

EROSION CONTROL NARRATIVE



DESCRIPTION OF PROJECT

This project involves reconstruction of a bridge over the Roaring Branch. The project is on Town Highway 3 (TH3) in the town of Sunderland. A double lane, single span, curved steel girder bridge will be constructed downstream of the existing bridge while traffic is maintained on the existing bridge during construction. Total roadway approach work including both approaches is approximately 93 meters. The limits of construction do not approach any buildings or other structures. No 'Threatened & Endangered Species,' wetlands, or historic resources have been identified.

Total disturbed area (excluding waste, borrow and staging areas):
0.52 ha (1.28 ac.)

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 drainageways. Due to the nature of the surrounding terrain, runoff water entering the project site will be primarily limited to that which is conveyed along roadway ditches.

DRAINAGE, WATERWAYS, BODIES OF WATER:

Roaring Branch is located in the project area. There are no other waterbodies or wetlands within the project area. 'The Roaring Branch is classified as flashy and steep with mountainous, forested surroundings and containing a streambed of mostly ledge with some boulders, cobbles and gravel.' The contributing drainage area at the bridge crossing is 53.3 sq. km.

TOPOGRAPHY, EXISTING ROADS, BUILDINGS, UTILITIES:

The topography of the project site is mountainous and wooded with TH3 following parallel to Roaring Branch which is contained by steep river banks along each side. Development along TH3 consists of a mix of permanent and seasonal residences. Overhead utility service along TH3 will need to be relocated.

VEGETATION:

A mix of hardwood and softwood trees of all sizes exist along TH3. The two residences near the bridge site have small areas of lawn and landscape plantings. No fields or other agricultural crops exist near the project. Impacts to vegetation will be limited to that which are effected by the construction of the new bridge along a new alignment.

Following construction of the new bridge, the existing bridge and roadway approaches will be removed, the slopes stabilized with stone fill and vegetation reestablished with standard seed and mulch practices.

SOILS:

The soils in the project vicinity have not been mapped; therefore, treat all soils as highly erodible.

SENSITIVE RESOURCE AREAS:

No 'Threatened & Endangered Species' or wetlands have been identified within the project limits and there will be no adverse effect to Historic resources. Archaeological features will be protected with fencing as shown on the Plan. The Roaring Branch is a resource being protected with stone lining of stream banks and pumping sediment to settling basins.

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 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.

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. The new drain swales from stations 3+591 - 3+632 will require this technique. These areas shall be stabilized within 48 hours of reaching final grade or during intermitant 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 a distance of 1500 - 3000 (5'-10') 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 30 000 (100'). Silt fence shall be installed prior to any upslope earthwork.

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 approved area such that they will not be subject to erosion.

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 3700 x 15 000 (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 150mm diameter shall be used. See project special provisions for additional information.

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.)

PERMANENT EROSION CONTROL MEASURES

Several permanent erosion control measures will be utilized:

Roadway ditch slopes are less than 3% slope and therefore will be grass lined. Grass swales are adequate to prevent soil erosion in gently sloping ditches.

Stone lining of the stream banks with Stone Fill, Type IV as specified by VTrans Hydraulics personnel is specified. This stone will protect from stream bank erosion during design storm events.

Stone Fill, Type I will be utilized at culvert outlets and near the top of concrete abutments 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.

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 or 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 Plan or as directed by the Engineer or on-site coordinator. Do not modify the type, size or location of any control without approval of the Engineer or 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 measures promptly once damage is discovered.

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 downslope side of perimeter control measures.

SEDIMENT SETTLING BASIN SIZING CRITERIA

| PUMP FLOW RATE | | REQUIRED SURFACE AREA | | LENGTH / WIDTH = 2:1 | | | |
|----------------|-----------------------|-----------------------|-------------------|----------------------|--------|-------|-------|
| Q (gpm) | Q (m ³ /s) | (ft ²) | (m ²) | 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 |

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|---------------------------|-------------------------|-------------|------------|
| PROJECT NAME: | SUNDERLAND | | |
| PROJECT NUMBER: | BRF 0114(2) | | |
| FILE NAME: | /PW/93/009/sj009ecn.xls | PLOT DATE: | 7/21/2004 |
| PROJECT LEADER: | R. R. WHITCOMB | DRAWN BY: | J. GILMORE |
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