In Line Storage Solution

*LS 203 and EQ Sewer, Bath Charter Township*

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Southern Clinton County Municipal Utilities Authority
SCCMUA Service Area
Bath Township WWCS

• Collection system statistics per 2016 SRF Project Plan
  • 183,000' of 6" – 21" gravity sewer
  • 47,000' of force main
  • 20 lift stations
  • 836,000 gpd purchased capacity at SCCMUA CWP

• System-wide Issues
  • Corrosion in old concrete trunk sewers
  • Odor complaints
  • Conveyance capacity constraints (undersized sewers and lift stations)
  • Long force main retention times
  • Wastewater flows exceed purchased capacity
Problem Areas
• Capacity issues
• LS 201 and LS 202 upgrades/issues
• Force main rerouting
• LS 202 service area
• WWTP capacity limitations
- Three forcemains
- Manually controlling LS 203
- Corrosion/Odor
- LS 219 capacity
- Small lift stations and long force mains
- Future development
Alternatives

As part of S-2 Grant, several alternatives were evaluated to address the Township’s WW issues specific to the LS 203 area:

1. Do nothing
2. Equalization storage
3. Re-route LS 214 service area (upstream of LS 203) to LS 201
4. I/I reduction in LS 202 and LS 203 service areas
5. Re-route LS 214 service area to DeWitt Township Collection System
Equalization Storage Concerns

- Corrosion
- Odor
- Minimal flushing velocities
- Deep construction

Image courtesy of: wxyz.com/news

Image courtesy of: theconcreteprotector.com
Equalization Storage

Large diameter EQ basin
Equalization Storage

Oversized in-line trunk sewer
Equalization Storage

• Oversized in-line trunk sewer design selected
  • Allows for elimination of two lift stations (reduced O&M costs)
  • Improves hydrogen sulfide issues (corrosion and odor) in Webster Road
  • Allows maximum flow control for LS 202 service area by reducing inputs to the service area
  • Least expensive EQ alternative considered

• Project to be constructed in two phases
Equalization Storage – Phase 1
Design

- Depth of Construction
- Subsurface Conditions
- Corrosion
- Equalization Triggers
- LS Communication
- Pipe Embedment
- Flexibility
Design – Depth of Construction

- Existing hydraulics requires deep construction
- Wet well depth: 31'
- Sewer depth: 18' – 23'

![Image of deep excavation site](Image courtesy of: pdsigns.ie)
Design – Subsurface Conditions

- Wetland/perched water
- High groundwater table
- Saturated silt, muck, marl
- Local anecdotes
  - Sinking equipment
  - “You’ll never get a sewer in there!”
- BORINGS!!
  - 6 borings along Drumheller
Design – Corrosion

• Existing trunk sewer had corrosion issues

• EQ sewer increases detention times (during EQ mode) and increases potential for corrosion

• Design a system capable of withstanding hydrogen sulfide corrosion

  • Polymer manholes
  • Plastic (flexible) pipe
Design – EQ Triggers/LS Communication
Design – Pipe Embedment

PIPE EMBEDMENT DETAIL

NOTES

SUITABLE PIPE EMBEDMENT ENVELOPES AND UNSTABLE SOIL REPLACEMENT MATERIALS INCLUDE:

1. IN DRY TRENCH WITH STABLE NATIVE SOILS – GRANULAR MATERIALS, CLASS II, MODIFIED TO 100% PASSING A 1” SIEVE, OR 21AA, MODIFIED PER SPECIFICATIONS.

2. IN WET TRENCH – CRUSHED 6A STONE WITH NON-WOVEN GEOTEXTILE SEPARATOR OVERLAPPED AT SEAM.
Design – Flexibility

**POTENTIAL MANHOLE CONFIGURATIONS**

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<th>MH Number</th>
<th>54&quot; Vylon Round (ft)</th>
<th>54&quot; Vylon Square (ft)</th>
<th>60&quot; ADS Sanitite Round (ft)</th>
<th>60&quot; ADS Sanitite Square (ft)</th>
<th>Corrosion Resistant [Y/N]</th>
<th>Internal Drop [Y/M]</th>
<th>Chimney Diameter [ft]</th>
<th>Step Orientation</th>
<th>Rim Elevation</th>
<th>Cut to Lowest Pipe Invert</th>
<th>Adjusting Rings</th>
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**NOTES:**

- 269 L.F. OF 54"/60" SAN. @ -0.10%
- (431 L.F. MH-MH)
- EX. 18" SAN. (ABAN)
- EX. 18" (ABAN)
Phase I Construction

- Abandoned L.S. 203
- Abandoned L.S. 216
- Installed new L.S. 203
- Abandoned 1,600 L.F. of 18" Sewer
- 700 L.F. of 8" Gravity Sewer
- 2,200 L.F. of 60" Gravity Sewer
NOTE THE RED BULL CAN!!

Construction – Corrosion
Construction
Construction
Construction
Construction
Construction
Construction
The Results
Questions?