

**Wardsboro BF 013-1(21)
VT 100, Bridge 70**

**Wardsboro BF 013-1(22)
VT 100, Bridge 73**

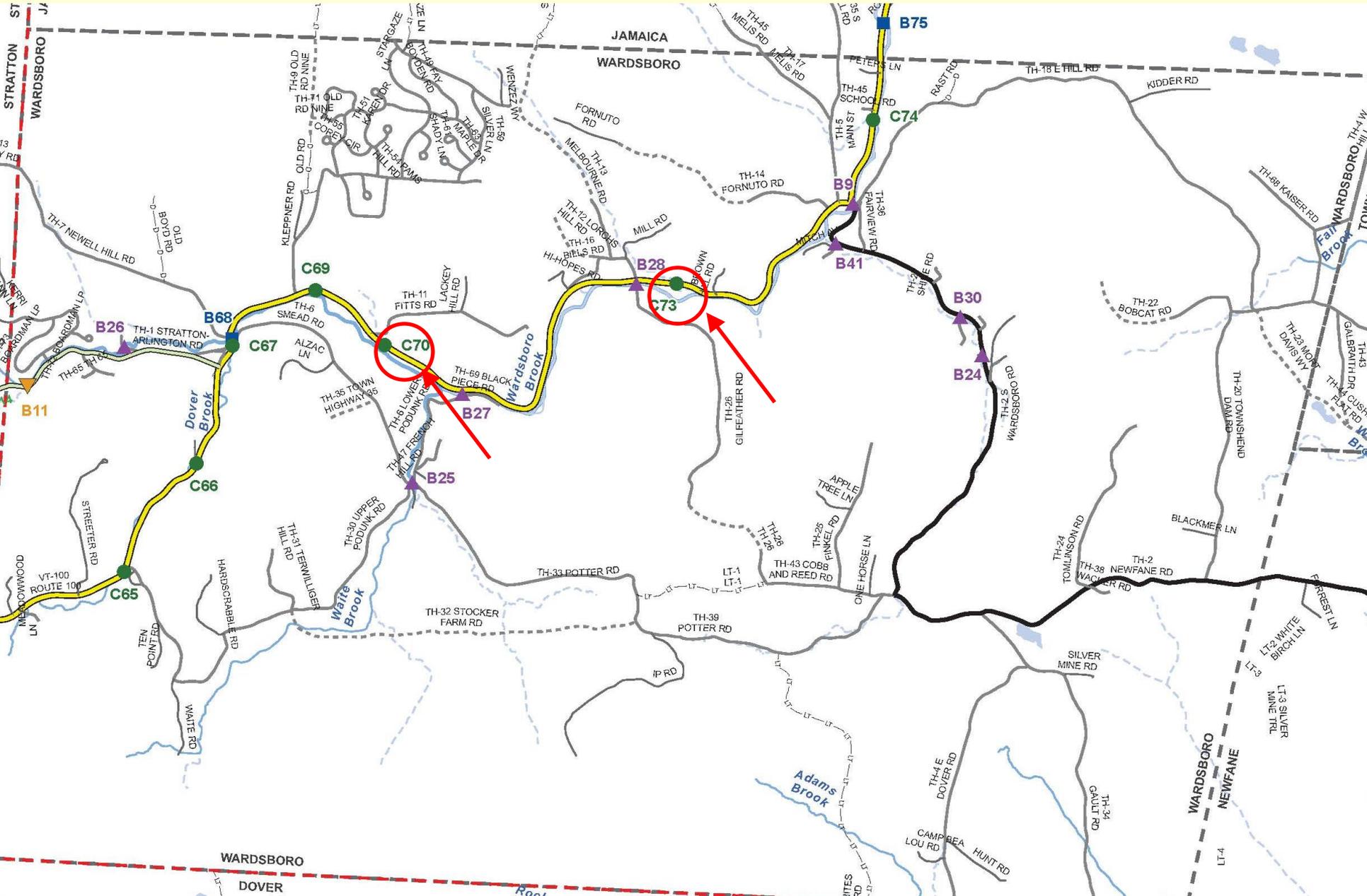
Regional Concerns Meeting



**Presented by
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Vermont Agency of Transportation
Chris.Williams@State.VT.US**

September 17, 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 and resources is minimized
- Less impacts = less process = less money = faster delivery
- Accelerated Bridge Construction (ABC) is very efficient
- Shift from individual projects to programmatic approach
- Accelerated Project Delivery is the result
- 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
- 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

- Develop plans, estimate and specifications

Project Background

- The structures are owned and maintained by the State
- VT Rte 100 is a State Highway
- Functionally labeled as a Rural Minor Arterial
- Posted Speed = 50 mph (Design Speed)
- The bridges were built in 1957 (56 years old)
- Bridges are Corrugated Metal Plate Pipe Arch
- Bridge 70 = 6' x 9' x 64' long
- Bridge 73 = 5'-7" x 7'-11" x 50' long

Traffic Data

	“Current Year” 2016	“Design Year” 2036
Average Annual Daily Traffic	1,100	1,200
Design Hourly Volume	150	170
Average Daily Truck Traffic	130	210
%Trucks	13.7	20.4

EXISTING BRIDGE DEFICIENCIES

Inspection Rating Information (Based on a scale of 9)

	B-70	B-73
Channel Rating	6 Satisfactory	7 Good
Culvert Rating	3 Serious	3 Serious

Rating Definitions

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

Deficiencies

- Serious culvert rating with perforations and rust in bottom
- The roadway width is substandard
- There is no guard rail or approach rail
- The culverts constrict the natural channel width
- The bridge is undersized hydraulically

Bridge 70

**This portion of the presentation
is specific to Bridge 70**

Looking East over Bridge



05.15.2013

Looking West over Bridge



05.15.2013

Culvert Inlet



05.15.2013

Culvert Outlet

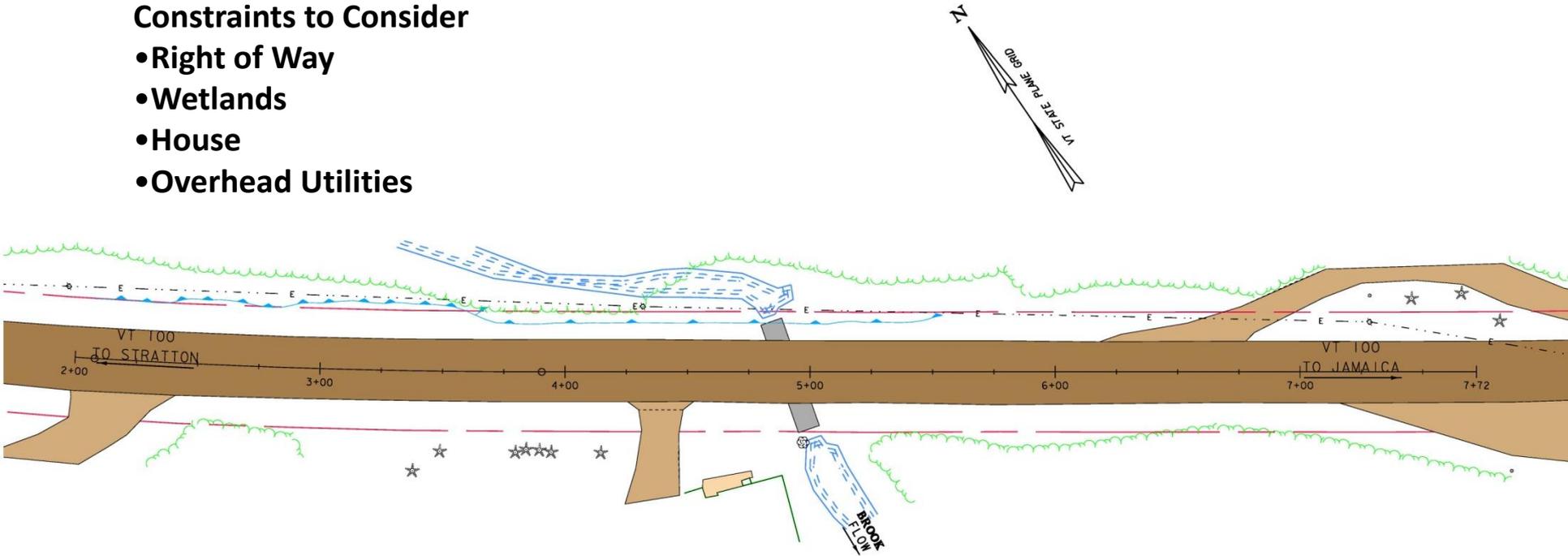


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Layout Showing Constraints

Constraints to Consider

- Right of Way
- Wetlands
- House
- Overhead Utilities



Alternatives Considered

Rehabilitation (Preventative Maintenance)

- Culvert Lining
- Invert Repair
- Both are short-term fixes and are not used when the existing pipe is already undersized

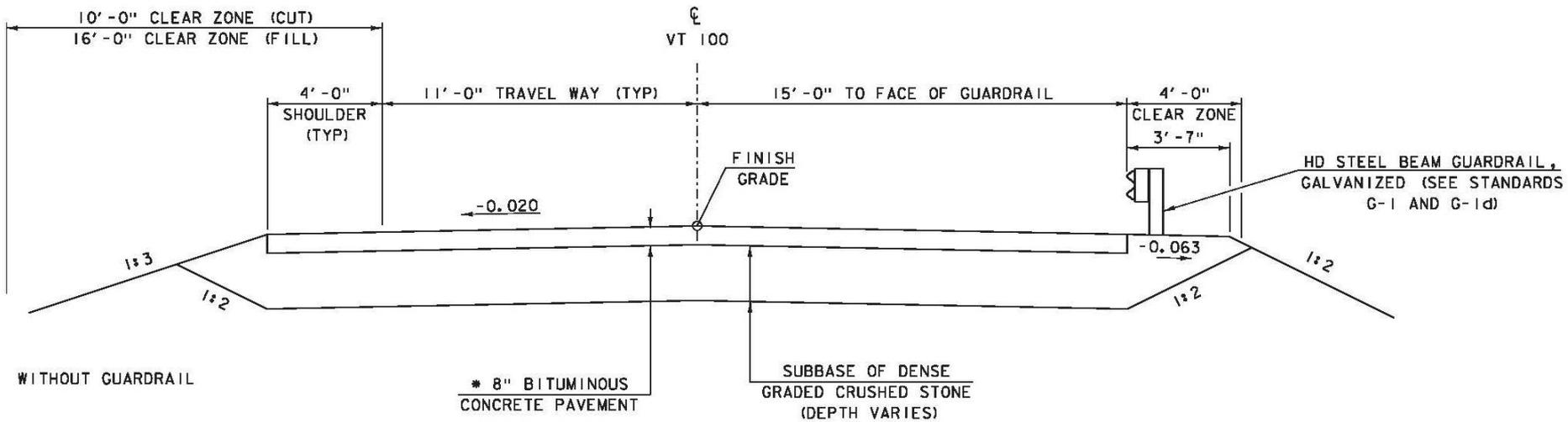
Full Bridge Replacement

- Replace with a precast concrete box culvert
- Cost-effective
- Long-term fix

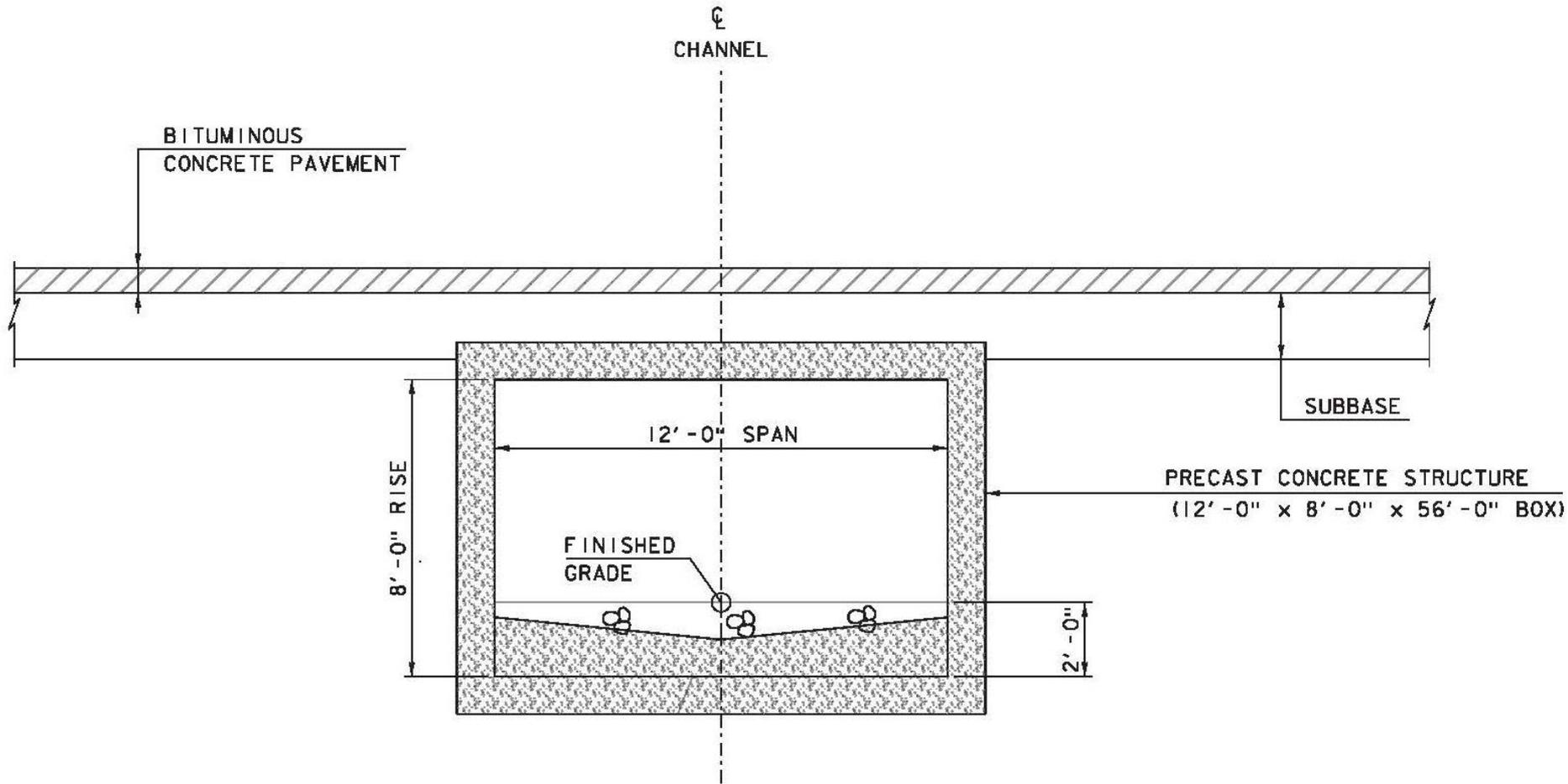
Full Bridge Replacement Details

- 12' wide x 8' high concrete box culvert
- 30' roadway width between face of rail
- Maintain existing centerline of bridge
- Maintain vertical grade of bridge
- Long term (80 year) solution

Roadway Typical



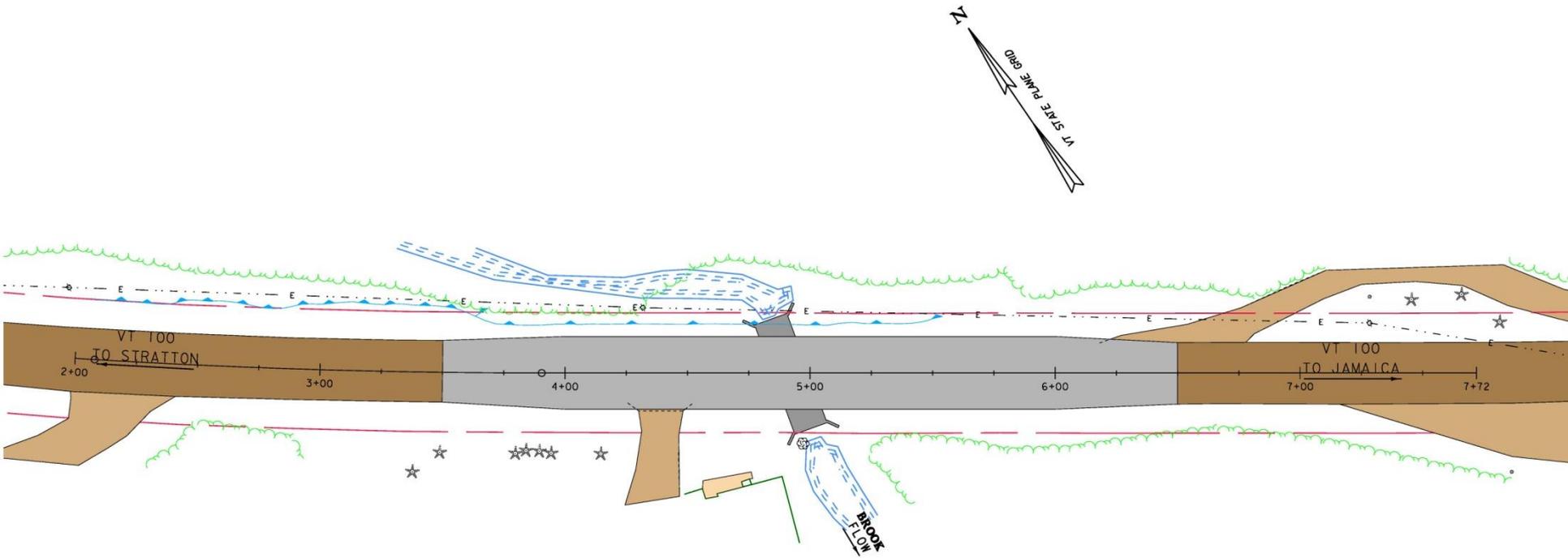
Box Culvert Typical



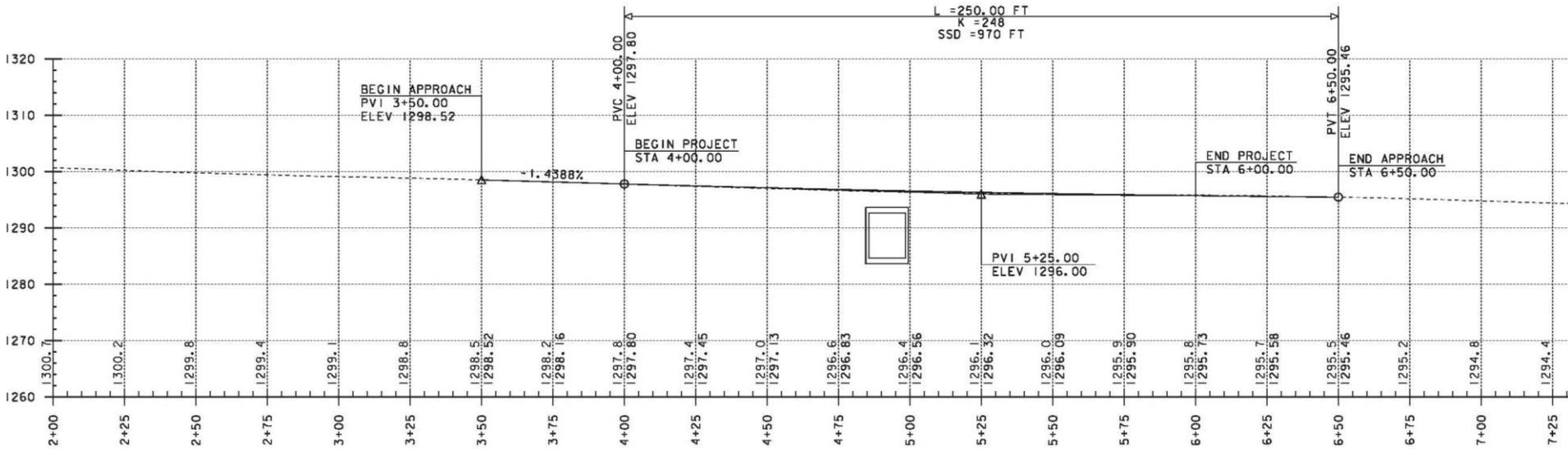
TYPICAL PRECAST BOX CULVERT SECTION

SCALE: 3/4" = 1'-0"

Full Replacement - Layout



Full Replacement - Profile



Recommendation on Alternatives

- VAOT recommends Complete bridge replacement
- Rehabilitation is not cost-effective at this point
- Long-term fix

Methods to maintain traffic will be based on recommended alternative

Methods to Maintain Traffic

- Temporary Bridge
- Phased Construction
- ABC w/ short-term bridge closure

Methods to Maintain Traffic

Temporary Bridge

- One-lane bridge with alternating traffic (with lights)
- Traffic congestion and/or conflicts w/ one-lane
- Environmental & Property Impacts
- Long project development duration
- Long construction duration
- High cost of development and construction

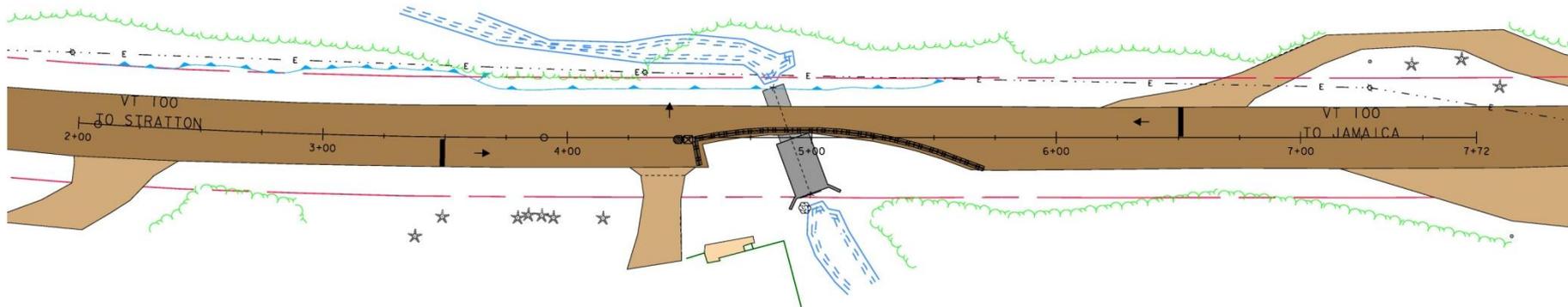
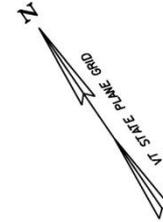
Methods to Maintain Traffic

Phased Construction

- Traffic congestion and/or conflicts due to one-lane
- Relatively long construction phase
- Safety concerns w/ motorists near workers

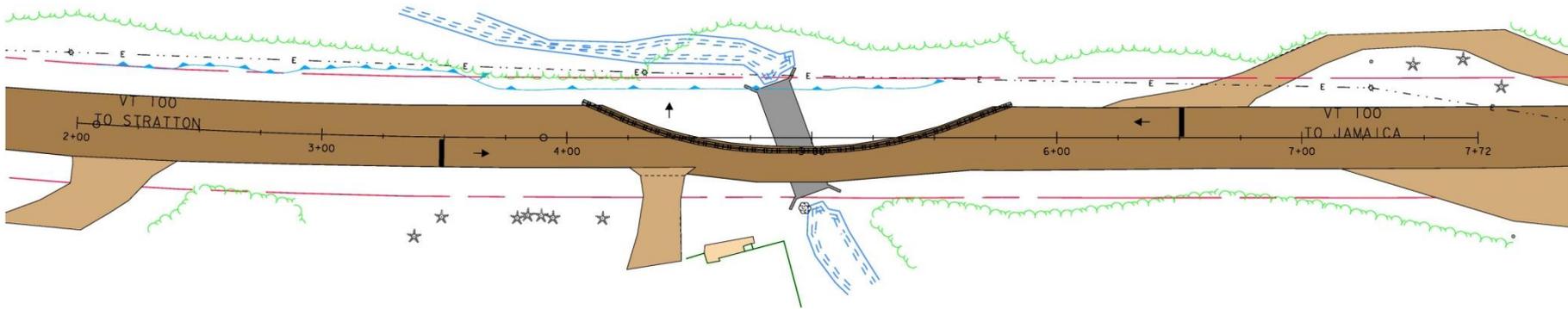
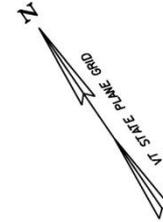
Phased Construction – Phase 1

- Traffic on upstream portion of existing culvert
- Remove downstream portion of bridge
- Construct downstream portion of new bridge



Phased Construction – Phase 2

- Traffic on downstream portion of new bridge
- Remove upstream portion of existing bridge
- Construct upstream portion of new bridge

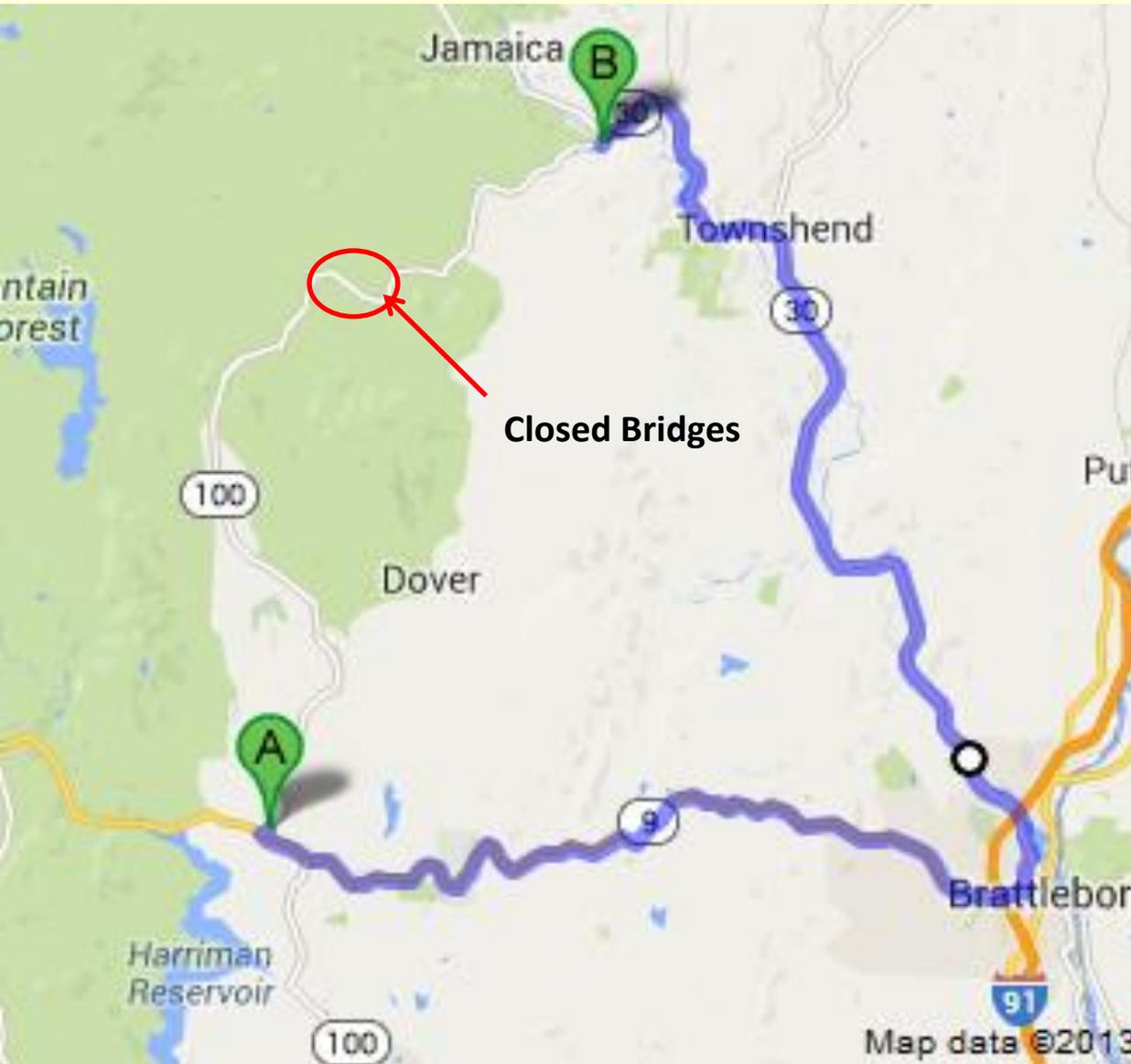


Methods to Maintain Traffic

Short-term bridge closure with ABC

- Bridge 70 to be closed for 7 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)
- State would be responsible for detour route
- Public Outreach to provide advance notice for planning

Detour Route



A-B Thru Route = 22 miles

A-B Deetour Route = 42 miles

Added Miles = 20 miles

End-End = 64 miles

Alternatives Matrix – Bridge 70

	Replacement w/ Off-site detour	Replacement w/ Phased Construction	
Maintenance of Traffic	\$30,000	\$110,000	
Construction w/ CE + Contingencies	\$528,000	\$653,000	
Preliminary Engineering	\$132,000	\$164,000	
Right of Way	\$29,000	\$36,000	
Total Project Cost	\$689,000	\$853,000	
Design Life	80 Years	80 Years	
Project Development Duration	>4 years	>4 years	
Construction Duration	3 months	8 months	
Closure Duration	7 days	None	

Conclusion and Recommendation

Bridge 70

Full Bridge Replacement using Phased Construction

- Long term (80 year) fix
- Addresses all sub-standard features
- Long detour route not required as for bridge closure option
- Minimal mobility impacts
- Minimal impact to environmental resources
- Minimal impact to adjacent property owners

Bridge 73

**This portion of the presentation
is specific to Bridge 73**

Looking East over Bridge



05.15.2013

Looking West over Bridge



05.15.2013

Culvert Outlet

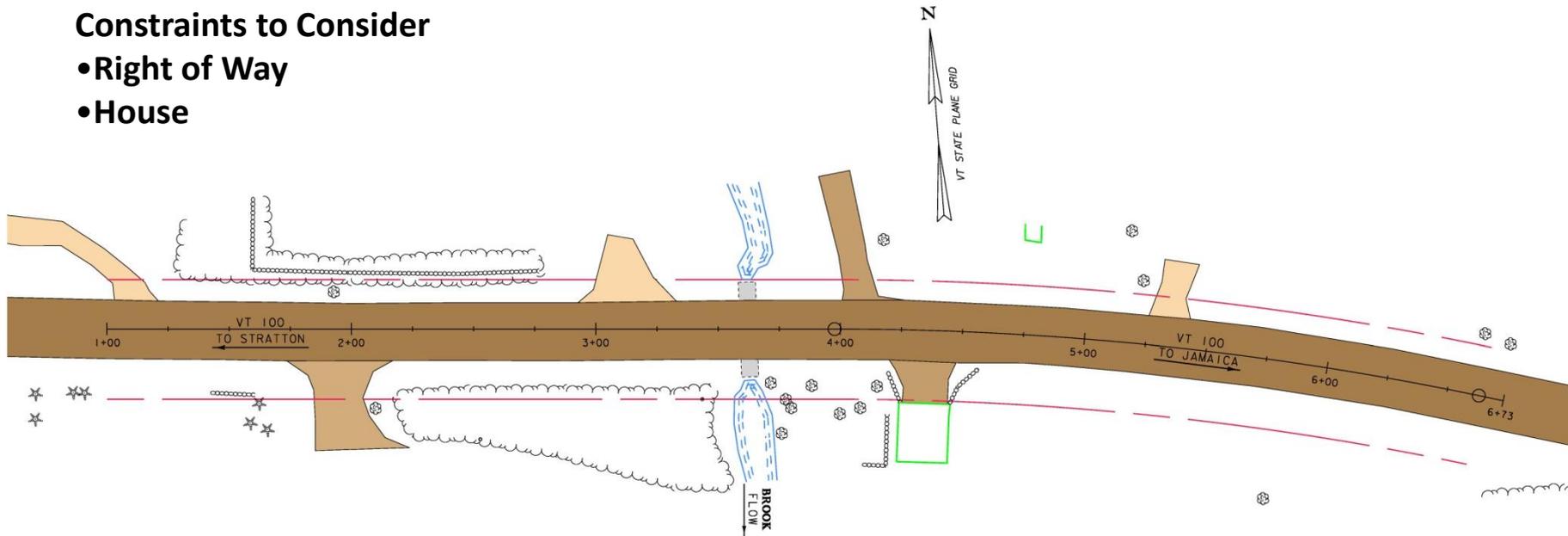


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Alternatives Considered

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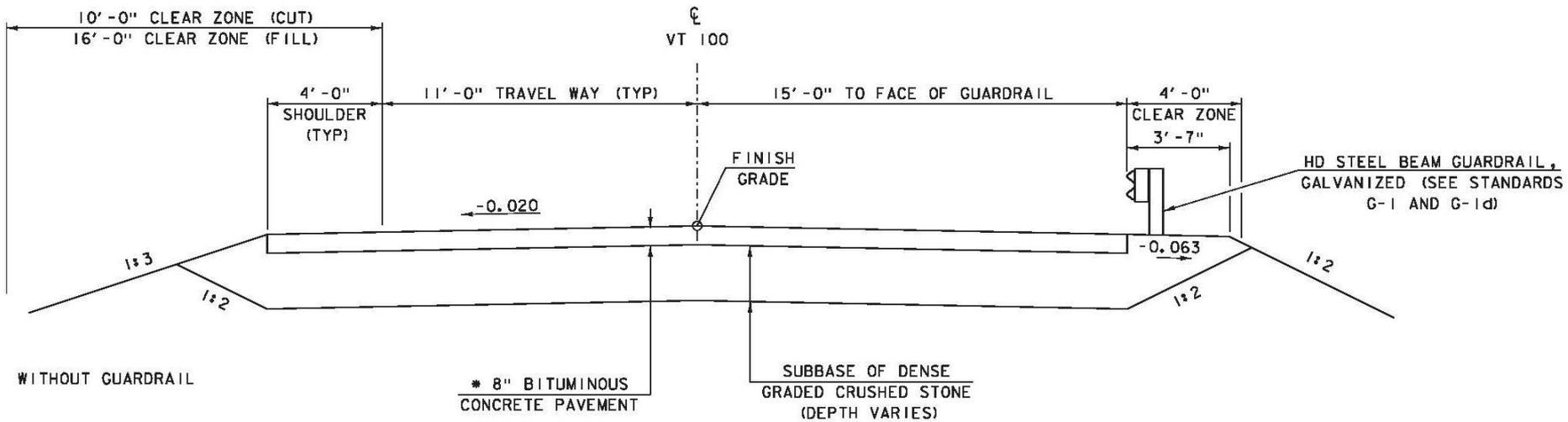
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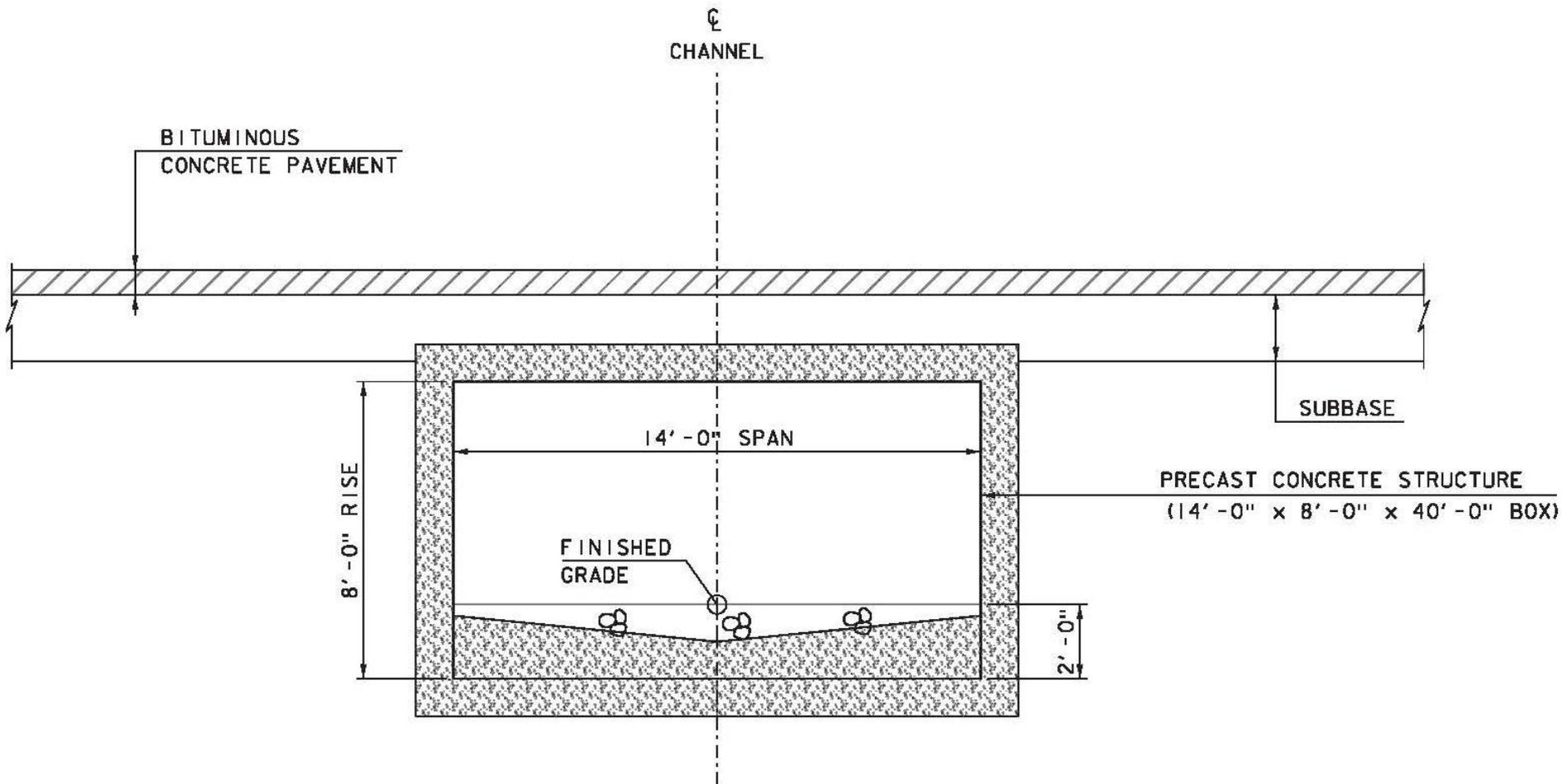
Full Bridge Replacement Details

- 14' wide x 8' high concrete box culvert
- 30' roadway width between face of rail
- Maintain existing centerline of bridge
- Maintain vertical grade of bridge
- Long term (80 year) solution

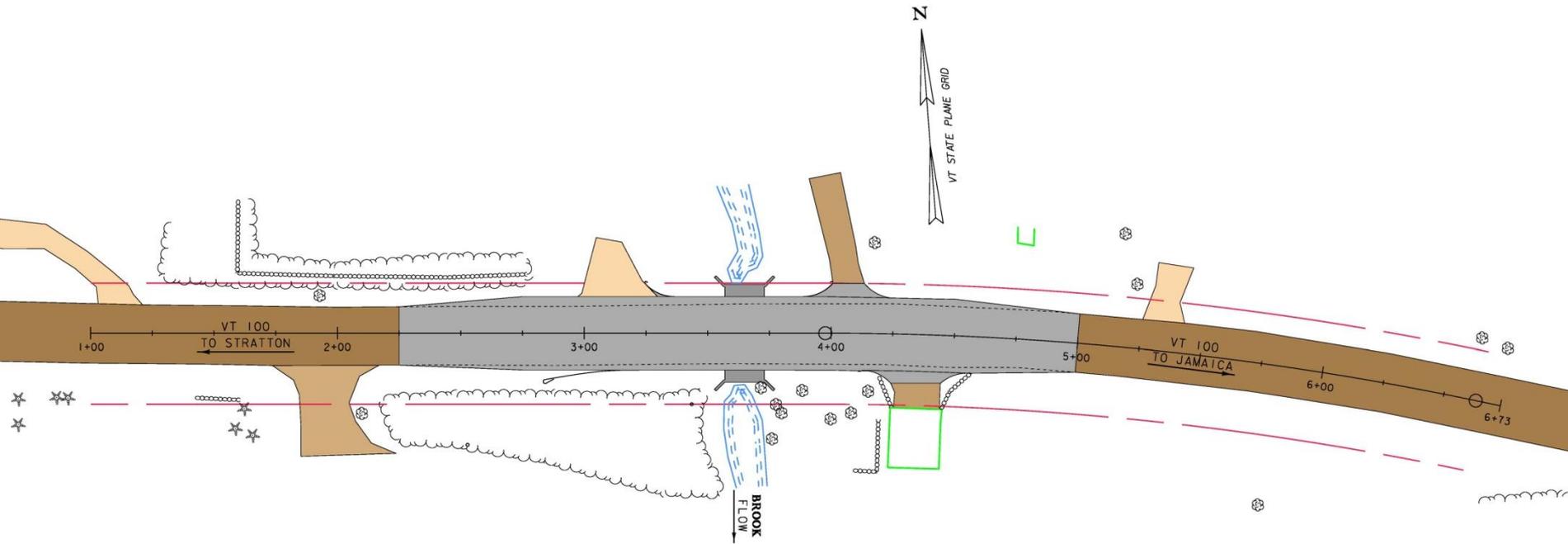
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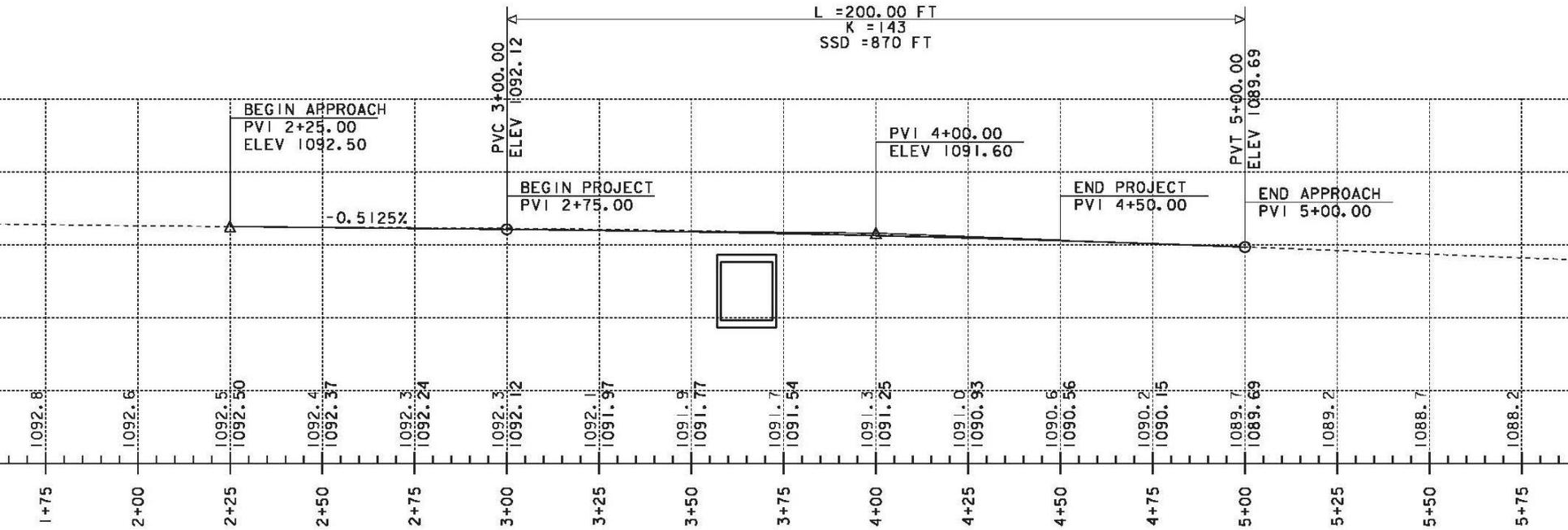
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Full Replacement - Layout



Full Replacement - Profile



VT 100 PROFILE

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Methods to Maintain Traffic

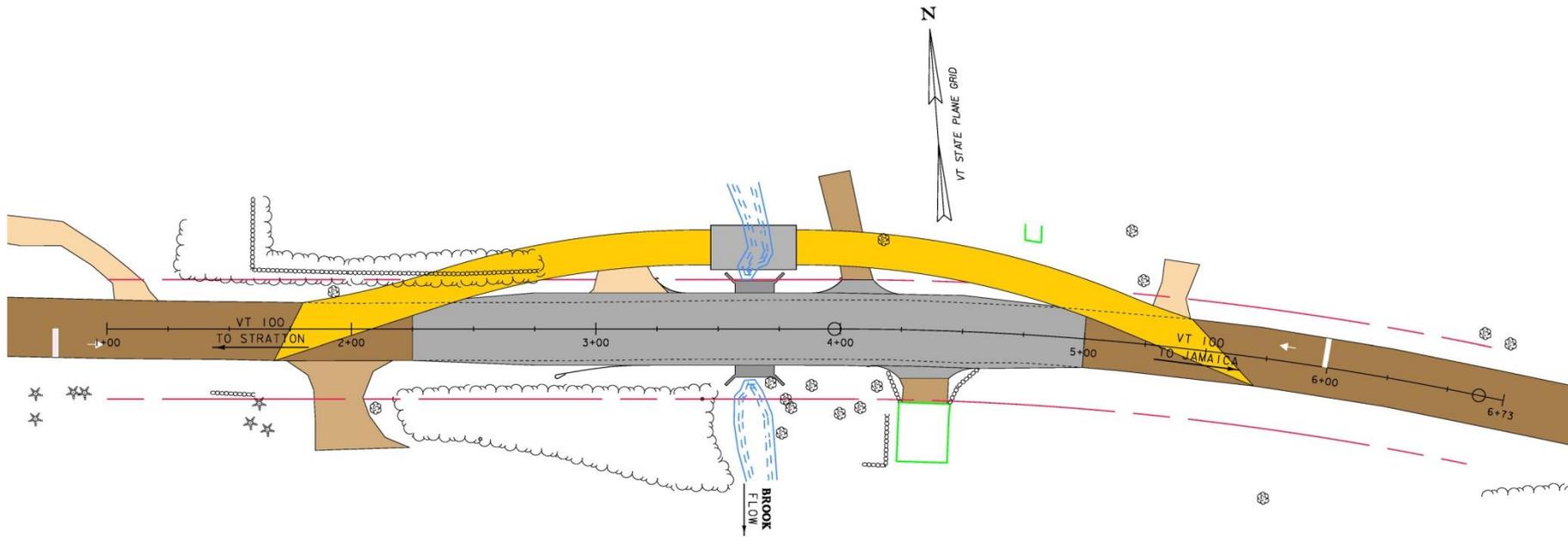
- Temporary Bridge
- Phased Construction
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Methods to Maintain Traffic

Temporary Bridge

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- Long project development duration
- Long construction duration
- High cost of development and construction

Temporary Bridge



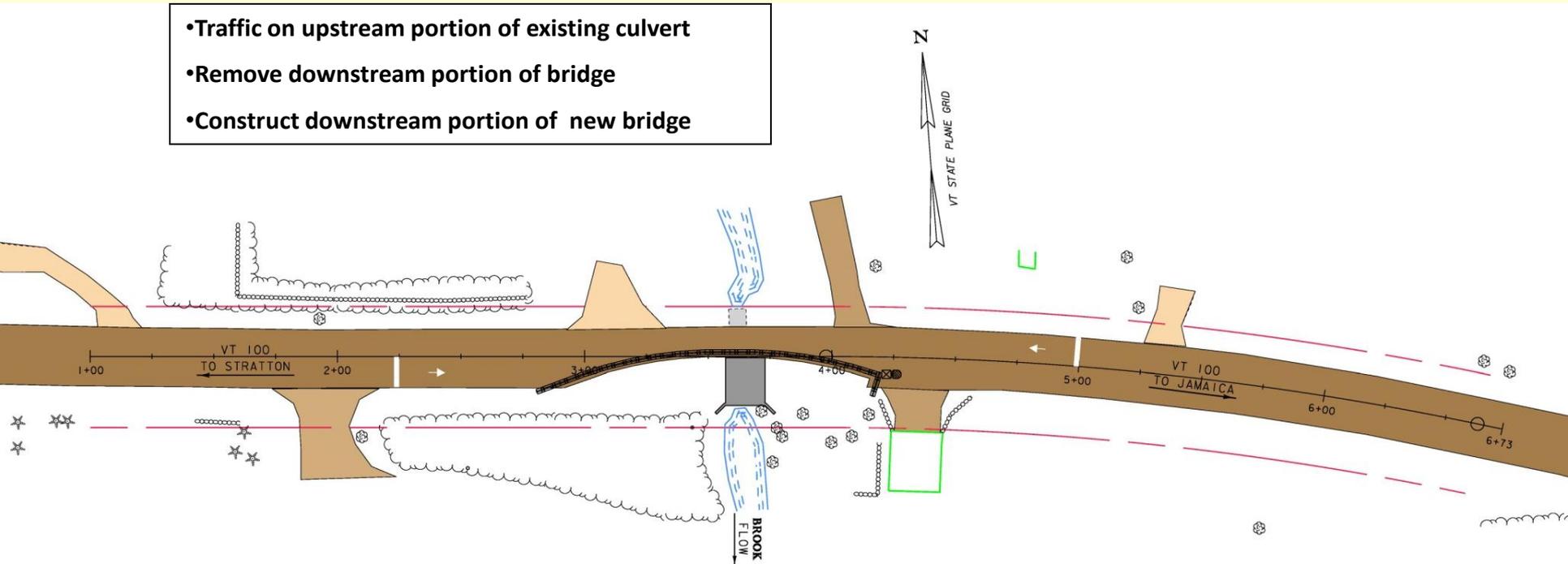
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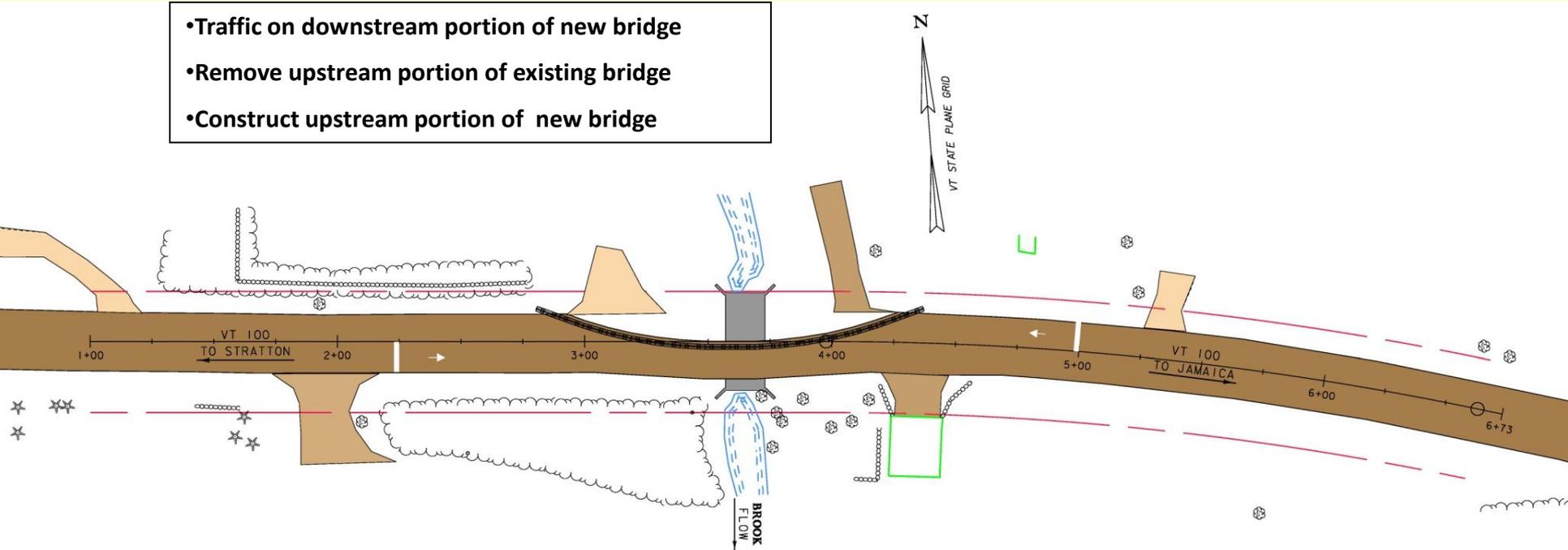
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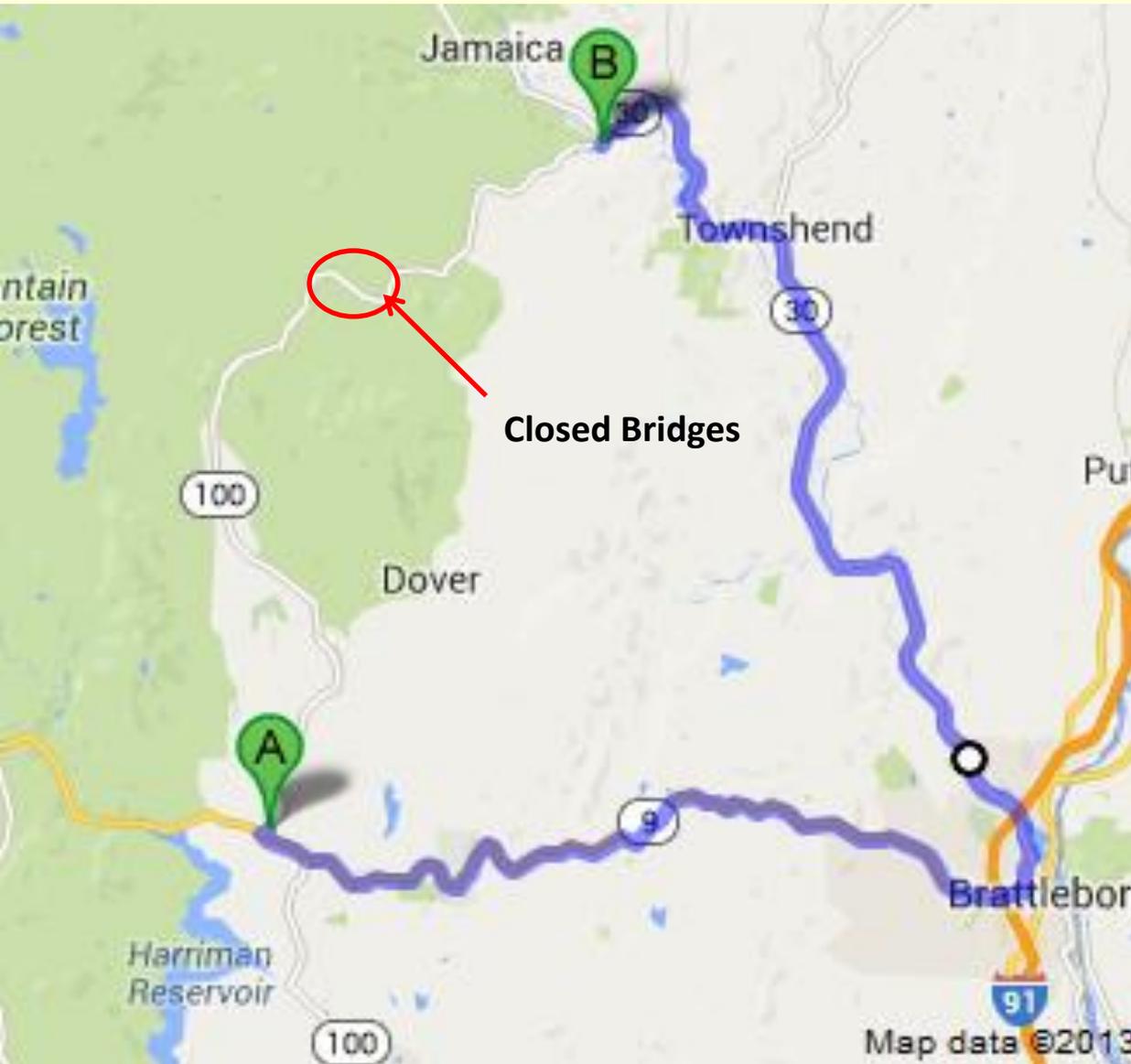


Methods to Maintain Traffic

Short-term bridge closure with ABC

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- Contract incentives/dis-incentives to encourage contractor
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Alternatives Matrix - Bridge 73

	Replacement w/ Off-site detour	Replacement w/ Phased Construction	Replacement w/ Temporary Bridge
Maintenance of Traffic	\$30,000	\$110,000	\$110,000
Construction w/ CE + Contingencies	\$466,000	\$591,000	\$597,000
Preliminary Engineering	\$117,000	\$148,000	\$150,000
Right of Way	\$26,000	\$32,000	\$33,000
Total Project Cost	\$609,000	\$771,000	\$780,000
Design Life	80 Years	80 Years	80 Years
Project Development Duration	>4 years	>4 years	>4 years
Construction Duration	3 months	8 months	8 months
Closure Duration	7 days	None	None

Conclusion and Recommendation

Bridge 73

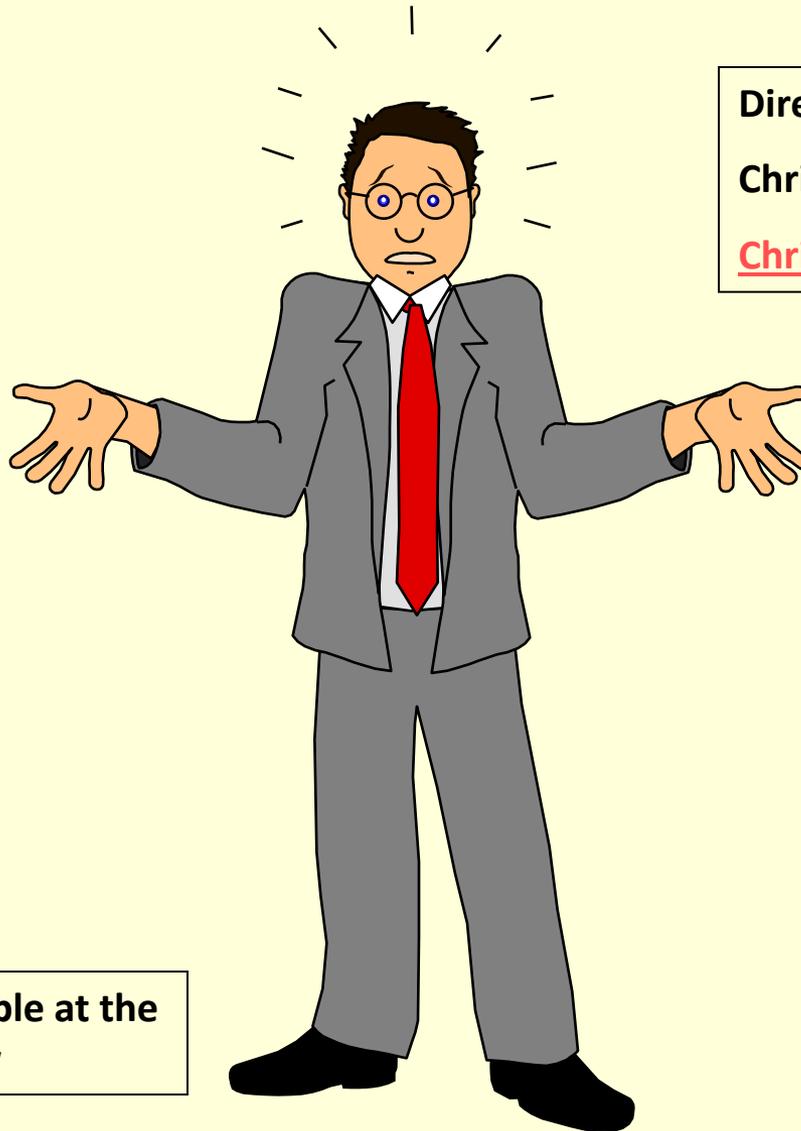
- Full Bridge Replacement using Phased Construction
- Long term (80 year) fix
- Addresses all sub-standard features
- Project Development time minimized
- Minimal mobility impacts
- Minimal impact to environmental resources
- Minimal impact to adjacent property owners

Next Steps

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

- Consider comments from this meeting
- Develop Conceptual Plans
- Hold Public 502 Hearing
- Consider bundling bridge 70 and 73 projects for design and/or construction

Questions



Direct any questions to:

Christopher P. Williams, P.E.

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This presentation is available at the
web address shown below

<https://outside.vermont.gov/agency/vtrans/external/Projects/Structures/13B072>