

**PROJECT DESCRIPTION**

This project involves the rehabilitation of a single span bridge carrying VT Route 17 over Mill Brook in the Town of Fayston. The existing bridge is approximately 24.6 meters long and 7.3 meters wide. The superstructure (steel beams, railings, and concrete deck) will be completely replaced and the abutments will be widened. The alignment for Route 17 will be shifted approximately 0.80 meters to the south. One lane of traffic will be maintained on the bridge at all times. It is anticipated that this project will last one construction season. The total length of roadway approach work is approximately 75.4 meters. The site is located at 471021.824 N, 186974.389 E based upon NAD 83/92. Total disturbed area (excluding waste, borrow and staging areas): 0.41 ha.

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

**SITE INVENTORY & ANALYSIS**

**OFF SITE DRAINAGE CHARACTERISTICS:**

The roadway in the project area is generally built up above the surrounding ground. The terrain includes a steep wooded hill in the northeast quadrant sloping down towards the road and well established fields, lawns, and woods in the other three quadrants. The roadway along VT 17 is on a horizontal curve in the area of the bridge and is superelevated with the high side at the northern shoulder. Roadway surface drainage will generally be towards the southern shoulder.

**DRAINAGE, WATERWAYS, BODIES OF WATER:**

Mill Brook is located in the project area with an unnamed intermittent stream in the northwest quadrant of the bridge. There is also a Class II wetlands located north of VT 17 and west of Mill Brook. There is a small pond in the southwest quadrant of the project. The drainage basin for Mill Brook is characterized by a narrow river valley within steeply mountainous terrain. The streambed consists of cobbles and small boulders. The abutments are protected by large granite blocks. The contributing drainage area at the bridge crossing is 49 sq. km.

**TOPOGRAPHY, EXISTING ROADS, BUILDINGS, UTILITIES:**

The topography of the project site is generally hilly along each side of VT Route 17, sloping towards Mill Brook. Development along this portion of VT 17 consists of permanent residences with lawns, open fields, and woods abutting the project with several gravel drives.

The overhead utilities follow VT 17, crossing diagonally across the road just to the west of the bridge. The utility poles at the southwest and southeast corner of the bridge will need to be relocated to accommodate bridge widening and construction access.

**VEGETATION:**

There are numerous small hardwood and softwood trees along VT Route 17 and the river banks. Impacts to vegetation will be limited to that which is affected by the widening of the bridge and roadway approaches. Some immature 2-6 inch diameter trees will be removed. Following the reconstruction of the bridge, 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 Washington County. The soil type identified for the entire project area is Rumney fine sandy loam. This soil type is described as "formed in loamy over sandy alluvial deposits on flood plains that are frequently flooded for brief duration from fall through late spring. They are very deep to bedrock and poorly drained." These soils have a water table at depths of 0 to 0.5 m below the surface. Permeability is moderate or moderately rapid in the solum and rapid or very rapid in the substratum. Flooding is a concern during periods of high rainfall but is of short duration and usually occurs in the spring.

The listed soil erodability coefficient (K-value) for this type is 0.24. 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 roadway 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. Mill Brook and a small portion of Class II wetlands are the only identified resources.

**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 new concrete wingwalls to accommodate the bridge widening. Stabilization of disturbances to the river banks will be accomplished with cofferdams and Stone Fill, Type II and Type IV.

**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 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 Controls Details' sheet EPSC-2M. 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 1800 mm from the toe of slopes 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 temporary stone check dams and silt fence 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 entrances 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 inch diameter shall be used. See typical erosion control detail sheets for materials and construction methods to be utilized when constructing a stabilized entrance.

Temporary sediment settling basins will be utilized on this project for dewatering cofferdams.

**PERMANENT EROSION CONTROL MEASURES**

Several permanent erosion control measures will be utilized:

Stone lining of the river banks with Stone Fill, Type IV as specified by VTrans Hydraulics personnel. This stone will protect from river 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. 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 accepted Erosion Control Plan and Schedule or as directed by the Engineer. The contractor shall 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			
		L (ft)	W (ft)	L (m)	W (m)
Q(gpm)	Q(m <sup>3</sup> /s)	(ft <sup>2</sup> )	(m <sup>2</sup> )		
50	0.0032	595	55	35.0	5.3
100	0.0063	1200	111	49.0	7.5
150	0.0095	1776	165	59.6	9.1
200	0.0126	2368	220	68.8	10.5
250	0.0158	2970	276	77.0	11.7
300	0.0189	3560	330	84.4	12.9
350	0.0221	4155	386	91.2	13.9

<b>STATE OF VERMONT AGENCY OF TRANSPORTATION</b>	
Town Of <b>FAYSTON</b>	Bridge No. <b>36</b>
Highway No. <b>VT 17</b>	Log Sta.
VT 17 OVER MILL BROOK	
<b>EROSION CONTROL NARRATIVE</b>	
Designed By <b>J.T. KLEIN</b>	Drawn By <b>B.J. MASSE</b>
Checked By <b>M.A. COLGAN</b> Date <b>1/06</b>	Bridge Design Supervisor <b>M.A. COLGAN</b> Date <b>1/06</b>
PROJECT <b>FAYSTON</b>	PROJECT NO. <b>BHF 0200(9)</b>
I.G.C. Info.	
Bridge Sheet No. <b>50543ERN</b>	Sheet <b>45</b> of <b>70</b>