



FY17 Vermont Better Roads Grant Application

Please complete this page ONCE and return with your Grant Category Application(s)

Town/Organization: Town of Swanton Contact Person(s): Harold Garrett

Address: PO Box 711, Swanton, VT 05488

Street Address Town Zip
Email: highwaydept@swantonvermont.org Phone: (802) 868 - 7281

DUNS #: 32180531 Fiscal Year End Month (MM): 12

Accounting System: Automated Manual Combination

Please use the suggested documentation checklist below to ensure that all of the relevant items regarding your application have been included.

- Grant application cover sheet (Only submit one)
- Grant application form (One per category/project)
- Itemized Cost estimate for labor, equipment, and materials (see enclosed Cost Estimate Worksheet). If applicable, please break down funding by source (i.e. different grant sources)
- Project Location Map (please show location of affected water)
- Sketch of proposed erosion control measures or other management practices, including distances in feet
Also show approximate location of town/other right-of-way and/or property lines
- Photo(s) of the project area
- Letters of Support (RPC, VTrans District Technical Staff, ANR Rivers and Streams Engineers, etc.)
- If Category C River/Road Conflict or Category D River/Stream Structure or Culvert, you must attach ANR/ACOE consultation



Vermont Better Roads Grant Program Application

Please complete one application per category and/or project you are applying for. You may make copies of the application for multiple applications per category and/or multiple categories.

Please check the Category you are applying for:

- B. Correction of a Road Related Erosion Problem and/or Stormwater Mitigation Retrofit for both gravel and paved roads
- C. Correction of a Stream Bank or Slope Related Problem
- D. Structure/culvert upgrades

Town/Organization: Town of Swanton

Project Name: Bank and Slope Stabilization of Kelly Brook at Waugh Farm Road

Road Name: Waugh Farm Road TH #: 17 Structure # (if applicable): _____

Road Type: Unpaved Uncurbed

Class 3

Watershed: Missiquoi Watershed

Please provide a thorough description of the problem (ex. Roadway has steep slope with no ditch which is causing roadway erosion):

The steep side slopes at the Waugh Farm Road culvert crossing of Kelly Brook are eroding at both the inlet and outlet and the roadway is prone to over-topping. The 36" plastic corrugated culvert is in good condition but is susceptible to failure because of the erosion. The project site is less than 40 ft. from where Kelly Brook empties into the Missiquoi River. When water levels are high on the river, the Kelly Brook backwaters and scours the culvert outlet (see attached photos).

Description of Project and how you plan to complete the work (ex. Stone line 500' of ditch by reshaping ditch and stone lining, working from the top of the project down to the bottom):

In consultation with the ANR River Management Engineer, it was decided that up-sizing the culvert would have very limited benefit because of the backwatering effect. The town proposes to armor the bank and road slope adjacent to the culvert inlet and outlet. The town will also lower the road elevation at the project site to allow high waters from Kelly Brook to flow over the roadway with minimal damage to the road surface and reduced risk of culvert failure. A high-water bypass is appropriate at this location because it is a very low volume road (one residence and farm fields) and there are alternate routes.

Expected Effects (+ & -) on water quality (ex. Erosion will be eliminated by placing the stone ditch):

Once completed, the proposed project will halt the erosion that is currently happening at the culvert inlet and outlet. The high-water bypass will disperse the erosive waters of Kelly Brook during flood events which will significantly reduce the amount of sediment that is traveling from the roadway directly to the Missiquoi River.



Distance from end of project to nearest water (stream, lake, or stormwater system that outlets directly to water). 0-50'

Progress to Date:

Is there an emergency reason this project must be completed quickly? If yes, please explain:
No.

Has this project been identified through a municipal road inventory, capital budget plan, tactical basin plan, culvert inventory, or other management plan? If yes, please list which.

Yes: Identified as a high erosion- 2015 culvert inventory No

Please list any professionals you may have contacted for assistance with this project (ANR River Management Engineer, Army Corps of Engineers, VTrans District Technical staff, Basin Planner etc.):
The Town of Swanton met with Chris Brunelle, ANR River Management Engineer, on 4/1/2016 and incorporated his comments into the project. The Town also worked with the Northwest Regional Planning Commission.

Is the project located in the town "Right of Way?" Yes, No, Both (if "Both" please explain further).
Yes.

Will the town road crew complete this work? Yes, No, Some (if "some" please explain further).
Yes.



Describe how the grant funds will be spent and/or attach a project budget:
See attached project budget.

How do you plan to meet the required 20% match on this grant?:
The 20% match will be met through town labor and equipment.

Requested Grant Amount (\$20,000 max Category B, \$40,000 max Categories C & D): \$ 8,524.00
Estimated Total Project Cost (including 20% local match): \$ 10,655.00
Estimated Completion Date: 09/30/2017

REQUIRED ATTACHMENTS:

- Itemized Cost Estimate (labor, equipment, materials)
(For assistance, call Better Backroads at 802-828-4585)
- Project Location Map
(Please show location of affected water; 1:12,000 USGS map, if possible)
- Sketch of proposed erosion control measures, including:
 - Distances (ft.)
 - Estimate of waste & borrow quantities
 - Approx. location of town/other right-of-way and/or property lines
- Photo(s) of the project area.
- Agreement for Entry and/or Deed of Easement (if project is outside Town ROW).
- If project involves stream or river/road conflict, include documentation of consultation with a River Management Engineer.
- Other appropriate supporting documents.

By signing this application I certify that all the information provided is accurate to the best of my knowledge. We will comply with all the requirements of the grant including making our books available for audit if required.

SIGNATURE OF APPLICANT: (Must be Town Administrator/Manager or Select Board Chair)

Name:  Title: TOWN ADMINISTRATOR



Figure 1- Outlet of Kelly Brook culvert into Missiquoi River. Sediment load of Kelly Brook is visible.



Figure 2- Inlet of culvert.

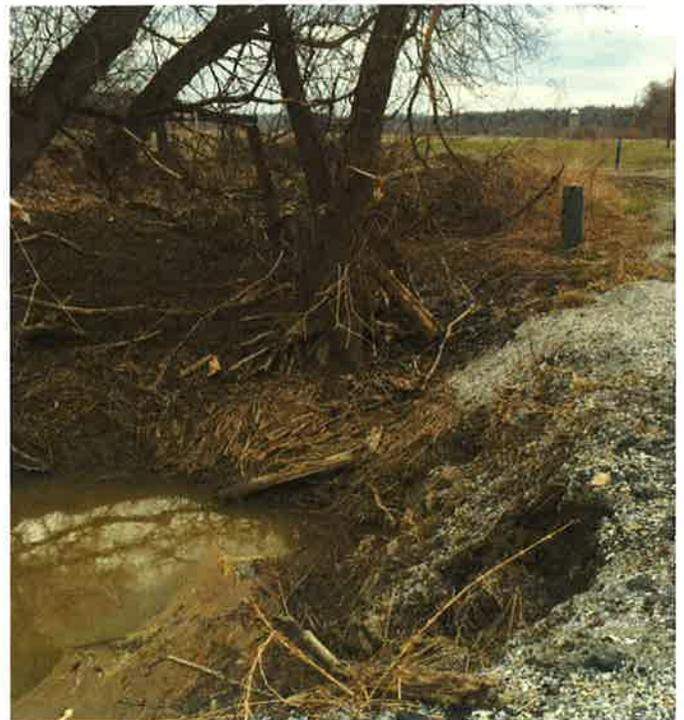
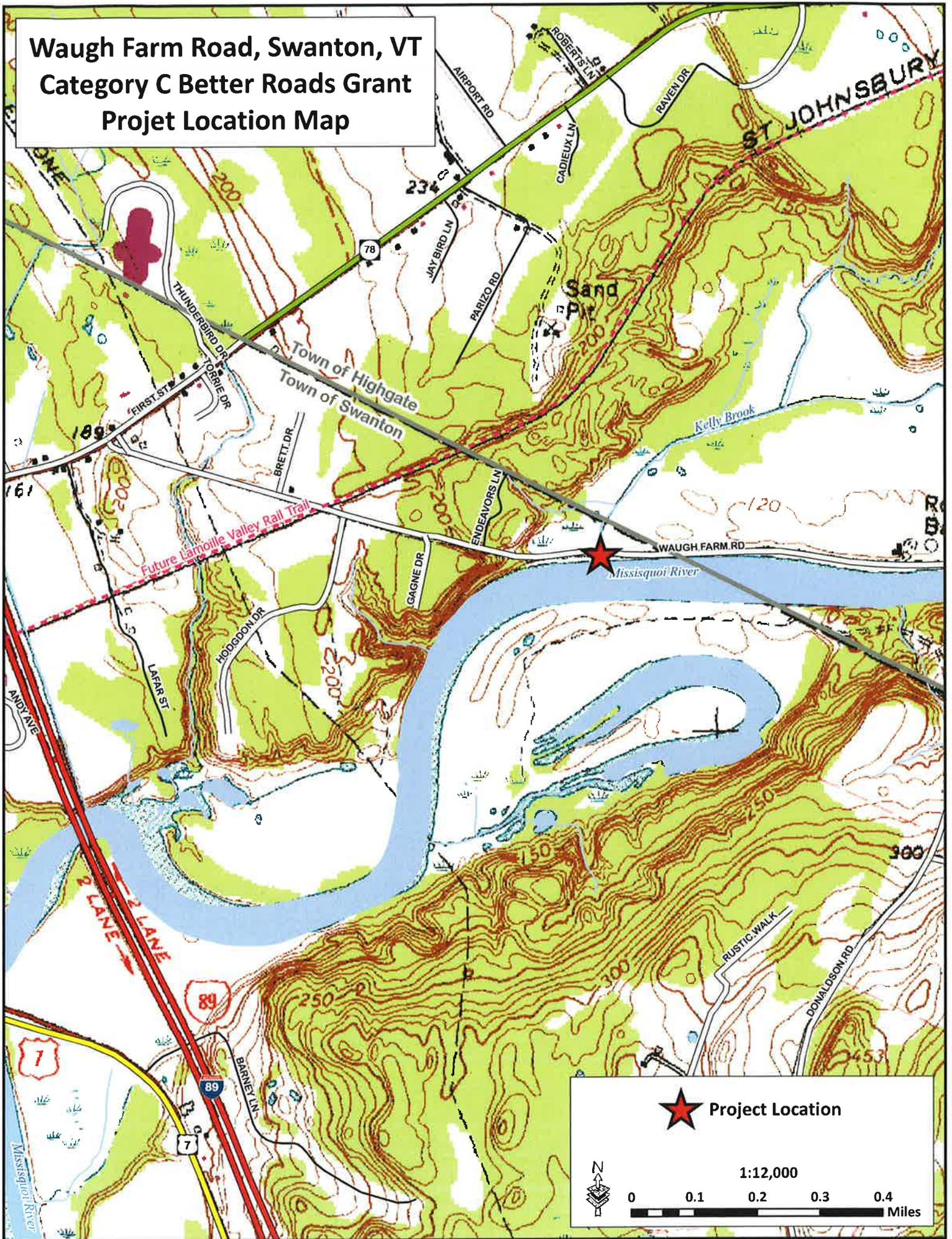


Figure 3 Side view of culvert inlet



Figure 4- View of roadway at culvert. The roadbed will be gradually lowered at the culvert site to act as a high-water bypass.

**Waugh Farm Road, Swanton, VT
Category C Better Roads Grant
Project Location Map**



**Waugh Farm Road, Swanton, VT
Category C Better Roads Grant
Project Sketch**

Town of Highate
Town of Swanton

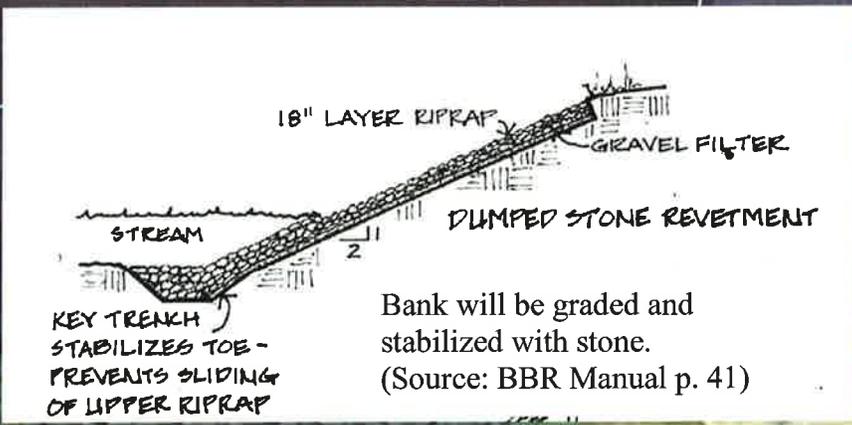
Kelly Brook

Town ROW (approx.)
24.75 ft. from road centerline

Gradual lowering
of road to accomodate
high water.

Stabilize slope adjacent
to culvert at Kelly Brook.

Missisquoi River



1 inch equals 100 feet
0 80 160
Feet

High Water Bypass: A flat, low-lying section of road that serves as an emergency spillway to allow water to flow over the road with minimal damage during extreme flow events.

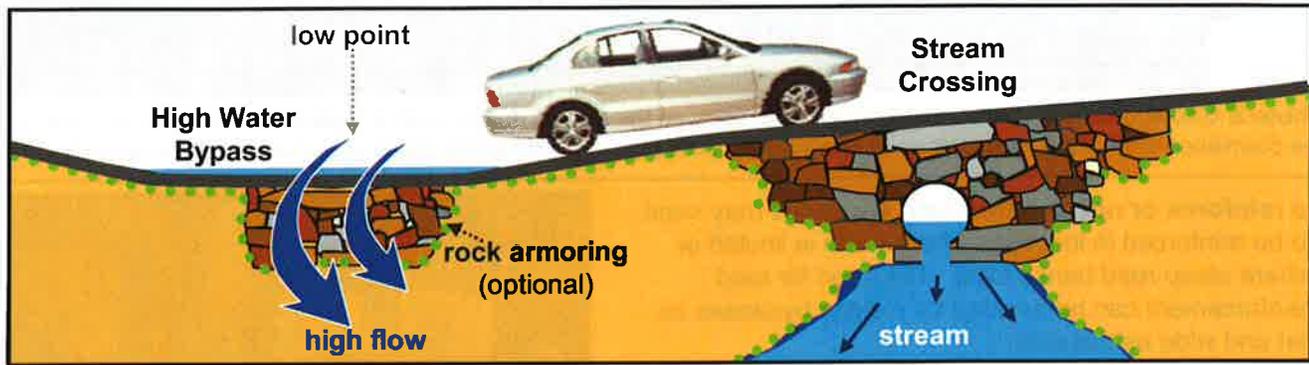


Figure 1: Stream Crossing with a high-water bypass

Purpose

A high-water bypass provides a stable overflow area to minimize road failure and bridge/culvert damage during extreme flow events. It is impractical to design bridges and culverts to adequately handle all possible storm events. On streams crossings that frequently overtop, a high-water bypass controls the path of the flood water, reducing the potential for erosion on the road or failure at the stream crossing.

Benefits of a high-water bypass

- Reduces risk of failures at stream crossings by directing extreme flows across road at a stable location;
- Minimizes erosion of costly road material and damage to drainage structures;
- Reduces emergency maintenance needed to make roads passable after damage by high water flow;
- Allows for effective management of storm flows beyond the design capacity of bridges and culverts;
- Reduces “firehose effect” of confining flood flows to main stream channel; and
- Connects floodplains on opposite sides of a road.

Considerations

- Make bypass wide and flat to encourage sheet flow.
- In locations where space is limited, or large road banks exist, it may be necessary to reinforce the bypass area to minimize the potential for erosion.
- In areas where space is limited, a bypass may be constructed directly over a stream crossing.
- These structures are intended for extreme events, not as regular flow channels for frequent events.

Where to use a high-water bypass

- Where flow historically overtops a bridge or culvert.
- On lower traffic volume roads where sheet flow of water over road is more acceptable.
- Where it is desirable to connect the floodplains on either side of the road instead of concentrating all of the stream’s flow at the crossing structure.

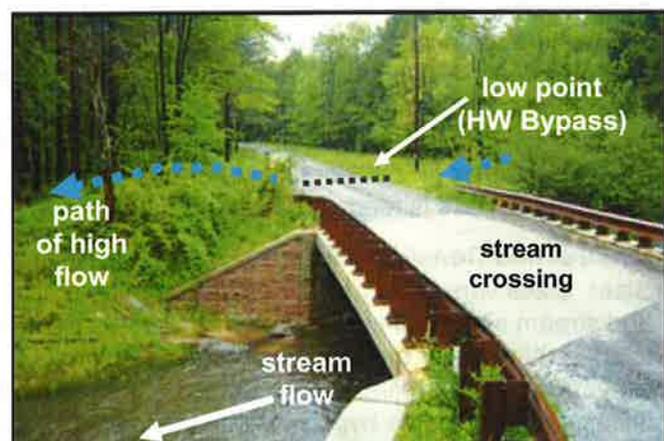


Photo 1: The low point in the above site is away from the stream. Little reinforcement was needed at this site because of the relatively flat terrain.

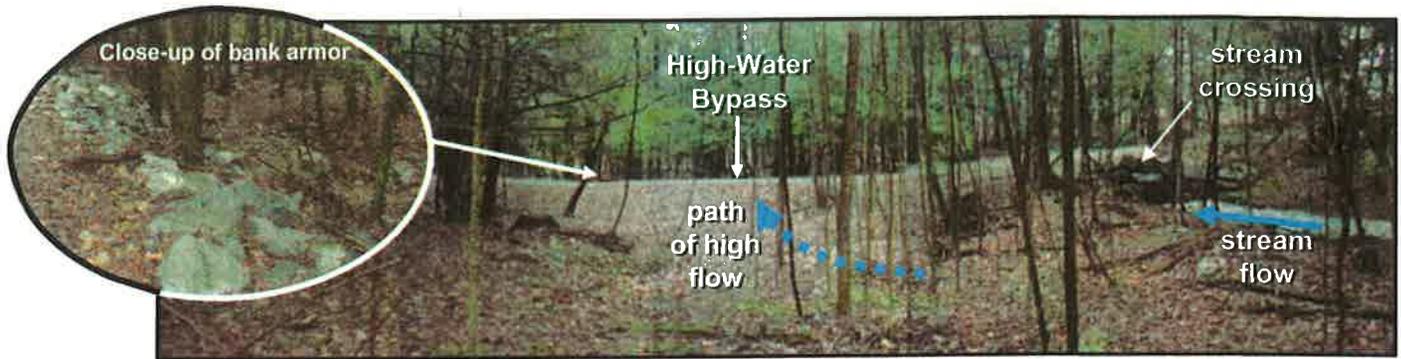


Photo 2: Geo-synthetic and rock reinforcement was used on the bypass due to width limitations and a steep drop-off on the downslope side of the road. When stream flow exceeds pipe capacity at the crossing, water will flow over the bypass.

To reinforce or not to reinforce? Bypasses may need to be reinforced in locations where width is limited or where steep road banks exist. The need for road reinforcement can be avoided by making bypasses as flat and wide as possible.

Road Reinforcement: In areas where bypass width is limited, or more frequent flows are expected, it may be necessary to armor the roadway itself as in the example to the right. 3-dimensional geogrid (**photo 4**) adds additional strength and helps to tie the surface together. #3* stones provide traffic support while resisting erosion.

Bank Reinforcement: If a drop-off exists on the side of the road, it should be armored with rock to prevent erosion as water flows across the road. The bypass in **Photo 2** above is armored with R7* rip-rap.

Construction Sequence – (see photos 3-5)

This location was reinforced due to high overflow frequency.

1. **Excavation:** Dig into the road to create room for surface reinforcement. Depth will depend on size of geogrid, size of stone, and elevation of road. A 10" excavation depth is shown in example here. (**photo 3**)
2. **Geotextiles:** Place fabric, then geogrid in excavated area. Geogrid is secured with pins. (**photo 4**)
3. **Rock:** Fill geogrid with rock, #3* as shown. (**photo 4**)
4. **Surface:** After an additional layer of fabric over the stone, the bypass is ready for aggregate. (**photo 5**)

Construction Considerations

- **Size:** Sizes vary greatly depending on available space and stream size. Make the bypass as wide as possible to spread the water out and encourage sheet flow.
- **Elevation:** Use leveling equipment to be sure that the finished surface of the bypass will be the lowest section of road in the floodplain.
- **Shape:** Flat and wide! The finished bypass surface should be as flat and wide as possible to insure even sheet flow and minimize erosive forces.

*#3 and R7 rock sizes refer to PA Department of Transportation Section 408 Specifications.



Photo 3: Excavation of bypass.



Photo 4: Fabric, geogrid, and #3* stone.



Photo 5: Finished bypass blends into rest of road.



4/13/2016

David Jescavage
Town Administrator
Town of Swanton
P.O. Box 711
Swanton, VT 05488

Dear David:

I am pleased to write this letter in support of the Town of Swanton's grant application to the Vermont Better Roads Program. It is my understanding that the Town will use the grant funds to stabilize eroding slopes on the Waugh Farm Road at the culvert crossing of Kelly Brook. The Friends of Northern Lake Champlain (FNLC) fully supports roadway projects that mitigate excessive sedimentation loads into Missisquoi Bay and Lake Champlain. In 2013, the FNLC partnered with Swanton Town and Village on a *Stormwater Management Plan*. We applaud the Town's past efforts to address water quality and look forward to our continued collaboration.

Best of luck with your application.

Sincerely,

A handwritten signature in cursive script, appearing to read "Denise Smith".

Denise Smith
Executive Director



75 Fairfield Street • St. Albans, VT 05478 • (802) 524-5958 • Fax (802) 527-2948

April 14, 2016

David Jescavage
Town Administrator
Town of Swanton
P.O. Box 711
Swanton, VT 05488

Dear David:

The Northwest Regional Planning Commission (NRPC) is pleased to support the Town of Swanton's Better Roads Program grant application. It is my understanding that the Town is seeking funds to mitigate an eroding slope at the Waugh Farm Road crossing of Kelly Brook, a tributary of the Missiquoi River. I have visited the site and understand why it is a high priority for the town.

This project will have both positive water quality and flood resiliency benefits. In conjunction with lowering the road, armoring the banks around the culvert crossing will reduce erosion in and eliminate potential sediment and nutrient from entering the Missiquoi River and ultimately Lake Champlain.

Good luck with your project!

Sincerely:

Bethany Remmers
Assistant Director