Paul Ferland, City of Fall River
Andrew Smith, Wright-Pierce

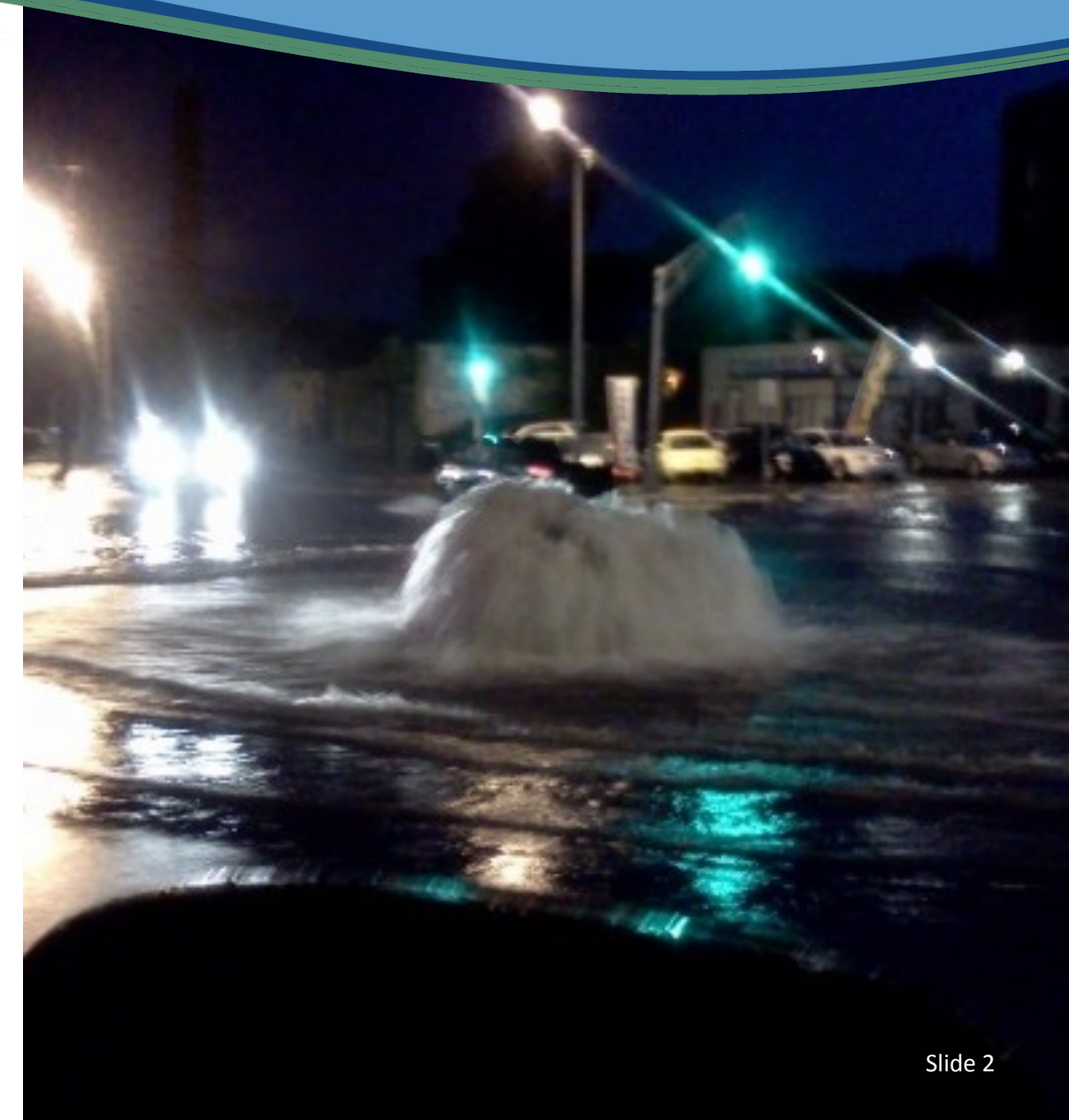
The Dancing Manhole Cover of Globe Street

Presented at the 2018
NEWEA Annual Conference

WRIGHT-PIERCE
Engineering a Better Environment

Presentation Overview

- The Problem
- The Design
- Construction
- Lessons Learned
- Project Status



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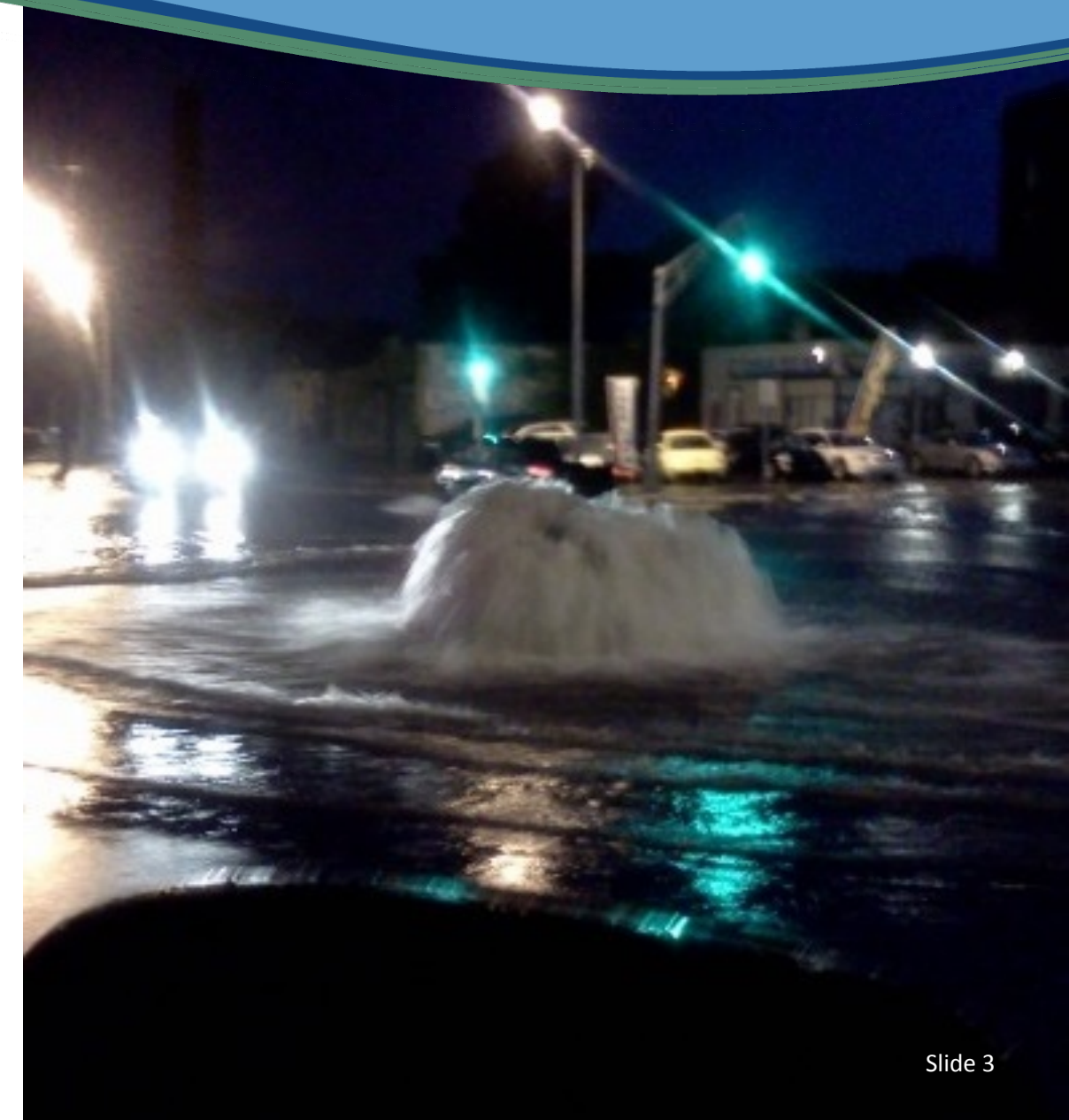
The Problem

Sanitary Sewer Overflows

- Occur during Wet Weather
- Urban Flooding
- Requires Storm Response
- Public Health Risk
- Environmental Hazard
- Quality of Life Issue



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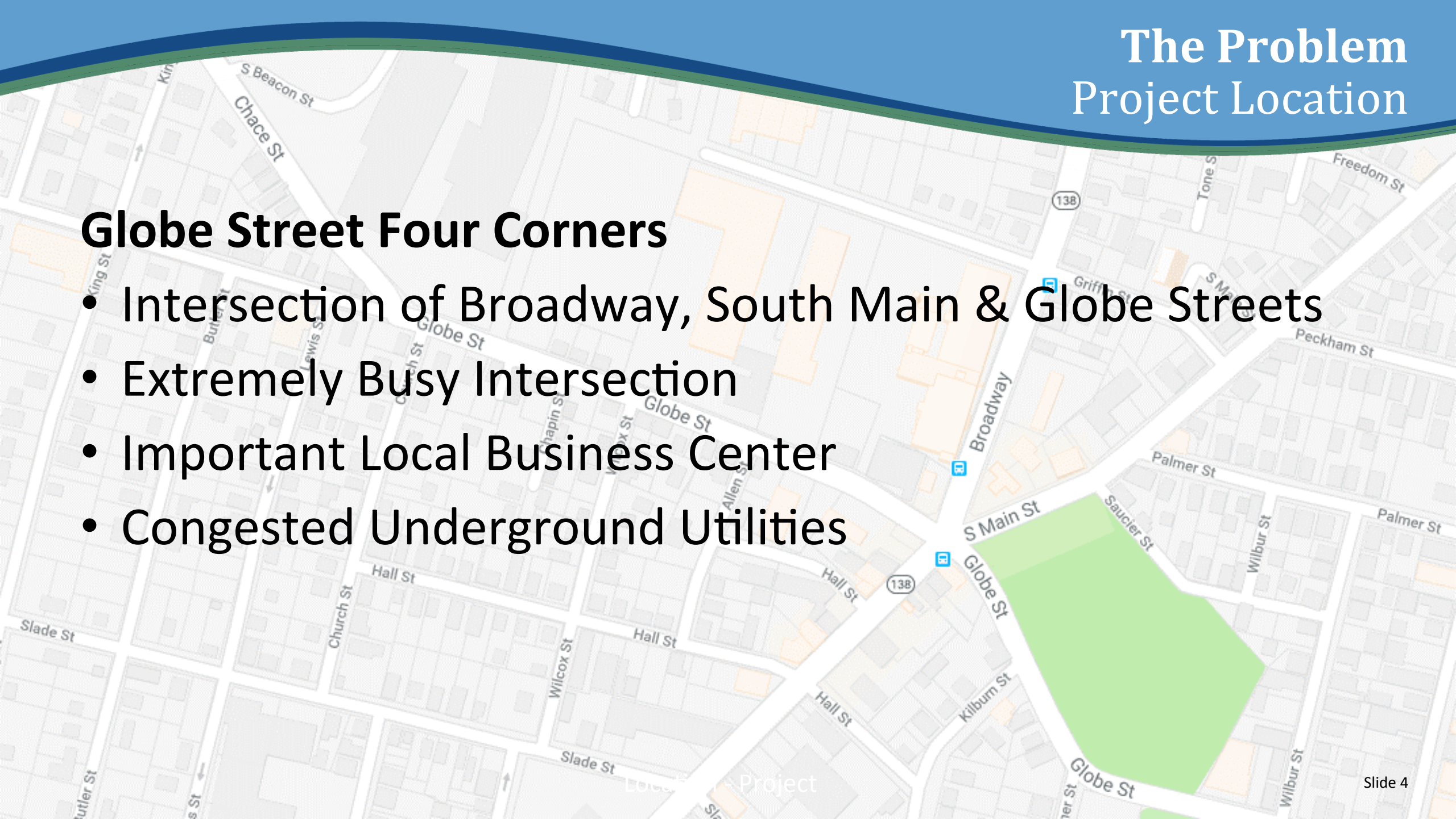
The Problem
Project Location

Globe Street Four Corners

- Intersection of Broadway, South Main & Globe Streets
- Extremely Busy Intersection
- Important Local Business Center
- Congested Underground Utilities

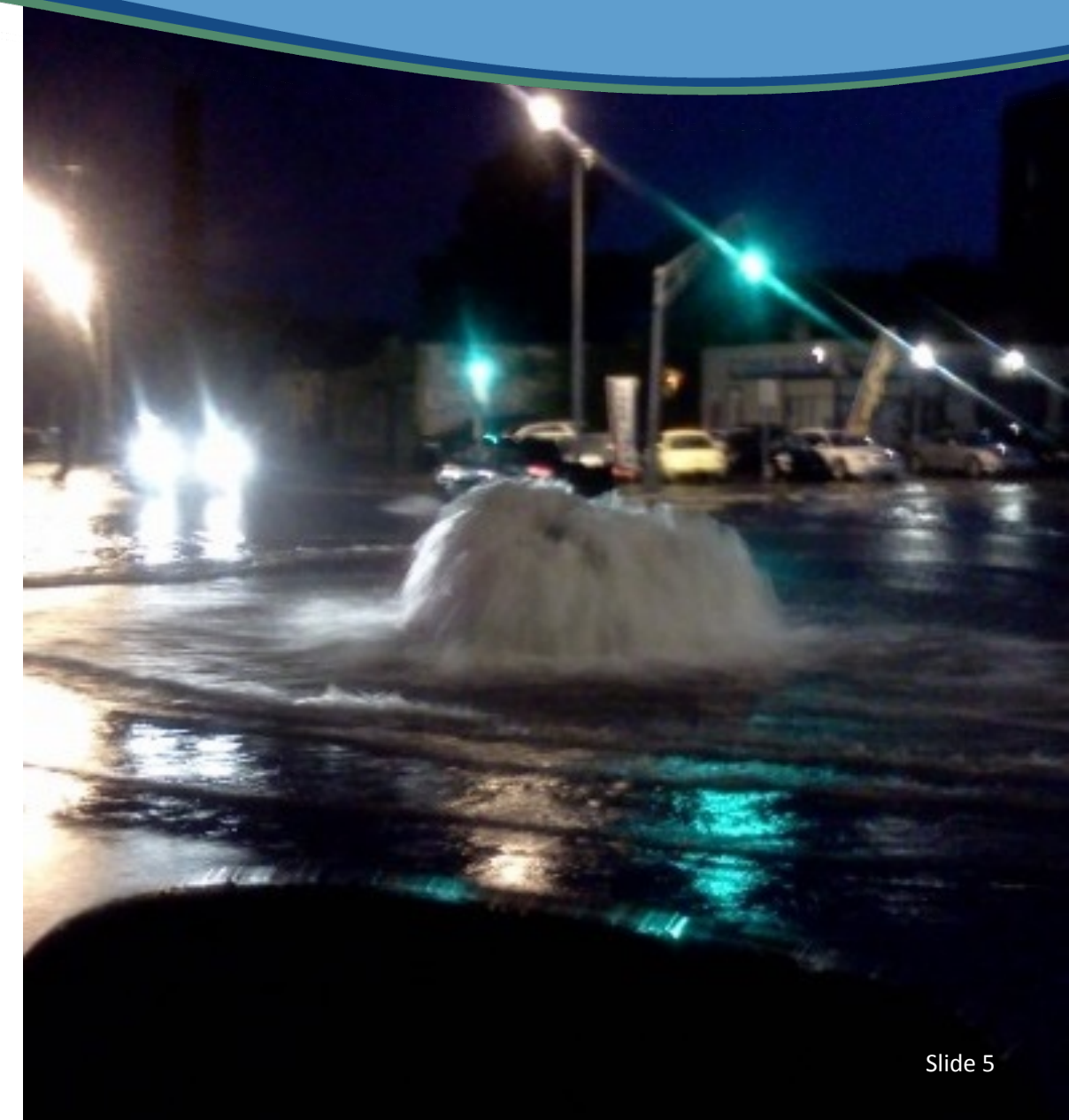


Location of Project

The Problem

The Goal

- Mitigate SSOs
- Minimize Cost
- Minimize Disruption
- Utilize CSO Storage Tunnel



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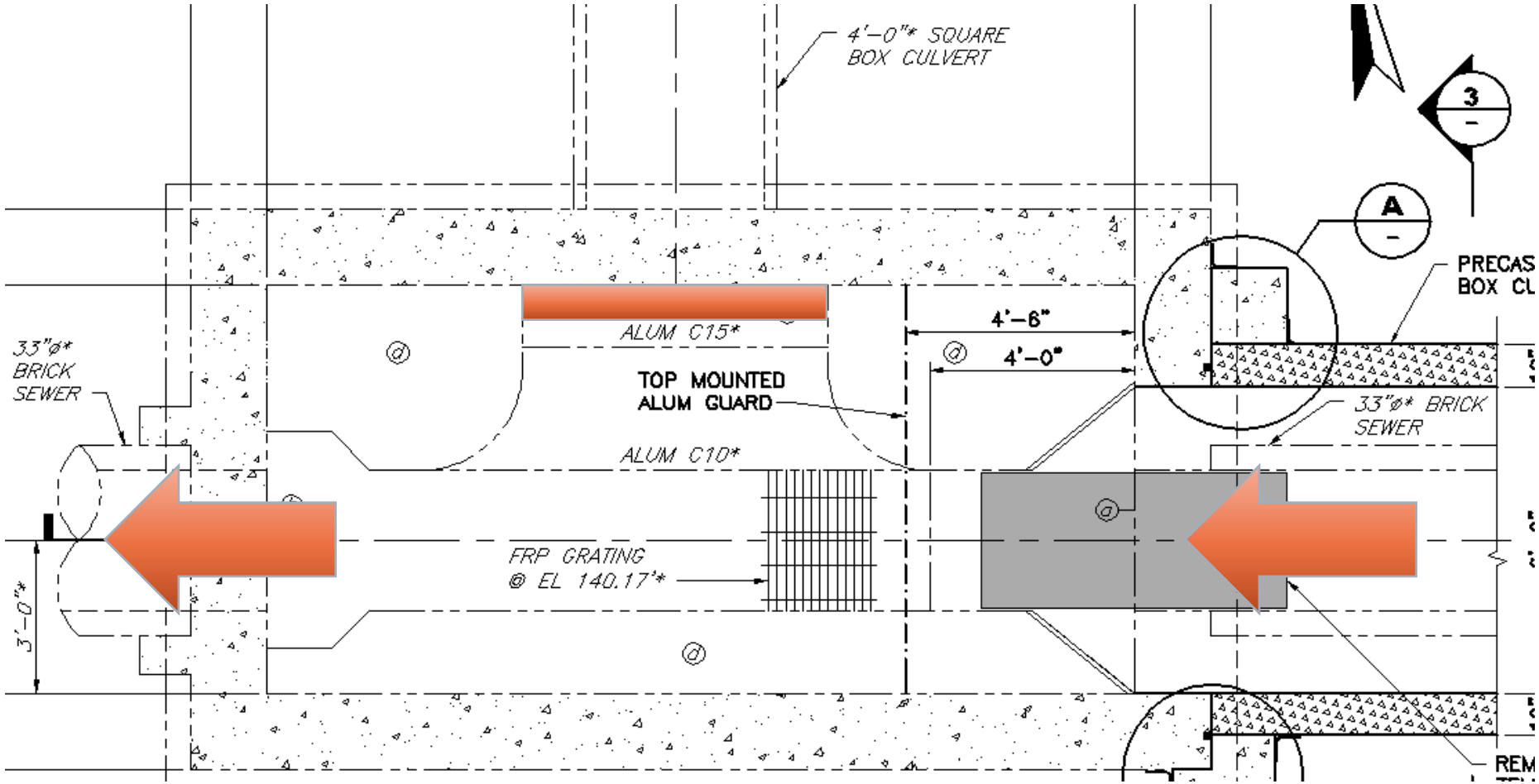
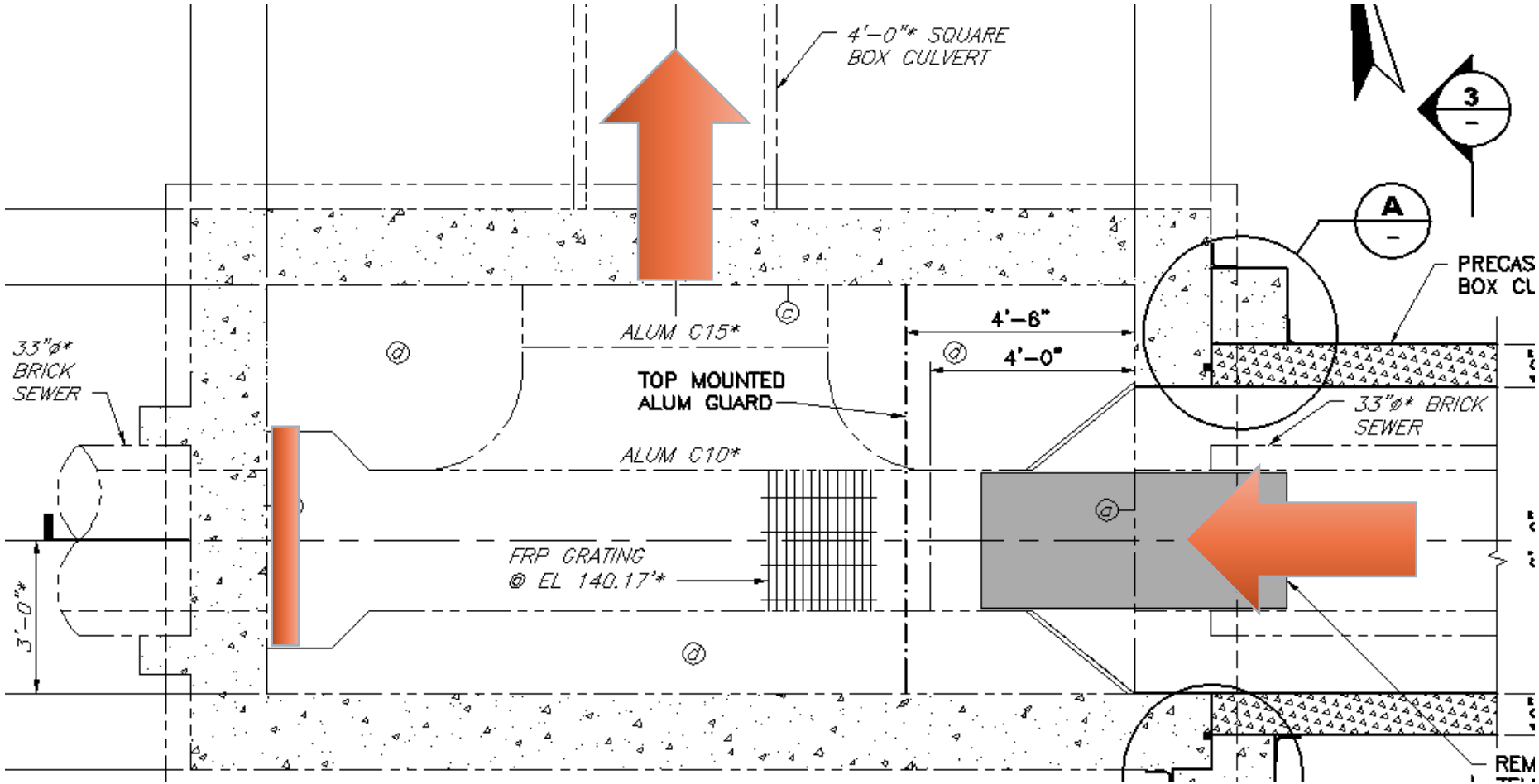
The Problem
Globe St. Sewers

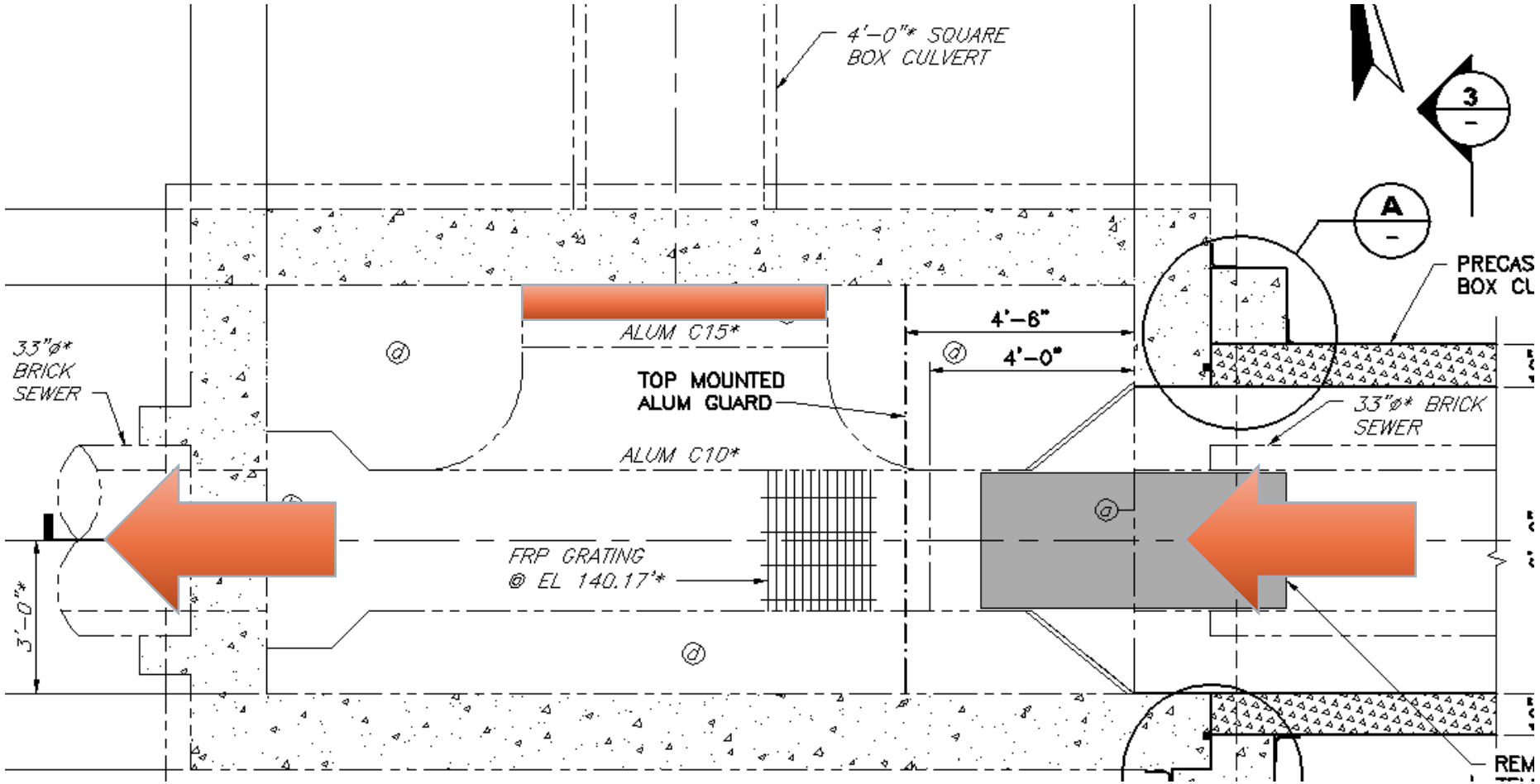
Dry Weather Operation



Wet Weather Operation



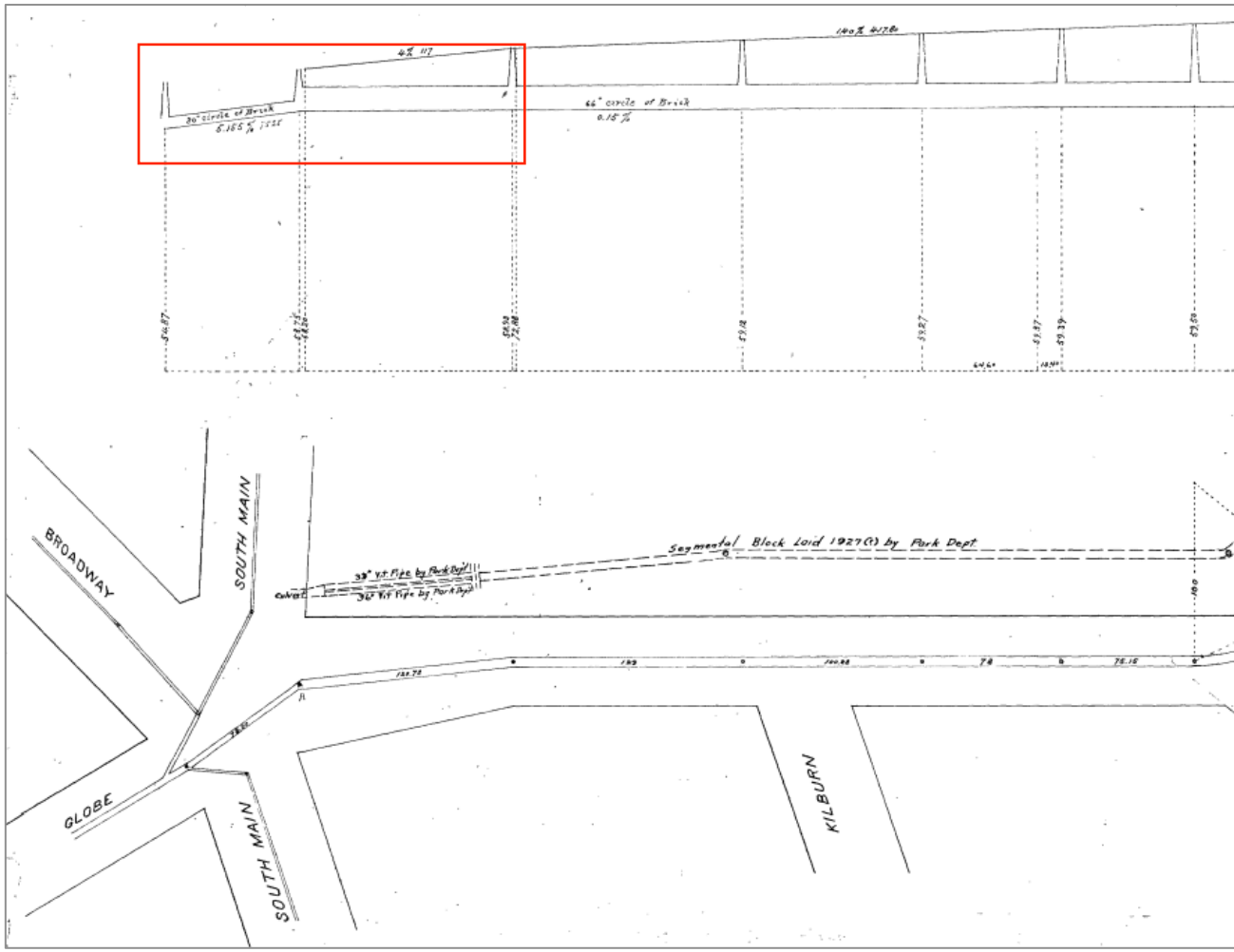
Tunnel is Full!



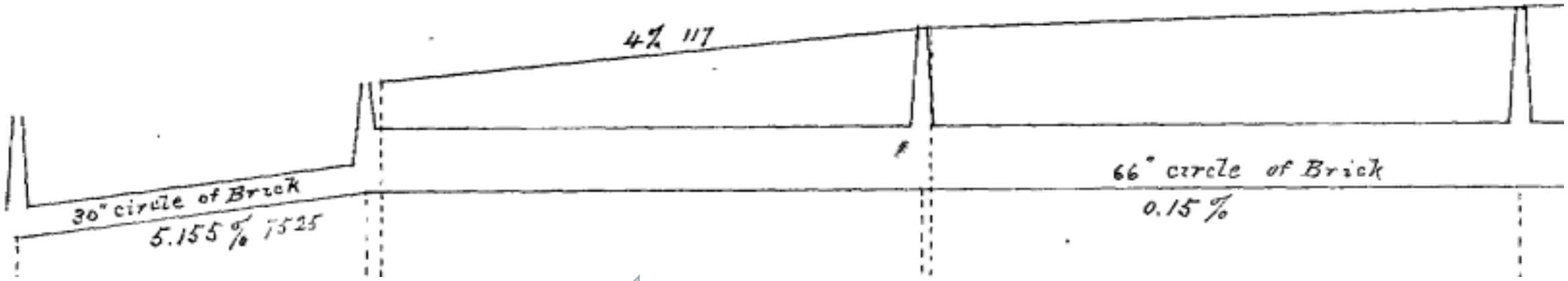
The Problem

Globe Street Sewer Plans

- Early 1900s
- 66” Brick Sewer
- “Four Corners” Intersection



The Problem



Little Pipe (30”, 90 cfs) ← Big Pipe (66”, 290 cfs)

INSTALL A BIGGER PIPE!

Critical Sewer Main

- Maintain wet weather flows

Congested Utilities

- Use existing sewer corridor
- No bypass pumping
- Sewer live during construction

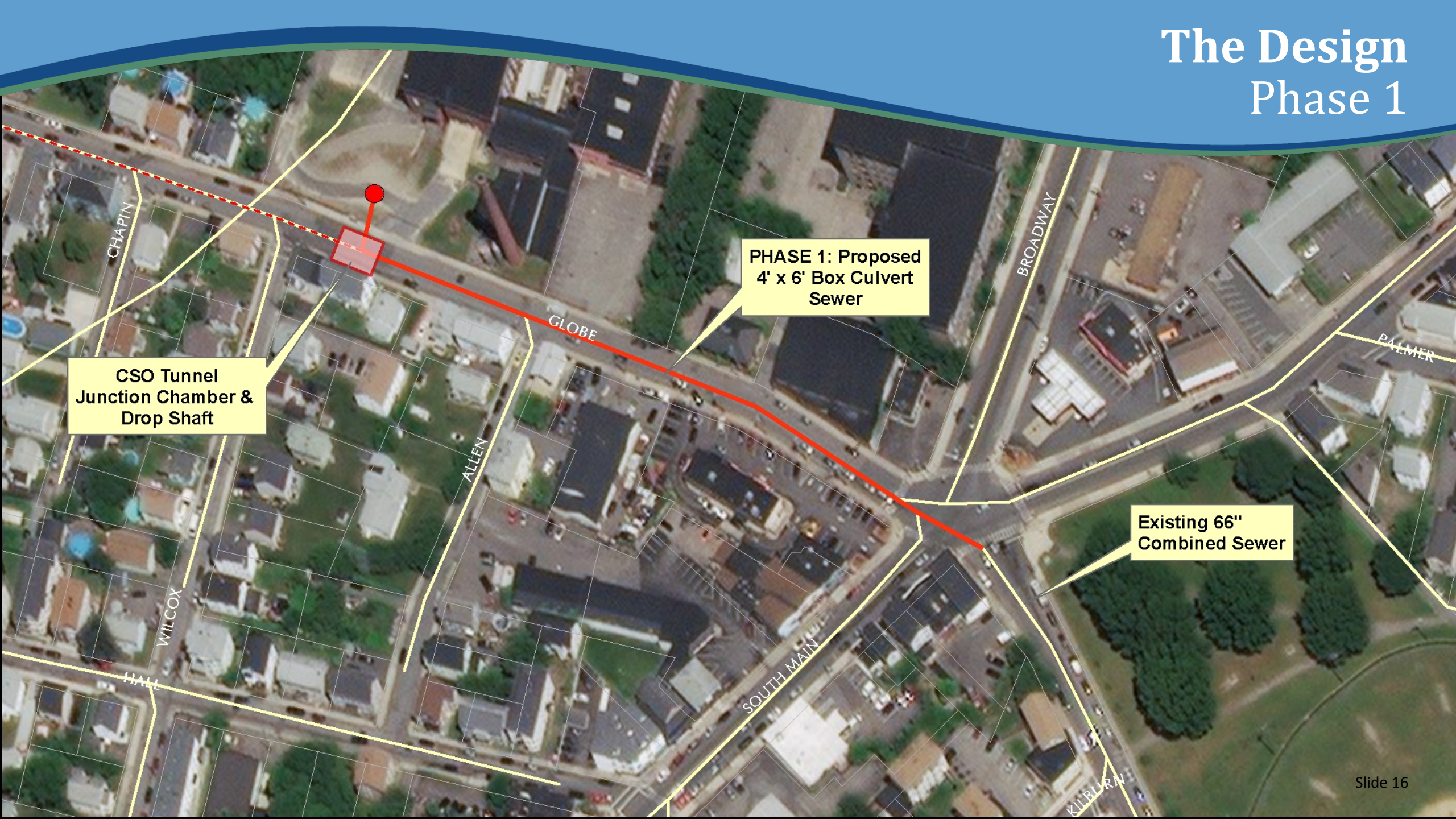
Traffic & Neighborhood Issues

- Minimize disruption
- Maximize traffic flow

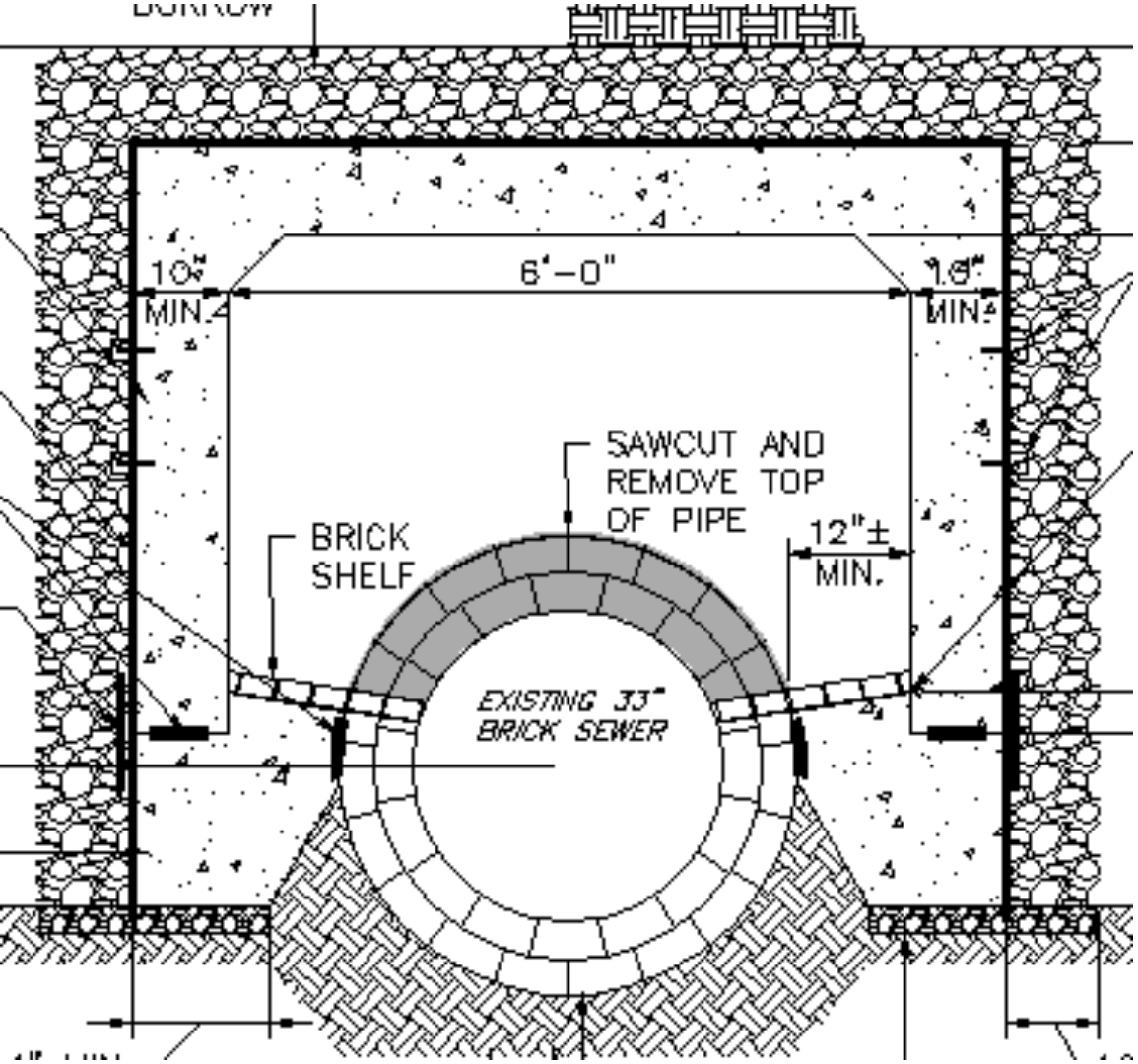
The Design
Proposed Work

Location - Project

The Design
Phase 1



The Design



Construction Sequence

1. Excavate Existing Sewer
2. Pour Concrete Base
3. Cut Top Off Sewer
4. Maintain Sewer Flows
5. Install 4’ x 6’ Culvert
6. Build Brick Invert Shelf

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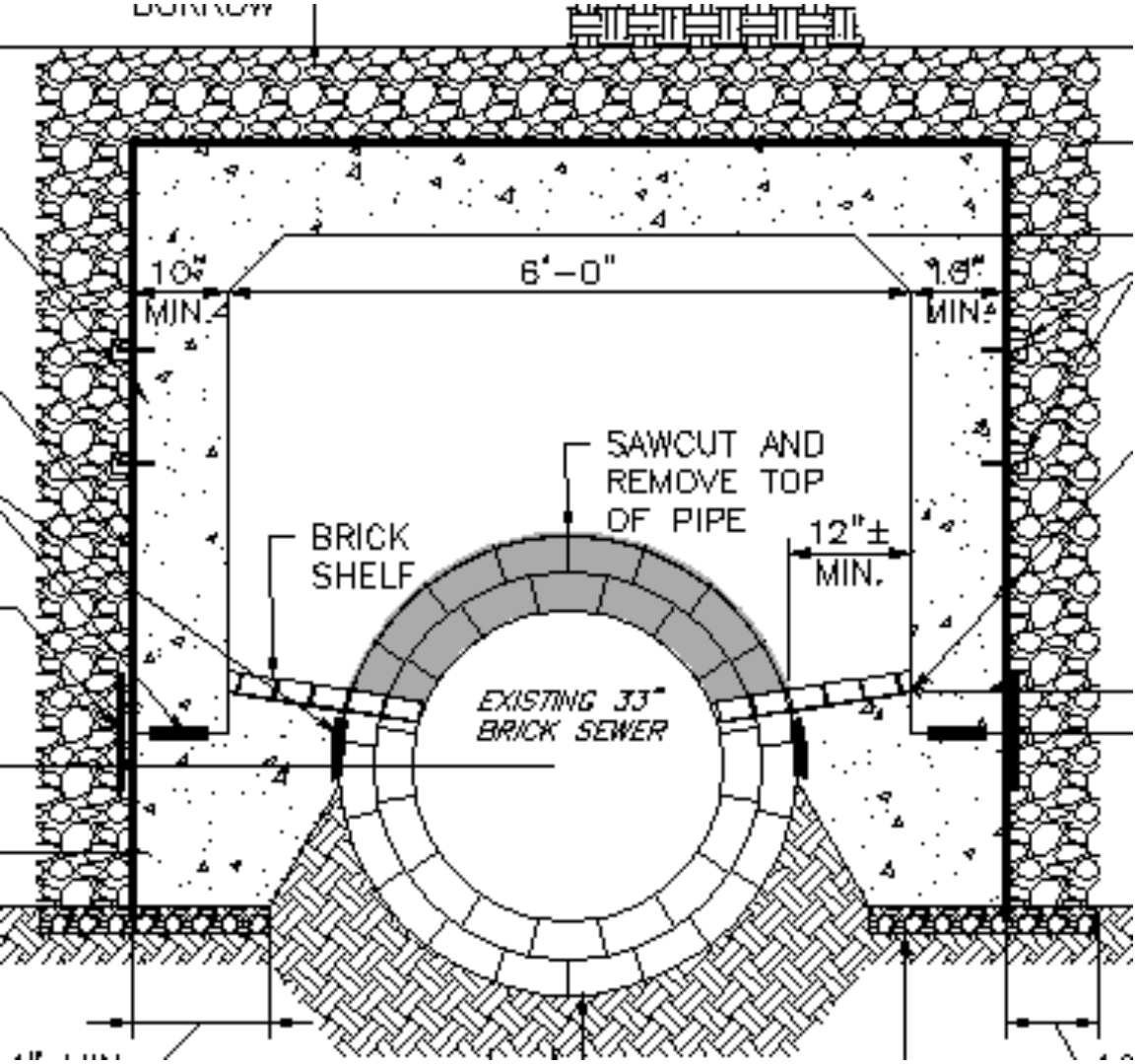
The Design



Watertight

- Hydrophilic Water Stop
- Butyl Rubber Seal/STS Gasket
- External Joint Wrap

Corrosion Prevention

- Anti Corrosion Admixture

Integrity of Brick Sewer

- Bid Allowance for Repairs

Construction
Initiation

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Construction
Preparing to Pour Base

Construction
Hydrophilic Water Stop

Construction
First Concrete Pour

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Construction
Cutting Brick Sewer

Construction
Removing Brick Sewer

Construction
Removing Brick Sewer

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Construction
First Section

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Construction

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Construction
Building Brick Invert

Construction
Sealing Joints

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Construction

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Construction
When it rains…

Construction
Demolishing Manhole

Construction
Installing New Manhole

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Construction
Rock

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Construction

Drill rig & Pneumatic hammer

Construction
Pre-drill Rock

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Construction
Cast-in-place Closure Pour

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Construction
Sewer Junction

Construction
Sewer Junction

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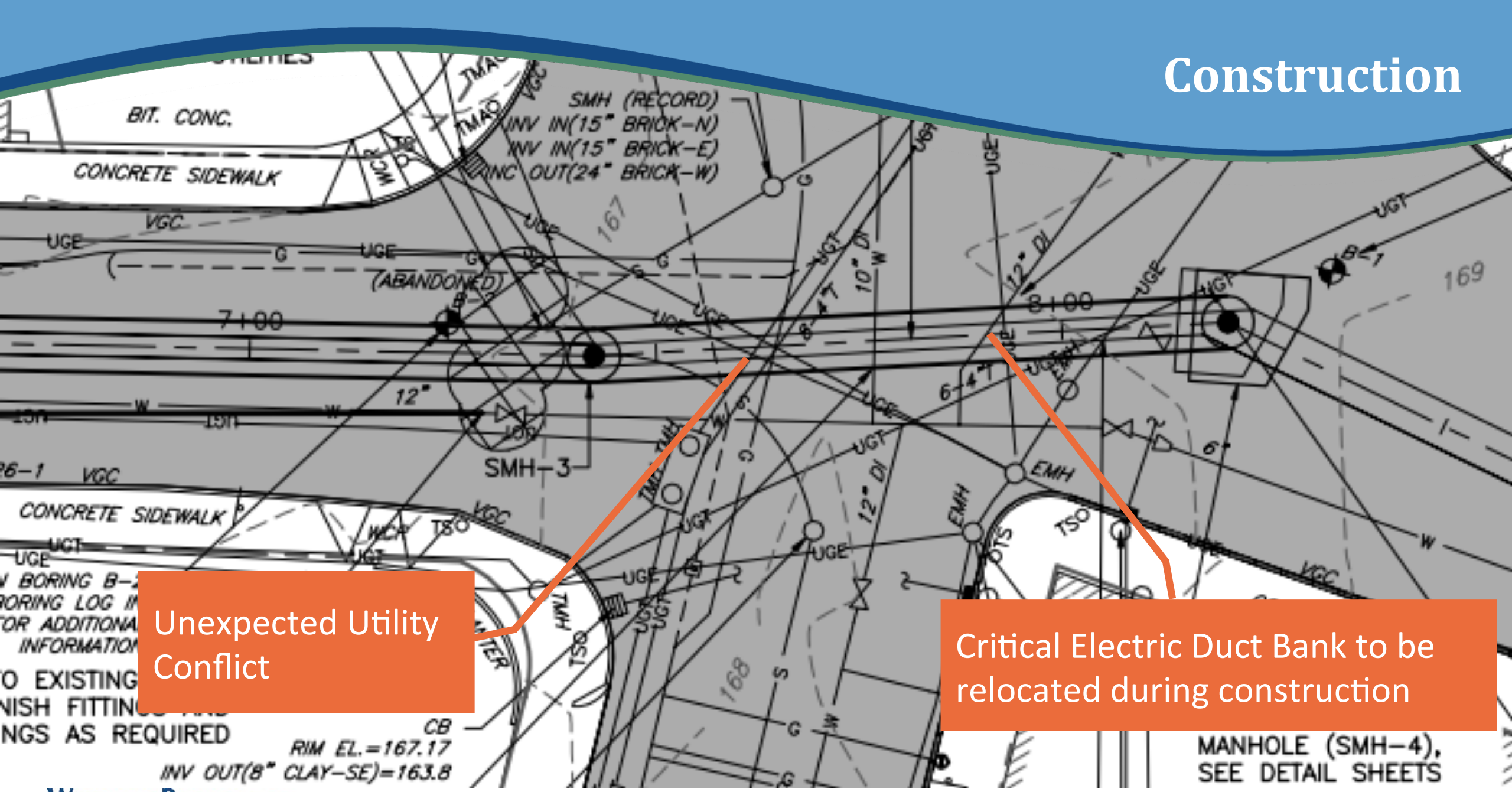
Construction
Approaching Intersection

Construction



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Utility Conflict

- Gas
- Telephone
- Electric
- Telephone

Construction
Utility Conflict

Construction
Utility Conflict

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Construction

Construction
Closure Pour

Construction
More Rock

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Transition Manhole Excavated

- 33” Sewer in front
- 66” Sewer in back

Wet-weather event

Flows contained in trench

Construction
Last Manhole!

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Construction
Last Manhole!

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Construction

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Completion

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Lessons Learned

Utility Coordination

- Start Early in Design
- Communicate Often

Lessons Learned

Plan for Contingencies

- Contaminated Soils
- Brick Sewer Repairs
- Backflow Preventers

Lessons Learned

Take Care of the Neighbors

- Major Disruption
- Economic Impact
- Communication is Critical!

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Lessons Learned

Work as a Team

- Owner
- Engineer
- Contractor

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Project Team

CITY OF FALL RIVER

Owner

WRIGHT-PIERCE

Engineer

KEVILLE ENTERPRISES

RPR

KR REZENDES

Contractor

Project Closeout

Engineer's Estimate	$4,100,000
Total Bid	$3,433,850
Final Contract	$3,339,263

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Project Closeout

- ✓ Operational for 7 Months
- ✓ No Dancing Manholes
- ✓ Planned CSO Tunnel Operational Adjustments are a Success

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Paul Ferland, City of Fall River
Andrew Smith, Wright-Pierce

Thank You

The Dancing Manhole Cover of Globe Street

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