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Pipe Jacking and Microtunneling: A Story of Rivers and Poor Ground Conditions

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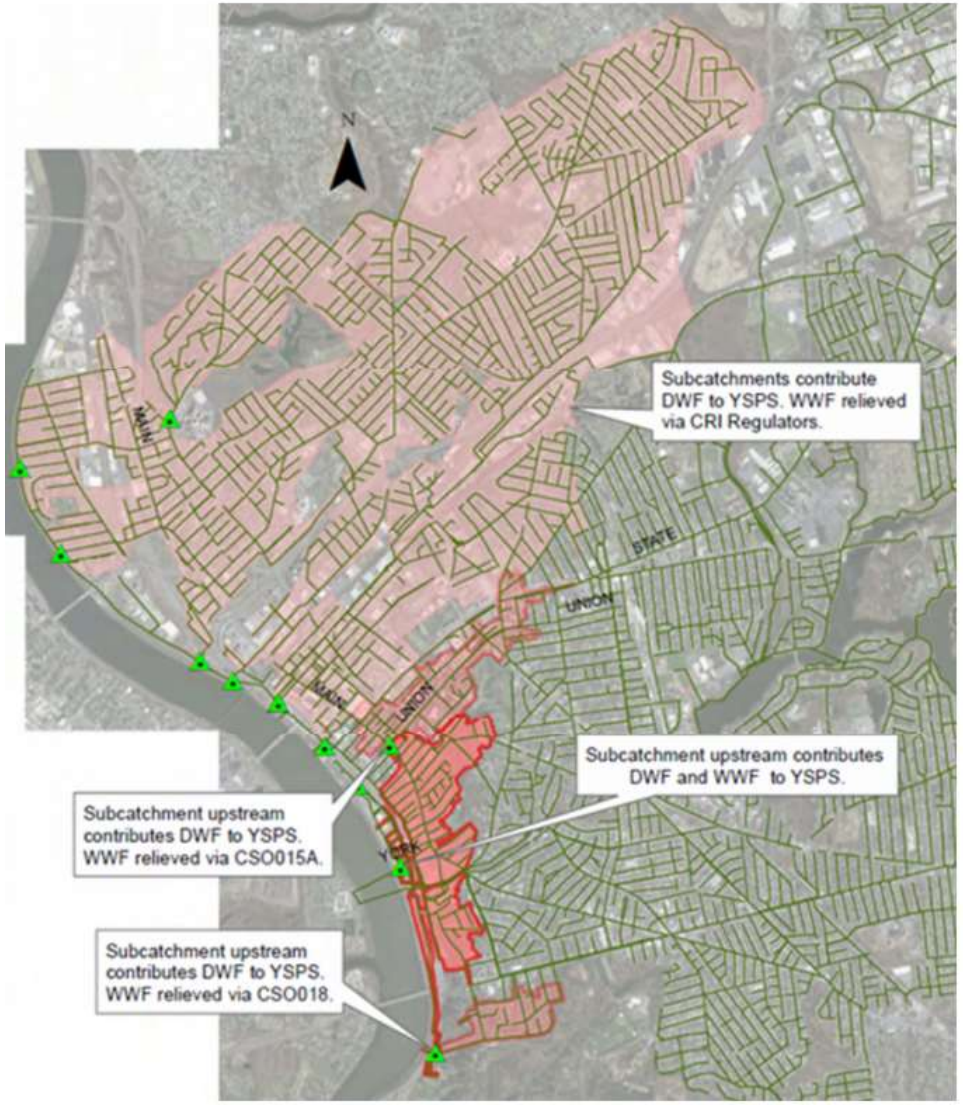
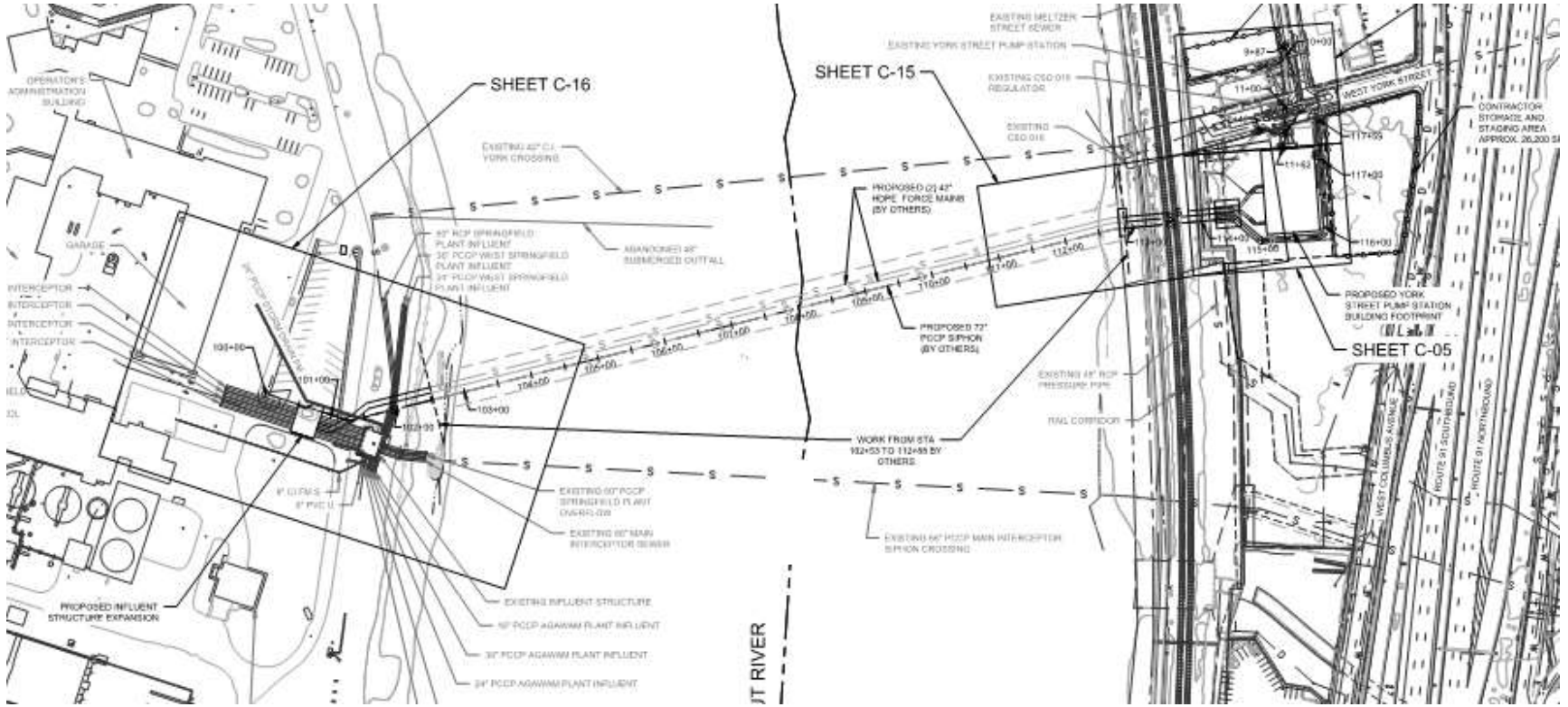
Springfield, MA

- Springfield Water and Sewer Commission (SWSC)
- Two collection systems – Main Intercepting Sewer, and the Connecticut River Interceptor
- ACO driven IWP for CSO volume and frequency reductions
- Phase 2 deadline of December 2022

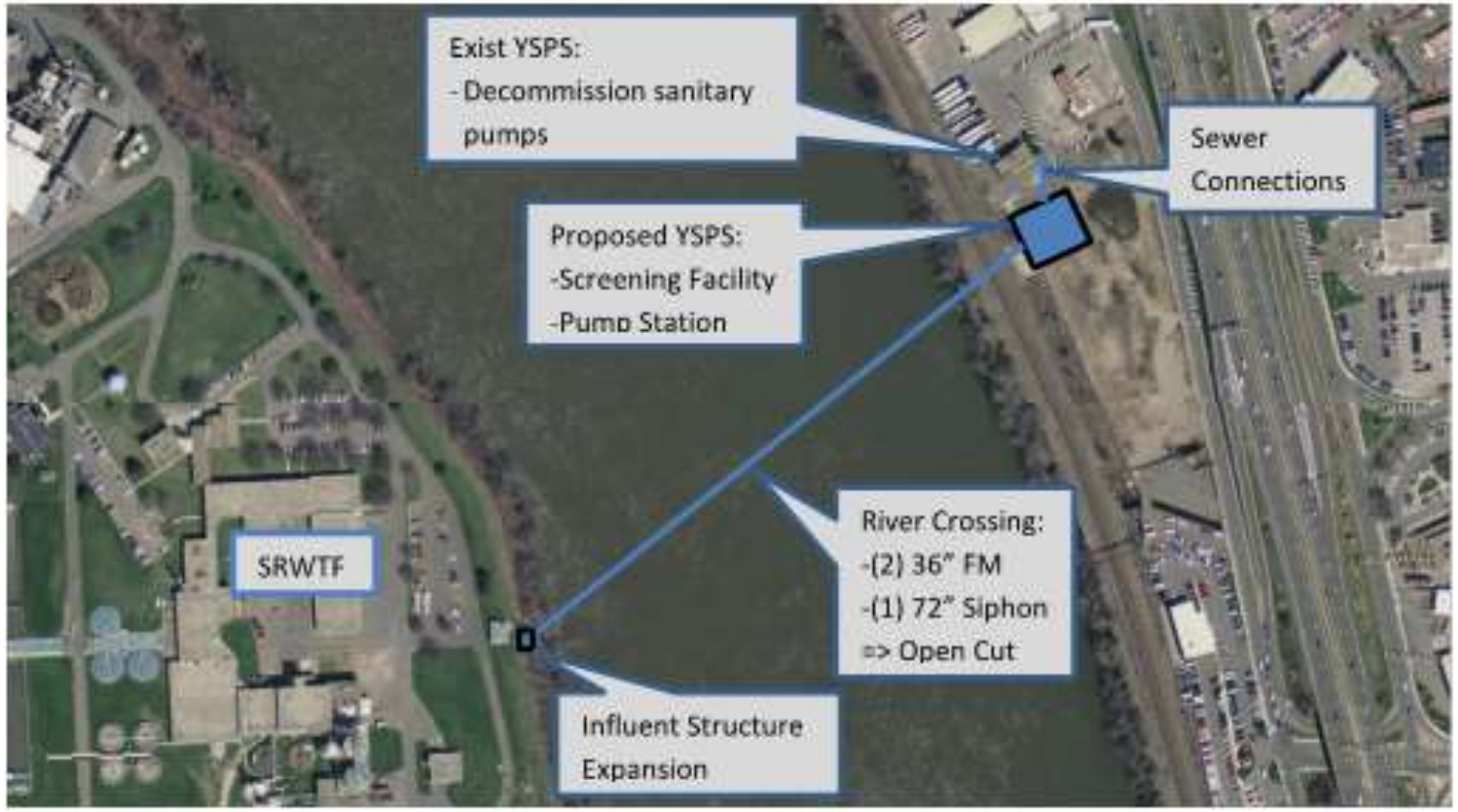


The Project

- Phase 2 of SWSC's Integrated Wastewater Plan (IWP)
- Project executed under Ch149A (MGL) (Construction Manager at Risk alternative delivery method)



Recommended Alternative

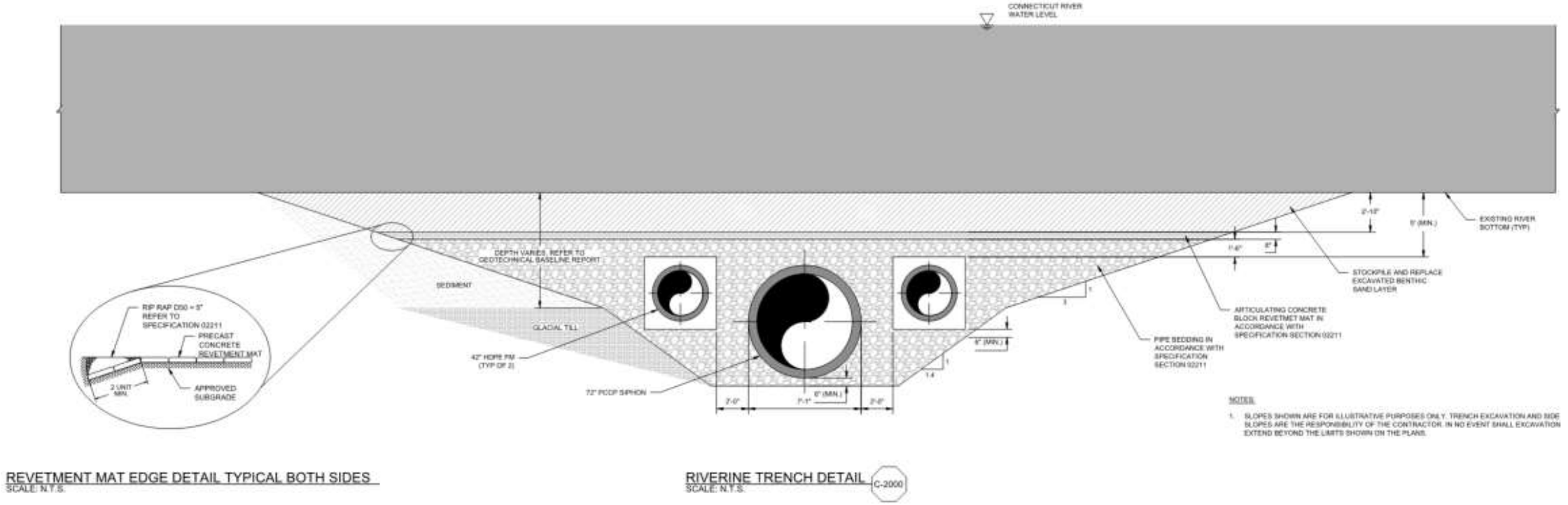


- 62 MGD pump station on the east side of the river
- River crossing using open cut cofferdam construction
  - Two 36-inch diameter force mains to convey CRI system flows,
  - And a 72-inch diameter siphon to provide redundancy for MIS system flows.

The Site

Pump Station

River Crossing Refinement



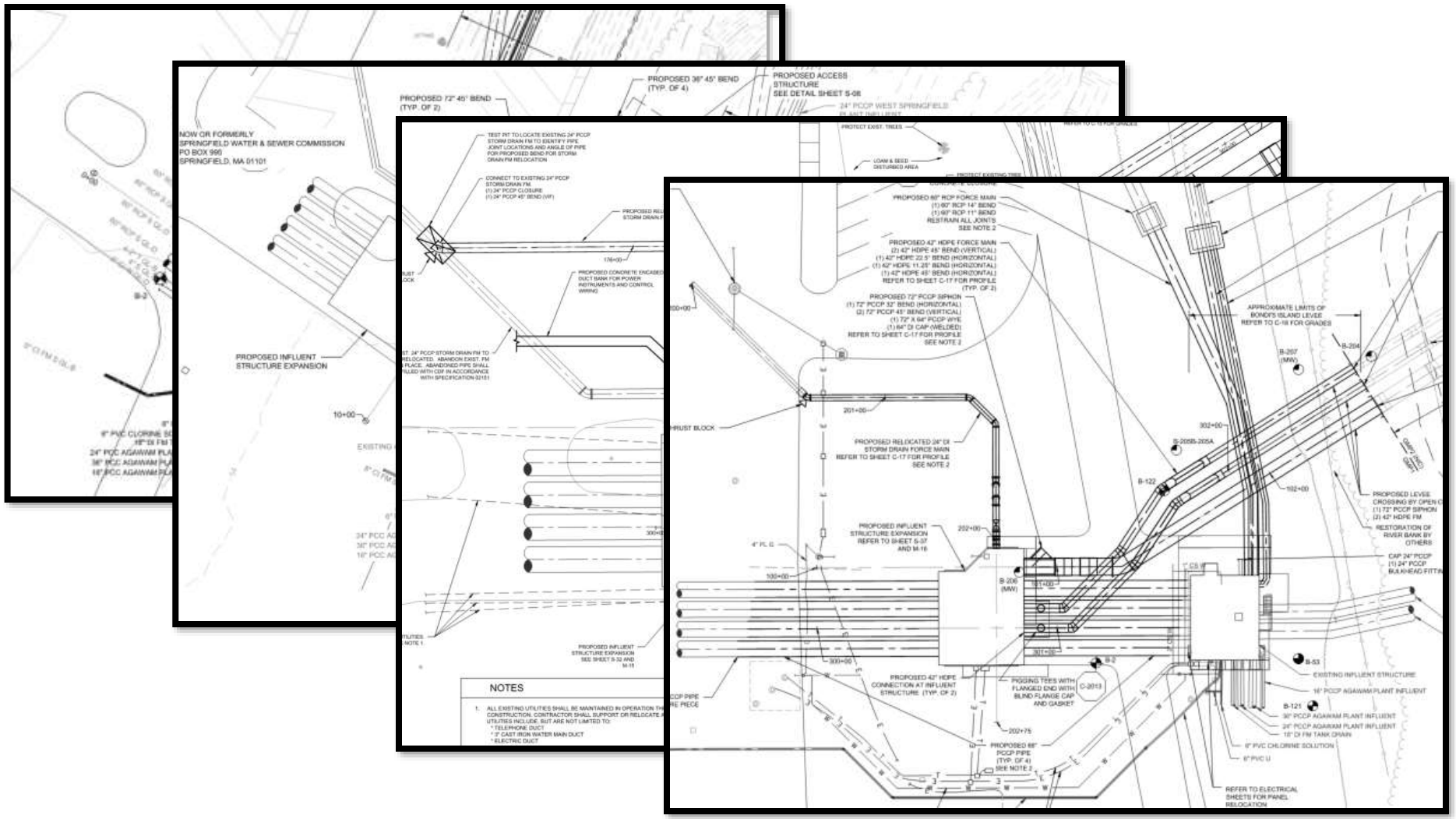
REVETMENT MAT EDGE DETAIL TYPICAL BOTH SIDES
SCALE: N.T.S.

RIVERINE TRENCH DETAIL C-2000
SCALE: N.T.S.

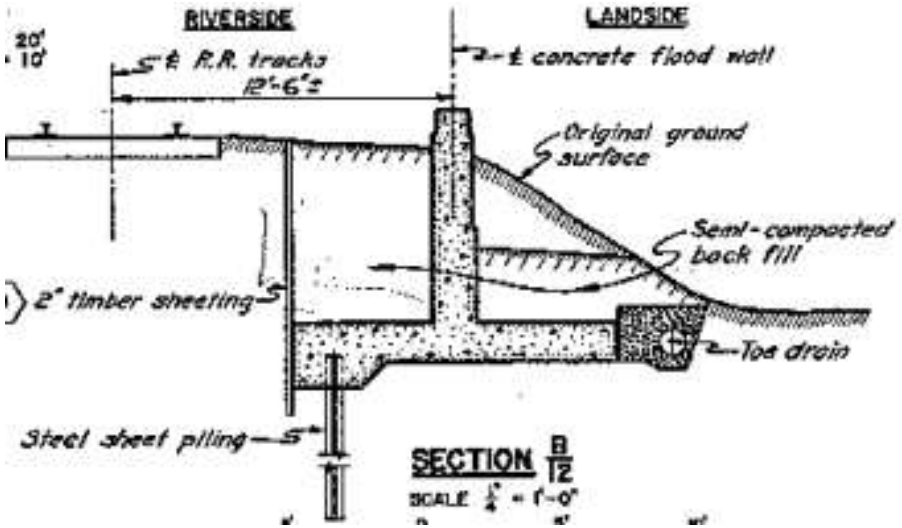
Dredged Crossing:

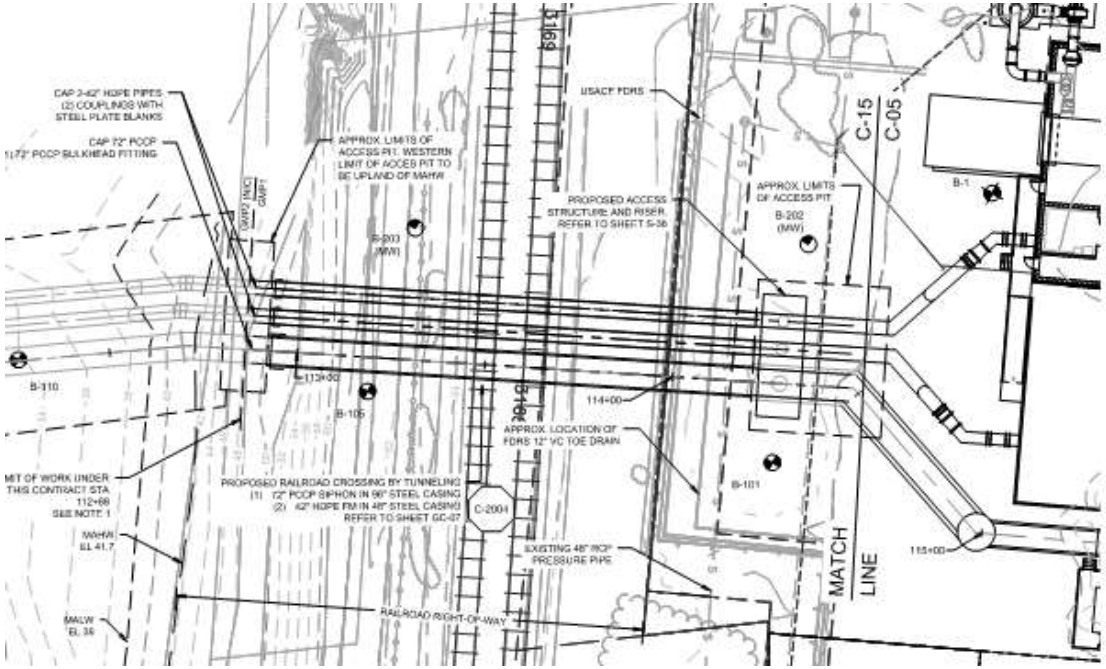
- ✓ Geotechnical Conditions
- ➢ Regulatory and Environmental Considerations

Influent Structure Expansion & Levee Crossing



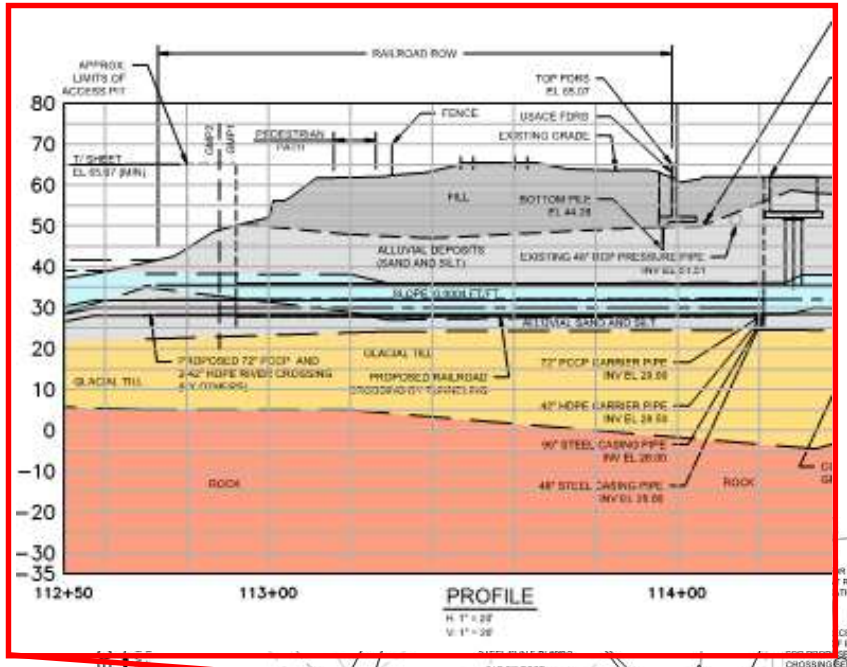
East Bank Crossing



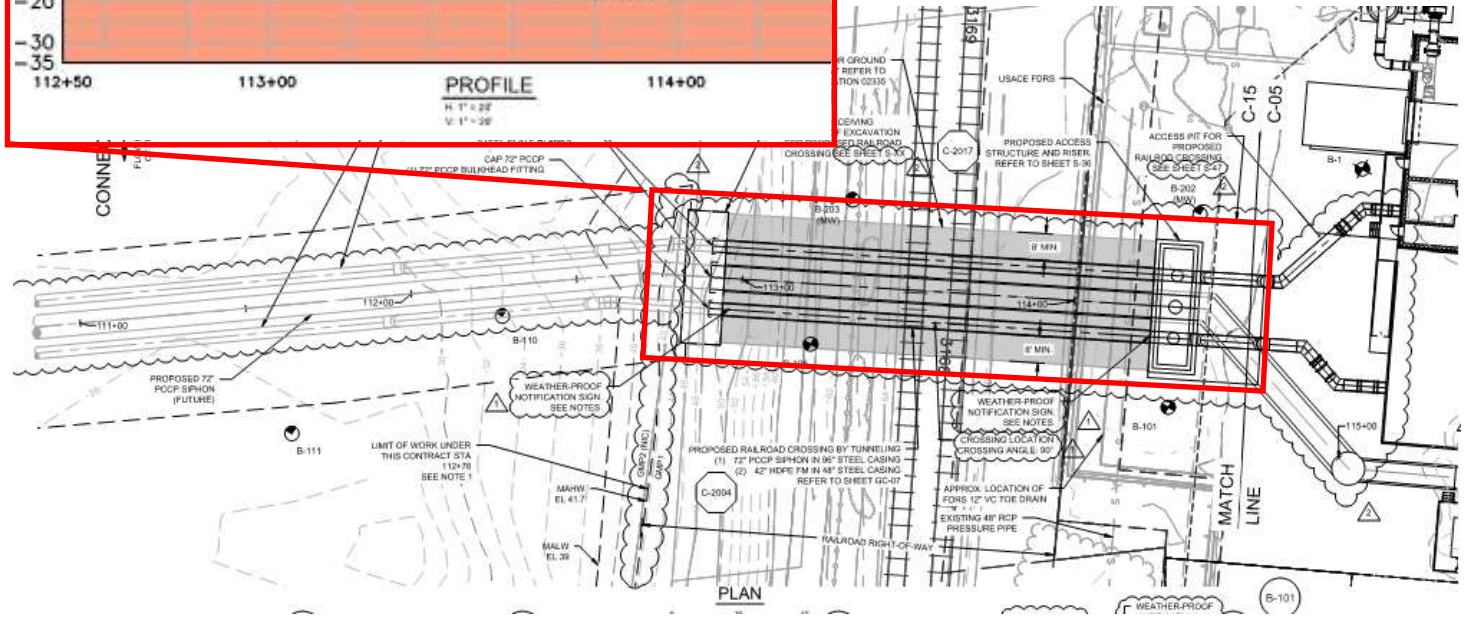


- Short run - ~150ft
- 3 bores – 96”, 2x 48”
- Active AMTRAK Rail
  - Must remain in service
- Army Corps Flood Damage Reduction System – Flood Wall

Geotechnical Information

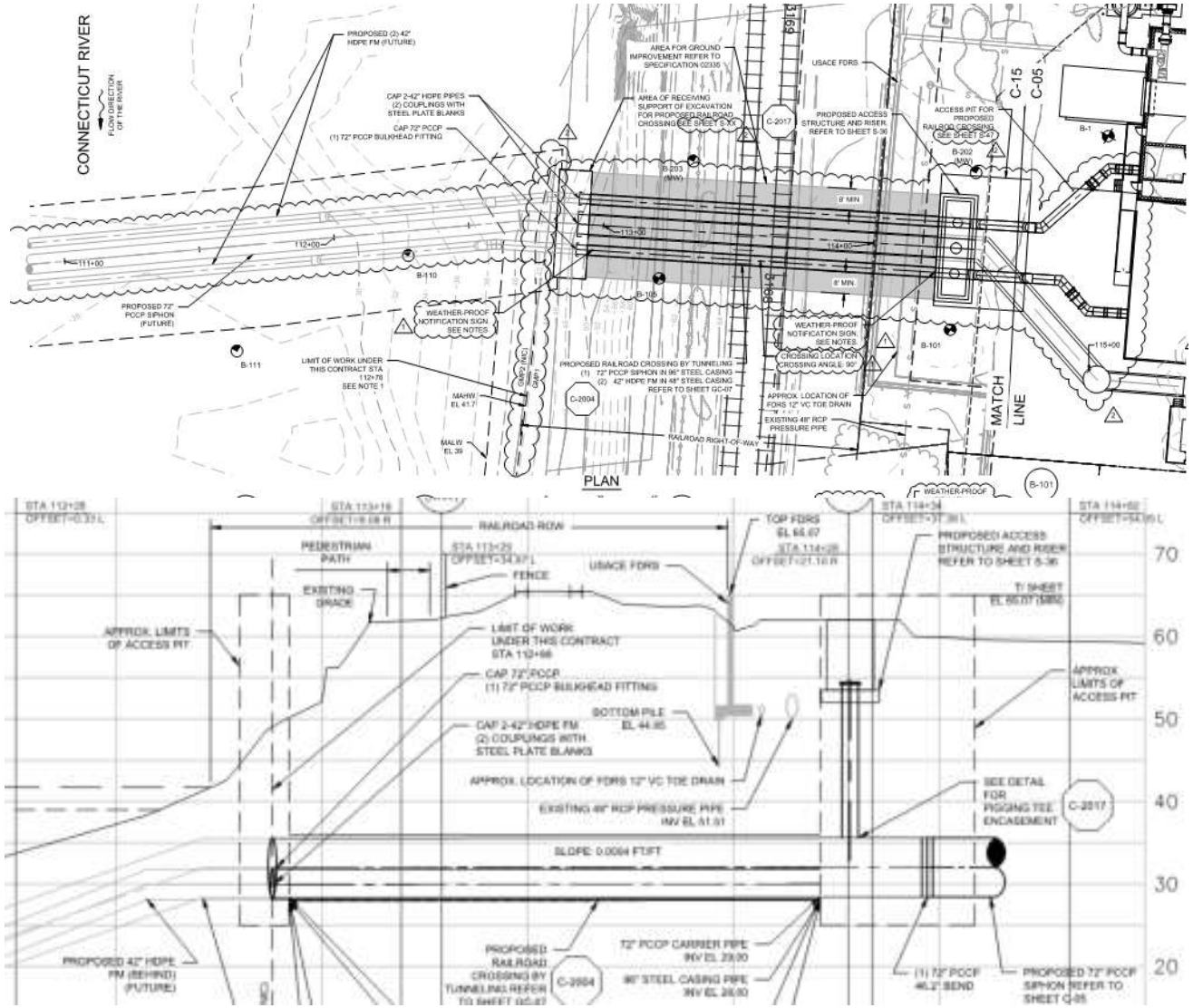


- Poor soil\groundwater conditions
  - Alluvial clay primarily
  - Some alluvial sands and silts, hydraulically connected to the Connecticut River at top and bottom of bore
  - Potential for glacial till outcroppings at bottom of bore



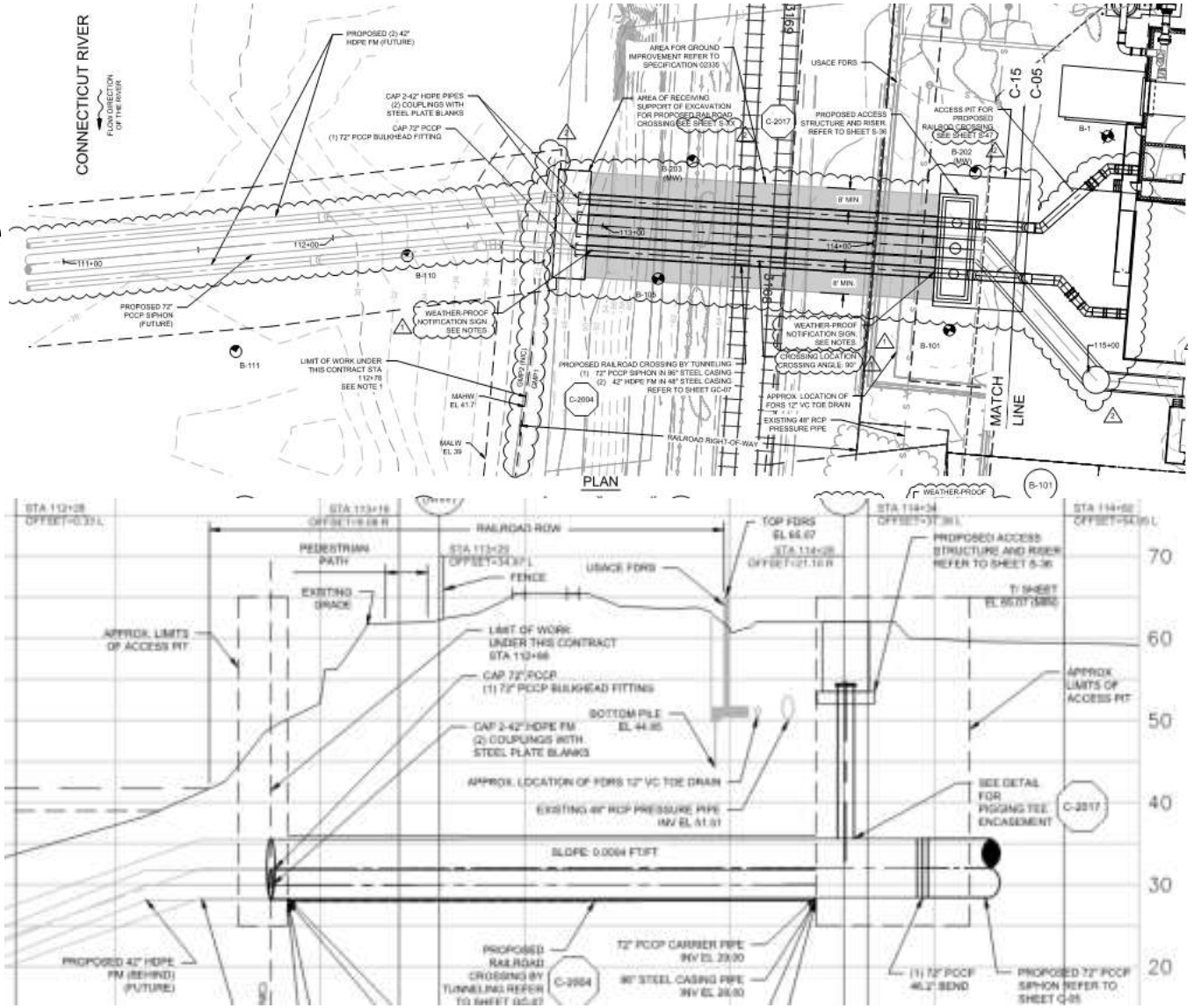
Initial Approach - assumed Jack and Bore

- Jacking Pit east of FDRS\RR
- Access pit above MAHW in slope
- Ground improvements to handle water
- Less expensive than MTBM, higher risk
- Ended up issuing as “Trenchless Installation” – open to proposer method



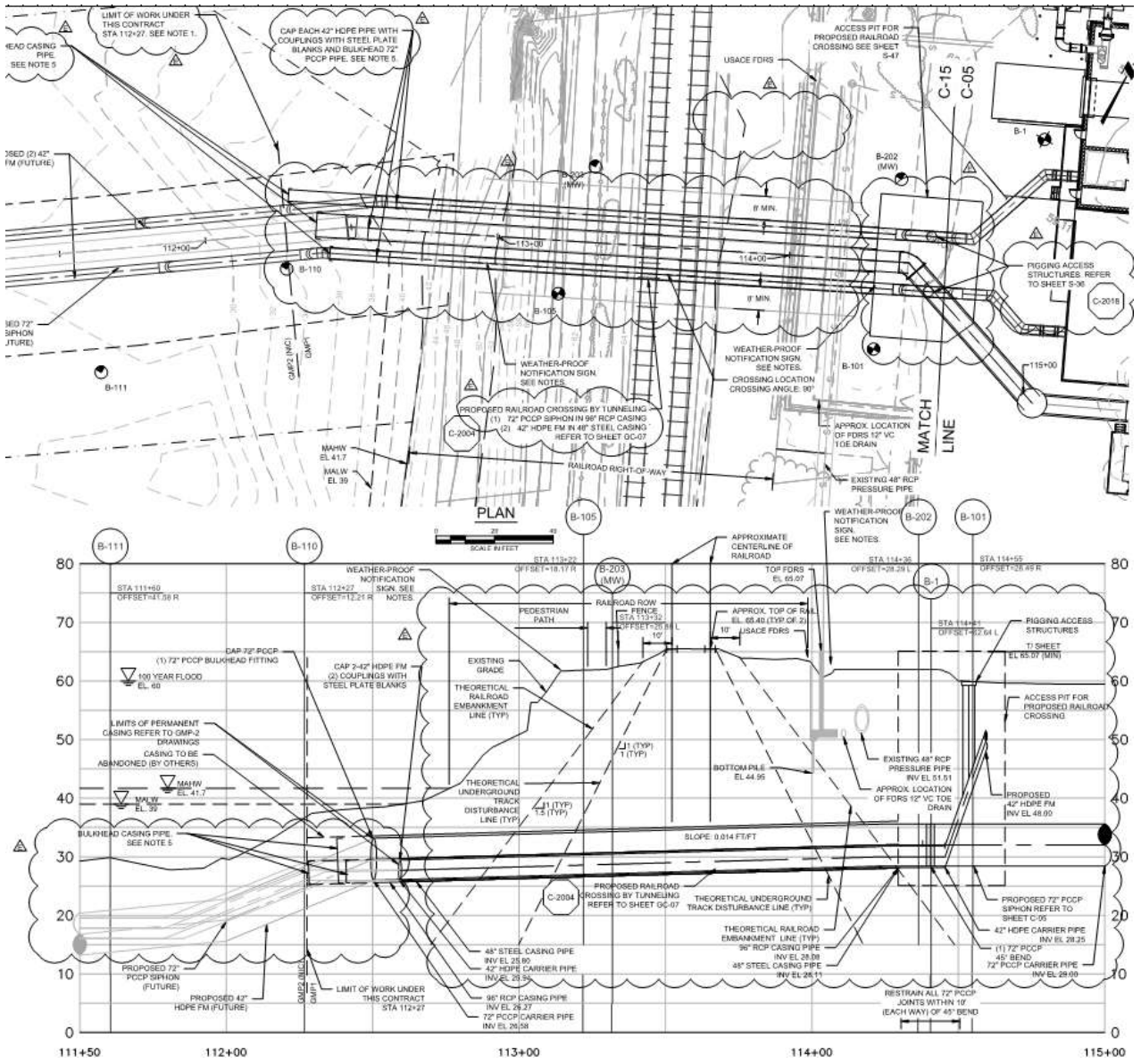
Proposal Feedback

- Riverside access pit is expensive and substantial – slopes and permit constraints.
- Eliminating the pit (“blind jack”) difficult and expensive
- Ground improvements are expensive and risky – risks of over improvement, frac-out, missing a sand seam



Alternate Proposal

- Proposer preferred MTBM approach:
  - Lower risk of ground loss, mitigates groundwater issues, eliminates ground improvements
- Proposed for roughly equivalent price
- Design team identified possibility to eliminate river side access pit by “daylighting” in river



Status of Project

- Design-Bid => Construction Manager at Risk (CMAR)
- Two phase project:
  - GMP1 – York Street Sewer Pump Station and Springfield Regional Wastewater Treatment Facility
    - Construction On-going through May 2021
  - GMP2 – Connecticut River Sewer Force Mains and Interceptor Crossing
    - Currently in proposal phase – received
    - Anticipated Award – February 13, 2020
    - Construction anticipated to begin: May 2020
- Project to be fully completed by December 2021

Questions?

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