

Wall Construction

The following procedures comply with the generally accepted industry standards for the installation of segmental retaining walls with special attention given to the unique features of the Shea “Series 50” product line. Every attempt should be made to follow these procedures as closely as possible unless the project specifications, drawings or the final engineered wall design directs otherwise.

Site Preparation

Before beginning work, contractors should make sure that they have thoroughly studied the project specifications, the final engineered drawings for the wall and complied with all the requirements for product submittals. Contractors should also have a clear understanding of their scope of work and their responsibilities that may be covered elsewhere in the project specifications and are not in the actual wall construction section.

For projects that do not have a formal set of plans and specifications but do have a “signed and stamped” final engineered wall plan, the contractor should refer to these procedures whenever a topic is not specifically covered in the final engineered plan.



Excavation

The contractor should carefully excavate the wall construction area to the lines and grades shown on the construction drawings. Exercise caution to keep the soil undisturbed in areas that will not need modification during wall construction. Be sure to identify above and below ground utilities including power lines, communication lines, sewer and drainage structures, etc.

Preparing the Leveling Pad

Excavate a trench to a minimum thickness of 6 inches and to a width that extends a minimum of 6 inches in front and behind the actual location of the base units along their designated placement. If the wall layout requires either inside or outside radius curves, it is a good idea to increase the width of the leveling pad to accommodate adjustment during wall alignment. For all but straight walls where the bottom elevation doesn't



change along the entire length of the wall, stakes should be driven to the proper height as determined by a transit to indicate the proper bottom elevation of the wall. These stakes should also show where base step-ups are located. Bear in mind that each step-up causes the leveling pad location to step back by one inch due to the integral setback of Shea “Series 50” units.

Fill the trench and any over-excavated areas with the specified base material. Unless specified otherwise, this material should generally consist of a well-draining material that also contains enough fines that the leveling pad will hold its shape after compaction. Depending on the region, this material may be referred to as road base, $\frac{3}{4}$ " minus, crush and run or Class 5. Fully compact the base material and add or remove material as necessary to keep the leveling pad as close to the final level grade as possible. Where step-ups are located, base material should taper up at roughly a 45° angle.

At times a concrete leveling pad may be required or desirable in lieu of a compacted granular base material. Unless the leveling pad is designed as a true “footing” and extends below frost depth, the concrete should not contain steel reinforcing and should consist of a relatively weak mix capable of breaking up under frost pressures. This allows for resettlement as the frost dissipates. Also, when using a concrete leveling pad take extra care to keep the pad level and any step-ups at their proper height to avoid difficulty in maintaining height tolerances.

Base Course Installation

The first (base) course of a Shea wall requires the use of a Base Block. This unit does not have the special groove on the bottom. This makes for easier leveling of the base course and also provides greater shear resistance at the interface between the leveling pad and Shea base block.

Walls should generally be built starting at the lowest point in the wall. Make sure to properly place the edge of the first unit at an even 2 foot increment from any fixed wall features such as a 90° corner, a control joint or building structure. This helps to avoid unnecessary cutting or trimming of the Shea units and improves wall aesthetics.

Depending on the type of material used for the leveling pad and how level the pad is to start with, base course leveling may be easier if the leveling pad is topped and screed with up to $\frac{1}{2}$ " of clean sand. On long straight sections of wall, it may be helpful to set units with a canter or tip-back of up to $\frac{1}{2}$ ". This increases the ability to maintain a positive wall batter and minimize rotation during soil compaction when robust compaction equipment is used.



As base units are laid, ensure that the units are in full contact with the leveling pad and check to ascertain that the units are level both front-to-back and left-to-right. Use a jig if necessary to maintain a consistent leveling plane from unit-to-unit. Lay units end-to-end and avoid gaps between units. The use of a string line will help ensure proper wall alignment along straight sections of wall. After the base units have been placed and before compacting the backfill material behind the wall, compaction to the specified embedment depth should be done in front of the wall.

Backfilling and Compaction

When all the units comprising a section of wall at a single elevation have been placed, aligned and leveled, fill the gaps between the units with a clean crushed rock material at least $\frac{1}{2}$ " – $\frac{3}{4}$ " in size. Use this same material behind the back of the block to a depth of at least 1' or as otherwise indicated in the final engineered drawings. This material serves as a "French drain" to relieve water build-up and also, because it is self-compacting, it relieves installers from having to operate compaction equipment close to the back of the units.

At times, a **filter fabric** may be specified behind the drainage aggregate material. This helps keep the drainage zone clean and free from sedimentation. If present, wrap the fabric forward over the drainage aggregate as the other backfill material is placed.



When **drain tile** is used, it should be located as shown in the plans or drawings. Generally, the drain tile runs along the back of the wall and is at the bottom of the drainage aggregate zone at an elevation at or above the bottom finished grade level. Drain tile should "daylight" at least every 50' along the length as well as at every low point in the wall.

Place the specified backfill material and thoroughly compact material in 8" lifts. Backfill material should be compacted to 95% of standard proctor. **Improper or inadequate compaction is a primary source of contractor-caused wall failures.** Close attention should be paid to changes in consistency and moisture

content of all backfill material. Use the proper type of compaction equipment. Sandy or gravelly materials respond best to plate compaction equipment and clayey materials usually should be "kneaded" by using a hand-operated "jumping jack" or "sheep's foot ". Heavy-duty compaction equipment should be kept a minimum of 5' from the back of the Shea Wall to avoid wall rotation.

Placing Additional Courses

Prior to placing successive courses, sweep and keep clean any backfill material from the top of the Shea units and make sure that all voids are filled with the proper drainage material. Place the next course in a running bond pattern or as otherwise shown on the engineer's detailed wall elevation plan. Set the upper unit and slide it forward until its bottom "groove" is in full contact with the bottom unit's "tongue". Check and adjust level at every course elevation. If shimming is required, use a material such as an asphalt shingle and cover as much of the "low" surface area as possible to achieve the desired result.



Geogrid Placement

When a geosynthetic reinforcement (geogrid) is required, use only the type (or types) specified. Also, make sure the reinforcement is cut to the proper lengths as indicated on the final engineered plan. Most geogrid types are “uni-axial” and must be laid perpendicular to the wall face. Check the manufacturer’s data to insure proper orientation. The geogrid should be laid on the top of the block as near to the front face as possible and extend back over a compacted, level backfill to the length required. Sandwich the reinforcement under the next course of

Shea “Series 50” units to anchor in-place. Pull

the grid taut to remove slack or wrinkles. Stake the back of the geogrid prior to placing backfill material to maintain tension. When placing backfill over a layer of geogrid, start just behind the drainage aggregate and fill towards the back of the geogrid. Avoid operating backfill equipment directly on the tensioned geogrid as much as possible. A minimum of 6” of backfill should be placed over the grid prior to the operation of any tracked equipment. Avoid sharp turning and sudden braking with all types of equipment to avoid displacing, wrinkling or damaging the geogrid reinforcement.

