

# EROSION CONTROL NARRATIVE

## DESCRIPTION OF PROJECT

This rapid bridge construction project involves the rehabilitation of a three span bridge carrying US Route 4 over the Ottauquechee River in the Town of Woodstock. The existing bridge is approximately 202 feet long and 32 feet wide. The superstructure (steel beams, railings, and concrete deck) will be completely replaced and the abutments and piers will be rehabilitated to support the new superstructure. The roadway centerline for Route 4 will be shifted 0.9 feet to the north along the bridge. The bridge superstructure will be widened approximately 3.13 feet to the north and 2.25 feet to the south to accommodate increased lane widths. Sheet pile retaining walls with a cast-in-place concrete caps will be constructed along approaches to accommodate fills required for the roadway widening. Traffic will be detoured away from the project site during rapid bridge construction using a regional detour. Existing heavy stone fill will be chinked in the channel around the base of Pier 2 to fill voids. It is anticipated that this project will last approximately six to eight weeks. The total length of roadway approach work is approximately 148 feet. The site is located at N 109006.88, E 133662.78 based upon NAD 83/92.

Total disturbed area (excluding waste, borrow and staging areas): 1.00 ac.

No "Threatened & Endangered Species" have been identified in the project area.

Although this project is located in the Woodstock Historic Village District, the proposed project will not adversely effect any historic resources.

## SITE INVENTORY & ANALYSIS

### OFF SITE DRAINAGE CHARACTERISTICS:

The roadway in the project area is generally built up above the surrounding ground with steep slopes along the Ottauquechee River. The bridge itself is on a tangent profile, with a 0.5% slope up towards the Village of Woodstock. The roadway is a typical crowned section. Roadway surface drainage will generally be towards both shoulders.

### DRAINAGE, WATERWAYS, BODIES OF WATER:

The Ottauquechee River is located in the project area. There are no other water bodies or wetlands that are located in the area of the project. The drainage basin for the Ottauquechee River is characterized by a narrow river valley within steeply sloped hills. This character also causes the river to rise rapidly and flow swiftly as evidenced by the rocky/cobbly bottom and the bank erosion observed along the river. The contributing drainage area at the bridge crossing is 119.3 sq. miles.

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

The topography of the project site is generally flat along each side of US Route 4, sloping very steeply towards the Ottauquechee River. Beyond the approaches the terrain slopes up hill away from the site. Church Street Ext. forms a Y intersection with US 4 in the southeast quadrant of the project, just to the east of the bridge. River Street forms a Y intersection with US 4 in the northwest quadrant of the project, just to the west of the bridge. Development along this portion of US 4 consists of three permanent residences with manicured lawns and large trees abutting the project in the northeast, southeast, and northwest quadrants. A community center is located at the southwest quadrant of the approach.

Overhead utility service will not need to be relocated. The overhead utilities follow US 4, crossing the river north of the bridge. There is an existing water main south of the bridge that intersects an original main under the roadway along the east approach. The abandoned section of the original main crosses under the existing bridge superstructure. The abandoned section will be removed with the existing superstructure.

### VEGETATION:

There are several trees along US Route 4 with both large and small hardwoods located along the river banks. The residences near the bridge site have small areas of lawn adjacent to the roadway. Impacts to vegetation will be limited to that which is affected by the widening of the bridge and roadway, and the construction of the proposed retaining walls along the approaches. Some immature 2-6 inch diameter trees will be removed. Following the construction of the bridge superstructure and substructures, the existing slopes will be stabilized with stone fill and/or vegetation will be reestablished with standard seed & mulch practices.

### SOILS:

The Soil Conservation Service has mapped the soils throughout Windsor County. The soil type identified within the project area is Urban Land-Windsor-Agawam complex. "Urban Land is mostly covered by streets, parking lots, buildings and other structures of urban areas. Agawam soils formed in loamy over sandy glaciofluvial deposits and Windsor soils formed in sandy glaciofluvial deposits on outwash plains and terraces. Windsor soils are very deep to bedrock and excessively drained. Permeability is rapid or very rapid. Agawam soils are very deep to bedrock and well-drained. Permeability is moderately rapid in the upper part of the solum and moderately rapid or rapid in the lower part. The substratum has rapid permeability."

The listed soil erodability coefficient (K-value) is 0.28 for Agawam soils and 0.17 for Windsor soils. Generally, K-value indicates the following: 0.0 - 0.23 = low erodability; 0.24 - 0.36 = moderate erodability; 0.37 and higher = higher erodability.

The majority of the approach work is "in a fill typical", meaning the roadway is higher than the surrounding mean ground elevation. Due to engineering requirements for selective fill material for the widening of the roadway, much of this fill material will need to be brought in from an outside source. Since we do not know where this source pit will be, we can not provide erodability properties for the fill. See the roadway cross sections for fill areas.

### SENSITIVE RESOURCE AREAS:

No "Threatened & Endangered Species" have been identified within the project limits and there will be no adverse effect to Historic or Archaeological features.

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

Disturbance of soils near natural or man-made waterways consists of that which is necessary to construct the abutment modifications and retaining walls and place stone fill around Pier 2. Stabilization of disturbances to the river banks will be accomplished by resetting existing stone fill and re-vegetation.

### 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 an equivalent product, will be utilized on all slopes steeper than 3:1 that are not lined with stone fill. These 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 measures to control sediment transport include:

Silt fence will be installed to prevent sediment transport to down gradient areas. Each line of silt fence shall 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. Silt fence shall be installed prior to any upslope earthwork.

Measures such as 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 approved area such that they will not be subject to erosion.

Stabilized construction entrances and staging areas shall be established. The minimum size of a stabilized construction entrance is 12' x 50'. All surface water flowing to or diverted towards a construction entrance shall be piped under the stone. Pipes shall be appropriately sized for the contributing area, however, no pipes smaller than 6 inch diameter shall be used. See typical erosion control detail sheets for materials and construction methods to be utilized when constructing a stabilized entrance.

### PERMANENT EROSION CONTROL MEASURES

Several permanent erosion control measures will be utilized:

Stone Fill Type III will be placed around the base of Pier 2 to fill existing voids near the pier foundation and in front of Abutment 1 and Abutment 2.

Stone Fill, Type II will be utilized at the Abutment 1 slope and 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. These areas shall be seeded and mulched promptly upon achieving final grade.

### GENERAL EROSION & SEDIMENT CONTROL GUIDELINES

The Erosion Prevention and Sediment Control Plans are meant as a guideline for preventing erosion and controlling sediment transport. The work outlined in this narrative consists of applying measures throughout the life of the project to control erosion and minimize the sedimentation of receiving waters. The measures include stabilization and structural practices, stormwater 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 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. 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.

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. Collect and route clean offsite runoff around or through the project site using diversion berms, diversion to 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

## STATE OF VERMONT AGENCY OF TRANSPORTATION

Town Of	WOODSTOCK	Bridge No.	50
Highway No.	U. S. ROUTE 4	Log Sta.	
		Surv. Sta.	
U. S. ROUTE 4 OVER OTTAUQUECHEE RIVER			
<b>EROSION CONTROL NARRATIVE</b>			
Designed By	J. T. KLEIN	Drawn By	B. J. MASSE
Checked By	Date	Bridge Design Supervisor	
K. G. KRETSCH	10/06	M. A. COLGAN	Date 10/06
PROJECT	WOODSTOCK	PROJECT NO. BHF 020-2 (32)	
I.G.C. Info.			

**VHB Vanasse Hangen Brustlin, Inc.**

Bridge Sheet No. ZJ028ECNAR Sheet 57 of 71

VHB NO. 51298

plot date: 10/11/2006