Site Analysis

Your retaining wall design must begin with a proper site analysis. The conditions at the site will determine your wall height and location, as well as reinforcement requirements. Check the soil type and conditions at the base of your wall for adequate bearing pressure. The soil below a wall needs to be strong enough to support the weight of the wall resting on it. If the soil is in a moist or wet condition, extra precautions may be required to provide a stable base. An accurate site plan must also include the location of all lot lines, utilities, buildings, driveways and parking areas. Note any permanent trees or vegetation. Prior to design, proper permits, owner approvals, utility clearances* and temporary easements must be obtained.

If your jobsite has any of the following conditions, get a complete engineering analysis from a qualified designer before proceeding:

- Soft or unstable soils
- Excessive water runoff
- Surcharges greater than a residential driveway
- Waterfront and shoreline sites
- Terraces
- Slopes greater than 3 to 1 above or below the wall
- Wall heights exceeding 4'

Finalize Design

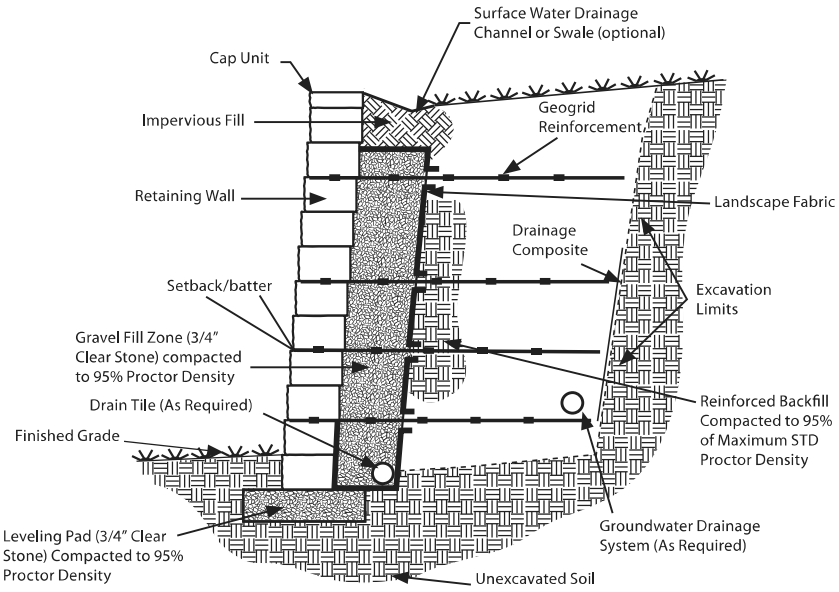
Develop a wall layout that will maximize drainage and direct the flow of water around the wall and away from buildings. Consider material and equipment access at the site, and try to minimize the excavation and hauling of soil and fill.

Getting Started

Build on stable, well-compacted ground. Spend extra care and preparation on the base and bottom row of your wall. Any unevenness in the base course will be amplified and difficult to correct after several courses have been installed. Always begin your wall construction at the lowest possible point of your base and step up. You should also begin from the corner blocks of steps and work outward to the end of the wall.

Reference the CMHA for more information.

Typical Reinforced Wall Application



Leveling Pad

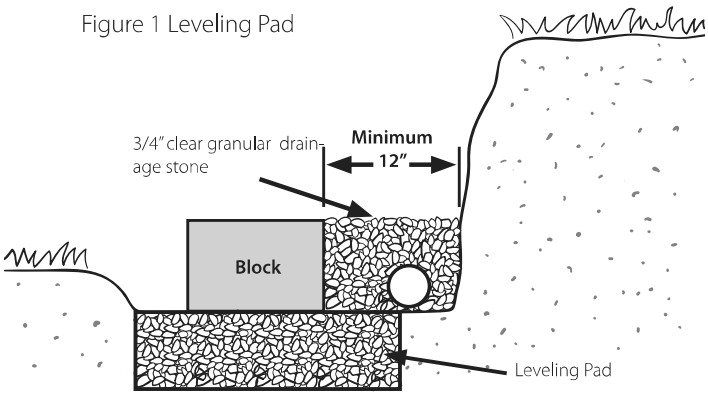
Excavate a shallow trench at the base of your planned wall. It should be a minimum of 24" wide and 8" deep to accommodate the leveling pad material and required unit embedment below grade. Place a minimum of 6" of base material in the leveling pad layer. Base material should consist of either granular, well-drained coarse sand, angular gravel or crushed stone. Use a hand-operated plate compactor to compact the base material every 2" to achieve a solid and level foundation. The leveling pad may be stepped in 8" increments to match any grade changes along the front of the wall.

Unit Installation

Place retaining wall units side-by-side in the center of the leveling pad (Figure 1). Align and level each unit with adjacent ones side-to-side and front-to-rear. Carefully tap high points with a rubber mallet. A thin layer of sand (1" or less) may be used on top of the compacted base material to help level the first course. Always align from the back of units, not from irregular front faces. A string line and level will keep each new row of blocks on track.

After placing and leveling the first course, install drain tile behind the block as necessary. If applicable, fill voids in and between block and a minimum of 12" behind block with clean granular drainage rock. Replace enough fill in front of the base course to secure it. Fill behind block with drainage rock until it is level with the top of the first course. Compact the fill with a hand-operated plate compactor on both sides of the first course to required specifications, or to 95% of maximum Standard Proctor Density (a method used to determine compaction). Compact on top of the block, and clean the top of the first course units to begin installation of second course.

Figure 1 Leveling Pad



Unit Embedment

Generally, if the grade in front of the wall is level, one half of the first course should be embedded below grade. Embedment should be increased for special conditions such as slope, soft foundation soils or shoreline applications. As a general rule, the first course of block should be embedded at a 6" minimum. For walls that are 4' or higher, add 1" embedment per one-foot rise.

Leveling Pad

Excavate a shallow trench at the base of your planned wall. It should be a minimum of 24" wide and 8" deep to accommodate the leveling pad material and required unit embedment below grade. Place a minimum of 6" of base material in the leveling pad layer. Base material should consist of either granular, well-drained coarse sand, angular gravel or crushed stone. Use a hand-operated plate compactor to compact the base material every 2" to achieve a solid and level foundation. The leveling pad may be stepped in 8" increments to match any grade changes along the front of the wall.

Additional Courses

Install additional courses with seams of each successive course offset by several inches from the units below for structural stability.

County Block and Tribute retaining walls with pins:

For the second and additional courses, set each unit 1" back from its finished position. Insert two pins in the front holes, and pull blocks forward so pins are fully seated into slots in two separate units below, locking them together. County Block Jumbo units only require 2 pins per block; these may be placed in any 2 of the 3 available holes. It may be necessary to tap pins lightly with a hammer for proper alignment. Check each course for tightness of each unit with adjacent units and check wall alignment.

Winston and Integrity retaining walls without pins:

If your wall system does not require the use of pins or cube system, be sure that the lower units are clean and additional courses are properly locked in place with the built in concrete locking mechanism.

Drain Tile

Drain tile should be placed behind the wall and extruded wherever possible. This means the drain tile may have to be extruded through the face of the wall (Figure 2) or at the end of the wall (Figure 3).

Unit Installation

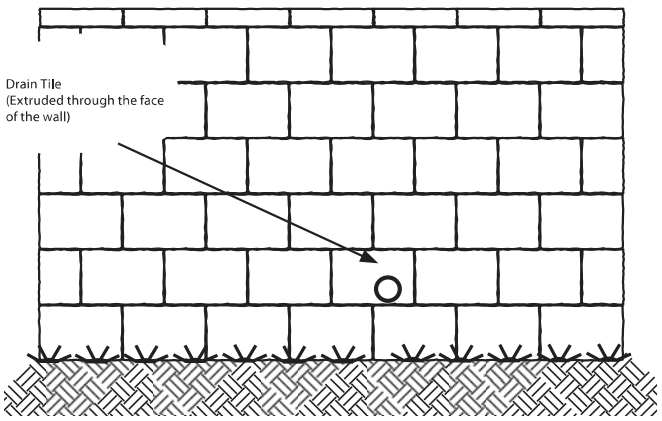
Place retaining wall units side-by-side in the center of the leveling pad (Figure 1). Align and level each unit with adjacent ones side-to-side and front-to-rear. Carefully tap high points with a rubber mallet. A thin layer of sand (1" or less) may be used on top of the compacted base material to help level the first course. Always align from the back of units, not from irregular front faces. A string line and level will keep each new row of blocks on track.

After placing and leveling the first course, install drain tile behind the block as necessary. If applicable, fill voids in and between block and a minimum of 12" behind block with clean granular drainage rock. Replace enough fill in front of the base course to secure it. Fill behind block with drainage rock until it is level with the top of the first course. Compact the fill with a hand-operated plate compactor on both sides of the first course to required specifications, or to 95% of maximum Standard Proctor Density (a method used to determine compaction). Compact on top of the block, and clean the top of the first course units to begin installation of second course.

Unit Embedment

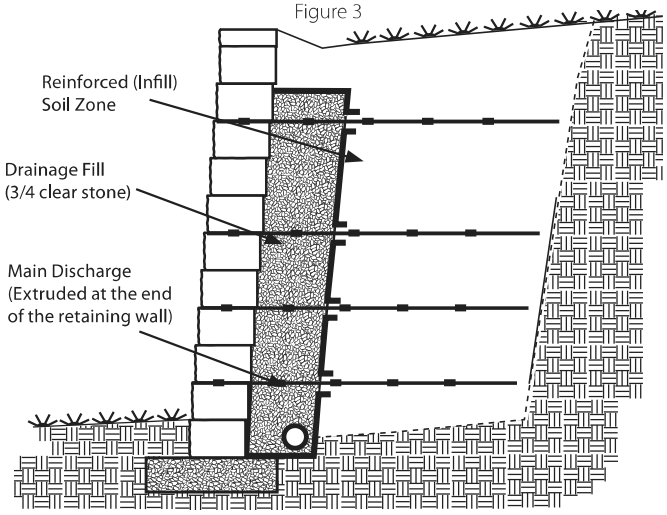
Generally, if the grade in front of the wall is level, one half of the first course should be embedded below grade. Embedment should be increased for special conditions such as slope, soft foundation soils or shoreline applications. As a general rule, the first course of block should be embedded at a 6" minimum. For walls that are 4' or higher, add 1" embedment per one-foot rise.

Figure 2



Retaining Wall Front

Figure 3



Note: This guide offers typical installation recommendations for retaining walls under 4' high. For retaining wall installations over 4' high, and for walls that will be installed in wet or unstable soils, in areas with heavy surcharges, or applications that require drainage or other special conditions, a final design must be performed by a qualified engineer; site conditions and specific design parameters may vary. If you have questions, take time and ask a qualified contractor or your retaining wall distributor for more information.

Standard Proctor Density is referred to several times in this guide. Proper placement and compaction of soils is essential to the successful performance of any retaining wall system. Reinforced soil structures routinely specify that all soils be compacted to 95 % maximum density as determined by ASTM D698-Standard Proctor Density. Post construction settlement is an obvious concern of poorly compacted materials, excessive lateral wall movement and/or insufficient shear strength. Soils must be compacted in lifts to achieve maximum soil shear strength and validate the design.

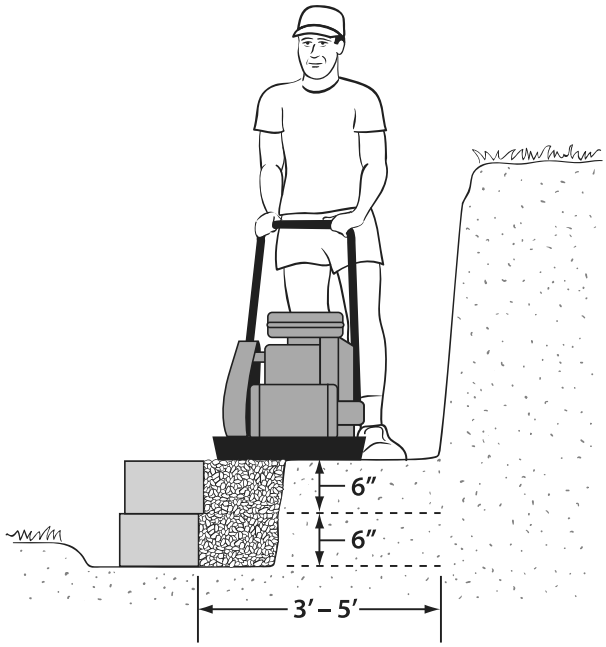
*Call Diggers Hotline in advance (811) before digging to locate any underground lines.

Backfilling and Compaction

After each course is aligned, if applicable, fill in block cores and voids between units with drainage rock. Then, backfill and compact each course as you continue constructing the wall. Make sure to backfill in front of the wall until the desired grade is achieved (Figure 4). Next, use a hand-operated plate compactor directly over the top of the block to consolidate aggregates and pulverize any residual concrete fragments (slag). When compacting, it is important to backfill in small lifts. Know your compactor and how much it can handle. Most small compactors can handle a 6" lift at a time. This is a good general rule to follow when using a compactor. Work from the back of the wall to the furthest edge of excavated area, with a three to five foot minimum compacted zone, until all materials are compacted.

Retaining walls require only a certain amount of compaction with hand-operated equipment to consolidate the soil and minimize settling. Excessive compaction can cause forward rotation of the wall facing. Large equipment operating too close to the wall may cause over-compaction and result in localized bulging. It can also damage geogrid reinforcement materials.

Figure 4



Geogrid Reinforcement

If geogrid reinforcement is required, excavate behind wall location for a distance equal to the designed embedment length of the grid. Construct the wall up to the designated height of first grid layer. Place and compact granular fill within and behind the wall. Backfill and compact soil behind the granular fill in the reinforced zone.

Lay geogrid, cut to appropriate sizes and with the strength direction perpendicular to the wall, on top of units. The cut ends should nearly touch the front edge of the units but not extend past the front face. Extend the grid pieces to the back of the slope. Place the next course of units on top of the geogrid and be sure the units are locked in place by pins (if applicable) or the concrete locking mechanism. Pull units forward, making sure they are secure. Place granular drainage rock in cores (if applicable) between block and 1' behind units. Pull geogrid taut – staking is recommended – before placing backfill material. Compact backfill in 6" lifts behind wall.

*Estimation Geogrid Charts can be found on County Materials' website at www.countymaterials.com. Simply go to Downloads / Product Installation & Maintenance Guides / Landscaping. There you will find HTS Manuals specific to County Block, Integrity™, Rib Rock™ and Tribute.

Ending and Capping a Retaining Wall

End a retaining wall by either stepping the courses or rolling the wall into the existing embankment. As a general rule, 2' of block buried into the hillside will prevent potential erosion. Complete your wall with available cap units placed flush with the face, set back slightly or set out as much as 1". Cap units should be installed by starting on one end of the wall, not in the middle. Use retaining wall adhesive on all cap units to hold them in place. Cap units may need to be split or cut for a proper fit (Figure 5).

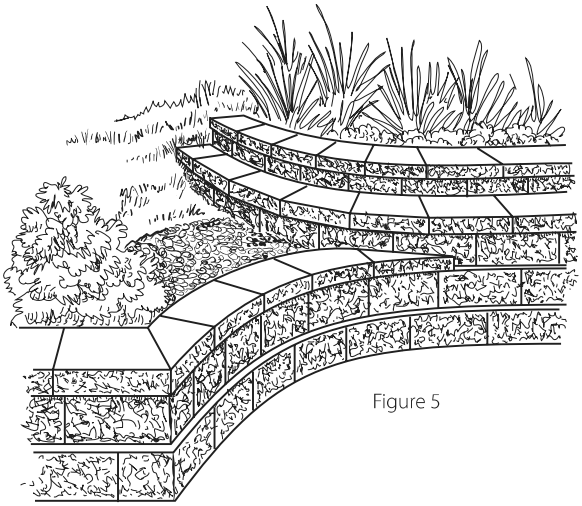


Figure 5

Inside Corners

Lay a unit perpendicular to the end of the wall so its side face is flush with the back of the first course. Complete the first course. On each successive row, alternate the position of units over the right angle to obtain an interlocking corner (Figure 6). For retaining wall systems with concrete locking mechanisms, make sure to cut or chisel off the locking mechanism to achieve the proper overlap.

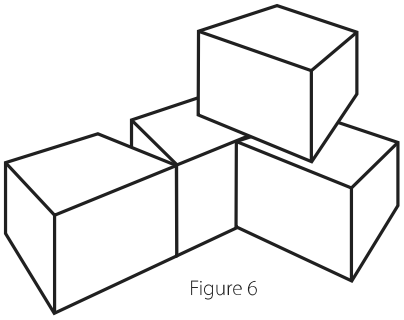


Figure 6

Curves

Simply fan or bring the tails of units together to make convex (outside), concave (inside) and serpentine curves (Figure 7).

Tribute retaining walls with curves:
The Tribute retaining wall system can create 4' radius curves with no cutting of units.

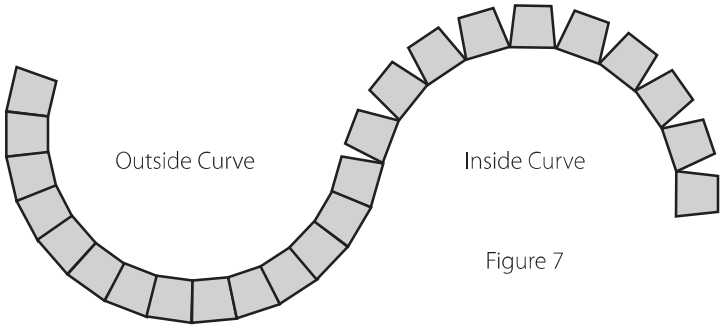
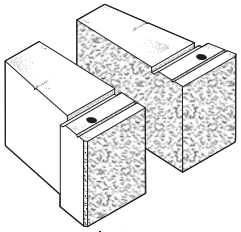
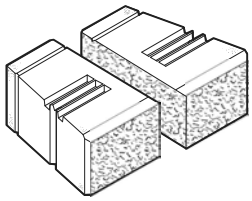


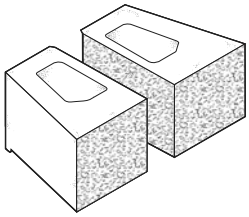
Figure 7



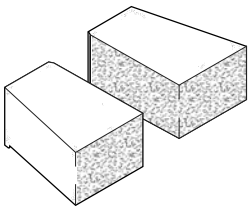
County Block



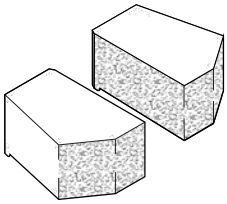
Tribute



Integrity



Winston (Straight)



Winston (Tri-split)

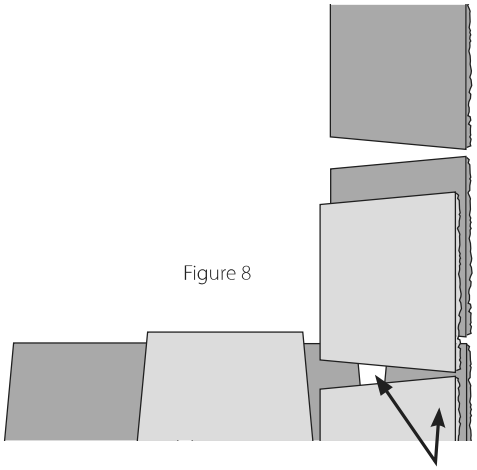


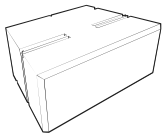
Figure 8

Smooth TRIBUTE

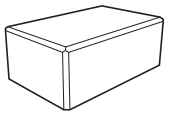
Smooth TRIBUTE® WALL SYSTEMS offer a clean aesthetic. Featuring multiple pin grooves on the top surface, these units allow a combination of retaining and freestanding wall options. Tribute Smooth units can be efficiently split in half in the field to construct pillars and wall accents.



Full Unit
(Front & back finish)
10 1/8 x 15 5/8 IN
6 HEIGHT



Corner / Column Unit
(4 sides finish)
10 1/8 x 15 5/8 IN
6 HEIGHT



PRODUCT NUMBERS

Smooth Face	
Enlighten	0076036N
Majestic	0076030N
Reflection	0076033N
Timeless	0076027N
Vision	0076023N
Allure	0076039N

Smooth Face Corner	
Enlighten	0076037N
Majestic	0076031N
Reflection	0076034N
Timeless	0076028N
Vision	0076023CRN
Allure	0076040N

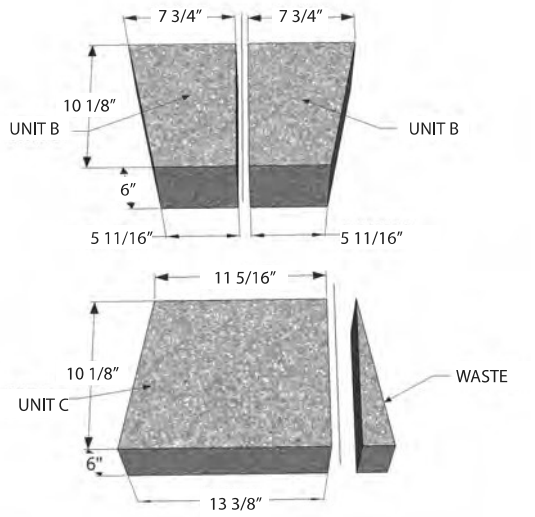
For Freestanding seat walls the Smooth Face Corner can be used in combination with adhesive.

SPECIFICATIONS

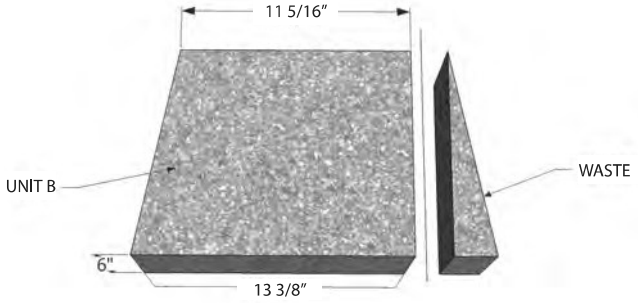
	SRW/FSW Unit	Corner/FSW Unit
Size (in.)	16 x 10 1/8	16 x 10 1/8
Pallet Type	Single	Single
Plant Production	Janesville	Janesville
Thickness (in.)	6	6
Per Pallet		
Layers	5	5
Sections		
UNITS per		
SqFt	1.5/1.7	1.5
Layer	8	8
Pallet	40	40
LBS per		
Layers	520	520
Pallet	2600	2600
pc	65	65
Column per		
	SRW/FSW = .67/.5	Corner = .65
Colors		
	Allure, Vision, Majestic, Timeless, Reflection, Enlighten	

Cutting Guide

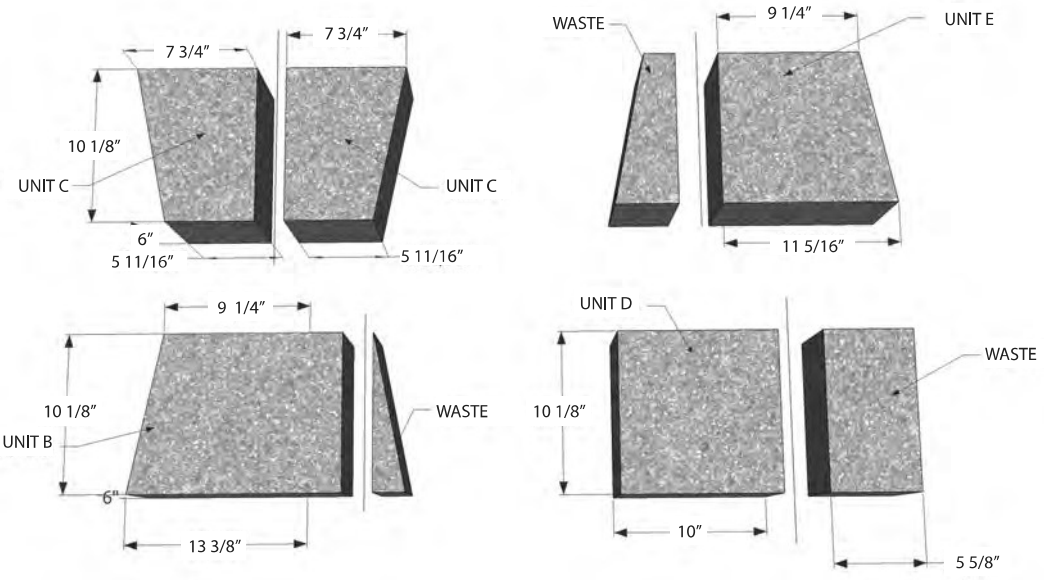
Wall Into Pillar



Wall Corner



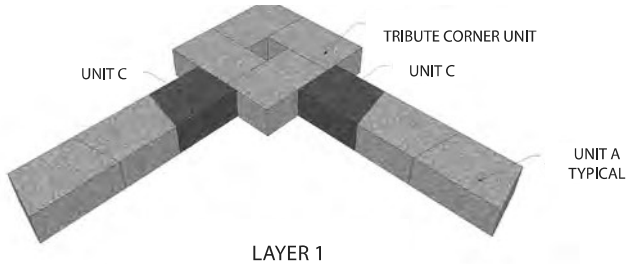
Wall End



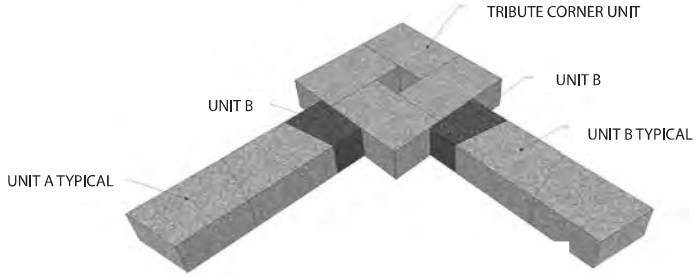
Smooth TRIBUTE - Corner Column & Wall

Assembly

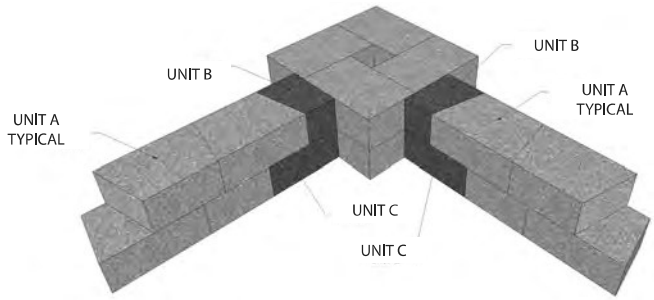
Wall Into Pillar



LAYER 1

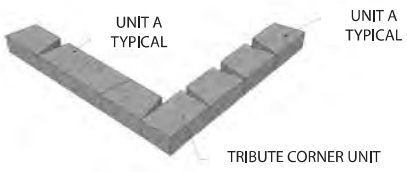


LAYER 2

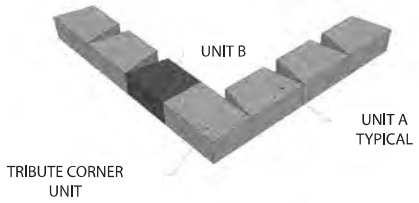


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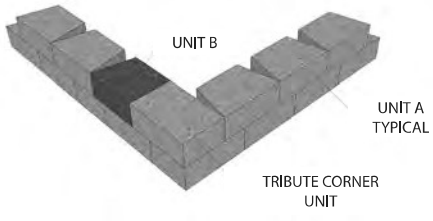
Wall Corner



LAYER 1



LAYER 2

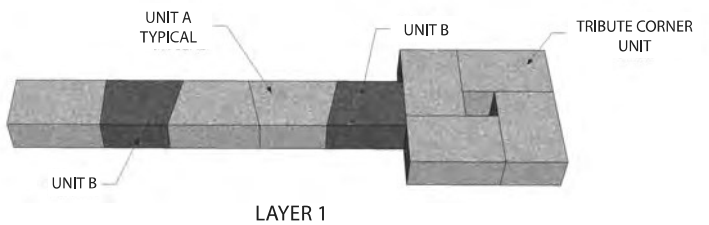


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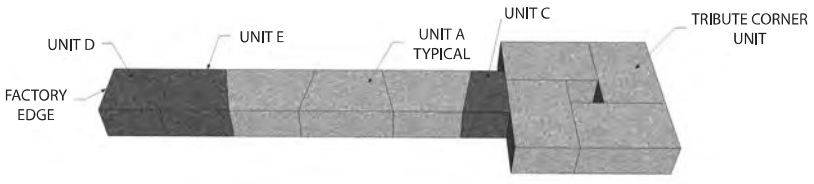
Smooth TRIBUTE - Corner Column & Wall

Assembly

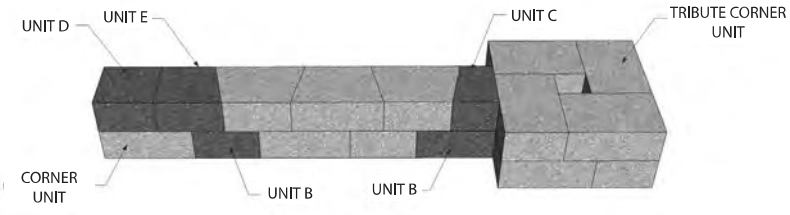
Wall End



LAYER 1



LAYER 2



ASSEMBLED