

STONE FILL

**\*\*From Jamaica ER STP 013-2(12)**

- xx. DESCRIPTION. This work shall consist of furnishing and placing stone fill material inside of, as well as upstream and/or downstream of, a culvert or pipe to facilitate aquatic organism passage and mimic the native channel.

The work under this Section shall be performed in accordance with these provisions, the Plans, and Section 613 of the Standard Specifications.

- xx. GENERAL REQUIREMENT. An on-site meeting shall be conducted prior to and during placement of the first bed lift to determine that the installation is appropriate. Attendees at this meeting shall include the Engineer, Contractor, ANR River Management Engineer, Geomorphologist, VT Regional Fisheries Biologist, and other representatives of VTrans and the Contractor as deemed appropriate.

- xx. MATERIALS. Stone Fill, Culvert Lining shall consist of Stone Fill, Type II meeting the requirements of Section 613 supplemented with material excavated from the channel and/or the tailings of a topsoil screening operation.

Stone Fill, Channel Armoring shall consist of Stone Fill, Type III meeting the requirements of Section 613 supplemented with material excavated from the channel and/or the tailings of a topsoil screening operation.

Gradation shall be adjusted to conform to the following:

Type E3. The longest dimension of the stone shall be at least 36 inches, and at least 50 percent of the volume of the stone in place shall have a least dimension of 24 inches, and at least 25 percent of the particles shall have a maximum dimension of 2 inches and be well graded material.

Bed material shall be approved by the Engineer and the Agency of Natural Resources prior to use.

- xx. PLACING. The Engineer shall be notified and a fluvial Geomorphologist shall be onsite during critical points of construction, such as the start of the culvert lining or streambed armoring.

Fill in voids in the stone with a mixture of fines from the existing stream bed material. Fill voids by hand tamping with metal tamping rods or other methods. Plate compactors shall not be used.

Streambed materials and fines shall be placed with an excavator and worked into the voids with the excavator and by hydraulic setting/washing with a metal wand to reach between stones. Voids shall be filled prior to placing each additional lift. The Contractor shall utilize excavated gravels and sediments to fill

in the voids of large stone bed armoring to a minimum of 85% of the voids in the bed. Voids shall be left in the riprap at the edge of the stone-water interface with the intentional arrangement of stone at the base of the wall to create submerged voids for improved aquatic habitat and shall not be intentionally filled with excavated gravels and sediments at the base of the new stream embankment.

Once all material has been placed in the stream channel, the Contractor shall slowly wet the stream to minimize the effects of the initial sediment pulse. The Contractor shall minimize the movement of sediment downstream of the site. The Contractor shall reconstruct the channel such that no underflow occurs and the majority of the stream flow is carried along the surface of the new streambed. The proposed elevated grade of the scoured channel pool shall be a smooth transition at the upstream and downstream limits as shown on the profile to achieve the texture, channel roughness, and composition of the native bed and bed forms upstream and downstream in a smooth longitudinal channel profile, and bed armoring shall not create abrupt transitions that might otherwise become barriers to aquatic organism passage. The Contractor shall return native boulders (greater than 12" in smallest dimension) to the stream bed to increase channel roughness, reduce velocities, and improve instream habitat. All work shall be approved by the Engineer.

xx. METHOD OF MEASUREMENT. The quantities of Special Provision (Stone Fill, Channel Armoring) and Special Provision (Stone Fill, Stream Bed Material) to be measured for payment will be the number of cubic meters (cubic yards) installed in the complete and accepted work, measured within the limits shown on the Plans or as directed by the Engineer.

xx. BASIS OF PAYMENT. The accepted quantities of Special Provision (Stone Fill, Channel Armoring) and Special Provision (Stone Fill, Culvert Lining) will be paid for at the Contract unit price per cubic meter (cubic yard). Payment will be full compensation for furnishing, transporting, and placing the material specified and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Excavation required for the placement of Special Provision (Stone Fill, Streambed Material) will be paid for separately under Contract item 203.27.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
900.608 Special Provision (Stone Fill, Channel Armoring)	Cubic Yard
900.608 Special Provision (Stone Fill, Culvert Lining)	Cubic Yard