STATE OF VERMONT
AGENCY OF TRANSPORTATION

Scoping Report

FOR

Weston BF 013-2(13)

VT ROUTE 100, BRIDGE 98 OVER THE WEST RIVER

September 10, 2013

Table of Contents

Table of Contents **2**

I. Site Information **3**

Need 3

Traffic 3

Design Criteria 4

Inspection Report Summary 4

Hydraulics 5

Utilities 5

Right Of Way 5

Resources 5

Wetlands/Watercourses: 5

Hazardous Materials: 6

Historic: 6

Archeological: 6

Stormwater: 6

II. Maintenance of Traffic **6**

Option 1: Temporary Bridge 7

Option 2: Phased Construction 7

Option 3: Off-Site Detour 8

III. Alternatives Discussion **8**

Alternative 1: No Action 8

Alternative 2: Minor Rehabilitation 8

Alternative 3: Full Bridge Replacement 9

IV. Alternatives Summary **10**

V. Cost Matrix **11**

VI. Conclusion **12**

VII. Appendices **13**

I. Site Information

Bridge 98 is located on VT Route 100 in a rural area approximately 1.1 miles south of the intersection with VT 155. It is adjacent to the intersection of VT 100 and TH-15, Felton Road and is located on a tangent. Sight distance is good in the vicinity 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 and mapping in the Appendix for more detailed information.

Roadway Classification	Rural Minor Arterial (State Highway)
Bridge Type	Single span, cast-in-place concrete deck on rolled beams.
Bridge Length	34 feet
Year Built	1959
Ownership	State of Vermont

Need

Bridge 98 carries VT Route 100 across the West River. The following is a list of deficiencies of Bridge 98:

1. The bridge is structurally deficient with a substructure rating of 4 (Poor).
2. Bridge lane and shoulder widths are substandard.
3. The bridge does not meet hydraulic standards.
4. 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	1900	2000
DHV	330	350
ADTT	150	250
%T	8.9	14.2
%D	57	57

The project location is not at a high crash location.

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 2,000 and a design speed of 50 mph for a Rural Minor Arterial.

Design Criteria	Source	Existing Condition	Minimum Standard	Comment
Approach Lane and Shoulder Widths	VSS Table 4.3	12'/4.5' (33')	11'/5' (32')	
Bridge Lane and Shoulder Widths	VSS Section 4.7	12'/3.25' (30.5')	11'/5' (32')	Substandard
Clear Zone Distance	VSS Table 4.4	Some items in the approach areas may be substandard, such as utility poles, side slopes, and ditches	20' fill / 12' (1:3) cut 14' (1:4) cut	Substandard, but beyond project scope
Banking	VSS Section 4.13	Varies	8% (max) 6% max. at side road	
Speed		50 mph	50 mph (Design)	
Horizontal Alignment	AASHTO Green Book Table 3-10b	Roadway alignment is straight in the project area	R_{min} = 758' @ e=8%	
Vertical Grade	VSS Table 4.5	-0.59% (south) 0.85% (north)	4% (max) for level terrain	
K Values for Vertical Curves	VSS Table 4.1	Bridge is on vertical curve (sag) K=174	110 crest / 90 sag	
Vertical Clearance Issues	VSS Section 4.8	None noted	14'-3" (min)	
Stopping Sight Distance	VSS Table 4.1	709'	400'	
Bicycle/Pedestrian Criteria	VSS Table 4.7	Approx. 3' shoulder	5' 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 std for Q_{10}	Q_{50} with one ft freeboard	Substandard
Structural Capacity	SM, CH 3.4.1	Structurally Deficient	Design Live Load: HL-93	Substandard

Inspection Report Summary

Deck Rating	5 Fair
Superstructure Rating	7 Good
Substructure Rating	4 Poor
Channel Rating	5 Fair
Deficiency Status of Structure	SD Structurally Deficient

From latest inspection report:

"09/10/2011 – Irene note: Small erosion hole formed along the outer edge of the approach roadway at the southeast corner adjacent to the curb and pylon. Filled in with stone and gravel. Pylon tipped out but was impacted hard recently and not storm related. – MJ/DK"

"4/18/2011 The spalling in the bridge seats on the ends at Abutment 1 should be repaired. The spalling is starting to undermine the upstream fascia beam abutment 1 and threaten the downstream bearing at abutment 1. The deck continues to deteriorate along with the abutments. There is deep scour hole at abutment 1 which is over the chest waders which should be filled in with some means of scour protection. DCP & FRE"

Hydraulics

A Preliminary Hydraulics Report was done for this project and can be seen in the Appendix. The existing bridge is not capable of meeting the hydraulic standard for State-owned bridges, which requires passing the 50 year storm event (Q_{50}) with one foot of freeboard below the low beam elevation. In fact, the Q_{10} flow cannot pass through the structure. The hydraulics staff recommends a clearspan perpendicular to the river of 50 ft. minimum to provide the appropriate Bank Full Width, and raising the bottom of beams to elevation 1430.4 to provide an adequate waterway for Q_{50}.

A small amount of material removed from the river bank near the NW wingwall would provide minor improvements to the flow characteristics, such as reduced turbulence and reduced scour tendencies.

Utilities

There are aerial utilities running along the west (downstream) side of VT Route 100 through the project area and along TH-15, Felton Road. Near the project location, the utilities cross VT 100 in two places. Relocation of aerial utilities will be required. The existing utilities are shown on the Layout Sheet. There are believed to be no buried utilities in the project area.

Right Of Way

The existing 4-rod State Right-of-Way is plotted on the Layout Sheet. Also shown is the 3-rod Right-of-Way claimed by the Town of Weston on TH-15, Felton Road. Negotiations with the Town are anticipated to address work done in the Town Right of Way for work at the intersection of TH-15 and VT 100.

Resources

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

Wetlands/Watercourses:

See the Resource Identification Memo in the Appendix. Summarizing, there are high function, high value Class II wetlands within the immediate area of the project. Locations are shown in the Appendix. It should be possible to accomplish the work without disturbing these wetlands.

The West River is regulated by the US Army Corps of Engineers (COE), thus any impacts below Ordinary High Water require permitting. The river is classified as an Essential Fish Habitat and therefore there are no non-reporting activities.

Wildlife Habitat

Based on a VT Fish and Wildlife linkage rating of "4", good wildlife habitat exists on both sides of VT 100 within this corridor. Connectivity is expected to be adequate.

Rare, Threatened and Endangered Species

According to the VT Fish and Wildlife Natural Heritage Database, there are no federal or state listed mapped threatened or endangered plants or animals within the project corridor and no impacts are anticipated.

Agricultural

No impacts to any prime agricultural soils are anticipated.

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. Most are closed and none are near the project. None are expected to be impacted by the project.

Historic:

There are no historic or section 4(f) properties in the project area.

Archeological:

There are no known areas of archeological sensitivity in the vicinity of the project.

Stormwater:

The stormwater conditions on this project are unknown. There are no known concerns.

II. Maintenance of Traffic

The Vermont Agency of Transportation has developed an Accelerated Bridge Program, which focuses on faster delivery of construction plans, permitting, and Right of Way, as well as faster construction 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.

Since the current alignment and sight distance are adequate, and there would be adverse impacts, building a new bridge off-alignment was ruled out. The following options have been considered:

Option 1: Temporary Bridge

A temporary bridge could potentially be placed on either side of the existing bridge from a constructability standpoint. If this method of traffic maintenance is chosen, a one lane bridge with alternating two-way traffic would be appropriate, with a temporary traffic signal on each end. Temporary Right-of-Way would be necessary.

There are factors however on both sides that would require resolution. See the plans in the appendix. On the west side of the bridge, the southern approach for a temporary bridge would have a potential minor impact on a wetland area. It is probable that a temporary approach on the northwest quadrant of the bridge could be built to avoid the wetlands there. On the east side of the bridge, wetlands could probably be avoided, but a temporary bridge approach on the east side would impact TH-15, Felton Road. Because of the skew of the river and the rising elevation of the adjacent terrain, a temporary bridge on the east side would be difficult to construct and would require a lot of space. There would be potential impacts to the first property on Felton Road.

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

Disadvantages: Regardless of which side a temporary bridge is built on, this option would require temporary Right-of-Way acquisition. There would be temporary impacts to adjacent properties, including Class II wetlands. This traffic control option would be costly, and time consuming, as construction activities would require a portion of a second construction season, due to the temporary bridge.

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 minimizing impacts to adjacent property owners and environmental resources. Based on the traffic volumes, it is reasonable to close one lane of traffic, and maintain one lane of traffic, alternating direction, with a traffic signal at each end. Difficulties present on this project include the close proximity of TH-15 and a residential driveway at the northwest quadrant of the bridge. These features would be within the traffic signal stop bars, which is not ideal since traffic turning onto or off of them will be interrupting the traffic flow through the zone.

Advantages:

Traffic flow would be maintained through the project corridor during construction. Also, this option would have minimal impacts outside the existing Right of Way.

Disadvantages:

- Phasing typically exposes the traveling public and the work crews to additional safety risks, as they co-exist in close proximity. There are minor delays occasionally with phased construction.
- Phased construction typically takes much longer. The contractor will be forced to work in tight quarters, which slows the work. Mobilization for certain tasks must be repeated for phased construction whereas it is done once normally. The longer the contractor is on site, the more his costs rise due to on-site general conditions costs.

- Phased construction costs more, as many tasks must be done two or even three times as work moves through the phases. Also, temporary traffic signals would likely be used, which add cost.

Option 3: Off-Site Detour

This option would close the bridge and reroute traffic onto VT 103 in Ludlow, then south on VT 103 to Chester. From there, the detour would go west on VT 11 back to VT 100 in the Town of Londonderry. The end to end distance of this route is 43 miles. This detour adds 12 miles to the route through the area between Londonderry and Ludlow.

There are a couple of local bypass routes that may see an increase in traffic from local passenger cars. Local bypass routes are not signed detours, but may experience higher traffic volumes if VT 100 is closed during construction. The two most likely local bypass routes are Andover Road to the east into Andover (approximately 18.2 miles end to end) or Old County Road (approximately 3.5 miles end to end) to the west.

Advantages: This option would eliminate the need for a temporary bridge, which would significantly decrease cost and time of construction, cost of Right of Way acquisition, and resource impacts. It allows a safer and much faster construction project than phasing.

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

III. Alternatives Discussion

Alternative 1: No Action

This alternative leaves the bridge in its current condition. Generally, a No Action choice suggests that nothing will be done for at least the next ten years. Given the rating of 4 (Poor) for the substructures, however, it is not advisable for the No Action alternative to be chosen. The bridge seats need attention soon, and there are significant cracks in some areas of the abutments. The bridge is rated as structurally deficient. The No Action Alternative is not recommended.

Alternative 2: Minor Rehabilitation

Bridge repair was considered, which would include minor repairs to the deck and repairs to surface deficiencies on the abutments, replacement of the bridge railings, and new membrane and pavement. However, there has been deterioration of the substructures and deck such that major repair or replacement work is required. There is significant deterioration of the bridge seats, and the cracking in some areas of the substructures is also significant. The scour concerns and hydraulic condition would not be addressed with Minor Rehabilitation. No further consideration will be given to Minor Rehabilitation.

Alternative 3: Full Bridge Replacement

This alternative describes the replacement of all bridge components; substructure, superstructure, deck, and railing. All structural conditions, scour, and hydraulic issues would be resolved. The full 80 year service life estimated for new bridge construction is provided.

Several full replacement alternatives were considered:

- 3a - full replacement, off-site detour;
- 3b - full replacement, temporary bridge;
- 3c - full replacement, phased construction.

For comparison, a fourth alternative was briefly considered in which the new bridge is not raised, but matches the existing low beam elevation. The hydraulic standard is not met when matching the existing low beam elevation and it was determined that building a new bridge to meet hydraulic standards is approximately 10% more expensive. The fourth alternative was not developed further.

a. Alignment

The existing horizontal alignment is straight and ideal on the bridge and for over one hundred feet in either direction. A full replacement alternative that maintains traffic on the existing bridge while a new bridge is constructed off alignment was briefly considered, but this idea was discarded for two reasons; impacts on abutting properties, resources, and Right of Way needs; and the fact that new horizontal curves would be introduced into a currently very satisfactory condition.

The vertical alignment of the existing bridge and roadway is geometrically favorable. However, in the full replacement alternatives, vertical alignment is influenced by the hydraulic conditions at the site. The recommendation of the preliminary hydraulics report is to provide a 50 ft. clearspan and a low beam elevation of 1430.4 to meet the hydraulic standard. Using this low beam elevation and a shallower superstructure depth raises the bridge grade by approximately 1.7 ft. This will require an extension of the project to blend new grades back into existing, and a wider impact area, including toes of slopes, than the current footprint. A 20 degree skew would be proposed to accommodate simpler design of integral abutments and precast superstructure if applicable.

The proposal is to maintain the existing horizontal alignment and raise the bottom of beam elevation to 1430.4.

b. Bridge

The proposed bridge characteristics are as follows:

- Bridge length would be 59 ft. River clearspan would be 50 ft.
- Horizontal alignment would be unchanged.
- Low beam elevation 1430.4 (raised approximately 2 ft.).
- Vertical alignment would be raised 1.7 ft.
- Skew would be 20 degrees.
- Lane and shoulder widths should be 5-11-11-5.

- No raised sidewalk on the bridge, but lane and shoulder widths to accommodate shared vehicular, bicycle, and pedestrian use.
- New bridge rail required to be TL-3, min. Consideration should be given to Galvanized Three Rail Box Beam Bridge Rail (TL-4), with Galvanized Three Rail Box Beam Approach section
- There is uncertainty regarding the geotechnical characteristics of the site. A preliminary study conducted by VTrans indicates that several nearby residential wells encountered bedrock at fairly shallow depths, in a range of 2 ft. to 30 ft. There are no other known borings in the vicinity. Typically, integral abutments would be the first choice on a full replacement project where bedrock is deep enough for piles. If bedrock is very shallow, reinforced concrete abutments on spread footings could be placed directly on the bedrock. For intermediate depths of bedrock, the spread footings could be supported by micropiles.
- Traffic could be maintained by any of the three methods described above; off-site detour, temporary bridge, or phased construction.

IV. Alternatives Summary

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

Alternative 3a: Full Replacement with Off-site detour.

Alternative 3b: Full Replacement with Temporary Bridge.

Alternative 3c: Full Replacement with Phased Construction.

V. Cost Matrix[1]

Weston BF 013-2(13)		Do Nothing	Alt 3a	Alt 3b	Alt 3c
			Full Replacement	Full Replacement	Full Replacement
			Off-Site Detour	Temporary Bridge	Phased Construction
COST	Bridge Cost	$0	$605,600	$605,600	$667,000
	Removal of Structure	$0	$40,000	$40,000	$60,000
	Roadway	$0	$261,300	$305,000	$335,500
	Maintenance of Traffic	$0	$21,000	$150,000	$15,000
	Construction Costs	$0	$927,900	$1,100,600	$1,077,500
	Construction Engineering + Contingencies	$0	$269,100	$319,000	$312,500
	Total Construction Costs w CEC	**$0**	**$1,197,000**	**$1,419,600**	**$1,390,000**
	Preliminary Engineering[2]	**$0**	**$299,000**	**$355,000**	**$348,000**
	Right of Way	**$0**	**$0**	**$0**	**$0**
	Total Project Costs	$0	$1,496,000	$1,774,600	$1,738,000
	Annualized Costs	$0	$18,700	$22,200	$21,800
SCHEDULING	Project Development Duration[3]	None	2 years	4 years	2 years
	Construction Duration	None	5 months	12 months	8 months
	Closure Duration (If Applicable)	None	4 weeks	none	none
ENGINEERING	Typical Section - Roadway (feet)	33'	33'	33’	33’
	Typical Section - Bridge (feet)	3-12-12-3	5-11-11-5	5-11-11-5	5-11-11-5
	Traffic Safety	No Change	Improved	Improved	Improved
	Alignment Change	No	Vertical Only	Vertical Only	Vertical Only
	Bicycle Access	No Change	Improved	Improved	Improved
	Hydraulic Performance	No Change	Meets Std	Meets Std	Meets Std
	Pedestrian Access	No Change	Improved	Improved	Improved
	Utility	No Change	Relocation	Relocation	Relocation
OTHER	ROW Acquisition	No	No	Yes	No
	Road Closure	No	Yes	No	No
	Design Life	<10 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

Alternative 3a is recommended to replace the bridge while maintaining traffic on an offsite detour, increasing the span, and raising the roadway to meet the hydraulic standard. This solution provides a completely new bridge, meeting the applicable standards, with a length of 59 ft. and a curb to curb width of 32 ft. This alternative will be the least expensive one, and provides a safe work zone. The closure would be expected to be 4 weeks. It is desirable over a phased method, which takes much longer and provides a less safe work zone for workers and travelers through the zone. A temporary bridge option is the most expensive and takes the longest, usually extending into the following construction season to finish up the removal of the temporary bridge and restoration of the temporary bridge site and the approaches.

VII. Appendices

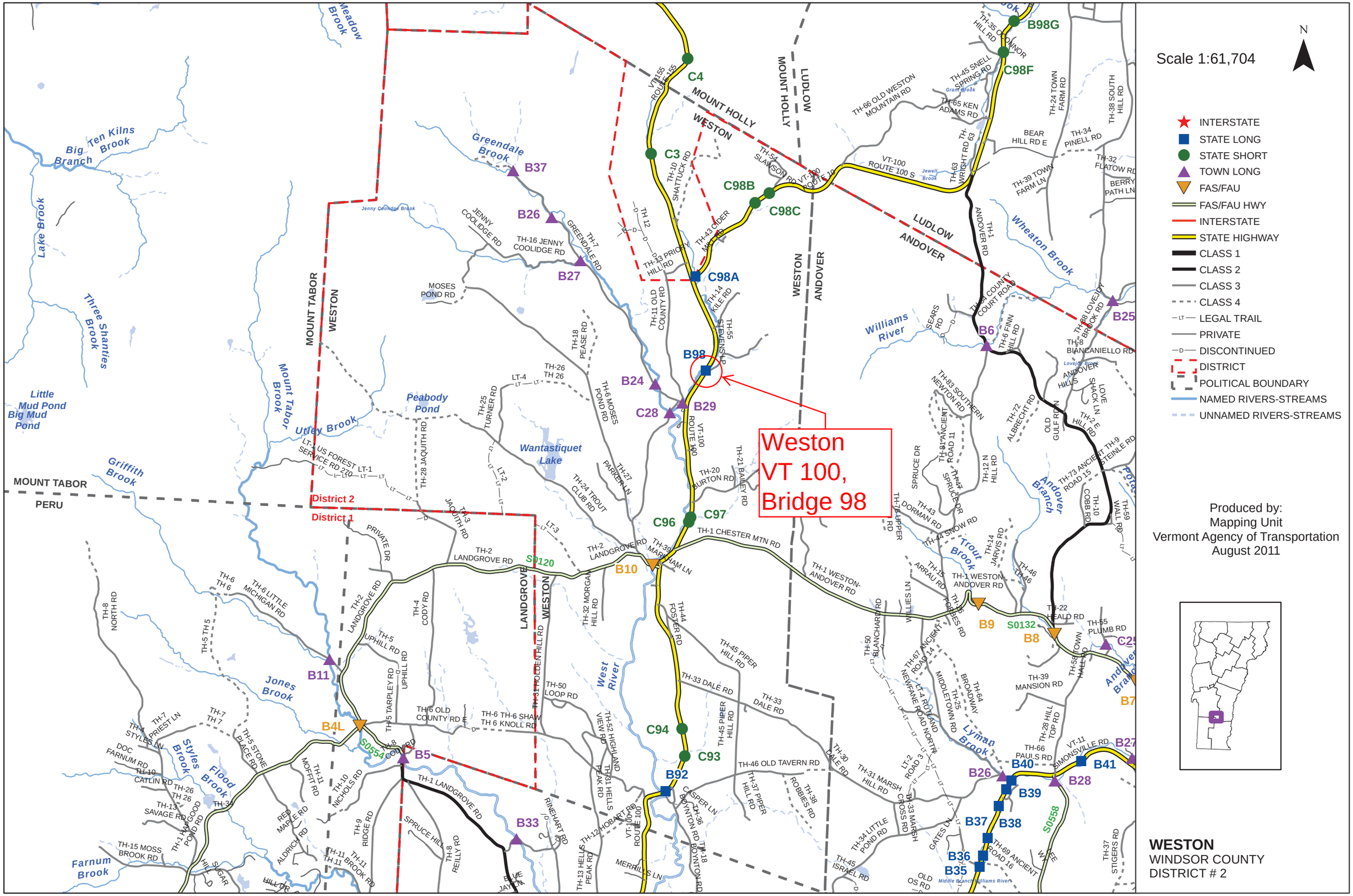
- Site Pictures
- Town Map
- Bridge Inspection Report
- Hydraulics Memo
- Preliminary Geotechnical Information
- Natural Resources Memo
- Archeology Memo
- Historic Memo
- Detour and Local Bypass Maps
- Community Input
- Plans
    - Existing Conditions
    - Proposed Typical Sections
    - Proposed Layout
    - Proposed Profile
    - Phasing Typical Sections
    - Phasing Layouts
    - Temporary Bridge

Deterioration of Abutment 1

Concrete erosion at Girder Bearing

North Approach, Looking North

South Approach, Looking South


Weston
VT 100,
Bridge 98
Scale 1:61,704
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
WESTON
WINDSOR COUNTY
DISTRICT # 2
District 2
District 1
MOUNT TABOR
PERU
MOUNT HOLLY
LUDLOW
WESTON
ANDOVER
LANDGROVE
Big Ten Kilns Brook
Big Branch
Lake Brook
Three Shanties Brook
Little Mud Pond
Big Mud Pond
Griffith Brook
Mount Tabor Brook
Utley Brook
Peabody Pond
Wantastiquet Lake
Greendale Brook
Jenny Coolidge Brook
Meadow Brook
Jones Brook
Styles Brook
Flood Brook
Farnum Brook
West River
Williams River
Wheaton Brook
Andover Branch
Trout Brook
Lyman Brook
Grant Brook
Jewell Brook
Lovejoy Brook
Middle Branch Williams River
C4
C3
C98B
C98C
C98A
B98
C28
B29
C96
C97
C94
C93
B92
B10
B9
B8
B4L
B5
B11
B37
B26
B27
B24
B33
B6
B25
B98G
C98F
B40
B41
B39
B38
B37
B36
B35
B28
S0120
S0554
S0132
S0558
VT-100 ROUTE 100
VT-100 ROUTE 100 S
VT-100 ROUTE 100 N
VT-155 ROUTE 155
TH-1 CHESTER MTN RD
TH-1 WESTON-ANDOVER RD
TH-2 LANDGROVE RD
TH-1 LANDGROVE RD
TH-33 DALE RD
TH-46 OLD TAVERN RD
TH-31 MARSH HILL RD
TH-66 OLD WESTON MOUNTAIN RD
TH-45 SNELL SPRING RD
TH-65 KEN ADAMS RD
TH-63 WRIGHT RD
TH-24 TOWN FARM RD
TH-38 SOUTH HILL RD
BEAR HILL RD E
TH-34 PINELL RD
TH-32 FLATOW RD
BERRY PATH LN
TH-39 TOWN FARM LN
TH-1 ANDOVER RD
TH-1 COUNTY COURT ROAD
TH-6 FINN HILL RD
TH-8 BIANCANIELLO RD
TH-89 LOVEJOY BROOK RD
TH-83 SOUTHERN NEWTON RD
TH-72 ALBRECHT RD
OLD GULF RD
TH-2 E HILL RD
TH-9 STEINLE RD
TH-73 ANCIENT ROAD 15
TH-10 COBB RD
TH-69 WALL RD
TH-12 N HILL RD
TH-47 SPRUCE DR
TH-43 DORMAN RD
TH-44 SNOW RD
TH-14 JARVIS RD
TH-46
TH-22 HEALD RD
TH-55 PLUMB RD
TH-39 MANSION RD
TH-58 TOWN HALL
TH-28 HILL TOP RD
TH-66 PAUL S RD
VT-11 SIMONSVILLE RD
TH-64 BROADWAY
TH-25 MIDDLETOWN RD
TH-67 ANCIENT ROAD 14
TH-69 ANCIENT ROAD 16
TH-50 BLANCHARD RD
TH-45 PIPER HILL RD
TH-37 PIPER HILL RD
TH-38 ROBBIES RD
TH-33 MARSH CROSS RD
TH-34 LITTLE POND RD
TH-45 ISRAEL RD
TH-36 BOYNTON RD
TH-18 BOYNTON RD
TH-37 STIGERS RD
TH-21 BAILEY RD
TH-20 BURTON RD
TH-27 PARKER LN
TH-24 TROUT CLUB RD
TH-39 MARNHAM LN
TH-44 FOSTER RD
TH-32 MORGAN HILL RD
TH-31 HOLDEN HILL RD
TH-50 LOOP RD
TH-52 HIGHLAND VIEW RD
TH-31 HELLS PEAK RD
TH-13 HELLS PEAK RD
TH-12 HOBART RD
TH-54 SLAWSON RD
TH-10 SHATTUCK RD
TH-43 CIDER MILL RD
TH-43 PRIORY HILL RD
TH-11 OLD COUNTY RD
TH-14 KILE RD
TH-55 STEVENS LP
TH-35 O'CONNOR HILL RD
TH-16 JENNY COOLIDGE RD
JENNY COOLIDGE RD
TH-7 GREENDALE RD
MOSES POND RD
TH-18 PEASE RD
TH-6 MOSES POND RD
TH-26 TH 26
TH-25 TURNER RD
LT-4
LT-1 US FOREST SERVICE RD 270
TH-28 JAQUITH RD
TH-3 JAQUITH RD
PRIVATE DR
TH-2 LANDGROVE RD
TH-4 CODY RD
TH-5 UPHILL RD
UPHILL RD
TH-5 TARPLEY RD
TH-6 OLD COUNTY RD E
TH-6 TH-6 SHAW
TH 6 KNOLL RD
TH-8 COOLEY RD
TH-6 LITTLE MICHIGAN RD
TH-8 NORTH RD
TH-7 PRIEST LN
TH-4 STYLES LN
DOC FARNUM RD
TH-10 CATLIN RD
TH-13 SAVAGE RD
TH-14 GOOD POND RD
TH-15 MOSS BROOK RD
TH-5 STONE PLACE RD
TH-11 MOFFIT RD
TH-10 NICHOLS RD
RED MAPLE RD
ALDRICH RD
TH-9 RIDGE RD
TH-11 BROOK RD
SPRUCE HILL
TH-8 REILLY RD
RINEHART RD
BLUE JAY LN
MERRILLS LN
CASPER LN
SEARS RD
SPRUCE DR
WILLIES LN
TH-15 ARRAU RD
TH-16 FORBES RD
GATES LN
OLD OS RD
LOVE SHACK LN
ANDOVER HILLS
WAGE
TH-8 NORTH RD

STRUCTURE INSPECTION, INVENTORY and APPRAISAL SHEET

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

Inspection Report for WESTON **bridge no.:** 00098 **District:** 2

Located on: VT 00100 ML **over** WEST RIVER **approximately** 1.1 MI S JCT. VT.155 **Owner:** 01 STATE-OWNED

CONDITION

Deck Rating: 5 FAIR

Superstructure Rating: 7 GOOD

Substructure Rating: 4 POOR

Channel Rating: 5 FAIR

Culvert Rating: N NOT APPLICABLE

Federal Str. Number: 200013009814212

Federal Sufficiency Rating: 053.8

Deficiency Status of Structure: SD

AGE and SERVICE

Year Built: 1959 **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): 24

ADT: 002000 **% Truck ADT:** 09

Year of ADT: 1998

GEOMETRIC DATA

Length of Maximum Span (ft): 0032

Structure Length (ft): 000034

Lt Curb/Sidewalk Width (ft): 1.5

Rt Curb/Sidewalk Width (ft): 1.5

Bridge Rdwy Width Curb-to-Curb (ft): 30.5

Deck Width Out-to-Out (ft): 35.3

Appr. Roadway Width (ft): 033

Skew: 25

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: ROLLED BEAM

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

Kind of Material and/or Design: 3 STEEL

Deck Structure Type: 1 CONCRETE CIP

Type of Wearing Surface: 6 BITUMINOUS

Type of Membrane 2 PREFORMED FABRIC

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: 4 MEETS MINIMUM TOLERABLE CRITERIA

Deck Geometry: 5 BETTER THAN MINIMUM TOLERABLE CRITERIA

Underclearances Vertical and Horizontal N NOT APPLICABLE

Waterway Adequacy: 4 OCCASIONAL OVERTOPPING OF BRIDGE & ROADWAY WITH SIGNIFICANT TRAFFIC DELAYS

Approach Roadway Alignment: 8 EQUAL TO DESIRABLE CRITERIA

Scour Critical Bridges: 8 STABLE FOR SCOUR

DESIGN VEHICLE, RATING, and POSTING

Load Rating Method (Inv): 1 LOAD FACTOR (LF)

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: 052013 **Insp. Freq. (months)** 12 **X-Ref. BrNum:**

INSPECTION SUMMARY and NEEDS

5/6/2013 Spalling on the fascias should be cleaned and patched. South east cheekwall has not changed from last inspection. More riprap should be installed along abutment #1 to help stop any further scour there is no undermining at this time. ~FRE/DAK

09/10/2011 - Irene note: Small erosion hole formed along the outer edge of the approach roadway at the southeast corner adjacent to the curb and pylon. Filled in with stone and gravel. Pylon tipped out but was impacted hard recently and not storm related. ~ MJ/DK

04/18/2011 The spalling in the bridge seat s on the ends at abutment 1 should be repaired. The spalling is starting to undermine the upstream fascia beam abutment 1 and threaten the downstream bearing at butment1 the deck continues to deteriorate along with the abutments. There is deep scour hole at abutment1 which is over the chest waders which should be filled in with some means of scour protection. DCP & FRE

04/21/2009 The overall condition of this bridge is fair, due to slow deterioration of the deck soffit area, slow breakdown of the abutment No.1 stemwall ,and deep local scour running along the stemwall of abutment No.1. PLB

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 27, 2013

SUBJECT: Weston – BF-013-2(13) – VT 100 BR 98 over West River

---

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 1923 based on the bridge inspection reports and record information. The bridge is owned by the State, based on the bridge inspection reports, located on VT 100 approximately 1.1 miles south of the intersection with VT 155. The bridge is a 2-lane single span rolled beam and concrete deck bridge. The bridge also has an asphalt pavement surface. The bridge is significantly askew (i.e. 26°±) to the river and located at the downstream end of a river bend. The abutments appear to be normal to the stream. The total width of bridge is approximately 34.67 feet normal to the roadway (29.67' curb to curb), but approximately 39.4 feet along the stream. The total clear span along the roadway is approximately 28 feet (abutment face to abutment face), but the clear span normal to the stream is approximately 24.5 feet. The superstructure depth for the span is approximately 3.25 feet (11" deck and 28" beam). The approximate height to the bottom of the superstructure to the streambed varies since the bridge is located at the downstream of a curve, but the maximum height is approximately 9 feet.

The existing bridge does not meet the hydraulic standard for the Q_{50} design storm event. In fact, the Q_{10} storm event doesn't pass through the structure. The bridge is located on the West River. The structure is located on a section of the river having a well-defined channel having a sandy-gravelly streambed with some stones. 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 foundations have not been fully evaluated or selected at this time.

Recommendations

The bridge option selection criteria should be to provide a bridge opening that does not restrict the 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 35 feet, but the actual field conditions have varying natural bank full stream widths within the study reach between 25 to 30 feet upstream of the bridge and between 30 to 35 feet downstream of the bridge from site observation and survey.

It has been assumed a replacement structure will be located in the existing horizontal roadway alignment. Given the site constraints relative to TH 15, it was anticipated that the South (Left) abutment will only be able to be adjusted slightly towards the South which will make the span increase in a northerly direction for the North abutment. For a replacement structure, we have

anticipated that the proposed abutments will be vertical face concrete abutments placed normal to the river with 3H:2V sloped stone fill placed to provide scour protection in front of the abutments.

Based on our analysis, we have reviewed a couple of viable replacement bridges. A 50-foot clear span (normal to the stream channel between the abutment faces) with low beam elevation of 1430.4 feet and a 60-foot clear span with low beam elevation of 1430.7 feet are the viable options which pass the Q_{50} design storm event through the structure and meet the VTrans hydraulic standards. However, each of the potential options will also require a significant low beam elevation adjustment (i.e. 2 feet and greater which also increases the roadway elevations) and possible reconfiguration of the TH 15 intersection since the existing structure is significantly undersized. Conversely creating too long a replacement span to limit roadway elevation adjustments will not be desirable given the bridges location and its existing river characteristics (i.e. being located just downstream of a large bend).

As anticipated and based on the modeling, the longer 60-foot span option will have lower velocities in the area of the bridge than the existing conditions. However, the magnitudes of the velocities for the 50-foot structure increase in the vicinity of the bridge for the Q_{50} design flow event due to the flow being passed through a constricted area, rather than having a relief over the roadway in a submerged condition in the existing condition. Both options noted above are also recommended to have approximately 4' to 4.5' height of 3H:2V sloped stone fill for scour protection in front of both abutments. It is anticipated that this stone fill will be blended back to the existing banks along wing walls. If additional stone fill height is determined to be necessary during further bridge design, the low beam elevation will need to be evaluated further and possibly raised slightly. Refer to the attached sketches showing the limits of the stone fill slopes and bridge opening cross section configuration.

It is noted with the stone fill scour protection for the 50-foot option provides width through the structure of approximately 30 feet of channel width at the toe, which is relatively close to the existing conditions just upstream of the bridge site and also close to the estimated VANR BFW. This 50-foot option also appears to be able to blend into the site better given some of the site constraints, but it is noted there will be slightly increased velocities from the existing conditions for the Q_{50} design event which will most likely require some stream armoring. The proposed opening width at the toe of the 60-foot option is approximately 40 feet. Therefore, the 50-foot clear span structure is the preferred option since it appears to fit the bridge site better, but the 60-foot clear span structure is also considered to be viable option. For this particular bridge site, it may not be practical to meet the above recommendations and meet the VTrans Hydraulic Standards. If a different bridge alternative is desired which will not meet the VTrans Hydraulic Standards, the VTrans Hydraulic section should be contacted in order for other options to be considered.

<u>Temporary Bridge/Phasing</u>
Based on pre-scoping information from the Structures Group, it has not been determined whether a detour or a temporary bridge will be used for this location.

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

NSM CCB

From: Nicholas S. Meltzer, P.E., Geotechnical Engineer, via Christopher C. Benda P. E., Soils and Foundations Engineer

Date: July 9, 2013

Subject: Weston BF 013-2(13) Preliminary Geotechnical Information

---

In an effort to assist the Structures Section with their bridge type study, the Soils and Foundations Unit within the Materials and Research Section has completed a review of available geological data for Bridge 98 on Vermont 100 in Weston, which flows over the West River. This review included our in-house bridge boring files, record plans, USDA Natural Resources Conservation soil survey records, surficial geology and bedrock maps of the State and the Agency of Natural Resources Well logs.

Previous Projects

Record plans were found for the project, which show the bridge supported on spread footings placed 6 feet below the bottom of streambed. No soil information was available. The Soils and Foundations Unit maintains a GIS based historical record of subsurface investigations, which contains electronic records for the majority of borings completed in the past 10 years. An exploration of this map revealed no previous borings in the town of Weston

Water Well Logs

The Agency of Natural Resources (ANR) documents and publishes all water wells that are drilled for residential or commercial purposes. Published online, the logs can be used to determine general characteristics of soil strata in the area. The soil description given on the logs is done in the field, by unknown personnel, and as such, should only be used as an approximation. Five surrounding well logs were examined for depths to bedrock and soil strata.

Figure 1 contains the project and surrounding well locations. The specific wells used to gain information on the subsurface conditions are highlighted by red boxes.

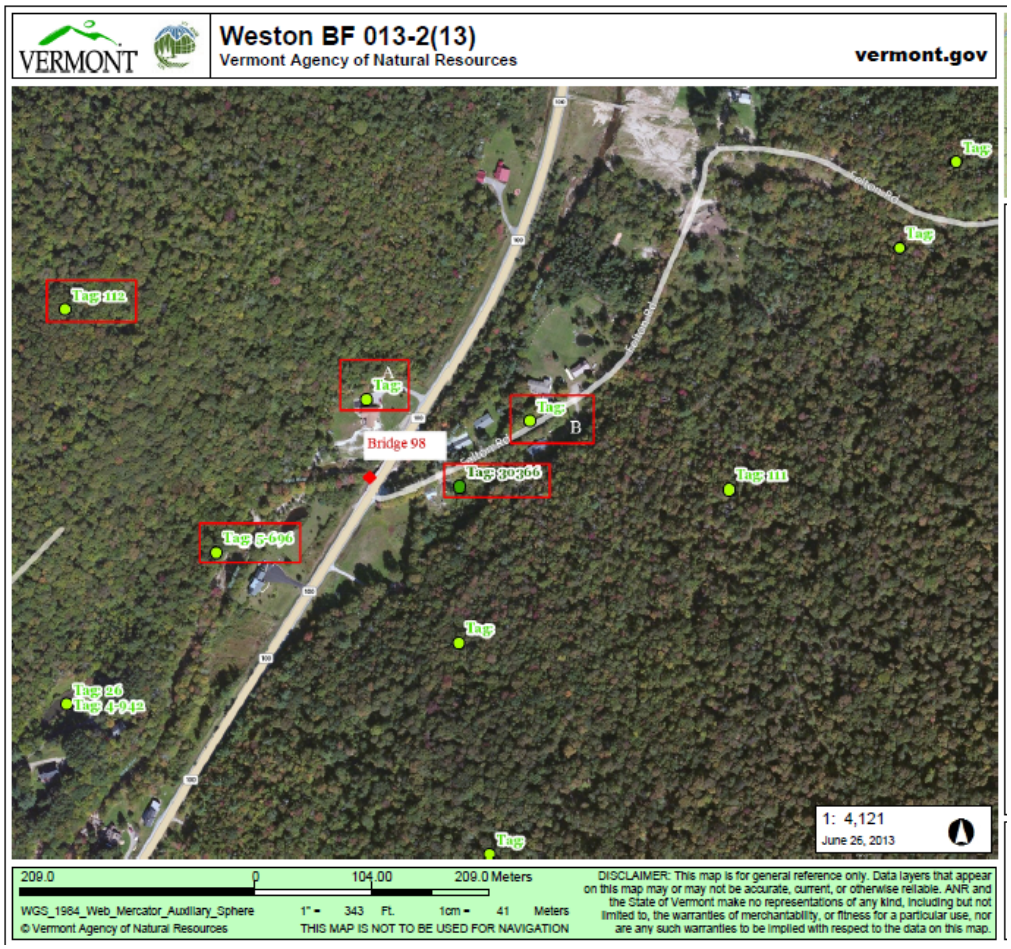


Figure 1. Highlighted well locations near subject project

Table 1 lists the well sites used in gathering the surrounding information. Wells are listed with the distance from the bridge project, depth to bedrock, and type of soils encountered.

Table 1. Depths to bedrock and subsurface strata of surrounding sites

Well Number	Distance From Project (feet)	Depth To Bedrock (feet)	Overburden Material
"A"	225	30	Gravel
"B"	500	12	N/A
30366	275	20	Till & boulders
5696	500	2	N/A
112	1000'	47	Clay

USDA Soil Survey

The United States Department of Agriculture Natural Resources Conservation Service maintains a surficial geology map of the United States, which is available online. According to the Web Soil Survey, the strata directly underlying the project site consists of Podunk fine sandy loam, which is well draining and has a seasonally high water table, which can lead to flooding.

A site visit was conducted to determine potential issues with boring operations, and to make any other pertinent observations about the project. Figure 2 was taken on June 16, 2013.

Figure 2. View of bridge, looking North

Overhead power exists on the NW and SE corner of the bridge, which may conflict with boring operations. With the available sight distance, the borings could also easily be located in the roadway.

With a relatively short span, it is anticipated the structure may be replaced with a precast arch or stub abutment, which would both be founded on spread footings. If this is the case, two borings could be completed in the roadway, to relatively shallow depths, in a short timeframe. If integral abutments are the preferred alternative, borings should be advanced to bedrock, in which case we recommend two borings on opposite corners. The shallow depths to bedrock seen in private wells could make integral abutments unfeasible.

Figure 3 shows the West River flowing downstream. The minimal presence cobbles and boulders should not interfere with boring and pile driving operations.

Figure 3. View looking downstream

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

- A precast arch supported on spread footings
- Reinforced concrete abutments on spread footings
- Pile caps on a single row of H-Piles
- Spread footings supported on micropiles

If spread footings are the favored alternative, two borings in the roadway to a depth of 35 feet should be completed. If piles are the chosen foundation preference, we recommend a minimum of two borings be taken 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 bedrock.

If you have any questions or would like to discuss this report, please contact us by phone at (802) 828-6910, or via email at chris.benda@state.vt.us.

cc: Project File/CCB
NSM

State of Vermont
Program Development Division
One National Life Drive
Montpelier, VT 05633-5001
www.aot.state.vt.us

[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: 5/15/2013

Subject: Weston BF 013-2(13) - Natural Resource ID

I have completed my natural resource ID 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 completed a field visit. I have evaluated 100 feet of the approaches and 50 feet upstream and downstream.

Wetlands/Watercourses
There are wetlands within the immediate area of the project. The wetlands are all scrub shrub/forested wetlands which are all Class II wetlands. Wetlands at this site all exhibited signs of hydric soils, wetland vegetation and hydrology indicators at the time of the visit. Functions and values of the wetlands at this project site have high functions and values with the primary functions being flood storage, wildlife habitat and erosion control. Location information was collected and is available and it is in the geo-database ready for "dgn" creation.

The West River flows through the project area. Any impacts below ordinary high water to this watercourse will need to be avoided and minimized and reported to the ANR and US Corps of Engineers (COE) for permitting purposes. Additional field work will be required if wetland areas cannot be avoided. As this waterway is classified as having Essential Fish Habitat "EFH" under the COE GP there are no non-reporting activities.

Wildlife Habitat
According to VT Fish and Wildlife linkage rating "4", good wildlife habitat exists on both sides of VT Route100 within this corridor. As this is a bridge project opportunities to cross will exist.

The West River supports a variety of aquatic organisms. Timing restrictions for in-stream work will be likely.

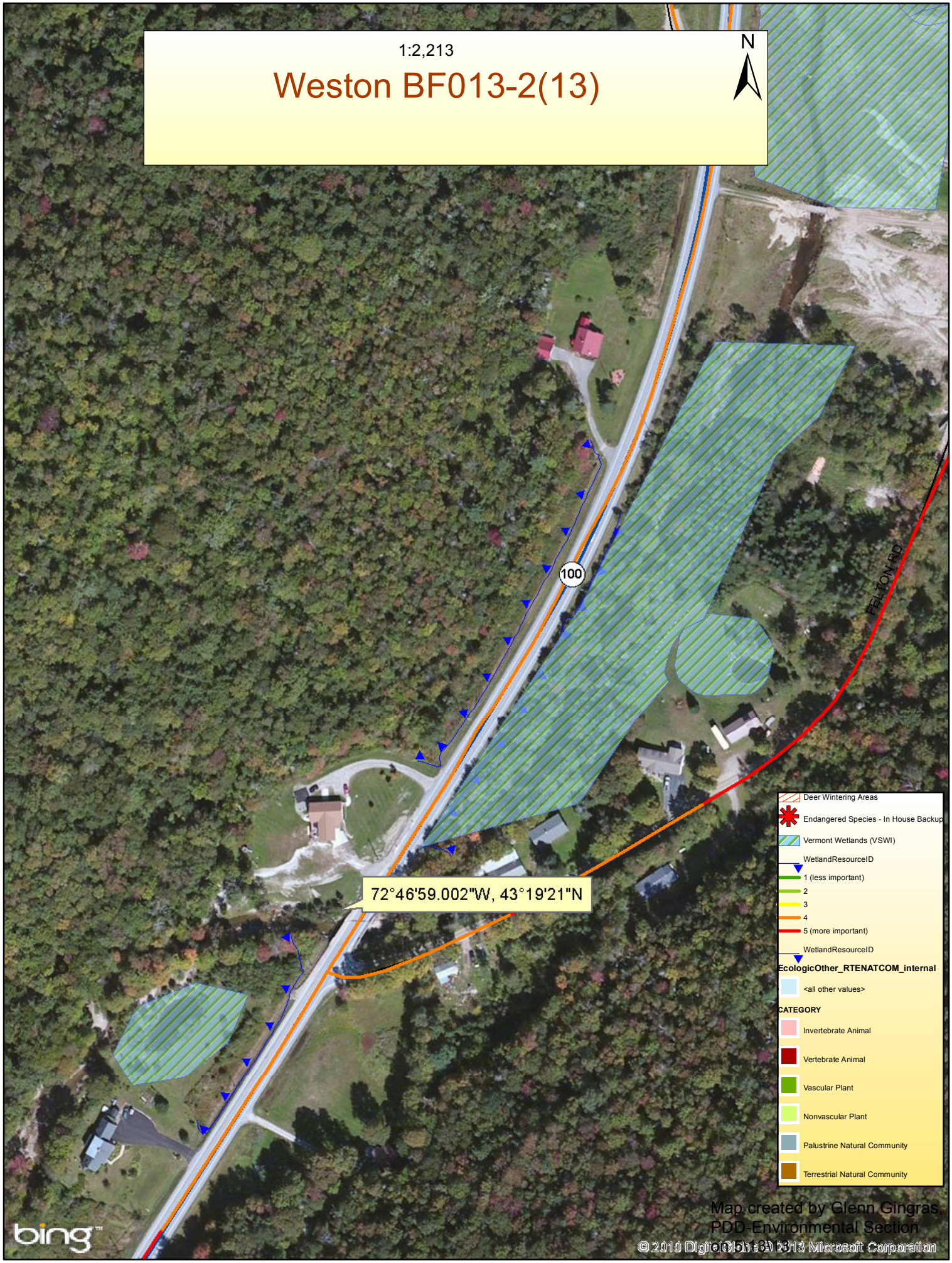
Rare, Threatened and Endangered Species (R/T/E)
According to the VT Fish and Wildlife Natural Heritage Database there are no federal or state listed mapped threatened or endangered plants or animals within the project corridor, therefore, no impacts are anticipated.

Agricultural Soils
No impacts to any prime agricultural soils are anticipated.

1:2,213

Weston BF013-2(13)

N



Map created by Glenn Gingras,
PDD-Environmental Section

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, Environmental Specialist

From: Jeannine Russell, VTrans Archaeology Officer

Date: June 24, 2013

Subject: Weston BF 013-2(13) – Archaeological Resource ID

This is a scoping study for Bridge 98 on VT 100. The project area is defined by a 200 foot radius adjacent to the bridge. A field visit was conducted on 5-24-13 for the above bridge project. No areas of archaeological sensitivity were encountered during the site visit and there are no known sites in the vicinity of the project.

Please contact me if you have any questions.

Thank you,
Jen Russell
VTrans Archaeology Officer

VTrans Working to Get You There
Vermont Agency of Transportation

Brady, James

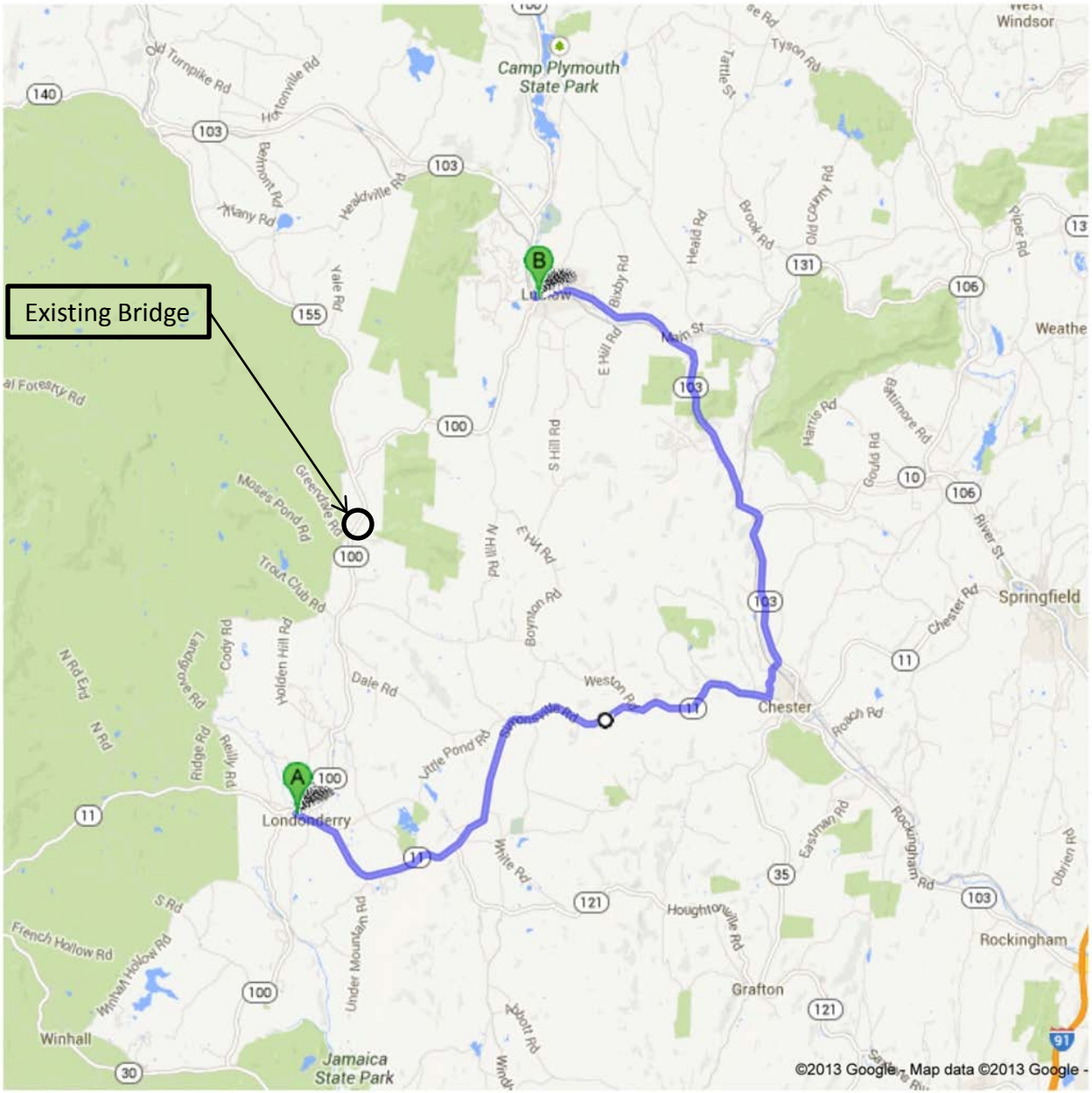
From: Newman, Scott
Sent: Tuesday, May 14, 2013 3:41 PM
To: Brady, James
Cc: Williams, Chris
Subject: Weston BF 013-2(13)

Hi James,

There are no Historic or Section 4(f) properties in the project area for the above-subject project.

Thanks,
Scott

Off Site Detour Option

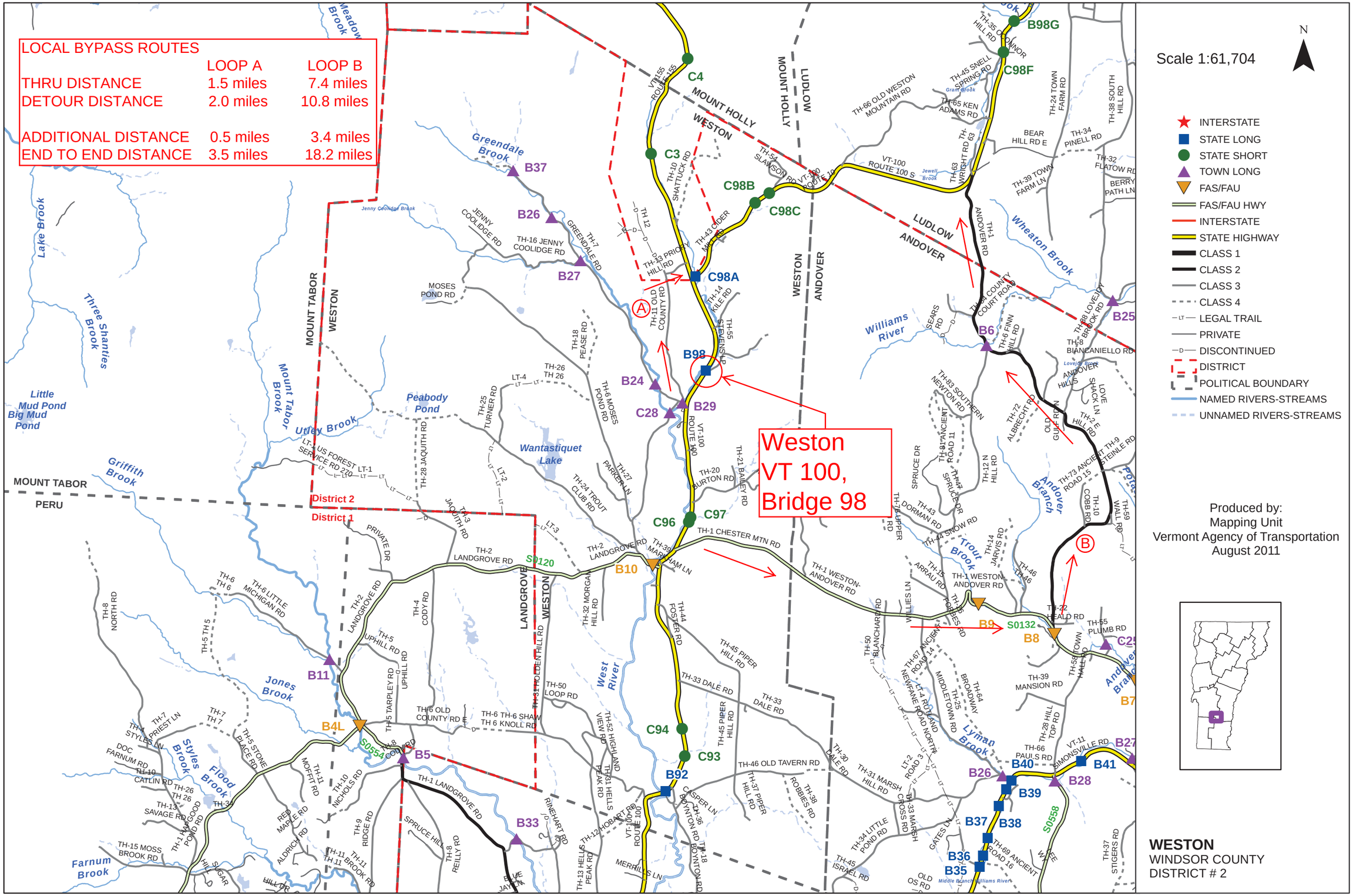


Mileage Summary

A-B Thru = 15.5 miles
A-B Detour = 27.5 miles
Added Miles = 12 miles
End – End Distance = 43 miles

Major Factors

Traffic Volume = 1,900
Added Miles = 12 miles
Duration = 4 weeks
Will have significant affect on the intersections of VT 11 & VT 103, VT 11 & VT 100, and VT 100 & VT 103 as well as other intersections


LOCAL BYPASS ROUTES
LOOP A
LOOP B
THRU DISTANCE 1.5 miles 7.4 miles
DETOUR DISTANCE 2.0 miles 10.8 miles
ADDITIONAL DISTANCE 0.5 miles 3.4 miles
END TO END DISTANCE 3.5 miles 18.2 miles
Weston
VT 100,
Bridge 98
Scale 1:61,704
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
WESTON
WINDSOR COUNTY
DISTRICT # 2
District 2
District 1
MOUNT TABOR
PERU
MOUNT HOLLY
WESTON
LUDLOW
ANDOVER
LANDGROVE
Greendale Brook
Lake Brook
Three Shanties Brook
Little Mud Pond
Big Mud Pond
Mount Tabor Brook
Utley Brook
Peabody Pond
Wantastiquet Lake
Griffith Brook
Jones Brook
Styles Brook
Flood Brook
Farnum Brook
West River
Williams River
Wheaton Brook
Andover Branch
Trout Brook
Lyman Brook
B98G
C98F
C4
C3
C98B
C98C
C98A
B37
B26
B27
B98
B24
C28
B29
C96
C97
B10
B9
S0132
B8
B11
B4L
S0554
B5
B33
C94
C93
B92
B6
B25
B40
B41
B39
B38
B37
B36
B35
B28
S0558
S0120

Local & Regional Input Questionnaire

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. No
2. Is there a "slow season" or period of time from May through October where traffic is less? No
3. Please describe the location of emergency responders (fire, police, ambulance) and emergency response routes. Rt 100
4. Where are the schools in your community and what are their schedules? Flood Brook Union School Rt 11 Londonderry, Vt.
5. Is the proposed project on an established or planned school bus or public transit route(s)? Yes
6. Are there any businesses (including agricultural operations) that would be adversely impacted either by a detour or due to work zone proximity? No
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? Yes
8. Are there any town highways that might be adversely impacted by traffic bypassing the construction on another local road? Yes
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. GNAT-TV, Vermont Journal, The Message
11. Is there a local business association, chamber of commerce or other downtown group that we should be working with? No

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? No
2. Are there any concerns with the width of the existing bridge? No
3. What is the current level of bicycle and pedestrian use on the bridge? Low

4. If a sidewalk or wide shoulder is present on the existing bridge, should the new structure have one? No

5. Is there a need for a sidewalk or widened shoulder if one does not currently exist? Please explain. No

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? No

7. Are there any special aesthetic considerations we should be aware of? No

8. Are there any traffic, pedestrian or bicycle safety concerns associated with the current bridge? If yes, please explain. No

9. Does the location have a history of flooding? If yes, please explain. No

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? No

12. Are there any other comments you feel are important for us to consider that we have not mentioned yet? No

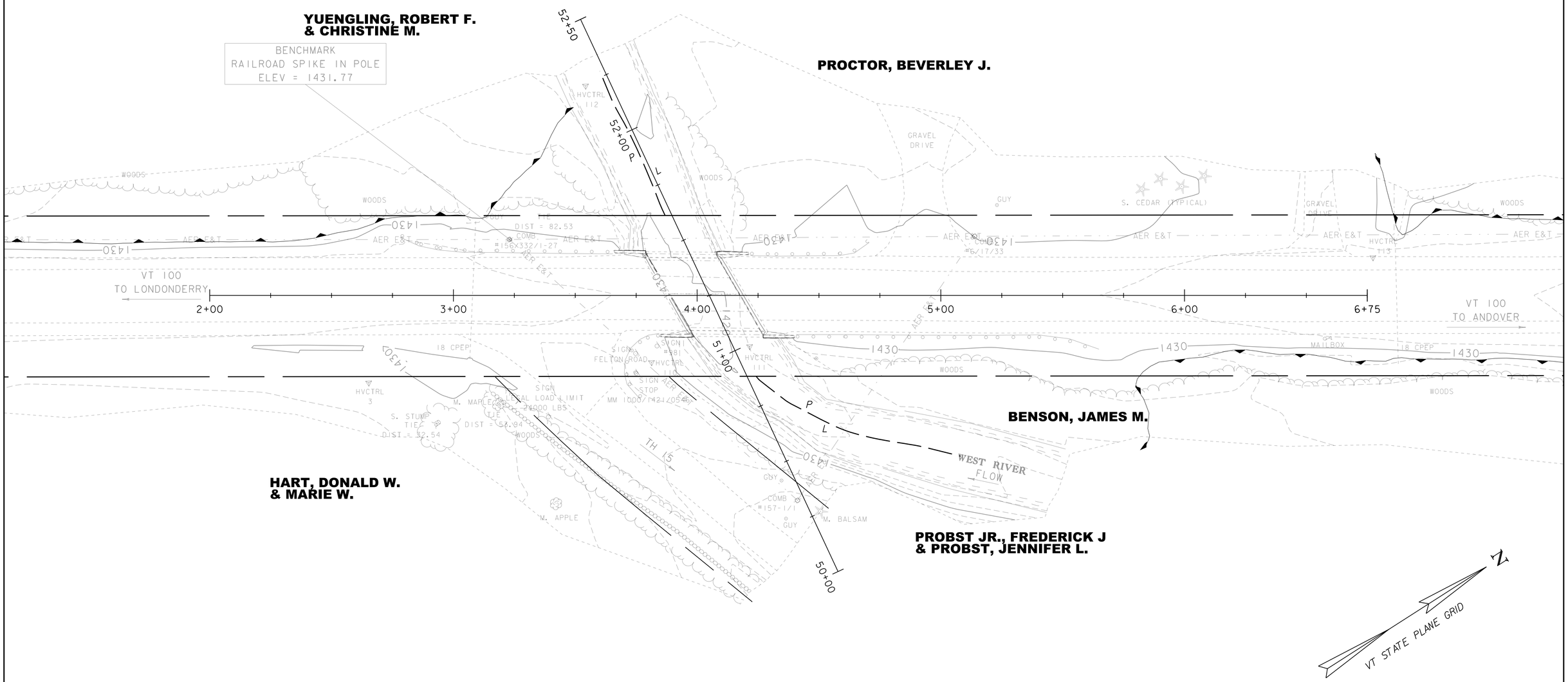
Land Use & Public Transit Considerations – to be filled out by the municipality or RPC.

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. None

3. Are there any existing, pending or planned development proposal that would impact future transportation patterns near the bridge? No If so please explain.

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

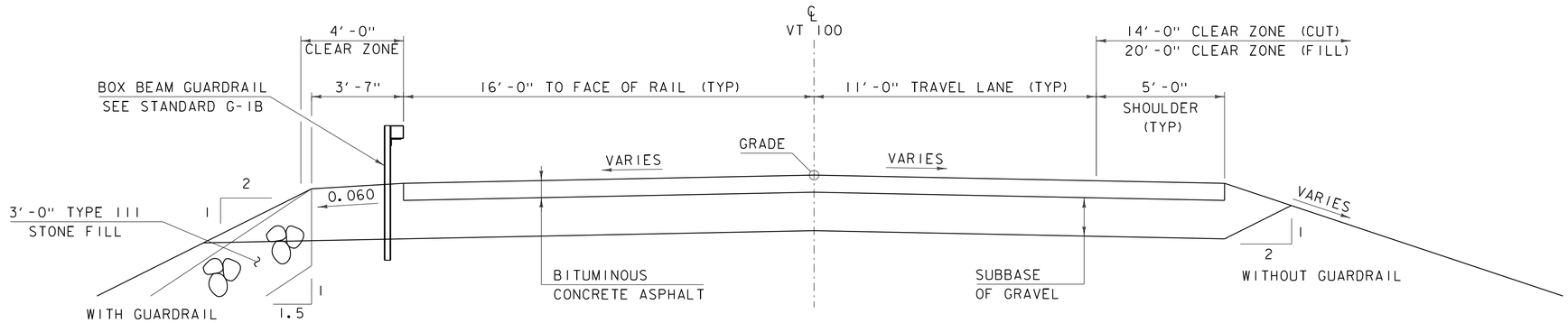


EXISTING BRIDGE DATA
ROLLED STEEL BEAM BRIDGE W/
CIP CONCRETE DECK
BRIDGE BUILT IN 1959
BRIDGE LENGTH = 34 FT.
WATERWAY AREA = xx SF

EXISTING CONDITIONS

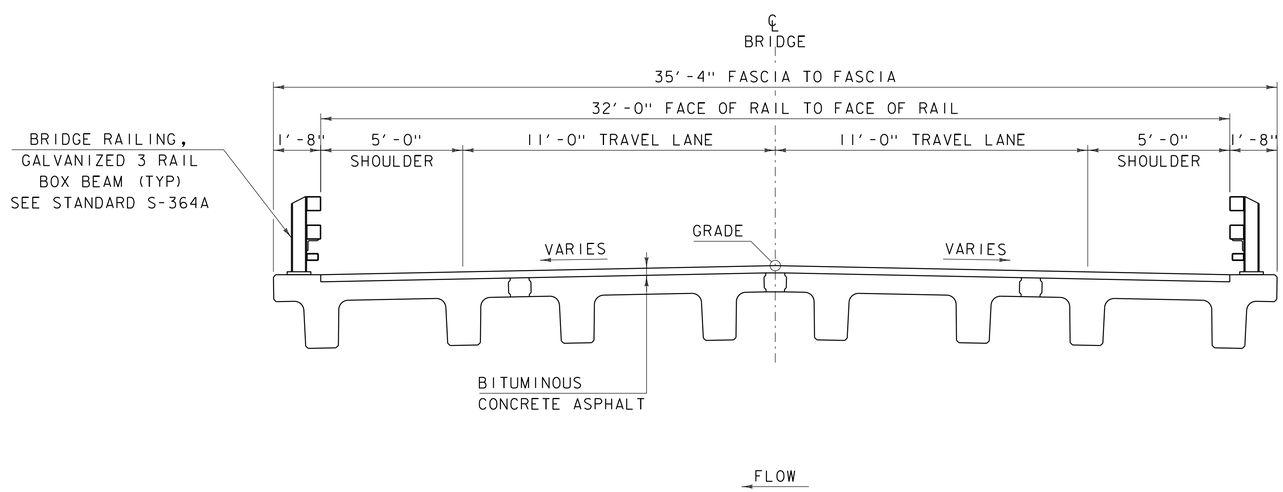
SCALE 1" = 20'-0"
20 0 20

PROJECT NAME: WESTON	
PROJECT NUMBER: BF 013-2(13)	
FILE NAME: Structures/13b076bdr.dgn	PLOT DATE: 15-AUG-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: L.J.STONE
DESIGNED BY: L.J.STONE	CHECKED BY: ------
EXISTING CONDITIONS	SHEET 1 OF 15



PROPOSED VT 100 TYPICAL SECTION

SCALE 3/8" = 1'-0"



PROPOSED BRIDGE TYPICAL SECTION

SCALE 3/8" = 1'-0"

MATERIAL TOLERANCES

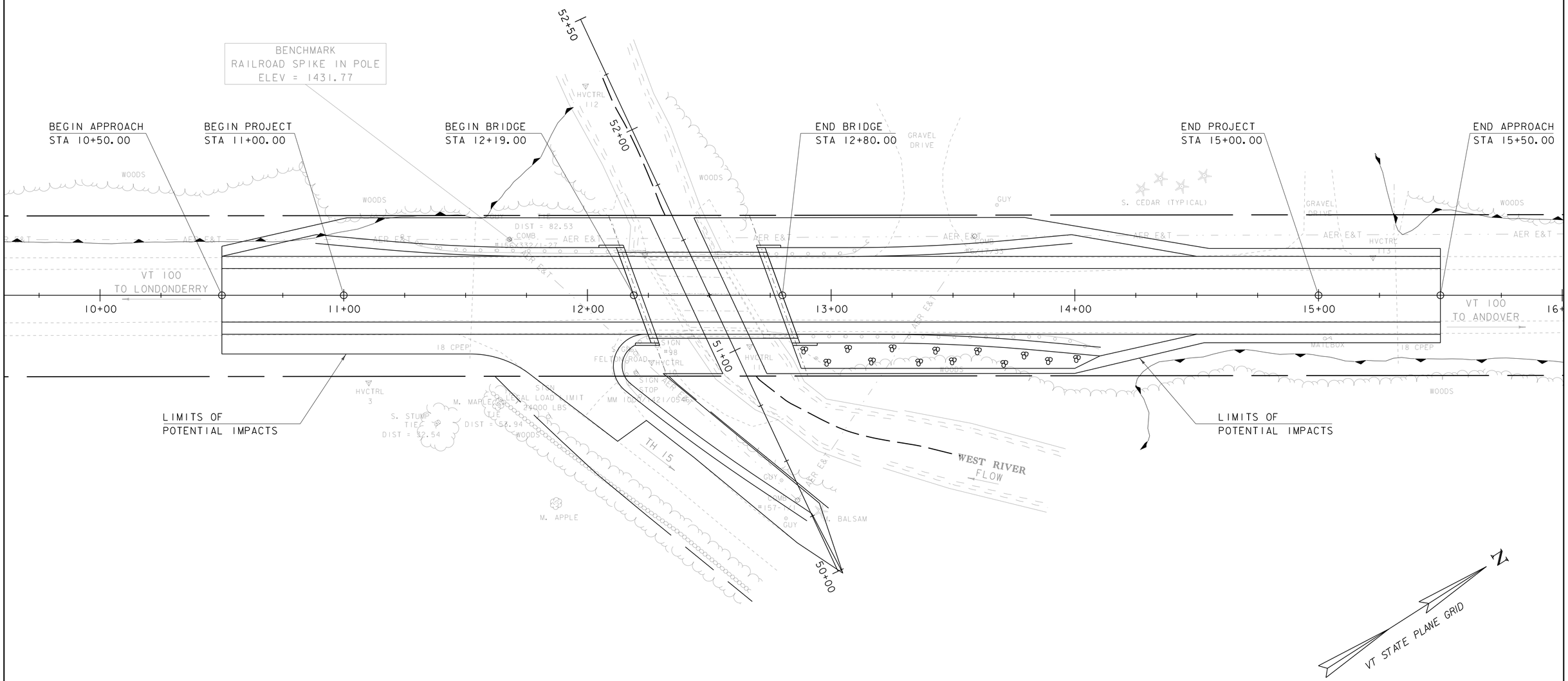
(IF USED ON PROJECT)

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

PROJECT NAME: WESTON
PROJECT NUMBER: BF 013-2(13)

FILE NAME: 13b076\s13b076typical.dgn
PROJECT LEADER: C.P.WILLIAMS
DESIGNED BY: ----------
TYPICAL SECTIONS

PLOT DATE: 15-AUG-2013
DRAWN BY: D.D.BEARD
CHECKED BY: ------
SHEET 2 OF 15

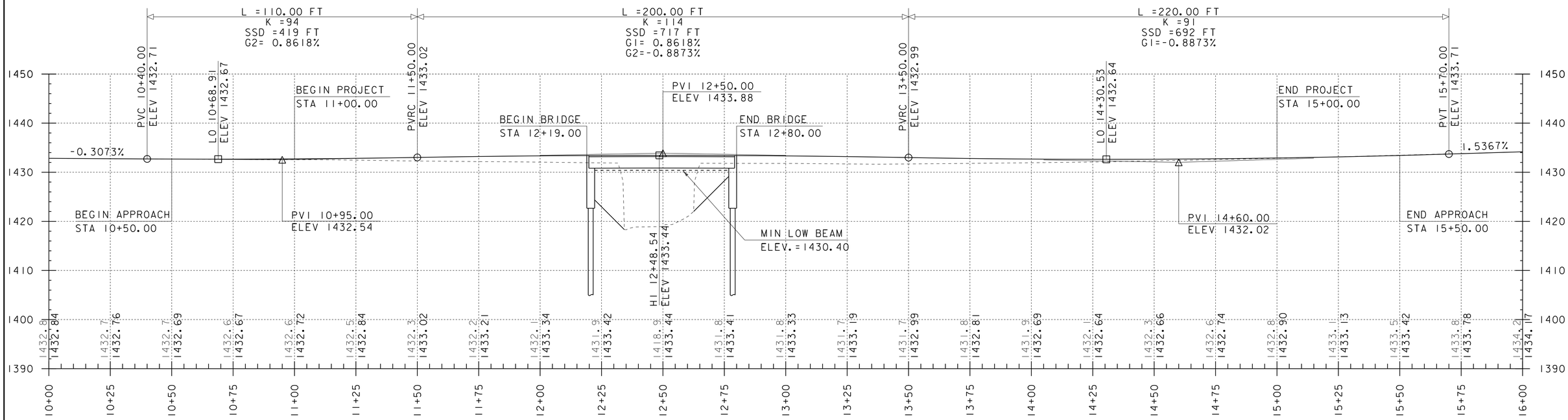


EXISTING BRIDGE DATA
ROLLED STEEL BEAM BRIDGE W/
CIP CONCRETE DECK
BRIDGE BUILT IN 1959
BRIDGE LENGTH = 34 FT.
WATERWAY AREA = xx SF

LAYOUT SHEET

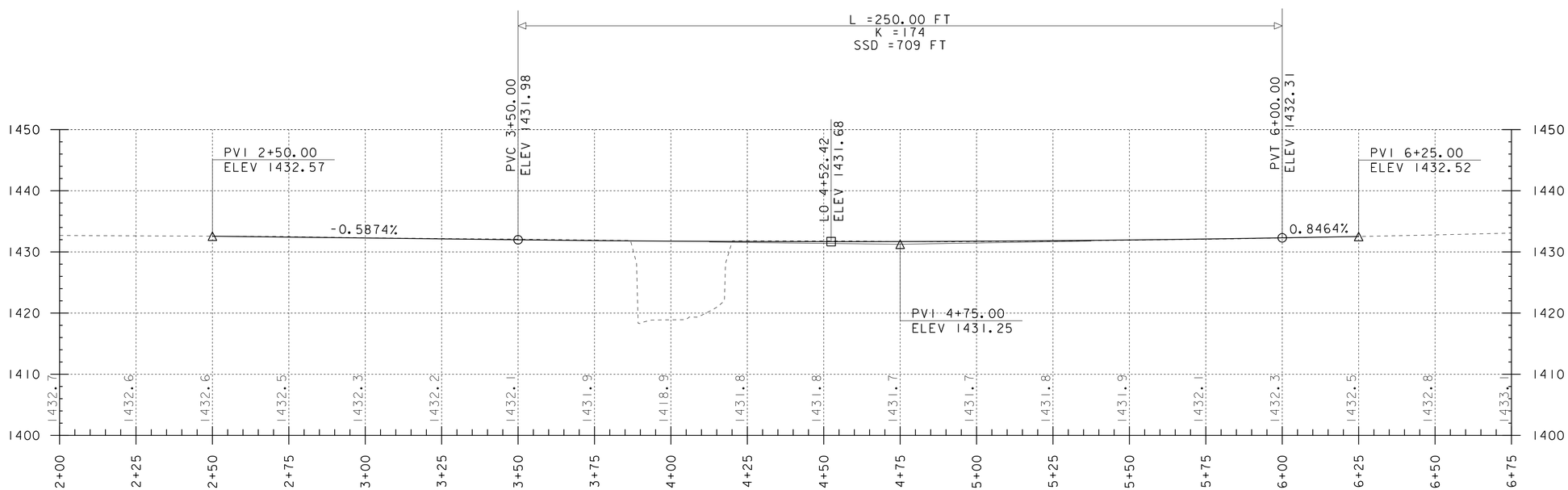
SCALE 1" = 20'-0"
20 0 20

PROJECT NAME: WESTON	
PROJECT NUMBER: BF 013-2(13)	
FILE NAME: Structures/13b076bdr.dgn	PLOT DATE: 15-AUG-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: D.D.BEARD	CHECKED BY: ------
LAYOUT	SHEET 3 OF 15



VT 100 PROPOSED PROFILE

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



VT 100 EXISTING PROFILE

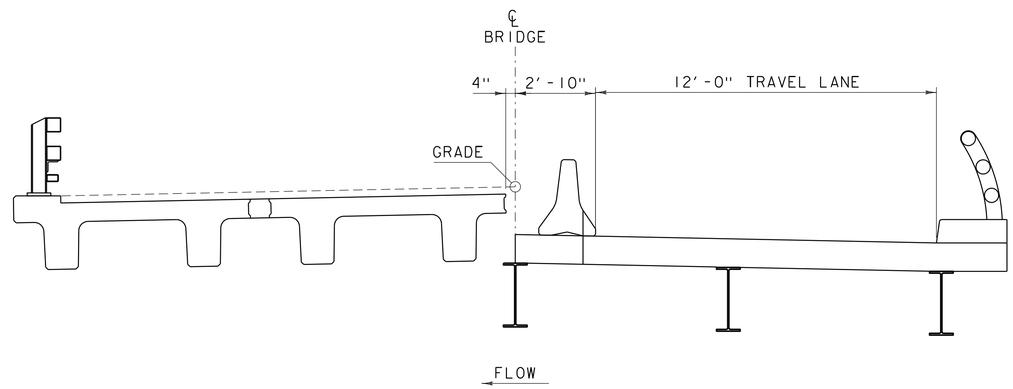
SCALE: HORIZONTAL 1"=20'
VERTICAL 1"=10'

NOTE:

GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄

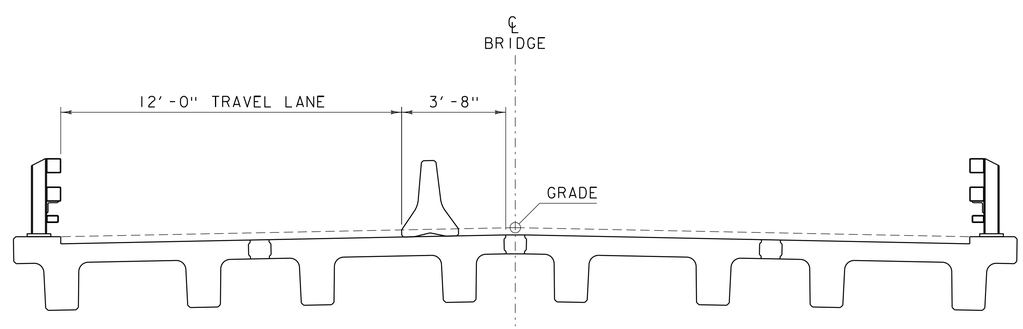
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

PROJECT NAME: WESTON	
PROJECT NUMBER: BF 013-2(13)	
FILE NAME: Structures/13b076pro.dgn	PLOT DATE: 15-AUG-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: L.J.STONE
DESIGNED BY: L.J.STONE	CHECKED BY: ------
PROFILE SHEET	SHEET 4 OF 15



PHASE 1 TYPICAL SECTION

SCALE 3/8" = 1'-0"



PHASE 2 TYPICAL SECTION

SCALE 3/8" = 1'-0"

NOTE: PAVEMENT TO BE APPLIED AFTER PHASE 2

PROJECT NAME: WESTON	
PROJECT NUMBER: BF 013-2(13)	
FILE NAME: 13b076\s13b076phasing.dgn	PLOT DATE: 19-AUG-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: ----------	CHECKED BY: ------
PHASING TYPICAL SECTIONS	SHEET 5 OF 15

BENCHMARK
RAILROAD SPIKE IN POLE
ELEV = 1431.77

BEGIN APPROACH
STA 10+50.00

BEGIN PROJECT
STA 11+00.00

BEGIN BRIDGE
STA 12+19.00

END BRIDGE
STA 12+80.00

END PROJECT
STA 15+00.00

END APPROACH
STA 15+50.00

52+50

N 82°22'44" W

52+00

51+00

50+00

N 32°37'16.48" E

VT 100
TO LONDONDERRY

VT 100
TO ANDOVER

10+00

11+00

12+00

13+00

14+00

15+00

16+

WOODS

GRAVEL DRIVE

S. CEDAR (TYPICAL)

GUY

HVCTRL 112

HVCTRL 113

HVCTRL 111

HVCTRL 110

HVCTRL 3

TIE
DIST = 82.53
COMB
#156X332/1-27

COMB
#6/17/33

18 CPEP

SIGN
FELTON ROAD

SIGN
#98

SIGN
STOP
MM 1000/1421/054

SIGN
LEGAL LOAD LIMIT
24000 LBS

½" UP 18"

M. MAPLE

S. STUMP
TIE
DIST = 82.54

TIE
DIST = 52.94

TH 15

COMB
#157-1/1

M. APPLE

M. BALSAM

MAILBOX

WEST RIVER
FLOW

AER E&T

N

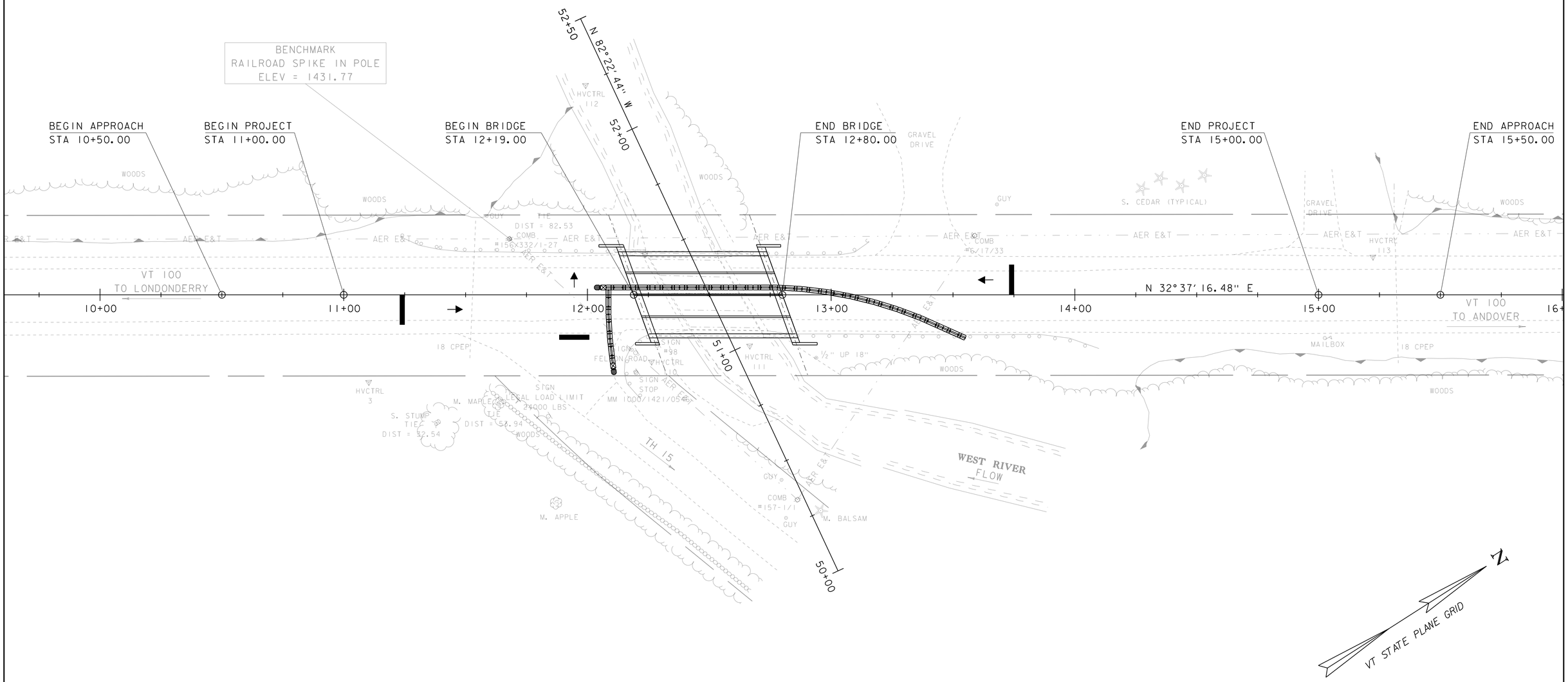
VT STATE PLANE GRID

EXISTING BRIDGE DATA
ROLLED STEEL BEAM BRIDGE W/
CIP CONCRETE DECK
BRIDGE BUILT IN 1959
BRIDGE LENGTH = 34 FT.
WATERWAY AREA = xx SF

PHASE 1 LAYOUT

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

PROJECT NAME: WESTON	
PROJECT NUMBER: BF 013-2(13)	
FILE NAME: Structures/13b076phasing.dgn	PLOT DATE: 15-AUG-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: L.J.STONE
DESIGNED BY: L.J.STONE	CHECKED BY: ------
PHASE 1LAYOUT SHEET	SHEET 6 OF 15

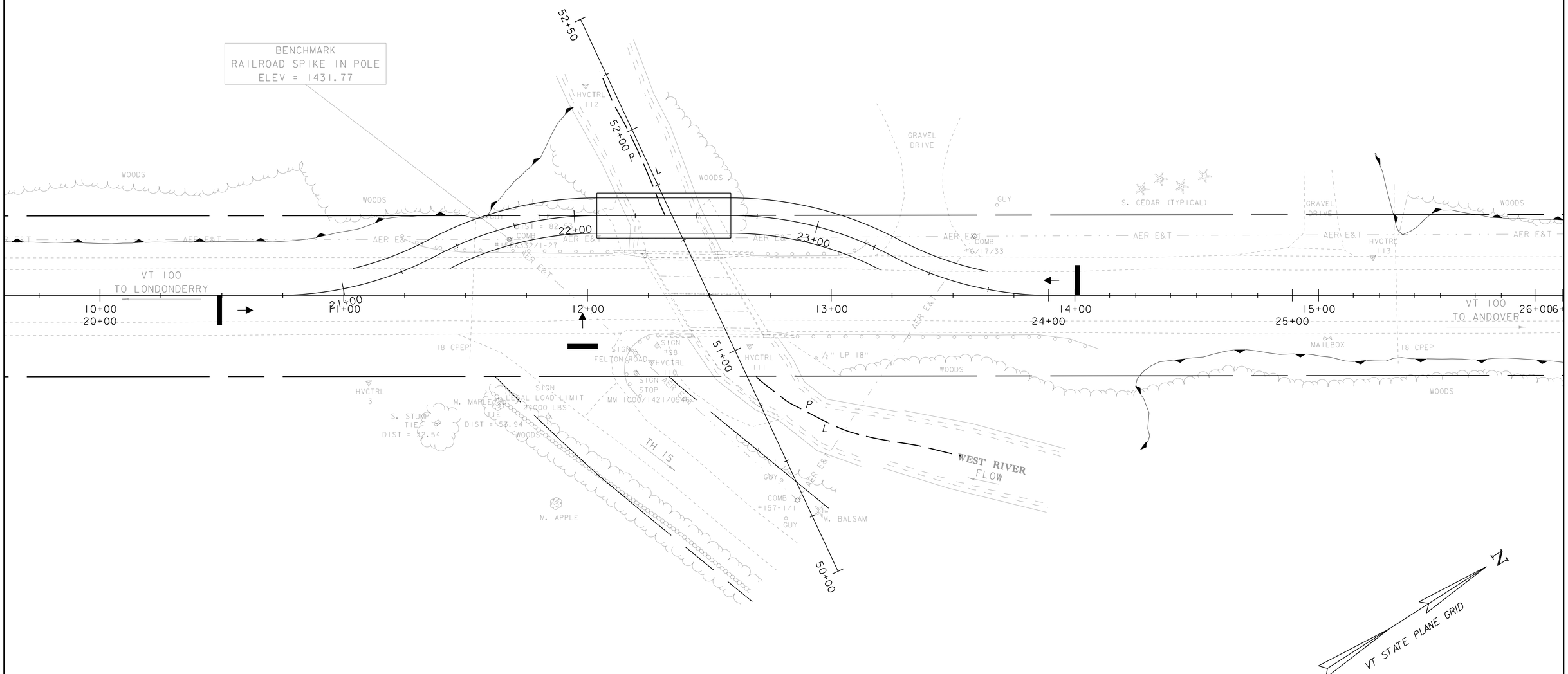


EXISTING BRIDGE DATA
ROLLED STEEL BEAM BRIDGE W/
CIP CONCRETE DECK
BRIDGE BUILT IN 1959
BRIDGE LENGTH = 34 FT.
WATERWAY AREA = xx SF

PHASE 2 LAYOUT

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

PROJECT NAME: WESTON	
PROJECT NUMBER: BF 013-2(13)	
FILE NAME: Structures/13b076phasing.dgn	PLOT DATE: 15-AUG-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: L.J.STONE
DESIGNED BY: L.J.STONE	CHECKED BY: ------
PHASE 2 LAYOUT SHEET	SHEET 7 OF 15



NOTE: TEMPORARY ALIGNMENT IS BASED OFF OF STANDARD E-107 USING A SPEED OF 20 MPH AND A SUPERELEVATION OF 2%

EXISTING BRIDGE DATA
ROLLED STEEL BEAM BRIDGE W/
CIP CONCRETE DECK
BRIDGE BUILT IN 1959
BRIDGE LENGTH = 34 FT.
WATERWAY AREA = xx SF

DOWNSTREAM ONE LANE TEMPORARY BRIDGE LAYOUT

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

PROJECT NAME: WESTON	
PROJECT NUMBER: BF 013-2(13)	
FILE NAME: Structures/13b076bdr.dgn	PLOT DATE: 15-AUG-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: ------	CHECKED BY: ------
TEMPORARY BRIDGE LAYOUT SHEET	SHEET 8 OF 15