



Iowa Department of Transportation

SPECIAL PROVISIONS FOR MSE WALL STONE BACKFILL

Pottawattamie County
IM-NHS-29-3(102)48--03-78

Effective Date
December 16, 2014

THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

120229.01 DESCRIPTION.

The work shall consist of installing the Mechanically Stabilized Earth (MSE) Retaining Wall designated on the project drawings with Granular Backfill as specified herein. Section 2432 of the Standard Specifications shall be used with the exception of what is specified herein.

120229.02 DESIGN AND MATERIALS.

A. Design.

1. Design Requirements.

The design by the wall system supplier shall consider the internal stability of the wall mass. Wall design shall be according to LRFD Bridge Design Specifications, with a minimum service life of 75 years.

2. Submittals.

- a. Submit results of the gradation sieve analyses for the stone backfill material for the MSE walls 5 days prior to the start of the wall construction to the Engineer. The number of tests and required certification shall be in accordance with Section 2432 of the Standard Specifications.
- b. Submit results of bulk density tests performed on the stone backfill material for the MSE wall 5 days prior to the start of the wall construction to the Engineer.
- c. Geotextile fabric for use to separate the MSE fill and the embankment fill: Provide the manufacturer's specifications and material source. Deliver samples of the product to the Engineer a minimum of 10 days prior to delivery on site.

B. Materials.

1. Backfill Material.

- a. Use crushed stone base material as MSE wall backfill that is free from organic material, shale or other poor durability particles and otherwise deleterious materials.

- b. The backfill shall conform to the Macadam Crushed Stone requirements in Section 4122 of the Standard Specifications with the exception the Abrasion limit identified in Table 4122.03-1 is 40. The Macadam Crushed Stone shall be screened over the 3/4 inch screen.
- c. Stone backfill material shall have a total unit weight of 105 pounds per cubic foot +/- 5 pounds per cubic foot.
- d. Obtain the Engineer's approval for the source.
- e. The backfill material shall meet the electrochemical requirements in Article 2432.02, B, 5 of the Standard Specifications with the exception the Resistivity requirement is eliminated.

2. Geotextile Fabrics:

Geotextile fabric for use to separate the MSE fill and the embankment fill shall conform to the following requirements:

Table 120229.02-1: High Strength Geotextile for use in Load Transfer Pad

Property	Value	Test Method
Flow Rate	120 gal/min/ft ²	ASTM D 4491
Tensile Strength (both directions)	120 lb/ft	ASTM D4632
Elongation at Break	50%	ASTM D4632
Apparent Opening Size	No. 70 US Sieve	ASTM D4751

120229.03 CONSTRUCTION.

A. Stone Backfill Placement.

- 1. Place backfill material in a manner to closely follow the erection of each lift of panels or wire mesh facing. At each level for earth reinforcing, roughly level the backfill material before placing and connecting reinforcement. Place reinforcing normal to the face of the wall.
- 2. At the end of each day's operations, shape the last level of backfill material so as to permit runoff of rainwater away from the wall face.
- 3. Consolidate backfill using vibrator, plate tamper, or other compaction equipment. Place backfill material in the reinforced zone as shown in the contract documents in maximum 8 inch lifts. Consolidate the backfill material with vibrator, plate tamper, or other equipment without disturbing or distorting earth reinforcing and panels and in accordance with the MSE wall vendor requirements. Closely follow panel erection with placement of fill lifts. No tests will be required for compaction of stone backfill.

B. Quality Control.

Perform a gradation sieve analysis of the stone backfill and for every change in source and/or type of material (ASTM C136). Perform bulk density testing (ASTM C 29) and water content testing (ASTM C566) for the material to ensure specified total unit weight is met. All required testing will be completed to the satisfaction of the Engineer at no additional cost to the Iowa DOT. No tests will be required for compaction of stone backfill.

120229.04 METHOD OF MEASUREMENT.

The quantity of Granular Backfill, that is placed in the reinforced earth zone; identified as an MSE wall design requirement in the contract documents for any core-out or other remedial/ground improvement location; or placed in the temporary excavation zone behind the reinforced earth zone as shown in the contract documents, will be measured in cubic yards.

120229.05 BASIS OF PAYMENT.

- A.** Payment for Granular Backfill for the reinforced earth zone; any core-outs or other remedial/ground improvement locations; and placed in the temporary excavation zone behind the reinforced earth zone as shown in the contract documents, will be made for the quantity of material furnished, hauled, actually placed, and compacted for the contract unit price cubic yard up to the contract quantity.
- B.** If the slope shown for the temporary excavation zone in the contract documents is not adequate for safety, provide written notification to the Engineer, including a copy of a slope stability analysis, and identification of the additional quantity of stone backfill material that will be needed, before the work begins. The slope stability analysis is to be done by a Professional Engineer licensed in the State of Iowa, at no additional cost to Iowa DOT. If approved by the Engineer, the additional quantity for Stone backfill material will be adjusted according to Article 1109.03, A of the Standard Specifications.