

PROJECT DESCRIPTION

The project is located on Town Highway 1 over the Otter Creek in the town of Leicester, Vermont. The project area is located approximately 1.61 kilometers (1.0 miles) westerly of the junction of Town Highway 3 and Town Highway 1. The project extends in an east-west direction at this location or approximately 0.19 kilometers (0.12 miles) along Town Highway 1.

Construction will involve the replacement of Bridge #6 on a revised alignment approximately 1.22 meters (4 feet) downstream of the existing alignment. Work will include: construction of a new single span steel girder bridge structure with concrete deck and asphalt overlay that completely spans Otter Creek, new concrete abutments (on piles) and improved roadway approaches and channel work. Town Highway 1 will not be closed during construction work. Traffic will be maintained on an adjacent temporary two-way bridge located downstream during construction.

The vertical clearance of the bridge above streambed will be increased slightly from 6.5 meters (21.3 feet) to 6.7 meters (21.9 feet). There will be a decrease in the waterway full opening by 7 square meters (75 square feet) but the waterway flow characteristics with the location of the new bridge will be greatly improved by the elimination of the poorly aligned existing piers located within the creek channel. In addition, flow characteristic improvements will be realized by realignment of the creek channel subsequent to necessary excavation work during the new abutment installations.

The total disturbed area, excluding waste, borrow and staging areas, is 0.716 hectares.

SITE INVENTORY AND ANALYSIS

OFF SITE DRAINAGE CHARACTERISTICS

The project site is predominantly level. There are some preexisting unlined ditches along both sides of Town Highway 1 at STA 0+940 – STA 0+980 RT, STA 1+150 – STA 1+260 LT. In general, the road surfaces are the high point of the local terrain. Therefore, surface water runoff will flow off the roadway, along the side of the road and toward the Otter Creek. There seems to be little vegetation to impede this flow and particulate transport is probably high.

DRAINAGE, WATERWAYS, BODIES OF WATER

The project site includes Otter Creek, which is characterized as sinuous and alluvial. Otter Creek has a wide flood plain with a relatively flat slope and a drainage area of 1270 square kilometers. The entire project site is within the flood plain and is surrounded by defined wetland areas.

TOPOGRAPHY, EXISTING ROADS, BUILDINGS, UTILITIES

The terrain is flat at the construction site but changes to hilly and mountainous upstream. Town Highway 1 is a paved Class 2 road. Town Highway 12 is a gravel Class 3 road. The Vermont Railway crosses Town Highway 1 at STA 0+992. There is a one story wood frame house at STA 1+037 RT. The aerial utility lines span both sides of Town Highway 1, but they will be relocated by Central Vermont Power Supply to eliminate any interference with the construction site.

VEGETATION

There is little vegetation within the project site. There is a thin strip of trees on both banks of the Otter Creek. There is some brush on the west side of the railroad tracks. There are some residential type grasses growing along both sides of Town Highway 1.

No vegetation is specifically marked for removal and the impacts to the vegetation will be limited to that which is necessary for the construction of the new bridge.

SOILS

There are two soil types listed in the project area. From west to east, they are Limerick silt loam (Le) and Winooski very fine sandy loam (Wo).

The Limerick series consists of very deep, poorly drained soils on flood plains. They formed in loamy alluvium. Permeability is moderate. Slope ranges from 0 to 3 percent. Mean annual precipitation is about 34 inches and mean annual temperature is about 45 degrees F.

The Winooski series consists of very deep, moderately well drained soils formed in alluvial material. These soils are on nearly level floodplains. Slope ranges from 0 to 3 percent. Permeability is moderate or moderately rapid. Mean annual precipitation is about 45 inches and the mean annual temperature is about 49 degrees F.

The listed soil erodibility coefficient (K-Value) for both of these soils is 0.49. This value is in the range of soil that is classified as not highly erodable. (USDA Soil Conservation Service, 1967)

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)
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

SENSITIVE RESOURCE AREAS

There are nine wetland areas and four archeologically sensitive areas defined around the project site.

The drive at STA 1+026 LT is just outside an archeologically sensitive area. In this area, only fill is to be added. There will be no cuts made or removal of topsoil. All work done for adding the fill will be done within the drive limits.

All work on Town Highway 12 will be conducted from the roadway, also.

Protective fencing will be placed between the project site and all archeologically sensitive lands to avoid accidental impacts. Because precautions will be taken to avoid impacts to all identified archeological sensitive areas, this project qualifies for the category of "No Historic Properties Affected" because no buildings, structures, districts or archeological resources listed on or eligible for the National Register of Historic Places are located in the area of potential effect.

The well at STA 1+060 RT should be monitored for quantity and quality before, during and after construction.

It is important to note that the wetlands on the southern side of the Leicester-Whiting Road are unique to Vermont in that they are dominated by Buttonbush (*Cephalanthus occidentalis*). This plant is at the northern fringe of its natural range and is an important food supply for wildlife.

PROXIMITY TO NATURAL OR MAN-MADE WATER FEATURES

The removal of the existing structure and the construction of the new structure will take place on the banks and over the Otter Creek.

TEMPORARY EROSION PREVENTION AND SEDIMENT CONTROL

SEEDING AND MULCHING

Mulch should be applied to exposed soil at the end of each work day. This will require careful planning of the phasing of earth moving. Seed and mulch should be applied as soon as no more soil disturbance is expected to occur. Seed and mulch should be applied to topsoil stockpiles as well as to areas of disturbed soil.

PROJECT DEMARCATION FENCE

Install PDF along the perimeters of areas of disturbed soils. This fencing prevents construction equipment from pushing debris into areas of undisturbed vegetation, and minimizes the area of disturbed soil.

SURFACE ROUGHENING

If surfaces of slopes are left rough, this can help to reduce water velocity and increase infiltration rates. Rough slopes hold water, seed, and mulch better than smooth slopes. Slope surfaces can be roughened by running wheeled construction equipment across the slope or driving tracked equipment up and down the slope. The grooves created by the construction equipment should run across the slope horizontally and not up and down the slope. Slopes can also be scarified to produce the desired surface roughness.

COFFERDAM

Cofferdams are provided to ensure that the excavation of the existing abutments and construction of the new abutments adjacent to the Otter Creek are done in the dry. This may involve the design, construction, maintenance, and removal of a watertight structure or may involve alternate methods of dewatering and stabilizing the site.

CHECK DAM

A check dam is a small dam made of concrete, masonry, rock, metal, wood, sandbags, or other erosion-resistant materials placed in small erosion control waterways or around storm drain inlets. The purpose of a check dam is to reduce or prevent erosion and sedimentation by reducing velocities, by promoting deposition of sediment, and by stabilizing channel grades. Check dams can be damaged by heavy runoff or high water velocities, so be sure to inspect them often and repair or replace them when necessary.

SILT FENCE

A silt fence is a temporary sediment barrier installed at the toe of a slope, or adjacent waterway. The purpose of the silt fence is to intercept and detain small amounts of sediment from unprotected areas of limited extent, and to reduce water velocity on the construction site. A silt fence is constructed of synthetic sedimentation control fabric fastened to a support structure such as a lightweight stock fence. The fence is built parallel to contours where possible. The lower edge of the filter fabric must be buried about 6 inches below ground surface to prevent underflow, and the ends of the fence should be curved uphill to prevent flow around the ends. Silt fence shall also be built around the stabilized construction area.

STABILIZED CONSTRUCTION ENTRANCE

A stabilized pad of crushed stone located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, sidewalk or parking area. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights-of-way.

PERMANENT EROSION CONTROL MEASURES

STONE FILL

Stone fill, Type III, will be placed on the sides and in front of Abutments #1 and #2 at STA 1+075 – STA 1+097 LT & RT and STA 1+113 – STA 1+138 LT & RT. This will prevent runoff from eroding the sides of the banks leading down to the Otter Creek. This will also act as a buffer to prevent the Otter Creek from scouring the soil around the abutments.

DRAINAGE DITCH AND PIPES

A pipe will be installed at STA 2+020 to allow the uninterrupted flow of surface runoff from the drainage ditch on the east of Town Highway 12 to the Otter Creek. Stone fill Type III will be placed at STA 1+130 – STA 1+225 RT and will serve a dual purpose. The stone will help support the edge of the road better than compacted fill and will help keep the roadway edge from being eroded by runoff flow along the south side of Town Highway 1 at this location.

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 stones or some other suitable cover, 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.

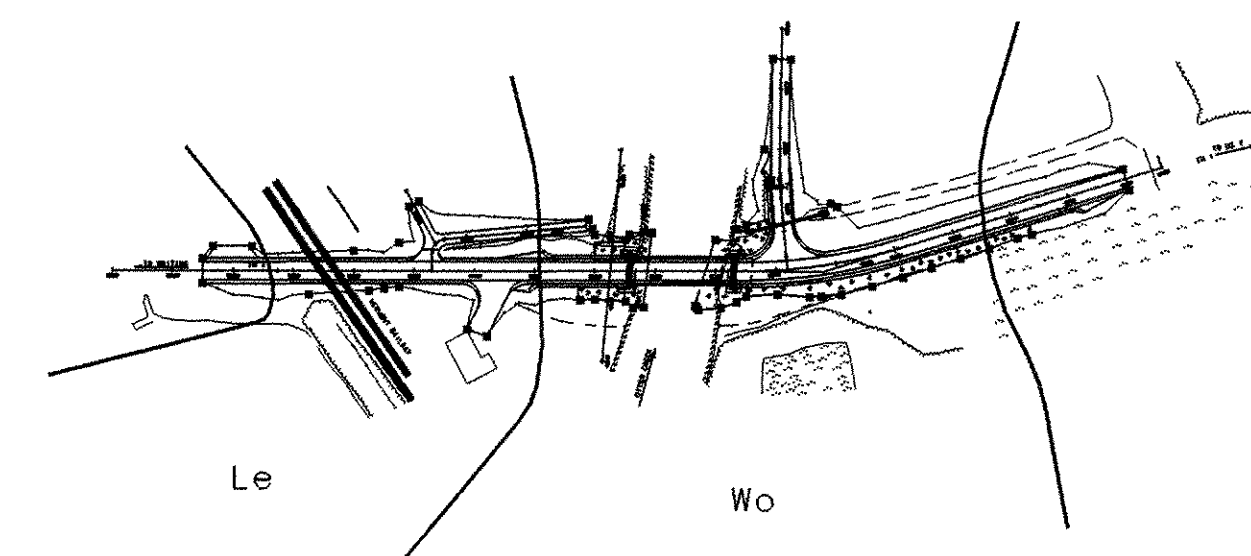
Install all erosion and sediment control measures as shown in the Erosion Control Plan or as directed by the Engineer and On-Site Coordinator. Do not modify the type, size or location of any control or practice without approval of the Engineer. Any changes shall be noted on the plans, in the weekly inspection 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.



DELINEATION OF DIFFERENT SOIL TYPES

SHEET NAME: EROSION CONTROL NARRATIVE	
PROJECT NAME: LEICESTER	HIGHWAY NO.: FAS 0160
PROJECT NUMBER: BRF 0160(3)S	BRIDGE NO.: TH 6
	OVER: OTTER CREEK
FILE NAME: 95J288\Structures\sj288ecd.dgn	PLOT DATE: 17-AUG-2005
PROJECT MANAGER: R. R. WHITCOMB	DRAWN BY: VAOT
DESIGNED BY: C. CARLSON	IPARM NAME: sj288ecn.1
BRIDGE SHEET NUMBER:	SHEET 21 OF 90