

# EROSION PREVENTION AND SEDIMENT CONTROL NARRATIVE

## PROJECT DESCRIPTION

This project involves the replacement of the existing Corrugated Metal Pipe Arch (CMPA) culvert with a pre-cast concrete box culvert, and the related approach work. Bridge #2 is located on Vermont Route 8 in the town of Readsboro, approximately 1.3 miles north of its intersection with VT RTE 100. The new culvert will be a concrete box approximately 88' long, 8' tall and 12' wide. The new culvert will be on the same alignment, at a 45° skew from the centerline of the road.

It is anticipated that this project will last one construction season.

Area of disturbance is approximately 0.42 acres.

## SITE INVENTORY AND ANALYSIS

### **OFF SITE DRAINAGE CHARACTERISTICS**

The property surrounding the project site consists of well established vegetation with minimal slopes at the project site. The property surrounding the project site is mostly grass land with the woods line approximately 50-70 feet from the centerline of VT RTE 8 on either side. Due to the nature of the surrounding terrain the project site should not receive any runoff water from off project areas.

### **DRAINAGE, WATERWAYS, BODIES OF WATER:**

The only waterway in the project area is an unnamed tributary to the West Branch of the Deerfield River, which Bridge #2 carries under VT RTE 8.

### **TOPOGRAPHY, EXISTING ROADS, BUILDINGS, UTILITIES:**

The topography of the project site is forest, with grass and brush in the immediate vicinity of the construction site. There are no buildings or utilities in the project area. A section of the VAST trail crosses VT RTE 8 at the project site.

### **VEGETATION:**

The vegetation in the project area is grass and varied brush. The impact to vegetation will be limited to that which is affected by removal of the existing culvert and installation of the replacement culvert. After the project is finished the slopes will be stabilized with stone fill and vegetation will be reestablished with standard seed and mulch practices.

### **SOILS:**

All soil data came from the U.S. Department of Agriculture Soil Conservation Service for the county of Bennington, Vermont. Soil type is classified as Wilmington Fine Sandy Loam. Slopes: 0-8%, very stony, potentially highly erodible land. Soil "K factor" = 0.43.

Note: Generally, K-values indicate the following: 0.0 – 0.23 = low erodibility; 0.24 – 0.36 = moderate erodibility; 0.37 and higher = higher erodibility.

### **SENSITIVE RESOURCE AREAS:**

There are no 'Threatened & Endangered Species' living on or near the project site and there are no historical, archeological or archeologically sensitive areas on or near the project site.

### **PROXIMITY TO NATURAL OR MAN-MADE FEATURES:**

Disturbance of soils near natural or man-made waters will consist of that which is necessary for the replacement of the existing culvert, wingwall and headwall replacement and guardrail work. Disturbed stream banks will be stabilized with Stone Fill, Type II under laid with geo-textile fabric.

## TEMPORARY EROSION PREVENTION & SEDIMENT CONTROL

### **TEMPORARY EROSION PREVENTION MEASURES TO BE UTILIZED INCLUDE:**

"Project Demarcation Fencing," denoted -PDF- on the plans, to delineate the limits the contractor can access with construction equipment. This measure limits the area that can be disturbed and exposed to erosion.

Seeding and mulching is needed on areas flatter than 1:3, and biodegradable erosion control matting or equivalent product is needed on slopes greater than or equal to 1:3

Tracking of all exposed slopes, combined with temporary mulching, will also be utilized on a regular basis. If an area will be without construction activity for 7 days, it must be mulched within 48 hours. If the area is to be without construction activity for 14 days, it must be seeded and mulched within 48 hours. The forecast of rainfall events shall also trigger protection of exposed slopes. If rainfall is predicted the Contractor must stabilize the site accordingly prior to the forecasted event.

### **TEMPORARY MEASURES TO CONTROL SEDIMENT TRANSPORT INCLUDE:**

Silt fence will be installed a distance of 5' to 10' from the toe of slopes to prevent sediment transport to down gradient areas. Each line of silt fence will be placed along the contour with ends turned slightly uphill to create a ponding effect should water try to run along the fencing and around the ends. The maximum slope length between separate runs of silt fence is 100'. Silt fence shall be installed prior to any upslope earthwork.

Stabilized construction entrances to the project site, staging areas, as well as waste and borrow areas shall be established. The minimum size of a stabilized construction entrance is 12'X50'. All surface water flowing to or diverted toward a construction entrance shall be piped under the stone. Pipes shall be appropriately sized for the contributing area, however, no pipe smaller than 6" diameter shall be used. See typical detail on 'Erosion & Sediment Control Plan' sheet for materials and construction method to be utilized when constructing a stabilized entrance.

Temporary sediment settling basins may or may not be utilized on this project. If a sediment settling basin is to be used for dewatering a cofferdam, it should be sized based upon the following criteria: (See Sediment Settling Basin Sizing Criteria.) The proposed location of the basin must be included in the contractors plan submittal for approval before use.

Measures such as temporary stone check dams, construction entrances, sediment basins, silt fence, and sand bags shall be checked regularly for accumulation of sediment. Sediment build-up shall be removed when the level of sediment reaches one-half the height of the control measure. Sediments shall be disposed of in an area such that they will not be subject to erosion.

## PERMANENT EROSION CONTROL MEASURES

### **SEVERAL PERMANENT EROSION CONTROL MEASURES WILL BE UTILIZED:**

Stone lining of the stream banks with Stone Fill, Type II as specified by VTrans Hydraulics personnel. This stone will provide protection from stream bank erosion during design storm events. In areas with large slopes, stone fill under laid with geo-textile fabric is required. Areas at stations 71+57 LT – 71+88 LT and 70+98 RT – 71+50 RT all require this technique.

Stone Fill, Type II will be utilized at culvert outlets to dissipate water velocities and reduce erosion potential. Grass or other suitable ground cover will be established outside of the roadway limits where stone lining has not been specified. Specifically stations, 71+24 LT – 71+60 LT, 71+84 LT – 72+23 LT, 70+80 RT – 71+60 RT, AND 71+73 RT – 72+00 RT.

All slopes shall be stabilized within 48 hours of reaching final grade or during intermittent phases of construction activity.

## GENERAL EROSION & SEDIMENT CONTROL GUIDELINES

The Erosion Control Plans are meant as a guideline for preventing erosion and controlling sediment transportation. The work outlined in this narrative consists of applying measures throughout the life of the project to control erosion and minimize the sediment to receiving waters. The measures include stabilization and structural practices, storm water controls and other pollution prevention controls. This document serves as a guide for the Contractor to make an Erosion Prevention and Sediment Control Plan which shall be submitted to the Construction Environmental Engineer for approval.

Coordinate the installation, use, and removal of erosion and sediment control measures with construction activities to ensure economical, effective and continuous erosion and sediment control. Employ temporary stabilization practices in incremental stages as construction proceeds. The contractor will use additional erosion control measures as necessitated by the sequence of construction and as directed by the engineer. See section 652.10 of the Vermont AOT Standard Specifications for Construction, dated 2001.

Install all erosion and sediment control measures as shown in the Erosion Control Plan or as directed by the engineer. Do not modify the type, size or location of any control or practice without approval of the engineer. All changes shall be approved by the Construction Environmental Engineer and also be noted on the plans, in the weekly inspection report, and reported to the appropriate authority in a timely manner. Inspect all control measures weekly and after each rainfall event. Repair measures shall be taken as needed.

Preventing initial soil erosion is much more effective than treating eroded sediment. Therefore, stabilize all disturbed areas promptly after construction activity has temporarily or permanently ceased. Temporary vegetation established as noted in the plans and approved by the Construction Environmental Engineer. Perimeter control measures shall be installed following clearing, but prior to the start of any grubbing or grading activity, install other temporary controls in incremental stages as construction proceeds.

Maintaining vegetated buffers along stream banks, wetlands or other sensitive areas is a crucial erosion and sediment control measure that should be established wherever possible.

Control only sediment-laden runoff generated by the project site using diversion berms, diversion channels, culverts and/or temporary pipes.

Do not allow construction equipment to operate on the down slope side of perimeter control measures.

## SEDIMENT SETTLING BASIN SIZING CRITERIA

PUMP FLOW RATE		REQUIRED SURFACE AREA		LENGTH = 2:1 WIDTH			
Q (gpm)	Q (m <sup>3</sup> /s)	(ft <sup>2</sup> )	(m <sup>2</sup> )	L (ft)	W (ft)	L (m)	W (m)
50	0.0032	595	55	35.0	17.0	10.6	5.3
100	0.0063	1200	111	49.0	24.5	15.0	7.5
150	0.0095	1776	165	59.6	29.8	18.2	9.1
200	0.0126	2368	220	68.8	34.4	21.0	10.5
250	0.0158	2970	276	77.0	38.5	23.4	11.7
300	0.0189	3560	330	84.4	42.2	25.8	12.9
350	0.0221	4155	386	91.2	45.6	27.8	13.9

PROJECT: READSBORO	PROJECT NO. : ST CULV (4)
DESIGN FILE NAME: 04c176/structures/so4c176ecnotes.dgn	PLOT DATE: 18-JUL-2006
IPARM FILE NAME: s04c176ecnarr.i	DRAWN BY: M.FESSEL
DESIGNED BY: E.L.RUSTAY	CHECKED BY: M.GAGULIC
SQUAD LEADER: C.P.WILLIAMS	SHEET: 30 OF 39
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