

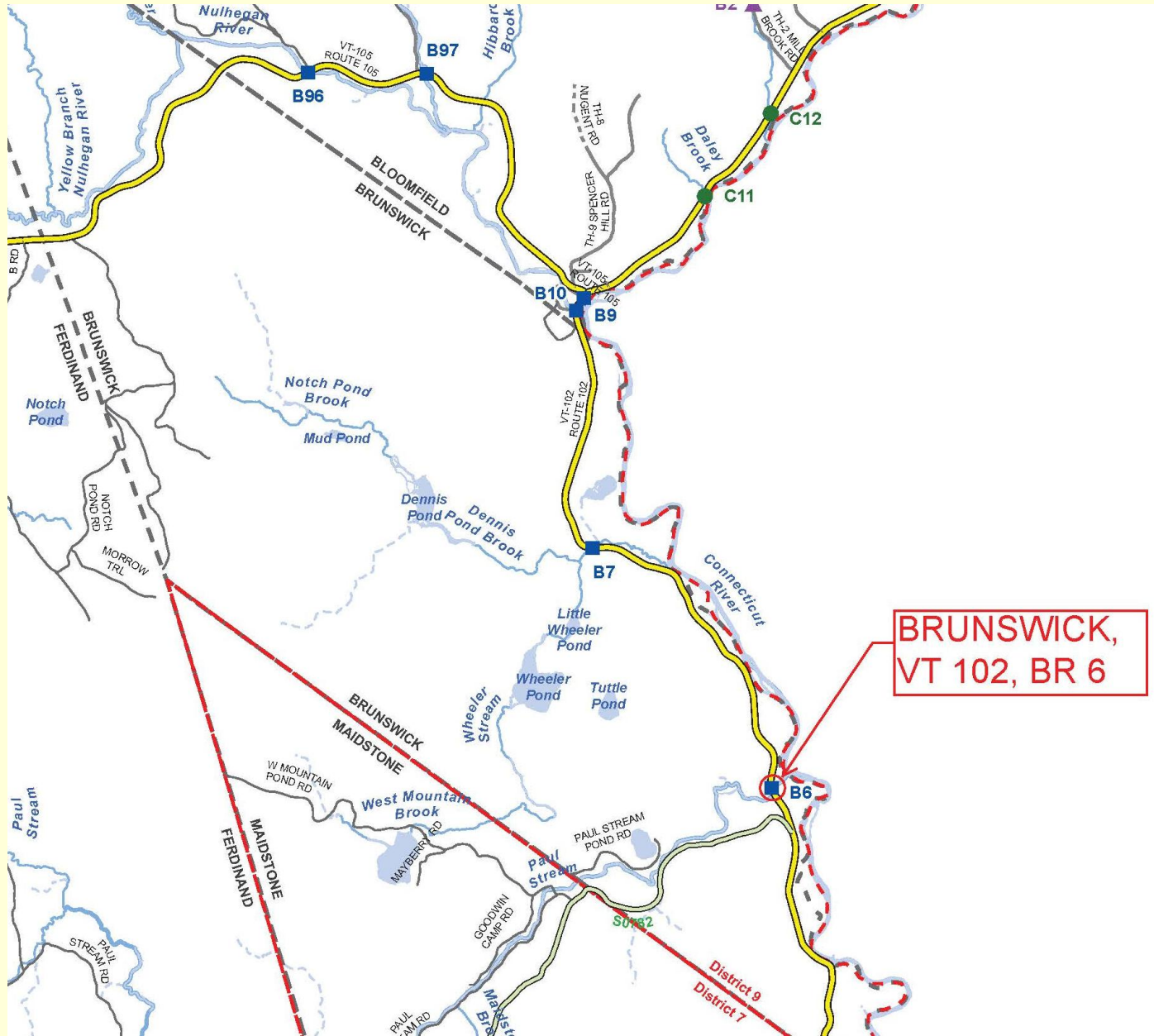
Brunswick BF 0271(23) Bridge 6 on VT Route 102 over Paul Stream Regional Concerns Meeting



**Presented by
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PROJECT LOCATION



Meeting Outline

- Purpose of the Meeting
- 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-

Phases of Development

Project
Funded

Project
Defined

Contract
Award

Project Definition

Project Design

Construction

Identify resources &
constraints

Evaluate alternatives

Public Participation

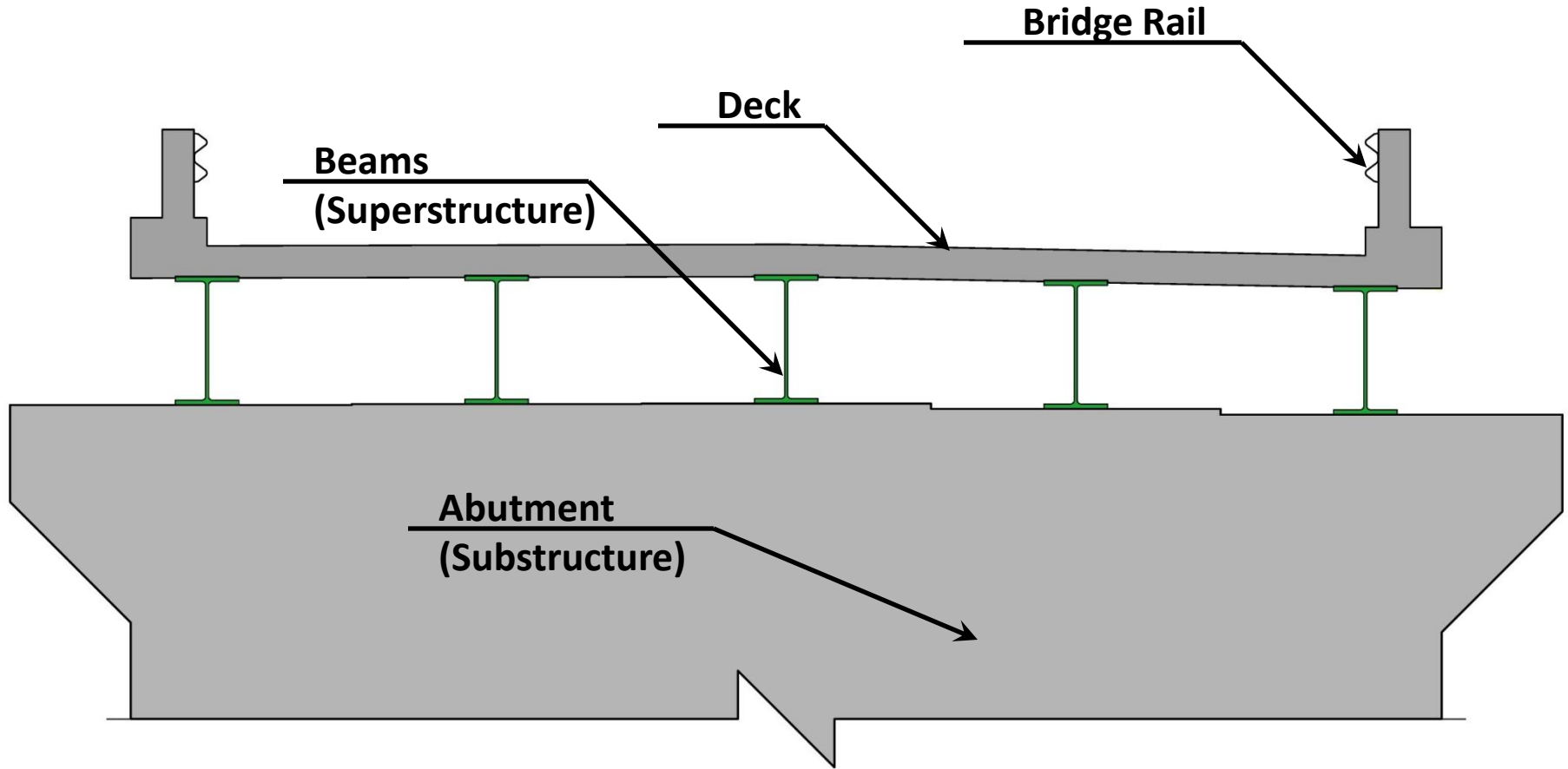
Build Consensus

- Quantify areas of impact

- Environmental permits

- Develop plans, estimate and specifications

Description of Terms Used



Cross Section of Bridge

Project Background

- The structure is owned and maintained by the State
- Funding will be 80/20 Federal/State (no local funds)
- Functionally labeled as a Rural Major Collector
- Design Speed = 50 mph (Not posted)
- Existing bridge is a three-span concrete T-beam
- Bridge length = 109 feet
- Bridge Width = 20 feet
- The bridge was built in 1932 (82 years old)

Traffic Data

	“Current Year” 2016	“Design Year” 2036
Average Annual Daily Traffic	550	580
Design Hourly Volume	75	75
Average Daily Truck Traffic	65	100
%Trucks	11.2	16.1

EXISTING BRIDGE DEFICIENCIES

Inspection Rating Information (Based on a scale of 9)

Bridge Deck Rating	4 Poor
Superstructure Rating	5 Fair
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 a Poor deck rating and the Superstructure and Substructure only rated Fair.
- The bridge is too narrow for the roadway classification and design speed
- The bridge does not meet hydraulic standards
- The horizontal alignment is substandard

Looking north over Bridge



Looking south over Bridge





Hole in deck at curb

**Underside of Deck
& Concrete T-Beam**



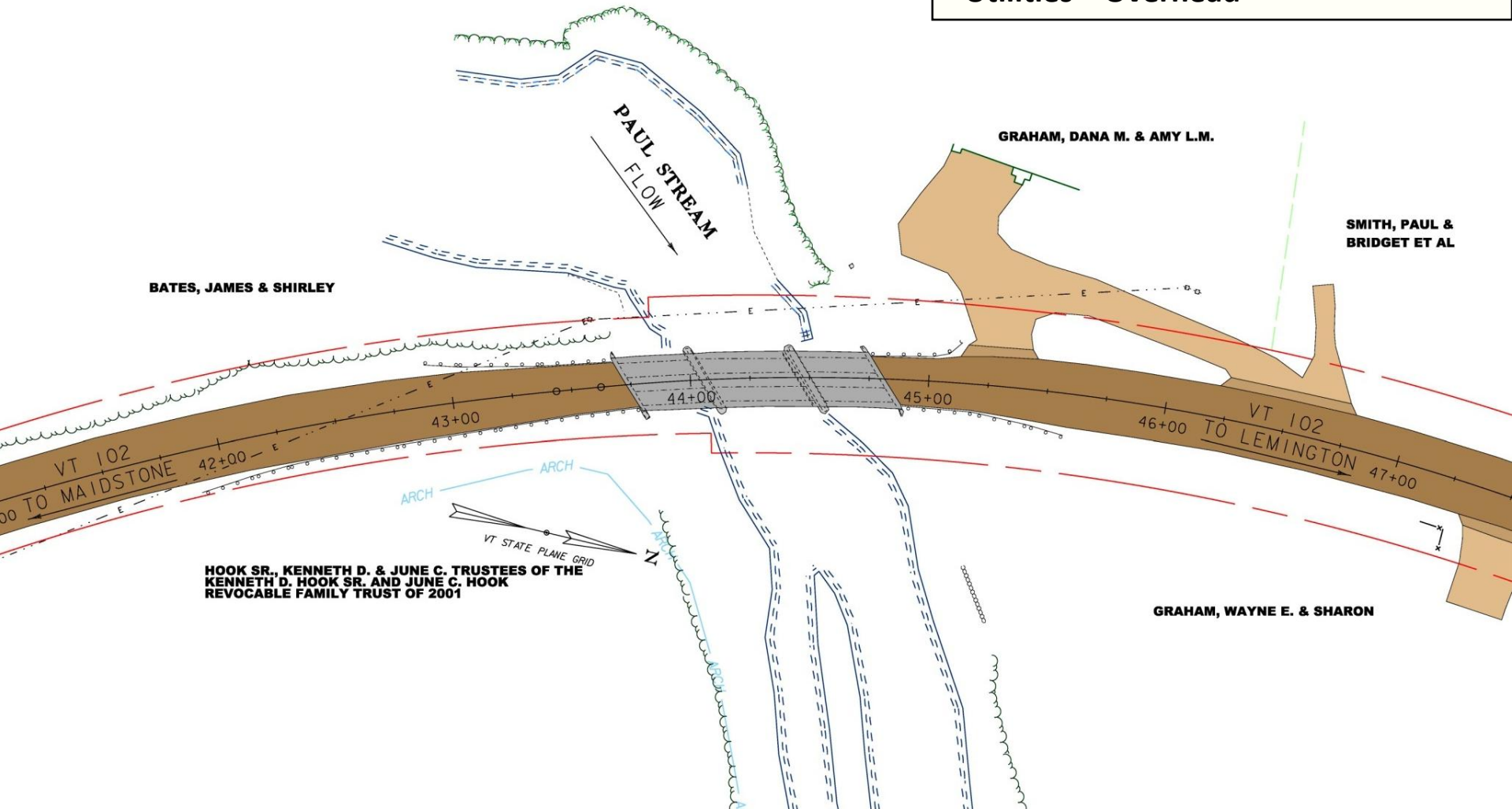
Downstream Fascia showing pier deterioration



Layout Showing Constraints

Constraints present

- Right of Way
- Buildings
- Archeological
- Utilities – Overhead



Alternatives Discussion

- Rehabilitation was ruled out due to the deteriorated condition of the existing abutments and narrow width
- Rehabilitation was not detailed in the Scoping Report

Full bridge replacement alternatives considered:

- One span
- Two span
- Three span

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

Replacement Details

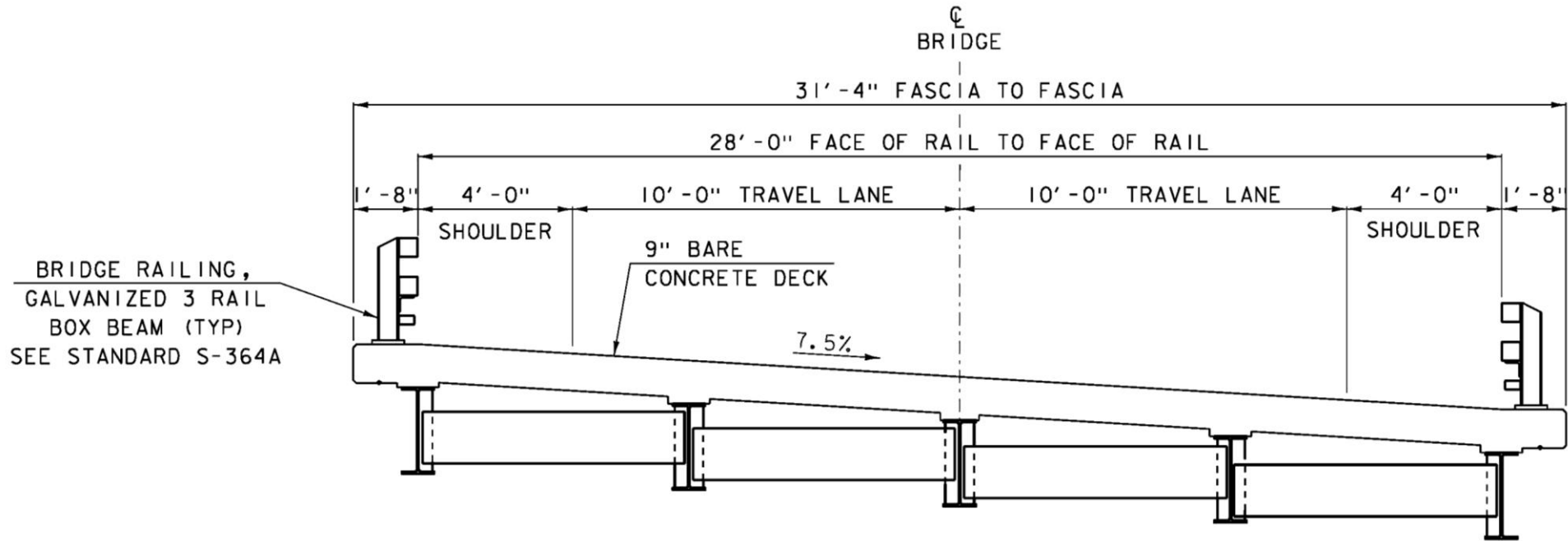
Common Details

- 28' width rail to rail distance (4-10-10-4)
- Maintain approximate existing centerline of road
 - Standards can be met by banking for curve
- Raise grade to meet the hydraulic standards
- Abutments skewed at 30 degrees
- Long term (80 year) solution

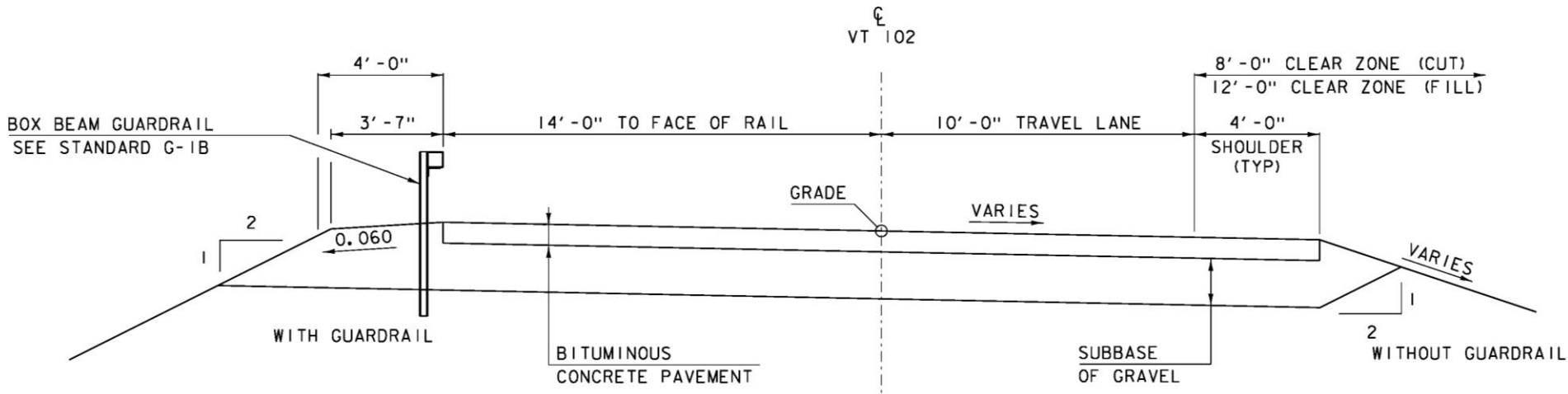
Alternatives

- One span - 101' long
- Two span - 107' long with 1 Pier in the middle
- Three span - 114' long with 2 Piers

Bridge Typical



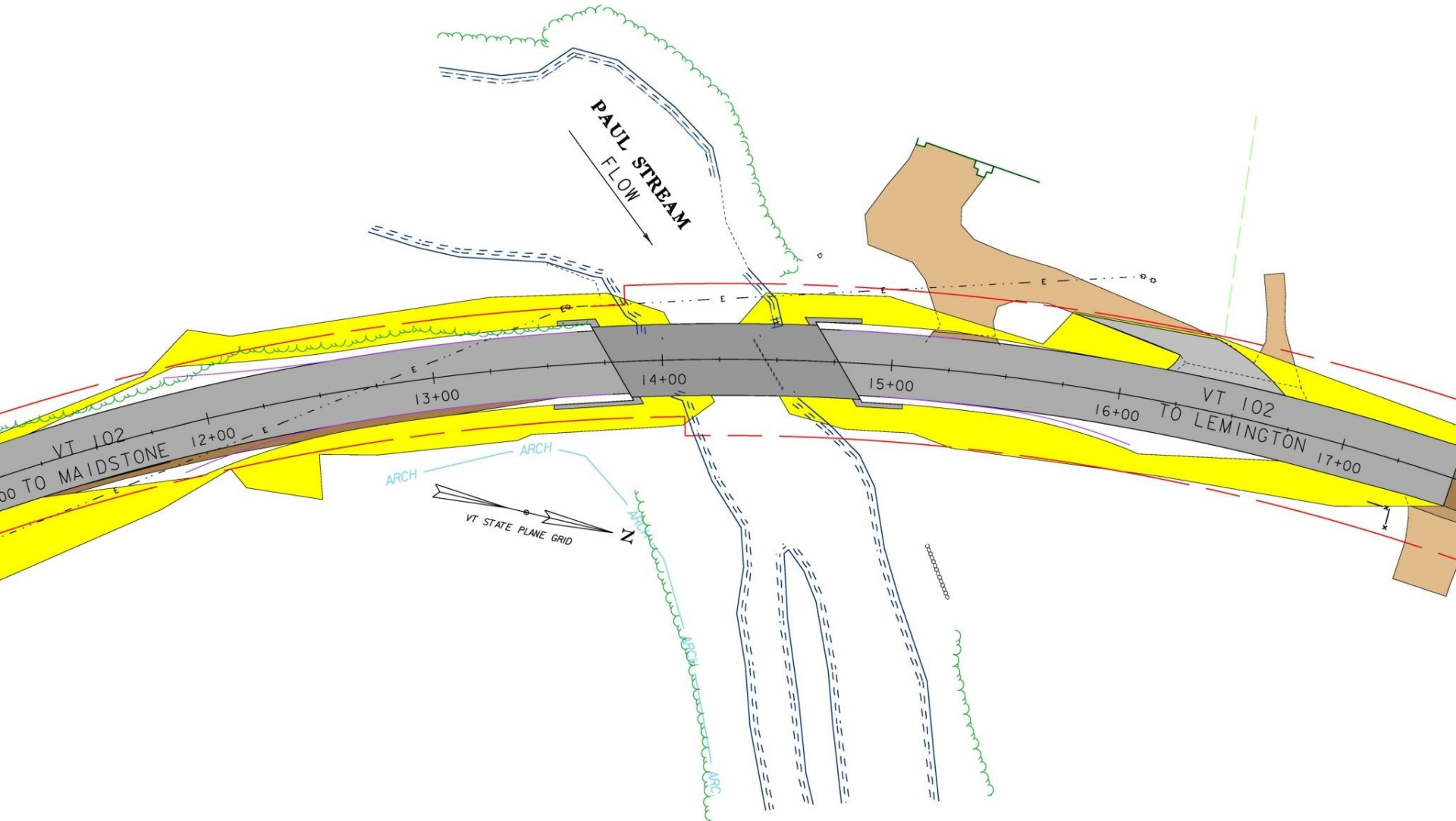
Roadway Typical



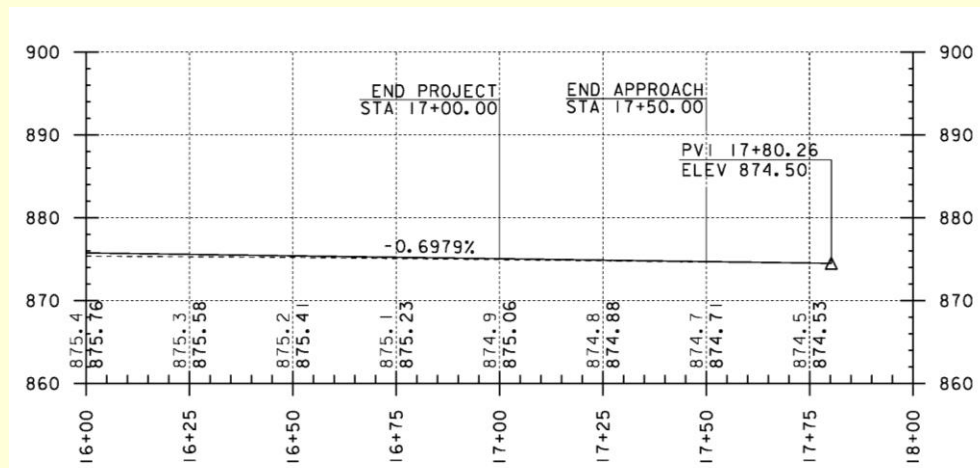
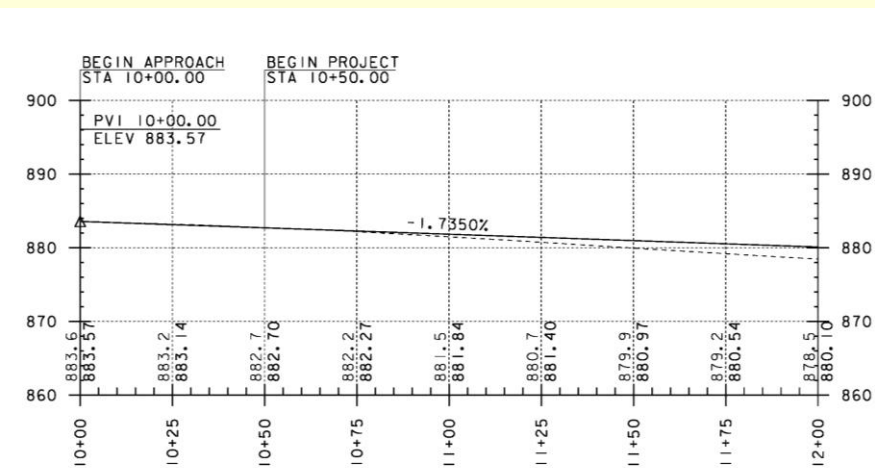
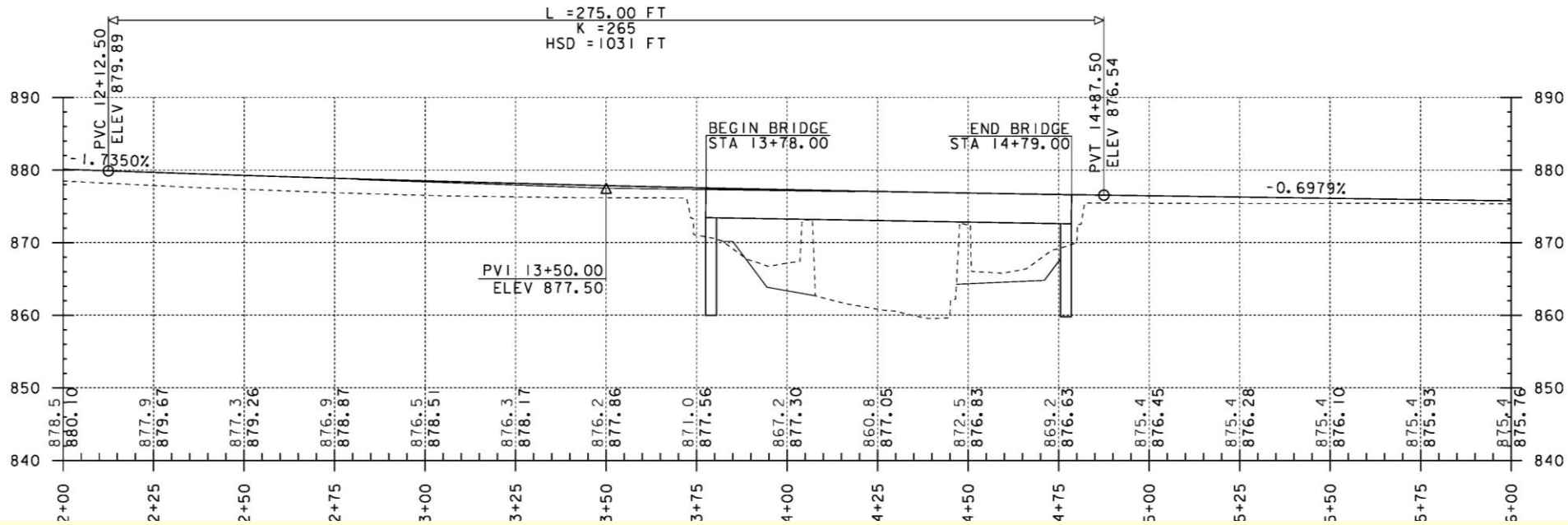
PROPOSED VT 102 TYPICAL SECTION

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

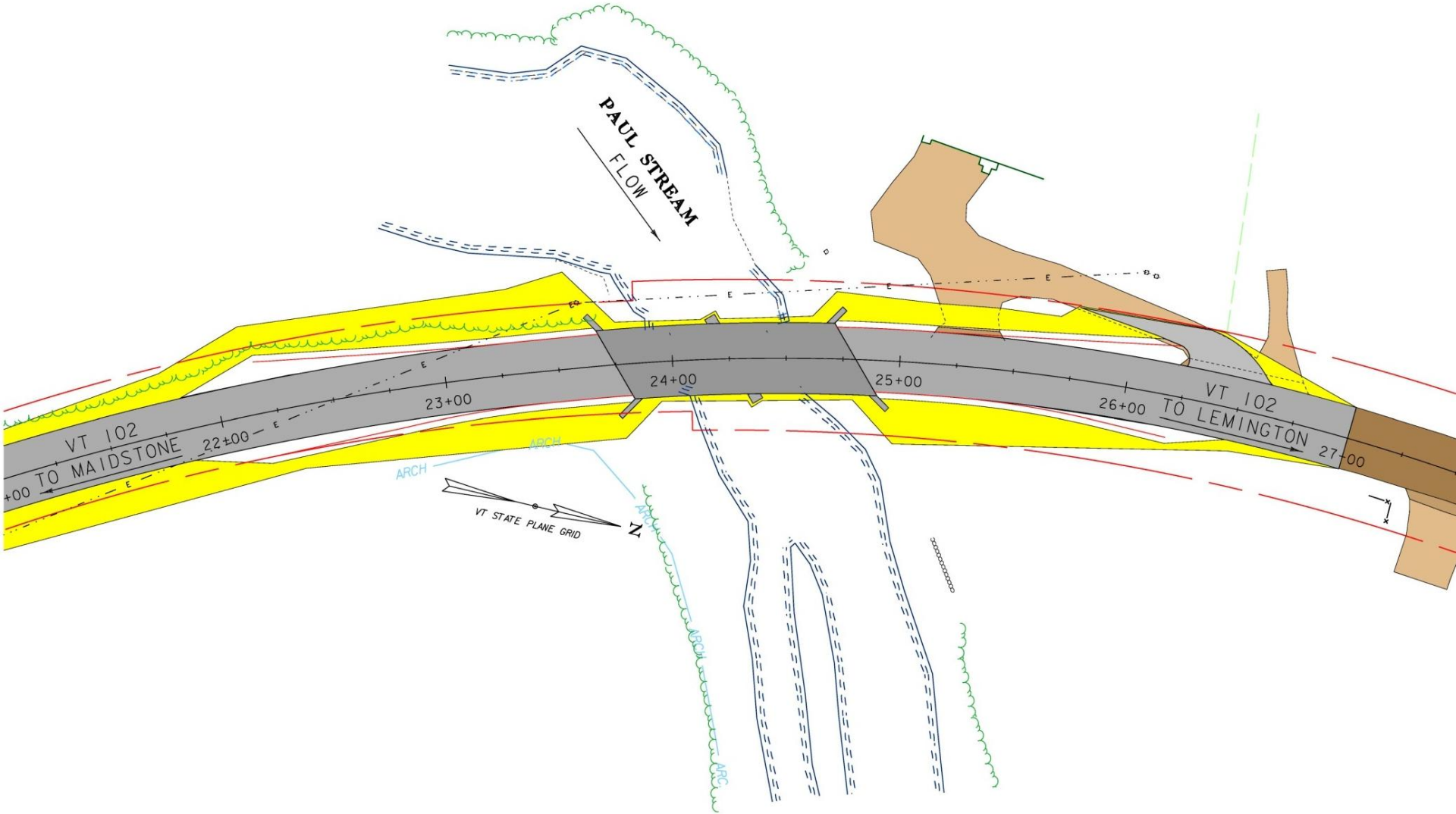
Layout – Complete Replacement Alt 2a - Single span



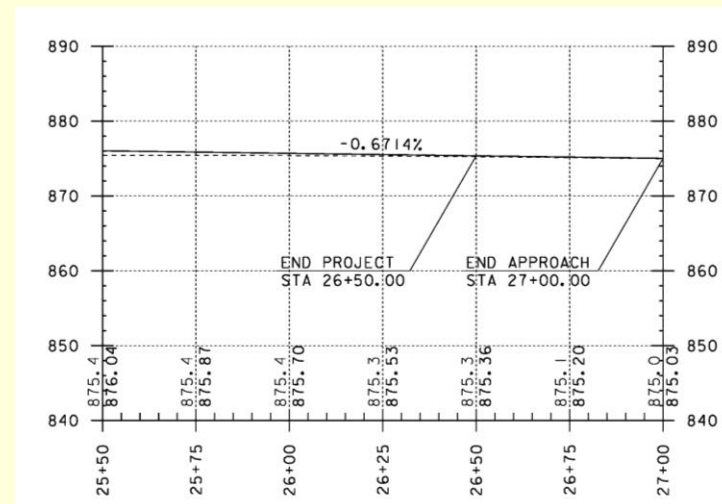
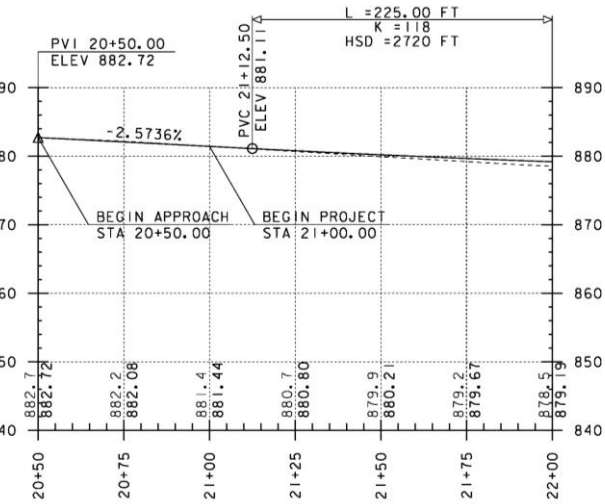
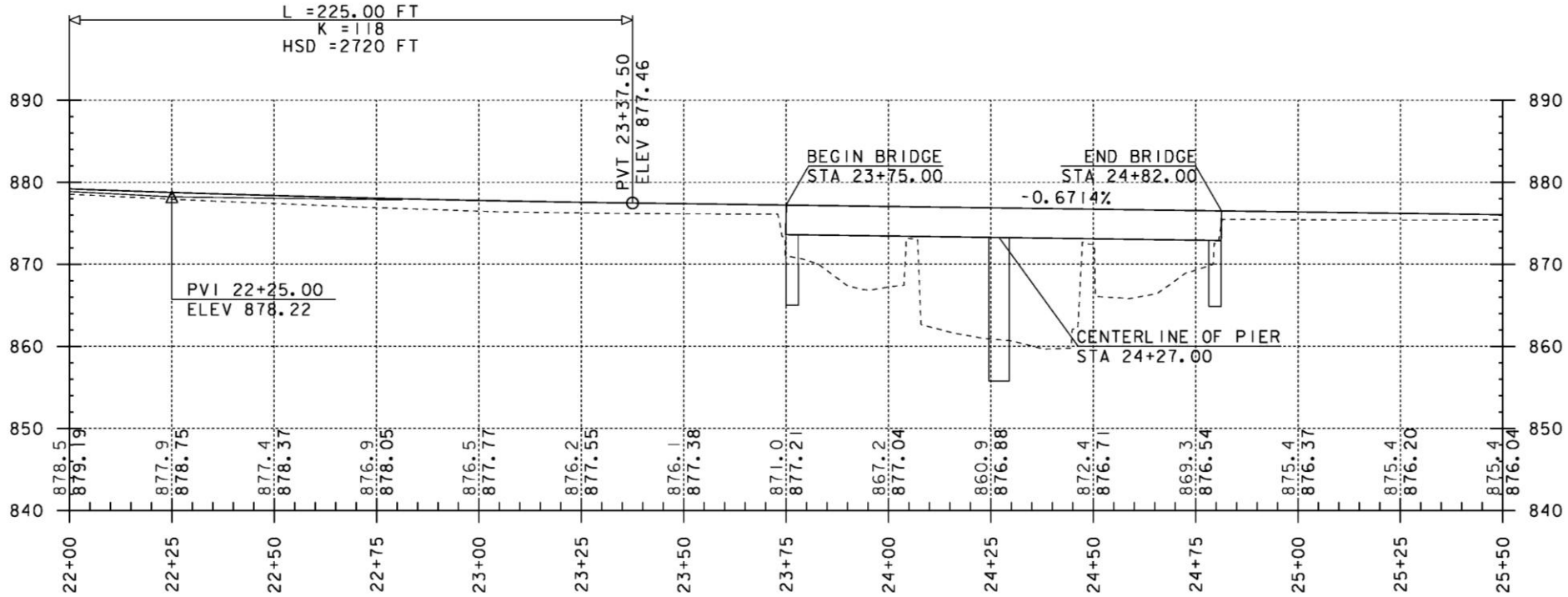
Profile - Alt 2a - Single Span



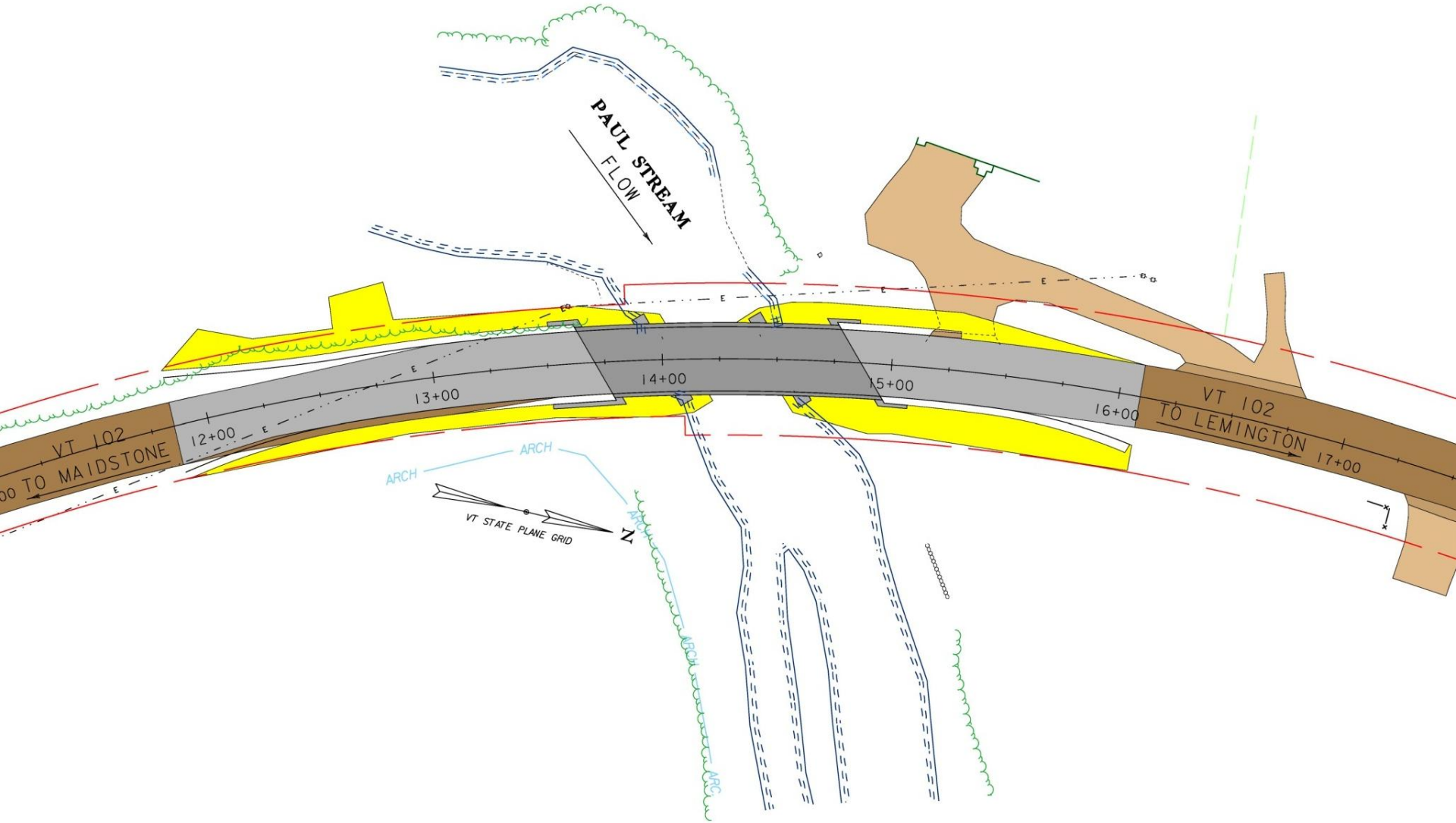
Layout – Complete Replacement Alt 2b - 2 span



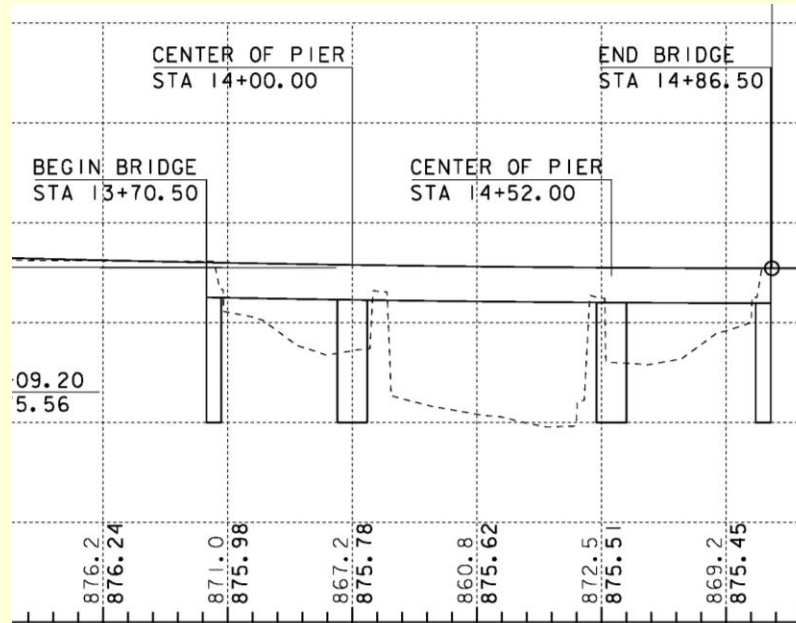
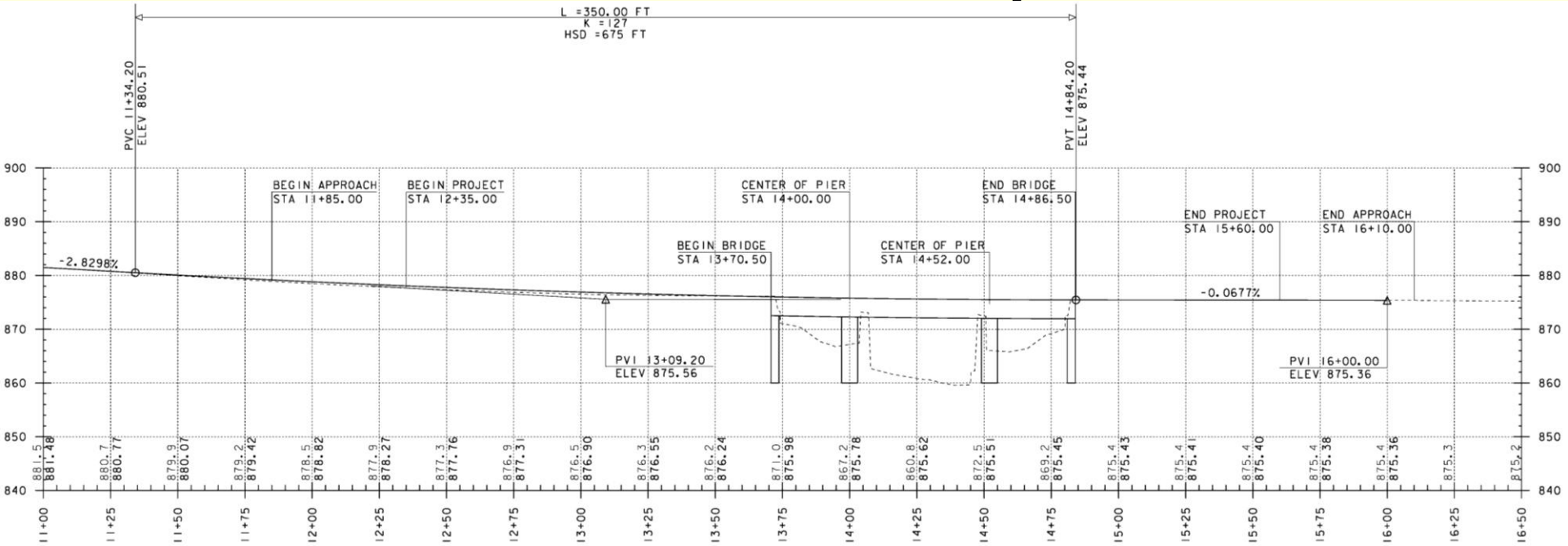
Profile - Alt 2b - 2 Span



Layout – Complete Replacement Alt 2c - 3 span



Profile – Alt 2c – 3 Span



Enlarged view of bridge

Methods to Maintain Traffic

Three general methods available:

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

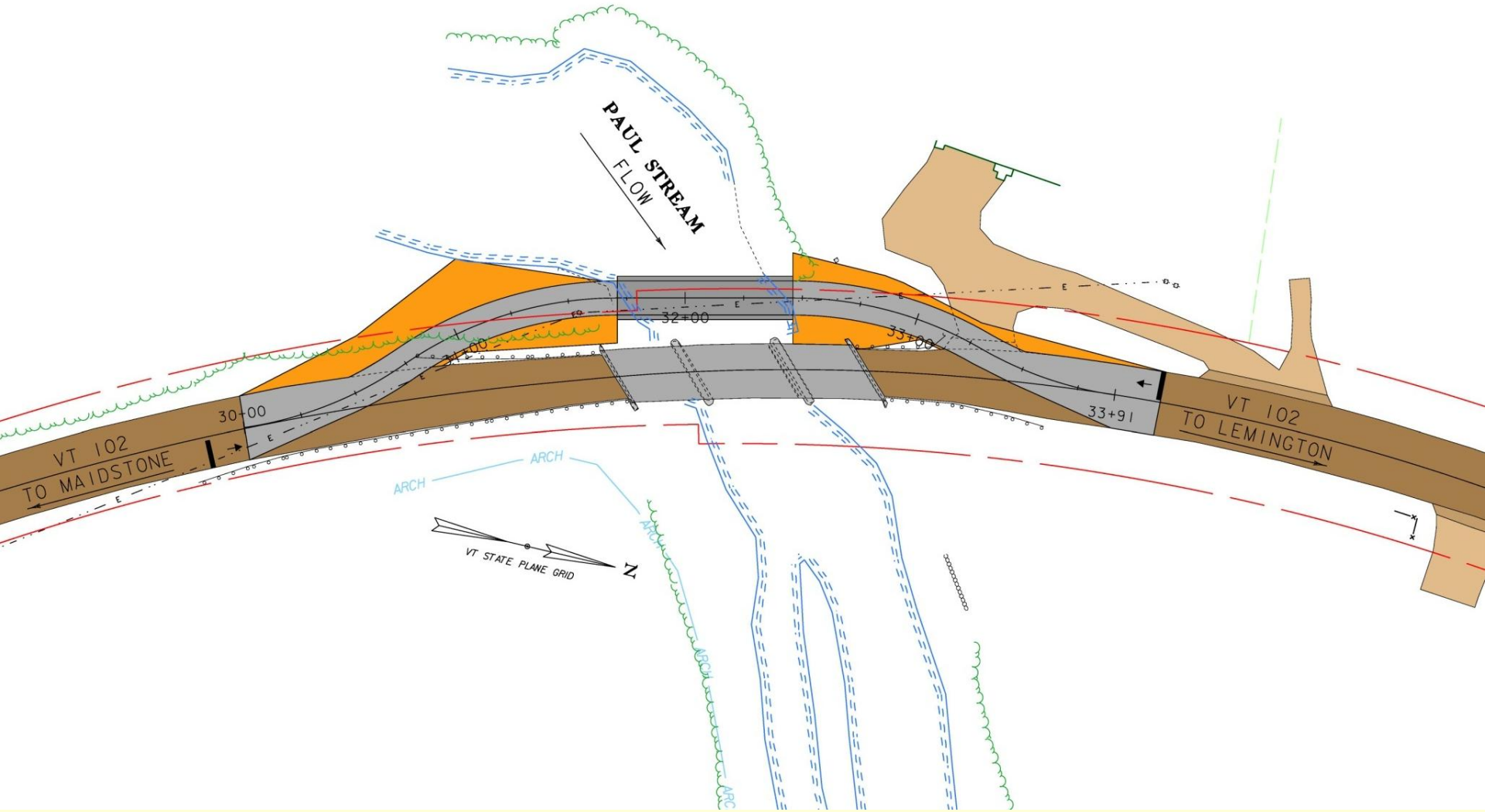
Phased Construction Option

- Ruled out since would require building wider than required or shifting the alignment due to the width of the existing bridge
- Build half new bridge while traffic is on half of old bridge
- Switch traffic on new bridge portion
- Build remainder of new 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 – safety concerns
- Can usually be done without ROW acquisition

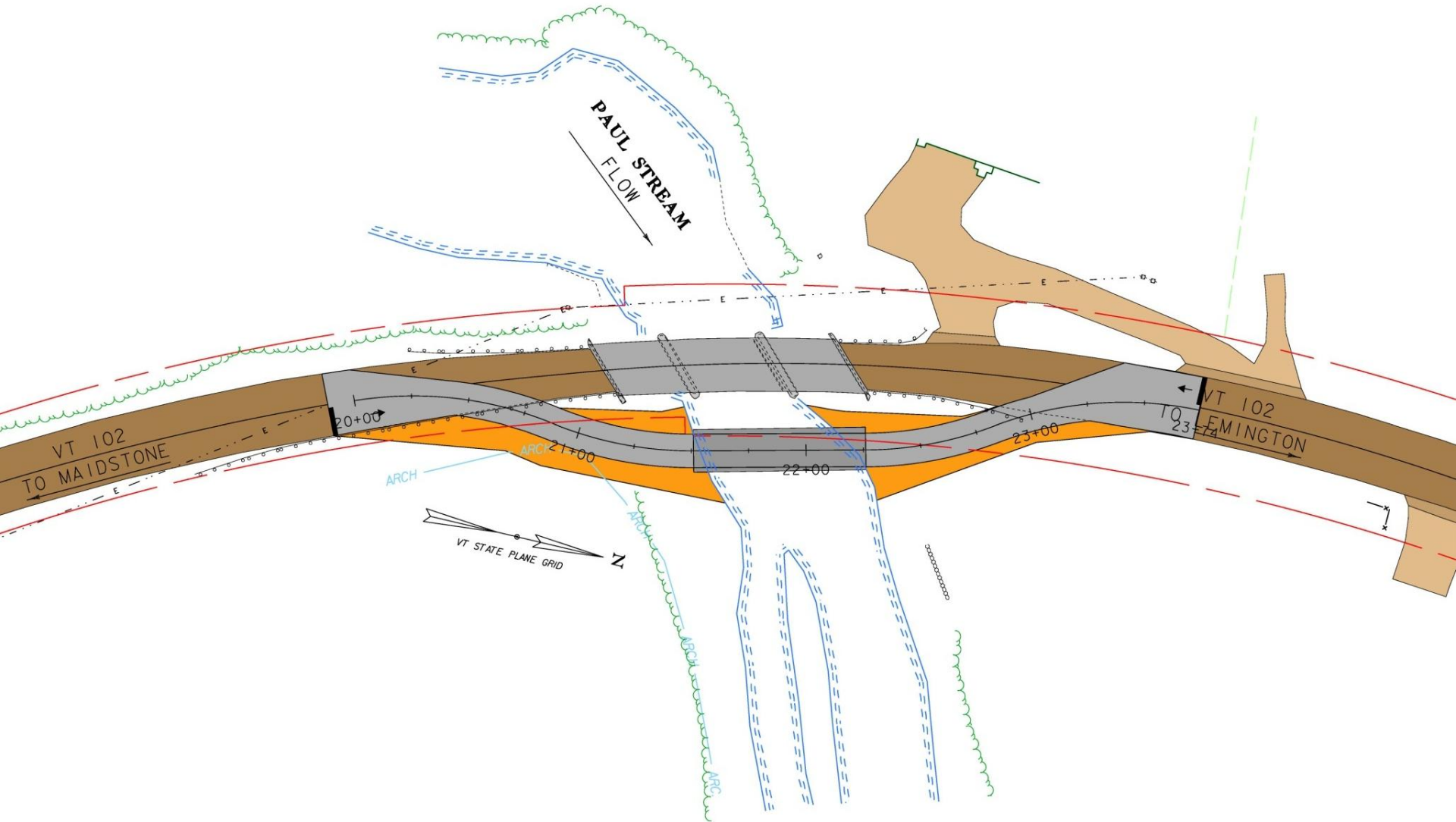
Temporary Bridge Option

- Construct temporary bridge to maintain traffic
- 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
- Right-Of-Way acquisition is necessary
- Environmental impacts are increased
- Property owner impacts are increased
- Project Delivery time increased
- Project Costs increased-

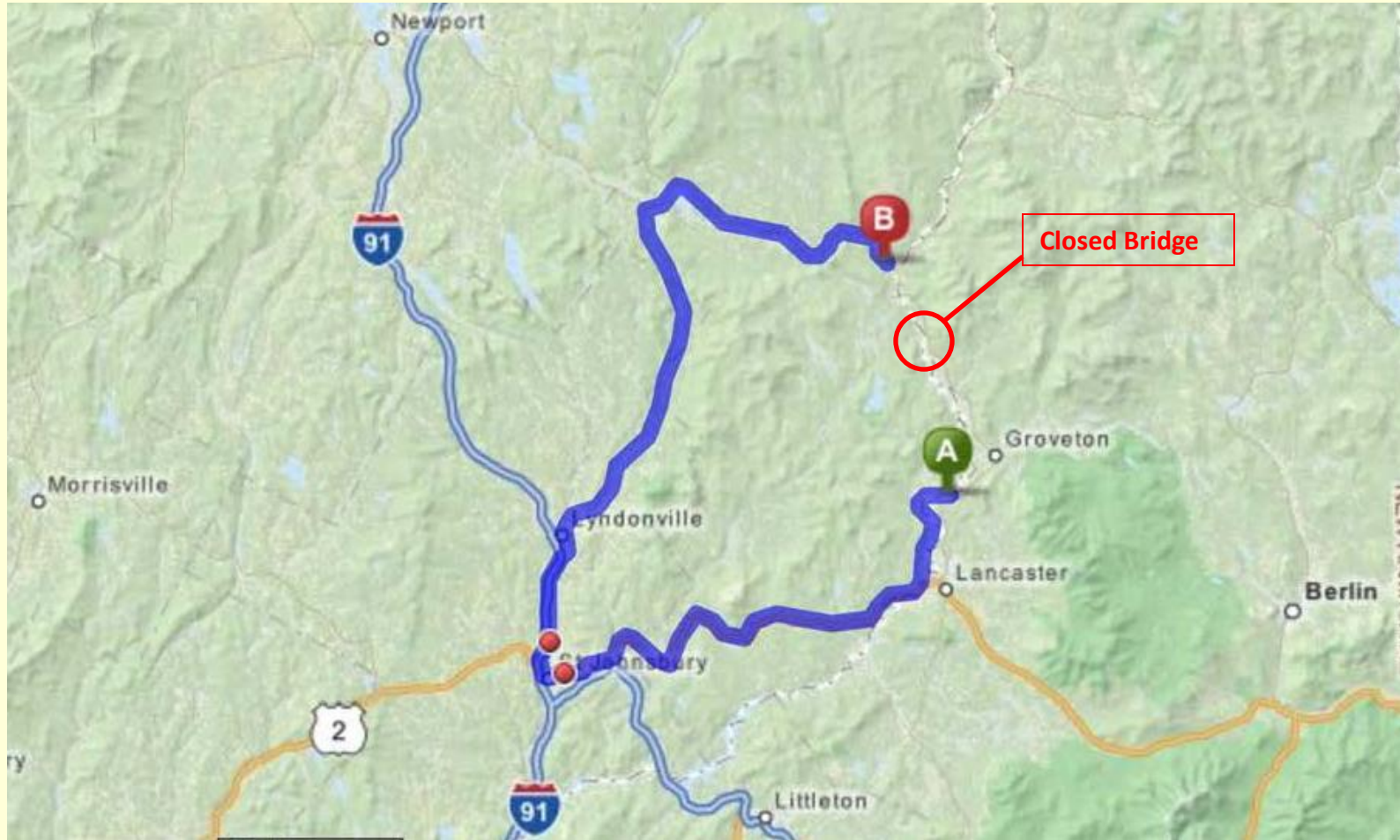
Layout – One Lane Temporary Bridge Upstream



Layout – One Lane Temporary Bridge Downstream



Accelerated Bridge Construction with Bridge Closure Option



A to B on Thru Route: 16 Miles
A to B on Detour Route: 83 Miles
Added Miles: 67 Miles
End to End Distance: 99 Miles

Major Factors

Added Miles: 67
Traffic Volume: 550 vpd
Duration: 4 weeks

This option ruled out due to the combination of traffic volume, detour distance, and duration of closure required

Alternatives Matrix

	Single Span w/ Temporary Bridge	Two Span w/ Temporary Bridge	Three Span w/ Temporary Bridge
Construction w/ CE + Contingencies	\$2,310,000	\$2,586,000	\$2,839,000
Preliminary Engineering	\$412,000	\$461,000	\$506,000
Right of Way	\$125,000	\$140,000	\$154,000
Total Project Cost	\$2,847,000	\$3,187,000	\$3,499,000
	Base	12% over Base	23% over Base
Design Life	80 Years	80 Years	80 Years
Project Development Duration	4 years	4 years	4 years
Construction Duration	15 months	15 months	15 months
Closure Duration	None	None	None

Conclusion and Recommendation

Complete Replacement w/ One span bridge while maintaining traffic on a one lane temporary bridge with traffic signals

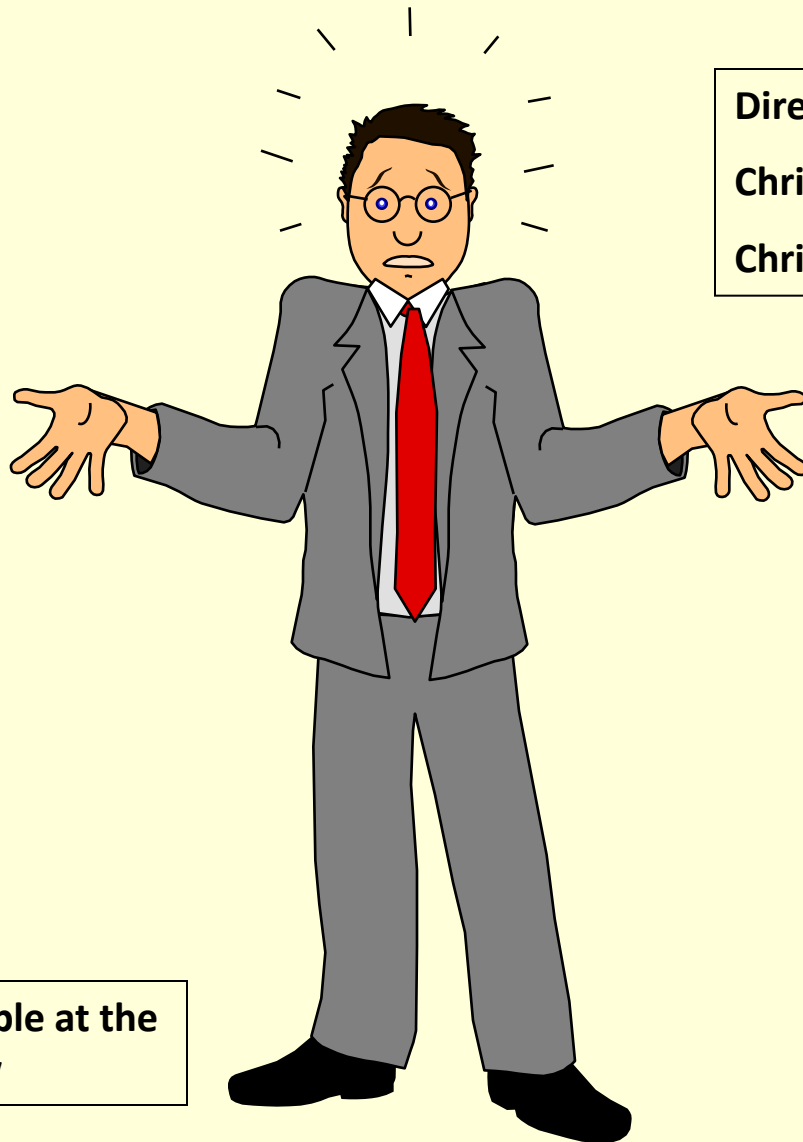
- Proposed bridge will meet all standards
- Lowest cost solution
- Lowest future maintenance costs
- Minimal environmental impact to stream

Next Steps

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

- Meet to discuss comments from this public meeting
- Decide how to proceed and document
- Develop Conceptual Plans
- Hold public meeting to present Conceptual plans
- Historic permitting process
- PROJECT DEFINED milestone
- Develop Preliminary Plans
- Environmental permitting
- Utility relocation

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/13C056>