B. Referenced Documents

AASHTO T 96

AASHTO T 104

ASTM C 295

811.2 Materials

811.2.01 Rock Embankment Material

A. Requirements

1. Use unweathered quarry-run stones, smaller than 4 ft (1.2 m), in any dimension as rock embankment material.
2. Include all other quarry stone sizes in the embankment. Limit rock fines to a maximum of 25 percent passing a 2 in (50 mm) sieve and 10 percent passing a No. 4 (4.75 mm) sieve.
3. Ensure that the material contains 5 percent or less shaly or flaky particles and meets abrasion requirements for a Class A or B coarse aggregate.
4. Ensure that the material has 15 percent or less loss in the magnesium sulfate soundness test.
5. Use the material only when approved by a petrographic rock analysis.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test as follows:

Test	Method
Abrasion	AASHTO T 96
Soundness (Magnesium Sulfate)	AASHTO T 104
Petrographic analysis	ASTM C 295

D. Materials Warranty

General Provisions 101 through 150.

Section 812—Backfill Materials

812.1 General Description

This section includes the requirements for four types of material used as backfill: foundation backfill, Types I and II, imperfect trench backfill, Type III, and mechanically stabilized wall backfill.

812.1.01 Related References

A. Standard Specifications

Section 810—Roadway Materials

B. Referenced Documents

AASHTO T 27

GDT 4

GDT 6

GDT 7

GDT 67

812.2 Materials

812.2.01 Foundation Backfill, Type I

A. Requirements

1. Use natural or artificial mixtures of materials consisting of hard, durable particles of sand or stone, mixed with silt, clay and/or humus material for Type I backfill.
2. Have the final blend of material meet the requirements of Class I or II soils in Subsection 810.2.01.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test as follows:

Test	Method
Soil gradation	GDT 4
Volume change	GDT 6
Maximum density	GDT 7 or GDT 67

D. Materials Warranty

General Provisions 101 through 150.

812.2.02 Foundation Backfill, Type II

A. Requirements

1. Type

   Use material that meets the requirements of Section 800, Class A or B aggregate. Crushed concrete may be used provided it meets the requirements of Section 800 that are applicable to Group 2 Aggregates.

   Do not use backfill aggregate containing soil or decomposed rock.

2. Gradation

   Use material that meets the following gradation requirements:

Sieve Size	% Passing by Weight
1-1/2 in (37.5 mm)	100
1 in (25 mm)	80-100
No. 8 (2.36 mm)	0-5

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test as follows:

Test	Method
Sieve analysis	AASHTO T 27

D. Materials Warranty

General Provisions 101 through 150.

812.2.03 Imperfect Trench Backfill, Type III

A. Requirements

1. Type

   Use material made from either of the following for Type III backfill:

   - A natural soil with a density of less than 95 lb/ft³ (1520 kg/m³) when tested with GDT 7
   - An artificial mixture of soil and organic material, such as hay, leaves, or straw

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

The laboratory will:

1. Test the soil density with GDT 7.
2. Review the mixture and the percentages of each material, and approve a mixture suitable for the Project.

D. Materials Warranty

General Provisions 101 through 150.

812.2.04 Mechanically Stabilized Embankment Backfill

A. Requirements

Use material comprised of crushed stone, natural sand, or a blend of crushed stone and natural sand free of soils, organic or any other deleterious substances that meet the following additional requirements:

1 Crushed Stone

Use a material manufactured from Class A or B stone free of soil overburden and having a soundness loss of not more than 15 percent.

2. Natural Sand

Use material that consists of strong, hard, durable particles, is non-plastic, and has a durability index of at least 70.

3. Gradation

Sieve Size	% Passing by Weight
4 in (100 mm)	100
2 in (50 mm)	80 -100
No. 10 (2 mm)	20 - 90*
No 200 (75 μm)	0 - 12
* Natural Sand may be 20 - 100	

4. Chemical

Ensure the material meets the following chemical requirements:

Test Method	Requirement
Ph	6.0 – 9.5
Resistivity	>3000 ohms/cm
Chlorides	<100 ppm
Sulfates	<200 ppm
Note: These chemical requirements are not applicable to MSE walls stabilized with an approved extensible reinforcement.	

5. Maximum Dry Density

Use backfill material with a maximum dry density equal to or greater than the design unit weight shown on the plans. If no maximum dry density of the backfill material is shown, use a weight of 125 lb/ft^3 (2000 kg/m^3) .

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test the material as follows:

Test Method	Requirement
Percent Wear	AASHTO T96 (“A” Grading)
Sieve Analysis	AASHTO T 27
Material Passing No. 200 (75 μm) Sieve	AASHTO T 11
Durability Index	GDT 75
Maximum Dry Density	GDT 7 or GDT 24a, GDT 24b
Soundness (Magnesium Sulfate)	AASHTO T 104

D. Materials Warranty

General Provisions 101 through 150.

Section 813—Pond Sand

813.1 General Description

This section includes the requirements for pond sand.

813.1.01 Related References

A. Standard Specifications

General Provisions 101 through 150.

B. Referenced Documents

GDT 4

GDT 6

GDT 7

GDT 67

AASHTO T 11 and AASHTO T 27

813.2 Materials

813.2.01 Pond Sand

A. Requirements

Make pond sand exclusively of granular crushed stone fines, relatively free of silt balls, that meet these requirements:

Gradation	
Sieve Size	**Percent Passing by Weight**
4 in (100 mm)	100
1-1/2 in (37.5 mm)	90-100
No. 200 (75 μm)	0-35
Other Properties	
Maximum dry density	90 lb/ft³ (1440 kg/m³) (minimum)
Volume change	0-25%