the base course. Stagger them from the previous course, backfill and compact.



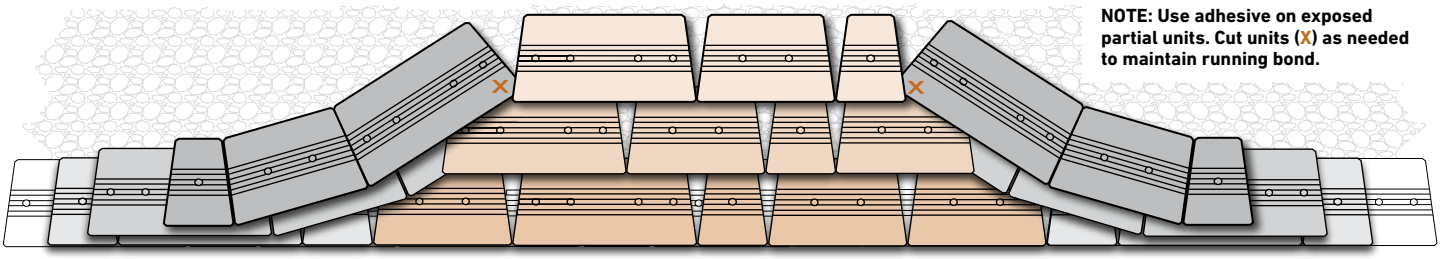
SECOND STEP COURSE

Start the second step course in the center of the step placing the unit staggered to the bond below. Place it 2" from the rear of the 1st row of the steps - level and glue into place. Continue to cover the entire length of the stairs.



SECOND WALL COURSE

Place a block near the second course of steps, maintaining running bond with the base course. Measure and cut a block to fit the space remaining between the unit used for the step tread and the next course of the wall. Place the unit in the wall, making sure that both vertical edges fit tightly against both the step tread and the wall. Angle the blocks flush with the face of the previous course and glue in place with a concrete adhesive.

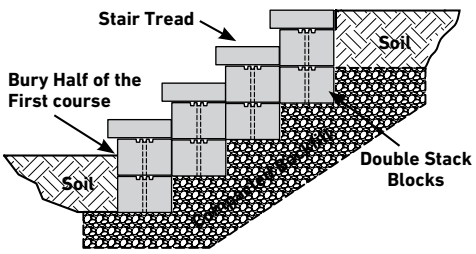


When constructing steps, you must consider whether it is a fill or a cut-grade situation. Construction is similar but varies in the amount of dummy unit required.

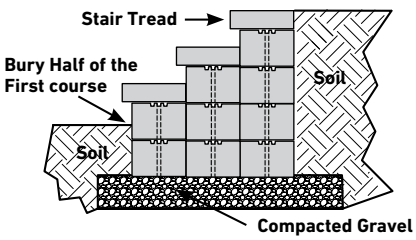
A fill step will have a base course of dummy units in the entire footprint of the steps. For each additional step, add dummy units behind the facing units for stability. There are two methods for creating the step facing. Use complete sets of 6-inch high units. A cut-grade set of steps will use one layer of dummy blocks under each step, effectively stepping up the grade. *See illustration below for more details.*

All applications will require some sort of tread to cover the facing units.

TYPICAL CROSS-SECTION: CUT SCENARIO

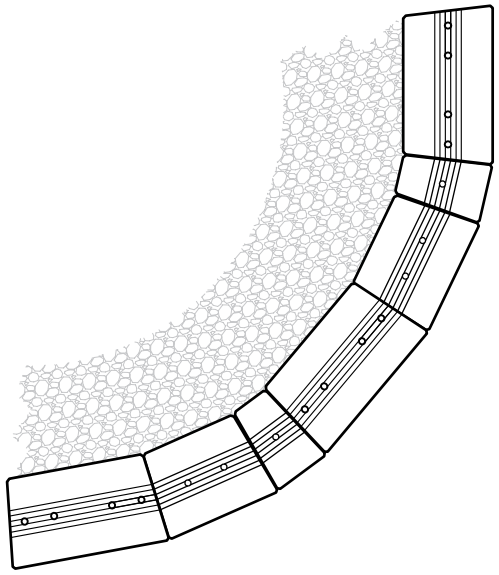


TYPICAL CROSS-SECTION: FILL SCENARIO



Outside Curves & Inside Curves

OUTSIDE CURVES

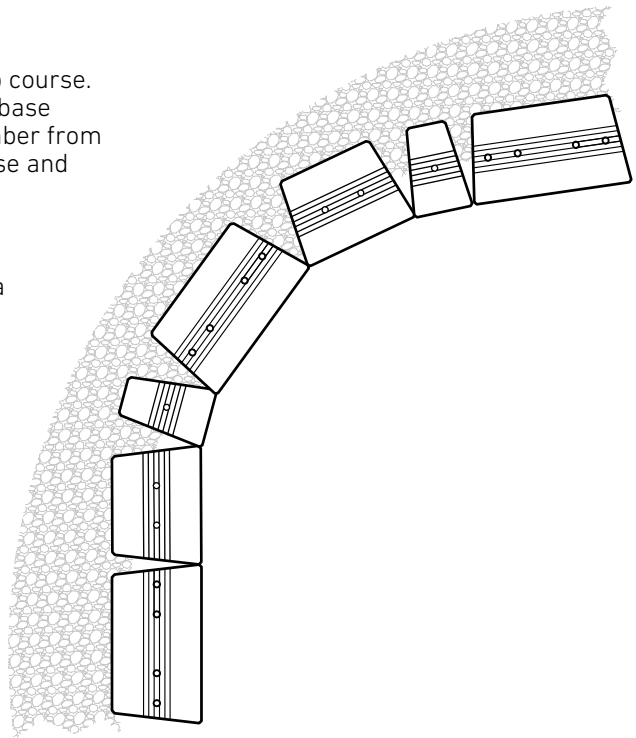


CALCULATE THE RADIUS
When building an outside curve, begin by calculating the radius of the top course. This will be the smallest radius in the wall and must not be less than the minimum outside radius for the system, 4 feet. To calculate the radius of the base course, multiply the number of courses by 1 inch and add that number to the radius of the top of the wall. This will be the radius of the base course.

BASE COURSE
Drive a stake into the ground at the desired center of the curve. Attach a string and rotate it in a circle around the stake to mark the radius in the soil. Align the back of the block with the curve and ensure level placement from side to side and front to back.

ADDITIONAL COURSES
On each course, the pin must be in contact with the appropriate channel of the block on the course below to ensure structural stability. The setback of the block will cause the radius of each course to gradually decrease and eventually affect the running bond of the wall. To maintain proper running bond, use partial units as needed. Once a block is cut to size, glue it in place with a concrete adhesive.

INSIDE CURVES



CALCULATE THE RADIUS
When building an inside curve, begin by calculating the radius of the top course. This will be the largest radius in the wall. To calculate the radius of the base course, multiply the number of courses by 1 inch and subtract that number from the radius of the top of the wall. This will be the radius of the base course and should not be less than the minimum inside radius of 8 feet.

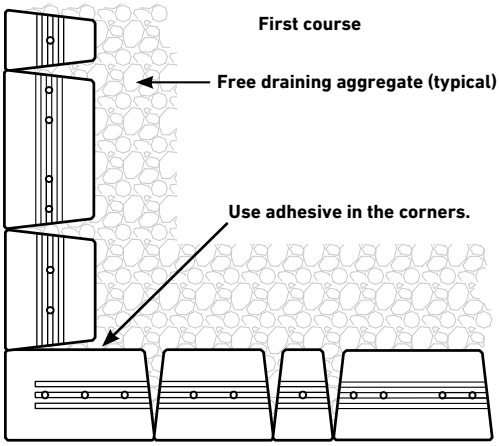
BASE COURSE
Drive a stake into the ground at the desired center of the curve. Attach a string and rotate it in a circle around the stake to mark the radius in the soil. Align the back of the block with the curve and ensure level placement from side to side and front to back.

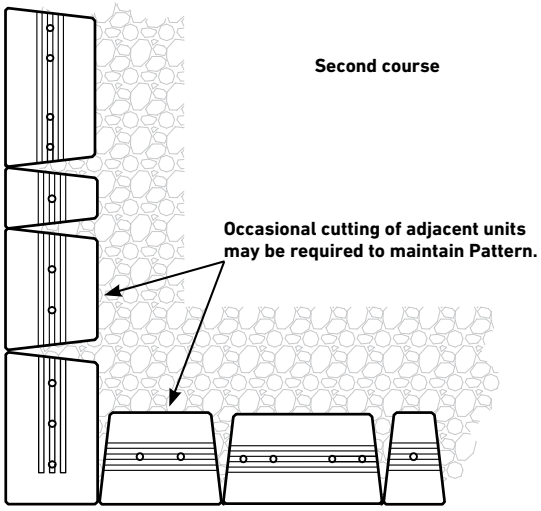
ADDITIONAL COURSES
On each course, the pin must be in contact with the appropriate channel of the block on the course below to ensure structural stability. The setback of the block will cause the radius of each course to gradually increase and eventually affect the running bond of the wall. To maintain proper running bond, use partial units as needed. Once a block is cut to size, glue it in place with a concrete adhesive.

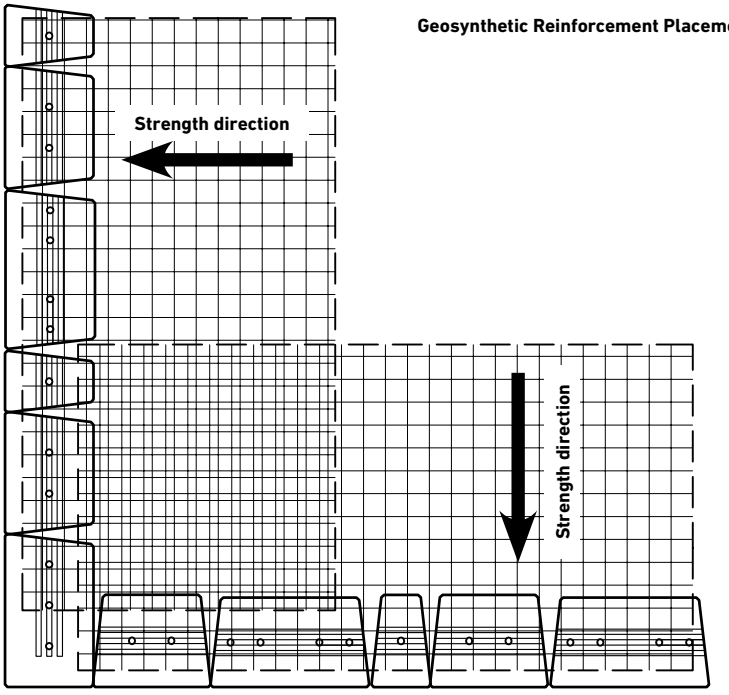
Outside 90-Degree Corners

BASE COURSE
To build an outside 90° corner, begin by placing a corner/column block at the corner with the wide side to the front of the wall. Then lay the rest of the base course working from the corner/column block out in both directions.

ADDITIONAL COURSES
Begin the second course by placing a corner/column block perpendicular to the course beneath. Set back the corner/column units to reflect the system batter of the wall. Alternate the corner block orientation with each course and always use a concrete adhesive. Place the second and third blocks on either side of the corner block.







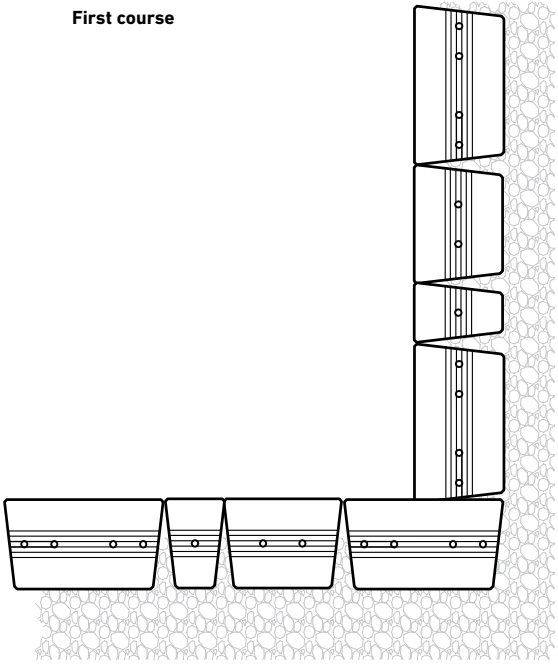
Inside 90-Degree Corners

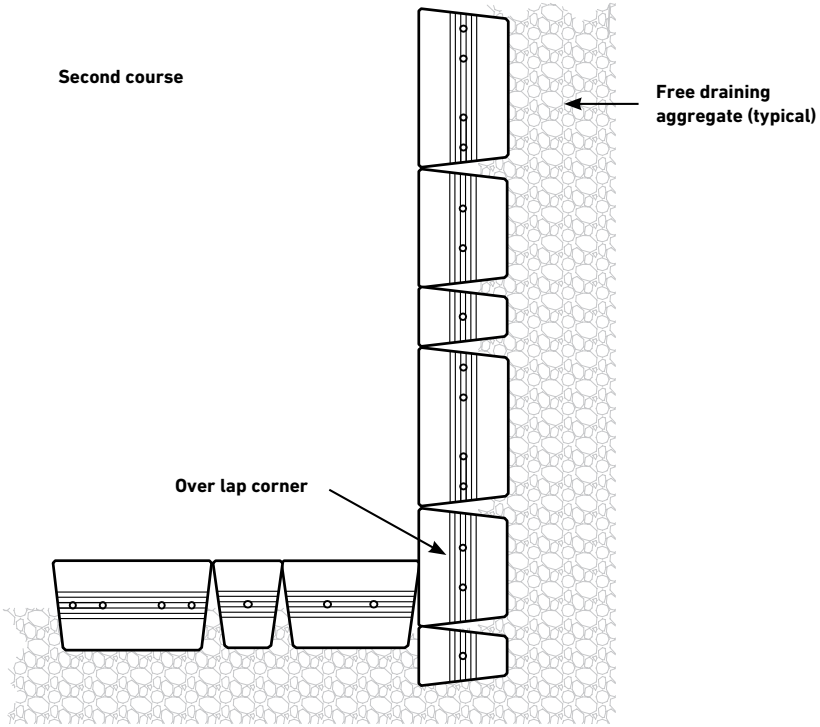
BASE COURSE

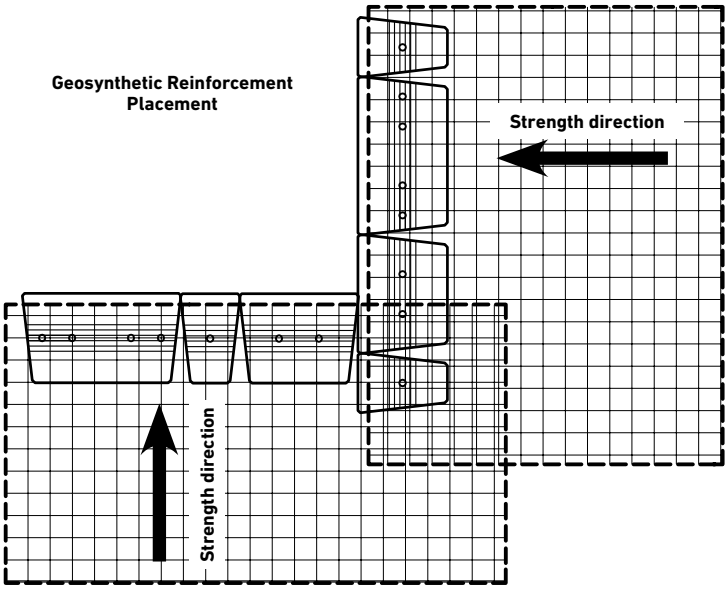
To create an inside 90^0 corner, begin by placing a block at the corner. Then lay a second block perpendicular to the first and continue laying out the rest of the base course working from the corner out. Make sure to construct the base course according to standard site prep and installation procedures described earlier.

ADDITIONAL COURSES

On the second course, place all blocks on bond along one side of the corner. Once the second course of one wall is established, begin the second course of the adjacent wall. Block placement in the corner should alternate direction with each succeeding course. Once the corner block is in position, glue it in place with a concrete adhesive.





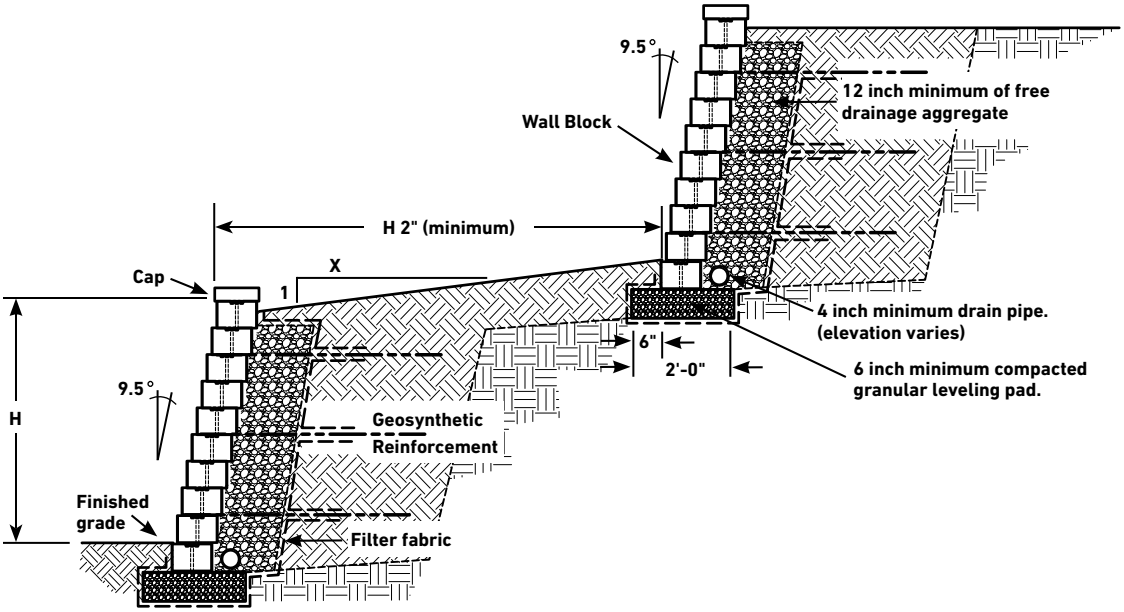


Terraced Walls

INDEPENDENT TERRACED WALLS

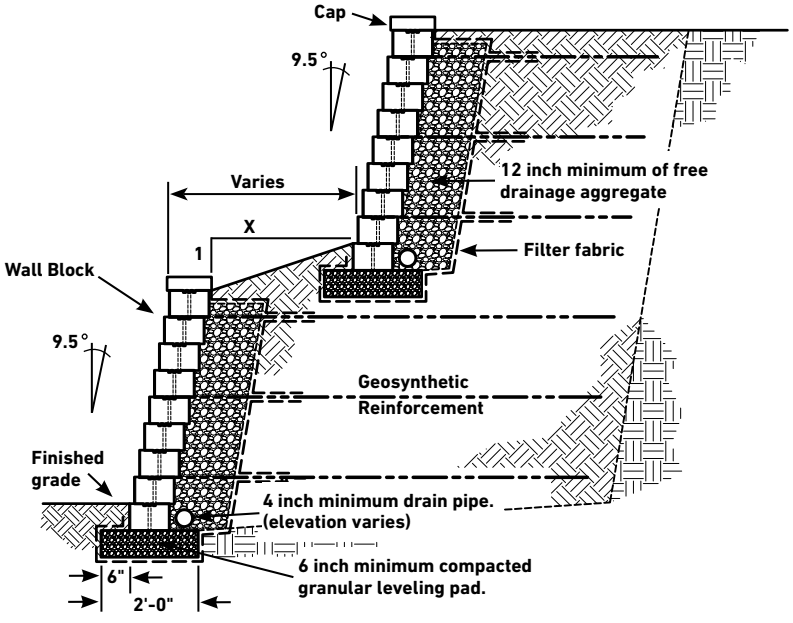
For each wall to be independent of others, it must be built using the 2:1 ratio – the upper wall must be built a distance away from the lower wall of at least twice the height of the lower wall. In addition, the upper wall must also be equal to or less than the height of the lower wall. Exceptions to this general rule include weak soil conditions or where slopes exist above, below or between wall locations. For example, if the lower terrace is 2 feet tall, the distance between the terraces must be at least 4 feet and the upper wall must not be higher than 2 feet.

Drainage is vital to maintaining stable, long-lasting terraced walls. Drainpipe must be installed so the water is directed around or under the lower wall. Never place the drain outlet for the upper wall above or behind the lower wall.



DEPENDENT TERRACED WALLS

When the distance between the lower wall and the upper wall is less than twice the height of the lower wall, the walls become structurally dependent on each other. In this situation, it is important to take global stability into account, incorporating geogrid – and longer layers – into the wall plan, In addition, structurally dependent walls require eve more excavation, backfill and time. Be sure to check the wall plan for specific requirements. For structurally dependent walls, consult with a qualified engineer.



Freestanding Wall Installation Instructions – Best Practices

EXCAVATION

Excavate for the leveling pad. The trench should be 22" wide and 12" deep. *See Diagram 13.*

Diagram 13—Excavation

PREPARING THE LEVELING PAD

Create a leveling pad of compacted base material that extends a minimum of 6 inches in front of and 6 inches behind the wall units. This pad should be at least 6 inches deep after compaction. *See Diagram 14.*

Diagram 14—Leveling Pad

BASE COURSE

Once the pad is compact and level, begin placing the units. Center the units on the pad and alternate the short and long faces. The ends of the units should be in contact. Level the blocks front to back and side to side. Lay subsequent blocks in the same manner. The base course must be buried below grade and should be included when calculating total wall height. *See Diagram 15.*

Diagram 15—Base Course*

CONSTRUCTION OF THE NEXT COURSE AND PIN PLACEMENT

- Clean any debris off the top of the blocks
- Place the next course of blocks and align the pin core with the vertical channel of the block on the course below and maintain running bond.
- Insert pins through the pin cores. *See Diagram 16*.
- Repeat this process to complete the wall. Glue top two courses and caps in place with a concrete adhesive.

Diagram 16—Pin Placement*

STRUCTURAL DESIGN ELEMENTS

Structural design elements must be used if a freestanding wall is more than 10 feet long. Structural design elements include:

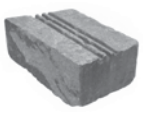
- Curves
- 90-Degree Corners
- Columns

WALL UNITS*

6 inch Small Unit

6 inch Medium Unit

6 inch Large Unit



6 inch Small Column Unit

6 inch Medium Column Unit

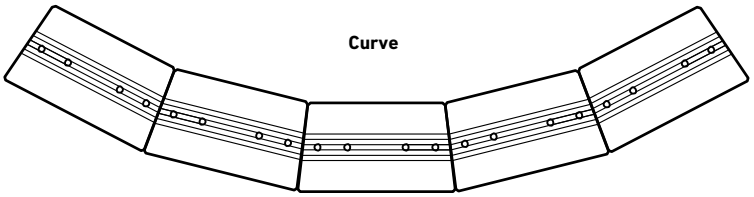
6 inch Large Column Unit

**Blocks used in diagrams are for install reference only does not depict the face of Shelton Wall.*

Curves, 90-Degree Corner & Ending a Wall Without a Column

CURVES

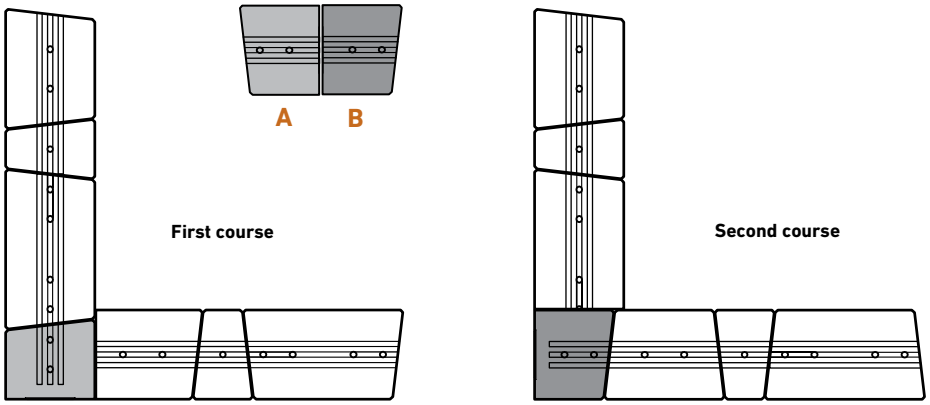
Add stability and natural flow to walls with curves. While units can be turned somewhat, it may be necessary to make cuts with a concrete saw or splitter. As a rule, the smaller the units, the tighter the radius. Conversely, the larger the units, the larger the radius. Use approximately the same number of units for each course. The approximate minimum radius the system can turn, using all three pieces without cutting, is 3'-3", measured to the outside face of the wall.



90-DEGREE CORNERS

To create a 90* corner in a straight wall, split the large wall unit down the middle using the split line as a guide. *See Diagram 17*. Alternate the position of the corner units on each course until the desired height is reached. Glue all corner units with concrete adhesive.

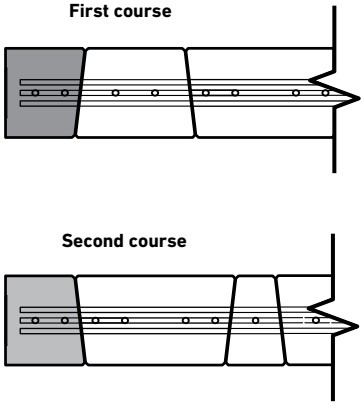
Diagram 17—Split block in half*



ENDING A WALL WITHOUT A COLUMN

To end a wall without a column, split the unit down the center using the split line as a guide. Alternate courses as shown until the desired height of wall is reached. Cut wall units to maintain running bond. Glue all corner pieces with a concrete adhesive. *See Diagram 18.*

Diagram 18—Wall End Example*



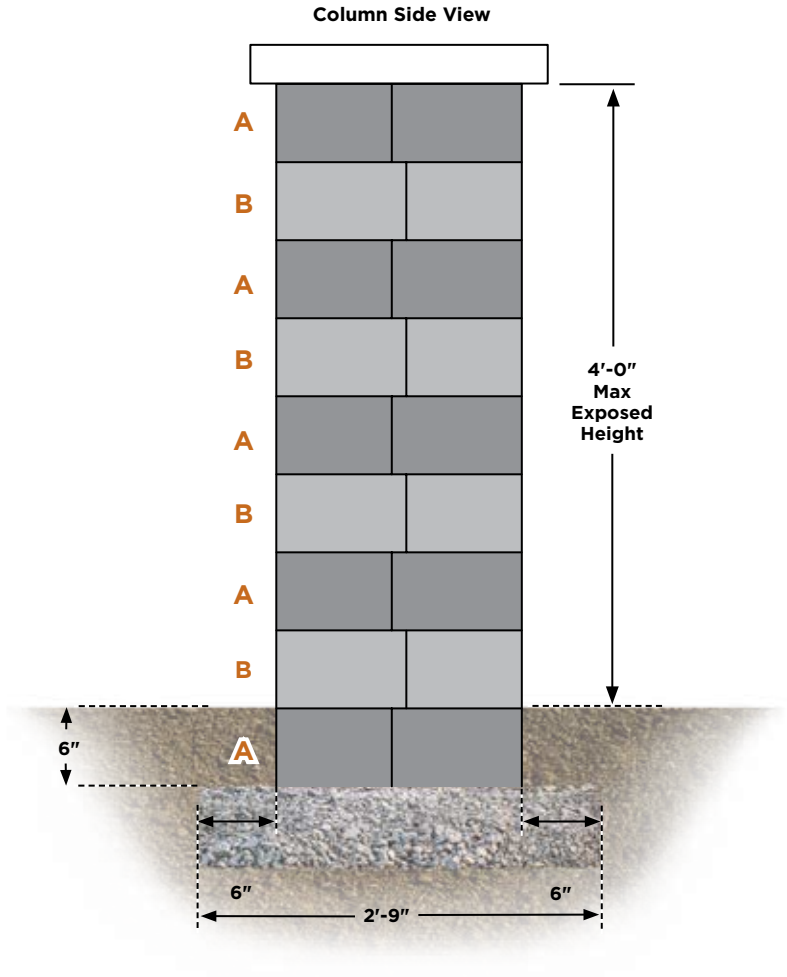
*Blocks used in diagrams are for install reference only does not depict the face of Shelton Wall.

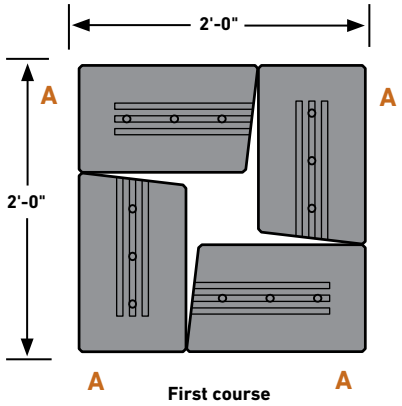
Columns

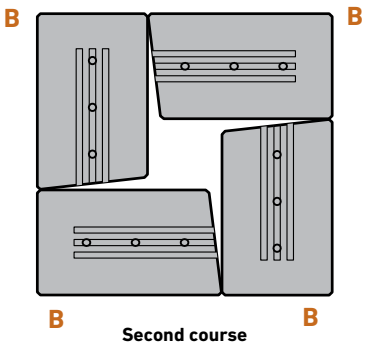
COLUMNS

When used with a freestanding wall, a column increases wall stability. The column leveling pad should extend 6 inches beyond each column edge and be at least 6 inches deep after compaction. To build a column, place the first column unit and level front to back and side to side. Place the second perpendicular to the first. Use a square as a guide. Place the third and fourth units in a similar fashion. Make sure all units are level with each other.

Alternate the position of the column units on each course and continue placing units in this manner. Glue every course. Continue building until you've reached the desired height. Cap the column with a cap unit of your choice and glue in place.

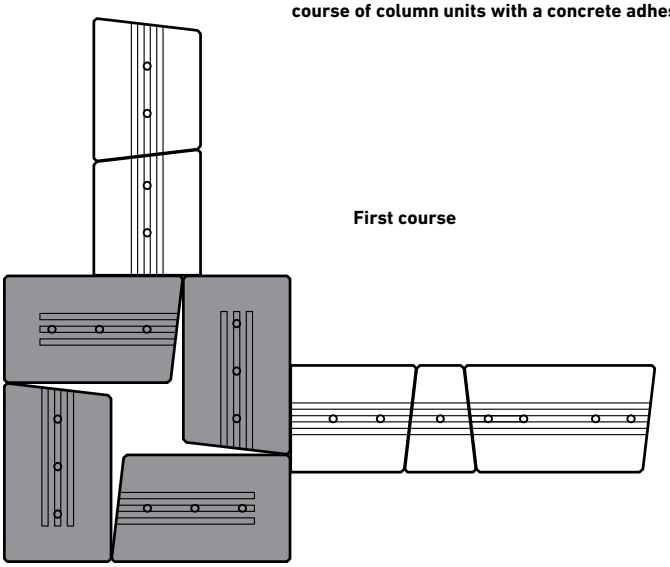




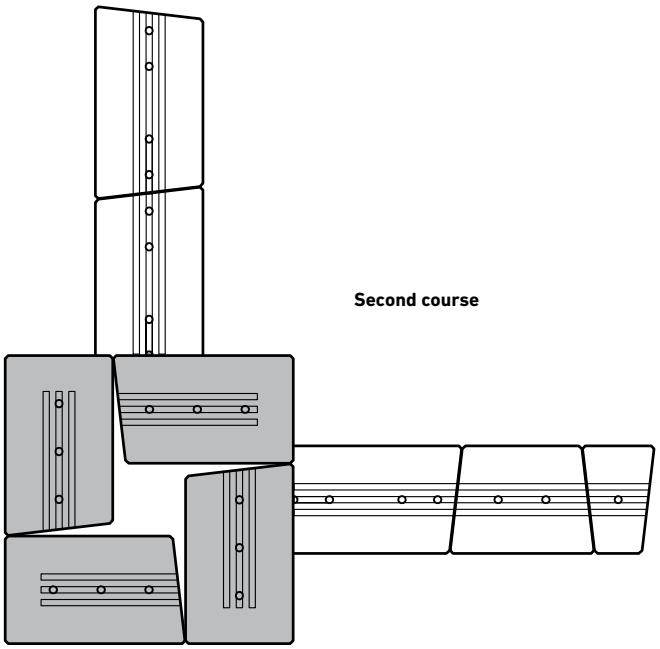


90-Degree Corner at Column

Frequently, a 90° turn is made at a column. To build this column, cut one column unit per course. Stack column units in a rotating pattern for each course. Glue each course of column units with a concrete adhesive.



First course



Second course

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