

Construction Specification SR -01	ROCK VANES
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1. Description

Rock vanes are in-stream structures constructed for the purpose of reducing shear stress on streambanks. Rock veins are constructed as shown in **Standard Drawing SR-01a**, and as set forth in the plans for the project. Rock Vanes shall consist of both Footer Rocks, placed below the invert of the proposed channel, as well as Vane Rocks.

2. Materials

Rock vanes shall be constructed of angular, flat or cubed rock obtained from a source that is approved by the Contracting Officer prior to execution of a contract for the project. 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, native rock present on the site may be authorized for use by the Contracting Officer. In no instance will concrete or other “debris” be allowed. All rock under this specification shall meet the conditions of material specification **MS-01 Rock**.

3. Rock Size

Rock used for the construction of rock vanes will meet the following size requirements. All units are shown in feet (ft) and pounds (lbs). Rock sizes apply to both Footer Rocks and Vane Rocks.

3.1 Rock Size

	A-axis	B-axis	C-axis
Minimum Size	4	3	2
Maximum Size	8	6	5

- 3.2** Rock Weight - The dry unit weight of each rock shall be 150 lbs/cuft or greater.

4. Source of Materials

Prior to execution of a contract, the Contractor will locate potential sources of rock. The Contractor and Contracting Officer will jointly visit the site(s) to determine whether the rock meets the requirements as set forth in these specifications. The Contractor shall be responsible for obtaining from the rock provider, a certification that the rock meets NYSDOT specifications for rock riprap. A site visit may be waived by the Contracting Officer when rock will come from a source that has been approved in the past.

5. Construction Methods:

- 5.1** Rock Vanes shall be installed according to the Project Drawings, Standard Drawing SR-05a, and the following specifications. All Rock Vane installation will be done in the presence of the Contracting Officer or Project Engineer.
- 5.2** Rock Vanes shall be constructed so that adjoining rocks taper in an upstream direction, from the bankfull elevation to the stream invert. The upstream end of the Rock Vane is set at an angle of 20°-30° tangent to the curve. (Drawing SR-01).
- 5.3** The downstream end of the Rock Vane shall be keyed into the streambank at the bankfull elevation. The Rock Vane shall be keyed a minimum of eight feet (8') into the streambank. The upstream end of the Rock Vane is keyed into the streambed at the invert elevation. The Rock Vane shall be installed with a slope of 4% to 7% from the streambed invert to the bankfull elevation.
- 5.4** Footer Rocks shall be installed as shown in the Project Drawings, Standard Drawing SR-05a, and the following specifications. Footer Rocks shall be firmly keyed into the streambed.
- 5.5** Vane Rocks shall be placed in a linear fashion so as to produce the sloping Rock Vane, and shall be placed with tight, continuous surface contact between adjoining rock. Rock shall be placed so as to have no significant gap between adjoining rock.
- 5.6** Vane Rock shall be placed so as to have a final smooth surface along

the top plane of the Rock Vane. No Vane Rock shall protrude higher than the other rock in the Rock Vane. A completed Rock Vane has a smooth, continuous finish grade running in an upstream direction from the bankfull elevation to the streambed.

- 5.7** Upon completion of the Rock Vane, the Contractor shall place stabilizing vegetation as shown in the Vegetation Plan and Specifications.
- 5.8** The Contractors shall upon completion of the work reshape the slopes and stream bottom to the specified elevations. All unsuitable and surplus rocks will be removed from the site.

6. Measurement and Method of Payment

- 6.1** Rock Vanes will be measured and paid for at the contract unit price for each rock vane installed.
- 6.2** The contract unit price shall be full compensation for the transport of all materials, excavation, installation, and maintenance of rock vanes, and for all materials, labor, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.

7. Special Conditions

- 7.1** Prior to the start of work, the Contracting Officer and Project Engineer shall designate representatives authorized to observe the Contractors construction of the Rock Vanes. The Contractor shall construct all Rock Vanes in the presence of an authorized GCSWCD representative.
- 7.2** Placement of Footer Rocks is critical to the success of Rock Vanes. To insure proper placement, the Contractor shall provide a portable pump to de-water excessive ground water from the excavation.
- 7.3** The construction of Rock Vanes requires equipment which can place rock in precise locations. An excavator of a suitable size, and containing a thumb is suggested.
- 7.4** The GCSWCD has estimated that each Rock Vanes will require approximately 62 cuyds (92 Tons) of rock per rock vane. Estimated rock volumes found in the USACOE permit section of this document shall not be used for calculating total rock volumes required. It shall be the responsibility of the Contractor to verify all required rock volumes.