**STATE OF VERMONT**
**AGENCY OF TRANSPORTATION**

# Scoping Report

**FOR**

# Enosburg BRO 1448(40)

**Bridge 48 on Boston Post Road (TH 2)**
**Over the Tyler Branch**

July 13, 2012

## Table of Contents


I. Site Information ..... 3

Traffic ..... 3

Design Criteria ..... 3

Inspection Report Summary ..... 4

Hydraulics ..... 4

Utilities ..... 4

Right Of Way ..... 4

Environmental Resources ..... 4

II. Maintenance of Traffic ..... 5

Option 1: Road Closure (Off-Project Detour) ..... 5

Option 2: Temporary Bridge ..... 5

Option 3: Phased Construction ..... 6

III. Alternatives Discussion ..... 6

The "Do Nothing" Alternative ..... 6

Superstructure Considerations ..... 6

Substructure Considerations ..... 6

Geometric Considerations ..... 7

IV. Alternatives Summary ..... 8

V. Conclusion ..... 8

VI. Appendices ..... 9

# I. Site Information

The bridge is located on Boston Post Road at the intersection of Boston Post Road and Tyler Branch Road. 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 Minor Collector |
| Existing Bridge Type | 70' Temporary Mabey Bridge |
| Replaced Bridge Type | Single Span 47' Steel Beam with Concrete Deck |

**Traffic**

| Traffic Data | 2015 | 2035 | 2055 |
|---|---|---|---|
| AADT | 690 | 740 | ~ |
| DHV | 100 | 110 | ~ |
| ADTT | 45 | 55 | ~ |
| %T | 5.8 | 6.9 | ~ |
| %D | 56 | 56 | ~ |
| Flexible ESAL | ~ | 2015 ~ 2035 | 2015 ~ 2055 |
| | | 200,000 | 433,000 |

**Design Criteria**

The design standards for this bridge project are the Vermont State Standards, dated October 22, 1997[1].

| Design Criteria | Source | Existing Condition | Minimum Standard | Comment |
|---|---|---|---|---|
| Approach Lane and Shoulder Widths | VSS Table 5.3 | 10'/1' (22'[2]) | 10'/2' (24') | Substandard |
| Bridge Lane and Shoulder Widths | VSS Table 5.3 | 9'/0' (18') | 10'/2' (24') | Substandard |
| Clear Zone Distance | VSS Table 5.5 | | 12' fill / 8' cut | |
| Banking | VSS 5.13 | | 8% (max) | |
| Speed | | 50 mph (Posted) | 50 mph (Design) | |
| Horizontal Alignment | AASHTO Green Book Table 3-10 | R=3700' | Min 3.1% banking | Substandard |
| Vertical Grade | VSS Table 5.6 | 14% | 7% (max) for rolling terrain | Substandard |
| K Values for Vertical Curves | VSS Table 5.1 | 15 | 110 crest / 90 sag | Substandard |
| Vertical Clearance Issues | VSS Section 5.8 | Overhead utilities | 14'-3" (min) | Meets minimum |
| Stopping Sight Distance | VSS Table 5.1 | 110' | 400' | Substandard |
| Bicycle/Pedestrian Criteria | VSS Table 5.8 | None | 2' Shoulder | Substandard |
| Bridge Railing | Structures Policy | None | TL-3 | Substandard |

[1] http://www.aot.state.vt.us/progdev/standards/05collect.htm

[2] The Inspection Report incorrectly lists this as 26'.

**Inspection Report Summary**
Structural Evaluation: 2 Intolerable, Replacement Needed

**Hydraulics**
From preliminary hydraulics report: "[T]he primary recommendation would be to use a 45-foot single span having a minimum low chord elevation of 553.2 feet to allow the bridge opening width to match the existing condition Bank Full Width of the stream at this location which does not allow for any constriction of the stream flow conditions."

**Utilities**
There are overhead utilities passing diagonally over the bridge. Any construction activity on the bridge will necessitate moving these.

**Right Of Way**
The existing Right-of-Way is listed as 4 rods on Boston Post Road in the location of the bridge. This information has been plotted on the Layout Sheet.

**Environmental Resources**
The environmental resources present at this project are shown on the Layout Sheet.

*Agricultural:*

There are prime agricultural soils within the project area. These soils are in the Podunk variant silt loam series.

*Archaeological:*

The SW quadrant is archaeologically sensitive.

*Wetlands:*

There are wetlands located in all quadrants of the project except the NW.

*Hazardous Materials:*

None identified.

*Historic:*

The adjacent properties to the project location have been deemed not historic.

*Rare, Threatened and Endangered Species*

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

*Stormwater:*

There are no stormwater related concerns of note to offer at this time for this project.

## II. Maintenance of Traffic

The Vermont Agency of Transportation is in the process of finalizing an 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 the duration 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 early. The Agency will consider the closure option on most projects where rapid reconstruction or rehabilitation is feasible. The use of precast 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: Road Closure (Off-Project Detour)**

This option entails utilizing accelerated construction materials and methods to reduce the length of construction to one construction season and reduce the length of time that the road is closed to a 4 week period. Based on input from the Town, the Contractor can choose a 4 week closure period between the middle of June and the end of August. The official detour will be determined by the Town, who will also be responsible for installing, maintaining and paying for all necessary signing and traffic control[3]. One possible detour route would send Boston Post Road traffic along to VT 108 to Tyler Branch Road for an end to end distance of 11 miles. Several local roads could be affected by increases in local traffic, including Tyler Branch Road, Bogue Rd, Sand Hill Rd, and Horseshoe Circle Rd.

**Option 2: Temporary Bridge**

The existing bridge is a one-lane Mabey bridge without signalization. Thus, a two-lane temporary bridge and one-lane bridge with traffic signals both unnecessarily add expense and complexity to the project and will not be considered further for this location.

The least expensive method to provide a temporary crossing at this location during construction would be to utilize the existing temporary bridge during construction. This could be accomplished in two ways. One, the temporary bridge could remain where it is and a new structure could be built on a revised alignment. Or, two, temporary abutments could be built next to the existing bridge and the road could be closed for part of a day while the existing Mabey bridge is moved to the temporary abutments. For an extra $50,000 in construction costs, a new temporary bridge could be placed off-alignment, so the road need not be closed for part of a day while the existing Mabey is moved into place. Once a temporary bridge is set off-alignment, the new structure could be built on the existing alignment.

The existing horizontal alignment is fairly straight in this location, and building a new structure off-alignment would most likely make the alignment worse in this location. In addition, any permanent or temporary off-alignment bridges would impact either the wetlands or archaeologically sensitive areas or both. While the Right of Way (ROW), listed as 4 rods (66 ft), is wider than normal in this location, it is still not wide enough to house two bridges side by side without acquiring additional rights.

[3] While the Town would be responsible for any detour routes, the Agency can provide limited support during the design process.

The Town has requested that a project to replace the existing structure in this location progress as quickly as possible through the system and have indicated a willingness to entertain closing the road during construction. Utilizing a temporary bridge in this location would increase the cost and length of time necessary to deliver the project by requiring permits for wetland impacts, further exploration of the archaeologically sensitive land and the acquisition of additional temporary or permanent rights. Since there exists another less expensive and quicker option of maintaining traffic in this location during construction, these temporary bridge options will not be considered further in this report.

**Option 3: Phased Construction**

Another method of keeping the road open during construction without impacting the wetlands and archaeologically sensitive resources and without requiring the acquisition of additional rights is to build the new structure one lane at a time, or in phases. This method would still require either a shifted horizontal alignment, additional expenses for another temporary bridge, or a partial day closure to shift the existing temporary bridge.

Shifting the horizontal alignment would increase the design and construction costs by requiring additional earth and road construction while not improving the site characteristics and possibly diminishing them. While the time required to deliver the project would remain the same, the time required to complete a phased construction project increases because some of the construction tasks have to be performed multiple times. In addition to the increased design and construction costs mentioned above, the costs also increase for phased construction because of the inconvenience of working around traffic and the effort involved in coordinating the joints between the phases. Another negative aspect of phased construction is the decreased safety of the workers and vehicular traffic, which is caused by increasing the proximity and extending the duration that workers and moving vehicles are operating in the same confined space. Since phased construction would result in a longer, more expensive, and less safe construction project, it will not be considered further.

## III. Alternatives Discussion

Just about every aspect of the existing bridge is substandard for the project location under consideration. The bridge and approach lanes and shoulders are too narrow; the super-elevation (banking) is too flat for the curve and speed; the vertical curve is too tight, reducing sight distance; and the bridge railing is insufficient for the speed.

**The "Do Nothing" Alternative**

The "Do Nothing" alternative is not feasible in this location because the Town would like to keep the route open and something needs to be done to keep the route open.

**Superstructure Considerations**

Consideration of what to do with the superstructure is relatively easy. Since Boston Post Road is to remain open and the temporary bridge is to be removed, a new superstructure is required in this location.

**Substructure Considerations**

The existing abutments consist of laid up stone dating from at least 1924 with a concrete facing. The latest inspection report indicates that the substructure is in poor condition with cracks and pieces missing from the concrete facing. These abutments would need some work in order to safely support a new superstructure.

*Substructure Rehabilitation*

A 90 year-old laid up stone abutment can be extended, perhaps 20 years, with a new facing. The expected design life of a new structure is 80 years. If the substructures were rehabilitated twice, we could conceivably get 40 more years of useful life for a total of 130 years from the existing abutments. At this point, one would want to replace the existing abutments to allow the remaining 40 years of superstructure life to be realized. The costs associated with replacing a substructure underneath a superstructure are appreciably higher than replacing a substructure with no superstructure to maintain in place. Thus, it does not make financial sense to extend the life of the existing 90 year-old laid up stone abutments to eventually have them replaced in a more expensive manner in the future.

*Substructure Replacement*

Thus, the only option being considered here will be a complete substructure replacement. Based on the Geotechnical report, this would most likely be a spread footing on bedrock.

**Geometric Considerations**

With a complete bridge replacement, it is possible to provide a revised superstructure width. Thus, the recommendation is to provide the State Standard minimum width of 24' for this section of road. The proposal also includes new crash-tested bridge and approach rail suitable for this location.

The horizontal and vertical geometry are made substandard in this location by the design speed of 50 mph through this stretch. Some concern was expressed by the Town about how to mitigate vehicle speeds if the bridge were to be widened. The recommendation is to make the Boston Post Road and Tyler Branch Road intersection a four-way stop condition. According to the Manual on Uniform Traffic Control Devices (MUTCD), "Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop"[4] is eligible for a multi-way stop application, and "STOP […] signs (see Figure 5B-1) should be considered for use on low-volume roads where engineering judgment or study, consistent with the provisions of Sections 2B.04 to 2B.10, indicates that [… an intersection] has restricted sight distance for the prevailing vehicle speeds."[5]

One caveat to installing stop signs where they have not previously existed is that during the transition period, there may be a higher incidence of accidents because cross-traffic is expecting the previously unrestricted traffic to stop but the previously unrestricted traffic is not used to stopping at this location and continues through the intersection without stopping. This can be mitigated by several factors in this location. One is educating the public about the impending change to traffic patterns at this location. The second requires that additional temporary warning signs and signals be installed drawing people's attention to the modified traffic pattern. And the third factor unique to this location is that traffic has been stopping or yielding at this location for the past 6 or more years since the installation of the single lane Mabey bridge.

Additional site safety improvements taken from the Road Safety Audit recommendations from 2009 are included in this proposal. These recommendations include updated and properly installed

[4] http://mutcd.fhwa.dot.gov/htm/2009/part2/part2b.htm
[5] http://mutcd.fhwa.dot.gov/htm/2009/part5/part5b.htm

regulatory and informational signs, new line striping and the removal of extraneous pavement to create standard pavement radii at the intersection to produce a better defined intersection.

## IV. Alternatives Summary

The Alternative still under consideration is a complete bridge replacement with a 24' wide travel way, constructed by closing Boston Post Road for a 4 week period between June 15th and August 31st.

A listing of the costs and durations for this alternative are shown below.

| Enosburg BRO 1448(40) | | Alt 1 | Alt 3 |
|---|---|---|---|
| | | Do Nothing | Complete Replacement |
| COST | Bridge Costs | $0 | $410,000 |
| | Removal of Structure | $0 | $40,000 |
| | Channel Work | $0 | $20,000 |
| | Roadway | $0 | $150,000 |
| | Erosion Control | $0 | $20,000 |
| | Temporary Bridge | $0 | $0 |
| | Construction Costs | $0 | $640,000 |
| | Construction Engineering & Contingencies | $0 | $224,000 |
| | Total Construction Costs w/ CEC | $0 | $864,000 |
| | Preliminary Engineering | $0 | $160,000 |
| | Right of Way | $0 | $0 |
| | Total Costs | $0 | $1,024,000 |
| | Local Share | $0 | $51,200 |
| ENGINEERING | Typical Section - Roadway (feet) | 22' | 24' |
| | Typical Section - Bridge (feet) | 0-9-9-0 | 2-10-10-2 |
| | Traffic Safety | High Risk | Improvement |
| | Alignment Change | No | Slight improvement |
| | Bicycle Access | No | Yes |
| | Hydraulic Opening | Adequate | Adequate |
| | Pedestrian Access | No | None required |
| | Utility | No Change | Relocation |
| SCHEDULING | Project Development Duration | 0 years | 2 years |
| | Construction Duration | 0 months | 3 months |
| | Mobility Impact Duration | 0 weeks | 4 weeks |
| OTHER | ROW Acquisition | No | No |
| | Road Closure | No | Yes |
| | Design Life | 0 years | 80 years |

## V. Conclusion

The quickest, least expensive and safest option, and thus the recommended option, for this location is to completely replace the existing bridge with a standard 24' wide bridge with updated bridge and approach railing with the inclusion of various safety improvements to the intersection of Boston Post Road and Tyler Branch Road.

## VI. Appendices

- Site Pictures
- Town Map
- Bridge Inspection Report
- Hydraulics Memo
- Natural Resources Memo
- Archeology Memo
- Historic Memo
- Plans
    - Proposed
        - Typical Sections
        - Layout
        - Profile
- Proposed Detour Route

2004 photo of existing bridge, looking southward.

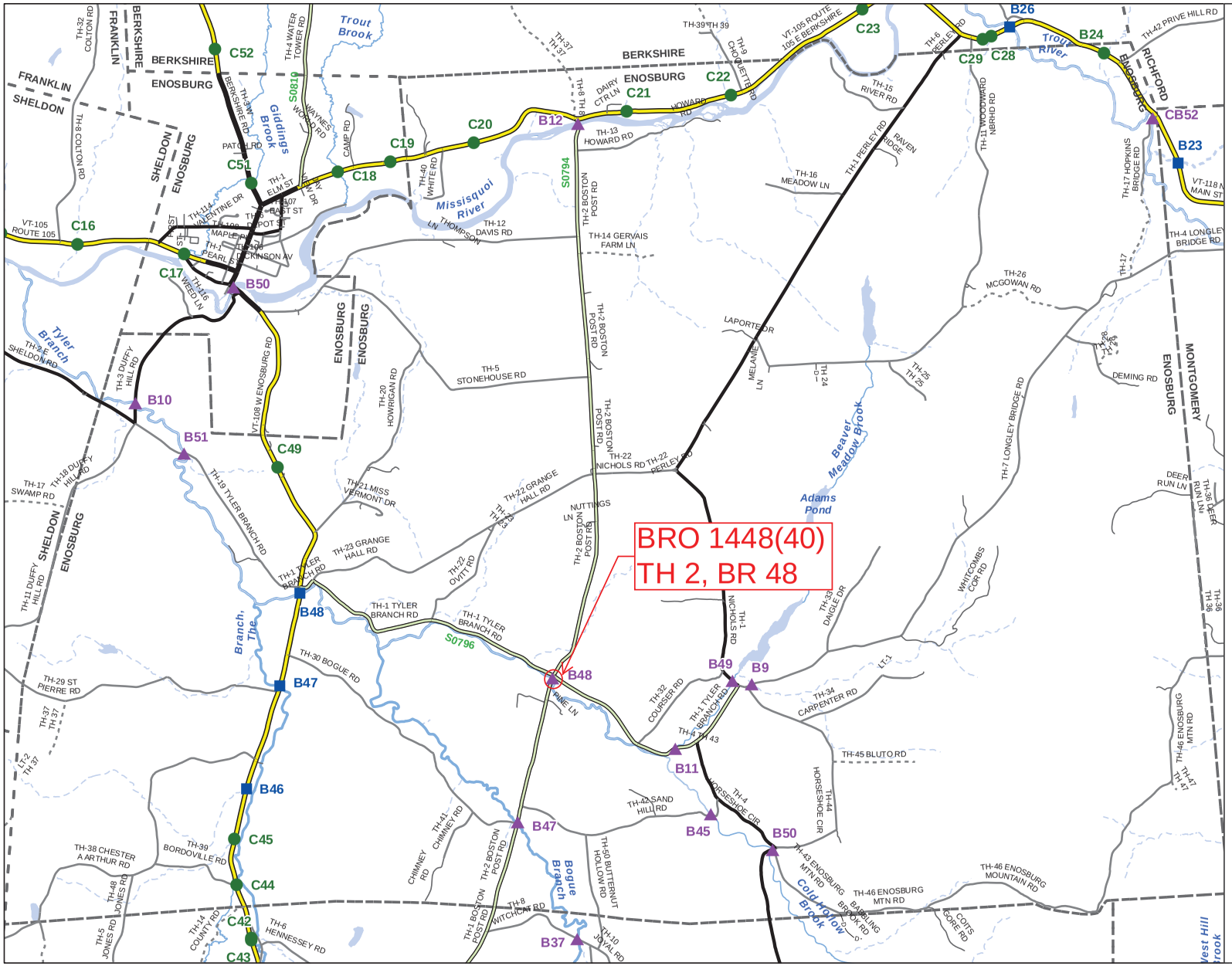
2010 photo of existing bridge, looking southward.

2010 photo of existing bridge, looking northward.

Tyler Branch, looking upstream.

Tyler Branch, looking downstream.

Existing abutments and steel, looking upstream.


BRO 1448(40)
TH 2, BR 48
Scale 1:43,579
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
ENOSBURG
FRANKLIN COUNTY
DISTRICT # 8
Trout Brook
Giddings Brook
Missisquoi River
Tyler Branch
Branch, The
Bogue Branch
Cold Hollow Brook
Beaver Meadow Brook
Adams Pond
Trout River
West Hill Brook
FRANKLIN
SHELDON
BERKSHIRE
ENOSBURG
RICHFORD
MONTGOMERY
C16
C17
C18
C19
C20
C21
C22
C23
C28
C29
C42
C43
C44
C45
C49
C51
C52
B9
B10
B11
B12
B23
B24
B26
B37
B45
B46
B47
B48
B49
B50
B51
CB52
S0794
S0796
S0819

# STRUCTURE INSPECTION, INVENTORY and APPRAISAL SHEET

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

**Inspection Report for** ENOSBURG **bridge no.:** 00048 **District:** 8

**Located on:** C2002 **over** TYLER BRANCH **approximately** AT JCT C2 TH 1 **Owner:** 03 TOWN-OWNED

## CONDITION

**Deck Rating:** 3 SERIOUS

**Superstructure Rating:** 4 POOR

**Substructure Rating:** 4 POOR

**Channel Rating:** 5 FAIR

**Culvert Rating:** N NOT APPLICABLE

**Federal Str. Number:** 100603004806031

**Federal Sufficiency Rating:** 9

**Deficiency Status of Structure:** SD

## AGE and SERVICE

**Year Built:** 1924 **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):** 06

**ADT:** 000400 **% Truck ADT:** 03

**Year of ADT:** 2008

## GEOMETRIC DATA

**Length of Maximum Span (ft):** 0043

**Structure Length (ft):** 000047

**Lt Curb/Sidewalk Width (ft):** 0

**Rt Curb/Sidewalk Width (ft):** 0

**Bridge Rdwy Width Curb-to-Curb (ft):** 17.8

**Deck Width Out-to-Out (ft):** 20.2

**Appr. Roadway Width (ft):** 026

**Skew:** 00

**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:** TEMP MABEY BRIDGE

**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** 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:** 2 INTOLERABLE, REPLACEMENT NEEDED

**Deck Geometry:** 0 BRIDGE CLOSED

**Underclearances Vertical and Horizontal:** 0 BRIDGE CLOSED

**Waterway Adequacy:** 6 OCCASIONAL OVERTOPPING OF ROADWAY WITH INSIGNIFICANT 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):** 2 ALLOWABLE STRESS (AS)

**Posting Status:** E OPEN, TEMPORARY STRUCTURE

**Bridge Posting:** 4 POSTING REQUIRED

**Load Posting:** 01 NO LOAD POSTING SIGNS EXIST NEAR BRIDGE

**Posted Vehicle:** POSTING NOT REQUIRED

**Posted Weight (tons):** 00

**Design Load:** 0 OTHER OR UNKNOWN

## INSPECTION and CROSS REFERENCE

**X-Ref. Route:**

**Insp. Date:** 082010 **Insp. Freq. (months)** 24 **X-Ref. BrNum:**

## INSPECTION SUMMARY and NEEDS

08/11/10 The SW bearing pad in need of realignment or resetting to a level position. The old structure beneath the maybe bridge remains intact even though it appears weakened. PLB

09/03/08 Temporary mabey bridge is in good condition. Except for some loose bolts in the double chord section of the top of the mabey bridge. The bolts should be torque up. DCP

**VT AGENCY OF TRANSPORTATION PROGRAM DEVELOPMENT DIVISION**

# HYDRAULICS UNIT

**TO:** Chris Williams, Structures Project Manager

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

**DATE:** May 29, 2012

**SUBJECT:** ENOSBURG - BRO 1448(40) - TH 2 Bridge 48 over Tyler Branch of Missisquoi

---

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 1924 based on available information. The bridge is owned by the Town. The original bridge was determined to be structurally deficient and a temporary single-lane "Bailey"-Type bridge was installed on temporary bridge seats to span over the existing structure. The original bridge was a narrow 2-lane single span having rolled beams with concrete decking having a width of approximately 20 feet. The original clear span between the abutments is approximately 41 feet at a location just below the bridge seats, but the abutment walls have a slight batter with the clear opening being approximately 39 feet near the streambed elevation. The abutments are stone masonry with cast-in-place concrete fascia. The structure is basically perpendicular across Tyler Branch of the Missisquoi River below a bend in the stream.

Most of the calculated flows, except the $Q_{500}$ event, pass through the existing structure. Therefore, the existing bridge has adequate hydraulic capacity for the design flow ($Q_{25}$) event based on our analysis of the existing conditions. We did not evaluate the existing bridge for scour as part of the preliminary design because bedrock ledge is visible in the streambed and in the vicinity of the existing abutments.

Recommendations

Based on initial discussions with the Structures Group, it was determined that the existing bridge will be totally replaced with a new bridge that will be located on the existing alignment. Since there appears to be bedrock in the vicinity of the abutments, it is anticipated that the replacement structure will have vertical abutment faces and the foundations will be founded and pinned to the existing bedrock. It is anticipated the proposed deck will be designed per applicable road design standards which we have assumed to be two 9-foot lanes with 2-foot shoulders and an adequate width allowable for the placement of the bridge rail (assumed to be 18" on each side). Therefore, the proposed bridge deck width was assumed to be 25 feet wide for modeling purposes.

Since our analysis indicated the existing bridge had adequate hydraulic capacity for the design storm event, it was anticipated that the replacement structure should have a similar span length and hydraulic opening with the assumed low beam elevation at 554.0 feet. As noted above, the new abutment walls were to be vertical and not battered like the existing abutments. Therefore, we chose to analyze a 40-foot clear span (between the abutment faces) that would provide a similar hydraulic opening as the existing structure, but also analyze a bridge having a span equivalent to the Bank Full Width field conditions of 45 feet.

Therefore based on our analysis, the replacement structure could be a 40-foot single span bridge located on the existing roadway alignment and will adequately pass the design storm ($Q_{25}$) event. However, the primary recommendation would be to use a 45-foot single span having a minimum low chord elevation of 253.2 feet to allow the bridge opening width to match the existing condition Bank Full Width of the stream at this location which does not allow for any constriction of the stream flow conditions.

As noted above, scour was not reviewed at this time since there appears to be bedrock ledge within the streambed and in the vicinity of the existing abutment locations. It is anticipated the proposed abutments will be founded and pinned to this bedrock and scour calculations will not be necessary. However based on the velocities from the analyses, it is anticipated that Type 2 or 3 Stone Fill will be necessary for armoring the channel banks near the replacement structure.

Temporary Bridge

Based on discussions with the Structures Group, it is anticipated that a detour will be used during the construction of the new bridge.

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

BMB
cc: Hydraulics Project File via NJW
Hydraulics Chrono File

**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: Jeff Ramsey, VTrans Environmental Specialist

From: Glenn Gingras, VTrans Environmental Biologist

Date: 4/16/2012

Subject: Enosburg BRO 1448(40) - Natural Resource ID

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

**Wetlands/Watercourses**
There are wetlands within the project area. Formal wetland delineation according to US Army Corps of Engineers Wetland Delineation Manual was not completed and wetlands were identified using best professional judgment for resource identification/planning purposes. The wetlands are located in all quadrants of the project except the NW. Wetlands in the project area are emergent and forested wetlands adjacent to the Tyler Branch. A shape file with approximate wetland boundaries is available for reference.

The Tyler Branch flows westerly through the project area. This river would support a variety of aquatic organisms including wild brook trout. Efforts to minimize water quality impacts during construction will need to be evaluated as the project design moves forward.

The US Corps of Engineers and the Agency of Natural Resources- Department of Environmental Conservation would regulate all activities below ordinary high water and to wetlands.

**Wildlife Habitat**
General Wildlife habitat exists within the surrounding area. The project area consists of agricultural lands. There are no wildlife corridor issues within the project area.

**Rare, Threatened and Endangered Species**
There are no mapped rare, threatened or endangered species within the project area.

**Agricultural Soils**
There are prime agricultural soils within the project area. These soils are in the Podunk variant silt loam series.

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

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

Date: 6/4/2012

Subject: Enosburg BRO 1448(40) – Archaeological Resource ID

Jeff,

I've completed the mapping of potential archaeological resources within the project area around Bridge 47 along TH 2 in Enosburg. A field visit was conducted on 4/10/2012 as part of the new GPS initiative. The SW quadrant is archaeologically sensitive and has been mapped on the attached ArcMap. The data can currently be found in the archaeology geodatabase.

Feel free to contact me with any questions or comments,

Brennan

**Brennan Gauthier**
VTrans Assistant Archaeologist
tel. 802-828-3965
Brennan.Gauthier@state.vt.us

VTrans Working to Get You There
Vermont Agency of Transportation

Enosburg BRO 1448(40)
1:670
N
Miles
BRANCH RD
Arch Sensitive
BOSTON POST RD
TH-2
Map created by BCG,
PDD-Environmental Section
on 6/4/2012.

## Ramsey, Jeff

**From:** O'Shea, Kaitlin
**Sent:** Thursday, April 12, 2012 4:18 PM
**To:** Ramsey, Jeff
**Cc:** Newman, Scott; Williams, Chris
**Subject:** Pilot Project - Enosburg BRO1448(40) Historic Resource ID

Good afternoon,

I have completed the historic resource ID for Enosburg BRO1448(40): Bridge 48 and the adjacent properties are not historic.

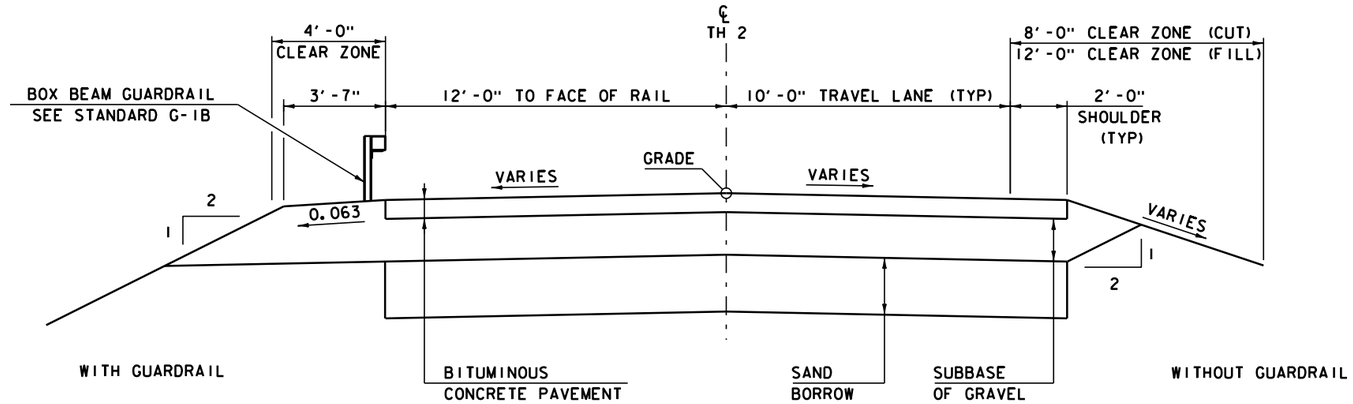
This resource ID is part of the GPS/GIS Pilot Project. As discussed, initial review for historic resources is completed via desk review (maps, bridge inspection photos, Google Earth) and can be determined to have no historic resources without site visits. Other projects will require a site visit in order to determine if there are historic resources located within the project area. Historic resources will continue to be identified on a map and scanned for the project files. When appropriate, historic resources will be mapped by the GPS in order to compare and contrast the effectiveness and application of these resource ID procedures.

I am keeping a spreadsheet for these pilot projects which outlines review methods, resource notes, resource ID and how the ID is submitted (GPS data, email memo, resource map, etc.) I'll bring this to the next project meeting.

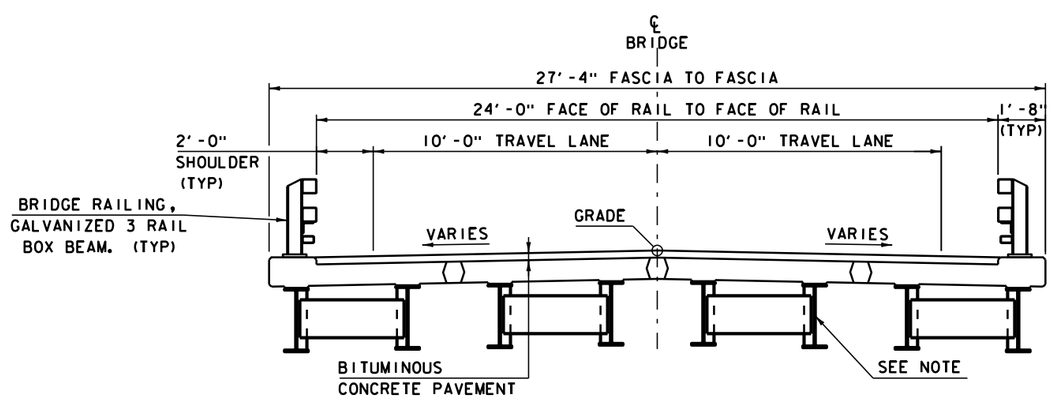
Let me know if you have any questions.
Thanks,
Kaitlin

---
Kaitlin O'Shea
Historic Preservation Specialist
Vermont Agency of Transportation

802-279-0869
Kaitlin.O'Shea@state.vt.us




## PROPOSED TH 2 TYPICAL SECTION




## PROPOSED BRIDGE TYPICAL SECTION

NOTE: PREFABRICATED BRIDGE UNIT (PBU) SUPERSTRUCTURE SHOWN
SUPERSTRUCTURE TYPE AND DIMENSIONS MAY CHANGE WHEN DESIGNED

## MATERIAL TOLERANCES

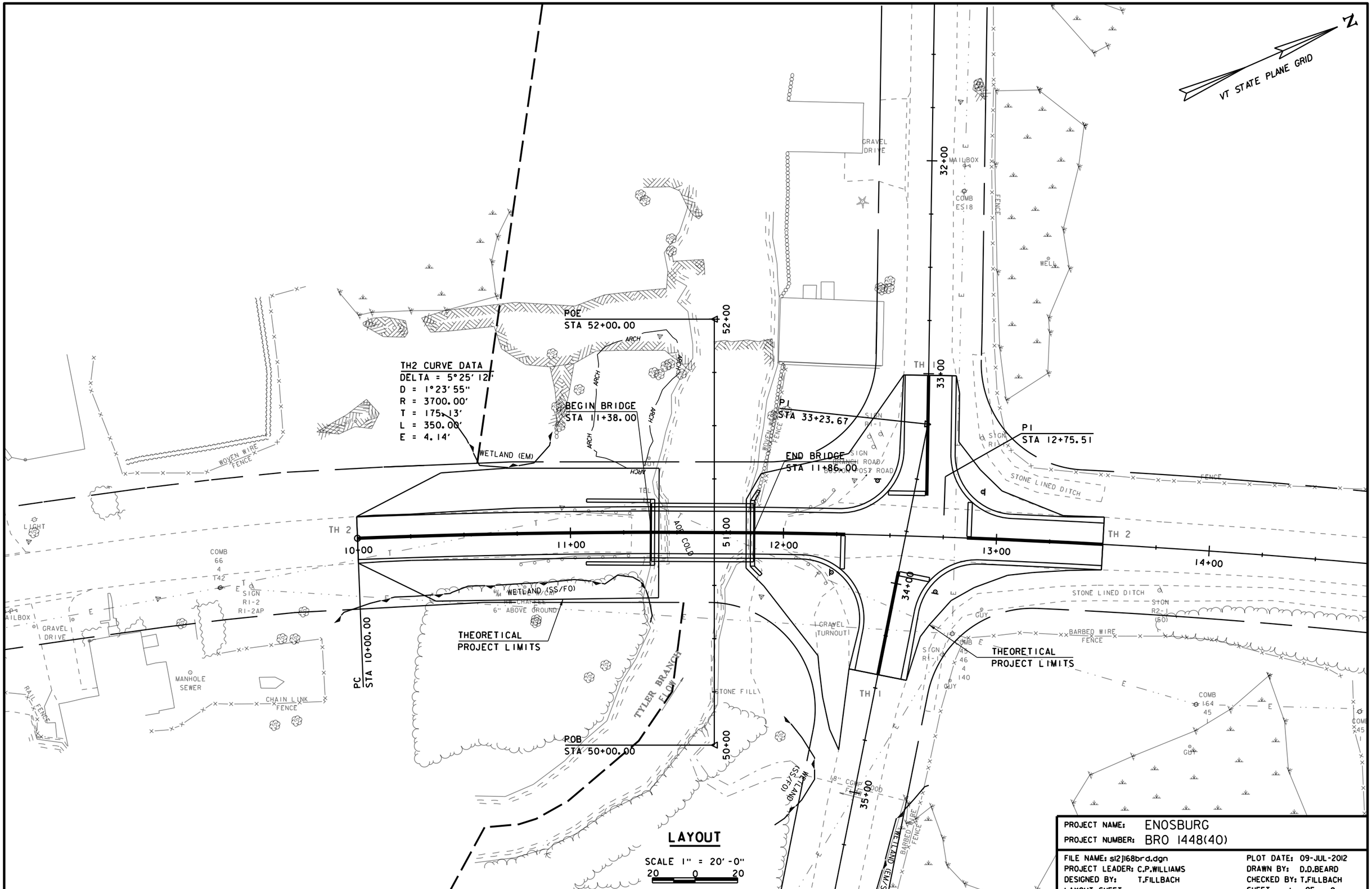
(IF USED ON PROJECT)

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

PROJECT NAME: ENOSBURG
PROJECT NUMBER: BRO 1448 (40)

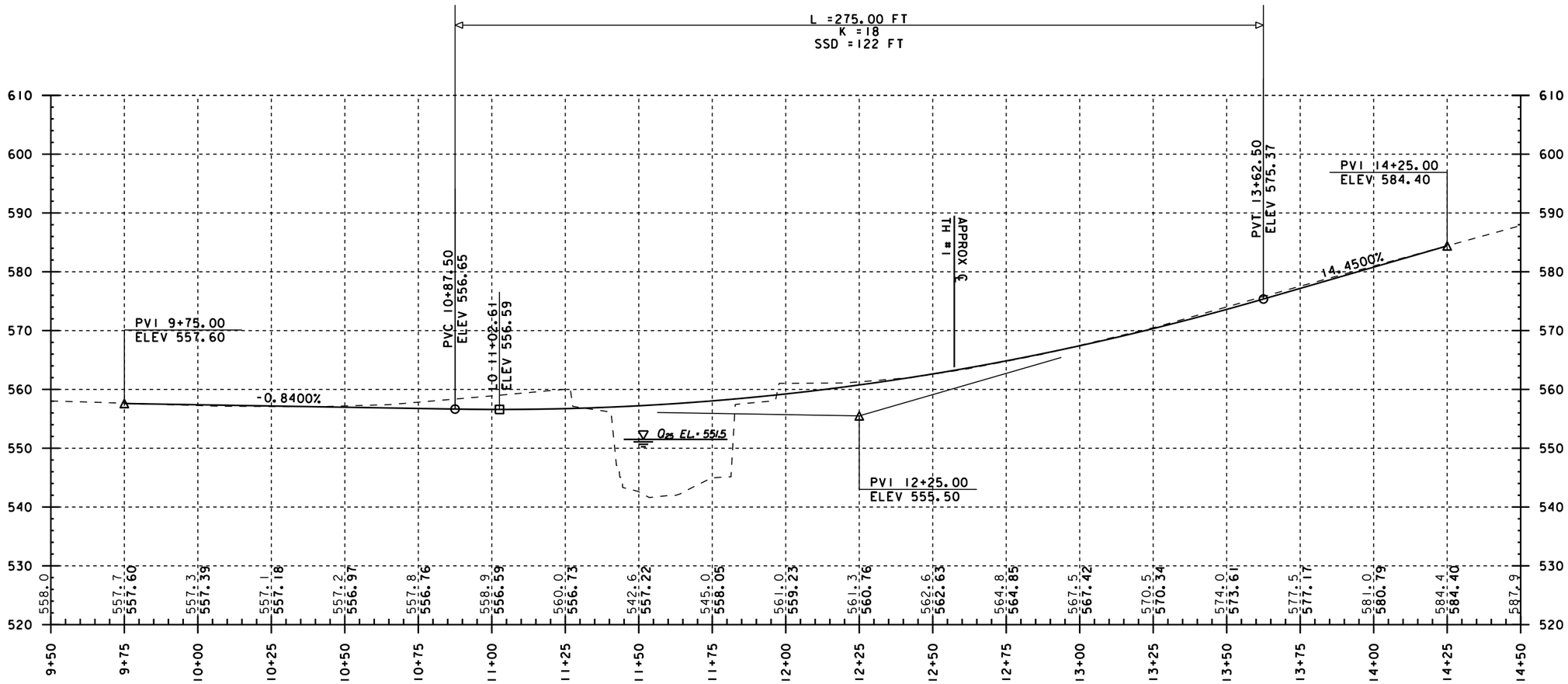
FILE NAME: s12j168typ.dgn
PROJECT LEADER: C.P.WILLIAMS
DESIGNED BY: T.FILLBACH
TYPICAL SECTIONS

PLOT DATE: 09-JUL-2012
DRAWN BY: D.D.BEARD
CHECKED BY: T.FILLBACH
SHEET 2 OF 9

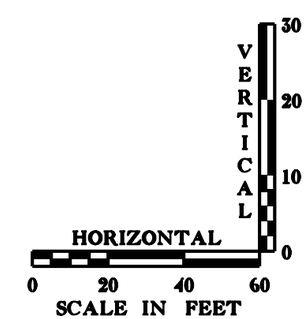



| | |
|---|---|
| PROJECT NAME: | ENOSBURG |
| PROJECT NUMBER: | BRO 1448(40) |

| | |
|---|---|
| FILE NAME: s12j168brd.dgn | PLOT DATE: 09-JUL-2012 |
| PROJECT LEADER: C.P.WILLIAMS | DRAWN BY: D.D.BEARD |
| DESIGNED BY: T.FILLBACH | CHECKED BY: T.FILLBACH |
| LAYOUT SHEET | SHEET 1 OF 9 |




## TH 2 PROPOSED PROFILE




NOTE:

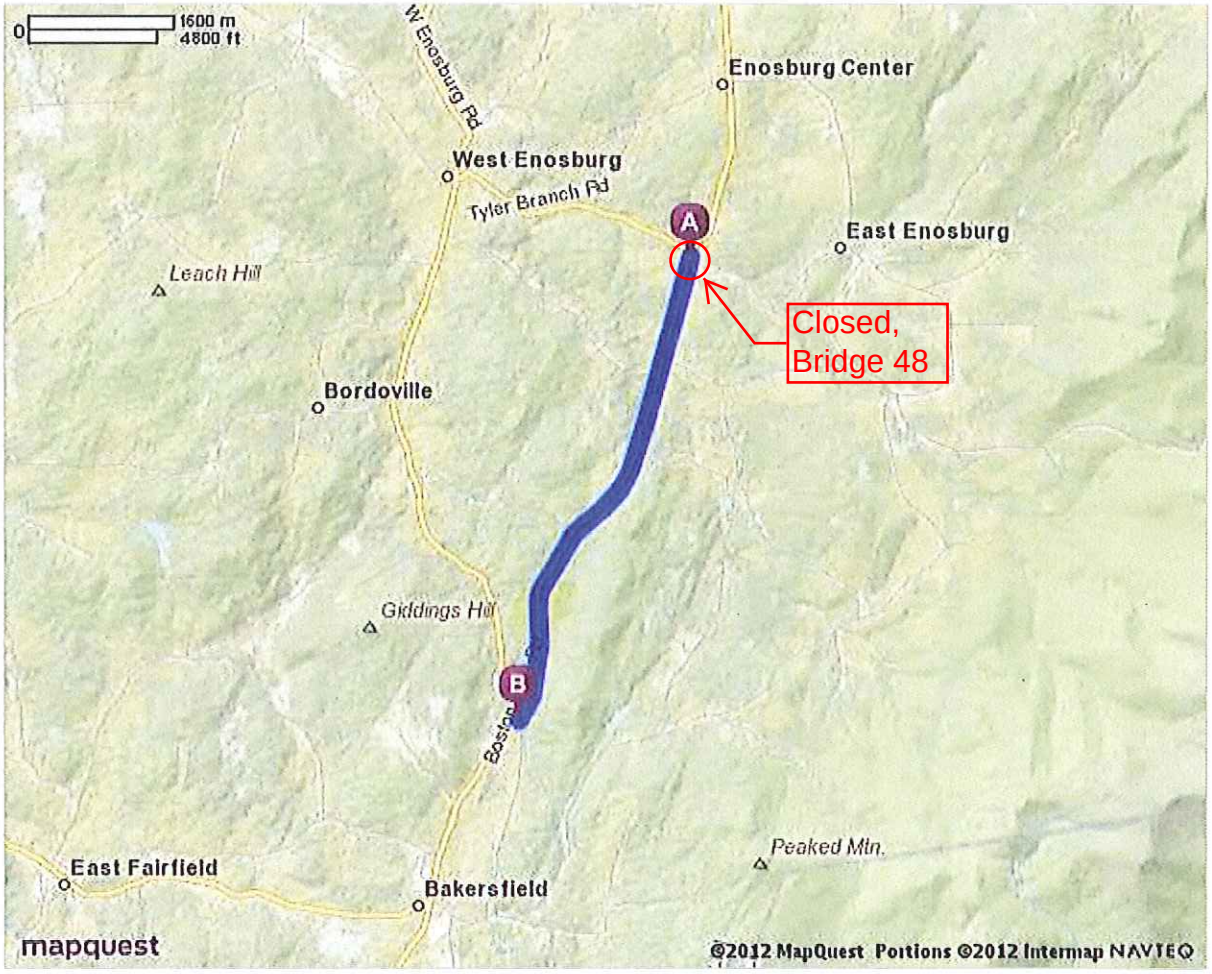
EXISTING SURVEY INFORMATION SHOWN ON THE PLANS INCLUDES THE TEMPORARY BRIDGE

GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄

GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

| | |
|---|---|
| PROJECT NAME: ENOSBURG | |
| PROJECT NUMBER: BRO 1448(40) | |
| FILE NAME: s12j168profile.dgn | PLOT DATE: 09-JUL-2012 |
| PROJECT LEADER: C.P.WILLIAMS | DRAWN BY: D.D.BEARD |
| DESIGNED BY: T.FILLBACH | CHECKED BY: T.FILLBACH |
| PROFILE SHEET | SHEET 3 OF 9 |

## Route Map Hide




All rights reserved. Use subject to License/Copyright | Map Legend

Directions and maps are informational only. We make no warranties on the accuracy of their content, road conditions or route usability or expeditiousness. You assume all risk of use. MapQuest and its suppliers shall not be liable to you for any loss or delay resulting from your use of MapQuest. Your use of MapQuest means you agree to our Terms of Use

From Point A:

Travel 4.25 miles South on Town Highway 2

To Point B.

Route Map Hide

All rights reserved. Use subject to License/Copyright | Map Legend

Directions and maps are informational only. We make no warranties on the accuracy of their content, road conditions or route usability or expeditiousness. You assume all risk of use. MapQuest and its suppliers shall not be liable to you for any loss or delay resulting from your use of MapQuest. Your use of MapQuest means you agree to our Terms of Use

From Point A:

Travel 2.11 Miles West on Town Highway 1

Turn Left onto VT 108 South

Travel 4.94 Miles on VT 108 South

To Point B.

Detour Length: 7.05 Miles

Additional Length: 2.8 Miles

End to End Length: 11.3 Miles