



## **Murata™ Mechanically Stabilized Earth (MSE) Retaining Wall Installation Guide**

Refer to the *Murata Gravity Wall Specifications* in conjunction with this guide.

### **1) Excavation**

- a) Contractor shall excavate to the lines and grades shown on the construction drawings. Contractor shall use caution not to over-excavate beyond the lines shown or to disturb the foundation soils beyond the lines shown.
- b) Contractor shall verify locations of existing structures and utilities prior to excavation. Contractor shall ensure all surrounding structures and utilities are protected from the effects of wall excavation.

### **2) Foundation Soil Preparation**

- a) Foundation soil shall be defined as any soil located beneath the leveling pad and backfill zone. This includes undisturbed native soil, re-worked on-site or imported soil placed as engineered fill prior to wall construction.
- b) Foundation soil shall be excavated as dimensioned on the plans, and compacted per the soils report prior to placement of leveling pad material.
- c) Foundation soil shall be examined by the geotechnical engineer on site to ensure that the actual foundation soil strength meets or exceeds assumed design strength. Soil not meeting the required strength shall be removed and replaced with acceptable fill material, compacted as specified by the geotechnical engineer.

### **3) Leveling Pad Installation**

- a) The leveling pad shall be constructed of Murata fill. Murata fill shall be placed in uniform lifts not exceeding 8 inches (200 millimeters) and within 1% of optimum moisture content (National Concrete Masonry Association, 2010, p. 201).
- b) The leveling pad shall be compacted per the geotechnical report to provide a level hard surface on which to place the first course of blocks.
- c) The leveling pad shall be constructed to ensure proper wall embedment and the final elevation shown on the plans.
- d) The leveling pad material shall be a minimum of 6 inches deep.

#### **4) Drain Pipe Installation**

- a) A minimum of a 4 inch (102 millimeters) diameter drain pipe shall be installed per plans.
- b) The drain pipe shall be installed to maintain gravity flow of water to the outside of the retained soil. Additional excavation may be required in order to achieve adequate slope.
- c) The drain pipe shall empty to daylight at 50 foot (15.25 meters) intervals maximum into a storm sewer, manhole, along a slope below the retained soil mass, or as specified by the project engineer.
- d) Areas of high water may have additional requirements. Drainage requirements shall be verified by a civil engineer.

#### **5) Geotextile Filter Installation**

- a) A geotextile filter shall be installed between Murata fill and native soils along the back of the excavation.
- b) The geotextile filter shall not be installed below Murata fill on native foundation and backfill zone soils.
- c) If soil is called for above the Murata fill, the geotextile filter shall be installed between the soil and Murata fill.

#### **6) Murata Retaining Wall Base Course Unit Installation**

- a) Compaction of the block core Murata fill is optional.
- b) The block base course shall be in full contact with the leveling pad. Proper care shall be taken to develop straight lines and smooth curves on base course per the wall layout on the construction documents.
- c) Using strings and a level, each base block shall be level from back to front and side to side. Alignment and levelness of each block may be achieved with a dead blow hammer. This is an iterative process. Adjusting one block may move adjacent blocks out of alignment and levelness.
- d) All block cores, cavities, and voids behind the base course shall be filled to the excavated slope with Murata fill. Murata fill shall be placed at moisture content near optimum in uniform lifts not exceeding 8 inches (200 millimeters) (National Concrete Masonry Association, 2010, p. 201) and compacted to the dry density specified by the geotechnical engineer.
- e) Each course shall be level and properly aligned before placing the next course.

- f) The consolidation zone shall be defined as any Murata fill within 3 feet (910 millimeters) behind the wall (National Concrete Masonry Association, 2010, p. 201). Compaction within the consolidation zone shall use methods that will not disrupt the stability or batter of the wall. Final compaction requirements in the consolidation zone shall be established by the geotechnical engineer of record.
- g) A compactor shall be used to consolidate the area behind the base course, as specified in the geotechnical report. All excess Murata fill shall be swept from the top of the units.

## **7) Subsequent Murata Retaining Wall Course Installation**

- a) Compaction of the block core Murata fill is optional.
- b) Additional courses of wall units shall be placed, as needed, on top of the previous course. Blocks shall be positioned so the alignment tab is in contact with the back of the block below.
- c) A running bond is preferred. The center of the current course shall align with the seam between two blocks on the lower course.
- d) Every other course shall be checked for proper alignment and levelness.
- e) All block cores, cavities, and voids behind the course shall be filled to the excavated slope with Murata fill and compacted to the dry density specified by the geotechnical engineer.
- f) Each course shall be installed in a like manner. The block installation procedure described above shall be repeated to the wall height on the construction documents.

## **8) Cap Stone Installation**

- a) After the final layer of Murata fill is compacted, any dust and remaining Murata fill shall be swept from the top course.
- b) A continuous closed 1/8" (3.2 millimeters) bead of SEK SureBond SB-20 or SEK SureBond SB-15 shall be placed around the filled cell of the top course.
- c) The capstone shall be set on top of the adhesive and checked for levelness and alignment.

## **9) Additional Construction Considerations**

- a) Construction Tolerances (National Concrete Masonry Association, 2010, p. 184)
  - i) Running Bond Control: 3 inches (76 millimeters) maximum joint eccentricity from center of block below

- ii) Vertical Control: 1 ¼ inches (32 millimeters) maximum over a 10 foot-0 inches (3.05 meters) distance  
  
(1)3 inches (76 millimeters) maximum overall
- iii) Horizontal Control: 1 ¼" (32 millimeters) maximum over a 10 foot-0 inches (3.05 meters) distance  
  
(1)3 inches (76 millimeters) maximum overall
- iv) Rotation Control: ±2°
- b) An independent testing firm or geotechnical engineer shall be hired by the owner to provide material testing and inspection services.
- c) An independent firm shall keep an inspection log and provide written reports at predetermined intervals to the owner.
- d) A testing frequency shall be set to establish a proper compaction protocol to consistently achieve the minimum compaction requirements set by the design specifications. If full-time inspection and testing at 8 inch lifts is not provided, then the following testing frequency shall be followed:
  - i) One test for every 8 inches (200 millimeters) of vertical fill placed and compacted, for every 25 lineal feet (7.6 meters) of retaining wall length, starting on the first course of block.
  - ii) Compaction test locations should be varied to cover the entire area of backfill zone, including the area compacted by the hand-operated compaction equipment.
  - iii) Once a test protocol is deemed acceptable, testing can be conducted randomly at locations and frequencies determined by the geotechnical engineer.