PNWS-AWWA | Spring Conference
May 3, 2019

Restoring Water System Confidence With CIPP

Presented by:
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CITY OF Salem AT YOUR SERVICE

murraysmith

Agenda

01 Background & History

02 Project Goals

03 Design Phase

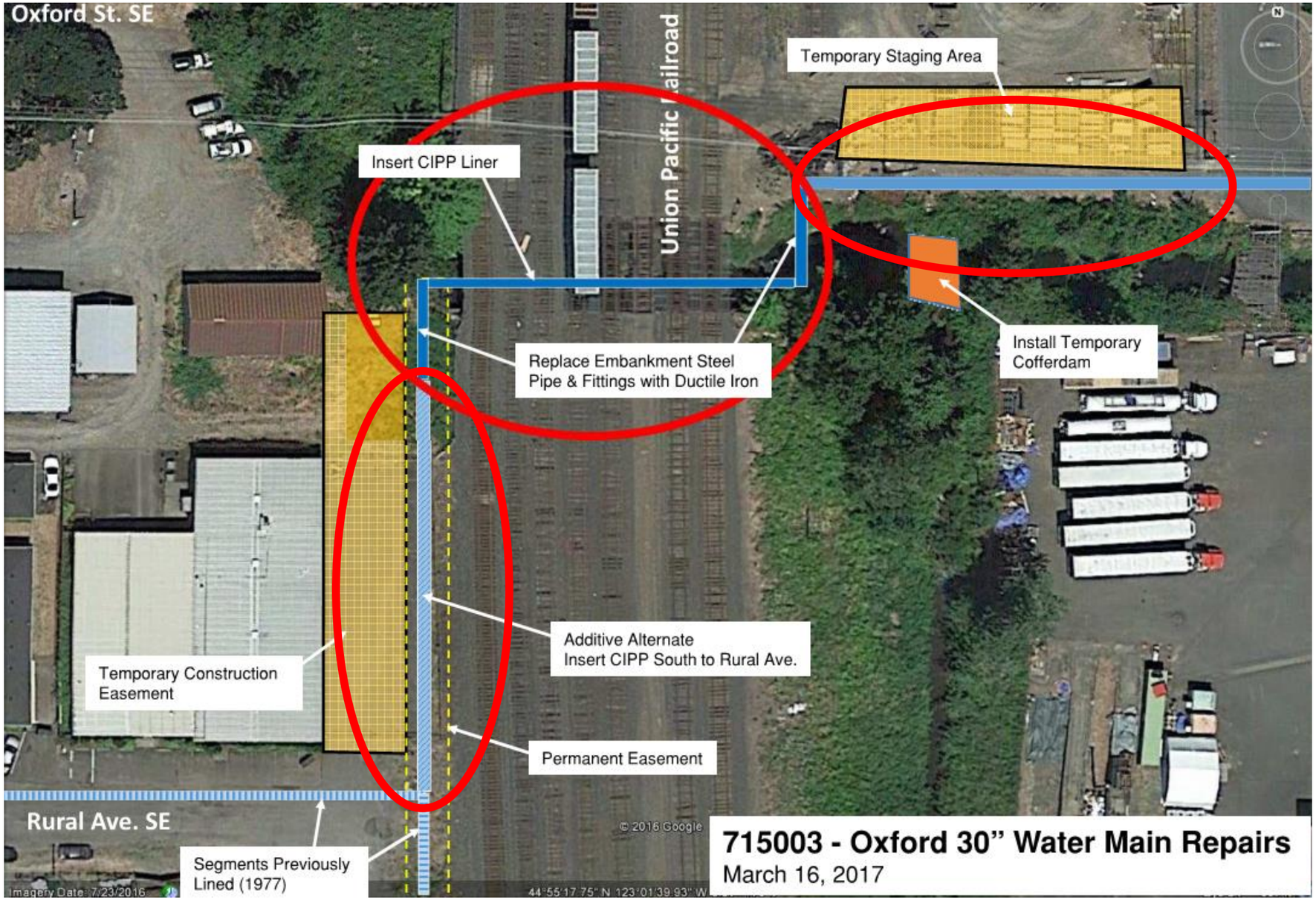
04 Permitting

05 Construction Phase

06 Q&A

Background & History

Site Map


Oxford St. SE
Union Pacific Railroad
Temporary Staging Area
Insert CIPP Liner
Replace Embankment Steel Pipe & Fittings with Ductile Iron
Install Temporary Cofferdam
Additive Alternate Insert CIPP South to Rural Ave.
Temporary Construction Easement
Permanent Easement
Rural Ave. SE
Segments Previously Lined (1977)
© 2016 Google
715003 - Oxford 30" Water Main Repairs
March 16, 2017

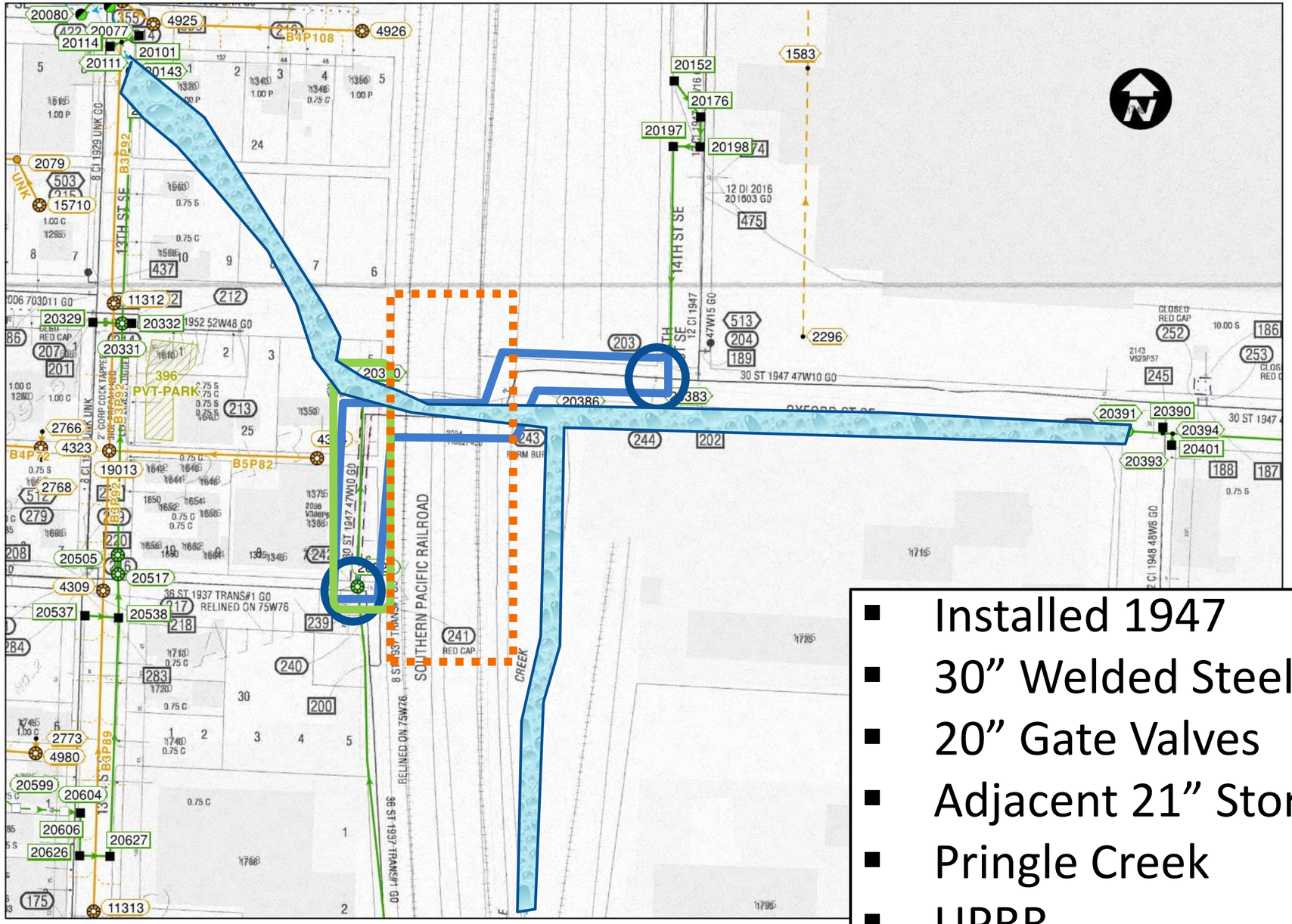
Existing Conditions

Pipeline Purpose

- Intertie between service areas
- System redundancy
- System looping

Existing Conditions

715003 Oxford 30" Water Main Rehabilitation - Utilities



- Installed 1947
- 30” Welded Steel Pipe
- 20” Gate Valves
- Adjacent 21” Storm
- Pringle Creek
- UPRR

Existing Conditions

Existing Pipe Deficiencies

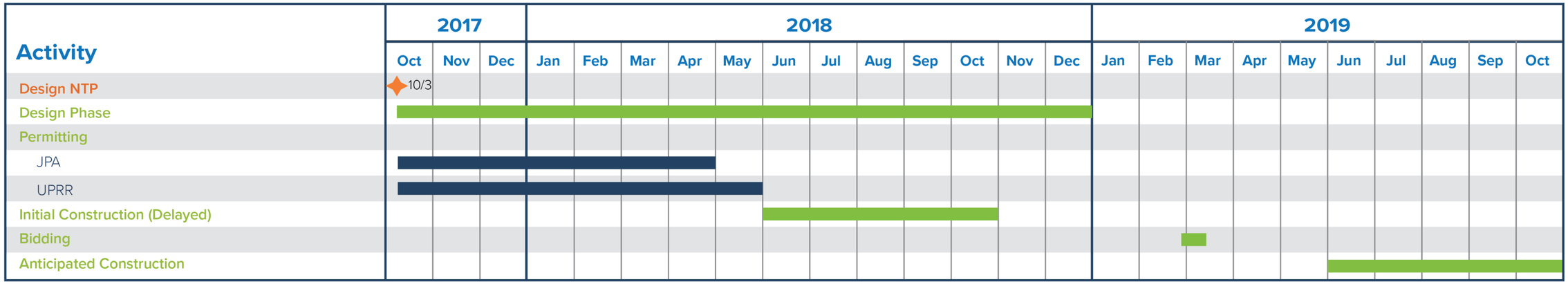
- Holes in steel pipe
  - City performed repair in 2013
- Existing isolation valve confidence low

Project Goals

Project Goals

1. Return system confidence
   - Rehabilitate and replace deficient intertie piping
   - Install new isolation valves
2. Minimize environmental impacts
   – Proactive rehab to avoid catastrophic failure
   – Minimize footprint in Pringle Creek
3. Cost Effective Repair

Project Schedule



Design

Design Considerations

- Project Goals
- Existing Pipe Conditions
- Environmental Impacts
- Railroad Impacts
- Site Access
- Rehabilitation Technology Analysis

Design Philosophy

- Favor trenchless rehabilitation in creek
  - Technique Evaluation
  - CIPP curing methods, increase competition
- Avoid direct UPRR impacts
- Cost-effective solution
- Isolation valve installation ahead of construction
- Upgrade piping for O&M considerations

Permitting

Joint Permit Application

This is a joint application, and must be sent to both agencies, who administer separate permit programs. Alternative forms of permit applications may be acceptable; contact the Corps and DSL for more information.

Date Stamp

U.S. Army Corps of Engineers Portland District	Oregon Department of State Lands
Corps Action ID Number	DSL Number

(1) APPLICANT AND LANDOWNER CONTACT INFORMATION

	Applicant	Property Owner (if different)	Authorized Agent (if applicable) ☑ Consultant ☐ Contractor
Contact Name	Michael Linn, PE		Brendan O'Sullivan, PE
Business Name	City of Salem		MurraySmith
Mailing Address 1	555 Liberty Street SE		888 SW 5th Avenue
Mailing Address 2	Room 325		Suite #1170
City, State, Zip	Salem, OR 97301		Portland, OR 97204
Business Phone	503-588-6211		503.225.9010
Cell Phone			
Fax			
Email	mlinn@cityofsalem.net		Brendan.O'Sullivan@murraysmith.us

(2) PROJECT INFORMATION

A. Provide the project location.

Project Name	Tax Lot #	Latitude & Longitude*
Oxford 30" Water Main Repairs	1500	44.9218 & -123.0277
Project Address / Location	**City (nearest)**	**County**
1500 14th Street SE	Salem	Marion

Township	Range	Section	Quarter/Quarter
T07S	03W	35	SENW

Brief Directions to the Site
22nd St. SE off of 22/99E/ Mission St SE; Rt onto Oxford St. SE; Site is at the turn where Oxford becomes 14th St.

B. What types of waterbodies or wetlands are present in your project area? (Check all that apply.)

☑ River / Stream ☐ Non-Tidal Wetland ☐ Lake / Reservoir / Pond
☐ Estuary or Tidal Wetland ☐ Other ☐ Pacific Ocean

Waterbody or Wetland Name**	River Mile	6th Field HUC Name	6th Field HUC (12 digits)
Pringle Creek		Willamette	170900070301

C. Indicate the project category. (Check all that apply.)

☐ Commercial Development ☐ Industrial Development ☐ Residential Development
☐ Institutional Development ☐ Agricultural ☐ Recreational
☐ Transportation ☐ Restoration ☐ Bank Stabilization
☐ Dredging ☐ Utility lines ☐ Survey or Sampling
☑ In- or Over-Water Structure ☑ Maintenance ☐ Other:

1 March 2014

B. Describe the existing navigation, fishing and recreational use of the waterway or wetland.
This portion of Pringle creek is not used for navigation, fishing, or recreational use.

2 March 2014

Utility Contracts System: Page 1 of 1

Utility Contracts System

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WELCOME TO THE UTILITIES ONLINE APPLICATION SYSTEM

- Before you Begin:
  - Applicants must complete all application fields. To save your application progress and return at a later time, click the "save" button. Failure to click the "save" button shall forfeit your previous progress. To send your final application, you must click the "submit" button. **BE ADVISED: Your application will not be deemed received by Union Pacific until the applicant clicks the "submit"button AND all fees in full are submitted.**
- Application Timeline Approval Information:
  - All crossing applications shall at a minimum take 30-45 days for review.
  - All encroachment applications shall take 90-120 days for review.
  - In addition to the minimum review time noted above (30-45 days), any variances require secondary review and shall take an additional 30-45 days for secondary review (60-90 days total).
- Payment Information:
  - The following fees shall apply:
    - Maintenance Review Request fee: $505.00
    - Crossings:
      - Crossing application fee: $505.00
      - 5-business-day rush fee: $10,055.00
      - 15-business-day rush fee: $5,055.00
    - Encroachments:
      - Encroachment application fee: $3,055.00 **If your application is an encroachment and a crossing, the encroachment fee shall apply.*
    - Right of Entry:
      - Right of Entry application fee: $1,045.00
    - Environmental Right of Entry:
      - Environmental Right of Entry application fee: $1,055.00
    - Drainage & Water Rights:
      - Drainage & Water Rights application fee for crossing/encroachments: $3,055.00
    - Mitigation Review:
      - Electric applications over 750 volts with an intersecting angle of less than 45 degrees or parallels UPRR Right of Way: $3,505.00
    - **NOTE: To avoid UPRR Specification Variance fees as noted above, applicant will provide Exhibit A's with no less than 45 degrees of an intersecting angle**
    - One rush fee applies to one folder number (application).
  - *Eg. If an applicant submits 5 applications and submits one 5-day rush payment ($10,055.00), the applicant will be able to rush one folder number (application), but the four remaining folder numbers (applications) shall be processed under our normal processing time*

☐ **I agree to the terms and conditions.**

Continue

https://www.uprr.com/rem/ucs/jas/ 5/10/2018

Removal/Fill Quantities

	VOLUME (CY)	MATERIAL
REMOVAL	22.5	NATIVE ROCK/SOIL BACKFILL
	6.5	PIPE
	8.3	NATIVE ROCK (TO BE SALVAGED)
	37.3	**TOTAL REMOVAL BELOW OHW**

FILL	8.3	SALVAGED NATIVE ROCK
	29	PIPE AND TRENCH MATERIALS
	8	ISOLATION STRUCTURE (*TEMPORARY FILL*)
	45.3	**TOTAL FILL BELOW OHW**

Protected Species

Lamprey Ammocytes

Steelhead

Permit Requirements

- Isolation structures
- Fish salvage
- In-Water Work Period
  - June 1 to October 15
- Soil Storage / Removal Plan
- Surface Restoration

Permitting – UPRR

Union Pacific Railroad

- No physical impact to R/W
- Access through it required, therefore permit needed
- Flagger requirements

Construction

Bidding Results

Apparent Low Bidder	Bid Amount
Contractor #1	$498,900 (Non-responsive)
Contractor #2	$512,315
Contractor #3	$519,694
Engineer's Estimate	***$531,460***
Contractor #4	$548,864
Contractor #5	$578,449

- City entered in contract with Contractor #2

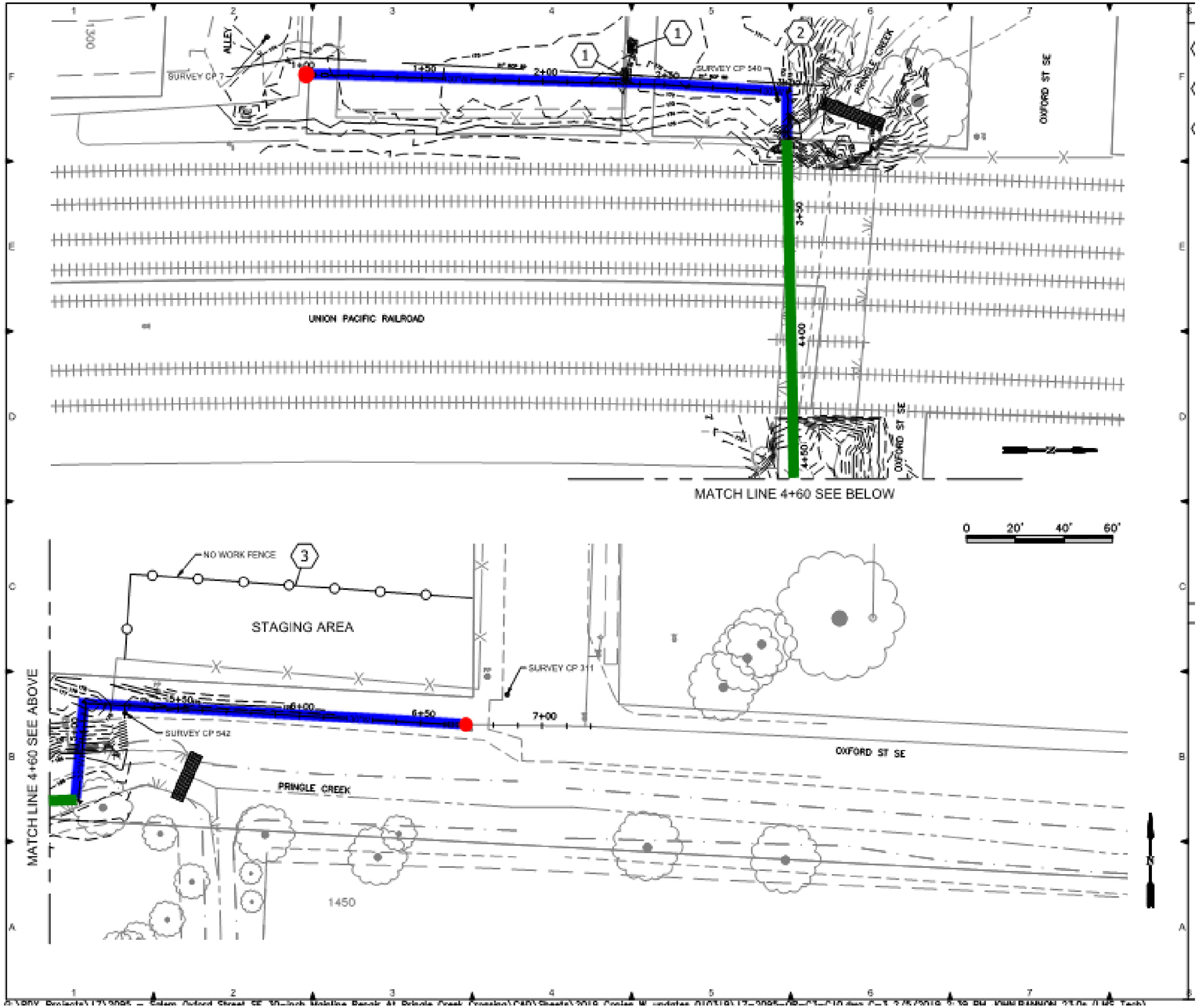
Construction Sequence

1. Isolation valve install by City
2. Creek isolation & flow diversion
3. Fish salvage
4. Potholing to verify pipeline characteristics
5. Order CIPP materials
6. Open cut pipe replacement

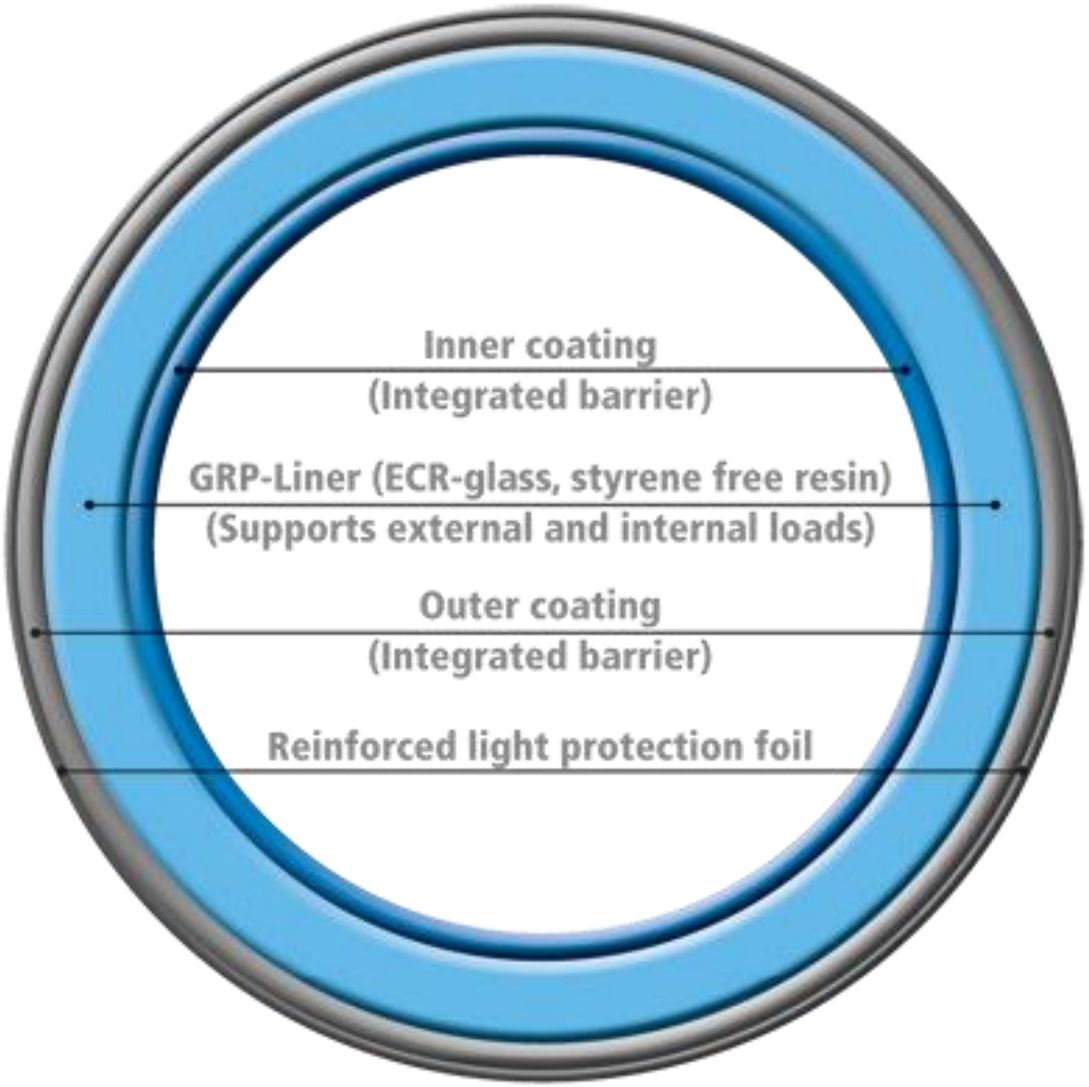
Construction Sequence

6. Obstruction removal for CIPP install
7. CIPP liner Installation
8. CIPP end seal installation
9. Post installation CCTV and testing of CIPP
10. Testing & disinfection of complete main
11. Waterline connections

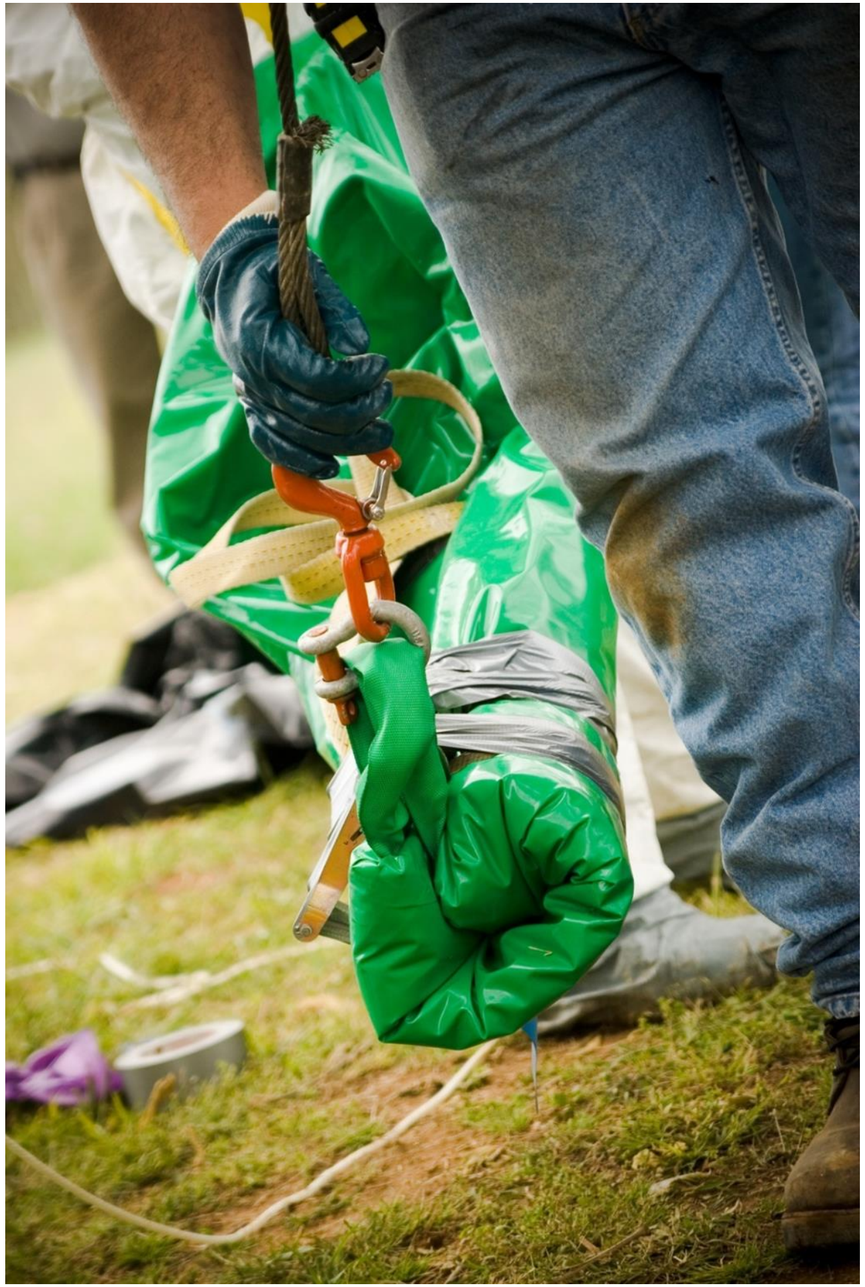
Construction Sequence



Manufacturing of UV-CIPP



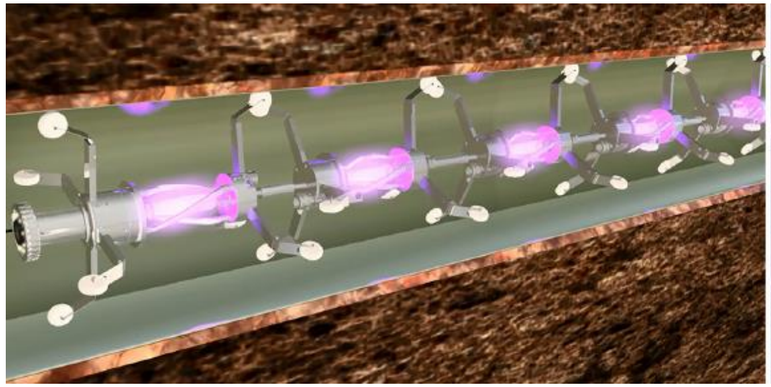
Construction - CIPP

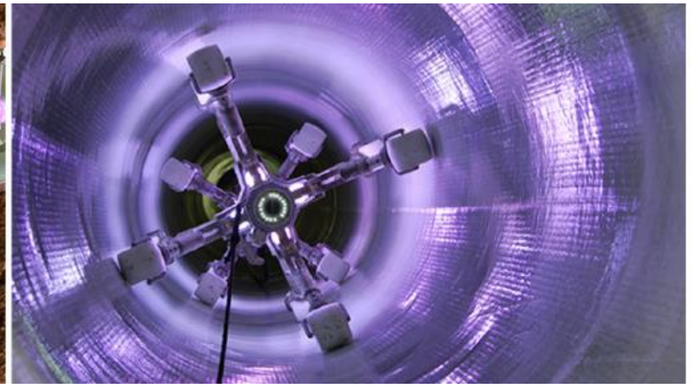


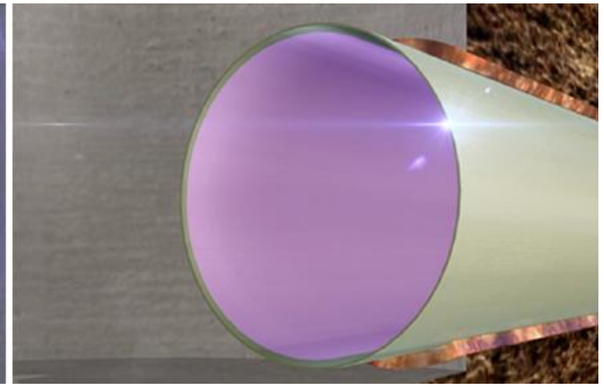
Construction - CIPP

SAERTEX multiCom®

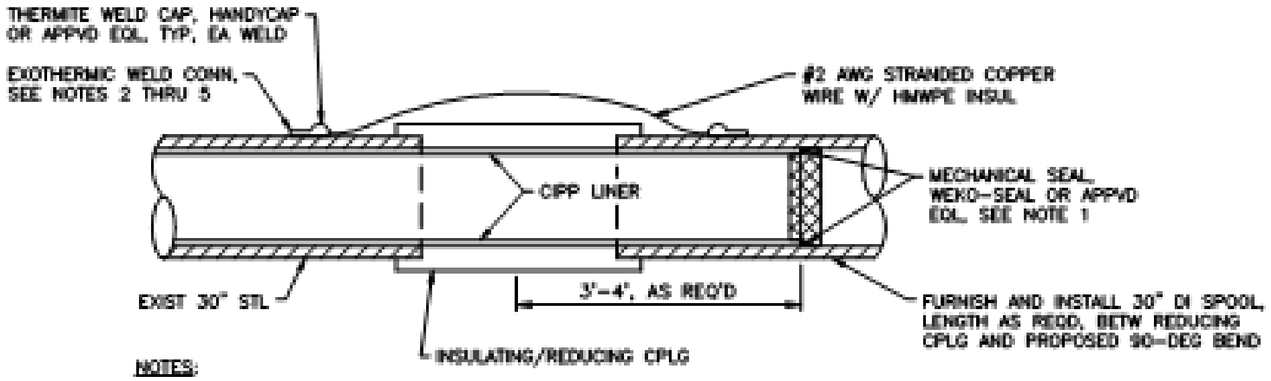
- Fully Structural Liner
- Internal and External Forces
- Product Life – 70 to 100 years







Construction - CIPP



NOTES:

1. REMOVE EXISTING CEMENT LINING ON DUCTILE IRON AND INSTALL MECHANICAL SEAL DIRECTLY TO BARE METAL. LIMITS OF CEMENT LINING REMOVAL SHALL BE MINIMIZED SO BARE METAL IS COMPLETELY COVERED BY MECHANICAL SEAL. ANY BARE METAL LEFT EXPOSED SHALL BE COATED IN CORROSION RESISTANT PRIMER.

2. GRIND SURFACE OF WELD AREA ON PIPE TO BRIGHT METAL. AREA OF GROUND SURFACE SHALL NOT EXCEED THE AREA OF WELD CAP.

3. USE COPPER SLEEVE FOR THERMITE WELD OF #2 AWG WIRES.

4. WELDER AND CARTRIDGE SIZE VARIES ACCORDING TO SURFACE SHAPE, MATERIAL, AND SURFACE ORIENTATION. CONSULT WELDER MANUFACTURER FOR RECOMMENDED WELDER AND CARTRIDGE.

5. COAT COMPLETED THERMITE WELD CONNECTION AND BARE METAL WITH CORROSION RESISTANT BONDING/PRIMING AGENT, ROYBOND 747 OR APPROVED EQUAL, PRIOR TO PLACEMENT OF WELD CAP.

1 CIPP END CONNECTION

Scale: NTS

Construction Challenges

- Site access
- Existing pipe ID verification
- End seal construction
- CIPP hydrostatic pressure testing
- UPRR interface and logistics

Construction Challenges

Construction Challenges

Lessons Learned/Confirmed

- Permitting
  - Assume worse case review duration
  - Agency drivers & tailor applications

- Minimize impacts to sensitive areas

Q&A

Thank you!

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