This Technical Bulletin is the sixth in a series of information papers in which we will be providing application ideas and "how-to" tips for VERSA-LOK Retaining Wall Systems.

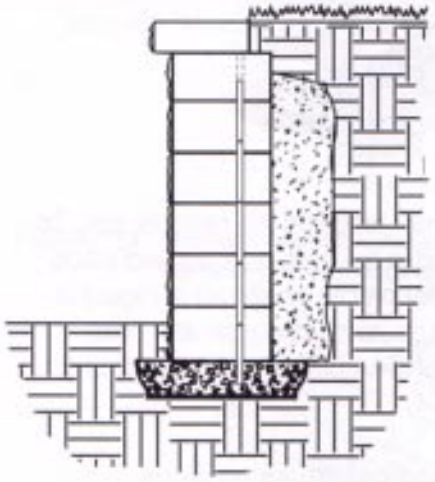
VERTICAL RETAINING WALLS AND FREESTANDING WALLS

VERTICAL RETAINING WALLS
(No setback)

The standard VERSA-LOK unit is adaptable to building vertical walls with no setback, if required. Straight walls can be pinned from back hole to back hole when units are laid on a half-bond only; no further modification is needed in this case. If the bond changes from half-bond, it will be necessary to drill "receiver" holes in the unit directly beneath the course being laid. Both concave (inside) and convex (outside) curved vertical walls can also be built; however, drilling of receiver holes is necessary for all curves regardless of radius or bond desired. Do not build vertical or freestanding walls in a stacked bond (units stacked directly on top of each other).

The maximum recommended exposed height of a vertical VERSA-LOK retaining wall without reinforcement is three feet. At this height, embedment of one course (6") below grade is strongly recommended for added wall stability. For vertical VERSA-LOK walls in excess of three feet high, special soil reinforcing requirements are needed - consult the technical department at VERSA-LOK.

FIGURE 1 **VERSA-LOK vertical retaining wall**

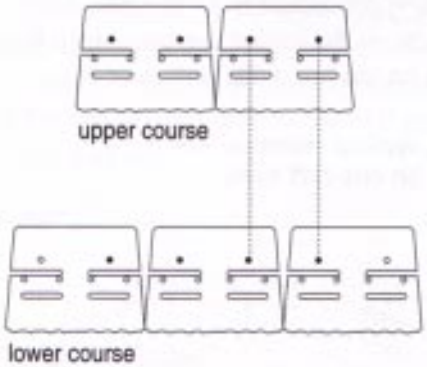


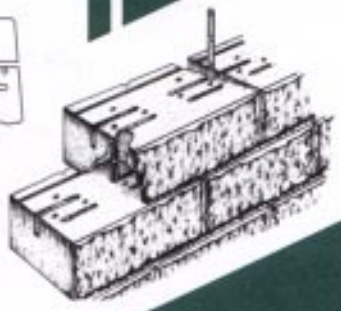
Installing Straight, Vertical Retaining Walls (Half-bond)

Procedures for excavation of subgrade, preparation of leveling pad, laying of base course units, and placement and compaction of granular drainage fill when building vertical retaining walls are the same as those used when building conventional VERSA-LOK walls.

Before placing the second course of units in a straight, vertical wall, insert VERSA-TUFF® pins in all back holes of base course units and, using a second pin and hammer, drive them approximately two inches into the leveling pad soil. (Figure 1) Align the second course unit on half-bond so that the back holes line up with the back hole in each of the two units below. (Figure 2) Insert a pin in each hole and continue installation procedures until the wall is finished.

FIGURE 2 **Straight, vertical retaining wall Pinning on one-half bond (Pin hole to hole using rear holes)**



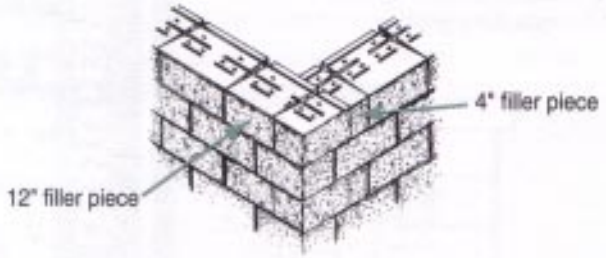


VERSA-LOK® Retaining Wall Systems

Ending a straight, vertical retaining wall can be accomplished by either stepping the courses down or returning the wall into the existing grade. The end curve created when returning the wall into an existing grade will require drilling to pin. See VERSA-LOK's *Design & Installation Guidelines* - Basic Wall Design section for additional information.

Inside and outside 90° corners for a straight, vertical wall can be built, but filler pieces must be made to maintain half-bond on outside corners. On the base course, lay up the corner the same as for a conventional 90° outside corner, then alternate the

FIGURE 3 90° outside corner - Laid on one-half bond



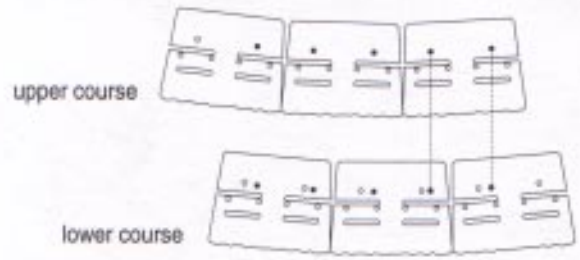
12-inch by 8-inch corner piece on the next course. To maintain the half-bond in the wall, saw cut and place 12-inch and 4-inch filler pieces as shown in Figure 3. Alternate every other course. All corner and filler pieces will require VERSA-LOK adhesive, or drilling and pinning.

Installing Curved, Vertical Retaining Walls

The trapezoidal shape of the standard VERSA-LOK unit allows installation of both inside and outside curves in a vertical (no setback) wall. The minimum outside radius at which a vertical retaining wall can be built without cutting of the units is 8'-0". Regardless of radius or bond, it will be necessary to drill holes in the rear of the units of the course below to receive pins. (Figure 4 Pinning on half-bond)

The drilling and pinning procedure is as follows. After setting the base course in the radius desired, place the second course units (in the bond desired) over the

FIGURE 4 Curved, vertical retaining wall Pinning on one-half bond



course below. Using a 1/2"-diameter x 10"-long masonry bit and hammer drill, insert the drill in each of the two rear holes of the upper unit. Bore a hole approximately two inches deep in the lower unit and pin it. (Figure 11) Continue this procedure until the wall is completed.

Note: Using VERSA-LOK concrete adhesive in place of pins is not recommended on wall units. Full curing of the adhesive may take several days and wall units may "slide" as work progresses on the upper courses.

Capping of Vertical Retaining Walls

Put the finishing touch on your vertical retaining wall with standard VERSA-LOK caps; both A and B types can be used. For straight, inside and outside curves, and serpentine walls, follow standard capping installation instructions as covered in Technical Bulletin 4 - *VERSA-LOK Caps.*

FREESTANDING WALLS

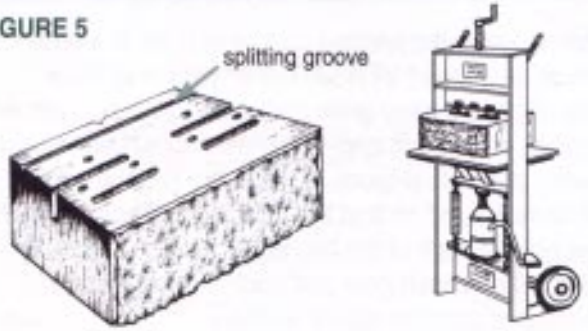
Freestanding walls are low vertical walls that have both sides exposed. They can be placed on grade or on top of an existing conventional VERSA-LOK wall as an attractive match of texture and color. To maintain the split-face on both the front and back of the wall, some modification of the VERSA-LOK unit is necessary.

Because they become unstable at heights over three feet, freestanding walls are not recommended in excess of that height. They should be used for aesthetic purposes only and not relied upon to resist any lateral loads. If structures to resist loads are needed, such as traffic barriers or railings, contact a VERSA-LOK Technical Service Representative for typical barrier details.

Installing Straight, Freestanding Walls

VERSA-LOK standard units have a splitting groove two inches from the back face. (Figure 5) Splitting the unit on this groove creates a textured split-face, similar in

FIGURE 5



appearance to the front split-face. When laying units in a straight line, alternate the units placing the rear split-face next to the front face of the adjoining unit. (Figure 6) Carry this pattern for the entire length of the wall.

FIGURE 6

Place succeeding courses the same way. Straight, freestanding walls can be pinned in either a one-half or one-third bond using the standard holes and slots (Figures 7 & 8). Either bond must be maintained throughout the wall to avoid drilling holes.

FIGURE 7 **Pinning on one-half bond**

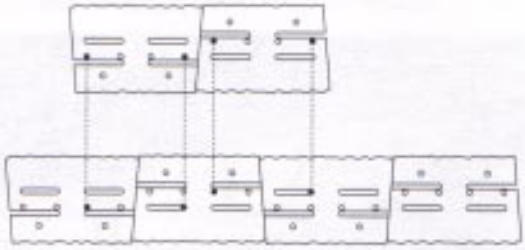
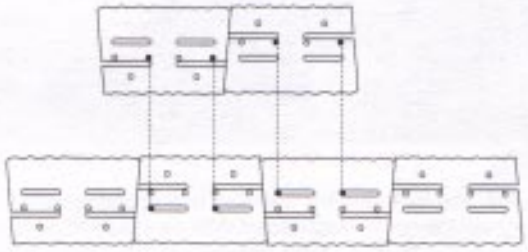


FIGURE 8 **Pinning on one-third bond**



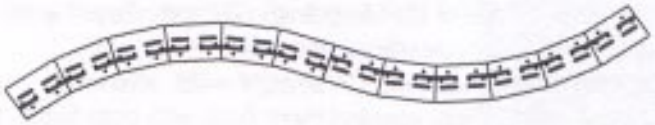
Installing Curved, Freestanding Walls

Inside and outside curves and serpentine, freestanding walls with a textured face on two sides can also be built with the standard VERSA-LOK unit. To avoid extensive cutting or gaps between units, butting all units tight together is necessary. (Figure 9) This results in an eight-foot outside radius. An example of drilling and pinning requirements at this radius with units laid on a one-third bond is shown in Figures 10 and 11.

The procedure for drilling is similar to that mentioned earlier in this bulletin - position upper course units in the bond desired for the vertical wall, drill through both rear holes into the unit below, and pin it. (Figure 11)

Whenever a transition between a straight and curved freestanding wall or between an inside and outside curve (serpentine wall) occurs, some minor cutting of

FIGURE 9 **Freestanding, serpentine wall Sides of all units butted together**



every other course is required to maintain a gap-free appearance on both sides of the wall. In addition to pinning, use VERSA-LOK's concrete adhesive on all courses of a freestanding wall (straight or curved) to help stabilize the wall.

FIGURE 10 **Curved, freestanding wall (8' radius) Pinning on one-third bond**

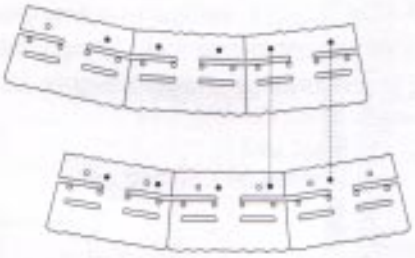
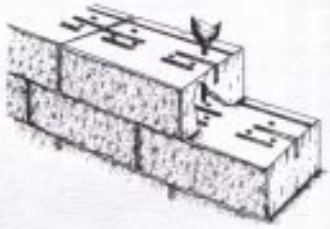


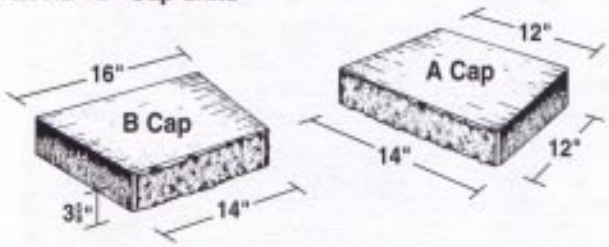
FIGURE 11 **Drilling "receiver" holes in vertical or freestanding walls**



Capping of Freestanding Walls

It is recommended that standard type A and B caps be used to finish freestanding walls. Because these caps are split on one face only, one side of the finished wall will show all textured caps; the other all smooth faced caps. (Figure 12) There will also be a one inch overhang on both sides of the wall. On straight walls, alternate type A and B caps. On curves, use type B caps to reduce the amount of cutting that is necessary to eliminate gapping. Cutting may be required because of the slightly different radius of B caps to the split, two-sided wall unit.

FIGURE 12 **Cap units**

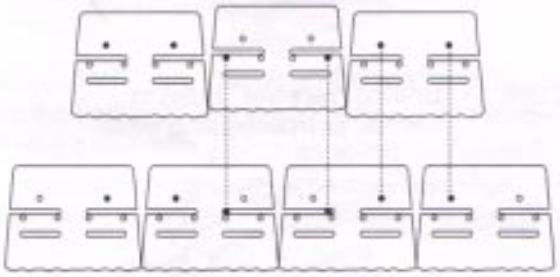


If a two-sided, split-face cap is required, it is recommended that a minimum of two inches be split off the smooth face of standard A and B caps. To achieve a uniform split appearance, the use of a hydraulic splitter will be required. On straight walls, alternate type A and B caps, keeping them flush with both faces of the 10-inch wide wall below. On curved and serpentine walls, the radius of either type A or B caps is different from that of the wall units. This requires cutting of all caps to achieve a gap-free finished appearance to the wall.

Inset Wall is an Attractive Option ...

Insetting alternate units in every second course of a VERSA-LOK straight, vertical retaining wall can create an attractive, custom-built look. Simply follow the pinning procedures as shown in Figure 13.

FIGURE 13 **Inset wall**
Pinning on one-half bond

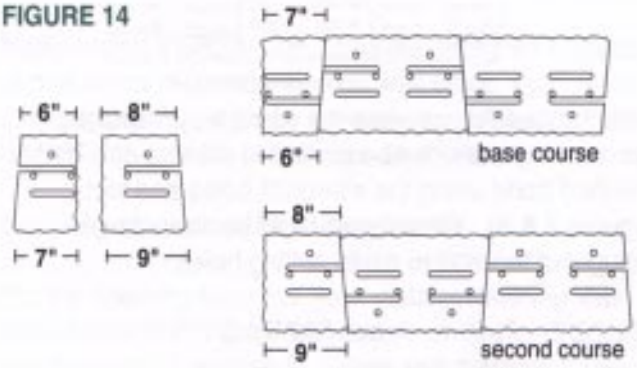


Inset pattern in this vertical retaining wall is easily accomplished and can be pinned for added wall stability.

End Wall Detail - Freestanding Wall

A suggested end wall detail for a freestanding wall is covered in Figure 14. Both split pieces of a standard, full-length VERSA-LOK unit can be used.

FIGURE 14



This attractive freestanding walkway wall at Maplewood Community Center in Maplewood, MN was capped with standard A and B caps. Note uniform split-face and smooth cap finish appearance.

Ask for VERSA-LOK'S *DESIGN & INSTALLATION GUIDELINES* for additional information.

VERSA-LOK®
Retaining Wall Systems
VERSA-LOK Retaining Wall Systems
A division of Kiltie Corporation
6348 Hwy. 36, Suite 1 • Oakdale, MN 55128
(651) 770-3166 • (800) 770-4525 • (651) 770-4089 fax
www.versa-lok.com

OBERFIELD'S *INC*®
SOLID PERFORMANCE IN CONCRETE PRODUCTS®
Columbus • Delaware • Marion • Marysville • Sunbury

528 London Road, PO Box 362
Delaware, OH 43015-0362
614-252-0955
740-369-7644
800-845-7644
Fax 740-363-7644
www.oberfields.com