

SECTION 32 14 40: STONE FOR
PAVING AND SEATING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. The conditions and general requirements of the Contract, Division 00, and applicable parts of Division 01 apply to the work under this Section.
- B. Related Documents: The Massachusetts Highway Department (MHD) Standard Specifications for Highways and Bridges, 1988, and all subsequent amendments shall apply to this Section for general requirements, materials, and execution of Work only. Compensation for Work specified in this Section shall be included as part of the total Contract sum for this project.
- C. The following related items are included under the Sections listed below:
 - 1. Section 03 30 53 "Cast-In-Place Concrete" (for footings)
 - 2. Section 11 16 13 "Play Equipment" (for adjacent play structures)
 - 3. Section 31 20 00 "Earth Moving" (for excavation, backfilling, and grading)
 - 4. Section 32 12 16 "Asphalt Paving" (for adjacent, transition paving for stone paving)
 - 5. Section 32 18 16 "Poured-In-Place Rubber Safety Surfacing" (for abutting surfacing and base for seating boulders)

1.02 WORK INCLUDED

- A. Provide all labor, equipment, implements, and materials required to furnish, install, construct, and perform all site improvements complete as shown on the Drawings and specified herein.
- B. Two types of stones, preferable from onsite excavation and removal, shall be included:
 - 1. Seating Boulders at Playground
 - 2. Stone Pathway at Outdoor Learning Lab
- C. Work shall also include:
 - 1. Select, move, stockpile, protect, and relocate existing boulders and stones.
 - 2. Furnish and install drainage course ($\frac{3}{4}$ crushed stone). See Section 31 20 00 "Earth Moving."
 - 3. Furnish and install geotextile fabric.

4. Furnish and install aggregate.
5. Furnish and install additional boulders and stones if/where needed.

1.03 DESCRIPTION

- A. Seating Boulders at Playground: Install onsite boulders as seating elements within the playground, per the Drawings.
 1. The boulders to be used for seating shall be selected for size and smooth, rounded shape with no sharp edges or corners
- B. Stone Pathway at Outdoor Learning Lab (ADD ALT. #3): Construct a placed stone path from on-site material to form an irregular path adjacent to the asphalt walkway, as shown in the Drawings.
 1. The stone to be used shall be selected for size and smooth, rounded shape and flat top, so they are walkable on one side without being slippery and without abrupt horizontal level changes.

1.04 REFERENCES

- A. Standards: The following referenced standards and standard specifications, referred to thereafter by designation only, form a part of this Section:
 1. ASTM D 2434 – Standard Test Method for Permeability of Granular Soils (Constant Head).
 2. ASTM D 2859 – Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials.
 3. ASTM D 3776 – Standard Test Methods for Mass Per Unit Area (Weight) of Fabric.
 4. ASTM D 3786 – Standard Test Method for Bursting Strength of Textile Fabrics – Diaphragm Bursting Strength Tester Method.
 5. ASTM D 4491 – Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 6. ASTM D 4533 – Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
 7. ASTM D 4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
 8. ASTM D 4716 – Standard Test Method for Determining the (In plane) Flow rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
 9. ASTM D 4751 – Standard Test Method for Determining Apparent Opening Size of a Geotextile.

10. ASTM D 4833 – Standard Test Method for Index Puncture Resistance of Geomembranes, and Related Products.
11. ASTM D 5199 – Standard Test Method for Measuring the Nominal Thickness of Geosynthetics.

1.05 SUBMITTALS

- B. Product Data: Submit in accordance with Section 01 33 00.
- C. Submit product data sheets with manufacturer’s specifications for all items in this section, including materials, preparation instructions, storage and handling recommendations, and installation methods.
- D. Submit samples for furnished boulders and stones.

1.06 SAMPLES

- A. Owner’s Representative shall review and approve on-site Contractor’s pre-selection of boulders and stone for reuse prior to them being installed.
- B. Seating Boulders at Playground: Construct a sample “mock-up” at location for review and approval
- C. Stone Pathway at Outdoor Learning Lab (ADD ALT. #3): Construct a sample of a ten-foot-long length “mock-up” of the placed stone path for approval.
- D. These samples shall be the standard from which all work will be judged.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Store existing boulders until ready for installation.
- B. The Contractor shall be solely responsible for all materials stored on the site once delivered. Any materials left unsecured at the job site shall be solely at the contractor’s own risk.

PART 2 - MATERIALS

2.01 DRAINAGE STONE

- A. Drainage stone shall be $\frac{3}{4}$ ” washed crushed stone drainage course, per Section 31 20 00 “Earth Moving”

2.02 GEOTEXTILE FABRIC

- B. Geotextile Fabric shall meet the following requirements:

1. Composition: Non-woven, needle-punched, UV-treated polypropylene or spun-bonded polyester fabric.
2. Recycled Content: 10 percent post-consumer and 10 percent or more of pre-consumer recovered materials.
3. Size: 5 to 6 feet wide by 250 feet long.
4. Weight, ASTM D3776: Min. 3.24 ounces per square yard.
5. Grab Tensile Strength: ASTM D4632: min. 81/79 pounds.
6. Elongation: 59/63.
7. Mullen Burst Strength, ASTM D3786: min. 130 pounds.
8. Puncture Resistance, ASTM D4833: min. 45.1 pounds.
9. Trapezoid Tearing Strength, ASTM D4533: min. 42/71 pounds.
10. Permittivity, ASTM D4491: min. 2.09 sec-1.
11. Flow Rate, ASTM D4491: min. 300 gal/ft/min.

2.03 AGGREGATE

- A. Aggregate to fill joints shall conform to MassDOT standard M2.01.6.

2.04 BOULDERS

- A. All boulders existing on-site that meet the size and shape requirements shall be reused in locations shown on the drawings. For excess boulders, see Section 31 20 00 "Earth Moving"
- B. Boulders shall be a minimum of 18" in any direction
- C. Boulders shall not have sharp or angular edges
- D. The Owner's Representative shall approve selected boulders

PART 3 - EXECUTION

3.01 PREPARATION

- A. Examine all surfaces and substrates prior to installation.
- B. Notify the Owner's Representative if any conditions are not as shown in the drawings.
- C. Proceed only when surfaces and substrates are corrected.

3.02 DRAINAGE STONE

- A. Install drainage stone continuous from playground drainage course.
- B. Restore existing facilities used during construction to original condition at start of work or as specified elsewhere in the Contract Documents.

3.03 GEOTEXTILE FABRIC

- A. Install geotextile fabric continuous with playground fabric.
- B. Place geotextile fabric below drainage stone. Wrap fabric at edges to contain stone.
- C. Lap seams a minimum of 3 inches per Drawings.

3.04 SEATING BOULDERS AT PLAYGROUND

- B. Owner's Representative shall be on site the first day on which the seating boulders are placed to approve final location.
- C. Boulders shall be placed as shown on the drawings. The boulders shall be placed so that the tops are rounded and approximately 12-18" above the elevation of the playground surface.
- D. No angular, pointed, or sharp faces shall show on the top or sides of the seating boulder.
- E. No boulders shall be placed inside the play equipment safety zone. (See Drawings)

3.05 STONE PATHWAY AT OUTDOOR LEARNING LAB

- A. Placed stone per Drawings and as directed by the Owner's Representative in the field.
- B. Use stone dust setting bed of minimum 2" depth and 6" of compacted crushed stone, per Drawings.

3.06 PROTECTION

- A. Protect placed boulders and stone path.

END OF SECTION

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