ASCE

PIPELINES 2015 CONFERENCE

Baltimore, MD | August 23-26

Alternative Pipe Material Choice provides Trenchless Solution

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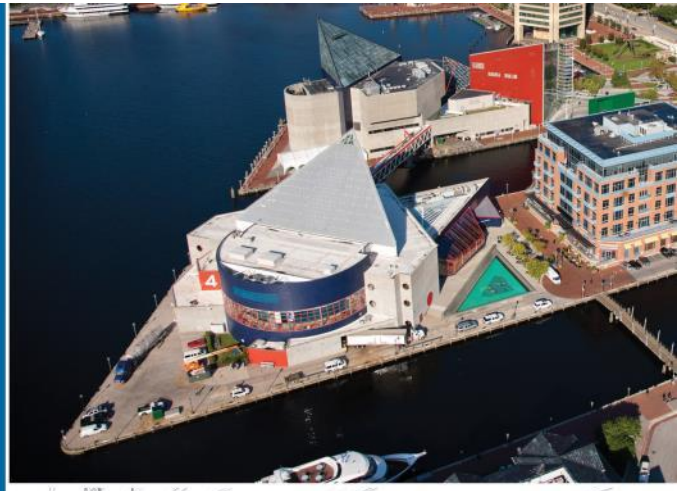


Case Study

City of Edmonton

Alberta, Canada

Case Study


POUNDMAKER INDUSTRIAL
Proposed 48” Diameter
Sewer Pipeline
21
2

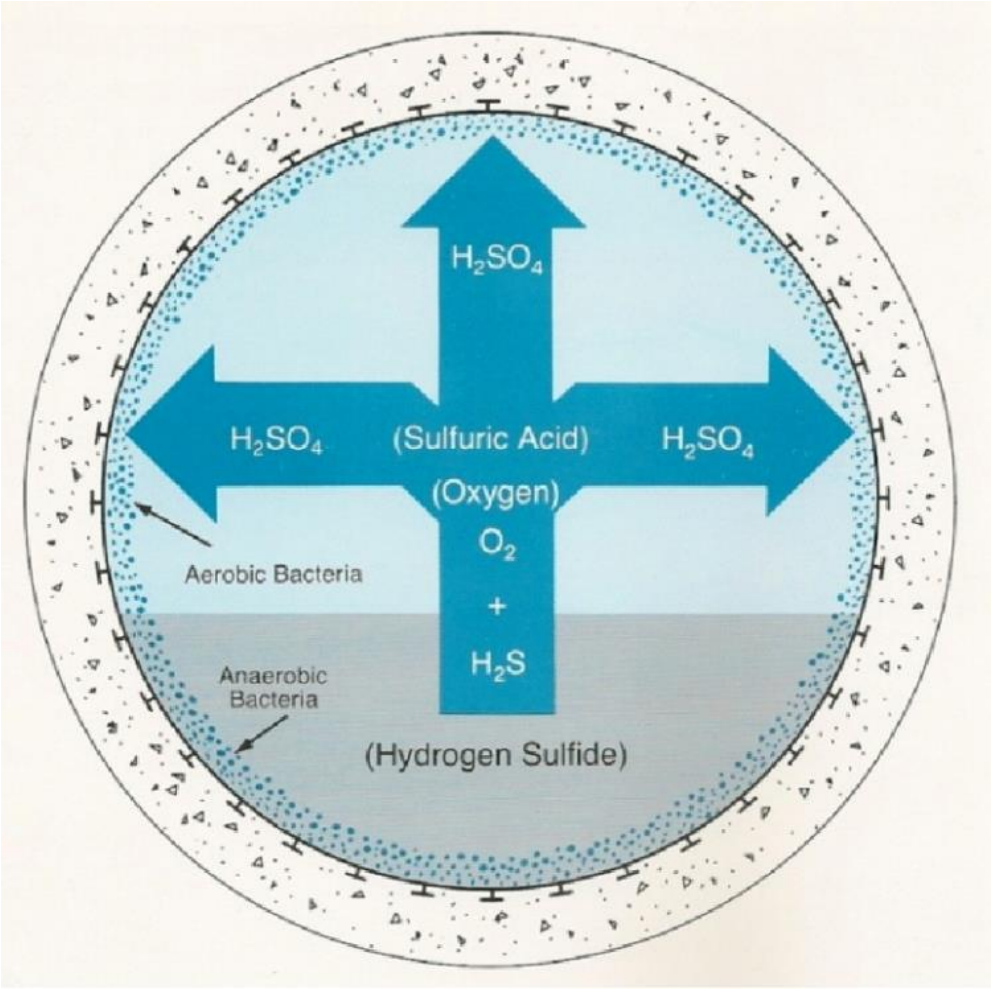
Case Study

Original Design

Specified Materials :	PVC
	RCP w/ Liner
Installation Method:	Direct Bury
Burial Depth:	Min. Depth 12 feet
	Max. Depth 33 feet
Project Length:	2240 ft

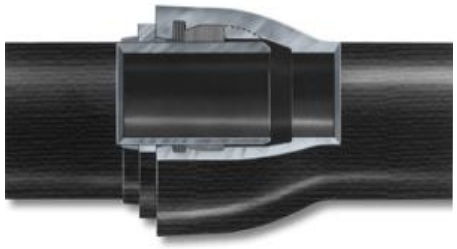


Why do you need a liner?



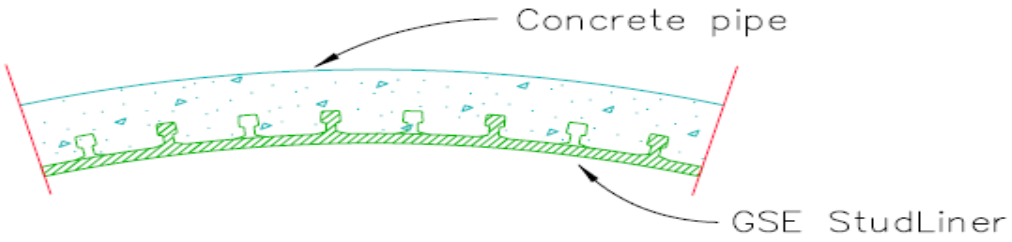
Corrosion Resistant Pipe Materials

- PVC
- Fiberglass Pipe
- High Density Polyethylene (HDPE)
- Ductile Iron with Epoxy Liner
- Concrete with Plastic Liner

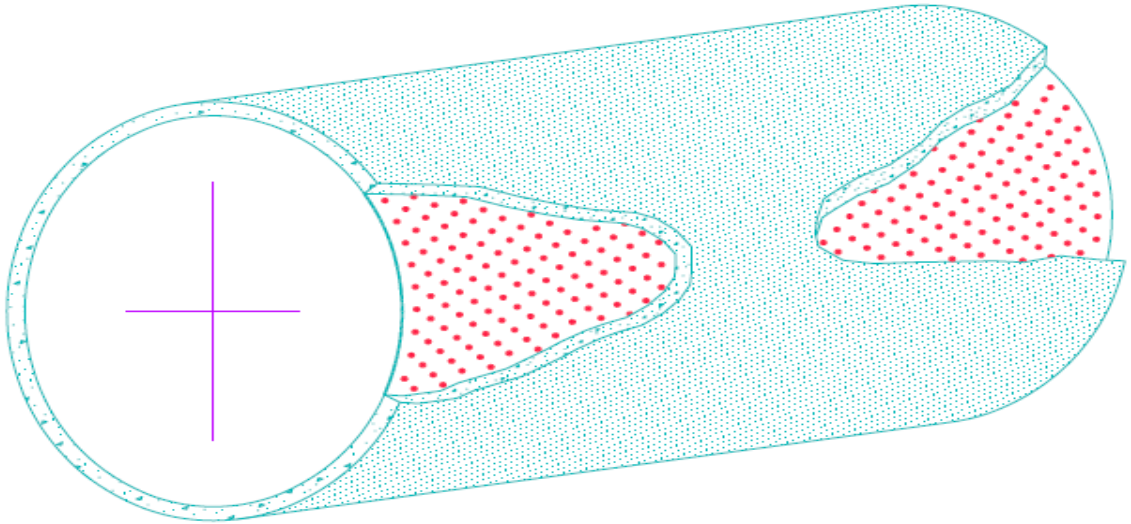





HDPE Lined Concrete Pipe



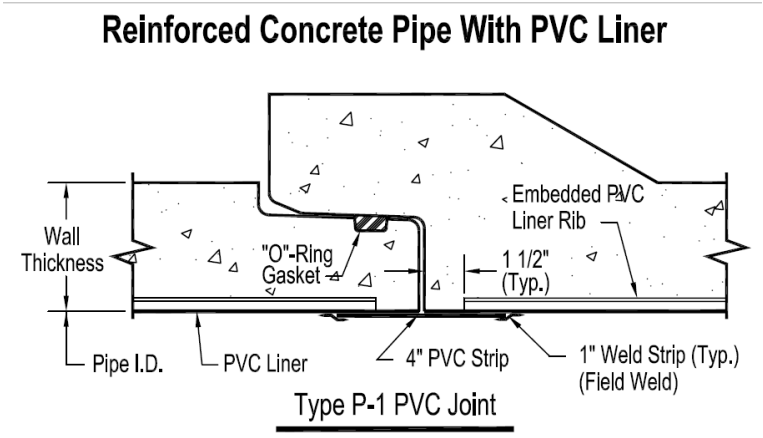
Partial Section Thru Pipe



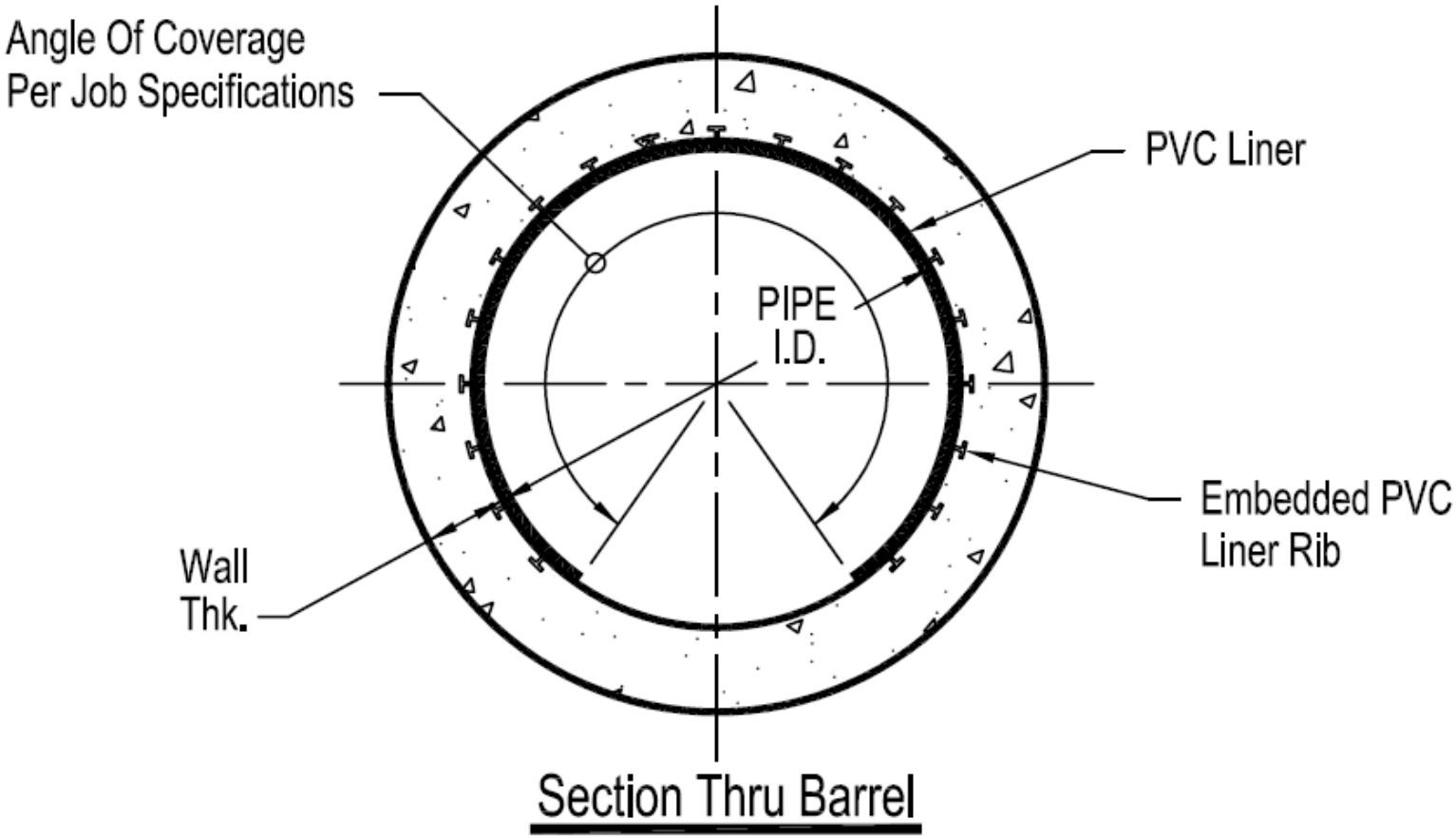
Concrete Pipe With GSE StudLiner



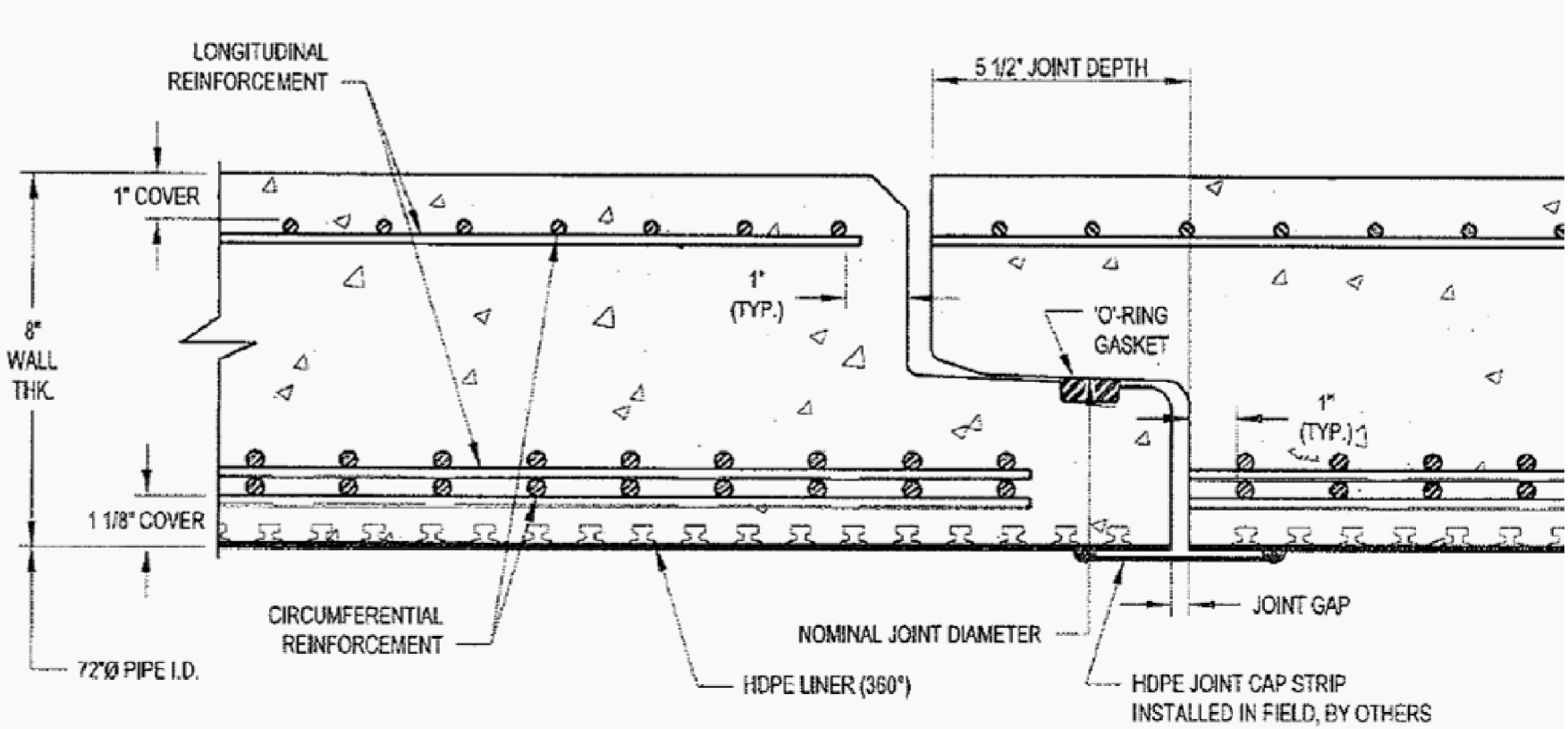
PVC Lined Concrete Pipe



PVC/HDPE Lined Concrete Pipe



PVC/HDPE Lined Concrete Pipe





Case Study

Difficult conditions

- Poor Soil Conditions
- High Water Table
- Potential High Sulphide Concentration

Significant risks caused bids to be considerably higher than expected.



Case Study

Alternate Proposal – Michels Canada

- Trenchless Installation
- Pipe Materials: 1. FRP Jacking Pipe

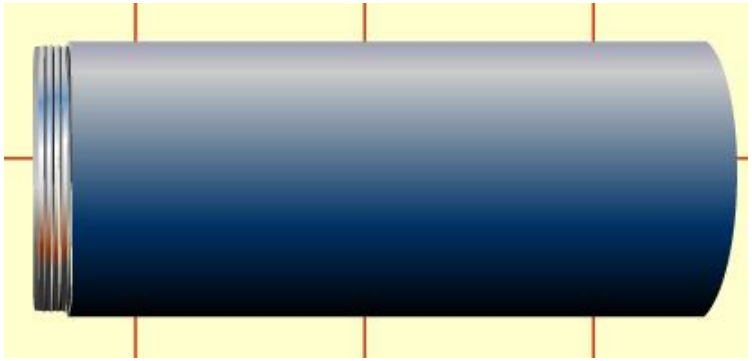
  2. Steel Jacking Pipe w/ FRP Carrier Pipe (Two-Pass)

This Alternate Bid was Less Expensive than the Direct Bury Original Proposals



Case Study

FRP Jacking Pipe



Steel Jacking Pipe (Casing) for Two-Pass Tunnel Section

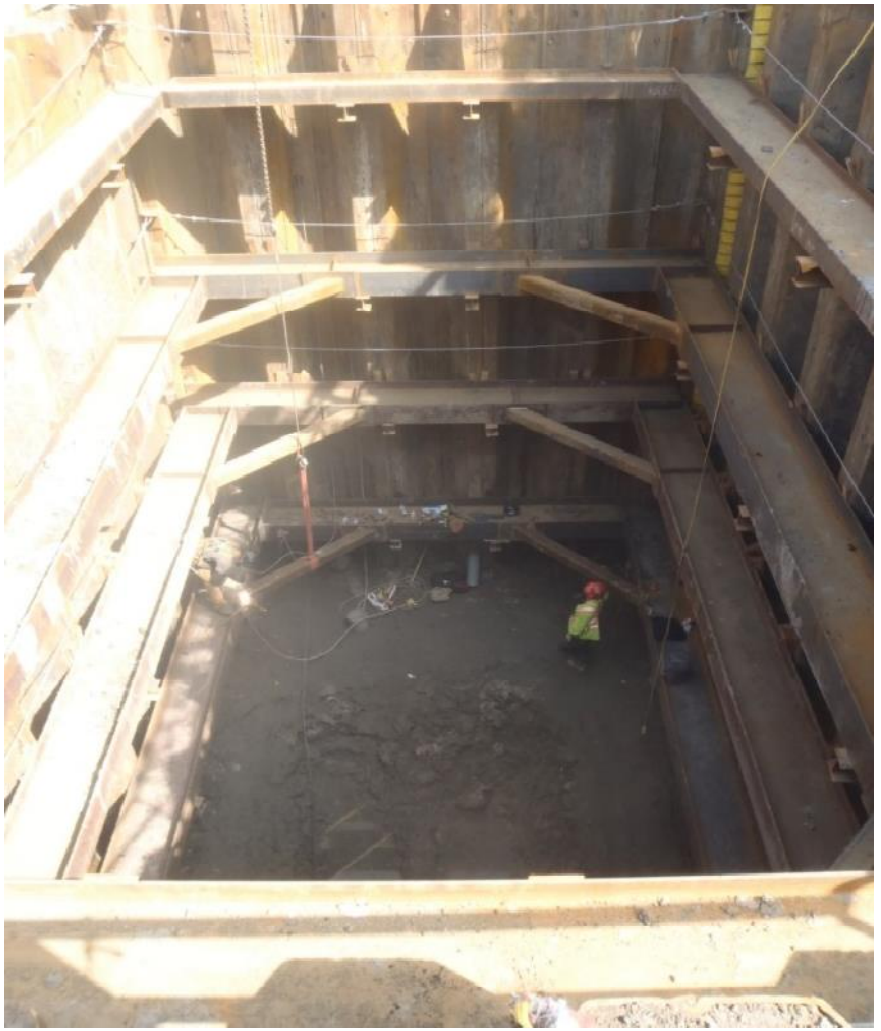
Case Study

Construction began April 2012 with a 20 months construction schedule

Case Study

Shafts

- 11 shaft locations
- Interlocking Steel Sheets
- Dewatering Wells
- Concrete Floor Slabs



Case Study

End Seal

- Low Strength Concrete
- Steel Face Plate
- 1 inch Thick Rubber Launch Seal

Case Study

Akkerman SL52

Microtunneling Boring Machine (MTBM)

Case Study

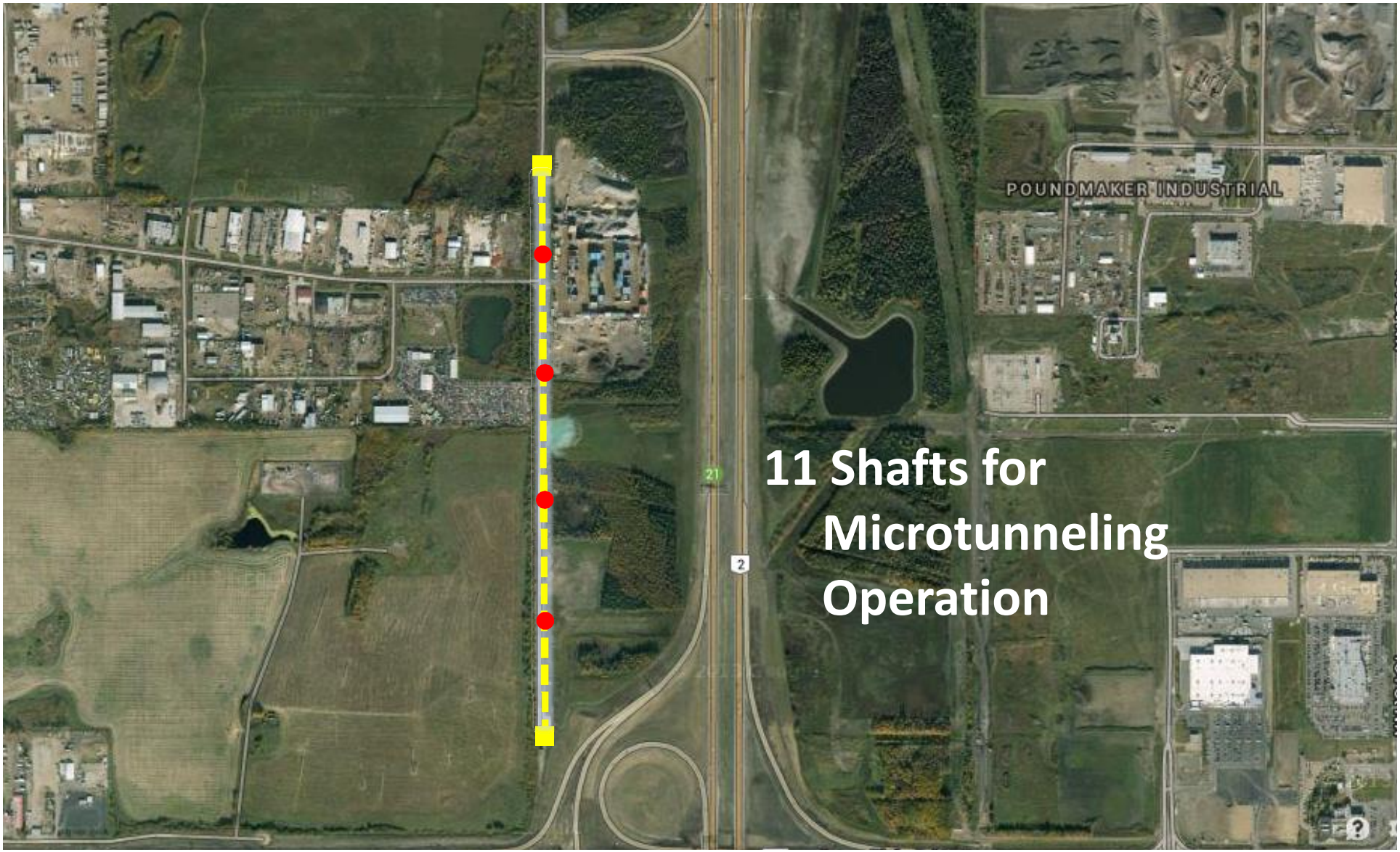
Akkerman

Jacking Frame

840 Tons Capacity



Case Study


POUNDMAKER INDUSTRIAL
11 Shafts for Microtunneling Operation

Case Study

Difficult conditions become more difficult

- Peat located directly above pipe zone
- Potential for pipe flotation
- Required additional geotechnical investigation



Case Study

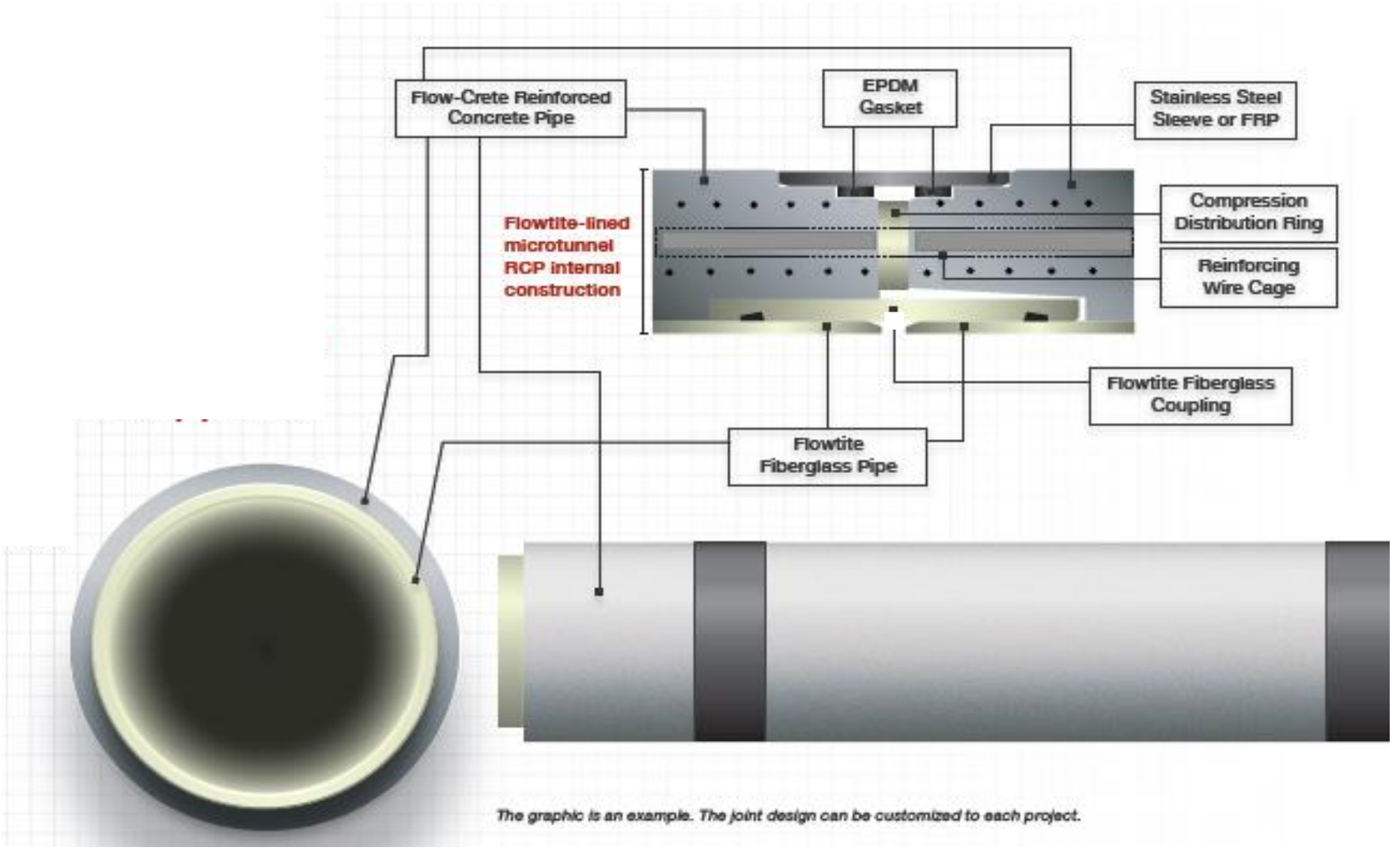
What is Peat?

- Peat is highly organic soil derived mainly from plant remains.
- Extremely compressible
- Known to be problematic for pipe installations



FRP Lined Concrete Pipe

FRP Lined Concrete Pipe



The graphic is an example. The joint design can be customized to each project.



Product Comparisons

Liner RCP Product	Corrosion Resistance	Joint Corrosion Protection Required	Gravity Sewer	Pressure Sewer
PVC Liner	Yes	Yes	Yes	No
HDPE Liner	Yes	Yes	Yes	No
FRP Liner	Yes	No	Yes	Yes



FRP Lined Jacking Pipe

Case Study

Change of Microtunneling Pipe

- To reduce the risk of buoyancy due to peat zones, FRP Lined RCP Jacking Pipe in lieu of FRP Jacking Pipe
- FRP Lined RCP Jacking Pipe used in two of the five final tunnel drives.
- FRP Liner provided same corrosion resistance as FRP jacking pipe.



Case Study

- 1400 LF DN48 Flowcrete Jacking Pipe

  (FRP Lined RCP)

- Long jacking drive of 1000 ft

Case Study

Lessons Learned

- Value Engineering (creative solutions) can provide considerable cost savings
- Alternate Materials provide added value to project and can reduce risk.
- Microtunneling (trenchless technology) can be a more cost effective solution than traditional open cut installation. Especially in poor soil conditions.
- Microtunneling can be successfully installed in difficult ground conditions.

Acknowledgements

- The City of Edmonton Drainage Services Department
- Michels Canada Co.
- Stantec Consulting Ltd.
- Alberta Transportation
- My Special Thanks to “Peat”

Thank you

MICHELS CANADA

DRIVING INNOVATION.
TRANSFORMING CONSTRUCTION.

FLOWTITE

THOMPSON PIPE GROUP

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