

## SECTION 02335 - SUBGRADE AND ROADBED

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Bidding requirements, conditions of the contract and pertinent portions of sections in Division 1 of these specifications and MaineDOT Standard of Specifications (current version – as revised) Items 610 – Stonefill, Riprap, Stone Blanket, and Stone Ditch Protection, 703 – Aggregates, apply to the section as fully as though repeated herein.
- B. Section Includes:
  - 1. Coarse aggregate materials
  - 2. Fine aggregate materials
  - 3. Aggregate subbase (under asphalt, concrete)
  - 4. Aggregate base course (under asphalt, concrete)
- C. Related Sections:
  - 1. Excavation and Fill: Section 02315
  - 2. Embankment: Section 02330
  - 3. Hot-Mix Asphalt Pavement: Section 02741
  - 4. Grading: Section 02310

#### 1.02 UNIT PRICE - MEASUREMENT AND PAYMENT

#### 1.03 REFERENCES

- A. American Association of State Highway and Transportation Officials:
  - 1. AASHTO M147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses.
  - 2. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 10-lb Rammer and an 18-in. Drop.
- B. ASTM International:
  - 1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - 2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>).
  - 3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup>).
  - 4. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
  - 5. ASTM D4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- C. MaineDOT Standard Specifications
  - 1. 703.05 Aggregate for Sand Leveling
  - 2. 703.06 Aggregate for Base and Subbase

3. 703.29 Stone Ditch Protection
4. 703.31 Crushed Stone

1.04 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Materials Source: Submit name of materials suppliers and gradation specifications.
- C. Manufacturer's Certificate: Certify materials provided meet or exceed applicable MaineDOT specifications.

1.05 QUALITY ASSURANCE

- A. Furnish each aggregate material from an approved, documented source throughout the Work.
- B. Unless otherwise provided in the contract, all work shall conform to the following standards, as applicable.
  1. MaineDOT
  2. AASHTO
  3. ASTM
  4. AREMA
  5. Standard conditions and special conditions contained in any permit

PART 2 - PRODUCTS

2.1 COARSE AGGREGATE MATERIALS

- A. The material shall have a minimum degradation value of 15 as determined by the Washington State Degradation Test of 1967, except that the test will be run on the portion of a sample that passes the ½ in sieve and is retained on the No. 10 sieve, minus any reclaimed asphalt pavement used.
- B. BASE AGGREGATE: Aggregate for base shall be screened or crushed gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The gradation of the part that passes a 3 in sieve shall meet the grading requirements of the following table:

Sieve Designation <u>US Customary</u>	Percentage by Weight Passing Square Mesh Sieves Aggregates		
	<u>Type A</u>	<u>Type B</u>	<u>Type C</u>
	½ in	45-70	35-75
¼ in	30-55	25-60	25-70
No. 40	0-20	0-25	0-30
No. 200	0-5.0	0-5.0	0-5.0

1. Coarse Aggregate Type A, MaineDOT 703.06(a): Type A aggregate for base shall only contain particles of rock that will pass the 2 in square mesh sieve.

2. Coarse Aggregate Type B, MaineDOT 703.06(a): Type B aggregate for base shall only contain particles of rock that will pass the 4 in square mesh sieve.
3. Coarse Aggregate Type C, MaineDOT 703.06(a): Type C aggregate for base shall only contain particles of rock that will pass the 6 in square mesh sieve.

C. SUBBASE AGGREGATE:

1. Aggregate for base shall be screened or crushed gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The gradation of the part that passes a 3 in sieve shall meet the grading requirements of the following table:

Sieve Designation <u>US Customary</u>	Percentage by Weight Passing Square Mesh Sieves Aggregates			
	<u>Type D</u>	<u>Type E</u>	<u>Type F</u>	<u>Type G</u>
¼ in	25-70	25-100	60-100	-
No. 40	0-30	0-50	0-50	0-70
No. 200	0-7.0	0-7.0	0-7.0	0-10.0

2. Aggregate for subbase shall not contain particles of rock which will not pass the 6 in square mesh sieve.

D. STONE OUTLET PROTECTION:

1. Rock used for outlet protection shall consist of sound, durable rock that will not disintegrate by exposure to water or weather.
2. Fieldstone, rough quarry stone, blasted ledge rock or tailings may be used.
3. The rock shall be graded within the following limits or as otherwise approved:

Sieve Designation <u>US Customary</u>	Percentage by Weight <u>Passing Square Mesh Sieves</u>
12 in	90-100
4 in	0-15

E. CRUSHED STONE (FOR CONSTRUCTION ENTRANCE):

1. Crushed stone shall be obtained from rock of uniform quality and shall consist of clean, angular fragments of quarried rock, free from soft disintegrated pieces or other objectionable matter.
2. The stone, which shall be similar to railroad ballast, shall meet the following gradation requirements in the stockpile at the source:

Sieve Designation <u>US Customary</u>	Percentage by Weight <u>Passing Square Mesh Sieves</u>
2 ½ in	100
2 in	95-100
1 in	0-30
¾ in	0-5

## 2.2 FINE AGGREGATE MATERIALS

- A. AGGREGATE FOR TRENCH SAND: Trench Sand shall be sand of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The gradation shall meet the grading requirements of the following table:

Sieve Designation	Percentage by Weight
<u>US Customary</u>	<u>Passing Square Mesh Sieves</u>
3/8 in	85-100
No. 200	0-5.0

## 2.3 SOURCE QUALITY CONTROL

- A. Section 01400 - Quality Requirements: Testing and inspection services.
- B. Coarse Aggregate Material - Testing and Analysis: Perform in accordance with ASTM D698, ASTM D1557, AASHTO T180, ASTM D4318, and ASTM C136.
- C. Fine Aggregate Material - Testing and Analysis: Perform in accordance with ASTM D698, ASTM D1557, AASHTO T180, ASTM D4318, and ASTM C136.
- D. When tests indicate materials do not meet specified requirements, change material and retest.

## PART 3 - EXECUTION

### 3.1 EXCAVATION

- A. Excavate aggregate materials from on-site locations as indicated on Drawings.
- B. Stockpile excavated material meeting requirements for coarse aggregate materials.
- C. Remove excess excavated coarse aggregate materials not intended for reuse, from site.
- D. Remove excavated materials not meeting requirements for coarse aggregate materials from site.

### 3.2 STOCKPILING

- A. Stockpile materials on site at locations designated by Engineer on Drawings.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Separate different aggregate materials with dividers or stockpile individually to prevent mixing.
- D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

3.3 STOCKPILE CLEANUP

- A. Remove stockpiles. Leave area in clean and neat condition. Grade site surface to prevent freestanding surface water.

END OF SECTION 02335