Reading ER P23-1(404)
Selectboard Presentation

VT 106 – Bridge #12 over North Branch Black River

September 9, 2024

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Introductions

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VTrans Structures Lead Design Engineer

Jeff DeGraff, P.E.

VTrans Hydraulics Project Engineer

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Agenda

- Provide an update to project development
- Project overview and existing conditions
- Hydraulic analysis
- Proposed design and plans
- Traffic management plan
- Project schedule and timeline
- Provide an opportunity to ask questions and voice any concerns

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Location Map

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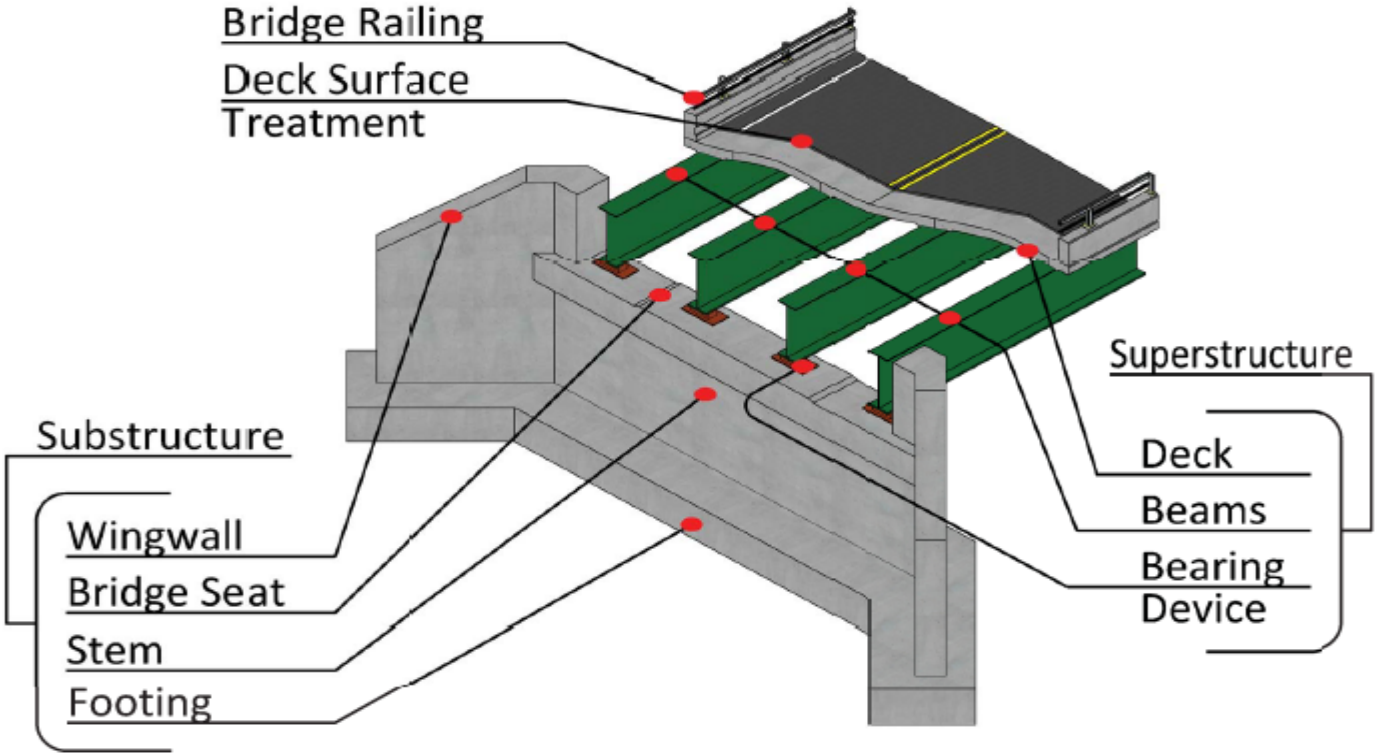
Project Overview

Bridge Terminology Description



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Looking North over Bridge

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Bridge #12

- Roadway Classification – Major Collector
- Bridge Type – 52’ single span girders
- Ownership – State of Vermont
- Constructed in 1940

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Existing Conditions - Bridge #12

- Deck Rating 6 (Satisfactory)
- Superstructure Rating 6 (Satisfactory)
- Substructure Rating 6 (Satisfactory)
- 24-month Inspection Frequency (from June 2023)

Deck - Concrete

- Spalling concrete in curbs and fascia
- Exposed rebar

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Deck - Joints

- Need to be repaired as potholes have started

Superstructure – Steel Beams

- Corrosion
- Section loss

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Substructure - Abutment

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- Minor voids, missing stones, unsure of age of stone abutment

Design Criteria and Considerations

- Criteria:
  - Average Daily Traffic (ADT) - 2,056 vehicles per day
  - Design Hourly Volume - 258 vehicles per hour
  - % Trucks: 4.7%
  - Design speed of 35 mph
  - Vertical sight distance standards
  - Bridge width standards
  - Waterway clearance and hydraulic capacity
- Considered:
  - Right-of-Way needed; Utility relocation needed
  - Adjacent property owners and drives
  - Historically sensitive properties
  - Nearby elementary school

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Alternatives Considered

- No Action
  - Additional maintenance required within 10 years
- Rehabilitation
  - Repair any spalling concrete, replace missing stone in abutments, and replacement of joints
  - New sidewalk/ curbs poured
  - 30-year design life
- Superstructure Replacement
  - New girders, bearings, deck, bridge rail, and bridge joints
  - Would address the maintenance issues (curb spalling, poor joints)
  - 40-year design life
- Full Bridge Replacement
  - Maintain existing alignment
  - 75-year design life

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Proposed Bridge Replacement – Bridge #12

- Full Bridge Replacement
  - New longer and shallower superstructure with concrete deck on galvanized steel beams
  - Increased hydraulic capacity
  - Widen Bridge to 11’/4’ typical each side to match corridor and provide bicycle/ pedestrian shoulder accommodations
    - Currently 11’/4’ (with sidewalk) on only one side and 11’/0’ other side
  - Meets all geometric criteria
    - Increasing sight distance
    - 2% roadway crown and vertical curve to promote runoff
  - Integral abutments with piles driven to bedrock
    - Flood resiliency
  - ROW needed; Minor utility relocation
  - 75-year design life
  - Anticipated Construction – Summer 2026

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Recommended Design Alternative

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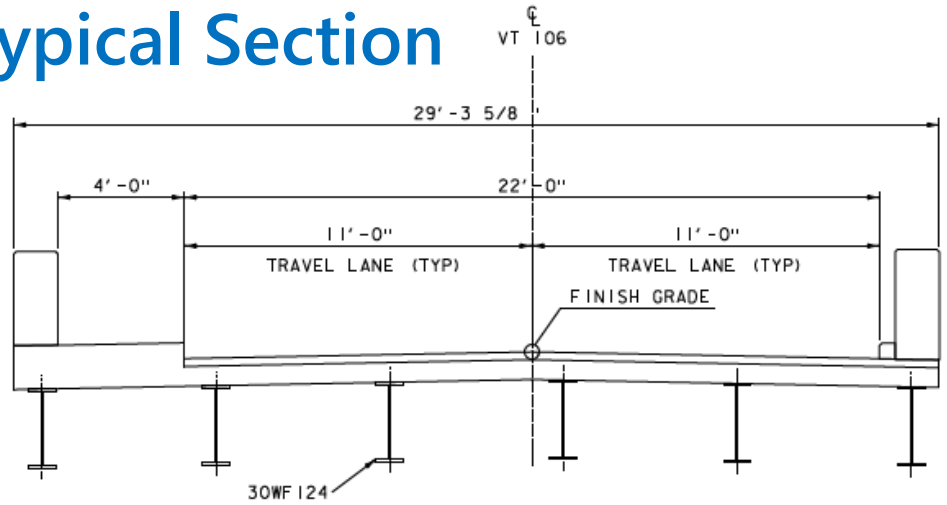
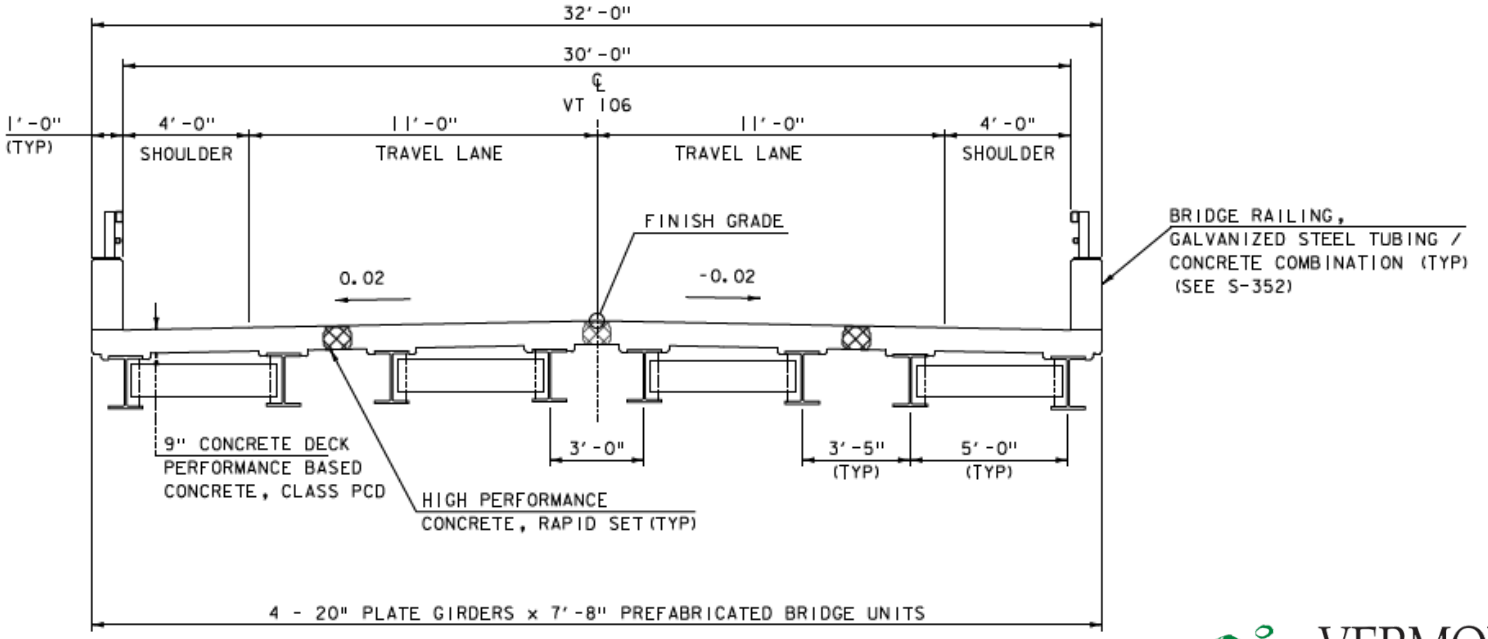
Proposed Typical Section



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



PROPOSED BRIDGE TYPICAL SECTION
SCALE 3/8" = 1'-0"

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Proposed Layout

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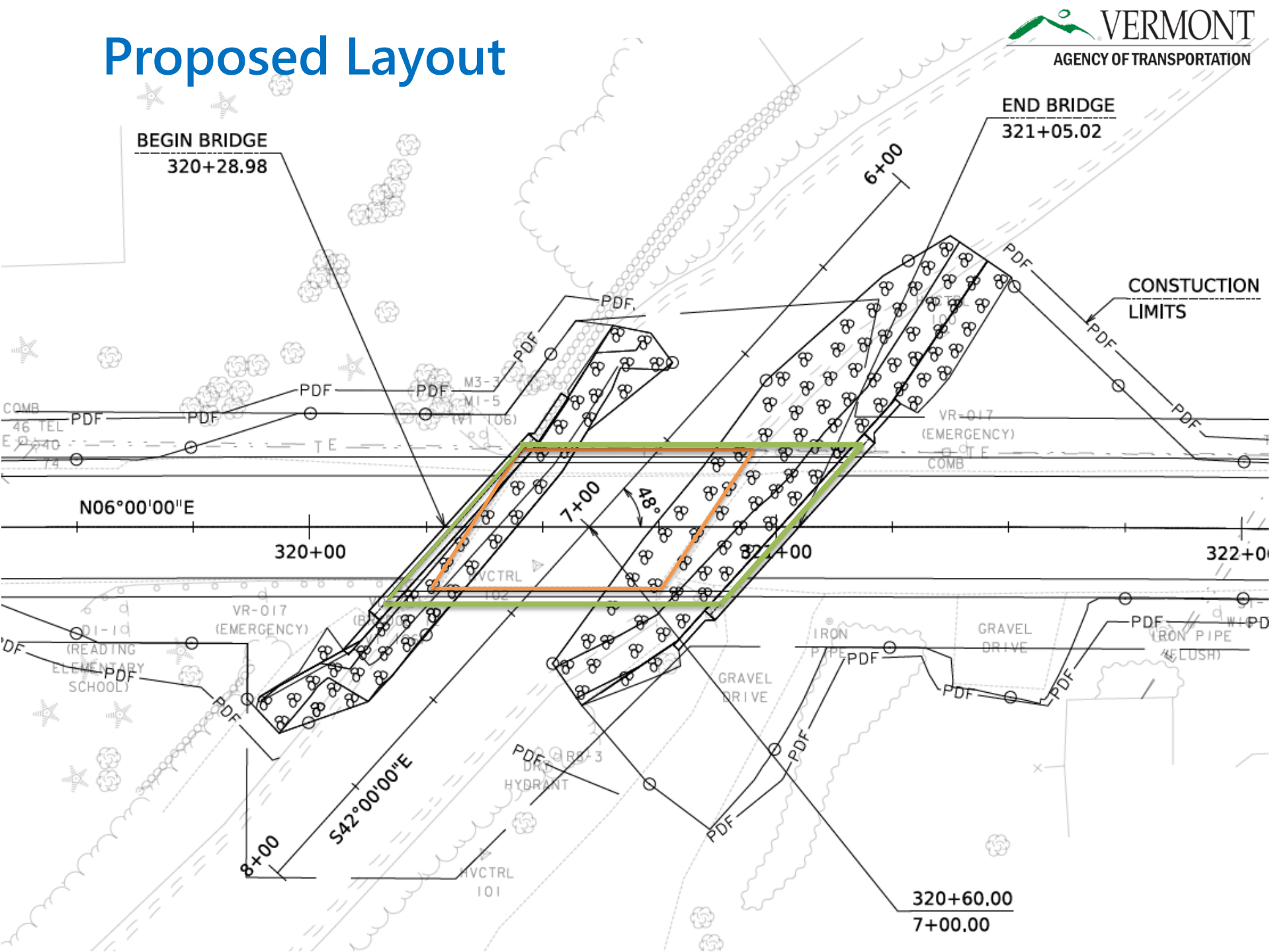
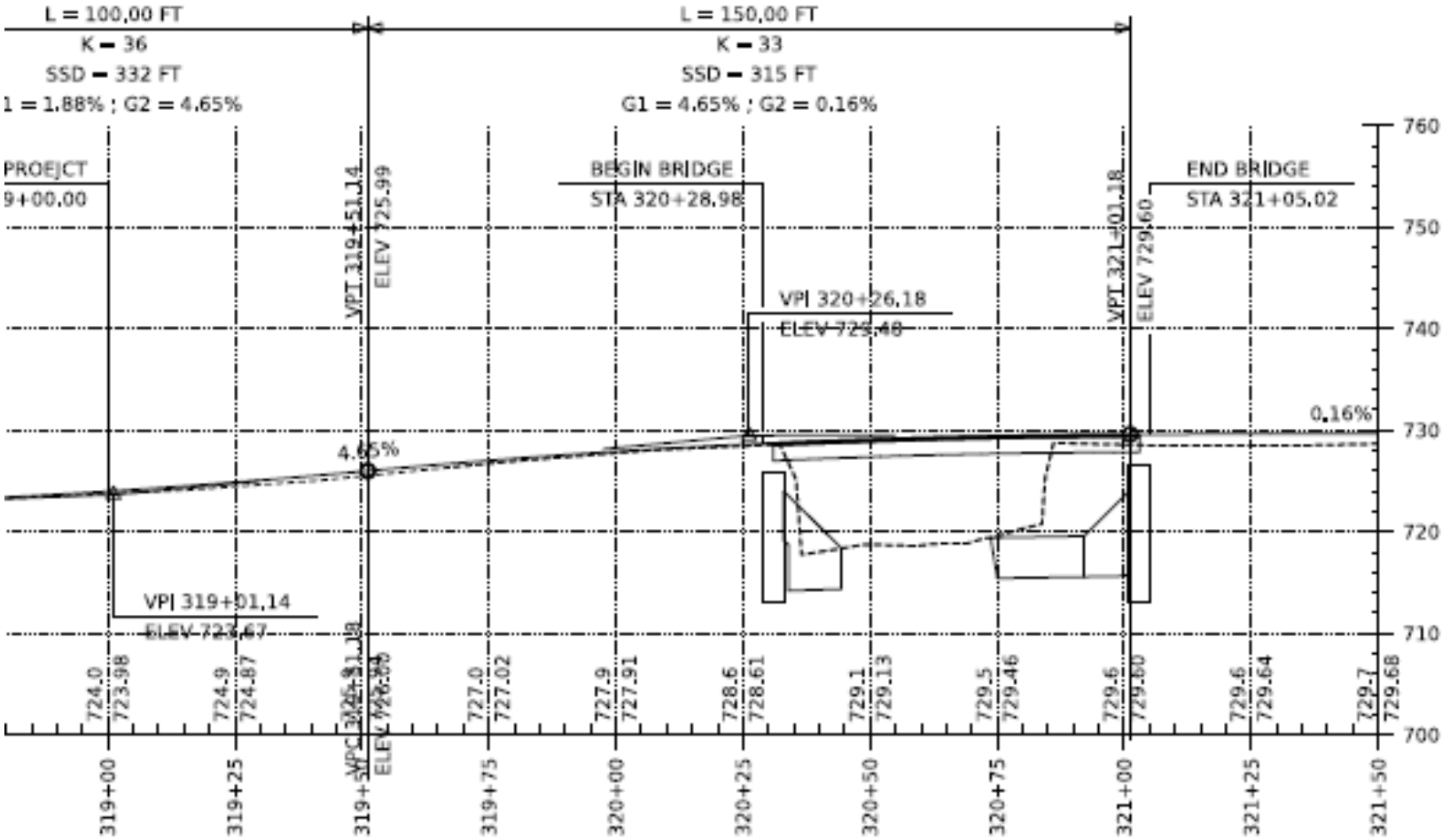


Proposed Profile



VT106 - PROFILE 1

1"=20'-0" HORIZONTAL

1"=10'-0" VERTICAL

Maintenance of Traffic Options Considered

- Temporary Bridge
- Phased Construction
- Road Closure with Offsite Detour and Accelerated Bridge Construction Techniques to shorten duration

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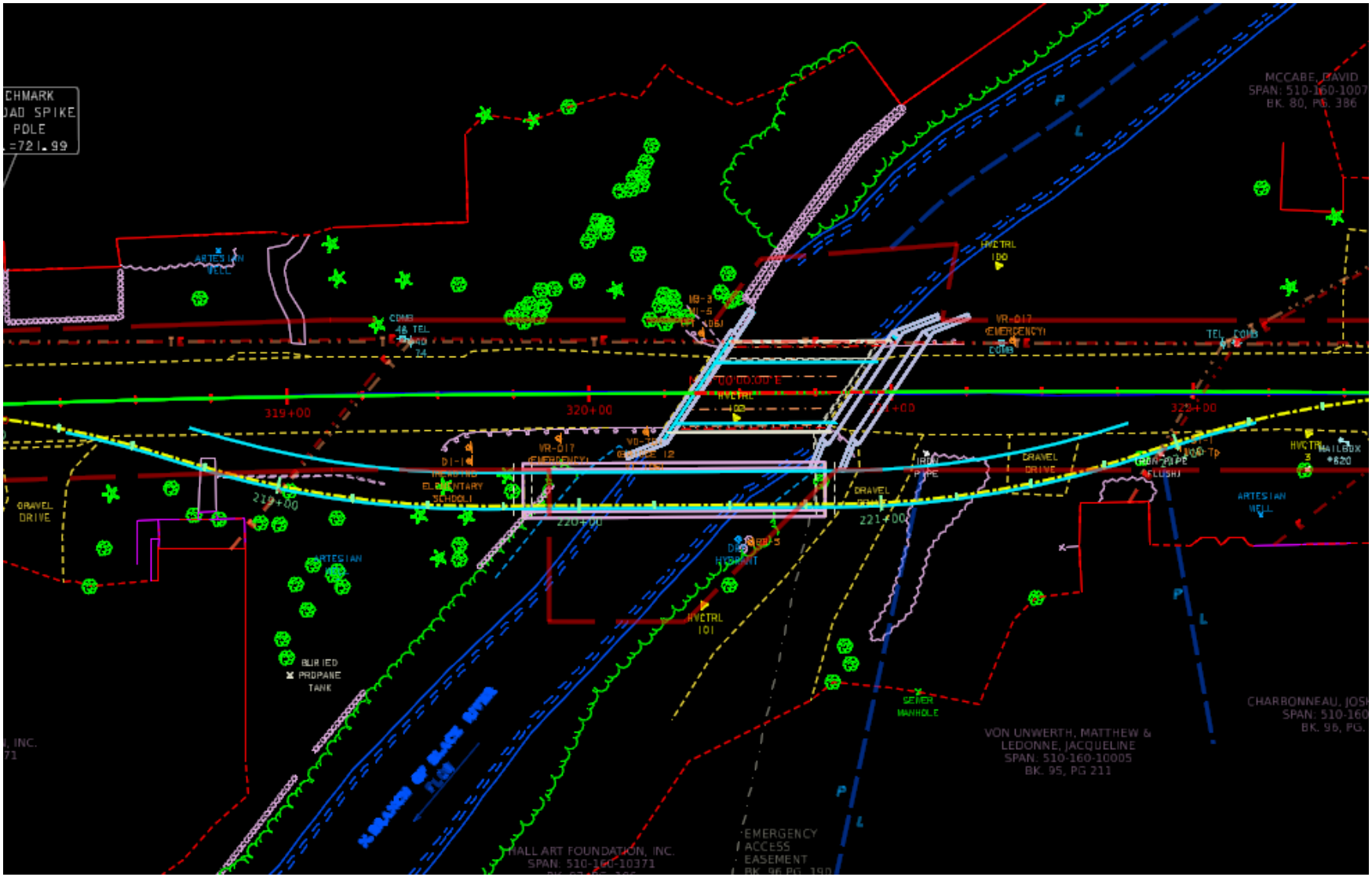

Temporary Bridge

- Layout of One Lane Temporary Bridge on downstream side

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Phased Construction

- One lane traffic maintained per side
- Work Completed in 2-phases
- Tight proximity between traffic and workers
- Narrow bridge site
- Longest duration, highest cost

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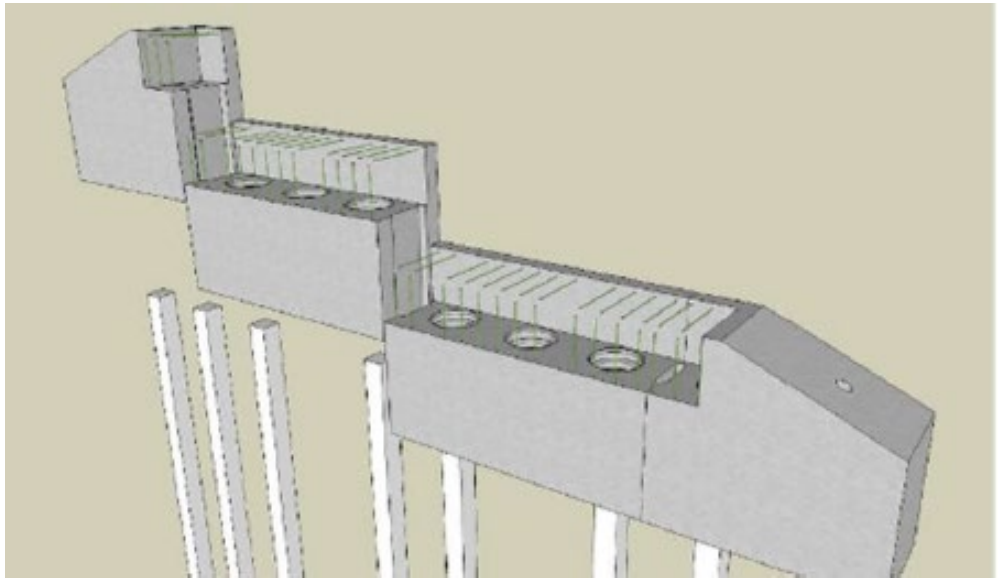

Road Closure

- Detour: chosen and signed by State
- 4-week closure (Bridge replacement option)
  - While school out of session
  - Alternating traffic control with flaggers outside closure period
- Innovations to reduce closure duration
  - Prefabricated Bridge Units (PBU's)
  - Precast abutments
- Preferred Traffic Control Option
  - Safest option to keep traffic away from construction area
  - Shortest construction duration
  - Least expensive option
  - Longest life expectancy; less maintenance

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Traffic Control – Offsite Detour

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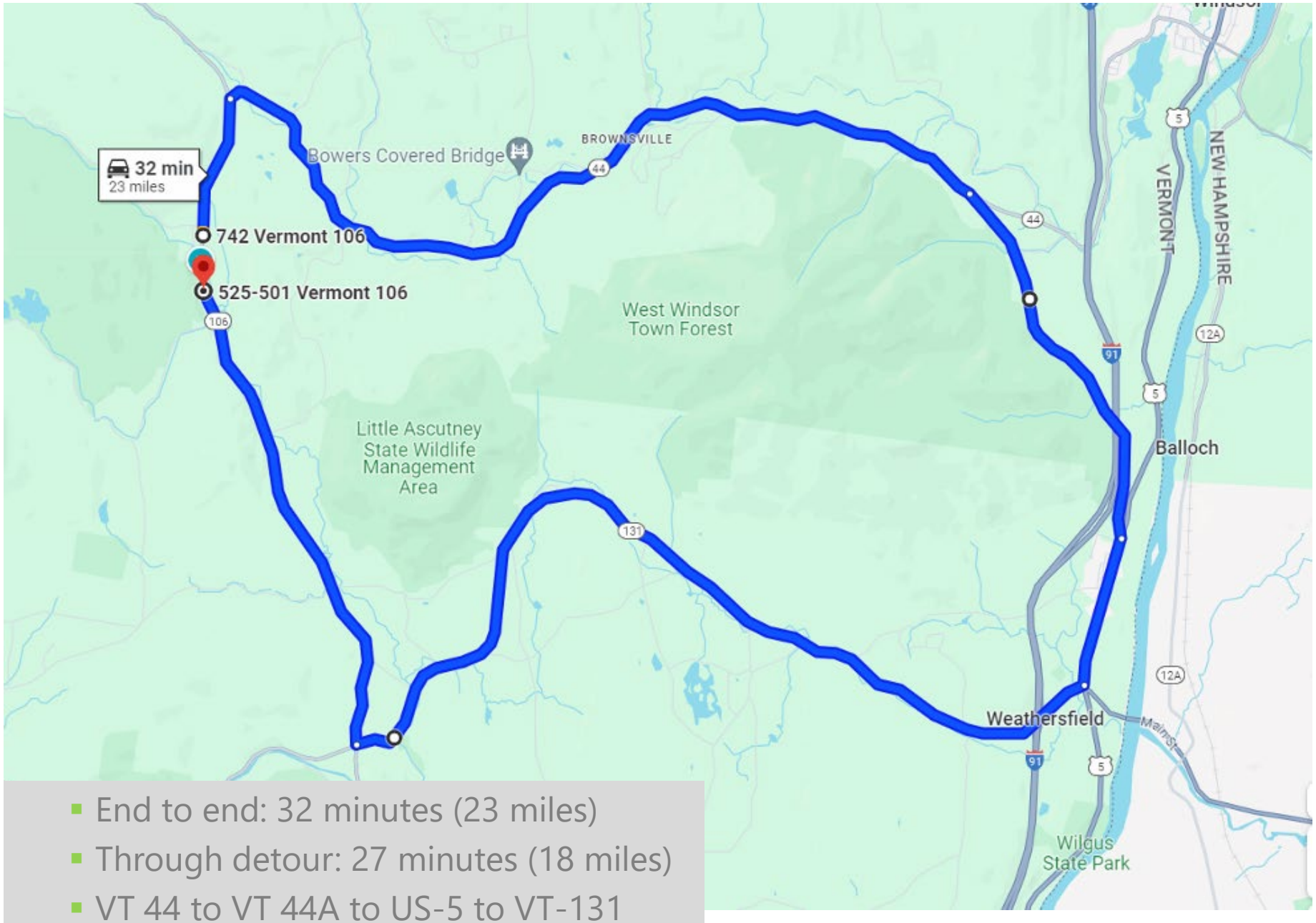

- End to end: 32 minutes (23 miles)
- Through detour: 27 minutes (18 miles)
- VT 44 to VT 44A to US-5 to VT-131

Project Schedule

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Reading ER P23-1(404) Development Schedule	
Scoping	Complete
Conceptual Plans	Complete
Preliminary Plans	Fall/Winter 2024
Permitting	Summer 2025
Final Plans	Summer 2025
Right-of-Way Clear	Fall 2025
Contract Plans	October 2025
Bid Advertisement	November 2025
Construction	April 2026 – October 2026 (Bridge closure 4 weeks during summer months while school out of session. Alternating one-way traffic with flaggers before and after closure period)

For more information:

- https://outside.vermont.gov/agency/vtrans/external/Projects/Structures/23b770

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Questions and Comments

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