



# Searsburg BF 010-1(50)

**VT Route 9 – Bridge #20 over Unnamed Brook**

April 14th, 2016



**Accelerated  
Bridge  
Program**  
VTRANS

# Introductions

**Nick Wark, P.E.**

VTrans Project Manager

**Jonathan Griffin, P.E.**

VTrans Scoping Engineer

**Tom Levins, P.E.**

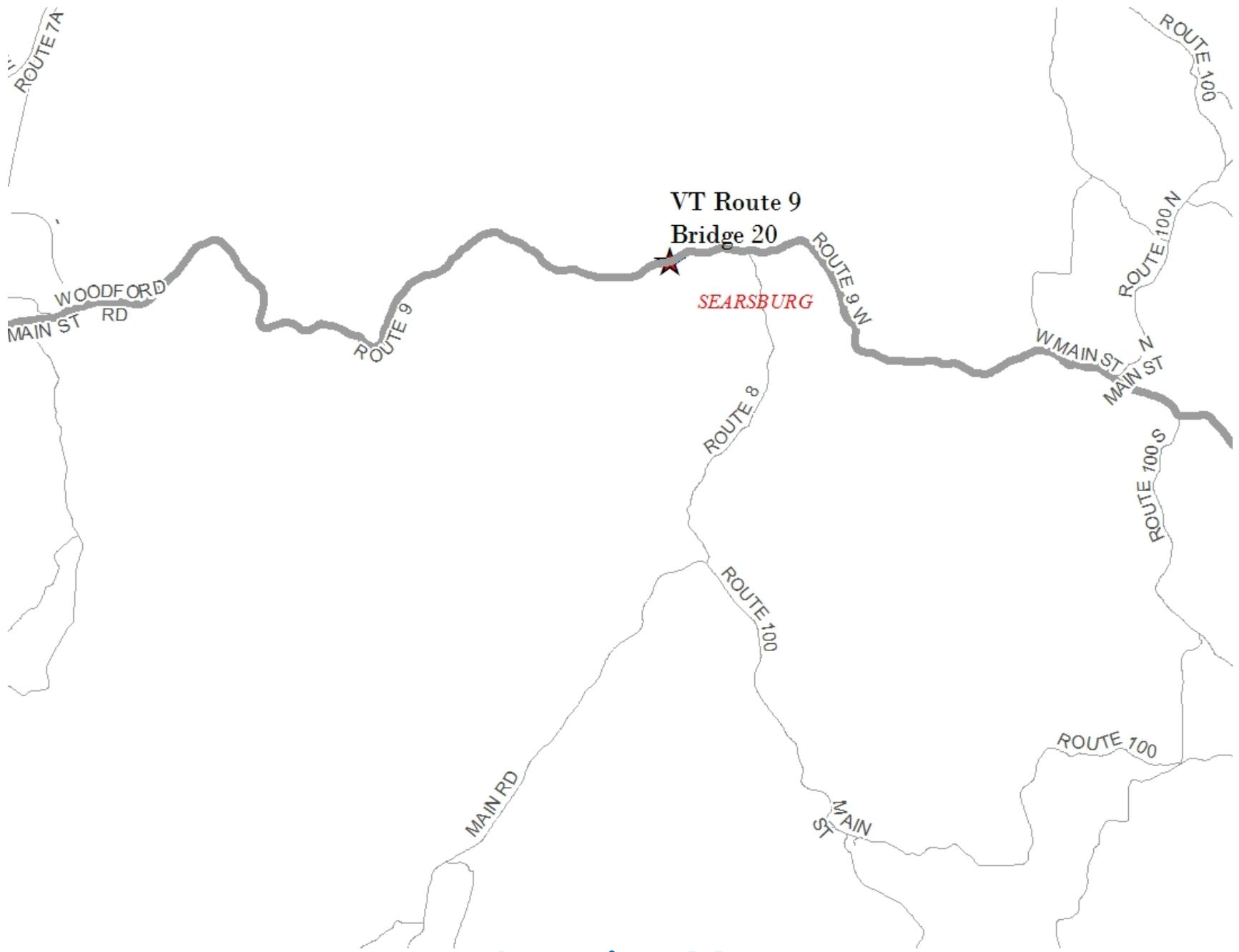
GM2 Design Consultant



# Purpose of Meeting

- Provide an understanding of our approach to the project
- Provide an overview of project constraints
- Discuss alternatives that were considered
- Discuss the recommended alternative
- Provide an opportunity to ask questions and voice concerns





Location Map

Bridge 20  
Project Location

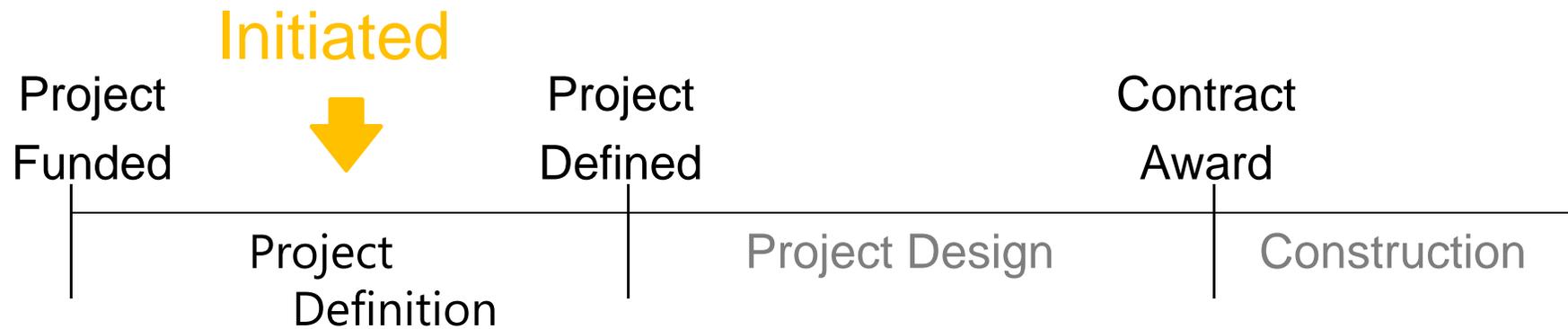


# Meeting Overview

- VTrans Project Development Process
- Project Overview
  - Existing Conditions
  - Alternatives Considered
  - Recommended Alternative
- Maintenance of Traffic
- Schedule
- Questions



# VTrans Project Development Process



- Identify resources & constraints
- Evaluate alternatives
- Public participation
- Build Consensus

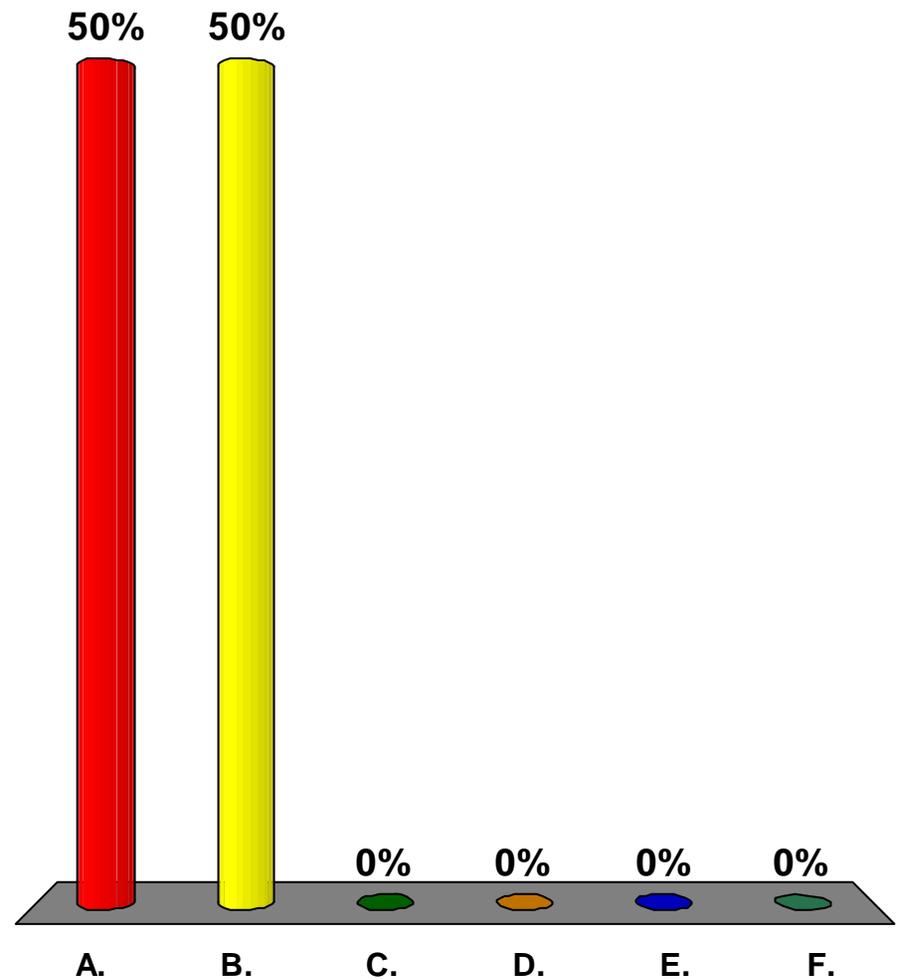
- Quantify areas of impact
- Environmental permits
- Develop plans, estimate and specifications
- Right-of-Way process if necessary



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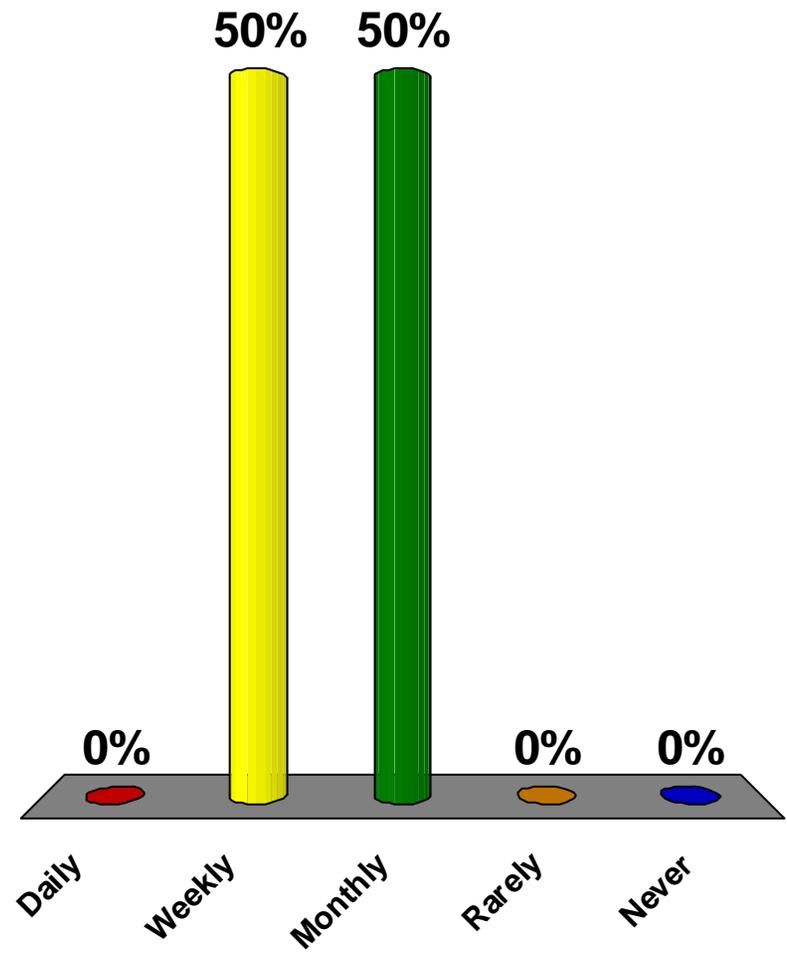
# Who are you representing?

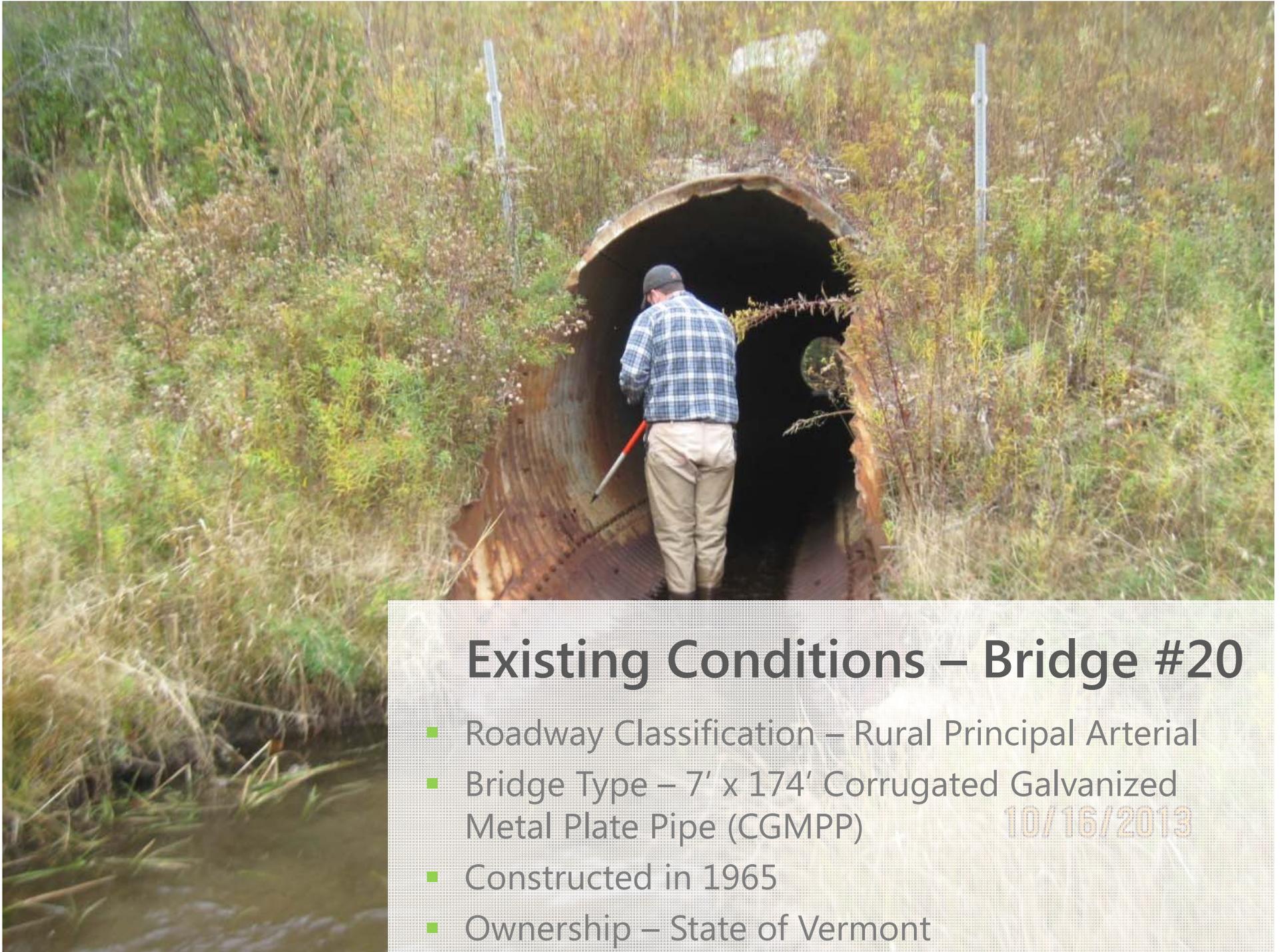
- A. Municipal Official
- B. Resident
- C. Local Business
- D. Independent Organization
- E. Emergency Services
- F. Other



# How often do you use this segment of Route 9?

- A. Daily
- B. Weekly
- C. Monthly
- D. Rarely
- E. Never





## Existing Conditions – Bridge #20

- Roadway Classification – Rural Principal Arterial
- Bridge Type – 7' x 174' Corrugated Galvanized Metal Plate Pipe (CGMPP) 10/16/2013
- Constructed in 1965
- Ownership – State of Vermont

## Existing Conditions – Bridge #20

- The existing culvert is rated “poor” and there is evidence of squashing at midspan. There are perforations throughout the culvert that are greater than 2 inches in width
- The bottom of the culvert is heavily rusted and rotted out
- The culvert does not meet the minimum bank full width standards
- The shoulders on VT 100 are substandard by 1.5 feet throughout the project area where there is guardrail



## Significant Deterioration

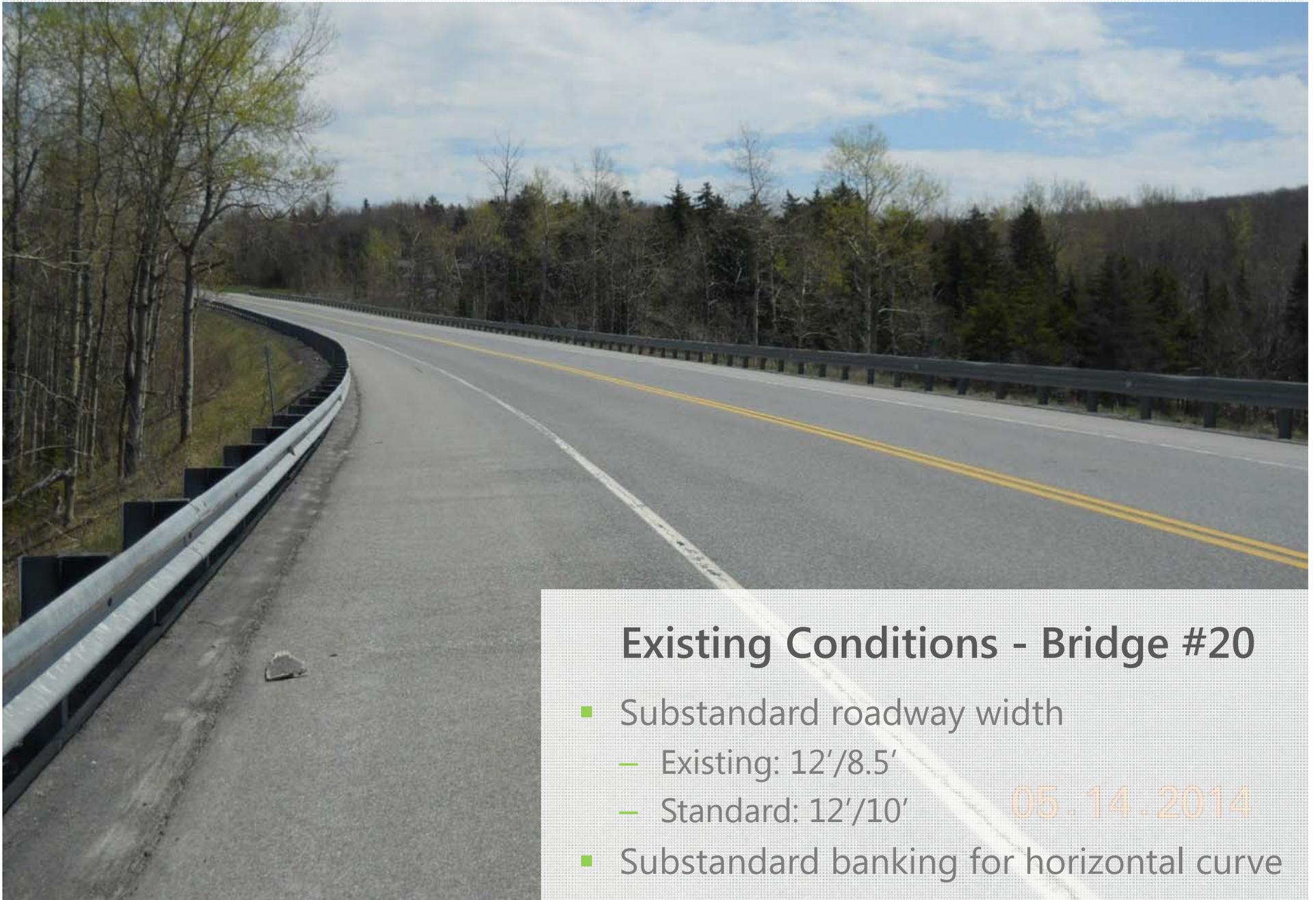


### Existing Conditions - Bridge #20

- Culvert Rating 4 (Poor)
- Heavily rotted invert
- Large Perforations Throughout

10/16/2013

## Looking East Over the Culvert



### Existing Conditions - Bridge #20

- Substandard roadway width
  - Existing: 12'/8.5'
  - Standard: 12'/10'
- Substandard banking for horizontal curve

05.14.2014

## Resource Constraints



### Existing Conditions - Bridge #20

- Wetlands upstream

05.14.2014

# Design Criteria and Considerations

- ADT of 3,400
- DHV of 520
- % Trucks: 15.2
- Design Speed of 50 mph
- Aquatic Organism Passage



# Alternatives Considered – Bridge #20

- No Action
  - Culvert is on annual inspections due to its condition, this alternative is not recommended
- Culvert Rehabilitation
  - Invert repair or culvert liner
  - 15 to 40 year design life
  - Substandard bankfull width and roadway banking
- Full Bridge Replacement – Concrete Box Culvert
  - Meets hydraulic standards and geometric standard
- Full Bridge Replacement – Trenchless Methods
  - Pipe ramming or jacking, or microtunneling
  - Substandard Roadway Banking
- Full Bridge Replacement – Integral Abutment Bridge
  - Meets hydraulic and geometric criteria



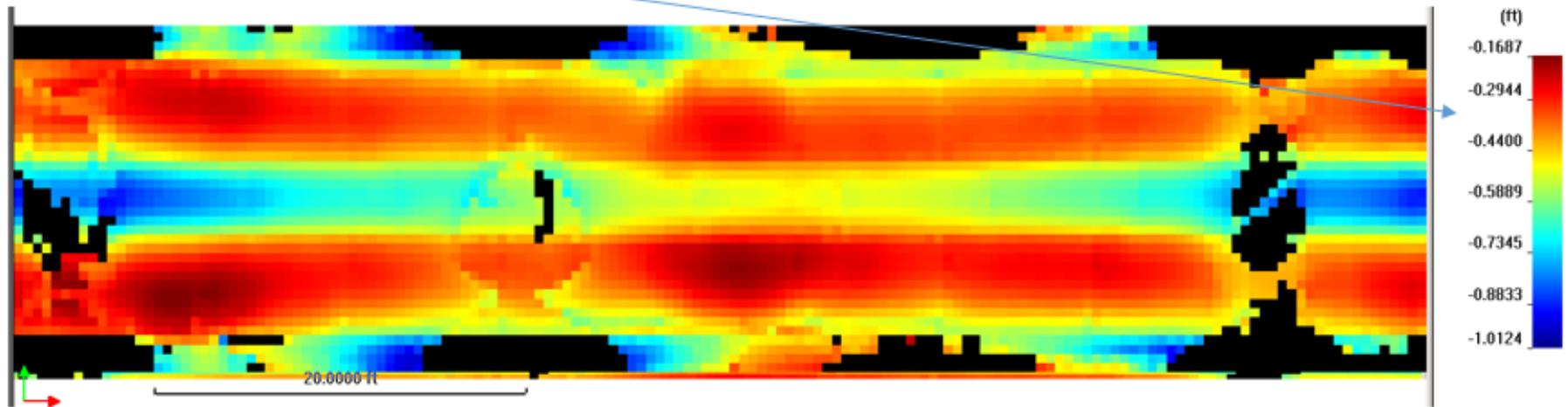
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## Recommended Alternative - Bridge #20

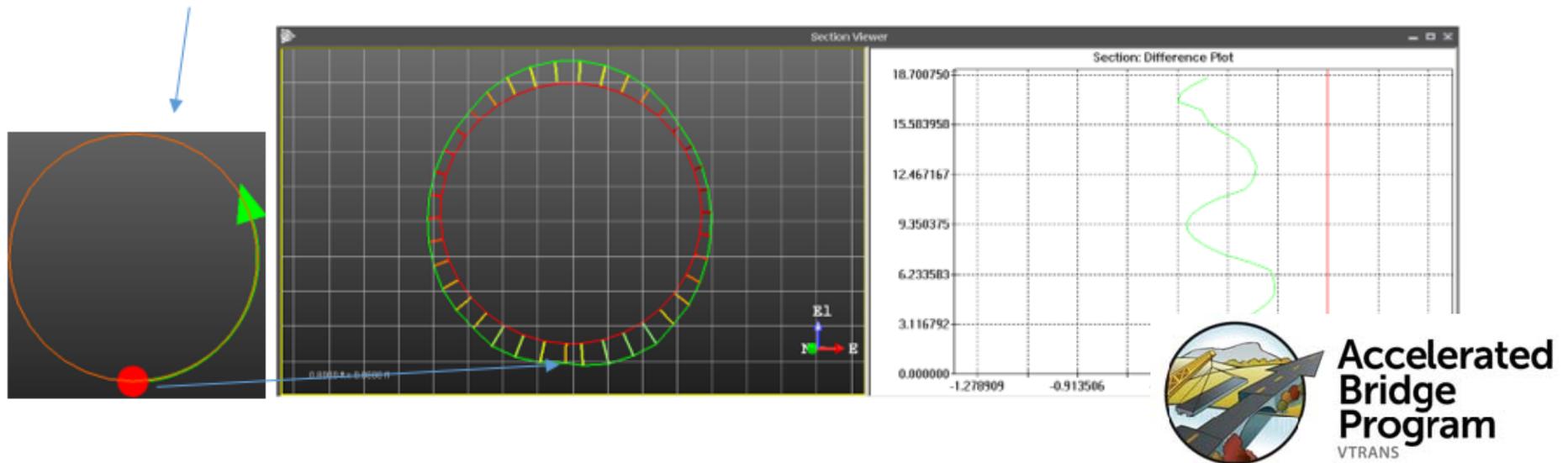
- Rehabilitation
  - New culvert slip liner or spray-on liner, a minimum 6' diameter required
  - Maintain existing roadway alignment
  - Utility relocation not expected
  - Permanent ROW will not be needed, but temporary rights are probably going to be needed downstream. Upstream wetland may force contractor to work from downstream end
  - Estimated construction year: 2018

## Comparative cross-sections of a 6 foot outer-diameter insert to existing culvert wall

Each cross-section includes a surface to model map that displays where on the pipe this cross-section lies, and is colored to indicate overall distance of the insert to the culvert wall (example below)

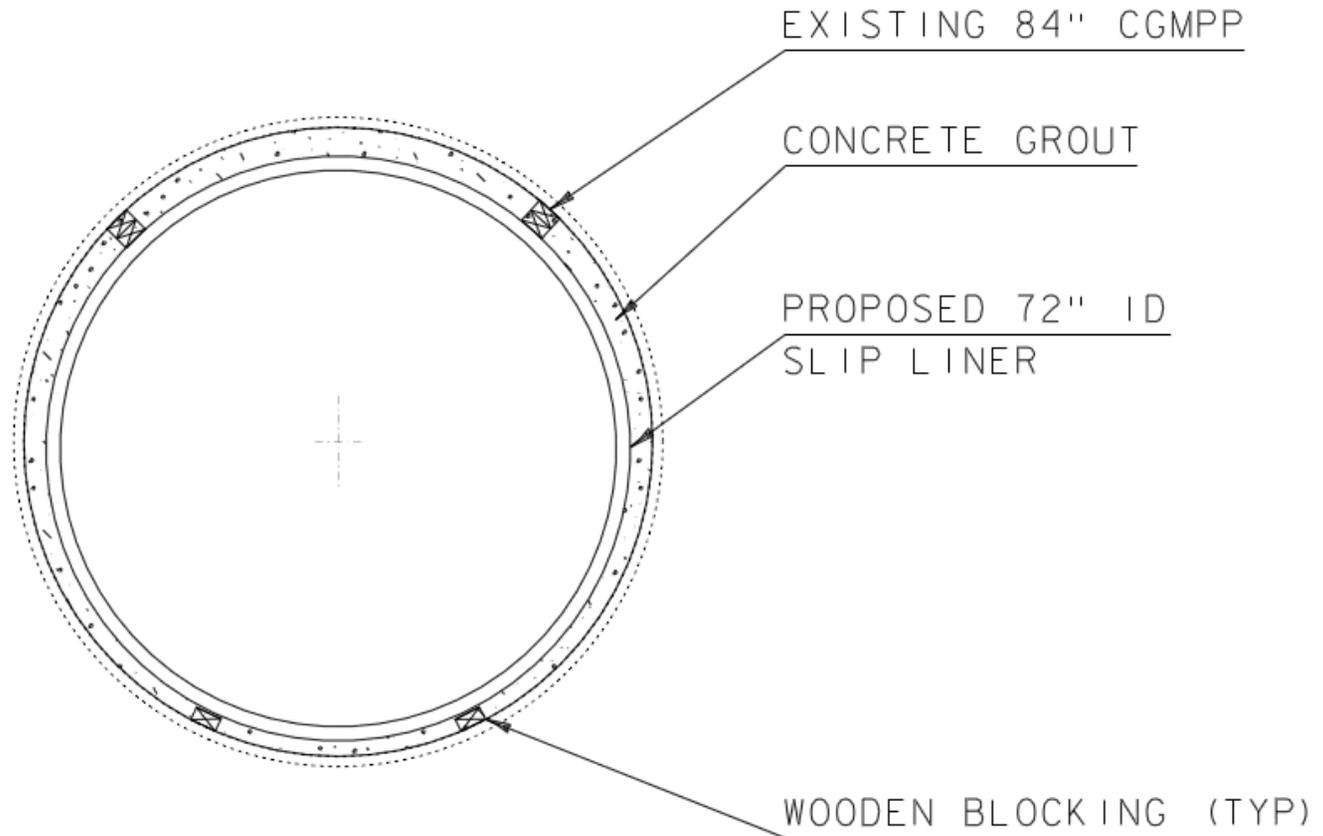


The cross-sections themselves are partitioned into half-foot intervals around the pipe, and a plot indicating the distance of each interval is included to the right of each cross-section. The plot begins at the base of the culvert and moves counter clock-wise around the pipe

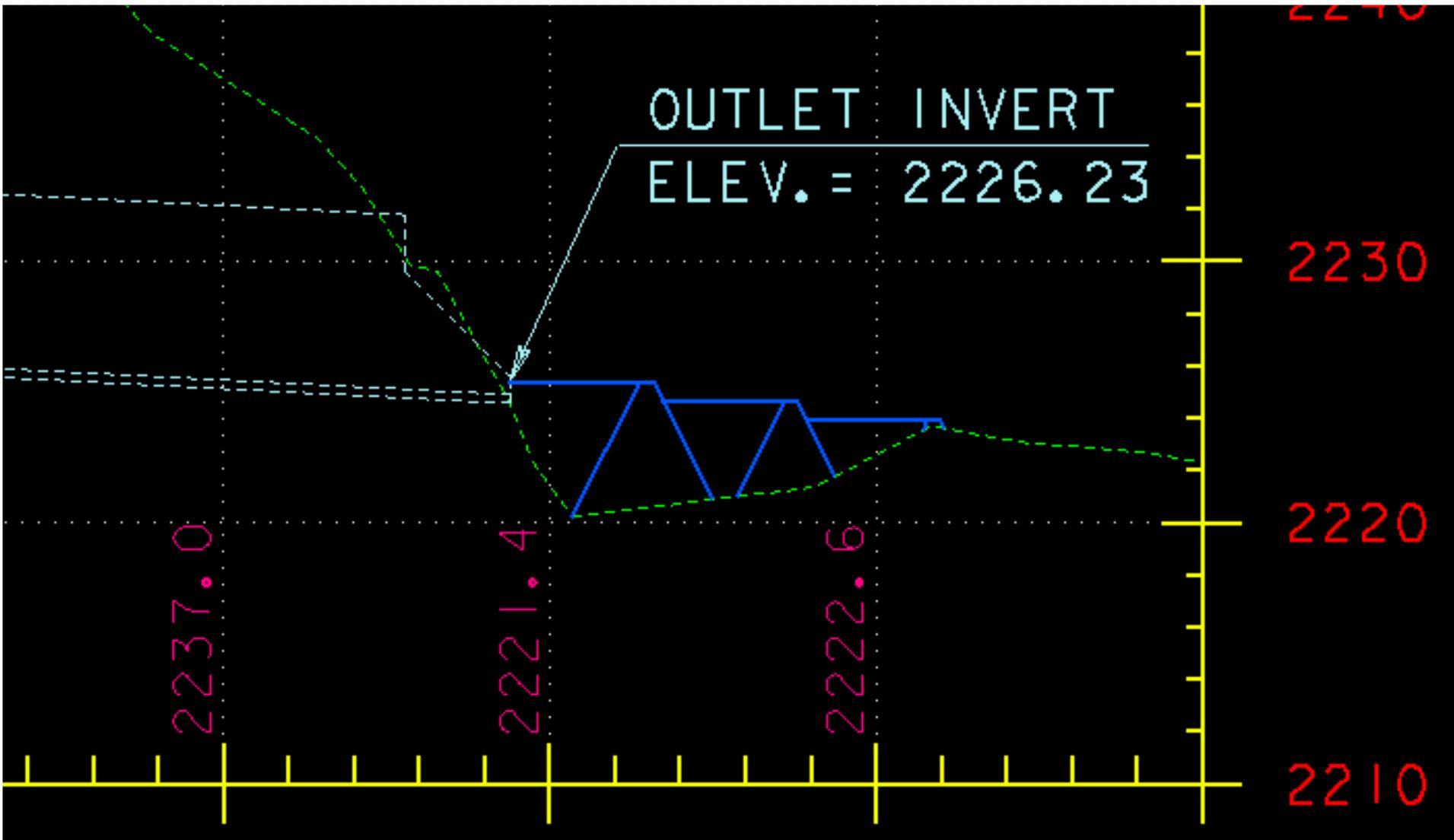


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# Typical Section



ALTERNATIVE IB TYPICAL SECTION



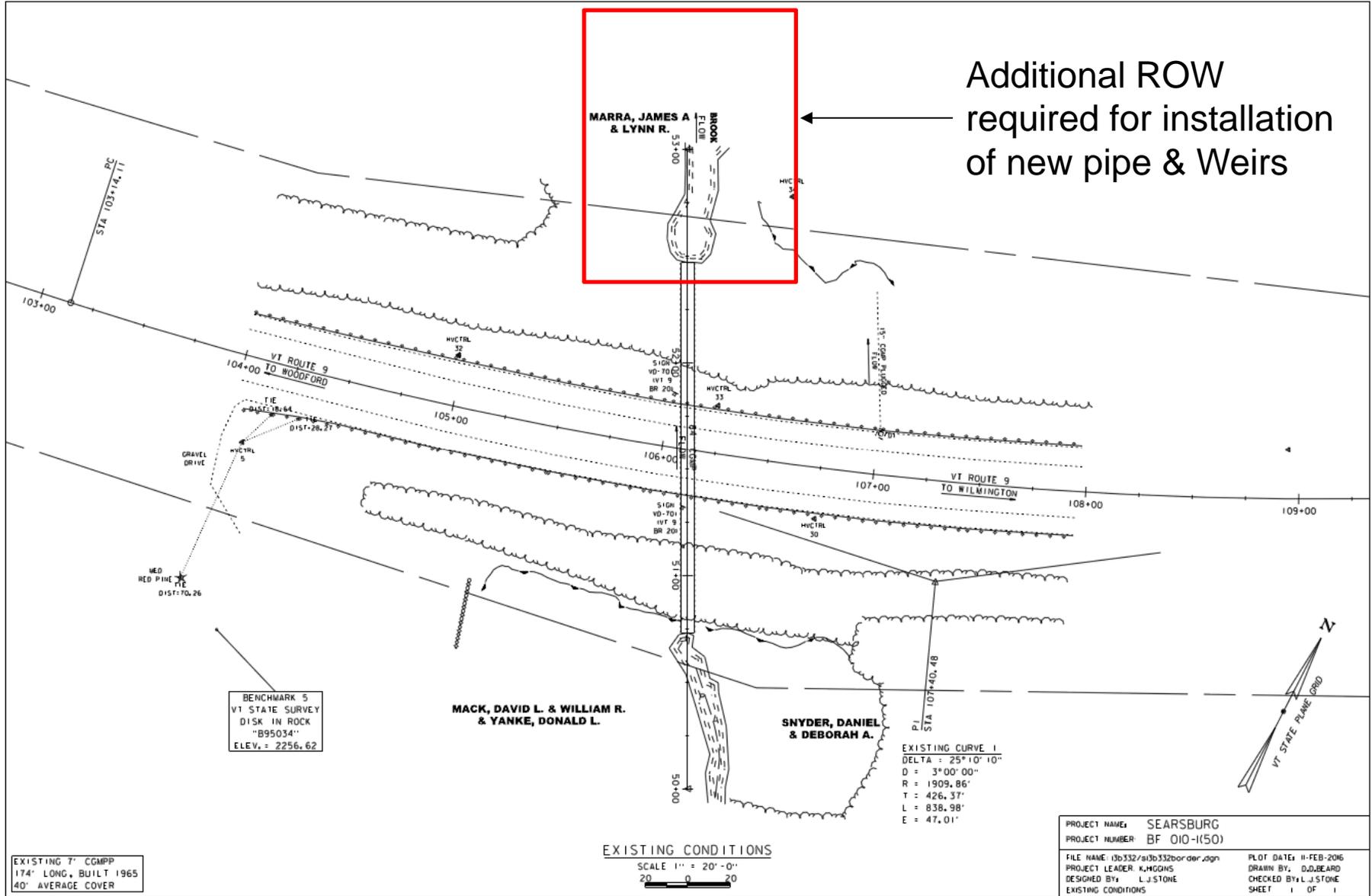
### ALTERNATIVE 1B IMPACTS

- Minimum of 3 weirs
- Approximately 40' Downstream Required

52+75

53+00

# Proposed Layout



# Maintenance of Traffic Options Considered

- Both lanes of Traffic Maintained on alignment
- Only temporary traffic interruptions for construction access



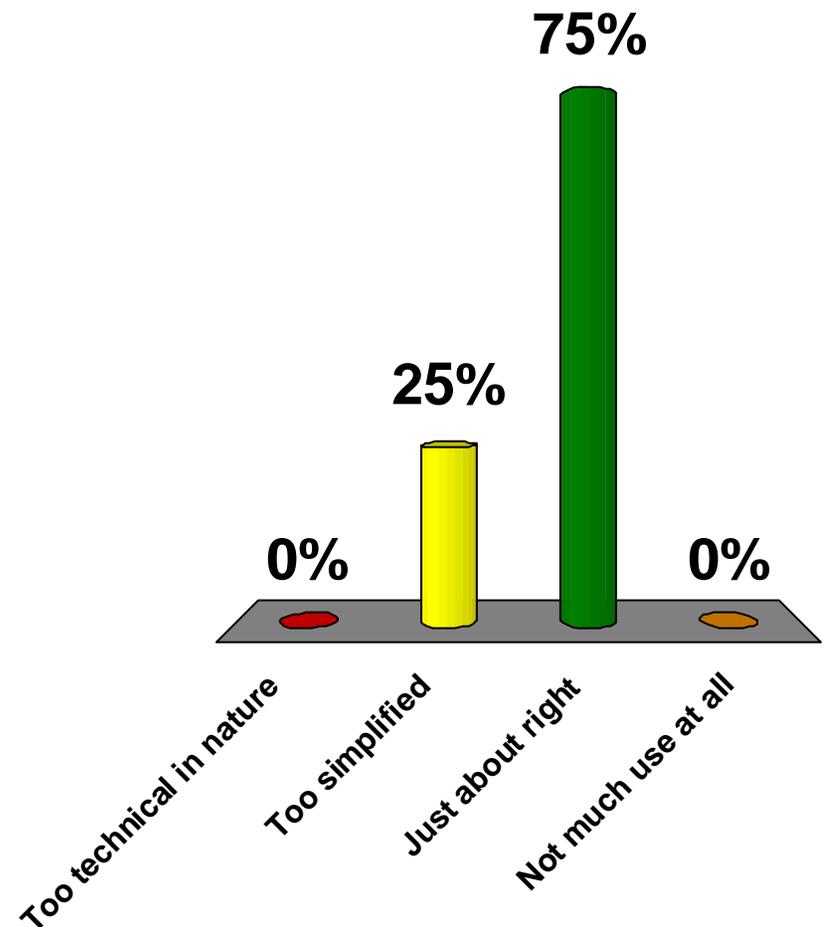
# Alternatives Matrix



Searsburg BF 010-1(50)	Alt 1: Culvert Rehabilitation		Alt 2: New Precast Box using Open Cut construction		Alt 3: New Pipe using Trenchless Technology			Alt 4: New Integral Abutment Bridge	
	a. Invert Repair	b. Culvert Liner			a. Pipe Jacking	b. Pipe Ramming	c. Micro-tunneling		
	Short Term Lane Closures		a. Offsite Detour	b. Temp Bridge	Short Term Lane Closures			a. Offsite Detour	b. Temp Bridge
<b>Total Project Costs</b> (Including E & C)	\$772,000	\$985,000	\$1,724,000	\$2,577,000	\$3,218,000	\$2,472,000	\$2,645,000	\$2,794,000	\$3,648,000
<b>Project Development Duration</b>	4 years	4 years	4 years	4 years	4 years	4 years	4 years	4 years	4 years
<b>Construction Duration</b>	2 months	2 months	6 months	18 months	6 months	6 months	6 months	6 months	18 months
<b>Closure Duration (If Applicable)</b>	N/A	N/A	2 weeks	N/A	N/A	N/A	N/A	4 weeks	N/A
<b>Geometric Design Criteria</b>	Substandard width and banking		Meets Criteria		Substandard width and banking			Meets Criteria	
<b>Alignment Change</b>	No		No		No			No	
<b>Utility</b>	No Change		No Change		No Change			No Change	
<b>ROW Acquisition</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Design Life</b>	15 Years	40 years	80 years		80 years			80 years	

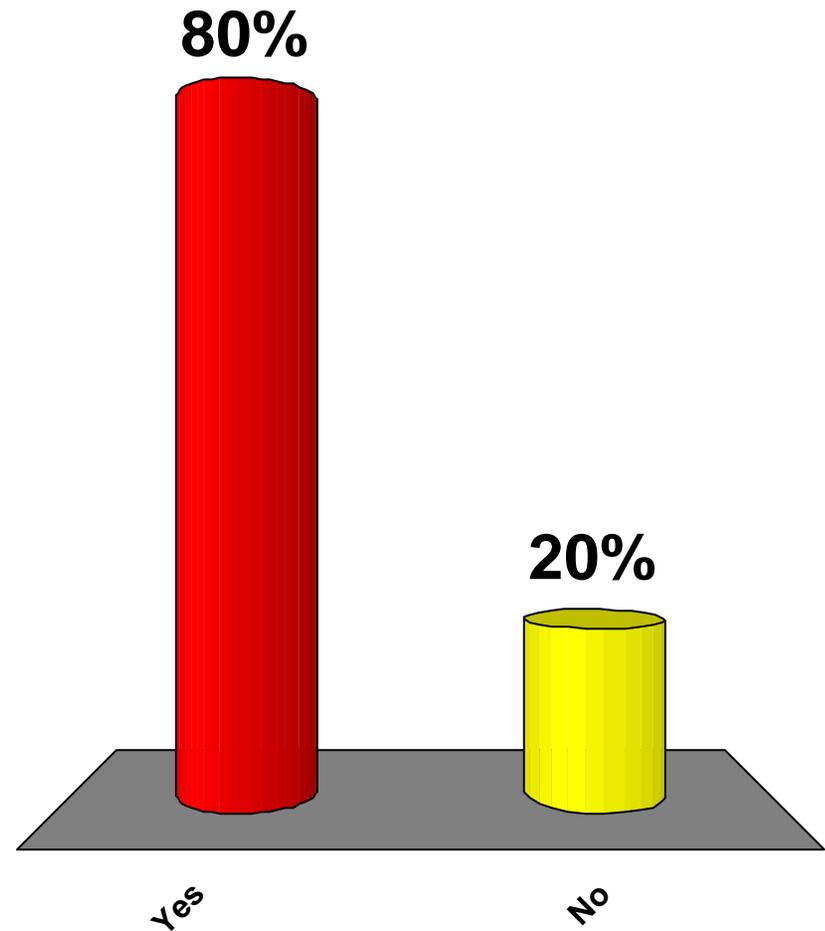
## Did you find this presentation to be?

- A. Too technical in nature
- B. Too simplified
- C. Just about right
- D. Not much use at all

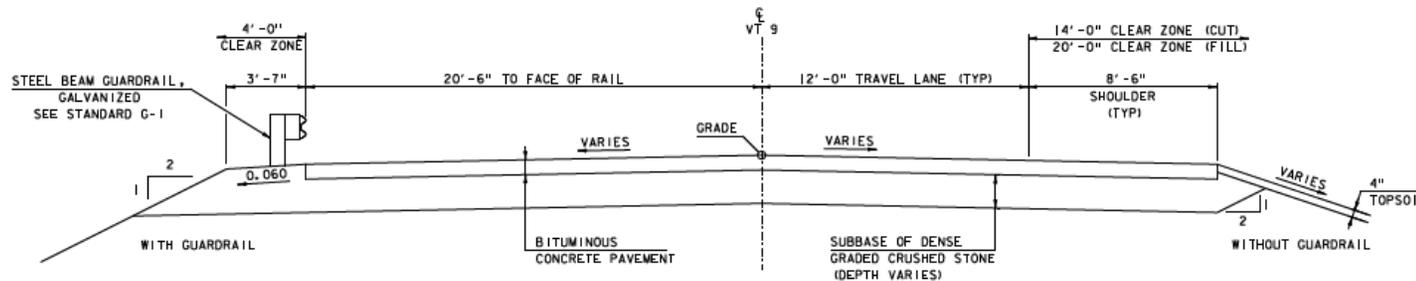


# Do you find the recommended scope of work satisfactory?

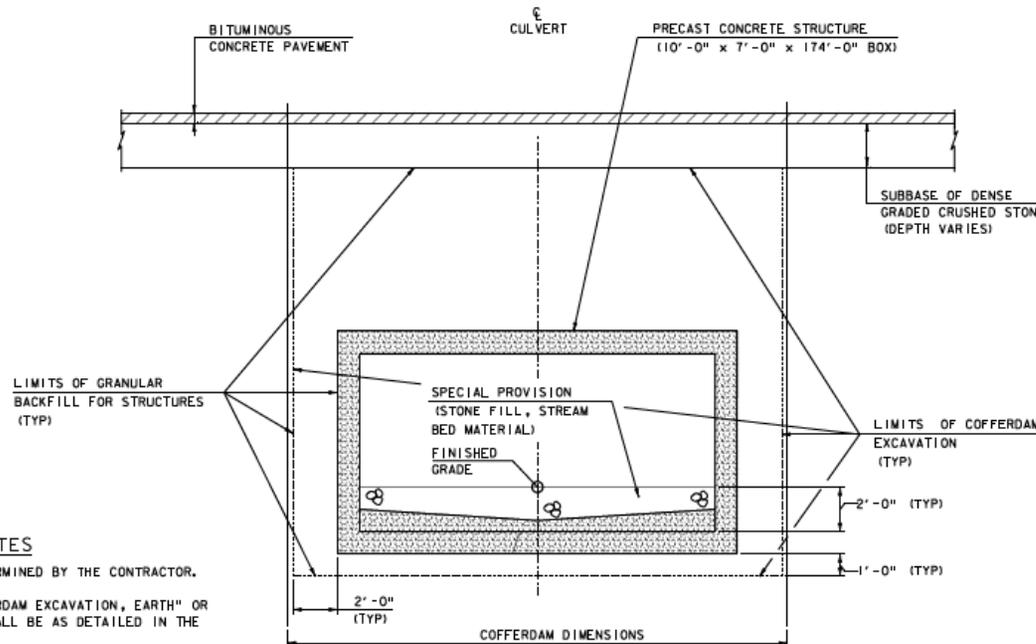
- A. Yes
- B. No



# Typical Sections



EXISTING VT 9 TYPICAL SECTION  
SCALE 3/8" = 1'-0"



## COFFERDAM NOTES

1. COFFERDAM DIMENSIONS TO BE DETERMINED BY THE CONTRACTOR.
2. THE PAY LIMITS OF EITHER "COFFERDAM EXCAVATION, EARTH" OR "COFFERDAM EXCAVATION, ROCK" SHALL BE AS DETAILED IN THE TYPICAL SECTION.
3. IF A COFFERDAM IS CONSTRUCTED WHICH IS LARGER THAN DETAILED ABOVE, NO MEASUREMENT AND PAYMENT WILL BE MADE FOR COFFERDAM EXCAVATION AND GRANULAR BACKFILL FOR STRUCTURES OUTSIDE THOSE PAY LIMITS.

ALTERNATIVE 2  
N. T. S.

## MATERIAL TOLERANCES (IF USED ON PROJECT)

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

PROJECT NAME: SEARSBURG  
PROJECT NUMBER: BF 010-I(50)

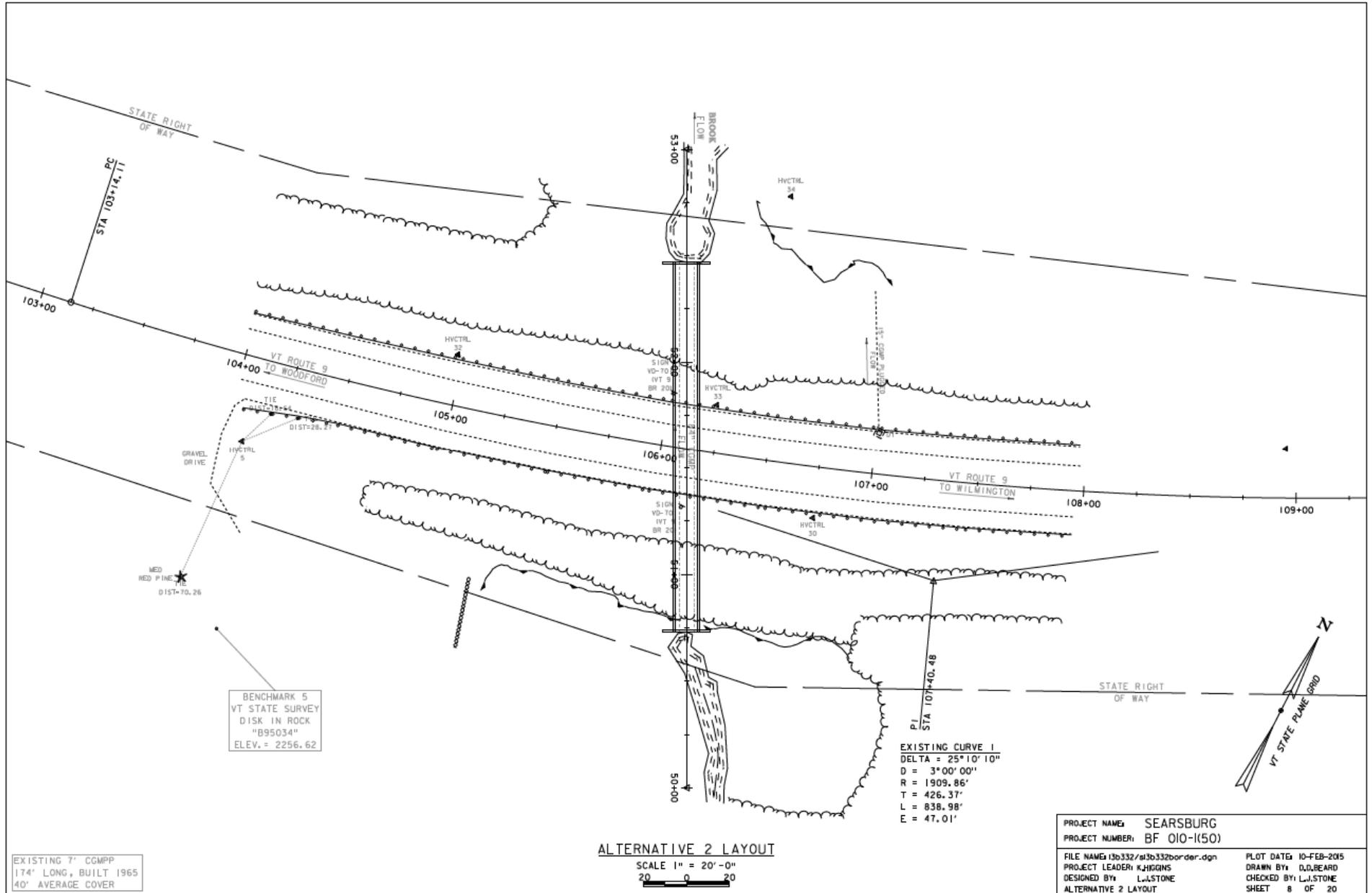
FILE NAME: 13b332\13b332\typical.dgn  
PROJECT LEADER: K.HIGGINS  
DESIGNED BY: L.J.STONE

PLOT DATE: 10-FEB-2015  
DRAWN BY: D.J.BEARD  
CHECKED BY: L.J.STONE  
SHEET 7 OF 20

# Proposed Layout



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# Maintenance of Traffic Options Considered

- Road Closure with Offsite Detour
- Temporary Bridge





## Road Closure

- 2 week closure
- Detour signed by State
- 0.6 miles end-to-end

# Traffic Control – Offsite Detour



- Short Term Road Closure w/ Offsite Detour

- Signed by State, detour route parallel to VT Route 9 and adds no distance to travel

- VT Route 9 to Old VT Route 9 back to VT Route 9

- Through Route: 0.3 Miles
- Detour Route: 0.3 Miles
- Added Miles: 0 Miles
- End-to-End: 0.6 Mile

