

## 214 –MECHANICALLY STABILIZED EARTH FILL

### SECTION 214

#### MECHANICALLY STABILIZED EARTH FILL

##### 214.1 DESCRIPTION

Provide and install the complete mechanically stabilized earth (MSE) fill system as specified in the Contract Documents. This includes at a minimum: excavation, grading, and compaction of the MSE Fill foundation, general and local dewatering as required for proper execution of the work, erection of welded wire facing elements, placement of soil reinforcing, and placement and compaction of select backfill material within the reinforced soil volume.

**BID ITEM**  
MSE Fill

**UNITS**  
Cubic Yard

##### 214.2 MATERIALS

**a. General.** Provide the complete MSE fill system (engineering design, geogrid, welded wire facing, and all necessary accessories) from an approved manufacturer in accordance with the acceptable alternates for each particular MSE fill as listed in the Contract Documents.

The Bureau of Construction and Materials will maintain a list of approved systems in the Retaining Wall Systems prequalified list. Products will remain on the prequalified list as long as field performance is satisfactory.

**b. Welded Wire Fabric.** Use welded wire fabric complying with **SECTION 1603** and the approved shop drawings. Galvanize the welded wire fabric in conformance with the requirements of ASTM A123.

**c. Backfill.** Provide aggregates for backfill that meet the requirements of MSE wall backfill, **SECTION 1107**.

**d. Soil Reinforcing.**

(1) Soil Reinforcing Geogrid. Use soil reinforcing geogrid of oriented, drawn, long chain high density polyethylene or polypropylene containing stabilizers and inhibitors added to the base plastic for resistance to ultraviolet and heat degradation. Use the geogrid material as designated in the approved wall system. The designated soil reinforcing geogrid will be accepted on the basis of a Type A Certification.

(2) Soil Reinforcing Geosynthetic. Use soil reinforcing of woven, high tenacity polyester yarns coated with polyvinyl chloride to maintain the integrity of the geosynthetic during handling and placement and to protect it during construction. Use the geosynthetic material as designated in the approved wall system. The designated soil reinforcing geosynthetic will be accepted on the basis of a Type A Certification.

**e. Attachment Devices.**

(1) Connectors. Use clevis connectors and connector rods fabricated of cold drawn steel wire complying with ASTM A82 and welded in accordance with ASTM A185 and galvanized in accordance with ASTM A153, or approved equal.

(2) Tie Bar. Use tie bars fabricated of cold drawn steel wire complying with ASTM A82 and galvanized in accordance with ASTM A153.

(3) Connection Pins. Use connection pins fabricated of cold drawn steel wire complying with ASTM A82 and galvanized in accordance with ASTM A153.

(4) Devices will be accepted on the basis of receipt and approval of a Type A Certification and visual inspection.

**f. Facing Geotextile.** Use a minimum Class 2 nonwoven geotextile that complies with **DIVISION 1700**.

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### 214.3 CONSTRUCTION REQUIREMENTS

**a. MSE Fill Excavation.** Remove all materials encountered without regard to classification. Coordinate excavation for the wall with the underdrain construction so that drainage pipes will be constructed as specified. Maintain stable sides at all excavations by providing reasonable cut back slopes or shoring, where necessary.

**b. Foundation Preparation.** Grade the foundation for the retained earth volume, for a width equal to or exceeding the length of the geogrid plus 6 inches, or to the limits shown in the Contract Documents. Prior to MSE fill construction, compact the foundations to Type AA, MR 3-3 according to **SECTION 205**. Remove and replace any foundation soils found to be unstable or unsatisfactory.

**c. MSE Fill Erection.** Check the plumbness and tolerances of each facing row prior to erection of the next facing row. Should any row be out of tolerance, remove the fill and reset the section to the proper tolerance.

Vertical and horizontal alignment of the MSE fill face shall not vary by more than 2 inches when measured along a 10-foot straightedge, or as shown in the plans and specifications. The overall vertical tolerance (plumbness) of the MSE Fill shall not exceed 1 inch per 10 feet of wall height. Negative (outward leaning) batter is not acceptable. The offset limit between consecutive rows of facing shall not exceed 1 inch from planned offset.

Place connectors within 1/2 inch from the dimensions shown on the Contract Documents or approved shop drawings.

**d. Backfill Placement.** Closely follow the erection of each lift of facing with backfill. At each reinforcing level, roughly level backfill before placing and or attaching the reinforcement. Place reinforcing as shown in the Contract Documents normal to the face of the MSE fill. For geosynthetic reinforcing, the end of the geogrid sheet will terminate with a transverse element at the retained soil limit to prevent curling of the sheet and aid in construction. Tightly draw the reinforcing against the connections at the connectors and stake the end of the geogrid sheet at the retained soil limit before backfilling is allowed, and maintain tautness during backfilling operations. Place backfill in maximum loose lift thickness of 10 inches or less as may be necessary to obtain the specified density.

Compact the entire retained earth volume to 95% of maximum laboratory dry density at a moisture requirement of MR 3-3, **SECTION 205**. For backfills containing more than 30% retained on the 3/4-inch sieve, use a method of compaction consisting of at least 4 passes of a roller. Accomplish compaction without disturbance or displacement of reinforcing and facing. Begin compaction from the area nearest the MSE fill face to the back of the reinforcing, except for a strip 3 feet wide adjacent to the backside of the facing. Compact this 3-foot strip with light mechanical tampers after compaction of the remainder of the layer. Soil density tests will not be required within this 3-foot area.

At the end of each day's operations, shape the last level of backfill to permit runoff of rainwater away from the wall face.

Remove and replace any wall materials that become damaged during backfill placement at the Contractor's expense.

### 214.4 MEASUREMENT AND PAYMENT

The Engineer will measure MSE Fill by the cubic yard. The Engineer will use the neat lines shown in the Contract Documents to compute the quantities.

Payment for "MSE Fill" at the contract unit price is full compensation for the specified work.