SR 1033-008 over I-83 and Mill Creek

Sherman Street Bridge Modification/Extension

NORTH 83 YORK WIDENING PROJECT

Stantec

pennsylvania DEPARTMENT OF TRANSPORTATION

ASHE Harrisburg

ASHE Altoona / PennDOT District 9-0 Joint Workshop

April 23, 2026

Presented By:
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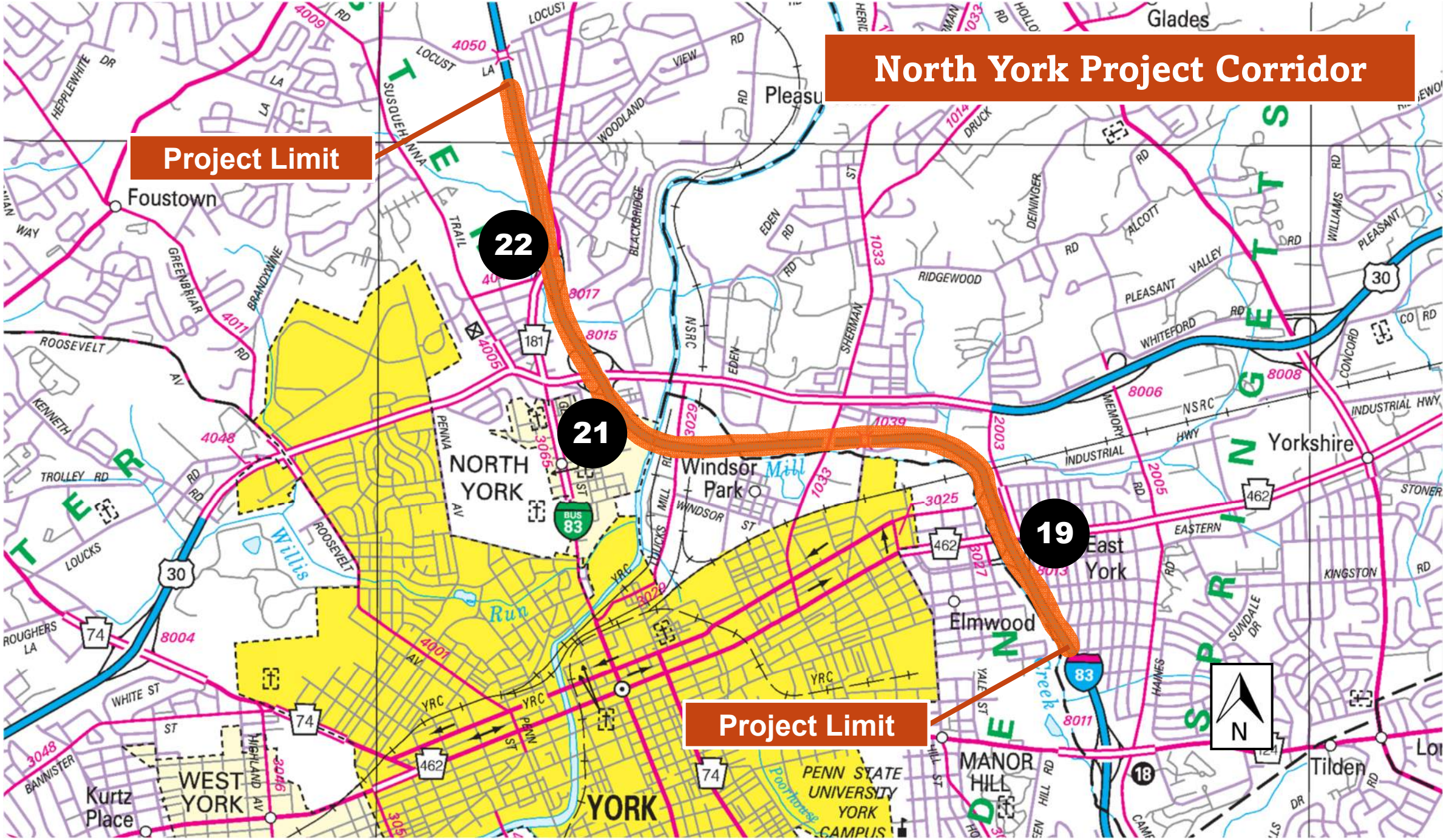
Associate, Sr. Structural Engineer
Stantec Consulting Services Inc.

Overall I-83 North York Widening Project


North York Project Corridor
Project Limit
Project Limit
22
21
19
Foustown
NORTH YORK
Windsor Park
Yorkshire
East York
Elmwood
WEST YORK
Kurtz Place
YORK
MANOR HILL
Tilden
PENN STATE UNIVERSITY YORK CAMPUS
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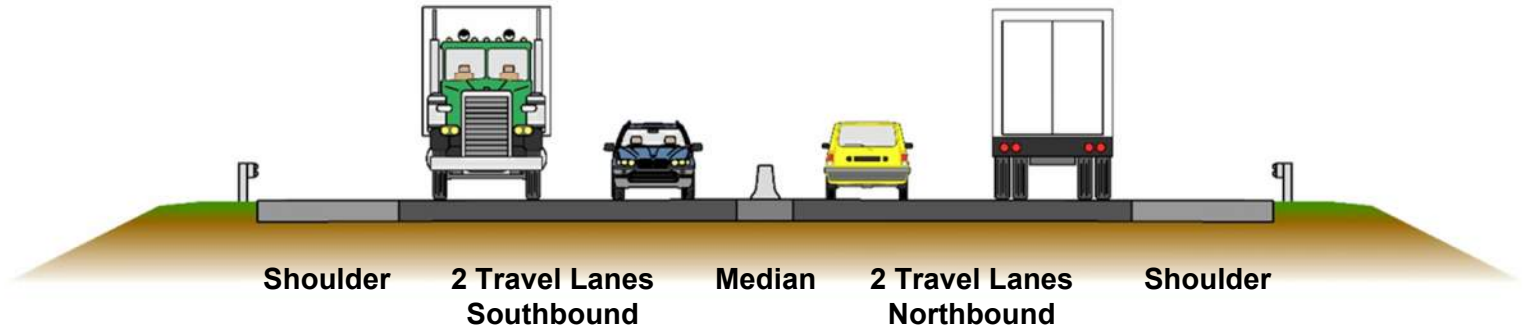
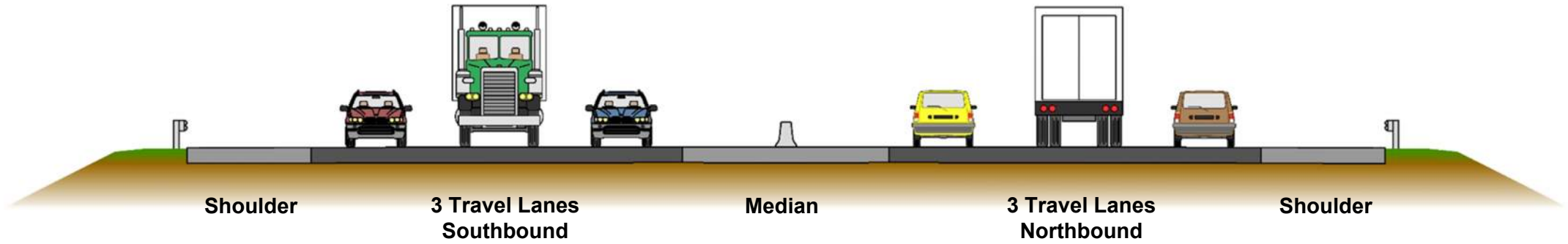
I-83: Widening to 6 Lanes



Out to Out Width of 68-ft

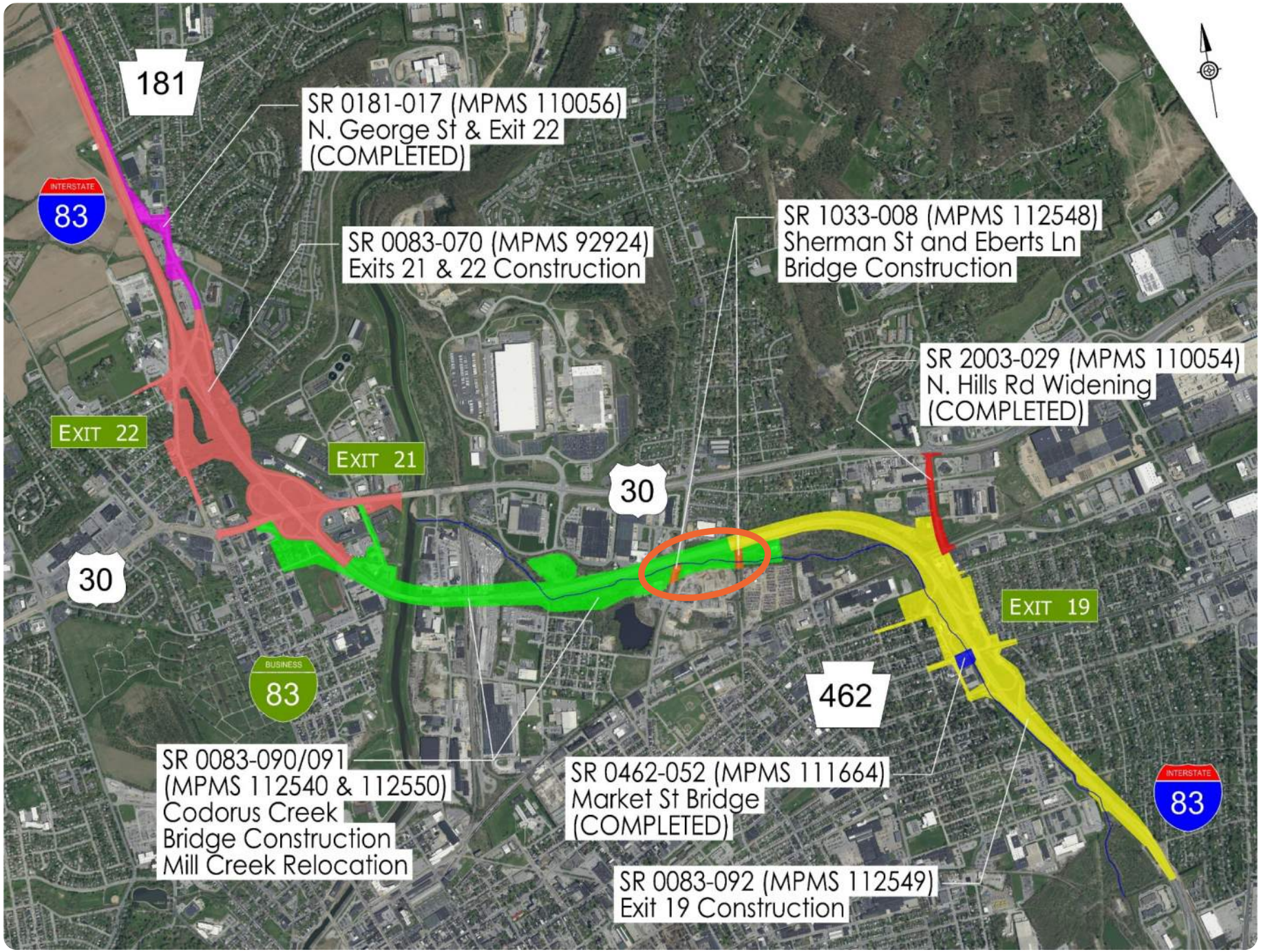


Out to Out Width of 122-ft

Project Delivery

3 Mainline Projects

4 Early Action Projects



Eberts Lane Bridge

Replaced the existing four-span concrete bridge with a two-span, bulb-tee beam bridge

Sherman St Bridge

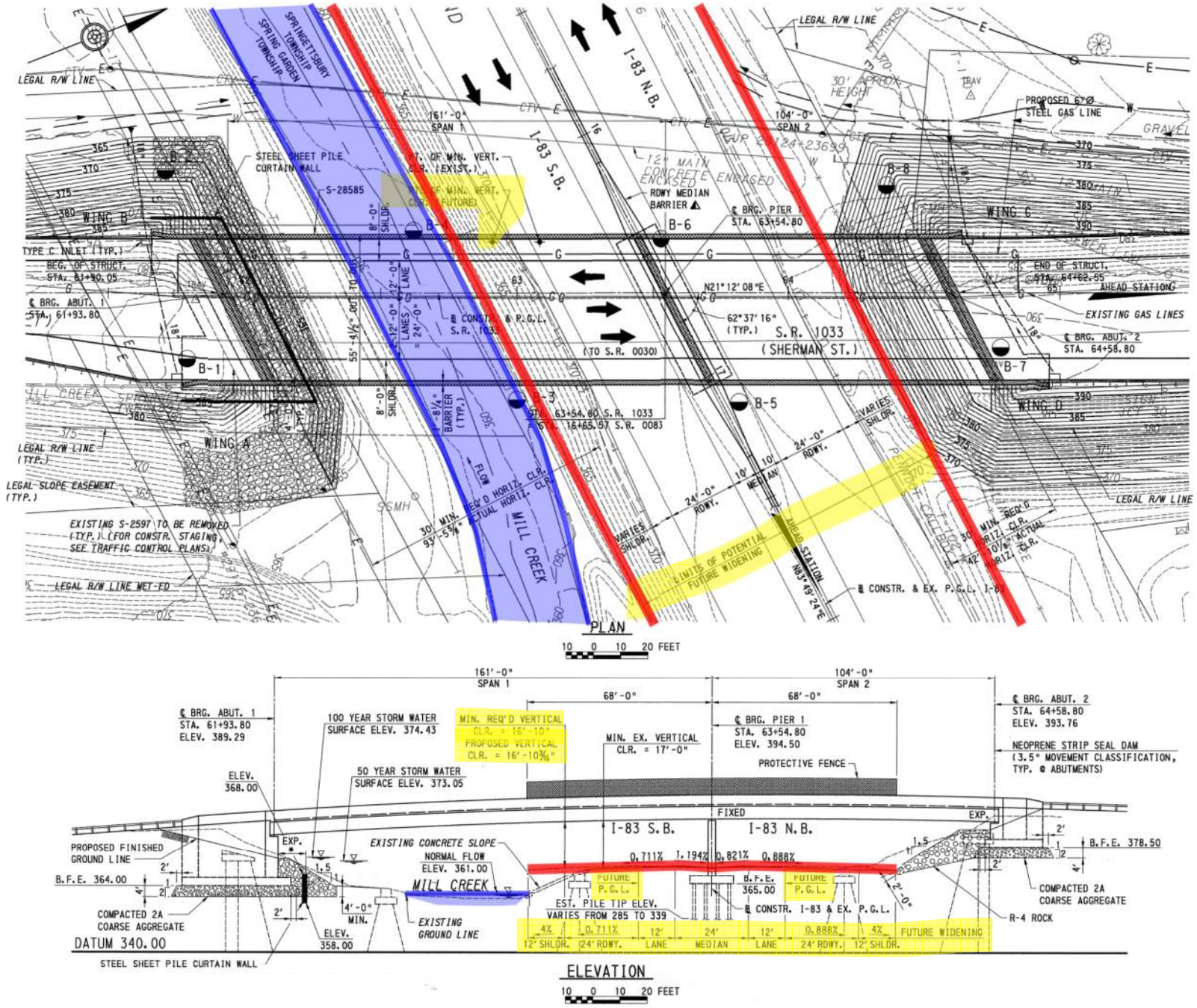
Existing two-span steel plate girder bridge

Why Modify the Sherman Street Bridge?

Existing Structure

Constructed In 2012

Designed to Accommodate the Future Widening



Mill Creek

Mill Creek

Flooding reportedly circa 2006 or 2011 (Hurricane Irene or Tropical Storm Lee)

Mill Creek

2021

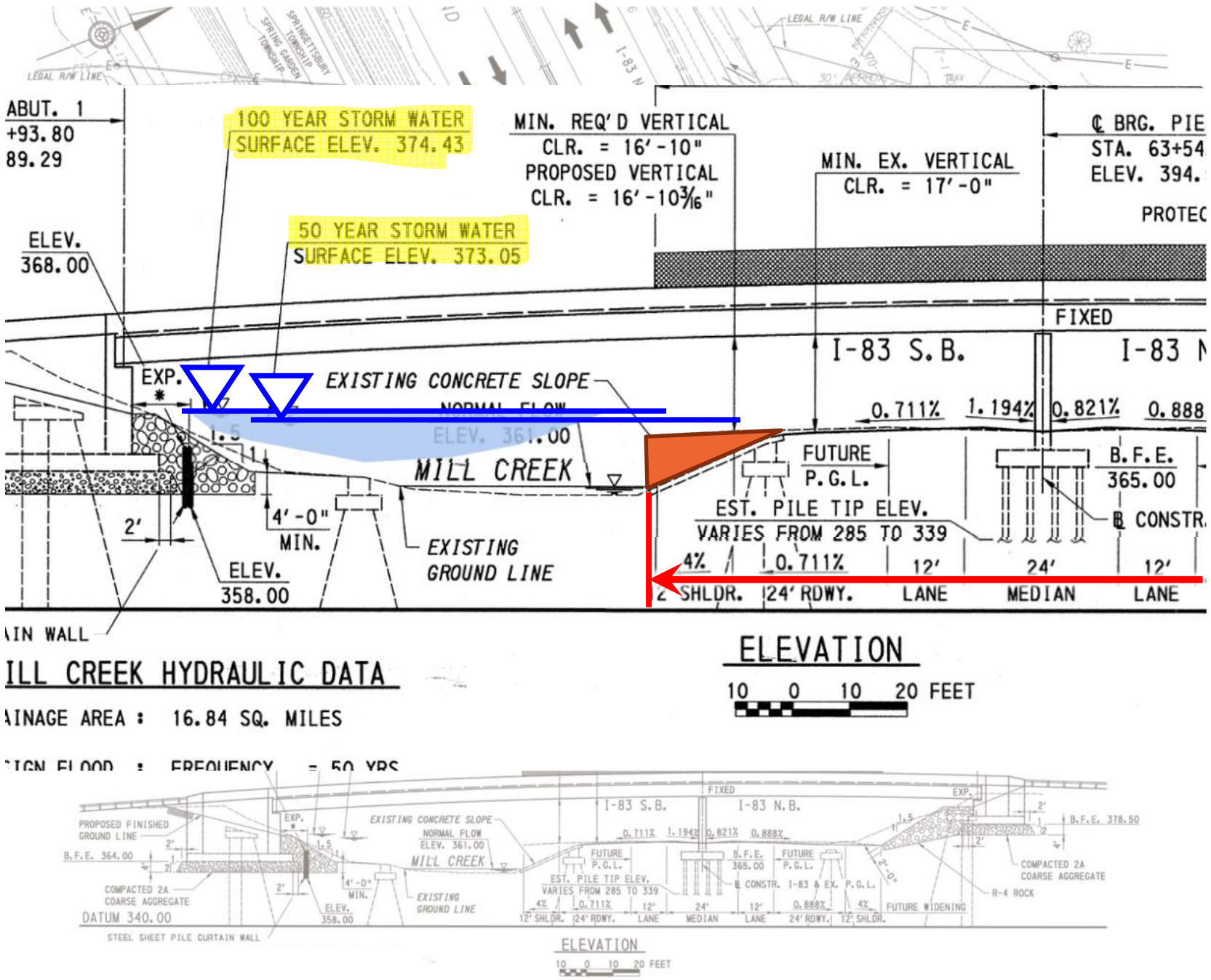
Hurricane Irene

Existing Structure

Constructed in 2012

Designed to accommodate the future widening

Future widening reduced hydraulic opening

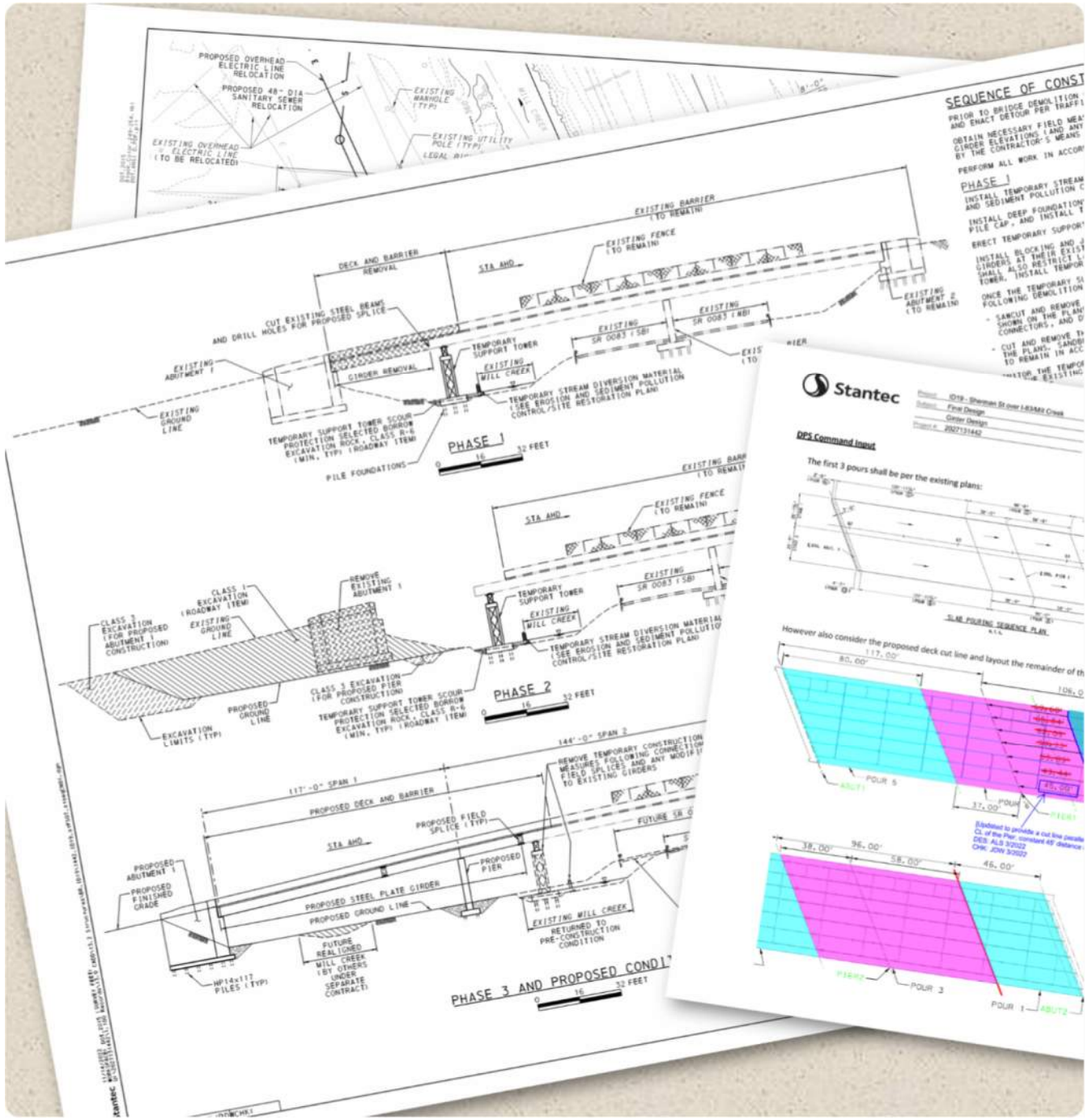


Mill Creek Stream Impacts

Mill Creek Stream Impacts

Mill Creek Stream Relocation

Design Challenges and Considerations



New Bridge Length and Splice Locations

Step 1: Determine New Bridge Length

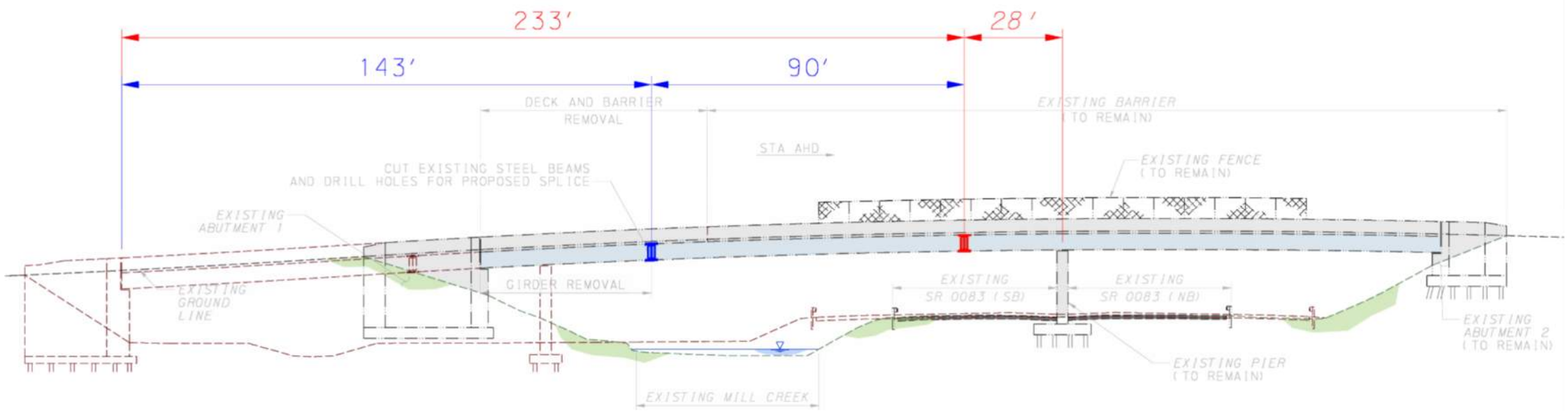
- Profile
- Hydraulic opening

Step 2: Determine Substructure Locations

- Existing substructure location
- Relocated Mill Creek
- Span arrangement

Step 3: Determine Girder Splice Location

- Splice-in at existing splice location?
- Cut existing girders and use new splice location?



Girder Splice

Splice-in at Existing Splice Location

Pros:

- Conventional work – “Common” Approach
- No temporary support required

Cons:

- Removes nearly half of the existing superstructure
- MPT on I-83 required during removal and erection operations – Added Cost

SELECTED!

Cut Existing Girders and Use New Splice Location

Pros:

- No MPT needed on I-83
- Retains 90 feet of the existing superstructure

Cons:

- Requires specialty work to cut and finish the beam
- Requires a temporary support during construction

Estimated cost savings approx. **$300k**

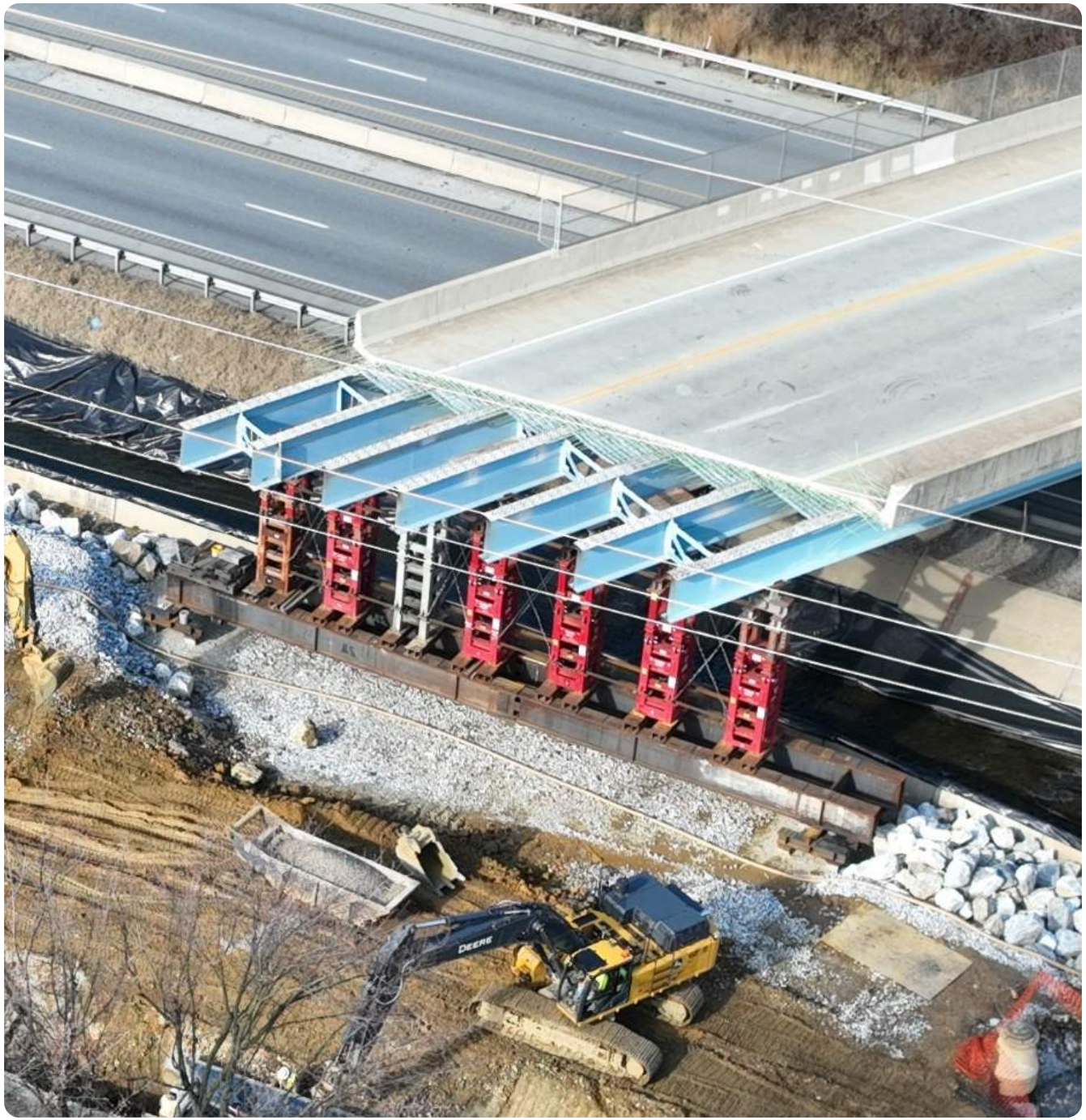
Temporary Support

Scour Considerations

- Provisions for temporary bridges during a flood event, but not temporary supports
- Deep foundations were required

Temporary Support Deflections

- Monitor for movement
- Jacking provisions for fine adjustments



Construction & Challenges

Ground Water and Sanitary Sewer Challenges

Eberts Lane Water Treatment

- Anticipated flow rate was 100 GPM
- Actual flow rate encountered **700 GPM**

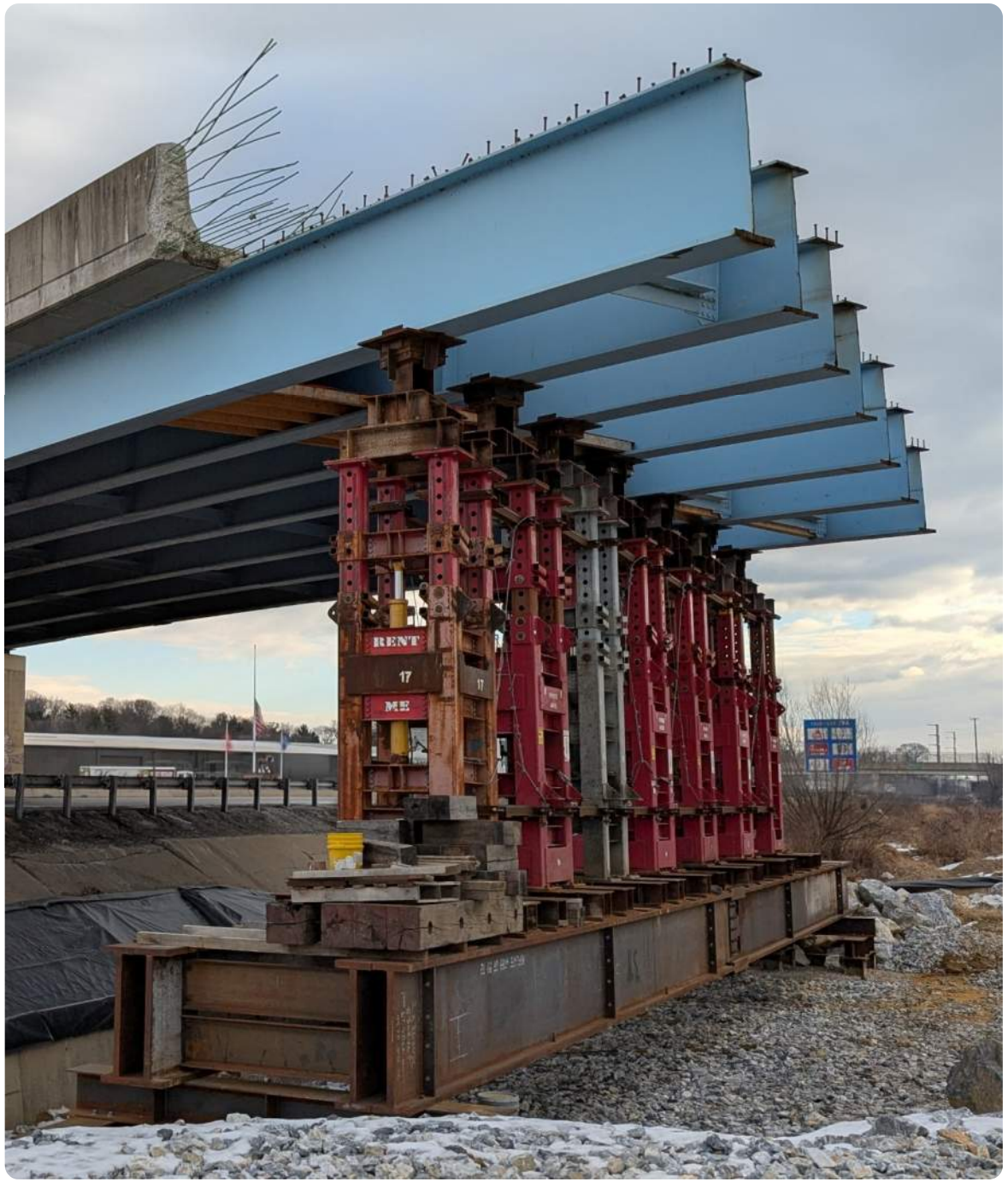
Solutions at Eberts – Applied at Sherman

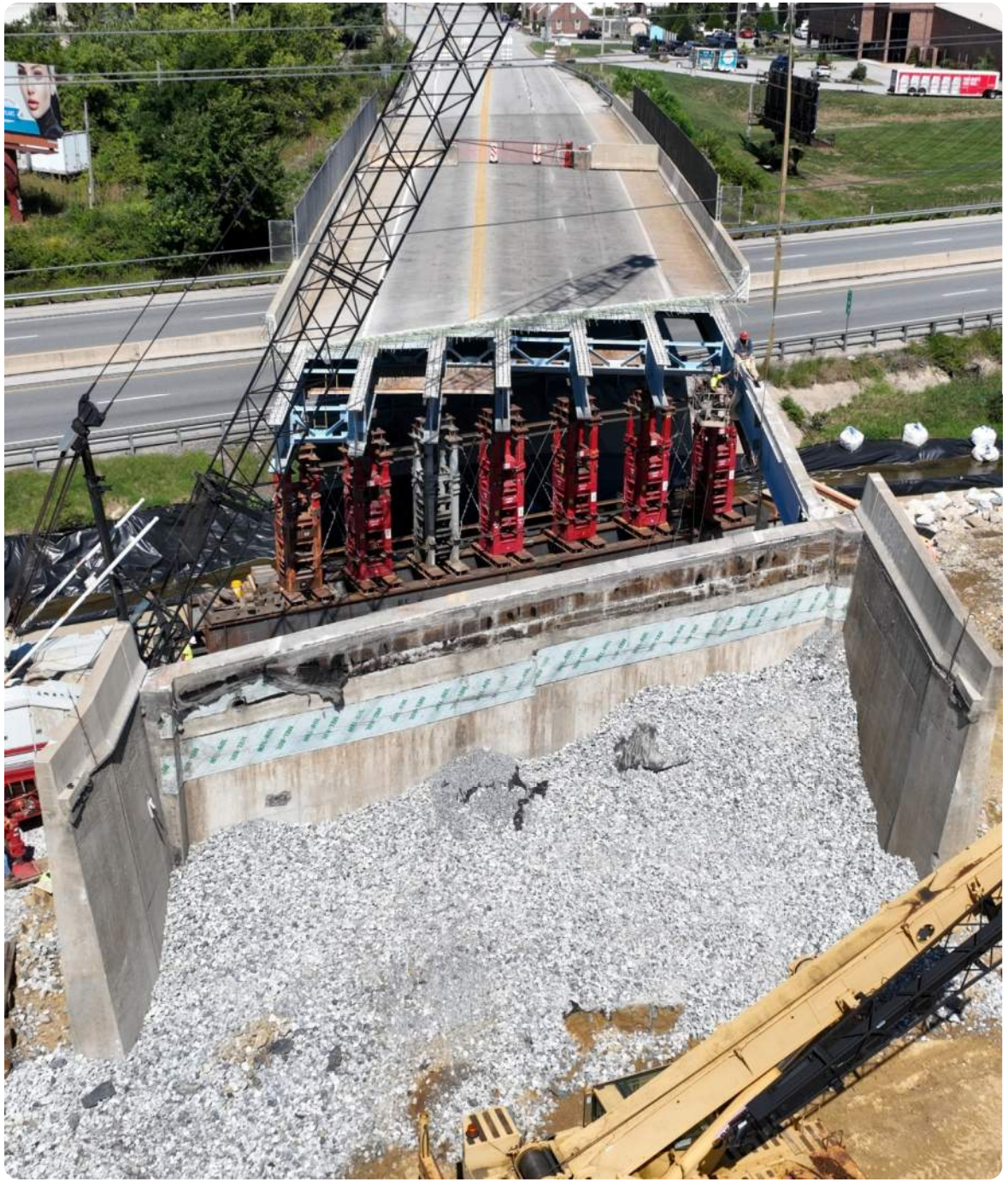
- Dog Box Inlets for bypass pumping
- Well Points to assist in filtering sediment
- “Agility Concept” between the Department and Springettsbury Township
- Larger Manholes and live switch between the existing Sanitary Sewer System and the relocated system


SUNBELT
RENTALS
PUMP
SOLUTIONS


CORE
CUT


CAT


RENT
17
ME



Foundations

KARST

Existing Structure Foundation Design

Existing plans showed driven piles.

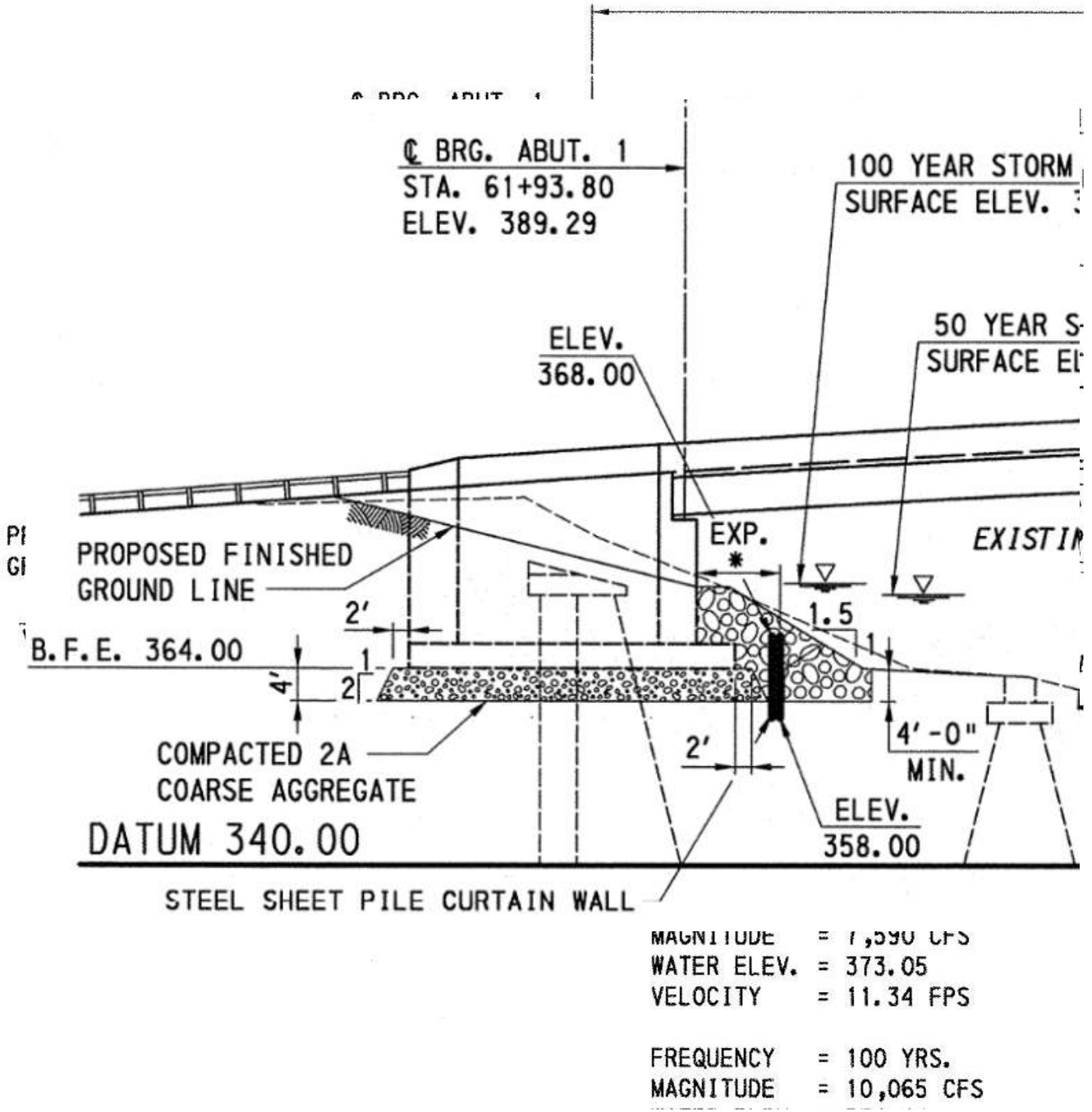
At some point during construction, foundations were converted to spread footings, reportedly due to driving issues.

No documentation of this change was available.

Details of reasons and issues were murky.

Project was a Design-Build (sort of).

Contacted EOR for the Existing bridge.

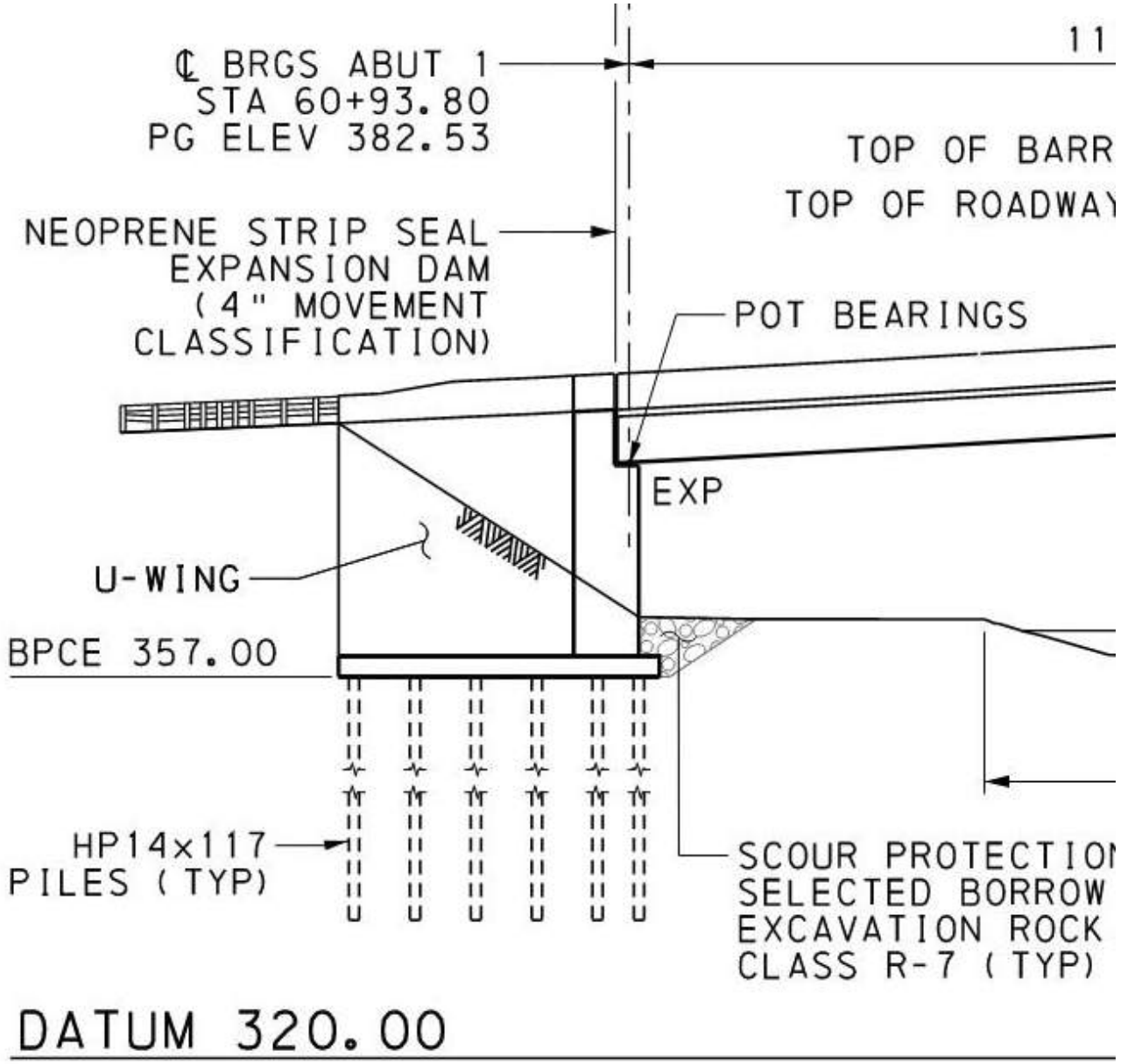



I'M
BATMAN

Proposed Foundations

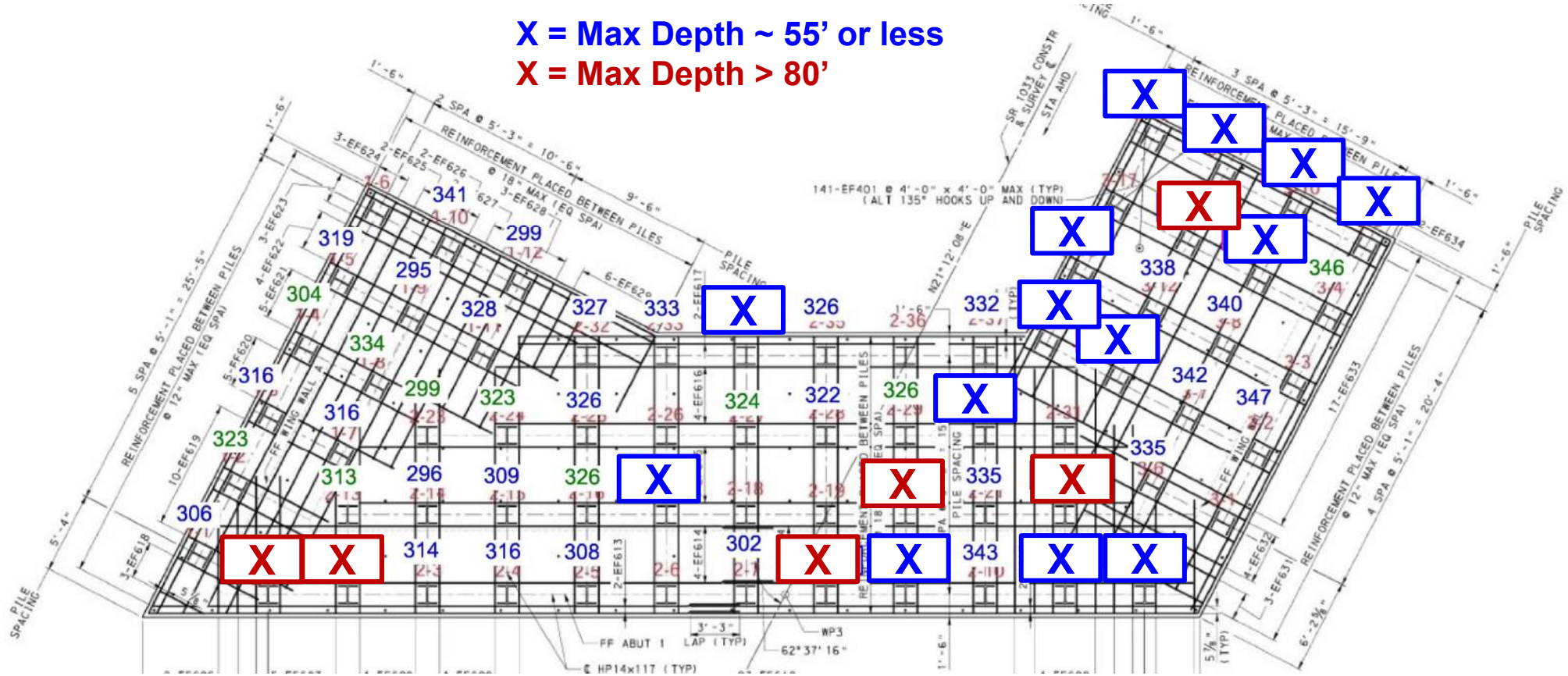
Predrilled Piles with Grouted Tips

- Vertical piles
- Predrilled into 5 ft of rock with 5 ft of competent rock below
- Grouted tips provided lateral resistance
- Air-track drilled to determine depth before drilling



Air Track Drilling Results

X = Max Depth ~ 55’ or less
X = Max Depth > 80’



Foundation Options

Predrilling = $$$$

- Not feasible given the required depth to rock

Use Spread Footings
(like existing bridge)

- Settlement and movement concerns

Drive Piles using a PDA

- Could be costly given depth to rock

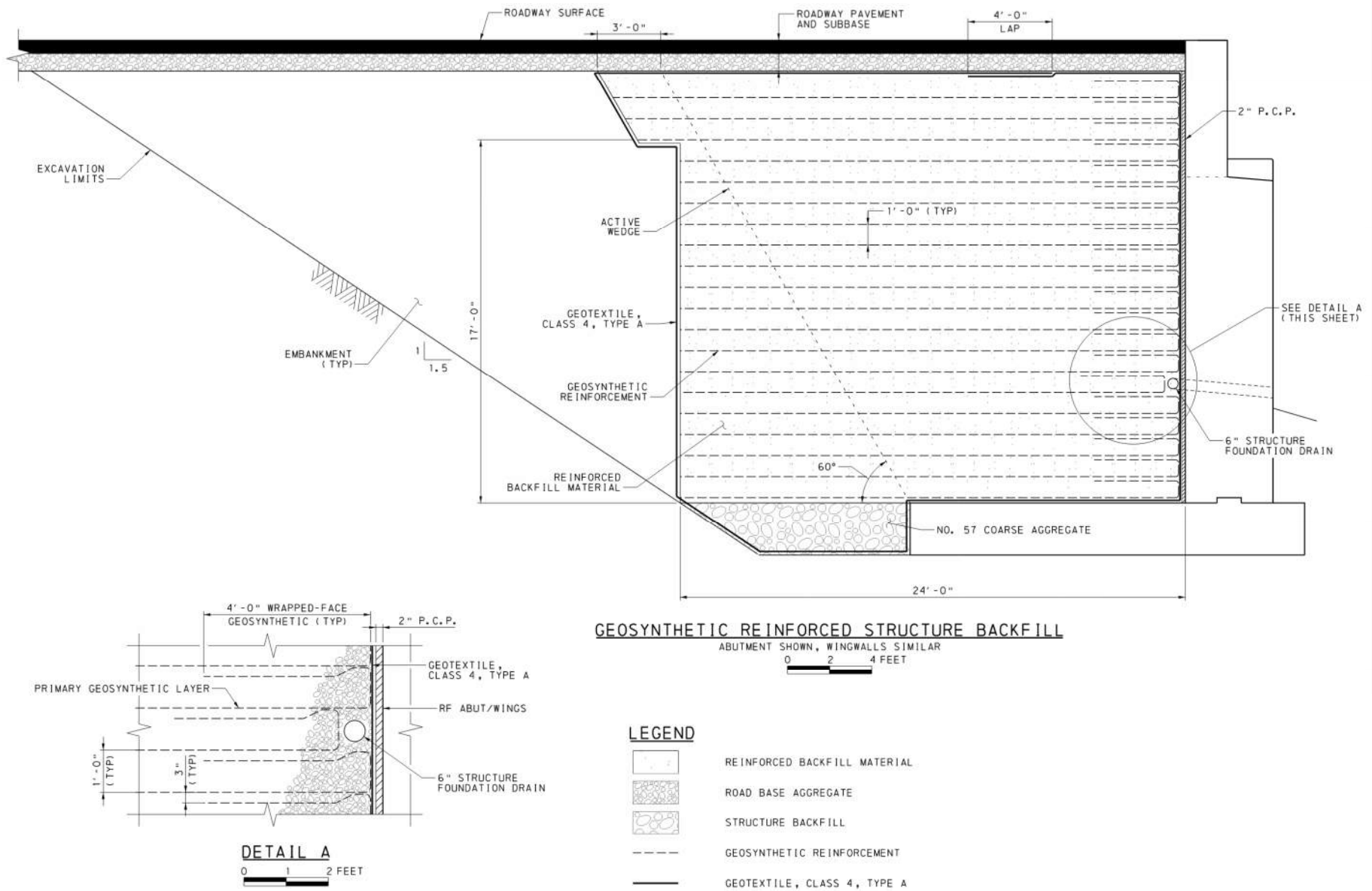
Final Decision: Drive Piles using a PDA

- Same pile size and quantity
- Minor design update to account for pile losses
- Provides least risk in the long-term
- Battered piles are not recommended – alternate solutions for lateral resistance

GRS Backfill

Elimination of predrilling reduces lateral capacity of vertical piles

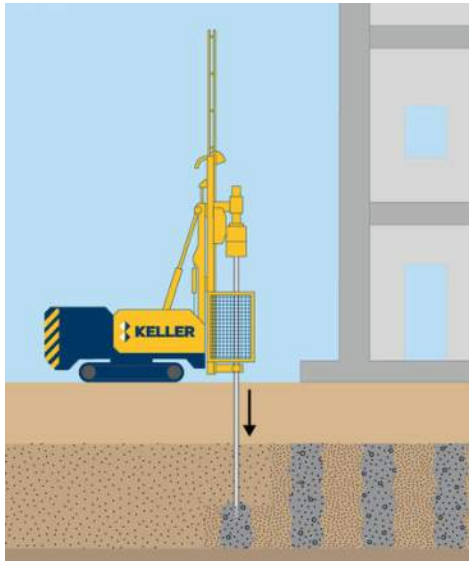
GRS backfill added to reduce lateral loading on the piles



Sinkhole Remediation Options

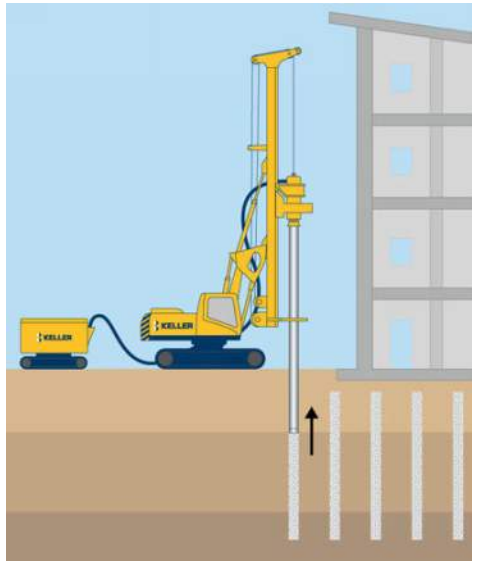
Low Mobility (Compaction) Grouting

- Lowest Risk/Highest Cost
- Est. $900k



Rigid Inclusions/ Aggregate Column

- Highest Risk/Lowest Cost
- Est. $300k



Combo of Low Mobility Grouting and Rigid Inclusions

- Medium Risk/Medium Cost
- Est. $550k

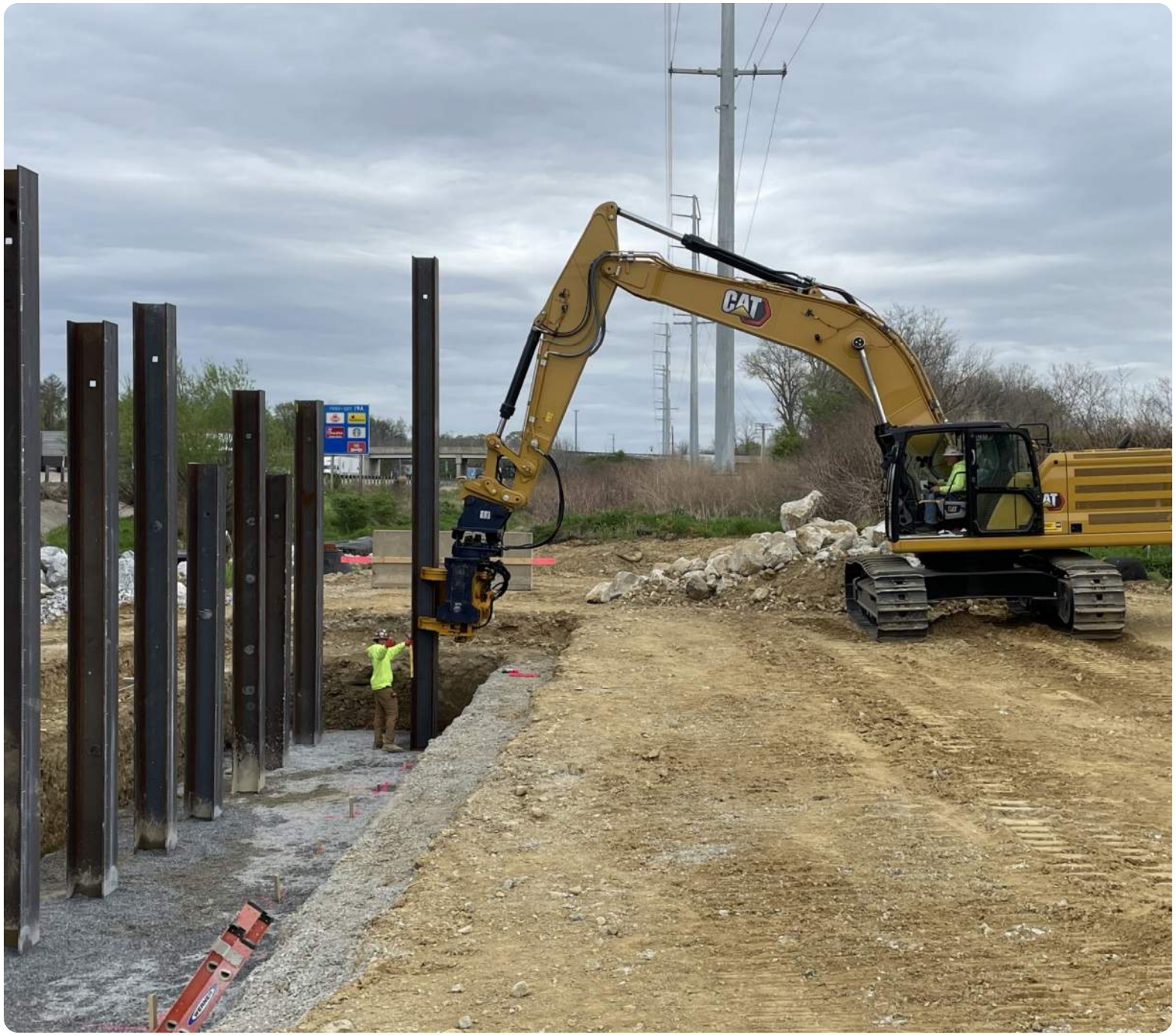
Also looked into other options, such as Dynamic Compaction.

Sinkhole remediation anticipated to be used in combination with spread footings and sheet pile containment

Final Foundation Decision

Stick with driven piles using a PDA to confirm capacity

“ A Driven Pile is a Proven Pile ”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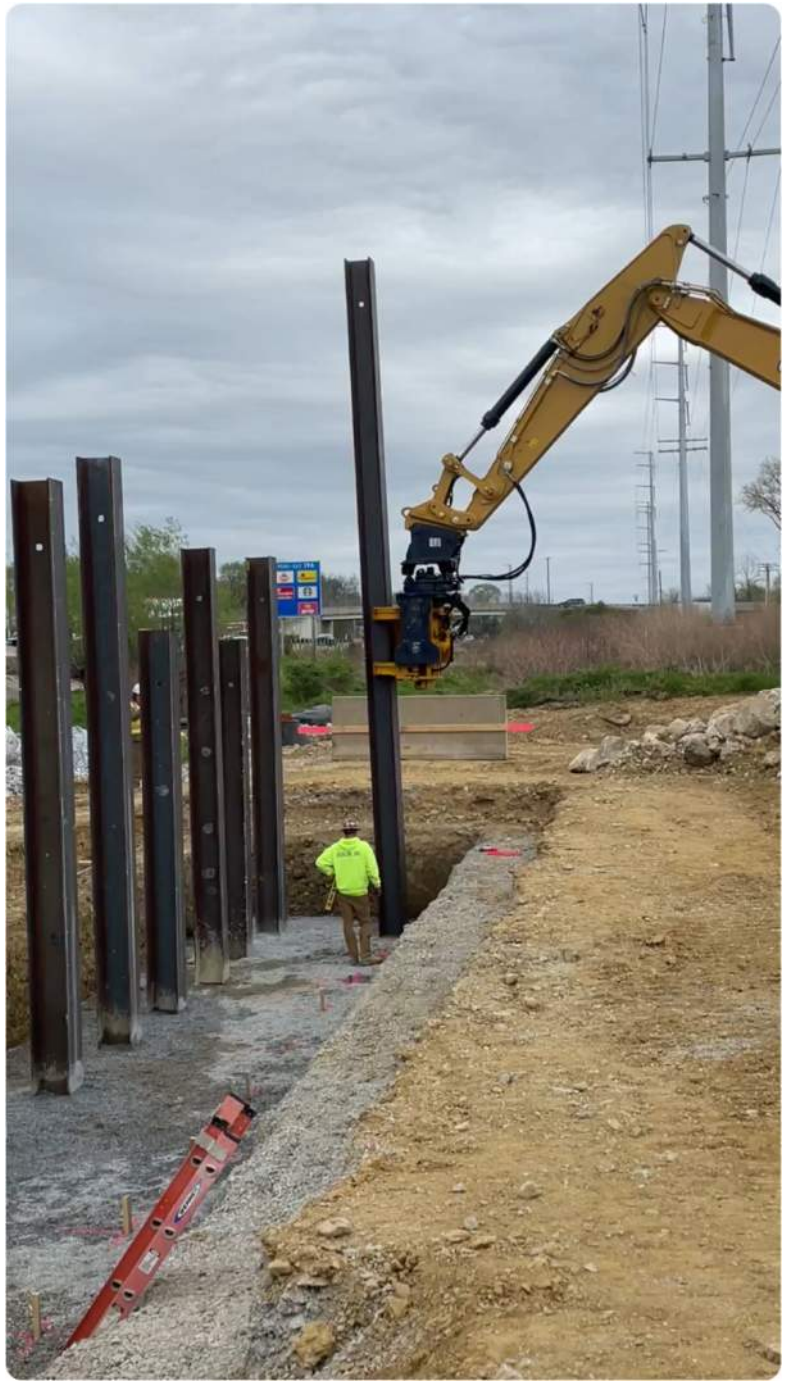


W.B.MASON

Conclusions

Construction Costs

Original Bid Price:	**$ 10.1 M**
• Eberts Lane Bridge:	**$ 2.7M**
• Sherman Street Bridge:	**$ 4.4M**
Final Contract Amount:	**$ 11.3 M**
• Added I-83 Repairs:	**$ 760k**
• Eberts Water Treatment:	**$ 430k**
• Sherman Foundations:	**$ 140k**
○ *Additional Work:*	*$ 785k*
○ *Deduct as-designed items:*	*($ 645k)*
• Misc Adjustments:	**($ 120k)**

Schedule:

12/31/2024 → 7/19/2025 → **10/13/2025**

Conclusions & Takeaways

- **Use all available resources!**
- **Foundations**
  - Evaluate need for Air-Track Drilling.
  - Additional borings in design?
  - “A driven pile is a proven pile”
- **Cutting vs Splicing**
  - Evaluate Risks vs Cost Benefits

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ENGINEERING DISTRICT 8-0

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Thank you

Questions?

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