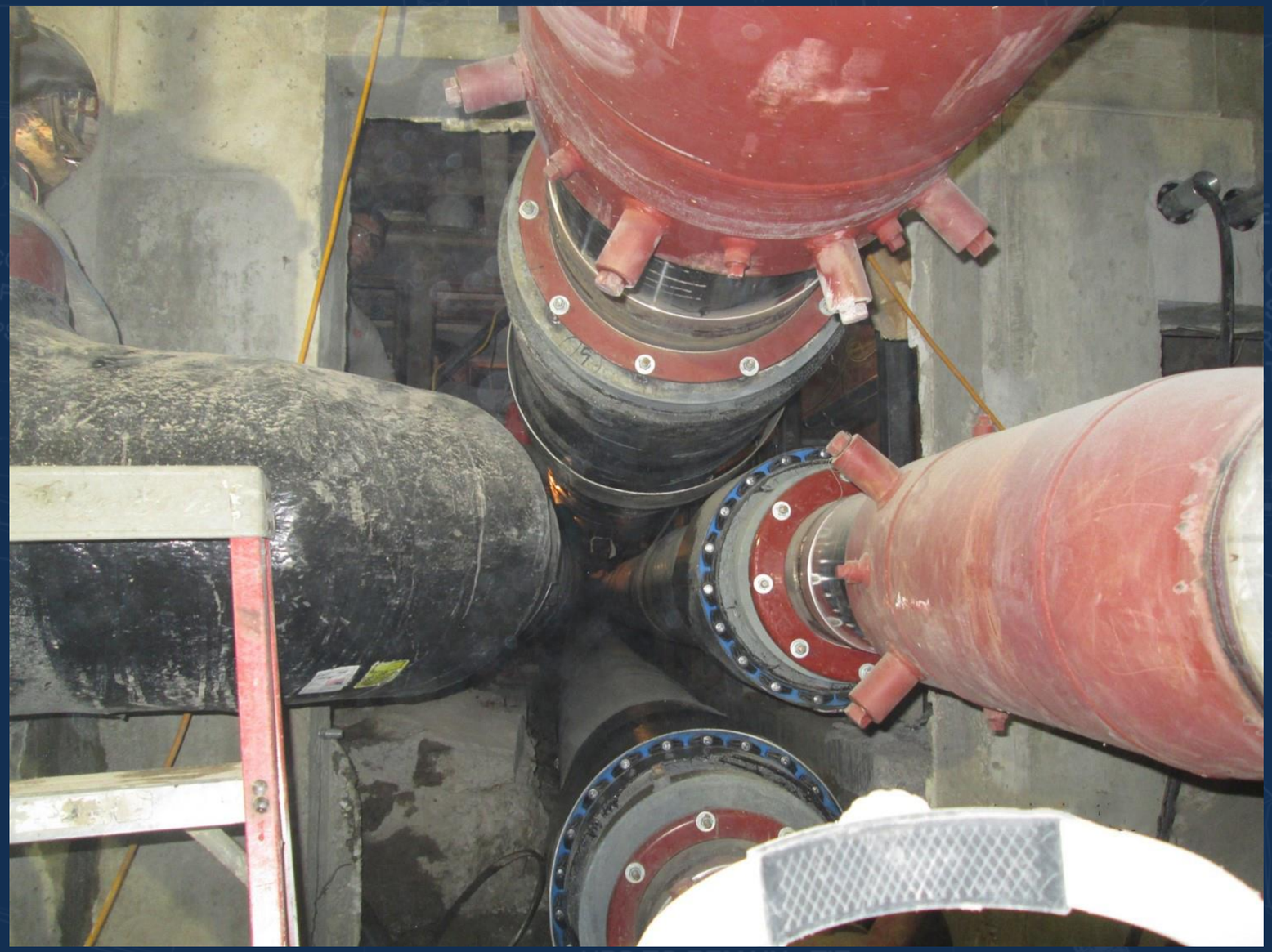
THE UNIVERSITY OF IOWA REPLACEMENT OF GRAND AVENUE STEAM DISTRIBUTION SYSTEM



THE UNIVERSITY OF IOWA

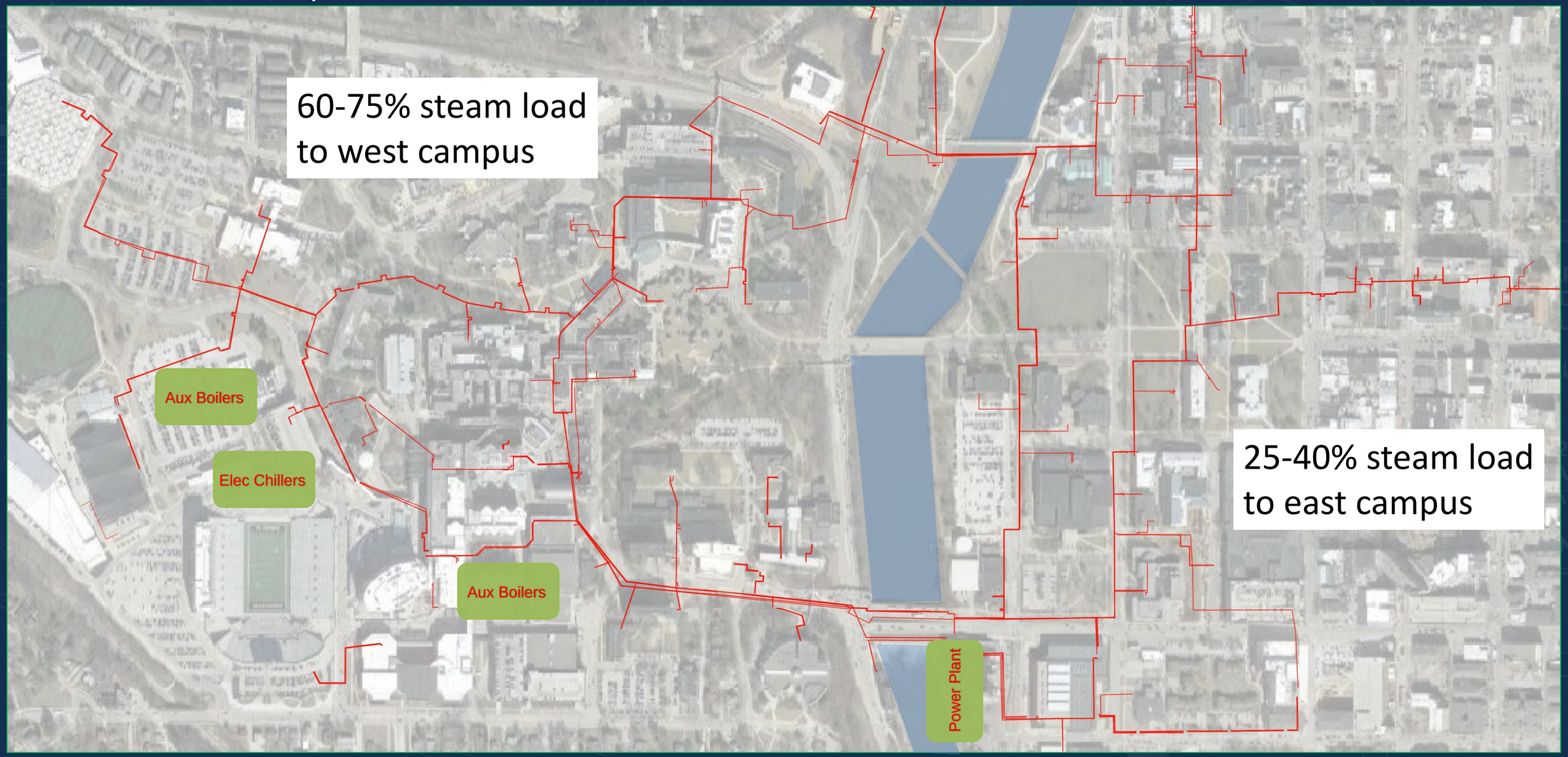
SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Agenda

- Why we need the project
- Project scope and schedule
- Design challenges
- Construction experience

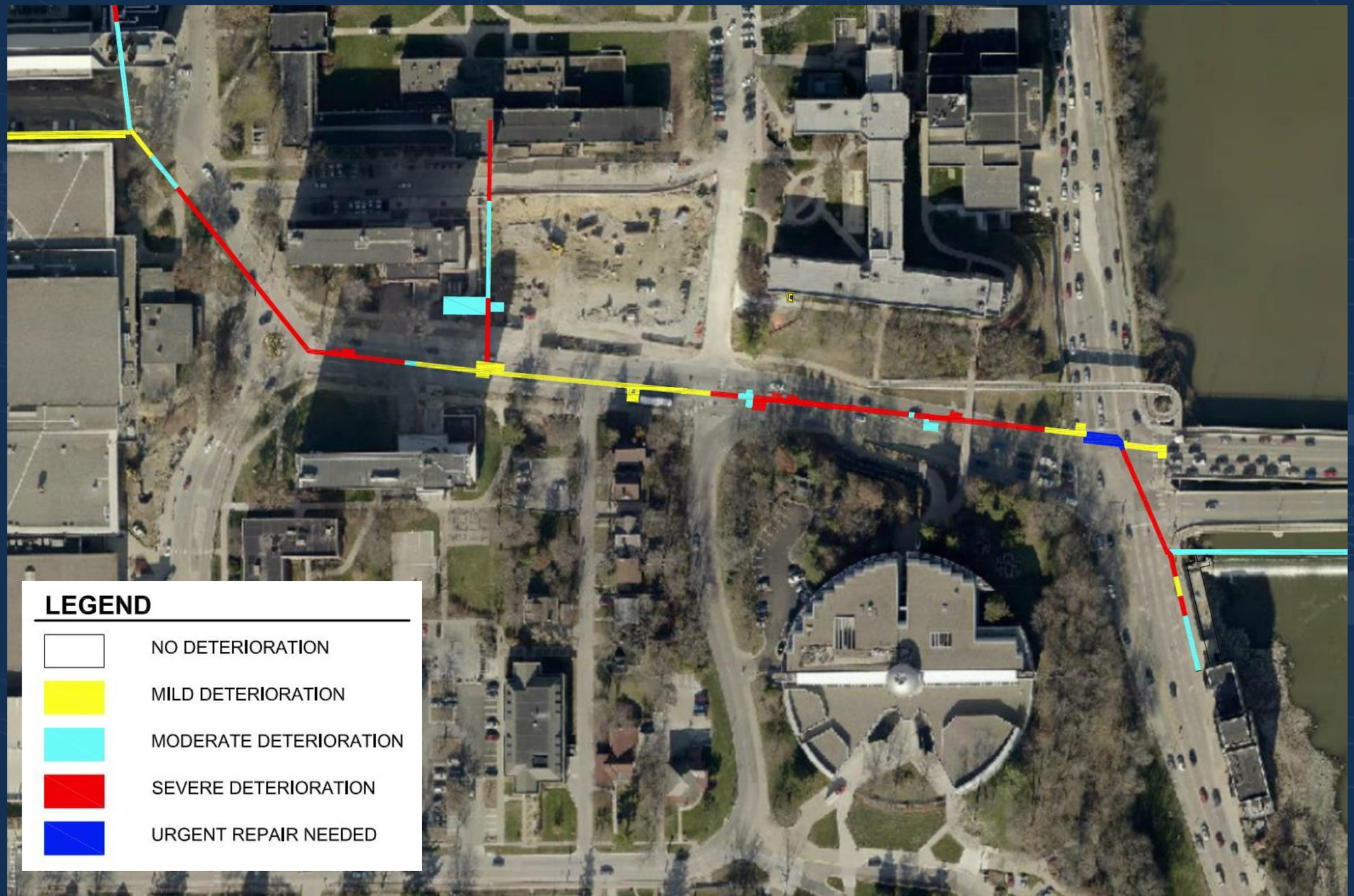
Why We Need This Project

Main Campus Steam Distribution



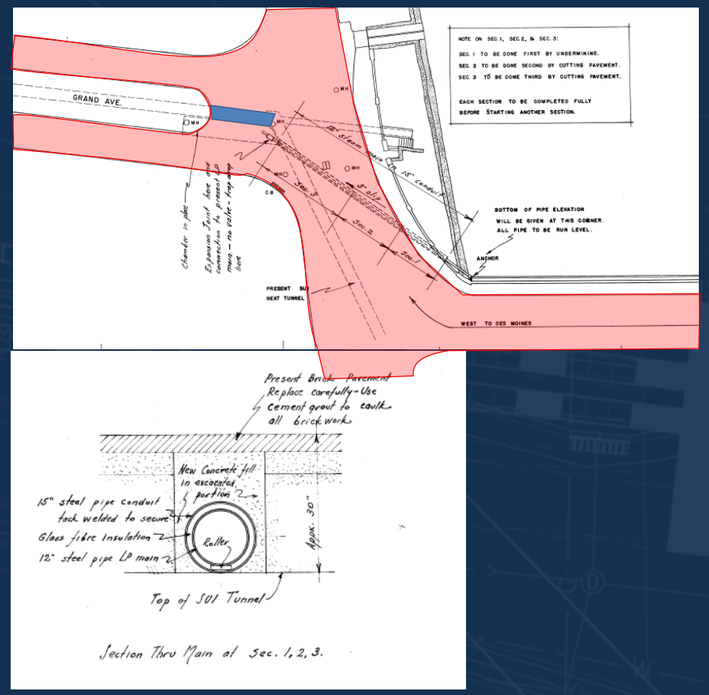
Why We Need This Project

Tunnel Condition Assessment

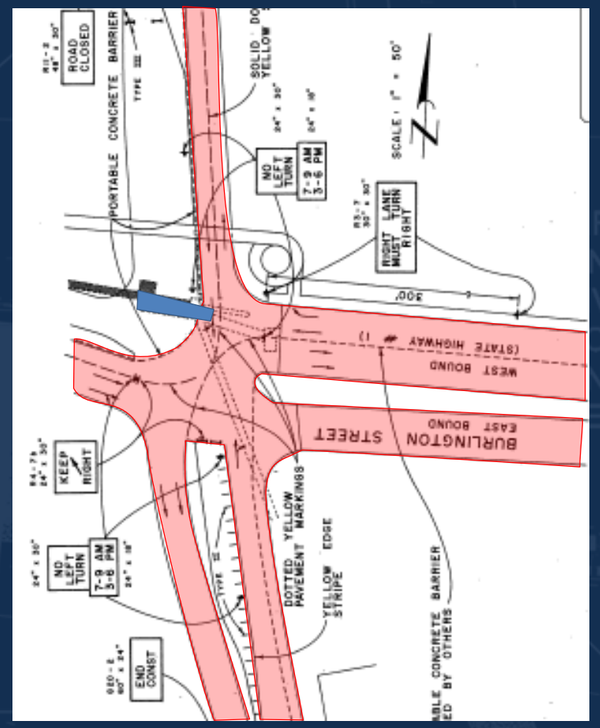


Why We Need This Project

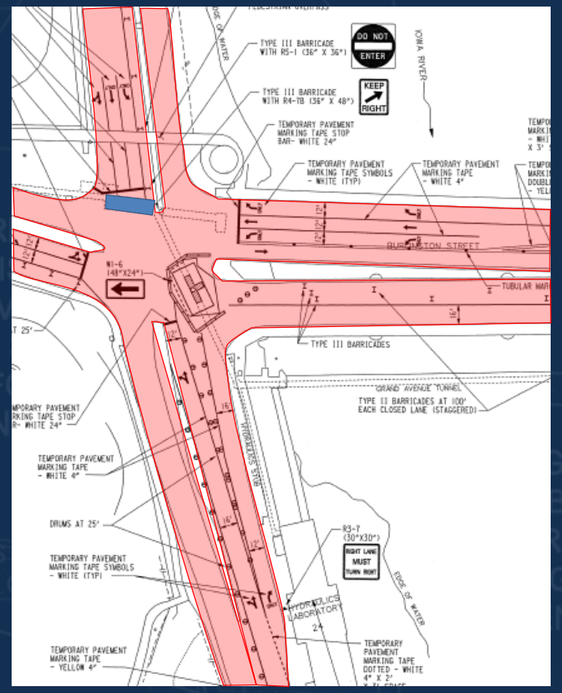
1944 direct-buried steam



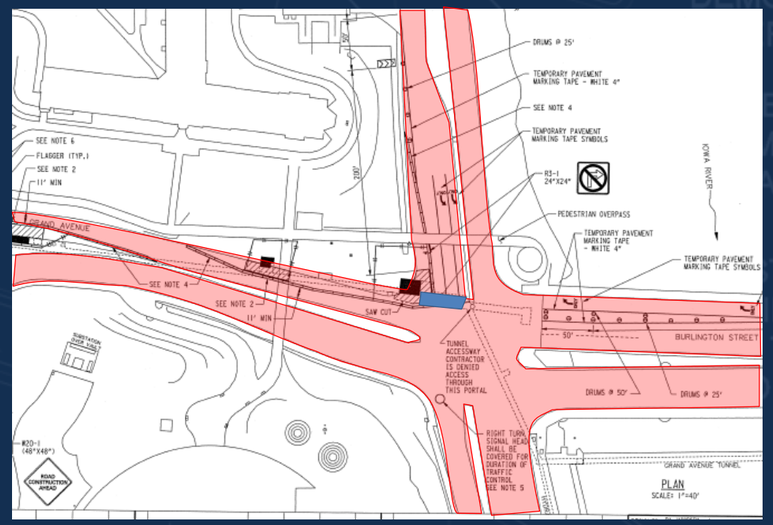
1986 Vault addition



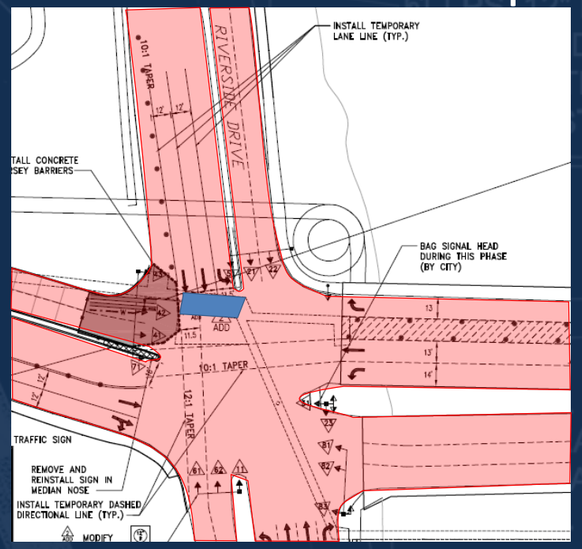
1993 Vault repair



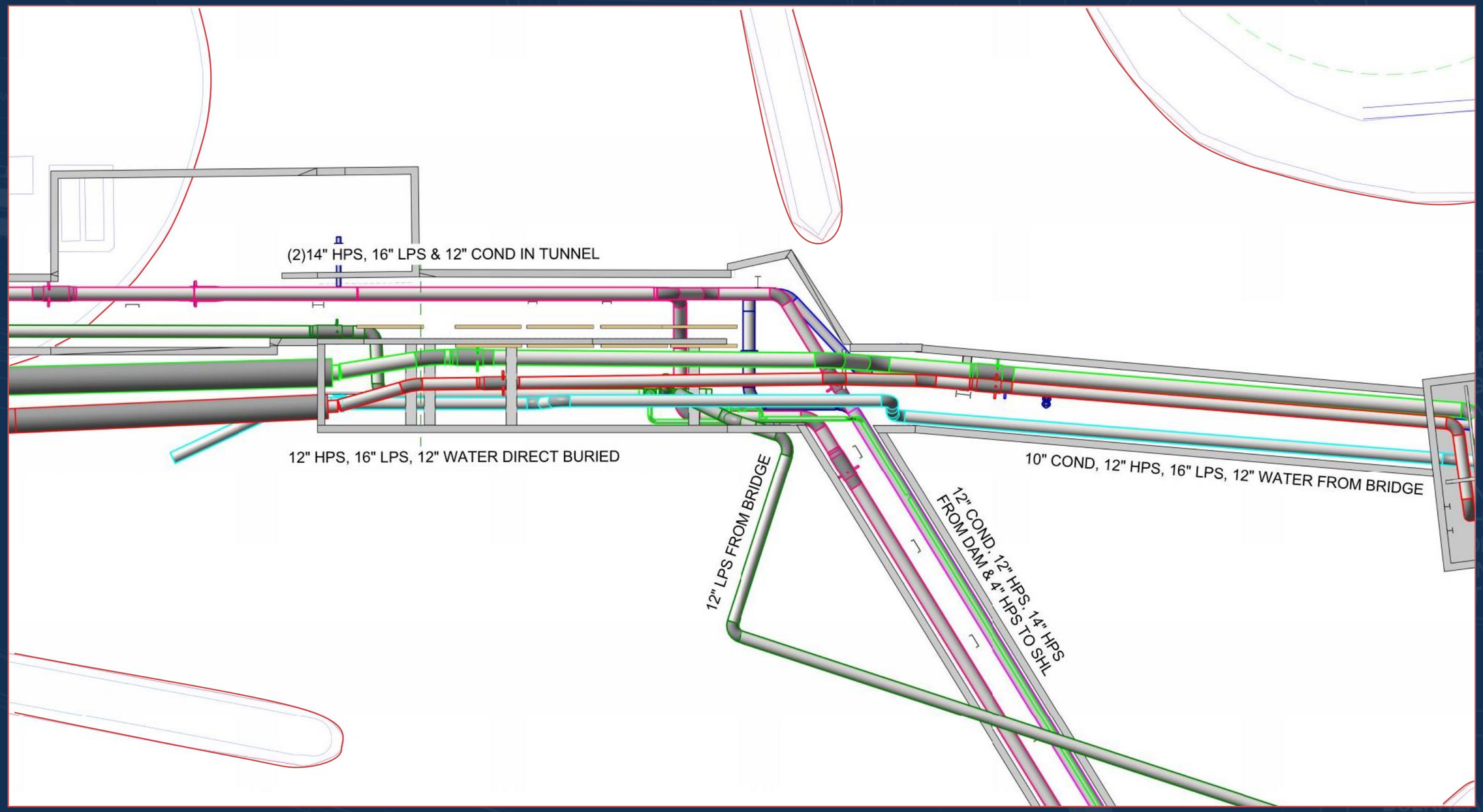
1995 Tunnel repairs



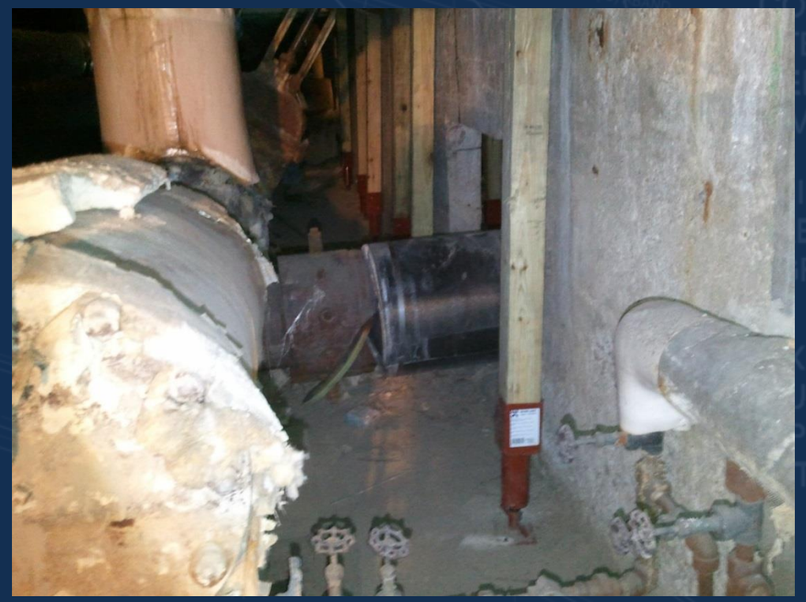
2008 direct-buried repairs



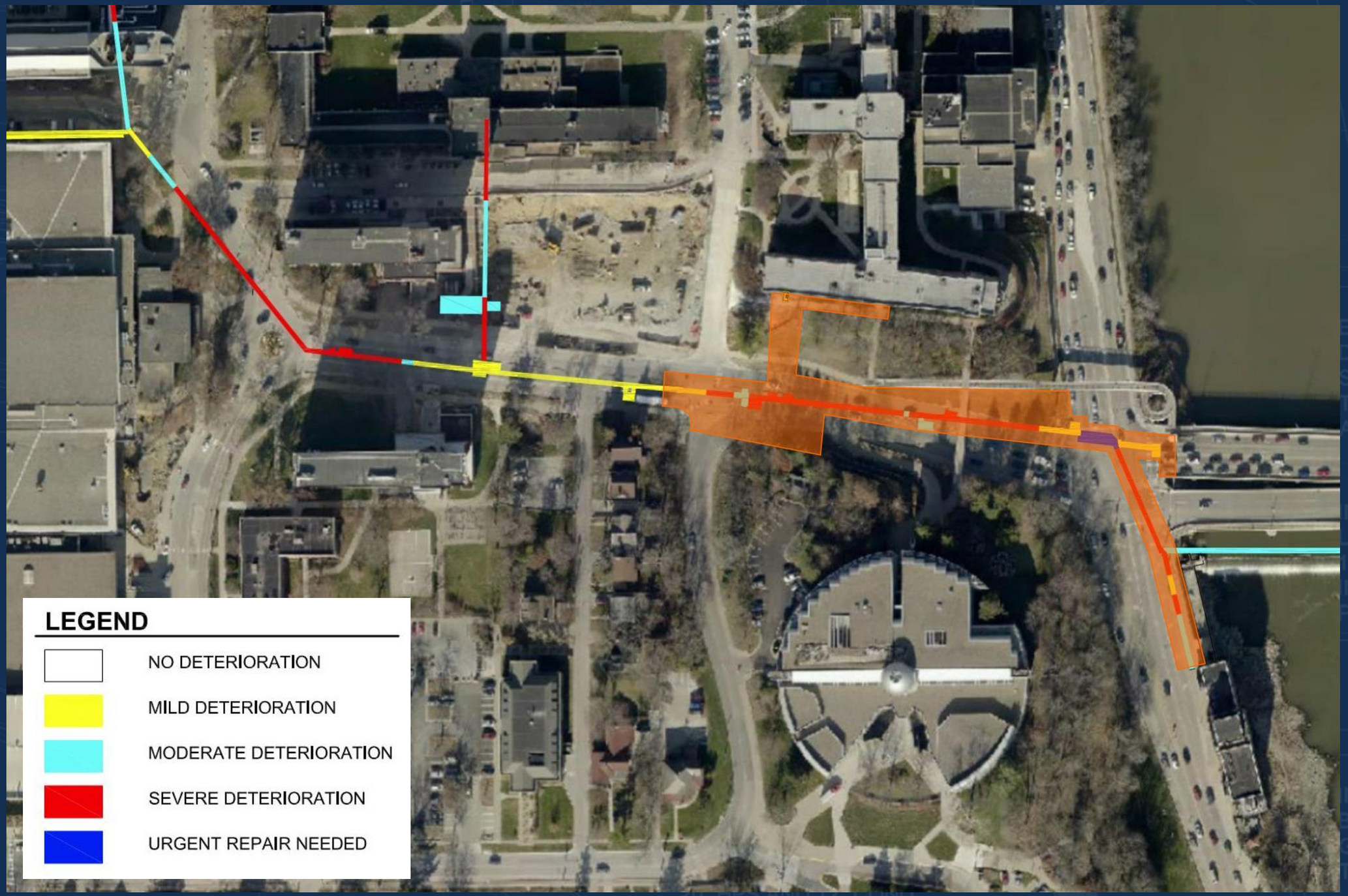
Why We Need This Project



Why We Need This Project



Project Scope

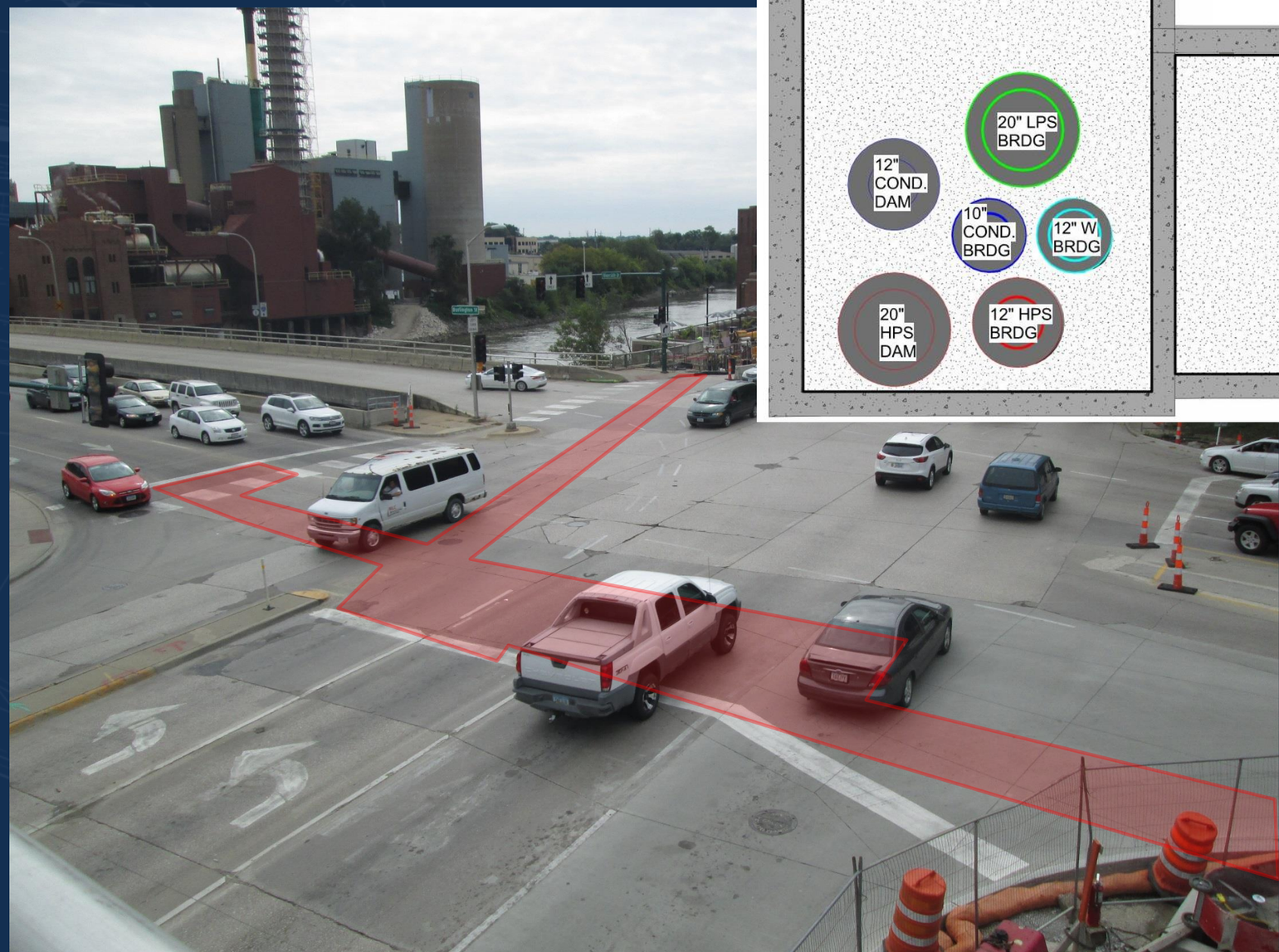


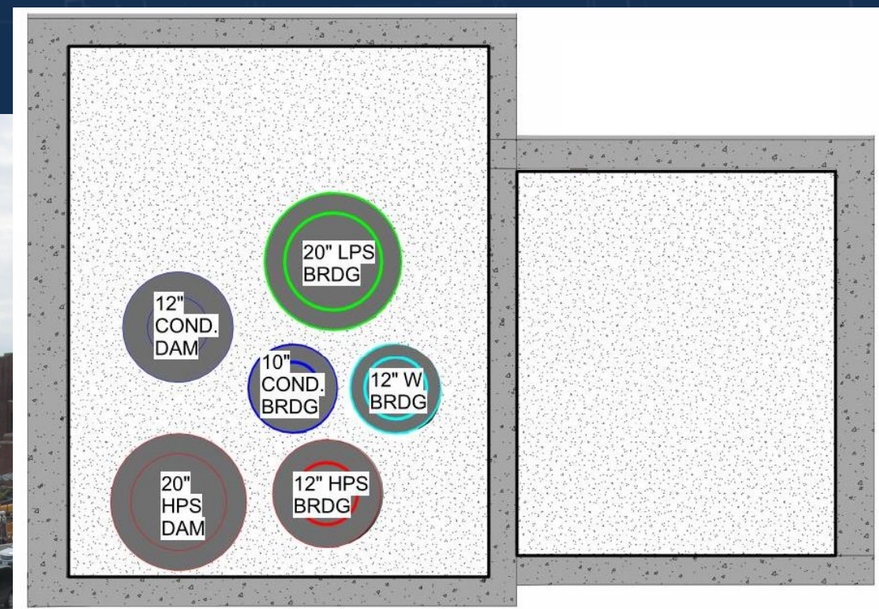
PROJECT SCHEDULE

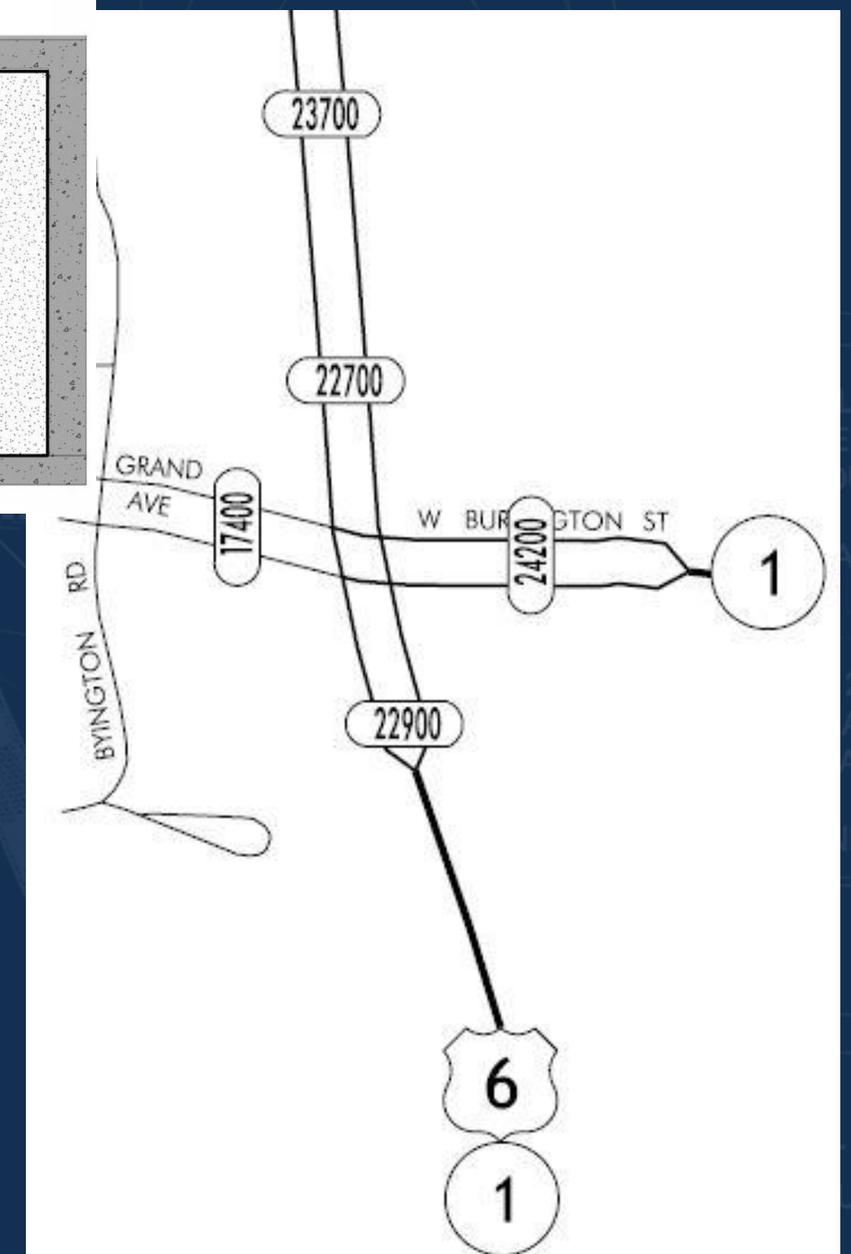
Start Design	August 1, 2014
Bids Received	January 13, 2015
Began Construction	February 4, 2015
Substantial Completion	October 21, 2016

Design Constraints

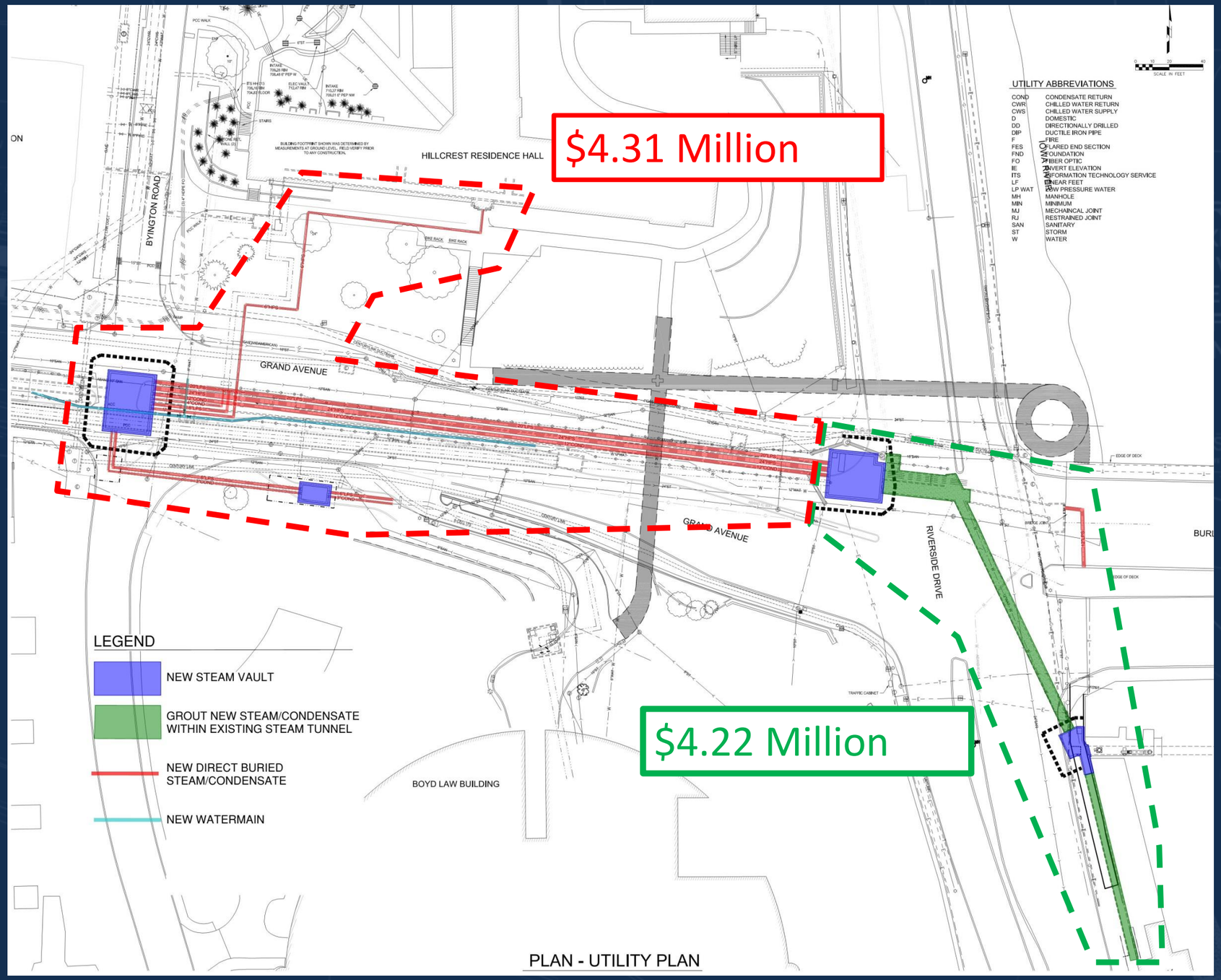
Design Constraints







Design Constraints

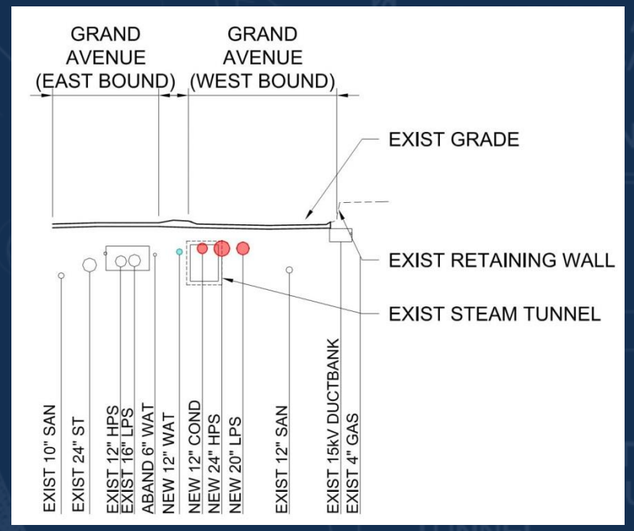


New tunnel and piping
$14,000/LF

Boring under highway
$13,000/LF (rock)

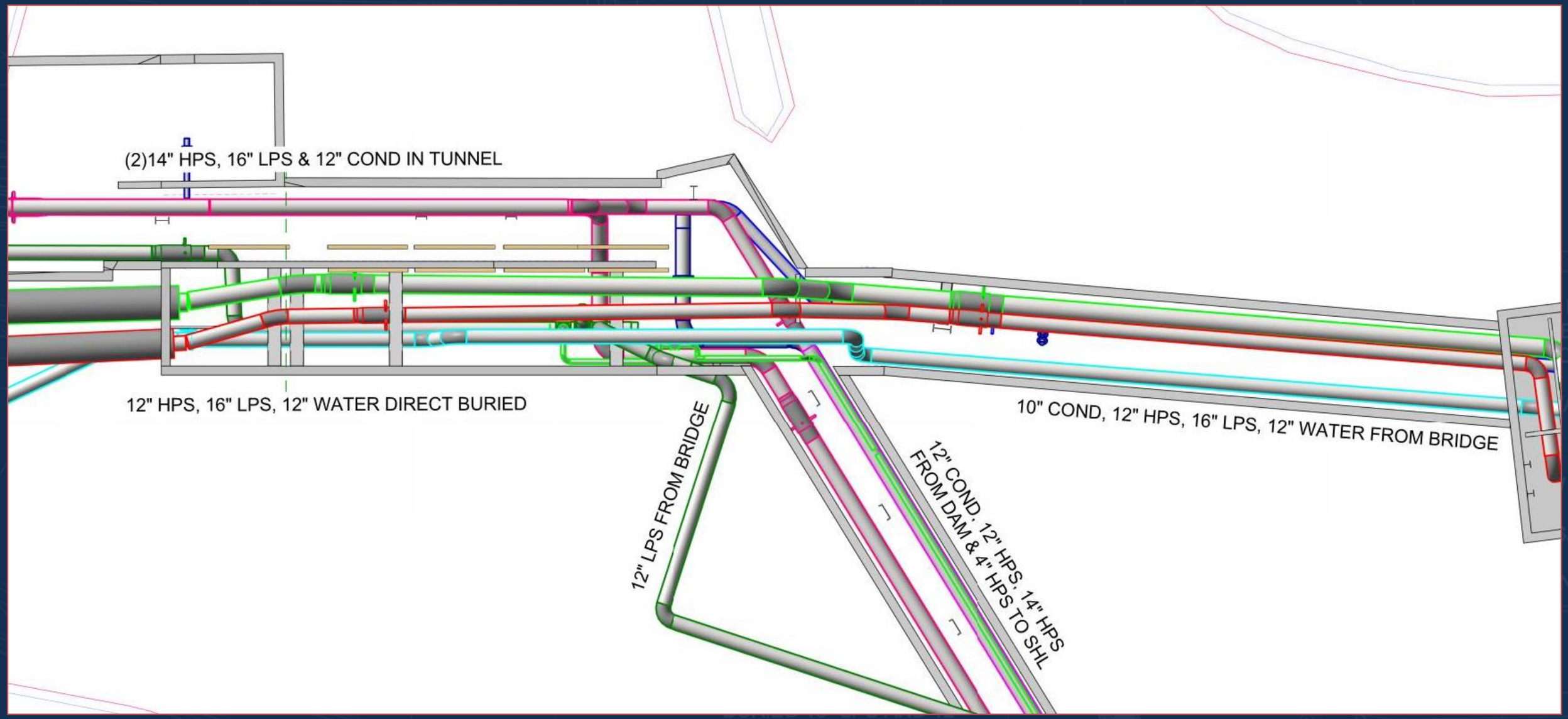
Direct Buried Piping in Tunnel
$10,000/LF

Direct Buried Piping
$7,000/LF



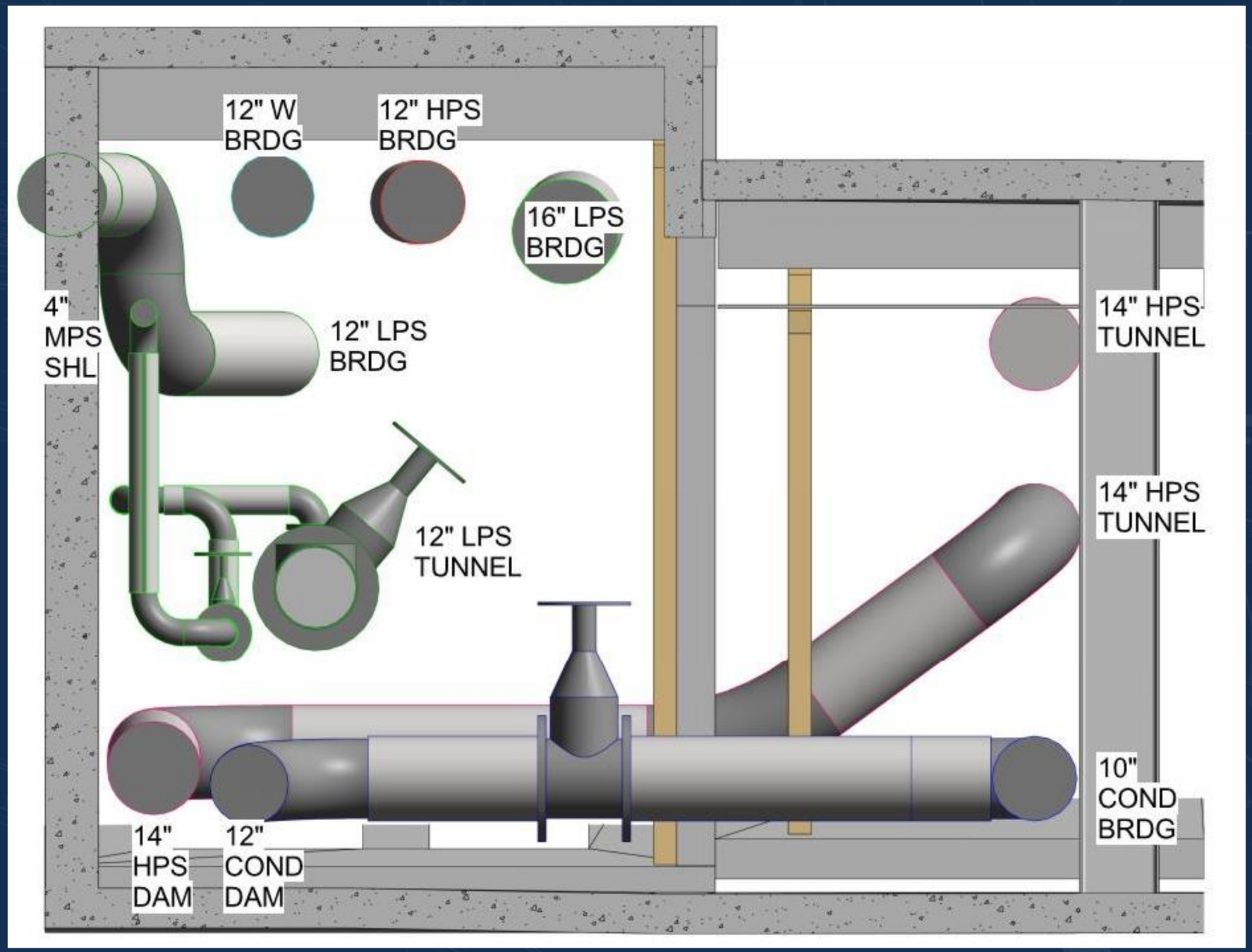
Utilizing Multiple Steam Sources

Finding an Alignment

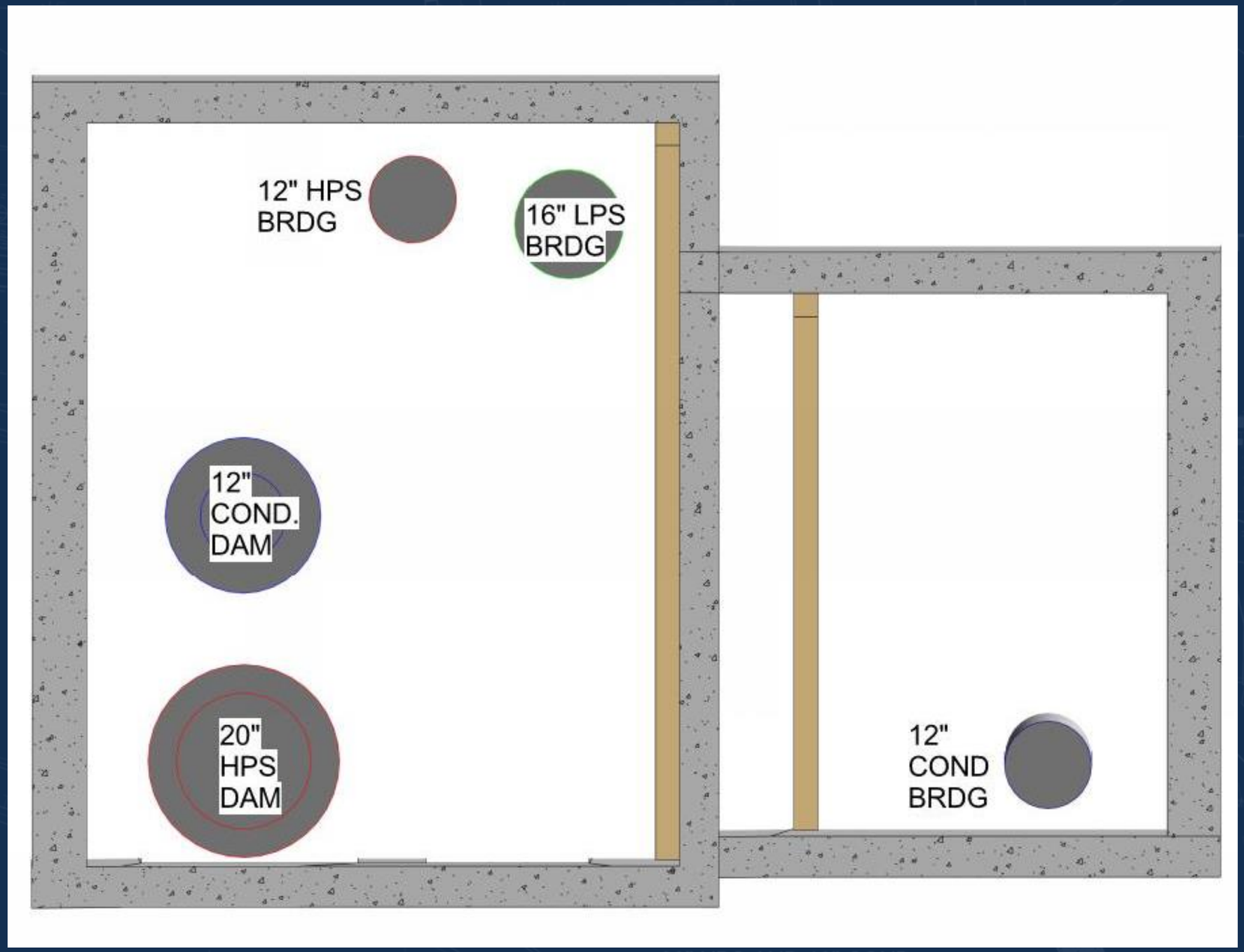


Making Room

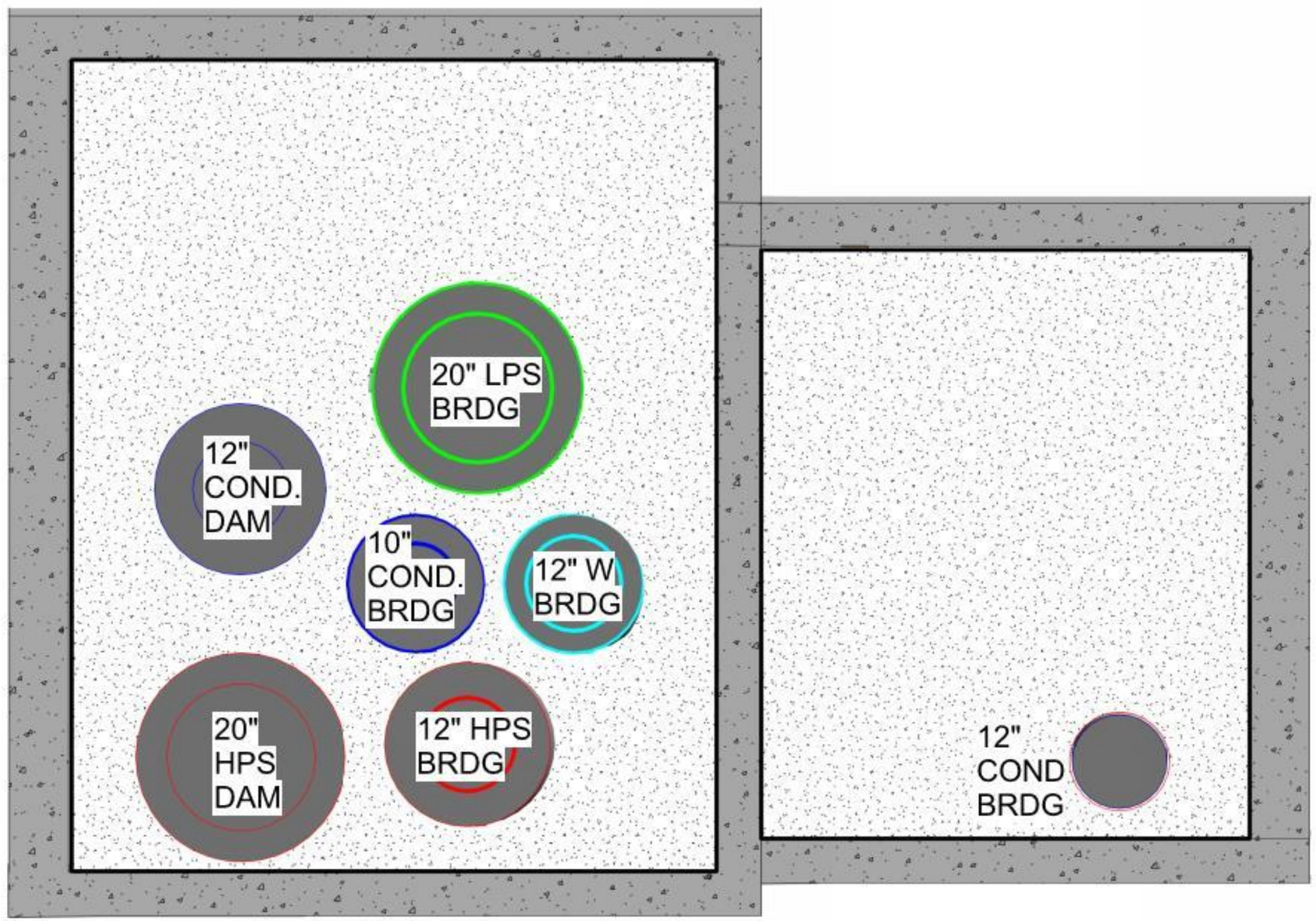
Making Room


12" W
BRDG
12" HPS
BRDG
16" LPS
BRDG
4"
MPS
SHL
12" LPS
BRDG
14" HPS
TUNNEL
12" LPS
TUNNEL
14" HPS
TUNNEL
10"
COND
BRDG
14"
HPS
DAM
12"
COND
DAM

Making Room

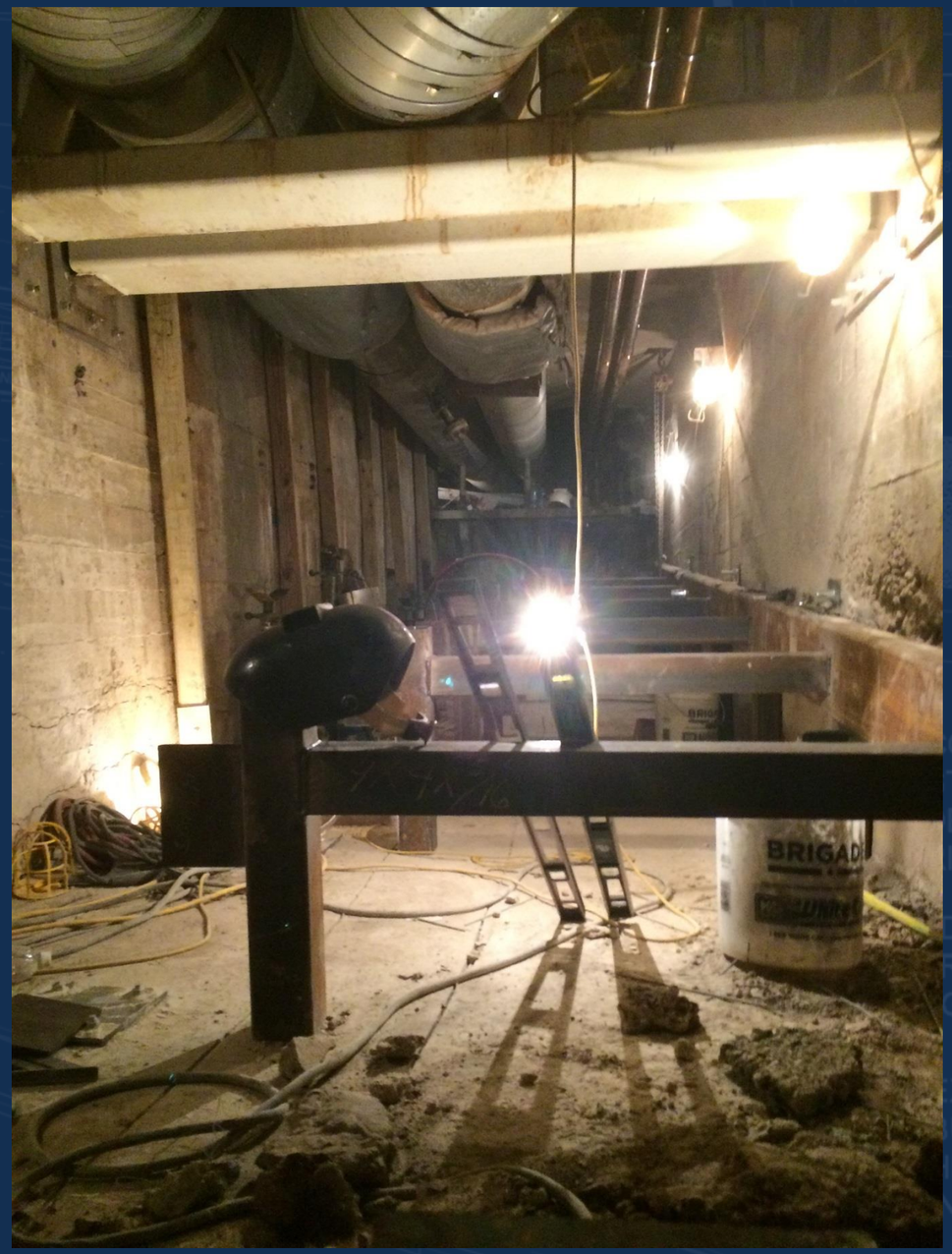


Making Room


20" LPS BRDG
12" COND. DAM
10" COND. BRDG
12" W BRDG
20" HPS DAM
12" HPS BRDG
12" COND BRDG

Working in Tight Spaces

Preventing Collapse During Construction



Installing Pipe in Short Sections

Contractor Innovations

Contractor Innovations

Effective Waterproofing

Value of Existing Information and Coordination

- Bid Amount = $8.461M
- Change Orders for Unforeseen = 2.0%
- Change Orders for Phase 2 = 2.6%

Questions?