

EROSION PREVENTION & SEDIMENT CONTROL NARRATIVE

DESCRIPTION OF PROJECT

This project involves reconstruction of Bridges 51N & 51S on Interstate 89, mm 70.6, over Joiner Brook, and U.S. Route 2 in the town of Bolton. Work includes replacement of superstructure steel, bearings, deck slabs, approach slabs, bridge rail, and approach rail. Work also includes replacement of pier #2 at Bridge 51N, and pier #3 at Bridge 51S with new wall piers, replacement of pier caps on all other piers, pier column repair, application of fiber reinforced polymer wrap as indicated, and construction of new backwalls at expansion abutments and new curtainwalls at fixed abutments. Traffic will be detoured with the use of crossovers onto the adjoining bridge creating 2 way traffic. Total disturbed area (excluding waste, borrow, and contractor's off-site staging areas) equals 4.24 acres.

*Disturbed area breakdown:

Median Crossovers - 1.85 Acres
Areas Around & Under Bridges - 1.57 Acres
Abutment Access from US 2 & TH - 0.71 Acre
Resident Engineer's Field Office - 0.11 Acre

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 within roadway ditches.

DRAINAGE, WATERWAYS, BODIES OF WATER:

Joiner Brook is located in the project area. It outlets into The Winooski River, approximately 800 ft. south of the project area. There are no other waterways or bodies of water within the project area. Runoff water entering the project area will be primarily limited to that which is conveyed via roadway ditches along I-89, US 2, and The Bolton Access Road.

TOPOGRAPHY, EXISTING ROADS, BUILDINGS, UTILITIES:

The topography of the project site is mountainous and wooded. The project area does not encroach upon any buildings. Joiner Brook is contained by stone lined river banks along each side. Development along the northern side of U.S. Route 2 consists of The Smilie Memorial School. To the north of U.S. Route 2, (Bolton Access Rd. and Curtis Lane), and to the south of U.S. Route 2, (Joiner Brook Rd.), exists primarily single family residences. Overhead utility services exist along the northern side of U.S. Route 2. Underground television cables are buried south of pier 4 (51S), and pier 3 (51N). Underground telephone cables, and a water line are buried between piers 5 (51S) & 4 (51N) and the north shoulder of U.S. Route 2.

VEGETATION:

A mix of hardwood and softwood trees of all sizes exist in the vicinity of the project area, very few within the project area. The triangular shaped section of land, bordered by Joiner Brook, U.S. Route 2, and Joiner Brook Rd., consists mainly of small trees, weeds, and other overgrown vegetation. Impacts to vegetation in this area will be limited to that which is affected by construction equipment accessing the bridge piers. Following construction, vegetation will be reestablished using standard seed and mulch practices.

SOILS:

The majority of the soil found within the project area is Hadley Very Fine Sandy Loam (Hf), 0 to 3% slopes. It is well drained to moderately well drained, and has an Erodibility Factor (K-Value) of 0.49. Typically, cultivated Hadley soil has a very dark grayish-brown very fine sandy loam surface layer about 6" thick. The material under this is dark grayish-brown very fine sandy loam to a depth of about 27" with a dark grayish-brown silt loam below this depth. Also present in the vicinity of the project are Agawam Fine Sandy Loam (AgA), 0 to 5% slopes, friable (brittle), well drained soils (K-Value 0.28) that consist of fine sandy loam over sandy material; Stetson Gravelly Fine Sandy Loam (StC), 12 to 20% slopes, deep, very friable, and somewhat excessively drained (K-Value 0.17); Munson & Raynham Silt Loam (MyB), 2 to 6% slopes, brown silt loam surface layer about 8" thick, over 7" of friable grayish-brown and olive silt loam (K-Value 0.49); Marlowe Extremely Stoney Loam (MeE), 20 to 60% slopes, on hillsides or ridges, moderately deep with rapid surface runoff (K-Value 0.20); Hartland Very Fine Sandy Loam (HfD), 12 to 25% slopes, deep and well drained (K-Value 0.49)

*Generally, K-Values indicate the following:
0.23 and lower - low erodibility
0.24 to 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 agricultural or archaeological features. Joiner Brook 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 waterway consists of that which is necessary to construct pier 2 (51N), partially reconstruct other piers, related abutment work, and approach work. One cofferdam will be required as pier 2 (51N) will require a new footing to be placed near the stream bank, although the stream bank will not be disturbed. All cofferdam work will take place more than 10 ft. from the top of the bank. No work within 15 feet of Joiner Brook will be below Q2.33 flow elevation.

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 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 is stabilized.

TEMPORARY MEASURES TO CONTROL SEDIMENT TRANSPORT INCLUDE:

Silt fence will be installed a distance of 5 to 10 feet 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 feet. 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 ft. by 50 ft. 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 inches diameter shall be used. See typical detail on 'Erosion Prevention & 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.)

The construction of crossovers, removal of crossovers, removal and/or reshaping of slopes around abutments, and/or construction and removal of temporary access roads from U. S. Route 2 or town highways, will extend the construction season into October or November. Therefore a large quantity of Items "654.10 - Erosion Matting", "613.10 - Stone Fill, Type I (Mod. Crushed Stone Berms)", and other erosion control items have been included for use under Winter Erosion Prevention & Sediment Control Plan for this project.

PERMANENT EROSION CONTROL MEASURES

PERMANENT EROSION CONTROL MEASURES TO BE UTILIZED INCLUDE:

Stone lining of roadway ditches (if disturbed) 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.

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

GRADING PLAN & CONSTRUCTION TIME TABLE

GRADING PLAN & CONSTRUCTION TIME TABLE APPEARS ON SHEET 71 OF 307.

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 Prevention and Sediment 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 and On-site Coordinator. 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. Initiate 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.

SIZING REQUIREMENT FOR SEDIMENT SETTLING BASIN

PUMP FLOW RATE Q (gpm)	REQUIRED SURFACE AREA Q (m ³ /s)	LENGTH WIDTH = 2:1					
		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 NAME:	BOLTON	
PROJECT NUMBER:	IM 089-2(29)	
FILE NAME:	IPW/99A268/sa268ecn.xls	PLOT DATE: 3/18/2004
PROJECT LEADER:	FARNSWORTH	DRAWN BY: WEEBER
DESIGNED BY:	STR6	CHECKED BY: FARNSWORTH
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