

# EROSION CONTROL NARRATIVE

## DESCRIPTION OF PROJECT

This project involves the shoring and reinforcement of the easterly piers of bridges 6 north and south on interstate 91 in the town of Brattleboro. Each bridge is a 5 span structure with span 3 over the Whetstone Brook. The shoring and reinforcement of the piers consists of a splint system using H-piles and channel/tension rod connection to the existing piers with a concrete leveling pad at the base. The construction area does not approach buildings or other structures. No 'Threatened & Endangered Species,' Wetlands, or Historic Resources have been identified in the project area. The site is located at longitude 73°-34'-42" west and latitude 42°-50'-56" north.

It is anticipated that this project will last approximately one month.

Total disturbed area: 0.8 acres

## SITE INVENTORY & ANALYSIS

### OFF SITE DRAINAGE CHARACTERISTICS:

The property surrounding the project site consists of well established vegetation, moderate to steeply sloping, mixed softwood and hardwood riparian buffer with some well defined drainage ways. Due to the nature of the surrounding terrain, runoff water entering the project site will be primarily limited to that which is conveyed along roadway ditches, and that which follows Williams Street along the 5<sup>th</sup> grade in the area of the project limits. The current roadway ditches are well defined and are not lined with stone.

### DRAINAGE, WATERWAYS, BODIES OF WATER:

Whetstone Brook is located in the project area and is considered an impaired waterway. There are no other water bodies or wetlands within the project area. The Whetstone Brook is classified as flashy and somewhat meandering, with upstream residential surroundings and in the area of the project consists of a man-made channel and streambed which was relocated from the existing as part of the interstate construction. The contributing drainage area at the bridge crossing is unknown.

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

The topography of the project site is primarily constructed slopes with Williams street following parallel to Whetstone Brook which is contained by a constructed channel along each side. Development along Williams Street consists of residential and mixed use, all of which are located upstream and downstream of the project limits. Overhead utility service follows along Williams Street with the need for relocation of the utility poles unlikely.

### VEGETATION:

In the vicinity of the project site, constructed slopes with grasses and small trees exist along Williams Street. The residences upstream of the project site have areas of lawn and landscape plantings. No fields or other agricultural crops exist near the project. Impacts to vegetation will be limited to that which are effected by construction equipment accessing the piers of the bridges.

Following construction, vegetation will be reestablished with standard seed & mulch practices.

### SOILS:

The soils for the project site are mainly processed materials placed during construction of the interstate. The slopes within the site all have been blanketed with 12" of crushed rock with the channel banks being lined with the equivalent of Type III Stone Fill.

No Soil Erodibility Coefficient (K-value) has been assigned to these soils, however, it is evident low erodibility can be assumed. 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:

No 'Threatened & Endangered Species' have been identified within the project limits and there will be no adverse effect to Historic or Archaeological features. Whetstone Brook is the only identified resource in vicinity of the project.

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

Disturbance of soils near natural or man-made waterways consists of that which is necessary to place leveling pads for the pier reinforcing system. This disturbance will be very minimal and shall be stabilized the same day of placement.

## 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. 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 crushed stone berms will be placed in ditches to reduce flow velocities and thus reduce the potential for erosion. Stone berms will be placed along the ditches such that the elevation of the top of each stone berm corresponds with the elevation of the toe of the preceding upslope stone berm. See 'Erosion Control Details' sheet. The stone berm may be removed once the stone lining of the ditches is complete and the surrounding area stabilized.

Temporary measures to control sediment transport include:

Silt fence will be installed a distance of 5'-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.

Sand bags filled with clean, small diameter stone, or an equivalent barrier, will be utilized in lieu of silt fence at piers 2 and 3 where the work will be near the edge of Whetstone Brook.

Measures such as temporary crushed stone berms, 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 to the project site, staging areas, as well as to waste and borrow 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" in 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 settling basin is to be used for dewatering a cofferdam, it should be sized based upon the pumping rate and target particle size to be settled out for the project site. The follow sizing criteria is based upon a target particle size of 0.01 mm and is provided as general guidance. (See Sediment Settling Basin Sizing Criteria.)

## PERMANENT EROSION CONTROL MEASURES

Permanent erosion control measures will be utilized as necessary:

Excavation associated with this project is very minimal and will not involve any drainage or change in grade.

Grass, or other suitable ground cover will be established on any of the slopes disturbed by the movement of construction equipment beneath the bridges.

## GENERAL EROSION & SEDIMENT CONTROL GUIDELINES

The Erosion 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. Repair measures promptly once damage is discovered.

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 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			
		L (ft)	W (ft)	L (m)	W (m)
Q (gpm)	Q (m <sup>3</sup> /s)				
50	0.0032	595	55	35.0	17.0
100	0.0063	1200	111	49.0	24.5
150	0.0095	1776	165	59.6	29.8
200	0.0126	2368	220	68.8	34.4
250	0.0158	2970	276	77.0	38.5
300	0.0189	3560	330	84.4	42.2
350	0.0221	4155	386	91.2	45.6

PROJECT NAME: BRATTLEBORO

PROJECT NUMBER: ST 091-1(52)

FILE NAME: /03a050/str/s0a050ecn.xls

PROJECT LEADER: S. FARNSWORTH

DESIGNED BY: S. FARNSWORTH

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PLOT DATE: 4/9/04

DRAWN BY: M. FOWLER

CHECKED BY: M. FOWLER

SHEET 6 OF 15