

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

BASE INSTALLATION



GREAT WALLS START AT THE BASE!

VERSA-LOK's unique beauty and structural integrity starts at the base. Proper preparation of the wall base is critical to the stability and appearance of the retaining wall. Careful base preparation also speeds unit installation and helps avoid wall alignment problems.

VERSA-LOK retaining walls are installed on an aggregate leveling pad. Rigid concrete footings extending below the frost line are not required or recommended. The flexibility of the leveling pad and mortarless units allows walls to accommodate freeze/thaw cycles without damage.

Proper installation, as covered in this bulletin, includes evaluation of foundation soil, layout of the wall base, excavation, leveling pad construction, and base (first) course installation. Site conditions and design considerations vary. None of the information presented here should be interpreted as a construction detail – further, project-specific engineering evaluations may be necessary.

WALL BASE COMPONENTS

Generally, a wall base consists of foundation soil, a six-inch-thick, compacted granular leveling pad, the base course of VERSA-LOK units embedded below grade, and compacted backfill placed in any areas excavated during base installation (see Figure 1). Site, soil, drainage, and other engineering concerns may require special base design and construction.



VERSA-LOK[®]
Retaining Wall Systems

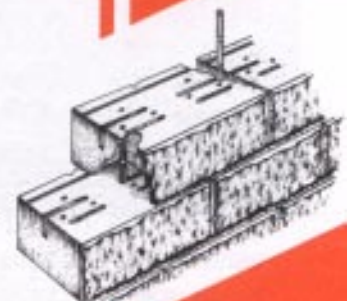
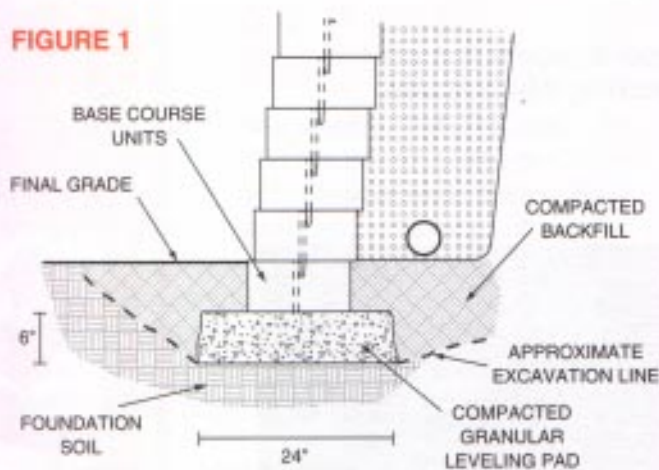


FIGURE 1

VERSA-LOK walls are generally installed on leveling pads consisting of coarse sand or well-graded, angular gravel. The material most commonly used for leveling pads is the gravel locally used as road base aggregate. Granular leveling pads provide stiff, yet somewhat flexible, bases to distribute wall weight.

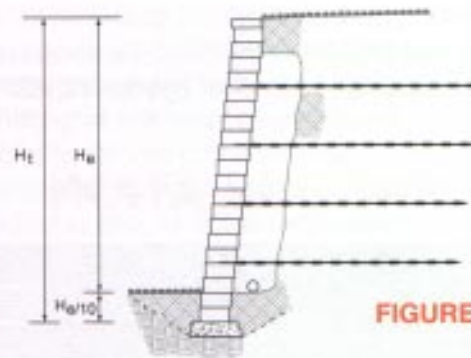
FOUNDATION SOIL

The foundation soil must have sufficient capacity to support the weight of the wall system. Foundation soils should be firm clays and silts or dense sands and gravels. Loose, soft, wet, or frozen soils are not acceptable.

Any unacceptable soils should be excavated and replaced with properly compacted backfill. If the wall will sit on backfill, such as in a utility trench excavation, be sure the entire depth of this backfill is well compacted, or replaced. A qualified soils engineer should address the suitability of the foundation soils and any necessary modifications.

EMBEDMENT

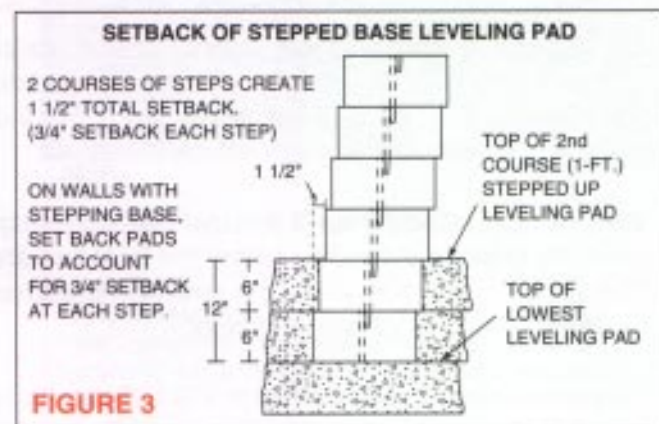
On level grade, VERSA-LOK walls should have at least one-tenth (1/10) of the planned exposed wall height embedded below grade. Example: embed one foot of units (two courses) for a wall that will have 10 feet exposed above grade – making a total wall height of 11 feet (see Figure 2). Increase these recommended embedment depths for special conditions such as poor foundation soil, a slope in front of the wall, or scour from water action. A soils engineer should evaluate these special conditions.

**FIGURE 2**

LAYOUT OF WALL BASE

When laying out the base, "backward plan" the base alignment to account for the 3/4" setback of each six-inch-high course. Place the base alignment forward of the planned top of the wall by a sufficient distance to allow room for this setback. For an outside (convex) curve, the setback decreases the radius of the curve as the wall goes higher. Be sure not to reach the minimum radius (8') before reaching the planned wall height. See *Technical Bulletin #3, Curves And Corners*, for additional information.

Where the wall base steps to match elevation changes along the wall base, be sure to account for the change of alignment at the steps. Each 6-inch-high step will set the base back 3/4" (see Figure 3).

**FIGURE 3**

EXCAVATION

Before excavating, confirm the location of all utility lines and take proper precautions when digging. Excavate a trench just deep enough for the placement of a 6-inch-thick leveling pad and the number of base units to be embedded. When necessary, also excavate areas where geosynthetic soil reinforcement will be placed.

LEVELING PAD CONSTRUCTION

Install and compact the leveling pad accurately to a smooth level surface. Always start at the lowest level and work upward. The leveling pad material should be granular road base aggregate or crushed stone. It *should not* be a cohesive soil like clay or silt. The pad should be at least 6 inches thick and 24 inches wide.

To quickly construct long sections of leveling pad, create forms by leveling and staking rectangular metal tubing along both sides of the planned pad. Place and compact granular base material within these leveled forms up to approximately 1/2" of the top. After compacting, fill the remaining space with sand and screed off excess material.



3. Fill forms with granular base material.



1. Set and level metal screed forms.



4. Compact leveling pad granular material.



2. Compact foundation (native) soil.



5. Screed sand for final leveling of pad.

INSTALLATION OF BASE COURSE UNITS

After compacting and leveling the pad, place the first course of units in the center of the pad. If the base steps, start at the lowest level of the wall and place the entire length of the lowest course before proceeding to the next course. Also, begin at any corners and work away from them. Place the units side by side. Front joints should be tight. Make sure unit bottoms completely contact the leveling pad. Align units using their backs *not* the irregular split faces. Refer to *Technical Bulletin # 3, Curves and Corners*, for additional alignment tips.

To ease placement of the base units, we suggest using a VERSA-LIFTER™ to hold the units while lowering them onto the leveling pad. Using the lifter will avoid disturbing the pad and minimize leveling problems caused by placing the units by hand.

Level each unit from front to rear, side to side, and with adjacent units. Use a 4-foot or longer level. Tap high points with a hard rubber mallet or a hand tamper. Take time to ensure a level base course. Minor unevenness at the base will be amplified and difficult to correct after additional courses are installed.

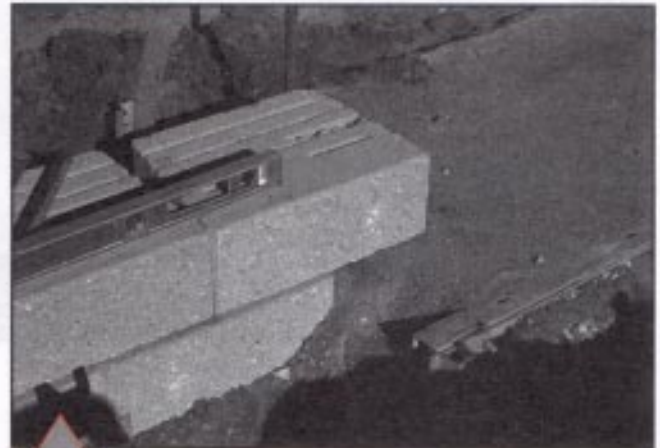


6. A VERSA-LIFTER™ aids in lifting and placing base course units.

After installing the base course, place and compact soil backfill behind the units and in any areas excavated in front of the wall. This avoids shifting of the base course due to construction activity. Do *not* place drainage aggregate behind embedded base course units – drainage material should not extend deeper than the final grade in the front of the wall.



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



8. Raise pad in 6-inch increments when grade changes.

ADDITIONAL INFORMATION ON BASE INSTALLATION

- Radius wall base installations - See *Technical Bulletin #3, Curves and Corners*
- Water applications - See *Technical Bulletin #1, Shoreline Protection*
- Call a VERSA-LOK Technical Service Representative at (800) 770-4525



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

Made under license from VERSA-LOK Retaining Wall Systems.

U.S. Patent D319,885, U.S. Patent D321,060, U.S. Patent D341,215, U.S. Patent D346,867, U.S. Patent D378,702, U.S. Patent D391,376 and other U.S. patents pending; Canadian Industrial Design Registration No. 63829, No. 71472, No. 73910, No. 73911, No. 73912, No. 77816, No. 79058, and No. 82288.

©1999 Kiltie Corporation Printed in U.S.A. TBS - 0199



OBERFIELD'S INC.®

SOLID PERFORMANCE IN CONCRETE PRODUCTS®
Columbus • Delaware • Marion • Maryville • Sunbury

528 London Road, PO Box 362
Delaware, OH 43015-0362

www.oberfields.com

614-252-0955
740-369-7644
800-845-7644
Fax 740-363-7644