

EROSION PREVENTION AND SEDIMENT CONTROL NARRATIVE

PROJECT DESCRIPTION

The project is located in East Montpelier on VT Rt. 14 over the Kingsbury Branch. The project includes the replacement of Bridge #71, the abutments and some minor approach work. The horizontal alignment is on the existing centerline of Rt. 14 and the vertical alignment is nearly the same as existing conditions. The project site is located in a historical area and there are archeologically sensitive sites located in and around the construction site. There is a 1600mm diameter penstock near the Southern abutment that cannot be disturbed. There is an old coal storage building at the Southeast end of the bridge with a natural covered roof (grass) that cannot be driven on. The bridge will be closed to traffic during construction and all traffic will be detoured around the site as shown on the plans.

It is anticipated that this project will last one construction season.

Area of disturbance is approximately 0.208 ha (0.501 acres).

SITE INVENTORY AND ANALYSIS

OFF SITE DRAINAGE CHARACTERISTICS

The property surrounding the project site consists of well established vegetation, buildings and moderate to steeply sloping ground. There are also trees on site as well as clearly defined drainage ways. Due to the nature of the surrounding terrain, runoff water entering the project site will be primarily limited to what is conveyed along roadway ditches and a box culvert located between stations 1+070 and 1+105 LT.

DRAINAGE, WATERWAYS, BODIES OF WATER:

Kingsbury Branch is located in the project area. There are no other water bodies or wetlands within the project area. The Kingsbury Branch is classified as rolling to mountainous, perennial, and straight at site but sinuous upstream and downstream containing a streambed of mostly ledge. The contributing drainage area at the bridge crossing is 131.1 sq. km. There is also a dam located upstream from the bridge.

TOPOGRAPHY, EXISTING ROADS, BUILDINGS, UTILITIES:

The topography of the project site is hilly with grass and buildings near the site. There are two buildings at the North end of the bridge and an old coal storage building at the South end of the bridge. There is an underground water line at the North end of the bridge and a drop inlet with a pipe outlet through the existing wingwall. There are also overhead utilities at the site that will be relocated as shown on the plans.

VEGETATION:

There are a few trees on site ranging from saplings to one large tree. There are two residences near the bridge site; each has a small parking area and one has a small grassy area. Impact to vegetation will be limited to the disturbance caused by construction of new abutments. Most if not all of the trees will be removed. The slopes are stabilized with stone fill and vegetation. The slope on the Northeast side of the bridge is approaching 1:1 and is unstable. The new wingwall will be longer and the slope will be 1:1.5 and stabilized with stone.

SOILS:

According to a soil survey completed by the United States Department of Agricultural Soil Conservation there is only one type of soil at this location. The soil is classified as Lamoine Silty Loam, with a K-value equal to 0.32, slopes of 3-8% and part of hydrologic group D. Due to the steep slopes found on site the soil has the potential of becoming highly erodible.

Generally, K-values indicate the following: 0.00 – 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. There are some old foundations located within the project site that are archeologically important. Kingsbury Branch is the only identified resource and there are no other wetlands in the project area.

PROXIMITY TO NATURAL OR MAN-MADE FEATURES:

Disturbance of soils near natural or man-made waterways consists of the work necessary to construct two new concrete bridge abutments and applicable roadway approaches as well as the removal of the existing crossing. Stabilization of disturbances to stream banks will be accomplished with Stone Fill Type IV, under laid with geo-textile fabric.

TEMPORARY EROSION PREVENTION & SEDIMENT CONTROL

TEMPORARY EROSION PREVENTION MEASURES TO BE UTILIZED INCLUDE:

"Project Demarcation Fencing," denoted -PDF- on the plans, will be used to delineate the limits the contractor can access with construction equipment. This measure limits the area that can be disturbed and exposed to erosion.

Limits of riparian buffer typically exist 50' from the edge of the river bank. However, there is a residential area within this buffer limit. As such, construction shall stay inside the construction limits and minimize impacts to the buffer zone.

Seeding, mulching, and biodegradable erosion control matting or an equivalent product will be utilized on all slopes greater than 1:3 that are not lined with stone fill. Geo-textile fabric is also required under all stone fill. These slopes shall be stabilized within 48 hours of reaching final grade or during intermittent phases of construction activity. Seeding and mulching shall also be applied immediately to all lawns disturbed beyond the work area delineated on these plans.

Tracking of all exposed slopes (including slopes required for the pedestrian detour), 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. If rainfall is predicted the Contractor must stabilize the site accordingly prior to the forecasted event.

If needed, temporary stone check dams will be placed in ditches, temporary or permanent, to reduce flow velocities and thus reduce the potential for erosion. Check dams will be installed per EPSC – 2M Detail Sheet. The check dams may be removed once the stone lining of the ditch is complete and the surrounding area stabilized.

TEMPORARY MEASURES TO CONTROL SEDIMENT TRANSPORT INCLUDE:

Silt fence will be installed per EPSC – 1M Detail Sheet. 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 around the drop inlet to create a temporary ponding area for particles to settle out as water drains through the barrier. Inlet protection shall be installed as soon as there is the possibility of water flowing to the structure. The height of the barrier shall be limited such that the ponding area does not present a hazard to the traveling public. Alternative inlet control measures shall be approved by the Engineer prior to implementation.

Measures such as temporary stone check dams, 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 area where they will not be subject to further erosion. Following completion of the substructure, the sediment in the traps shall be removed and the ground restored to its original slopes or graded as shown on the construction drawings.

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'X50' (3700'X15,000). All surface water flowing to or diverted toward a construction entrance shall be piped under the stone. Pipes shall be appropriately sized for the contributing area, however, no pipe smaller than 6" (150) diameter shall be used. See EPSC – 4M Detail 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 sediment settling basin is to be used for dewatering a cofferdam, it should be sized based upon the following criteria: (See Sediment Settling Basin Sizing Criteria.)

Special consideration must be given to the first pump-down of the cofferdams. This will contain the greatest volume of water with a high sediment load. The contractor may provide additional sediment traps within the Right – Of – Way if required or control the rate of draw-down. Additional sediment traps must be approved by the resident engineer.

PERMANENT EROSION CONTROL MEASURES

SEVERAL PERMANENT EROSION CONTROL MEASURES WILL BE UTILIZED:

Stone lining of the stream banks with Stone Fill, Type IV as specified by VTrans Hydraulics personnel. This stone will protect the stream bank from erosion during design storm events. Stone Fill, Type I will be utilized at the culvert outlet at station 1+027 LT 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. The area disturbed for construction of the pedestrian detour shall be returned to its original condition including seeding and mulching.

GENERAL EROSION & SEDIMENT CONTROL GUIDELINES

The Erosion Control Plans are meant as a guideline for preventing erosion and controlling sediment transportation. The work outlined in this narrative consists of applying measures throughout the life of the project to control erosion and minimize the sediment into receiving waters. The measures include stabilization and structural practices, storm water controls and other pollution prevention controls. This document serves as a guide for the Contractor to make an Erosion Prevention and Sediment Control Plan which shall be submitted to the Construction Environmental Engineer for approval.

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 2006.

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. All changes shall be approved by the Construction Environmental Engineer, and also 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 shall be taken as needed.

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. Also, attempt to time all grading to minimize soil exposure. Temporary vegetation shall be established as noted in the plans and approved by the Construction Environmental Engineer. Perimeter control measures shall be installed following clearing, but prior to the start of any grading or grading activity, install other temporary controls in incremental stages as construction proceeds. These perimeter controls shall be maintained until the site is permanently stabilized to the satisfaction of the Engineer and on-site coordinator.

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 = 2:1					
		L (ft)	L (m)	W (ft)	W (m)		
Q (gpm)	Q (m ³ /s)	Q (ft ² /s)	Q (m ² /s)	L (ft)	L (m)	W (ft)	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:	PROJECT NO.:
EAST MONTEPELIER	BRF 037-2 (8)
DESIGN FILE NAME: 86e054/structures/se054ecnotes.dgn	
IPARM FILE NAME: se054ecnar.l	PLOT DATE: 14-AUG-2006
SURVEYED BY: R. MOREAU	SURVEY DATE: 3/93
SQUAD LEADER: C. P. WILLIAMS	DRAWN BY: E.L. RUSTAY
EROSION CONTROL NARRATIVE	ROW SHEET 9 OF 14