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Valley Belt Gravity Sewer: Microtunneling Lessons Learned

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Agenda

Introductions / Acknowledgements > Overview / Background / History > Alternatives Considered > Recommendation Project Challenges Current Status / B-D-A Lessons Learned Closing / Summary / Q&A

Overview / Background / History

Location > Contour map > Original features > Designed in 1970s > Gravity sewers Pump station Force main > Industrial and residential flows





Overview / Background / History

- In 2005, NEORSD determined it was time to replace the Valley Belt Pump Station
- Considered two options:
 - In-kind pump station replacement
 - Gravity sewer
- Recommendation: replace with a gravity sewer







Alternatives Considered

- In 2006, we evaluated:
 - Two alternative horizontal alignments
 - Three alternative
 vertical alignments
 - Ten options for pipe materials
 - Six installation options
 - Costs to install

- Evaluated non-cost factors as well:
 - Hydraulics
 - Stakeholder coordination
 - H₂S generation / corrosion
 - > O&M considerations
 - Soils and water table
 - Neighborhood effects

Recommendation

- > 1,560 ft gravity sewer
- > Microtunnel
- > Two-pass system
 - 42-inch steel casing
 - > 18-inch PVC / FRP sewer
- Two jacking pits and one central reception pit
- Engineer's opinion of probable cost to construct: \$5.1M (2006)
- > NEORSD concerned about costs



Recommendation

- Project bid in 2006
- > Original bids were rejected
- Re-evaluated options
- Similar conclusions
- Re-bid project in 2008
- New engineer's estimate: \$5.9M
- Received four bids with \$6.1M low bid



Recommendation



Some of the Project Challenges

- Private property
- > Wetlands
- Flood plain of Cuyahoga River
- Multiple high pressure gas mains
- > Overhead power lines
- Challenging soils
- Keeping flows moving



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Current Status

- Construction completed in late 2009
- Final construction costs were ~ \$1M under bid price (20% below bid)
- Construction finished three months ahead of schedule
- > Won Ohio ACEC Honor Award

Before, During, and After







Lessons Learned

- Learn from previous projects
- Pumping is not always best
- Do homework up front
- Use the right tool for the job (two-pass system)
- Take advantage of the technology
- > Be proactive
- Define baseline before construction begins

- Consider long term costs
- Improve reliability
- > Address risks
- Be fair with project stakeholders
- Document, document, document!
- Allow for real world issues
- Trust, but verify
- Money spent in planning pays big dividends

Closing and Summary

- Eliminating the Valley Belt Pump Station was the "green" thing to do.
- The cost of a trenchless gravity sewer was about the same as a new pump station.
- Trenchless technologies can be used successfully for gravity sewer installations and often have numerous benefits.
- Success: experienced people working together with the right tools and resources.

Questions and Answers



