STATE OF VERMONT
AGENCY OF TRANSPORTATION

Scoping Report

FOR

Bradford BF 0191(29)

VT ROUTE 25B, BRIDGE 1 OVER THE WAITS RIVER

September 19, 2013

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I. Site Information

Bridge 1 is located on VT Route 25B near a light residential neighborhood approximately 0.2 miles east of the junction with VT 25. The bridge structure is straight, but the centerline curves on the bridge. The east and west approaches are on curves. Town Road 51, Appleton Road, is located close to the west end of the bridge. 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	Rural Major Collector (State Highway)
Bridge Type	3 span, cast-in-place concrete deck on rolled beams. Concrete abutments and piers.
Bridge Length	159 feet
Year Built	1933
Ownership	State of Vermont

Need

Bridge 1 carries VT Route 25B across the Waits River. The following is a list of deficiencies of Bridge 1:

1. The lane and shoulder widths on the existing structure and approaches are substandard. Pedestrian and bicycle accommodations are substandard as well.

2. The deck rating is 4 (Poor).

3. The channel rating is 5 (Fair), but the bridge is rated as 3 (Scour Critical). Scour has occurred at Pier #2. The hydraulic standard is not presently met.

4. Roadway geometry (K-values and sight distance) on approaches is substandard.

5. The existing bridge railing is substandard.

Traffic

A traffic study of this site was performed by the Vermont Agency of Transportation. The traffic volumes are projected for the years 2016 and 2036.

TRAFFIC DATA	2016	2036
AADT	1400	1500
DHV	180	190
ADTT	140	230
%T	10.7	15.6
%D	53	53

Design Criteria

The design standards for this bridge project are the Vermont State Standards, dated October 22, 1997. Minimum standards are based on ADT of 1,500-2000 and a design speed of 50 mph for a Rural Major Collector.

Design Criteria	Source	Existing Condition	Minimum Standard	Comment
Approach Lane and Shoulder Widths	VSS Table 5.3	10'/2' (24')	10'/4' (28')[2]	Substandard
Bridge Lane and Shoulder Widths	VSS Section 5.7	9'/1.25' (20.5')	10'/4' (28')[2]	Substandard
Clear Zone Distance	VSS Table 5.5	Unshielded utility pole opposite TH-51	20' fill / 12' (1:3) cut 14' (1:4) cut	Substandard
Banking	VSS Section 5.13	Varies, but is very small	8% (max) 6% max. at side road	Substandard
Speed		50 mph	50 mph (Design)[1]	
Horizontal Alignment	AASHTO Green Book Table 3-10b	R = 1,910' (West approach) R = 500' (East approach)	R_{min} = 1560' @ e=6% R_{min} = 758' @ e=8%	Substandard
Vertical Grade	VSS Table 5.6	0.72% (west approach)	7% (max) for rolling terrain	
K Values for Vertical Curves	VSS Table 5.1	Vertical curve on bridge K=223 (crest). Vertical curve on west approach K=18 (sag), east approach K=55 (sag)	110 crest / 90 sag	Approach vertical curves are substandard
Vertical Clearance Issues	VSS Section 5.8	None noted	14'-3" (min)	
Stopping Sight Distance	VSS Table 5.1	1306' on bridge 123' on west approach 335' on east approach	400'	Substandard on approaches
Bicycle/Pedestrian Criteria	VSS Table 5.8	Very narrow shoulder	4' Shoulder	Substandard
Bridge Railing	Structures Design Manual Section 13	Inspector's rating is "0", indicating not meeting current standards.	TL-3	Substandard
Hydraulics	VTrans Hydraulics Section	Does not meet hydraulics standard	50 year event with one ft. of freeboard below low beam elevation	Substandard
Structural Capacity	SM, CH 3.4.1	Unknown	HL-93	Substandard

1. The posted speed limit is 50 mph on and west of the bridge, and 30 mph east of the bridge. The speed limit signs are east of the approach curve, therefore, the design speed is 50 mph throughout the project.
2. The Vermont State Standards call for a 10'/3' width for this project. A 10'/4' width will be used because it is required for shared bicycle use with > 10% truck traffic (Table 5.8) and it is required to meet Highway Safety and Design Engineering Instruction HSDEI 11-004 for minimum width.

Inspection Report Summary

Deck Rating	4 Poor
Superstructure Rating	5 Fair
Substructure Rating	6 Satisfactory
Channel Rating	5 Fair
Scour status:	3 Scour Critical
Deficiency Status of Structure	SD Structurally Deficient

From latest inspection report:

"11/07/2011 – Deep local scour runs along Pier #2. The channel rating is lowered due to changes after Tropical Storm Irene. PLB

08/02/2011 – Structure is in need of extensive rehab or replacement in near future, deck is in poor condition and needs replacement, steel beams have heavy rusting along the exterior beams due to roadway runoff and random drains have spalled and enlarge holes along pavement and fascia have occurred. Scouring around pier 2 needs to be filled in with rip rap. MJK & NV

04/15/2009 – The bridge needs extensive rehabilitation. The concrete deck has reached a point where full depth holes may form; particularly in beam bay #3. The bridge rail needs attention now to repair damaged concrete posts. Substructure units are in fairly good condition. MJ/DS"

Hydraulics

A Preliminary Hydraulics Report was done for this project. The existing bridge is not capable of fully meeting the hydraulic standard of passing the 50 year storm event (Q_{50}) with one foot of freeboard below the low beam elevation of the bridge. The report outlines several options for a bridge replacement based on providing the bank full width as defined by Vermont ANR methods, and an adequate waterway. It can be seen in the Appendix. This bridge site is rated as scour critical in the latest inspection report. No specific scour calculations will be performed until final design is under way to determine more accurate foundation design parameters.

Utilities

There are several utilities in the project area:

- Aerial electric, cable, and communications lines run along the north (upstream) side of VT 25B and along the west side of the project area.
- An aerial electrical transmission line runs west of the project area.
- The Town of Bradford has a water line that runs along VT 25B and along Appleton Road, but will not be impacted.
- A buried fiber optic cable runs westward along VT 25B north of the project and becomes aerial just east of the river. It should not be affected.
- The Town owns a 4" PVC water line that is attached to the underside of the existing bridge superstructure. This line is abandoned and will be removed during the project. The Town has expressed interest in having a future water line crossing attached to the bridge. They will be referred to the Vermont Agency of Transportation Utilities and Permits Section when the time comes to attach a water line to the new bridge.

It is anticipated that the project can be accomplished without relocation of utilities.

Right Of Way

The existing Right-of-Way is plotted on the Layout Sheet. A 3-rod Right-of-Way is shown.

Resources

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

Biological:

The river is the only regulated natural resource in the immediate project area. There are no wetlands identified within the project area. Also, the river is not classified as a Navigable Waterway or an Essential Fish Habitat. Vtrans Environmental Specialists have requested that a dry crossing be provided on the eastern riverbank so that animals can travel under the bridge on that side.

Wildlife Habitat

The Resource Identification Completion Memo (see in Appendix) states that there is fish and wildlife habitat in the project area.

Rare, Threatened and Endangered Species

There are no mapped rare, threatened or endangered species within the project area.

Agricultural

There are prime agricultural lands within the project area. If a new bridge on a new alignment is chosen, a small amount of prime agricultural land would be affected.

Hazardous Materials:

According to the Vermont Agency of Natural Resources (VANR) Vermont Hazardous Sites List, there are a number of hazardous waste sites in the community, the closest one being on Appleton Road, TH-51. It apparently refers to a leaking residential fuel oil tank. This is not expected to impact the project.

Historic:

Bridge 1 is not historic and there are no section 106 or 4(f) resources in the project area.

Archeological:

There are areas of archeological sensitivity present in the general area around and south of Bridge 1. These areas are shown 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 will consider the closure option on most 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 should provide enhanced safety for the workers and the travelling public while maintaining project quality. The following options have been considered:

Option 1: Temporary Bridge

A temporary bridge could potentially be used with minimal risk to nearby resources such as agricultural soils and potentially sensitive archaeological areas if located on the north side of the existing bridge. However, temporary bridges come with a significant cost, in dollars and in time, for installation and removal, and for temporary Right of Way. Extensive utility relocation would be required. Construction usually extends into part of an additional season. Given that there is a reasonable detour on State routes nearby, the temporary bridge option for traffic maintenance is discarded.

Option 2: Phased Construction

Phased construction is the maintenance of one lane of two-way 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 environmental resources and adjacent property owners. Some less desirable characteristics associated with phasing include reduced safety of the traveling public, reduced safety of the work force, increased costs, and lengthened construction phase (and delays) due to the limitations of building half the bridge at a time. Given the drawbacks of phasing, and the presence of a reasonable detour, phasing construction will not be considered further.

Option 3: Off-Site Detour

This option would close the bridge for the duration of the work. In Bradford, the official detour would be west to VT 25, then north on US 5, and back to the east end of VT25B. The total end to end distance, from one end of Bridge 1 to the other via the detour, is approximately 3 miles, all on State or US highways. The through distance, from VT 25 to US 5 in the village center, is 1 mile. The detour would add 2 miles to the through route.

The Town has identified one bypass route which may see an increase in traffic. Bypass routes are not signed detours, but may experience higher traffic volumes if VT 25B is closed during construction. This bypass would be from VT 25B to Maple St. (TH-70, Class 3-Paved), Old Creamery Road (TH-27, Class 3-Paved), to VT 25 (1.8 miles end to end). It should be noted that there is a one lane bridge on Old Creamery Road that is posted for 12 tons maximum. It is not

appropriate for heavy truck traffic. Since there are presently no sidewalks on or near Bridge 1, a temporary pedestrian bridge is not planned.

A map of the detour route, and possible local bypass route which could see an increase in traffic, can be found in the appendix.

III. Alternatives Discussion

Bridge 1 is structurally deficient with a deck rating of 4 (poor). The superstructure has a rating of 5 (fair). Other deficiencies include lane and shoulder widths, K values, sight distance, and horizontal curves on the approaches, bridge railings, and hydraulics.

No Action

This alternative leaves the bridge in its current condition. The deck, rated 4 (poor), will continue to deteriorate, with full depth holes increasingly likely. As time goes by, more maintenance on the deck would be required, becoming more expensive and less effective over time. The superstructure is corroding and approaching the end of its useful life. Eventually the bridge would not be able to safely carry the full loads of traffic. From the standpoint of safety, economics, and convenience, this alternative is not recommended.

Rehabilitation

Rehabilitation includes replacement of one or more elements to resolve deficiencies on and immediately adjacent to the bridge. The deck, rated 4 (poor), would be replaced. The superstructure would also be replaced since it has a 5 rating (fair). Salvaging the existing beams is possible, but would require cleaning (including probable lead abatement) and recoating, and possibly repairs. The cost of replacement of the superstructure is not much more than the cost of rehabilitation. Replacement of the deck to meet the standard for lane and shoulder width would require major renovation work on the substructures to allow widening of the bridge. The renovations could be done to both abutments and both piers, or to both abutments and remove the piers. Removing the piers however would result in a deeper superstructure, exacerbating the substandard hydraulic condition. There would have to be scour protection measures added to this scour critical bridge. Since this is all costly work and results in several remaining substandard conditions, rehabilitation will not be considered further.

Complete Replacement

This alternative considered the replacement of all bridge components; substructure, superstructure, deck, and railing. An estimated 80 year service life is provided. Various considerations are listed below:

a. Horizontal Alignment

The bridge is within a horizontal S-curve (see attached plans). On the west side, existing curve #1 begins off the bridge and ends on the bridge approximately 18 ft. from the east end. After a tangent of approximately 48 ft, existing curve #2 reverses direction and begins approximately 30 ft. off the east end of the bridge. The existing horizontal curves are substandard because they are not properly superelevated. This report considers two horizontal alignment options:

- The new project could be built virtually on the existing alignment. The existing bridge deck is curved for most of its length, and the girders are straight. It is proposed that the new girders be straight and the new deck fascias be curved to match the existing geometry as close as possible. The overhangs in this case would be between 1'-6" and 2'-0", which is reasonable. The approach curves would remain substandard due to superelevation. This would be true whether one span or two spans are constructed. If the roadway is raised, roadway reconstruction will be necessary for some distance off each end of the bridge.
- The new project could be built on a new alignment south of the existing bridge. This change would allow for improvements to the horizontal curve/superelevation geometry, but it would still not be feasible to fully meet the standards because of superelevation issues. Specifically, a superelevation of approximately 6% would need to fully reverse on the bridge, which is not long enough to meet the required reversal distance. Increasing the length of roadway tangent to correct this would unreasonably extend the project length. The new centerline of bridge would vary from 22-32 ft. south of the existing (it's not parallel to existing). Prime agricultural soils would be slightly impacted and archaeologically sensitive areas are nearby.

A new alignment to the north was considered but poses bigger challenges geometrically, would require extensive utility relocation including buried fiber optics, and was thus not developed.

A comment was received from the community (see appendix for community input document) regarding the difficulty in sight distance for drivers exiting Appleton Road when there are high snow banks. Appleton Road intersects VT 25B at an angle of approximately 62 degrees from perpendicular, which is far from ideal. A minor realignment was considered that would allow the intersection to be close to 90 degrees and raises the grade of Appleton Road so that sight distance is improved. This change has not been proposed since it will be difficult to make this realignment without either using substandard turn radii onto Appleton Road or introducing a substandard curve in Appleton Road. Also, this realignment moves the intersection closer to the bridge, which is undesirable.

According to the latest crash report ending 12/31/11, there have been 5 crashes on VT 25B in Bradford in the last five years, the closest being a half mile away in the village. The current alignment is considered to be acceptable in that regard. The new alignment would be a slight improvement.

b. Vertical Alignment

The existing crest vertical alignment on the bridge meets the standard, but the sag vertical curves off each end are substandard for K values and sight distance. Some alternatives in this report propose constructing the minimum bottom of beam elevation at 477.2 to meet the hydraulic standard, which requires raising the elevation of the roadway up to 1.2 ft. above the existing. This would require the project to extend some distance further than normal to avoid making the existing curve geometry worse. Options considered for addressing the vertical curves include:

- Staying on the existing alignment and raising the grade of a new single span bridge and adjacent roadway meets the hydraulic standard and <u>improves</u> the substandard vertical curves, but does not <u>meet</u> the standards for vertical curves. Fully correcting the K values, sight distances, and horizontal curves would require extending the project an unreasonable distance.

- Raising the roadway alignment is not necessary for a new two span bridge. Although the bottom of beam elevation would be 477.5 to compensate for a new pier in the waterway, the superstructure can be shallower for the shorter spans. In this case, the project would end closer to the ends of the bridge, and as above, would not extend far enough to correct the vertical or horizontal alignment on the approaches.
- Constructing the bridge on a new alignment allows for improvement to existing geometry, but does not resolve all issues on the approach curves.

The same issues are present if the alignment is changed; fully meeting the geometric standards extends the project unreasonably.

c. Bridge Width

The existing bridge has a width of approximately 20.5 ft. curb to curb. The minimum standard required for this roadway classification, speed, and traffic volume is 28 ft. There are no raised sidewalks on the bridge, and there are none leading to and from the bridge; therefore a raised sidewalk is not proposed. A new bridge would have lane and shoulder widths of 4-10-10-4, which would accommodate shared space for pedestrians and cyclists.

d. Bridge Length and Skew

The existing three span bridge is 159 ft. long with two piers in the river. The existing substructures are skewed to the river at approximately 30 degrees. The Preliminary Hydraulics Report indicates that the bridge narrowly misses the required one foot of freeboard below low beam at Q_{50}, and is far from meeting the bank full width (BFW) calculated by the VT ANR model. To improve hydraulic conditions to meet standard, two length options were considered:

1. A new single span bridge with a length of 143 ft. This length is calculated to allow the new substructures to be installed at a skew of 30 degrees to the river, and positioned to provide the recommended 117 ft. clearspan. This alternative proposes bottom of beam elevation at 477.2 to meet the hydraulic standard, which results in a 1.2 ft. rise in roadway grade. A 4’-8” superstructure depth is assumed.

2. A new two span bridge with a total length of 146 ft, broken into two 73 ft. spans with a 5 ft. wide (max.) pier in the river. This length is calculated to allow the new substructures to be installed at a skew of 30 degrees to the river and positioned to provide the recommended 120 ft. clearspan. This alternative requires a low beam elevation of 477.5, but with an assumed superstructure depth of 3’-6”, the roadway grade does not need to be raised.

e. Superstructure Type

The proposed superstructure for a new bridge could consist of steel girders and a concrete deck, and although it could be handled as Prefabricated Bridge Units, a cast-in-place deck may be more practical and expedient. Various other types including prefabricated concrete sections could be considered by the designer.

f. Substructure Type

Integral abutments would be the substructure of choice if subsurface conditions allow the installation of piles. Simplified design methods could not be used due to the skew exceeding 20 degrees. If bedrock prevents the installation of piles, then the substructures would be either cantilevered stem wall on stub footings or stub abutment on MSE walls. The pier in the river would be cast-in-place concrete on piles or on a spread footing directly on bedrock.

g. Maintenance of Traffic

Traffic is recommended to be maintained on an off-site detour. Depending on the alternative chosen, the closure period could be from 8 to 16 weeks.

IV. Alternatives Summary

Based on the existing conditions and recommendations from others, the following alternatives are considered viable. All are full bridge replacement projects utilizing off-site detours:

Alternative 1: Single Span, Existing Alignment, Raise Grade 1.2 ft.
Alternative 2: Two Span, Existing Alignment, No raise in Grade.
Alternative 3: Single Span, New Alignment, Raise Grade 1.2 ft.
Alternative 4: Two Span, New Alignment, No Raise in Grade.

A cost matrix can be seen on the next page.

V. Cost Matrix[1]

Bradford BF 0191(29)		Do Nothing	Alternative 1	Alternative 2	Alternative 3	Alternative 4
			Full Bridge Replacement, Off-site Detour			
			1 Span	2 Span	1 Span	2 Span
			Raise 1 ft.	Raise 0 ft.	Raise 1 ft.	Raise 0 ft.
			Existing Alignment	Existing Alignment	New Alignment	New Alignment
COST	Bridge Cost	$0	$1,121,000	$1,352,000	$1,121,000	$1,352,000
	Removal of Structure	$0	$110,000	$110,000	$110,000	$110,000
	Roadway	$0	$396,000	$258,000	$625,000	$447,000
	Maintenance of Traffic	$0	$25,000	$25,000	$25,000	$25,000
	Construction Costs	$0	$1,652,000	$1,745,000	$1,881,00	1,934,000
	Construction Engineering + Contingencies	$0	$480,000	$506,000	$545,000	$561,000
	Total Construction Costs w CEC	**$0**	**$2,132,000**	**$2,251,000**	**$2,426,000**	**$2,495,000**
	Preliminary Engineering[2]	**$0**	**$533,000**	**$518,000**	**$679,000**	**$699,000**
	Right of Way	**$0**	**$215,000**	**$0[4]**	**$243,000**	**$200,000**
	Total Project Costs	$0	$2,880,000	$2,769,000	$3,348,000	$3,394,000
	Annualized Costs	$0	$36,000	$34,600	$41,900	$42,400
SCHEDULING	Project Development Duration[3]		4 years	4 years	4 years	4 years
	Construction Duration		6 months	6 months	6 months	6 months
	Closure Duration (If Applicable)		8 weeks	16 weeks	8 weeks	16 weeks
ENGINEERING	Typical Section - Roadway (feet)	24'	28'	28’	28’	28’
	Typical Section - Bridge (feet)	1.25-9-9-1.25	4-10-10-4	4-10-10-4	4-10-10-4	4-10-10-4
	Geometric Design Criteria	No Change	Slight Improvement, but Substandard	No Change	Improved, but Substandard	Improved, but Substandard
	Traffic Safety	No Change	Improved	Improved	Improved	Improved
	Alignment Change	No	Vertical only	No	Yes	Yes
	Bicycle Access	No Change	Improved	Improved	Improved	Improved
	Hydraulic Performance	No Change	Meets Std	Meets Std	Meets Std	Meets Std
	Pedestrian Access	No Change	Improved	Improved	Improved	Improved
	Utility	No Change	No Change	No Change	No Change	No Change
OTHER	ROW Acquisition	No	Yes	Yes[4]	Yes	Yes
	Road Closure	No	Yes	Yes	Yes	Yes
	Design Life	10 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.
[4] ROW at no cost from the Town of Bradford may be necessary for minor revisions to TH-51.

VI. Conclusion

Alternative 1 is recommended; replace the bridge on the existing alignment with a single span while maintaining traffic on an offsite detour, and raise the roadway. The costs for the various alternatives vary from lowest to highest by about 23%. The costs for the two alternatives replacing the bridge on alignment are quite close, and the costs for the two alternatives replacing the bridge off alignment are also quite close. This indicates that the cost saved by not raising the grade is balanced by the extra cost of constructing a new pier in the river. The off alignment alternatives were considered in an attempt to build an alignment that would meet the geometric standards without extending the project for an unreasonable distance. Even these alternatives do not provide this. Considering the extra cost to build off alignment, the additional Right of Way required, and the possible impact on an Archaeologically sensitive area, the off alignment alternatives were not chosen. Finally, Alternative 1 was selected over Alternative 2 to avoid the impacts associated with adding a pier to the middle of the river.

VII. Appendices

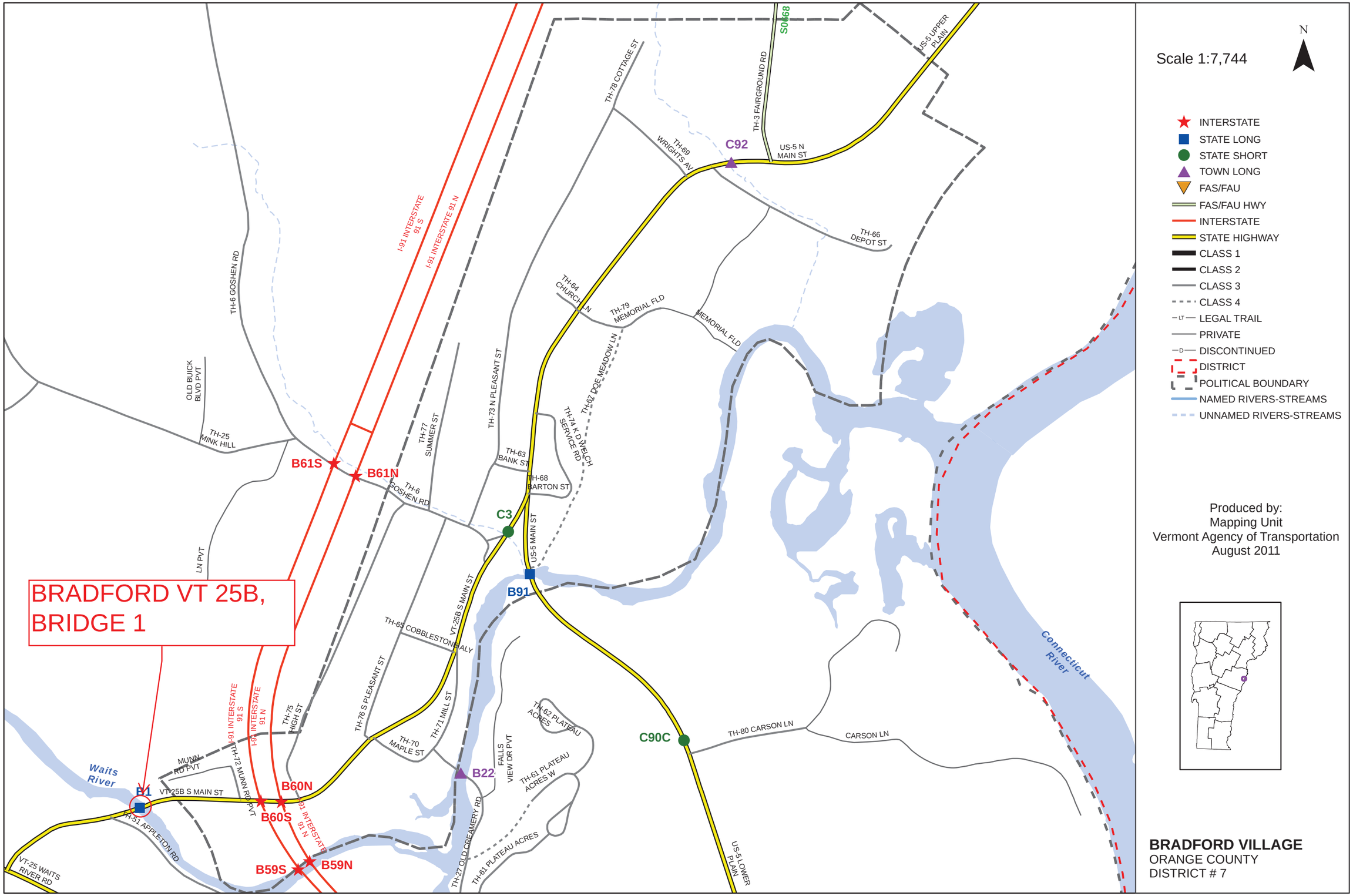
- Site Pictures
- Town Map
- Bridge Inspection Report
- Hydraulics Memo
- Preliminary Geotechnical Information
- Natural Resources Memo
- Archeology Memo
- Historic Memo
- Resource ID Completion Memo
- Detour Map
- Bypass Map
- Community Input
- Plans
    - Existing Conditions
    - Proposed Typical Sections
    - Proposed Layout
    - Profiles
    - Banking Diagram (Alternative #1 only)

Western Approach – Looking West

Eastern Approach – Looking East

Deck Deterioration

Concrete Deterioration



BRADFORD VT 25B,
BRIDGE 1
Scale 1:7,744
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
BRADFORD VILLAGE
ORANGE COUNTY
DISTRICT # 7
Waits River
Connecticut River
B1
B22
B59S
B59N
B60S
B60N
B61S
B61N
B91
C3
C92
C90C
I-91 INTERSTATE 91 S
I-91 INTERSTATE 91 N
TH-6 GOSHEN RD
OLD BUICK BLVD PVT
TH-25 MINK HILL
LN PVT
TH-78 COTTAGE ST
TH-3 FAIRGROUND RD
US-5 UPPER PLAIN
US-5 N MAIN ST
TH-69 WRIGHTS AV
TH-66 DEPOT ST
TH-64 CHURCH LN
TH-79 MEMORIAL FLD
MEMORIAL FLD
TH-67 DOE MEADOW LN
TH-74 K D WELCH SERVICE RD
TH-73 N PLEASANT ST
TH-77 SUMMER ST
TH-63 BANK ST
TH-68 BARTON ST
US-5 MAIN ST
VT-25B S MAIN ST
TH-65 COBBLESTONE ALY
TH-76 S PLEASANT ST
TH-71 MILL ST
TH-70 MAPLE ST
TH-75 HIGH ST
TH-72 MUNN RD PVT
MUNN RD PVT
VT-25B S MAIN ST
TH-51 APPLETON RD
VT-25 WAITS RIVER RD
TH-62 PLATEAU ACRES
FALLS VIEW DR PVT
TH-61 PLATEAU ACRES W
TH-27 OLD CREAMERY RD
TH-61 PLATEAU ACRES
TH-80 CARSON LN
CARSON LN
US-5 LOWER PLAIN

STRUCTURE INSPECTION, INVENTORY and APPRAISAL SHEET

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

Inspection Report for BRADFORD VILLAGE **bridge no.:** 00001 **District:** 7

Located on: VT 0025B ALT **over** WAITS RIVER **approximately** 0.1 MI E JCT. VT.25 **Owner:** 01 STATE-OWNED

CONDITION

Deck Rating: 4 POOR

Superstructure Rating: 5 FAIR

Substructure Rating: 6 SATISFACTORY

Channel Rating: 5 FAIR

Culvert Rating: N NOT APPLICABLE

Federal Str. Number: 200191000109012

Federal Sufficiency Rating: 045.9

Deficiency Status of Structure: SD

AGE and SERVICE

Year Built: 1933 **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): 01

ADT: 002500 **% Truck ADT:** 06

Year of ADT: 1998

GEOMETRIC DATA

Length of Maximum Span (ft): 0069

Structure Length (ft): 000159

Lt Curb/Sidewalk Width (ft): 0.1

Rt Curb/Sidewalk Width (ft): 0.1

Bridge Rdwy Width Curb-to-Curb (ft): 20.5

Deck Width Out-to-Out (ft): 23.3

Appr. Roadway Width (ft): 024

Skew: 30

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: 3-SPAN ROLLED BEAM

Number of Approach Spans: 0000 **Number of Main Spans:** 003

Kind of Material and/or Design: 3 STEEL

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: 1 MEETS CURRENT STANDARD

Approach Guardrail Ends: 1 MEETS 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: 6 OCCASIONAL OVERTOPPING OF ROADWAY WITH INSIGNIFICANT TRAFFIC DELAYS

Approach Roadway Alignment: 8 EQUAL TO DESIRABLE CRITERIA

Scour Critical Bridges: 3 SCOUR CRITICAL

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: 4 H 20

INSPECTION and CROSS REFERENCE

X-Ref. Route:

Insp. Date: 082011 **Insp. Freq. (months)** 24 **X-Ref. BrNum:**

INSPECTION SUMMARY and NEEDS

11/07/2011 Deep local scour runs along pier No.2. The channel rating is lowered due to changes after Tropical Storm Irene. PLB

08/02/11 Structure is in need of extensive rehab or replacement in near future, Deck is in poor condition and need replacement, steel beams have heavy rusting along the exterior beams due to roadway runoff and random drains have spalled and enlarge holes along pavement and fascia have occurred. Scouring around pier 2 needs to be filled in with rip rap. MJK & NV

04/15/2009 - The bridge needs extensive rehabilitation. The concrete deck has reached a point where full depth holes may form; particularly in beam bay #3. The bridge rail needs attention now to repair damaged concrete posts. Substructure units are in fairly good condition. - MJ/DS

VT AGENCY OF TRANSPORTATION PROGRAM DEVELOPMENT DIVISION

HYDRAULICS UNIT

TO: Chris Williams, Structures Project Manager

FROM: Melanie Haskins, Hydraulics Engineer (McFarland Johnson)
Brian Bennett, Hydraulic Engineer (McFarland Johnson)
via Nick Wark, VTrans Hydraulic Engineer

DATE: June 10, 2013

SUBJECT: Bradford Village – BF-0191(29) – VT 25B BR 1 over Waits River

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

Existing Bridge Information

The original bridge was constructed in 1933 based on record information. The bridge is owned by the State. The bridge is a 2-lane 3-span cast-in-place concrete rolled beam bridge with a cast in place concrete deck. The bridge has an asphalt pavement surface. The bridge is askew to the river by approximately 30°. The total width of bridge is approximately 23.25 feet normal to the roadway (20.4' curb to curb) which is equivalent to 28 feet along the stream. The abutment and piers are basically parallel with the stream. The total clear span along the roadway is approximately 156' with individual spans of approximately 41.5' (Left (North) abutment face to center of Left (North) pier), 74' (center of Left (North) pier to center of Right (South) pier) and 40.5' (center of Right (South) pier to Right (South) abutment face), going from Left (North) to Right (South). Taking into the account the width of the piers (i.e. 3.67' wide at the seat location) and modifying the spans to be normal to the stream, the normal clear spans are approximately 35.0', 64.1', and 35.9' going from Left (North) to Right (South). The superstructure depth for the spans is approximately 3.1'. The low flow stream channel flow runs between the 2 piers of the bridge. The approximate height to the bottom of the superstructure to the streambed varies since the bridge is located at the downstream of a curve with the minimum height being approximately 13.5 feet near the Right (South) Pier.

The bridge is located on the Waits River at approximately 4200 feet upstream of the Smith Hydroelectric Dam. This dam does not create any backwater influence on this bridge since it is located far enough upstream of the dam and having sufficient slope differential. The structure is located on a section of the river having a well-defined channel having a silty-gravelly streambed with some small stones. The existing bridge does not meet the VTrans hydraulic standard for the Q_{50} design storm event, but is close with the flow passing through the structure and having 0.8 ft of freeboard, instead of 1-foot, just upstream of the structure. Also, it is noted that the Q_{100} event creates a submerged inlet condition at the face of the bridge. We did not evaluate the scour for the existing conditions or any proposed bridge configurations as part of the preliminary design. Scour calculations will be performed during final hydraulics since the foundation types and configurations have not been determined at this time.

Recommendations

The bridge option selection criteria should be to provide a bridge opening that does not restrict the existing bank full width, nor provide an unrealistic widening of the existing channel, or create any worse backwater flooding conditions than the existing conditions. The VANR Bank Full Width (BFW) Equation estimates the width to be approximately 119 feet, but the actual field conditions

have varying natural bank full stream widths within the study reach of between 90 to 100 feet.

It has been assumed a replacement structure will be located in the existing roadway alignment having the same basic roadway geometry. For a replacement structure, we have anticipated that the piers will be removed and the proposed abutments will be vertical face concrete abutments with either a 3H:2V sloped stone fill scour protection placed in front of the Left (North) abutment and a 3H:1V sloped stone fill scour protection placed in front of the Right (South) abutment. It has further been assumed that all abutments and piers will match the existing conditions by being skewed to the roadway at approximately 30° to allow the river to flow through the abutments and piers normally. This layout orientation is preferred in order to eliminate the potential for any unnecessary backwater effects from abutments and piers being skewed to the river flow and not create any undo forces on the piers. It has further been assumed and recommended that any pier structures use semi-circular noses to be more hydraulically efficient. For the analysis, it has been assumed that the pier widths have been conservatively estimated to be 5-foot for the full depth.

Based on our analysis, there are multiple viable options which could be used at this location. All of the noted alternatives will provide approximately 1 feet of freeboard at the Q_{50} design storm event and meet the VTrans hydraulic design standard.

<u>Single Span Alternatives</u>
A minimum 117-foot clear span normal to the stream between the abutment faces (135' along the roadway). This option would be the ideal hydraulic alternative since it does not require any piers in the water and will be less likely to collect debris and ice. However, this option will most likely require an increase to the proposed deck elevation and further require modifications to the road grades on the approaches based on the anticipated depth required for the superstructure due to the longer span. Based on our modeling, this option will need a low beam elevation of approximately 477.2 feet. Further investigations need to be performed as part of preliminary bridge and roadway design to determine the actual superstructure depth and if the necessary grade modifications can be integrated into the site. Refer to the attached sketch showing the limits of the stone fill slopes and bridge opening cross section configuration.

<u>2-Span Alternatives</u>
There are two primary viable alternatives for a 2-Span bridge to replace the existing structure. The first 2-span recommendation will use a replacement bridge having a minimum 120-foot clear span normal to the stream channel between the abutment faces (138.6' along the roadway). It is proposed to have equal spans (60' each) using a single circular-nosed pier in the middle of the span and a low beam elevation at or above 477.5 feet. Refer to the attached sketch showing the limits of the stone fill slopes and bridge opening cross section configuration.

The second 2-span recommendation will use a replacement bridge having a minimum 135-foot clear span normal to the stream channel between the abutment faces (156' along the roadway). It is proposed to have equal spans (67.5' each) using a single circular-nosed pier in the middle of the span and a low beam elevation at or above 477.4 feet. Refer to the attached sketch showing the limits of the stone fill slopes and bridge opening cross section configuration.

While either of the 2-spans are viable and have similar results under the design Q_{50} storm event, the 135-foot 2-span performs better hydraulically at larger storm events (i.e. Q_{100} or larger) upstream of the bridge due to the larger bridge opening. It is also recognized that there are potential environmental issues with either of these options by relocating the pier to the center of the river in a

new location.

3-Span Alternatives

There are two primary alternatives for a 3-Span bridge to replace the existing structure. Both of the options use a minimum 135-foot clear span normal to the stream channel between the abutment faces (156' along the roadway). The first option is proposed to have 3 equal spans (45' each) with 2 circular-nosed piers and a low beam elevation at or above 477.6 feet. The benefit of equal spacing allows for a shallower superstructure depth due to having the same span distances. It is anticipated that the proposed deck elevation could be approximately the same as the existing deck elevation under this scenario. However, there is greater potential for environmental impacts by replacing the pier in locations closer together than the existing conditions pier locations. Also, the hydraulic opening width will be less than the existing conditions and have the potential for having problems for debris and ice jams in future large storm events. Refer to the attached sketch showing the limits of the stone fill slopes and bridge opening cross section configuration.

The second 3-span 135-foot bridge alternative proposes to have 2 approach spans (30' each) and a longer center span (75') using 2 circular-nosed 5-foot wide piers and will need a low beam elevation at or above 477.6 feet. This option is similar to the existing conditions which has a longer center span than the 2 approach spans. However due to the longer center span, it is anticipated that the proposed deck elevation will need to be increased from the existing condition due to the anticipated superstructure depth. During any preliminary design, these grade modifications will need to be reviewed further to determine the impact to the approaches. Also, the hydraulic opening width will be similar to the existing conditions and have the less potential for having problems for debris and ice jams in future large storm events than the equal spaced alternative. In addition, the piers would be in a similar location to the existing piers and anticipated to have less environmental issues. Refer to the attached sketch showing the limits of the stone fill slopes and bridge opening cross section configuration.

It is also noted that the proposed minimum low beam elevations for any of the potential pier alternatives may be reduced slightly if the pier width can be narrower than the assumed continuous 5-foot width based on preliminary investigations. However, additional investigations will be required during final hydraulics to confirm these findings.

Temporary Bridge/Phasing

Based on pre-scoping information from the Structures Group, it appears a temporary bridge will not be needed and an off-site detour would be utilized. However it is our understanding that this will be reviewed further in detail to select the best alternative.

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

MAH/BMB
cc: Hydraulics Project File via NJW
Hydraulics Chrono File

AGENCY OF TRANSPORTATION **OFFICE MEMORANDUM**

To: Chris Williams, P.E., Structures Project Manager

LAR CCB

From: Laura Ripley, Geotechnical Engineer, via Christopher C. Benda P. E., Soils and Foundations Engineer

Date: June 3, 2013

Subject: Bradford Village BF 0191(29) Preliminary Geotechnical Information

1.0 INTRODUCTION

The Soils and Foundations Unit within the Materials and Research Section has performed a preliminary geotechnical investigation for Bridge No. 1, located on VT 25B in the town of Bradford Village, VT. This report includes a review of available historical subsurface data and field observations made during a recent site visit. The materials referenced in this investigation include: VTrans boring files and record plans, Agency of Natural Resources (ANR) water well logs, ANR Environmental Interest Locator, USDA Natural Resources Conservation soil survey records and USGS bedrock and Vermont Geological Survey surficial geologic maps.

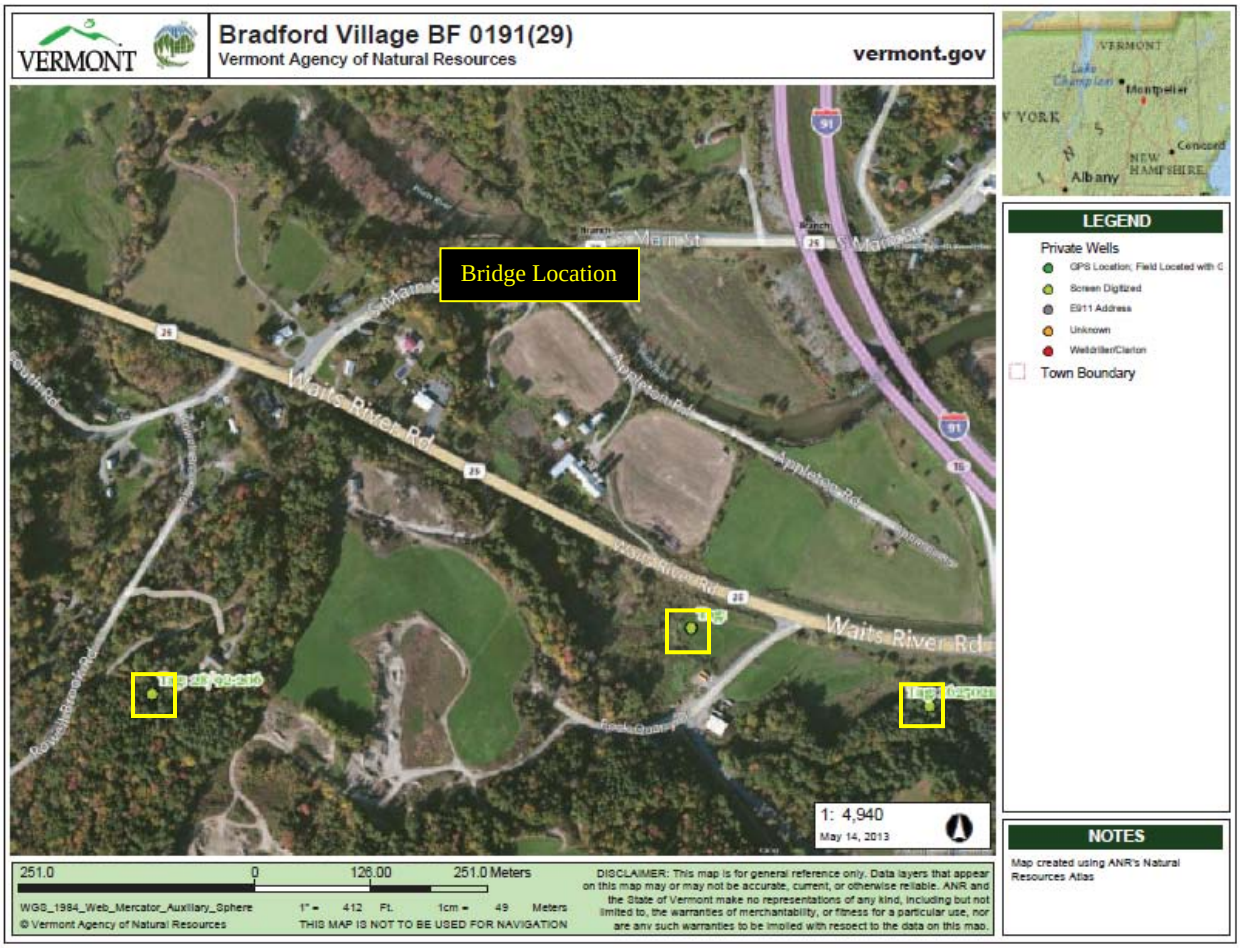
2.0 HISTORICAL SUBSURFACE INFORMATION

2.1 Previous Projects

No boring information was noted on the record plans recovered for Bridge No. 1. No boring log data were found in the Soils & Foundations project database or the in-house historical boring log records in the vicinity of this bridge.

2.2 ANR Water Well Logs

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 strata. The Agency of Natural Resources (ANR) Private Well Locator interactive map was reviewed for these purposes. The data provided estimates the depth to bedrock and expected soils types encountered on the site. It should be noted that these logs were developed and provided by well drilling companies whose employees may have had little to no formal training in identifying soil and rock. Water wells in close proximity of the subject bridge are highlighted in Figure 1.



Three wells were identified within an approximate radius of 2,000 feet, and the information for each is listed in Table 1.

Table 1. Well log descriptions of surrounding sites.

Well Tag Number	Distance From Project (feet)	Depth to Bedrock (feet)
28/92-206	2070	57
--	1350	58
1625021	1990	40

2.3 USDA Environmental Interest Locator

The U.S. Department of Agriculture (USDA) provides online maps with data locating potential environmental hazards. The area in Figure 2 shaded in green indicates Class II wetlands. The proximity and severity of these wetlands to the project site may cause complications during both drilling and construction. The square indicates a hazardous waste site, which is located approximately 650 feet from the site. There are currently no land use restrictions on this area.

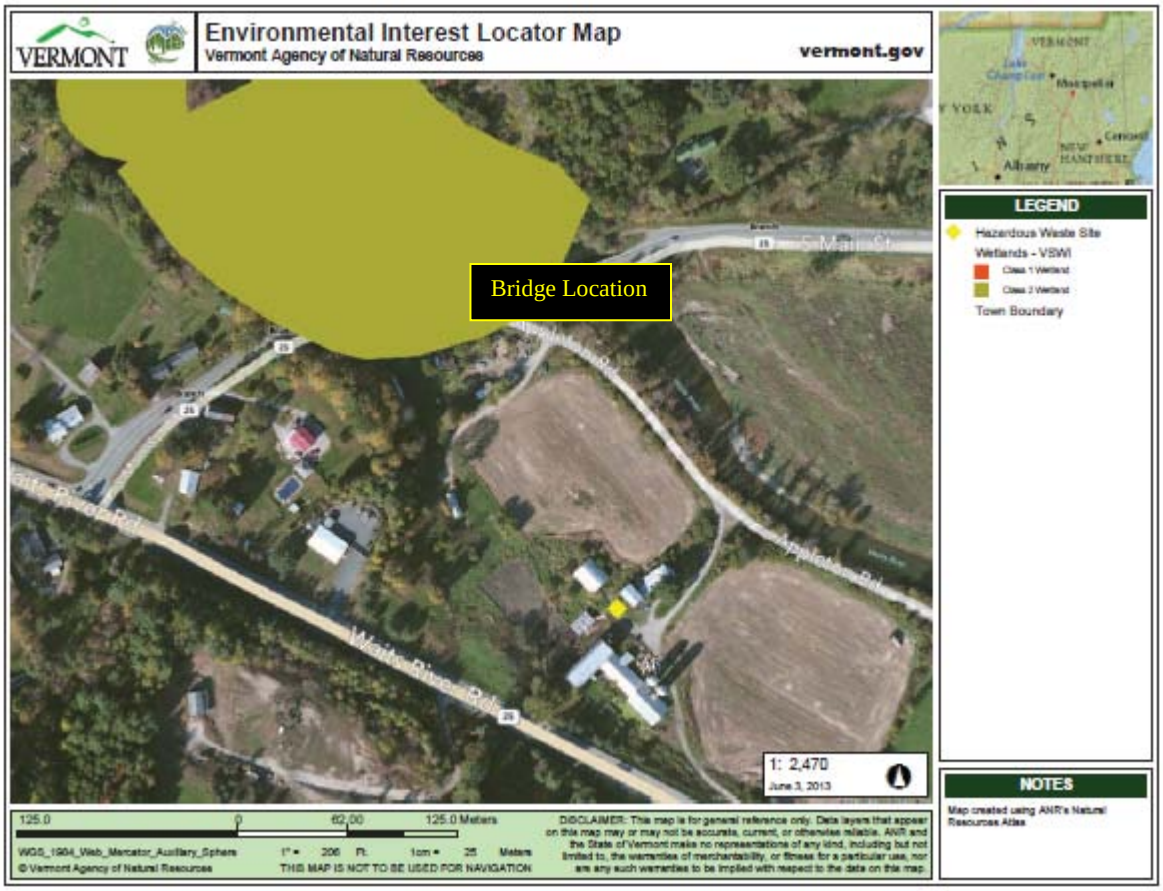


Figure 1 Hazardous waste site and wetlands proximity to bridge.

2.4 USDA Soil Survey

The U.S. Department of Agriculture (USDA) Natural Resources Conservation (NRC) soil survey records provide online published soil data. These indicated that the existing soils at the project site consist of both Hadley very fine sandy loam and Agawam fine sandy loam. These soils are well drained with a seasonal water table ranging from 4.0 – 6.0 feet, and can be very deep to bedrock.

2.5 USGS Bedrock Maps

Based on recent bedrock mapping for the 2011 State bedrock geologic map (Ratcliffe, N.M., Stanley, R.S, Gale, M.H., Thompson, P.J., and Walsh, G.J., 2011, Bedrock Geologic Map of Vermont: U.S. Geological Survey Scientific Investigations Map 3184, 3 sheets, scale 1:100,000), the rock type underlying this area consists of *",Gray to light-gray, fine-grained, micaceous quartzite a few cm to tens of cm thick, interbedded with dark-gray, graphitic slate, phyllite, or schist."* There was an outcropping of ledge observed on the northwest side of the bridge, approximately 20 feet from the eastern abutment; as seen in Figure 3. It should be noted that bedrock in the nearby area was moderately deep, so the profile may vary within the area of interest.

Figure 3. Bedrock outcrops on the northern side of the bridge.

3.0 FIELD OBSERVATIONS

Pertinent information was gathered in order to determine any potential issues with boring observations or design considerations.

Figure 3. View of existing site. Photograph was taken facing east.

Overhead utilities were noted on the northern side of the road, but were located at a distance that provides adequate clearance to access any of the abutments.

4.0 RECOMMENDATIONS

Based on the limited information gathered during this investigation, possible foundation options for a bridge replacement include the following:

- Cantilevered stemwall on spread footings
- Pile caps on a single row of H-piles (Integral Abutments)
- Stub abutment on MSE walls

It is recommended that a minimum of two borings be drilled to bedrock at opposite ends of the bridge be taken in order to assess the subsurface conditions. If variable conditions are noted or shallow bedrock is encountered, additional borings should be advanced to establish a more accurate subsurface profile.

If you have any questions or would like to discuss this report, please contact us by phone at (802) 828-2561.

cc: Read File/WEA
Project File/CCB
LAR

AGENCY OF TRANSPORTATION **OFFICE MEMORANDUM**

TO: Jeff Ramsey, Environmental Specialist

FROM: John Lepore, Transportation Biologist

DATE: May 1, 2013

SUBJECT: Bradford B_F 0191 (29)
VT 25B, Bridge 7 over Waits River
Natural Resource ID & Comments

The purpose of this memo is to let you know that I completed my initial resource identification for this project, which involves a crossing of the Waits River. In this location, the river is the only regulated natural resource in the immediate area. It is not classified as a *Navigable Waterway* or *Essential Fish Habitat*, but any in-stream work will require permitting.

It doesn't look like it is possible to construct a new bridge in this location without a pier in the river, but any measure which would reduce the in-stream work and structures would be a huge improvement. In addition, if a dry crossing could be incorporated under the bridge on the eastern side (left bank), it would help provide passage for a variety of mammals.

As for a temporary bridge, either side of the existing bridge would work for natural resources, but one on the upstream side would encroach the least into the river's floodplain.

If you have any questions about this, call me at 828-3963.

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: Jeff Ramsey, Vtrans Environmental Specialist

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

Date: 5/13/2013

Subject: Bradford Village BF 0191(29) – Archaeological Resource ID

Jeff,

A field visit was conducted on 5/6/2013 in order to assess archaeological sensivitiy in the APE for the proposed bridge replacement of Bridge 1 on VT25 in Bradford. The northern quadrants both contain remnants of bridge abutments from the previous bridge, and are *not* considered sensitive in this case. However, two areas of sensitivity were located in the general project area and can be viewed on the attached map. These areas were selected given a number of environmental and historic factors including proximity to waterway, natural travel corridors and proximity to convergence of major waterways. Also, Bradford and the surrounding towns are areas of known Native American presence in the contact period of the late 1600s and early 1700s.

Feel free to contact me with any questions or concerns that may arise as part of this project. The areas of sensitivity noted in this memo have been added to the archaeology geodatabase and are ready for import into a DGN file.

Sincerely,

Brennan

Brennan Gauthier
VTrans Archaeologist
Vermont Agency of Transportation
Program Development Division
Environmental Section
1 National Life Drive
Montpelier, VT 05633
tel. 802-828-3965
fax. 802-828-2334
Brennan.Gauthier@state.vt.us

VTrans Working to Get You There
Vermont Agency of Transportation

Bradford Village BF 0191(29)
Resource ID

0 45 90 180 270 360 Feet

1:3,033

N

Map created by BCG, PDD-Environmental Section on 5/13/2013.

Ramsey, Jeff

From: Newman, Scott
Sent: Friday, May 03, 2013 5:28 PM
To: Ramsey, Jeff
Cc: Williams, Chris
Subject: Bradford Village BF 0191(29)
Attachments: photo.JPG

Jeff,

Resource ID for the above subject project: there are no section 106 or 4(f) resources in the project area.

Thanks,
Scott

OFFICE MEMORANDUM

AOT - PROGRAM DEVELOPMENT DIVISION

RESOURCE IDENTIFICATION COMPLETION MEMO

TO: Chris Williams, Project Manager
FROM: Jeff Ramsey, Environmental Specialist
DATE: May 14, 2013
PIN: 13C054

Project: BRADFORD VILLAGE BF 0191(29)

ENVIRONMENTAL RESOURCES:

Wetlands:	___	Yes	X	No
Historic/Historic District:	___	Yes	X	No
Archaeological Site:	X	Yes	___	No two areas, see map
4(f) Property:	___	Yes	X	No
6(f) Property:	___	Yes	X	No
Agricultural Land:	X	Yes	___	No prime on both sides
Fish & Wildlife Habitat:	X	Yes	___	No the Waits River
Endangered Species:	___	Yes	X	No uncommon animal occurrence Waits River
Hazardous Waste:	___	Yes	X	No
Stormwater:	___	Yes	X	No
USDA-Forest Service Lands:	___	Yes	X	No
Wildlife Habitat Connectivity:	___	Yes	X	No
Scenic Highway/ Byway:	___	Yes	X	No
Act 250 Permits:	___	Yes	X	No

If you have any questions or need additional information please let me know.
Thanks,
Jeff

cc:
Project File

Total Travel Estimate: **2.14 miles - about 3 minutes**

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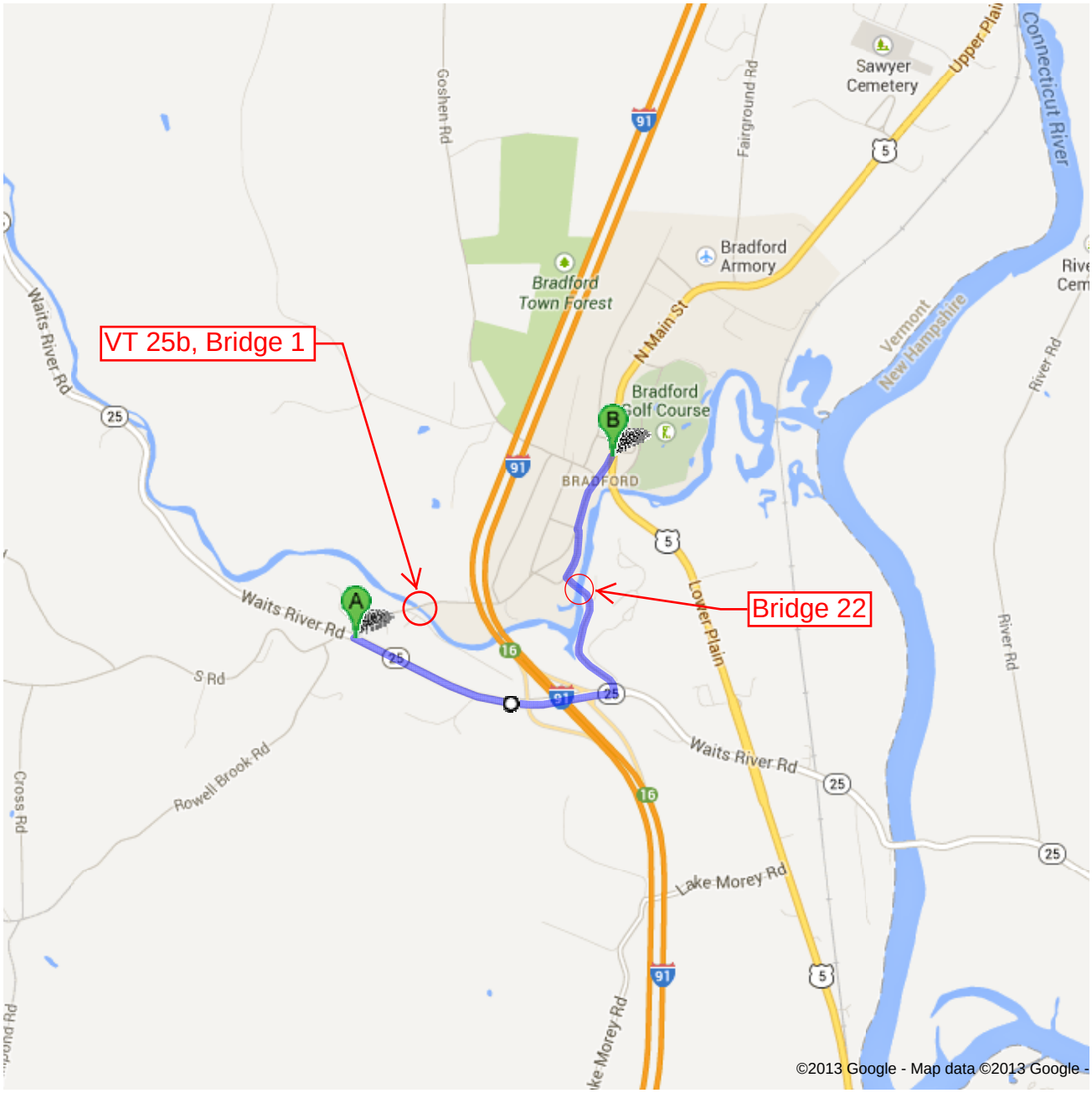
DETOUR ROUTE - South on US 5 to VT25, then west on Vt 25 to VT 25B.
A to B on Through Route: 1.0 Miles
A to B on Detour Route: 2.0 Miles
Added Miles: 1.0 Miles
End to End Distance: 3.0 Miles

Potential Local Bypass.

Directions to S Main St
1.5 mi – about **6 mins**
Bypass route, note bridge 22 on Old Creamery Road is a single lane bridge posted for 12 tons.



Thru Distance:	1.0 miles
Bypass Distance:	1.5 miles
Additional Distance:	0.5 miles
End to End Distance:	1.8 miles

Community Considerations – BRADFORD VT25B

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.

   Vermonster 4x4 Truck Race – twice a year (May + September weekend – check website: http://www.vermonster4x4.com/). The location of this event is not on VT25B but rather on Carson Ln off US5. Locals use VT25B as a bypass to get into the village instead.

2. Is there a "slow season" or period of time from May through October where traffic is less?

   Nope – traffic is consistent all year long.

3. Please describe the location of emergency responders (fire, police, ambulance) and emergency response routes.

   No impact on response routes. Please see attached map of Town facilities for emergency facility locations.

4. Where are the schools in your community and what are their schedules?

   Please see Town facilities map. The school on Fairground Rd ends roughly June 15 and starts the Wednesday before Labor Day.

5. Is the proposed project on an established or planned school bus or public transit route(s)?

   Current there is no established public transit route. There is a bus route that currently uses VT25B bridge, however a detour could use the Old Creamery Rd bridge. The improved weight limit on Old Creamery Rd bridge can now accommodate the school bus.

6. Are there any businesses (including agricultural operations) that would be adversely impacted either by a detour or due to work zone proximity?

   The only affected business might be Veneer Mill (also see location on Town map). They have deliveries using VT25B with tractor trailers. The Town noted that in July, the business shuts down and has no deliveries.

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?

   The only facility is the Town's pumphouse at the end of Appleton Rd, right by the bridge abutment. (see Town map).

8. Are there any town highways that might be adversely impacted by traffic bypassing the construction on another local road?

   Most of the local traffic will be using Old Creamery Rd bridge to go around. This is a one lane bridge.

9. Are there any other municipal operations that could be adversely impacted if the bridge is closed during construction? If yes, please explain.

   No.

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.

    Journal Opinion (http://www.jonews.com/contact.html)
    Bridge Weekly (http://www.thebridgeweekly.com/contactus.cfm)
    Valley News (http://www.vnews.com/contact-us)
    Radio – WYKR in Wells River
    Town Listserv

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

    Bradford Merchant's Association (http://www.bradfordmerchants.org/)
    Bradford Main Street Alliance (Ted Unkles, Selectboard – ted.unkles@state.vt.us)
    Lower Cohase Chamber of Commerce (Mark Neilsen, Executive Director - mjnart.nielsen@gmail.com)

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?

   There is a gentle curve from the south approach but no problem on the alignment. The sightline from Appleton Rd, particularly in the wintertime when snow piles above the rail makes for challenging navigation.

2. Are there any concerns with the width of the existing bridge?

   The width is currently too narrow. It is barely sufficient to have 2 cars (trucks) pass each other without knocking side mirrors.

3. What is the current level of bicycle and pedestrian use on the bridge?

This bridge is used heavily as an active pedestrian and bicycling route (used a loop around the village). There was also recent approval for a VAST snowmobile trail to cross VT25B. It's currently a dangerous conflict point with any bike/ped/snowmobile traffic with vehicles crossing the bridge.

4. If a sidewalk or wide shoulder is present on the existing bridge, should the new structure have one?

   There are 10-12ft wide shoulders leading to and from the bridge, but the bridge itself is a pinch point and there are no sidewalks or shoulders. Local traffic treat crossing this bridge as a 1 lane bridge.

5. Is there a need for a sidewalk or widened shoulder if one does not currently exist? Please explain.

   Yes, with the current wide shoulders leading to and from the bridge and the active pedestrian/bicycle activity over this bridge, the new structure should at least widen to support shoulders.

6. Does the bridge provide an important link in the town or statewide bicycle or pedestrian network such that bicycle and pedestrian traffic should be accommodated during construction?

   The bridge is an important link to the town and to the community for ped/bicycle activity. The town understands the need for construction and so the local traffic can be detoured onto Old Creamery Rd for the construction period.

7. Are there any special aesthetic considerations we should be aware of?

   It's not historical. The Town says anything is better than existing aesthetics!

8. Are there any traffic, pedestrian or bicycle safety concerns associated with the current bridge? If yes, please explain.

   As previously mentioned, the bridged is too narrow for 2-way traffic and pedestrians/bicycle traffic.

9. Does the location have a history of flooding? If yes, please explain.

   Yes, at least twice a year, every year during ice out – VT25B bridge has come very close to overtopping, and sometimes it has 2-3 inches on the deck.

10. Are you aware of any nearby Hazardous Material Sites?

No. The nearest (known) hazardous sites are the Bradford Mini Mart (leakage from the old gasoline dispensers) on VT25/US5 and the Auction Barn/Body Shop across US 5 from the Mini Mart.

11. Are you aware of any historic, archeological and/or other environmental resource issues?

    The area is in the Town's well head protection area where the water supply is.

12. Are there any other comments you feel are important for us to consider that we have not mentioned yet?

    VT25B is an important link to the community especially as an equal/alternate route during peak commuting times. Commuters coming from the west into Town can divert from VT25 and up US5 into downtown area. If VT25B did not exist, all the traffic will funnel onto VT25 and US5. VT25B is a good distributor of traffic.

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.

No.

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

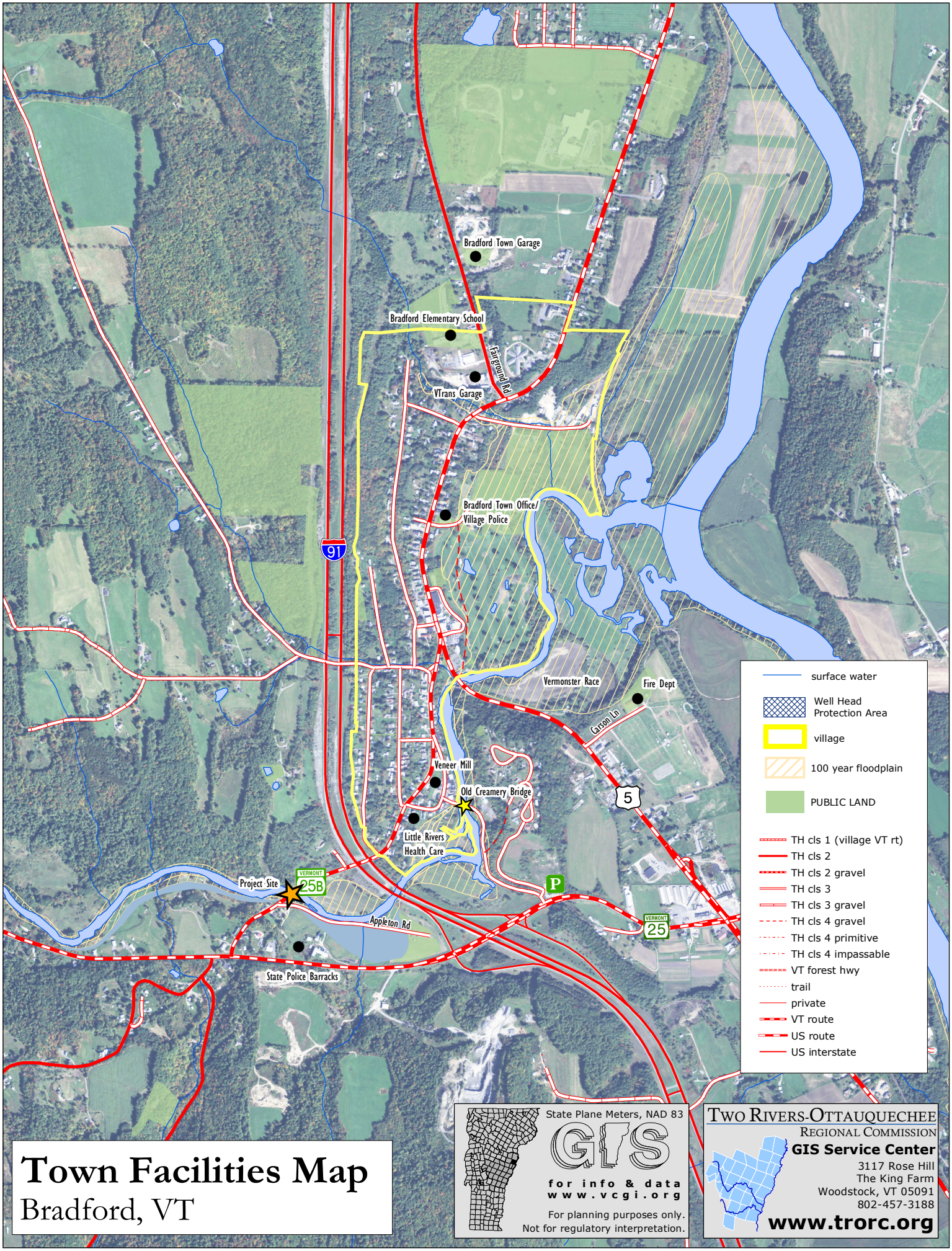
Please see attached existing and future land use map.

3. Are there any existing, pending or planned development proposal that would impact future transportation patterns near the bridge? If so please explain.

No.

4. Is there any planned expansion of public transit service in the project area? If not known please contact your Regional Public Transit Provider.

No.



Town Facilities Map

Bradford, VT

Current Land Use

Bradford, VT

Town Plan 2009

Map 1 of 5

2006 orthophotography

Adopted: September 10, 2009

50' contour
surface water
village
downtown designation
parcel boundaries
PUBLIC LAND
100 year floodplain
VSWI (wetlands)
structures
TH cls 1 (village VT rt)
TH cls 2
TH cls 2 gravel
TH cls 3
TH cls 3 gravel
TH cls 4 gravel
TH cls 4 primitive
TH cls 4 impassable
VT forest hwy
trail
private
VT route
US route
US interstate

0 0.1 0.2
Miles
1 inch = 1,450 feet

Village 1:17,400

0.3 0.15 0 0.3
Miles
1 inch = 3,000 feet

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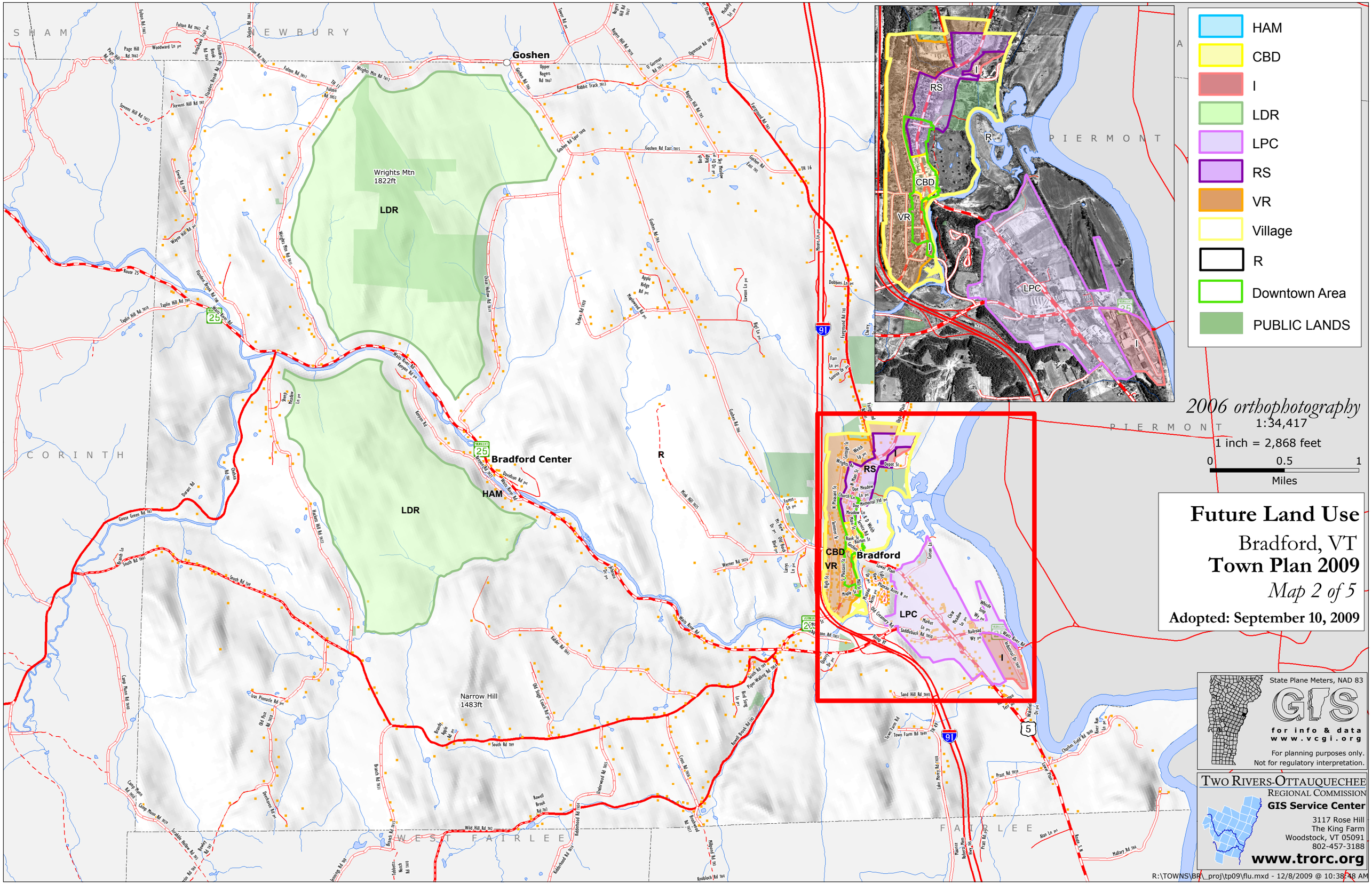
State Plane Meters, NAD 83

GIS

for info & data
www.vcgi.org

For planning purposes only.
Not for regulatory interpretation.

TWO RIVERS-OTTAUQUECHEE
REGIONAL COMMISSION
GIS Service Center
3117 Rose Hill
The King Farm
Woodstock, VT 05091
802-457-3188
www.trorc.org


Future Land Use
Bradford, VT
Town Plan 2009
Map 2 of 5
Adopted: September 10, 2009
2006 orthophotography
1:34,417
1 inch = 2,868 feet
0 0.5 1
Miles
HAM
CBD
I
LDR
LPC
RS
VR
Village
R
Downtown Area
PUBLIC LANDS
Goshen
Bradford Center
Bradford
Wrights Mtn
1822ft
Narrow Hill
1483ft
SHAM
NEWBURY
CORINTH
PIERMONT
WEST FAIRLEE
FAIRLEE
State Plane Meters, NAD 83
GIS
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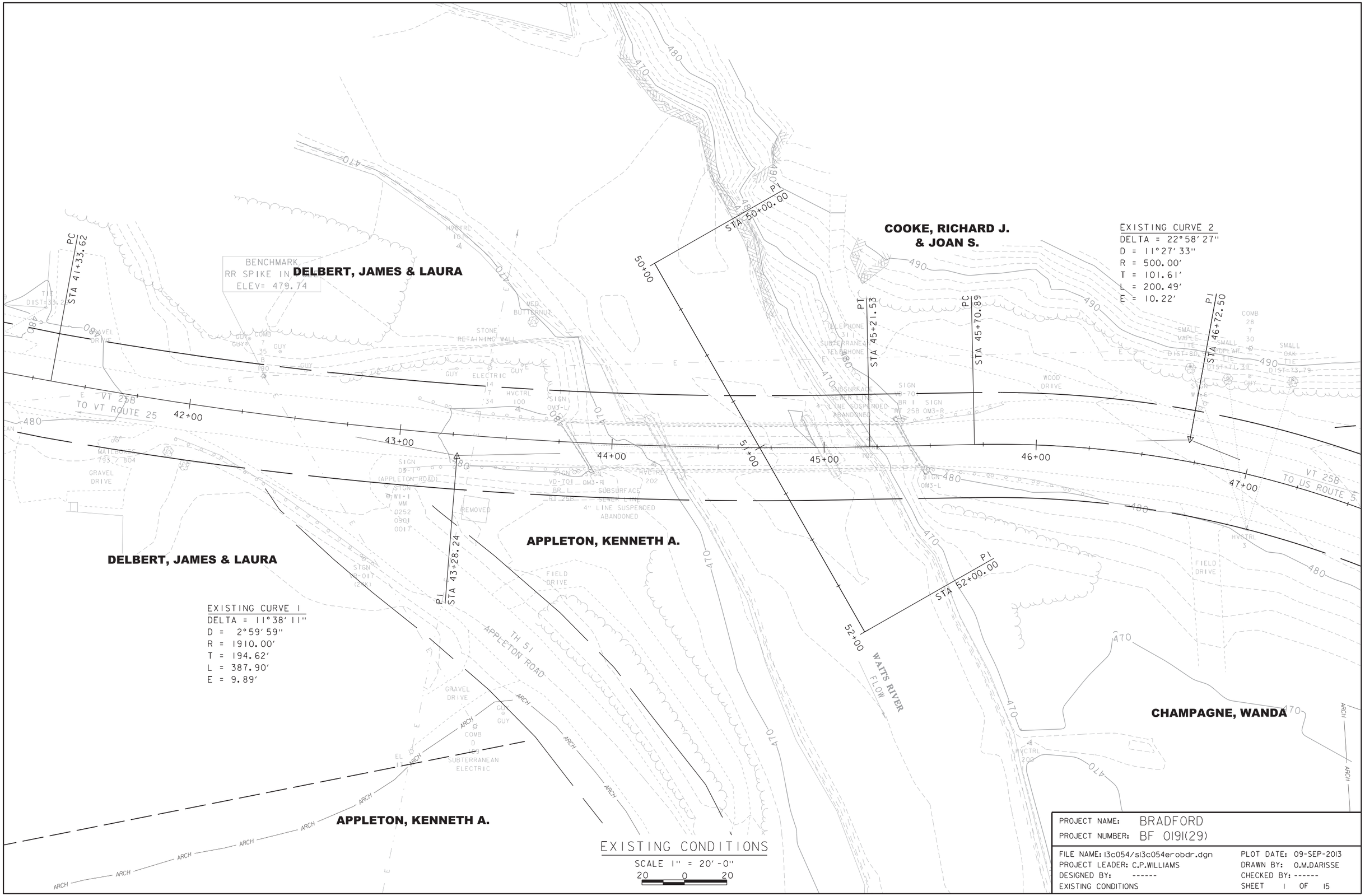
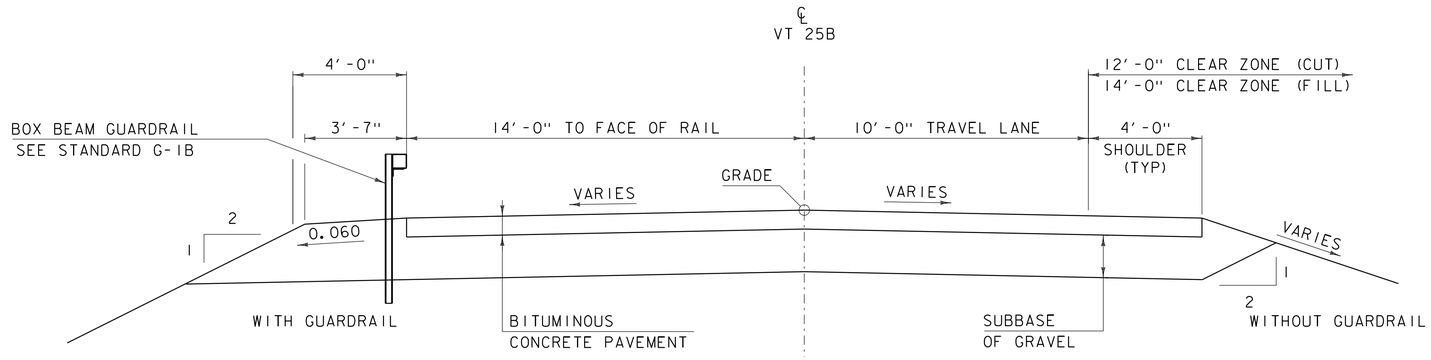
Two Rivers-Ottauquechee
Regional Commission
GIS Service Center
3117 Rose Hill
The King Farm
Woodstock, VT 05091
802-457-3188
www.trorc.org
R:\TOWNS\BR_proj\tp09\flu.mxd - 12/8/2009 @ 10:38:48 AM

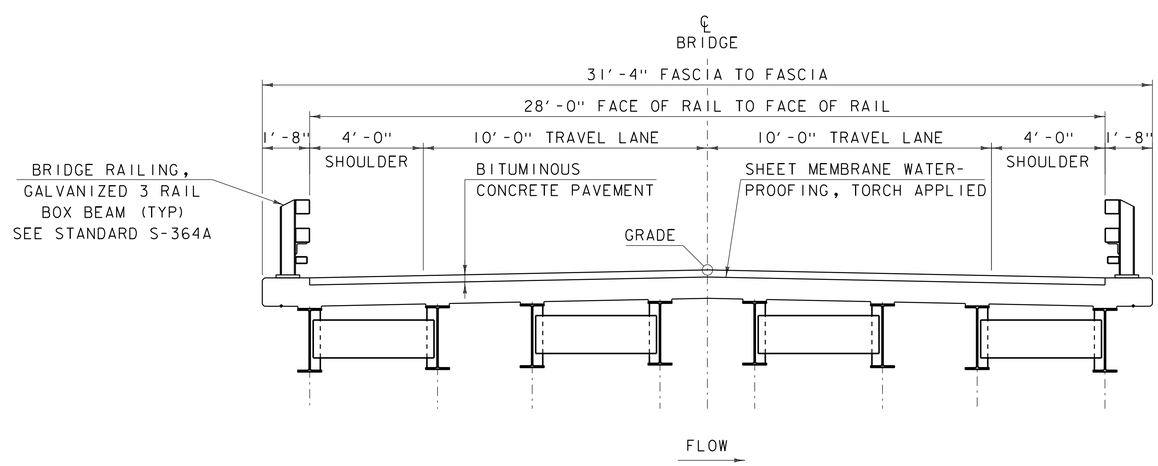


PROJECT NAME: BRADFORD	
PROJECT NUMBER: BF 0191(29)	
FILE NAME: 13c054/sl3c054erobdr.dgn	PLOT DATE: 09-SEP-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: O.M.DARISSE
DESIGNED BY: ------	CHECKED BY: ------
EXISTING CONDITIONS	SHEET 1 OF 15



PROPOSED VT 25B TYPICAL SECTION

SCALE 3/8" = 1'-0"



PROPOSED BRIDGE TYPICAL SECTION

SCALE 3/8" = 1'-0"

NOTE: PBU'S SHOWN FOR EXAMPLE,
SUPERSTRUCTURE NOT YET DESIGNED

MATERIAL TOLERANCES

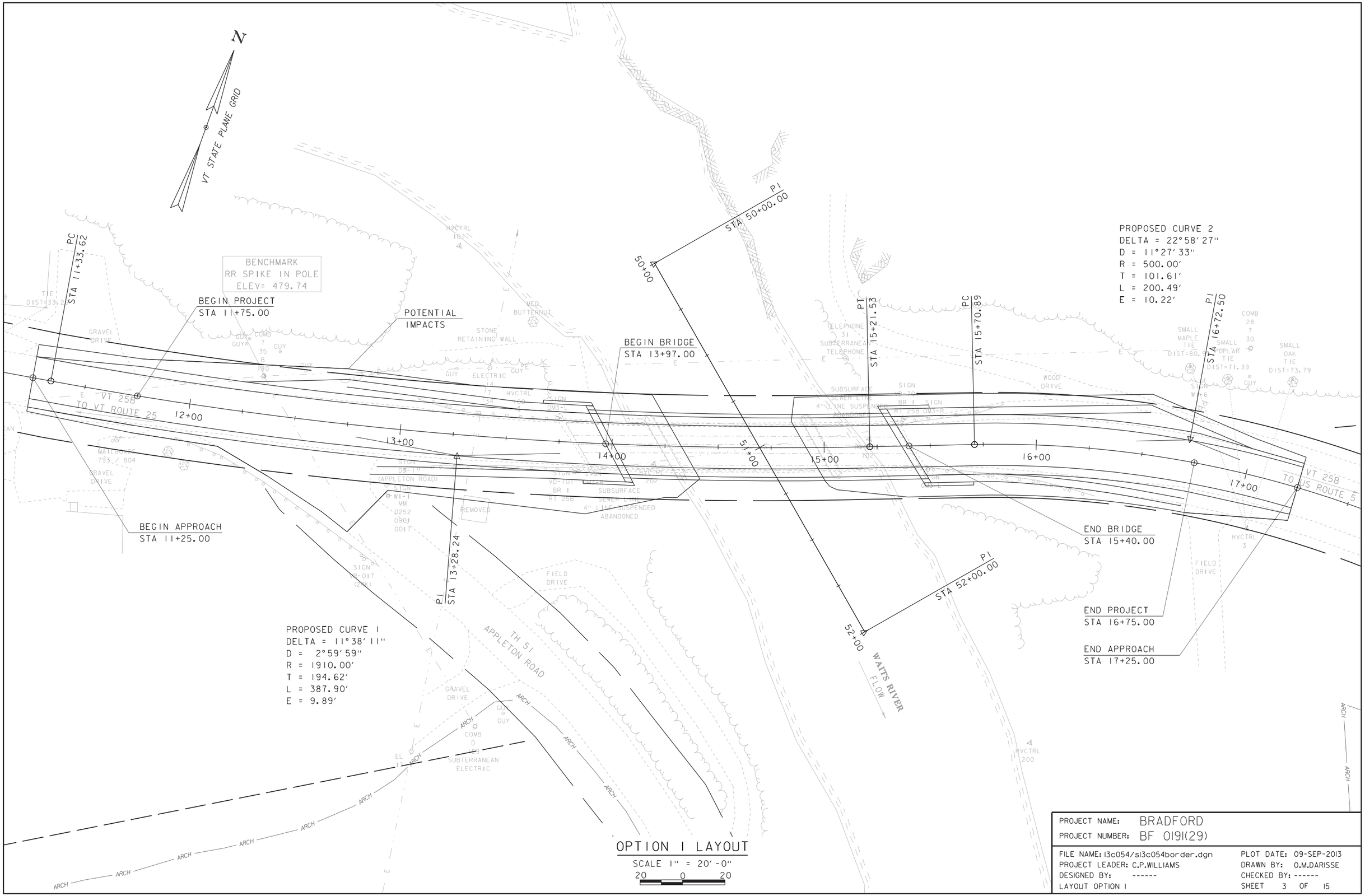
(IF USED ON PROJECT)

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

PROJECT NAME: BRADFORD
PROJECT NUMBER: BF 0191(29)

FILE NAME: 13J088\s13J088typical.dgn
PROJECT LEADER: C.P.WILLIAMS
DESIGNED BY: ----------
TYPICAL SECTIONS

PLOT DATE: 18-SEP-2013
DRAWN BY: O.M.DARISSE
CHECKED BY: ------
SHEET 2 OF 15

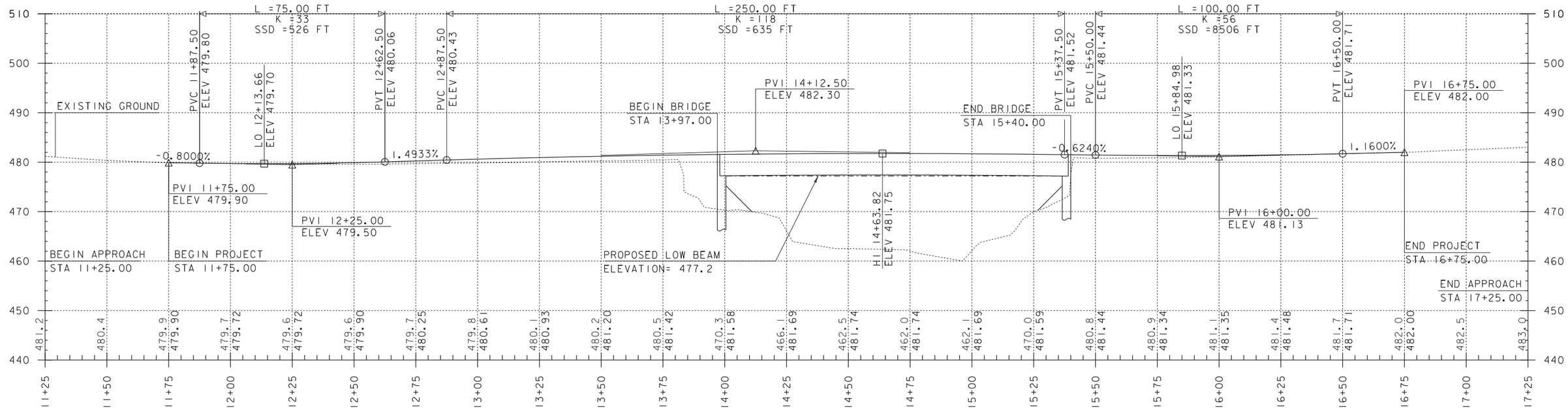


OPTION 1 LAYOUT

SCALE 1" = 20'-0"

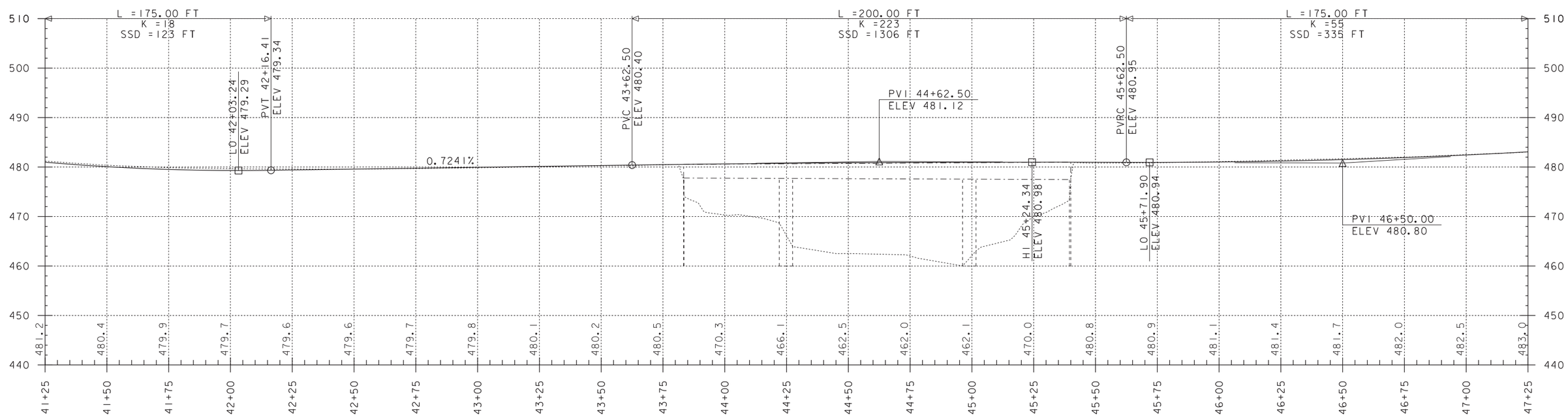
20 0 20

PROJECT NAME: BRADFORD	
PROJECT NUMBER: BF 0191(29)	
FILE NAME: 13c054/s13c054border.dgn	PLOT DATE: 09-SEP-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: O.M.DARISSE
DESIGNED BY: ------	CHECKED BY: ------
LAYOUT OPTION 1	SHEET 3 OF 15



VT RT 25B PROPOSED PROFILE #1

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



VT RT 25B EXISTING PROFILE

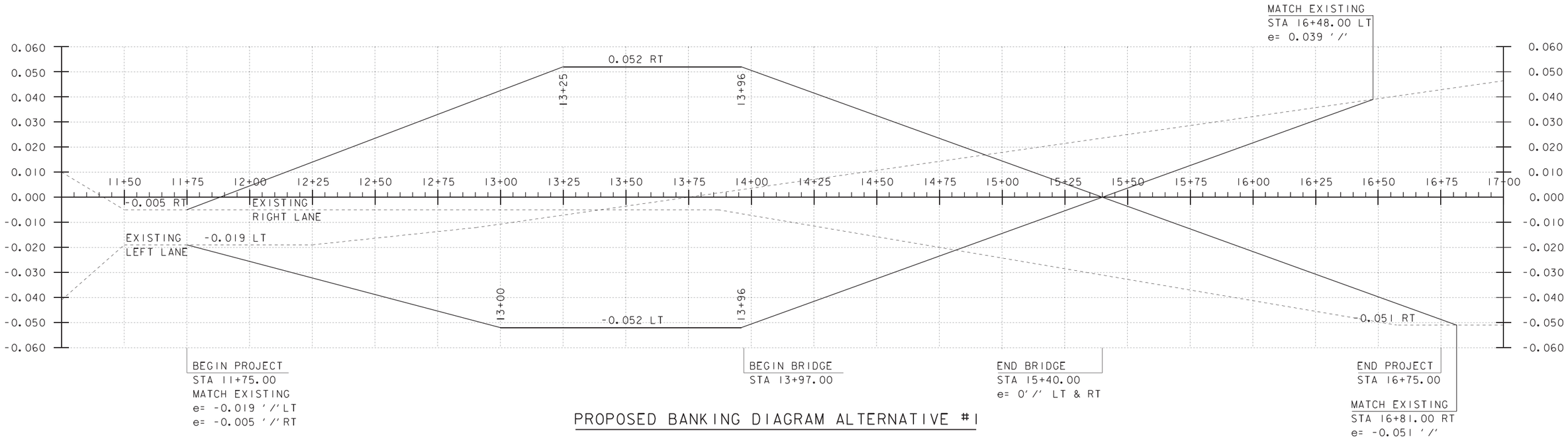
SCALE: HORIZONTAL 1"=20'-0"
VERTICAL 1"=10'-0"

NOTE:

GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄

GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

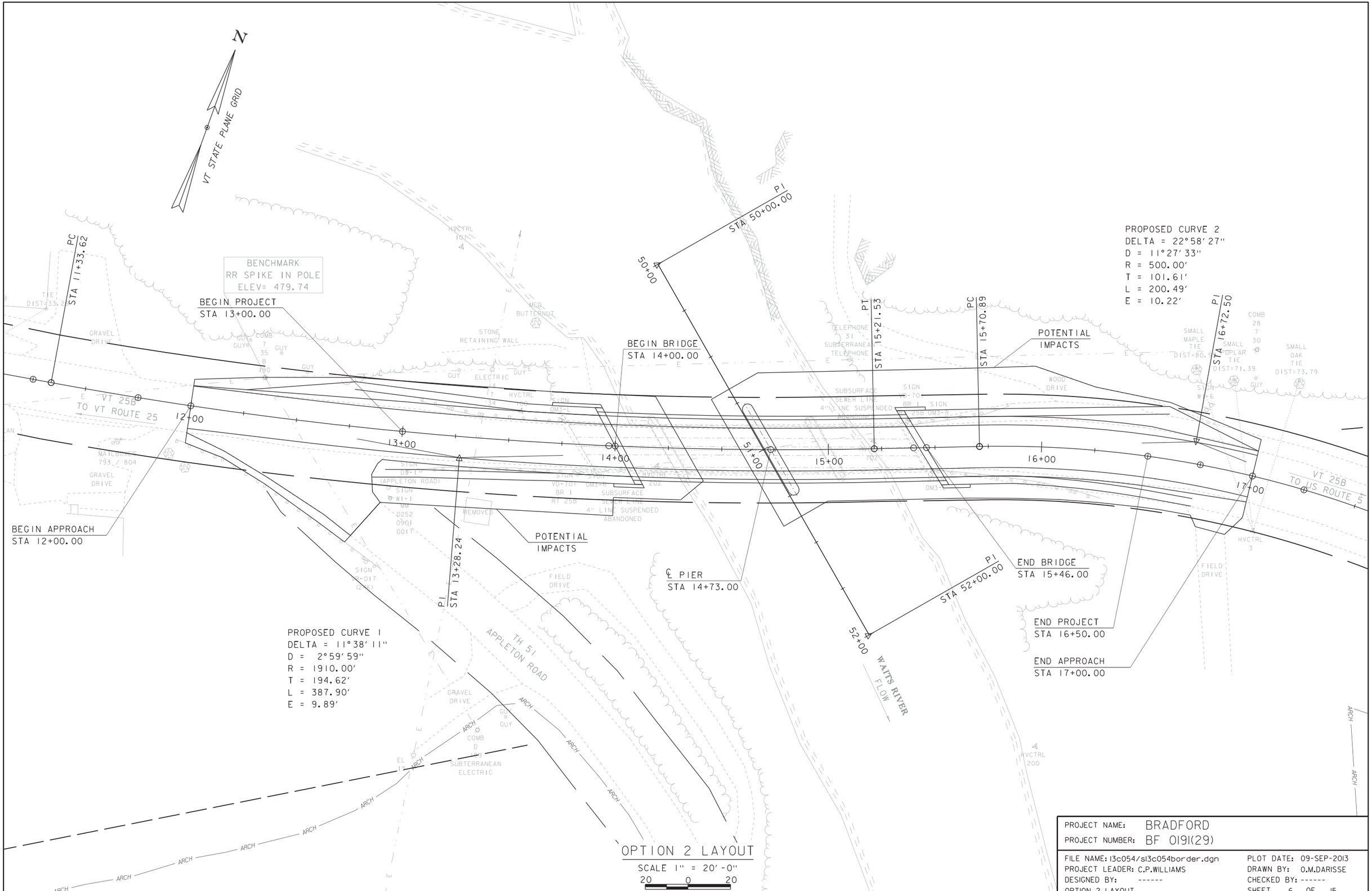
PROJECT NAME: BRADFORD	
PROJECT NUMBER: BF 0191(29)	
FILE NAME: 13c054/sl3c054profile.dgn	PLOT DATE: 09-SEP-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: O.M.DARISSE
DESIGNED BY: ------	CHECKED BY: ------
PROFILE SHEET	SHEET 4 OF 15



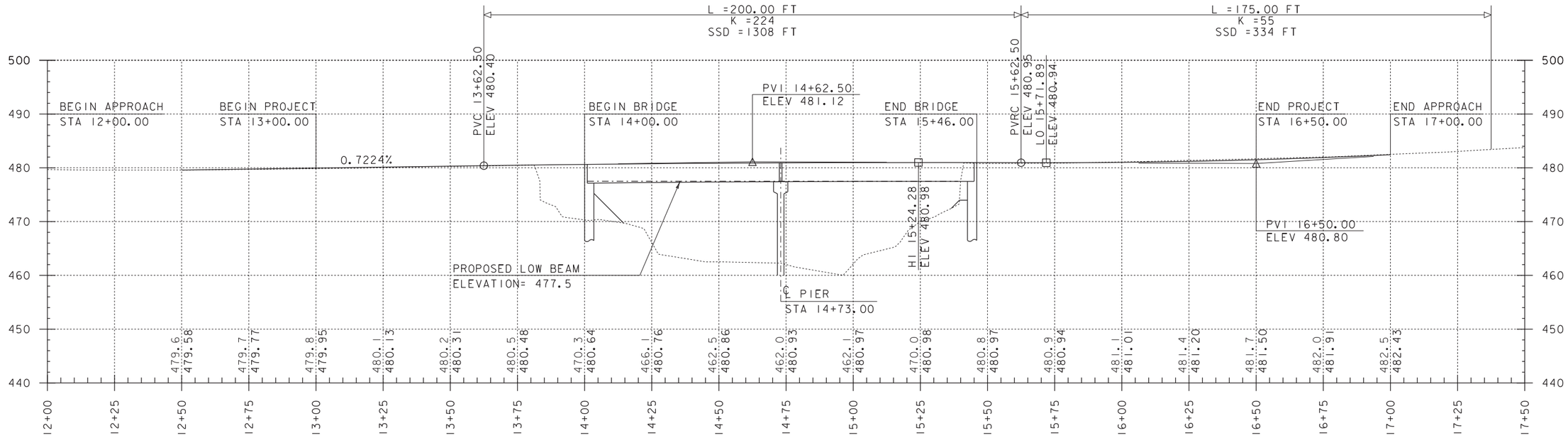
PROPOSED BANKING DIAGRAM ALTERNATIVE #1

SCALE: HORIZONTAL 1"=20'-0"
VERTICAL 1"=0.010 '/'

PROJECT NAME: BRADFORD	
PROJECT NUMBER: BF 0191(29)	
FILE NAME: 13c054/s13c054profile.dgn	PLOT DATE: 09-SEP-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: G.SWEENY	CHECKED BY: ------
OPTION 1 BANKING SHEET	SHEET 5 OF 15



PROJECT NAME: BRADFORD	
PROJECT NUMBER: BF 0191(29)	
FILE NAME: 13c054/s13c054border.dgn	PLOT DATE: 09-SEP-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: O.M.DARISSE
DESIGNED BY: ------	CHECKED BY: ------
OPTION 2 LAYOUT	SHEET 6 OF 15



VT RT 25B PROPOSED PROFILE #2

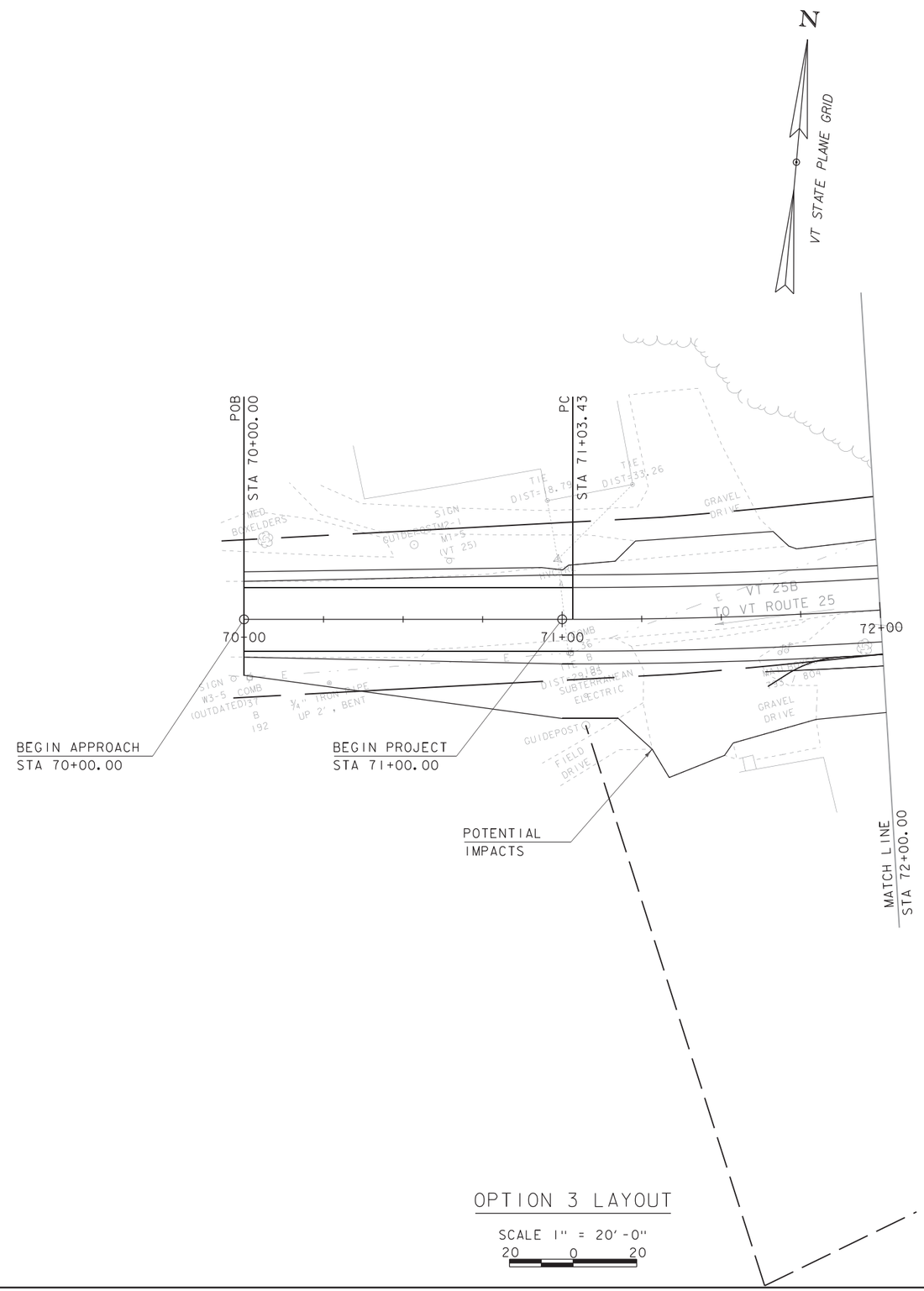
SCALE: HORIZONTAL 1"=20'-0"
VERTICAL 1"=10'-0"

NOTE:

GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄

GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

PROJECT NAME: BRADFORD	
PROJECT NUMBER: BF 0191(29)	
FILE NAME: 13c054/sl3c054profile.dgn	PLOT DATE: 09-SEP-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: O.M.DARISSE
DESIGNED BY: ------	CHECKED BY: ------
OPTION 2 PROFILE SHEET	SHEET 7 OF 15



OPTION 3 LAYOUT

SCALE 1" = 20'-0"

20 0 20

PROJECT NAME: BRADFORD	
PROJECT NUMBER: BF 0191(29)	
FILE NAME: 13c054/s13c054bdr.dgn	PLOT DATE: 09-SEP-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: G.SWEENY	CHECKED BY: T.FILLBACH
LAYOUT OPTION 3-1	SHEET 8 OF 15

N

VT STATE PLANE GRID

BENCHMARK
RR SPIKE IN POLE
ELEV= 479.74

BEGIN BRIDGE
STA 74+13.00

END BRIDGE
STA 75+56.00

PT
STA 74+07.53

72+00
73+00
74+00
75+00
76+00
77+00

MATCH LINE
STA 72+00.00

PI
STA 72+55.94

PC
STA 75+62.11

MATCH LINE
STA 77+00.00

TH 51
APPLETON ROAD

WATTS RIVER
FLOW

POTENTIAL
IMPACTS

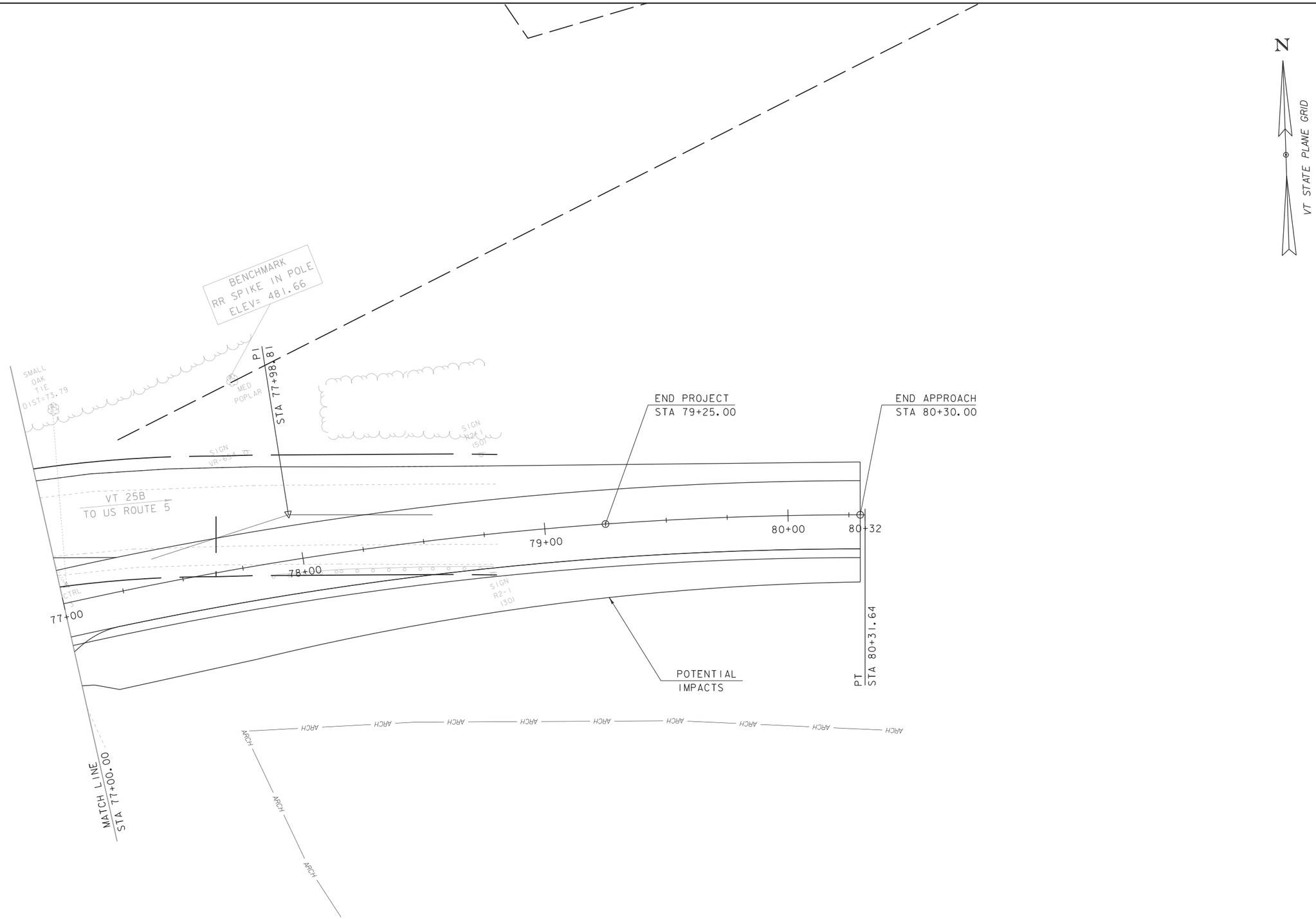
PROPOSED CURVE 1
DELTA = 10°53'23"
D = 3°34'52"
R = 1600.00'
T = 152.51'
L = 304.10'
E = 7.25'

PROPOSED CURVE 2
DELTA = 17°56'05"
D = 3°49'11"
R = 1500.00'
T = 236.70'
L = 469.53'
E = 18.56'

OPTION 3 LAYOUT

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

PROJECT NAME: BRADFORD	
PROJECT NUMBER: BF 0191(29)	
FILE NAME: I3c054/sI3c054border.dgn	PLOT DATE: 09-SEP-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: G.SWEENY	CHECKED BY: T.FILLBACH
LAYOUT OPTION 3-2	SHEET 9 OF 15

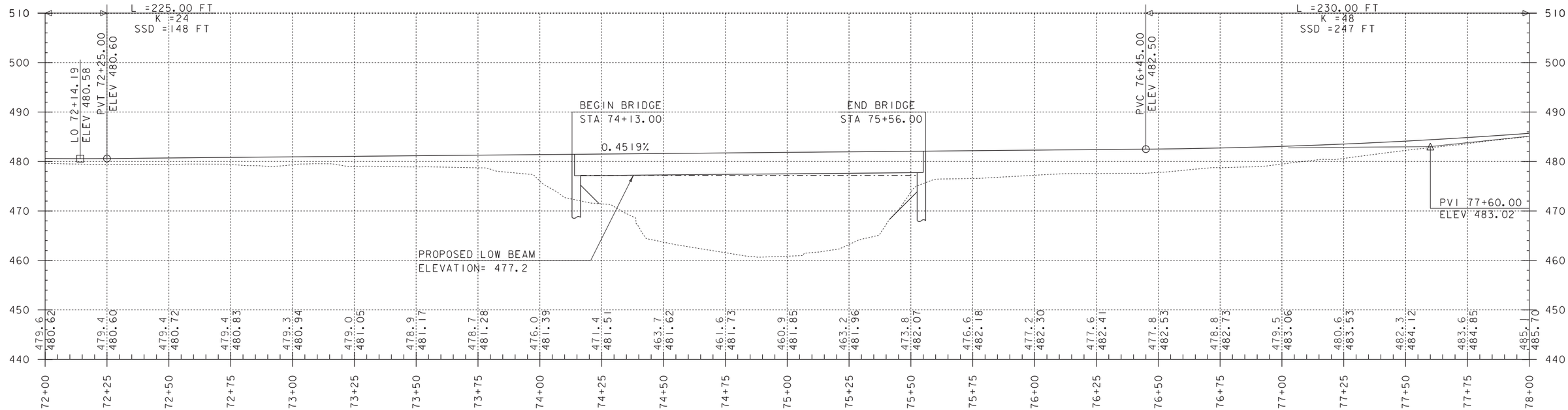


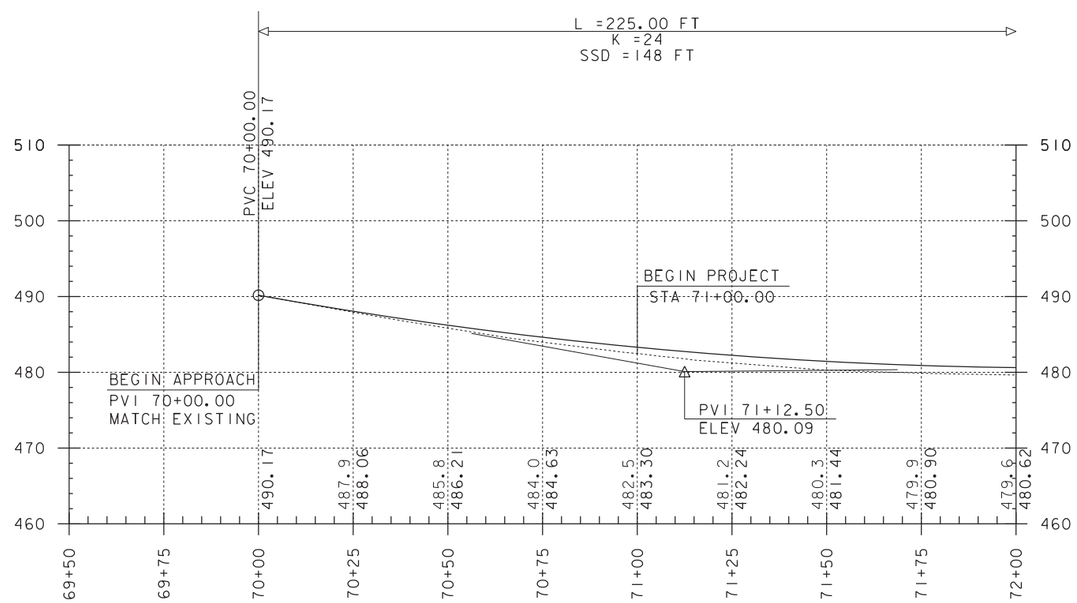
OPTION 3 LAYOUT

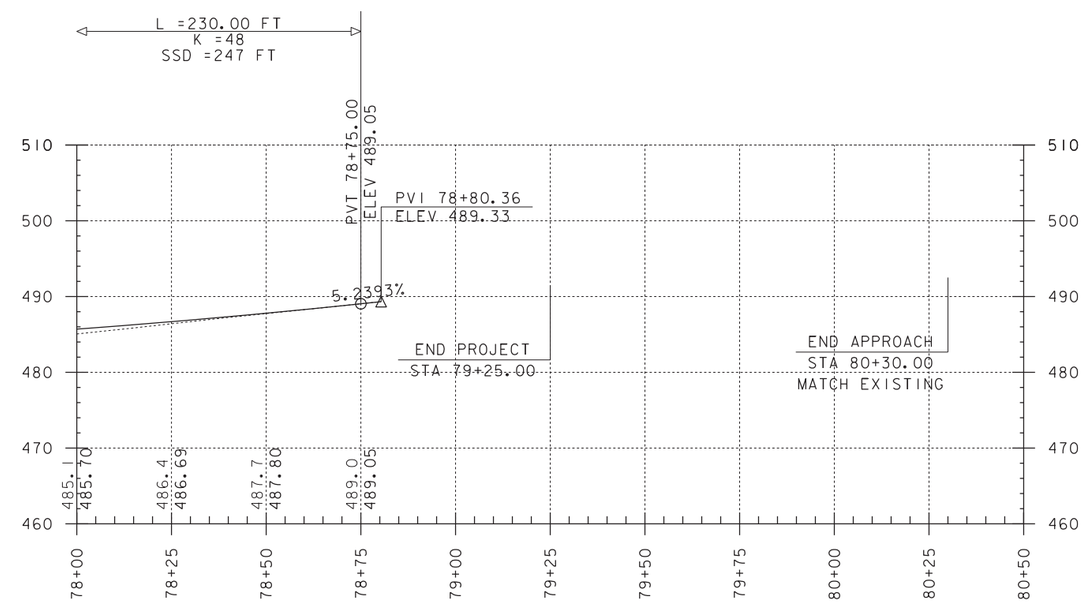
SCALE 1" = 20'-0"

20 0 20

PROJECT NAME: BRADFORD	
PROJECT NUMBER: BF 0191(29)	
FILE NAME: 13c054/s13c054border.dgn	PLOT DATE: 09-SEP-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: G.SWEENY	CHECKED BY: T.FILLBACH
LAYOUT OPTION 3-3	SHEET 10 OF 15







VT RT 25B PROPOSED PROFILE #3

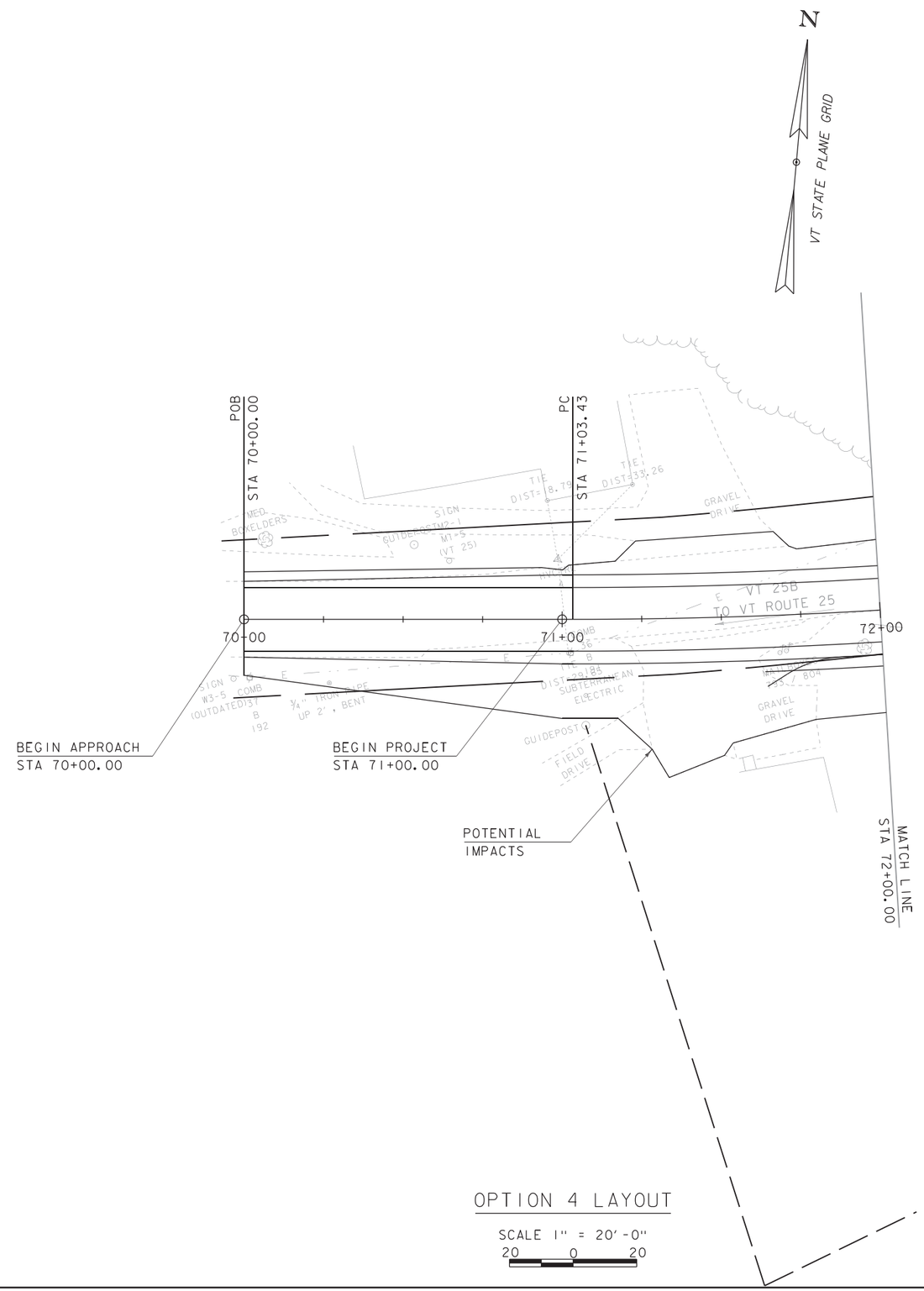
SCALE: HORIZONTAL 1"=20'-0"
VERTICAL 1"=10'-0"

NOTE:

GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄

GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

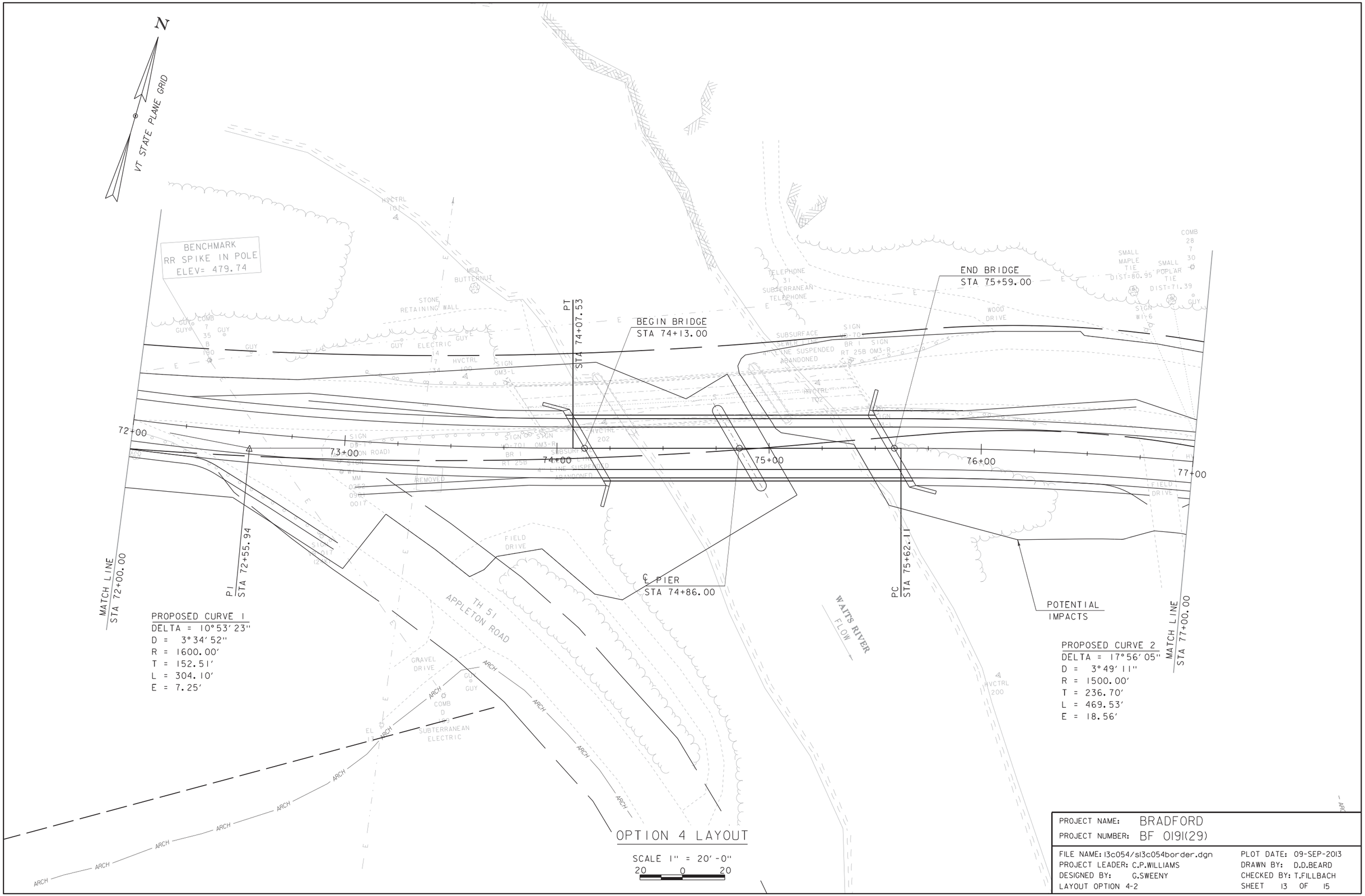
PROJECT NAME: BRADFORD	
PROJECT NUMBER: BF 0191(29)	
FILE NAME: 13c054/sl3c054profile.dgn	PLOT DATE: 09-SEP-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: O.M.DARISSE
DESIGNED BY: ------	CHECKED BY: ------
OPTION 3 PROFILE SHEET	SHEET 11 OF 15



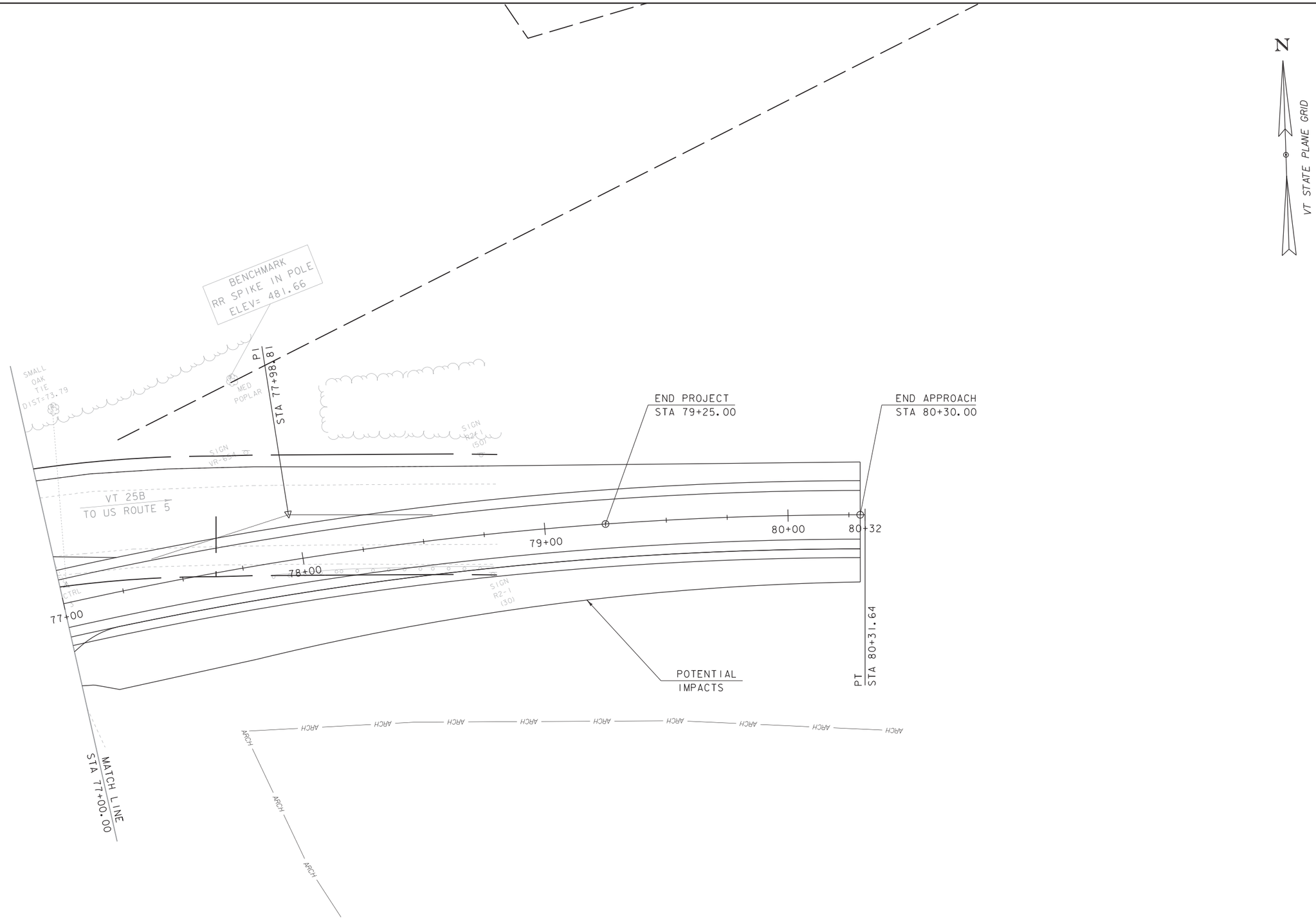
OPTION 4 LAYOUT

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

PROJECT NAME: BRADFORD	
PROJECT NUMBER: BF 0191(29)	
FILE NAME: 13c054/sl3c054bdr.dgn	PLOT DATE: 09-SEP-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: G.SWEENY	CHECKED BY: T.FILLBACH
LAYOUT OPTION 4-1	SHEET 12 OF 15



PROJECT NAME: BRADFORD	
PROJECT NUMBER: BF 0191(29)	
FILE NAME: 13c054/sl3c054border.dgn	PLOT DATE: 09-SEP-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: G.SWEENY	CHECKED BY: T.FILLBACH
LAYOUT OPTION 4-2	SHEET 13 OF 15

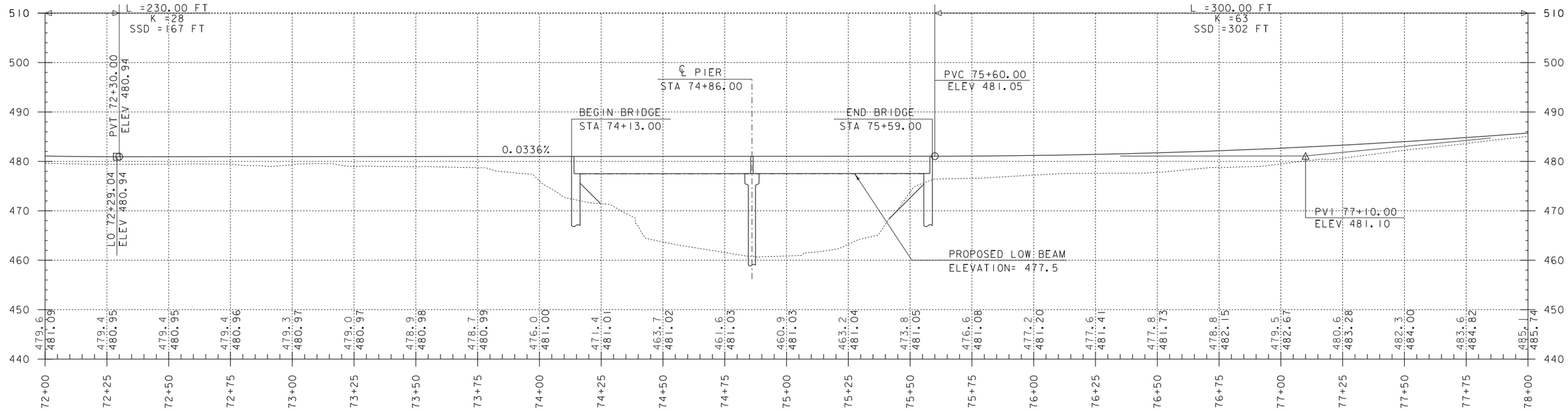


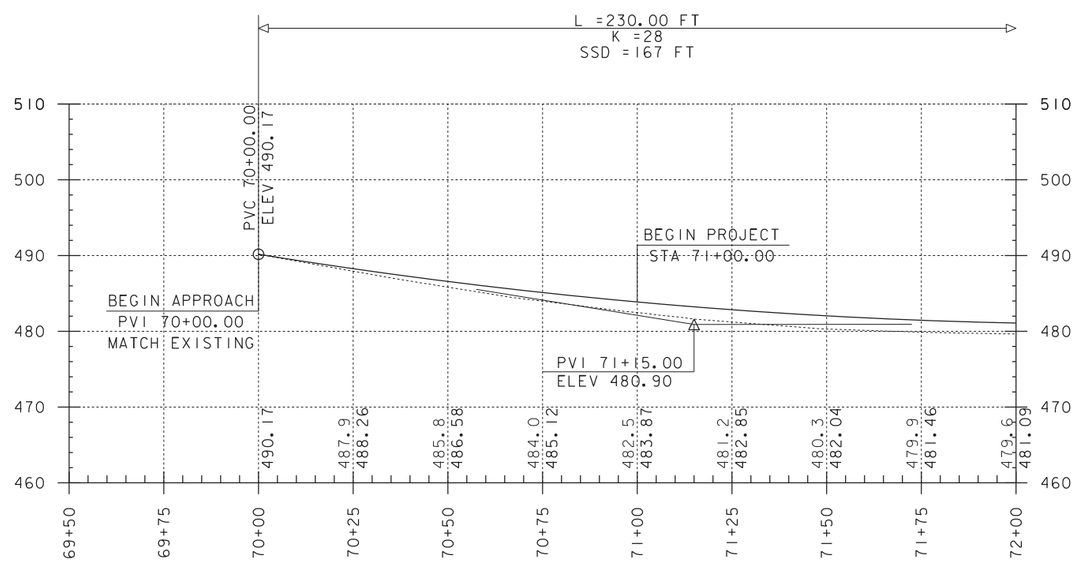
OPTION 4 LAYOUT

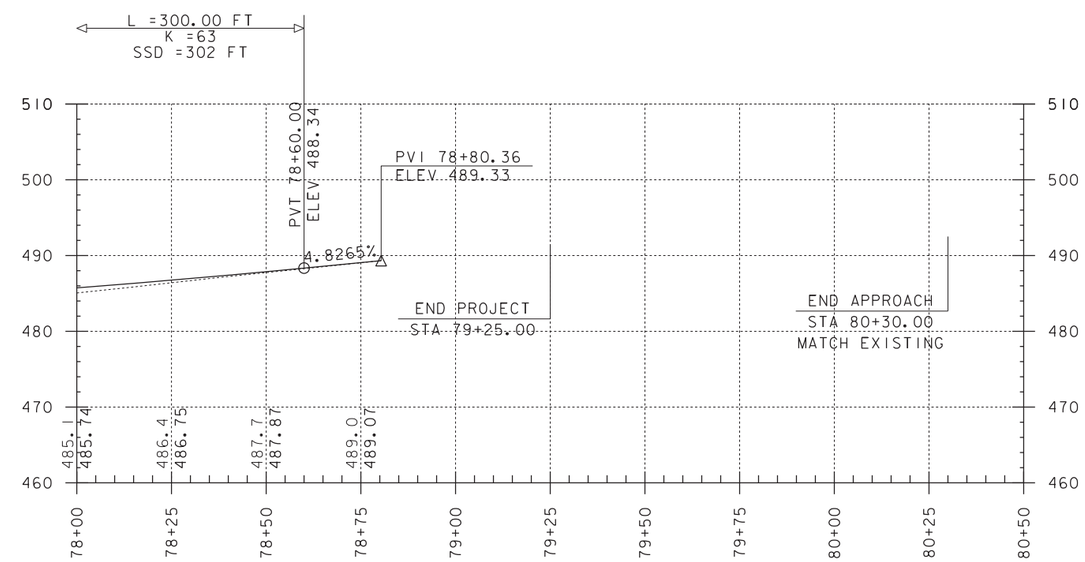
SCALE 1" = 20'-0"

20 0 20

PROJECT NAME: BRADFORD	
PROJECT NUMBER: BF 0191(29)	
FILE NAME: 13c054/s13c054border.dgn	PLOT DATE: 09-SEP-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: G.SWEENY	CHECKED BY: T.FILLBACH
LAYOUT OPTION 4-3	SHEET 14 OF 15







VT RT 25B PROPOSED PROFILE #4

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: BRADFORD	
PROJECT NUMBER: BF 0191(29)	
FILE NAME: 13c054/sl3c054profile.dgn	PLOT DATE: 09-SEP-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: O.M.DARISSE
DESIGNED BY: ------	CHECKED BY: ------
OPTION 4 PROFILE SHEET	SHEET 15 OF 15