Greenville Utilities

Water Treatment Plant Phase 1 Upgrades
CMAR Selection Pre-Submittal Meeting

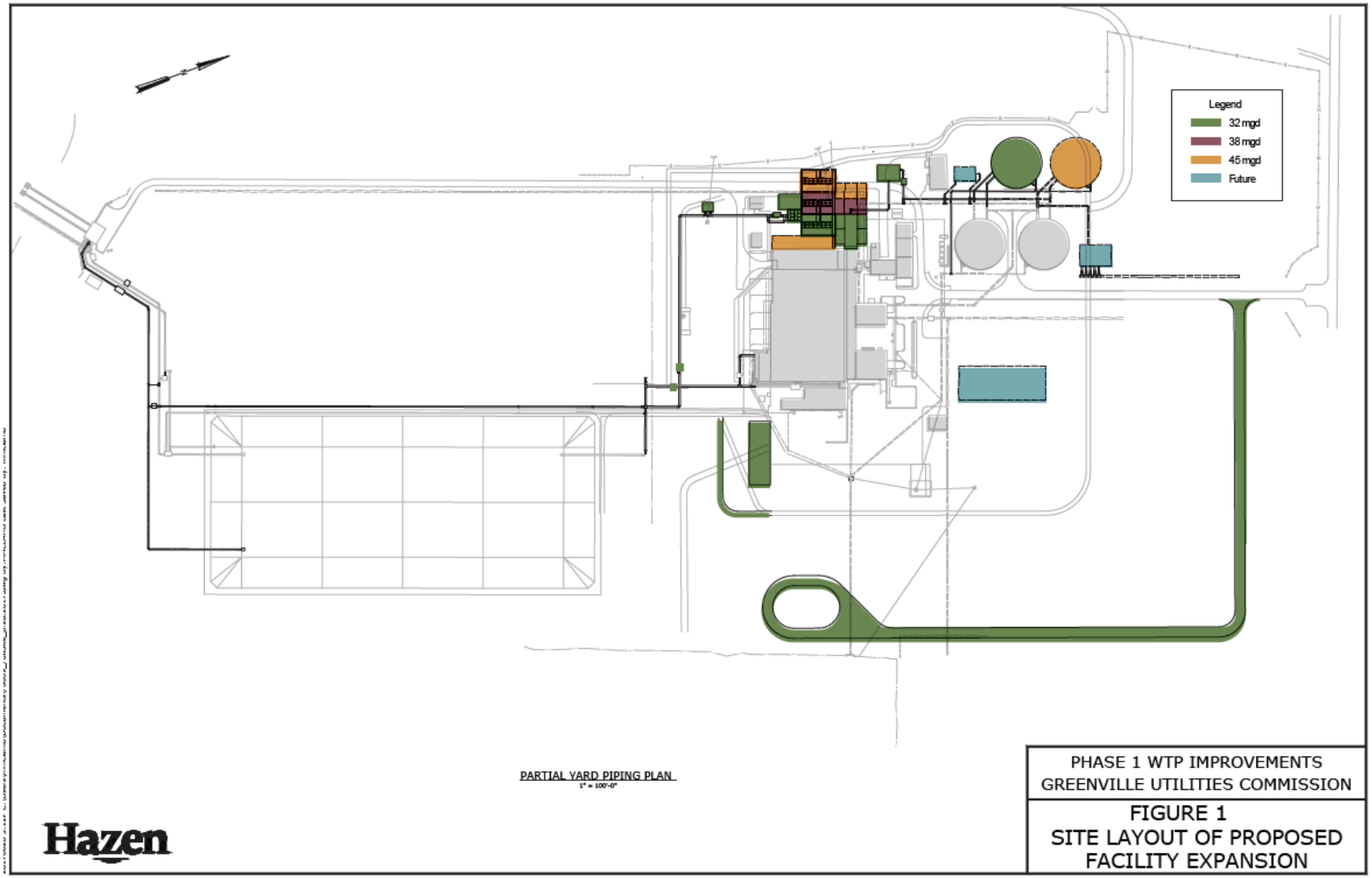
October 12, 2017

Hazen

Water Treatment Plant Phase 1 Upgrades

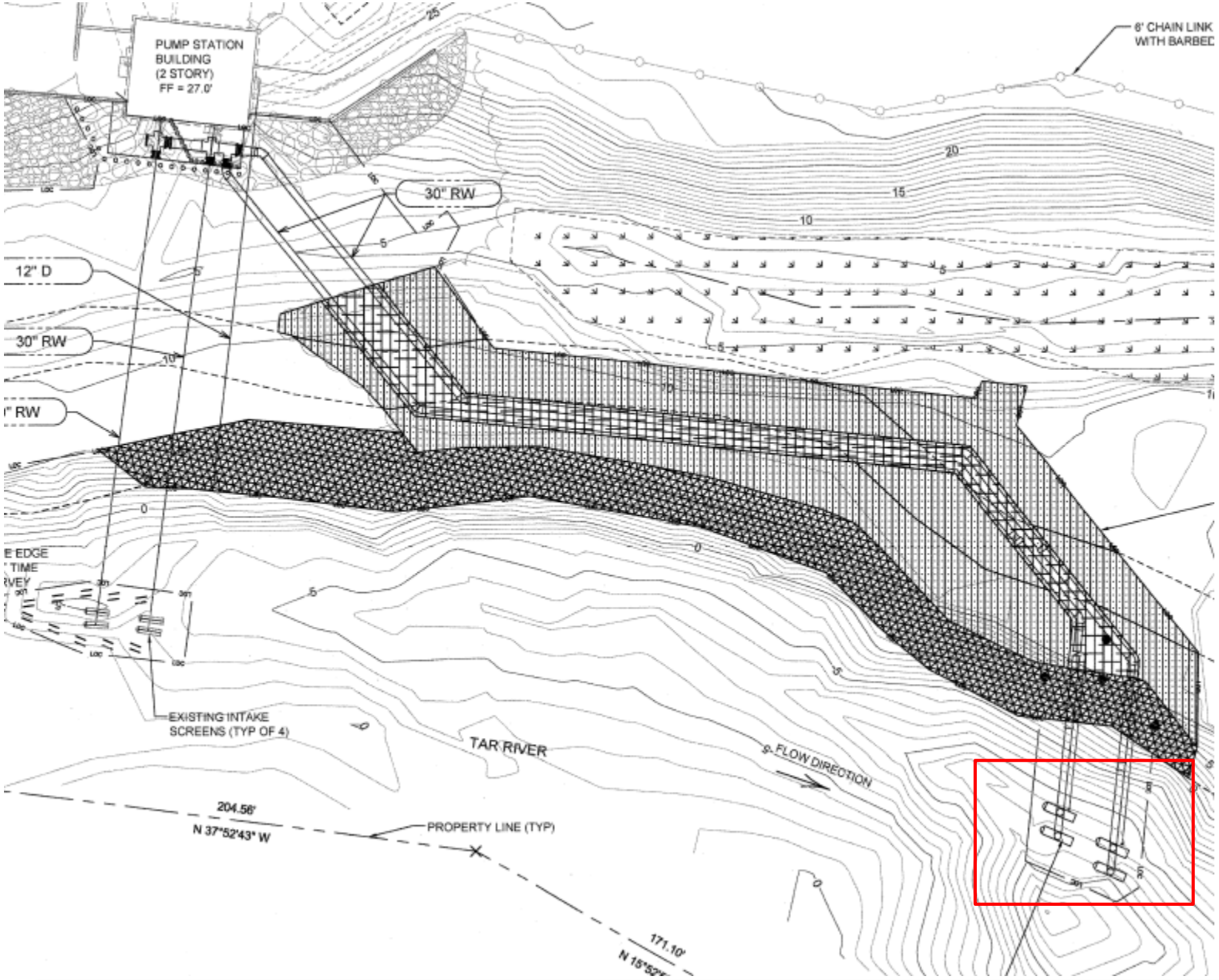
- 22 mgd WTP
- Expand capacity to 32 mgd
- Upgrades to most processes
  - Only minor improvements to ozone, PI, and lagoon

Facility Expansion Site Layout



Raw Water Intake

- Intake screens will require repair or replacement to resolve recent failures
- Hazen conducting further investigations
- Construction may require temporary pumping systems and cofferdams around the screens


PUMP STATION
BUILDING
(2 STORY)
FF = 27.0'
6' CHAIN LINK
WITH BARBED
30" RW
12" D
30" RW
" RW
EXISTING INTAKE
SCREENS (TYP OF 4)
TAR RIVER
FLOW DIRECTION
204.56'
N 37°52'43" W
PROPERTY LINE (TYP)
171.10'

Raw Water Pump Station

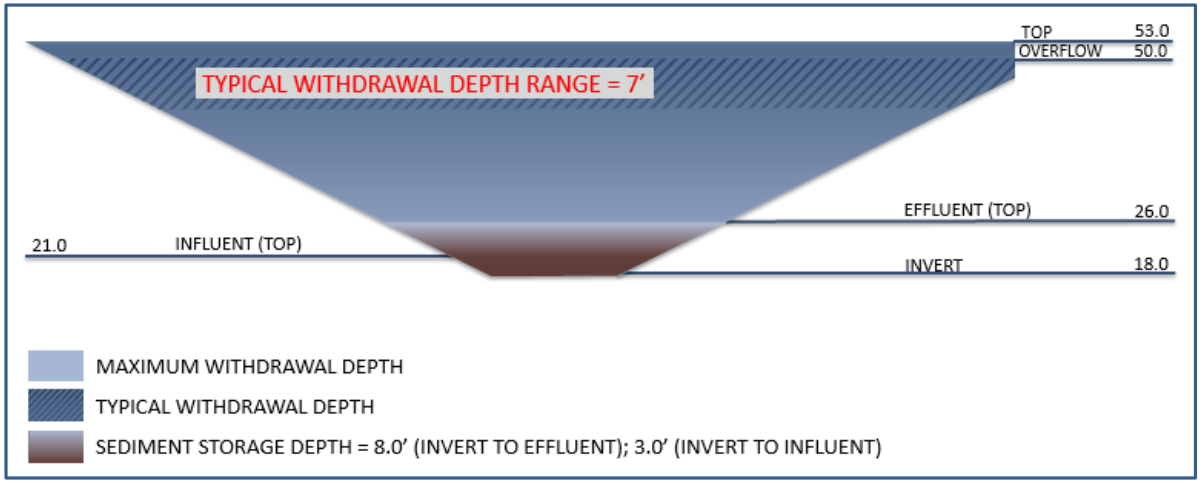
- Upsize intake piping and pump discharge header to 42-inch
- Raw Water Pumps
  - Impeller retrofit - No. 1, 3, and 4
  - Replace Motor - No. 4
  - Install vortex suppression
- Install parallel RW pipelines to PI and bypass to WTP

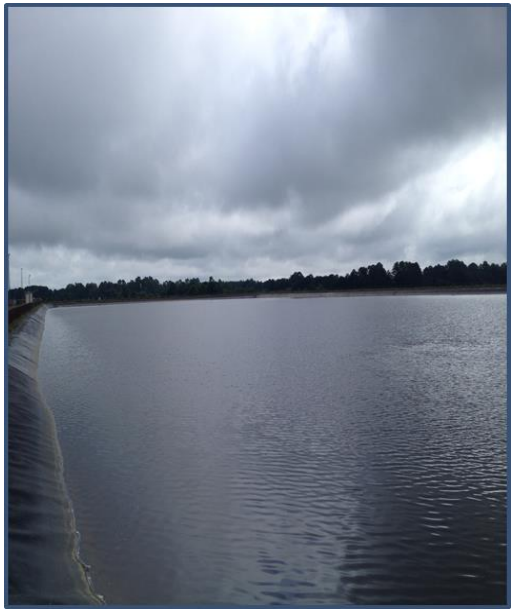
  ~2,000 ft of 30-inch

  ~1,600 ft of 48-inch
  (PI to Rapid Mix)

Modifications to Existing PI

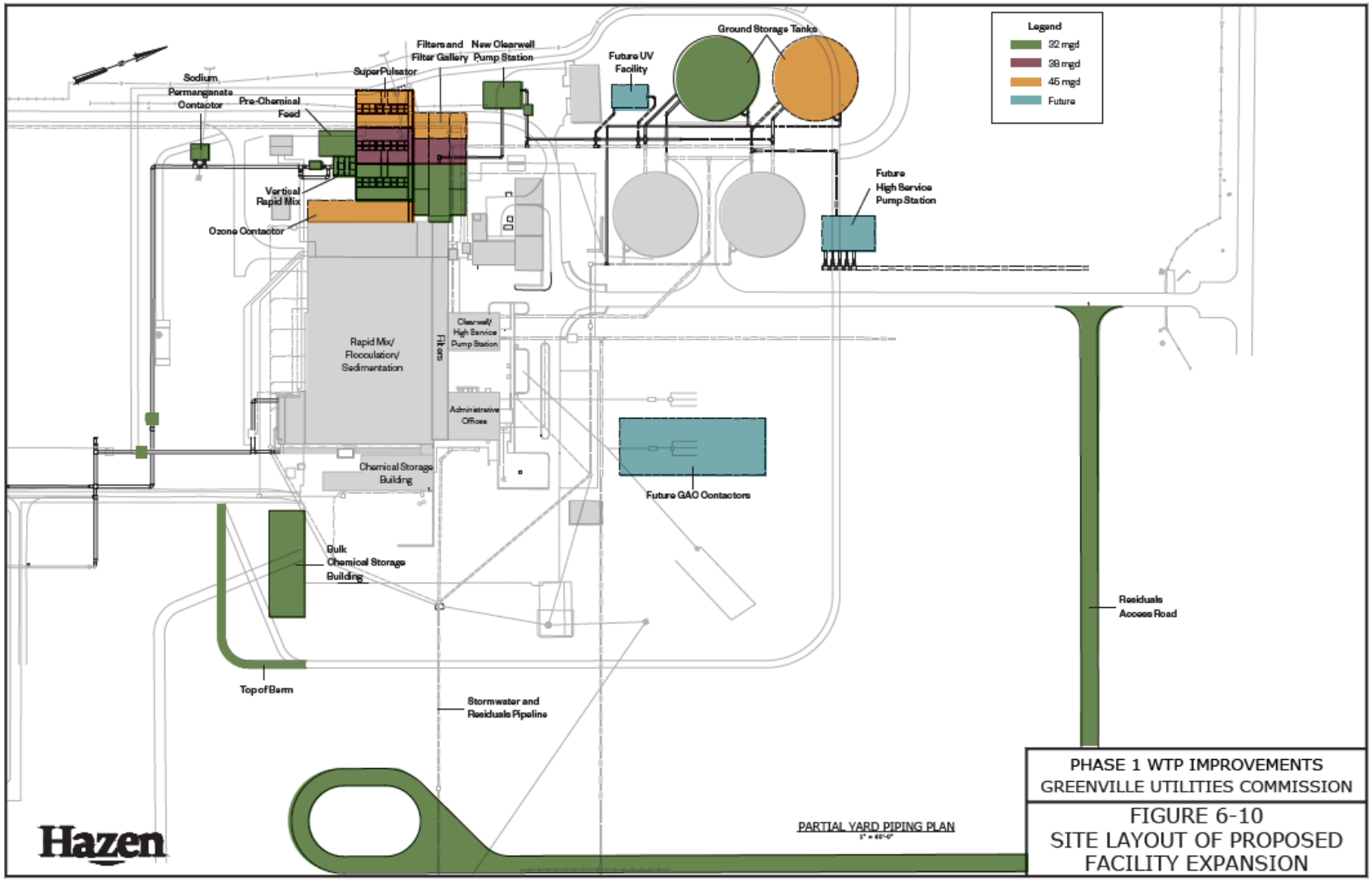
- Raise outlet structure in Pre-Sedimentation Impoundment to expand supply range and provide the ability to draw from a range of water quality zones.





WTP Upgrades – Enlarged Plan

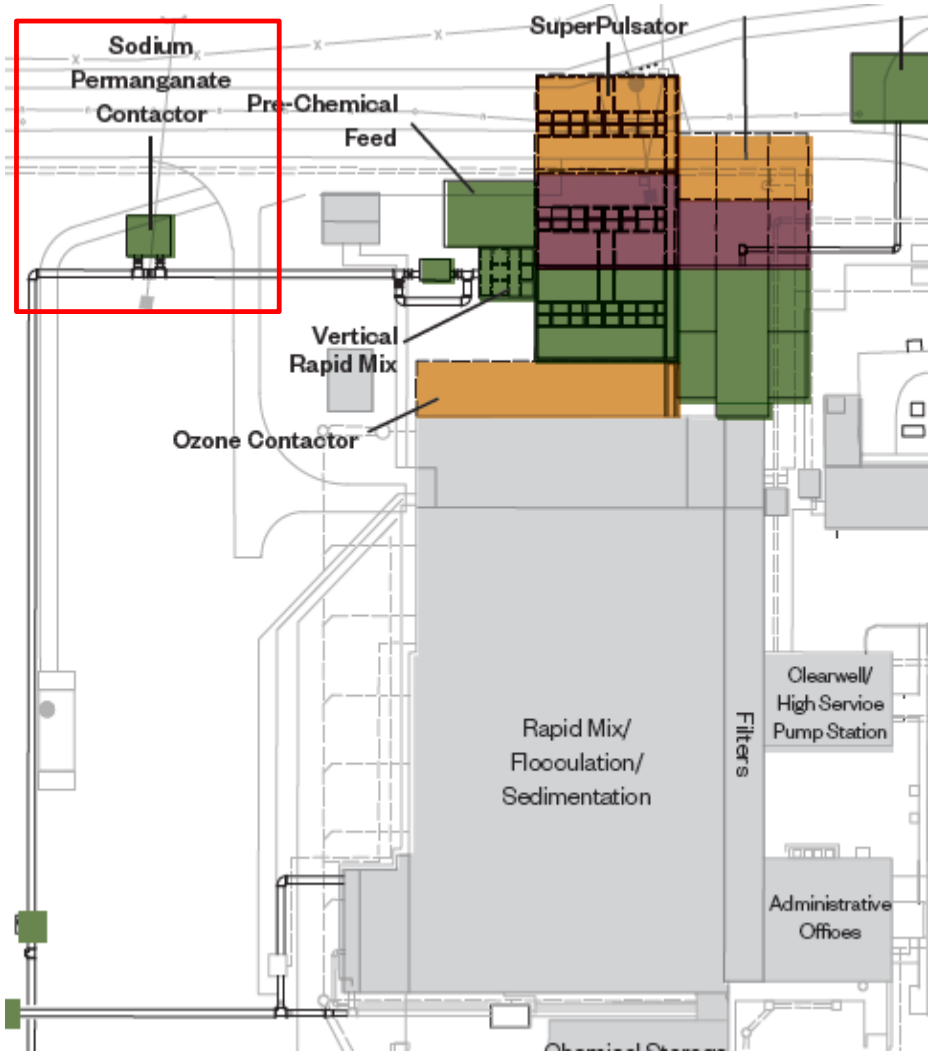
= Phase 1



Raw Water Contactor

= Phase 1

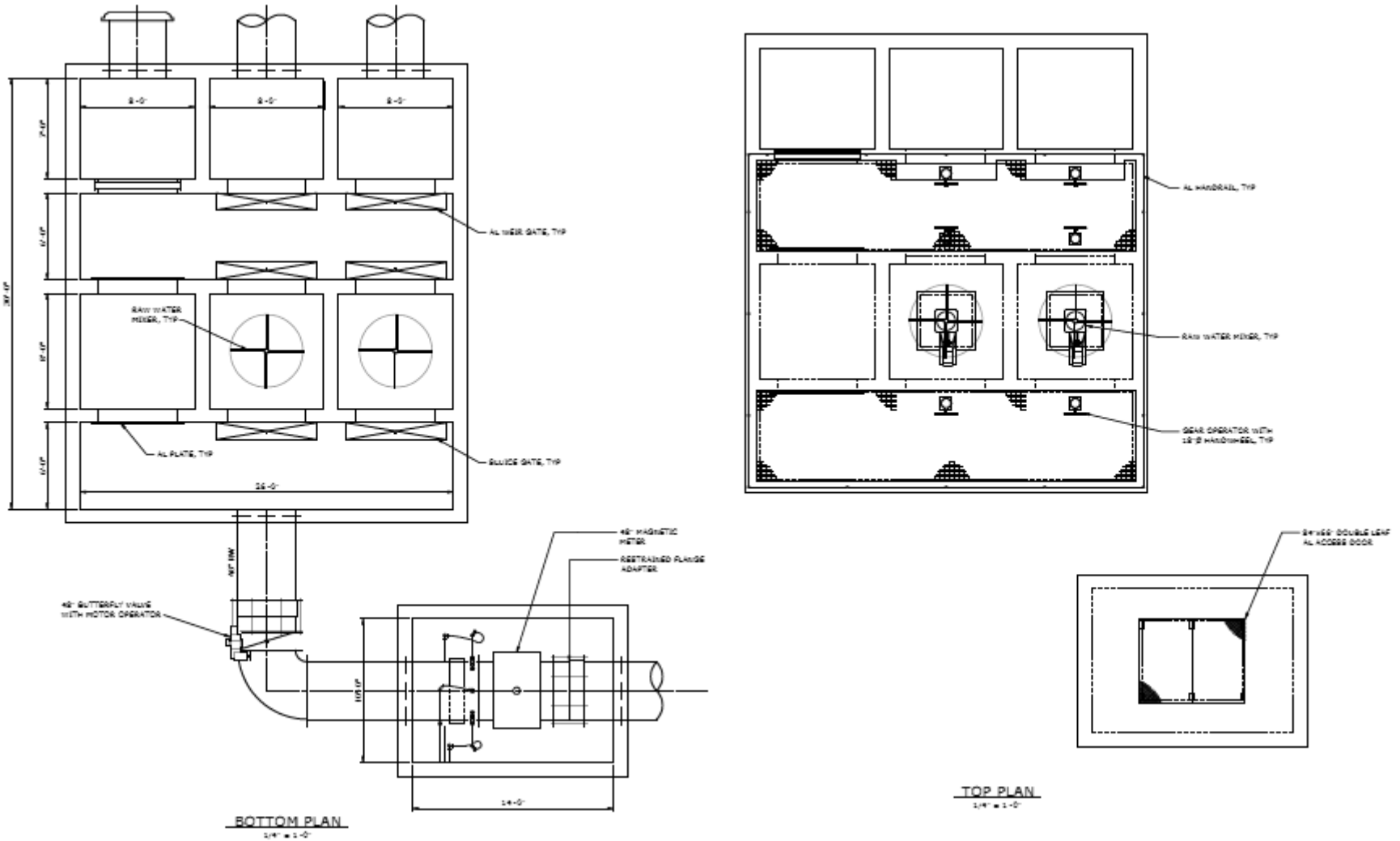
- 56,000 Gallon Raw Water Contactor
  - Provides sufficient sodium permanganate contact time
- Designed to accommodate future use as Pre-ozonation contactor



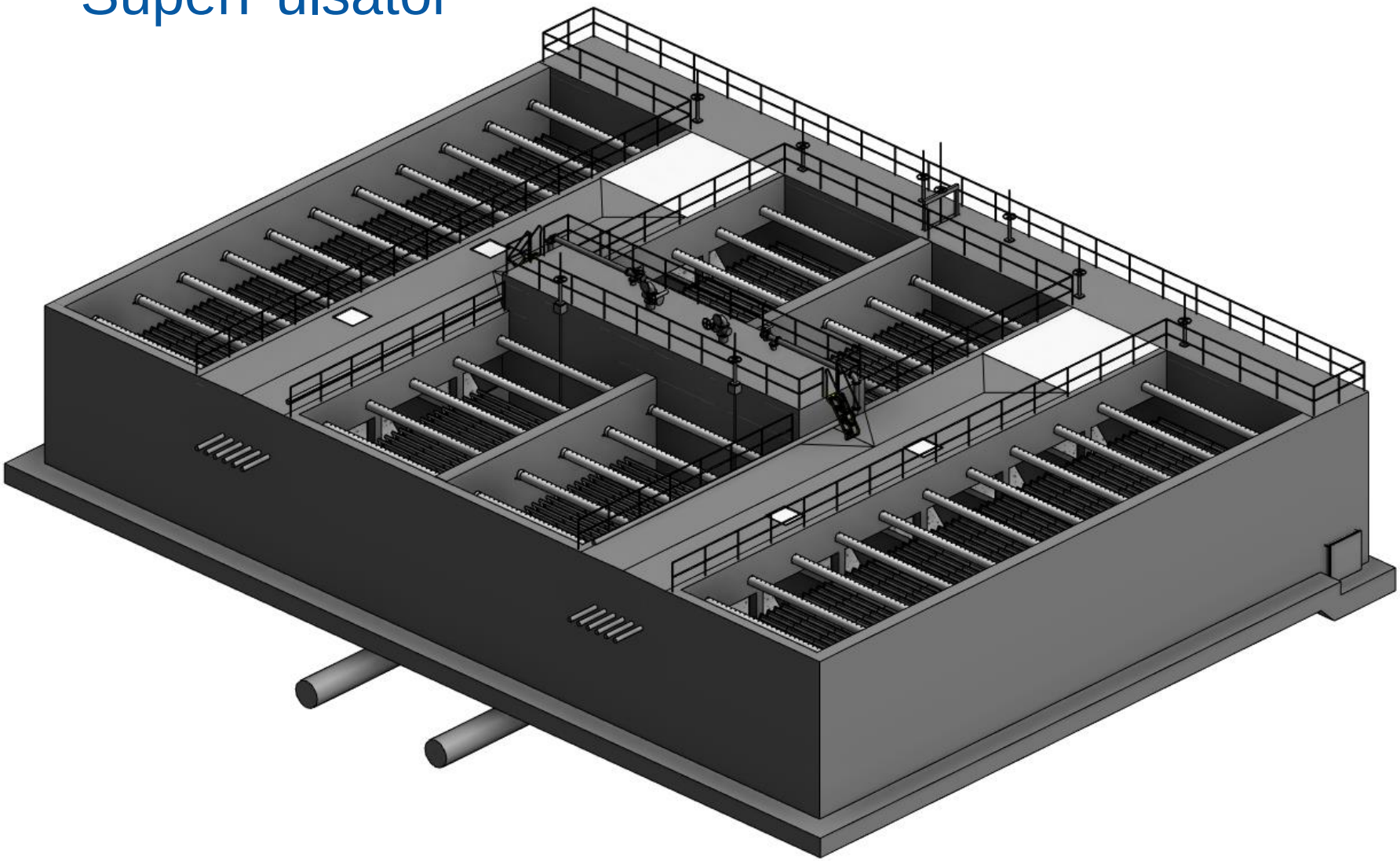
Coagulation and Sedimentation

- Existing
  - Increase raw water venturi meter and flow control valve size
  - Install finger weirs in the existing sedimentation basins
- New Train
  - New vertical rapid mix facility (single stage) with parallel basins. 2 basins expandable to 3 in the future
  - New 10-mgd SuperPulsator basin

Coagulation, Flocculation, and Clarification



SuperPulsator



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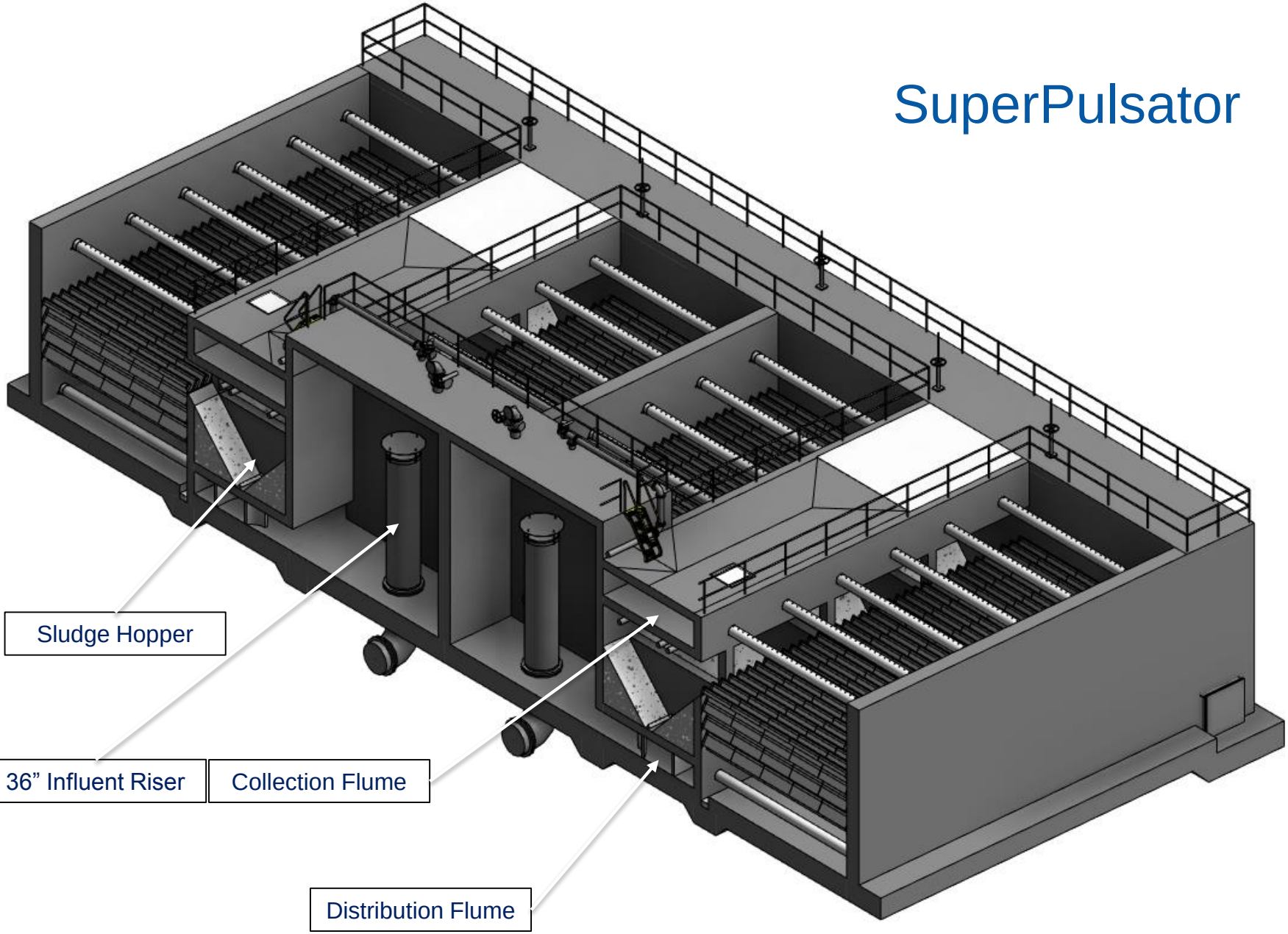
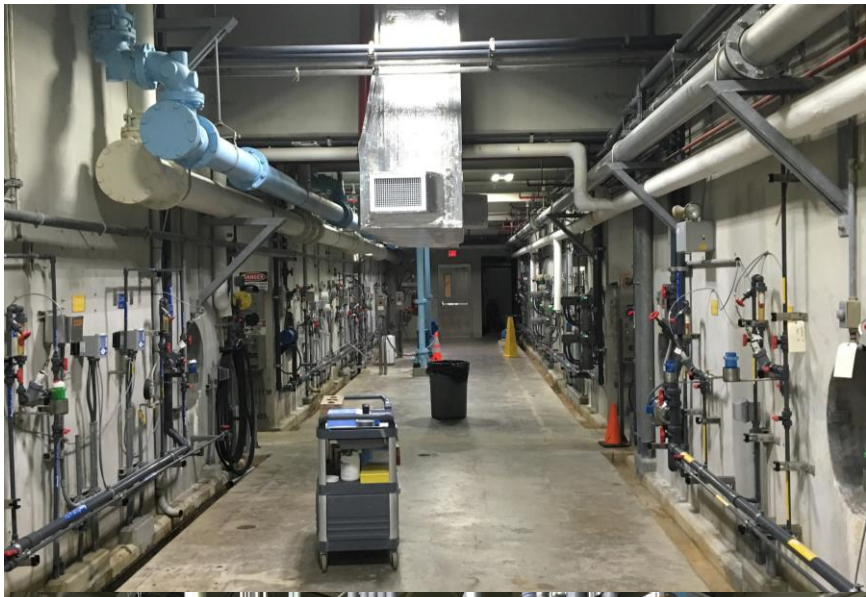


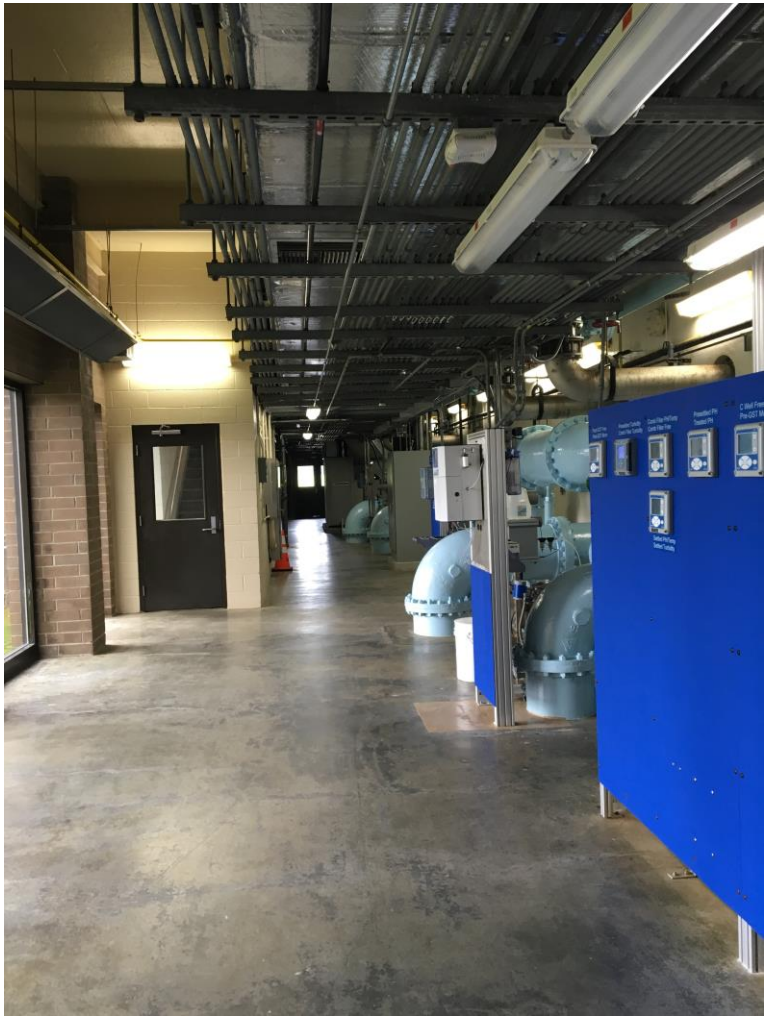
Ozone Improvements

- Replace Gas Flowmeters (GOX meters)
- Add O_3 monitoring to off-gas to monitor transfer efficiency

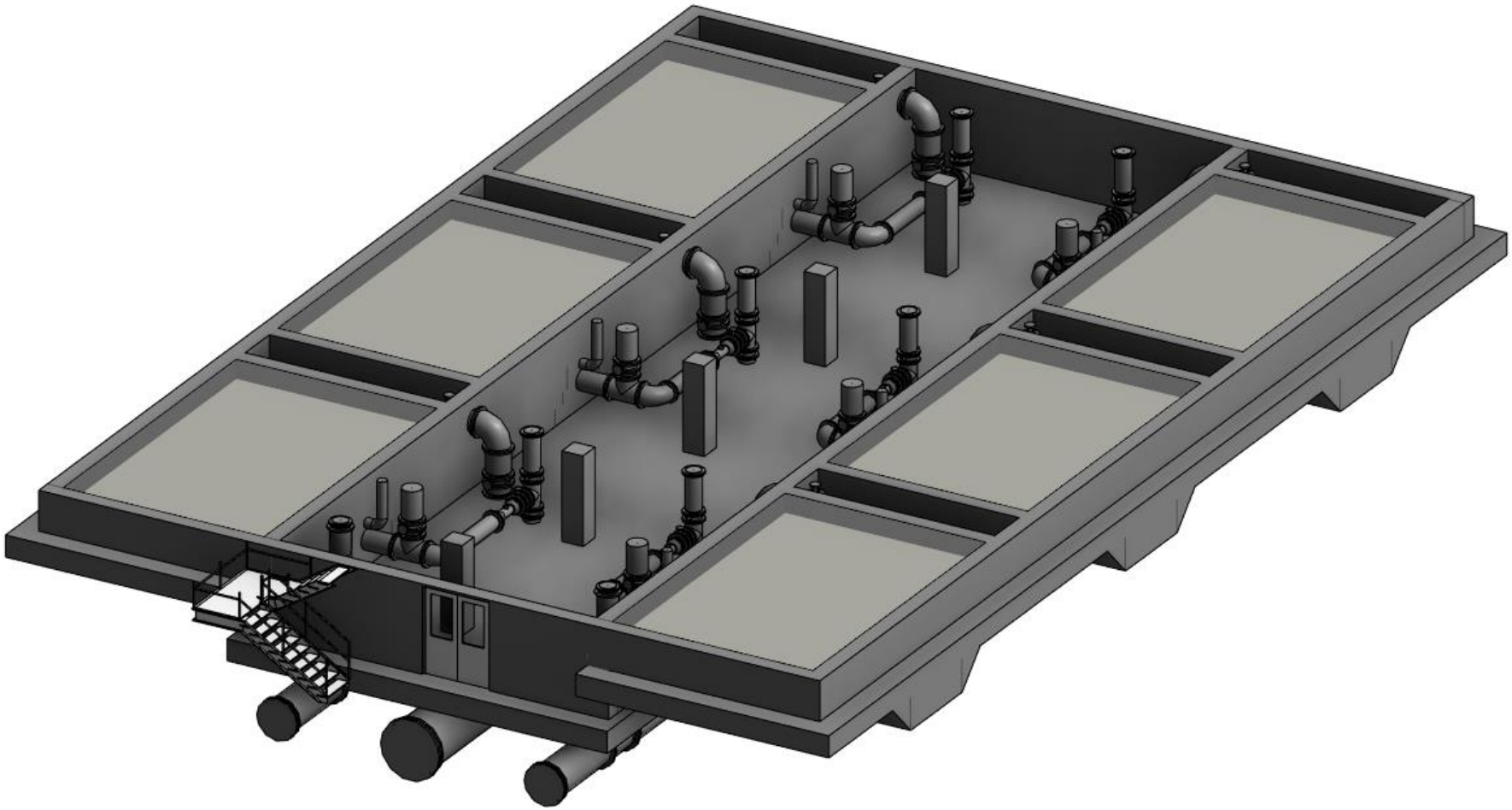


Filter Upgrades & Backwash Supply Line

- 4 new single cell filters (544 sf)
- Install new BW supply header in filter gallery
- Backup Backwash Supply
  - Install PRV on backwash line from high service pump header



New Filters



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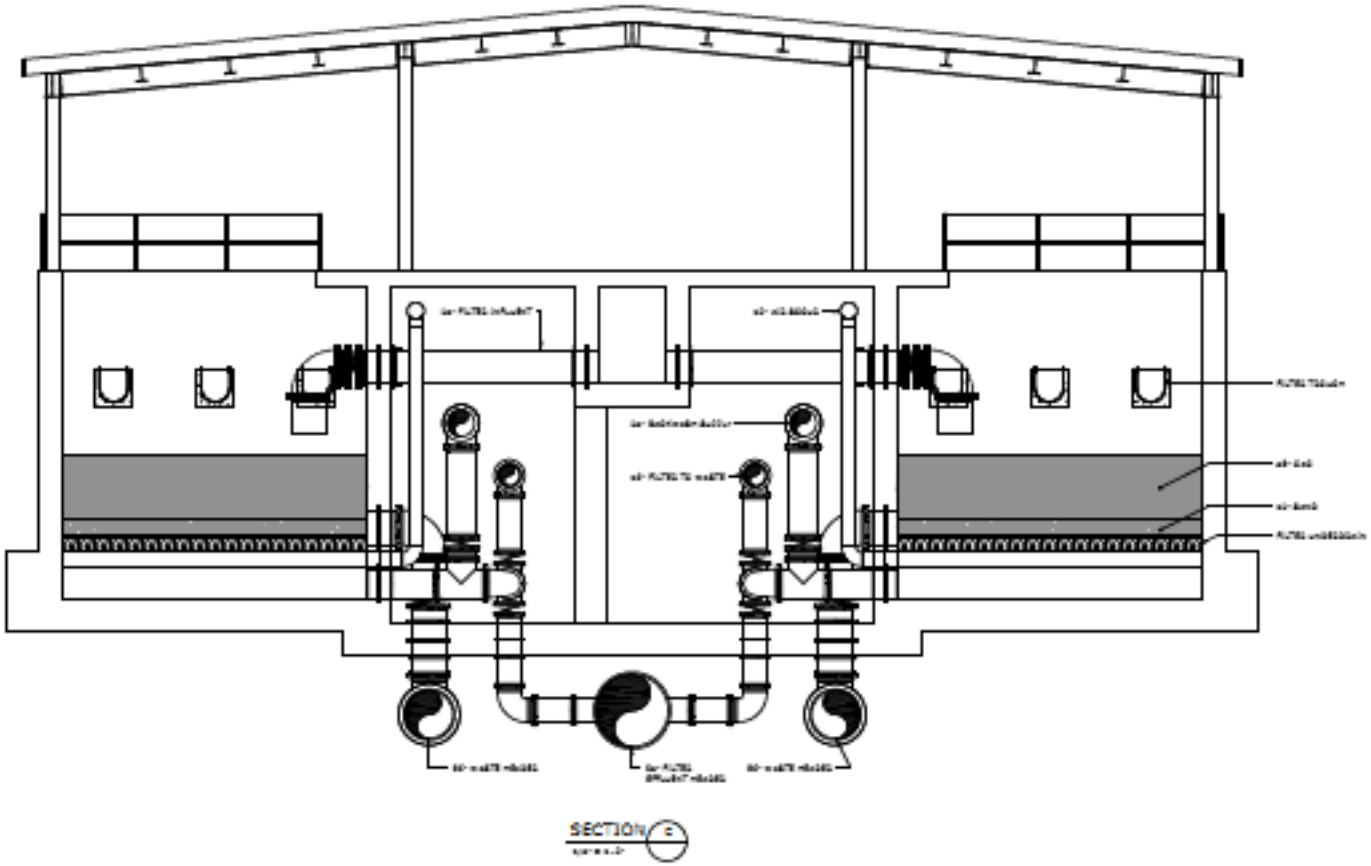
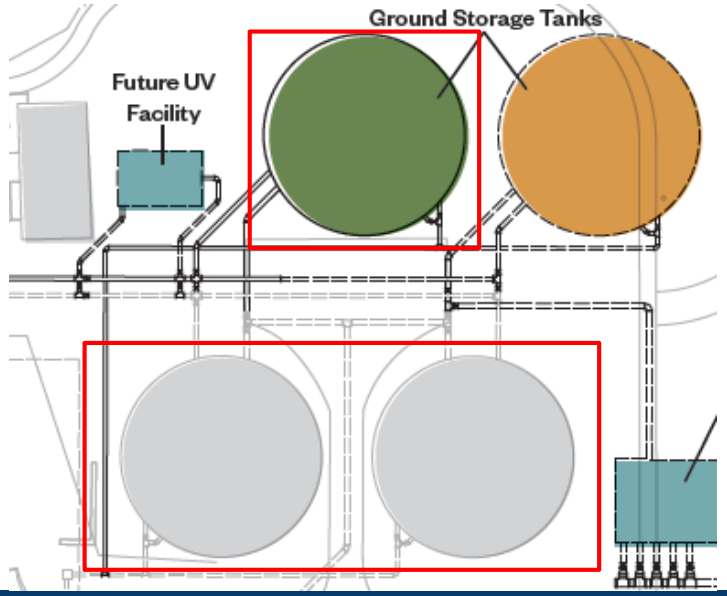


New Clearwell Pump Station

- New facility at NW Corner of WTP site
- 3 new clearwell pumps drawing from a wet well
- 54-inch transmission suction piping from new filters to CWPS
- 36-inch discharge piping from CWPS to Ground Storage Tanks

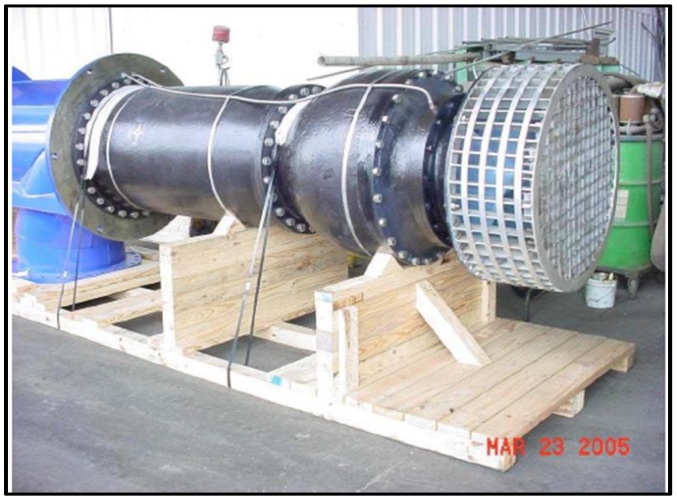
FW Storage Improvements

- Modify existing tanks with curtain baffling
- Install 1 new 3-MG clearwell tank with Inset-C shotcrete baffling
- New 36-inch yard piping to HS Pump Station
- New 24-inch Clearwell drain piping

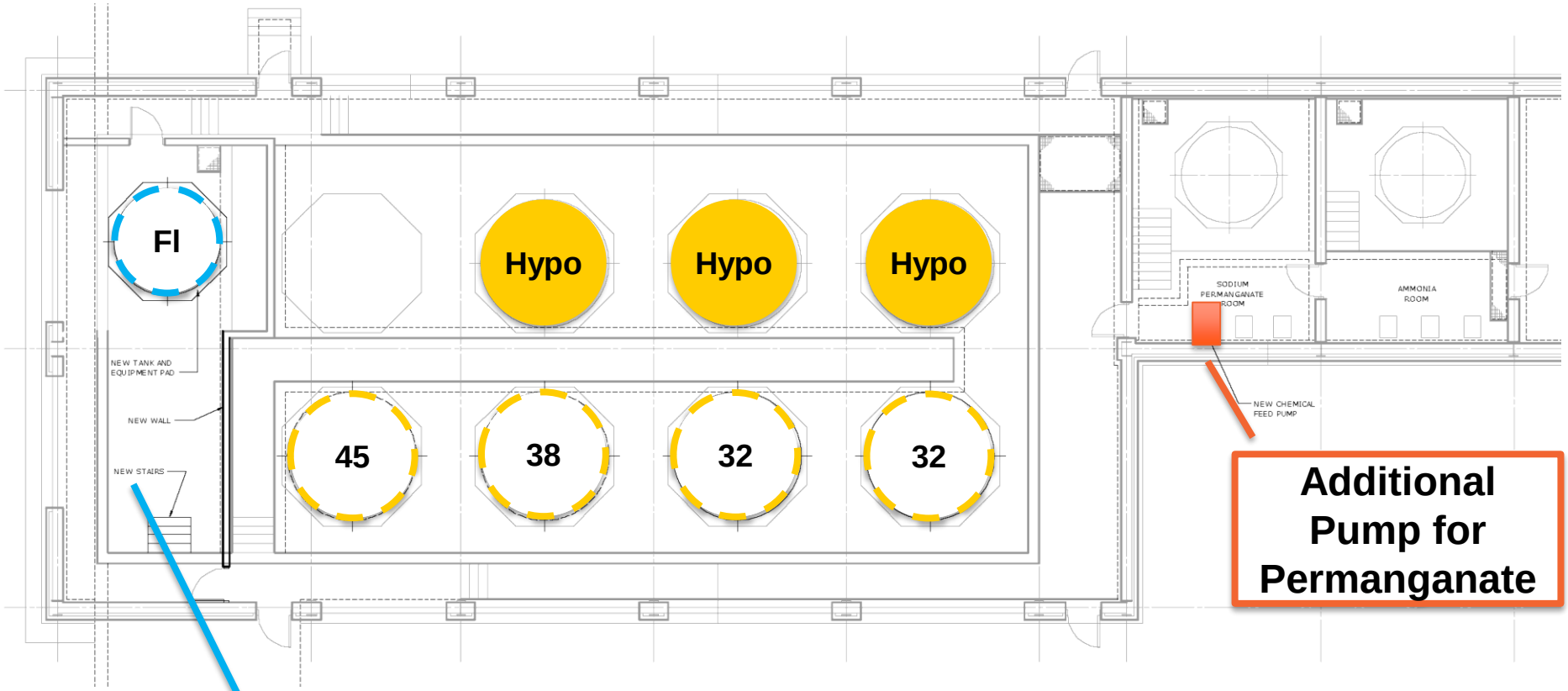


High Service Pump Station Upgrades

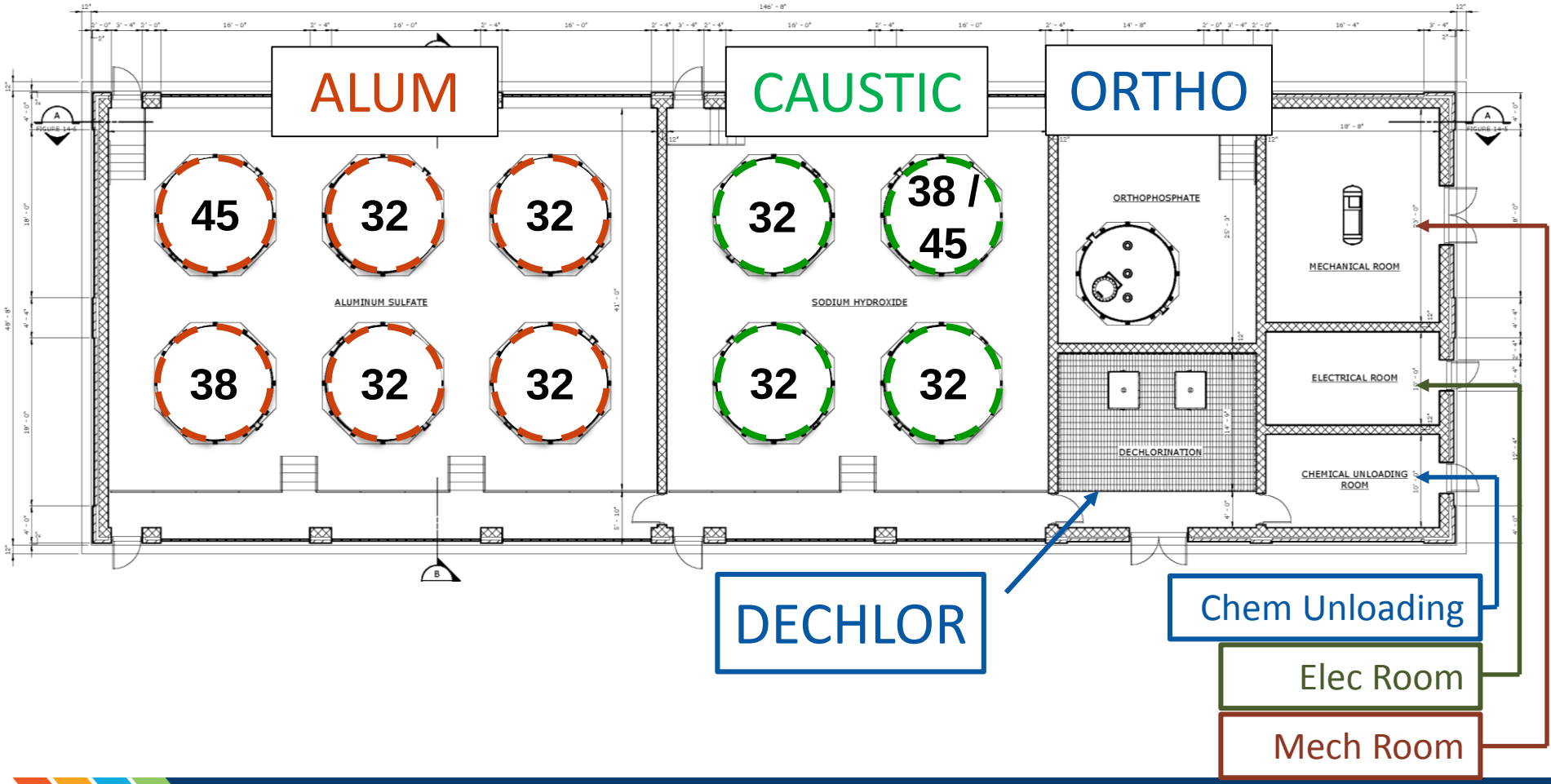
- Finished Water Pumps
  - Impeller retrofit and motor upgrade – No. 4
- Install vortex suppression
- Implement suction piping improvements



Improvements to Chemical Bulk Storage



New Chemical Bulk Storage Building



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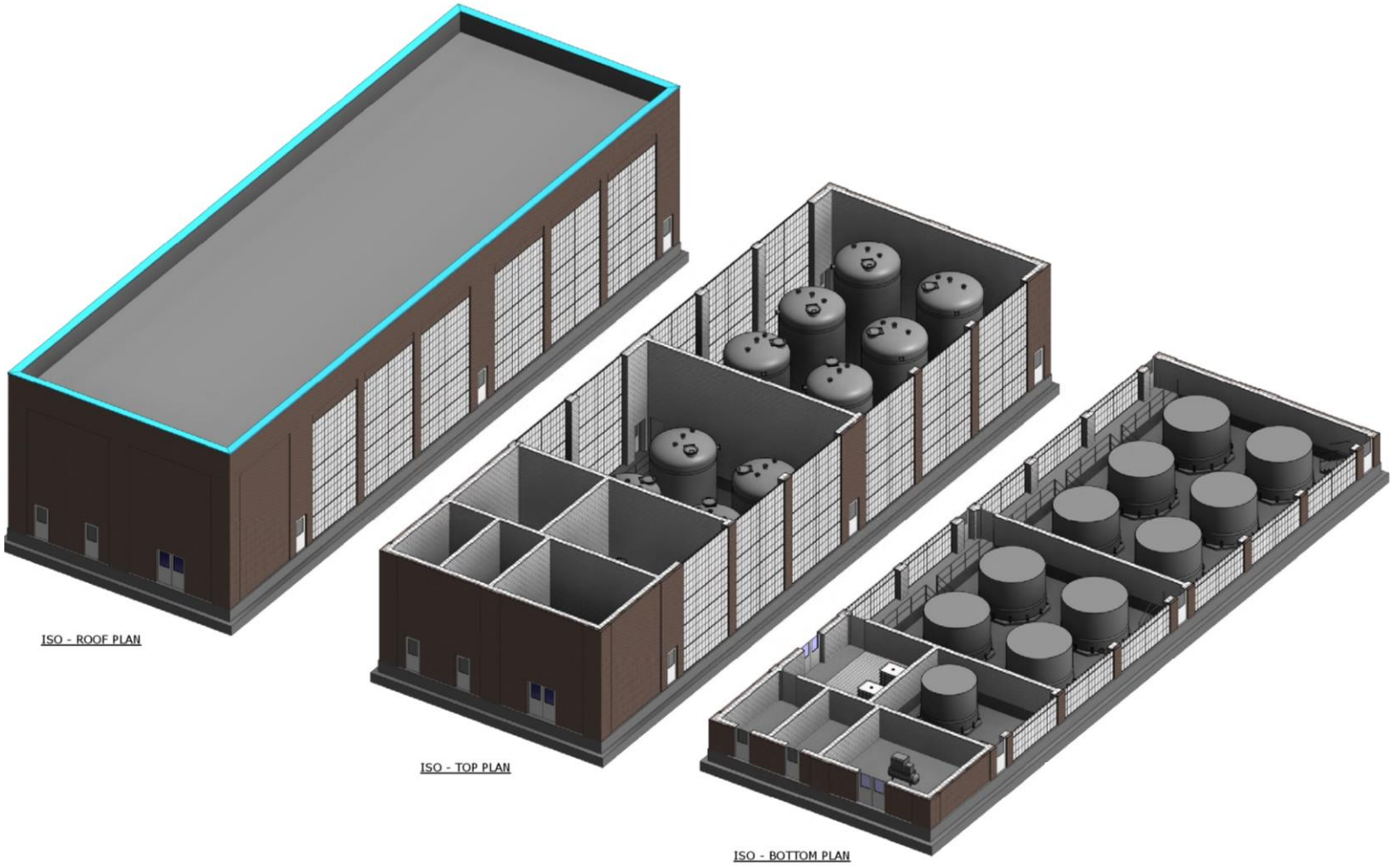
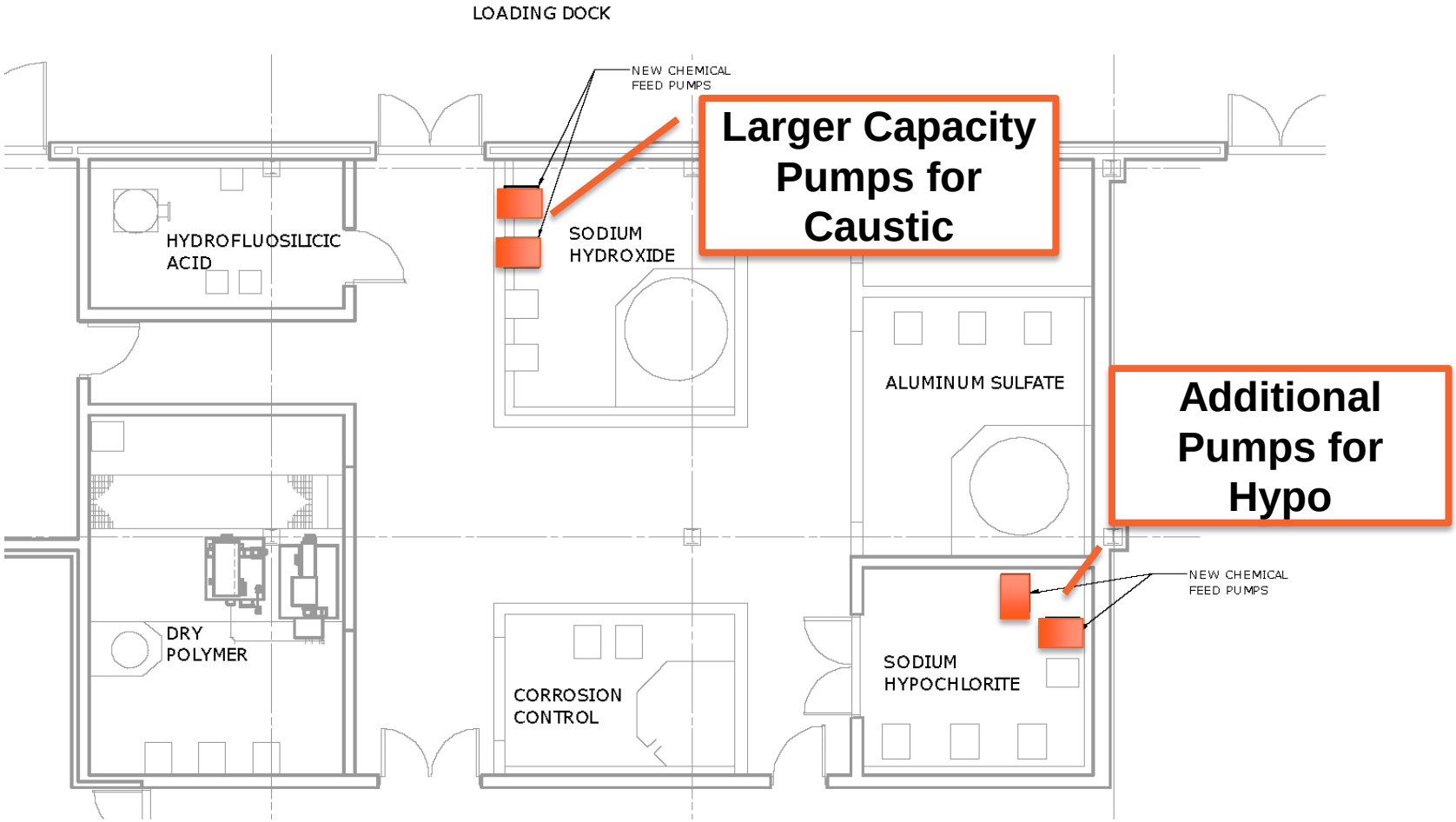
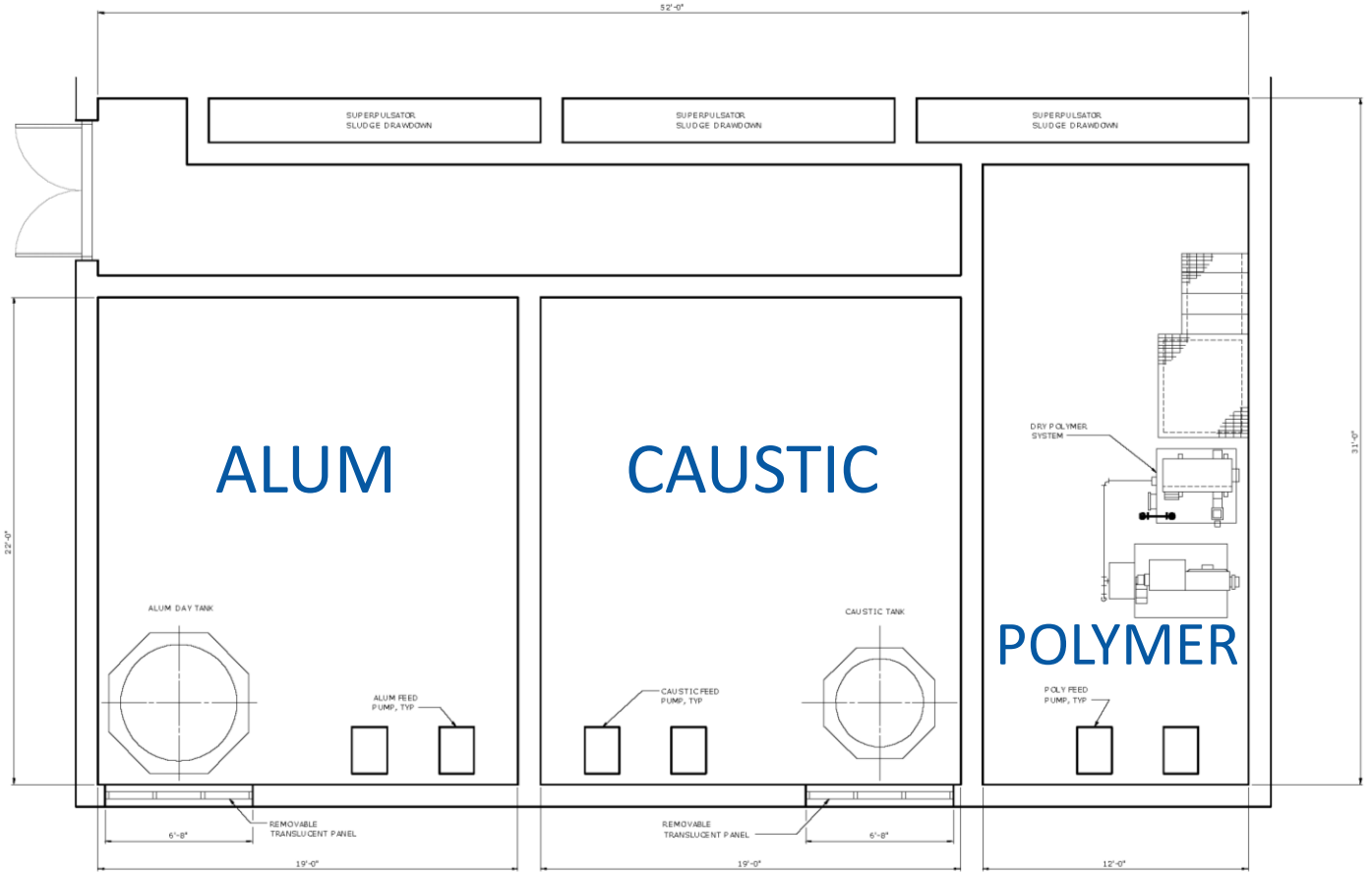


Improvements to Existing Chemical Feed



New Pre-Chemical Feed Facility

Adjacent to SuperPulsators



RAPID MIX CHEMICAL BUILDING PLAN

3/16" = 1'-0"

PHASE 1 WTP IMPROVEMENTS
GREENVILLE UTILITIES COMMISSION

Hazen

Residuals Management Improvements

- Construction of parallel 16-inch pipeline to lagoon
- Improvements to redistribute solids into lagoon
- Addition of road to lagoon for dewatering equipment access

Architectural Upgrades

- Break Room: new finishes and casework
- Lab: Minor changes to layout, new finishes and casework
- Control Room: modify layout
- Expand women's restrooms on 1st and 2nd floor
- Add Operations Supervisor Office and Storage in Filter Gallery

Electrical Upgrades

- New electrical power distribution - medium voltage primary loop to new facilities
  - Pre-Chemical Facility
  - Clearwell Pump Station
- Install 4th electrical utility transformer
- Electrical modifications to provide redundancy in key areas

QUESTIONS