FYFE®

TYFO® SYSTEM

PIPELINE REHABILITATION USING TYFO

Founded in 1988, Fyfe is a pioneer in the fiber-reinforced polymer (FRP) structural strengthening industry. Today we are a world leader in developing, testing and manufacturing Tyfo, an advanced composite system of specialized carbon and glass fabrics, which we combine with polymers to strengthen a wide range of infrastructure.

Building upon our industry leading US patent 'Fiber Reinforced Pipe' in 1999, our engineers and designers create pipe rehabilitation solutions for structural deficiencies in piping infrastructure. Our in-house team provides technical support and training to engineers, inspectors, contractors and owners in municipal, industrial, power generation thermal, hydropower and oil & gas markets.

The Tyfo system provides solutions for:

- Full structural repairs & pipeline renewal
- Leak and Joint repairs
- Strengthening for increase loadings
- Strengthening for repurposing pipelines
- Corrosion mitigation

Tyfo FRP system bonds to either the inside or outside of pipes and can be detailed to address complex configurations and transitions. Internal repairs offer a valuable trenchless solution frequently using existing entry points and with a limited site footprint they minimize impact to local traffic and adjacent property owners. A rapid emergency repair option offers greater than a 50-year design service life.

Tyfo FRP pipe repairs are suitable for:

- Pre-stressed concrete cylinder pipe (PCCP)
- Bar-wrapped concrete pipe
- Reinforced concrete pipe (RCP)
- Metallic piping (steel & various irons)
- FRP piping
- Other systems such as CIPP liners.

Applying the AWWA C305 code, designs can accommodate all internal loads (i.e. operating, transient, thrust and vacuum pressures) as well as all external loads (i.e. traffic, soil, groundwater and temperature). Other solutions can be developed using ASME PCC-2 in conjunction with ASME B31.1 & B31.3, and ASTM F1216 too.

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Pipe Questionnaire

Project Name:

Project Owner:

Location:

Pipeline Information (ID, Internal Diameter):

- ☐ PCCP (Pre-stressed Concrete Pipe)
- ☐ Metallic (steel, cast Iron, ductile iron), other:
- ☐ RCP (Reinforced Concrete Pipe)
- ☐ Bar wrapped pipe (C-303)
- ☐ Other:

Installation Use/Design Requirements:

1. Operating pressure: (psi)
2. Total pressure (operating + surge): (psi)
3. Vacuum pressure: (psi)
4. Depth of cover: (feet)
5. Soil modulus of reaction: (psi)
   if unknown okay to assume 1,000 psi? ☐ Yes ☐ No
6. Soil weight (lb/ft^3):
7. Water table height above top of pipe: (feet)
8. Temperature fluctuation (°F):
9. Live Loading (e.g., HS-20):
10. Thrust: (Kips)
11. ☐ Gravity ☐ Force main
12. ☐ External wrap design ☐ Internal wrap design
13. ☐ Standalone design ☐ Composite design

When possible please provide:

1. Plan and profiles drawings
2. Pipe section shop details/lay schedules
3. Inspection reports
4. Number of sections to be repaired
5. Total length to be repaired
6. Effluent chemical composition

Please provide pipe section properties, for example:

1. PCCP/RCP/C-303 pipe section shop drawings and tables
2. Wall thickness:
3. Material strengths (steel yield, concrete compressive):
4. Design standard/code of existing pipe:

Conveyance/Distribution Use:

- ☐ Potable water
- ☐ Sewer
- ☐ Raw water
- ☐ Storm
- ☐ Circ. water
- ☐ Penstock
- ☐ Other:

Scheduling:

When would you like an estimate: Desired construction schedule

When is construction: or shutdown window:

Please describe condition issues:

Please describe renewal goals (e.g., full structural, partial structural, local repairs, etc.):