



Vermont Better Roads Grant Program



Cover Sheet

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

Town/Organization: **Town of Middletown Springs**

Primary Contact Person (Responsible for Signing Grant Agreement): **Patty Kenyon** Title: **Town Clerk | Selectboard Clerk**

Address: **5 South Street, Middletown Springs, VT 05757**
Street Address *Town* *Zip*

Primary Contact Person Email: **middletown@vermontel.net** Phone: **(802) 235 - 2220**

SAM unique ID #: **DR6FCFK99HZ9** Fiscal Year End Month (MM): **06**

Town Clerk / Admin email: **Patty Kenyon | middletown@vermontel.net**

Road Foreman Name: **William Reed** Road Foreman Email: **middletown.roads@gmail.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: Middletown Springs

Road Name: Haley Rd TH #: 10 Structure # (if applicable): 167

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:

Haley Rd is a gravel road with a steep slope and lacks adequate ditching that results in road edge erosion and sediment runoff entering the tributary to Train Brook. In addition, the 36" culvert on the perennial stream (tributary to Train Brook) was destroyed in the April 2019 storm event and a temporary 24" culvert was installed. The original drainage culvert was failing and undersized for the perennial stream. The stream is located on a steep slope and repeat storm events have created mass failures on the inlet and outlet end, causing significant erosion of the stream embankments. The mass failures have also caused significant sediment to impact Train Brook. The project will also include installing a 15" driveway culvert in the driveway adjacent to the large culvert replacement for water from the uphill ditch to drain properly.

Has the town completed an MRGP compliant road erosion inventory?

- Yes
- No
- In progress

Project Length (linear feet along roadway): 1640 ft.

Number of structures/culverts replaced/repared: 4

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



***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 – Take pictures	<input type="checkbox"/> Concrete Bridge
<input type="checkbox"/> Ditch	<input type="checkbox"/> Rolled Beam/Plate Girder Bridge
<input type="checkbox"/> Foundation remains, mill ruins, stone walls, other – Take pictures	<input type="checkbox"/> Stone abutments or piers – Take pictures
<input type="checkbox"/> Buildings within 300 feet of work - Take pictures	
Project Description:	
<input checked="" type="checkbox"/> New ditches will be established	<input type="checkbox"/> All work will be completed from the existing road or shoulder
<input type="checkbox"/> Reestablishing existing ditches only	<input checked="" type="checkbox"/> There will be excavation within 300 feet or a river or stream – Take pictures
<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 – Take pictures	<input type="checkbox"/> Temporary off-road access is required
<input type="checkbox"/> Tree cutting/clearing – Take pictures	<input type="checkbox"/> The roadway will be realigned

Please describe the project and how it will create a positive water quality benefit:

The project will replace the temporary 24" drainage culvert (ID #167) with a 5'x8' steel culvert with pour-in-place headwalls and wingwalls. In addition, the project will upgrade the high priority segment, #107492, surrounding the culvert by establishing stone-lined ditching. The culvert upgrade will include installing stone rip-rap along the inlet and outlet of the culvert to prevent further erosion from storm events. The Haley Rd project will be the same design as the Spruce Knob Rd, which was successfully implemented by Middletown Springs.

Please list any professionals or partners that assisted with planning this project:

Josh Carvajal – River Scientist, VTDEC

Devon Neary – Transportation Planner, RRPC

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

(If No or Both, you will be required to have Agreement for Entry Liability Release for any impacted properties prior to the start of construction).



Vermont Better Roads Grant Program



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.

Requested Grant Amount:	\$ 57,633.15	Requested Grant Amount Max:
+		\$20,000 Category B
Local Match:	\$ 11,526.63 (in kind)	\$40,000 Category C
=		\$60,000 Category D
Total Project Cost:	\$ 57,633.15	

See page 6 for more information on calculating match

Estimated Completion Date: 10/1/2020

REQUIRED ATTACHMENTS:

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

- 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.

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:  Title: Town Clerk / Selectboard Clerk

MUST BE TOWN ADMINISTRATOR/MANAGER OR SELECT BOARD CHAIR



Vermont Better Roads Grant Program



Cost Estimate Worksheet

Town and Road Name: Middletown Springs – Haley Rd

Project Name: Haley Rd Culvert

Labor	Rate	# Hours	Total (Rate x Hours)
Road Foreman	27.00	120.00	3,240.00
Laborer	25.00	120.00	3,000.00
Laborer	14.00	40.00	560.00
Labor Total			6,800.00

Equipment	Rate	# Hours	Total (Rate x Hours)
JCB 4CX Backhoe	43.75	40.00	1,750.00
Single Axle Dump Truck	42.25	75.00	3,168.75
1 Ton Dump Truck	35.88	30.00	1,076.40
Excavator Rental SK 150	2,500.00	3.00	7,500.00
Dresta Loader	40.00	10.00	400.00
2" Water Pumps	400.00	1.00	400.00
Compactor Rental	150.00	7.00	1,050.00
Equipment Total			15,345.15

Materials	Rate	Amount	Total (Rate x Hours)
30'X71"x47" Culvert Arched	12,000.00	1.00	12,000.00
Poured & Reinforced Wing Walls	8,000.00	2.00	16,000.00
Type 3&4 jRock	14.00	60.00	840.00
10" Angular Rock	12.50	200.00	2,500.00
Bank run gravel	8.50	60.00	510.00
3/4" crushed gravel	13.00	200.00	2,600.00
15" Plastic Culvert	10.00	60.00	600.00
Straw Matting	53.00	6.00	318.00
Grass Seed	60.00	2.00	120.00
Materials Total			35,488.00

Miscellaneous	Rate	Amount	Total (Rate x Hours)
Misc. Total			

Grant Total	57,633.15
Match	11,526.63



Vermont Better Roads Grant Program



River Management Engineer Support Letter

I am providing this letter of support to the Town/City/Village of MIDDLETOWN SPRINGS for their Better Roads grant application on HALEY ROAD, which will have an impact on TRIBUTARY TO TRAIN BROOK.

Mile Marker, Road Name/TH Number

Name of River/Stream

Stream Alteration Permit Required for this project: Yes No

Upon review of the site, I have determined that the proposed project is eligible for a Stream Alteration Permit. Additionally, if this project is constructed according to the recommendations described below (see Comments), the following stream equilibrium and connectivity benefits will be achieved:

- Restores or enhances floodplain/access to floodplain
- Restores or enhances natural channel dimensions
- Establishes tree/shrub buffer
- Restores habitat (including aquatic organism passage)
- No additional benefits
- Further restricts or impacts the stream

Thank you for your consideration,

Signature Joshua Carvajal, RME

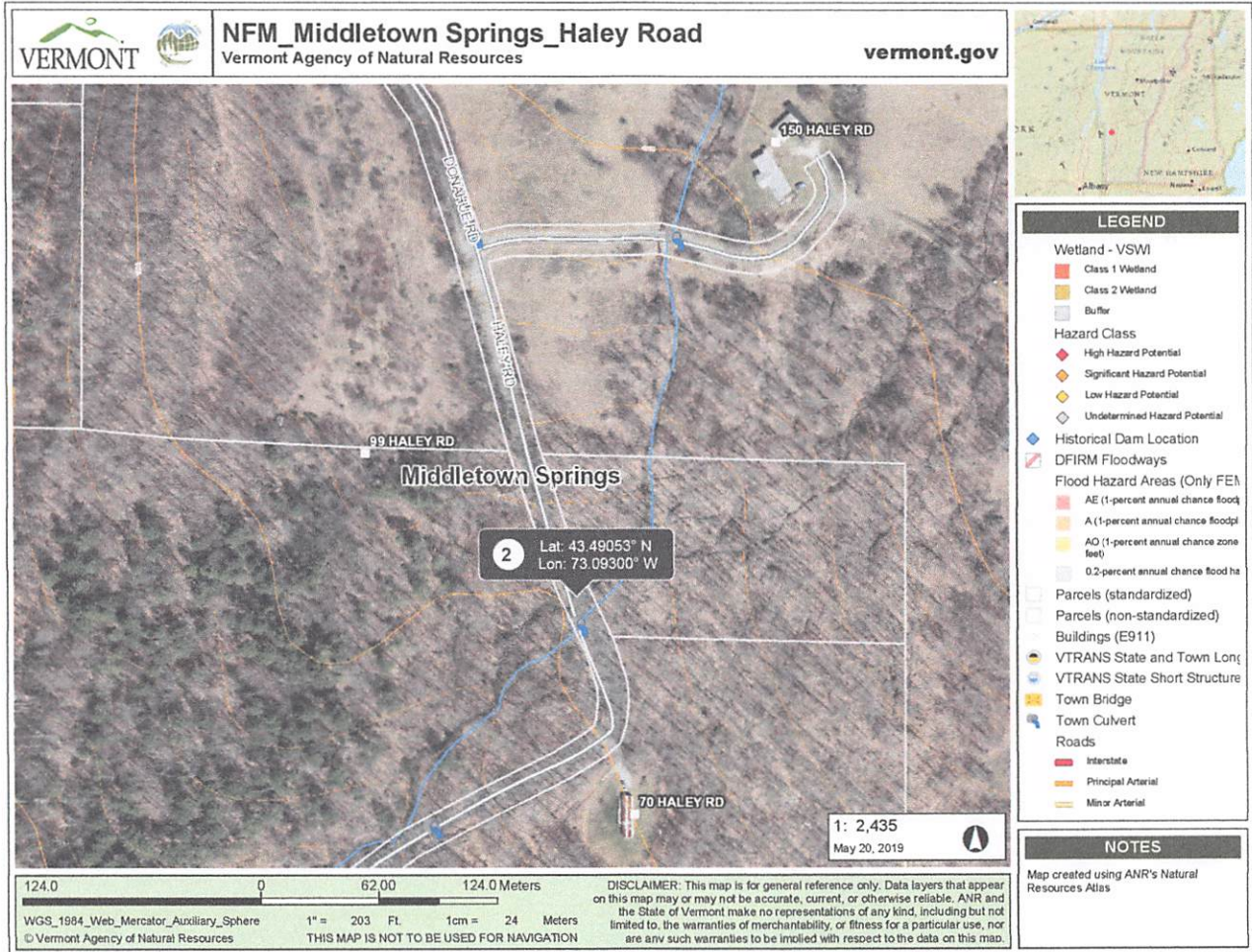
Comments:

Culvert was damaged during April 2019 flood event, sizing based on measured Bankfull Channel width and required minimum capacity for design flow rates.



_Culvert C...h CMP.pdf

79 KB



Area and Hydraulic Radius for Corrugated Steel Pipe Flowing Full

Round Pipe - Area & Hydraulic Radius		
Diameter Inches	Area Ft ²	Hydraulic Radius Feet
12	0.8	0.250
15	1.2	0.312
18	1.8	0.375
21	2.4	0.437
24	3.1	0.500
30	4.9	0.625
36	7.1	0.750
42	9.6	0.875
48	12.6	1.000
54	15.9	1.125
60	19.6	1.250
66	23.8	1.375
72	28.1	1.500
78	33.2	1.625
84	38.5	1.750
90	44.2	1.875
96	50.3	2.000
102	56.8	2.125
108	63.6	2.250
114	70.9	2.375
120	78.5	2.500
126	86.6	2.625
132	95.0	2.750
138	103.9	2.875
144	113.1	3.000

Pipe Arch - Area & Hydraulic Radius			
2 2/3" x 1/2" Corrugated Steel Pipe			
Diameter Inches	Pipe Arch Equivalent Size Inches	Waterway Area Ft ²	Hydraulic Radius A/πD Feet
15	17 x 13	1.1	0.280
18	21 x 15	1.6	0.340
21	24 x 18	2.2	0.400
24	28 x 20	2.4	0.462
30	35 x 24	4.5	0.573
36	42 x 29	6.5	0.690
42	49 x 33	8.9	0.810
48	57 x 38	11.6	0.924
54	64 x 43	14.7	1.040
60	71 x 47	18.1	1.153
66	77 x 52	21.9	1.268
72	83 x 57	26.0	1.380

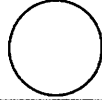
Pipe Arch - Area & Hydraulic Radius			
3" x 1" or 5" x 1" Corrugated Steel Pipe			
Diameter Inches	Pipe Arch Equivalent Size Inches	Waterway Area Ft ²	Hydraulic Radius A/πD Feet
54	60 x 46	15.6	1.104
60	66 x 51	19.3	1.230
66	73 x 55	23.2	1.343
72	81 x 59	27.4	1.454
78	87 x 63	32.1	1.573
84	95 x 67	37.0	1.683
90	103 x 71	42.4	1.800
96	112 x 75	48.0	1.911
102	117 x 79	54.2	2.031
108	128 x 83	60.5	2.141
114	137 x 87	67.4	2.259
120	142 x 91	74.5	2.373

ULTRA FLO' Pipe Arch - Area & Hydraulic Radius			
2 2/3" x 1/2" Corrugated Steel Pipe			
Diameter Inches	Pipe Arch Equivalent Size Inches	Waterway Area Ft ²	Hydraulic Radius A/πD Feet
18	20 x 16	1.7	0.36
21	23 x 19	2.3	0.42
24	27 x 21	3.0	0.48
30	33 x 26	4.7	0.60
36	40 x 31	6.7	0.71
42	46 x 36	9.2	0.84
48	53 x 41	12.1	0.96
54	60 x 46	15.6	1.10
60	66 x 51	19.3	1.23

Corrugated Steel Pipe

Heights of Cover

2 2/3" x 1/2" Height of Cover Limits for Corrugated Steel Pipe



H 20 and H 25 Live Loads

Diameter or Span, Inches	Minimum Cover, Inches	Maximum Cover, Feet ⁽²⁾					
		Specified Thickness, Inches					
		0.052	0.064	0.079	0.109	0.138	0.168
6 ¹⁰	12	388	486				
8 ¹⁰	12	291	365				
10 ¹⁰	12	233	392				
12	12	197	248	310			
15	12	158	198	248			
18	12	131	165	206			
21	12	113	141	177	248		
24	12	98	124	155	217		
30	12		99	124	173		
36	12		83	103	145	186	
42	12		71	88	124	159	195
48	12		62	77	108	139	171
54	12			67	94	122	150
60	12				80	104	128
66	12				68	88	109
72	12					75	93
78	12						79
84	12						66

H 20 and H 25 Live Loads, Pipe-Arch



Size		Minimum Structural Thickness, Inches	Minimum Cover, Inches	Maximum ⁽¹⁾ Cover, Feet	
Round Equivalent, Inches	Span x Rise, Inches			2 Tons/Ft. ² Corner Bearing Pressure	
	15	17 x 13	0.064	12	16
	18	21 x 15	0.064	12	15
	21	24 x 18	0.064	12	15
	24	28 x 20	0.064	12	15
	30	35 x 24	0.064	12	15
	36	42 x 29	0.064	12	15
	42	49 x 33	0.064*	12	15
	48	57 x 38	0.064*	12	15
	54	64 x 43	0.079*	12	15
	60	71 x 47	0.109*	12	15
	66	77 x 52	0.109*	12	15
	72	83 x 57	0.138*	12	15

E 80 Live Loads

Diameter or Span, Inches	Minimum Cover, Inches	Maximum Cover, Feet ⁽²⁾					
		Specified Thickness, Inches					
		0.052	0.064	0.079	0.109	0.138	0.168
12	12	197	248	310			
15	12	158	198	248			
18	12	131	165	206			
21	12	113	141	177	248		
24	12	98	124	155	217		
30	12		99	124	173		
36	12		83	103	145	186	
42	12		71	88	124	159	195
48	12		62	77	108	139	171
54	18			67	94	122	150
60	18				80	104	128
66	18				68	88	109
72	18					75	93
78	24						79
84	24						66

E 80 Live Loads, Pipe-Arch

Size		Minimum Structural Thickness, Inches	Minimum Cover, Inches	Maximum ⁽¹⁾ Cover, Feet	
Round Equivalent, Inches	Span x Rise, Inches			2 Tons/Ft. ² Corner Bearing Pressure	
	15	17 x 13	0.079	24	22
	18	21 x 15	0.079	24	22
	21	24 x 18	0.109	24	22
	24	28 x 20	0.109	24	22
	30	35 x 24	0.138	24	22
	36	42 x 29	0.138	24	22
	42	49 x 33	0.138*	24	22
	48	57 x 38	0.138*	24	22
	54	64 x 43	0.138*	24	22
	60	71 x 47	0.138*	24	22

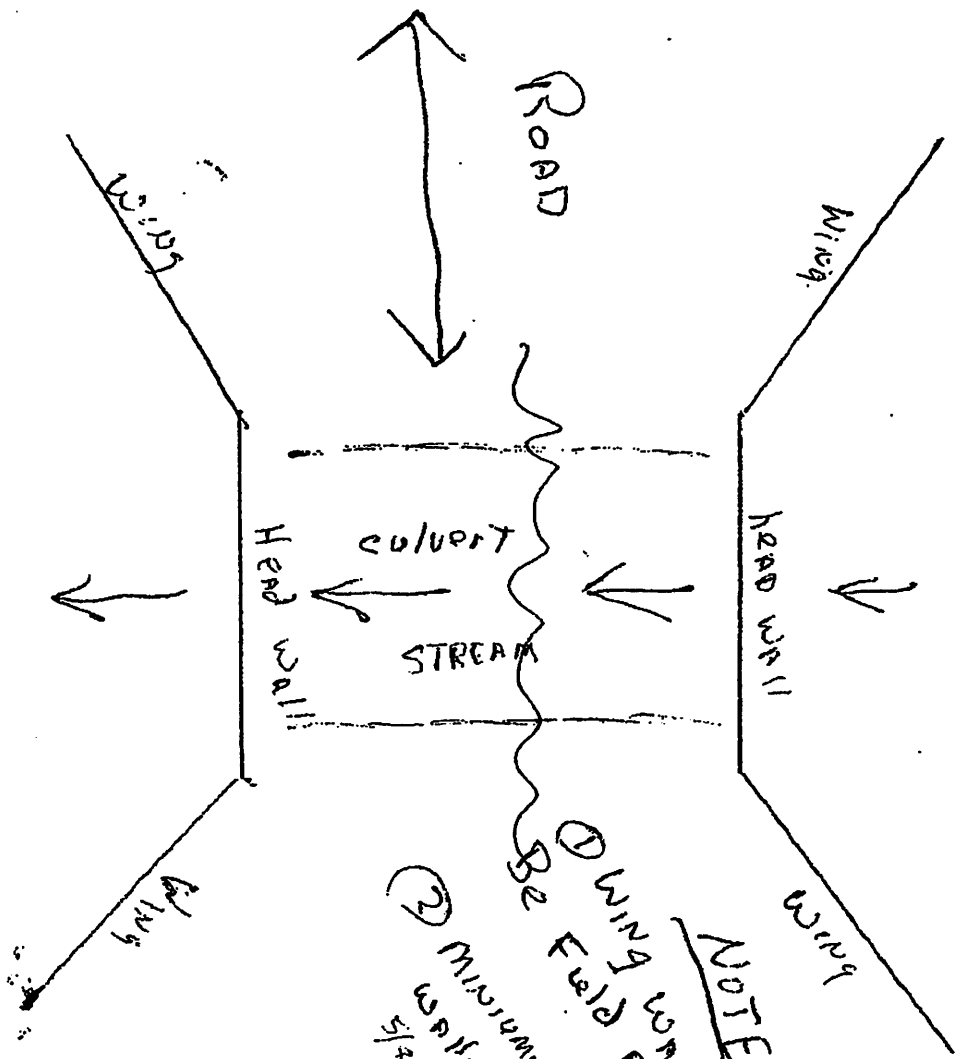
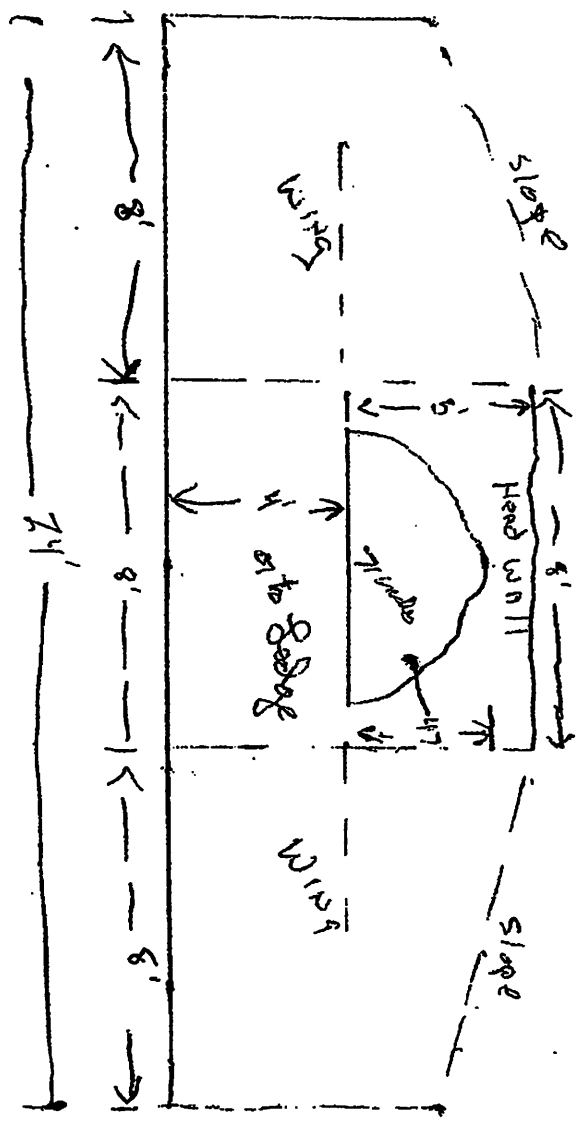
* These values are based on the AISI Flexibility Factor limit (0.0433 x 1.5) for pipe-arch.

Heights of Cover Notes:

1. These tables are for lock-seam or welded-seam construction. They are not for riveted construction. Consult your Contech Sales Representative for Height of Cover tables on riveted pipe.
2. These values, where applicable, were calculated using a load factor of $K=0.86$ as adopted in the NCSA CSP Design Manual, 2008.
3. The haunch areas of a pipe-arch are the most critical zone for backfilling. Extra care should be taken to provide good material and compaction to a point above the spring line.
4. E 80 minimum cover is measured from top of pipe to bottom of tie.
5. H 20 and H 25 minimum cover is measured from top of pipe to bottom of flexible pavement or top of rigid pavement.
6. The H 20 and H 25 pipe-arch tables are based on 2 tons per square foot corner bearing pressures.
7. The E 80 pipe-arch tables minimum and maximum covers are based on the corner bearing pressures shown. These values may increase or decrease with changes in allowable corner bearing pressures.

8. 0.052" is 18 gage.
0.064" is 16 gage.
0.079" is 14 gage.
0.109" is 12 gage.
0.138" is 10 gage.
0.168" is 8 gage.
9. For construction loads, see Page 15.
10. 1-1/2" x 1/4" corrugation. H20, H25 and E80 loading.
11. Smooth Cor™ has same Height of Cover properties as corrugated steel pipe. The exterior shell of Smooth Cor™ is manufactured in either 2 2/3" x 1 1/2" or 3" x 1" corrugations; maximum exterior shell gage is 12.
12. Sewer gage (trench conditions) tables for corrugated steel pipe can be found in the AISI book "Modern Sewer Design," 4th Edition, 1999. These tables may reduce the minimum gage due to a higher flexibility factor allowed for a trench condition.

Haley Road TH # 10



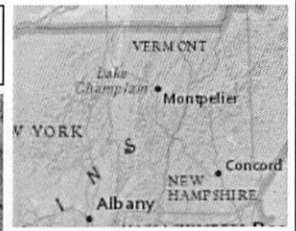
NOTE:
 ① Wing walls Angle to be Field Determined
 ② Minimum 12" wide walls arranged with 5/8" rebar



FY22 Better Roads - Middletown Springs

Vermont Agency of Natural Resources

vermont.gov



LEGEND

Road Erosion Scoring (MRGP):

- Fully Meets
- Partially Meets
- Does Not Meet
- Incomplete Data
- Not Connected

River Corridors (Aug 27, 2019):

- .5 - 2 sqmi.
- 2.5 - 5 sqmi.

River Corridor Easement

Parcels (standardized)

Parcels (non-standardized)

Roads

- Interstate
- Principal Arterial
- Minor Arterial
- Major Collector
- Minor Collector
- Local
- Not part of function Classification S

Waterbody

- Stream

Town Boundary

- Culvert to be replaced

1: 2,435
December 10, 2019

124.0 0 62.00 124.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 203 Ft 1cm = 24 Meters

© Vermont Agency of Natural Resources THIS MAP IS NOT TO BE USED FOR NAVIGATION

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. ANR and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.

NOTES

Haley Rd
RSID #107492
Culvert ID #167



RUTLAND REGIONAL PLANNING COMMISSION

December 13, 2023

**Mr. Alan May & Mr. Ross Gouin
Vermont Agency of Transportation
1 National Life Drive, Montpelier, VT 05633**

Dear Mr. May & Mr. Gouin,

The Rutland Regional Planning Commission (RRPC) is pleased to offer its support for the Town of Middletown Springs' Better Roads Category D Grant for culvert replacement and stone-lined ditching on Haley Rd.

The proposed work on Haley Rd will establish the appropriate drainage (stone-lined ditching) in compliance with MRGP. The work will upgrade one high priority segment to full MRGP compliance. In addition, the project will replace the temporary 24" culvert with a 5'x7' steel culvert with pour-in-place concrete wingwalls and headwalls. The culvert replacement is a vital need for Middletown Springs and to reduce erosion and sediment runoff into Train Brook. The culvert project will maximize resources by also upgrading the segment around the culvert. The proposed project is feasible and Middletown Springs has demonstrated proficiency with this type of culvert replacement which is evidenced by the Spruce Knob Rd culvert project. The proposed Haley Rd project will improve water quality directly reducing erosion and sediment runoff into Train Brook, which is a tributary of the Poultney River.

The RRPC fully supports the Town and strongly encourages VTtrans to fund the Haley Road Project. Thank you for the consideration and supporting our community partners.

Thank You,

A handwritten signature in black ink that reads "Ethan Pepin".

Ethan Pepin
Transportation Planner