

Town of Charleston

5063 Vt. Rte. 105
W Charleston VT 05872
Phone No: (802) 895-2814
Fax No: (802) 895-2814
charlestonadmin@comcast.net

April 12, 2016

Alan May
AOT Municipal Assistance Bureau
1 National Life Drive
Montpelier, VT 05633

Dear Alan:

The Town of Charleston appreciates the ongoing guidance and consultation of the various agencies collaborating in the Better Roads Grants program as we seek solutions to critical road erosion issues here in town. Please find attached the Town of Charleston's FY2017 applications to the Better Roads Grant Program.

For your reference, we are providing this list and brief comments about the relative priority of this year's proposed projects. All three roads have been identified on Charleston's Road Erosion Inventory & Capital Budget Plan, with Hudson Rd at the top of the list.

Hudson Rd Cement Culvert at Bowen Hill Road and Hudson Rd Multiple Culverts Upgrade are critical projects long overdue. Hudson is a key cross-town road with high traffic, and it has been the site of repeated closures due to washouts in recent federal disasters. As Hudson parallels the nearby Clyde River, erosion and culvert failure discharges sediment directly into the river. Both projects are included in a pending FEMA Hazard Mitigation Grant proposal first submitted in 2014, however, no award has been made and Charleston's eligibility is in question because the town does not participate in the NFIP. We have reason to believe that this will be resolved one way or the other before the award of Better Roads Grants, and we will update your office with any news. If Charleston is not awarded the FEMA grant, work must still proceed on Hudson Rd in 2016, and Better Roads funds will be essential.

East Echo Lake Rd Ditching and Crowning will remedy critical erosion issues at the site of the inlet leading from Seymour Lake to Echo Lake that compromise the road and discharge sediment and pollutants into Echo Lake. Working with the Echo Lake Protective Association, VT ANR, and Better Roads staff, this project is deemed high priority for 2016 with project outcomes expected to be highly effective.

Gratton Hill Rd Ditching and Culvert Upgrades Sites 1-3 (3 projects) cover a sizable segment of road that could be addressed one-by-one if needed. Ideally, completing all three projects in one year would enable the town to start at the top of the grade and also address critical ditch failures and bank erosion at the bottom of the road where ditches

feed into a brook leading directly to the Clyde River below. If the projects are not selected, Charleston will make spot repairs and reapply for assistance in FY2018.

Thank you for your time and consideration. Please don't hesitate to contact me or Colleen Kellogg in the Town Office if you have any questions or need additional information.

Sincerely,

A handwritten signature in cursive script that reads "Dean Bennett". The signature is written in black ink and is positioned above the typed name.

Dean Bennett, Chair
Charleston Selectboard



FY17 Vermont Better Roads Grant Application

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

Town/Organization: _____ Contact Person(s): _____

Address: _____

Street Address

Town

Zip

Email: _____ Phone: () _____ - _____

DUNS #: _____ Fiscal Year End Month (MM): _____

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



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: _____

Project Name: _____

Road Name: _____ 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: _____

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

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):

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



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:

Is there an emergency reason this project must be completed quickly? If yes, please explain:

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.):

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).



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

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

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

Estimated Total Project Cost (including 20% local match): _____

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: _____ Dean Bennett _____ Title: _____ Selectboard Chair _____

FROM: TOWN OF CHARLESTON ROAD INVENTORY 5/29/2014

Town of Charleston - Road Erosion Site Inventory May 2014

Site#3-Hudson Road- Center School Rd to Twin Bridge Rd

Priority:	#3-2016
Road Name:	Hudson Rd
TH#:	#1
Location:	From Center School Rd (east) to 1000 ft. past Twin Bridge Rd
Nearest Water Body:	The Clyde River is the nearest body of water. It still has an intact flood plan with minimal intrusion from structures.
Distance to Water Body:	Approximately 2000 ft depending on river's twists and turns.
Current Condition:	This section of the Hudson Rd has been repeatedly washed out, in the last 4 years in particular. This is due to significant logging of the ridge above the road and to the increase of heavy runoff events. The road also has the heaviest traffic in town, over 850 per day on weekdays much of it heavy trucks. The road has an insufficient gravel base and surface coat that cannot stand this degree of wear requiring an extreme amount of maintenance during mud season and when saturated from summer rain. Culvert are too small to take the heavy runoff and need to be oversized in this section with riprap headers and splash pools. Ditches cleaned and lined with matting and seeded.
Proposed Solution:	Replace culverts at the Bowen Hill , at Letorneau's, and Twin Bridge Rd with 30" or larger with rip rap and splash pools. Place and compact 12" of base run gravel in two lifts from the intersection of Center School Rd and the Hudson Rd east to 1000ft. past the intersection of Twin Bridge Rd and the Hudson Rd. Place and compact in two lifts 12" of 3/4" crusher run gravel on the same section.

Estimated Costs to Improve/ Repair

Culvert ,Ditch and Bank Stabilization		
Materials:	1-36" x 40' smooth HDP culvert w/headwall and splash pool	Cost: \$27,400.00
Materials:	1 -30" x 40' smooth HDP culvert w/riprap headwall & splash pool	Cost: \$3,800.00
Materials:	2 -18" x 20' smooth HDP culverts	Cost: \$1,216.00
Materials:	1 -24" x 40' smooth HDP culvert w/riprap headwall & splash pool	Cost: \$1,820.00
Materials	3060' ditching, matting and seeding	Cost: \$10,000.00

Machinery:	Excavator costs included in culvert estimates	Cost:	\$0.00
Machinery:	Grader (local match)	Cost:	\$0.00
Machinery:	Town trucks, loaders (local match)	Cost:	0
Labor:	Included in equipment rental or town employees (local match)	Cost:	0
Total Culvert, Ditching and Bank Stabilization Costs:			\$44,236.00
Crowning and Re-grading Roads			
Materials:	7928 cubic yards of bank run gravel in place on rd @\$21.45	Cost:	\$170,055.00
Materials:	7267 cubic yards of 3/4" crusher run gravel in place @\$21.45	Cost:	\$155,884.30
Machinery:	4 Ten wheeler trucks @\$80.00/hr 448 hours	Cost:	\$35,904.00
Machinery:	Vibrating roller @ \$375.00/day 3 days	Cost:	\$1,125.00
Machinery:	Grader (local match)	Cost:	0
Labor:	Flagger @\$200.00/day 14 days	Cost:	\$2,240.00
Total Crowning and Re-grading Roads			\$335,208.00
			0
Total Estimate for this project:			\$379,444.00
			0

PA-01-VT-1995-PW-00394(0) P	
Applicant Name:	Application Title:
CHARLESTON (TOWN OF)	bcorlcha c hudson rd
Period of Performance Start:	Period of Performance End:
06-15-2011	12-15-2012

Subgrant Application - Entire Application

Application Title: bcorlcha c hudson rd
Application Number: PA-01-VT-1995-PW-00394(0)
Application Type: Subgrant Application (PW)

Preparer Information	
Prefix	
First Name	WILLIAM
Middle Initial	
Last Name	CHASE
Title	Project Specialist
Agency/Organization Name	FEMA
Address 1	128 Lakeside Ave
Address 2	
City	Burlington
State	VT
Zip	05401
Email	gary.schelley@state.vt.us
Is the application preparer the Point of Contact? No	

Point of Contact Information	
Prefix	
First Name	Tom
Middle Initial	
Last Name	Jensen
Title	Selectboard Chair
Agency/Organization	Town of Charleston
Address 1	5063 VT Rte. 105
Address 2	
City	Charleston
State	VT

ZIP	05872
Phone	802-895-2814
Fax	802-895-2814
Email	jensentom5@aol.com

Alternate Point of Contact Information	
Prefix	
First Name	Colleen
Middle Initial	
Last Name	Kellogg
Title	Asst. Town Clerk and Treasurer
Agency/Organization	
Address 1	
Address 2	
City	
State	
ZIP	
Phone	
Fax	
Email	townofcharlestonvt@comcast.net

Project Description	
Disaster Number:	1995
Pre-Application Number:	PA-01-VT-1995-RPA-0066
Applicant ID:	019-13150-00
Applicant Name:	CHARLESTON (TOWN OF)
Subdivision:	
Project Number:	
Standard Project Number/Title:	305 - Road and Culvert Washout
Please Indicate the Project Type:	Neither Alternate nor Improved
Application Title:	bcorlcha c hudson rd
Category:	C.ROADS & BRIDGES
Percentage Work Completed?	80.0 %
As of Date:	07-15-2011
Comments	
Attachments	

Damage Facilities (Part 1 of 2)								
Facility Number	Facility Name	Address	County	City	State	ZIP	Site Previously Damaged?	Action

1	Hudson Rd		Orleans		VT		No
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Comments

Attachments

User	Date	Document Type	Description	Hard Copy File Reference	File Name	Action
WILLIAM CHASE	10-01-2011	Photos	photos	with PW	Char Photos Hudson Rd.pdf(1.77 Mb)	View
WILLIAM CHASE	10-01-2011	Photos	Photo of destroyed culvert	with PW	Char Culvert to be replaced.JPG(48.90 kb)	View
WILLIAM CHASE	10-03-2011	Map	Map	with PW	Map Char Hudson Rd.docx (52.42 kb)	View

Facility Name:	Hudson Rd
Address 1:	
Address 2:	
County:	Orleans
City:	
State:	VT
ZIP:	
Was this site previously damaged?	No
Location:	The damage on the Hudson Rd starts at the intersection with Center School Rd and continues SE for 2.3 miles.
Damage Description and Dimensions:	Due to the severe storms and flooding during the declared incident, April 23 to May 9, flood waters washed out road surface, base, and shoulders on 5 Sites. The road was washed out over the top of the road surface and along the ditches cutting into the road shoulders and base. Material was deposited in the roadway as well as being washed onto private property and into ditches. 4 culverts total were destroyed. Site 1: 2120' x various widths of 2' to 22' and various depths of 3" to 5'. Also on Site 1, two culverts were destroyed. Culvert A was an 18"x 32"CMP and Culvert B was a 24"x 40 CMP. Site 2: Culvert C was an 18"x 40' CMP that was washed out and destroyed including washed out road and embankment material for 24'x various widths of 4' to 8' x various depths of 3' to 4'. Site 3: Road material washed out for 900'x various widths of 2' to 6' and various depths of 3" to 2' Site 4: Road material washed out for 495'x various widths of 6' to 22' and various depths of 3" to 1' Site 5: Road material washed out for 1970'x various widths of 2' to 22' and various depths of 3" to 2'. On this site, Culvert D, a 42"x 36' CMP was destroyed. The GPS for the sites are the start and the damage distance is toward the SE. Ditches were filled for 2350'.

Scope of Work:

To return the facility to predisaster condition, WORK COMPLETE: The Applicant utilized Force Account Labor, Equipment, and Material plus Contract Services. Site 1: They utilized on site washed out material plus they placed, compacted and graded: 114 CY of new bank run and screened bank run gravel; 32 CY of 3/4" stone; 8 CY of large ledge and 190 CY of crusher run surface gravel. Ditches were cleaned and shaped for 895'. Two culverts were replaced with new of the same size and material: Culvert A 18"x 32' CMP, Culvert B 24"x 40' CMP Site 2: They placed 10 CY of new bank run and 1 CY of new surface material plus they installed Culvert C an 18'x 40' CMP. Site 3: They placed 48 CY of new bank run and 80 CY of new surface material. Ditches were cleaned for 450'. Site 4: They placed 30 CY of new bank run and 50 CY of new surface material. Site 5: They placed 108 CY of new bank run and 180 CY of new surface material. Ditches were cleaned for 1005'

WORK TO BE COMPLETED: The Applicant will place and grade 1580'x 4'x 3" of bank run gravel on the road bed and 1580'x 6'x 6" on the embankment at Site 4 = 235 CY bank run. They will then place and grade 1580'x 4'x 3" = 59 CY of surface aggregate to return the road to original profile. A 42"x 36' CMP will be installed on site 5.

The subgrantee is requesting direct administrative costs that are directly chargeable to this specific project. Associated eligible work is related to administration of this specific PA project only and in accordance with 44 CFR 13.22. These costs are treated consistently and uniformly as direct costs in all Federal awards and other subgrantee activities and are not included in any approved indirect cost rates.

Backup Documentation reviewed and is on file at Applicant's office. For auditing purposes, Applicant must retain records for a period of 3 years from the date of receipt of final payment.

See Hazard Mitigation Proposal

In the case of a change in the scope of work and/or a cost overrun, the applicant should immediately notify the state PA Officer, Gary Schelley 802-828-0425.

Federal funding is contingent upon the Applicant acquiring all necessary federal, state and local permits. Noncompliance with this requirement may jeopardize the receipt of federal funds.

GIS Coordinates

Project Location	Latitude	Longitude
Site 1 start	44.83833	-72.02384
Site 1 Culvert A	44.8371	-72.018
Site 1 Culvert B	44.83692	-72.01727.
Site 2 Culvert C	44.83344	-72.00618
Site 3 start	44.83813	-72.0037
Site 4 start	44.82653	-71.99489
Site 5 start	44.82425	-71.99089
Site 5 Culvert D	44.82379	-71.964

Special Considerations

1. Does the damaged facility or item of work have insurance coverage and/or is it an insurable risk (e.g., buildings, equipment, vehicles, etc)?	No
2. Is the damaged facility located within a floodplain or coastal high hazard area and/or does it have an impact on a floodplain or wetland?	Yes

If you would like to make any comments, please enter them below.
 (maximum 4000 characters)
 Flood Map 500083A dated 11/19/1976 See attached FIRMette.

3. Is the damaged facility or item of work located within or adjacent to a Coastal Barrier Resource System Unit or an Otherwise Protected Area?	No
4. Will the proposed facility repairs/reconstruction change the pre-disaster conditions (e.g., footprint, material, location, capacity, use of function)?	No
5. Does the applicant have a hazard mitigation proposal or would the applicant like technical assistance for a hazard mitigation proposal?	Yes

If you would like to make any comments, please enter them below.
 (maximum 4000 characters)
 See Hazard Mitigation proposal

6. Is the damaged facility on the National Register of Historic Places or the state historic listing? Is it older than 50 years? Are there more, similar buildings near the site?	No
7. Are there any pristine or undisturbed areas on, or near, the project site? Are there large tracts of forestland?	No
8. Are there any hazardous materials at or adjacent to the damaged facility and/or item of work?	No
9. Are there any other environmental or controversial issues associated with the damaged facility and/or item of work?	No

Attachments

User	Date	Document Type	Description	Hard Copy File Reference	File Name	Action
WILLIAM CHASE	10-01-2011	Floodplain	FIRMette	with PW	Char FIRMette Hudson Rd 1.pdf(207.95 kb)	View

For Category C, D, E, F, and G Projects only

Is effective mitigation feasible on this project?	Yes
If you answered Yes to the above question, the next question is required	
Will mitigation be performed on any sites in this project?	Yes
If you answered Yes to the above question, the next question is required	
Do you wish to attach a Hazard Mitigation Proposal?	Yes
If you answered Yes to the above question, the next two questions are required	
Please provide the Scope of Work for the estimate:	Place rip rap and fabric at the inlet and outlet of the 3 culverts already replaced and the 1 to be replaced. 3 @ 10'x 5'x 1.5' (times 2 ends) = 17 CY of rip rap and 50 SY of fabric plus 1 at 10'x 10'x 1.5', at the 42" culvert to be replaced, = 12 CY rip rap and 34 SY of fabric. Total =29 CY rip rap and 84 SY fabric.
Would you like to add the Hazard Mitigation Proposal as a cost line item to the project cost?	Yes
Comments	
Attachments	

Cost Estimate

Is this Project Worksheet for

(Preferred) Repair									
Sequence	Code	Material and/or Description	Unit Quantity	Unit of Measure	Unit Price	Subgrant Budget Class	Cost Estimate	Action	
1	0000	***** WORK COMPLETED *****							
2	9007	LABOR	1	LS	\$ 3,839.18	PERSONNEL	\$ 3,839.18		
3	9008	EQUIPMENT	1	LS	\$ 9,518.50	EQUIPMENT	\$ 9,518.50		
4	9009	MATERIAL	1	LS	\$ 8,059.20	CONSTRUCTION	\$ 8,059.20		
5	9003	CONTRACT COSTS	1	LS	\$ 13,224.45	CONTRACTUAL	\$ 13,224.45		
6	9901	DIRECT ADMINISTRATIVE COSTS (SUBGRANTEE)	1	LS	\$ 127.82	PERSONNEL	\$ 127.82		
7	0000	***** WORK TO BE COMPLETED *****							
8	3011	AGGREGATE SURFACE COURSE	59	CY	\$ 31.00	CONSTRUCTION	\$ 1,829.00		
9	3357	CMP 42" (FURNISH AND INSTALL)	36	LF	\$ 100.00	CONSTRUCTION	\$ 3,600.00		
10	3021	PIT RUN GRAVEL	235	CY	\$ 14.50	CONSTRUCTION	\$ 3,407.50		
							Total Cost: \$ 43,605.65		

Insurance Adjustments (Deductibles, Proceeds and Settlements)								
Sequence	Code	Material and/or Description	Unit Quantity	Unit of Measure	Unit Price	Subgrant Budget Class	Cost Estimate	Action
							Total Cost: \$ 0.00	

Hazard Mitigation Proposal - 0909								
Sequence	Code	Material and/or Description	Unit Quantity	Unit of Measure	Unit Price	Subgrant Budget Class	Cost Estimate	Action
1	4081	SLOPE PROTECTION (PLACED)	29	CY	\$ 45.00	SUPPLIES	\$ 1,305.00	
2	4130	RIP RAP FABRIC FOR UNDER	84	SY	\$ 3.28	SUPPLIES	\$ 275.52	
							Total Cost: \$ 1,580.52	

Total Cost Estimate:							\$ 45,186.17	
(Preferred Estimate Type + Insurance Adjustments + Hazard Mitigation Proposal)								

Comments
 Contractor Del Green bills his time as a contractor when he operates the Town Grader. The Town captured Labor time by taking the total cost per week including overtime and averaging the cost per hour by week. Hence, the Town Labor summary is used instead of the FEMA Labor Summary Form

Attachments						
User	Date	Document Type	Description	Hard Copy File Reference	File Name	Action
WILLIAM CHASE	10-01-2011	Force Account	Labor	with PW	Char FA Labor Hudson Rd.pdf(1.10 Mb)	View
WILLIAM CHASE	10-01-2011	Force Account	FA Equipment 1 of 2	with PW	Char FA Equip 1 of 2 Hudson.pdf(14.10 kb)	View
WILLIAM	10-01-		FA Equipment 2		Char FA Equip 2 of 2	

CHASE	2011	Force Account	of 2	with PW	Hudson.pdf(14.10 kb)	View
WILLIAM CHASE	10-01-2011	Force Account	FA Material	with PW	Char FA Materials Hudson.pdf(23.57 kb)	View
WILLIAM CHASE	10-01-2011	Additional Information	Contractor Summary	with PW	Char Contractor Summary Hudson.pdf (10.83 kb)	View
WILLIAM CHASE	10-01-2011	Additional Information	Town Cost Summary	with PW	Town Cost Summary Hudson.pdf(1.33 Mb)	View
WILLIAM CHASE	10-01-2011	Additional Information	Contractor and material backup	with PW	Material and Contractor backup.pdf (1.34 Mb)	View
WILLIAM CHASE	10-01-2011	Additional Information	Admin Cost	with PW	Char Admin Hudson Rd.xlsm(4.44 Mb)	View

Existing Insurance Information						
Insurance Type	Policy No.	Bldg/Property Amount	Content Amount	Insurance Amount	Deductible Amount	Years Required
Comments						
Attachments						

Comments and Attachments		
Name of Section	Comment	Attachment
Damage Facilities		Char Photos Hudson Rd.pdf Char Culvert to be replaced.JPG Map Char Hudson Rd.docx
Special Considerations		Char FIRMette Hudson Rd 1.pdf
Cost Estimate	<p>Contractor Del Green bills his time as a contractor when he operates the Town Grader. The Town captured Labor time by taking the total cost per week including overtime and averaging the cost per hour by week. Hence, the Town Labor summary is used instead of the FEMA Labor Summary Form</p>	Char FA Labor Hudson Rd.pdf Char FA Equip 1 of 2 Hudson.pdf Char FA Equip 2 of 2 Hudson.pdf Char FA Materials Hudson.pdf Char Contractor Summary Hudson.pdf Town Cost Summary Hudson.pdf Material and Contractor backup.pdf Char Admin Hudson Rd.xlsm

Bundle Reference # (Amendment #)	Date Awarded

Subgrant Application - FEMA Form 90-91

Note: The Effective Cost Share for this application is 75%

FEDERAL EMERGENCY MANAGEMENT AGENCY PROJECT WORKSHEET					
DISASTER		PROJECT NO.	PA ID NO. 019-13150-00	DATE 10-03-2011	CATEGORY C
FEMA	1995 - DR - VT				
APPLICANT: CHARLESTON (TOWN OF)				WORK COMPLETE AS OF: 07-15-2011 : 80 %	
Site 1 of 1					
DAMAGED FACILITY: Hudson Rd				COUNTY: Orleans	
LOCATION: Current Version: The damage on the Hudson Rd starts at the intersection with Center School Rd and continues SE for 2.3 miles.				LATITUDE:	LONGITUDE:
				44.8371	-72.018
				44.82653	-71.99489
				44.83813	-72.0037
				44.82379	-71.964
				44.83833	-72.02384
				44.83692	-72.01727
				44.83344	-72.00618
				44.82425	-71.99089
DAMAGE DESCRIPTION AND DIMENSIONS: Current Version: Due to the severe storms and flooding during the declared incident, April 23 to May 9, flood waters washed out road surface, base, and shoulders on 5 Sites. The road was washed out over the top of the road surface and along the ditches cutting into the road shoulders and base. Material was deposited in the roadway as well as being washed onto private property and into ditches. 4 culverts total were destroyed. Site 1: 2120' x various widths of 2' to 22' and various depths of 3" to 5'. Also on Site 1, two culverts were destroyed. Culvert A was an 18"x 32" CMP and Culvert B was a 24"x 40" CMP. Site 2: Culvert C was an 18"x 40" CMP that was washed out and destroyed including washed out road and embankment material for 24' x various widths of 4' to 8' x various depths of 3' to 4'. Site 3: Road material washed out for 900' x various widths of 2' to 6' and various depths of 3" to 2' Site 4: Road material washed out for 495' x various widths of 6' to 22' and various depths of 3" to 1' Site 5: Road material washed out for 1970' x various widths of 2' to 22' and various depths of 3" to 2'. On this site, Culvert D, a 42"x 36" CMP was destroyed. The GPS for the sites are the start and the damage distance is toward the SE. Ditches were filled for 2350'.					
SCOPE OF WORK: Current Version: To return the facility to predisaster condition, WORK COMPLETE: The Applicant utilized Force Account Labor, Equipment, and Material plus Contract Services. Site 1: They utilized on site washed out material plus they placed, compacted and graded: 114 CY of new bank run and screened bank run gravel; 32 CY of 3/4" stone; 8 CY of large ledge and 190 CY of crusher run surface gravel. Ditches were cleaned and shaped for 895'. Two culverts were replaced with new of the same size and material: Culvert A 18"x 32" CMP, Culvert B 24"x 40" CMP Site 2: They placed 10 CY of new bank run and 1 CY of new surface material plus they installed Culvert C an 18' x 40' CMP. Site 3: They placed 48 CY of new bank run and 80 CY of new surface material. Ditches were cleaned for 450'. Site 4: They placed 30 CY of new bank run and 50 CY of new surface material. Site 5: They placed 108 CY of new bank run and 180 CY of new surface material. Ditches were cleaned for 1005' WORK TO BE COMPLETED: The Applicant will place and grade 1580' x 4' x 3" of bank run gravel on the road bed and 1580' x 6' x 6" on the embankment at Site 4 = 235 CY bank run. They will then place and grade 1580' x 4' x 3" = 59 CY of surface aggregate to return the road to original profile. A 42"x 36" CMP will be installed on site 5. The subgrantee is requesting direct administrative costs that are directly chargeable to this specific project. Associated eligible work is related to administration of this specific PA project only and in accordance with 44 CFR 13.22. These costs are treated consistently and uniformly as direct costs in all Federal awards and other subgrantee activities and are not included in any approved indirect cost rates. Backup Documentation reviewed and is on file at Applicant's office. For auditing purposes, Applicant must retain records for a period of 3 years from the date of receipt of final payment. See Hazard Mitigation Proposal in the case of a change in the scope of work and/or a cost overrun, the applicant should immediately notify the state PA Officer, Gary Schelley 802-828-0425. Federal funding is contingent upon the Applicant acquiring all necessary federal, state and local permits. Noncompliance with this requirement may jeopardize the receipt of federal funds.					
Does the Scope of Work change the pre-disaster conditions at the site?		Special Considerations included? Yes No			
Yes No					

Hazard Mitigation proposal included? Yes No		Is there insurance coverage on this facility? Yes No			
PROJECT COST					
ITEM	CODE	NARRATIVE	QUANTITY/UNIT	UNIT PRICE	COST
1	0000	*****WORK COMPLETED*****	0/LS	\$ 0.00	\$ 0.00
2	9007	LABOR	1/LS	\$ 3,839.18	\$ 3,839.18
3	9008	EQUIPMENT	1/LS	\$ 9,518.50	\$ 9,518.50
4	9009	MATERIAL	1/LS	\$ 8,059.20	\$ 8,059.20
5	9003	CONTRACT COSTS	1/LS	\$ 13,224.45	\$ 13,224.45
6	9901	DIRECT ADMINISTRATIVE COSTS (SUBGRANTEE)	1/LS	\$ 127.82	\$ 127.82
7	0000	*****WORK TO BE COMPLETED*****	0/LS	\$ 0.00	\$ 0.00
8	3011	AGGREGATE SURFACE COURSE	59/CY	\$ 31.00	\$ 1,829.00
9	3357	CMP 42" (FURNISH AND INSTALL)	36/LF	\$ 100.00	\$ 3,600.00
10	3021	PIT RUN GRAVEL	235/CY	\$ 14.50	\$ 3,407.50
11	0909	Hazard Mitigation Proposal	1/LS	\$ 1,580.52	\$ 1,580.52
				TOTAL COST	\$ 45,186.17
PREPARED BY WILLIAM CHASE		TITLE Project Specialist		SIGNATURE	
APPLICANT REP. Tom Jensen		TITLE Selectboard Chair		SIGNATURE	

CHARLESTON (TOWN OF) : PA-01-VT-1995-PW-00394

Conditions Information

Review Name	Condition Type	Condition Name	Description	Monitored	Status
Final Review	Other (EHP)	Standard Condition #2	This review does not address all federal, state and local requirements. Acceptance of federal funding requires recipient to comply with all federal, state and local laws. Failure to obtain all appropriate federal, state and local environmental permits and clearances may jeopardize federal funding.	No	Approved
Final Review	Other (EHP)	Standard Condition #1	Any change to the approved scope of work will require re-evaluation for compliance with NEPA and other Laws and Executive Orders.	No	Approved
Final Review	Other (EHP)	Standard Condition #3	If ground disturbing activities occur during construction, applicant will monitor ground disturbance and if any potential archeological resources are discovered, will immediately cease construction in that area and notify the State and FEMA.	No	Approved

EHP Review	Other (EHP)	Standard Condition #2	This review does not address all federal, state and local requirements. Acceptance of federal funding requires recipient to comply with all federal, state and local laws. Failure to obtain all appropriate federal, state and local environmental permits and clearances may jeopardize federal funding.	No	Recommended
EHP Review	Other (EHP)	Standard Condition #1	Any change to the approved scope of work will require re-evaluation for compliance with NEPA and other Laws and Executive Orders.	No	Recommended
EHP Review	Other (EHP)	Standard Condition #3	If ground disturbing activities occur during construction, applicant will monitor ground disturbance and if any potential archeological resources are discovered, will immediately cease construction in that area and notify the State and FEMA.	No	Recommended

Internal Comments

No.	Queue	User	Date/Time	Reviewer Comments
3	<u>Final Review</u>	MINNS BRIAN	10-07-2011 03:39 PM GMT	10/07/2011 The Hazard Mitigation Proposal included in this project is cost effective and technically feasible. The HMP is approved and the project cost has been increased by \$1580.44 Brian Minns, PAC
2	EHP Review	THOMAS PETER	10-07-2011 01:13 PM GMT	<p>Due to the severe storms and flooding during the declared incident, April 23 to May 9, flood waters washed out road surface, base, and shoulders on 5 Sites. The road was washed out over the top of the road surface and along the ditches cutting into the road shoulders and base. Material was deposited in the roadway as well as being washed onto private property and into ditches. 4 culverts total were destroyed. Site 1: 2120' x various widths of 2' to 22' and various depths of 3" to 5'. Also on Site 1, two culverts were destroyed. Culvert A was an 18"x 32' CMP and Culvert B was a 24"x 40' CMP. Site 2: Culvert C was an 18"x 40' CMP that was washed out and destroyed including washed out road and embankment material for 24'x various widths of 4' to 8' x various depths of 3' to 4'. Site 3: Road material washed out for 900'x various widths of 2' to 6' and various depths of 3" to 2' Site 4: Road material washed out for 495'x various widths of 6' to 22' and various depths of 3" to 1' Site 5: Road material washed out for 1970'x various widths of 2' to 22' and various depths of 3" to 2'. On this site, Culvert D, a 42"x 36' CMP was destroyed. The GPS for the sites are the start and the damage distance is toward the SE. Ditches were filled for 2350'. - wkennedy - 10/04/2011 18:16:32 GMT</p> <p>This project has been determined to be Statutorily Excluded from Environmental review in accordance with 44 CFR Part 10.8 (c). Particular attention should be given to the project conditions before and during project implementation. Failure to comply with these conditions may jeopardize federal assistance including funding. - wkennedy - 10/04/2011 18:51:56 GMT</p> <p>Town of Charleston Hudson Rd. (Locus: 44.83833 -72.02384 to 44.82379 -71.964). - wkennedy - 10/05/2011 14:34:24 GMT Per National Wetlands Inventory mapper or Vermont Agency</p>

of Natural Resources- Natural Resource Atlas, this project is not located in a wetland and will not affect wetland values or functions. - wkennedy - 10/04/2011 18:49:11 GMT
 Per VT Agency of Natural Resources' Natural Resource Atlas, there are no Federal or State threatened or endangered species located within or near this project area. - wkennedy - 10/04/2011 18:21:43 GMT
 Per VT Agency of Natural Resources' Natural Resource Atlas, there are no Federal or State threatened or endangered species located within or near this project area. - wkennedy - 10/04/2011 18:20:05 GMT
 Please provide road names, town and GPS references in scope of work
 Per Flood Insurance Rate Map (FIRM) community map and panel number 500083A dated 11/19/1976 ; the project is located outside the Special Flood Hazard Areas (SFHA) (100-year floodplain). - wkennedy - 10/04/2011 18:25:15 GMT
 A determination of No Historic Properties Affected is made under the terms of the Vermont Programmatic Agreement (2011), Appendix C, Section III, A & B.No consultation with SHPO is required. - wkennedy - 10/04/2011 18:18:43 GMT
 The following replaces the above reference.

A determination of No Historic Properties Affected is made under the terms of the Vermont Programmatic Agreement (2011), Appendix C, Section III, subsections A through G. .No consultation with SHPO is required. - wkennedy - 10/05/2011 15:07:26 GMT
 please add other allowances for culverts, etc based on scope of work

10/04/11 - THE PROPOSED MITIGATION IS TECHNICALLY FEASIBLE AND CONSIDERED COST EFFECTIVE UNDER RR POLICY 9526.1/APPENDIX A/15% RULE. GEORGE BROSKY, MITIGATION SPECIALIST

1	<u>Mitigation Review</u>	BROSKY JR GEORGE	10-04-2011 02:43 PM GMT
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Go Back

VT AGENCY OF TRANSPORTATION PROGRAM DEVELOPMENT DIVISION
HYDRAULICS UNIT

TO: Christine Emmons, District Technician, District 9
FROM: Leslie Russell, P.E., Hydraulics Project Engineer
DATE: 12 October 2011
SUBJECT: Charleston TH 30 - ~0.7 miles from TH 1
BOWEN HILL

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

Hydrology

This site has a hilly drainage basin. It is mostly open land cover. The total contributing drainage area is about 6 acres. There is an overall length of 950 feet from the divide to the site, with a 170 foot drop in elevation, giving an average overall channel slope of 17.7 %. Using several hydrologic methods, we came up with the following design flow rates:

<u>Recurrence Interval in Years</u>	<u>Flow Rate in Cubic Feet per Second (CFS)</u>
Q2.33	7
Q10	11
Q25	13 - Town Highway Design Flow
Q50	15
Q100	17 - Check flow

Existing Conditions

We did not make a site visit. The existing structure was reportedly a 12" pipe that provides a waterway opening of 0.8 sq. ft. Since we did not make a site visit, we have no other information on the site.

Our calculations show the 12" pipe was not adequate hydraulically. Headwater to depth ratios are not within the allowable values.

Recommendations

In sizing a new structure we normally attempt to select structures that meet the hydraulic standards, fit the natural channel width, the roadway grade and other site conditions. Since we did not make a site visit, we do not know what size structure will fit the channel width or the roadway grade. We were told that a 24" pipe was installed at this site. The 24" pipe works hydraulically and also works based on calculated channel width. This pipe provides 3.1 sq. ft. of waterway area and results in a headwater depth at Q25 = 2.2' and at Q100 = 2.9'.

General comments

We recommend a minimum cover of 3' over all pipe structures. Pipe manufactures 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.

Stone Fill, appropriately sized for this site, 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.

The Agency of Natural Resources (ANR), Corps of Engineers, or other permitting agency may have additional concerns regarding replacement of this structure, or any channel work. The River Management Engineer should be contacted with respect to those concerns, before a replacement structure is ordered. If ANR requires the invert of the structure to be buried to provide a natural bottom, the size of the structure will have to be larger to provide the required waterway area.

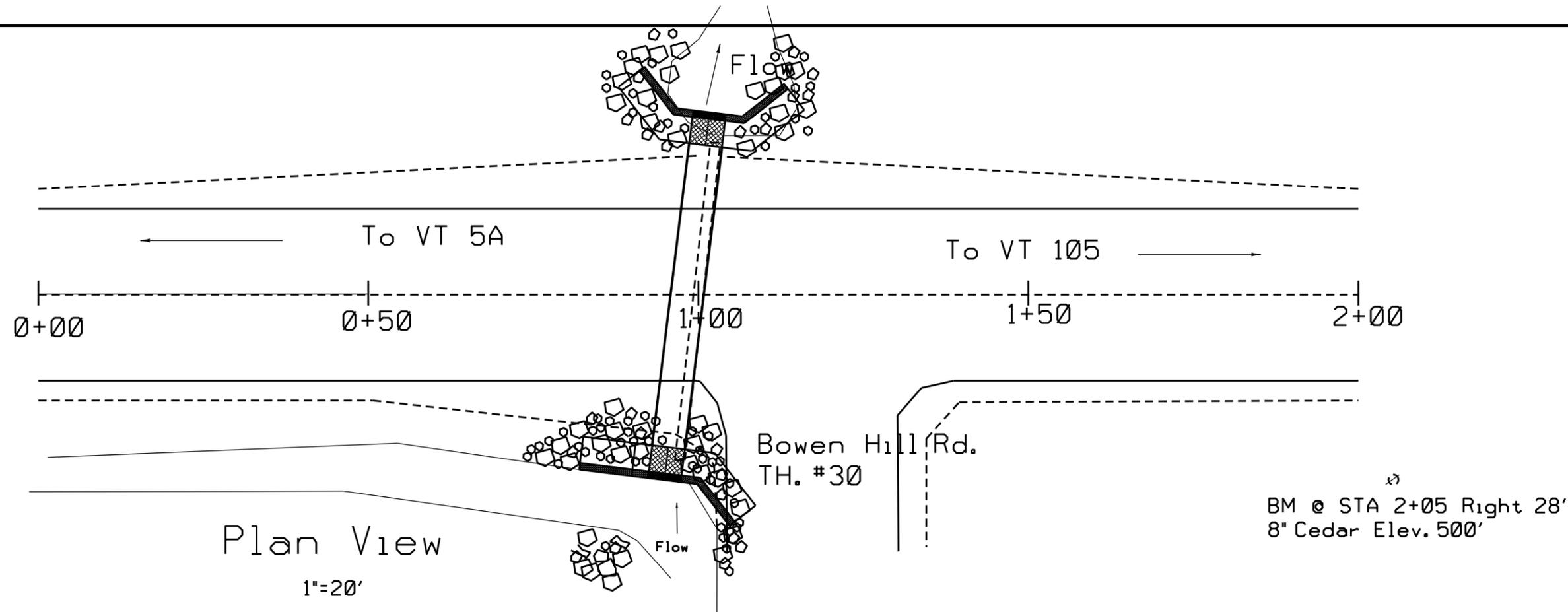
Please keep in mind that no site visit was made, so site specific issues have not been addressed. The final decision regarding the replacement of this structure should take into consideration matching the natural channel conditions, the roadway grade, environmental concerns, safety, and other requirements of the site.

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

LGR

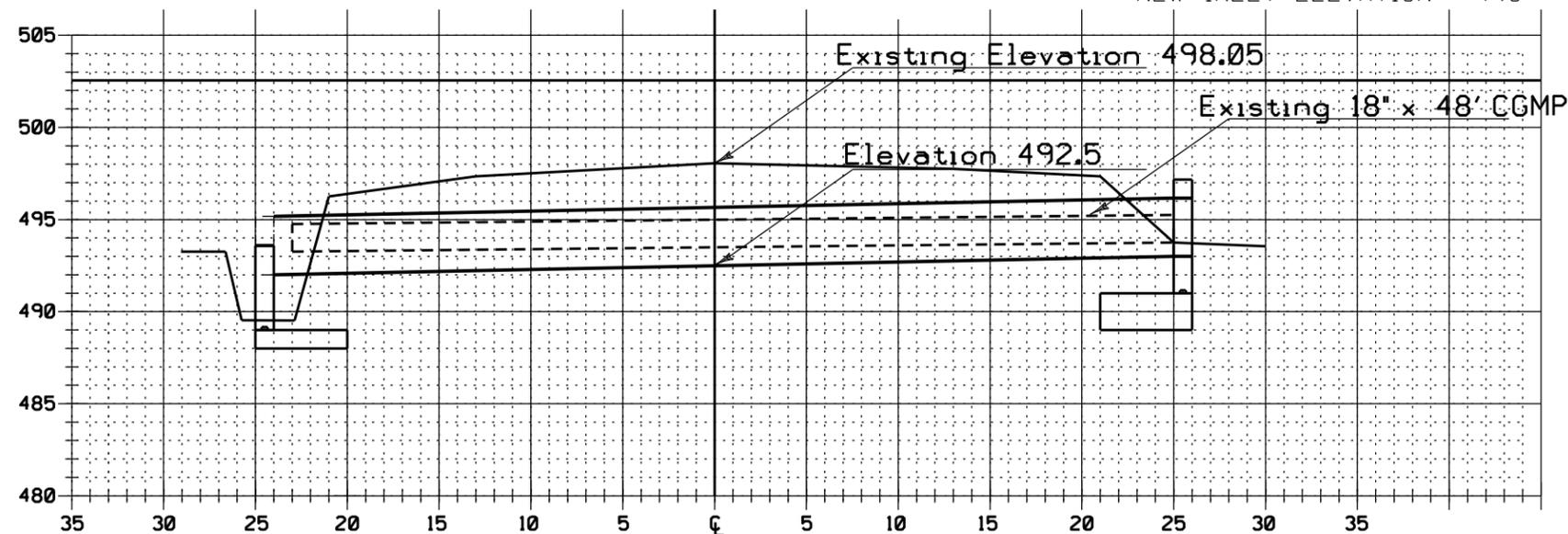
cc: Barry Cahoon, A.N.R. River Management Engineer
Hydraulics Project File via NJW
Hydraulics Chrono File

Non_PMS_Projects\Hydraulics\ProjectFiles_NonCADD\Charleston\TH 30 -- 0.7 miles from TH
1\Charleston TH 30 prel hyd memo



EXISTING OUTLET ELEVATION = 493.25
 NEW OUTLET ELEVATION = 492

EXISTING INLET ELEVATION = 493.55
 NEW INLET ELEVATION = 493



Notes:

Install a new 57"wx38"h X 50'l pipe arch with new Inlet, Outlet Headwalls, and Flared Wingwalls buried 4' below stream bed.

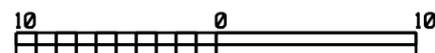
Headwalls on both outlet and inlet will be built in accordance with Vermont Standards D-33 and D-34 as well as Vermont Agency of Transportation Hydraulics study.

A minimum of 2' of cover over pipe arch with 18" Rc radius corner for H20-H25 Live Load. (AISI 1994). The existing Road elevation will need to be raised to have adequate pipe cover.

Charleston Hudson Rd. @ Bowen Hill

STA. 1+00

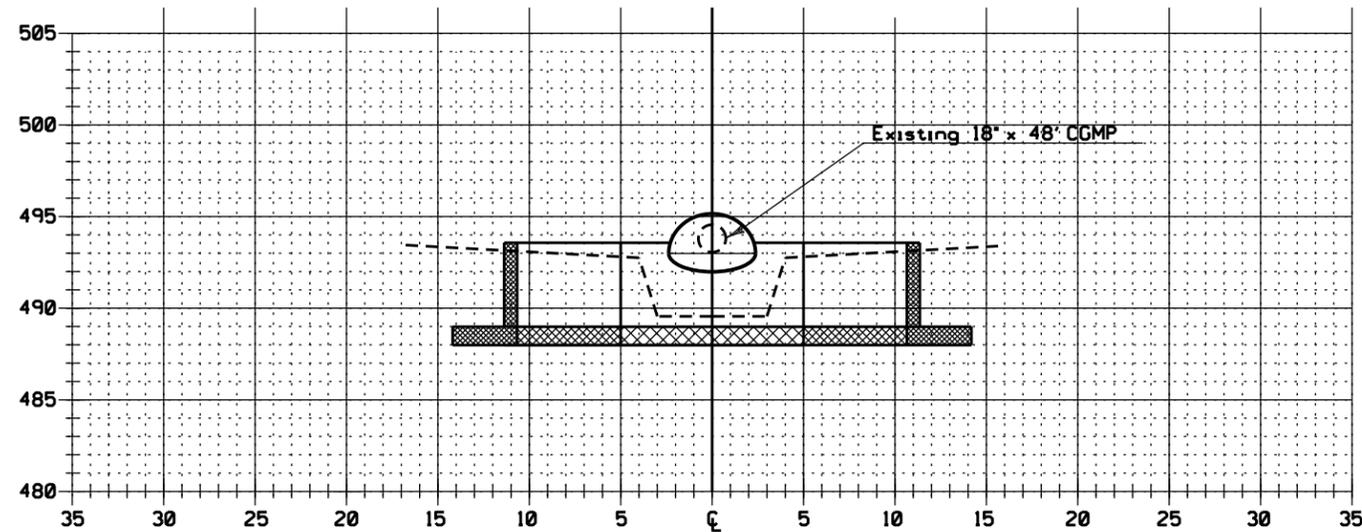
SCALE 1" = 10'-0"



Surveyed 6/18/12 SWK, DRR, SMM

PROJECT NAME:	Charleston Hudson Rd. @ Bowen Hill
PROJECT NUMBER:	Charleston Hudson Rd. @ Bowen Hill
FILE NAME:	Charleston Hudson Rd. @ Bowen Hill
PROJECT LEADER:	S. Keysor
DESIGNED BY:	SMM
HOT DATE:	\$\$\$DATE\$\$\$
DRAWN BY:	S. Morin
CHECKED BY:	S. Keysor
SHEET _1_ OF 2_	

EXISTING OUTLET ELEVATION = 493.25
 NEW OUTLET ELEVATION = 492



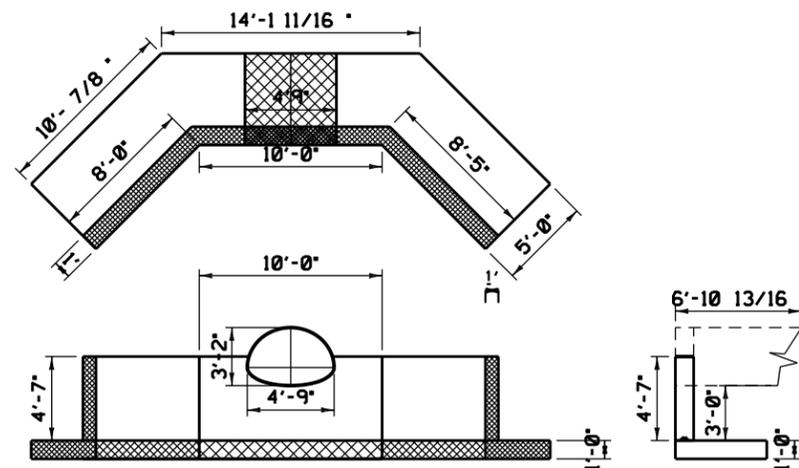
OUTLET CHANNEL CROSS SECTION

27' OFFSET from CL

SCALE 1" = 10'-0"

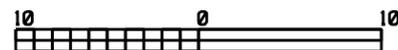


Flared Wingwalls are drawn to a 45 degree angle but can be changed to match into existing slopes if necessary.

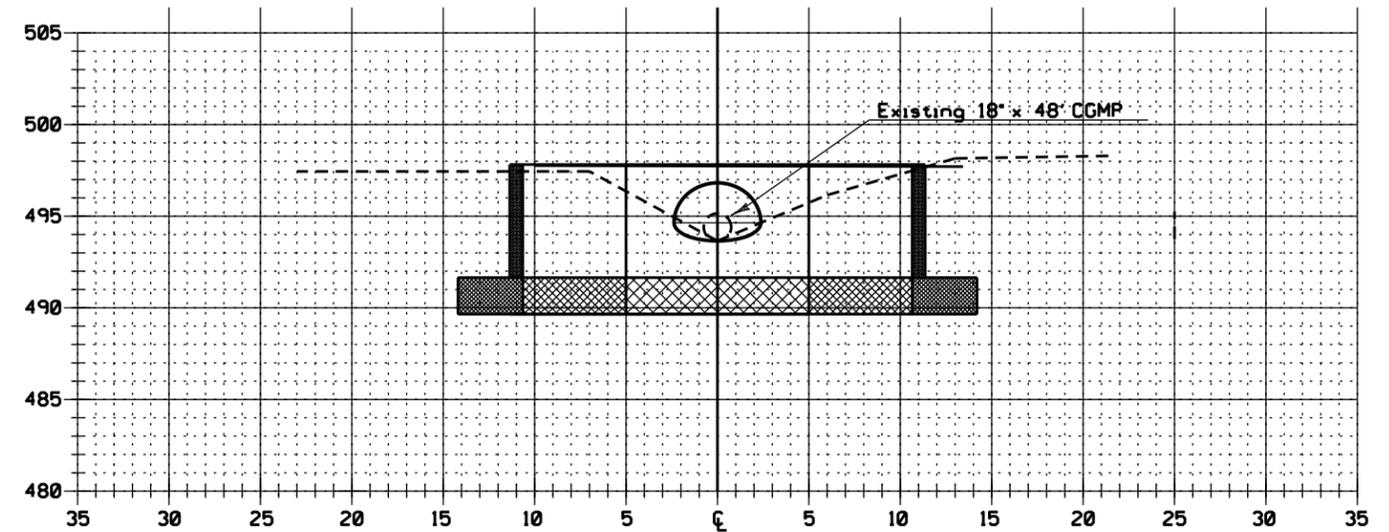


OUTLET CRADLE HEADWALL

SCALE 1" = 10'-0"



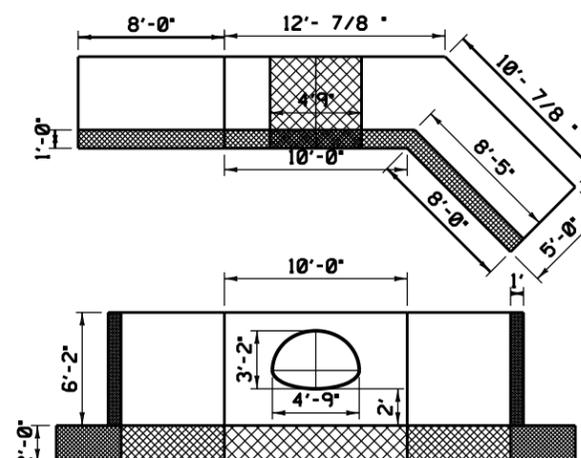
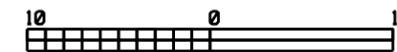
EXISTING INLET ELEVATION = 493.55
 NEW INLET ELEVATION = 493



INLET CHANNEL CROSS SECTION

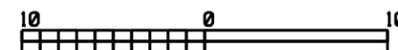
27' OFFSET from CL

SCALE 1" = 10'-0"



INLET HEADWALL

SCALE 1" = 10'-0"



PROJECT NAME: Charleston Hudson Rd. @ Bowen Hill	
PROJECT NUMBER: Charleston Hudson Rd. @ Bowen Hill	
FILE NAME: Charleston Hudson Rd. @ Bowen Hill	LOT DATE: \$\$\$DATE\$\$\$
PROJECT LEADER: S. Keysar	DRAWN BY: S. Morin
DESIGNED BY: SMM DRR	CHECKED BY: S. Keysar
SHEET 2 OF 2	



VERMONT

State of Vermont
Highway Division
Maintenance & Operations Bureau
District 9
4611 US Route 5
Newport, VT 05855
vtrans.vermont.gov

Agency of Transportation

[phone] 802-334-7934
[fax] 802-334-3337
[ttd] 800-253-0191

November 13, 2015

Town of Charleston
C/o Colleen Kellogg
5063 VT Route 105
West Charleston, VT 05872

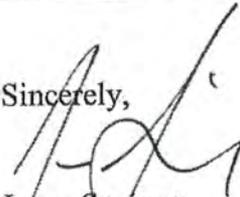
RE: Hudson Rd, 404 Hazard Mitigation Grant, Culvert Replacement Estimate

Dear Colleen,

Below is the estimate for the culvert replacement at the intersection of Bowen Hill Rd as per your request.

Item #	Item Description	Unit Price	Units	Qty.	Total \$
203.30	EARTH BORROW	6.91	CY	985	\$ 6,806.35
204.20	TRENCH EXCAVATION OF EARTH	11.75	CY	38	\$ 446.50
204.25	STRUCTURE EXCAVATION	21.83	CY	54	\$ 1,178.82
204.30	GRANULAR BACKFILL FOR STRUCTURES	37.21	CY	43	\$ 1,600.03
501.33	CONCRETE, HIGH PERFORMANCE CLASS A	748.90	CY	25	\$ 18,722.50
613.11	Stone FILL, TYPE II	35.97	CY	42	\$ 1,510.74
635.11	MOBILIZATION/DEMOBILIZATION	3000.00	LS	1	\$ 3,000.00
641.10	TRAFFIC CONTROL	3000.00	LS	1	\$ 3,000.00
651.15	SEED	8.61	LB	10	\$ 86.10
651.17	SEED, WINTER RYE	2.94	LB	5	\$ 14.70
651.18	FERTILIZER	5.07	LB	100	\$ 507.00
651.20	AGRICULTURAL LIMESTONE	601.70	TON	0.5	\$ 300.85
651.25	HAY MULCH	544.99	TON	0.5	\$ 272.50
	New 57"wx38"h X 50'l Pipe Arch			1	\$ 3,800.00
	Delivery				\$2,000.00
				Total	\$ 43,246.09

Sincerely,


Jason Seyigny
District Technician



Cement Culvert w/ Headwall at Bowen Hill Rd Intersection
Charleston FY2017 Better Roads Application

Image of VOBCIT site indicating culvert locations

Home Help Sign in

View Structure Expand fields Help Close

ID: 6a1dd112-c64d-4df1-a798-d37beb6ad8d6

Municipality	CHARLESTON
Road	HUDSON RD
Local ID	41st on Hudson 2nd class
X-coordinate (or lat)	537918
Y-coordinate (or lng)	259828
Inventory date	5/7/2014
Culvert type	Round
Culvert material	Steel Corrugated
Height	18 in
Width	18 in
Length	60 ft
Overall condition	Fair

Photos

Google Mixed Imagery Show: Structure Legend Reset map

Map data ©2016 Google Terms of Use Report a map error



Bowen Hill culvert inlet to be replaced by 36" with headwall and splash pool



Bowen Hill culvert outlet

**Project: Cement Culvert w/ Headwall Hudson Rd at Bowen Hill Rd Intersection
Charleston FY2017 Better Roads Application**

Intersecting Bowen Hill Rd presents significant overland drainage source. A class 4 road, maintenance is minimal and undermined by logging and seasonal sugaring trucks, causing significant erosion.



Above: eroded ditch approaching culvert inlet.

At left: culvert inlet. Culvert is undersized to handle overland drainage from uphill class 4 road (Bowen Hill Rd). Ditch/culvert approach eroded.

**Project: Cement Culvert w/ Headwall Hudson Rd at Bowen Hill Rd Intersection
Charleston FY2017 Better Roads Application**

At right, road erosion over culvert outlet.



At left: culvert outlet. Culvert is undersized and “hanging culvert” contributes to erosion. “Downstream” from here, landowner ditches and culvert pipes to drain fields bring water directly to Clyde River. Plans include stone splash pool here to correct erosion and sediment into river.

State of Vermont
Highway Division
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4611 US Route 5
Newport, VT 05855
vtrans.vermont.gov

Agency of Transportation

[phone] 802-334-7934
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[ttd] 800-253-0191

April 11, 2016

Letter of Recommendation

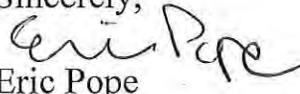
To Whom It May Concern,

The Town of Charleston has expressed concern over the condition of a culvert on Hudson Rd as it intersects with Bowen Hill Rd. The Town has been in close contact with the District 9 office and we have performed site visits to investigate and concur with their concern. Quite a bit of scouring and undermining has occurred, further Hydraulic Analysis has proven the current structures to be quite undersized.

It is of our opinion, being the District Project Manager and Tech Team, that this project is an excellent fit for a Better Roads Grant. We have assisted the town to determine proper hydraulic sizing as well as adequate structural support for this site, and will continue to provide support and assistance throughout the project.

Thank You.

Sincerely,


Eric Pope
District 9 Technician

24 Apr 2014

Project: **Hudson Road Drainage Project**

Pg 1 of 5

Total Benefits: **\$555,397**

Total Costs: **\$460,039**

BCR: **1.21**

Project Number:

Disaster #: DR-4022-VT

Program: HMGP

Agency: **Town of Charleston**

State: **Vermont**

Point of Contact: Tom Jensen

Analyst: Tom Jensen

Project Summary:

Project Number:

Disaster #: DR-4022-VT

Program: HMGP

Agency: Town of Charleston

Analyst: Tom Jensen

Point of Contact: Tom Jensen

Phone Number: 802-895-4137

Address: PO Box 3, West Charlesto, Vermont, 05872

Email: jensentom5@aol.com

Comments:

Structure Summary For:

Hudson Road, Hudson Road, Charleston, Vermont, 05872, Orleans

Structure Type: Other

Historic Building: No

Contact: Tom Jensen

Benefits: \$555,397

Costs: \$460,039

BCR: 1.21

Mitigation	Hazard	BCR	Benefits	Costs
Drainage Improvement	Damage-Frequency Assessment	1.21	\$555,397	\$460,039

24 Apr 2014

Project: **Hudson Road Drainage Project**

Pg 2 of 5

Total Benefits: **\$555,397**

Total Costs: **\$460,039**

BCR: **1.21**

Project Number:

Disaster #: DR-4022-VT

Program: HMGP

Agency: **Town of Charleston**

State: **Vermont**

Point of Contact: Tom Jensen

Analyst: Tom Jensen

Structure and Mitigation Details For: Hudson Road, Hudson Road, Charleston, Vermont, 05872, Orleans

Benefits: \$555,397

Costs: \$460,039

BCR: 1.21

Hazard: **Damage-Frequency Assessment - Flood**

Mitigation Option: Drainage Improvement

Latitude:

Longitude:

Project Useful Life: 50

Mitigation Information

Basis of Damages: Historical Damages

Number of Estimated Damage Events: 3

Number of Events with Know Recurrence Intervals: 0

Roads And Bridges

Estimated Number of One-Way Traffic Trips Per Day: 833

Additional Time per One-Way Trip: 0:30

Number of Additional Miles: 15.0

Federal Rate: 0.550

Economic Loss Per Day of Loss of Function: \$19,213

Facility Description:

Hudson Road, a 4.5 mile Gravel Surfaced road in Charleston, VT

Historic Damages Before and After Mitigation

Analysis Year: 2014

Analysis Duration: 39

Utilities (\$/day):

Year Built: 1976

User Input Analysis Duration:

Buildings (\$/day):

Roads/Bridges (\$/day): \$19,213.15

24 Apr 2014

Project: **Hudson Road Drainage Project**

Pg 3 of 5

Total Benefits: **\$555,397**

Total Costs: **\$460,039**

BCR: **1.21**

Project Number:

Disaster #: DR-4022-VT

Program: HMGP

Agency: **Town of Charleston**

State: **Vermont**

Point of Contact: Tom Jensen

Analyst: Tom Jensen

Damages Before Mitigation

Damage Year: 2011

RI: 5.00

Are Damages In Current Dollars? No

Buildings (Days):

Utilities (Days):

Roads (Days): 4.0

Project Worksheet Damages (\$)	\$45,186
Town Annual Damages (\$)	\$2,500
Total	\$124,539
Total Inflated	\$128,707

Damages After Mitigation

RI: 10.00

Are Damages In Current Dollars? Yes

Buildings (Days):

Utilities (Days):

Roads (Days): 4.0

Project Worksheet Damages (\$)	\$45,186
Town Annual Damages (\$)	\$2,500
Total	\$124,539

Damage Year: 2011

RI: 2.00

Are Damages In Current Dollars? No

Buildings (Days):

Utilities (Days):

Roads (Days): 2.0

Project Worksheet Damages (\$)	\$9,830
Town Annual Damages (\$)	\$2,500
Total	\$50,756
Total Inflated	\$51,834

RI: 5.00

Are Damages In Current Dollars? Yes

Buildings (Days):

Utilities (Days):

Roads (Days): 2.0

Project Worksheet Damages (\$)	\$9,830
Town Annual Damages (\$)	\$2,500
Total	\$50,756

Damage Year: 2013

RI: 1.00

Are Damages In Current Dollars? No

Buildings (Days):

Utilities (Days):

Roads (Days): 2.0

Project Worksheet Damages (\$)	\$8,967
Town Annual Damages (\$)	\$2,500
Total	\$49,893
Total Inflated	\$50,182

RI: 2.00

Are Damages In Current Dollars? Yes

Buildings (Days):

Utilities (Days):

Roads (Days): 2.0

Project Worksheet Damages (\$)	\$8,967
Town Annual Damages (\$)	\$2,500
Total	\$49,893

24 Apr 2014

Project: **Hudson Road Drainage Project**

Pg 4 of 5

Total Benefits: **\$555,397**

Total Costs: **\$460,039**

BCR: **1.21**

Project Number:

Disaster #: DR-4022-VT

Program: HMGP

Agency: **Town of Charleston**

State: **Vermont**

Point of Contact: Tom Jensen

Analyst: Tom Jensen

Summary Of Benefits

Expected Annual Damages Before Mitigation

Expected Annual Damages After Mitigation

Expected Avoided Damages After Mitigation (Benefits)

Annual: \$75,746
Present Value: \$1,045,351

Annual: \$35,502
Present Value: \$489,954

Annual: \$40,244
Present Value: \$555,397

Mitigation Benefits: \$555,397

Mitigation Costs: \$460,039

Benefits Minus Costs: \$95,358

Benefit-Cost Ratio: 1.21

Cost Estimate

Project Useful Life (years): 50

Construction Type:

Mitigation Project Cost: \$404,836

Detailed Scope of Work: Yes

Annual Project Maintenance Cost: \$4,000

Detailed Estimate for Entire Project: Yes

Final Mitigation Project Cost: \$460,039

Years of Maintenance: 50

Cost Basis Year:

Present Worth of Annual Maintenance Costs: \$55,203

Construction Start Year:

Estimate Reflects Current Prices: Yes

Construction End Year:

Project Escalation:

24 Apr 2014

Project: **Hudson Road Drainage Project**

Pg 5 of 5

Total Benefits: **\$555,397**Total Costs: **\$460,039**BCR: **1.21**

Project Number:

Disaster #: DR-4022-VT

Program: HMGP

Agency: **Town of Charleston**State: **Vermont**

Point of Contact: Tom Jensen

Analyst: Tom Jensen

Justification/Attachments

Field	Description	Attachments
Additional Time per One-Way Trip	Based on time required to detour if Hudson Road is closed. The time required to detour the 15 miles is 30 minutes, on rural roads.	
Analysis Year	Analysis is the current year, 2014.	
Annual Project Maintenance Cost	Based on Infrastructure improvement projects, default value is 50 years.	
Estimated Number of One-Way Traffic Trips Per Day	See Traffic Data COUNT from JAMAR Technologies, traffic counts for July 22, 2010 is 833 VPD.	Traffic Data.pdf
Facility Description	Brief description of the facility, Hudson Road. A 1.6 mile stretch of the road is being mitigated.	Traffic Data.pdf
Historic damages before mitigation	See attached Project Worksheets (PW's) for DR-1995, occurred in May of 2011; also attached PW's for DR-4022 and DR-4140	August 2013 DR-4140.pdf; August 2011 DR-4022.pdf; May 2011 DR-1195 PW.pdf
Mitigation Project Cost	Based on an estimate prepared using VT "Orange Book" 2009-2011 Edition, for project cost information.	
Number of Additional Miles	Map attached and on file with project application. Detour route is Route 105 West, to Junction of Rt 5A, back to Hudson Road.	
Roads/Bridges	Project is for Hudson Road, an existing gravel-surfaced road.	
Year Built	Road has been in existence for hundreds of years; year built used as the first issued flood maps for Orleans County.	