

DESCRIPTION OF PROJECT

This project involves reconstruction of Bridge Number 50 on Town Highway 60 (Elm Street) over Otter Creek in the town of Wallingford. A new single span, precast concrete box beam bridge will be constructed on the existing alignment. Traffic will be detoured during construction using existing local roads. The local terrain is hilly to mountainous, with a narrow flood plain. The stream bed consists of sand, gravel and cobbles, and the drainage area is 265.5 square kilometers. Vegetation in the immediate vicinity of the bridge consists of a mixture of trees, shrubs and grasses. The soils within the project area consist of moderately to excessively drained loose to medium silty-sand. No 'Threatened & Endangered Species' have been identified within the project limits and there will be no adverse effect to Archaeological, wetland, floodplain or agricultural features. Historic concerns with respect to this project have been addressed under a Memorandum of Agreement between FHWA, SHPO and VTrans.

Total disturbed area (excluding waste, borrow and staging areas): 0.09 ha (0.213 acres)

Name of receiving waters: Otter Creek

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 forest with 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.

DRAINAGE, WATERWAYS, BODIES OF WATER:

Otter Creek is located in the project area. There is also, a small, unnamed waterway east of the Otter Creek beyond the end of the project limits.

TOPOGRAPHY, EXISTING ROADS, BUILDINGS, UTILITIES:

The topography of the project site is mountainous and wooded with Elm Street crossing perpendicular to Otter Creek. Otter Creek is contained by low river banks along each side. Development along Elm Street consists of primarily permanent, single family residences in a rural setting. Overhead utility services exist along the southern side of Elm Street.

VEGETATION:

A mix of hardwood and softwood trees of all sizes exist along Elm Street. The three residences near the bridge site have small areas of lawn and landscape plantings. No fields or other agricultural crops exist near the project. Impacts to vegetation will be minimal as no additional structures will be required for traffic control and the bridge will be constructed on the existing alignment.

SOILS:

The Soil Conservation Service has mapped the soils throughout Rutland County. The soil type identified for this project site is 18D (Windsor loamy sand). This soil type is described as '...very deep, excessively drained, and moderately steep...found on the sides of long and narrow terraces and hills that are higher than the adjacent flood plains and at the base of hills and mountains...soil is generally covered with a thin layer of undecomposed and moderately decomposed leaves, needles, and twigs ...under this layer is dark brown loamy sand of 0 to 50 (0 to 2 inches), the subsoil is yellowish brown loamy sand of 50 to 300 (2 to 12 inches) and light olive brown sand 300 to 600 (12 to 24 inches), the substratum is light olive brown sand 600 to 1525 (24 to 60 inches)...permeability is rapid to very rapid...erosion is a moderate hazard...'

The listed Soil Erodibility Coefficient (K-value) for this soil type is 0.17.

SENSITIVE RESOURCE AREAS:

No 'Threatened & Endangered Species' have been identified within the project limits and there will be no adverse effect to agricultural or archaeological features. Otter Creek is the only identified resource and there are no mapped wetlands within the vicinity of the project.

PROXIMITY TO NATURAL OR MAN-MADE WATER FEATURES:

Disturbance of soils near waterways consists of that which is necessary to construct one new concrete bridge abutment, partially reconstruct the other, and minor approach work. One cofferdam will be required as abutment #2 will require a new footing to be placed along the stream bank. Stabilization of disturbances to stream banks will be accomplished with Stone Fill, Type IV.

RIPARIAN BUFFER

A fifty foot (50 ft) riparian conservation buffer boundary will be maintained around the Otter Creek. Impacts within this buffer shall be minimized.

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 3H:1V 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 stone check dams will be placed in ditches if stone lining is not being accomplished simultaneously with the ditch work. Check dams reduce flow velocities and thus reduce the potential for erosion. They 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 Controls Details' sheet. The check dams 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 1500 - 3000 (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 30 000 (100'). Silt fence shall be installed prior to any upslope earthwork.

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 3700 x 15 000 (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 150mm 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.

The sediment settling basin to be used for dewatering purposes should be sized based upon the pumping rate and target particle size to be settled out. The following 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

Several permanent erosion control measures will be utilized:

Stone lining of roadway ditches with clean, angular Stone Fill, Type I will be used to prevent erosion during storm events. See 'Erosion Control Details' sheet for typical ditch section.

Stone lining of the stream banks with Stone Fill, Type IV as specified by VTrans Hydraulics personnel is specified. This stone will protect from stream bank erosion during design storm events.

Grass, or other suitable ground cover will be established outside of the roadway limits where stone lining has not been specified.

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.

Measures such as temporary stone check dams, silt fence, and sediment basins 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.

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 ³ /s)	(ft ²)	(m ²)		
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:	WALLINGFORD	
PROJECT NUMBER:	BRO 1443(31)	
FILE NAME:	/PW/94J084/sj084ecn.xls	PLOT DATE: 3/18/2004
PROJECT LEADER:	R. WHITCOMB	DRAWN BY: J. GILMORE
DESIGNED BY:	D. BONNEAU	CHECKED BY: D. BONNEAU
EROSION CONTROL NARRATIVE		SHEET 15 OF 38