

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: Sandgate, Vermont

Project Name: Reupert Road Hair Pin

Road Name: Reupert Road TH #: _____ Structure # (if applicable): _____

Road Type: Paved or Unpaved (circle one) Curbed or Uncurbed (circle one)
Class 1 Class 2 Class 3 Class 4 (circle one)

Watershed: White Creek / Hudson Basin #1

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

This is a very steep, narrow road at a hair pin curve. A perennial stream passes through and under a 36" culvert which is also in a deteriorated condition.

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):

The new culvert will be sloped to the bed of the brook with armoring at the outflow. The road bed will be slightly widened and rebuilt with fabric. Essential guard rails will be installed.

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

The appropriate sized culvert will increase its resilience to flooding. Elimination of the perched outfall will stop the downhill headcut and incision of the streambed.

Distance from end of project to nearest water (stream, lake, or stormwater system that outlets directly to water). Please circle one: 0-50' 50-250' 250'+

Progress to Date:

NONE

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: Culvert Inventory, Road Erosion Risk Analysis Maps.

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.):

Josh Carvajal DEL RIVER MANG ENGINEER
Chris Taft, VTRANS TECHNICAL ASSISTANCE
Jim Henderson, Bennington RPC

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

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

The Roadcrew will work along side the hired excavator operator and will be responsible for project management.



Describe how the grant funds will be spent and/or attach a project budget: The majority of the grant funds will be spent on materials and the excavator sub contract.

How do you plan to meet the required 20% match on this grant?: The roadfare man will match the grant w/ time spent on the job and project management. Truck time and loader time will also be contributed.

Requested Grant Amount (\$20,000 max Category B, \$40,000 max Categories C & D): \$ 30,688

Estimated Total Project Cost (including 20% local match): \$ 38,360.00

Estimated Completion Date: 12/30/2017

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: [Signature]

Title: OWNERS SELECT BOARD

Cost Estimate Worksheet

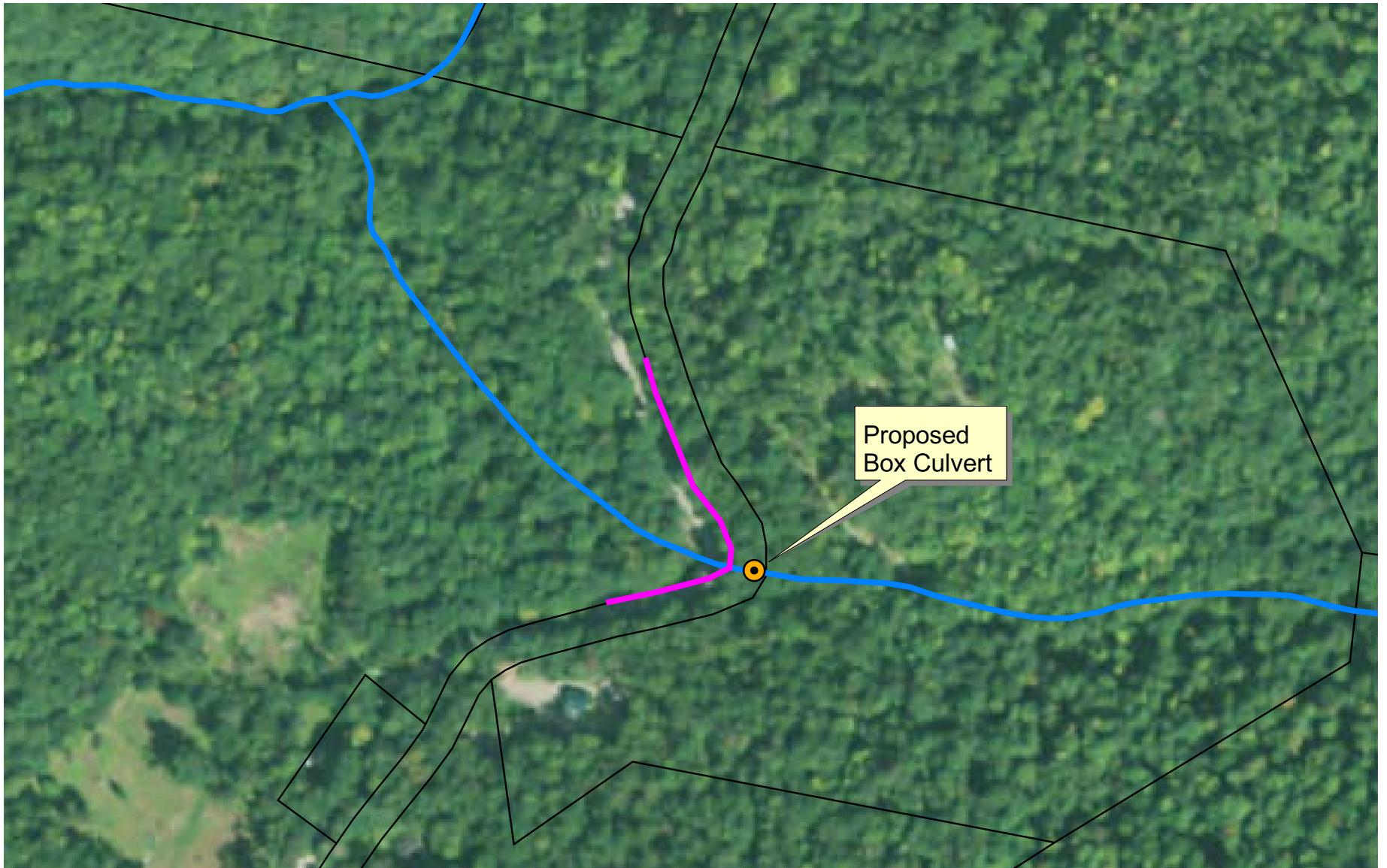
Town and Road Name: *Sandgate Rupert Rd.*

Project Name: *Rupert Road Hair Pin*

Labor	Rate	# Hours	Total (Rate x Hours)
<i>Road Foreman</i>	<i>30.15 per hr</i>	<i>30</i>	<i>604.50</i>
Labor Total			
<i>604.50</i>			
Equipment	Rate	# Hours	Total (Rate x Hours)
<i>Hired Excavator w/ Operator</i>	<i>100.00 per hr</i>	<i>29</i>	<i>2900</i>
Equipment Total			
<i>2900</i>			
Materials	Rate	Amount	Total (Rate x Amount)
<i>Curbcut 64" X 43" Arch</i>			<i>7000.00</i>
<i>Gravel</i>	<i>12.00 per yd.</i>	<i>170 yds</i>	<i>3,060.00</i>
<i>Slute Rip Rap</i>	<i>400.00 per load</i>	<i>35 loads</i>	<i>14,000.00</i>
<i>Road Fabric</i>	<i>35.20 per roll</i>	<i>1 roll</i>	<i>352.00</i>
<i>Guard Rails</i>			<i>9,544.00</i>
<i>Hydro Seeding</i>			<i>9,900.00</i>
Materials Total			
<i>34,856.00</i>			
Miscellaneous	Rate	Amount	Total (Rate x Hours)
Miscellaneous Total			

Grand Total *38,360.00*
 Match *7,672.00*





 Proposed Gaurd Rail
 Rivers and Streams
 Parcel Lines

Rupert Road Hair Pin
2017 Better Back Roads Grant Proposal
Sandgate, Vermont

Scale 1:2,400





Rupert Road Hair Pin

Culvert Intake



Rupert Road Hair Pin

Culvert Out Flow

VT AGENCY OF TRANSPORTATION PROGRAM DEVELOPMENT DIVISION
HYDRAULICS UNIT

TO: Christopher Taft, District 1 Project Manager
Michael Yannotti, District 1 Technician

FROM: Leslie Russell, P.E., Hydraulics Project Manager

DATE: 13 April 2016

SUBJECT: Sandgate TH 4 (Rupert Road) over unnamed stream
GPS coordinates: N 43.1922° W 73.2029°

Received
APR 18 2016
VTrans
PDD-LTF

We have completed our hydraulic study for the above referenced site, and offer the following information for your use:

Hydrology

This site has a mountainous drainage basin. It is totally forested. The total contributing drainage area is about 0.12 sq. mi. (77 acres). There is an overall length of 2615 feet from the divide to the site, with a 700 foot drop in elevation, giving an average overall channel slope of almost 27%. The stream slope at the site was estimated to be about 20% or above. Using several hydrologic methods, we selected the following design flow rates:

<u>Annual Exceedance Probability</u> (% AEP)	<u>Flow Rate in Cubic Feet per Second</u> (CFS)
43	39
10	62
4	74 - Local Road Design Flow
2	86
1	97 - Check flow

Channel Morphology

This stream is intermittent. The channel is very steep gradient. There is likely little coarse sediment transport at the site as the channel has a lot of ledge in it. Field measurements of bankfull width varied from 4' to 6' upstream and estimated to be about the same downstream. The Vermont Hydraulic Geometry Relationships anticipate a bankfull width of 5' for stream channels in equilibrium at this watershed size. No indications of active vertical or horizontal instability were observed.

Existing Conditions

The existing structure is a 3' corrugated metal pipe that provides 7.1 sq. ft. of waterway area.

Our calculations, field observations and measurements indicate the existing structure does not meet the current standards of the VTrans Hydraulic Manual nor does the existing structure meet state stream equilibrium standards for bankfull width (span length). The existing structure constricts the channel width, resulting in an increased potential for debris blockage. Headwater to depth ratios exceed allowable values established in the current VTrans Hydraulics Manual. Water overtops the road below the design 4% AEP.

Replacement Recommendations

In sizing a new structure we attempt to select structures that meet both the current VTrans hydraulic standards, state environmental standards with regard to span length and opening height, and allow for roadway grade and other site constraints.

The low height from the stream bed to the road limits the replacement options to a box structure or an arch, as the roadway would have to be raised substantially for a pipe.

Based on the above considerations and the information available, we recommend any of the following structures as a replacement at this site:

1. A concrete box with a 5' wide by 3' high inside opening providing 15 sq. ft. of waterway area. This structure will result in a headwater depth of 3.2' at 4% AEP and of 4.0' at 1% AEP, with no roadway overtopping up to 1% AEP.
2. A 64" wide by 43" high corrugated metal pipe arch that provides 14.7 sq. ft. of waterway area. This structure will result in approximate headwater depth of 3.4' at 4% AEP and of 4.3' at 1% AEP, with no roadway overtopping up to 1% AEP. This structure will not have the recommended cover over the top of the pipe.
3. Any similar structure with a minimum clear span of 5' and at least 15 sq. ft. of waterway area, that fits the site conditions, could be considered.

Prior to any further action toward implementation of any of the above recommendations, structure size and type must be confirmed, and may be modified, by the VT ANR River Management Engineer to ensure compliance with state environmental standards for stream crossing structures.

Other regulatory authorities including the US Army Corps of Engineers may have additional concerns or requirements regarding replacement of this structure.

General Comments

If a new box is installed, we recommend it have full headwalls at the inlet and outlet. The headwalls should extend at least four feet below the channel bottom, or to ledge, to act as cutoff walls and prevent undermining.

If the pipe arch is installed, concrete headwalls should be constructed at the inlet and outlet. The headwalls may be either half height or full height. The headwalls should extend at least four feet below the channel bottom or to ledge, to prevent undermining of the structure. We recommend a minimum cover of 3' over all pipe structures. Obtaining the minimum cover of 3' could be a problem at this site. Pipe manufacturers can provide specific recommendations for minimum and maximum fill heights and required pipe thickness.

It is always desirable for a new structure of this size to have flared wingwalls at the inlet and outlet, to smoothly transition flow through the structure, and to protect the structure and roadway approaches from erosion. The wingwalls should match into the channel banks. Any new structure should be properly aligned with the channel, and constructed on a grade that matches the channel. A new structure should span the natural channel width.

Stone Fill, Type III should be used to protect any disturbed channel banks or roadway slopes at the structure's inlet and outlet, up to a height of at least one-foot above the top of the opening. The stone

fill should not constrict the channel or structure opening.

Please note that while a site visit was made, these recommendations were made without the benefit of a survey and are based on limited information. The final decision regarding replacement of this structure must comply with state regulatory standards, and should take into consideration matching natural channel conditions, roadway grade, environmental concerns, safety, and other requirements.

Please contact us if you have any questions or if we may be of further assistance.

LGR

cc: Josh Carvajal, A.N.R. River Management Engineer
Hydraulics Project File via NJW



Bennington County Conservation District

Promoting rural livelihoods and protecting natural resources in southwestern Vermont

May 13, 2015

Board of Supervisors

Ken Leach
Chair
(Rupert)
325-2514

Jim Henderson
Vice-Chair
(Sandgate)
375-9461

Alan Calfee
Treasurer
(Dorset)
231-2555

Debbie Johnson
(Shaftsbury)
442-5945

Joe Nolan
(Arlington)
733-2143

Partners/Staff

Philip Rivara
Natural Resources
Conservation
Service Soil
Conservationist

Shelly Stiles
District Manager

Alan May
Agency of Transportation
Municipal Assistance Bureau
1 National Life Drive
Montpelier, VT 05633

Re: Town of Sandgate BBR grant application

Dear Alan,

The Bennington County Conservation District supports the Town of Sandgate's Better Back Roads grant application to implement erosion control measures on South East Corners Road in Sandgate, Vermont. This steep stretch of road is inadequately drained, causing severe erosion and direct sediment discharge into Tidd Brook and the Green River. The Green River, a high quality trout stream, is a tributary to the Batten Kill, itself one of the state's few Outstanding Resource Waters.

We encourage your team to approve the Town's request for funding.

Thank you.

Sincerely,

Shelly Stiles, district manager



Bennington County Regional Commission

111 SOUTH STREET • SUITE 203 • BENNINGTON, VERMONT 05201 • (802) 442-0713 OR 442-0682 • FAX
(802) 442-0439

Alan May
Agency of Transportation
Municipal Assistance Bureau
1 National Life Drive
Montpelier, VT 05633

April 12, 2016

Dear Alan,

The Bennington County Regional Commission support's the Town of Sandgate's Better Road Grant Applications to perform erosion control measures on two stretches of Southeast Corners Road, the replacement of a deteriorated and undersized culvert on Rupert Road and the remedy of a road/streambed conflict on Hamilton Hollow Road. BCRC staff have visited all the project sites with Mike Hill, Sandgate Road Foreman.

The lower section of Southeast Corner Road is a high priority site for the Town. This steep stretch of road is inadequately drained, causing severe erosion and direct sediment discharge into the Green River, a high quality trout stream. The clay road base on this hill leads to an annual mud season nightmare which not only exasperates the erosion and sedimentation but has caused damage to local resident's vehicles.

The upper section of Southeast corner road requires a new roadbed and a stone lined ditch to eliminate water seepage up through the roadbed. A new culvert will also be installed.

A three foot culvert located on a hair pin curve of Rupert Road is undersized, deteriorated and perched. This culvert would be replace with an appropriately sized culvert sloped with the stream bed. Guard rails will be added along this very steep and narrow section of road.

The upper end of Hamilton Road is squeezed between a natural knoll and Hopper Brook creating a very narrow passage way. Inadequate drainage along the knoll causes stormwater to drain down the roadbed causing erosion, the transport of sediment into Hopper Brook and severe icing in the winter months. A stone lined ditch will be installed and connected to an existing culvert.

Thank you for your consideration of these very important projects.

Sincerely,



Jim Henderson

Environmental Program Manager