

# EROSION PREVENTION AND SEDIMENT CONTROL NARRATIVE

## PROJECT DESCRIPTION

This project is located on Town Highway (TH) 45, Bridge No. 33 in the County of Orange, Town of Tunbridge, Vermont. Construction will consist of the rehabilitation of the Cilley Covered Bridge over the 1st Branch of the White River, including replacing a damaged tie-beam and knee bracing; installing new siding; replacing approximately ¼ of both bottom chords; and replacing the floor beams and decking in kind with eastern hemlock. The end of the bridge at abutment No. 2 will be plumbed straight. The work on abutments will include installing a new bridge seat and back wall at abutment No. 1, and rethinking the laid up stone at abutment No. 2 along with pouring a new concrete bridge seat. The bridge will be closed during construction and traffic will be detoured approximately 1 mile to VT 110 on Falls Hill Road.

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

Area of disturbance is 0.17 acres

## SITE INVENTORY AND ANALYSIS

### OFF SITE DRAINAGE CHARACTERISTICS

The property surrounding the project site consists primarily of well established level agricultural fields. Any runoff water entering the project site will be primarily limited to that conveyed along roadway ditches.

### DRAINAGE, WATERWAYS, BODIES OF WATER:

The 1<sup>st</sup> Branch of the White River is located in the project area. There are no other waterways or wetlands within the project area.

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

The approach to the east side of the bridge consists of agricultural fields on both sides of the road. The approach to the west side of the bridge has agricultural fields on the right side of the road and a steeply sloped wooded hillside on the left. There are no buildings in the immediate vicinity of the project. Overhead utility service follows along TH 45, and is expected that the contractor will protect the existing utilities while working on the bridge.

### VEGETATION:

The vegetation on the east approach to the bridge is grass, shrubs and agricultural fields. The west approach to the bridge has agricultural fields on the right, with a steeply sloped hardwood covered ridge on the left.

### SOILS:

All soil data came from the U.S. Department of Agriculture Soil Conservation Service for the county of Orange, Vermont. Soils on the West side of the bridge are Belgrade Silt Loam, 8-15% slopes, "k - factor" = 0.49, considered highly erodible. Soils on the East side of the bridge are Hadley Very Fine Sand Loam, 0% slopes, "k - factor" = 0.49, considered not highly erodible due to level ground.

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

### SENSITIVE RESOURCE AREAS:

No 'Threatened & Endangered Species' have been identified within the project limits and there will be no adverse effect to Historic or Archeological features. The current project ROW exists partially within the limits of a designated Archeologically sensitive are. Duncan Wilkie, the state archeologist was consulted regarding how to proceed. He agreed to clear the project NO EFFECT as long as construction stays within the current ROW limits, with the condition that temporary protective fencing is placed along the ROW to keep construction activity out of the sensitive area.

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

Disturbance of soils near natural or man-made waters consists of that which is necessary to rehabilitate the two bridge abutments and applicable roadway approaches as well as the rehabilitation of the existing bridge. Stabilization of disturbances to the stream banks will be accomplished with Stone Fill.

## 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, mulching, and biodegradable erosion control matting or equivalent product is needed on slopes greater than 3:1. In areas with large slopes, stone fill under laid with erosion control matting is required. All slopes shall be stabilized within 48 hours of reaching final grade or during intermittent phases of construction activity.

Tracking of all exposed slopes, combined with temporary mulching, will also be utilized on a regular basis. Any slopes to be exposed for several days prior to final grading shall be tracked and mulched. The forecast of rainfall events shall also trigger protection of exposed slopes.

Temporary stone check dams will be placed in ditches to reduce flow velocities and thus reduce the potential for erosion. Check dams will be placed along the ditches such that the elevation of the top of each check dam corresponds with the elevation of the toe of the preceding upslope check dam. See "Erosion Control Details" sheet. The check dams may be removed once the stone lining of the ditch is complete and the surrounding area stabilized.

### TEMPORARY MEASURES TO CONTROL SEDIMENT TRANSPORT INCLUDE:

Silt fence will be installed at a distance of 5' to 10' (1500-3000) 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' (30,000). Silt fence shall be installed prior to any upslope earthwork.

Measures such as temporary stone check dams, silt fence, and turbidity curtains 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.

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.)

## PERMANENT EROSION CONTROL MEASURES

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

Stone lining of the stream banks with Stone Fill, Type III as specified by VTrans Hydraulics personnel. This stone will protect from stream bank erosion during design storm events. Stone Fill, Type I 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. 3:1 slopes shall be seeded and mulched promptly upon achieving final grade.

## 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.

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 105.23 of the Vermont AOT Standard Specifications for Construction, dated 2001.

Install erosion and sediment control measures as shown in the Erosion Control Plan as needed or as directed by the engineer. Do not modify the type, size or location of any control or practice without approval of the engineer. Any changes shall 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 shall be established if the area is to be without construction activity for a period of 14 days. 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 WIDTH = 2:1			
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: TUNBRIDGE	PROJECT NO.: BHO 1444 (42)
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DESIGNED BY: R. S. YOUNG	CHECKED BY: R. S. YOUNG
SQUAD LEADER: C. P. WILLIAMS	SHEET: 32 OF 40
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