Dayton’s New Parallel Interceptor

REDUNDANCY FOR CRITICAL SERVICE USING CUSTOM PIPE TECHNOLOGY
Within The Levees
Permitting & Coordination
## Project Goals

<table>
<thead>
<tr>
<th>Full Redundancy</th>
<th>Isolation</th>
<th>Facilitate Future Rehab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide full redundancy to the City’s most critical sewer infrastructure</td>
<td>Allow for full isolation of both the existing and proposed interceptors</td>
<td>Facilitate future rehabilitation and repair of the existing interceptor without bypass pumping</td>
</tr>
</tbody>
</table>
# Project Costs

<table>
<thead>
<tr>
<th>Buy in Bulk</th>
<th>Dayton’s Cost</th>
<th>Per Mile Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constructing 2 miles of 4 total miles</td>
<td>$17.9 Million (3 Bids within 4% of each other)</td>
<td>$9 to $12 Million per Mile</td>
</tr>
</tbody>
</table>


Shape and Material

Evaluated multiple concepts to arrive on the chevron shaped concrete box

- Match existing interceptor inverts
- Shallow depth of cover
- Size Changes to go under storm crossings
- H20 Loading
- Sloped bottom to prevent sedimentation
Corrosion Protection

- Corrosion in existing sewer
- Increased corrosion where Siphons Connect
- ConBloc Anti-Microbial Admixture (ASTM C494 Type S and ASTM C1577)
- Spray on acid resistant lining in junction chambers
Anti Floatation

- Shallow cover
- High groundwater when river is flooded
- Anti-floatation wings where cover is insufficient to prevent flotation
- Concrete box offers weight advantage over round pipe
Under Pressure
# Under Pressure

<table>
<thead>
<tr>
<th></th>
<th>Point A</th>
<th>Point B</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-Year Flood Elevation</td>
<td>734.0</td>
<td>736.5</td>
</tr>
<tr>
<td>Peak Internal Surcharge Elevation</td>
<td>721.0</td>
<td>732.5</td>
</tr>
<tr>
<td>Differential</td>
<td>13 FT / 5.6 PSI</td>
<td>4 FT / 1.7 PSI</td>
</tr>
<tr>
<td>Approximate Invert Elevation</td>
<td>706.0</td>
<td>715.4</td>
</tr>
<tr>
<td>Internal Surcharge Pressure (No Flood)</td>
<td>15 FT / 6.5 PSI</td>
<td>17.1 FT / 7.4 PSI</td>
</tr>
</tbody>
</table>
Under Pressure

13 PSI
- ✔️ ASTM C443

5 PSI
- ✔️ Round Conc. Pipe
- ✔️ Box Conc. Pipe

UH OH!

MR. SCOTT, I MUST HAVE MORE POWER!
Joint Design

• Our team developed a specification which references ASTM C1677, but requires 13 PSI modifications.

• How can this be done?
Joint Design

- How do we test this thing?
- Special testing devices can be fabricated.

- We opted for proof of design testing at the place of manufacture.
  - Ohio EPA required a secondary mastic seal as insurance.

13 PSI \times 144 \text{ IN}^2\text{/FT}^2 \times 44.6 \text{ FT}^2 = 83,500 \text{ LBS!}
Gasketed Joints

- Gaskets factory applied and tested
- Mastic field applied
Joint Testing

- Testing performed at the precast factory
- Tests performed using a custom test gasket

Hand-pump water within gap to 13 PSI.

10-minute hold
Closing

• Chain of actions led us to the construction underway today.

• A barrier at any step could have sent us to a deep tunnel or other extreme.

• Thorough, thoughtful PTI process brought Ohio EPA on board.

• Full redundancy will be established for this critical portion of Dayton’s system.
Thank you

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