

ROAD COMMISSION FOR OAKLAND COUNTY

SPECIAL PROVISION
FOR
NATURAL CHANNEL STRUCTURES

RCOC:AP/JO

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RCOC20SP814A
ORG:04-05-21

a. Description

This section includes the installation of Cross-Vanes using stacked stones as vane arms. Portions of the vanes installed into the stream bank are referred to as vane sills. All structures will be installed in accordance with these specifications here and their respective details and on-drawing specifications on the Contract Drawings.

b. Materials

1. Vane and Footer Stones.

Stone for the Vane and Footer Stones shall consist of solid native igneous rock and shall be approved by the Engineer prior to placement. The stone shall have a minimum bulk specific gravity of 2.5 and shall not be layered, striated, visibly porous, or known to be subject to breaking down when exposed to water or weathering. Broken concrete, precast concrete blocks, grouted riprap, cobblestone, limestone, sandstone, shale or any sedimentary rock shall NOT be used. Vane and footer stones shall be angular in shape, tabular and blocky, stackable without rocking, and follow the sizing set forth in the Contract Documents and noted below:

Minimum Size Dimensions – 1.0 ft (short axis-min) by, 1.0 ft (intermediate axis-min) by, 2.0 ft (long axis-min) where the long axis is set across the width of the channel in the throat section and longitudinally along the arm section. Bottom of footer stone depth shall be 2.0 feet, minimum, below stream bed finished grade. Placed vane and footer stones not conforming to minimum size dimensions shall be removed and replaced as directed by the Engineer at no additional cost.

2. Geotextile Liner shall be provided.

3. Rock pool fill shall meet the requirements of Riprap, Plain, RCOC (8"-16").

4. Void fill material shall meet the requirements for Aggregate, 6A or be clean sandy gravel material as approved by the Engineer.

c. Construction

The Contractor shall meet the material requirements, design dimensions, and elevations provided on plans, as well as the performance criteria specifications outlined herein.

1. Surface elevations and the intermediate slope of the boulders, stone blocks, structure stones, pool depths and vane arms shall conform to the spot elevations specified on the Contract Drawings or as directed by the Engineer.

2. Placed material not conforming to the specified tolerance limits shall be removed and replaced as directed by the Engineer at no additional cost.

3. Cross Vane Installation

Installation of the Cross-Vanes shall be as described unless otherwise approved by the Engineer to the spot elevations and vane slope percentage listed in the plans. The contractor is responsible for determining the elevation to excavate based on the material size ordered.

A. Excavate the entire area to the elevations required to construct the cross vanes and rock pools as shown on the plans and as required based on the material ordered. Excavate for toe stone protection and bank side slopes.

B. Place geotextile liner on entire area and shingle lap joints at least 2 feet.

C. Construct cross vanes by stacking flat vane stones as shown on the plan details and toe into banks.

D. Fill rock pool area to the elevations shown with stone meeting the specification for Riprap, Plain, RCOC (8"-16"). Fill voids within rock pool area with Aggregate 6A or suitable job excavated material to within 6" below the top of rock in order to nest stones. The backfill materials shall be compacted with water in 6 inch lifts until refusal. Suitable job excavated material shall consist of clean sandy/gravel free of clay or organics and is subject to the approval of the Engineer.

E. Unsuitable materials shall be removed from the channel and not reused in backfilling the vanes. Unsuitable materials are concrete debris, trash, organic muck, woody debris, clay, fine sand, and silty soils.

d. Measurement and Payment.

The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Cross Vane	Square Yard

Cross Vane includes furnishing and installation of Cross-Vanes with placement and repositioning of stones (if necessary), and for all material, labor, equipment, tools, and incidentals necessary to complete the work per the plans. All excavation to prepare the area, filling of rock pools, geotextile liner, aggregate fill, including compaction, in order to nest stones will also be included in the **Cross Vane** pay item.

Armoring the banks behind the toe of slope will be paid for as Riprap, Plain, RCOC (SYD) contained elsewhere in the proposal.