

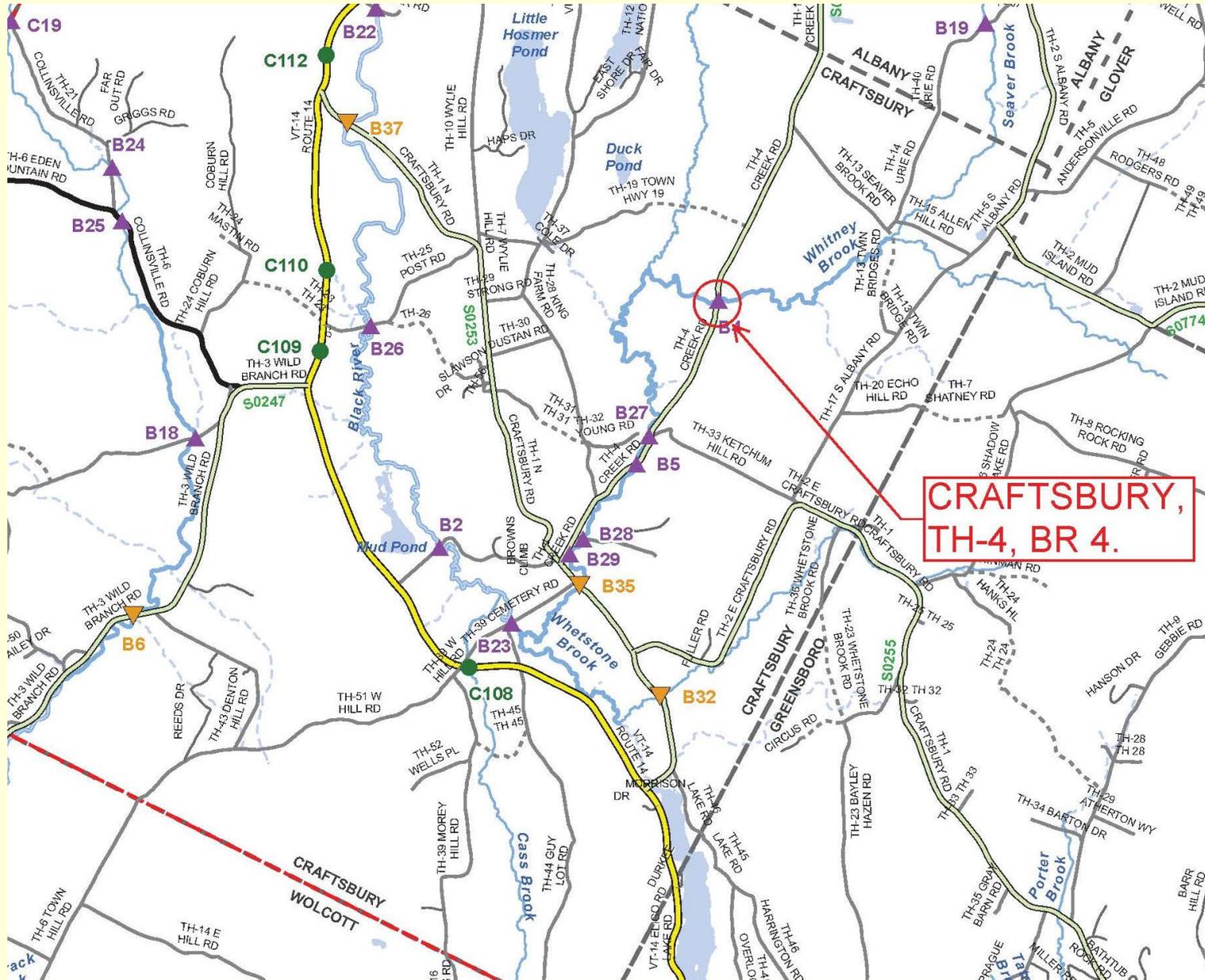
Craftsbury BO 1449(34) Bridge 4 on Creek Road (TH 4) over Whitney Brook Alternatives Presentation



**Presented by
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October 15, 2013

PROJECT LOCATION



Meeting Outline

- Purpose of the Meeting
- Structures Section Re-organization
- Existing bridge deficiencies
- Alternatives considered
- Summary and recommendation
- Next Steps

Purpose of Meeting

- Present the alternatives that we have considered
- Explain the constraints to the project
- Help you understand our approach to the project
- Provide you with the chance to ask questions
- Provide you with the chance to voice concerns
- Build consensus for the recommended alternative-

Accelerated Bridge Program

- Began in January 2012
- Bridges are deteriorating faster than we can fix them
- Short-term closures are key
- Impacts to property owners and resources is minimized
- Less impacts = less process = less money = faster delivery
- Accelerated Bridge Construction (ABC) is very efficient
- Accelerated Project Delivery is the result
- Shift from individual projects to programmatic approach
- Goal of 25% of projects into Accelerated Bridge Program
- Goal of 2 year design phase for ABP (5 years conventional)

Project Initiation & Innovation Team

- Part of re-organization in January 2012
- All Structures projects will begin in the PIIT
- Very efficient process
- Look for innovative solutions whenever possible
- Involved until Project Scope is defined
- Hand off to PM to continue Project Design phase

Phases of Development

Project
Funded

Project
Defined

Contract
Award

Project Definition

Project Design

Construction

Identify resources &
constraints

Evaluate alternatives

Public Participation

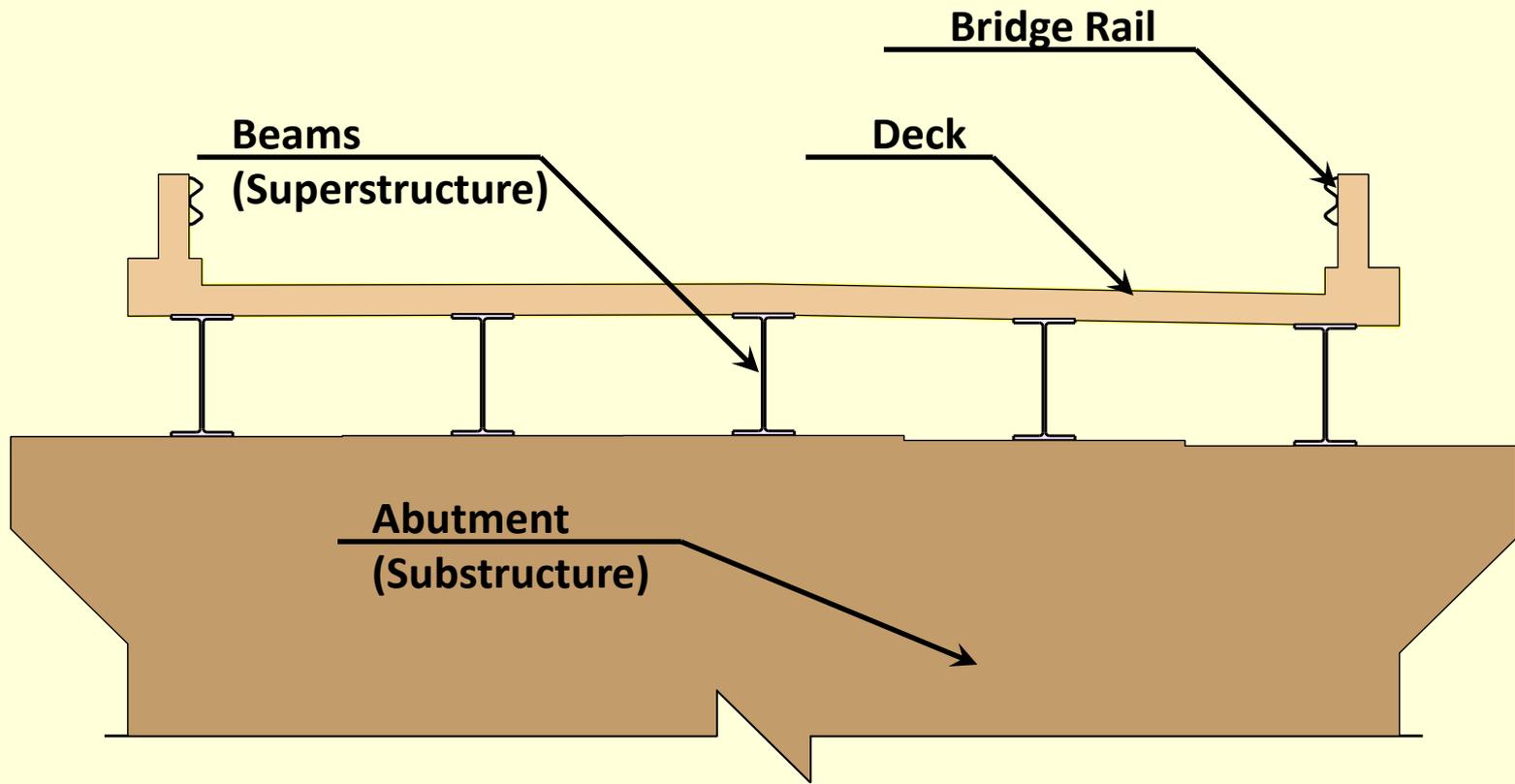
Build Consensus

- Quantify areas of impact

- Environmental permits

- Develop plans, estimate and specifications

Description of Terms Used



Project Background

- The structure is owned and maintained by the Town
- Creek road (TH 4) is a Class 2 Town Highway
- Functionally labeled as a Rural Minor Collector
- Posted Speed = 35 mph (Design Speed)
- Existing bridge is a single span steel beam w/ concrete deck
- Span length = 41 feet
- Bridge Width = 17.7 feet (curb-curb)
- The bridge was built in 1929 (84 years old)

Traffic Data

	“Current Year” 2016	“Design Year” 2036
Average Annual Daily Traffic	200	210
Design Hourly Volume	50	50
Average Daily Truck Traffic	15	20
%Trucks	1.5	2.0

EXISTING BRIDGE DEFICIENCIES

Inspection Rating Information (Based on a scale of 9)

Bridge Deck Rating	3 Serious
Superstructure Rating	3 Serious
Substructure Rating	5 Fair

Rating Definitions

- 9 Excellent**
- 8 Very Good**
- 7 Good**
- 6 Satisfactory**
- 5 Fair**
- 4 Poor**
- 3 Serious**
- 2 Critical**
- 1 Imminent Failure**

Deficiencies

- The bridge is structurally deficient with full depth holes in the deck and major section loss in the beams
- The roadway and bridge are too narrow for the roadway classification and design speed
- The bridge and approach rail are substandard
- The horizontal and vertical alignment are substandard

Looking North over Bridge



Looking South over Bridge



Beam and Deck Deterioration



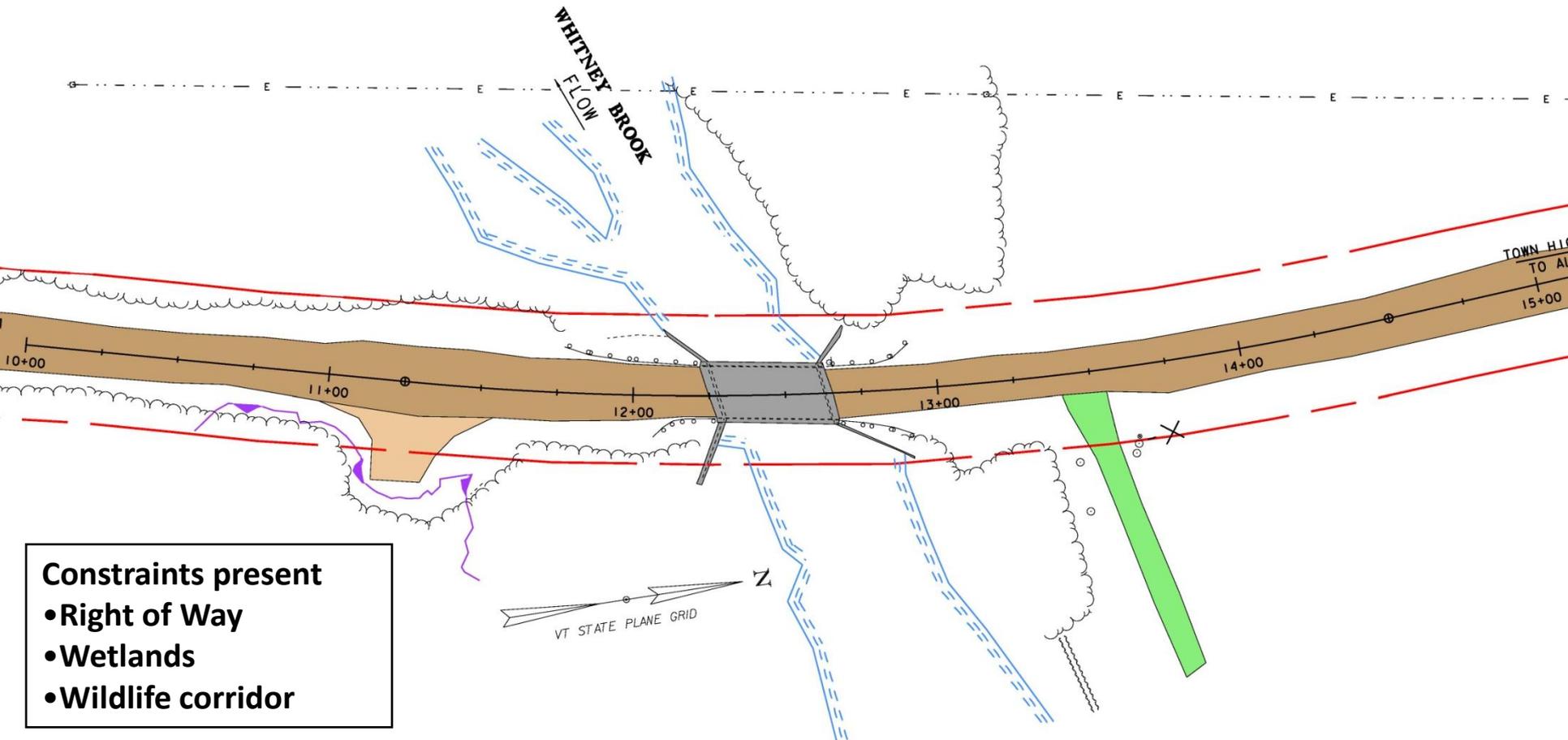
South Abutment



North Abutment



Layout Showing Constraints



Alternatives Discussion

Rehabilitation was ruled out due to the age and deteriorated condition of the existing bridge and was not detailed in the Scoping Report

Full bridge replacement alternatives considered

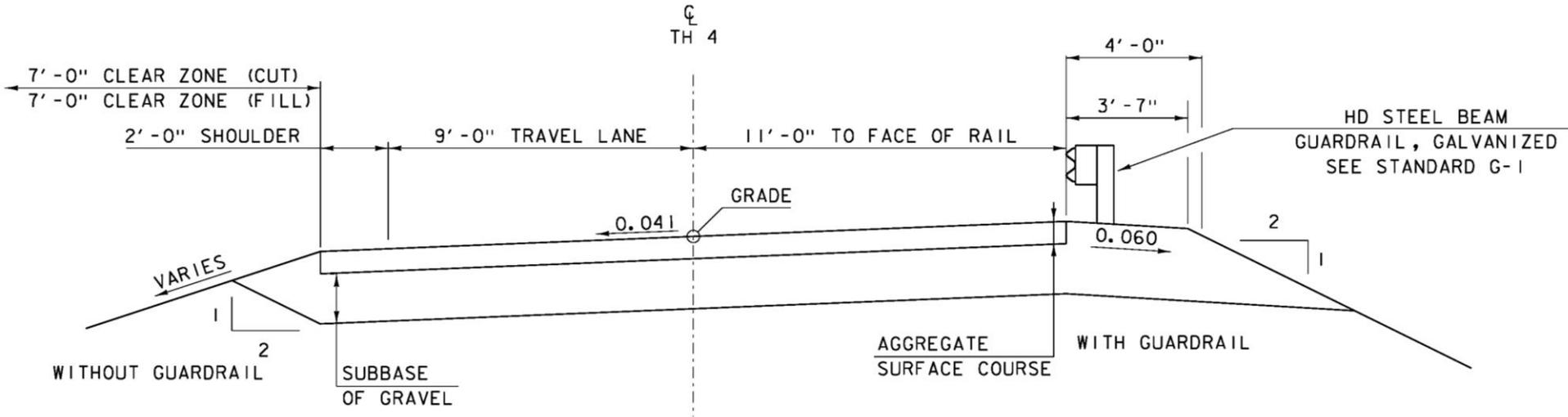
- 42' span rigid frame (arch)
- 68' span steel beam bridge on spread footings
- 85' span steel beam bridge w/ integral abutments

Note: The method to maintain traffic during construction will be considered separately later in the presentation

Common Replacement Details

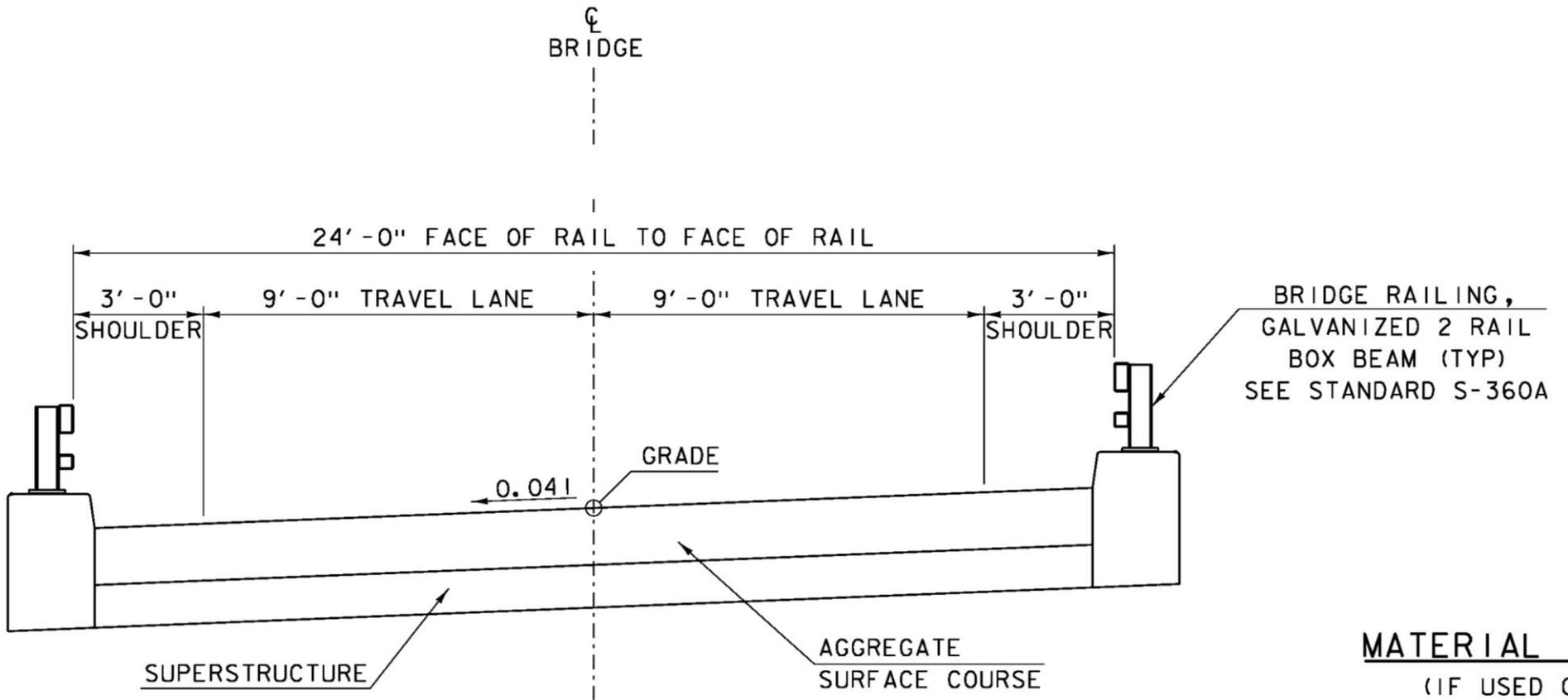
- Complete Bridge replacement warranted
- 24' width between face of rail @ bridge (22' on roadway)
- Maintain existing centerline of road
- Raise the vertical grade of road to improve sight distance
- Long term (80 year) solution

Roadway Typical



PROPOSED TH 4 TYPICAL SECTION

Bridge Typical 42'



42' PROPOSED BRIDGE TYPICAL SECTION

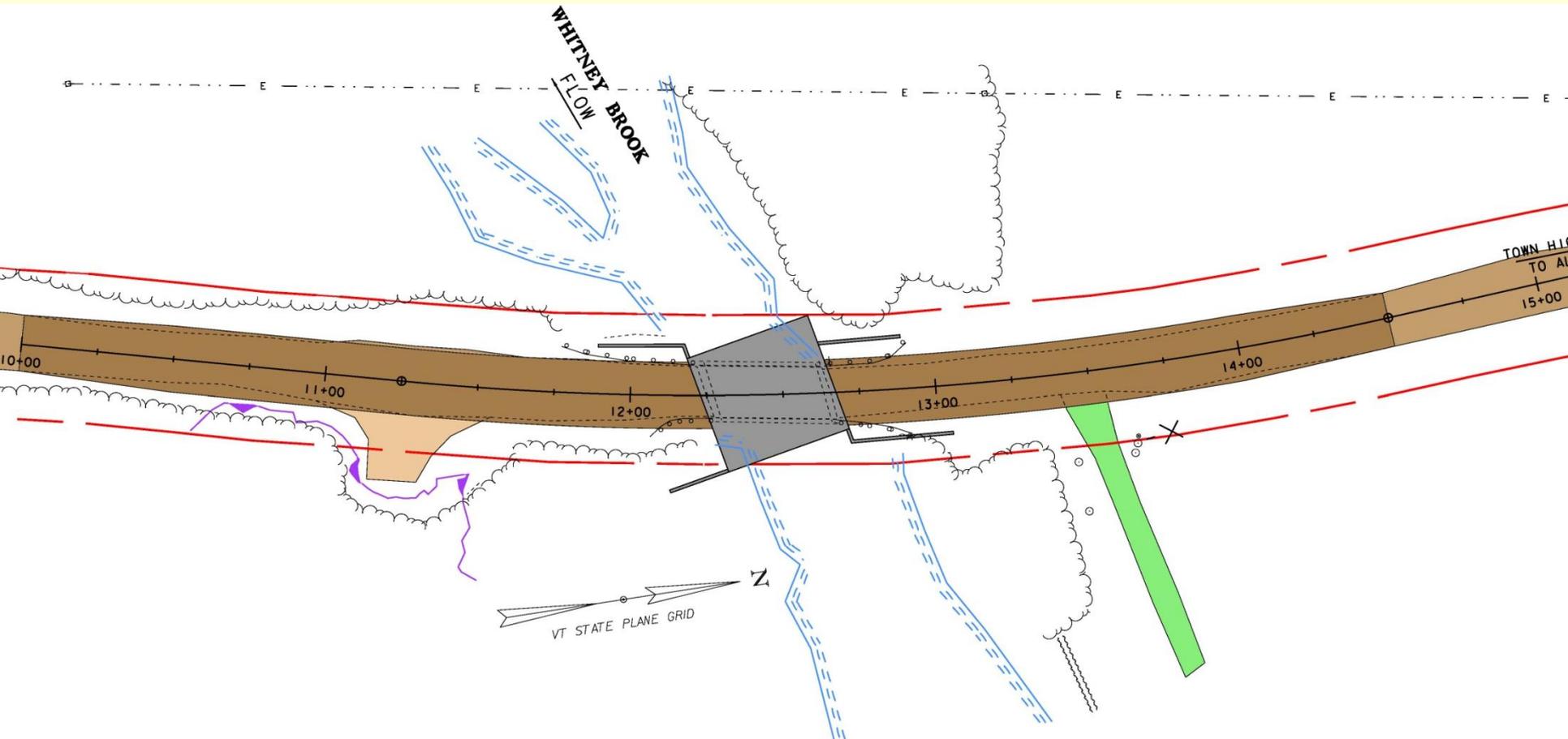
MATERIAL

(IF USED C

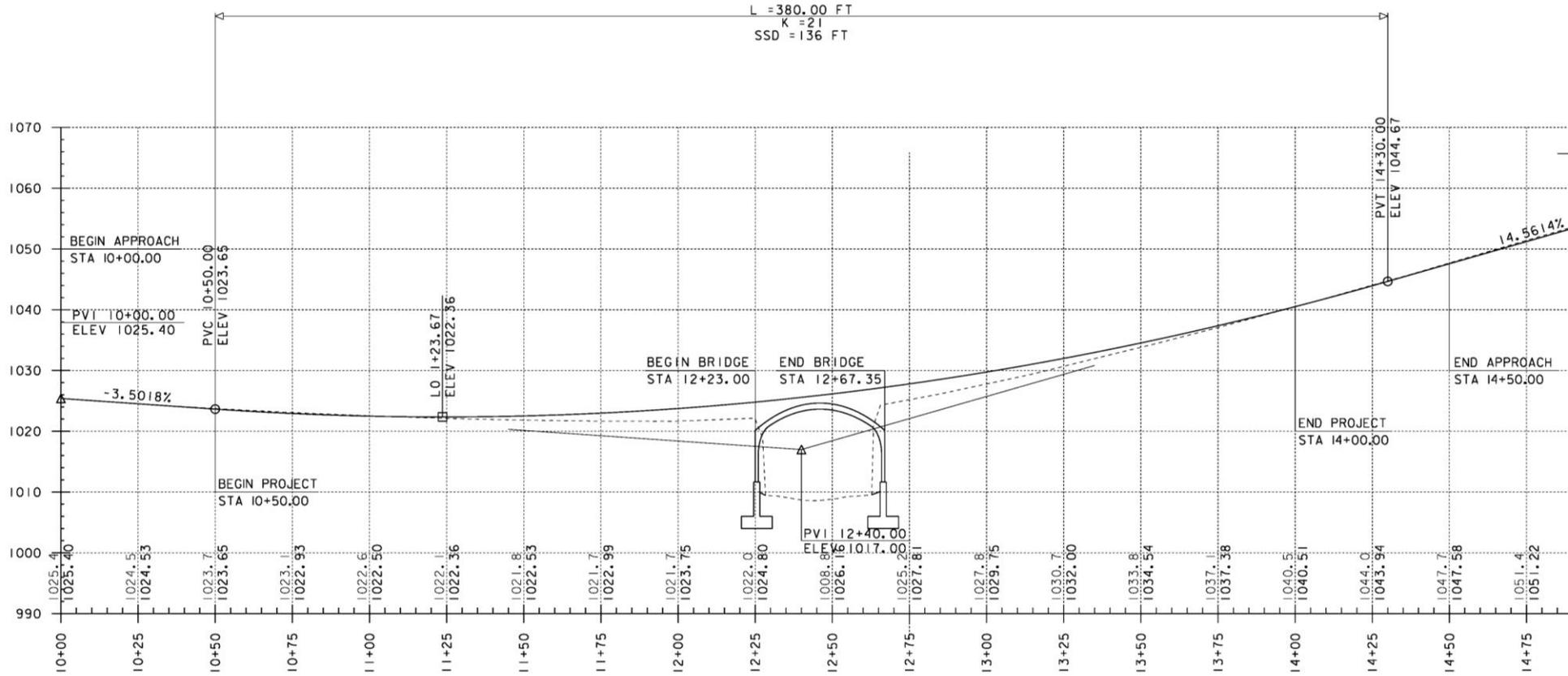
SURFACE

- PAVEMENT (TOTAL TH
- AGGREGATE SURFACE

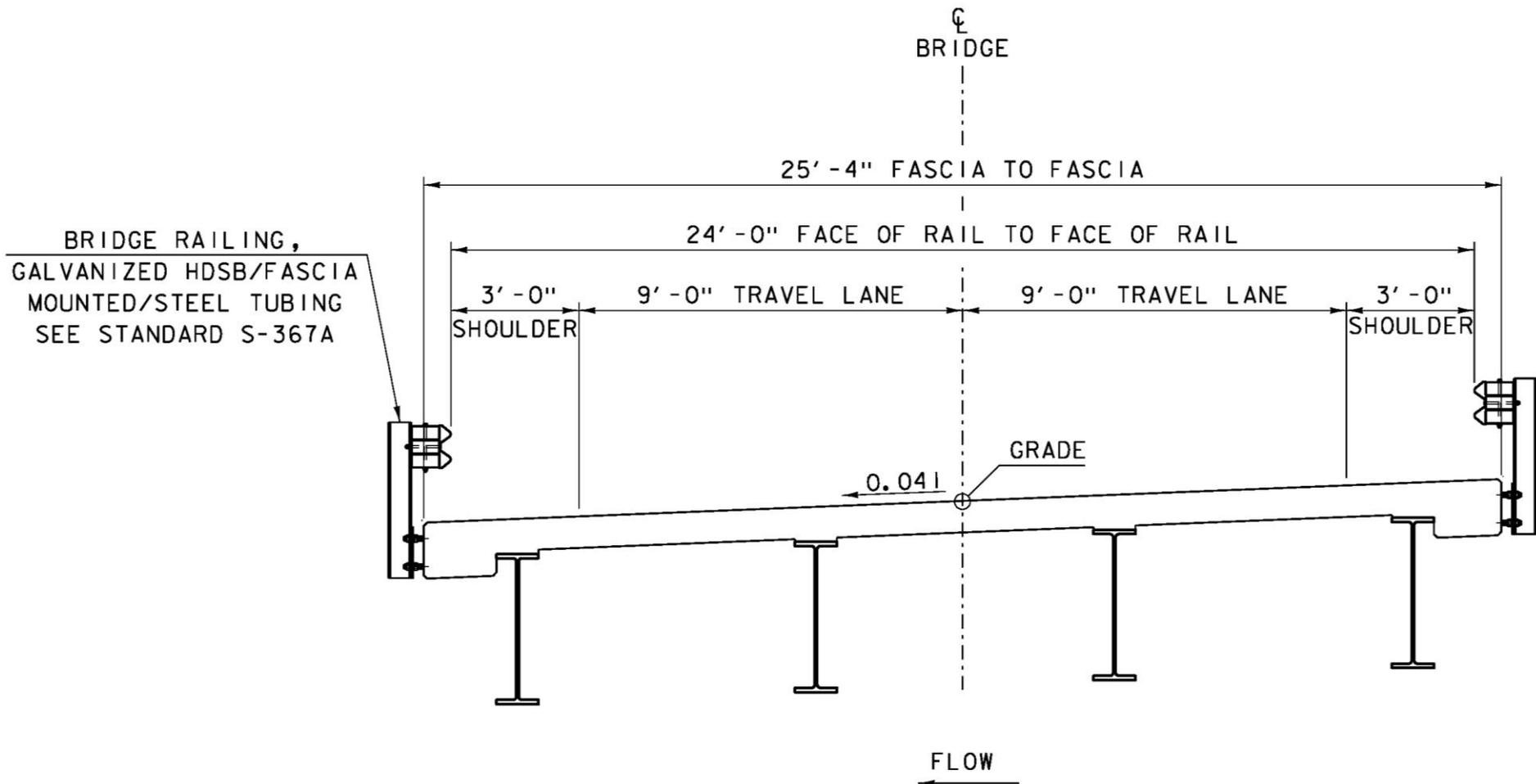
Layout 42' Rigid Frame



Profile 42' Rigid Frame

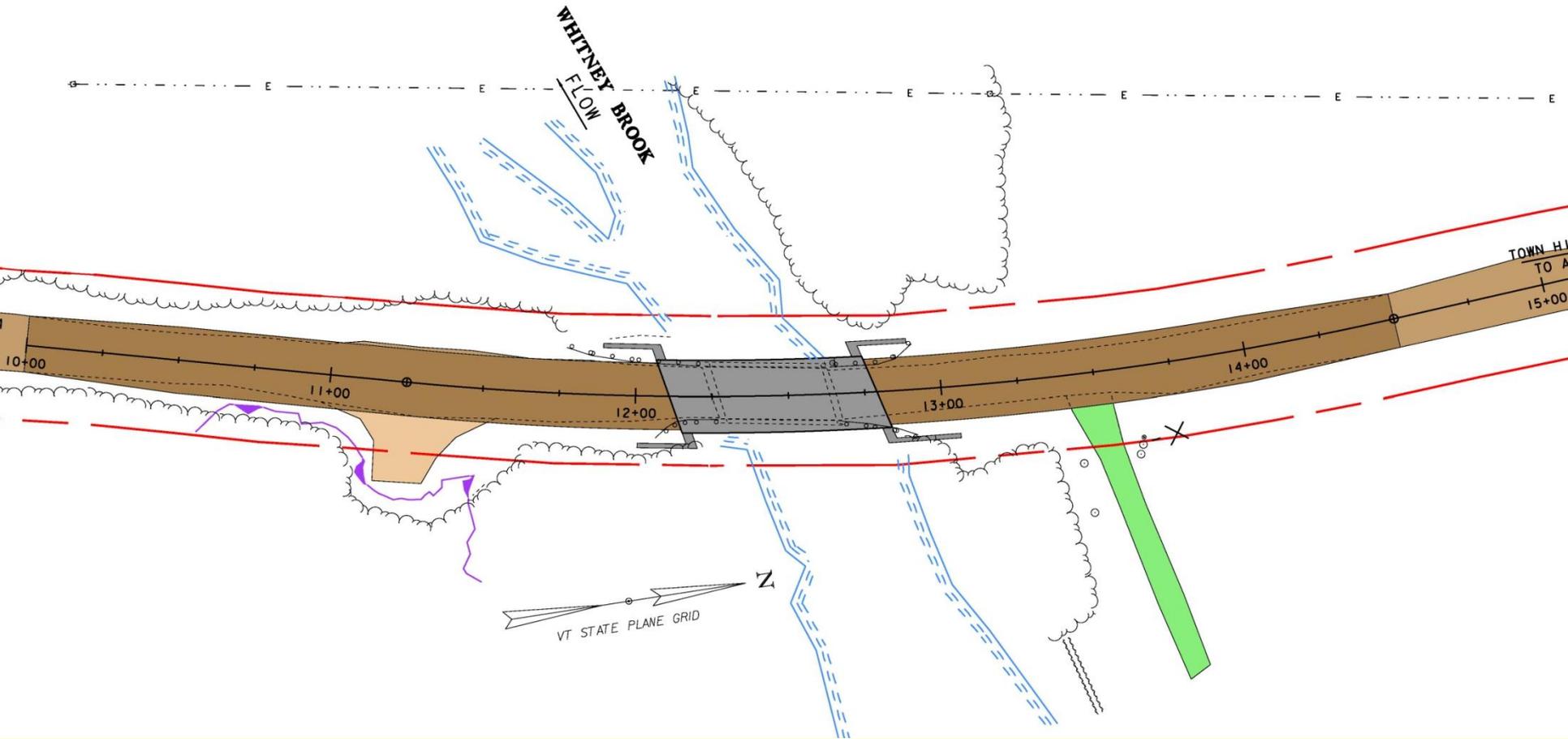


Bridge Typical 68' & 85' options

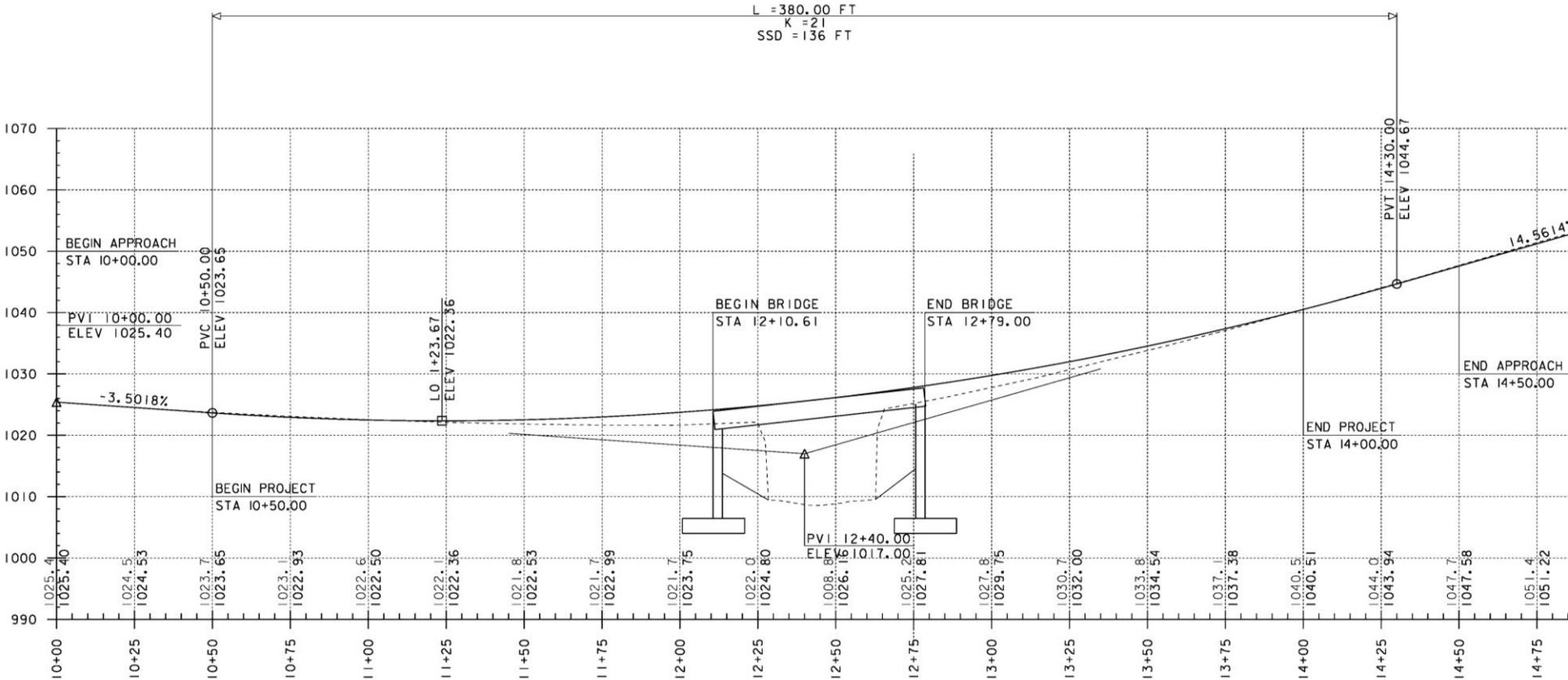


68' AND 85' PROPOSED BRIDGE TYPICAL SECTION

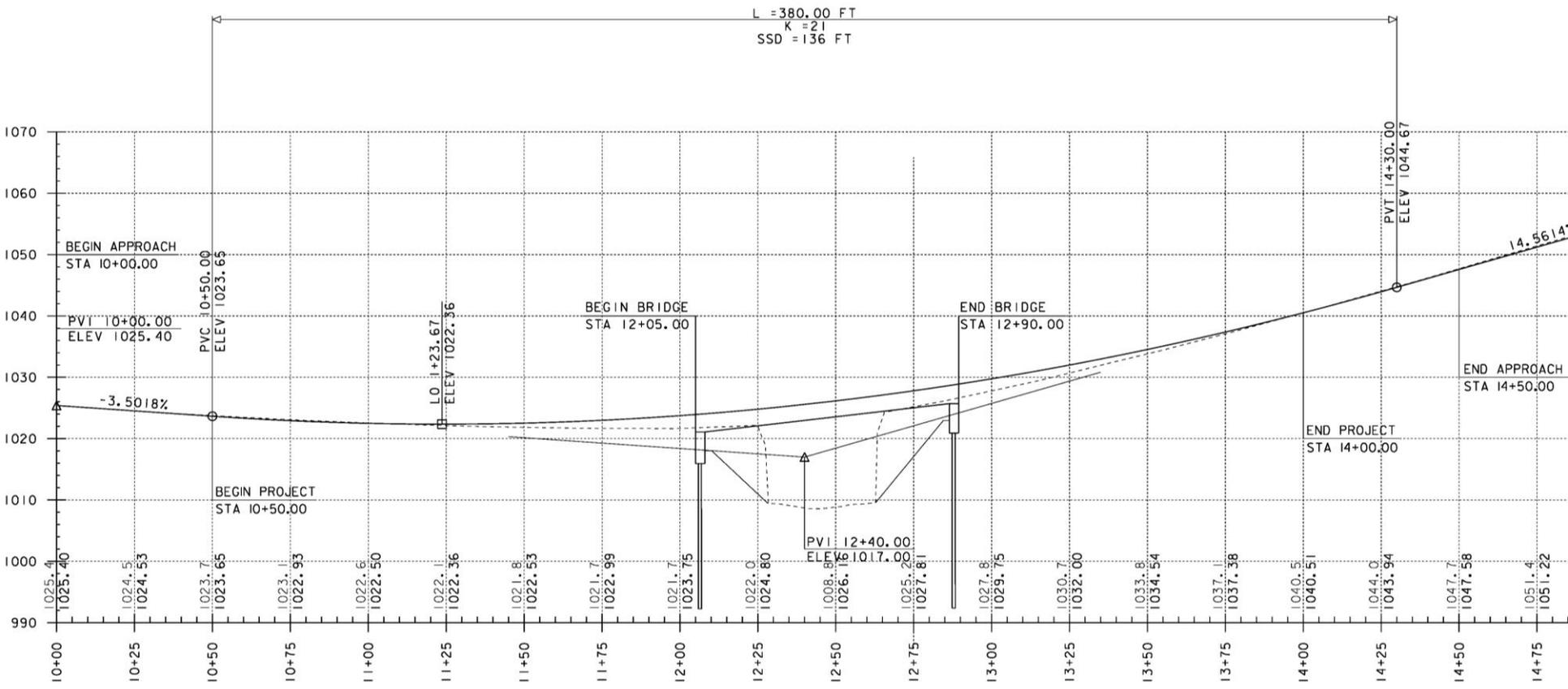
Layout 68' Bridge w/ spread footings



Profile 68' bridge w/ spread footings



Profile 85' Bridge w/ Integral Abutments



Recommendation on Alternatives

VAOT recommends Rigid Frame

- Low initial cost
- Low maintenance cost
- Short construction duration

Methods to maintain traffic will be based on recommended alternative

Methods to Maintain Traffic

Three general methods available:

- Phased Construction
- Temporary Bridge
- Short-term bridge closure w/ off-site detour & ABC

Methods to Maintain Traffic

Phased Construction

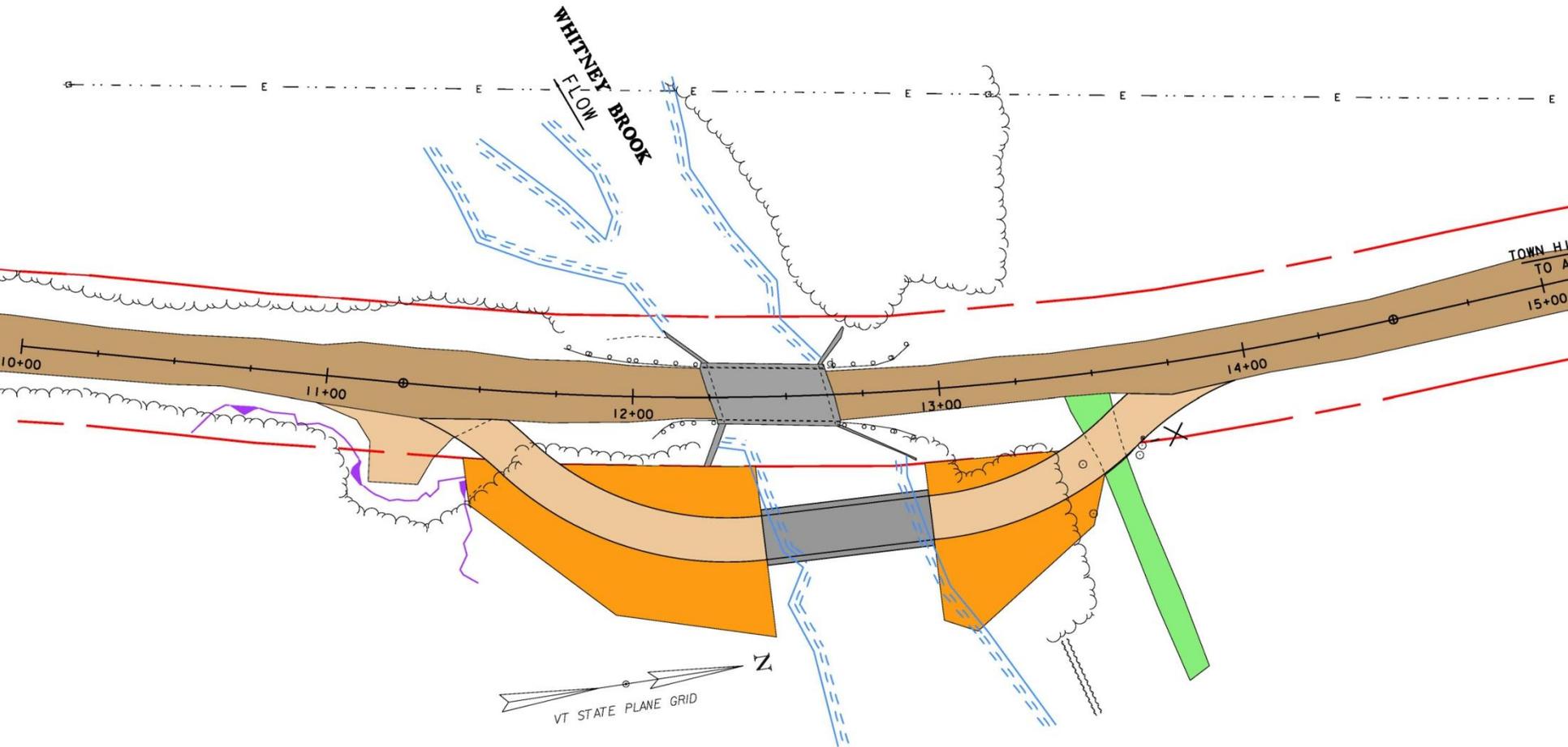
- Maintain one lane of traffic on portion of existing bridge while constructing a portion of the new bridge
- Existing bridge is too narrow for this method unless horizontal alignment is changed since 14'-6" minimum width required for each phase
- Changing horizontal alignment can not be justified due to cost, impacts to property owners and environment
- This method ruled out and not considered further

Methods to Maintain Traffic

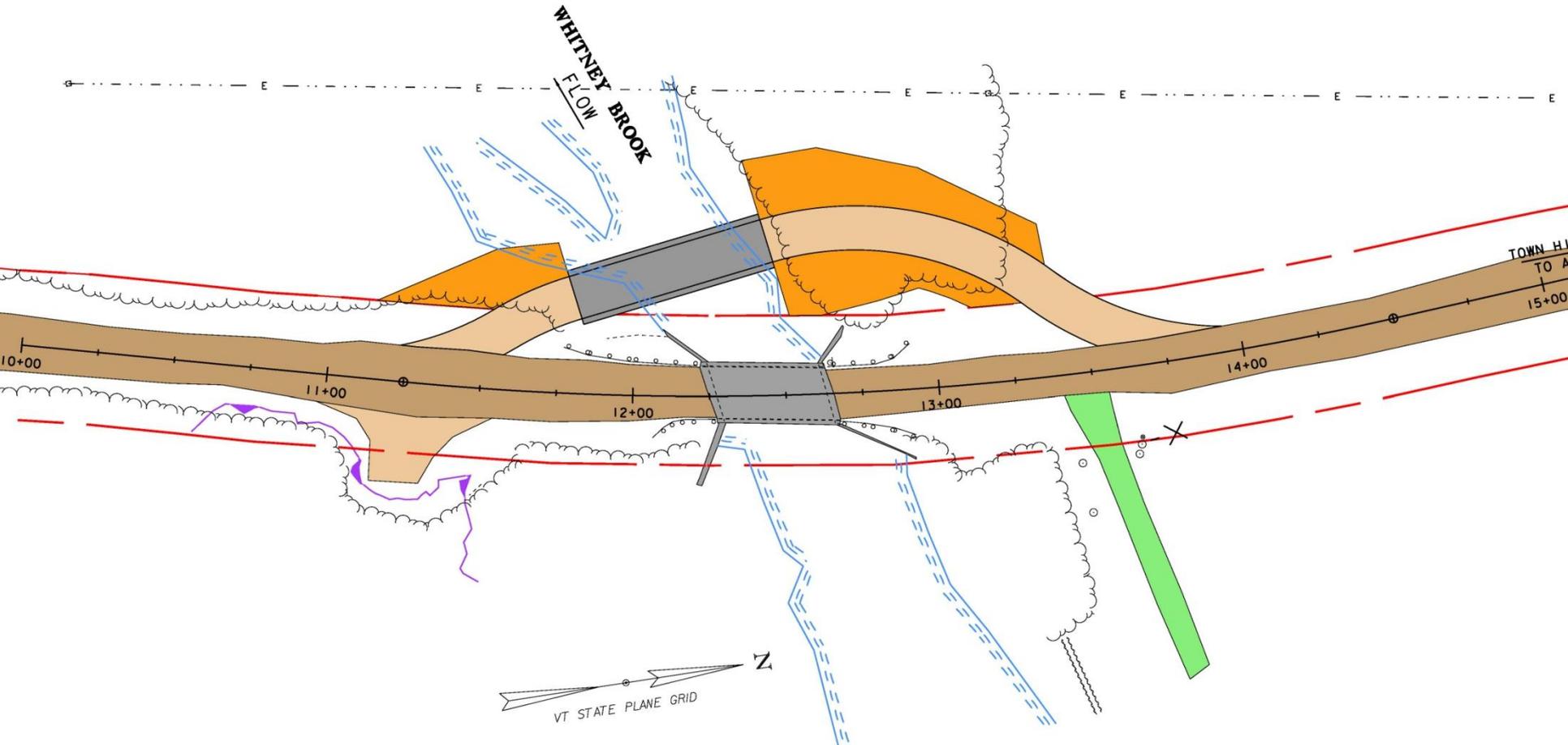
Temporary Bridge

- One-lane bridge with alternating traffic (no lights)
- Traffic congestion and/or conflicts w/ one-lane
- Environmental & Property Impacts
- Long project development process
- High cost of development and construction
- Consider both sides for possible location

Temporary Bridge - Upstream



Temporary Bridge - Downstream

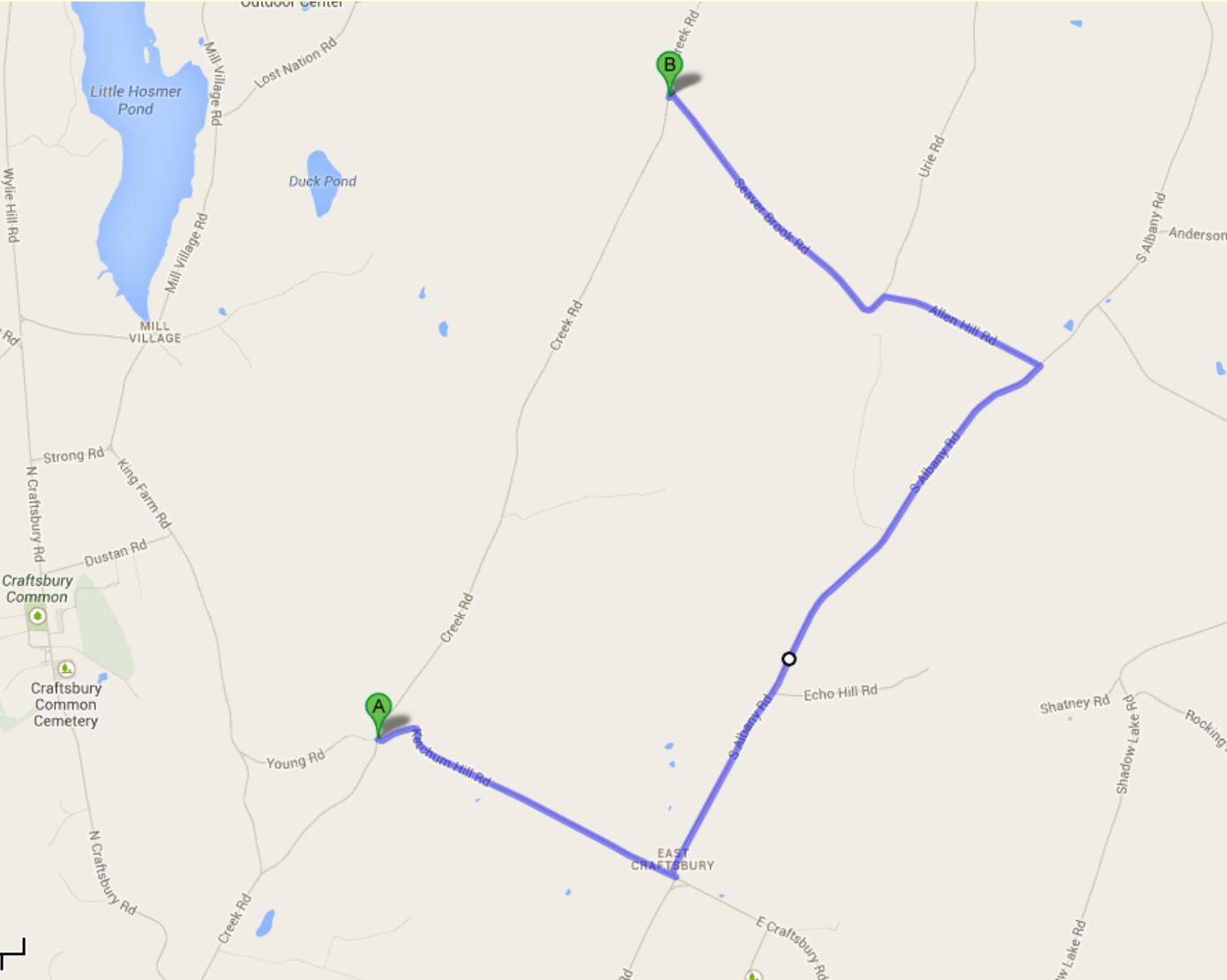


Methods to Maintain Traffic

Short-term bridge closure with detour and ABC

- Bridge 4 to be closed for 28 days (maximum)
- Allow 24/7 construction during bridge closure
- Contract incentives/dis-incentives to encourage contractor
- Community would have input on time of closure (between June 1 and September 1)
- Town will be responsible for detour route
- Public Outreach to provide advance notice for planning
- Local share will be cut in half (10% reduced to 5%)-

Possible Detour Route



A to B on Thru Route: 2.2 Miles
A to B on Detour Route: 4.6 Miles
Added Miles: 2.4 Miles
End to End Distance: 6.8 Miles

Major Factors
Added Miles: 2.4
Traffic Volume: 200 vpd
Duration: 4 weeks

Alternatives Matrix

	42' w/ Temp Bridge	42' w/ Detour	68' w/ Temp Bridge	68' w/ Detour	85' w/ Temp Bridge	85' w/ Detour
Construction w/ CE + Contingencies	\$1,111,300	\$922,100	\$1,291,600	\$1,102,400	\$1,248,500	\$1,059,200
Preliminary Engineering	\$218,800	\$181,500	\$254,300	\$217,000	\$245,800	\$208,500
Right of Way	\$51,000	\$43,000	\$51,000	\$43,000	\$51,000	\$43,000
Total Project Cost	\$1,381,100	\$1,146,600	\$1,596,900	\$1,362,400	\$1,545,300	\$1,310,700
Town Share	\$138,110 (10%)	\$57,330 (5%)	\$159,690 (10%)	\$68,120 (5%)	\$154,530 (10%)	\$65,535 (5%)
Design Life	80 Years	80 Years	80 Years	80 Years	80 Years	80 Years
Project Development Duration	4 years	4 years	4 years	4 years	4 years	4 years
Construction Duration	18 months	6 months	18 months	6 months	18 months	6 months
Closure Duration	None	28 days	None	28 days	None	28 days

Conclusion and Recommendation

Structure Type

Full Bridge Replacement w/ Rigid Frame

- Low initial cost
- Low maintenance cost
- Long term (80 year) fix

Traffic Maintenance Method

Bridge closure w/ off-site detour & ABC

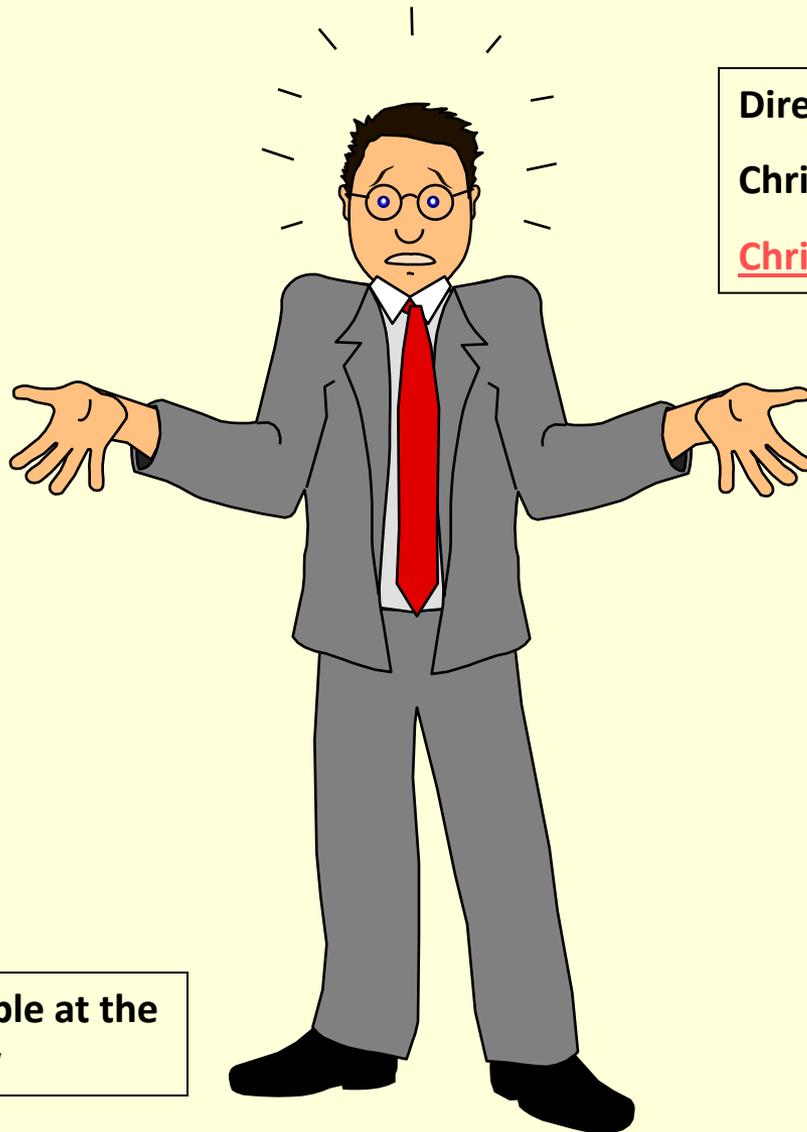
- Project Development time minimized
- Minimal mobility impacts
- Minimal impact to environmental resources
- Minimal impact to adjacent property owners
- Takes advantage of reduced local share for closure--

Next Steps

This is a list of a few important activities expected in the near future and is not a complete list of activities.

- Wait to hear Town response to recommendation
- Develop Conceptual Plans
- Request another public meeting (if necessary)
- Hold meeting to present Conceptual Plans
- Discuss if Town wants to take responsibility for any of the Right-of-Way activities to expedite the project

Questions



Direct any questions to:

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This presentation is available at the
web address shown below

<https://outside.vermont.gov/agency/vtrans/external/Projects/Structures/13J100>