



Received

APR 18 2016



VTrans  
PDD-LTF

# FY17 Vermont Better Roads Grant Application

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

Town/Organization: Town of Charlotte Contact Person(s): Dean Bloch

Address: P.O. Box 119 Charlotte 05445  
Street Address Town Zip

Email: dean@townofcharlotte.com Phone: (802) 425-3071 ext. 5

DUNS #: 028790046 Fiscal Year End Month (MM): 06

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



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APR 10 2016

VTrans  
PDD-LTF



# 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 Charlotte and Lewis Creek Association

Project Name: Ahead of the Storm, Thorp Brook Restoration, Swale Improvements

Road Name: East Thompson's Point Rd TH #: 46 Structure # (if applicable): \_\_\_\_\_

Road Type: Unpaved Uncurbed

Class 3

Watershed: Thorp Brook

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

The swale along the north side of East Thompson's Point Rd at the Mack farm field collects runoff from 17.3 acres including portions of East Thompson's Point and Greenbush Roads, residential properties, and portions of two farms. The ROW ditch is undersized and eroding and causes water to overtop and cause erosion in the adjacent field. The sediment laden water is directly discharged in to the stream, impacting Thorp Brook's stream morphology and water quality. +

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 swale at western end of project area will be realigned to eliminate the sharp bend and provide for more snow storage. Reshape and revegetate 575' of eroding swale and provide for buffer from active agriculture. Replace farm access with a 20' long 42" x 29" CMP pipe arch culvert with stone reinforced driving surface. Install 210' stone lined swale with stone check dams. Concurrent with this work the Town is seeking a separate BBR grant to accomplish installation of a bio-retention area with 3 stone filter +

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

The reinforced surfaces and right-sized swale and culvert will significantly improve water quality by eliminating sediment produced by swale and access erosion. Similarly field erosion will be reduced because water will now stay in the swale instead of flowing across the field. The check dams and filter berms will slow and retain water allowing sediment to settle prior to entering the stream. With slower flows and increased water infiltration, expected effects will include reduced nutrients and sediments flowing toward +



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

Progress to Date:

30% designs and cost opinions are complete. Landowner and town have provided approval to do project along with long term stewardship. This site will be an Ahead of the Storm flood resiliency education site

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: Tactical Basin Plan

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.):  
Lewis Creek Association provided current VT ANR ERP funding to pursue this flood resiliency demonstration project that is being overseen by VT DEC Watershed Management Division. Its consulting engineer firm is Milone & MacBroom, Inc. Vermont Nature Conservancy, Vermont Land Trust and US NRCS staff were consulted with as well.

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

Yes this project is in the town ROW. The project is also partially located on adjacent private lands where both the town and landowner have a mutually agreeable management plan and an agreement for entry.

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

Yes, with limited oversight from design engineer.



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

Grant funds will be spent on reshaped grass lined and stone lined swale sections, stone check dams, and improved farm access with culvert. Labor, Equipment, Materials, and Oversight are broken out by item in the attached project budget.

How do you plan to meet the required 20% match on this grant?:

Match requirement will include funds from the Town Highway budget. Match will also include a perpetual 10+ foot field side grass filter strip to be managed by the farm.

Requested Grant Amount (\$20,000 max Category B, \$40,000 max Categories C & D): \$ 16,000.00

Estimated Total Project Cost (including 20% local match): \$ 20,000.00

Estimated Completion Date: 11/30/2016

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: *V.R. M...*

Title: 4/15/2016



TOWN OF CHARLOTTE

**AGREEMENT FOR ENTRY, LIMITED RELEASE  
AND LONG TERM MAINTENANCE**

**THIS AGREEMENT**, made and entered into this 14<sup>TH</sup> day of April, 2016

by and between the Town of Charlotte, in the State of Vermont, (hereinafter "Town"), and Mack Farm, Inc. (Robert Mack representative) of 3637 Greenbush Road, in the Town of Charlotte, Vermont (hereinafter "Owner").

**WHEREAS**, the Owner owns certain land and premises in the Town of Charlotte, which adjoin Town Highway No. 46 maintained by the Town; and

**WHEREAS**, the Town desires, at its own expense, to perform certain work on or for the benefit of the highway (described more particularly below) (hereinafter "the Work"), which Work also will be of benefit to the Owner's property; and

**WHEREAS**, performance of the Work may require the Town, with its own forces or those of contractors, to enter upon the Owner's property, in areas outside the existing highway right-of-way;

**NOW, THEREFORE**, the parties, intending to be legally bound, hereby agree as follows:

**1. Description of the Work.** The Work will consist of the following:  
Water quality bio-retention and swale installation practices and maintenance over time as described in two Vermont Better Roads Grant Program Applications submitted by deadline of 4/15/16.

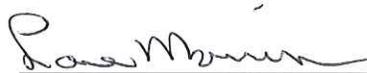
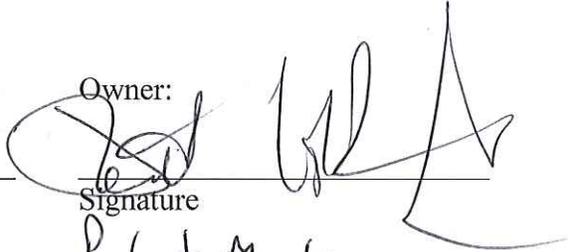
**2. Right of Entry; Limited Release.** The Owner hereby grants the Town, with its own forces or those of contractors, the right to enter upon the Owner's property, with workers and equipment, for the purpose of undertaking the Work, and hereby waives, releases and discharges any claims, whether styled as trespass or otherwise, that may arise from such entry.

**3. Retention of Certain Other Rights.** Notwithstanding paragraph 2 of this Agreement, the Owner retains the right to assert against the Town, its contractors or other parties any claims that may arise from negligent acts or omissions during performance of the Work.

(Over)

4. **Waiver:** The Owner having been informed of its right to an appraisal to estimate the value of the right-of-entry herein granted and to receive just compensation based on that appraisal, hereby waives these rights.

5. This Agreement for Entry, Limited Release and Long Term Maintenance is not binding unless one of the parties signing below receives a Better Backroads grant to perform the Work set forth above in Paragraph 1.

|   |  |
|---|--|
| For The Town:   | Owner:   |
|  |  |
| Signature   | Signature  |
| <u>LANE MORRISON</u>  | <u>Robert Mack</u>   |
| Printed Name  | Printed Name (must be owner)   |

SELECT BOARD  
Title (must be authorized agent)

In Presence of:

|   |
|---|
|  |
| Signature   |
| <u>Dean Bloch</u>   |
| Name of Witness (as to both)  |



**CHITTENDEN COUNTY RPC**  
*Communities Planning Together*

110 WEST CANAL STREET, SUITE 202  
WINDSOR, VERMONT 05404  
(802) 846-4490  
WWW.CCRPCVT.ORG

Date: April 4, 2016

To: Town of Charlotte and Lewis Creek Association (LCA)  
c/o Dean Bloch, Town Administrator  
Town of Charlotte  
PO Box 119  
Charlotte, VT 05445

The Chittenden County Regional Planning Commission is pleased to support your joint proposal to the FY17 Better Roads grant program to improve the water quality of Thorp Brook through stormwater drainage improvements along East Thompson's Point Road in the Town of Charlotte.

The project is consistent with the Northern Lake Champlain Direct Drainages (Basin 5) Tactical Basin Plan and would also help to implement Strategy #3.2.3 of the County's 2013 Regional Plan aka the ECOS Plan, which calls for actions to "improve the safety, water quality, and habitat of our rivers, streams, wetlands and lakes in each watershed."

The Town and the LCA have proven to be key partners in the region in identifying water quality concerns and the proposed project represents a win-win for the Town, for landowners and most importantly, for improved water quality.

Please let me know if there is anything else we can do to support this project. Please feel free to contact me should you have any questions.

Best regards,

A handwritten signature in cursive script that reads 'Charlie Z Baker'.

Charlie Baker  
Executive Director



**Vermont Department of Environmental Conservation**  
Watershed Management Division  
Essex Junction Regional Office  
111 West Street  
Essex Junction, VT 05452

*Agency of Natural Resources*

[phone] 802-879-2339

April 11, 2016

VTrans Back Roads Review Committee

Dear Grant Review Team,

I am writing to support the Town of Charlotte and the Lewis Creek Association's application to address field and road runoff in the vicinity of Thompson's Point Road in Charlotte.

As the Agency of Natural Resources' basin planner for the Town Farm Bay watershed (part of Basin 5), I have reviewed water quality data collected at Thorp Brook, a stream that crosses the road in question, and determined it to have high phosphorus and sediment levels, often above the Vermont water quality standards. Based on multiple years of results and my knowledge of the landscape, it is my opinion that the sediment sources (and associated phosphorus) include the farm field. The stormwater that erodes the sediment from the field includes surface runoff originating above Greenbush Road, the road and the adjoining field. The proposed swale will catch that water before it enters the farm field, reducing erosion of sediment from the field.

The proposed new swale and increased capacity of the existing road swale to carry sediment and to capture it behind check dams and ponds, along with frequent maintenance of these structures would reduce sediment loading to the brook from the road and field.

Sincerely,

A handwritten signature in black ink that reads "Karen Bates".

Karen Bates  
DEC Watershed Coordinator



# Vermont Land Trust

CONSERVING LAND FOR THE FUTURE OF VERMONT

April 5, 2016

8 Bailey Avenue  
Montpelier, VT 05602  
(802) 223-5234  
(802) 223-4223 fax  
www.vlt.org

Marty Illick- Executive Director  
Lewis Creek Association  
442 Lewis Creek Road  
Charlotte, VT 05445

**Re: VLT Support for Thorp Brook Headwater Restoration**

**REGIONAL OFFICES**

Central Vermont  
8 Bailey Avenue  
Montpelier, VT 05602  
(802) 223-5234

Champlain Valley  
P.O. Box 850  
Richmond, VT 05477  
(802) 434-3079

Northeast Kingdom  
P.O. Box 427  
St. Johnsbury, VT 05819  
(802) 748-6089

Southeast Vermont  
and Mountain Valley  
54 Linden Street  
Brattleboro, VT 05301  
(802) 251-6008

Southwest Vermont  
and Mettowee Valley  
10 Furnace Grove Road  
Bennington, VT 05201  
(802) 442-4915

To Whom It May Concern:

Vermont Land Trust is pleased to hear of the proposed water quality project on the conserved Mack farm parcel on East Thompson's Point Road in Charlotte. Vermont Land Trust, along with Vermont Housing and Conservation Board and Vermont Agency of Agriculture, Food and Markets, holds a farmland conservation easement on this parcel; protecting its resources in perpetuity.

Currently, storm water runoff spills at times out of the swales along the edge of the farm fields and out of the undersized ditch along the road causing erosion of the fields. The sediment then dumps into Thorp Brook impacting water quality and its stream morphology. This project, undertaken by the Lewis Creek Association and the Town of Charlotte, proposes to reshape the swales along the farm fields and road, put a 15' grass filter strip in place, replace undersized culverts, and create a sediment settling area. The goal is to reduce erosion of the farm fields and subsequent sediment loading into Thorp Brook.

VLT offers its full support for this project which clearly furthers the primary purpose of the conservation easement "to conserve productive agricultural and forestry lands and soil resources" as well as helps to achieve the state's water quality goals.

Sincerely,

Cara Montgomery  
Regional Stewardship Manager

VLT# 130119, TCF-LaBerge



Ahead of the Storm  
Existing Conditions Photo Documentation Summary  
Mack Farm



*Figure 1: Runoff from Greenbush Road and homes on the far side of the road travels through the adjacent farm fields to Mack's farm field.*



*Figure 3: A swale runs from north to south along the west edge of the Mack's farm field, carrying water to the East Thompson Point Road swale.*



*Figure 2: Runoff from fields and Greenbush Road travel through farm fields down to the site.*



*Figure 4: The swale from the north turns sharply to the east, joining the East Thompson Point Road swale.*

Ahead of the Storm  
Existing Conditions Photo Documentation Summary  
Mack Farm



*Figure 5: Rill erosion has occurred in the Mack farm field when water in the swale traveling from the north leaves the swale and cuts across the field to the road swale.*



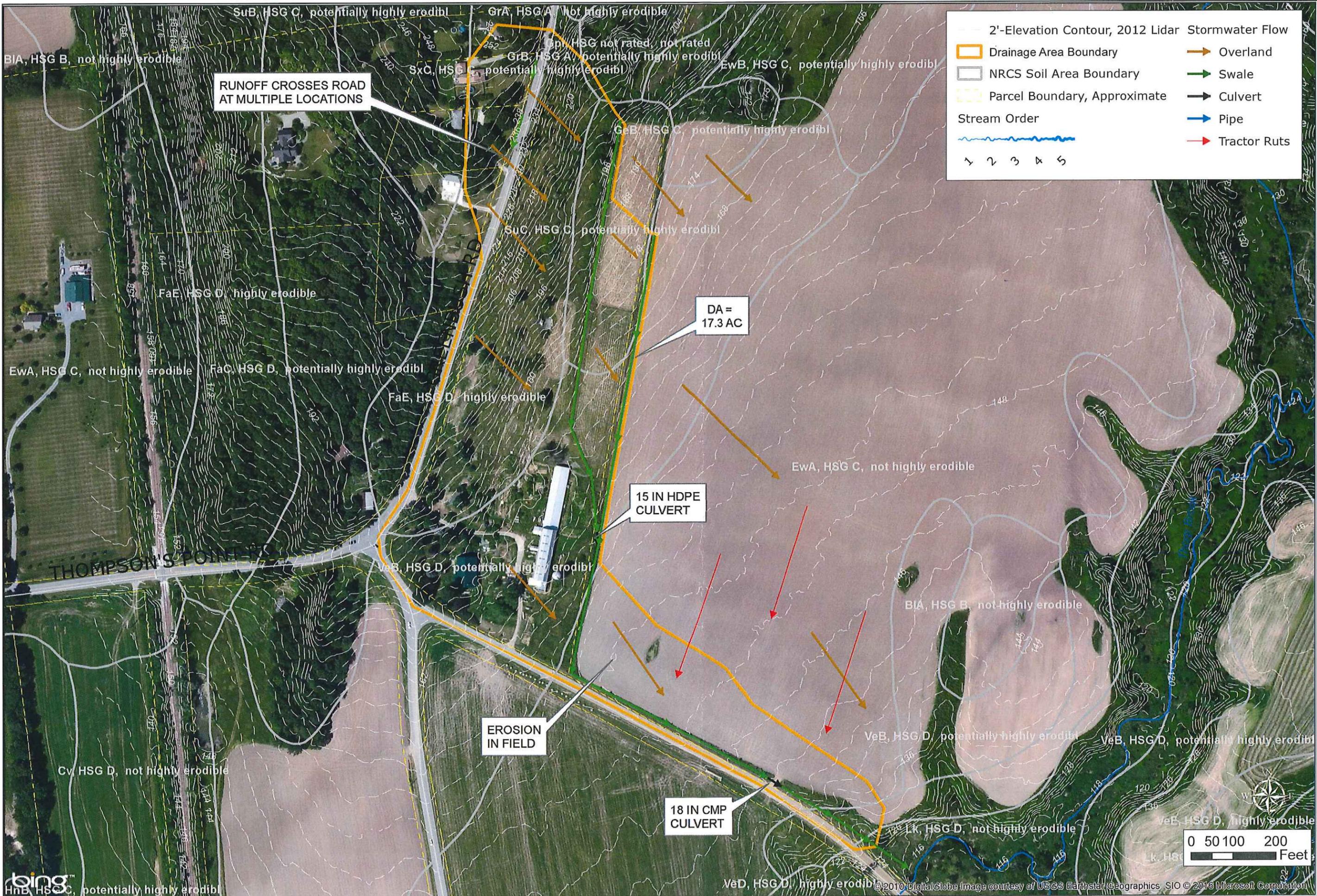
*Figure 7: The Mack farm field is harvested close to the edge of the swale. The trees in this photo have been moved.*



*Figure 6: A vegetated swale travels along East Thompson Point Road. The trees in this photo have been moved.*



*Figure 8: Possible location of a bioretention area adjacent to East Thompson Point Road, prior to water entering Thorp Brook*



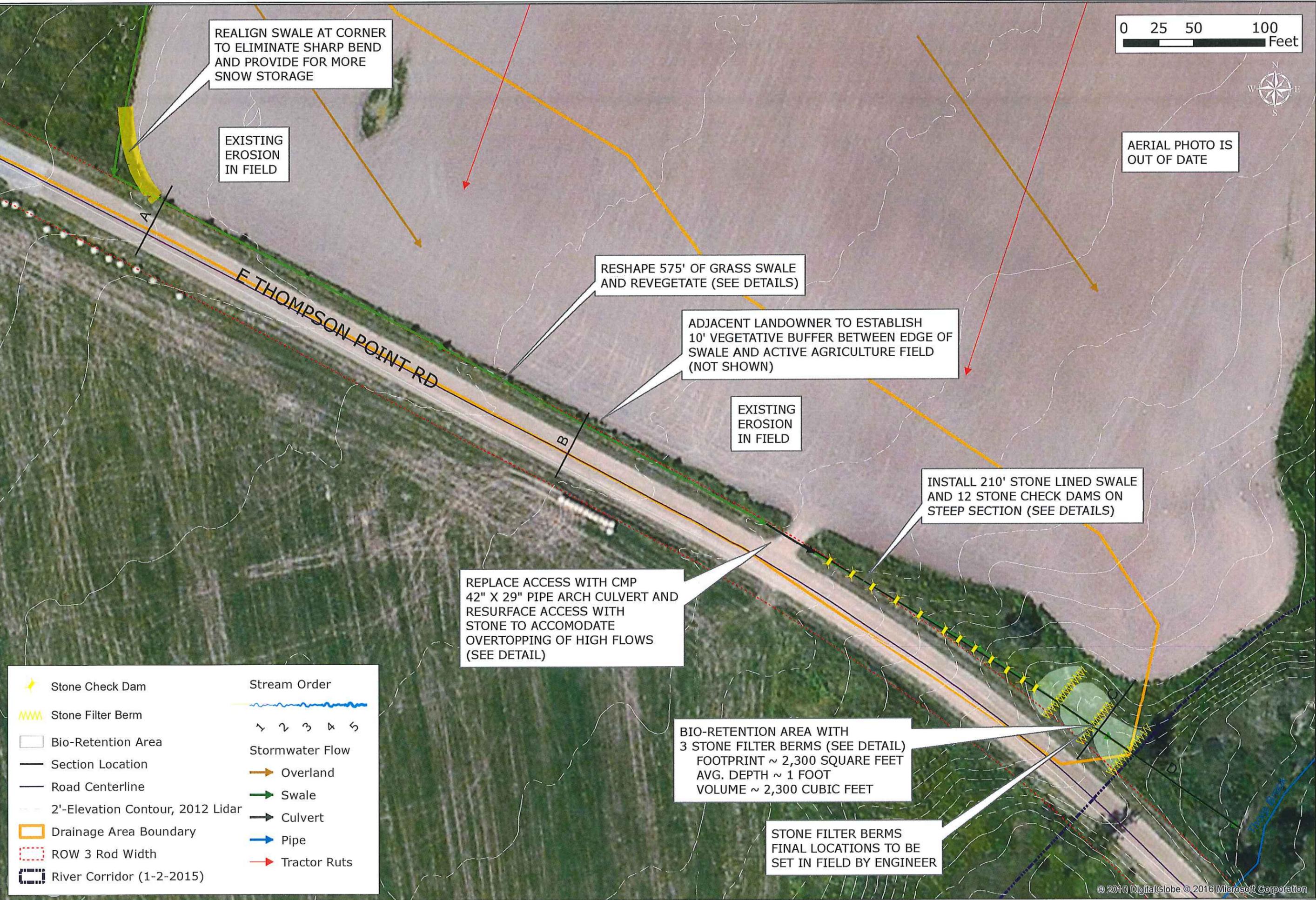
**MILONE & MACBROOM**  
 1 South Main Street, 2nd Floor  
 Waterbury, Vermont 05676  
 (802) 882-8335 Fax (802) 882-8346  
 www.miloneandmacbroom.com

**SOURCE(S):**  
 2012 LIDAR 2 FT CONTOURS, VCGI  
 BING AERIAL  
 NRCS SOIL MAPPING  
 MMI FIELD DATA

**EXISTING CONDITIONS**  
**AHEAD OF THE STORM**  
**THORP BROOK HEADWATERS RESTORATION**  
 EAST THOMPSON POINT ROAD  
 CHARLOTTE, VERMONT

**CONCEPT DESIGN**

Map By: JCL  
 MMI#: 3452-22  
 MXD:  
 1st Version: 4/8/2016  
 Revision:  
 Scale: 1"=200'



- |                                  |                 |
|----------------------------------|-----------------|
| Stone Check Dam                  | Stream Order    |
| Stone Filter Berm                | Stormwater Flow |
| Bio-Retention Area               | Overland        |
| Section Location                 | Swale           |
| Road Centerline                  | Culvert         |
| 2'-Elevation Contour, 2012 Lidar | Pipe            |
| Drainage Area Boundary           | Tractor Ruts    |
| ROW 3 Rod Width                  |                 |
| River Corridor (1-2-2015)        |                 |

0 25 50 100 Feet



REALIGN SWALE AT CORNER TO ELIMINATE SHARP BEND AND PROVIDE FOR MORE SNOW STORAGE

EXISTING EROSION IN FIELD

RESHAPE 575' OF GRASS SWALE AND REVEGETATE (SEE DETAILS)

ADJACENT LANDOWNER TO ESTABLISH 10' VEGETATIVE BUFFER BETWEEN EDGE OF SWALE AND ACTIVE AGRICULTURE FIELD (NOT SHOWN)

EXISTING EROSION IN FIELD

INSTALL 210' STONE LINED SWALE AND 12 STONE CHECK DAMS ON STEEP SECTION (SEE DETAILS)

REPLACE ACCESS WITH CMP 42" X 29" PIPE ARCH CULVERT AND RESURFACE ACCESS WITH STONE TO ACCOMODATE OVERTOPPING OF HIGH FLOWS (SEE DETAIL)

BIO-RETENTION AREA WITH 3 STONE FILTER BERMS (SEE DETAIL)  
FOOTPRINT ~ 2,300 SQUARE FEET  
AVG. DEPTH ~ 1 FOOT  
VOLUME ~ 2,300 CUBIC FEET

STONE FILTER BERMS FINAL LOCATIONS TO BE SET IN FIELD BY ENGINEER

AERIAL PHOTO IS OUT OF DATE

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Waterbury, Vermont 05676  
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www.miloneandmacbroom.com

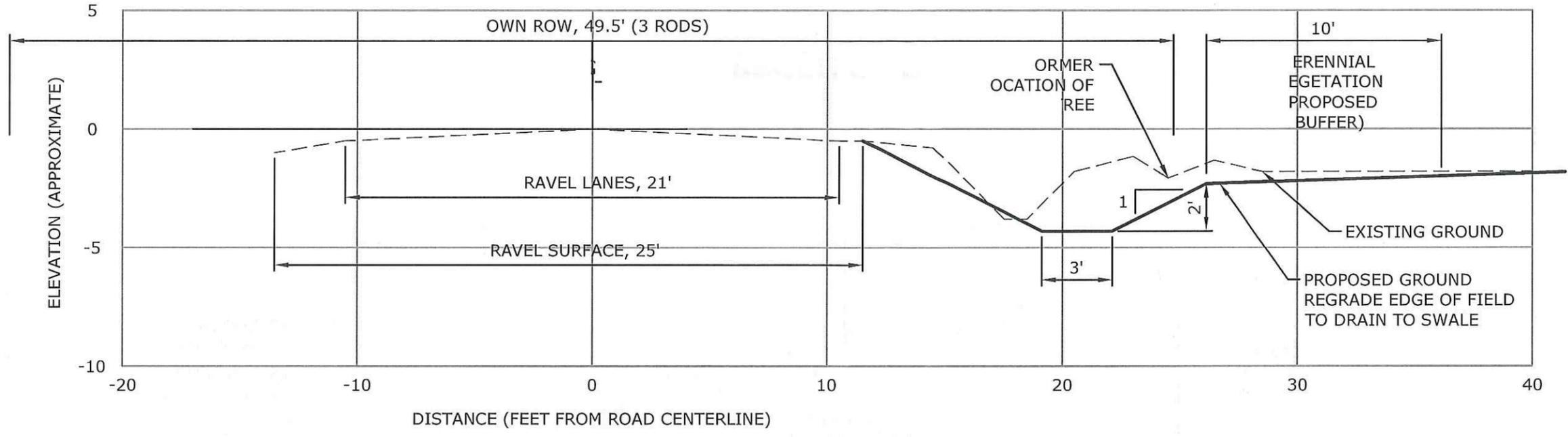
SOURCE(S):  
2012 LIDAR 2 FT CONTOURS, VCGI  
VCGI 2013 15 CM CHITTENDEN COUNTY IMAGERY  
MMT FIELD DATA

LAYOUT  
**AHEAD OF THE STORM**  
**THORP BROOK HEADWATERS RESTORATION**  
EAST THOMPSON POINT ROAD  
CHARLOTTE, VERMONT  
CONCEPT DESIGN

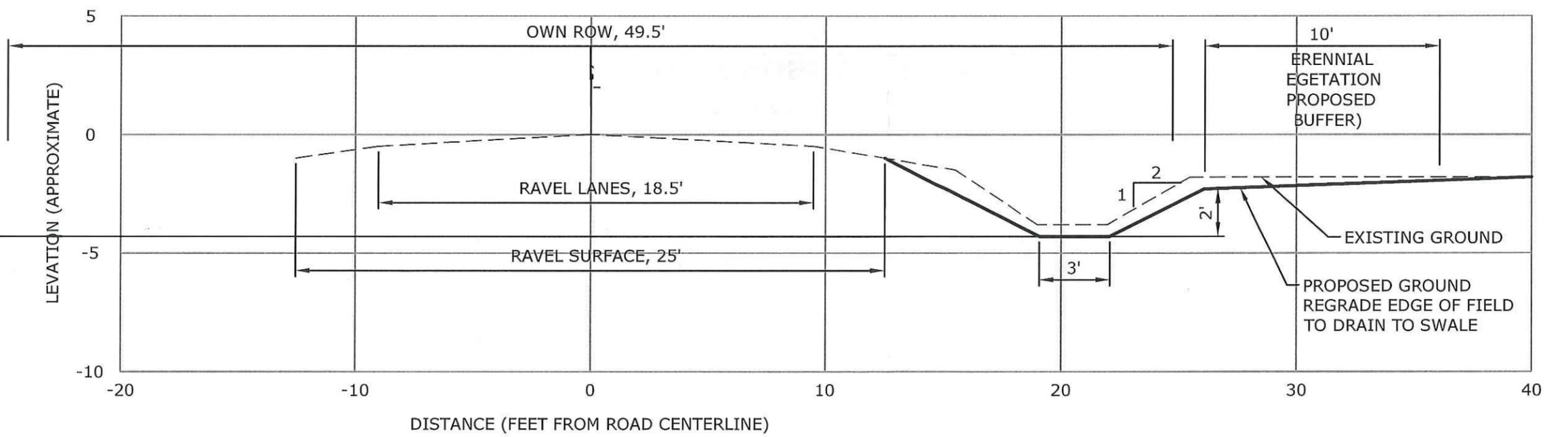
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MXD:  
1st Version: 4/8/2016  
Revision:  
Scale: 1"=60'

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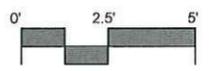
Printed by: JCS/STC On this date: Fri, 2016 April 8 - 4:08pm



**ROAD CROSS SECTION - A**  
SCALE: 1"=5'



**ROAD CROSS SECTION - B**  
SCALE: 1"=5'



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 1 South Main Street, 2nd Floor  
 Waterbury, Vermont 05676  
 (802) 882-8335  
 Fax (802) 882-8346  
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**DETAILS - ROAD CROSS SECTIONS**  
 AHEAD OF THE STORM  
 THORP BROOK HEADWATER RESTORATION  
 EAST THOMPSON POINT ROAD  
 CHARLOTTE, VERMONT

CONCEPT DESIGN

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| JCL<br>DESIGNED     | JCL<br>DRAWN | RS<br>CHECKED |
| SCALE: 1"=5'        |              |               |
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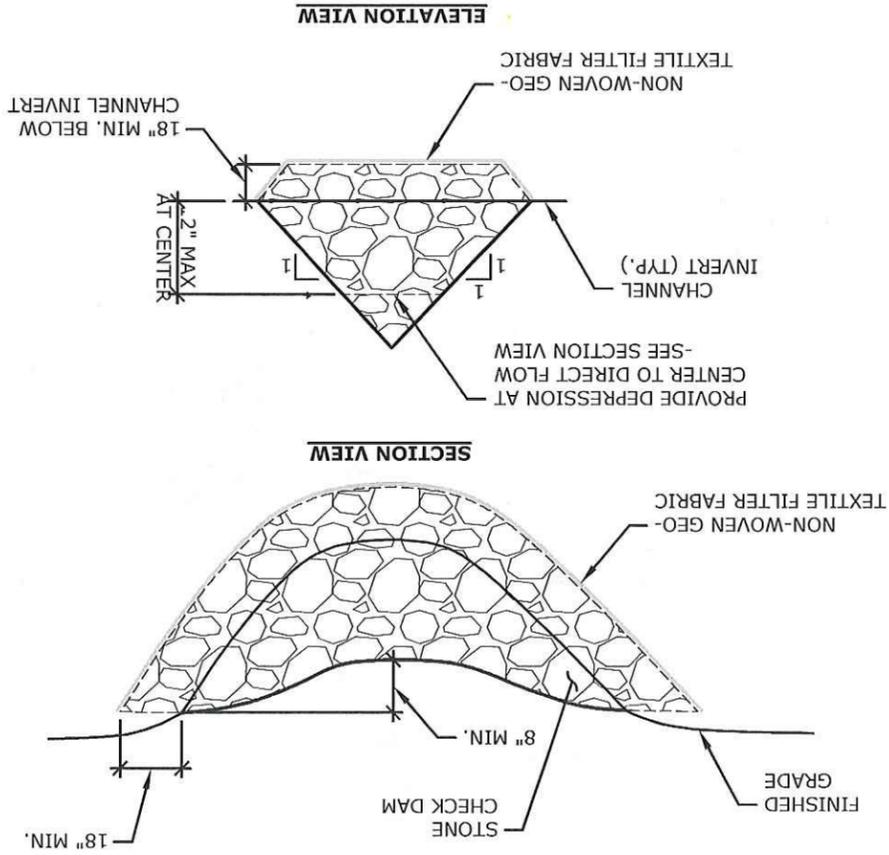
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## STONE CHECK DAM

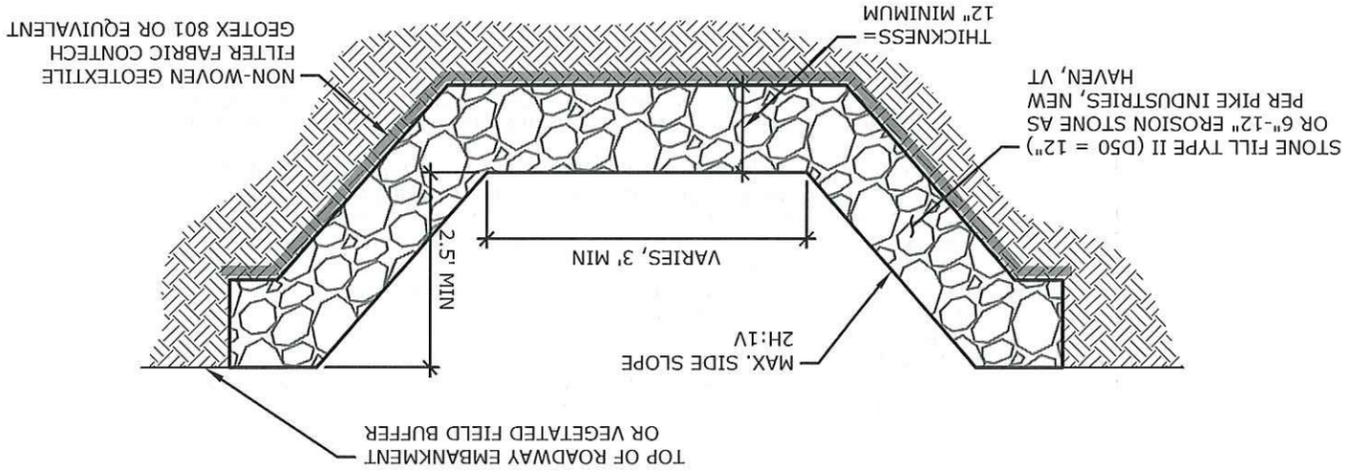
NOT TO SCALE

NOTES:  
 EXTEND THE STONE A MINIMUM OF 18 INCHES BEYOND THE BANKS AND CHANNEL  
 INVERT OF THE SWALE TO PREVENT CUTTING AROUND THE ENDS OF OR UNDERNEATH  
 THE CHECK DAM  
 USE TYPE II STONE FILL (D50=12") OR 6"-12" EROSION STONE AS PER PIKE  
 INDUSTRIES, NEW HAVEN, VT  
 USE CONTECH GEOTEX 801 NON-WOVEN GEOTEXTILE FILTER FABRIC OR APPROVED  
 EQUAL ALONG THE BOTTOM OF THE CUTOFF TRENCH AS A FILTER  
 FINAL LOCATION OF CHECK DAMS TO BE DETERMINED BY ENGINEER IN FIELD. PLACE  
 TO MATCH ELEVATION OF DOWNSTREAM DAM TO BASE OF UPSTREAM DAM.



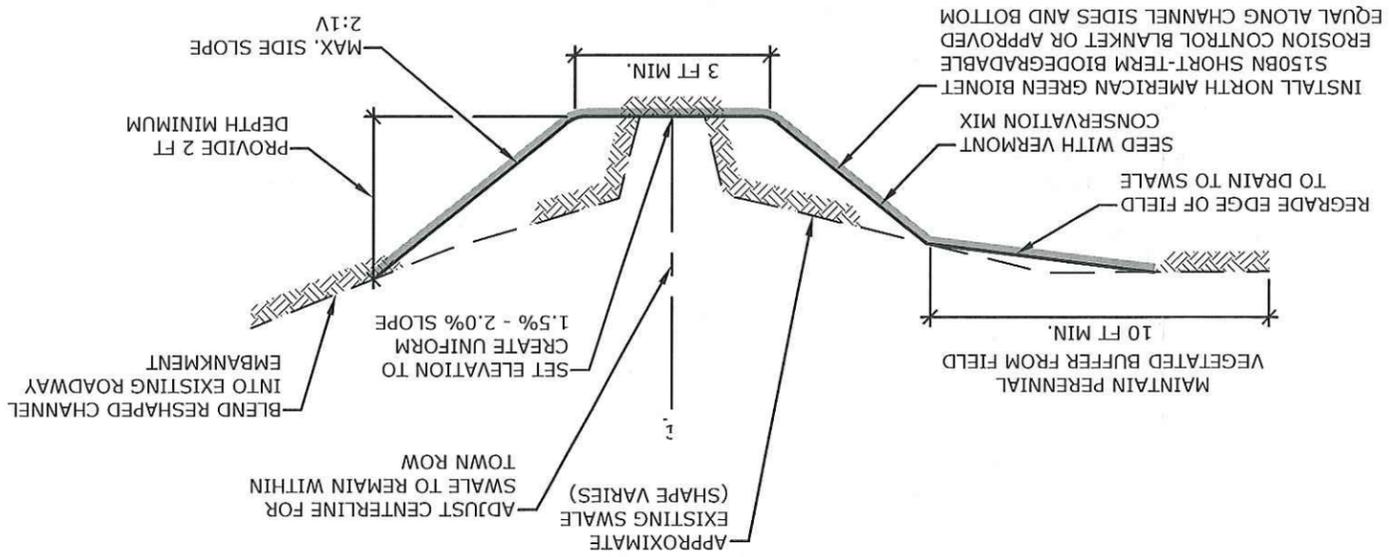
## STONE LINED SWALE

NOT TO SCALE



## RESHAPED GRASS SWALE

NOT TO SCALE



### DETAILS

AHEAD OF THE STORM  
 THORP BROOK HEADWATER RESTORATION  
 EAST THOMPSON POINT ROAD  
 CHARLOTTE, VERMONT

CONCEPT DESIGN

### REVISIONS

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PROJECT NO. 3452-22

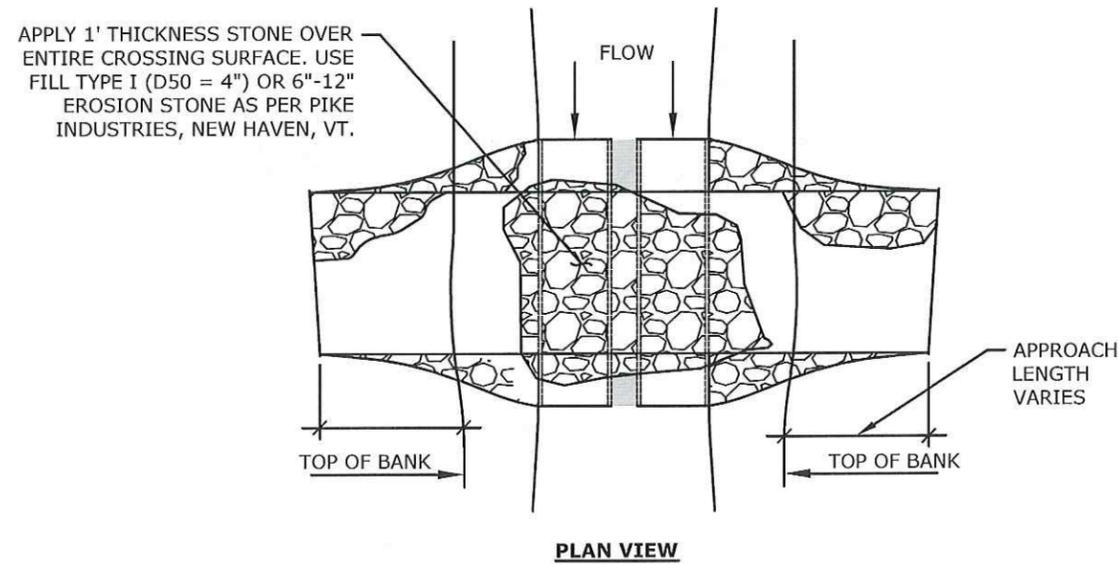
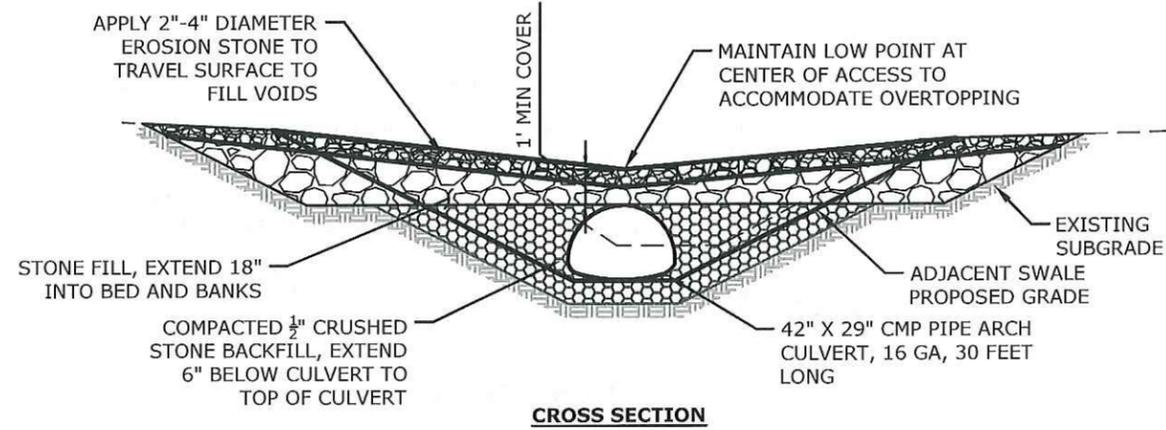
DATE 4/8/2016

SCALE NOT TO SCALE

DESIGNED BY JCL  
 CHECKED BY JCL  
 DRAWN BY RS

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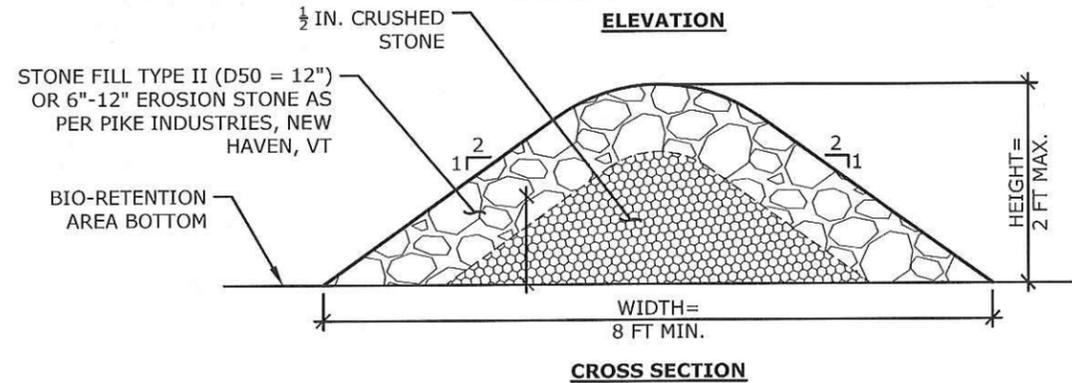
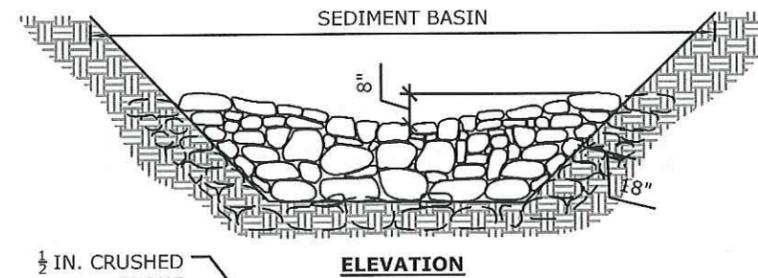
Plotted by: JESSICA On this date: Fri, 2016 April 8 - 4:08pm



**FIELD ACCESS CULVERT**  
NOT TO SCALE

**OPERATION AND MAINTENANCE NOTES**

1. THE CONCEPTUAL STORMWATER PLAN HAS BEEN DESIGNED TO MINIMIZE MAINTENANCE TO THE SYSTEM AND ONLY REQUIRE MAINTENANCE THAT CAN EASILY BE COMPLETED.
2. PERIODICALLY, INCLUDING AFTER LARGE STORMS AND REGULARLY DURING THE FALL, REMOVE LEAVES AND DEBRIS ACCUMULATED AT THE CULVERT AND AT FILTER BERMS.
3. THE ACCUMULATION OF SEDIMENT WITHIN THE BIO-RETENTION AREA SHOULD BE MONITORED AND INSPECTED A MINIMUM OF ONCE ANNUALLY. REMOVE SEDIMENT AFTER APPROXIMATELY 12 INCHES OF SEDIMENT HAS ACCUMULATED.
4. SWALES ARE EXPECTED TO REQUIRE RESHAPING AND REMOVAL OF SEDIMENT APPROXIMATELY EVERY 5 TO 10 YEARS.
5. THE BIO-RETENTION AREA, FILTER BERMS, AND SWALES CAN BE MOWED OR BRUSH-HOGGED AT THE END OF EACH GROWING SEASON.
6. MAINTENANCE OF THE SYSTEM SHOULD ONLY OCCUR DURING LOW FLOW AND IN THE GROWING SEASON AFTER SPRING RUNOFF.
7. RESEEDING OF THE SPECIFIED SEED MIX SHOULD OCCUR AFTER REMOVAL OF SEDIMENT FROM THE BIO-RETENTION AREA OR RESHAPING OF SWALES.



**NOTES:**  
EXTEND THE STONE A MINIMUM OF 18 INCHES INTO BANKS AND BOTTOM TO PREVENT CUTTING AROUND THE ENDS OR UNDER THE FILTER BERM.

**STONE FILTER BERM**  
NOT TO SCALE

**MILONE & MACBROOM**  
1 South Main Street, 2nd Floor  
Waitsfield, VT 05676  
(802) 882-5435  
Fax (802) 882-4346  
www.miloneandmacbroom.com

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CONCEPT DESIGN

**AHEAD OF THE STORM**  
**THORP BROOK HEADWATER RESTORATION**  
EAST THOMPSON POINT ROAD  
CHARLOTTE, VERMONT

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|------------------------|--------------|---------------|
| JCL<br>DESIGNED        | JCL<br>DRAWN | RS<br>CHECKED |
| SCALE<br>NOT TO SCALE  |              |               |
| DATE<br>4/8/2016       |              |               |
| PROJECT NO.<br>3452-22 |              |               |
| <b>06</b>              |              |               |

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