

PROJECT DESCRIPTION

This project is located on Town Highway 4 near the intersection of Town Highway 1 and Town Highway 4. The purpose of this project is the replacement of the existing concrete slab bridge with a new 8.75 meter concrete slab bridge. The bridge replacement will occur on alignment with minimal roadwork. The road will be closed during construction and traffic will be detoured. No temporary bridge will be utilized.

This project includes the relocation of a mailbox, replacement of the steel beam guardrail, and the construction of six drive approaches and a walkway. Ditch work and several pipes will be installed on the project. Two deciduous trees and two evergreen trees will be planted and the existing underground telephone utility will be relocated aerially by Verizon.

The total disturbed area, excluding waste, borrow and staging areas, is 0.31 hectares.

SITE INVENTORY AND ANALYSIS

OFF SITE DRAINAGE CHARACTERISTICS

Currently, off-site water draining towards the project is limited to the Debuse/Shanley property in the southwest quadrant of the project. Runoff from the other three quadrants of the project either drains away from the project limits or is intercepted by the Rogers Brook prior to entering the project site.

DRAINAGE, WATERWAYS, BODIES OF WATER

The project site includes Rogers Brook, which is characterized as a small, sinuous, semi-alluvial stream. The streambed consists mostly of ledge through the site with some cobbles and boulders. The drainage area is 9.8 square kilometers. There are no state significant wetlands in the project site. There is one small Class III wetland (less than ¼ acre) in the NW quadrant. This wetland is currently part of an active pasture and has a very low functional value.

TOPOGRAPHY, EXISTING ROADS, BUILDINGS, UTILITIES

The terrain is generally hilly and sloping and slopes steeply along the bank of Rogers Brook within the project site. Town Highway 1 and Town Highway 4 are Class II dirt roads. There are three houses and a barn within the project site. The overhead electrical lines and underground telephone utilities are located along the left side of Town Highway 4.

VEGETATION

The project site contains a mix of agricultural and forested lands. There are several grass lawns and a grass field. There is a scattering of small to medium size hard and softwood trees along the roadways. And there is a denser arrangement of small to medium trees and a tangle of underbrush along the banks of Rogers Brook.

No trees are specifically marked for removal and every reasonable effort should be taken to retain the existing trees. Several deciduous trees are included in the project plans to restore the project site. The impacts to all other vegetation will be limited to that which is necessary for the construction of the new bridge.

SOILS

The soil in the project area is labeled StB, Stetson gravelly fine sandy loam, 5 to 12 percent slopes.

The Stetson series consists of very deep, well drained and somewhat excessively drained soils on outwash plains, terraces, kames, and eskers. These soils formed in glaciofluvial deposits derived mainly from slate, shale and phyllite, with lesser amounts of gneiss, granite and limestone. Slope ranges from 0 to 60 percent. Permeability is moderate or moderately rapid in the solum and rapid or very rapid in the substratum. Well drained and somewhat excessively drained. Many areas are used for hay, pasture, and cultivated crops. Common crops are potatoes, oats, and silage corn. Remaining areas are wooded. Common tree species are eastern white pine, white spruce, red spruce, and sugar maple. The shrink-swell potential of the soil is low. Soil erodibility is low. (USDA Soil Conservation Service, 1967)

SENSITIVE RESOURCE AREAS

On the southern approach to the bridge, a historic barn is only three meters from the eastern edge of the roadway, and there are large maple trees in the front yard of a historic house which is within nine meters of the western edge of the roadway.

On the northern approach, along the west side of TH 4, three resource areas have been identified. A historic stone wall, an area that is archaeologically sensitive and a class III wetland have each been identified and labeled on the project plans.

Rogers Brook is also considered a sensitive resource being a cold water fishery.

Temporary protective fencing will be placed as shown on the Erosion Control Sheets between stations 1+000 and 1+060 LT, stations 1+095 and 1+150 LT, and between station 1+025 RT and sideline station 9-045 RT in order to protect sensitive resource areas from accidental impacts.

No 'Threatened & Endangered Species' or deer wintering areas have been identified within the project limits.

PROXIMITY TO NATURAL OR MAN-MADE WATER FEATURES

The removal of the existing structure and the construction of the proposed structure will take place on the banks and over Rogers Brook.

TEMPORARY EROSION PREVENTION AND SEDIMENT CONTROL

SEEDING AND MULCHING

Mulch should be applied when phasing of earth grading activities dictates that the slopes will be exposed for several days or when a rainfall event is forecast. Seed and mulch should be applied as soon as possible upon reaching final grade. Stockpiles of topsoil and fine grained materials shall be protected from eroding.

PROJECT DEMARCATION FENCE

Project demarcation fencing will be utilized as shown on the plans to limit the area that construction equipment may disturb during construction. Archaeological fencing is also used extensively on this project and acts to serve the same purpose as Project Demarcation Fencing yet at a higher level of visibility.

SURFACE ROUGHENING

The slopes being built up near the bridge approaches between stations 1+075 - 1+130 should be roughened by tracking up and down the slope with a bulldozer or by scarifying with the teeth of the excavator such that small grooves perpendicular to the flow of runoff. This technique should be used daily as the slopes are built until the stone fill is placed.

COFFERDAMS

The contractor has the option of providing a cofferdam at each abutment or piping the water through the abutment areas.

CHECK DAM

Temporary stone check dams shall be used in the ditch along the mainline from stations 1+045 LT. - 1+080 LT. as well as along the sideline from stations 9+005 RT. - 9+025 RT. while the roadwork is in progress. The check dams may be removed once the stone lining of the ditches is accomplished.

SILT FENCE

Silt fencing shall be installed near the downhill limits of construction activity and shall be installed in lines parallel with the contours. Particular areas requiring silt fence on this project are indicated on the plan set. No particular stations are listed as silt fencing may need to be moved or installed in phases to maximize its effectiveness. Additional areas may require protection with the use of silt fencing as the project progresses.

STABILIZED CONSTRUCTION ENTRANCE

Stabilized construction entrances to the project site, staging areas, as well as to waste and borrow areas shall be established. The purpose of a stabilized entrance is to reduce or eliminate the tracking of sediment onto public rights-of-way. See the typical detail on the 'Erosion Prevention & Sediment Control Plan #2' sheet for materials to be used and standard construction techniques.

PERMANENT EROSION CONTROL MEASURES

STONE FILL

Stone fill, Type III, will be placed around Abutments #1 and #2 at STA 1+075 - STA 1+087 LT & RT and STA 1+093 - STA 1+103 LT & RT. This will prevent runoff from eroding the steep banks and will also act as a buffer to prevent Rogers Brook from scouring the soil around the abutments.

STONE LINED DITCHES

Stone lined ditches will be constructed along the sides of the roads to convey concentrated runoff in areas that are too steep for grass lining. They will be constructed from STA 1+044 LT - STA 1+075 LT and STA 1+043 RT - SL STA 9+025 RT.

SEED AND MULCH

Seeding and mulching is one of the most effective means of controlling erosion. Therefore, all exposed surfaces outside of the roadway limits, which are not specified to be covered by stone, will be seeded and mulched.

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, storm water 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 and On-site Coordinator. 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 and On-site Coordinator. 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. Repair or replace any damaged measures.

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 Q(gpm)	REQUIRED SURFACE AREA Q(m ³ /s)	LENGTH WIDTH = 2:1					
		(ft ²)	(m ²)	L (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

SHEET NAME:	EROSION CONTROL NARRATIVE	
PROJECT NAME:	WESTFORD	HIGHWAY NO.: TH 4
PROJECT NUMBER:	TH2 9436	BRIDGE NO.: 2
		OVER: ROGERS BROOK
FILE NAME:	94j22\Structures\sj22ero.dgn	PLOT DATE: 25-MAR-2005
PROJECT MANAGER:	R. R. WHITCOMB	DRAWN BY: STRI
DESIGNED BY:	C. CARLSON	IPARM NAME: sj22ero.I
BRIDGE SHEET NUMBER:		SHEET 20 OF 56