STATE OF VERMONT
AGENCY OF TRANSPORTATION

Scoping Report

FOR

Poultney BF 0138(12)

FAS ROUTE 138 (VT ROUTE 140), BRIDGE 2 OVER THE FINEL HOLLOW BROOK

January 9, 2015

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I. Site Information

Bridge 2 is a Town owned bridge located on FAS Route 138 (Town Highway 2/VT Route 140) approximately 2.2 miles east of the junction with VT Route 30. There are two historic houses in the immediate vicinity of the project, and archaeological resources both upstream and downstream. The existing conditions were gathered from a combination of a Site Visit, the Inspection Report, the Route Log and the existing Survey. See correspondence in the Appendix for more detailed information.

Roadway Classification	Major Collector
Bridge Type	Concrete T-beam bridge
Bridge Length	31 feet
Year Built	1900
Ownership	Town of Poultney

Need

Bridge 2 carries FAS Route 138 across the Finel Hollow Brook. The following is a list of deficiencies of Bridge 2 and FAS Route 138 in this location:

1. The existing T-beams are in fair condition. They have exposed rebar, especially near the fascia where they are subjected to deicing salts. The substructure is also in fair condition with some heavy spalling especially at the downstream wingwalls.

2. The existing bridge and approach widths are too narrow for the roadway classification and traffic volumes.

3. The bridge railing does not meet crash standards. Additionally, the concrete bridge rail is damaged from collision and has cracked through in the southwest quadrant.

4. The horizontal curve through the project area is substandard.

5. The sag vertical curve and headlight sight distance through the project area are substandard.

6. The clear span of the bridge does not meet the ANR bank full width requirements.

Traffic

A traffic study of this site was performed by the Vermont Agency of Transportation. The traffic volumes are projected for the years 2017 and 2037.

TRAFFIC DATA	2017	2037
AADT	1,400	1,400
DHV	160	160
ADTT	85	120
%T	3.7	5.1
%D	56	56

Design Criteria

The design standards for this bridge project are the Vermont State Standards, dated October 22, 1997. Minimum standards are based on an ADT of 1,400, a DHV of 160, and a design speed of 35 mph for a Major Collector.

Design Criteria	Source	Existing Condition	Minimum Standard	Comment
Approach Lane and Shoulder Widths	VSS Table 5.3	9'/1' (20')	9'/2' (22')	Substandard
Bridge Lane and Shoulder Widths	VSS Section 5.3	9'/1.3' (20.6')	9'/3' (24')	Substandard
Clear Zone Distance	VSS Table 5.5		12' fill / 10' cut	
Banking	VSS Section 5.13	Varies	8% (max), Limit to 6% for side road intersection	
Speed		35 mph posted	35 mph (Design)	
Horizontal Alignment	AASHTO Green Book Table 3-9	R = 310'	R_{min} = 332' @ e = 6.0% (25 mph)	Substandard
Vertical Grade	VSS Table 5.6	4.1909% (max)	9% (max) for rolling terrain	
K Values for Vertical Curves	VSS Table 5.1	K_{crest} = 46, K_{sag} = 25	40 crest / 50 sag	Substandard
Vertical Clearance	VSS Section 5.8	No Issues Noted	14'-3" (min)	
Stopping Sight Distance	VSS Table 5.1	346', 152'	225'	Substandard
Bicycle/Pedestrian Criteria	VSS Table 5.8	1' shoulder	3' Shoulder	Substandard
Bridge Railing	Structures Design Manual Section 13	Historic Concrete Railing with substandard approaches and height.	TL-2	Substandard
Hydraulics	VTrans Hydraulics Section	1. Passes Q_{50} storm event with over 7.0' of freeboard 2. 23' Bank full width	1. Pass Q_{50} storm event with 1.0' of freeboard 2. 30'(min) Bank full width	Substandard
Structural Capacity	SM, Ch. 3.4.1	Not Structurally Deficient	Design Live Load: HL-93	

Inspection Report Summary

Deck Rating	5 Fair
Superstructure Rating	5 Fair
Substructure Rating	5 Fair
Channel Rating	7 Good

06/26/12 – Fair condition as deck, fascias, exterior T-beams, and substructure continue to deteriorate. Concrete parapet along the southwest side is cracked through. Bridge should have extensive recon or replacement in near future. ~MJK/JM

05/03/10 – Approach rail should be connected to the bridge rail. Broken section of the concrete parapet rail should be repaired. Trees and brush should be removed from the channel. Spalling on abutment #2 should be cleaned and patched. ~FRE/RF

Hydraulics

The existing clear span is approximately 23' wide with a clear height of approximately 15'. The stream makes a slight turn into the bridge and comes straight out of the structure. There is some ledge constricting the channel through the structure. The bridge inspection reports do not indicate any hydraulic problems.

The existing structure does meet the current standards of the VTrans Hydraulic Manual although it does not meet state stream equilibrium standards for bankfull width (span length). With the average low beam elevation of 533.5' and a Q_{50} water surface elevation of 525.7', there is more than the required 1 foot of freeboard. All flows up to and including Q500 flow through this bridge.

The VTrans Hydraulics Section has made recommendations for either a rehabilitation project or a replacement project. These recommendations can be found in the Preliminary Hydraulics Report in the Appendix.

Utilities

The existing utilities are shown on the Existing Conditions Layout Sheet, and are as follows:

Municipal Utilities

- There are no municipal water or sewer mains in the project area.

Public Utilities

Underground:

- There are no known buried utilities in the vicinity of the project.

Aerial:

- The primary aerial electric transmission lines (3 phase) and communication cables are adjacent to TH 2, and the existing bridge, on the north side of the TH 2. At a point just east of the TH 9 (Finel Hollow Road) these aerial facilities cross to the south side of TH 2; this aerial crossing of the TH is approximately 130' east of the existing bridge.

- There are aerial electric and telephone service lines which cross TH 2 approximately 30' west of the existing bridge.

- There is a service line which crosses the road near the west end of bridge; this will probably need to be relocated for construction.

It is anticipated that overhead utilities will have to be relocated for construction.

Right Of Way

There is an existing 4-rod Right-of-Way centered on TH 2 and an existing 3-rod Right-of-Way centered on TH 9. The existing Right-of-Way is plotted on the Existing Conditions Layout Sheet. Depending on the alternative selected, additional Right-of-Way may need to be acquired.

Resources

The environmental resources present at this project are shown on the Existing Conditions Layout Sheet, and are as follows:

Biological:

Wetlands/Watercourses

No wetlands are present within the project area.

Finel Hollow Brook is the only watercourse present in the project area. Finel Hollow Brook is a direct tributary to the Poultney River. Between 2005-2007, a phase 1 geomorphic assessment was conducted by Hilary Solomon, Poutney Mettowee Natural Resources Conservation District. The report is available for reference.

The US Corps of Engineers and the Agency of Natural Resources- Department of Environmental Conservation will regulate all activities below ordinary high water within the Finel Hollow Brook. Once project plans are conceptualized, the designer should evaluate potential impacts on waterways and evaluate required project permits..

Wildlife Habitat

No significant terrestrial wildlife habitat exists within the project area. A variety of aquatic species including wild brook trout occur within the Finel Hollow Brook. In stream timing restrictions will be likely required during construction.

Rare, Threatened and Endangered Species (R/T/E)

The VT Fish and Wildlife Diversity database indicates that no R/T/E species are present within the project area. The USFWS Information, Planning and Conservation System-(IPac) mapping indicates no occurrences of any federally listed species.

Agricultural

Prime agricultural soils are mapped within the entire project area.

Hazardous Materials:

According to the Vermont Agency of Natural Resources (VANR) Vermont Hazardous Sites List, the closet hazardous waste site is located over a half a mile away. It is anticipated that there will be no impacts to hazardous waste sites.

Historic:

Bridge 2 is not a historic resource due to loss of integrity. The two adjacent properties located to the Northwest and Southwest of the bridge are historic.

The replacement railing should be compatible with the historic properties.

Archaeological:

Two quadrants of archaeological sensitivity were identified based on undisturbed soil profiles and proximity to historic structures. The bridge is located in the village of East Poultney, an early hub of activity in the late 18th and early 19th centuries. Both quadrants are likely to contain cultural material related to early industrial and social contexts.

The brick Federal-style residential structure in the NW quadrant was built in 1811 by Thomas Todd, an early pioneer in woolen manufacturing in Poultney. He also constructed a dam and several grist, carding and cider mills in the 1820's. A grist/cider mill in the SW quadrant was run by his son, Alanson Todd in 1820. The adjacent building was erected by Alanson in the mid 1820's and included a mill and barn complex, now located in the SW quadrant. This mill was later known as "Shaw's Grist and Cider Mill" ca. 1880 and is mentioned in the Child's Gazetteer for Rutland County in 1881-1882. Further background and archival research will likely yield additional information related to the history of the site.

Although not considered archaeologically sensitive, it's interesting to note the presence of a series of large red slate slabs upstream from the current bridge. These slabs appear to be components of a larger slate footbridge that was likely erected contemporaneously with the Todd House. The stone is of similar color and size to many of the foundation stones visible in the outbuildings associated with house.

If a temporary off-alignment bridge is required during construction, a Phase 1 sub-surface survey will be needed to assess site presence in both the Northwest and Southwest quadrants. A series of maps and photographs to help highlight some of the important components of this resource can be found in the Appendix.

Stormwater:

There are no stormwater concerns for this project.

II. Maintenance of Traffic

The Vermont Agency of Transportation reviews each new project to determine suitability for the Accelerated Bridge Program, which focuses on faster delivery of construction plans, permitting, and Right of Way, as well as faster construction of projects in the field. One practice that will help in this endeavor is closing bridges for portions of the construction period, rather than providing temporary bridges. In addition to saving money, the intention is to minimize the closure period with faster construction techniques and incentives to contractors to complete projects sooner. The Agency considers the closure option on all projects where rapid reconstruction or rehabilitation is feasible. The use of prefabricated elements in new bridges will also expedite construction schedules. This can apply to decks, superstructures, and substructures. Accelerated Construction provides enhanced safety for the workers and the travelling public while maintaining project quality. The following options have been considered:

Option 1: Off-Site Detour

This option would close the bridge and reroute traffic onto an offsite detour. Since the bridge is located on a class 2 Town Highway, it would be the responsibility of the Town of Poultney to choose the preferred detour route, and manage the sign selection and placement. The Town would also be responsible for management of emergency services through the closure period.

There are several possible routes that would be appropriate for a detour at this site. These routes vary in end-to-end distance from 9.4 miles to 17.9 miles, and take approximately the same time to drive. Regardless of the route chosen, it is likely that any of these routes could see increased traffic if TH 2 were closed during construction. Some possible detour routes which the Town of Poultney may want to choose are as follows:

1. VT Route 140 (TH 2), to VT Route 30, Ward Road, Lewis Road, Gorhamtown Road, Watkins Hill Road, Finel Hollow Road, back to VT Route 140 (12.0 mi end-to-end).

2. VT Route 140 (TH 2), to Hillside road, Lewis Road, Gorhamtown Road, Watkins Hill Road, Finel Hollow Road, back to VT Route 140 (9.4 mi end-to-end).

3. VT Route 140 (TH 2), to Thrall Road, VT Route 30, Endless Brook Road, Lamb Hill Road, Mountain Road, Coy Hill Road, back to VT Route 140 (17.9 mi end-to-end).

A map of possible detour routes can be found in the Appendix.

Advantages: This option would eliminate the need for a temporary bridge, which would significantly decrease cost and time of construction. This option would not require the need to obtain rights from adjacent property owners for a temporary bridge. Also, this option would not have impacts to archaeological and historic resources adjacent to the bridge. This option reduces the time and cost of the project both at the development stage and construction. Additionally, by closing the bridge, and not constructing a temporary bridge, the local share would be reduced by 50% as per VT legislative Act 153 of 2012.

Disadvantages: Traffic flow would not be maintained through the project site during construction.

Option 2: Phased Construction

Phased construction is the maintenance of one way alternating traffic on the existing bridge while building one lane at a time of the proposed structure. This allows keeping the road open during construction, while having minimal impacts to adjacent property owners and environmental resources.

While the time required to develop a phased construction project would remain the same, the time required to complete a phased construction project increases because some of the construction tasks have to be performed multiple times. In addition to the increased design and construction costs mentioned above, the costs also increase for phased construction because of the inconvenience of working around traffic and the effort involved in coordinating the joints between the phases. Another negative aspect of phased construction is the decreased safety of the workers and vehicular traffic, which is caused by increasing the proximity and extending the duration that workers and moving vehicles are operating in the same confined space. Phased construction is usually considered when the benefits include reduced impacts to resources and decreased costs and development time by not requiring the purchase of additional ROW.

Based on the current traffic volumes, it is acceptable to close one lane of traffic, and maintain one lane of traffic, both ways, with a traffic signal. However, due to horizontal constraints, this option is not being considered. In order to keep one lane open to traffic, approximately 12 feet of the existing bridge width needs to remain for Phase 1. The existing bridge is 20 feet wide, which does not provide enough of a working width to make this method advantageous. Additionally, this option would increase the design and construction costs, while not improving the existing substandard horizontal alignment.

Phased construction would not be possible at this site without shifting the alignment of the proposed bridge, widening the proposed bridge, or using a temporary bridge for one of the phases. None of those options are ideal. Additionally, phased construction would result in a longer, more expensive, and less safe construction project, and thus, it will not be considered further.

Option 3: Temporary Bridge

From a constructability standpoint, a temporary bridge could be placed on either the upstream or downstream side of the existing bridge. Both an upstream and a downstream temporary bridge would have temporary impacts to archaeologically sensitive and historic resources. Additionally both options would have temporary impacts to the private drives located in the immediate project vicinity. The intersections of FAS Route 138 with Finel Hollow Road would need to be temporarily reconfigured during construction for the placement of a temporary bridge. A temporary bridge would require additional rights from adjacent property owners, and would require a temporary relocation of overhead utilities.

A one-way temporary bridge would be adequate based on the daily traffic volumes. Due to the substandard sight distance, any one-way temporary bridge should be signalized. See the Temporary Bridge Layout Sheets in the Appendix.

Advantages: Traffic flow can be maintained through the project corridor during construction.

Disadvantages: This option would require additional Right-of-Way acquisition for placement of the temporary bridge. This option would have adverse impacts to adjacent properties and resources. There would be decreased safety to the workers and to vehicular traffic, because of cars driving near the construction site, and construction vehicles entering and exiting the construction site. This traffic control option would be costly, and time consuming, as construction activities would take a second construction season, in order to set up the temporary bridge.

III. Alternatives Discussion

No Action

The existing bridge is not structurally deficient. However, both the superstructure and the substructure have fully exposed reinforcing steel. The existing concrete railing has collision damage and has cracked, separating entirely from itself. In the interest of safety to the traveling public, the No Action alternative is not recommended.

Superstructure Replacement

A superstructure replacement option for this bridge would include a new precast superstructure and substructure repair as follows:

- There is a small portion of map cracking on the existing substructures, which could be caused from Alkali Silica Reaction (ASR). Because of the rapid deterioration typical of ASR and a substructure rating of Fair, a design life of 25 years should be assumed for this option.

- There is fully exposed rebar in the wingwalls along with heavy loss of concrete. These areas should be prepared for patching, and patched with the appropriate concrete repair class. Also, anodes should be put in the new concrete to discourage further deterioration.

- The existing bridge seats would be cut down and new bridge seats would be poured to accommodate the new superstructure.

The existing substructure is in fair condition, and it is reasonable to assume that the existing substructure can safely carry anticipated traffic loads for an additional 25 years. Since the existing T-beams are integral with the deck, replacement of the deck only is not feasible.

The existing lane widths and shoulders on the bridge are 9 feet wide and 1 foot wide respectively; this does not meet the minimum standard of 9 feet and 3 feet respectively. It is proposed that 9 foot lanes with 2 foot shoulders be constructed for this alternative. This provides the maximum bridge width possible without making major modifications to the substructures.

Advantages: This alternative would address the structural deficiencies of the existing bridge, with minimum upfront costs. This option would have minimal impacts to adjacent properties and resources. Additionally, by rehabilitating the bridge, instead of fully replacing the bridge, the local share would be reduced by 50% as per VT legislative Act 153 of 2012.

Disadvantages: The current bridge does not meet the minimum width standards; this option will widen the bridge approximately 9 inches on each side, but this will still not meet the minimum standard. Additionally, this option would match the existing horizontal and vertical alignments, which are substandard.

Maintenance of Traffic: The possible options here would be either an offsite detour or a temporary bridge.

Full Bridge Replacement On Alignment

Due to the many constraints at the project site, the current horizontal alignment will be considered even though it is substandard. By maintaining the existing alignments, impacts to resources and adjacent properties will be minimized. The substandard vertical alignment and substandard roadway/bridge widths will be brought up to standard for this option.

This alternative would replace the existing bridge with a new superstructure as well as a new substructure at the existing location. The various considerations under this option include: the bridge width and length, skew, superstructure type and substructure type.

a. Bridge Width

The current curb to curb width is approximately 20 feet. This does not meet the minimum standard of 24 feet. Since a new 80+ year bridge is being proposed, the bridge geometry should meet the minimum standards. A 24 foot width bridge will be proposed.

b. Bridge Length and Skew

The existing bridge is 31 feet long with no skew. This provides a clearspan normal to the channel of 23 feet.

The Hydraulics Section has recommended that any new structure should have a clearspan normal to the channel of 30 feet to meet the ANR bank full width requirements. Vertical abutments with a bridge length of 36 feet will be appropriate here due to exposed bedrock, which inhibits the use of integral abutments. No skew will be recommended in order to match the site conditions.

d. Superstructure Type

The replacement structure could either be a new bridge or a concrete arch or frame:

- New Bridge

  A prefabricated structure would be the preferred choice, due to decreased construction time. The possible 36' length bridge types that are most commonly used in Vermont are steel and composite concrete deck, solid slabs, box beams with a cast in place structural deck, or NEXT beams. The superstructure depth is not critical for meeting hydraulic standards, so the superstructure type can be determined at a later time. The superstructure would have straight beams, with a varying overhang to account for the curved roadway.

- Concrete Arch or Frame

  This site is a good candidate for an arch or frame based on the minimum required span to meet hydraulic standards and the vertical rise. In order to reduce construction time, a precast structure would be preferred. There is exposed ledge, therefore a subfooting would have to be poured in order to create a level surface for the erection of prefabricated substructure. There are several 3-sided structure types that are used in Vermont that would be appropriate at this site, such as a 3-sided frame, a bebo arch, or bridge in a backpack. A 3-sided, 32 foot span precast structure would be specified for this option, and the type of structure would be determined at a later time.

e. Substructure Type

The western abutment currently lies directly on bedrock. The eastern abutment appears to be founded on a spread footing. As such, for a new bridge, the western abutment will likely be a stub abutment founded directly on bedrock. The eastern abutment could potentially be replaced with a reinforced concrete abutment on a spread footing or a pile supported abutment. Any rapid construction alternative should have sufficient subsurface information to verify the in-situ conditions. In order to reduce construction time, precast abutment components may be used where possible.

f. Maintenance of Traffic:

Either a temporary bridge or an offsite detour could be utilized for traffic control at this site.

Full Bridge Replacement Off Alignment

The current horizontal alignment does not meet the current standards, so an off-alignment option that meets all geometric standards was evaluated. This option would have relatively large impacts to the archaeological and historical resources in the project area, as well as to the property in the southeast quadrant of the project. In order to minimize impacts to historical and archaeological resources, the horizontal alignment should be designed and appropriately warned for a 25 mph design speed. A design exception would not be required for this reduction based on Section 5.3 of the Vermont State Standards.

This alternative would replace the existing bridge with a new superstructure as well as a new substructure on a new alignment at the existing location. The various considerations under this option include: the bridge width and length, skew, superstructure type and substructure type.

a. Bridge Width

The current curb to curb width is approximately 20 feet. This does not meet the minimum standard of 24 feet. Since a new 80+ year bridge is being proposed, the bridge geometry should meet the minimum standards. A 24 foot width bridge will be proposed.

b. Bridge Length and Skew

The existing bridge is 31 feet long with no skew. This provides a clearspan normal to the channel of 23 feet.

The Hydraulics Section has recommended that any new structure should have a clearspan normal to the channel of 30 feet to meet the ANR bank full width requirements. Vertical abutments with a bridge length of 36 feet will be appropriate here due to exposed bedrock, which inhibits the use of integral abutments. No skew will be recommended in order to match the site conditions.

c. Superstructure Type

The replacement structure could either be a new bridge or a concrete arch or frame:

- New Bridge

  A prefabricated structure would be the preferred choice, due to decreased construction time. The possible 36' length bridge types that are most commonly used in Vermont are steel and composite concrete deck, solid slabs, box beams with a cast in place structural deck, or NEXT beams. The superstructure depth is not critical for meeting hydraulic standards, so the superstructure type would be determined at a later time. The superstructure would have straight beams, with a varying overhang to account for the curved roadway.

- Concrete Arch or Frame

  This site is a good candidate for an arch or frame based on the minimum required span to meet hydraulic standards and the vertical rise. In order to reduce onsite construction time, a prefabricated structure would be preferred. There is exposed ledge, therefore a subfooting would have to be poured in order to create a level surface for the erection of a prefabricated abutment. There are several 3-sided structure types that are used in Vermont that would be appropriate at this site, such as a 3-sided frame, a bebo arch, or bridge in a backpack. A 3-sided, 32 foot span precast structure would be specified for this option, and the type of structure would be determined at a later time.

d. Substructure Type

The western abutment currently lies directly on bedrock. The eastern abutment appears to be founded on a spread footing. As such, for the new bridge option, the western abutment will likely be a stub abutment founded directly on bedrock. The eastern abutment could potentially be replaced with a reinforced concrete abutment on a spread footing or a pile supported abutment. Any rapid construction alternative should have sufficient subsurface information to verify the in-situ conditions. In order to reduce construction time, prefabricated abutment components may be used where possible.

e. Maintenance of Traffic:

Traffic would be maintained on the existing bridge for this alternative.

IV. Alternatives Summary

Based on the existing site conditions, bridge condition, and recommendations from hydraulics, there are several viable alternatives:

Alternative 1a: Superstructure Replacement with Traffic Maintained on Off-Site Detour
Alternative 1b: Superstructure Replacement with Traffic Maintained on a Temporary Bridge
Alternative 2a: Full Bridge Replacement with New Bridge and Traffic Maintained on Off-Site Detour
Alternative 2b: Full Bridge Replacement with New Bridge and Traffic Maintained on Temporary Bridge
Alternative 3a: Full Bridge Replacement with an Arch or Frame and Traffic Maintained on Off-Site Detour
Alternative 3b: Full Bridge Replacement with an Arch or Frame and Traffic Maintained on a Temporary Bridge
Alternative 4: Full Bridge Replacement Off Alignment with Traffic Maintained on the Existing Bridge

V. Cost Matrix[1]

Poultney BF 0138(12)		Do Nothing	Alt 1a	Alt 1b	Alt 2a	Alt 2b	Alt 3a	Alt 3b	Alt 4
			Superstructure Replacement		Full Bridge Replacement New Bridge		Full Bridge Replacement Arch or Frame		Full Bridge Replacement
			Offsite Detour	Temporary Bridge	Offsite Detour	Temporary Bridge	Offsite Detour	Temporary Bridge	Off Alignment
COST	Bridge Cost	$0	$210,000	$210,000	$487,000	$487,000	$481,000	$481,000	$487,000
	Removal of Structure	$0	$10,000	$10,000	$26,000	$26,000	$26,000	$26,000	$26,000
	Roadway	$0	$175,000	$175,000	$231,000	$231,000	$231,000	$231,000	$312,000
	Maintenance of Traffic	$0	$40,000	$199,000	$81,000	$271,000	$81,000	$271,000	$128,000
	Construction Costs	$0	$435,000	$594,000	$825,000	$1,015,000	$819,000	$1,009,000	$953,000
	Construction Engineering + Contingencies	$0	$131,000	$179,000	$248,000	$305,000	$246,000	$303,000	$286,000
	Total Construction Costs w CEC	**$0**	**$565,500**	**$772,200**	**$1,072,500**	**$1,319,500**	**$1,064,700**	**$1,311,700**	**$1,238,900**
	Preliminary Engineering[2]	**$0**	**$130,500**	**$178,200**	**$206,250**	**$253,750**	**$204,750**	**$252,250**	**$238,250**
	Right of Way	**$0**	**$0**	**$53,460**	**$0**	**$91,350**	**$0**	**$91,350**	**$142,950**
	Total Project Costs	$0	$696,000	$1,003,860	$1,278,750	$1,664,600	$1,269,450	$1,655,300	$1,620,100
	Annualized Costs	$0	$27,900	$40,200	$16,000	$20,900	$15,900	$20,700	$20,300
TOWN SHARE		$0	$17,400 (2.5%)	$50,200 (5%)	$63,900 (5%)	$166,460 (10%)	$63,470 (5%)	$165,530 (10%)	$162,000 (10%)
SCHEDULING	Project Development Duration[3]	N/A	2 years	4 years	2 years	4 years	2 years	4 years	4 years
	Construction Duration	N/A	4 months	18 months	6 months	18 months	6 months	18 months	8 months
	Closure Duration (If Applicable)	N/A	2 weeks	N/A	6 weeks	N/A	4 weeks	N/A	N/A
ENGINEERING	Typical Section - Roadway (feet)	20'	22'	22'	22'	22'	22'	22'	22'
	Typical Section - Bridge (feet)	1.3-9-9-1.3	2-9-9-2	2-9-9-2	3-9-9-3	3-9-9-3	3-9-9-3	3-9-9-3	3-9-9-3
	Geometric Design Criteria	Substandard horizontal and vertical curve and substandard width	Substandard horizontal and vertical curve and substandard width		Substandard horizontal curve		Substandard horizontal curve		Meets All Geometric Criteria
	Traffic Safety	No Change	Improved	Improved	Improved	Improved	Improved	Improved	Improved
	Alignment Change	No	No	No	No	No	No	No	Yes
	Bicycle Access	No Change	Improved	Improved	Improved	Improved	Improved	Improved	Improved
	Hydraulic Performance	Substandard BFW	Substandard BFW	Substandard BFW	Meets Standard	Meets Standard	Meets Standard	Meets Standard	Meets Standard
	Pedestrian Access	No Change	Improved	Improved	Improved	Improved	Improved	Improved	Improved
	Utility	No Change	Relocation	Relocation	Relocation	Relocation	Relocation	Relocation	Relocation
OTHER	ROW Acquisition	No	No	Yes	No	Yes	No	Yes	Yes
	Road Closure	No	Yes	No	Yes	No	Yes	No	No
	Design Life	<10 years	25 years	25 years	80 years	80 years	80 years	80 years	80 years

[1] Costs are estimates only, used for comparison purposes.
[2] Preliminary Engineering costs are estimated starting from the end of the Project Definition Phase.
[3] Project Development Durations are starting from the end of the Project Definition Phase.

VI. Conclusion

We recommend **Alternative 3a**; to replace the existing structure with a precast arch or frame while maintaining traffic on an offsite detour.

Structure:
While the rehabilitation option has the lowest upfront costs, a bridge replacement has a lower per year cost based on an 80 year design life compared to a 25 year design life. The annualized total cost for a full bridge replacement is less expensive than the superstructure replacement option, since the existing substructures would require costly repairs to gain only an additional 25 years of service.

The cost of a precast 3-sided structure is slightly lower than a new bridge on spread footings. Additionally, the maintenance costs are lower for a buried structure since it is not directly exposed to deicing salts. The closure time for a buried structure is also less, so traffic impacts are not as great. Therefore, a 3-sided precast buried structure is recommended.

The new structure will be prefabricated reinforced concrete and have a span of 32 feet and a rise of approximately 10 feet. The new structure will meet the minimum low beam requirements, as per the VTrans Hydraulic Section's recommendations. There are several structure type options to choose from such as a Bebo arch, a 3-sided frame, or a bridge in a backpack to name a few. The structure type can be determined at a later date, or left up to the contractor.

The proposed structure will have two 9 foot travel lanes with 3 foot shoulders. All or part of the substructure will be founded on ledge, so in order to provide a level surface, subfootings will be poured prior to placing the buried structure. The existing bridge is not considered historic due to a loss of integrity, however the surrounding properties are historic, and the proposed bridge should have railing that compliments these properties. The bridge will have a single span of 34 feet with no skew to match the channel.

Traffic Control:
It is recommended that traffic be maintained on an offsite detour. This option will eliminate temporary and permanent impacts to surrounding historic and archaeological resources and will not require Right-of-Way acquisition. The ADT on TH 2 is 1,400, which is considered relatively low. Additionally, there are several reasonable detour routes that could be signed by the Town of Poultney. Therefore, it is reasonable to close the road and reroute traffic while the new bridge is being constructed. By closing the road as opposed to constructing a temporary bridge structure, both the project development time and the project cost are significantly reduced. Additionally, by closing the bridge to traffic during construction, and not constructing a temporary bridge, the local share is reduced by 50% per VT Legislation ACT 153 of 2012.

There is a large volume of trucks that use TH 2 as a through route. The detours available may not be appropriate for larger trucks. As such, it is recommended that a Public Outreach Coordinator is involved at an early stage in order to choose a regional detour and warn truckers ahead of the closure period of the appropriate routes to take. Portable Changeable Message Signs should also be placed ahead of the closure period in order to warn drivers to find alternate routes depending on where they are driving to.

Design Criteria:
FAS Route 138: FAS Route 138 currently has several substandard design features. The horizontal alignment, vertical alignment (substandard k-values and stopping sight distance), and shoulder widths are substandard through the project area. The proposed alternative will meet design standards for shoulder widths, and vertical curve criteria. The horizontal curve will remain substandard in order to minimize impacts to surrounding resources and adjacent properties.

VII. Appendices

- Site Pictures
- Town Map
- Bridge Inspection Report
- Hydraulics Memo
- Preliminary Geotechnical Information
- Natural Resources Memo
- Archeology Memo
- Historic Memo
- Local Input
- Detour and Local Bypass Maps
- Plans
    - Existing Conditions
    - Proposed Typical Sections
    - Alternative 1 Layout and Profile
    - Alternative 2 Layout and Profile
    - Alternative 3 Layout and Profile
    - Traffic Control Sheets

Looking West over the bridge

Looking East over the bridge

Exposed reinforcing steel in T-beams

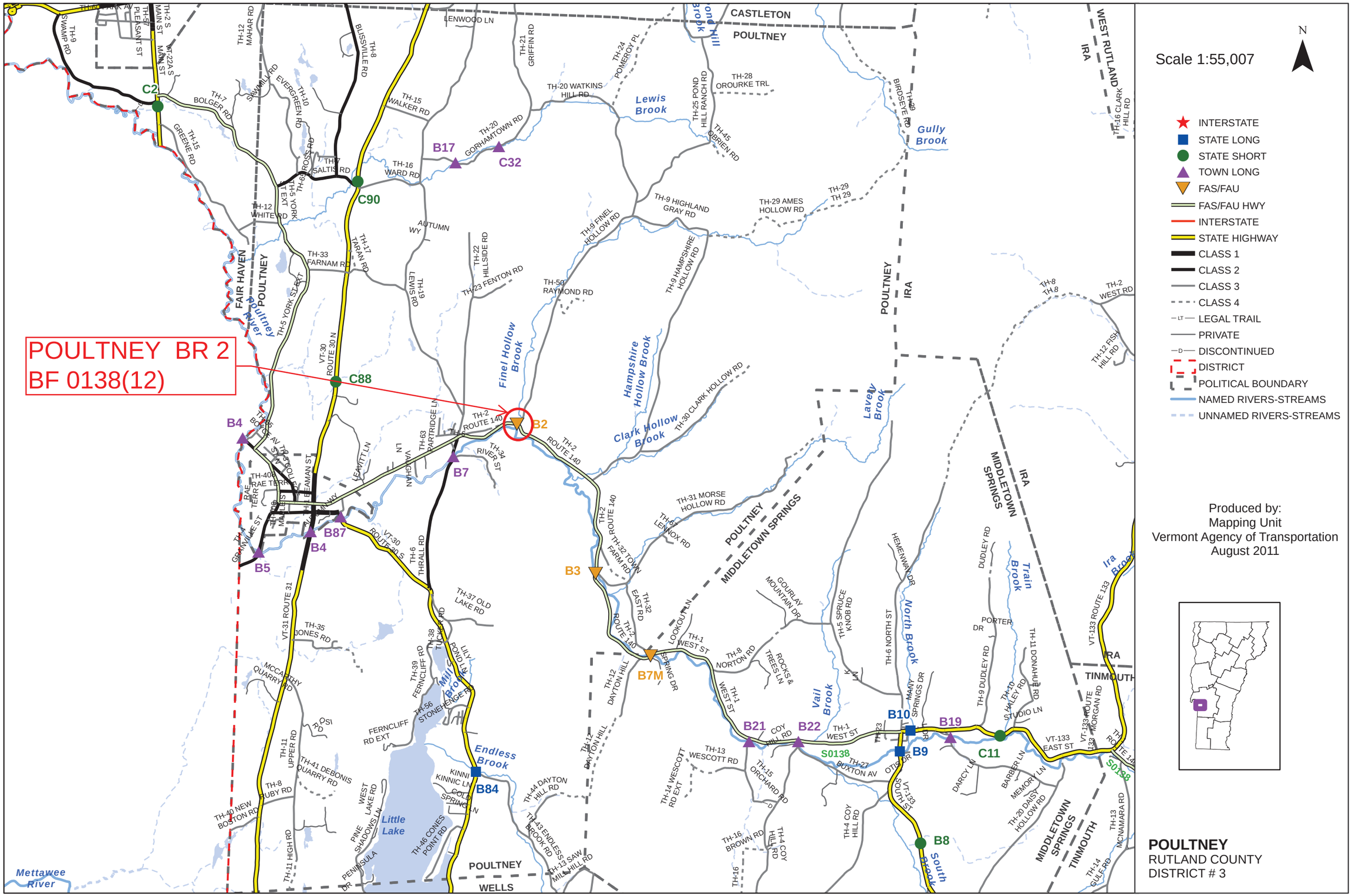
Exposed reinforcing steel in deck soffit

Exposed reinforcing steel in abutment/wingwall

Exposed reinforcing steel in abutment/wingwall

Looking Upstream

Damage/Exposed Reinforcing steel in Bridge Railing


POULTNEY BR 2
BF 0138(12)
Scale 1:55,007
N
INTERSTATE
STATE LONG
STATE SHORT
TOWN LONG
FAS/FAU
FAS/FAU HWY
INTERSTATE
STATE HIGHWAY
CLASS 1
CLASS 2
CLASS 3
CLASS 4
LEGAL TRAIL
PRIVATE
DISCONTINUED
DISTRICT
POLITICAL BOUNDARY
NAMED RIVERS-STREAMS
UNNAMED RIVERS-STREAMS
Produced by:
Mapping Unit
Vermont Agency of Transportation
August 2011
POULTNEY
RUTLAND COUNTY
DISTRICT # 3
CASTLETON
POULTNEY
WEST RUTLAND
IRA
POULTNEY
IRA
MIDDLETOWN SPRINGS
IRA
TINMOUTH
IRA
FAIR HAVEN
POULTNEY
WELLS
Lewis Brook
Gully Brook
Finel Hollow Brook
Hampshire Hollow Brook
Clark Hollow Brook
Lavery Brook
Train Brook
Ira Brook
North Brook
Vail Brook
South Brook
Endless Brook
Little Lake
Mettawee River
Poultney River
C2
C90
C88
B17
C32
B4
B2
B7
B87
B5
B3
B7M
B21
B22
B10
B19
B9
C11
B8
B84
S0138

STRUCTURE INSPECTION, INVENTORY and APPRAISAL SHEET

Vermont Agency of Transportation ~ Structures Section ~ Bridge Management and Inspection Unit

Inspection Report for POULTNEY **bridge no.:** 00002 **District:** 3

Located on: TR 02 FAS 138 **over** FINEL HOLLOW BROO **approximately** 2.2 MI E JCT. VT.30 **Owner:** 03 TOWN-OWNED

CONDITION

Deck Rating: 5 FAIR

Superstructure Rating: 5 FAIR

Substructure Rating: 5 FAIR

Channel Rating: 7 GOOD

Culvert Rating: N NOT APPLICABLE

Federal Str. Number: 200138000211172

Federal Sufficiency Rating: 058.7

Deficiency Status of Structure: FD

AGE and SERVICE

Year Built: 1900 **Year Reconstructed:** 0000

Service On: 1 HIGHWAY

Service Under: 5 WATERWAY

Lanes On the Structure: 02

Lanes Under the Structure: 00

Bypass, Detour Length (miles): 23

ADT: 001090 **% Truck ADT:** 06

Year of ADT: 1995

GEOMETRIC DATA

Length of Maximum Span (ft): 0025

Structure Length (ft): 000031

Lt Curb/Sidewalk Width (ft): 0

Rt Curb/Sidewalk Width (ft): 0

Bridge Rdwy Width Curb-to-Curb (ft): 20.6

Deck Width Out-to-Out (ft): 23.4

Appr. Roadway Width (ft): 020

Skew: 07

Bridge Median: 0 NO MEDIAN

Min Vertical Clr Over (ft): 99 FT 99 IN

Feature Under: FEATURE NOT A HIGHWAY OR RAILROAD

Min Vertical Underclr (ft): 00 FT 00 IN

STRUCTURE TYPE and MATERIALS

Bridge Type: CONCRETE T-BEAM

Number of Approach Spans 0000 **Number of Main Spans:** 001

Kind of Material and/or Design: 1 CONCRETE

Deck Structure Type: 1 CONCRETE CIP

Type of Wearing Surface: 6 BITUMINOUS

Type of Membrane 0 NONE

Deck Protection: 0 NONE

APPRAISAL *AS COMPARED TO FEDERAL STANDARDS

Bridge Railings: 0 DOES NOT MEET CURRENT STANDARD

Transitions: 0 DOES NOT MEET CURRENT STANDARD

Approach Guardrail 0 DOES NOT MEET CURRENT STANDARD

Approach Guardrail Ends: 0 DOES NOT MEET CURRENT STANDARD

Structural Evaluation: 5 BETTER THAN MINIMUM TOLERABLE CRITERIA

Deck Geometry: 2 INTOLERABLE, REPLACEMENT NEEDED

Underclearances Vertical and Horizontal N NOT APPLICABLE

Waterway Adequacy: 7 SLIGHT CHANCE OF OVERTOPPING BRIDGE & ROADWAY

Approach Roadway Alignment: 6 EQUAL TO MINIMUM CRITERIA

Scour Critical Bridges: 8 STABLE FOR SCOUR

DESIGN VEHICLE, RATING, and POSTING

Load Rating Method (Inv): 2 ALLOWABLE STRESS (AS)

Posting Status: A OPEN, NO RESTRICTION

Bridge Posting: 5 NO POSTING REQUIRED

Load Posting: 10 NO LOAD POSTING SIGNS ARE NEEDED

Posted Vehicle: POSTING NOT REQUIRED

Posted Weight (tons):

Design Load: 2 H 15

INSPECTION and CROSS REFERENCE

X-Ref. Route:

Insp. Date: 062012 **Insp. Freq. (months)** 24 **X-Ref. BrNum:**

INSPECTION SUMMARY and NEEDS

06/26/12 Fair condition as deck, fascias, exterior t beams & substructure continues to deteriorate. Concrete parapet along the southwest side is cracked through. Bridge should have extensive recon or replacement in near future. ~MJK JM

05/03/10 Approach rail should be connected to the bridge rail. Broken section of the concrete parapet rail should be repaired. Trees and brush should be removed from the channel. Spalling on abutment #2 should be cleaned and patched. ~ FRE/RF

VT AGENCY OF TRANSPORTATION PROGRAM DEVELOPMENT DIVISION

HYDRAULICS UNIT

TO: Chris Williams, Structures Project Manager

FROM: Leslie Russell, P.E., Hydraulics Project Supervisor

DATE: 23 July 2014

SUBJECT: Poultney BF 0138(12) VT 140 (FAS 138) BR 9 over Finel Hollow Brook – Preliminary Hydraulics

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

Existing Conditions

This is a major town collector road so is subject to Q50 flows. The existing structure is a single span concrete t-beam bridge that was built in 1900. The abutments are concrete. The western abutment was built on ledge. The clear span is approximately 23' wide with a clear height of approximately 15'. The stream makes a slight turn into the bridge and comes straight out of the structure. There is some ledge constricting the channel through the structure. The bridge inspection reports do not indicate any hydraulic problems.

Our calculations, field observations and measurements indicate the existing structure does meet the current standards of the VTrans Hydraulic Manual although it does not meet state stream equilibrium standards for bankfull width (span length). With the average low beam elevation of 533.5' and a Q50 water surface elevation of 525.7', there is more than enough freeboard with this bridge. In fact, all flows up to and including Q500 flow through this bridge.

Recommendations

In sizing a new structure we attempt to select structures that meet both the current VTrans hydraulic standards, state environmental standards with regard to span length and opening height, and allow for roadway grade and other site constraints. Since this bridge is hydraulically adequate, our primary concern with a new bridge is not to increase Q100 water surface elevation and try to meet ANR stream equilibrium standards for bankfull width.

Based on the above considerations and the information available, we recommend the minimum standards for a new bridge at this site:

1. A new bridge should have a 30' minimum clear span measured perpendicular to the channel. It seems it can be widened more easily on the eastern side. The low beam elevation should be no lower than 531.0' in order not to have any increase in water surface elevations.

2. If it is determined that the existing abutments can be rebuilt and reused, then the low beam of this bridge should be no lower than 531.0'.

General Comments

If a new bridge is installed, the bottom of abutment footings should be at least six feet below the

channel bottom, or to ledge, to prevent undermining. Abutments on piles should be designed to be free standing for a scour depth at least 6' below channel bottom.

It is always desirable for a new structure of this size to have flared wingwalls at the inlet and outlet, to smoothly transition flow through the structure, and to protect the structure and roadway approaches from erosion. The wingwalls should match into the channel banks. Any new structure should be properly aligned with the channel, and constructed on a grade that matches the channel. A new structure should span the natural channel width.

Stone Fill, Type IV should be used to protect any disturbed channel banks or roadway slopes at the structure's inlet and outlet, up to a height of at least one-foot above the top of the opening. The stone fill should not constrict the channel or structure opening.

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

LGR

cc: Hydraulics Project File via NJW
Hydraulics Chrono File

AGENCY OF TRANSPORTATION **OFFICE MEMORANDUM**

To: Chris Williams, Project Manager, Structures

TDE CEE

From: Thomas D. Eliassen, Transportation Geologist via Callie Ewald, P.E. for Christopher C. Benda, P.E., Geotechnical Engineering Manager

Date: July 2, 2014

Subject: Poultney BF 0138(12) Preliminary Geotechnical Information Report

In an effort to assist the Structures Section with their bridge type study, the Geotechnical Engineering Unit within the Construction and Materials Bureau has completed a review of available geological data near Bridge No. 2 on Vermont Route VT-140 which crosses over Finel Hollow Brook in Poultney, Vermont. Figure 1 shows the bridge as viewed from the east.

Figure 1 Bridge No. 2 on VT-140 in Poultney, Vermont.

This review included a review of as-built record plans, the examination of historical in-house bridge boring files, observations made during a site visit, a review of USDA Natural Resources

Conservation soil survey records, published surficial and bedrock geologic maps and water well logs on-file at the Agency of Natural Resources.

As-built construction plans were not found for this bridge.

Figure 3 shows the current abutments. Note that the western abutment lies directly on bedrock.

Figure 2 Photograph looking north showing the bridge abutments. Notice bedrock exposed at western abutment.

No boring log data were found in the Soils & Foundations project database or in-house historical boring log records.

A site visit was performed on April 4, 2014 for the purposes of assessing topographic and geologic conditions that may impact the design and/or construction of the proposed bridge. Observations were also made of existing utility locations and logistical site access conditions. The topography is of fairly low relief adjacent to the Poultney River as it flows toward the west. The brook bottom appeared to be floored by gravel and cobbles. Overhead cable, telephone and power lines are present along the northern side of VT-140. Access for drilling borings appears favorable.

USDA Natural Resources Conservation soil survey records indicate that surficial soils in the area of the bridge consist of 52B—Macomber-Dutchess complex, 3 to 8 percent slopes. Figure 4 presents a depiction of soil types in the vicinity of the subject bridge.

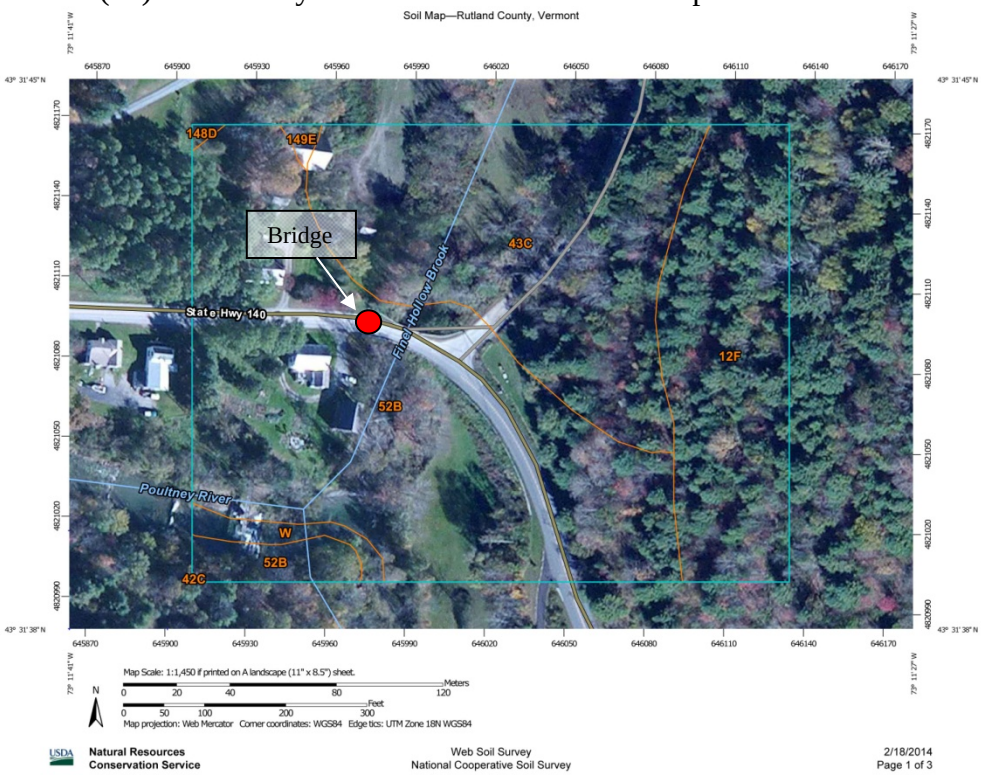

Figure 3 USDA Soil Map showing the distribution of soil types at the subject project site.

Drilling logs from private drinking water wells in the area of a project can be helpful in anticipating what may be encountered in the subsurface. The Agency of Natural Resources Private Well Locator interactive map was reviewed for these purposes.

Seven water wells are present within approximately a ¼-mile radius from the subject project location. Based on lithologies reported on the driller logs, the subsurface in the area of the subject bridge is underlain by glacial till (hardpan), gravel and clay deposits. Figure 5 depicts the reported lithologies encountered in these nearby water wells. It should be noted that these logs were developed and provided by the well drilling companies whose employees may have had little to no training in identifying soil and rock.

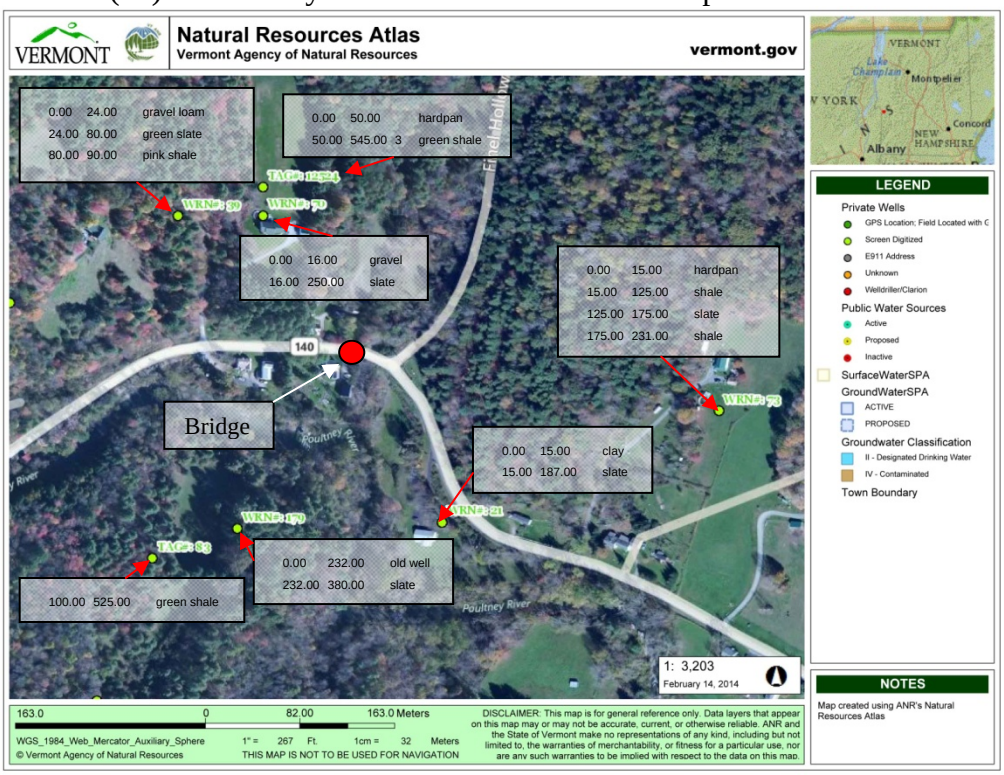

Figure 4 Map showing water well locations in the vicinity of Bridge 2. Also listed on this map are the driller well log notes referencing the stratigraphy encountered.

Surficial mapping conducted for the 1970 Surficial Geologic Map of Vermont indicates that the subject area is underlain by recent alluvium and glacial till.

According to the 2011 bedrock map of Vermont, the project area overlies bedrock consisting of Mettawee slate facies rocks of the Bull Formation described as "Greenish-gray to pale-lustrous-green chlorite-muscovite-quartz phyllite, and green and purple, bedded and mottled phyllite. Locally contains boudins and thin beds of limestone and pods of pinkish-gray to cream-white dolostone, and minor quartzite".

As a result of our preliminary investigation, we anticipate the following possible foundation options:

- Reinforced concrete abutments on spread footings
- Pile supported abutments

We recommend drilling two borings at opposite corners of the proposed bridge in order to more fully assess the subsurface conditions at the site including, but not limited to, the soil properties, ground water conditions and depth to and condition of bedrock. If variable conditions are encountered or bedrock is shallow, additional borings should be advanced to establish a more detailed bedrock profile.

If you have any questions, please feel free to contact us at 828-6916.

c: WEA/Read File
CCB/Project File

State of Vermont
Program Development Division
One National Life Drive
Montpelier, VT 05633-5001
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[phone] 802-828-3979
[fax] 802-828-2334
[ttd] 800-253-0191

Agency of Transportation

To: James Brady, VTrans Environmental Specialist

From: Glenn Gingras, VTrans Environmental Biologist

Date: 04/18/14

Subject: Poultney BF 0138(12) - Natural Resource ID

I have completed my natural resource scoping review for the above referenced project. My evaluation has included the following resources: wetlands, wildlife habitat, agricultural soils, and rare, threatened and endangered species. I have reviewed all existing mapped information and performed a site review of the project area.

The project involves bridge 2 on VT140 (TH2) in Poultney, VT. The bridge carries travelers over Finel Hollow Brook at this location. As the project is in scoping an alternative has not been selected. Resources have been identified in the surrounding area to aid in the determination of a least damaging practical alternative.

Wetlands/Watercourses

No wetlands are present within the project area.

Finel Hollow Brook is the only watercourse present in the project area. Finel Hollow Brook is a direct tributary to the Poultney River. Between 2005-2007, a phase 1 geomorphic assessment was conducted by Hilary Solomon, Poutney Mettowee Natural Resources Conservation District. The report is available for reference at here.

The US Corps of Engineers and the Agency of Natural Resources- Department of Environmental Conservation would regulate all activities below ordinary high water within the Finel Hollow Brook. Once project plans are conceptualized we can evaluate potential impacts on waterways and evaluate project permits that will be required.

Wildlife Habitat

No significant terrestrial wildlife habitat exists within the project area. A variety of aquatic species including wild brook trout would occur within the Finel Hollow Brook. In stream timing restrictions will be likely required during construction.

Rare, Threatened and Endangered Species (R/T/E)

I have queried the VT Fish and Wildlife Wildlife Diversity database and no R/T/E species are present within the project area. The USFWS Information, Planning and Conservation System-(IPac) mapping indicates no occurrences of any federally listed species.

Agricultural Soils

Prime agricultural soils are mapped within the entire project area.

VERMONT

Jeannine Russell
VTrans Archaeology Officer
State of Vermont
Environmental Section
One National Life Drive
Montpelier, VT 05633-5001
www.aot.state.vt.us

[phone] 802-828-3981
[fax] 802-828-2334
[ttd] 800-253-0191

Agency of Transportation

To: James Brady, VTrans Environmental Specialist

From: Jeannine Russell, VTrans Archaeology Officer
via Brennan Gauthier, VTrans Archaeologist

Date: 04/18/2014

Subject: Poultney BF 0138(12) – Archaeological Resource ID

James,

A field visit was conducted on 4/17/2014 in order to assess archaeological sensitivity in the area around Bridge No.2 on TH2 (Route 140) over Finel Hollow Brook in Poultney, Rutland County, VT. Field information was collected in the form of sketch maps and digital photography. Areas of archaeological sensitivity have been digitally mapped and added to the geodatabase for inclusion on future plans.

Two quadrants of archaeological sensitivity were identified based on undisturbed soil profiles and proximity to historic structures. The bridge is located in the village of East Poultney, an early hub of activity in the late 18th and early 19th centuries. Both quadrants are likely to cultural material related to early industrial and social contexts.

The brick Federal-style residential structure in the NW quadrant was built in 1811 by Thomas Todd, an early pioneer in woolen manufacturing in Poultney. He also constructed a dam and several grist, carding and cider mills in the 1820s A grist/cider mill in the SW quadrant was run by his son, Alanson Todd in 1820. The adjacent building was erected by Alanson in the mid 1820s and included a mill and barn complex, now located in the SW quadrant. This mill was later known as "Shaw's Grist and Cider Mill" ca. 1880 and is mentioned in the Child's Gazetteer for Rutland County in 1881-1882. Further background and archival research will likely yield additional information related to the history of the site.

Although not considered archaeologically sensitive, it's interesting to note the presence of a series of large red slate slabs upstream from the current bridge. These slabs appear to be components of a larger slate footbridge that was likely erected contemporaneously with the Todd House. The stone is of similar color and size to many of the foundation stones visible in the outbuildings associated with house.

Both areas have been added to the archaeology VTrans geodatabase and should be added to future plan sets. If a temporary off-alignment bridge is required during construction, a Phase 1 sub-surface survey will be needed to assess site presence in both the NW and SW quads. Please feel free to contact me with any questions or concerns that may arise. For reference, I've included a series of maps and photographs to help highlight some of the important components of this resource ID.

Sincerely,

Brennan Gauthier
VTrans Archaeologist
Vermont Agency of Transportation
Environmental Section
1 National Life Drive
Montpelier, VT 05633
tel. 802-828-3965
Brennan.Gauthier@state.vt.us

VTrans Working to Get You There
Vermont Agency of Transportation

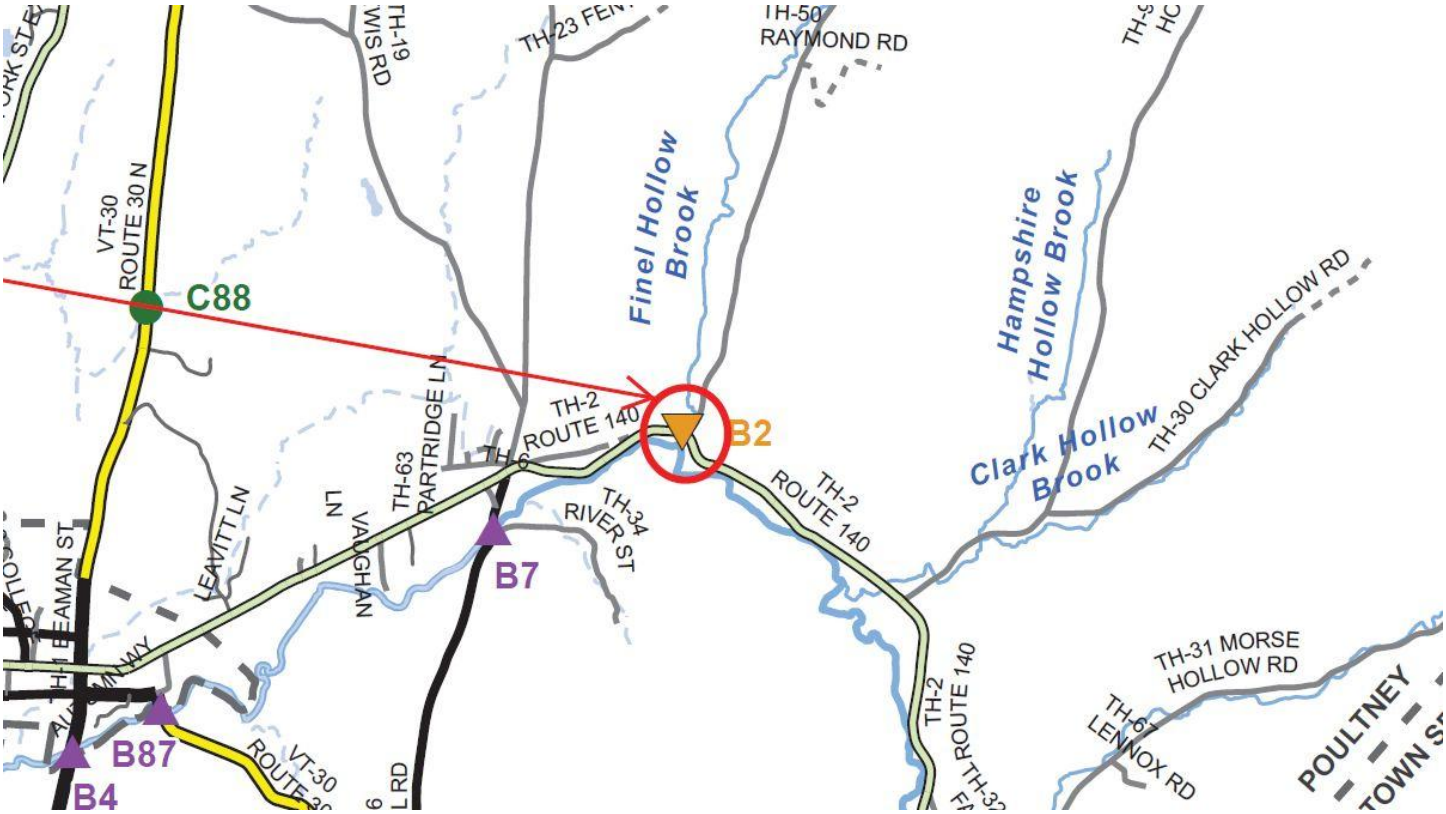


Figure 1: Bridge Location - Current Town Highway Map

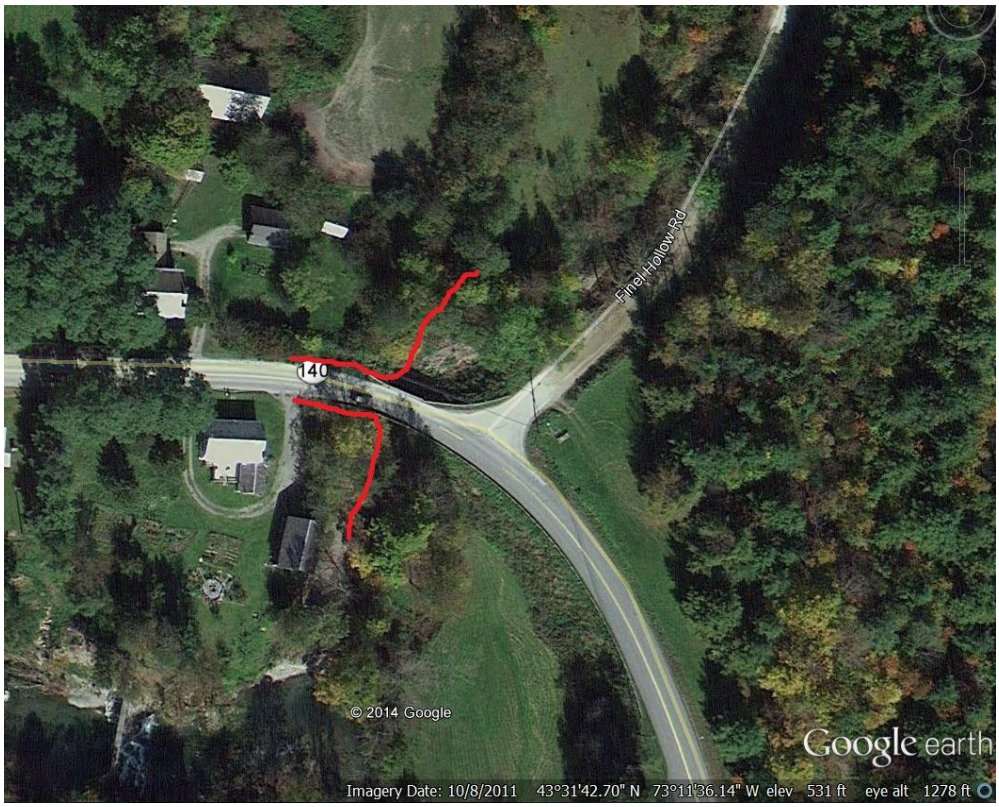


Figure 2: Arch Sensitive Quadrants

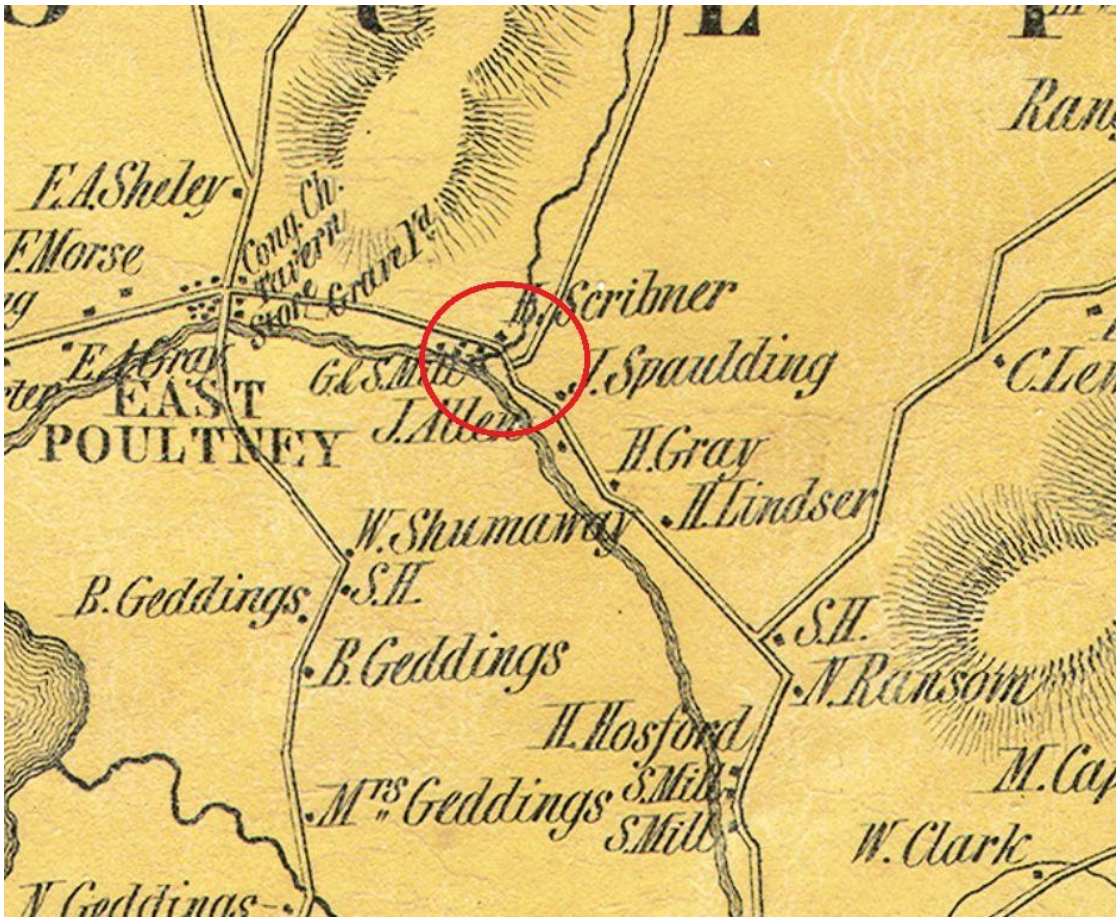


Figure 3: 1850s Map

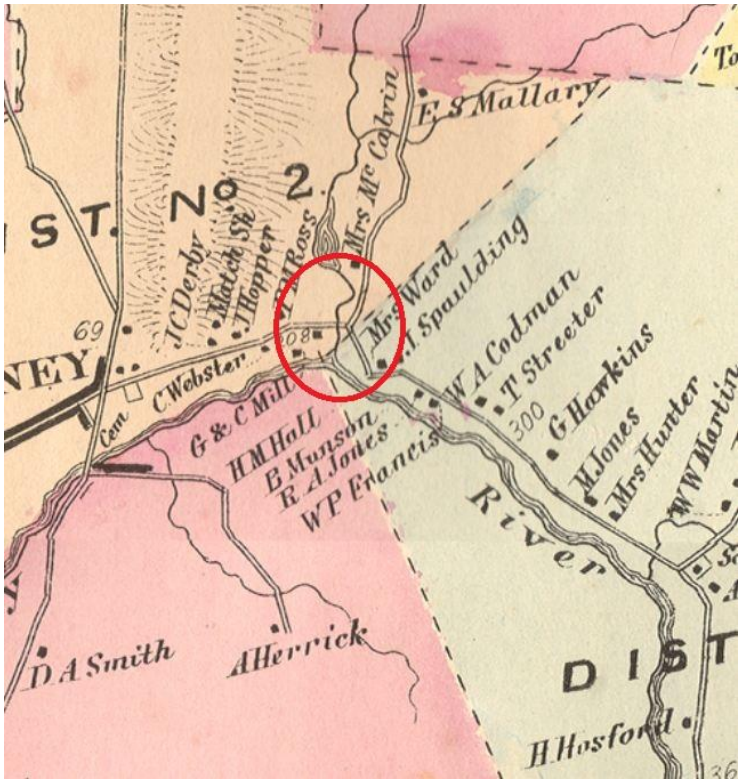


Figure 4: 1860s Map

shown that a fair without a horse-trot is not only possible, but really most successful.

East Poultney, a post village, located near the centre of the township, on Poultney River, contains three churches, two stores, one hotel, two blacksmith shops, one cheese factory, a tannery, saw mill, grist mill, etc., and a number of neat, substantial dwellings. The east village, though now the smallest of the two, was formerly the business centre of the town, and continued so until the building of the railroad, completed in 1852, and the springing up of the slate business in the west part of the town, when the west village outstripped it and is now much the larger place. Among the old houses of this village is that of Joseph Mears, built about the year 1780, and for a time used as a church by the Thompsonites, a division of the Congregational Church. The houses occupied by Stephen Scott and Mr. C. Ross, were built by John and Josiah Grant about the year 1800. The old Eagle Tavern, now occupied by Alexander Murdock, was built previous to the year 1800.

Shaw's grist and cider mill, located about half a mile east of East Poultney, operates two runs of stones, and manufactures about 450 barrels of cider per year.

The Green Mountain Grist Mill, owned by E. J. Williams, was built by him in 1872. It operates four runs of stones, and does custom work to a great extent.

Figure 5: 1882 Gazetteer Entry

Figure 6: Possible Slate Slab Footbridge

Stone, Laura

From: O'Shea, Kaitlin
Sent: Monday, February 03, 2014 11:09 AM
To: Brady, James
Cc: Newman, Scott; Williams, Chris
Subject: Poultney BF 0138(12) Historic Resource ID

Hi James,

This project isn't in NERD, but it's on Chris Williams' list of Bridge IDs and I was in the Poultney area last week.

The historic resource ID for Poultney Bridge 2 is complete. The bridge is not a historic resource due to loss of integrity. The two adjacent properties located to the NW and SW of the bridge are historic. These have been identified on arcmap and saved under the project name.

The replacement railing should be compatible with the historic properties, such as a modified tenney or something similar. This can be discussed as the project progresses.

Please let me know if you have any questions.

Thanks,
Kaitlin

Kaitlin O'Shea
Historic Preservation Specialist
Vermont Agency of Transportation

802-828-3962
Kaitlin.O'Shea@state.vt.us

Local & Regional Input Questionnaire

Project Name: Bridge # 2 over Finel Hollow Brook **Project Number: Poultney BF 0138(12) FAS 0138**

Community Considerations

1. Are there any scheduled public events in the community that will generate increased traffic (e.g. vehicular, bicycles and/or pedestrians), or may be difficult to stage if the bridge is closed during construction? Examples include: a bike race, festivals, cultural events, farmers market, concerts, etc. that could be impacted? If yes, please provide date, location and event organizers' contact info. **Solar Fest in Middletown Springs the second week in July.**
2. Is there a "slow season" or period of time from May through October where traffic is less? **Not really. No change in Traffic patterns that I aware of**
3. Please describe the location of emergency responders (fire, police, ambulance) and emergency response routes. **The locations of the Rescue Squad is on 409 VT Route 30 South. The Fire Department is located in the Village of Poultney at 263 Beaman Street. Their routes cover all Poultney locations. Mutual Aid covers Middletown Springs on Route 140.**
4. Where are the schools in your community and what are their schedules? **Poultney High School is located on East Main 154 East Main Street. The High School is located at 96 School Circle. Both Schools are located in the Village.**
5. In the vicinity of the bridge, is there a land use pattern, existing generators of pedestrian and/or bicycle traffic, or zoning that will support development that is likely to lead to significant levels of walking and bicycling? Please explain. **Yes. Bicyclists use Vt Route 140 often.**
6. Are there any businesses (including agricultural operations) that would be adversely impacted either by a detour or due to work zone proximity? **Yes.**
7. Are there any important public buildings (town hall or community center) or community facilities (recreational fields or library) in close proximity to the proposed project? **East Poultney Green, Churches, Museums.**
8. Are there any town highways that might be adversely impacted by traffic bypassing the construction on another local road? **Yes. The Finel Hollow Rd, Hampshire Hollow, the Highland Gray Rd, Pond Hill Ranch Rd. and the Gorhamtown Rd.**
9. Are there any other municipal operations that could be adversely impacted if the bridge is closed during construction? If yes, please explain. **Road maintenance and perhaps fire protection. Access would be affected by detours.**
10. Please identify any local communication channels that are available—e.g. weekly or daily newspapers, blogs, radio, public access TV, Front Porch Forum, etc. Also include any unconventional means such as local low-power FM. **WVNR local radio station, the Lakes Region Free Press and the Rutland herald.**

11. Is there a local business association, chamber of commerce or other downtown group that we should be working with? **the Poultney Chamber of Commerce.**

Design Considerations

1. Are there any concerns with the alignment of the existing bridge? For example, if the bridge is located on a curve, has this created any problems that we should be aware of? **Yes. a curve that creates vehicles to cross into other traffic lanes. Especially large trucks.**

2. Are there any concerns with the width of the existing bridge? **Yes. Not wide enough.**

3. What is the current level of bicycle and pedestrian use on the bridge? **Fair amount in the Summer and fall.**

4. If a sidewalk or wide shoulder is present on the existing bridge, should the new structure have one? Are there existing bicycle and/or pedestrian facilities on the approaches to the bridge? **There are no sidewalks or wide shoulders on this road approaching the bridge. If one were to be located it would have to start further on down the road in a Westerly and Easterly direction, otherwise it is not located to a connecting pedestrian facility.**

5. Does the Town have plans to construct either bicycle or pedestrian facilities leading up to the bridge? Please provide a copy of the planning document that demonstrates this (e.g. scoping study, master plan, corridor study) Please explain and provide documentation. **Not at this time. We are however near the East Poultney Green over the Gorge in East Poultney. Poultney STP EH 12(1) Thrall Road.**

6. Does the bridge provide an important link in the town or statewide bicycle or pedestrian network such that you feel that bicycle and pedestrian traffic should be accommodated during construction**? VT Route 140 from Poultney to Middletown Springs.**

7. Are there any special aesthetic considerations we should be aware of? **Just make it pretty and functional.**

8. Are there any traffic, pedestrian or bicycle safety concerns associated with the current bridge? If yes, please explain. **Too narrow and the alignment is terrible. The concrete guardrails are about to fall into the Finel Hollow Brook because of vehicles hitting them.**

9. Does the location have a history of flooding? If yes, please explain. **I have been here for 29 years and have never seen this area flood, however the land adjacent to is located in the Flood Zone.**

10. Are you aware of any nearby Hazardous Material Sites? **No.**

11. Are you aware of any historic, archeological and/or other environmental resource issues? **See the Categorical Exclusion application submitted to Kenneth Sikora dated July 8, 2011 and Mathew Hake Federal Highway Administration. I f you need a copy, I will send you a copy.**

12. Are there any other comments you feel are important for us to consider that we have not mentioned yet? **Please contact Chad Whitehead, PE from the Durfesne Group Consulting Engineers regarding the plans and bid specification s for this Bridge completed in 2010**

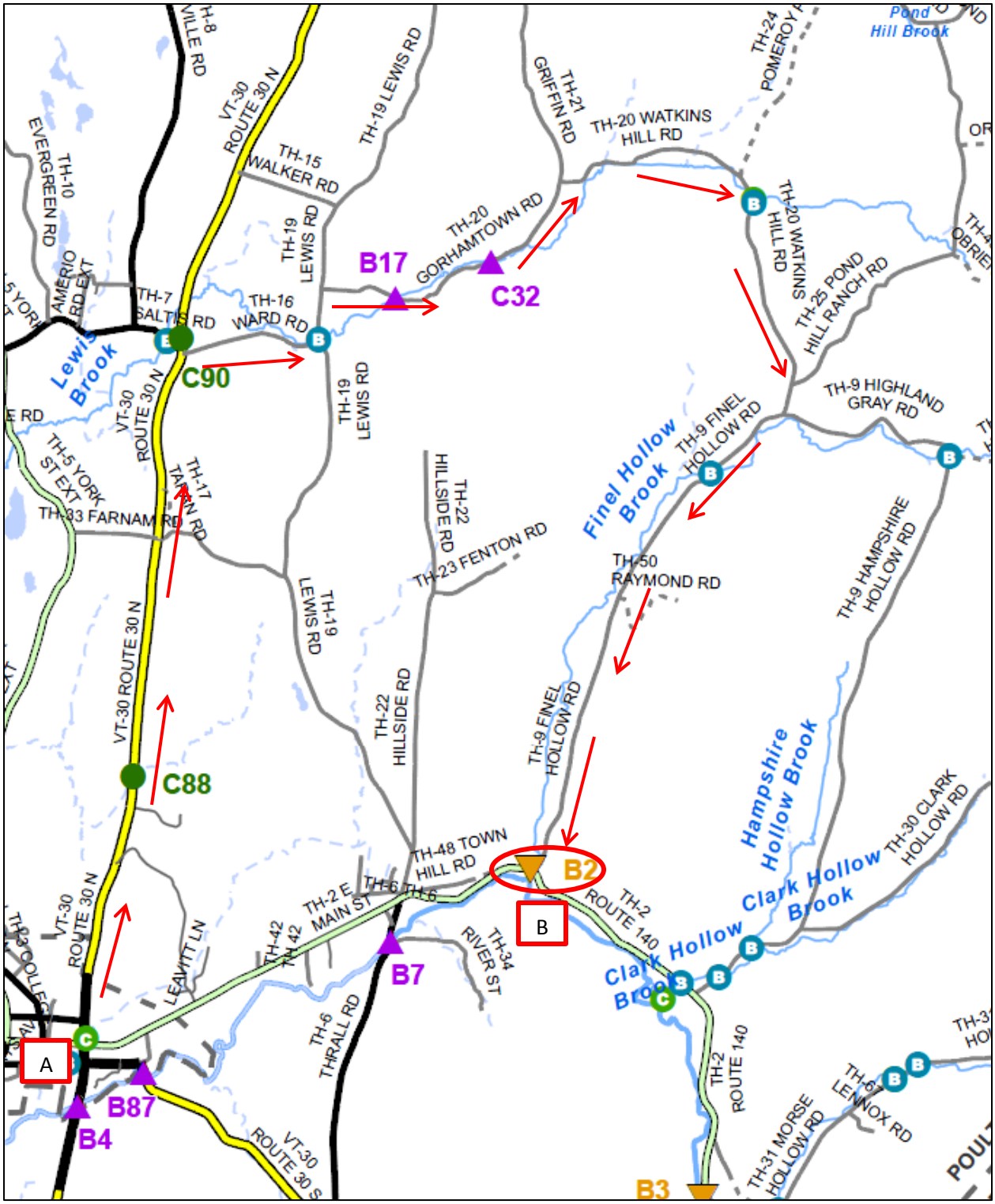
Land Use & Public Transit Considerations – to be filled out by the municipality or RPC.

1. Does your municipal land use plan reference the bridge in question? If so please provide a copy of the applicable section or sections of the plan. **Copy of Town Plan attached. Located in the Capital Plan**

2. Please provide a copy of your existing and future land use map, if applicable. **Attached**

3. Are there any existing, pending or planned development proposal that would impact future transportation patterns near the bridge? If so please explain. **None**

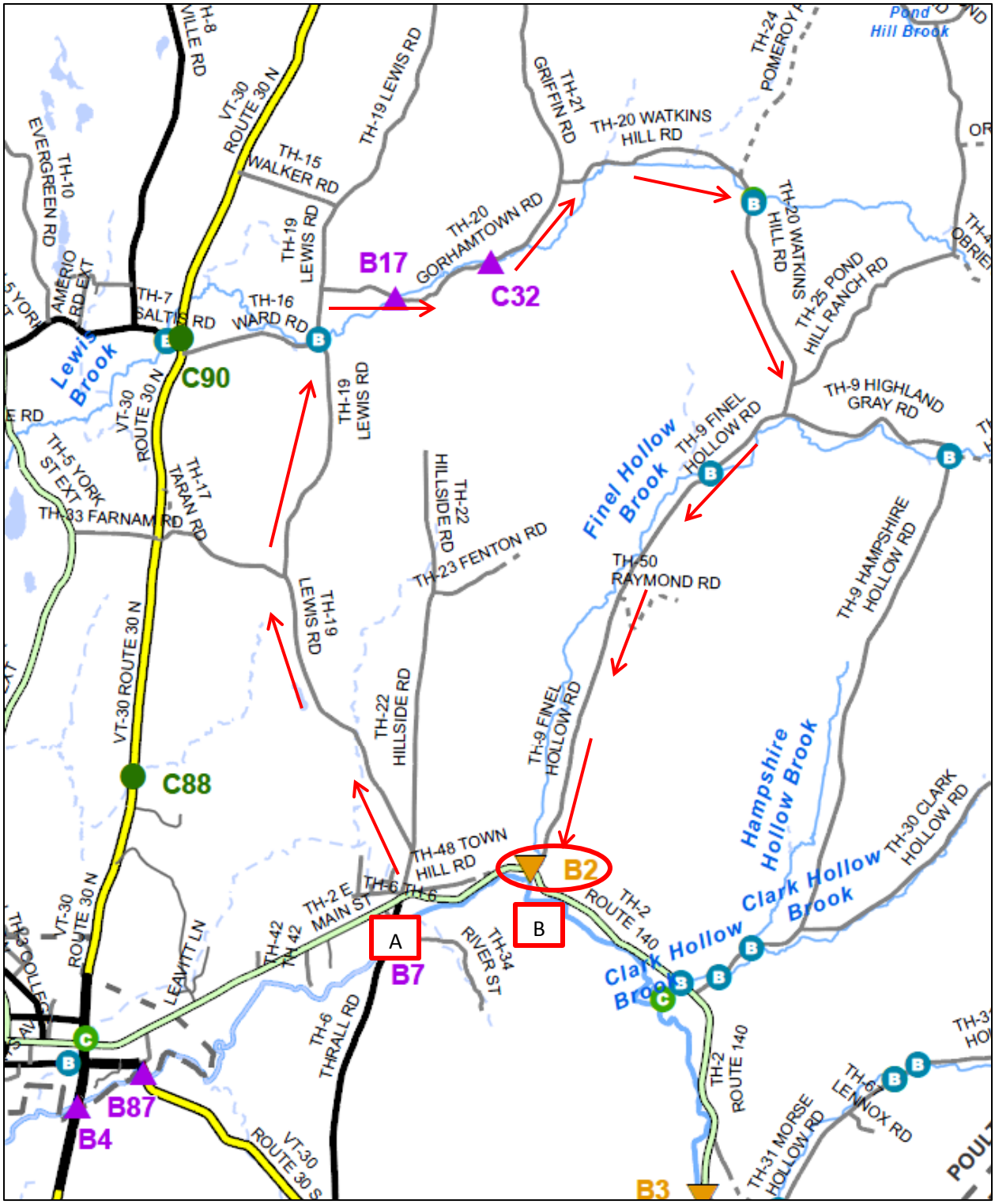
4. Is there any planned expansion of public transit service in the project area? If not known please contact your Regional Public Transit Provider. **None**



Possible Detour Route 1

VT Route 140 (TH 2), to VT Route 30, Ward Road, Lewis Road, Gorhamtown Road, Watkins Hill Road, Finel Hollow Road, back to VT Route 140

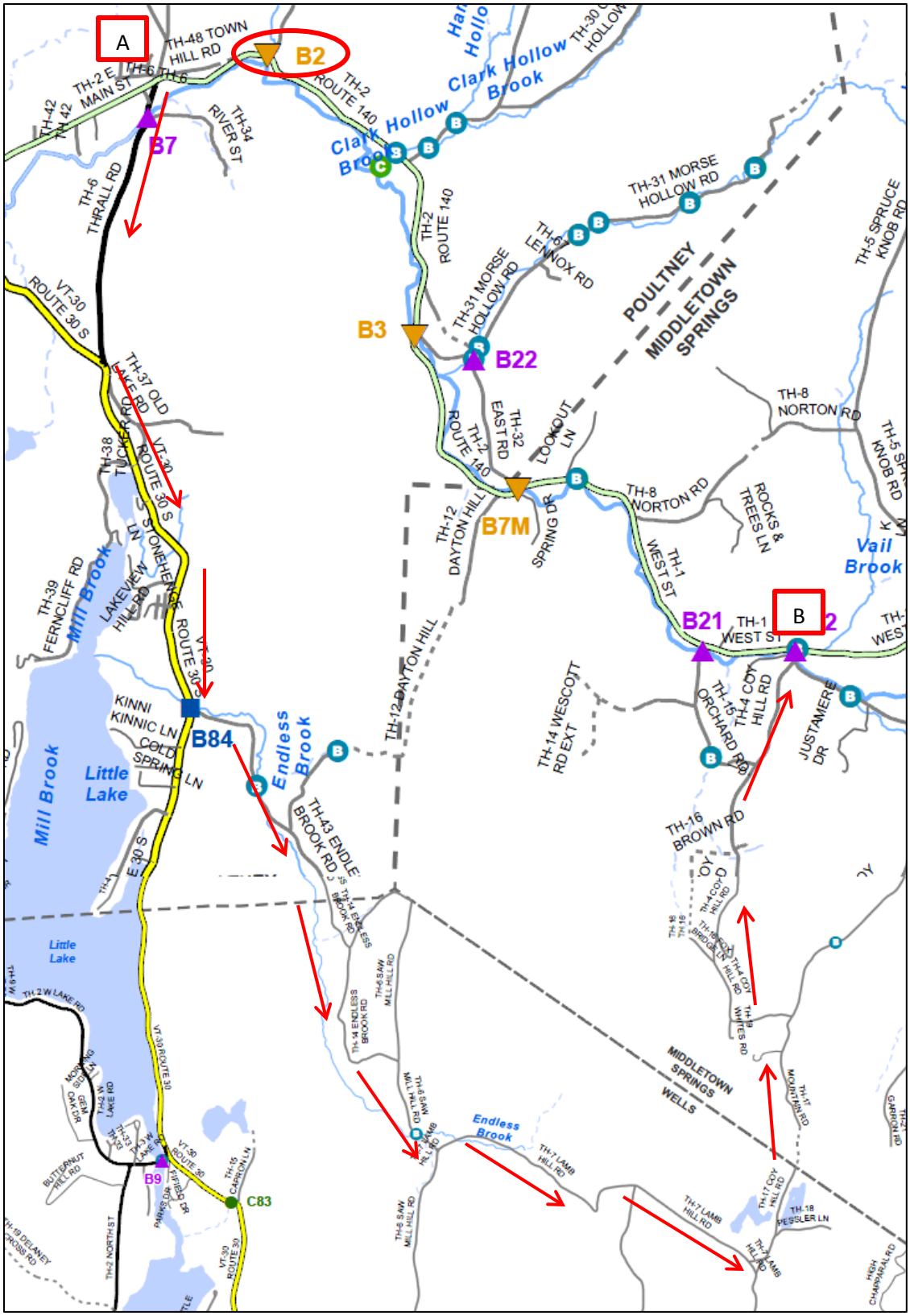
A – B Through Route: 2.2 Miles
A – B Detour Route: 9.8 Miles
Added Miles: 7.6 Miles
End-End Distance: 12.0 Miles



Possible Detour Route 2

VT Route 140 (TH 2), to Hillside road, Lewis Road, Gorhamtown Road, Watkins Hill Road, Finel Hollow Road, back to VT Route 140

A – B Through Route: 0.6 Miles
A – B Detour Route: 8.8 Miles
Added Miles: 8.2 Miles
End-End Distance: 9.4 Miles



Possible Detour Route 3

VT Route 140 (TH 2), to Thrall Road, VT Route 30, Endless Brook Road, Lamb Hill Road, Mountain Road, Coy Hill Road, back to VT Route 140

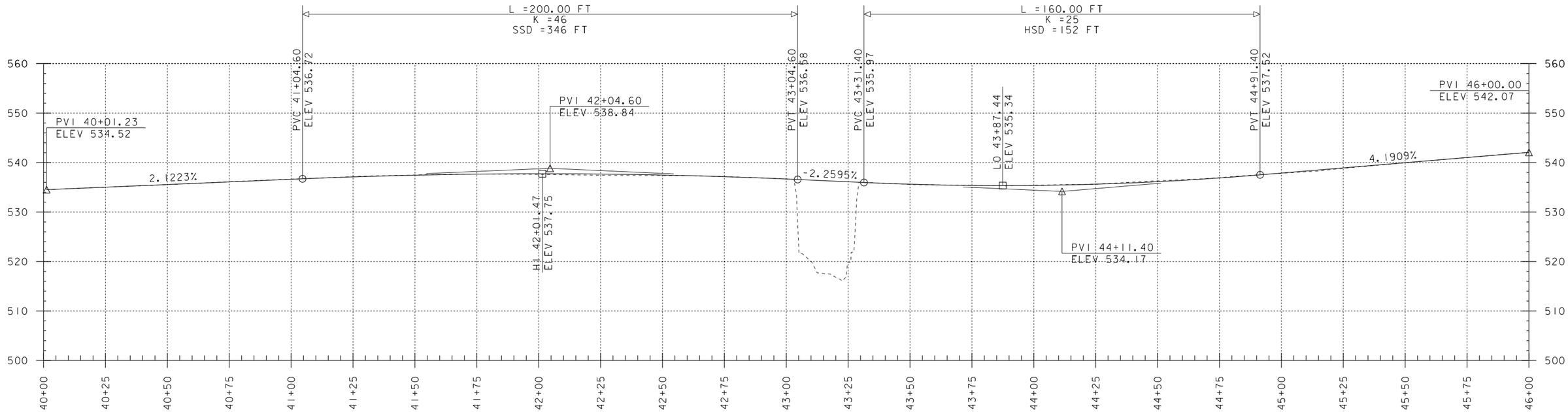
A – B Through Route: 5.6 Miles
A – B Detour Route: 12.3 Miles
Added Miles: 6.7 Miles
End-End Distance: 17.9 Miles

EXISTING CONDITIONS

SCALE 1" = 20'-0"

20 0 20

PROJECT NAME: POULTNEY	
PROJECT NUMBER: BF 0138(12)	
FILE NAME: 13j276/s13j276border.dgn	PLOT DATE: 09-DEC-2014
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: ------	CHECKED BY: ------
EXISTING CONDITIONS	SHEET 1 OF 14



TH 2 PROFILE

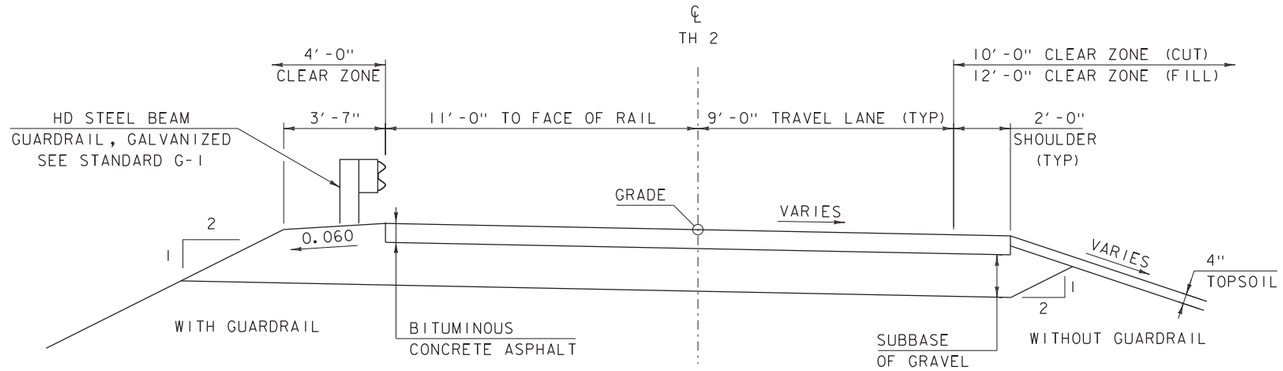
SCALE: HORIZONTAL 1"=20'-0"
VERTICAL 1"=10'-0"

NOTE:

GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄

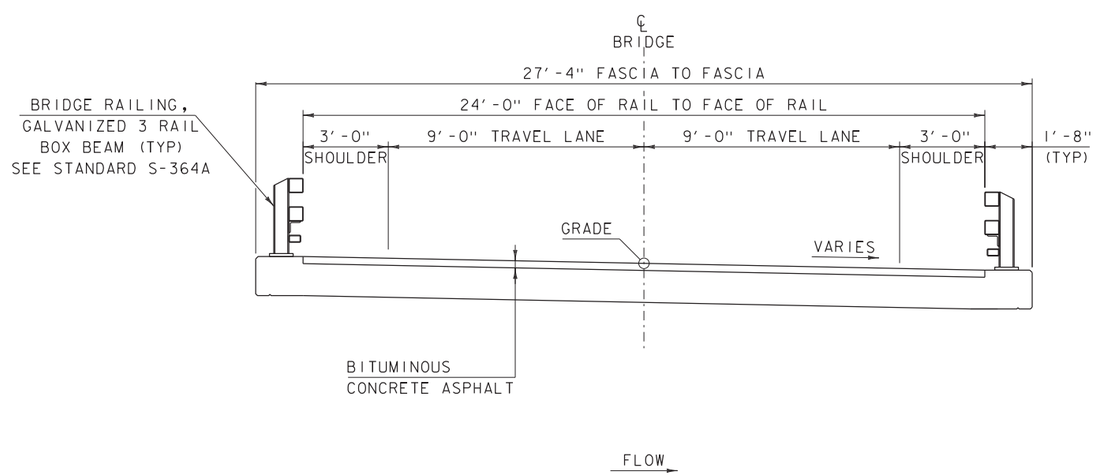
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

PROJECT NAME: POULTNEY	
PROJECT NUMBER: BF 0138(12)	
FILE NAME: 13j276/s13j276profile.dgn	PLOT DATE: 09-DEC-2014
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: ------	CHECKED BY: ------
PROFILE SHEET	SHEET 2 OF 14



PROPOSED TH 2 TYPICAL SECTION

SCALE 3/8" = 1'-0"



PROPOSED BRIDGE TYPICAL SECTION

SCALE 3/8" = 1'-0"

MATERIAL TOLERANCES

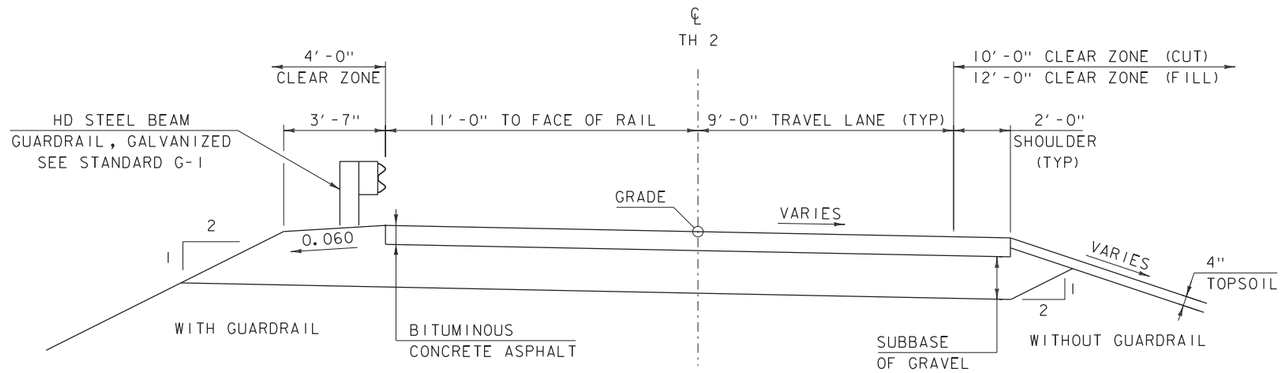
(IF USED ON PROJECT)

SURFACE	
- PAVEMENT (TOTAL THICKNESS)	+/- 1/4"
- AGGREGATE SURFACE COURSE	+/- 1/2"
SUBBASE	+/- 1"
SAND BORROW	+/- 1"

PROJECT NAME: POULTNEY
PROJECT NUMBER: BF 0138(12)

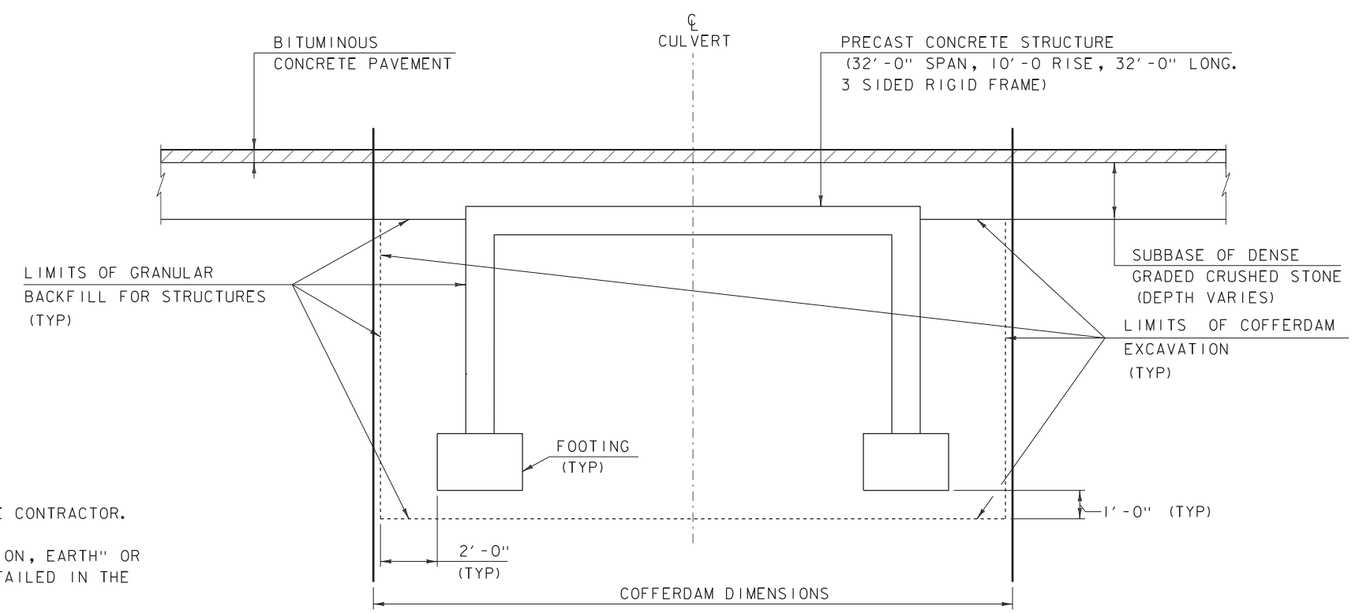
FILE NAME: 13j276/s13j276typical.dgn
PROJECT LEADER: C.P.WILLIAMS
DESIGNED BY: L.J.STONE
TYPICAL SECTIONS

PLOT DATE: 09-DEC-2014
DRAWN BY: D.D.BEARD
CHECKED BY: L.J.STONE
SHEET 3 OF 14



PROPOSED TH 2 TYPICAL SECTION

SCALE 3/8" = 1'-0"



ALTERNATIVE 3 TYPICAL SECTION

N.T.S.

COFFERDAM NOTES

1. COFFERDAM DIMENSIONS TO BE DETERMINED BY THE CONTRACTOR.
2. THE PAY LIMITS OF EITHER "COFFERDAM EXCAVATION, EARTH" OR "COFFERDAM EXCAVATION, ROCK" SHALL BE AS DETAILED IN THE TYPICAL SECTION.
3. IF A COFFERDAM IS CONSTRUCTED WHICH IS LARGER THAN DETAILED ABOVE, NO MEASUREMENT AND PAYMENT WILL BE MADE FOR COFFERDAM EXCAVATION AND GRANULAR BACKFILL FOR STRUCTURES OUTSIDE THOSE PAY LIMITS.

MATERIAL TOLERANCES

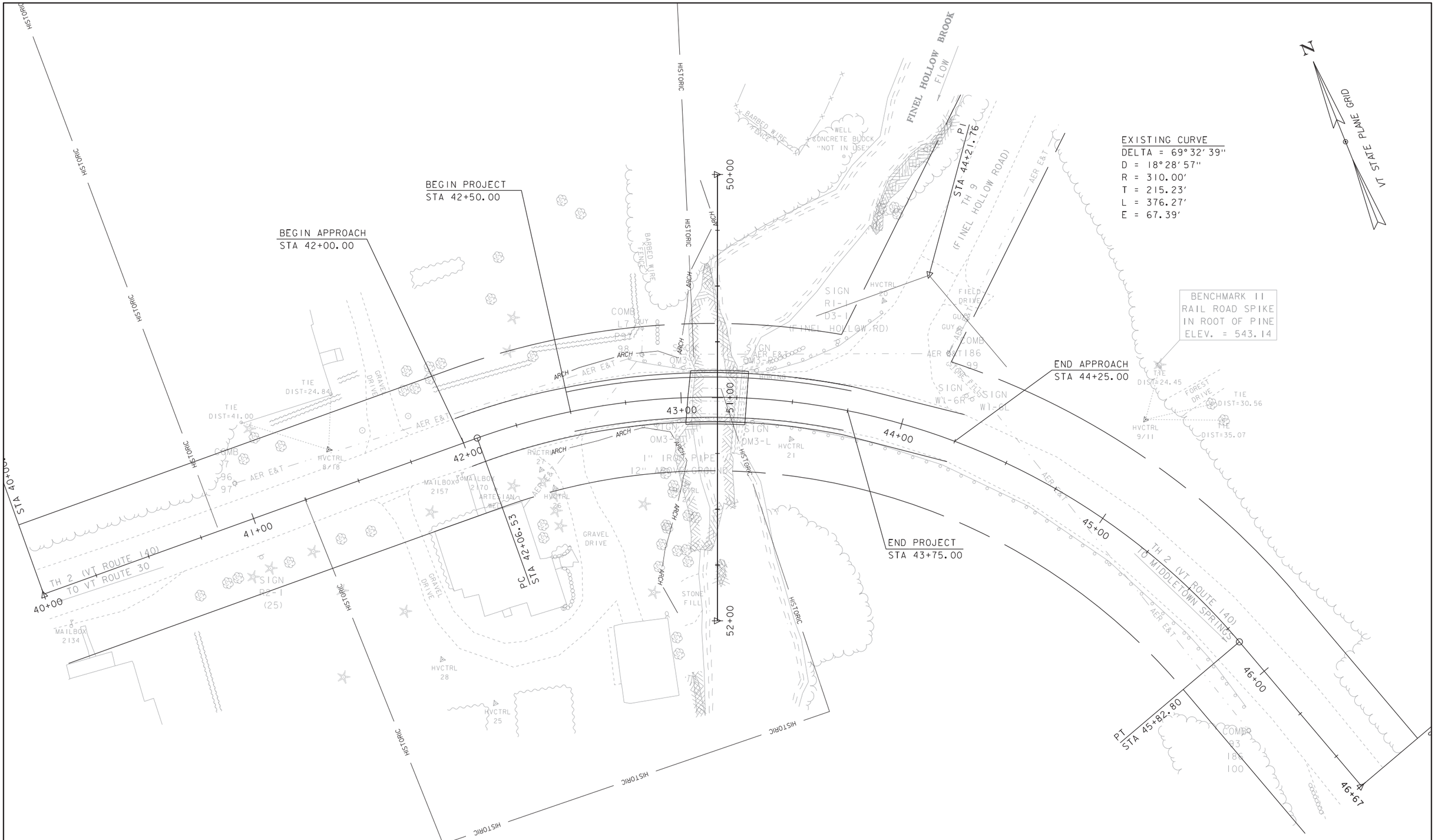
(IF USED ON PROJECT)

SURFACE	
- PAVEMENT (TOTAL THICKNESS)	+/- 1/4"
- AGGREGATE SURFACE COURSE	+/- 1/2"
SUBBASE	+/- 1"
SAND BORROW	+/- 1"

PROJECT NAME: POULTNEY
PROJECT NUMBER: BF 0138(12)

FILE NAME: 13j276/s13j276typical.dgn
PROJECT LEADER: C.P.WILLIAMS
DESIGNED BY: L.J.STONE
TYPICAL CULVERT SECTIONS

PLOT DATE: 09-DEC-2014
DRAWN BY: D.D.BEARD
CHECKED BY: L.J.STONE
SHEET 4 OF 14

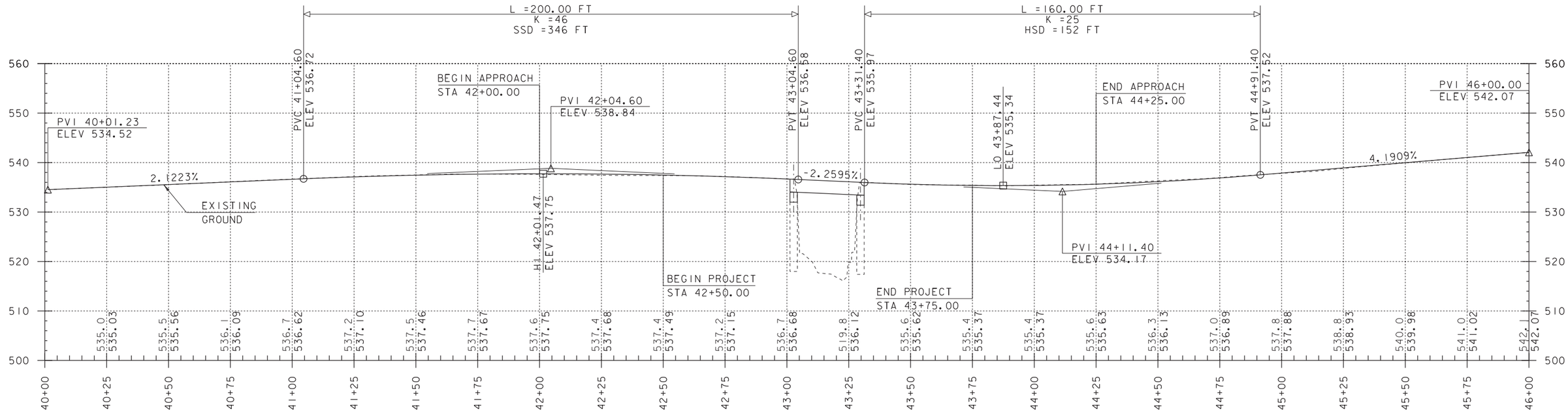


ALTERNATIVE #1 LAYOUT

SCALE 1" = 20'-0"

20 0 20

PROJECT NAME: POULTNEY	
PROJECT NUMBER: BF 0138(12)	
FILE NAME: 13j276/s13j276border.dgn	PLOT DATE: 09-DEC-2014
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: L.J.STONE	CHECKED BY: L.J.STONE
ALTERNTAIVE #1LAYOUT	SHEET 5 OF 14



ALTERNATIVE #1 PROFILE

SCALE: HORIZONTAL 1"=20'-0"
VERTICAL 1"=10'-0"

NOTE:

GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄

GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

PROJECT NAME: POULTNEY	
PROJECT NUMBER: BF 0138(12)	
FILE NAME: 13j276/s13j276profile.dgn	PLOT DATE: 09-DEC-2014
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: L.J.STONE	CHECKED BY: L.J.STONE
ALTERNATIVE 1 PROFILE SHEET	SHEET 6 OF 14

EXISTING CURVE
DELTA = 69°32'39"
D = 18°28'57"
R = 310.00'
T = 215.23'
L = 376.27'
E = 67.39'

BENCHMARK 11
RAIL ROAD SPIKE
IN ROOT OF PINE
ELEV. = 543.14

BEGIN PROJECT
STA 42+50.00

BEGIN APPROACH
STA 42+00.00

END PROJECT
STA 45+25.00

END APPROACH
STA 45+75.00

STA 40+00

PC
STA 42+09.53

PI
STA 44+21.76

PT
STA 45+82.80

TH 2 (VT ROUTE 140)
TO VT ROUTE 30

TH 2 (VT ROUTE 140)
TO MIDDLETOWN SPRINGS

TH 9
(FINEL HOLLOW ROAD)

FINEL HOLLOW BROOK
FLOW

VT STATE PLANE GRID

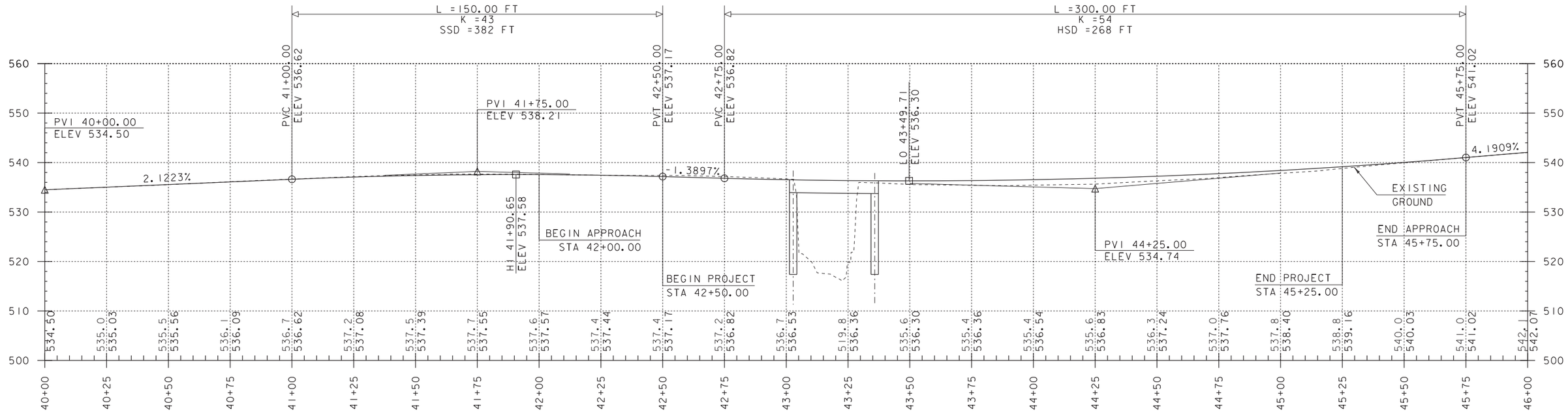
N

40+00
41+00
42+00
43+00
44+00
45+00
46+00
46+67
50+00
51+00
52+00

ALTERNATIVE #2 LAYOUT

SCALE 1" = 20'-0"
20 0 20

PROJECT NAME: POULTNEY	
PROJECT NUMBER: BF 0138(12)	
FILE NAME: 13j276/s13j276border.dgn	PLOT DATE: 09-DEC-2014
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: L.J.STONE	CHECKED BY: L.J.STONE
ALTERNATIVE #2 LAYOUT	SHEET 7 OF 14



ALTERNATIVE #2 PROFILE

SCALE: HORIZONTAL 1"=20'-0"
VERTICAL 1"=10'-0"

NOTE:

GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄

GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

PROJECT NAME: POULTNEY	
PROJECT NUMBER: BF 0138(12)	
FILE NAME: 13j276/s13j276profile.dgn	PLOT DATE: 09-DEC-2014
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: L.J.STONE	CHECKED BY: L.J.STONE
ALTERNATIVE 2 PROFILE SHEET	SHEET 8 OF 14

EXISTING CURVE
DELTA = 69°32'39"
D = 18°28'57"
R = 310.00'
T = 215.23'
L = 376.27'
E = 67.39'

BENCHMARK 11
RAIL ROAD SPIKE
IN ROOT OF PINE
ELEV. = 543.14

BLAESS, GEORGE A. & BARBARA P.

MOUNT, DAVID C. & SYLVIA

WILLIAMS, D. BRUCE & JOANNE D.

RINGER, WILLIAM L. Jr.

WADE, MAURICE H.

HUNTOON, BERNARD H. & LOUISE M. LIFE ESTATE

FINEL HOLLOW BROOK

TH 2 (VT ROUTE 140) TO VT ROUTE 30

TH 2 (VT ROUTE 140) TO MIDDLETOWN SPRINGS

TH 9 (FINEL HOLLOW ROAD)

STA 40+00

PC STA 42+96.53

STA 44+21.76 PI

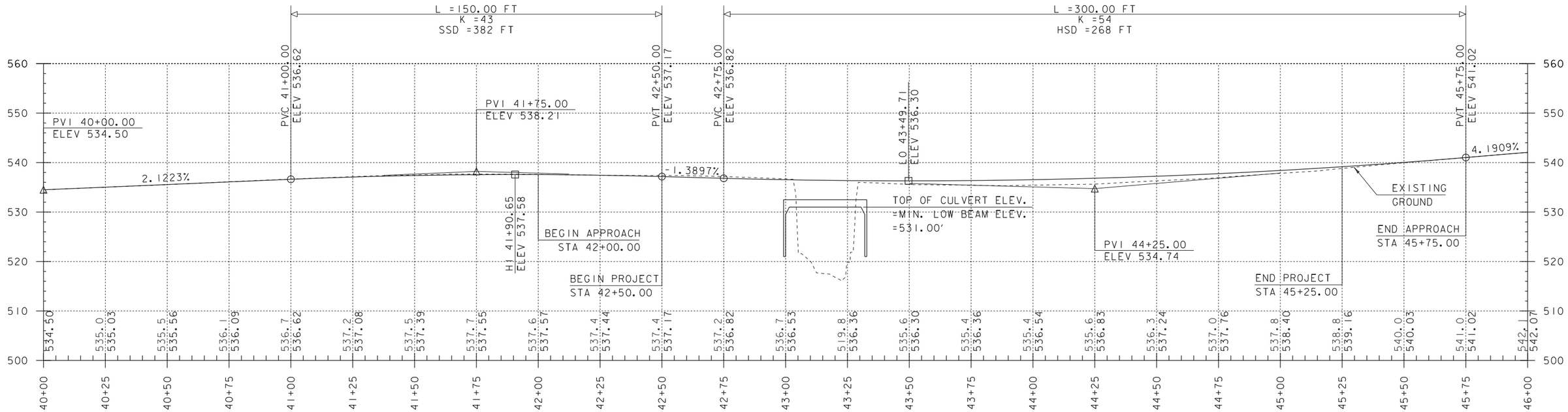
PT STA 45+82.80

VT STATE PLANE GRID

ALTERNATIVE #3 LAYOUT

SCALE 1" = 20'-0"
20 0 20

PROJECT NAME: POULTNEY	
PROJECT NUMBER: BF 0138(12)	
FILE NAME: 13j276/s13j276border.dgn	PLOT DATE: 09-DEC-2014
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: L.J.STONE	CHECKED BY: L.J.STONE
ALTERNATIVE #3 LAYOUT	SHEET 9 OF 14



ALTERNATIVE #3 PROFILE

SCALE: HORIZONTAL 1"=20'-0"
VERTICAL 1"=10'-0"

NOTE:

GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄

GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

PROJECT NAME: POULTNEY	
PROJECT NUMBER: BF 0138(12)	
FILE NAME: 13j276/s13j276profile.dgn	PLOT DATE: 09-DEC-2014
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: L.J.STONE	CHECKED BY: L.J.STONE
ALTERNATIVE 3 PROFILE SHEET	SHEET 10 OF 14

PROPOSED CURVE 1
DELTA = 19°48′06″
D = 16°51′06″
R = 340.00′
T = 59.34′
L = 117.50′
E = 5.14′

PROPOSED CURVE 2
DELTA = 49°44′33″
D = 16°51′06″
R = 340.00′
T = 157.62′
L = 295.18′
E = 34.76′

BEGIN PROJECT
STA 31+50.00

BEGIN APPROACH
STA 31+00.00

PI
STA 31+81.60

PI
STA 34+75.27

BENCHMARK 11
RAIL ROAD SPIKE
IN ROOT OF PINE
ELEV. = 543.14

END PROJECT
STA 35+50.00

END APPROACH
STA 36+00.00

PT
STA 32+39.76

PC
STA 33+17.65

PC
STA 31+24.25

PT
STA 36+12.83

FINEL HOLLOW BROOK
FLOW

TH 9
(FINEL HOLLOW ROAD)

TH 2 (VT ROUTE 140)
TO VT ROUTE 30

TH 2 (VT ROUTE 140)
TO MIDDLETOWN SPRINGS

VT STATE PLANE GRID

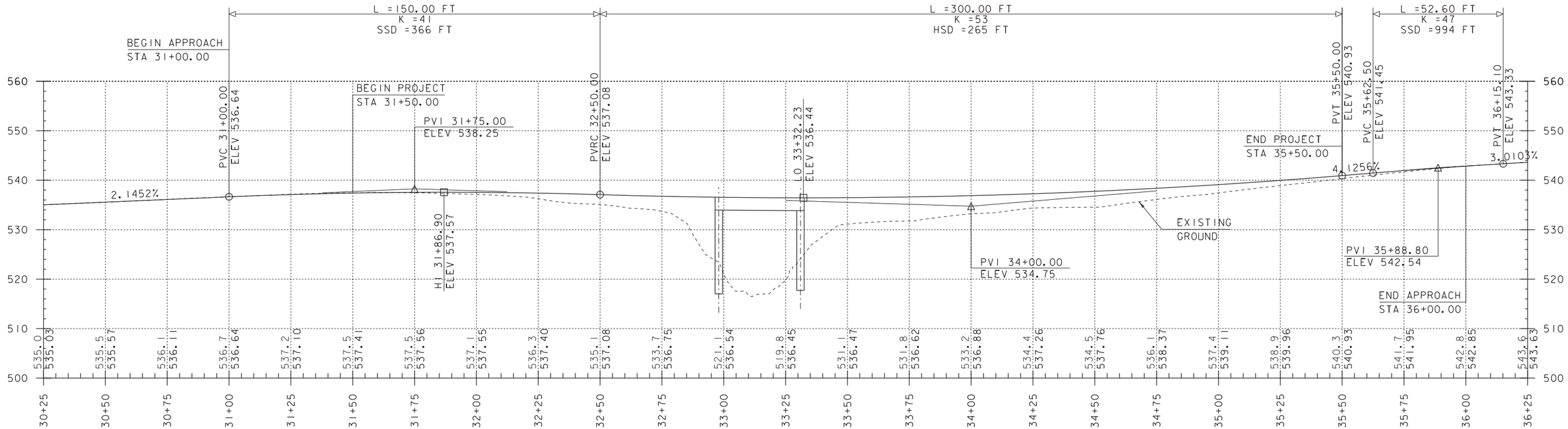
N

30+00
31+00
32+00
33+00
34+00
35+00
36+00
36+48
50+00
51+00
52+00

ALTERNATIVE #4 LAYOUT

SCALE 1" = 20′-0"
20 0 20

PROJECT NAME: POULTNEY	
PROJECT NUMBER: BF 0138(12)	
FILE NAME: 13j276/sl3j276border.dgn	PLOT DATE: 09-DEC-2014
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: L.J.STONE	CHECKED BY: L.J.STONE
ALTERNATIVE #4 LAYOUT	SHEET 11 OF 14



ALTERNATIVE #4 PROFILE

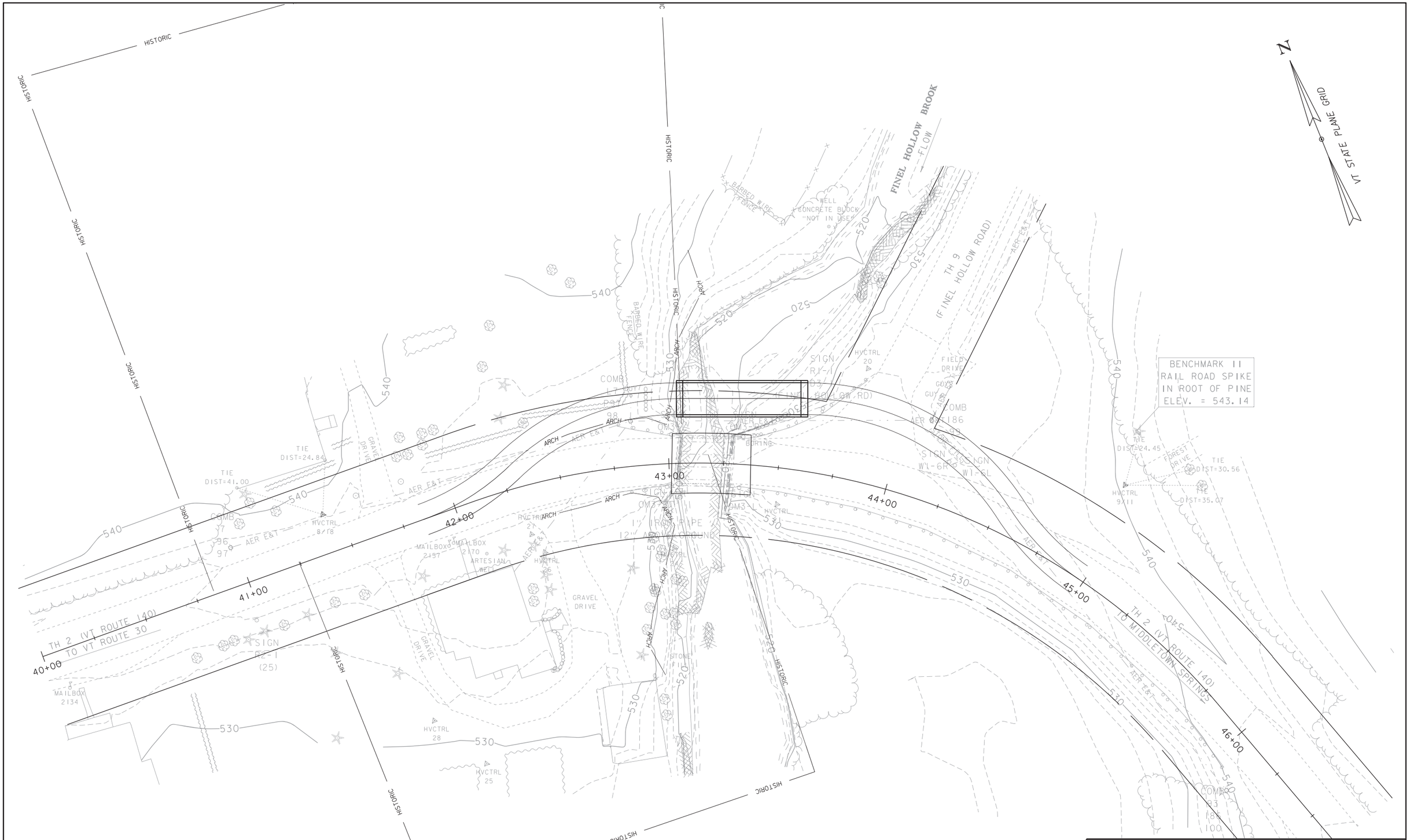
SCALE: HORIZONTAL 1"=20'-0"
VERTICAL 1"=10'-0"

NOTE:

GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄

GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

PROJECT NAME: POULTNEY	
PROJECT NUMBER: BF 0138(12)	
FILE NAME: 13j276/s13j276profile.dgn	PLOT DATE: 09-DEC-2014
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: L.J.STONE	CHECKED BY: L.J.STONE
ALTERNATIVE 4 PROFILE SHEET	SHEET 12 OF 14

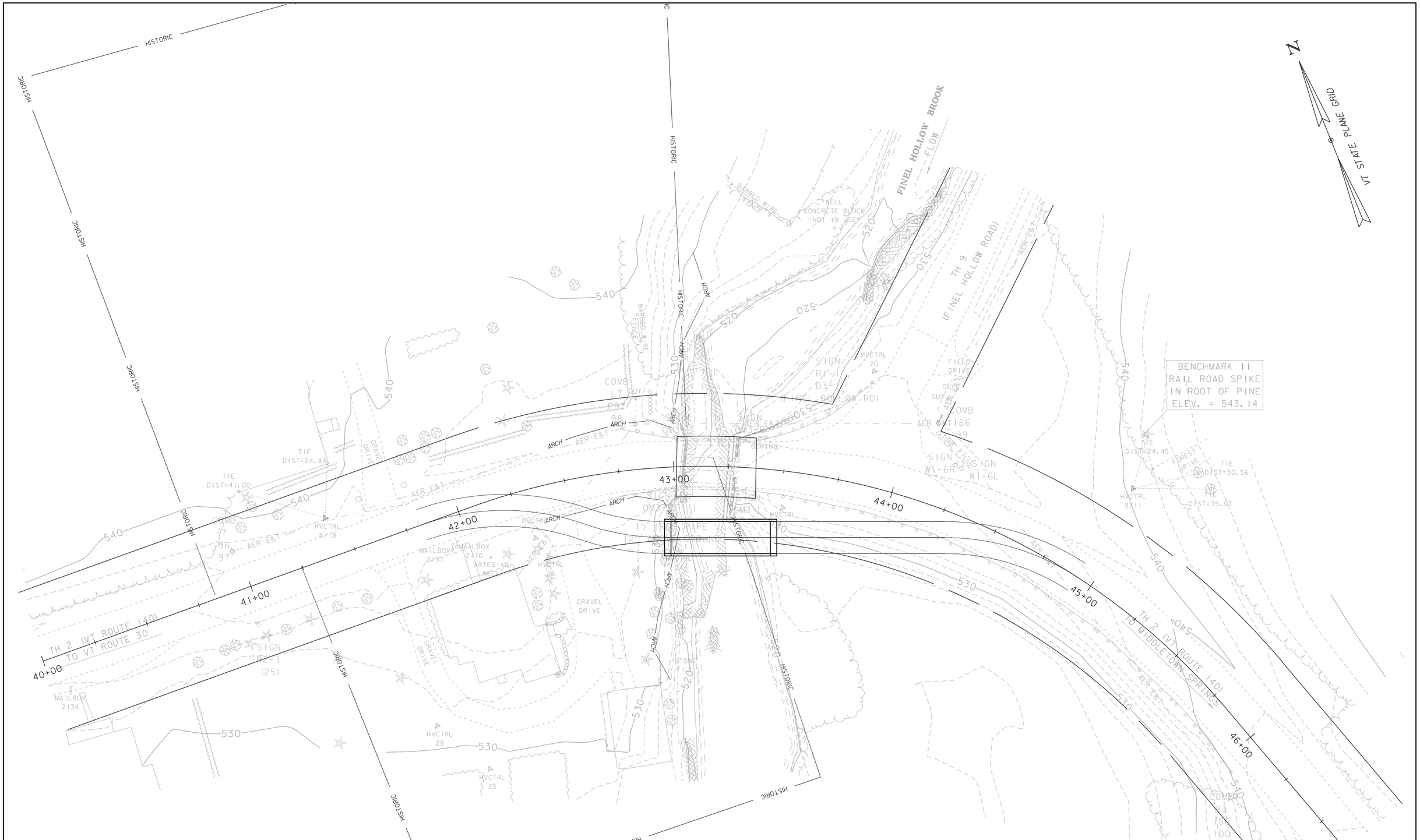


UPSTREAM TEMPORARY BRIDGE

SCALE 1" = 20'-0"

20 0 20

PROJECT NAME: POULTNEY	
PROJECT NUMBER: BF 0138(12)	
FILE NAME: 13j276/s13j276tempbridge.dgn	PLOT DATE: 09-DEC-2014
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: ------	CHECKED BY: ------
UPSTREAM TEMPORARY BRDIGE	SHEET 13 OF 14



DOWNSTREAM TEMPORARY BRIDGE

SCALE 1" = 20'-0"

20 0 20

PROJECT NAME: POULTNEY	
PROJECT NUMBER: BF 0138(12)	
FILE NAME: 13j276/sl3j276tempbridge.dgn	PLOT DATE: 09-DEC-2014
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: ------	CHECKED BY: ------
DOWNSTREAM TEMPORARY BRIDGE	SHEET 14 OF 14