



## SECTION 1010

### SELECT GRANULAR BACKFILL FOR STRUCTURAL SYSTEMS

**1010.1 Scope.** This specification covers backfill material used as part of a mechanically stabilized earth wall system or in other applications requiring an engineered backfill material.

**1010.2 Material.** The requirements for the gradation of the material, the general makeup of the material, and the testing of the material will apply to all potential uses of this material, unless otherwise specified on the plans or in the contract documents. The electrochemical requirements listed in this specification will apply to backfill material used for mechanically stabilized earth wall systems.

#### **1010.3 General.**

**1010.3.1** To ensure proper functioning of the structure, the backfill material used for structural applications shall be homogeneous, and in accordance with the following:

Sieve Size	Percent Passing by Weight (Mass)
4-inch (100 mm)	100
No. 40 (425 $\mu$ m)	0-60
No. 200 (75 $\mu$ m)	0-10

**1010.3.2** The frequency of sampling of the backfill material necessary to assure gradation control throughout construction shall be as directed by the engineer.

**1010.3.3** The dry unit weight (mass) of the backfill material shall be determined in accordance with AASHTO T 19, and shall be no less than 105 pounds per cubic foot (1682 kg/m<sup>3</sup>).

**1010.3.4** The plasticity index (PI) of the backfill material shall be determined in accordance with AASHTO T 90 and shall not exceed 6.

**1010.3.5** The angle of internal friction for the backfill material shall be no less than 34 degrees. No testing will be required whenever 80 percent of the particle sizes are greater than 0.75 inch (19 mm) or whenever the backfill material consists entirely of crushed limestone. When testing is required, testing shall be in accordance with one of the tests specified below.

**1010.3.5.1** The angle of internal friction may be determined by the direct shear test in accordance with AASHTO T 236. This test shall be performed on the portion of the material finer than the No. 10 (2 mm) sieve, utilizing a sample of the material compacted to 95 percent of the maximum density as determined by AASHTO T 99, Methods C or D (with oversize correction as outlined in Note 7 in that publication), at optimum moisture content.

**1010.3.5.2** The angle of internal friction may be determined by the triaxial compression test in accordance with AASHTO T 234-85.

**1010.3.6** The backfill material shall be, in the judgment of the engineer, substantially free of shale or other soft, poor durability particles and shall have a magnesium sulfate soundness loss less than 30 percent after four cycles as determined in accordance with AASHTO T 104.

**1010.3.7** The organic content of the backfill material shall be less than or equal to one percent and shall be measured in accordance with AASSHTO T 267 for material finer than the No. 10 (2 mm) sieve.

**1010.4 Electrochemical Requirements.** The following electrochemical requirements will apply to this backfill material whenever the material is used for mechanically stabilized earth wall systems.

**1010.4.1** Metallic Soil Reinforcement.

**1010.4.1.1** When metallic soil reinforcements are used, the backfill material shall be in accordance with the electrochemical requirements as follows:

<b>Requirement</b>	<b>Test Method</b>
Resistivity > 3000 ohm-cm	AASHTO T 288
pH of 5-10	AASHTO T 289
Chlorides $\leq$ 100 ppm	AASHTO T 291
Sulfates $\leq$ 200 ppm	AASHTO T 290

**1010.4.1.2** Whenever the resistivity of the backfill material is greater than or equal to 5000 ohm-cm, the chlorides and sulfates requirements may be waived.

**1010.4.2** Polymeric Soil Reinforcement. When polymeric soil reinforcements are used, the backfill material shall be in accordance with the electrochemical requirements as follows:

<b>Requirement</b>	<b>Test Method</b>
pH of 4.5-9	AASHTO T 289

**1010.5 Certification and Acceptance.**

**1010.5.1** The contractor shall furnish to the engineer written certification that the backfill material provided complies with the applicable sections of this specification. Copies of all test results for tests performed to ensure compliance with this specification shall be furnished to the engineer.

**1010.5.2** Acceptance will be based on the written certification, accompanying test reports, and any applicable tests performed as directed by the engineer.