

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: Hamilton Hollow

Road Name: Hamilton Hollow Rd. TH #: _____ Structure # (if applicable): 14

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

Watershed: Hopper Brook w/in Green River Watershed

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

Road is squeezed between Hopper Brook and a steep bank with very poor sight distances and poor drainage causing sheet flow, icing and sediment deposition in the stream.

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):

Removing the steep bank will allow a wider road bed and a new ditch connecting to existing culverts will enhance drainage and prevent sediment discharge.

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

Sheet flow across the road will be eliminated which will stop ice build-up, prevent sediment discharge and increase sight distances.

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: _____

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, VT River Manag. Engineer
Ethan Swift, VT Basin Planner

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

Both. a portion of the cut area is located on private property. Land owner permission and endorsement has been attained.

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: Funds will be spent on materials, tree removal contractor, earth removal contractor and road crew salaries

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

Requested Grant Amount (\$20,000 max Category B, \$40,000 max Categories C & D): 10,325

Estimated Total Project Cost (including 20% local match): ~~8,250~~ 12,906

Estimated Completion Date: _____

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: CHAIR

TOWN OF SANDGATE RD
HAMILTON HOLLOW RD

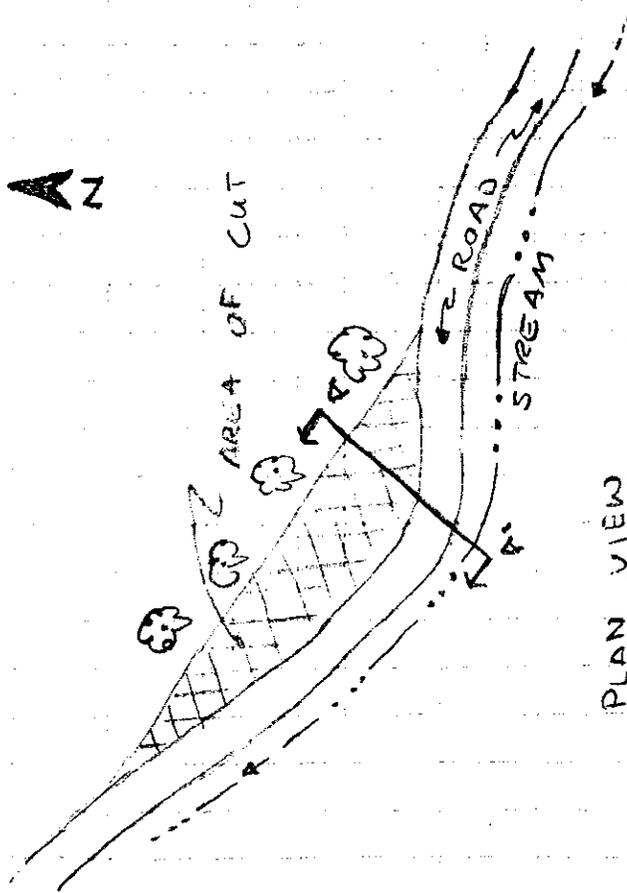
DATE: 021 / 2016
JOSH CARVAJAL, R.M.E.

MATERIAL QUANTITIES

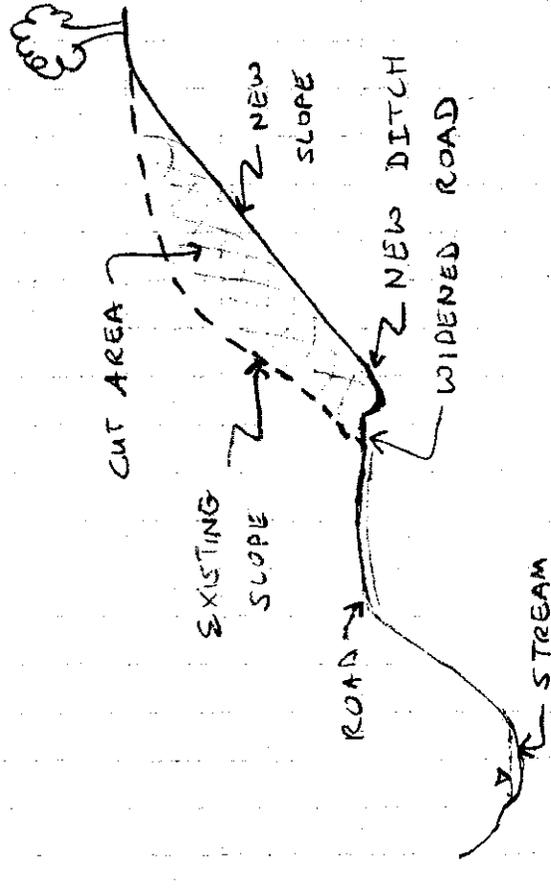
STONE LINING:

SEED MIX (LBS):

MULCH:

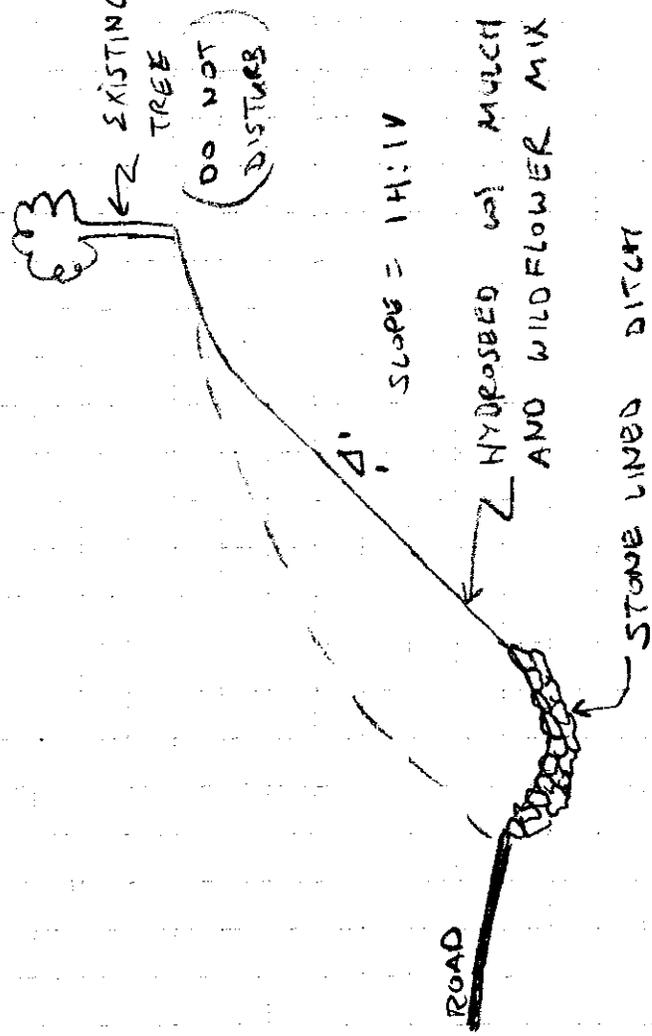


PLAN VIEW



A1

SECTION A-A



SLOPE DETAIL

Cost Estimate Worksheet

Town and Road Name: *SANDGATE, Hamilton Hollow Rd*

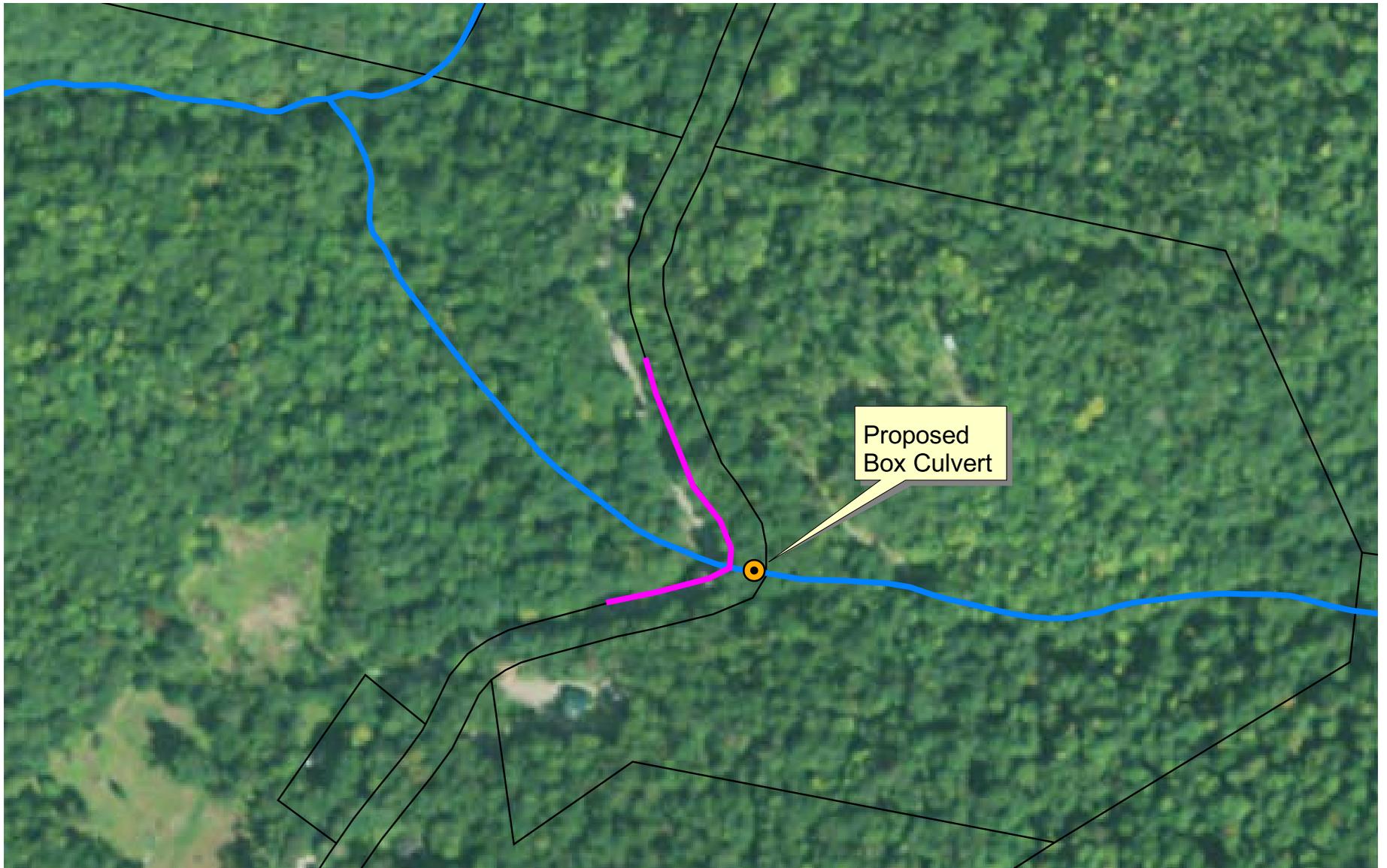
Project Name: *Hamilton Hollow*



Labor	Rate	# Hours	Total (Rate x Hours)
<i>Road Foreman</i>	<i>80.15</i>	<i>40</i>	<i>806.00</i>
<i>Road Crew</i>	<i>17.00</i>	<i>30</i>	<i>510.00</i>
<i>Subcontract Tree Removal*</i>	<i>100.00</i>	<i>28</i>	<i>2,800.00</i>
<i>Subcontract BANK Removal*</i>	<i>100.00</i>	<i>42</i>	<i>4,200.00</i>
Labor Total			
Equipment	Rate	# Hours	Total (Rate x Hours)
<i>Town Trucks</i>	<i>\$65.00</i>	<i>48</i>	<i>3,120.00</i>
Equipment Total			
Materials	Rate	Amount	Total (Rate x Amount)
<i>Ditch Stone</i>	<i>18.00 per yd</i>	<i>40 yds.</i>	<i>720.00</i>
<i>Hay and Seeding</i>			<i>750.00</i>
Materials Total			
Miscellaneous	Rate	Amount	Total (Rate x Hours)
Miscellaneous Total			

** Man hours and equipment*

Grand Total *12,906*
Match *2,581*



 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°

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>	<u>Flow Rate in Cubic Feet per Second</u>
(% AEP)	(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