

ROSETTA®

BY R.I. LAMPUS COMPANY



GRAND LEDGE

INSTALLATION GUIDE

GRAND LEDGE WALL BLOCKS

18 sq. ft. / pallet • 220 lbs. / sq. ft. • 4,000 lbs. / pallet



72" x 20" x 12"



60" x 20" x 12"

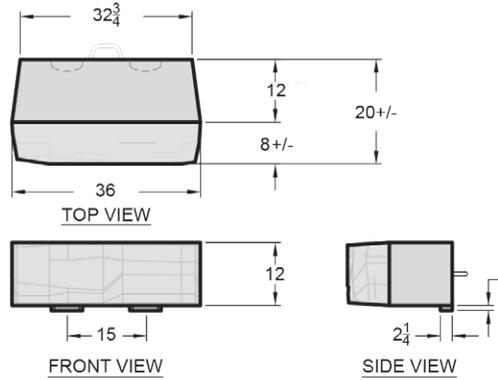
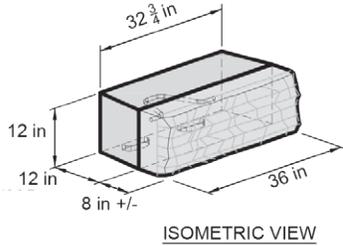


48" x 20" x 12"

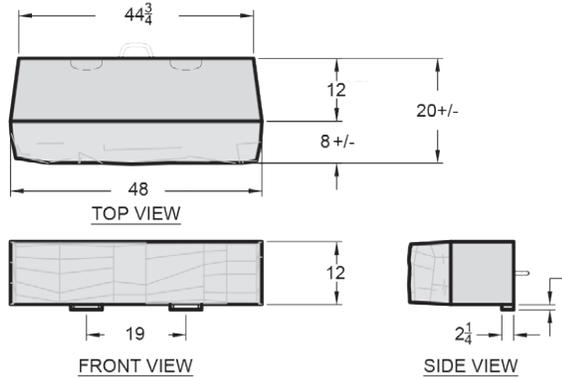
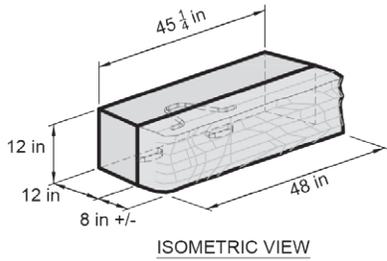


36" x 20" x 12"

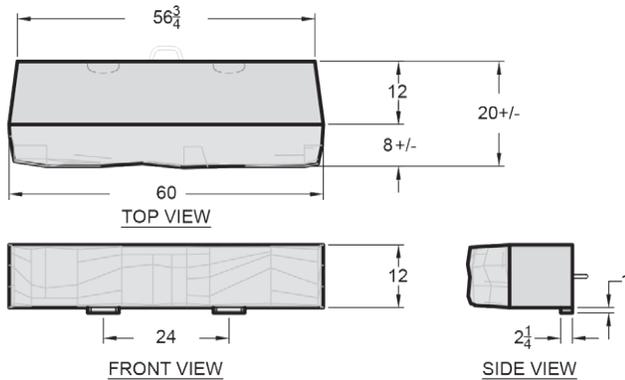
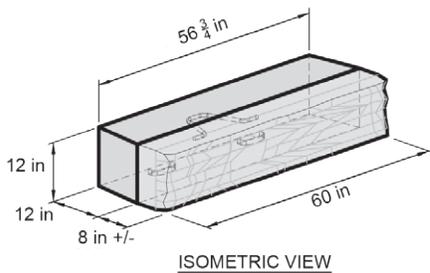
3-ft Block Weight = 660 lb



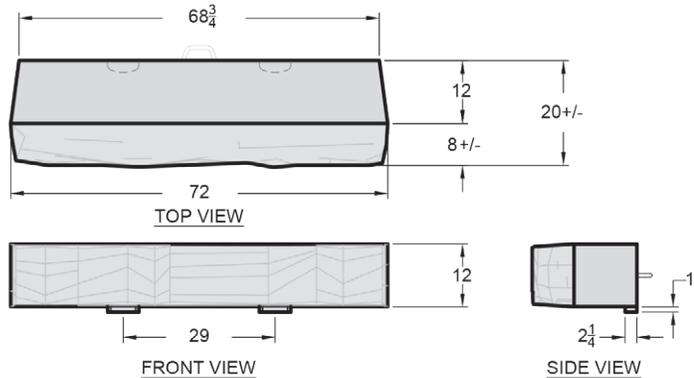
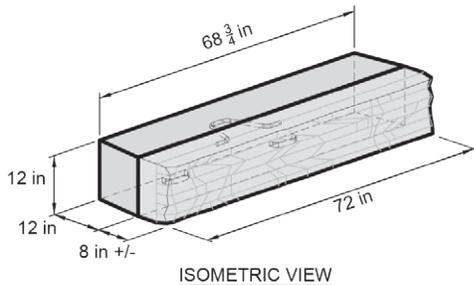
4-ft Block Weight = 890 lb



5-ft Block Weight = 1,080 lb



6-ft Block Weight = 1,350 lb



GRAND LEDGE 4-SIDED BLOCKS

One 12" & One 6" / pallet • 1,650 lbs. / pallet



51" x 26" x 12"



46" x 21" x 12"



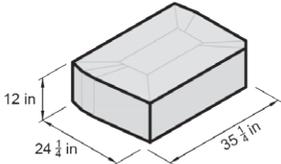
43" x 20" x 12"



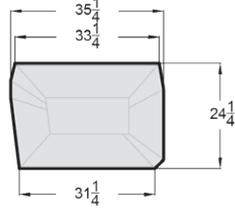
35" x 24" x 12"

Four-Sided Block A: 35 1/4-in x 24 1/4-in

Weight = 770 lb



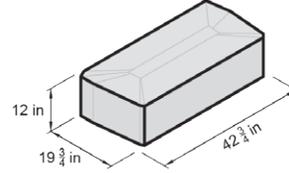
ISOMETRIC VIEW



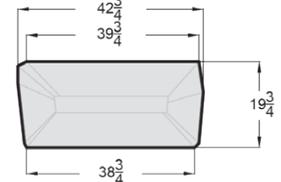
TOP VIEW

Four-Sided Block B: 42 3/4-in x 19 3/4-in

Weight = 760 lb



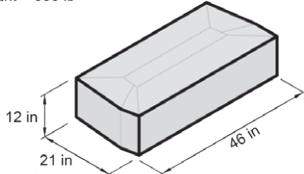
ISOMETRIC VIEW



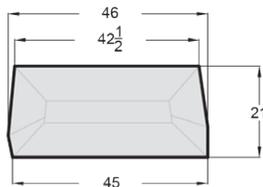
TOP VIEW

Four-Sided Block C: 46-in x 21-in

Weight = 880 lb



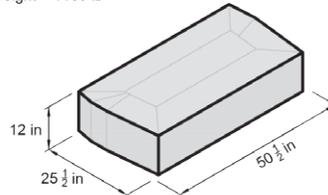
ISOMETRIC VIEW



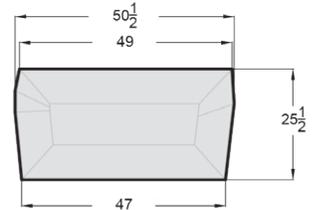
TOP VIEW

Four-Sided Block D: 50 1/2-in x 25 1/2-in

Weight = 1160 lb



ISOMETRIC VIEW



TOP VIEW

All Weights Are Approximate.

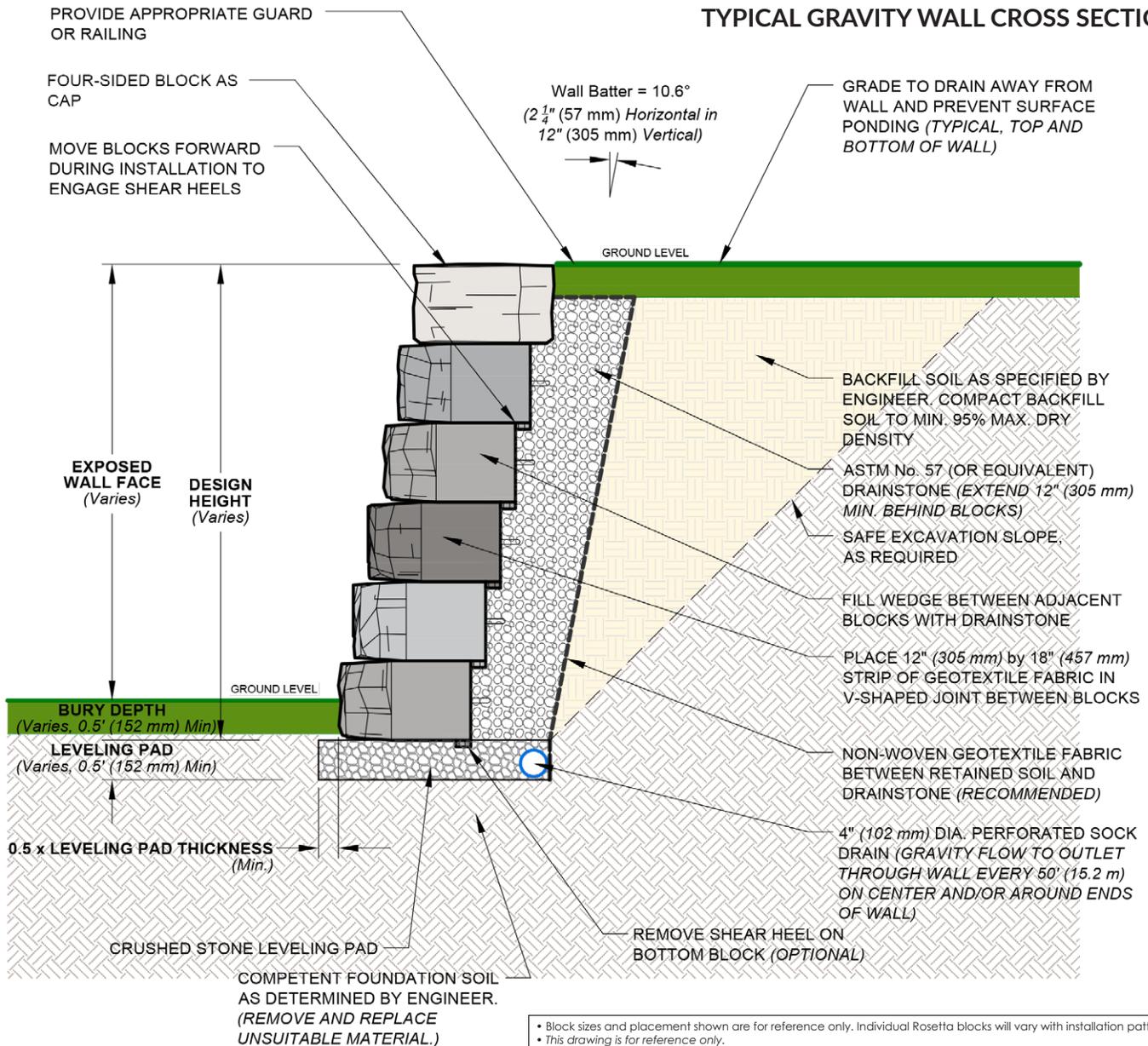


PRE-CONSTRUCTION:

Before you start construction, take the time to complete the necessary planning and preparation. This process will keep your project running efficiently and will aid in completing a quality installation. Make sure to address the following:

- Develop a project safety plan. Be sure to follow all applicable regulatory (ie. OSHA) standards. Be sure to address items such as: personal protective equipment, maintaining safe slopes, fall protection, rigging and lifting, and any other safety precautions.
- Attain the necessary permits and engineering. Permitting and engineering requirements vary location to location. Check with your local code requirements before constructing your wall.
- Review the project plans. Make sure that the plans take into account current site and soil conditions. Clays or poor soils place significantly greater loads on walls than free draining aggregates. If poor soils are present, make sure the plans account for them.
- Develop a plan to control surface water during construction. The time of year and local weather conditions can greatly impact the construction phase. Planning ahead can help alleviate issues related to water.

TYPICAL GRAVITY WALL CROSS SECTION



BASE PREPARATION:

Proper base preparation is one of the most critical elements of retaining wall construction. The retaining wall is only as stable as the foundation it is placed on. If subgrade soils are deemed unstable or excessively soft, contact a qualified geotechnical engineer for remediation. The solution may entail over-excavating and replacing the soft soil with compacted granular material.

First, excavate for the leveling pad. The minimum leveling pad thickness is 6 inches. Higher walls may require a thicker leveling pad based on the detailed wall design. The leveling pad should be a minimum of 36 inches wide, or wider if called for in the engineered construction drawings. The subgrade material should be compacted to 95% of its standard proctor maximum dry density.

Place a 4-inch diameter perforated drain at the back of the excavated trench. Make sure the drain has a long-term gravity outlet (either to daylight or to an approved catch basin).

Place clean crushed stone into the excavated trench. Level and compact stone to the design thickness. Check level with a laser or transit.

NOTE: Take time to make sure the base is accurately leveled. This will allow the wall to be installed much more efficiently.

PLACE BOTTOM COURSE:

Proper placement of the bottom course of wall blocks is critical in determining the overall appearance and integrity of the finished project. Take extra time on this step and the rest of the project will go smoothly.

Determine the best point of origin for the wall. If you have a fixed point, such as a building corner or a 90° corner, you will want to start the wall from that point and work your way out. This will minimize cutting of blocks. If there are no fixed points, start the wall at the lowest design elevation, as it is easier to step the base up than it is to step the base down.

Nearly all segmental block wall systems have a built in batter to provide greater wall stability. With Grand Ledge, the batter is 10.6 degrees, which equals 2 ¼ inches of setback for every 1-foot block height. The setback in blocks is achieved with shear heels which are cast into the blocks. You may find it useful to remove the shear heels from the blocks to be placed on the bottom course. This can be done using a demolition bar. Be sure to do this in a safe manner, keeping your body away from potential falling hazards.

Using an appropriately rated skid steer or small excavator and the Rosetta Lifting Device, place each block along the string line. Be sure that the safety latch on the Lifting Device is engaged before lifting each block. Use a bar to make small adjustments to bring the blocks into line. Because of the deeply textured faces of the blocks, it is best to align blocks by the mold line - the distinct transition between face texture and back of block.

After placing each block, check for level both front to back and side to side. If the block is out of level, either pick up the block and correct the base material, or tap it into place using the setting machine and a block of wood (to avoid marring the wall stone). Continue following the above procedures until the entire course of wall blocks has been placed.

PLACE UPPER COURSE:

Placing the next course of blocks is similar to placing the first course. The primary difference is that you must engage the shear heels of the upper blocks with the backs of the lower blocks. Tips to accomplish this include:

- Position the clevis in the Rosetta Lifting Device in such a way that the front of the block is slightly higher than the back of the block
- Hold each block behind and approximately ½ inch above the block below
- Swing the block toward the face of the block below until both shear heels engage
- Set the block down
- Make final adjustments with a large pry bar
- Ensure that adjacent blocks are aligned snugly side by side

BACKFILL:

Appropriate selection and placement of backfill is necessary for the structural integrity of the wall. Place only backfill materials which are consistent with the wall design. For safety reasons, do not stack wall blocks more than 3 feet high before backfilling. Before placing backfill materials, place an 18-by-12-inch strip of non-woven geotextile fabric in the v-shaped gaps between blocks. This will keep materials from eroding through the small voids between the blocks.

Place clean stone a minimum of 12 inches behind the wall. This creates a continuous drainage course for any water to rapidly reach the drain pipe. Hydrostatic pressure is the number one cause of retaining wall failure. This step is critical in keeping backfill materials dry and structurally sound.

Beginning at the back of the clean stone and working away from the wall, place and spread backfill soils. Compact soils in lifts of appropriate depth for the compaction equipment being used, typically 4-12 inches. Backfill materials must be compacted to 95% Standard Proctor. Generally, you should operate compaction equipment parallel to the face of the wall. Start at the back of the blocks, and work your way away from the wall until you reach undisturbed soils. Continue placing and compacting backfill materials until you approximately reach the top of the upper course of blocks.

FINISHING THE WALL:

Completing a few simple tasks near the end of the project will ensure that the wall will function properly and look good for years to come.

Make sure that the drain pipe is tied into a catch basin or run to a long term daylight opening. If you are using flexible drainpipe behind the wall, convert it to Schedule 40 PVC or equivalent before outleting from behind the wall. This will ensure that the pipe is not easily crushed during future construction.

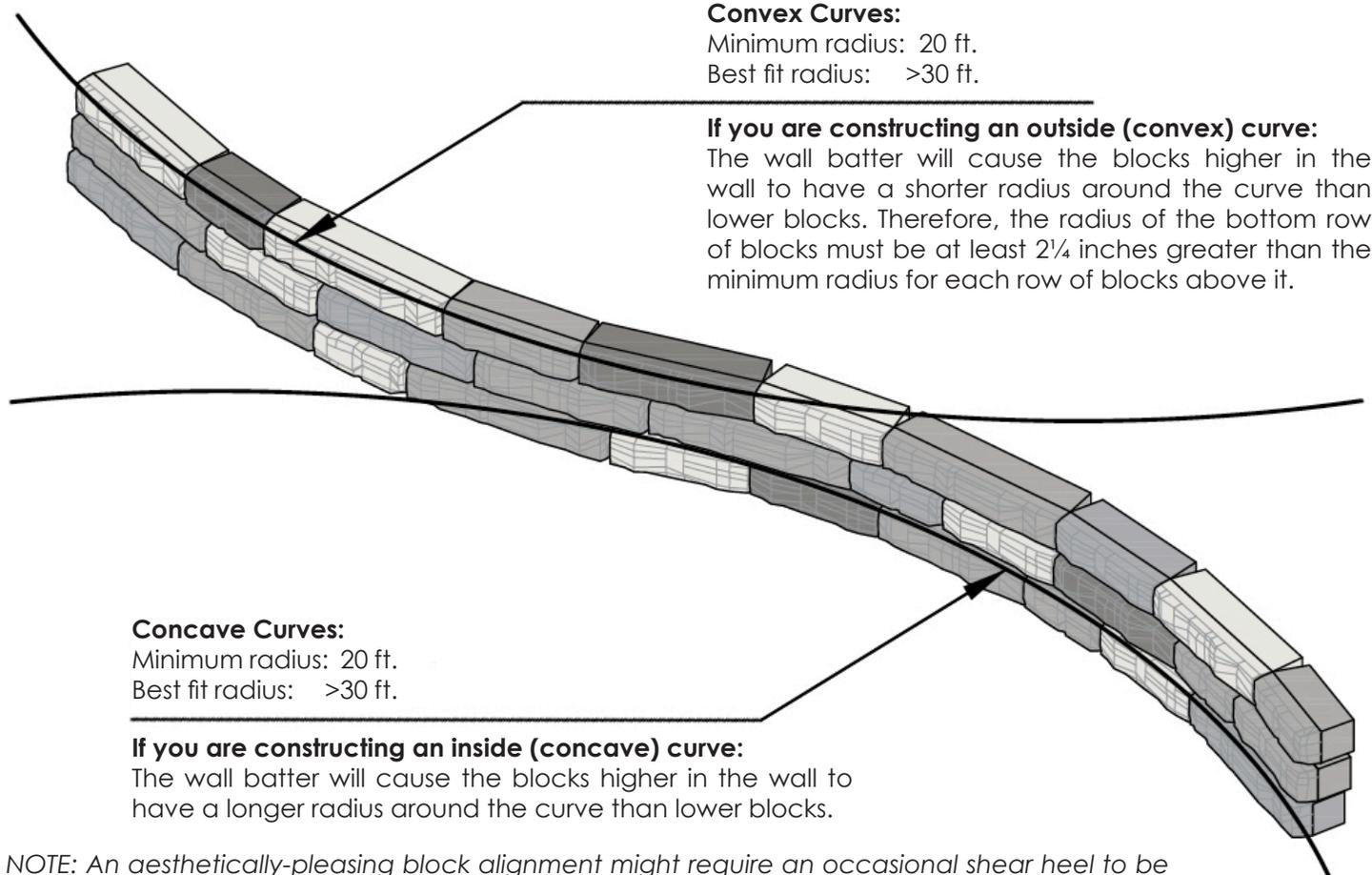
Place non-woven geotextile fabric over the clean stone. You may need to leave the clean stone down 4-6 inches from the top of the wall to allow for landscape or other materials.

Grade the top of the wall in such a way that water runs off away from the wall. Never leave the top of a wall graded where surface water will pond behind the wall. If future grading is to take place by others, you should have a responsible party sign off regarding this point.

CURVES:

Grand Ledge blocks are tapered to allow them to form a wide range of curves as may be desired for your project. The minimum radius that can be accomplished without cutting blocks depends on the taper angle and the block length. For the average mixture of block sizes within the Grand Ledge product line, the minimum radius that can be achieved is 20 feet; however, we recommend limiting the radii of curves to no less than 30 feet for better constructability and aesthetics. These minimum values are suitable for both outside (convex) and inside (concave) curves.

Grand Ledge blocks have shear heels which provide a setback from lower blocks in the wall, causing the wall to batter back. This batter is important to the engineering design of the wall, and it must be accounted for during construction of a curved wall section.



Convex Curves:

Minimum radius: 20 ft.

Best fit radius: >30 ft.

If you are constructing an outside (convex) curve:

The wall batter will cause the blocks higher in the wall to have a shorter radius around the curve than lower blocks. Therefore, the radius of the bottom row of blocks must be at least 2¼ inches greater than the minimum radius for each row of blocks above it.

Concave Curves:

Minimum radius: 20 ft.

Best fit radius: >30 ft.

If you are constructing an inside (concave) curve:

The wall batter will cause the blocks higher in the wall to have a longer radius around the curve than lower blocks.

NOTE: An aesthetically-pleasing block alignment might require an occasional shear heel to be removed to allow for a smoother curve. This is acceptable in limited amounts without significantly affecting wall structural performance.

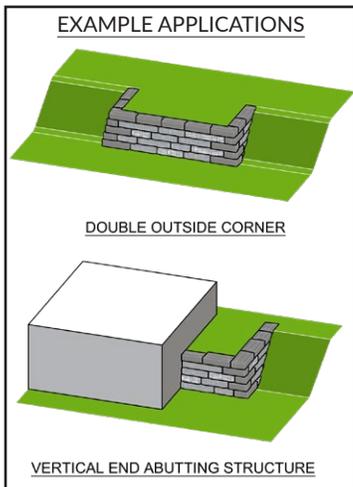
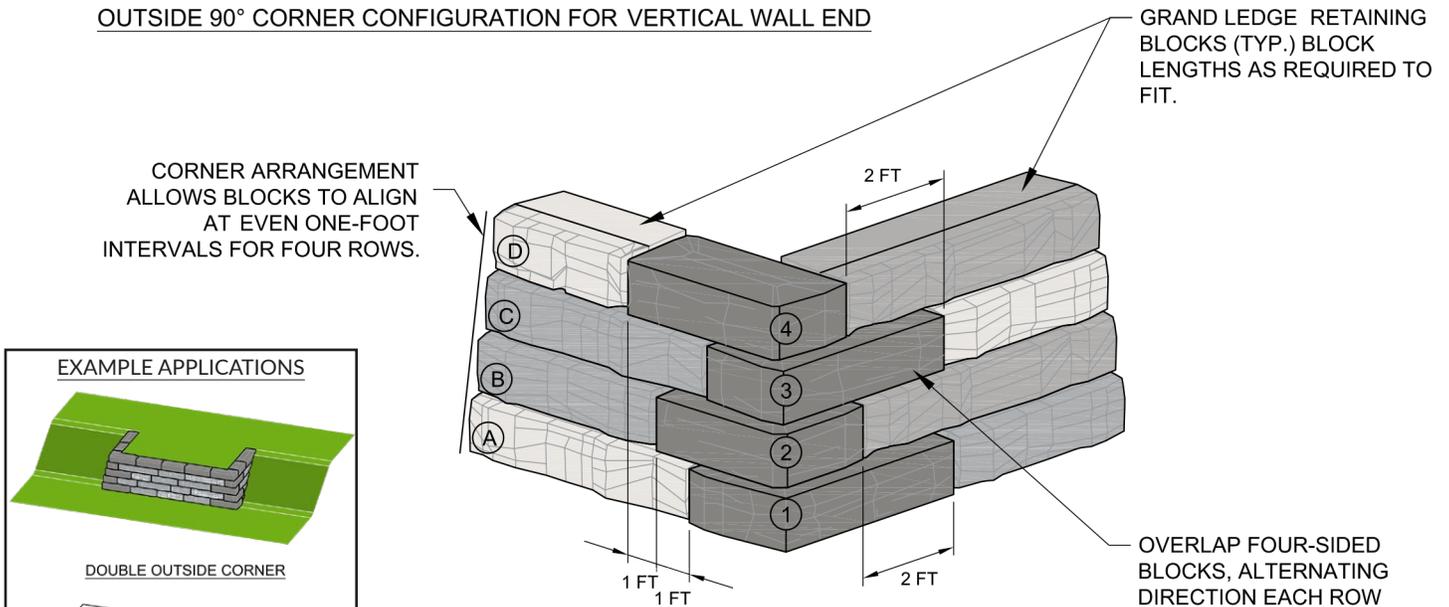
CORNERS:

Inside corners can be constructed using the Grand Ledge retaining blocks. Inside corners can be constructed by overlapping the perpendicular blocks from alternating rows. Alternatively, one leg of the wall can be constructed first and the perpendicular leg can then be abutted against it.

The Grand Ledge system has four, 4-sided blocks that are used to create 90° outside corners. Simply overlap the 4-sided blocks at the corner, alternating the orientation of the overlapping blocks by 90°. Each 4-sided block should be offset by the block below by 2 ¼ inches to maintain the batter of each leg of the wall.

For walls where there is an outside corner and a vertical constraint (such as another retaining wall or a foundation wall), or a pair of outside corners, cutting blocks may be necessary to fit the constraints and maintain the batter on each leg of the wall. Cutting can be reduced for walls of 4 feet or less by using the following pattern:

OUTSIDE 90° CORNER CONFIGURATION FOR VERTICAL WALL END



MINIMUM SIDE WALL LENGTH (NO CUTS)

- A. 60" x 20" WALL BLOCK
- B. 48" x 20" WALL BLOCK
- C. 60" x 20" WALL BLOCK
- D. 36" x 20" WALL BLOCK

CORNER BLOCKS

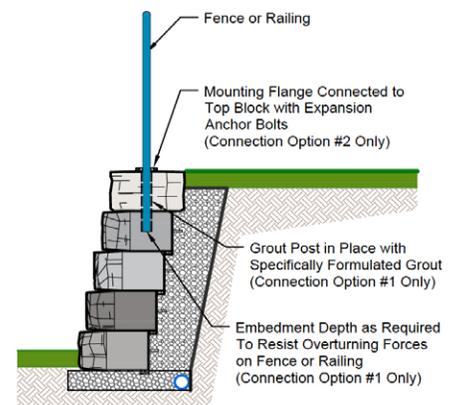
- 1. 50 ½" x 25 ½" 4-SIDED BLOCK
- 2. 35 ¼" x 24 ¼" 4-SIDED BLOCK
- 3. 46" x 21" 4-SIDED BLOCK
- 4. 42 ¾" x 19 ¾" 4-SIDED BLOCK

NOTE: Pattern shown minimizes the requirement for cutting blocks to fit to vertical constraints on either side of corner, and for double outside 90° corners, provided corner is spaced from end at an even one-foot increment and wall is straight. Cutting of blocks to fit will be required for other scenarios. Applicable to walls up to 4 feet tall (plus cap).

RAILINGS & GUARDS:

Building codes typically require railings, or guards, to be installed when retaining walls are over a certain height to prevent falls. Guards must be designed and constructed to resist the code-required loads.

Posts may be embedded in the backfill soil behind the wall, or can be fastened to the Grand Ledge blocks themselves. When attaching to the blocks, either grout the posts in cored holes or use a surface-mounted flange attached to the blocks with anchor bolts. To avoid spalling, maintain at least 4 inches clear distance from the core holes or bolt holes to the edge of the blocks. Make sure enough block mass is engaged by the posts to withstand the required loads.

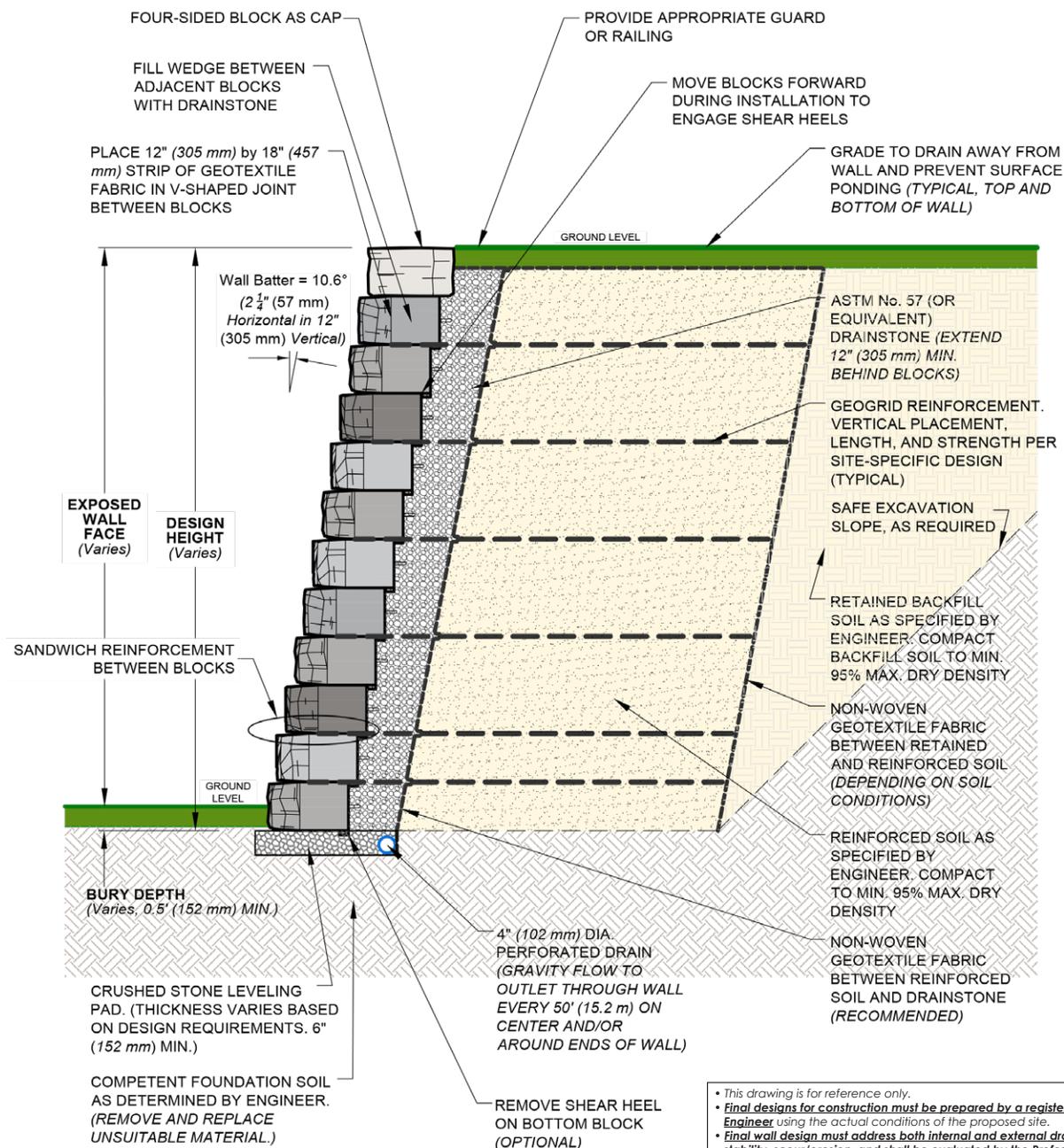


REINFORCED WALLS:

For walls that need to be taller than what is stable using an unreinforced, gravity-type structure (ie. stacked blocks), they can easily be reinforced with geogrid.

The leveling pad and bottom row of blocks are installed as outlined in the step-by-step instructions in this guide. Then, place the specified reinforced soil fill to the top of the block and compact. Place geogrid (of the specified strength) on the block and compacted reinforced soil lift. The geogrid should extend from the back of the face texture (i.e. mold line) to the specified length. Note that the strength of geogrid is usually different parallel to the roll direction versus perpendicular. Make sure it is placed in the correct direction. Do not overlap adjacent sheets.

The block-to-geogrid connection is simply a frictional ("sandwiched") connection, so the next row of blocks is placed right on top of the geogrid. Remove wrinkles and hold the geogrid tight while the reinforced backfill material is placed. Begin by placing backfill near the block and work outwards, toward the end of the geogrid. Compact in the same general pattern, from the back of the block outward. This helps to remove any slack. Avoid operating equipment directly on the geogrid; ensure there is at least 6 inches of soil over the geogrid prior to driving over it. Continue with the wall placement, repeating as necessary, placing geogrid layers at the vertical locations specified in the design.

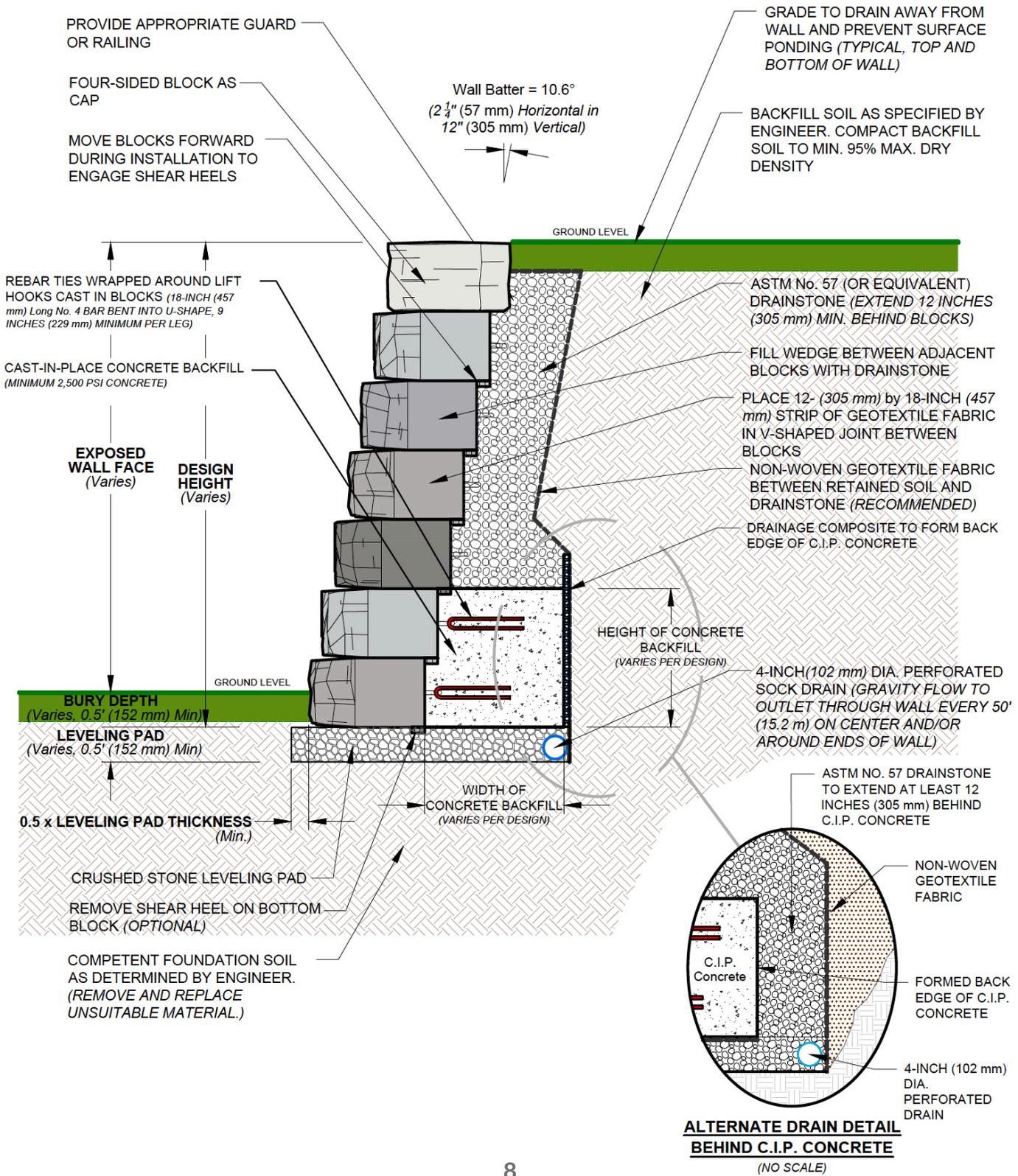


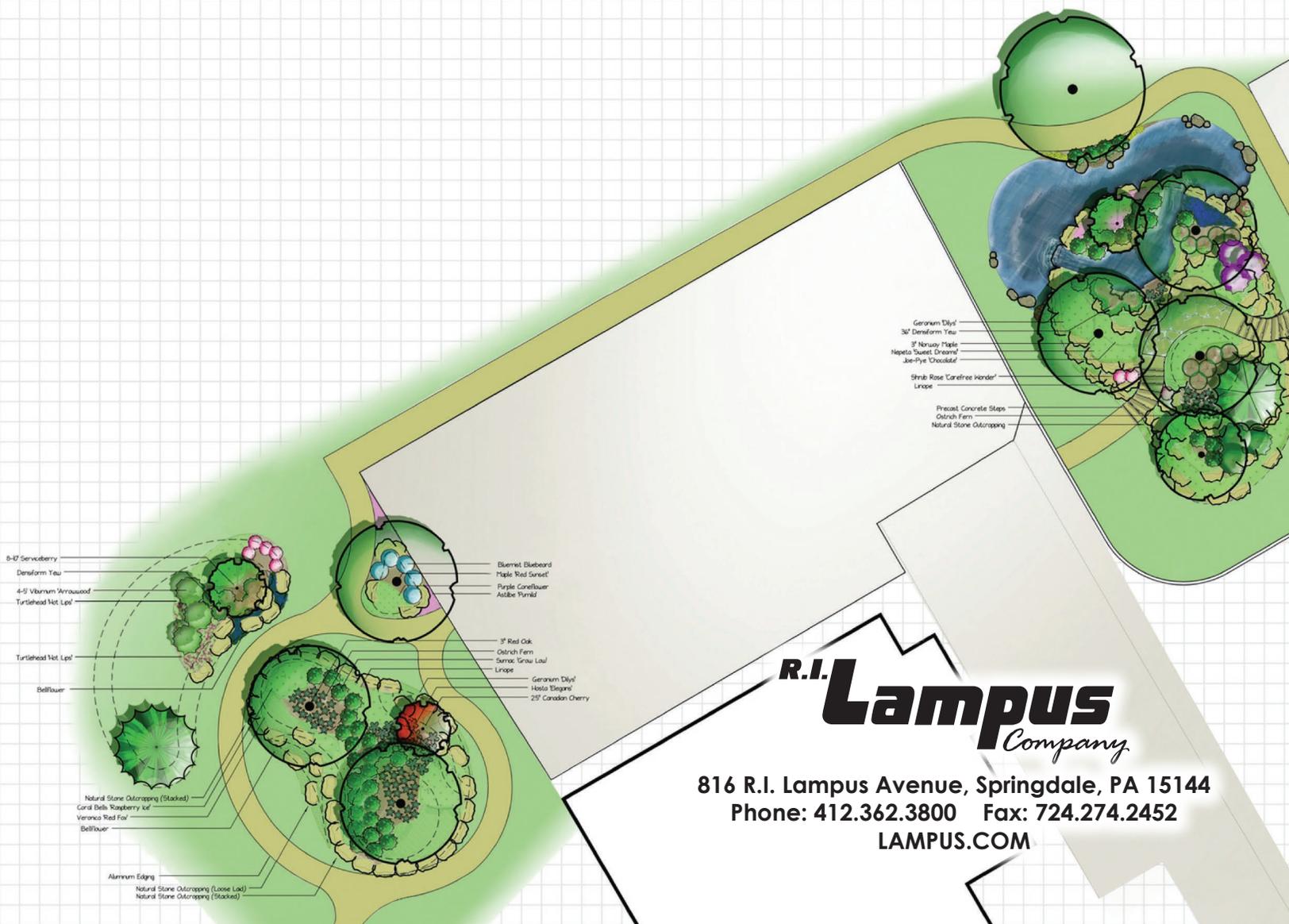
This drawing is for reference only.
 Final designs for construction must be prepared by a registered Professional Engineer using the actual conditions of the proposed site.
 Final wall design must address both internal and external drainage, global stability, scour/erosion, and shall be evaluated by the Professional Engineer who is responsible for the wall design.

CONCRETE BACKFILL:

Where more height is required than what can be obtained from a standard gravity wall, but site constraints make a geogrid reinforced wall undesirable, cast-in-place concrete can be used to add additional width and mass to the lower blocks of the wall, improving stability and allowing additional height.

Tie the Grand Ledge blocks to the cast-in-place concrete using 18-inch long lengths of No. 4 reinforcing steel bent into a "U", looped through the lift hooks in the back of the blocks and extending into the mass of concrete behind. The dimensions (height and width) of the cast-in-place concrete depend on the site-specific conditions and are determined as part of the wall design.





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