

# St. Johnsbury BHO 1447(30) Bridge 46 on TH 371 over Sleepers River Alternatives Presentation



Presented by  
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# Meeting Outline

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

# 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
- Accelerated Bridge Construction (ABC) with short-term closures used when appropriate
- Impacts to property and resources is minimized
- Results in project being delivered faster
- Goal of 25% of projects into Accelerated Bridge Program
- Goal of 2 year design phase for ABP (5 years conventional)
- Visit the website at [acceleratedbridge.vermont.gov](http://acceleratedbridge.vermont.gov)

# Project Initiation & Innovation Team

- Part of re-organization in January 2012
- Currently team of 5
- All 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

- Right-of-Way Process

- Utility Coordination

- Develop plans, estimate and specifications

# Project Background

- **Priority 17** in the Town Highway Bridge Program
- The structure is owned and maintained by the Town
- TH 371 is a Class 3 Town Highway
- Existing bridge is a 3-span concrete T-beam bridge
- Total bridge length of 127 feet
- Bridge width of 25.5 feet (including 5 foot sidewalk)
- The bridge was built in 1929 (84 years old)
- Bridge is structurally deficient and has a Federal sufficiency rating of **56.8 (out of 100) -**

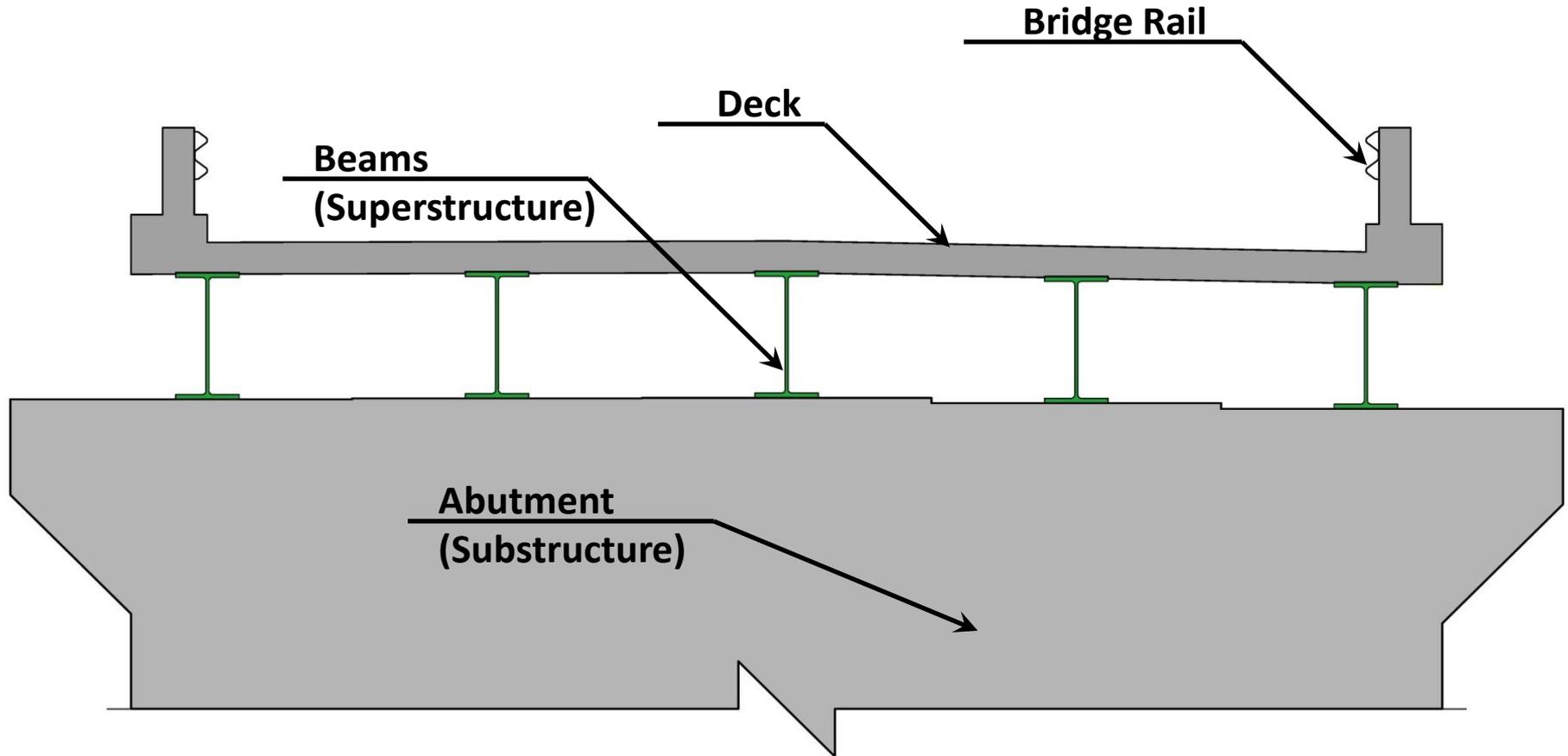
# Project Background (Cont)

- Traffic Data

	<b>2015</b>	<b>2035</b>
<b>AADT</b>	<b>1,200</b>	<b>1,200</b>
<b>DHV</b>	<b>160</b>	<b>160</b>
<b>ADTT</b>	<b>160</b>	<b>200</b>
<b>%T</b>	<b>5.5</b>	<b>6.9</b>

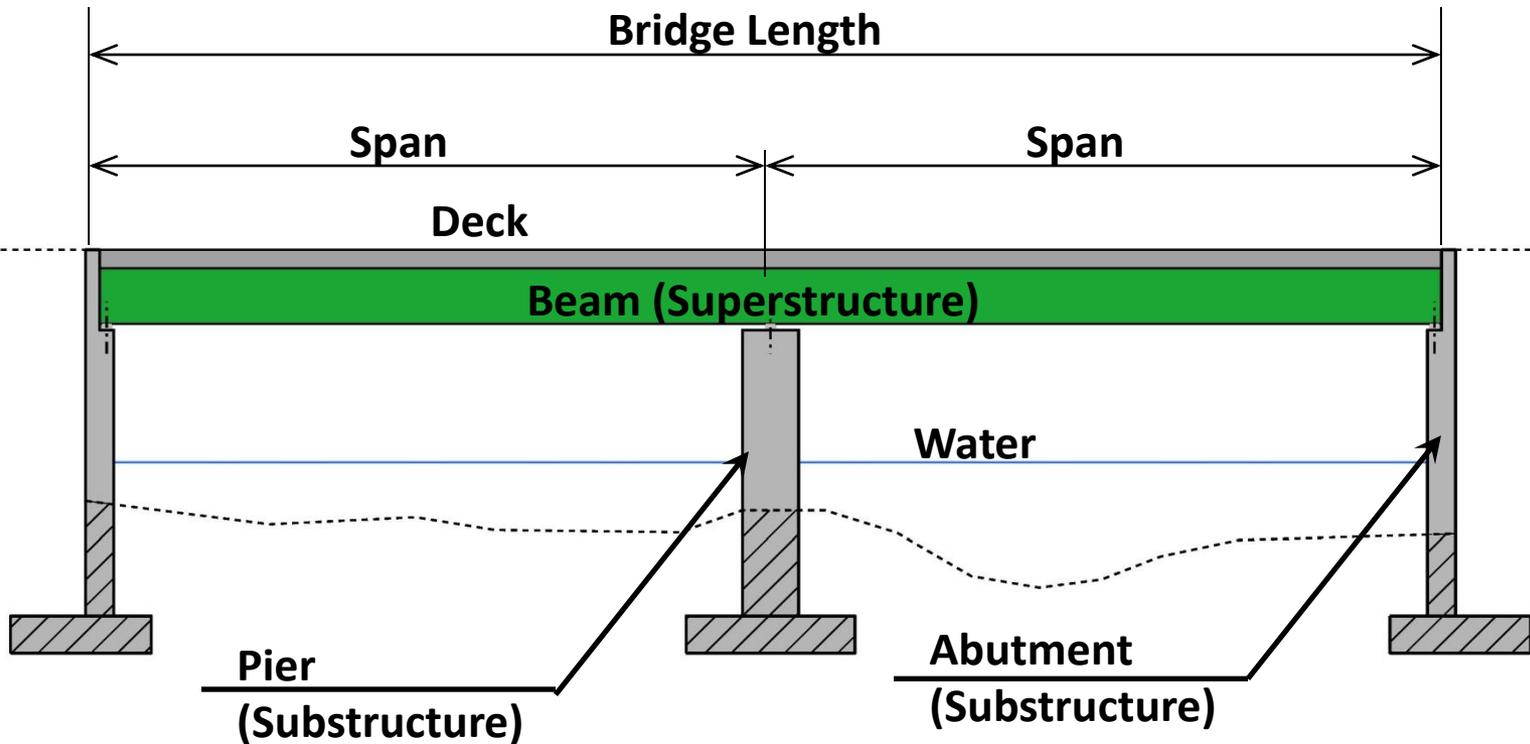
- Design speed = 30 mph

# Description of Terms Used



**Cross Section of Bridge**

# More Terms Used



**Elevation View of Bridge**

# EXISTING BRIDGE DEFICIENCIES

## Inspection Report Information (Based on a scale of 9)

Bridge Deck Rating	5 Fair
Superstructure Rating	5 Fair
Substructure Rating	5 Fair

## Deficiencies

- Width of bridge is substandard
- Curve on north end of bridge is substandard
- Bridge railing does not meet current standards

# Looking South



# North Pier



# South Pier



## Utilities on upstream (west) fascia



# Layout Showing Constraints

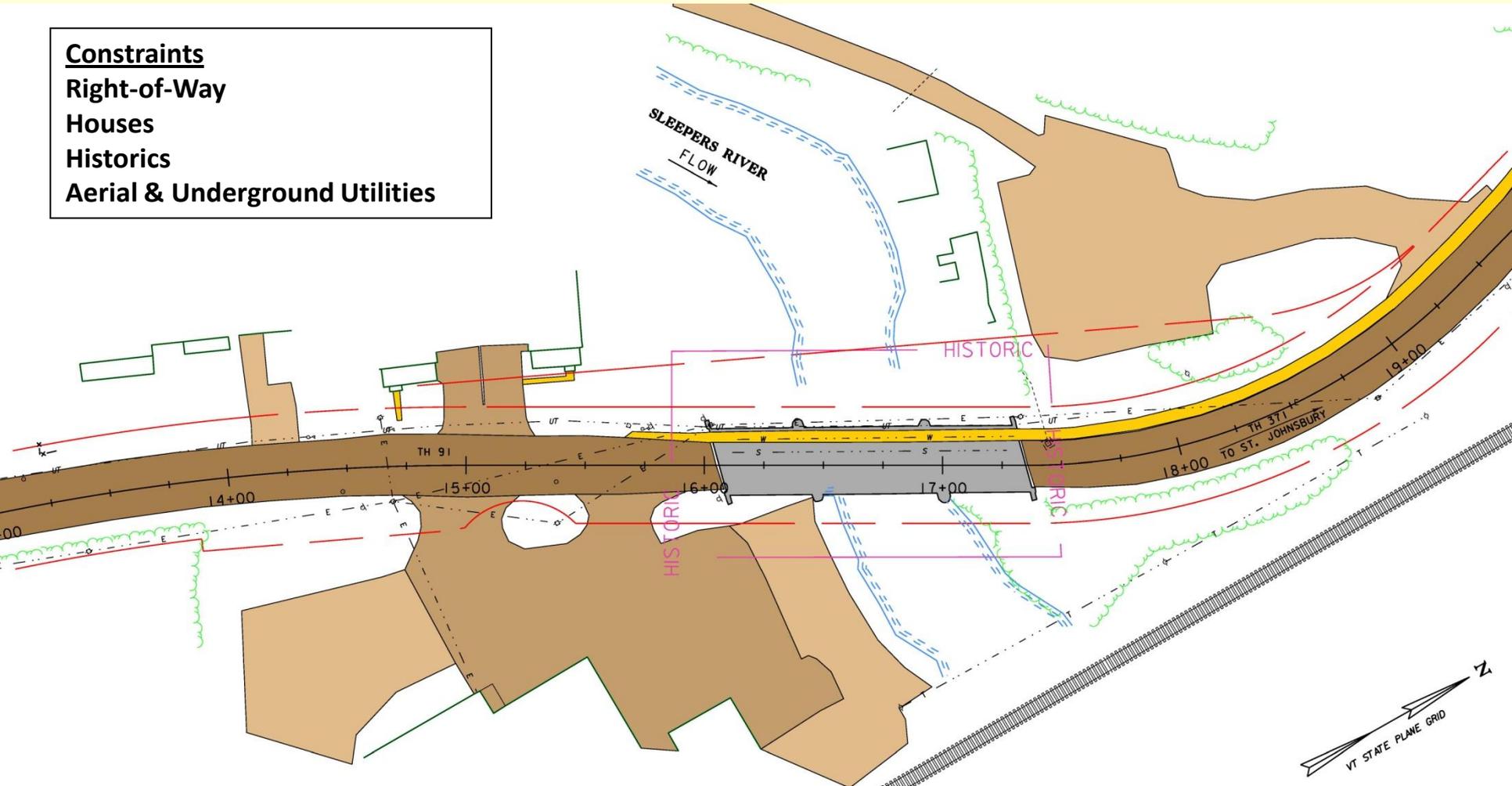
## Constraints

Right-of-Way

Houses

Historics

Aerial & Underground Utilities



# Alternatives Considered

1. Superstructure Replacement
2. Full Bridge Replacement
  - a) Off-Alignment using Phased Construction
  - b) On-Alignment Using Temporary Bridge

Note: A bridge closure option is not considered appropriate on this project due to the dead end road and the anticipated construction duration.

# Alternative 1

## Superstructure Replacement Details

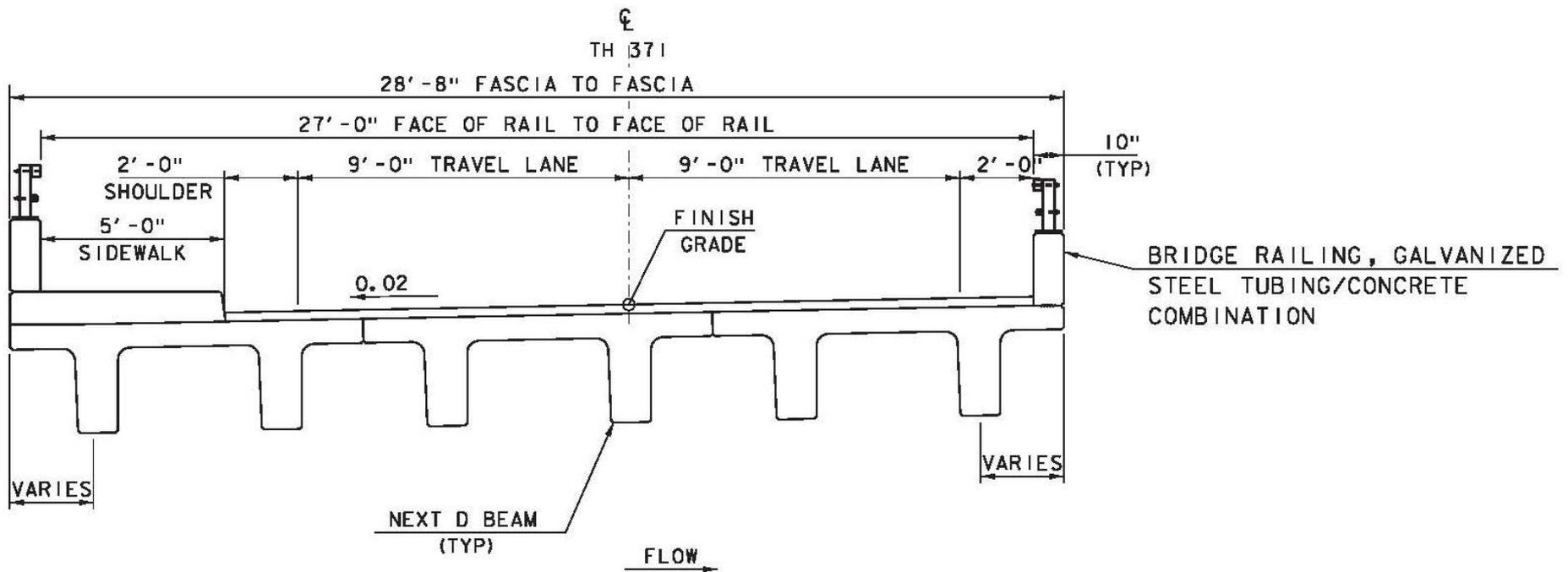
- Place new pier caps and patch existing piers
- Replace superstructure to width to meet standard
- Hydraulic standards would be met
- Temporary bridge required to maintain traffic
- Expected 30 year life expectancy

# Alternative 2

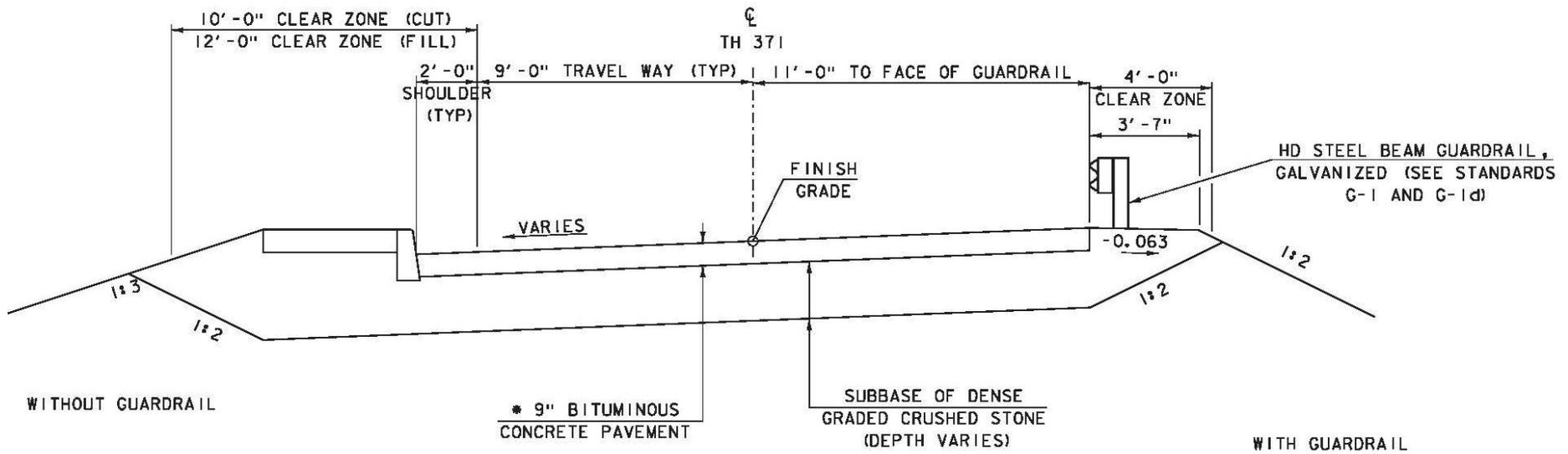
## Full Bridge Replacement Details

- Entire bridge would be replaced
- Reduce span to 90 feet
- Increase bridge rail-rail width to 27 feet (5'-2'-9'-9'-2')
- Long-term 80 year fix
- Traffic maintenance considered under a) and b) options

# Proposed Bridge Section



# Proposed Roadway Section



**TH 371 ROADWAY TYPICAL SECTION**

SCALE:  $\frac{3}{8}" = 1'-0"$

- \* 1 1/2" TYPE IVS OVER
- 1 1/2" TYPE IVS OVER
- 3" TYPE IIS OVER
- 3" TYPE IIS

# Alternate 2a

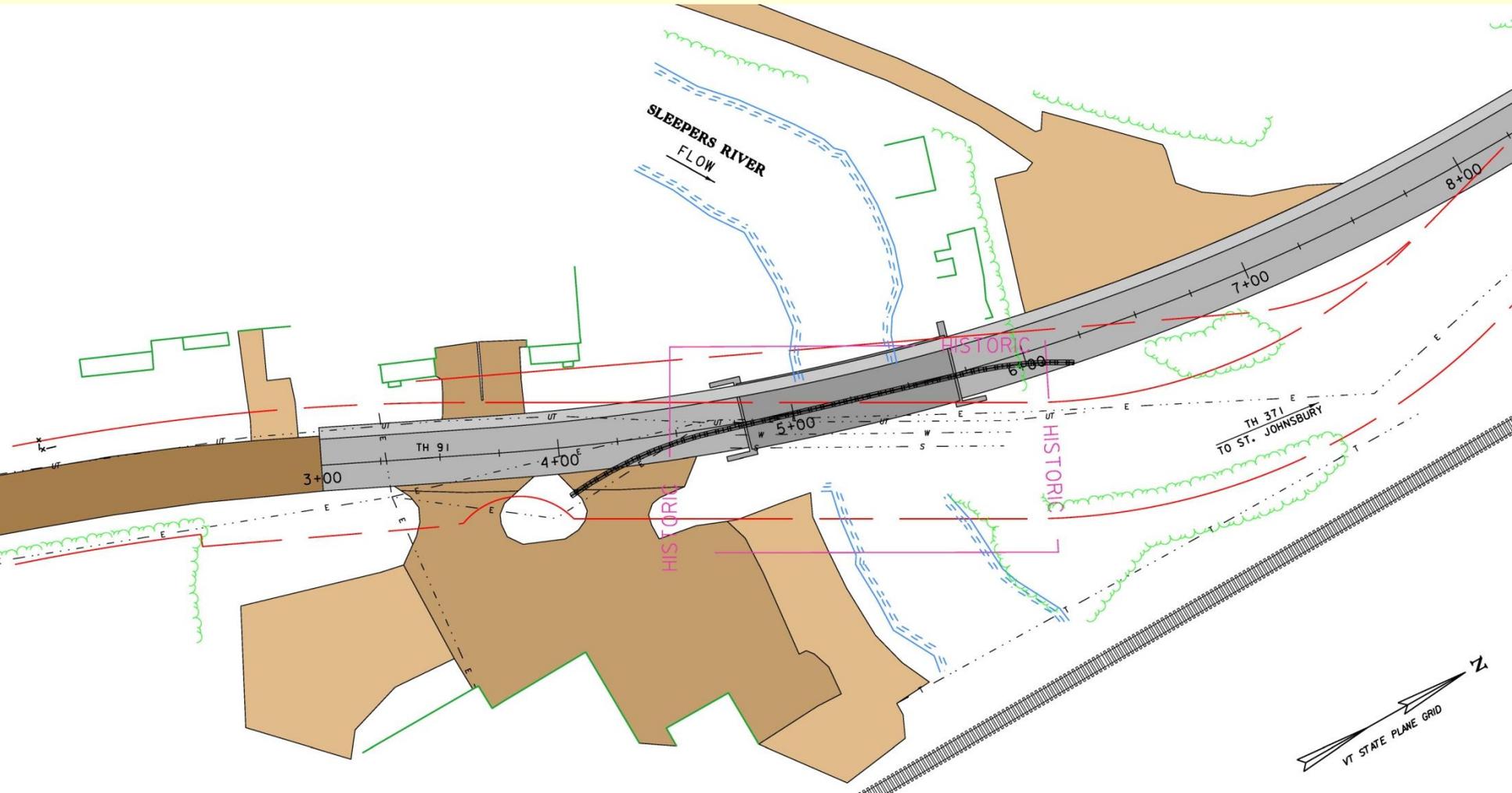
## Full Replacement – Off Alignment Phased Construction Option

- Construct new bridge on new alignment
- Build half new bridge while traffic is on half of old bridge
- One-Way alternating traffic with lights
- Queue lengths and queue times can be inconvenient
- Access to side drives/buildings needs to be considered
- Relatively long construction duration
- Workers & motorists in close proximity



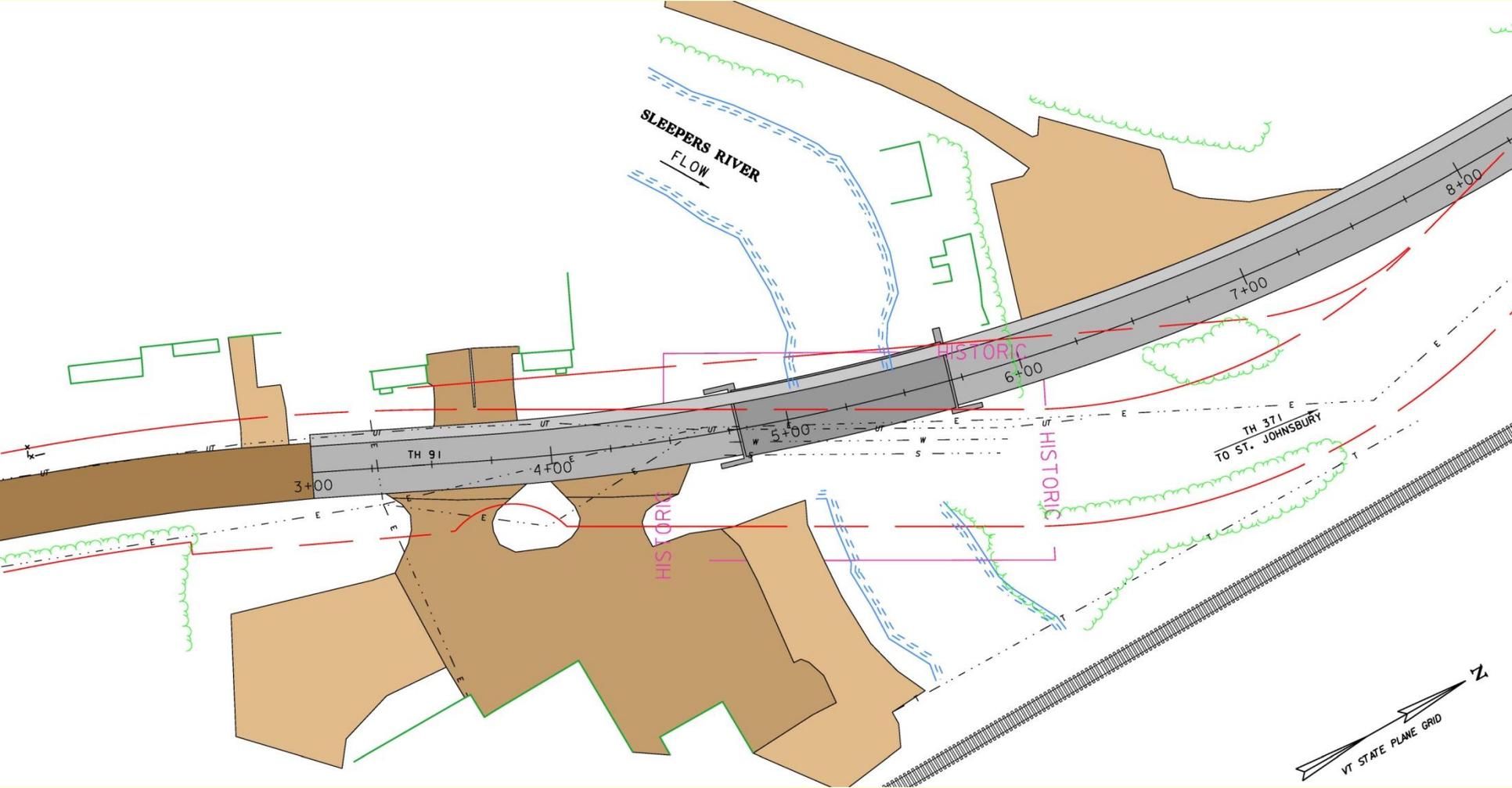
# Alternative 2a

## Phase 2

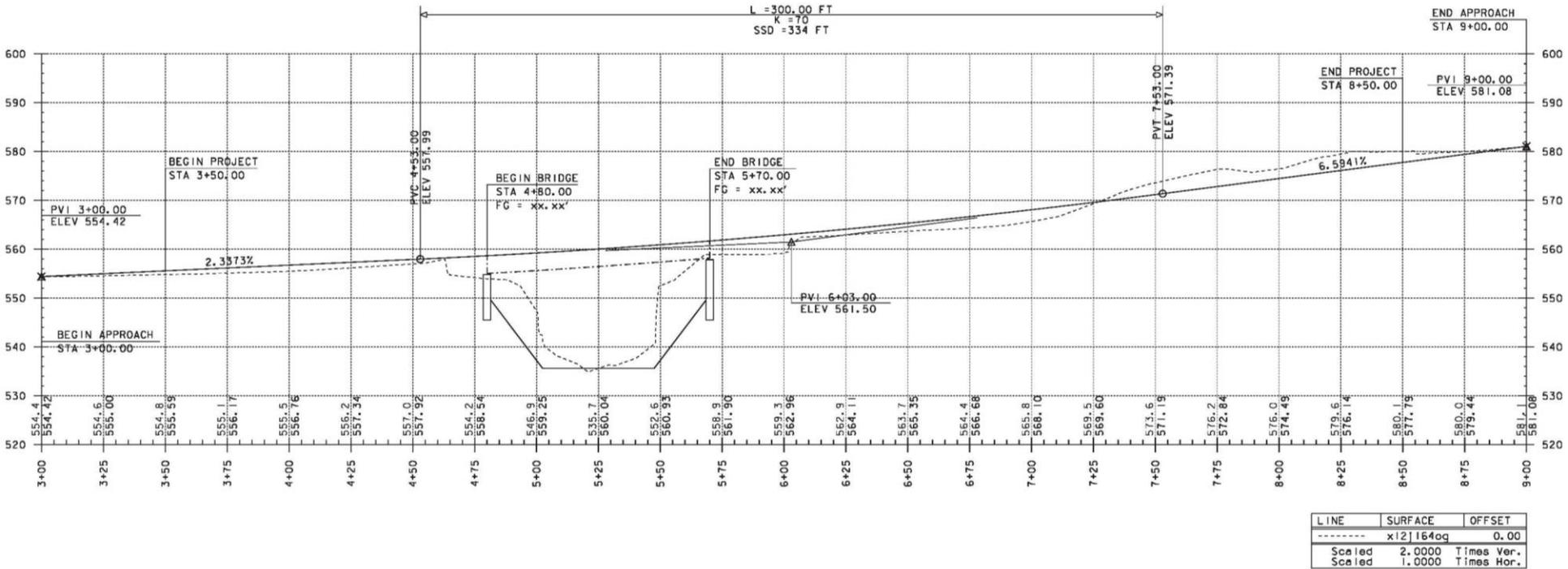


# Alternative 2a

## Replacement (Off Alignment) - Final



# Alternative 2a Profile



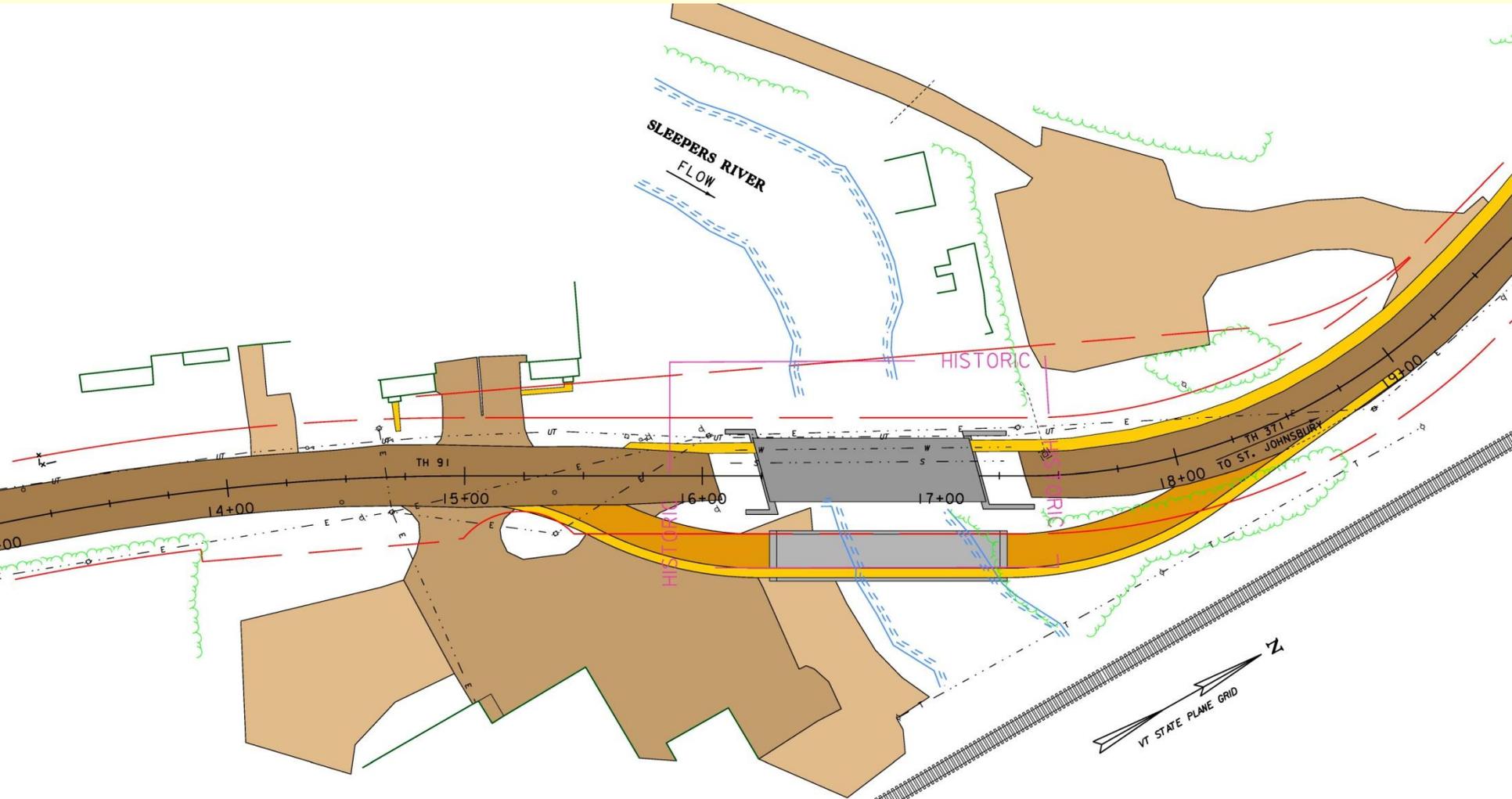
TH 371 (OLD US 5) PROFILE FOR OFF ALIGNMENT FULL BRIDGE REPLACEMENT

# Alternate 2b

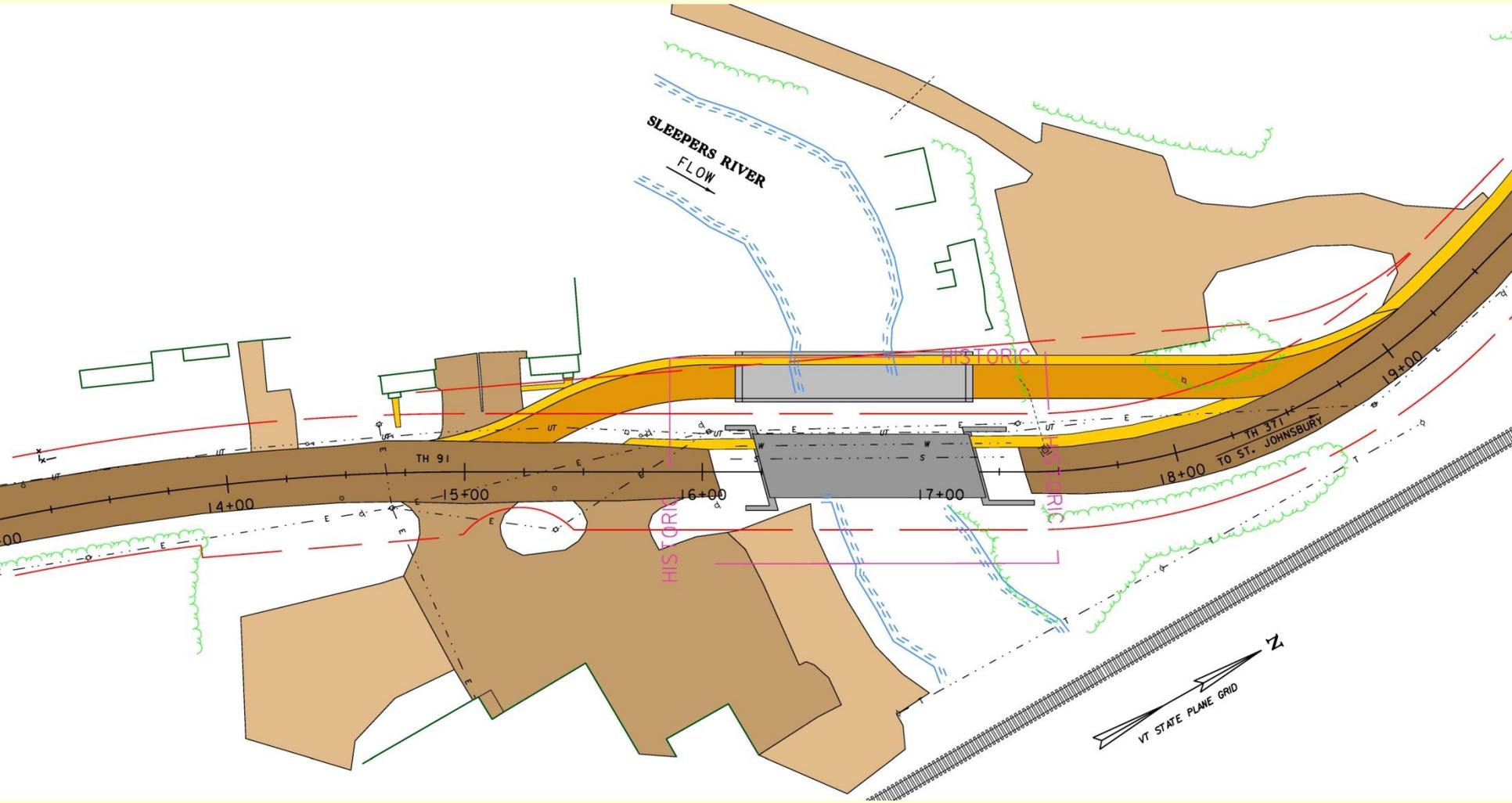
## Full Replacement – On Alignment Temporary Bridge Option

- Construct one-way temporary bridge to maintain traffic
- Pedestrian traffic would be routed onto Temporary bridge
- Construct new bridge on existing alignment
- Same typical section as Alternate 2a
- One-Way alternating traffic with lights
- Queue lengths and queue times can be inconvenient
- Access to side drives/buildings needs to be considered
- Very long construction duration

# Temporary Bridge Option Downstream

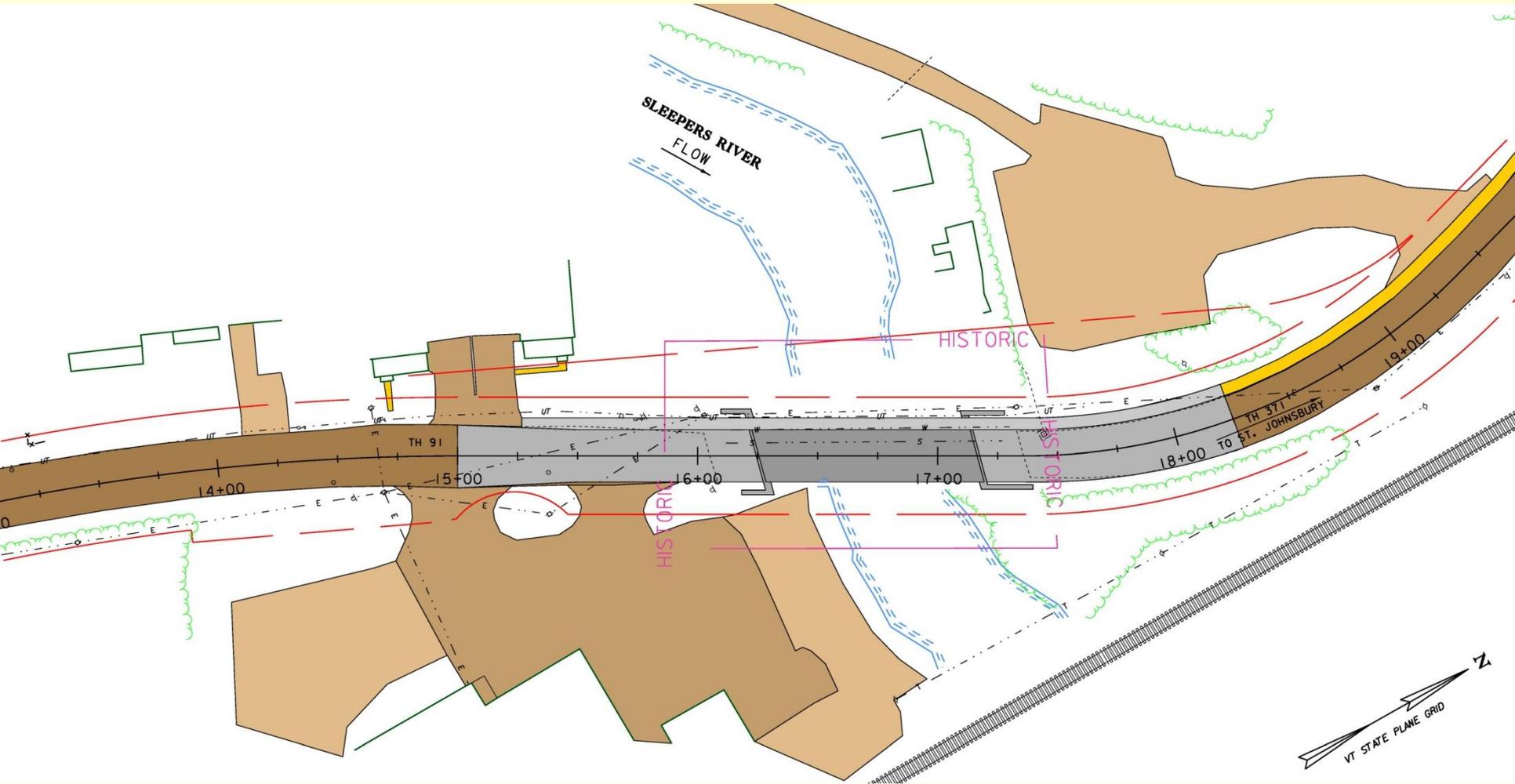


# Temporary Bridge Option Upstream

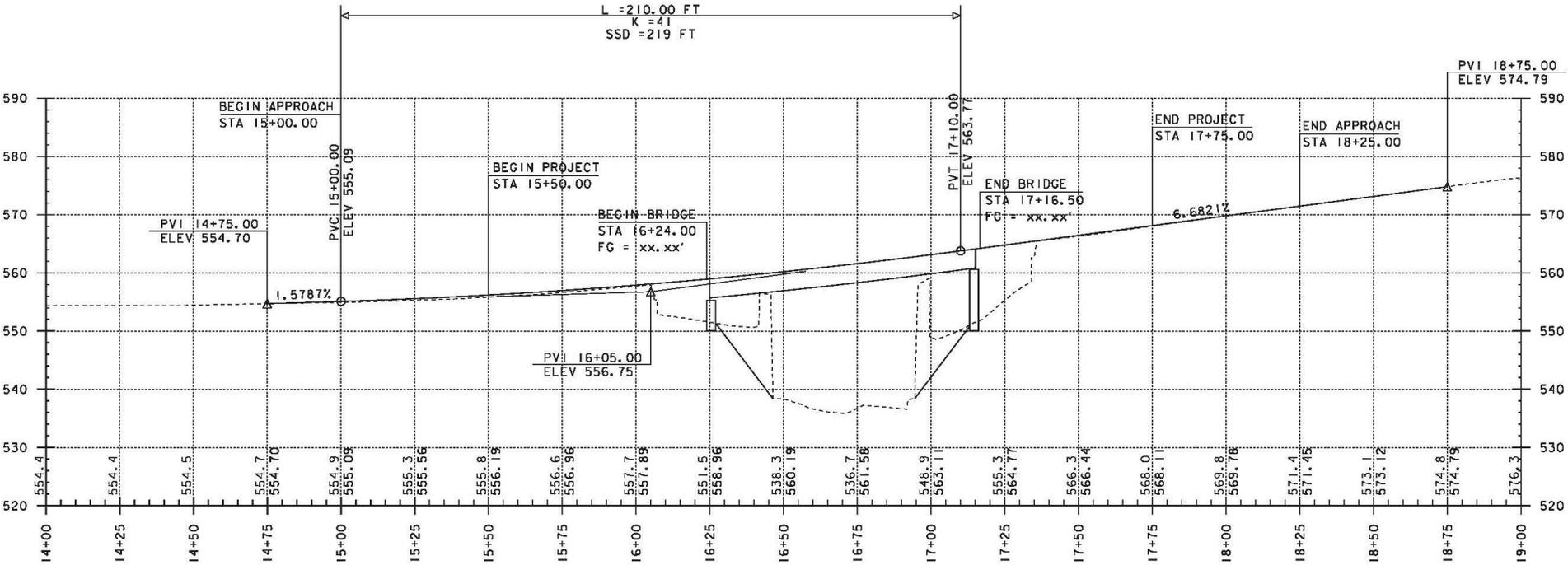


# Alternative 2b

## Replacement On Alignment - Final



# Alternative 2b Profile



TH 371 (OLD US 5) PROFILE FOR ON ALIGNMENT FULL BRIDGE REPLACEMENT

# Alternatives Matrix

	Superstructure Replacement w/ Temporary Bridge	Full Replacement Off Alignment Phased	Full Replacement On Alignment Temporary Bridge
Maintenance of Traffic	\$250,000	\$40,000	\$250,000
Construction w/ CE + Contingencies	\$1,336,400	\$1,836,900	\$2,031,900
Preliminary Engineering	\$308,400	\$423,900	\$468,900
Right of Way	\$79,000	\$155,500	\$79,000
<b>Total Cost</b>	<b>\$1,723,800</b>	<b>\$2,416,300</b>	<b>\$2,579,800</b>
<b>Town Share</b>	<b>\$86,190 (5%)</b>	<b>\$241,630 (10%)</b>	<b>\$257,980 (10%)</b>
<b>Design Life</b>	<b>30 Years</b>	<b>80 Years</b>	<b>80 Years</b>
Project Development Duration	>4 years	>4 years	>4 years
Construction Duration	8 months	8 months	18 months
Mobility Impact Duration	None	28 days	8 months

## Conclusion and Recommendation

- Full bridge replacement on improved alignment while maintaining traffic using phased construction

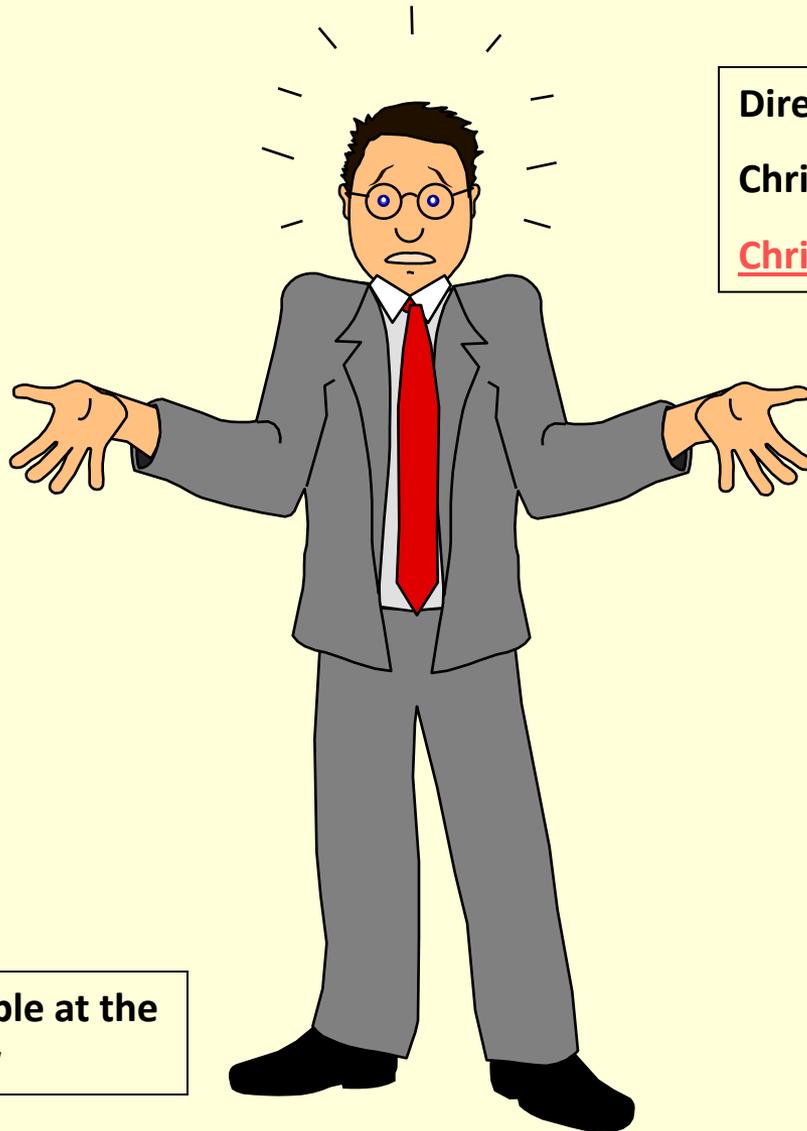
Comments on this recommendation:

- Choice between 2 options that both have extensive impacts
- Improved alignment addresses substandard curve
- Long term 80 year fix-

## Next Steps

- Wait for Town response to recommendation on proposed project
- Develop Conceptual plans and distribute for comment
- Hold Public Information meeting on proposed project
- Project Defined – MILESTONE
- Transfer project to Design Project Manager

# 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/12J164>