

GRADE CONTROL WEIR

**\*\*From Cabot-Danville FEGC F 028-3(26) C/1**

- xx. DESCRIPTION. This work shall consist of furnishing and constructing grade control weirs, including associated rock riffle lines, at the locations indicated in the Plans and as directed by the Engineer.
- xx. MATERIALS. Materials shall be furnished in accordance with the Plans and shall be approved by the Engineer prior to use.

Grade control weir and rock riffle line rocks shall be 1.5 feet to 3.0 feet in diameter with no more than one dimension less than 2.0 feet. Grade control weir rocks shall be constructed of angular, flat, or cubed rock and shall have two relatively flat opposing surfaces to facilitate weir construction. The size and quality of the grade control weir rocks shall be subject to approval by the Engineer.

The use of rock in stream projects requires a dense, low porosity material that can withstand stream flows as well as freeze-thaw cycles. When possible, consideration should be given to obtaining rock that is similar in color and texture to the native stone in the project area. Rock should be of sufficient hardness to resist weathering and shall be free of cracks and other blemishes. Porous rock, such as some limestones, and soft rock, such as shales, are not allowed. In some cases, the Engineer may authorize native rock present on the site for use. In no instance will concrete or other debris rock be allowed.

The dry unit weight of each rock shall be 150 lb/ft<sup>3</sup> or greater.

- xx. CONSTRUCTION REQUIREMENTS. Grade control weirs shall be constructed in accordance with the Plans, the following specifications, and as directed by the Engineer.
  - (a) Prior to the start of work, the Engineer shall designate representatives authorized to observe the Contractor's construction of the grade control weirs. The Contractor shall construct all grade control weirs in the presence of an authorized representative.
  - (b) The construction of grade control weirs requires equipment that can place rock in precise locations. An excavator of a suitable size, and equipped with a thumb, is strongly recommended.
  - (c) Grade control weirs shall be constructed as two (2) rock vanes on opposite sides of the stream with a connecting cross channel sill set at the proposed invert of the streambed, plus a rock riffle line located downstream. Grade control weirs and rock riffle lines shall consist of crest (or top) rocks and footer rocks.
  - (d) Grade control weirs shall be constructed so that adjoining rocks taper in an upstream direction, from the bankfull elevation to the stream invert. The upstream (lower) end of the grade control weir is set at a specific invert elevation and the downstream end of the Grade Control Weir is set at a "Weir End" elevation in accordance with the Plans.

- (e) Depth of the scour pool shall be 3.0 feet to 4.0 feet below the weir invert.
- (f) The downstream end of the grade control weir shall be keyed into the streambank at the "Weir End" elevation indicated in the Plans. The grade control weir shall be keyed a minimum of six (6) feet into the streambank. The upstream end of the grade control weir shall be keyed into the streambed at the invert elevation. The grade control weir shall be installed as shown in the Plans.
- (g) The grade control weirs shall be completed by the placement of a cross weir crest at the design invert of the streambed. Weir crest rocks shall be properly secured behind footer rocks, and shall be placed so that the weir crest rocks are level across the channel. The elevation of the weir crest shall be as determined in the Plans, specifications, or as determined onsite by the Engineer.
- (h) Footer rocks shall be installed as shown in the Plans and shall be firmly keyed into the streambed. Placement of footer rocks is critical to the success of grade control weirs. To ensure proper placement, the Contractor shall provide a portable pump to dewater excessive ground water from the excavation. All footer rock placement shall be conducted in a dry excavation.
- (i) Weir crest rocks, except those in the middle 1/3 of the bankfull width of the channel, shall be placed in a linear fashion so as to produce the sloping grade control weir, and shall be placed with tight, continuous surface contact between adjoining rock. Weir crest rocks shall be placed so as to have no significant gap between adjoining rock. Weir crest rocks in the middle 1/3 of the channel shall have gaps as shown in the Plans or as directed by Engineer.
- (j) Rock riffle lines shall be constructed across the channel perpendicular to the direction of flow, unless otherwise indicated in the Plans or directed by Engineer. Rocks shall be placed to result in the channel invert elevation indicated in the Plans and to conform with the channel cross sectional geometry indicated in the Plans.
- (k) As the grade control weir is constructed, the Contractor shall chink all voids between the footer rocks, and between the footer rocks and the weir crest rocks. Voids shall be chinked with small boulders, cobble, or rock fragments. Chinking will be conducted such that no voids greater than four (4) inches in size will be present.
- (l) Upon completion of the work, the Contractor shall reshape the slopes and stream bottom to the specified elevations. All unsuitable and surplus rocks shall be removed from the site.

xx. METHOD OF MEASUREMENT. The quantity of Special Provision (Grade Control Weir) to be measured for payment will be for each weir installed in the complete and accepted work.

1/26/2011

xx. BASIS OF PAYMENT. The accepted quantity of Special Provision (Grade Control Weir) will be paid for at the Contract unit price for each. Payment will be full compensation for constructing the grade control weir, including any necessary excavation, compaction, and controlling water flows; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
900.620 Special Provision (Grade Control Weir)	Each