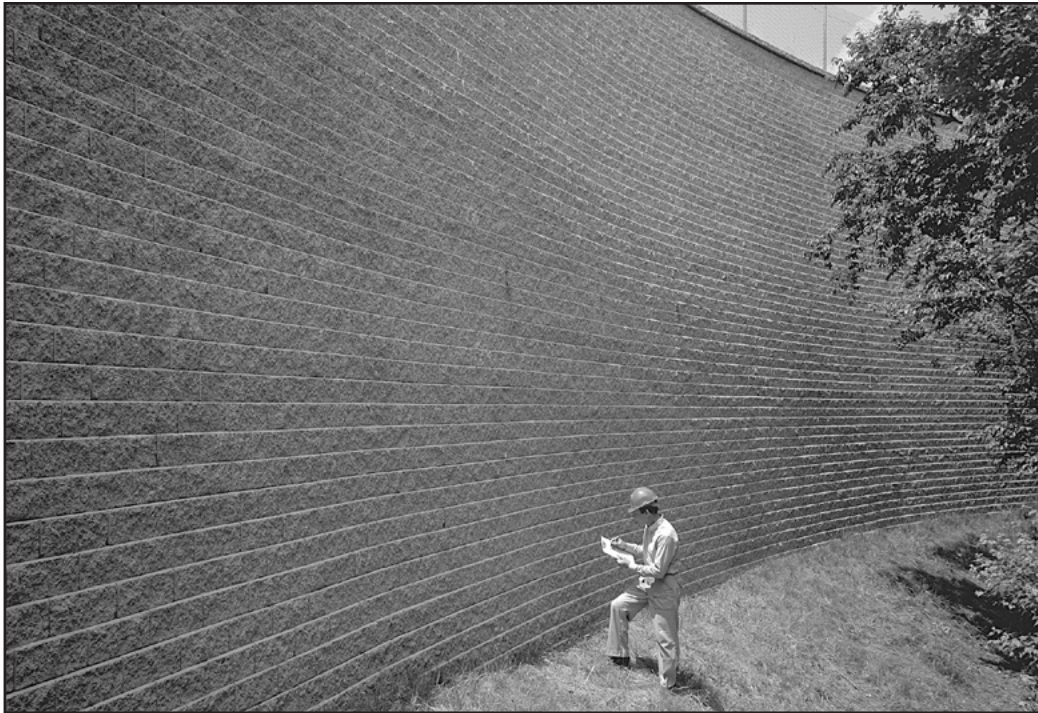


Base Installation

5



TECHNICAL BULLETIN

This Technical Bulletin is the fifth in a series of informational papers that provide specific application ideas and installation tips for VERSA-LOK® Retaining Wall Systems. Additional information is available in our *Design & Installation Guidelines*.

The information, including technical and engineering data, figures, tables, designs, drawings, details, suggested procedures and suggested specifications, presented in this publication is for general information only. While every effort has been made to ensure its accuracy, this information should not be used or relied upon for any application without verification of accuracy, suitability and applicability for the use contemplated, which is the sole responsibility of the user. A final, project-specific design should be prepared by a qualified, licensed, professional engineer based on actual site conditions. VERSA-LOK Retaining Wall Systems disclaims any and all express or implied warranties of merchantability fitness for any general or particular purpose, trademark or copyright in regard to information or products contained or referred to herein.

The unique beauty and structural integrity of VERSA-LOK® Retaining Wall Systems starts at the base. Proper installation of the wall base is critical to the stability and appearance of VERSA-LOK walls. Careful base preparation also speeds upper-wall installation and helps prevent alignment problems. VERSA-LOK retaining walls are placed on granular leveling pads embedded slightly below grade. Rigid concrete footings extending below frost depths are not needed or recommended. The flexibility of the leveling pads and the mortarless units accommodates freeze/thaw cycles without damage to the wall.

This bulletin provides a general overview of VERSA-LOK wall base components and installation. However, none of the information presented here should be interpreted as final construction details. Site conditions and design considerations will vary. A qualified professional engineer should prepare a final, project-specific design based on actual site conditions.

FOUNDATION SOIL

Foundation soil below the leveling pad and wall backfill must provide sufficient capacity to support the weight of the wall system. If the foundation material is fine soil (clay and silt) it should be stiff. If the foundation soil is coarse-grained (sand or gravel) it should be dense. Soft, loose, compressible, wet, frozen, or organic topsoils are not acceptable for foundation soils. A geotechnical should evaluate and determine the bearing capacity of foundation soils and any needed modifications.

Any unacceptable material should be excavated and replaced with properly compacted backfill. If the wall base is built over existing fill, such as utility-trench backfill or side-cast fill along basement walls, ensure this fill is properly compacted or replace it.

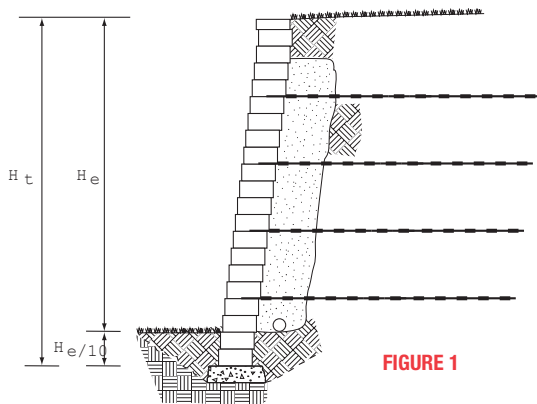


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EMBEDMENT

Burying the base of the wall provides enhanced stability and long-term protection for the leveling pad. However, VERSA-LOK walls do not need to be embedded below seasonal frost depths. Because VERSA-LOK units are installed without mortar, they are free to move slightly in relation to each other and can accommodate freeze/thaw cycles.

VERSA-LOK retaining walls typically have one-tenth of the exposed height embedded below grade. For example, a wall with 10 feet of exposed wall height (H_e) should have 1 foot (two courses) of units buried below grade, making the total wall height 11 feet (Figure 1). Short walls usually have a minimum of 0.5 feet (one course) embedded. The amount of embedment should be increased for walls with slopes at the toe and for special conditions such as poor foundation soils or water applications. The wall design engineer or soils engineer (or both) should address the needed embedment.



LEVELING PAD

VERSA-LOK walls are installed on granular leveling pads that distribute the weight of the wall units evenly and provide stiff, yet somewhat flexible, working pads. Leveling pads should be a minimum of 6 inches thick and 24 inches wide and usually consist of road base aggregate—a crushed gravel with some sand and a small amount of fine soil (Figure 2).

Rigid, high-strength concrete footings are generally not needed or recommended. The leveling pad should be flexible to move with freeze/thaw cycles. If concrete is used for a leveling pad, it should be a lean mix (200-300 psi) and no more than 2 to 3 inches thick. Concrete can be difficult to adjust, so make sure a concrete pad is exactly level before it sets. In rare situations where a rigid, steel-reinforced concrete footing is required, place it below frost depth.

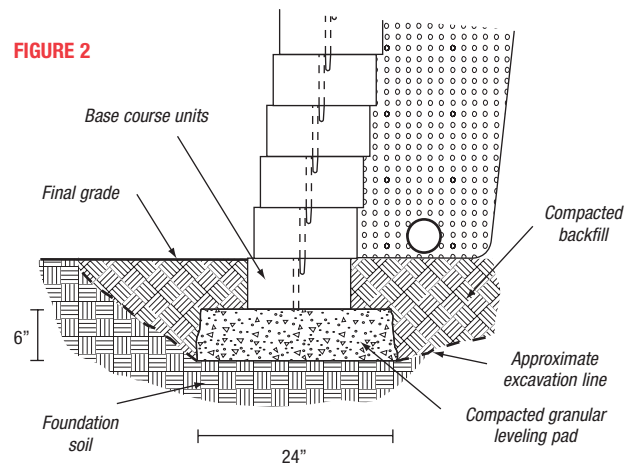
INSTALLATION OF BASE

LAYOUT OF WALL BASE

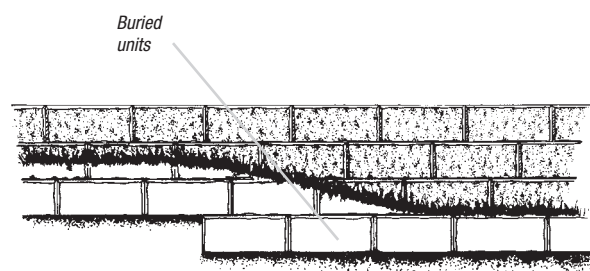
Carefully plan the location and alignment of the wall base to ensure the top of the wall will be at the desired location. Start base layout at the lowest point and work up. Allow room for the 3/4-inch setback in each 6-inch-high course by placing the wall base forward of the planned top-of-wall alignment.

Be sure to “backward” plan from the top of the wall when installing outside (convex) curves. As additional courses are added, the setback in each course will reduce the curve radius. It may shrink to less than the minimum (8 feet) without proper planning. See Technical Bulletin No. 3 for more information.

If the final grade along the front of the wall changes elevations, the wall base may be stepped up in 6-inch increments to match the grade change. Plan to step up often enough to avoid burying extra units while maintaining required embedment (Figure 3). Be sure the base layout accounts for the 3/4-inch horizontal setback that occurs at each 6-inch-high step-up of the base.



Stepped Base



EXCAVATION

Before excavating for the wall base, confirm location of all utility lines and other underground structures and take proper precautions when digging. Excavate a trench just deep enough to accommodate the leveling pad and wall embedment. Be sure any poor soils unacceptable as foundation material, such as organic topsoil, are also excavated, replaced and compacted.



1. Set and level metal screed forms.



2. Compact foundation (native) soil.



3. Fill forms with granular base material.

LEVELING PAD CONSTRUCTION

Place and compact granular leveling pad material to a smooth and level surface. Always start at the lowest level and work up. A thin layer of sand may be used at the top of the pad for final leveling.

To quickly construct long sections of leveling pad, create forms by staking and leveling rectangular metal tubing (screed rails) at the back and front of the planned pad alignment. Place gravel up to the top of forms and compact. After compacting, fill the remaining space with sand and screed off the excess material (see photos 1-5).



4. Compact leveling pad granular material.



5. Screed sand for final leveling of pad.

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TECHNICAL BULLETIN

For more detailed information regarding design and installation, please contact your local dealer or VERSA-LOK® Retaining Wall Systems.

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U.S. Patent D319,885,
U.S. Patent D321,060,
U.S. Patent D341,215,
U.S. Patent D346,667,
U.S. Patent D435,302,
U.S. Patent D439,678,
U.S. Patent D447,573,
U.S. Patent D452,332,
U.S. Patent D458,387,
U.S. Patent D537,533,
U.S. Patent D552,258,
U.S. Patent D555,810,
U.S. Patent D569,010,
U.S. Patent 6,488,448,
U.S. Patent 6,960,048,
U.S. Patent 7,229,235,
U.S. Patent 7,244,079
and other U.S. patents pending

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INSTALLATION OF BASE COURSE UNITS

Starting at the lowest level, center the first course of units on the leveling pad. Place the entire length of the lowest course before proceeding to the next course. Begin the base course at any corner and work away from there. Place the units side by side with the front joints tight. For easier placement of base course units, use a VERSA-Lifter® to hold the units while lowering them onto the leveling pad (see photo 6). This helps avoid disturbance of the pad, which may occur when placing units by hand.

Align the wall along the backs of units, not the irregular split front faces. For alignment tips on curves and corners, see Technical Bulletin No. 3. Level each unit from front to rear, side to side, and with adjacent units with a level that is at least 4 feet long. Tap high points with a hard rubber mallet or a hand tamper. Be patient and ensure the base course is level; any minor unevenness at the base will be amplified and difficult to correct after several courses are installed (see photos 7-8).

After the entire base course is installed, place and compact soil fill behind the units. Also replace any over-excavated soil in front of the units and compact. This helps keep the units in place during further construction activity. Backfill around the embedded units should be native soil. Do not place drainage aggregate behind embedded course(s). Drainage aggregate should not extend lower than the planned final grade in front of the wall.



6. Use a VERSA-Lifter® to aid in lifting and placing base course units.



7. Use a long level to maintain consistency unit to unit.



8. Step up leveling pad and base course in 6-inch increments when grade changes.