

EROSION CONTROL NARRATIVE

DESCRIPTION OF PROJECT

This project involves the rehabilitation of a two span bridge carrying VT Route 121 over the Saxtons River in the Town of Grafton. The existing bridge is approximately 98 feet long and 27.2 feet wide. The superstructure (steel beams, railings, and concrete deck) will be completely replaced and the abutments will be reconfigured to fit a wider roadway. The pier in the center of the river will be removed to an elevation level with the bottom of the channel. The alignment for Route 121 will not be changed and the bridge will be widened 4.08 feet to both the north and the south. One lane of traffic will be maintained at all times on a temporary bridge to be constructed to the north of the existing bridge. It is anticipated that this project will last one construction season. The total length of roadway approach work is approximately 768 feet. The site is located at Latitude N 43 degrees 9 minutes, Longitude W 72 degrees 34 minutes.

Total disturbed area (excluding waste, borrow and staging areas): 0.72 ac.

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 with steep slopes along the Saxtons River. The bridge itself is on a crest vertical curve centered on the pier. The roadway along VT 121 is on a horizontal and vertical curve through out the project limits and is super-elevated with the high point at the center line of roadway. Roadway surface drainage will generally be towards the northern and southern shoulders. The roadway along VT 35/121 is also on both a horizontal and vertical curve. Roadway surface drainage will generally be toward the eastern and western shoulders.

DRAINAGE, WATERWAYS, BODIES OF WATER:

The Saxtons River is located in the project area. There are no other water bodies or wetlands that are located in the impact area of the project. The drainage basin for the Saxtons River is characterized by a narrow river valley within steeply sloped hills. This character also causes the river to rise rapidly and flow swiftly as evidenced by the rocky/cobbly bottom and the bank erosion observed along the river. The contributing drainage area at the downstream corporate limits is 43.4 sq. miles as taken from the 1987 FEMA FIS.

TOPOGRAPHY, EXISTING ROADS, BUILDINGS, UTILITIES:

The topography of the project site is generally flat along each side of VT Route 121, gently sloping towards the Saxtons River. Along VT 35/121, the topography slopes steeply towards the Saxtons River to the east. Parker Hill Road forms a T intersection with VT 121 in the northeast quadrant of the project, just to the east of the bridge. VT 121 forms a Tee intersection with VT 35 at the west end of the bridge. Development along this portion of VT 121 and VT 35 consists of permanent residences with lawns, woods, and open fields abutting the project.

Overhead utility service will not need to be relocated. The overhead utilities follow VT 121, crossing the river north of the bridge, and run adjacent to VT 35 along the east side of the road.

VEGETATION:

There are several small hardwood and softwood trees located along VT Route 121 and along the river banks. The residences near the bridge site have small areas of lawn adjacent to the roadway. Impacts to vegetation will be limited to that which is affected by the widening of the bridge and roadway approaches, and the construction of the temporary bridge north of the existing bridge. Some immature 2-6 inch diameter trees will be removed. Following the construction of the bridge superstructure and substructures, 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 Windham County. The soil types identified within the project area are Quonset and Warwick soils (3B) on the east bank of the river, and Adams loamy fine sand (16B) along the west bank of the river. The Quonset and Warwick soils are described as excessively drained "gravelly sandy loam" to "very gravelly loamy sand". Permeability is moderately rapid or rapid in the subsoil and very rapid in the substratum for both Quonset and Warwick soils. "These soils are suited to cultivated crops. Erosion is a hazard, and the low available water capacity, or droughtiness, is a management concern." Adams loamy fine sand is "a very deep, gently sloping, well drained to excessively drained soil on terraces, knolls, and ridges." Permeability is rapid in the surface and subsoil layers, and very rapid in the substratum.

The listed soil erodability coefficient (K-value) is 0.20 for Quonset and Warwick soils and 0.17 for Adams loamy fine sand. 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 specific "Threatened & Endangered Species" have been identified within the project limits and there will be no adverse effect to Historic or Archaeological features. The Saxtons River has been identified as a sensitive fish habitat by the Army Corps of Engineers. All work in, above, and around the river shall be completed in accordance with the environmental permit requirements for this project.

The limits of the Riparian Buffer for the Saxtons River are identified on the following sheets. All work proposed within these limits shall be completed with extreme care so as to minimize impacts to this buffer zone.

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 the temporary detour bridge and to remove the pier. Stabilization of disturbances to the river banks will be accomplished with cofferdams and Stone Fill, Type IV.

All pier removal shall be completed from above through the use of lifting devices. No machinery or haul road access will be allowed in the Saxtons River. Special attention shall be paid to the Army Corps of Engineers' water quality control procedures.

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 measures to control sediment transport include:

Silt fence will be installed 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 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 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:

Chinking of the existing heavy stone fill that lines the river banks with Stone Fill, Type II is specified. This stone protects from river 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. 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 Erosion Control Plan and schedule 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.

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 ³ /s)	(ft ²)	(m ²)				
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

TOWN OF GRAFTON CAMBRIDGEPORT BRIDGE

Town Of	GRAFTON	Bridge No.	16G
Highway No.	TH 1	Log Sta.	
		Surv. Sta.	
TH 1 (CAMBRIDGEPORT BRIDGE) OVER THE SAXTONS RIVER			
EROSION CONTROL NARRATIVE			
Designed By	J. T. KLEIN	Drawn By	B. J. MASSE
Checked By	Date	Bridge Design Supervisor	
M. A. COLGAN	5/05	M. A. COLGAN	Date 5/05
PROJECT	GRAFTON	PROJECT NO.	TH2-0104
I.G.C. Info.			
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