



## **Cover Sheet**

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

Town/Organization: Bolton

Primary Contact Person (Responsible for Signing Grant Agreement): Brian Roberge

Title: Town Administrator

Address: \_3045 Theodor Roosevelt Highway,  
*Street Address*

Bolton VT  
*Town*

05676  
*Zip*

Primary Contact Person Email: townadmin@boltonvt.com Phone: ( 802 ) 434 – 5075 ext 224

SAM unique ID #: 078729 Fiscal Year End Month (MM): 06

Town Clerk / Admin email: townadmin@boltonvt.com

Road Foreman Name: Jacob Johnson Road Foreman Email: highwaybolton@gmavt.com



# Vermont Better Roads Grant Program



## **CATEGORY B/C/D**

Please complete one application per project you are applying for.

Please check the Category you are applying for:

- B. Correction of a Road Related Erosion Problem and/or Stormwater Mitigation
- C. Correction of a Stream Bank, Lake Shore or Slope Related Problem
- D. Structure/culvert 36" diameter or greater

Municipality: Bolton

Road Name: Notch Road TH #: 4 Structure # (if applicable): 040031

Road Type: Paved or **Unpaved** (select one) Road Class: 1 2 **3** 4 (select one)

Please provide a thorough description of the erosion/water quality problem (ex. Roadway has steep slope with no ditch which is causing severe roadway erosion, which outlets into the Lamoille River): Culvert 040031 is a 36" corrugated steel culvert that has had perpetual erosion and flooding issues due to its inadequate size, and placement. Over the years this culvert has over topped during large rain events and even in smaller rain events has erosion issues. There is scouring on the inlet, and embankment erosion and undercutting/perching at the outlet as well. There is a very shallow coverage between the top of this culver and the roadway surface.

Has the town completed an MRGP compliant road erosion inventory?

- Yes
- No
- In progress

Project Length (linear feet along roadway): 656 ft.

Number of structures/culverts replaced/repaired: 1

Average slope of roadway:  0-5%  5-10%  >10%

Provide a VERY detailed map of project location showing start and end points:  Included

Provide a sketch of project location showing distances and project details:  Included



# Vermont Better Roads Grant Program



Please provide the Road Segment ID (RSID) for your project. If several, please list all. In addition to the RSID please indicate what the resulting rating of each segment before construction as well as after construction in accordance with the MRGP.\* (i.e., Fully Meets Standard, Partially Meets, Does Not Meet) For assistance, please contact Better Roads Staff (802)828-4585.

RSID	Hydrologically Connected?		Pre-construction MRGP Conformance			Post-construction MRGP Conformance		
	Yes	No	Fully Meets	Partially Meets	Does Not Meet	Fully Meets	Partially Meets	Does Not Meet
142057	Yes				DNM	Yes		
142058	Yes				DNM	Yes		

\*In order to "Fully Meet" the standards the road segment must have proper crown, removal of shoulder berms, proper ditching, proper conveyance and no erosion present at culvert inlets and outlets.



# Vermont Better Roads Grant Program



**\*In order to “Fully Meet” the standards the road segment must have proper crown, removal of shoulder berms, proper ditching, proper conveyance and no erosion present at culvert inlets and outlets.**

**Environmental Concerns:**

All projects require a review of potential impacts by our environmental team. To expedite the review process, please check the boxes below that describe existing structures/conditions to be replaced/maintained (if any) and the project description that applies (if any).

Existing Structures:	
<input checked="" type="checkbox"/> Steel/Plastic Culvert	<input type="checkbox"/> Concrete Box Culvert
<input type="checkbox"/> Stone Culvert – <b>Take pictures</b>	<input type="checkbox"/> Concrete Bridge
<input checked="" type="checkbox"/> Ditch	<input type="checkbox"/> Rolled Beam/Plate Girder Bridge
<input type="checkbox"/> Foundation remains, mill ruins, stone walls, other – <b>Take pictures</b>	<input type="checkbox"/> Stone abutments or piers – <b>Take pictures</b>
<input type="checkbox"/> Buildings within 300 feet of work - <b>Take pictures</b>	
Project Description:	
<input type="checkbox"/> New ditches will be established	<input checked="" type="checkbox"/> All work will be completed from the existing road or shoulder
<input checked="" type="checkbox"/> Reestablishing existing ditches only	<input type="checkbox"/> There will be excavation within 300 feet of a river or stream – <b>Take pictures</b>
<input checked="" type="checkbox"/> The structure is being replaced on existing location/alignment	<input type="checkbox"/> Road reclaiming, reconstruction, or widening
<input type="checkbox"/> Excavation within a floodplain – <b>Take pictures</b>	<input type="checkbox"/> Temporary off-road access is required
<input type="checkbox"/> Tree cutting/clearing – <b>Take pictures</b>	<input type="checkbox"/> The roadway will be realigned

**Please describe the project and how it will create a positive water quality benefit** (ex. Reshape 500’ of ditch and line with 12 inch minus stone, to prevent sediment from entering the Lamoille River at the bottom of the hill):

The upsizing and replacement of this culvert will drastically help with moving water during large storm events under this roadway and prevent the frequent overtopping of the road by this channel which results in heavy sediment transport. Increasing the 3’ culver to a larger 9’ culvert and better (deeper) placement will result in less erosion at the inlet and outlet, which will result in the header embankments holding on to their soil. Bolton will re-crown the road, remove any berms, and re-establish any existing ditches to convey water more properly.

**Please list any professionals or partners that assisted with planning this project** (ANR River Management Engineer, Army Corps of Engineers, VTrans staff, Basin Planner, RPC staff, etc.):



# Vermont Better Roads Grant Program



Chris Dubin - Senior Transportation Planner, CCRPC. Joe Bartlett - CFM, Fitzgerald Environmental Associates

Is the project located in the town "Right of Way?" (select one)  Yes  No  Both

Please be aware, Municipalities are required to have an Agreement for Entry & Liability Release for any impacted properties (prior to the start of construction.)

## Budget:

Please attach a project budget and confirm below that is attached:

Project budget IS attached

Are you applying to other grant programs to help fund this project? If so, what programs? Please note that Better Roads requires a 20% local match and Better Roads funding may not be used as match for other state or federally funded programs.

No

<b>Requested Grant Amount:</b>	\$ 44,800.00	<b>Requested Grant Amount Max:</b>
+		\$20,000 Category B
<b>Local Match:</b>	\$ 11,200.00	\$40,000 Category C
=		\$60,000 Category D
<b>Total Project Cost:</b>	<b>\$ 56,000.00</b>	See page 6 for more information on calculating match

Estimated Completion Date: 12/31/2024

### REQUIRED ATTACHMENTS:

Please use the documentation checklist below to ensure that all of the relevant items regarding your application have been included. **It is preferred that your application is a single PDF file.**

- Grant application cover sheet
- Grant application form, including chart with RSID and MRGP compliance before and after project completion
- 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).
- Detailed Project Location Map
- Sketch of proposed project and erosion control measures or other management practices, including distances in feet
  - o Also show approximate location of town/other right-of-way and/or property lines and limits of work
- Photos must be color and clear to see.**
  - o **Please make sure there are enough photos to get a good idea of the project area**
- Other appropriate supporting documents.



# Vermont Better Roads Grant Program



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:

Name: Paula Merin Title: Select Board Chair

**MUST BE TOWN ADMINISTRATOR/MANAGER OR SELECT BOARD CHAIR**

## Vermont Better Roads Category B/C/D Grant Proposal Scoring Criteria

All applications will be scored on a sliding scale elected by the Better Roads Grant Selection Committee. Road BMP upgrades are considered the highest priority for grant funding when road segments are “hydrologically-connected,” currently “not meeting” MRGP standards, and road slopes are greater than 10%

- 1. Is the project using Best Management Practices (BMPs) that are proven and likely to maximize long term success, such as practices contained within the new VTrans Better Roads Manual and/or VT DEC MRGP Standards?? [maximum 20 points]**
  - The proposed project utilizes appropriate BMPs and has maximized the likelihood of long-term success (16-20 points)
  - The proposed project utilizes some appropriate BMPs but more could be done to increase the likelihood of success (11-15 points)
  - The proposed project does not utilize appropriate BMPs, or it is unclear whether the BMPs will be used appropriately and the likelihood of success is uncertain (0-10 points)
  
- 2. What are the expected Water Quality Benefits within the watershed? [maximum 25 points]**
  - Project will lead to significant improvements to water quality (21-25 points)
  - Project will lead to moderate improvements to water quality (16-20 points)
  - Project will lead to small improvements to water quality (1-15 points)
  - Project will lead to no obvious improvements to water quality (0 points)
  
- 3. Is the project in or does stormwater runoff from the project area drain into a hydrologically connected segment? [maximum 20 points]**
  - Yes; the entire project is in connected segment(s) (20 points)
  - Partially; part(s) of the project are in connected segments (5-19 points)
  - No; this project is not in a connected segment (0-5 points)
  
- 4. Will the project result in full compliance of one or more segments in accordance with the Municipal Roads General Permit (MRGP)? [maximum 25 points]**
  - All segments within the project will be in full compliance (25 points)
  - One or more segments will be in full compliance, with all other segments in partial compliance (11 – 24 points)
  - One or more segments will be a minimum of partial compliance (1- 10 points)
  - Project does not meet compliance or not applicable (does not have hydrologically connected segments) (0 points)

**Fitzgerald Environmental Associates**

Bolton Notch Road MRGP Culvert Replacement

Preliminary Cost Opinion

12/18/2023

Description	Unit	Estimated Quantity	Unit Price	Cost
Mobilization/Demobilization	LS	1	\$3,500.00	\$3,500.00
<b>Culvert Replacement</b>				
Contech 8'-10" x 6'-0" Steel Squash Pipe with Sediment Baffles	LS	1	\$18,500.00	\$18,500.00
Common Excavation (cut/fill)	CY	130	\$20.00	\$2,600.00
Structural Stone Backfill / Roadway gravel	CY	80	\$40.00	\$3,200.00
E-Stone Type I	CY	20	\$60.00	\$1,200.00
Excavator day rate	LS	3	\$2,000.00	\$6,000.00
Stream bypass (pumping / temp piping)	LS	1	\$5,000.00	\$5,000.00
Misc. Erosion Control/Site Restoration	LS	1	\$2,000.00	\$2,000.00
Laborer (Culvert assembly, seeding, fabric, restoration, etc.)	HR	80	\$60.00	\$4,800.00
<b>Engineering Services</b>				
Final Design and Permitting	LS	1	\$5,000.00	\$5,000.00
Construction Oversight	LS	1	\$3,000.00	\$3,000.00

Total Construction Subtotal: \$46,800.00  
Contingency (20%): \$9,360.00  

---

Total: **\$56,000.00**

Total Construction Subtotal with Engineering Services: \$54,800.00  
Contingency (20%): \$10,960.00  

---

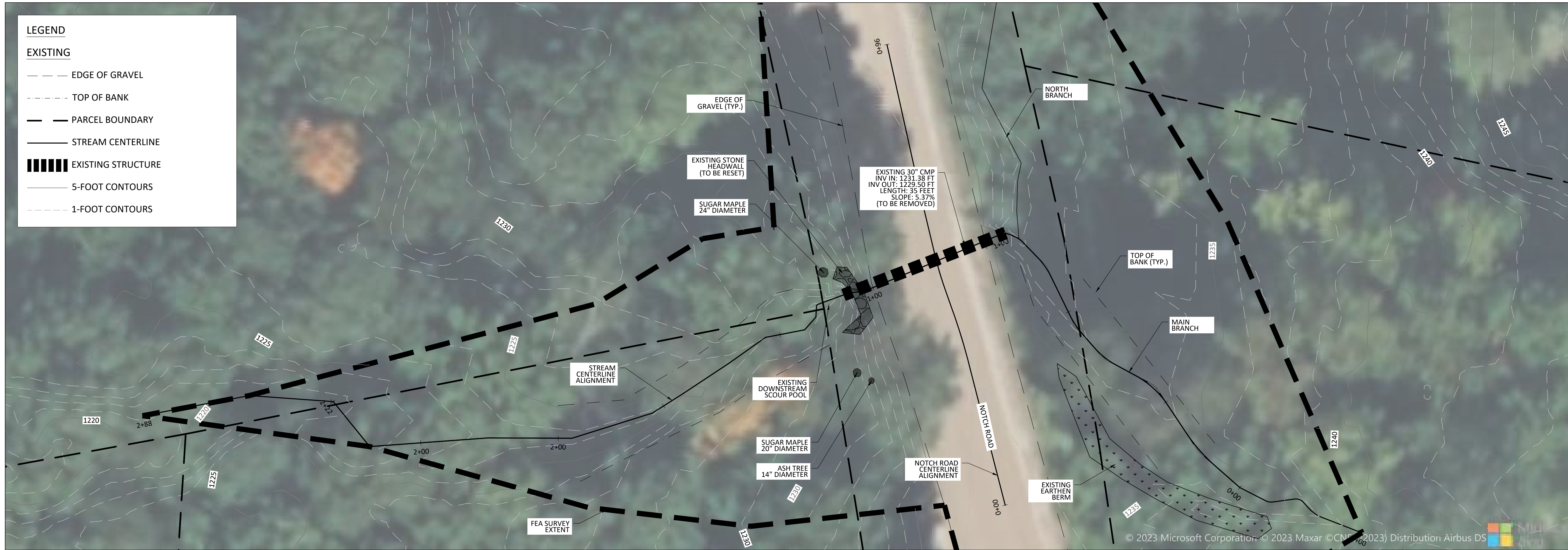
Total: **\$66,000.00**



**LEGEND**

**EXISTING**

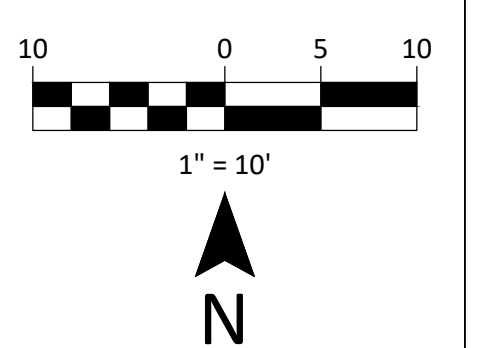
- EDGE OF GRAVEL
- - - - TOP OF BANK
- PARCEL BOUNDARY
- STREAM CENTERLINE
- ▬▬▬▬ EXISTING STRUCTURE
- 5-FOOT CONTOURS
- 1-FOOT CONTOURS



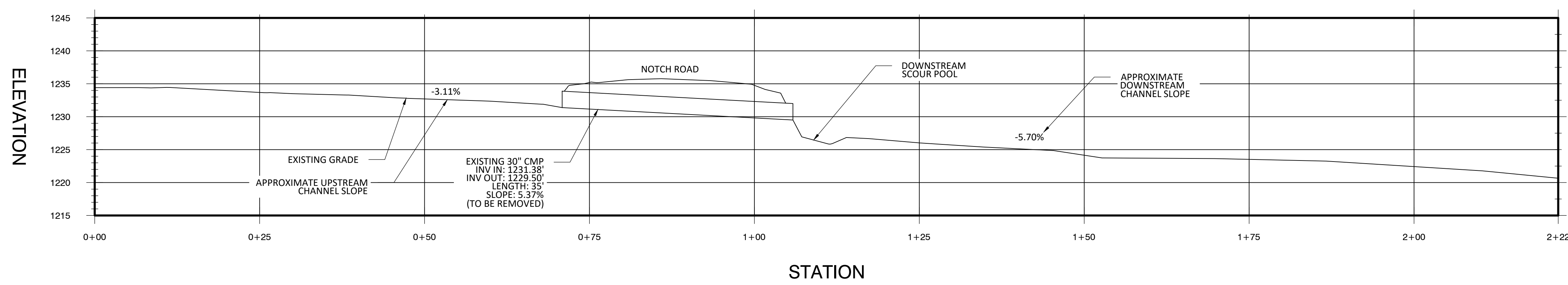
Fitzgerald Environmental Associates, LLC  
 164 Main Street, Suite 2  
 Colchester, VT 05446  
 Telephone: 802.876.7778  
[www.fitzgeraldenvironmental.com](http://www.fitzgeraldenvironmental.com)

SIGNATURE

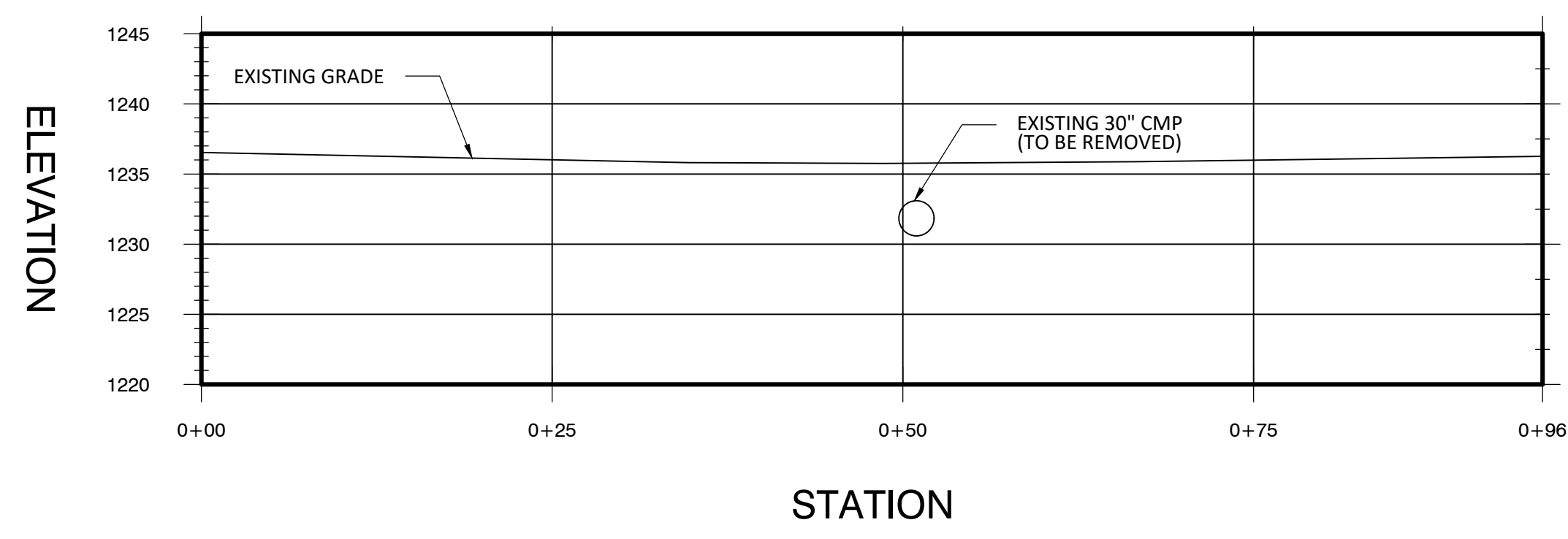
REVISIONS		
#	DESCRIPTION	DATE



**MAIN BRANCH STREAM CENTERLINE PROFILE**



**NOTCH ROAD CENTERLINE PROFILE**



**EXISTING CONDITIONS AND SOURCE NOTES:**

- EXISTING TOPOGRAPHIC FIELD SURVEY COLLECTED BY FEA WITH TOTAL STATION AND TRIMBLE CM GRADE GPS ON 11/07/23. PROFILE AND CROSS SECTION ELEVATIONS ARE REPRESENTATIVE OF SURVEY DATA.
- CONTOURS BEYOND FEA DETAILED SURVEY ARE FROM 2014 LIDAR DIGITAL ELEVATION MODEL (0.7-METER)
- GEOGRAPHIC DATA AND PLANS ARE REFERENCED TO THE VERMONT STATE PLANE IN US SURVEY FEET (NAVD83). ELEVATIONS ARE BASED ON NAVD88.
- THIS MAP IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED OR CONSTRUED FOR SUCH PURPOSES.

**SITE PLAN - EXISTING CONDITIONS**  
 CCRPC - MRGP BOLTON CULVERT REPLACEMENT  
 NOTCH ROAD, BOLTON, VT  
 NOT FOR CONSTRUCTION  
 30% PLANS

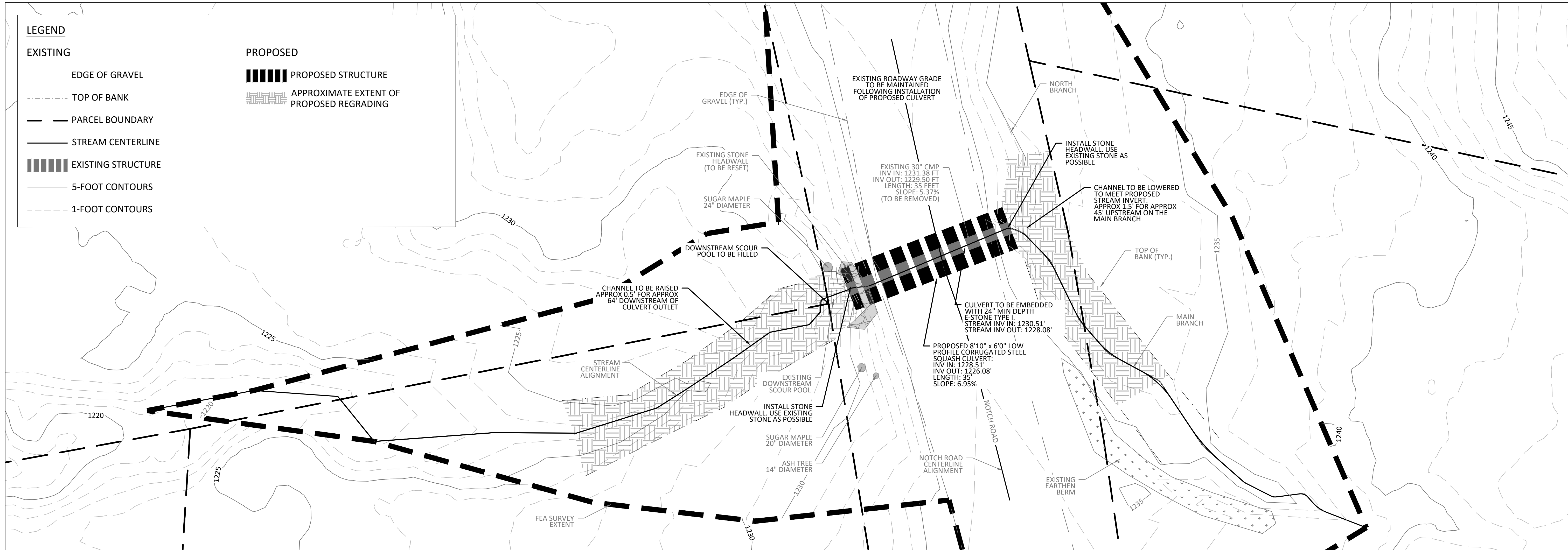
AEM DRAWN	JMD CHECKED
SCALE: 1" = 10'	
DATE: 2023-12-18	
PROJECT NO.: 23084	
SHEET NO.: 1 OF 2	
<b>EX-1</b>	
SHEET NAME	

S:\2023\23084\_CCRPC\_2023\_MRGP\_DESIGN\CAD\BOLTON NOTCH RD\BOLTON\_NOTCHRD\_CULVERT.DWG 12/18/2023 3:14:38 PM



- LEGEND**
- EXISTING**
- EDGE OF GRAVEL
  - TOP OF BANK
  - - - PARCEL BOUNDARY
  - STREAM CENTERLINE
  - ▨▨▨▨▨ EXISTING STRUCTURE
  - 5-FOOT CONTOURS
  - 1-FOOT CONTOURS

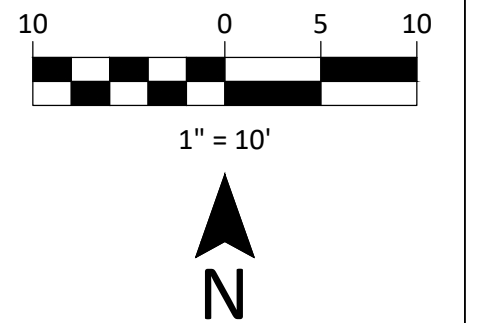
- PROPOSED**
- ▨▨▨▨▨ PROPOSED STRUCTURE
  - ▨▨▨▨▨ APPROXIMATE EXTENT OF PROPOSED REGRADING



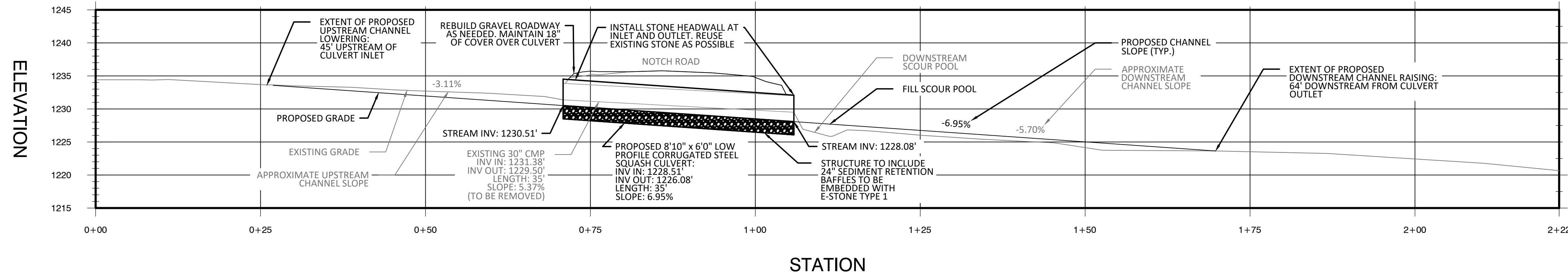
Fitzgerald Environmental Associates, LLC  
 164 Main Street, Suite 2  
 Colchester, VT 05446  
 Telephone: 802.876.7778  
 www.fitzgeraldenvironmental.com

SIGNATURE

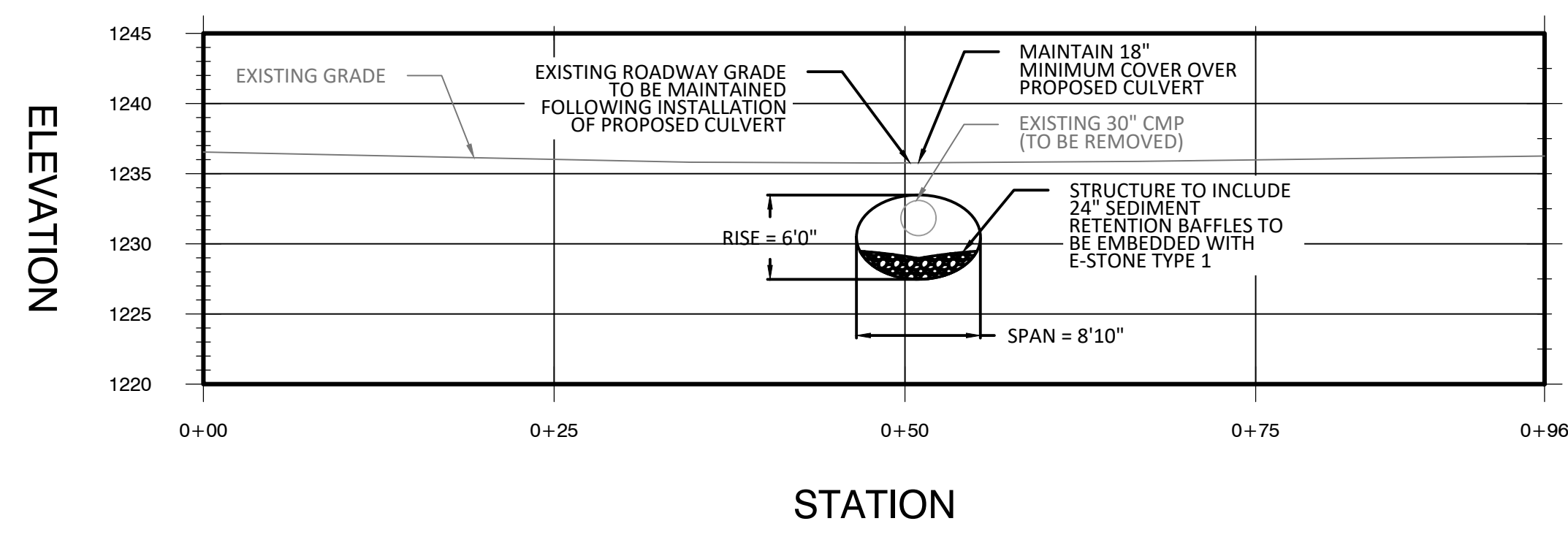
REVISIONS		
#	DESCRIPTION	DATE



**MAIN BRANCH STREAM CENTERLINE PROFILE**



**NOTCH ROAD CENTERLINE PROFILE**



**SITE PLAN - PROPOSED CONDITIONS**  
 CCRPC - MRGP BOLTON CULVERT REPLACEMENT  
 NOTCH ROAD, BOLTON, VT  
 NOT FOR CONSTRUCTION

AEM DRAWN	JMD CHECKED
SCALE: 1" = 10'	
DATE: 2023-12-18	
PROJECT NO.: 23084	
SHEET NO.: 2 OF 2	
<b>PR-1</b>	
SHEET NAME	

S:\2023\23084\_CCRPC\_2023\_MRGP\_DESIGNS\CAD\BOLTON NOTCH\BOLTON\_NOTCH\_CULVERT.DWG 12/18/2023 3:14:48 PM

30% PLANS



## MEMORANDUM

**To:** Chris Dubin  
Chittenden County Regional Planning Commission

**From:** Joe Bartlett, CFM; Abby Munterich, EIT; Jordan Duffy, P.E.

**Re:** Culvert Replacement Study for Notch Road, Better Roads Category D Application

**Date:** December 18, 2023

Chris,

We completed a desktop analysis and a detailed topographic survey to determine an appropriate replacement option for the culvert on Notch Road approximately 300 feet north of Duck Brook Circle. The existing 30" CMP culvert is in good condition, however it is very undersized. This has led to frequent flooding problems along and over the road, significant sediment accumulation filling the channel at the culvert inlet, and moderate erosion on the road embankment from flooding over the road. A simple hydrology and hydraulics analysis was prepared to inform the recommendations for a replacement structure presented in the 30% conceptual design plan.

### Field Survey

FEA completed a detailed field survey of the Notch Road culvert in November 2023. The existing culvert dimensions, cover depth, and culvert slope were measured in the field with a Nikon Total Station tied into benchmarks surveyed with a Trimble Geo7x (centimeter grade) GPS. A longitudinal profile was collected along the channel and multiple cross-sections were surveyed upstream and downstream of the culvert. Additional topographic survey data was collected to characterize the floodplain dimensions, the extent of sediment accumulation near the culvert inlet, and the surrounding roadway grades.

### Culvert Sizing Analysis

The culvert receives flow from two separate channels that converge at the inlet. The total drainage area to the culvert is 0.17 square miles. The contributing watershed is predominantly steep forested land with poorly drained soils. The channel is not mapped within USGS StreamStats due to its relatively small size. Regional USGS regressions for bankfull width predict a bankfull channel of 6 feet. However, the regression models are generally used for larger drainage areas and are less accurate for watersheds this size. During the field visit, the bankfull channel width was measured in the primary channel upstream of the culvert and the channel downstream. Widths ranged from 8 to 10 feet but were typically 8 feet in areas that were not scoured in the July 2023 floods.

FEA conducted a hydrologic analysis comparison, using various regression methods. The most applicable and conservative method analyzed was the USGS regional regression equation for Vermont (Olson, 2014). Flows were analyzed from the 2-year recurrence interval to the 100-year. These flows were then used in a simple hydraulic model in the Federal Highway Administration's HY8 Culvert Hydraulic Analysis Program.

### Proposed Culvert Replacement

Based on the existing conditions survey and culvert sizing analysis, FEA recommends a low-profile corrugated steel squash culvert with an 8'-10" span and a 6'-0" rise with 24" sediment retention baffles

(4 baffles spaced along the culvert). The structure will be embedded with 2 feet of e-stone type 1, which will maintain a natural bottom throughout the culvert. This structure will provide adequate width to meet the bankfull dimension of the channel, while also providing a low-profile structure rise to accommodate the existing roadway elevation. Other similarly dimensioned structures could also provide adequate hydraulic capacity and meet the intentions of the design.

Modeling results show that the existing 30" culvert overtops the roadway in the 25-year storm. Modeling of the proposed 10-foot wide structure shows the structure providing sufficient hydraulic capacity to efficiently pass the 100-year storm.

In addition to the culvert replacement, the proposed conceptual design includes the removal of accumulated sediment at the culvert inlet, and regrading of the upstream and downstream channels, as needed, to improve the geomorphic compatibility and sediment transport.

#### **Category D Scoring Criteria**

- The structure shown in our attached concept designs has approximately six (6) times the hydraulic capacity of the existing structure and will improve coarse sediment transport through the crossing, reducing maintenance requirements and maximizing long term success of the project.
- Water quality benefits associated with culvert replacement include improved geomorphic compatibility and sediment transport. Outlet scour and embankment erosion will be significantly reduced by preventing flooding over the roadway during large storm events.
- The culvert replacement is located on an intermittent stream channel that drains directly into Duck Brook, approximately 400 feet to the west.
- The project is located on MRGP segments 142057 and 142058. Both segments are scored as "Does not Meet". We observed embankment erosion at the culvert inlet and outlet. Conveyance areas and roadway drainage met MRGP standards. The project would result in full MRGP compliance for the two segments.
- We estimate project implementation to cost \$66,000, including final design and construction oversight. The recommended structure is a cost-effective option for providing the appropriate width while maintaining a short profile to provide appropriate cover.

Sincerely,



Joe Bartlett, Senior Watershed Scientist







Segment 142057 Looking North



Segment 142058 Looking Northeast – white foamy area is the inlet of the culvert. This is during the heavy rain on Monday 12/18





Culvert 040031 inlet



Culvert 040031 outlet





December 19, 2023

Brian Roberge  
Town Administrator  
townadmin@bolton.com  
Office line: (802) 434-5075 ext 224

RE: FY25 Better Roads Category D grant request

Dear Brian,

The Chittenden County Regional Planning Commission is pleased to support your Category D grant request to the VTrans FY25 Better Roads program. This grant is a key component as the town of Bolton continues to upgrade its stormwater infrastructure to reduce erosion and soil loss in priority areas. This specific location will look to replace and upsize a failing and eroding culvert. This culvert is both undersized and has poor alignment/depth of cover which results in water often flooding/overtopping. There is also erosion evident at the inlet and outlet of this culvert. A much larger and better placed culvert will result in significantly less overtopping events and less scouring at the inlet and outlet. Additionally, properly stabilized headers and embankments will reduce soil loss. These upgrades will help Bolton advance towards meeting their goals of the Municipal Roads General Permit through segment upgrades, as well as better compliance with the Vtrans road and bridge standards.

Furthermore, this project helps implement the following specific sections of the *Chittenden County ECOS Plan*, the combined Regional Plan, Metropolitan Transportation Plan and Comprehensive Economic Development Strategy for the County:

- Transportation Goal (Section 2.5.3): Provide accessible, safe, efficient, interconnected, secure, equitable, and sustainable mobility choices for our region's businesses, residents and visitors;
- Water Quality Strategy (Section 3.2.3): Improve the safety, water quality, and habitat of our rivers, streams, wetlands and lakes in each watershed; and
- Improves and maintains infrastructure to help support the Sustainable Growth Strategy (3.2.2): Strive for 80% of New Development in Areas Planned for Growth, Which Amounts to 15% of Our Land Area.

Thank you for the opportunity to support this project and we look forward to working with you in completing the project should your grant request be successful.

Sincerely,

A handwritten signature in black ink that reads "Chris Dubin".

Chris Dubin  
Senior Transportation Planner