



UNDERGROUND CONSTRUCTION TECHNOLOGY

THE UNDERGROUND UTILITIES EVENT | JANUARY 25-27, 2022 | FORT WORTH, TEXAS



Urban Construction of Large-Diameter Water Lines



Lockwood, Andrews
& Newnam, Inc.
A LEO A DALY COMPANY





Overview

Project Alignment & Background

Design Challenges

Construction Challenges

Large Diameter Interconnects

US-59 Tunnel Crossing

60-inch PCCP Internal Repairs



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Project Alignment & Background

8,000 LF

72-inch Water Line

8,000 LF

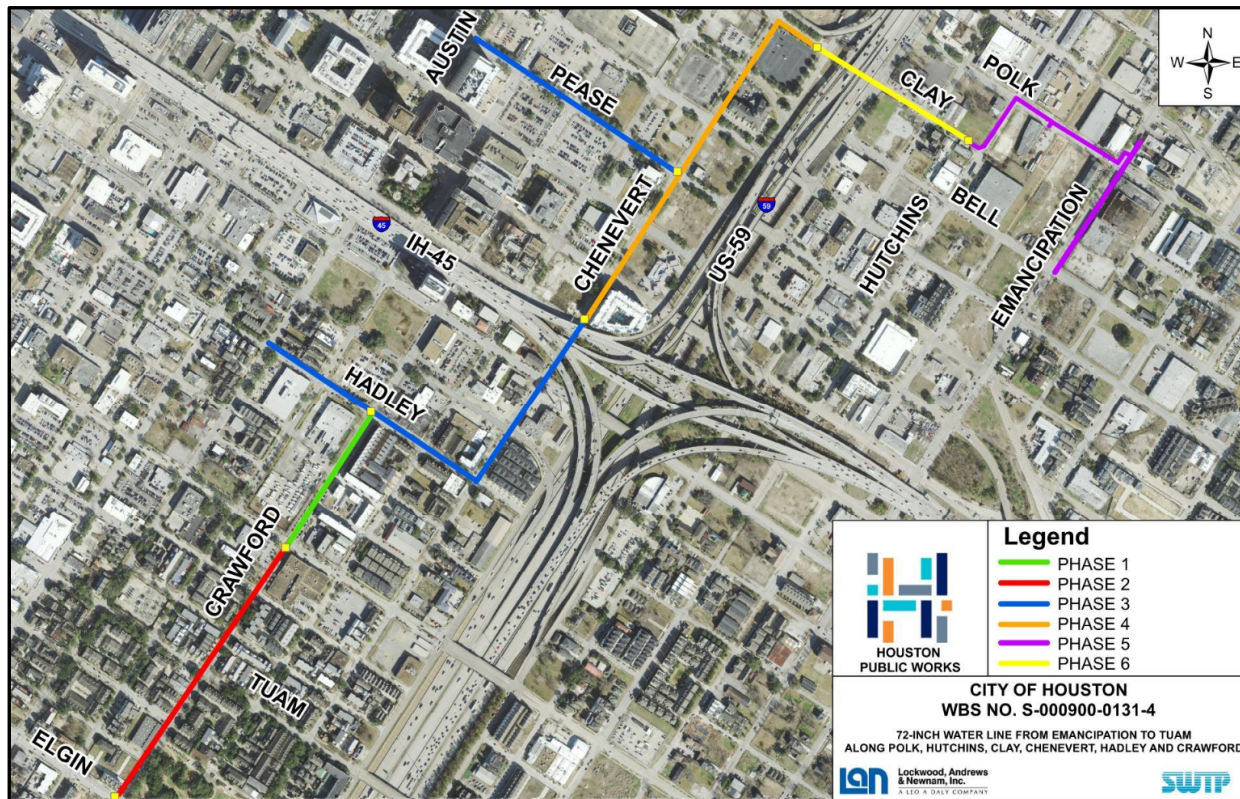
Storm Sewers up to 66-inch

55,500 SFT

Concrete Pavement

10,000 LF

Water Lines up to 24-inch



36,700 SFT

Driveways

18,500 SFT

Wheelchair Ramps

65,000 SFT

Sidewalks

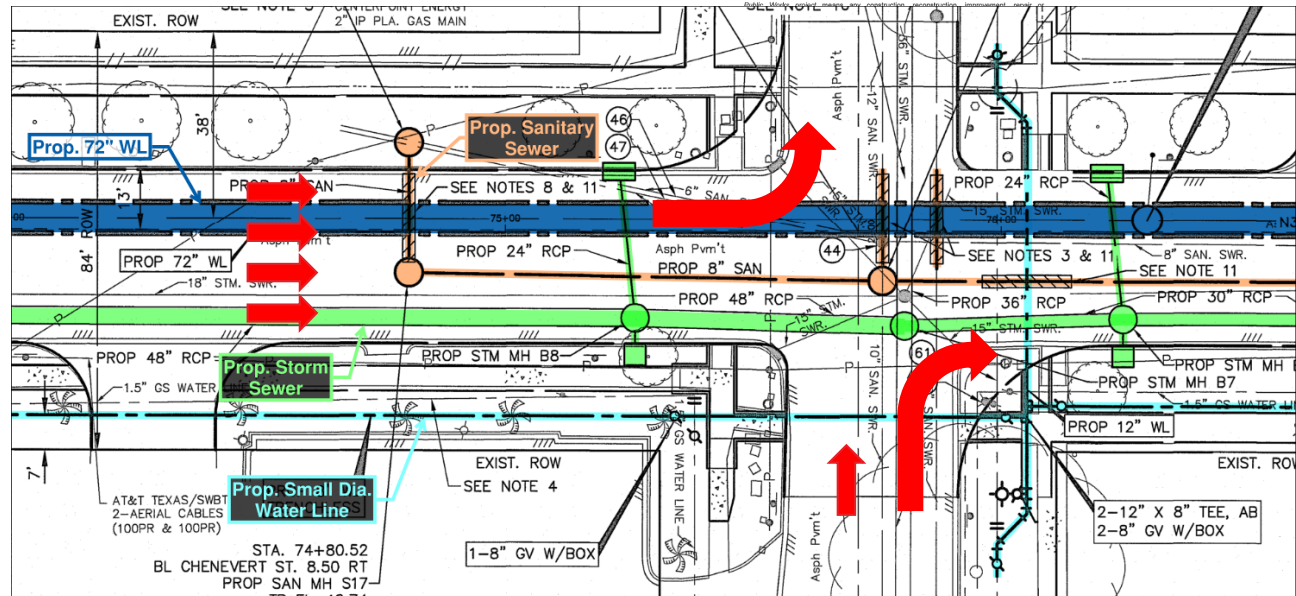


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Design Challenges

- Coordination
 - Local Agencies & Authorities
 - Private Utilities
 - Private Properties
- Utility Spacing & Conflicts



AGREEMENT FOR IMPROVEMENTS ABOVE CITY STANDARD FOR
TAX INCREMENT REINVESTMENT ZONE #2/
MIDTOWN REDEVELOPMENT AUTHORITY

THE STATE OF TEXAS
COUNTY OF HARRIS

CITY OF HOUSTON
Department of Public Works and Engineering

Sylvester Turner
Mayor

Katou Brenner, MBA, PEO
City Engineer
P.O. Box 1862
Houston, Texas 77251-1862
T: 832-936-2000
F: 832-936-2227
www.houston.gov

April 17, 2017

CITY OF HOUSTON
Houston Public Works

Sylvester Turner
Mayor

Carol Kilgus-Hendrix, P.E.
Director
P.O. Box 1862
Houston, Texas 77251-1862
409 266 2000
www.houston.gov

Certified Letter
FORWARDED TO: HARRIS COUNTY
January 17, 2019

RABINER/CHEN/ALSH
AT&T TEXAS/SWB
ASUB/WM/DC/RCH/REG

Re: 72-inch Water Line from Emancipation to Tamm along Pok, Hutchins, Clay, Chenevert, Hadley and Crawford, 1985 No. S-000820-0131-3
Notice of Encroachment into City of Houston Right-of-Way - 1st Notification

Dear Property Owner:

We are writing to inform you that the City of Houston (City) will proceed with construction of sidewalk improvements and installation of 12-inch water line in the 72-inch Water Line Project from Emancipation to Tamm area public right-of-way (ROW). Survey data shows a chain-link fence at 1515 Jefferson St., located within the public ROW. The chain-link fence represents an encroachment into the public ROW. We have determined that the chain-link fence is potentially in conflict with the proposed construction. In order to facilitate construction, the City will submit a final notification requesting that you remove the chain-link fence from the public ROW up to or beyond the property line of the parcel at 1515 Jefferson St.

Sec. 40-391 of the Code of Ordinances for the City provides the following definitions:

Facility means any structure, device or other thing whatsoever that is installed or maintained in, on, within, under, over or above a public right-of-way within the City.

Public right-of-way means any public street right-of-way located in the City, including the entire area between the boundary lines of every right-of-way (including but not limited to roads, streets, alleys, highways, boulevards, bridges, tunnels, or similar thoroughfares).

Public Work means any construction, reconstruction, improvement or maintenance of a facility.

CRITERION	COMMENT
Potential Conflict	CenterPoint Energy to confirm depth of gas line
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on Ordinance Program (LRO), this letter (Public Works Project) referenced above, project construction.

on & Day Engineers, Inc. and Lockwood, Greenlee with the proposed water line and

entitled "72-inch Water Line, Clay, Chenevert, Hadley and Crawford, 1985 No. S-000820-0131-3

ent signs, traffic signals, and poles would be to the

an criteria except where

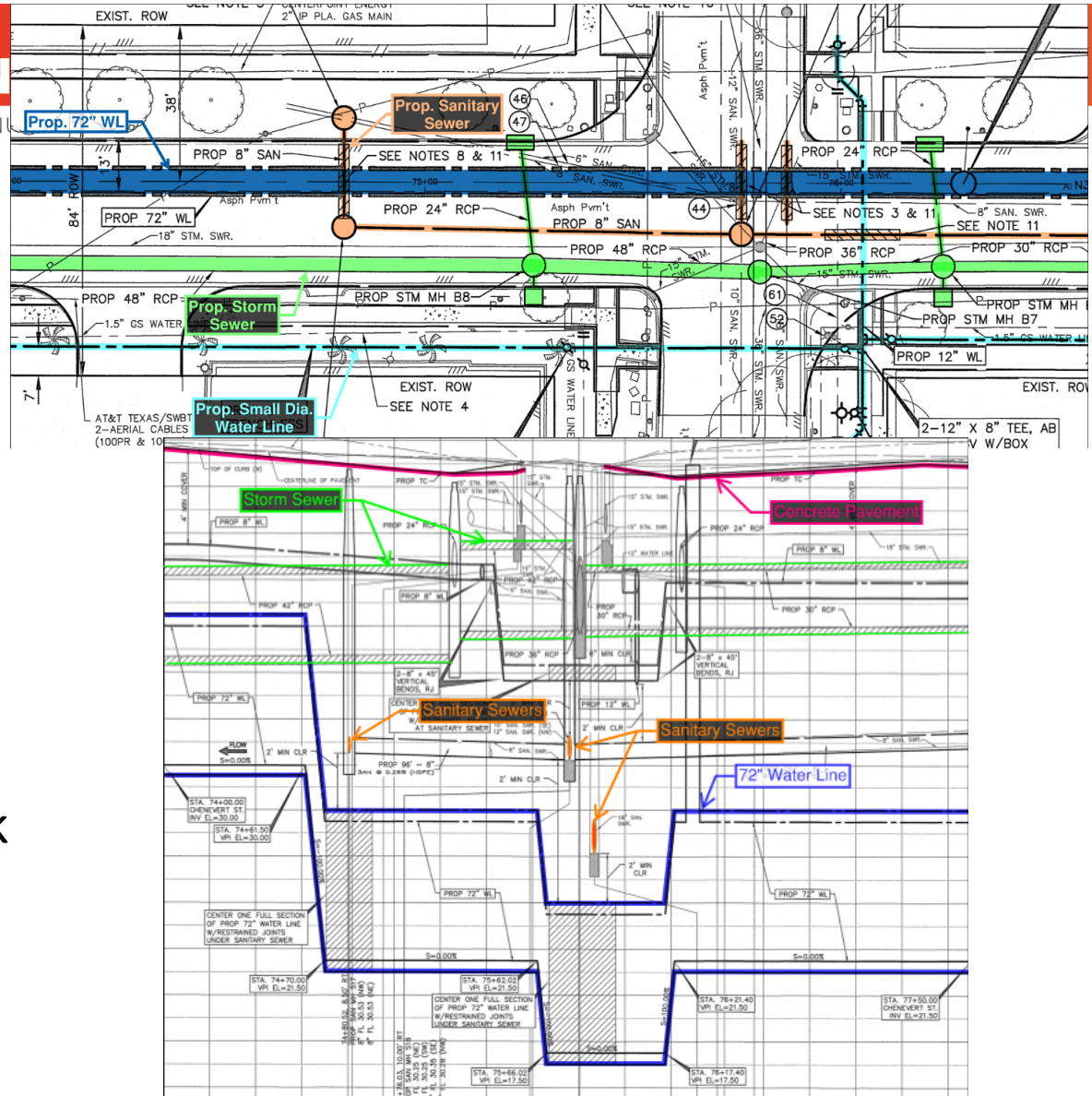
obligations regarding this



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- Coordination
 - Local Agencies & Authorities
 - Private Utilities
 - Private Properties
- Utility Spacing & Conflicts
 - Parallel Proposed Work
 - Crossing Gravity Lines





Construction Challenges

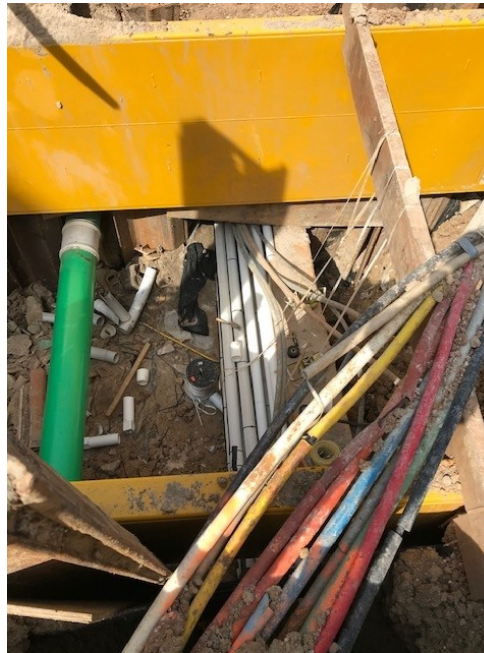
- ROW Constraints
- Staging Materials
- Community Impact
 - Lane Closures/Detours
 - Maintain Access to Public
 - Maintain Access to Residents





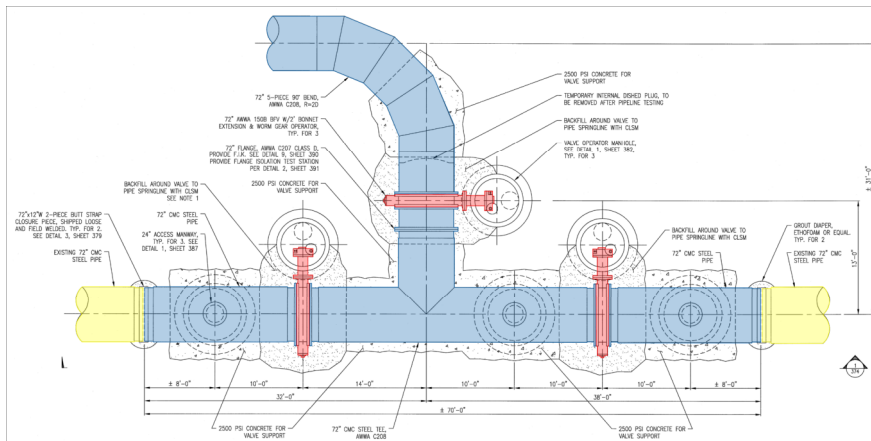
Construction Challenges

- Subsurface Challenges
- Underground Utilities
- Unknown Unmarked Utility
 - Work Around or Shut Down
 - Project Schedule Impact
 - Avoid Shutdown to Progress

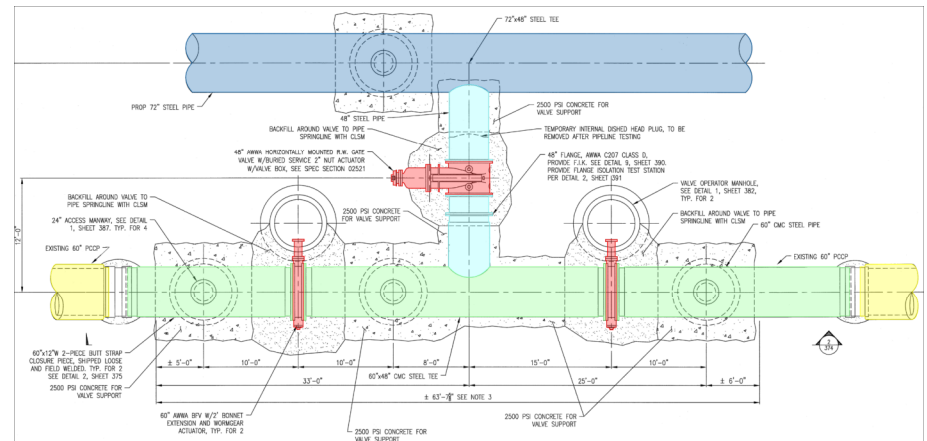


Large Diameter Interconnects

- 72-inch Steel Interconnect
 - 3 – 72-inch Butterfly Valves



- 60-inch PCCP Interconnect
 - 2 – 60-inch Butterfly Valves
 - 1 – 48-inch Gate Valve





Large Diameter Interconnects

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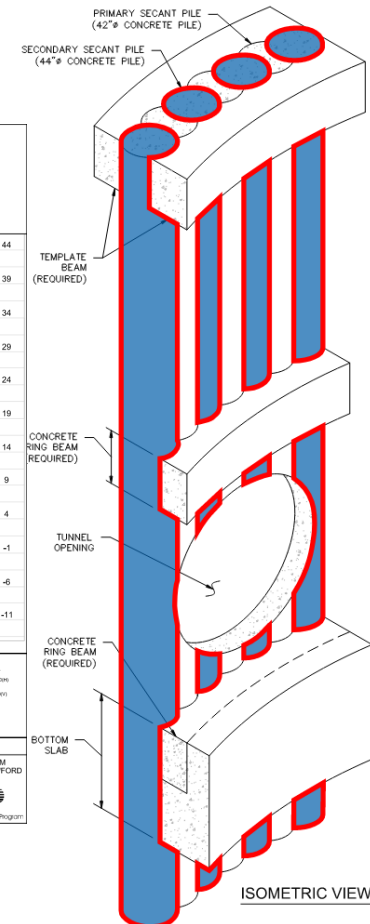
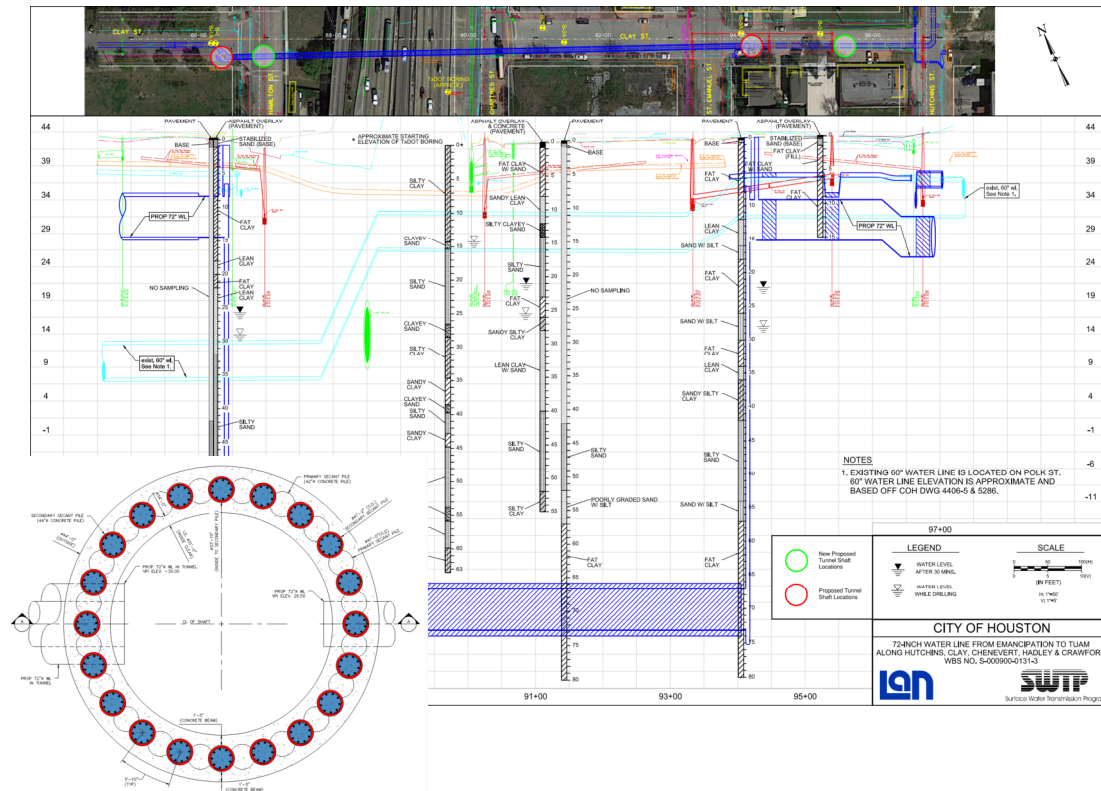


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US-59 Tunnel Crossing

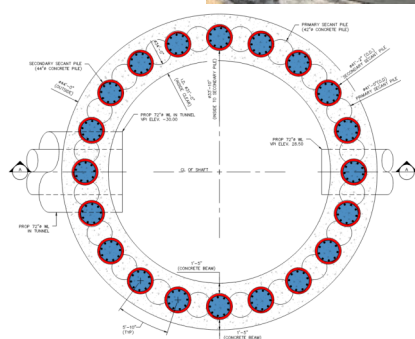
- TxDOT Freeway Upgrades
 - Tunnel Depth and Length
- Construction Modification
 - Secant Pile Shafts
- EPBM





US-59 Tunnel Crossing

- Proximity to Buildings
 - Monitoring Plans
- Noise & Settlement
 - Secant Pile Shaft Installation
- Maintain Access

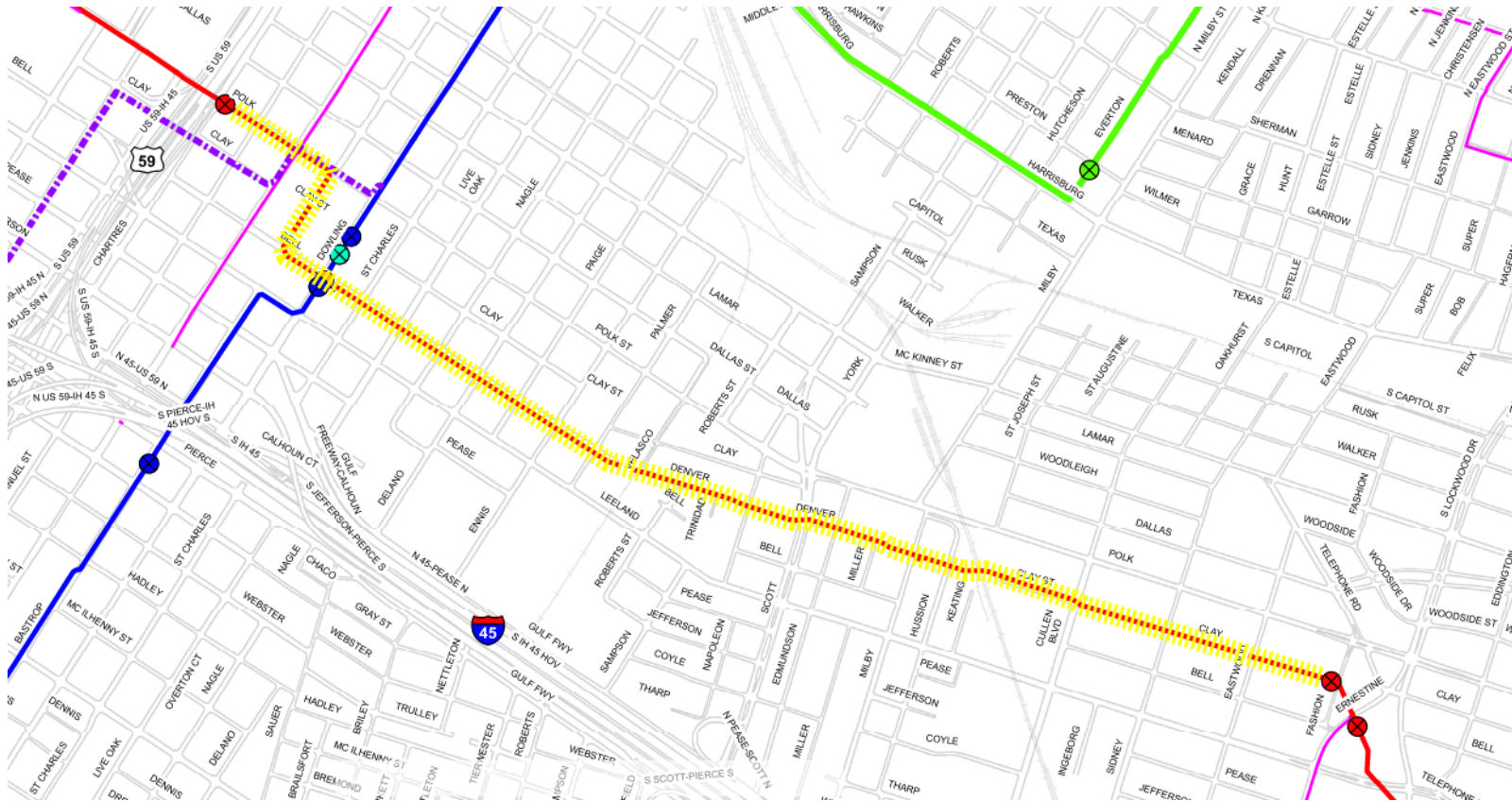




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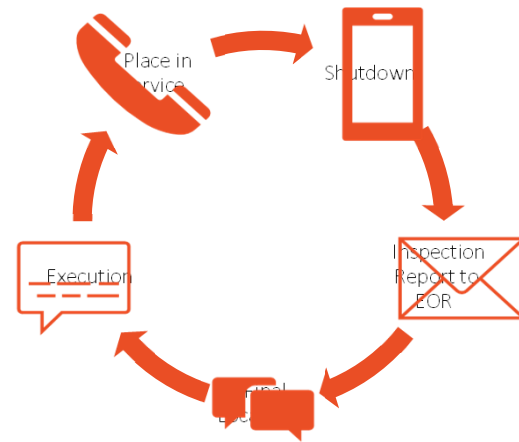
60-inch PCCP Internal Repairs





60-inch PCCP Internal Repairs

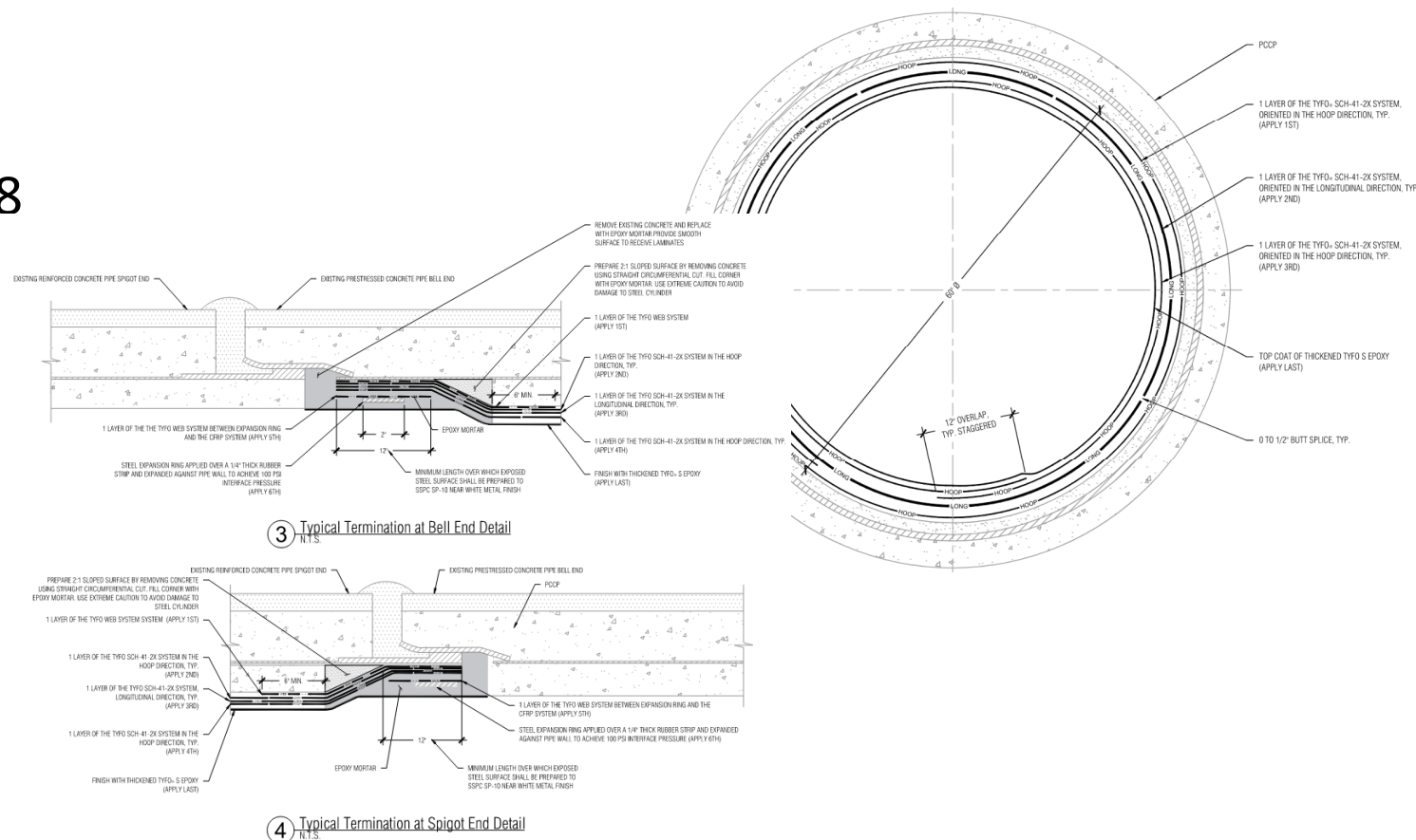
- Coordination
 - COH Maintenance
 - Harper Bros
 - Fiberwrap
 - LAN
 - Electromagnetic Testing Subcontractor (EMT)
- 2021 Assessment
 - 12 Pipe Sections with Distress
 - Pipes Scattered along Alignment
- Shutdown Schedule



Rank	Pipe Reference Number	Internal Pipe Marking	Pipe Piece Number	Low Station	Pipe Length (feet)	Pipe Class	Break Position (feet)	Number of Broken Wire Wraps by Region	Total Number of Broken Wire Wraps
1	11138*	14-5	432	83+21	16	125-18	2.5;4.5;6.5;9.5;11.5;14.0	10;10;10;5;15;15	65
2	11154*	14-24	448	85+77	16	125-9	4.5;7.0;12.5	10;15;5	30
3	11095*	13-2	389	76+30	16	125-9	4.5;7.5;13.0	5;15;5	25
4	10118*	3-38	98	27+89	16	125-9	3.0	15	15
5	11171	14-42	465	88+48	16	125-9	9.5	5	5

60-inch PCCP Internal Repairs

- CFRP
 - AWWA C305-18
 - Design Requirements





60-inch PCCP Internal Repairs

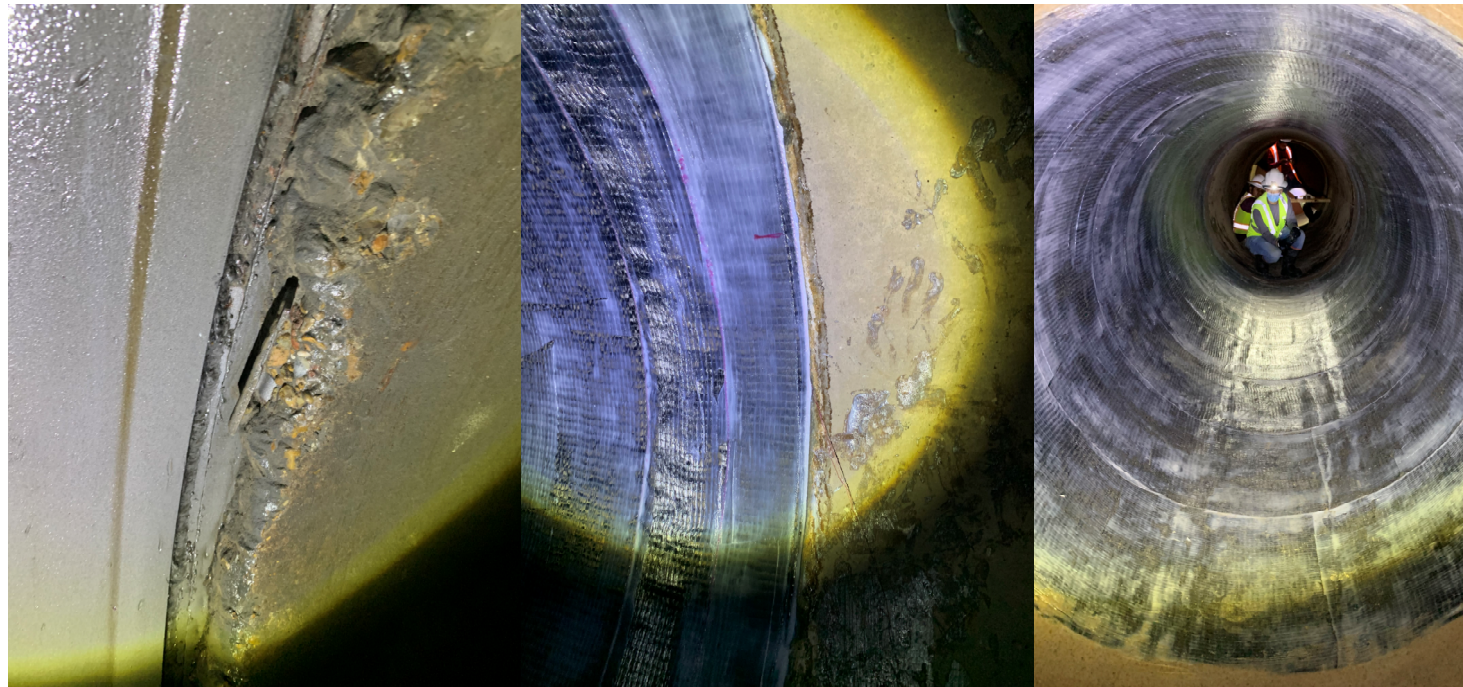
- CFRP
 - AWWA C305-18
 - Design Requirements
- Access & Safety Plan
- Surface Work Area Challenges





60-inch PCCP Internal Repairs

- Installation
 - Surface Preparation
 - Environmental Preparation
 - Joint Termination





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Questions? Urban Construction of Large-Diameter Water Lines



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**Lockwood, Andrews
& Newnam, Inc.**

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