

Freestanding Walls, Columns, and Vertical Walls

TECHNICAL BULLETIN

This Technical Bulletin is the sixth in a series of informational papers that provide application ideas and “how-to” tips for VERSA-LOK® Retaining Wall Systems.

FREESTANDING WALLS

Solid VERSA-LOK® Standard units do it all, including easy-to-install freestanding walls with the same natural, classic look as VERSA-LOK Standard retaining walls. VERSA-LOK units are easily modified by splitting off the back of the units. From these split units, installers can build freestanding walls with textured faces on both sides.

Unlike retaining walls, freestanding walls are exposed on both sides and do not retain soil. Designers can use VERSA-LOK freestanding walls for stand-alone walls set directly at grade (Figure 1) or for parapets, extending above the top of retaining walls (Figure 2).

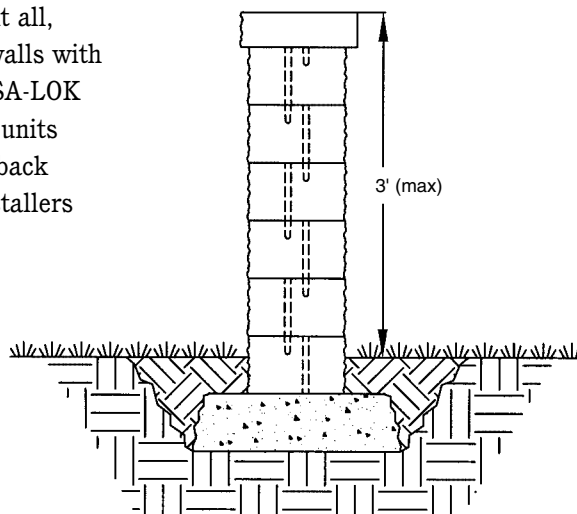


FIGURE 1

Similar to VERSA-LOK retaining walls, freestanding wall units inter-connect with pins and rest on granular leveling pads. No mortar or concrete footings are needed. The weight of freestanding units and the pinned unit connection provide wall stability. Stand-alone freestanding walls are stable up to three feet. Freestanding walls used as parapets at the top of retaining walls are stable up to 2.5 feet.

While VERSA-LOK freestanding walls provide excellent aesthetic options and visual screening, do not rely on them or use them to resist loads such as pedestrian or vehicular traffic. To protect against lateral loads, engineer-designed structures (like guardrails or concrete traffic barriers) should be installed behind walls. For more information, see Technical Bulletin No. 8 – Fences, Railings, & Traffic Barriers.

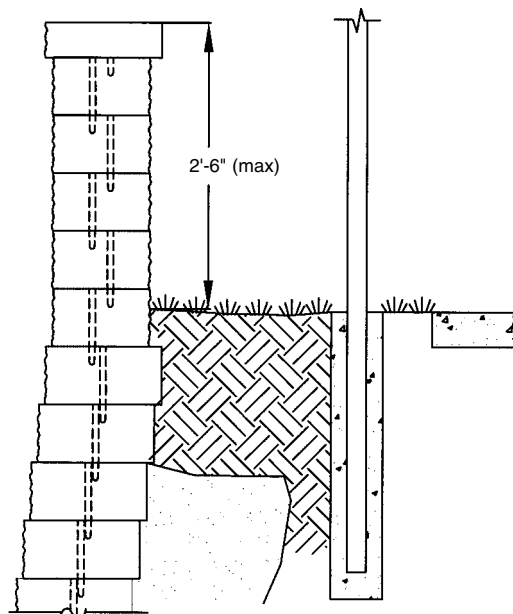


FIGURE 2

VERSA-LOK®
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SPLITTING UNITS FOR FREESTANDING WALLS

Splitting on the groove that extends across the back of a VERSA-LOK® Standard unit (Figure 3) creates a textured split-face on the back of the unit, similar to the appearance on the front face. Because this split is two inches from the back, it reduces the original 12-inch-deep unit to ten-inches deep. For consistent splits, a mechanical splitter must be used. In some cases, a supplier may be able to provide pre-split units for an added charge. Check with your local VERSA-LOK supplier.

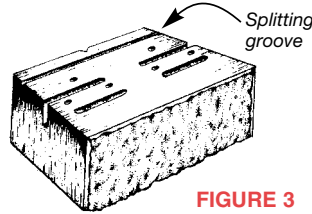


FIGURE 3

STRAIGHT FREESTANDING WALLS

Using these back-split units, install straight freestanding walls by aligning the rear split face of one unit with the front face of the units placed next to it (Figure 4).

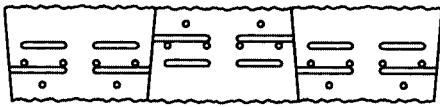


FIGURE 4

Continue alternating the direction units face as you place the remainder of units for the first course. Place succeeding courses in the same way but shift each course halfway over the units below (half-bond). Pin units using the center holes and front slots (Figure 5).

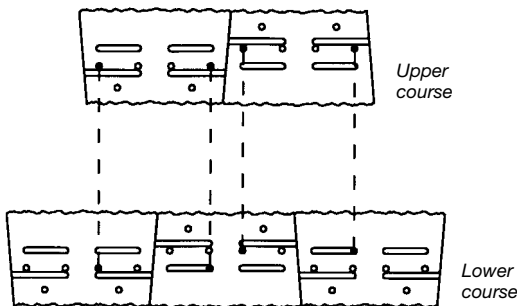


FIGURE 5

In addition to pinning, VERSA-LOK Concrete Adhesive is used between each course to help stabilize the wall. However, do not stop using pins. Full curing of adhesive may take several days. Without pins, wall units may slide as work progresses.

CURVED FREESTANDING WALLS

Create curved freestanding walls by placing the back-split units tightly next to each other, with the front of the units all on the same side (Figure 6). This creates about an eight-foot radius curve, measured from the front of the units. (No other radius is possible without gapping units or extensive saw-cutting.) Place succeeding courses the same way, with the next course of units shifted halfway over the units below (half-bond).

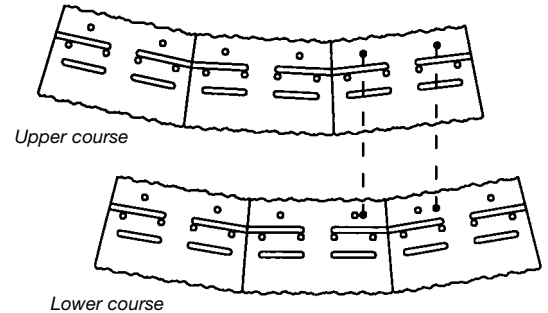


FIGURE 6

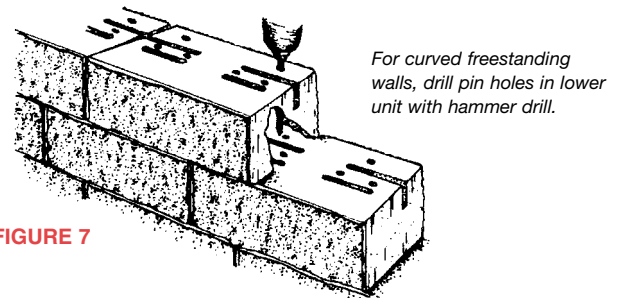


FIGURE 7

Pinning curved freestanding walls requires drilling receiving pinholes with a hammer drill (Figure 7). Pass a 1/2-inch-diameter by ten-inch-long masonry bit through the rear holes in upper units and bore two-inch deep holes into the lower units. Pin through the rear holes of the upper units into the newly drilled holes in lower units. Also use VERSA-LOK Concrete Adhesive on each course to help stabilize wall. Transitions from curved to straight walls or serpentine curves require saw-cutting units.

CAPS FOR FREESTANDING WALLS

There are two suggested methods for capping freestanding walls. The standard method uses VERSA-LOK® Caps without modification. Place these 12-inch-deep caps so they overhang both sides of the wall units by one inch. VERSA-LOK Caps have a split face only on the front, so this method leaves one side of the cap with a smooth face (Figure 8).

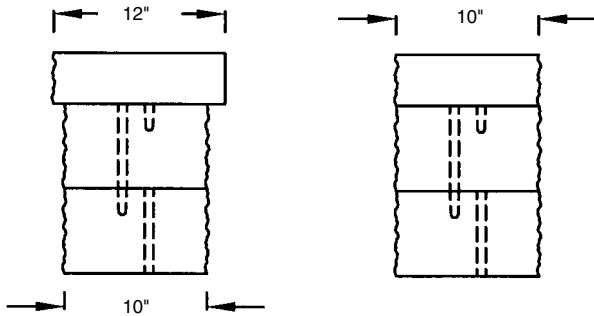


FIGURE 8

FIGURE 9

An alternate capping method provides textured faces on both sides of the cap but eliminates overhang of the cap. Using a mechanical splitter, split off the back two inches of the caps (a minimum two-inch split is needed to achieve a proper split). Place these modified caps with the split-faces of the caps flush with the faces of the wall units (Figure 9).

For straight freestanding walls, alternately place A and B cap units along the length of the wall. For curved walls, place all A caps or all B caps. The radius of either A or B caps is slightly different than the eight-foot radius of the wall units, so some cutting of caps on curved walls is needed to create a completely gap-free appearance. Arrange all cap units first, then secure with VERSA-LOK Concrete Adhesive. For more information on capping, see Technical Bulletin No. 4 – Caps.



ENDS FOR FREESTANDING WALLS

The end of a freestanding wall can be nicely finished with textured, split-faces that match the faces on the front and back of the wall. Split the modified freestanding wall units between the slots (Figure 10). This split should be as close to the slots on one side as possible, without exposing these slots. Place these split units at the end of each course, alternately using the narrower-split and then the wider-split units on succeeding courses. For the courses ending with the wider-split units, place a saw-cut partial unit next to the end unit to get back on half-bond (Figure 11).

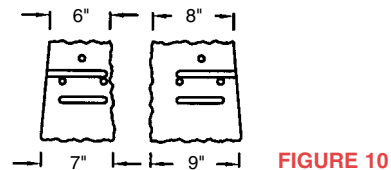


FIGURE 10

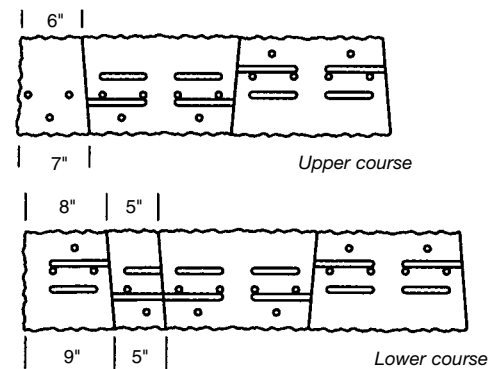


FIGURE 11

COLUMNS

A wide variety of attractive columns can be easily installed from VERSA-LOK Standard units. Like VERSA-LOK retaining walls, columns less than four feet high can be stacked without mortar, placed on granular leveling pads, and do not require footings below frost (Figure 12). Generally, columns should have a minimum of one course of units (six inches) buried below grade. VERSA-LOK columns typically have a vertical face (no setback).

While VERSA-LOK columns make excellent decorative landscape fixtures, they should not be used to support loads or exceed four feet in height without structural reinforcement designed by a qualified engineer

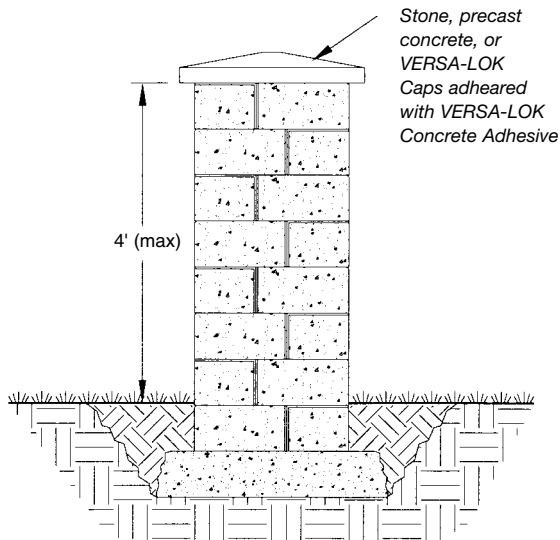


FIGURE 12

A 20-inch-square column is created simply by splitting VERSA-LOK® Standard units into half-units and placing a half-unit at each of the four corners of the column (Figure 13). For each succeeding course, shift the bond so the half-units being placed overlap the half-units below (Figure 14). One simple way to do this is to split four VERSA-LOK Standard units at a time. Place the four, right-side half-units first and then, for the next course, place the four, left-side half-units.

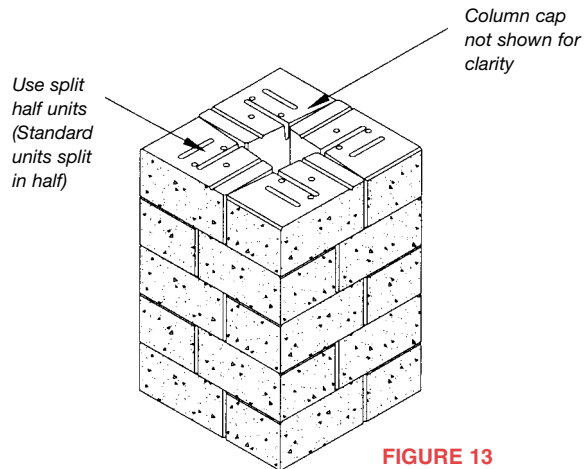


FIGURE 13

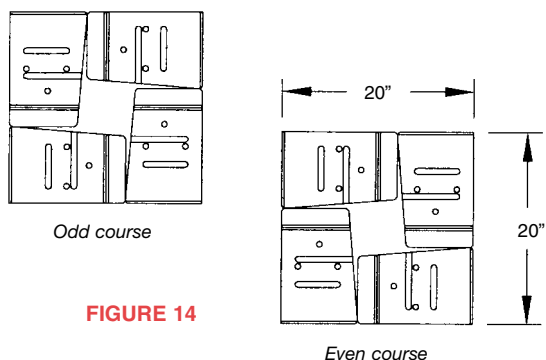


FIGURE 14

A 36-inch-square column also can be easily installed by combining four half-units with four whole units for each course of the column. Each succeeding course of units should be shifted so units placed overlap the units below (Figure 15). Building columns of other sizes is also possible by placing half-units at the corners and combinations of whole or saw-cut partial units between the corner, half-units.

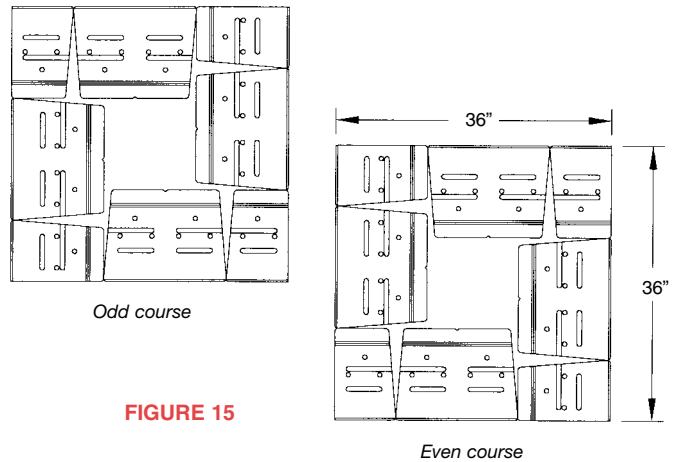


FIGURE 15

Units placed in columns will not pin. So each course of units should be adhered to the units below with VERSA-LOK Concrete Adhesive. Do not use rigid adhesive or mortars for VERSA-LOK columns on flexible granular pads, they will shift slightly causing rigid adhesives to fail.

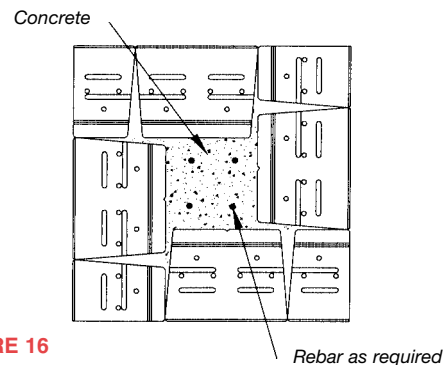


FIGURE 16

Columns can be built taller than four-feet-high but a taller column requires a structural footing below frost, tied to concrete and steel reinforcement within the column. The center hole of the column (behind the units) provides a space in which steel-reinforced concrete can be placed (Figure 16). Column units may require temporary bracing during placement of concrete within the column until the concrete sets. A qualified professional Civil Engineer should provide a design for columns over four feet high.

COLUMNS WITH WALLS

VERSA-LOK® columns can be combined with VERSA-LOK freestanding walls to create attractive landscaping elements. Also, columns provide an aesthetic way to create a corner within a freestanding wall (Figure 17). The suggested way to incorporate a column with a freestanding wall is to saw-cut the units in the freestanding wall to butt against the adjacent column. With proper design, columns can also be used as highlight elements or corner features within VERSA-LOK retaining walls.

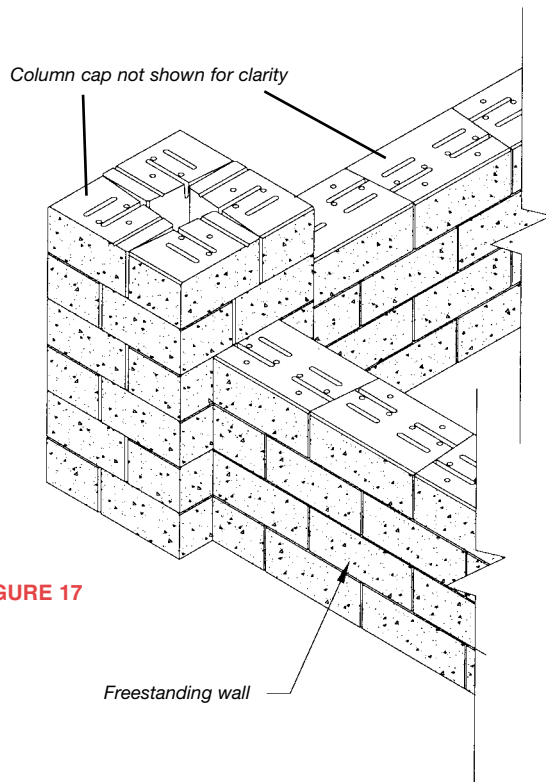


FIGURE 17

VERTICAL RETAINING WALLS

On tight project sites, building vertical VERSA-LOK retaining walls can save valuable space at the top of the wall. However, there are several reasons installing walls with the standard 3/4-inch setback may be preferable, when space allows. Vertical walls are not as stable as setback walls because they do not lean back into the soil. The maximum unreinforced vertical retaining wall height is three feet and may be lower depending on site and soil conditions. Vertical walls also eliminate the aesthetically pleasing horizontal lines created by the standard setbacks. Installers should use special care when building vertical walls to avoid moving units during construction. Any deviation in alignment of a vertical wall is very visible and also may affect wall stability. Also, reinforced vertical walls require more geogrid, better backfill, and more installation time than setback walls. While vertical walls are more difficult to pin properly, using VERSA-LOK Concrete Adhesive in place of pins is not recommended. The adhesive may take several days to fully cure and retained soil pressures may slide units out of place during, or shortly after, construction.

STRAIGHT VERTICAL RETAINING WALLS

Straight vertical walls are installed on half-bond (upper unit halfway over lower units) so the rear pin holes line up. Do not build vertical walls on stacked-bond (upper units directly over lower units). After laying the base course, insert pins into all the rear holes and, using a second pin and hammer, drive the pins two to four inches into the leveling pad. Pins in the base course provide a stop, keeping pins in the units above from dropping all the way through the upper units. Lay the next course of units so the rear holes in each upper unit line up with the rear holes in both units below (Figure 18). Insert pins through upper units, into the rear holes in the units below.

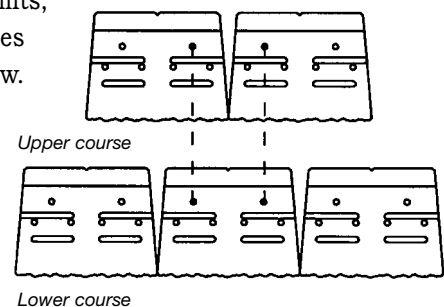


FIGURE 18

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TECHNICAL BULLETIN

This Technical Bulletin is the sixth in a series of informational papers that provide application ideas and "how-to" tips for VERSA-LOK® Retaining Wall Systems.

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U.S. Patent 6,488,448,
U.S. Patent D139,885,
U.S. Patent D321,060,
U.S. Patent D341,215,
U.S. Patent D346,667,
U.S. Patent D378,702,
U.S. Patent D391,376,
U.S. Patent D435,302,
U.S. Patent D452,332 and
other U.S. patents pending;

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CURVED VERTICAL RETAINING WALLS

Curved vertical walls require drilling so they can be pinned. The procedure for drilling pin holes is similar to that described previously for freestanding walls. Position upper course units on half-bond and drill through both rear holes in upper units into the lower units to create receiving pin holes (Figure 19). Pin units using these holes.

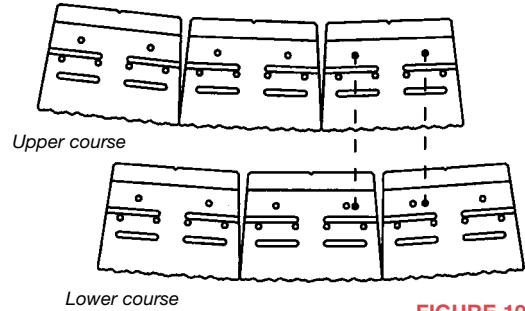


FIGURE 19

CORNERS FOR VERTICAL RETAINING WALLS

Inside and outside corners for vertical retaining walls are installed similarly to corners for setback walls. However, to maintain the half-bond needed for vertical walls, additional saw-cut partial units must be installed next to the corner units. For an outside 90-degree corner, lay a split half-unit at the corner and then place a saw-cut, 12-inch-wide, partial unit next to it (Figure 20). Corner and partial units should be secured with VERSA-LOK® Concrete Adhesive or drilled and pinned.

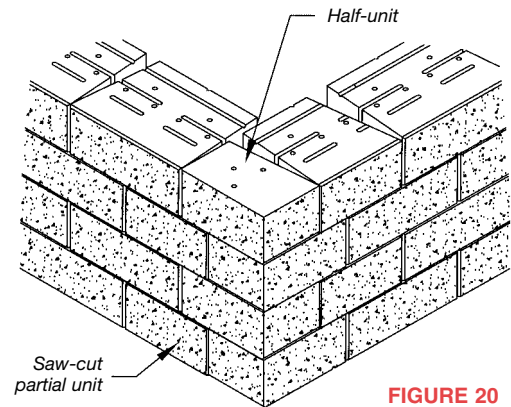


FIGURE 20