

Big Detention in the Little ROW

A Story by Matt Moffitt and Paul Siegfried

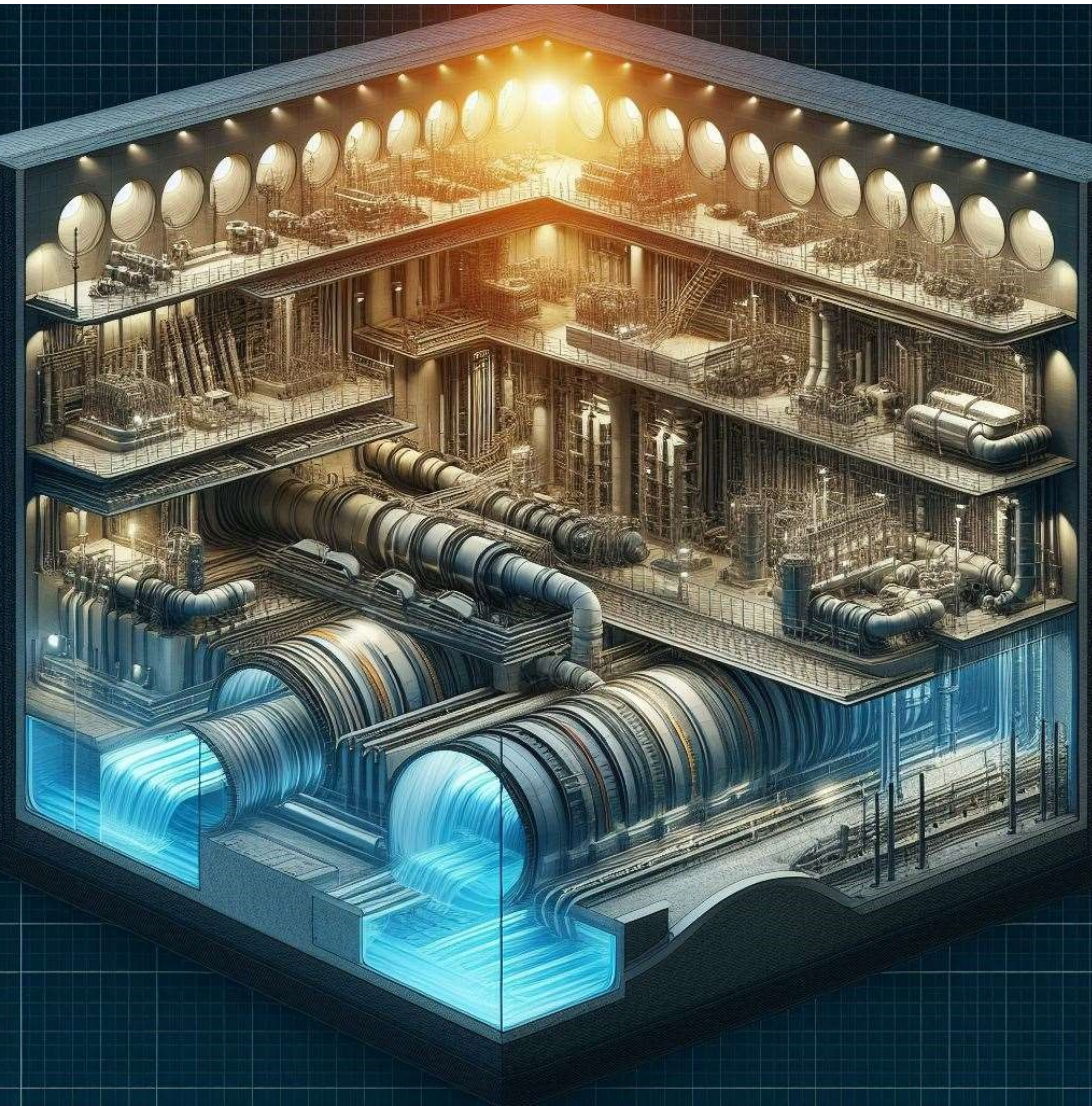




Once upon a time, in a cozy residential neighborhood, there existed a narrow road called Sunny Lane.



The houses on either side had white picket fences, and colorful flowers bloomed in every garden.

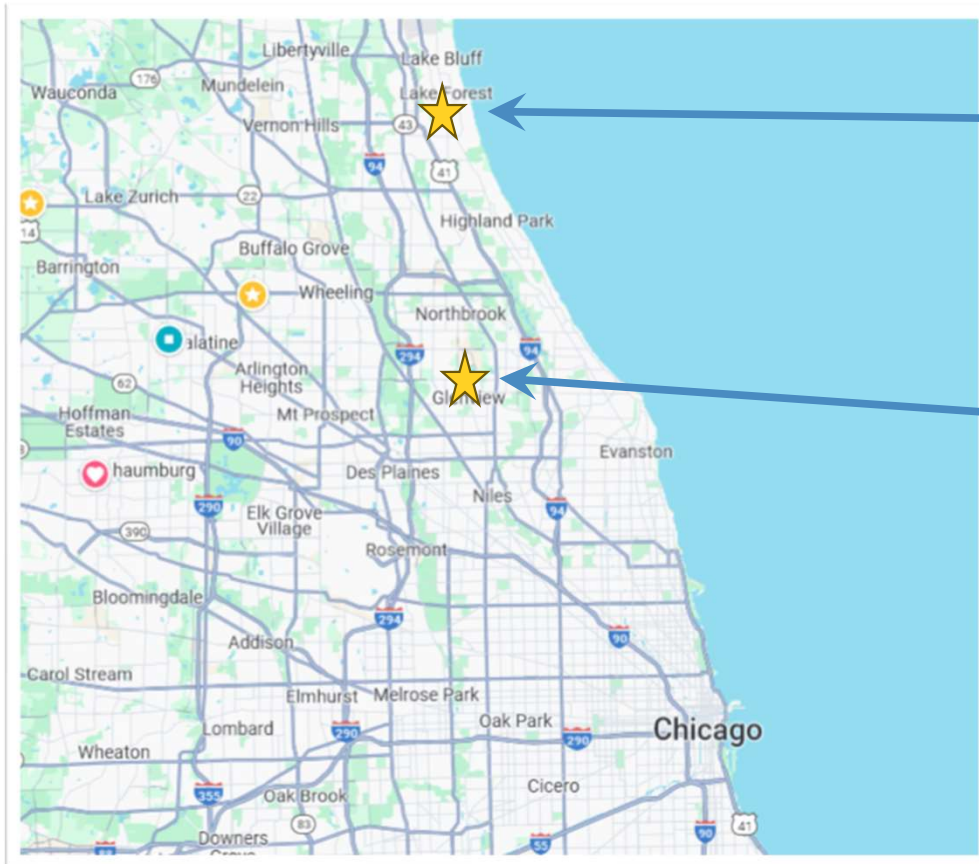


**But beneath
the surface,
a secret
adventure
awaited!**



Stormwater Superhero

Two Case Studies of StormTrap Installations within ROW



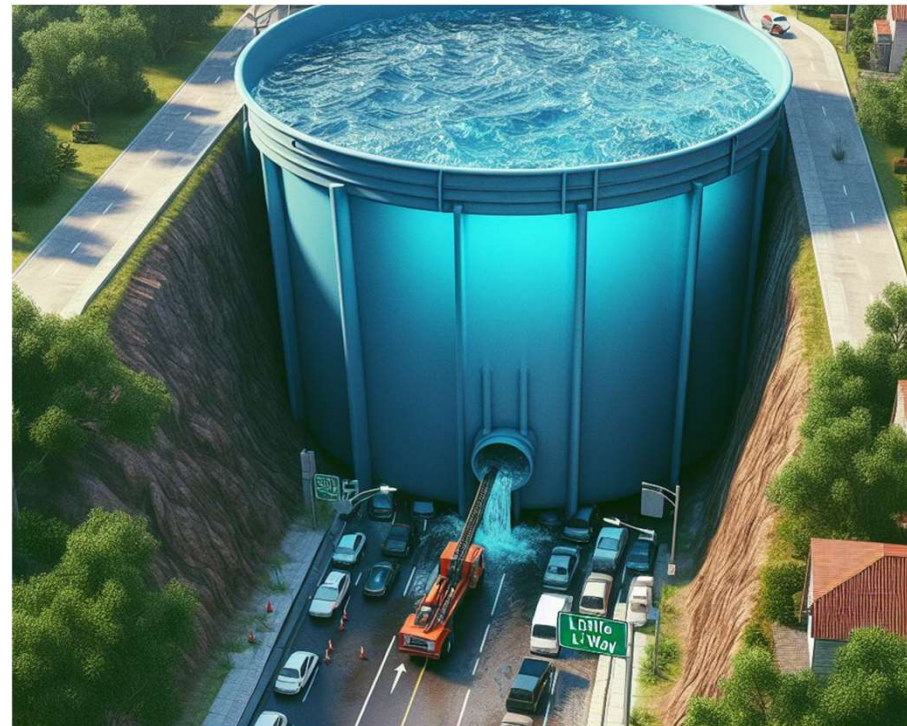
**City of Lake Forest –
Burr Oak
Stormwater
Improvements**

**Village of Glenview
– Tall Trees Flood
Mitigation**

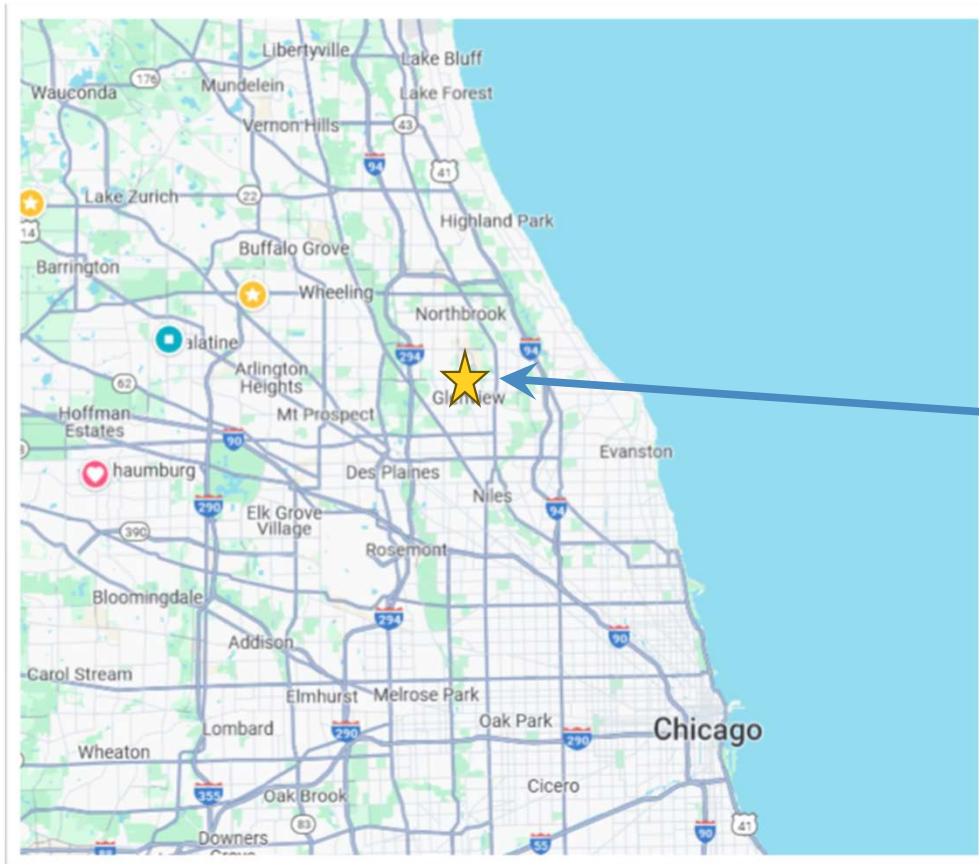
Case Studies: Village of Glenview and City of Lake Forest

Outline for Both Projects

- Project Overview
- Flooding Problem
- Analysis/Alternatives
- Recommended Project
- Design/Construction Challenges



Case Study 1



**Village of Glenview
– Tall Trees Flood
Mitigation**

Tall Trees: Project Background

- **Historic flood events**
 - 1987 – 7” over 16 hours
 - 2008 – 6” over 4 hours, 9.5” total
- **Regional studies**
 - MWRD (2013-2014)
 - Army Corps (2016-2020)



Tall Trees: Neighborhood Stormwater Study

- **Sources of flooding**
 - Riverine flooding
 - Sewer system backflow
 - Undersized storm sewer
- **At-risk structures**
 - 30 homes (100-year)

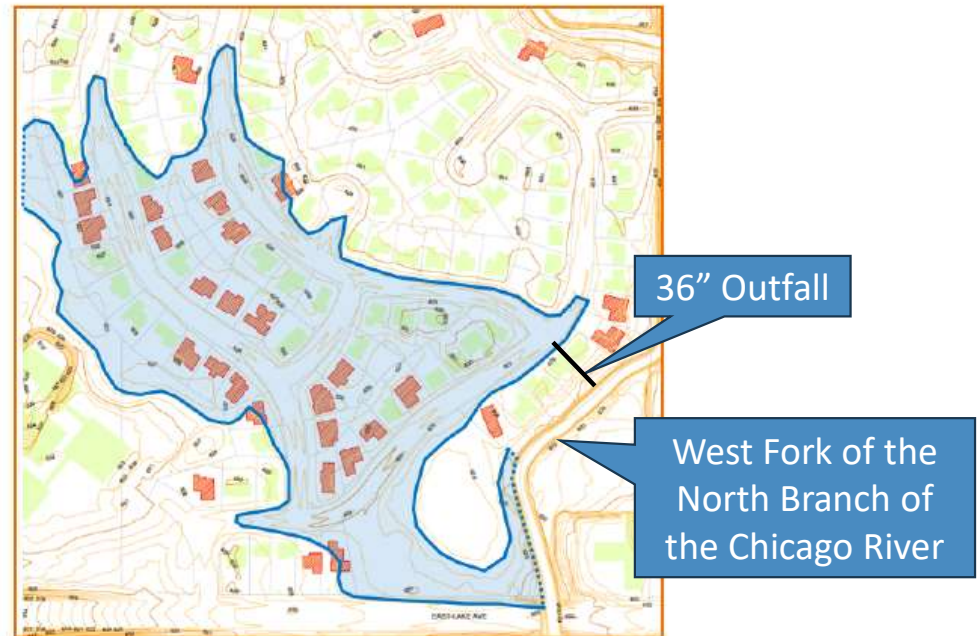


Figure 1 - 100-Year Floodplain Extents

Source: Stantec 12/2/2019 Technical Memo

Tall Trees: Conceptual Project

■ Goal

- Mitigate damages from localized street and river flooding

■ Project components

- Storm sewer improvements
- 1,000 linear ft of dual 10'x5' box culverts
- Pump station

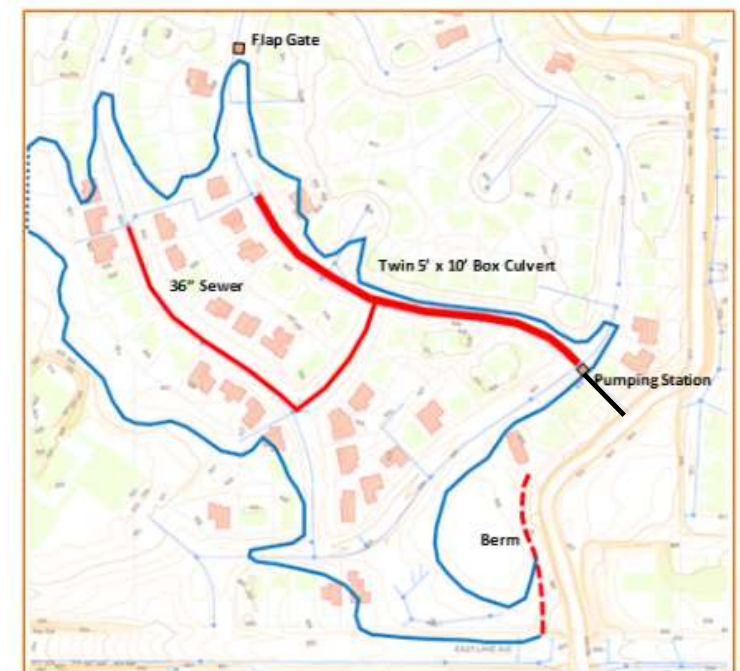
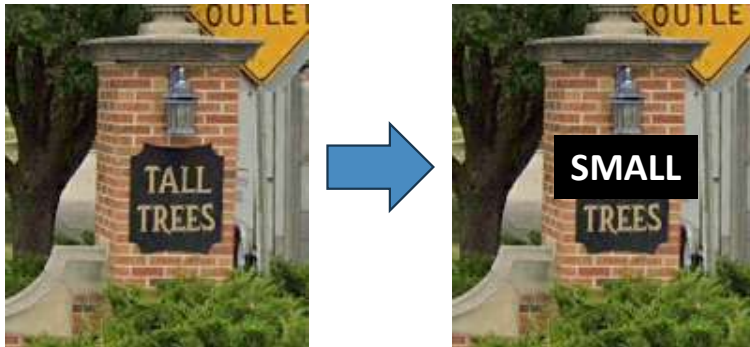


Figure 2 - Project Elements

Source: Stantec 12/2/2019 Technical Memo

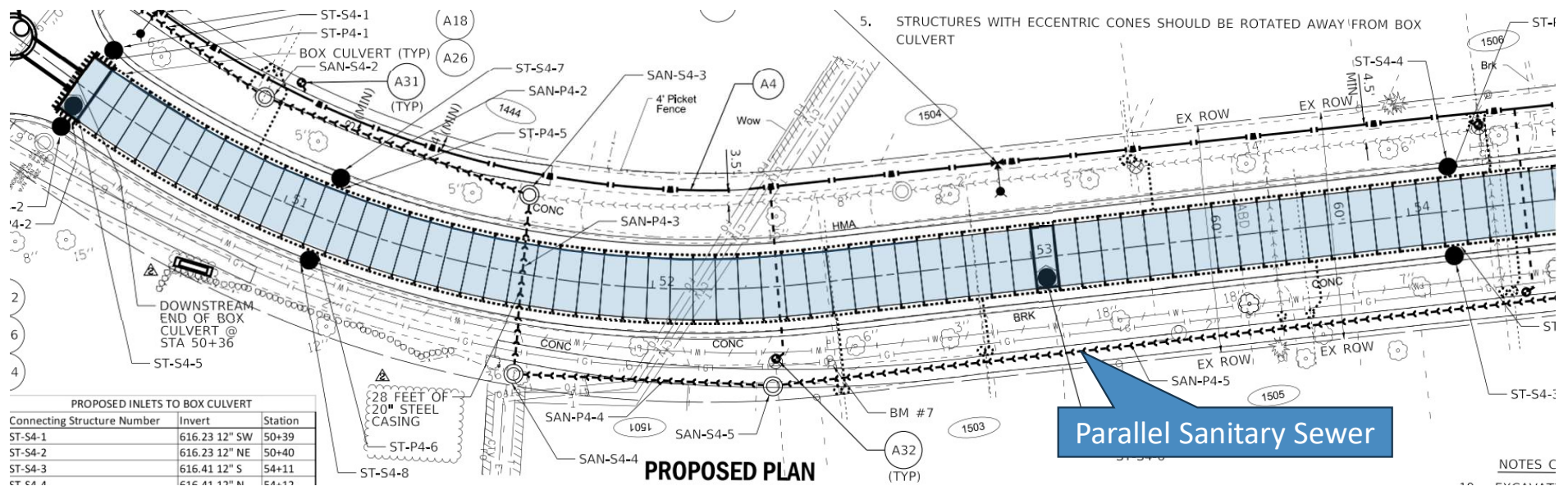
Tall Trees: Underground Storage Design Challenges

- Total width of box culverts
- Curvature of road
- Existing utilities
- Inlets and catch basins



Tall Trees: Culvert Design

- **Single 16'x5' box culvert**
 - Reduced number of side walls
 - Extended length by 218 feet



Tall Trees: StormTrap Alternate

■ StormTrap Design

- 9 vaults
- 18'-wide, 6'-6" tall
- 36" equalizer pipes

■ Advantages

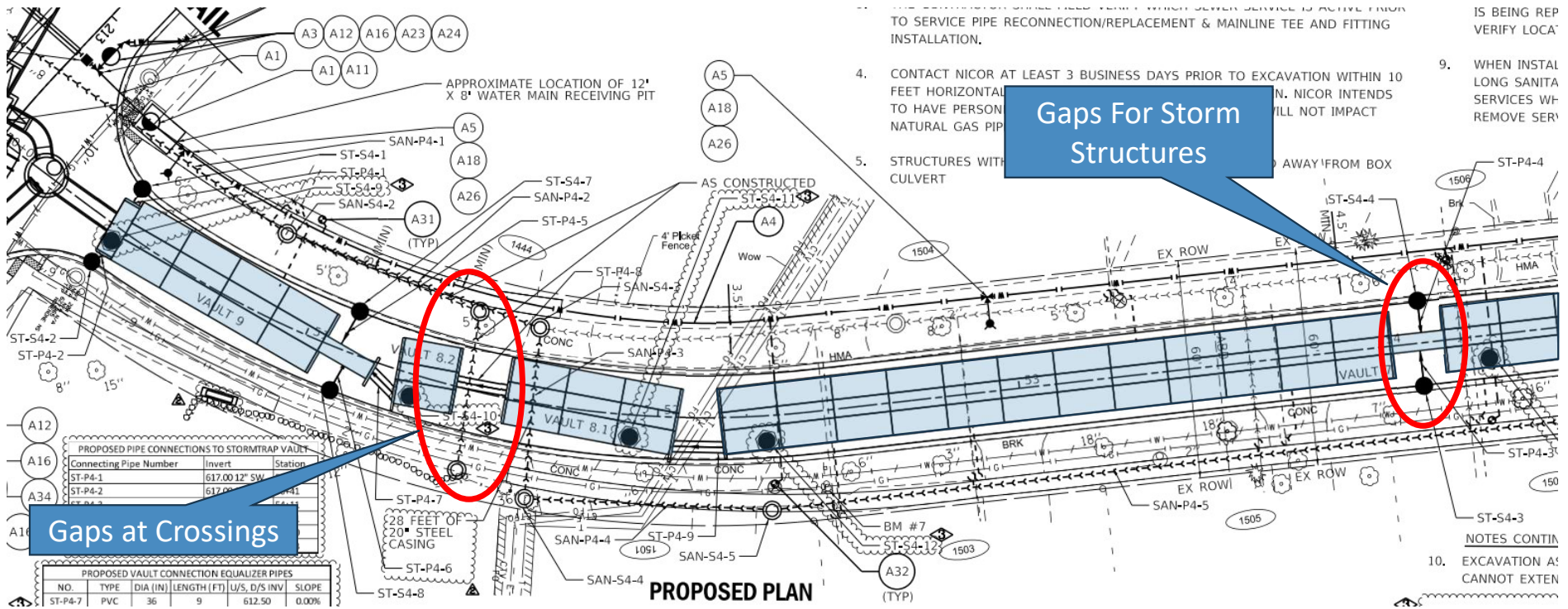
- Smaller, lighter pieces
- Cost savings

■ Challenges

- Curvature of roadway
- Space for storm structures



Tall Trees: StormTrap Alternate



Tall Trees: StormTrap Alternate

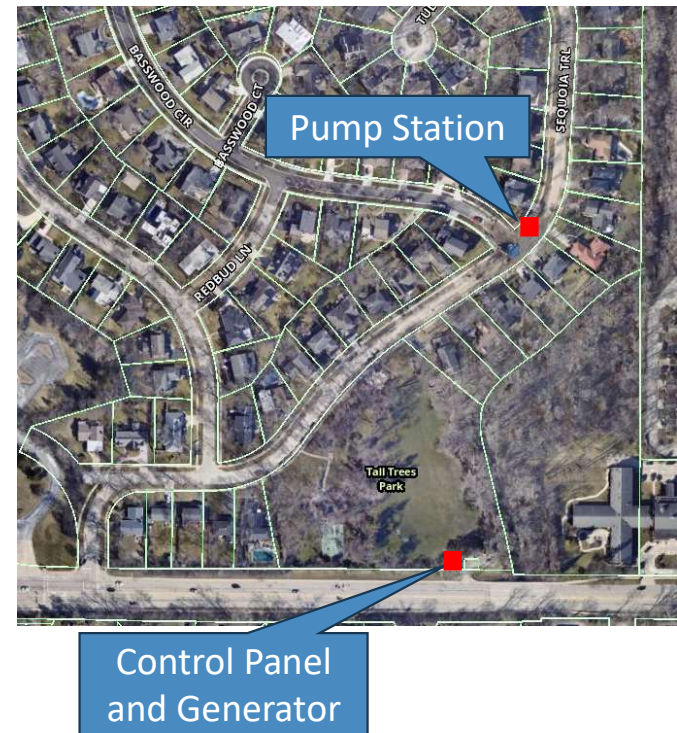


Tall Trees: StormTrap Alternate – Post-Construction

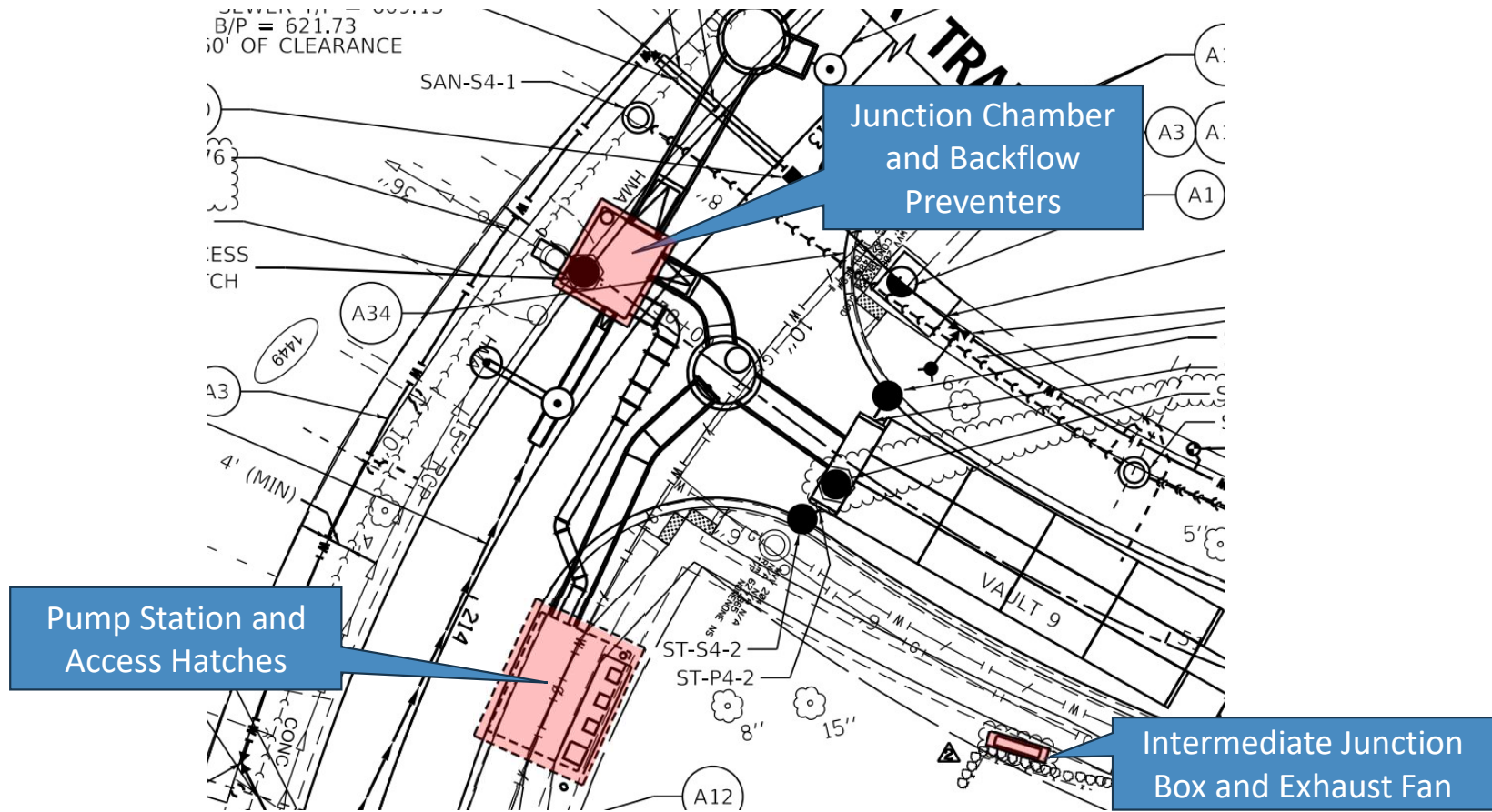


Tall Trees: Pump Station Design Challenges

- **Limited space in ROW**
- **Above-ground components required**
 - Exhaust fan
 - Control Panel
 - Generator
- **Distance to control panel and generator**
 - Electrical conduit
 - Intermediate junction box



Tall Trees: Pump Station



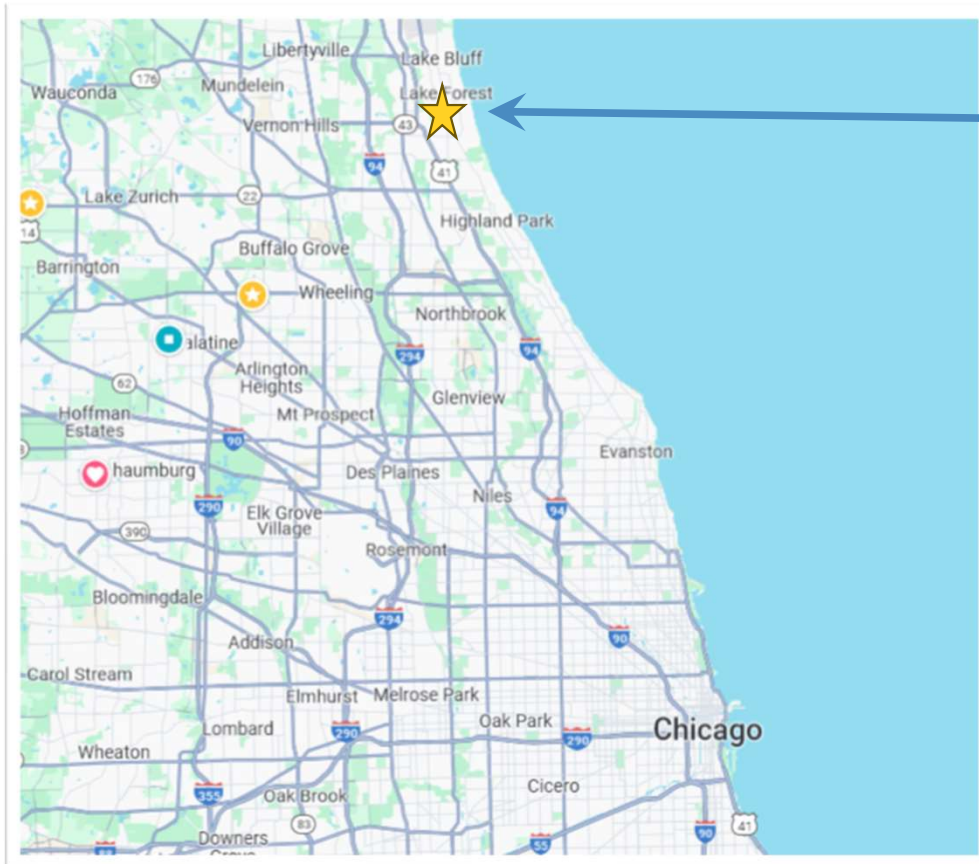
Tall Trees: Pump Station



Tall Trees: Control Panel and Generator



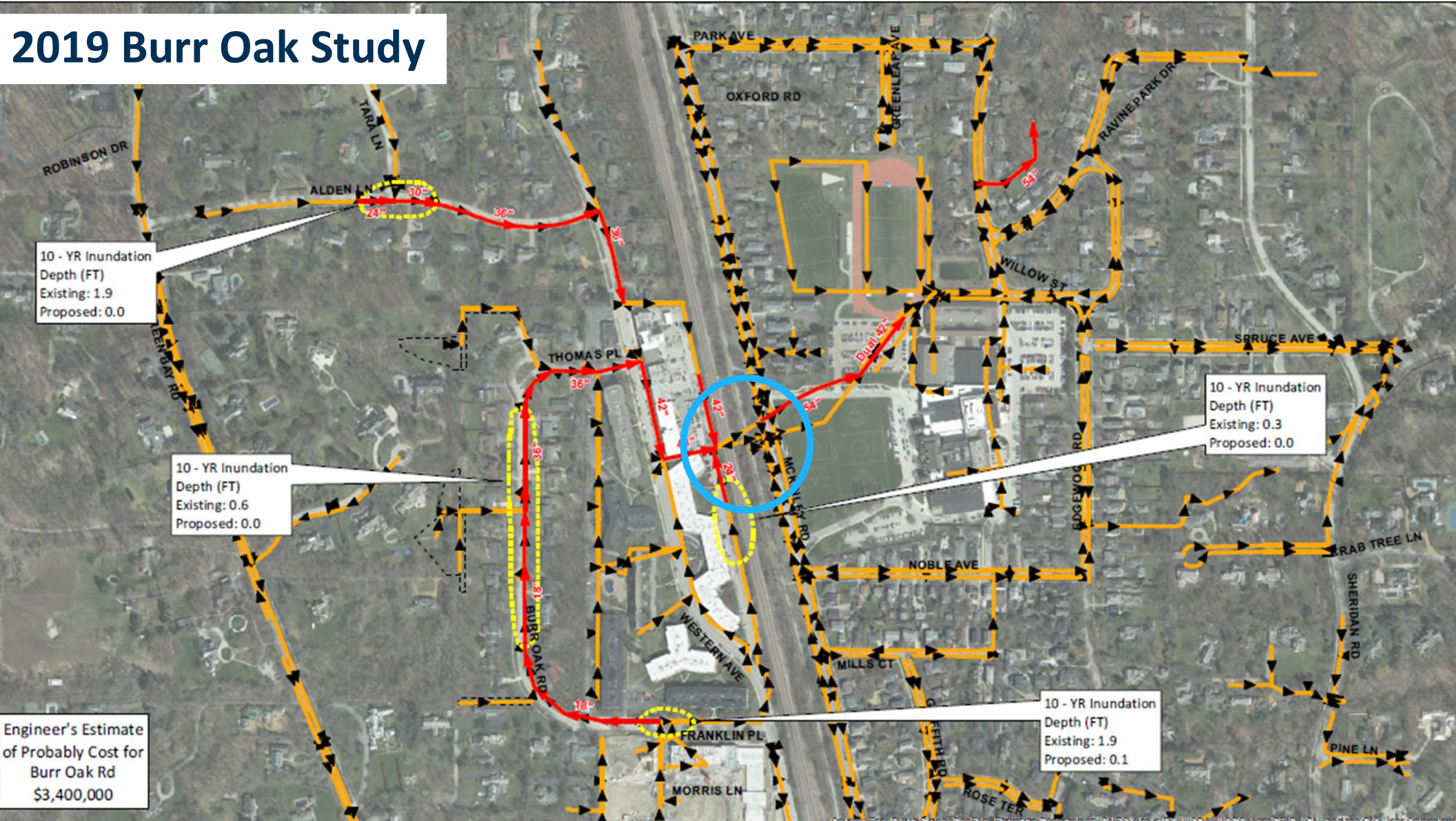
Case Study 2



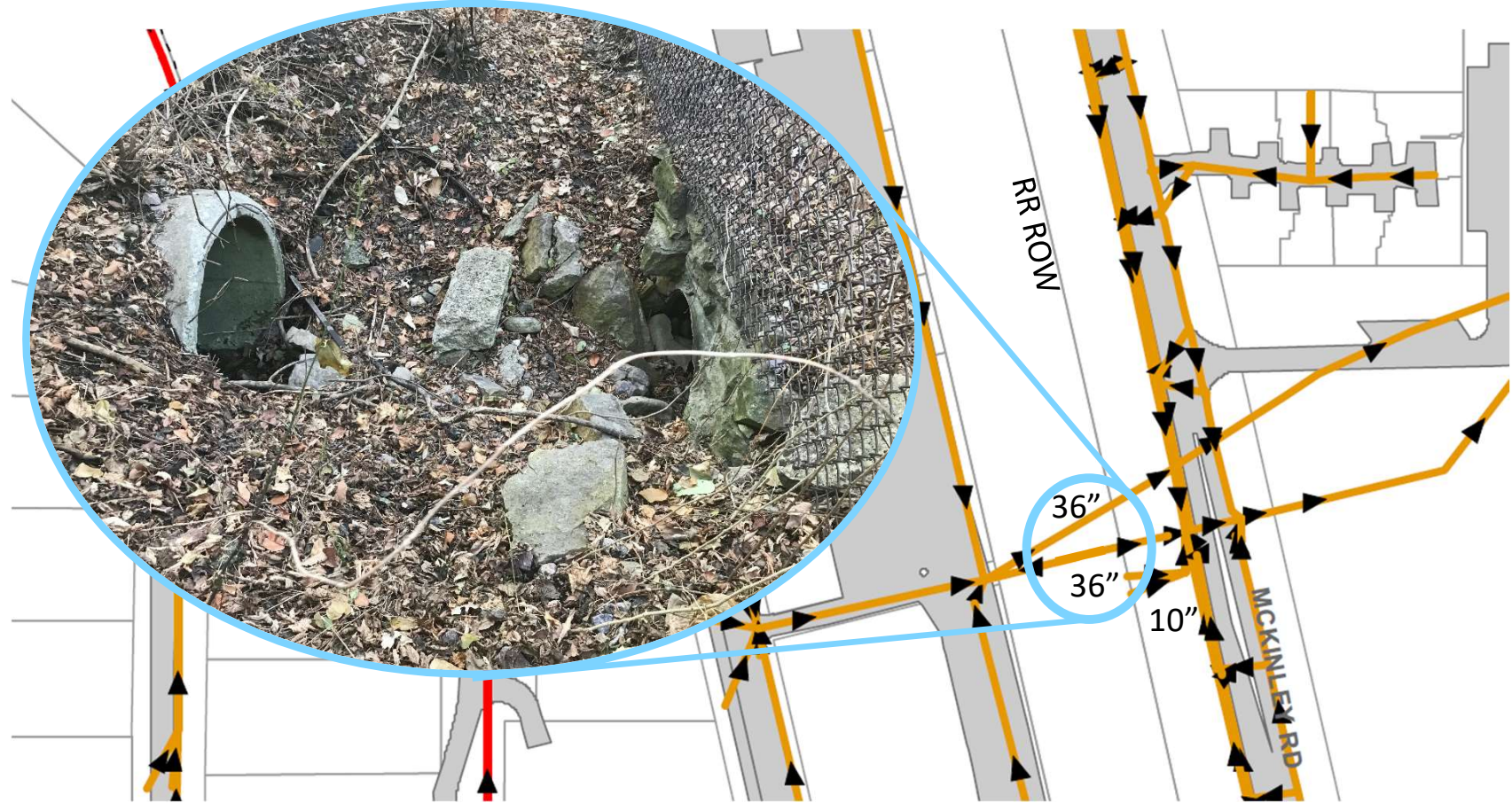
**City of Lake Forest –
Burr Oak
Stormwater
Improvements**

**Received \$2.75M
from LCSMC DCEO**

2019 Burr Oak Study



Unknown Condition



Back to the Drawing Board (SWMM Model)



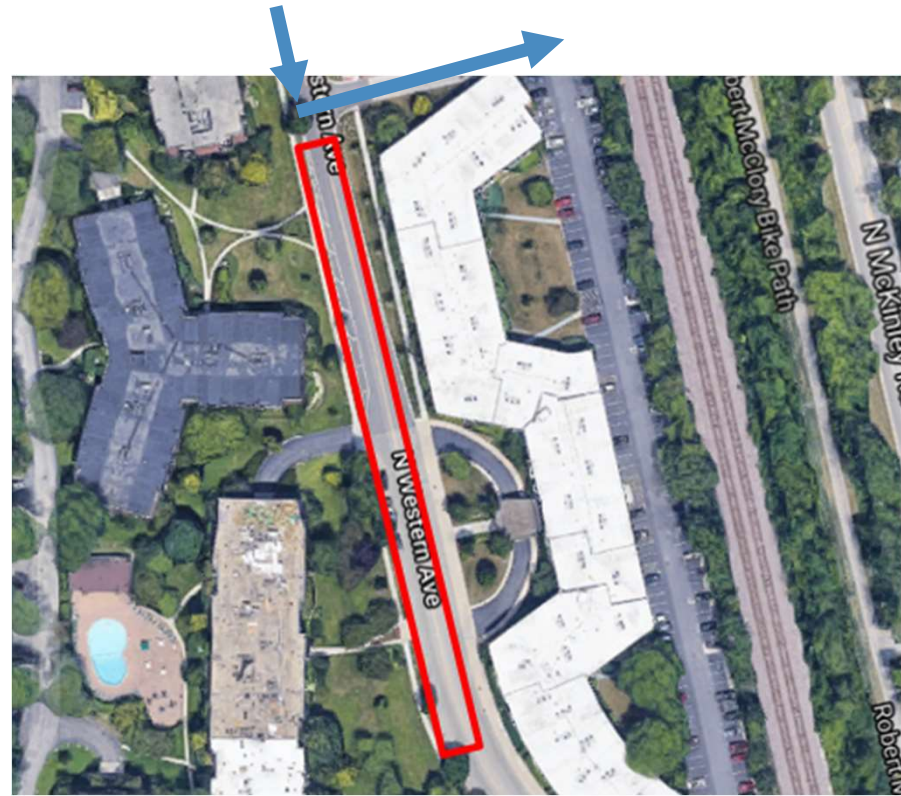
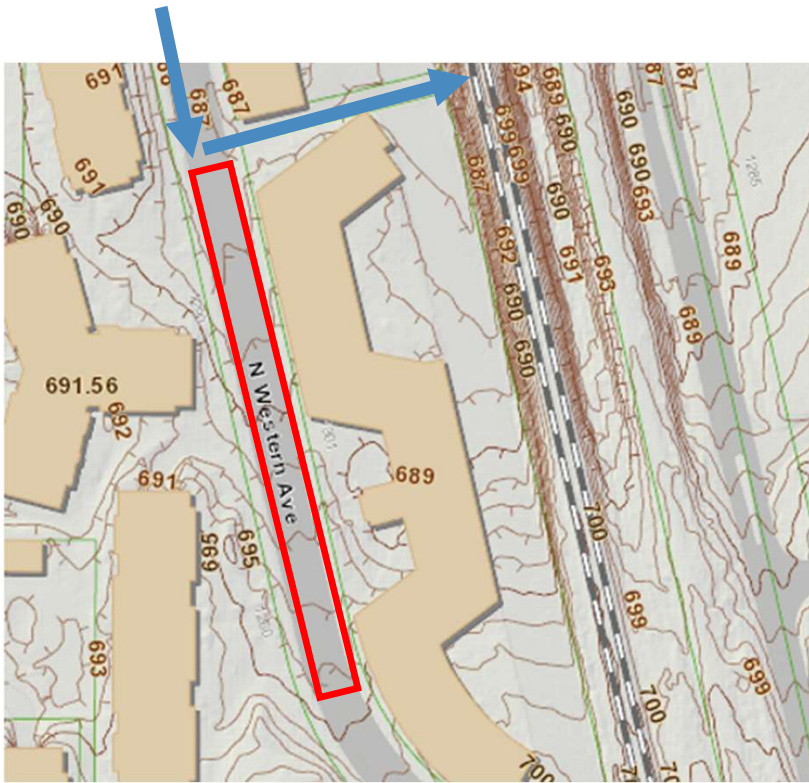
- **Maintain similar benefits**
- **Increase capacity under RR tracks**
- **Eliminate upsized outfall to ravine**
- **Consider Detention**

PLAN B - Upstream Detention (more like K!)

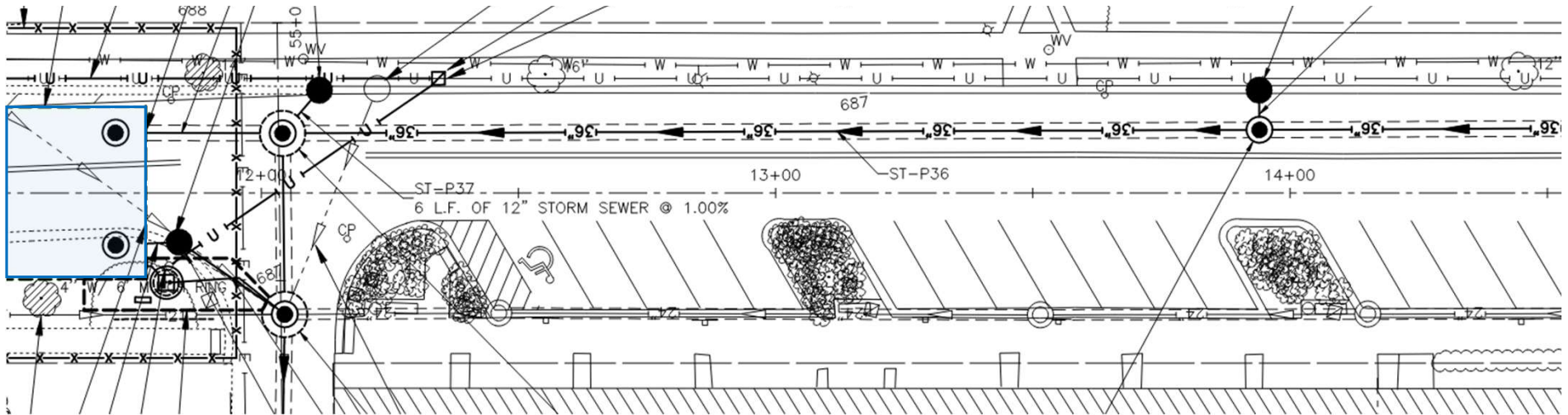
- Do NOT cross the tracks
- Solve problem upstream
- Underground Detention



Proposed StormTrap Location

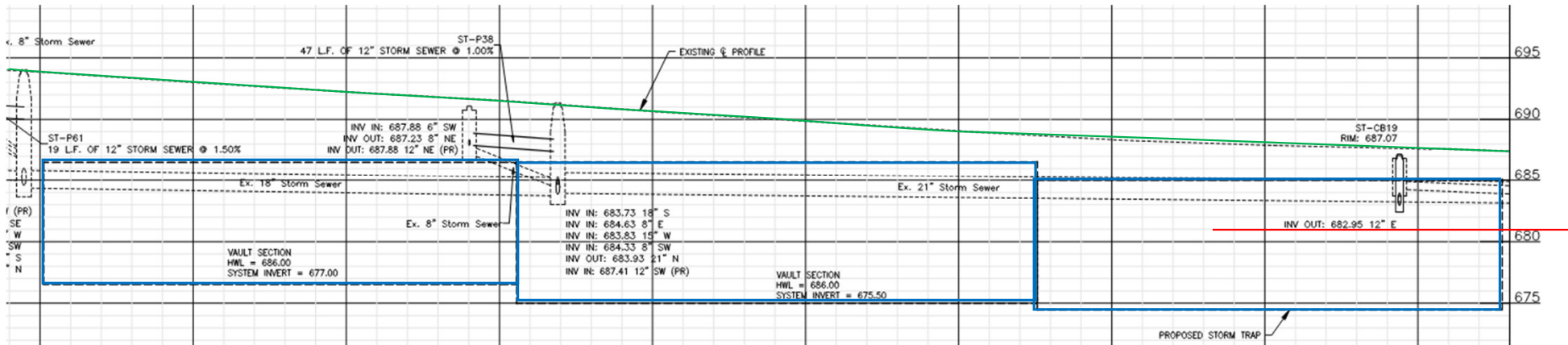


Western Avenue Challenges and Opportunities



- **New Streetscape on Northern Section (right)**
- **Need Streetscape over Vault**
- **No Sanitary Sewers**
- **Water Main far west (up)**

Western Avenue Challenges and Opportunities



- Segmented, variable height, vault
- Significant overburden
- Vault invert deeper than outfall
- Inlet filtration

ROW Construction Operations



ROW Construction Operations





Burr Oak Area Storm Sewer Improvement Project

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