Popple Dungeon Road Culvert Replacement Alternatives Presentation Meeting

Presented To
Town of Chester, VT

Presented by
VHB

April 18, 2018

Meeting with you today

- **Julie Hance**, Local Project Manager
- **Derek Kenison**, VTrans Project Supervisor
- **Aaron Guyette**, PE, VHB Project Manager
- **Jason Keener**, PE, VHB Project Engineer

Popple Dungeon Road Culvert Location

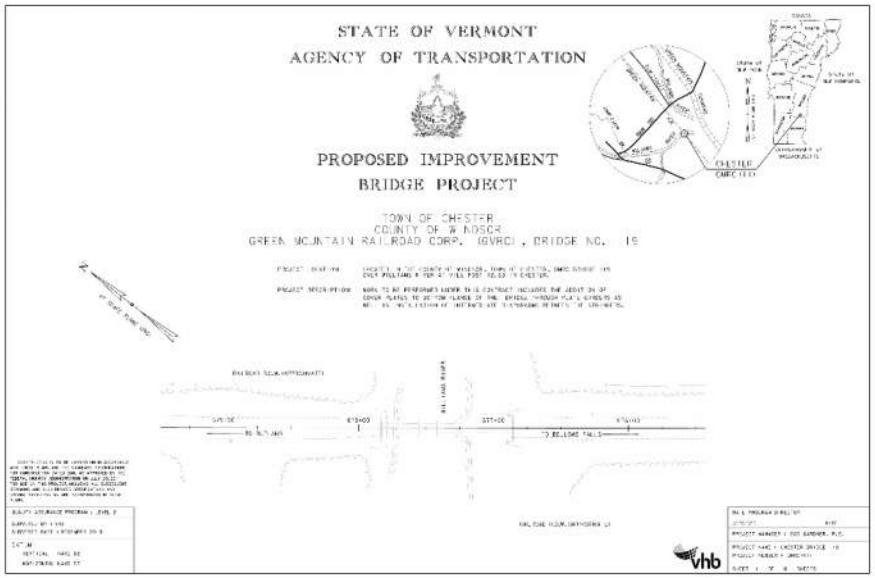
VTrans
Municipal Assistance Bureau
Project Development Process

Phase A - Project Definition

- Data Collection
- Local Concerns Meeting
- Purpose & Need Statement
- Alternatives Investigation
- ***Alternatives Presentation***
- Preferred Alternative Selection
- Conceptual Plans (25%)
- NEPA Documentation

Phase B – Project Design

- Preliminary Plans
- Environmental Permitting
- Right-Of-Way Process
- Final Plans (85%)
- Contract Plans (100%)



Phase C – Construction

- Bid Phase
- Field Construction
- Project Closeout

Existing conditions & Project concerns

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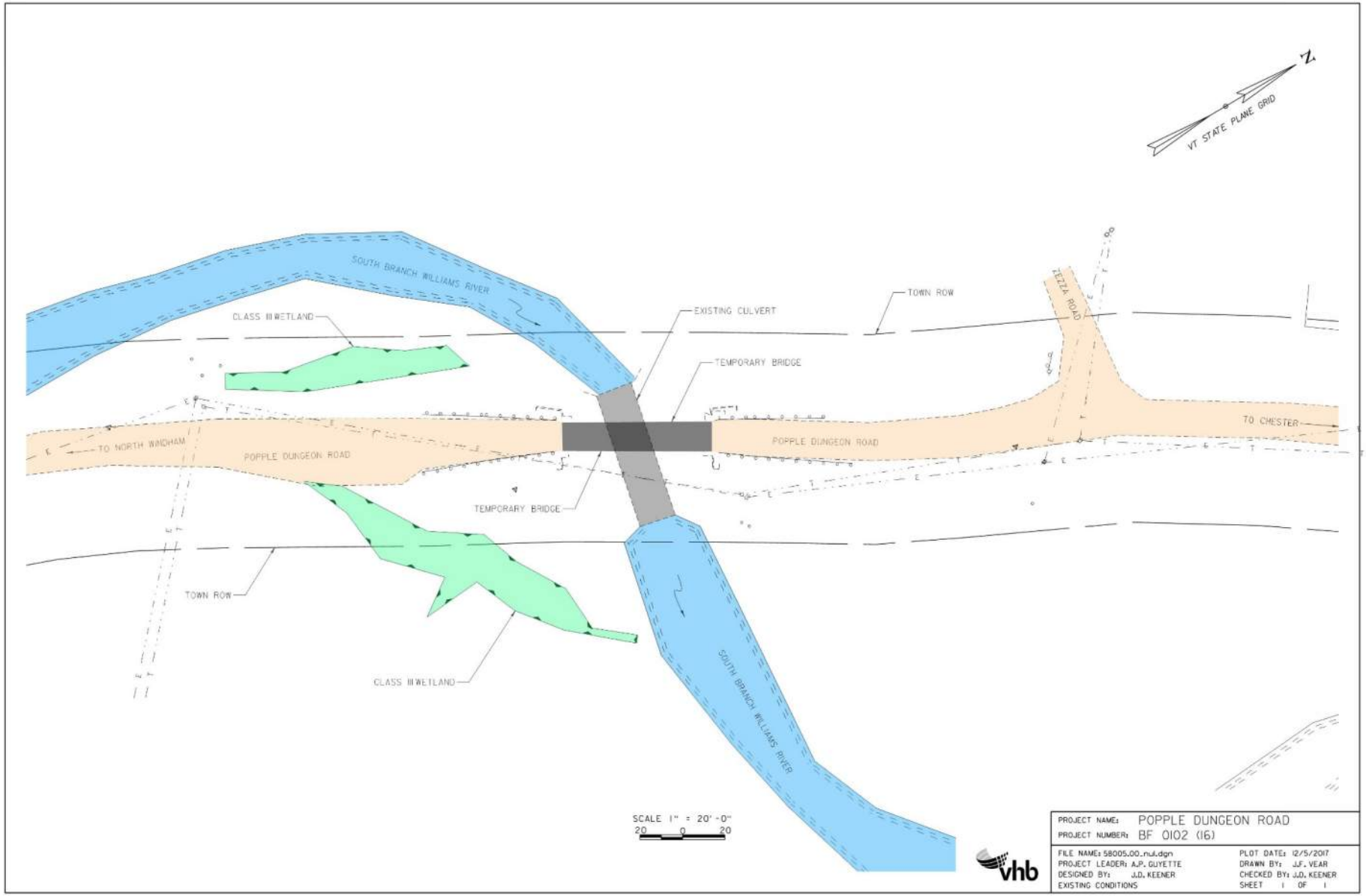
Culvert Deficiencies

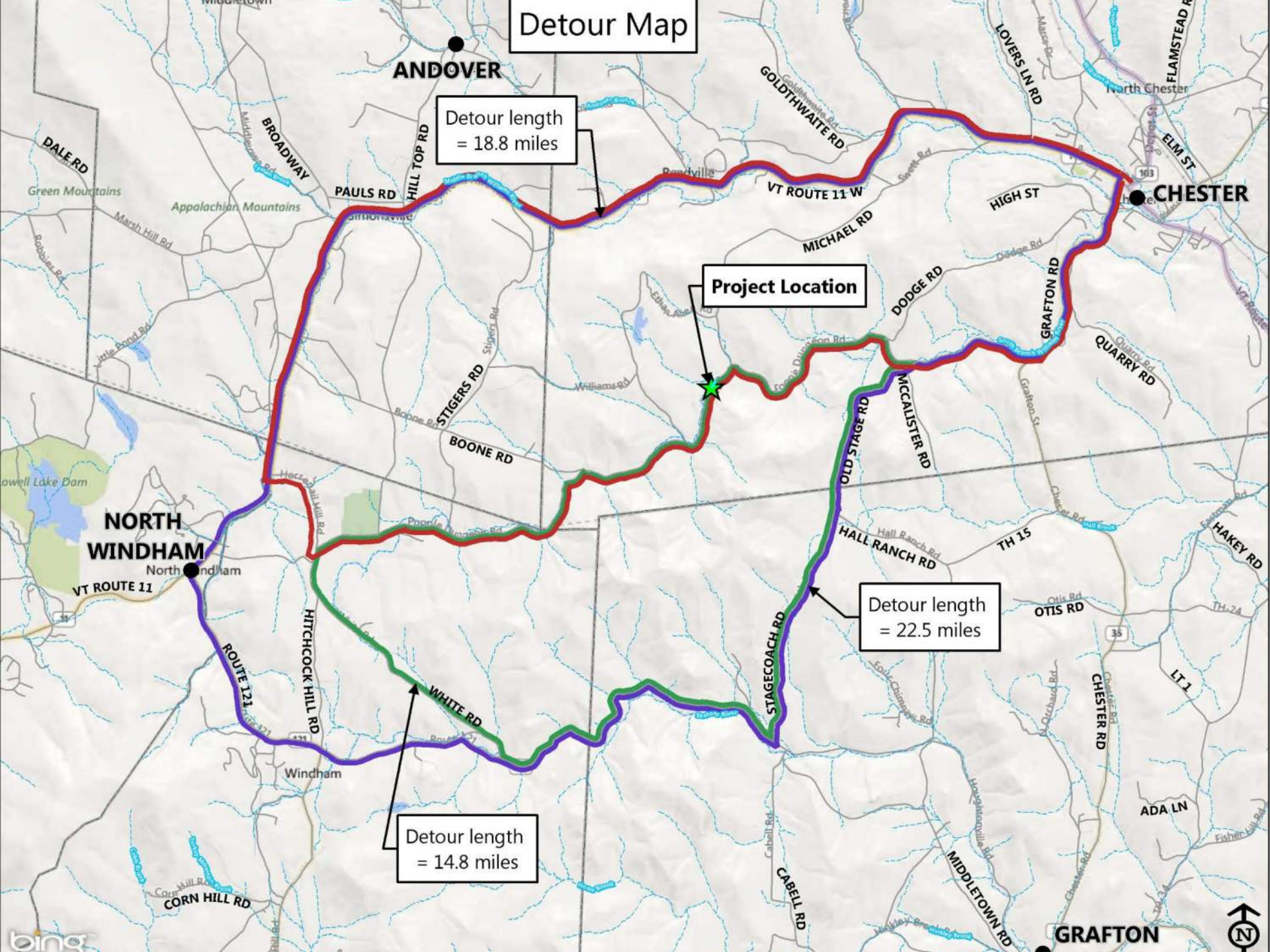
- Structural Deterioration
  - Undermining of Bottom and Sides
- Insufficient Hydraulic Capacity
  - Flooding of Popple Dungeon Road
- Aquatic Organism Passage
  - Perched Outlet
  - Non-Native Bottom
- Insufficient Width



Popple Dungeon Road Culvert Base Map

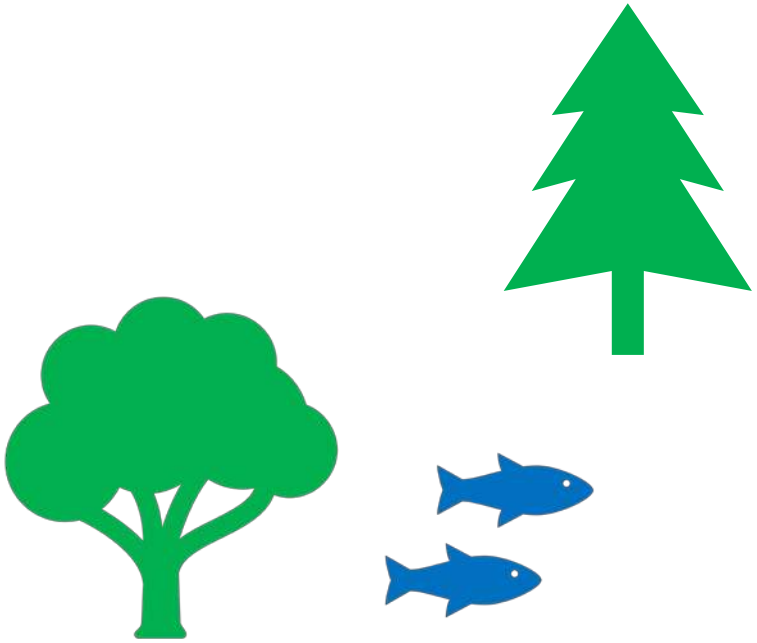
Project Concerns & Constraints

- Traffic Control
  - 15 Mile, 20-30 Minute Detour
- Permitting Requirements
  - Regulated Wetlands
  - Time of Year Restrictions (Fish & Bats)
- Rights-Of-Way
- Utilities
- Others


Detour Map
ANDOVER
Detour length
= 18.8 miles
CHESTER
Project Location
NORTH
WINDHAM
Detour length
= 22.5 miles
Detour length
= 14.8 miles
GRAFTON
DALE RD
BROADWAY
PAULS RD
HILL TOP RD
GOLDTHWAITE RD
LOVERS LN RD
FLAMSTEAD RD
ELM ST
VT ROUTE 11 W
HIGH ST
MICHAEL RD
DODGE RD
GRAFTON RD
QUARRY RD
STIGERS RD
BOONE RD
OLD STAGE RD
MCCALISTER RD
HALL RANCH RD
TH 15
HAKEY RD
OTIS RD
VT ROUTE 11
ROUTE 121
HITCHCOCK HILL RD
WHITE RD
STAGECOACH RD
CHESTER RD
LT 1
ADA LN
CABELL RD
MIDDLETOWN RD
CORN HILL RD
Green Mountains
Appalachian Mountains
North Chester
Windham

Anticipated Permitting Constraints

- In-Stream work windows
- Minimize and avoid disturbance to wetlands
- Tree cutting time of year restrictions



Previous Public Input

- Detour Concerns
- Emergency Response Time
- Noise Levels
- Funding & Cost

Project goals, objectives & alternatives

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Purpose and Need

"The purpose of the Popple Dungeon Road Culvert Replacement Project is to enhance mobility for all modes of transportation, improve safety and reliability of the structure, and ensure appropriate balance between transportation infrastructure and the natural environment."

Project Goals & Objectives

- Replace the existing culvert with a structure that meets current design standards
  - 22ft wide roadway
- Pass flows during major storm events
  - 140sf minimum waterway opening
- Allow for passage of aquatic organisms
  - 24ft bankfull width
- Minimize traffic control impacts

Project Alternatives

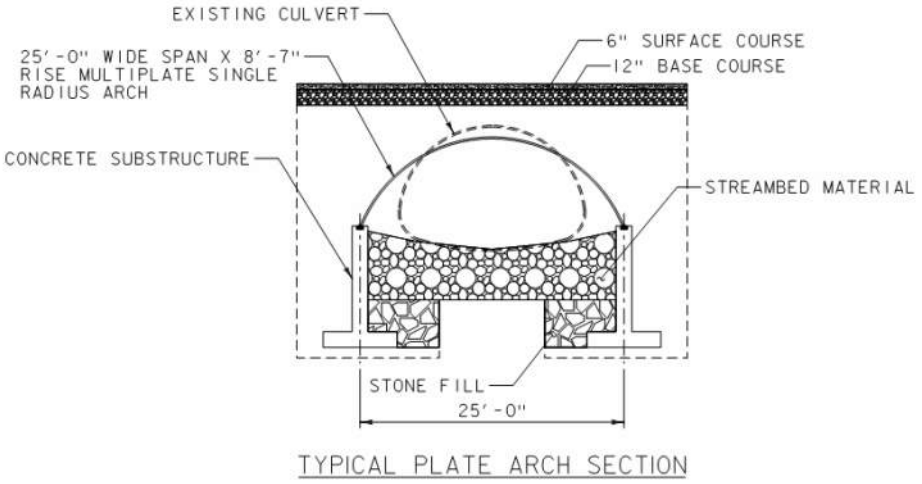
- Alternative A - “Do Nothing” alternative
- Alternative B - Structural plate arch culvert with onsite temporary bridge
- Alternative C - Cast-in-place concrete slab superstructure with onsite temporary bridge
- Alternative D - Precast/prestressed concrete slab superstructure with accelerated bridge construction

Alternative A

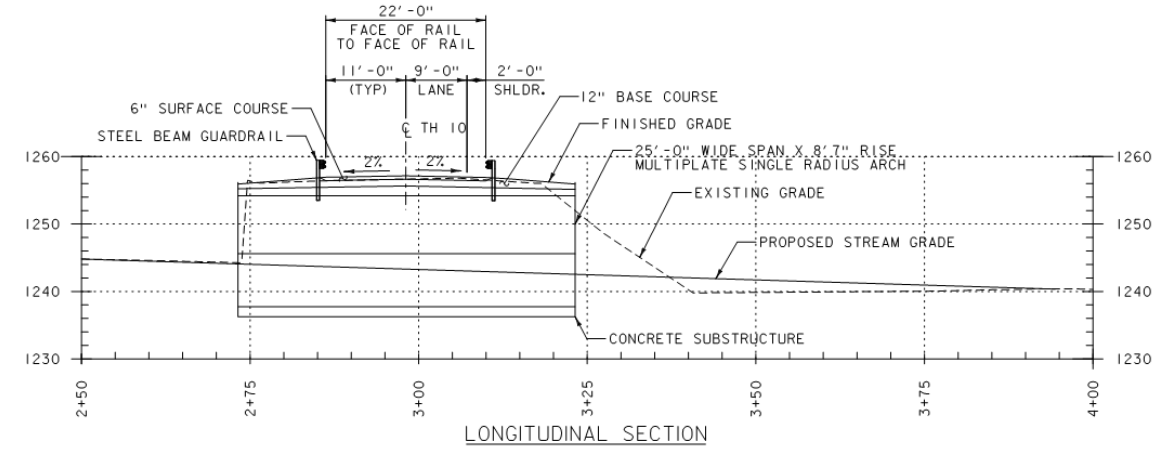
- Do nothing
- Maintain existing culvert and roadway
- Maintain current temporary bridge

Alternative B

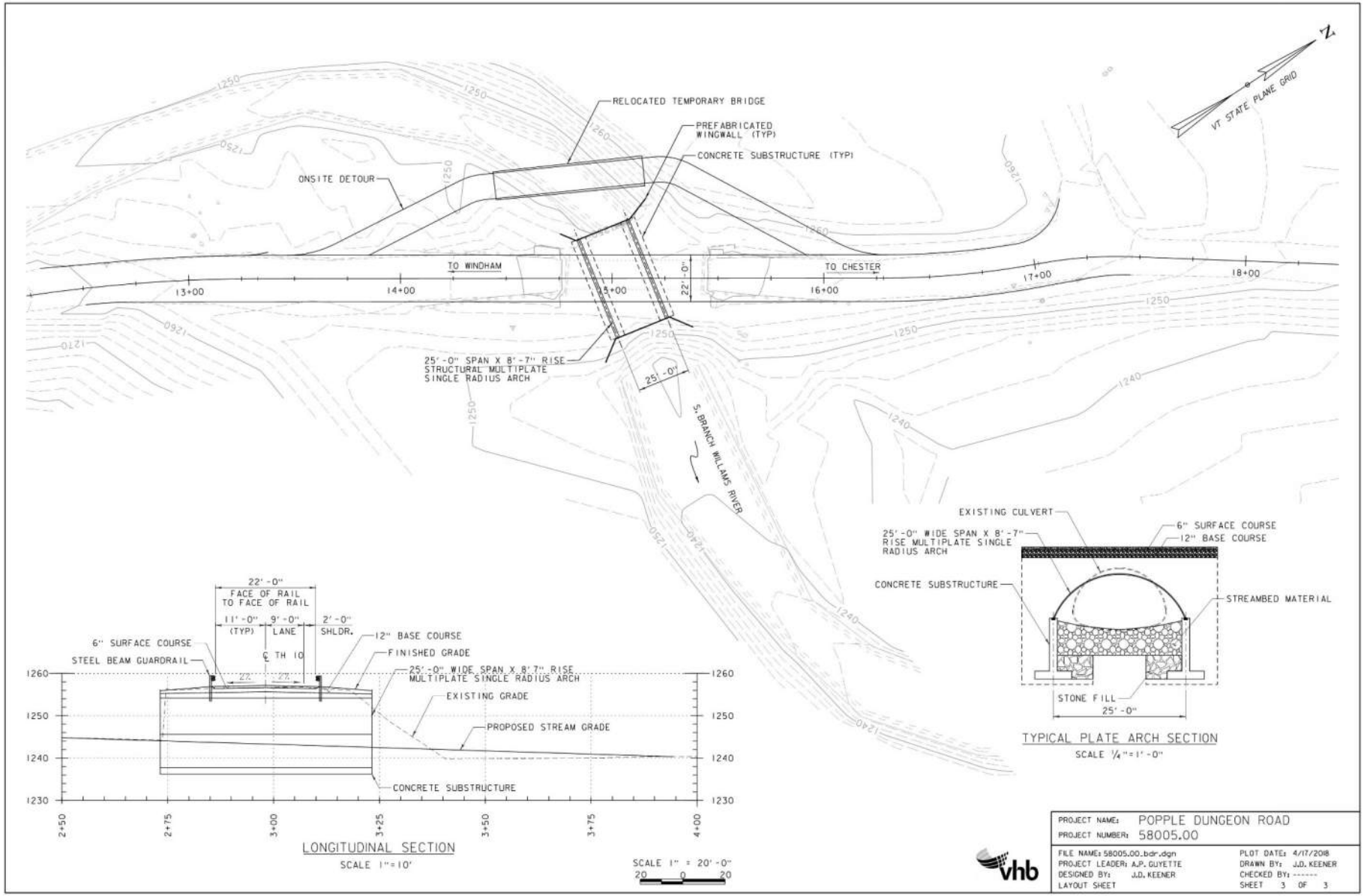
- Steel or aluminum structural plate arch culvert
- Cast-in-place concrete substructure
- On-site detour using temporary bridge



TYPICAL PLATE ARCH SECTION



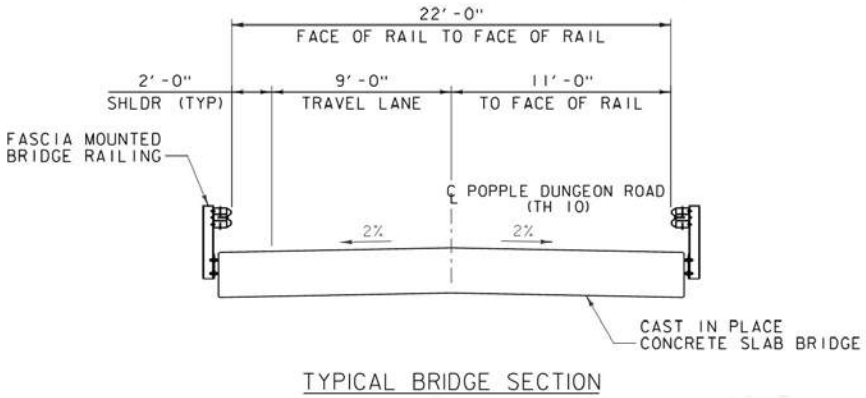
LONGITUDINAL SECTION



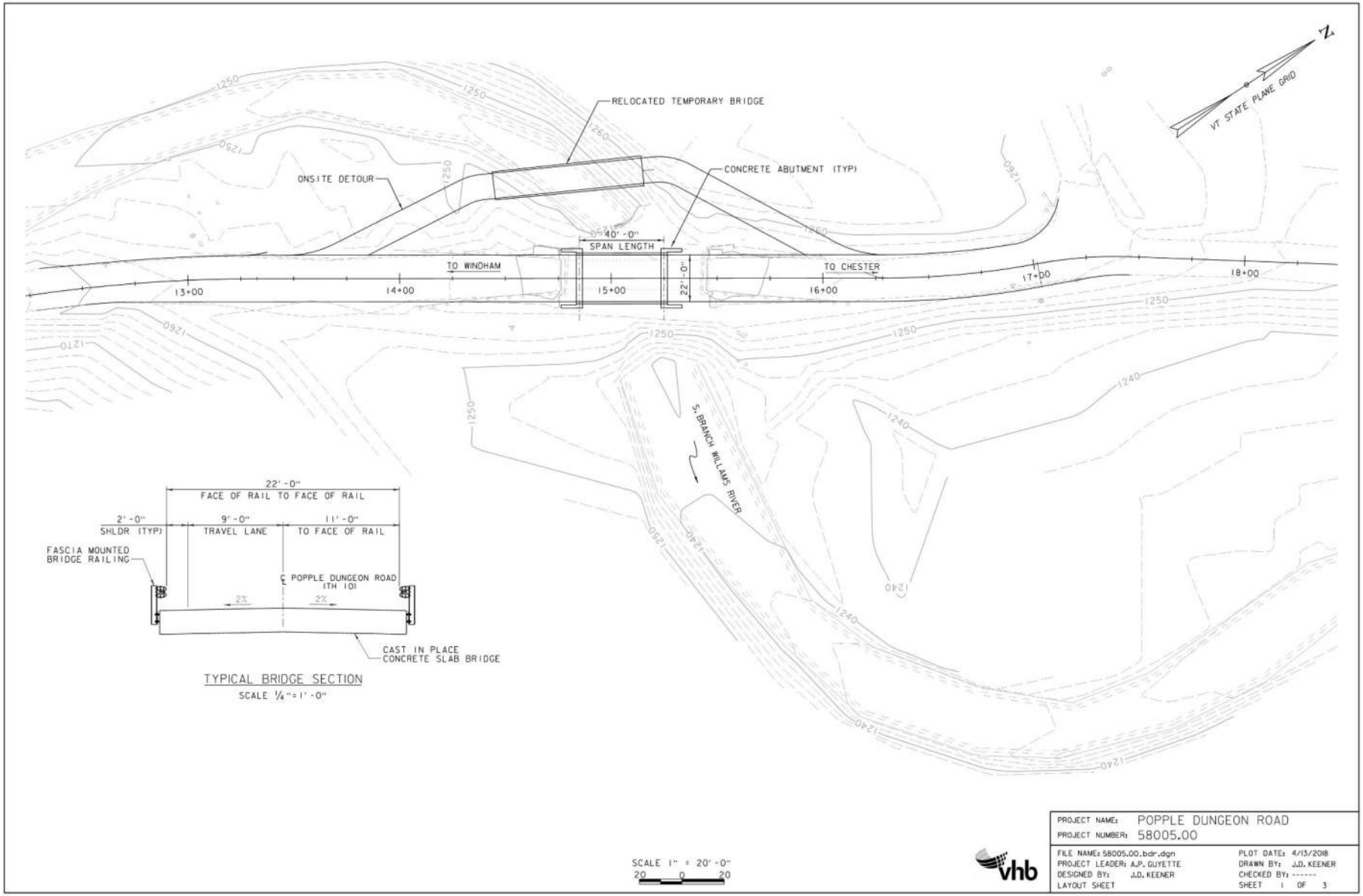
Alternative B - structural plate arch culvert alternative

Alternative C

- Cast-in-place concrete slab superstructure
- Cast-in-place concrete substructure on driven piles
- On-site detour using temporary bridge



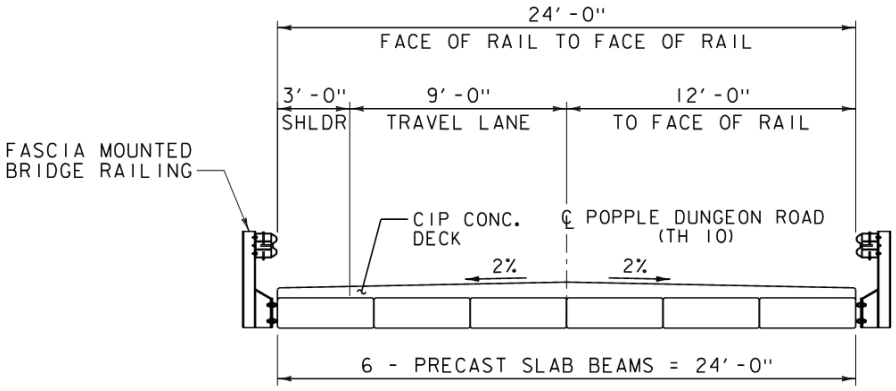
TYPICAL BRIDGE SECTION



Alternative C - cast-in-place concrete slab alternative

Alternative D

- Precast/prestressed concrete slab superstructure
- Precast concrete substructure on driven piles
- Off-site detour using w/ short duration road closure (21 days maximum)



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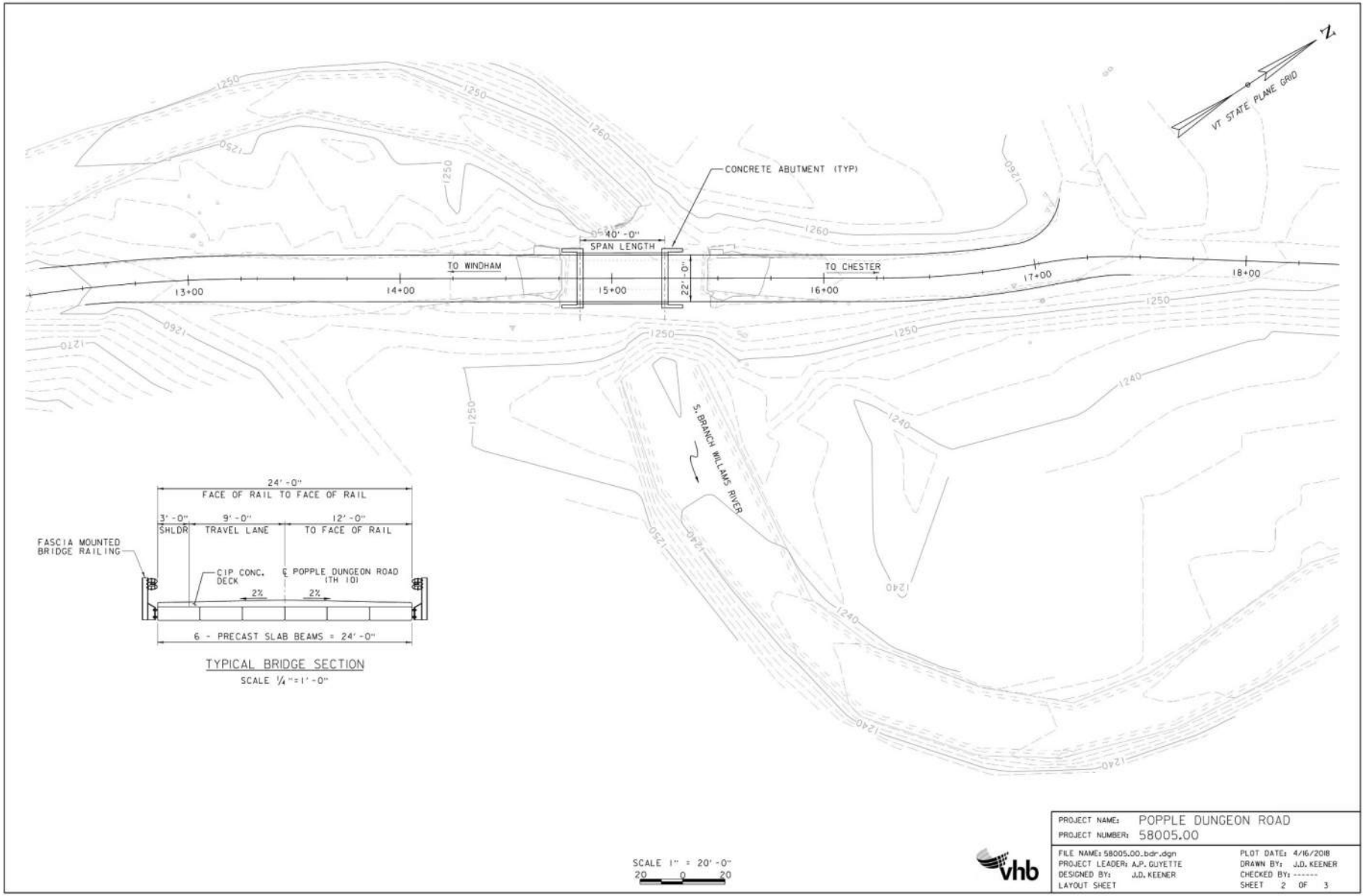
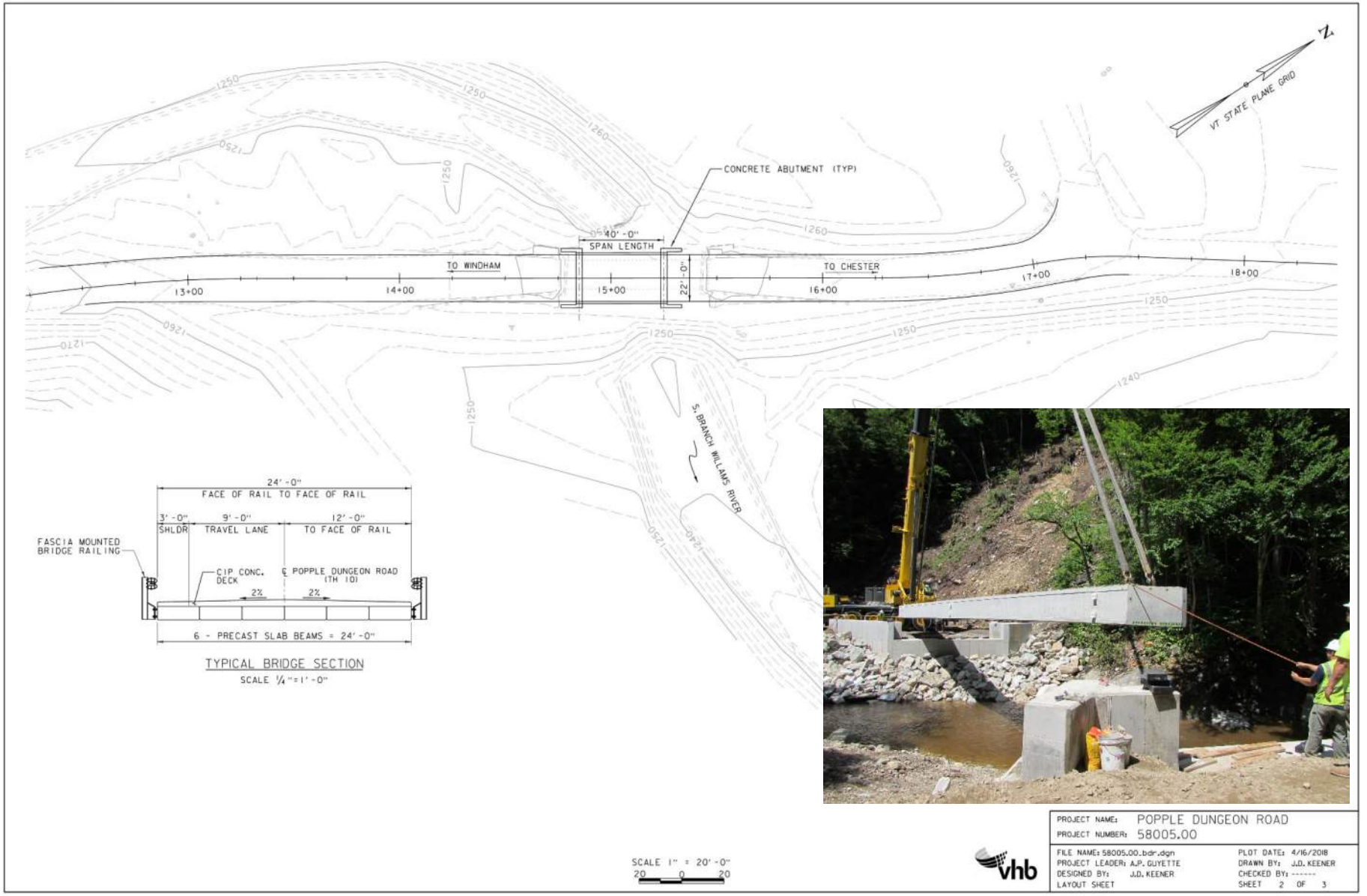


Alternative D - precast/prestressed concrete slab alternative

Alternatives comparison

	Plate Arch	CIP Slab	Precast Slab
Cost	$678,000	$700,000	$692,000
Advantages	Lowest Cost	AOP improvements	Shortest construction schedule
	Familiar construction	Familiar construction	Most environmental benefits
	No specialized equipment	Low maintenance structure	Low maintenance structure
			Smallest impact area
Disadvantages	Shortest design life	Highest cost	Mid-Range Cost
	Mid-range construction duration	Longest construction duration	Requires crane for pile installation
	Least environmental benefits	Requires crane for pile installation	Off-Site Detour
	Large impact area	Large impact area	



Recommended Alternative - Precast/prestressed concrete slab

Next Steps

- Finalize Alternatives Report
- Submit Alternatives Report with Recommended Alternative
- Town provides written response with Preferred Alternative
- Conceptual Design

Project Milestones

- Conceptual Plans – April/May2018
- Preliminary Plans – Spring 2018
- Right-Of-Way/Permitting – Spring/Summer 2018
- Final Design – Summer 2018
- Bid Phase – Fall 2018
- Construction – 2019

Questions

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