

Saddle Creek Retention Treatment Basin

Industry Day

April 26, 2018



Disclaimer

This presentation is providing information to interested parties and is not contractually binding. City reserves the right to modify or change as it sees fit.

Safety Minute



Safety starts
with me

Project Team

City Assistant Director:	Jim Theiler
City Project Manager:	Jake Hansen
City Construction Manager:	Eitan Tsabari
City Administration:	Heather Tippey-Pierce

PMT Facility Coordinator:	Scott Aurit
PMT Compliance Coordinator:	Pat Nelson
PMT Construction Manager Contact:	Kent Bienlien

Design Project Manager:	Dave White, Wade Trim
Design Project Engineer:	John Weiland, Wade Trim
Design Structural Engineer:	Brian Gombos, Wade Trim
Construction Representative:	John Arvai, Wade Trim

Meeting Agenda

MORNING

10:00 AM – Introductions

10:05 AM – Project History and Overview

10:35 AM – Project Requirements

10:45 AM – Procurement and Prequalification

11:15 AM - Site Conditions and Risk Elements

11:45 AM - Q&A

12:00-1:00 PM – Networking Lunch Break (cafeteria available on-site)

Meeting Agenda (cont.)

AFTERNOON

1:00 PM – Construction Sequencing

1:30 PM – Concrete Work

1:50 PM – Process Overview and Equipment Requirements

2:05 PM – Upcoming CSO Program Work

2:15 PM – Q&A

2:30-3:30 PM – Visit Project Site

Design Team



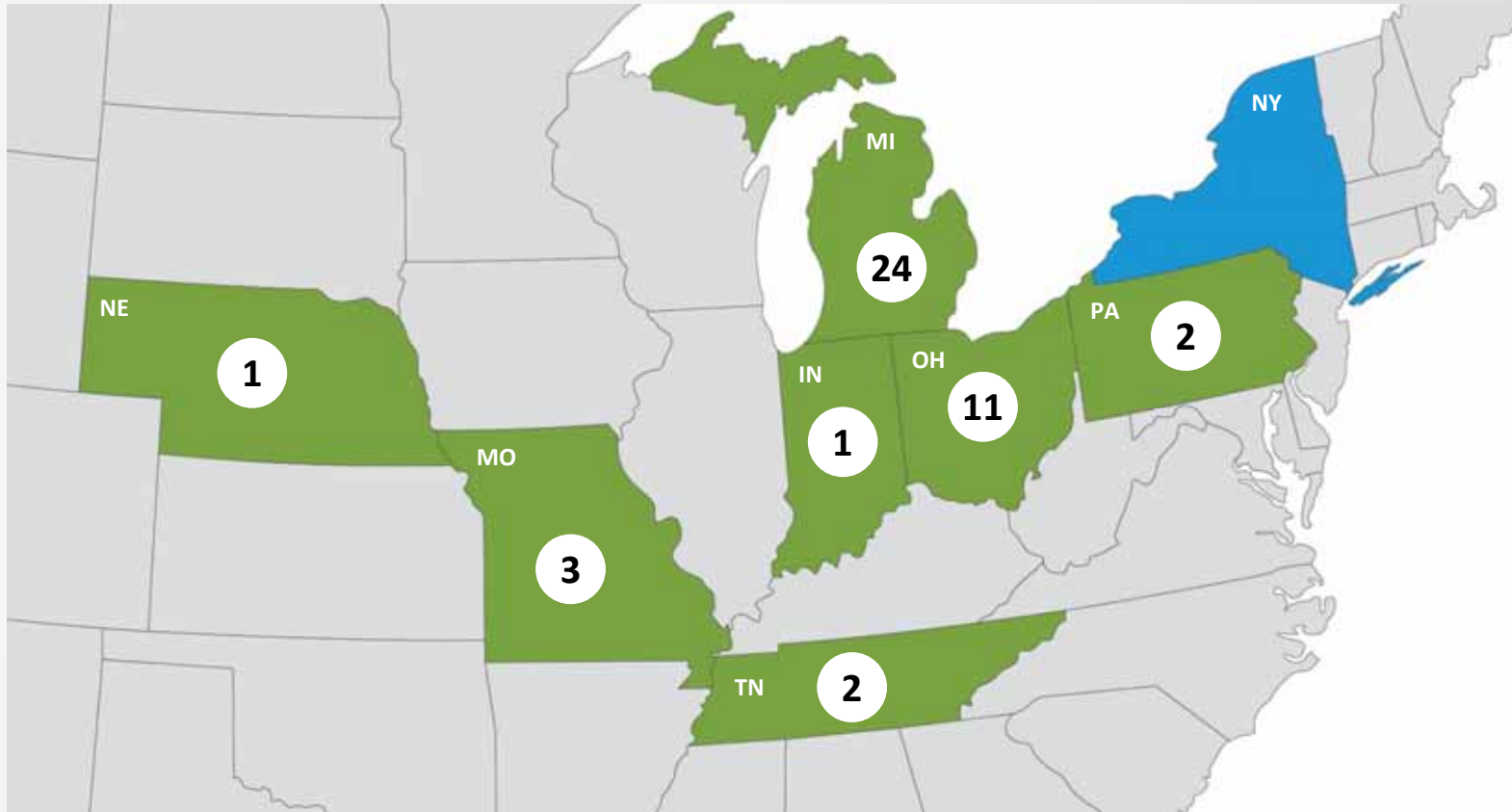
Brown & Caldwell
Kirkham Michael
Alley Poyner Macchietto
Alvine Engineering
Vireo

Lovgren Marketing
Terracon
Johnna Roberts
Emanon Group
Associated Engineering

Wade Trim Background



RTB Facilities Experience



RTB Facilities Experience





CSO Program and Project History

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City's Long Term CSO Control Plan

Meeting the increased requirements of the federal Clean Water Act

- Balancing the following needs:
 - Compliance
 - Affordability
 - Acceptance



Major Elements of Final Long Term Control Plan



Underground Storage Tanks



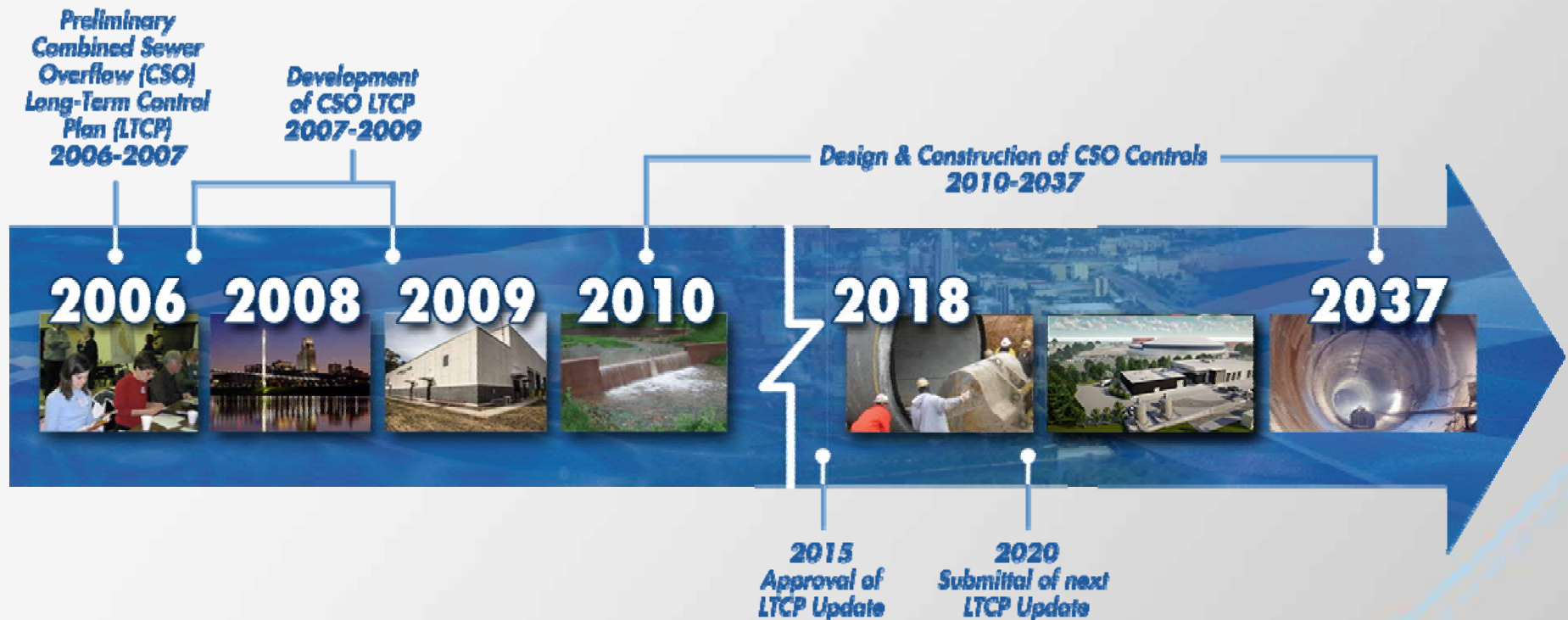
Green Solutions



Targeted Sewer Separation



CSO Program Timeline



Project History

- Original Project Design: 2013-2015
- Bidding: 2015
- Value Engineering: 2015-2016
- Early Soils Removal Project: 2016
- Redesign: 2017-2018

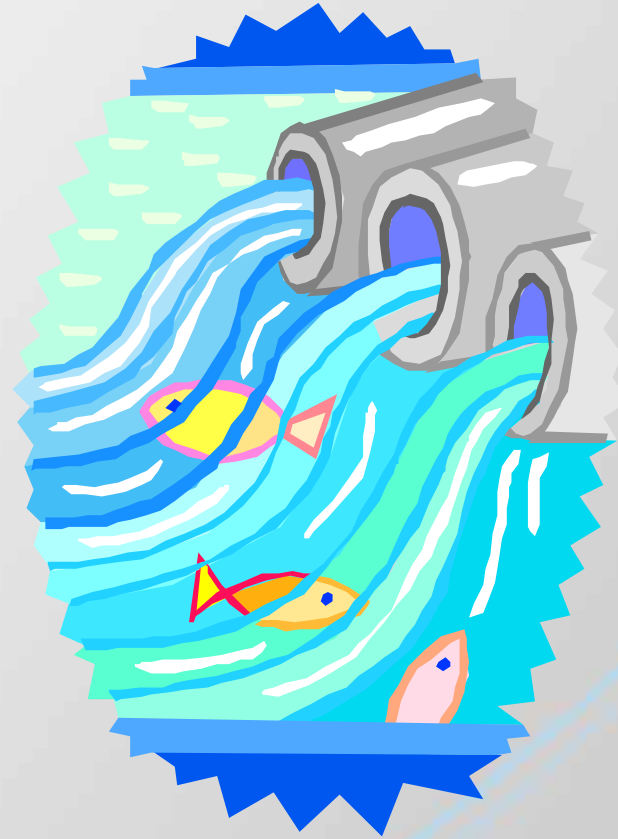


Project Background

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Purpose of the Project

Treat and reduce the volume of combined stormwater and sewage entering the Little Papillion Creek to improve water quality and meet EPA requirements by removing solids from combined sewage and disinfecting flows



Additional Objectives

- Reduce odors in CSO 205 Channel and Facility Operations
- Replace old grit facility and conveyance sewer
- Provide office space for City staff



Project Area



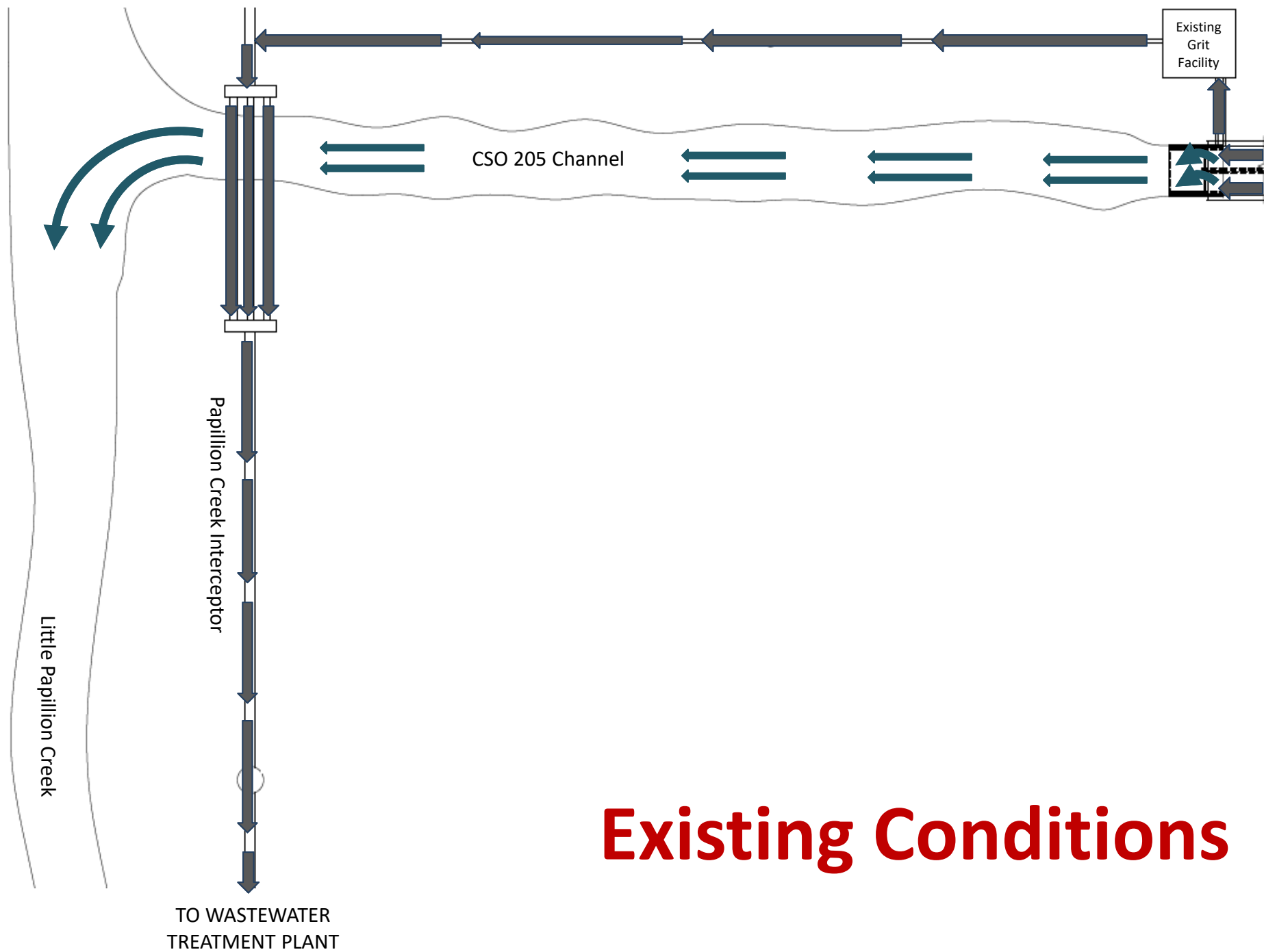
Combined Sewer Overflows

- Overflows occur on average between 50 and 60 days in most years
- As little as 0.10th inch of rain can cause an overflow









Existing Conditions



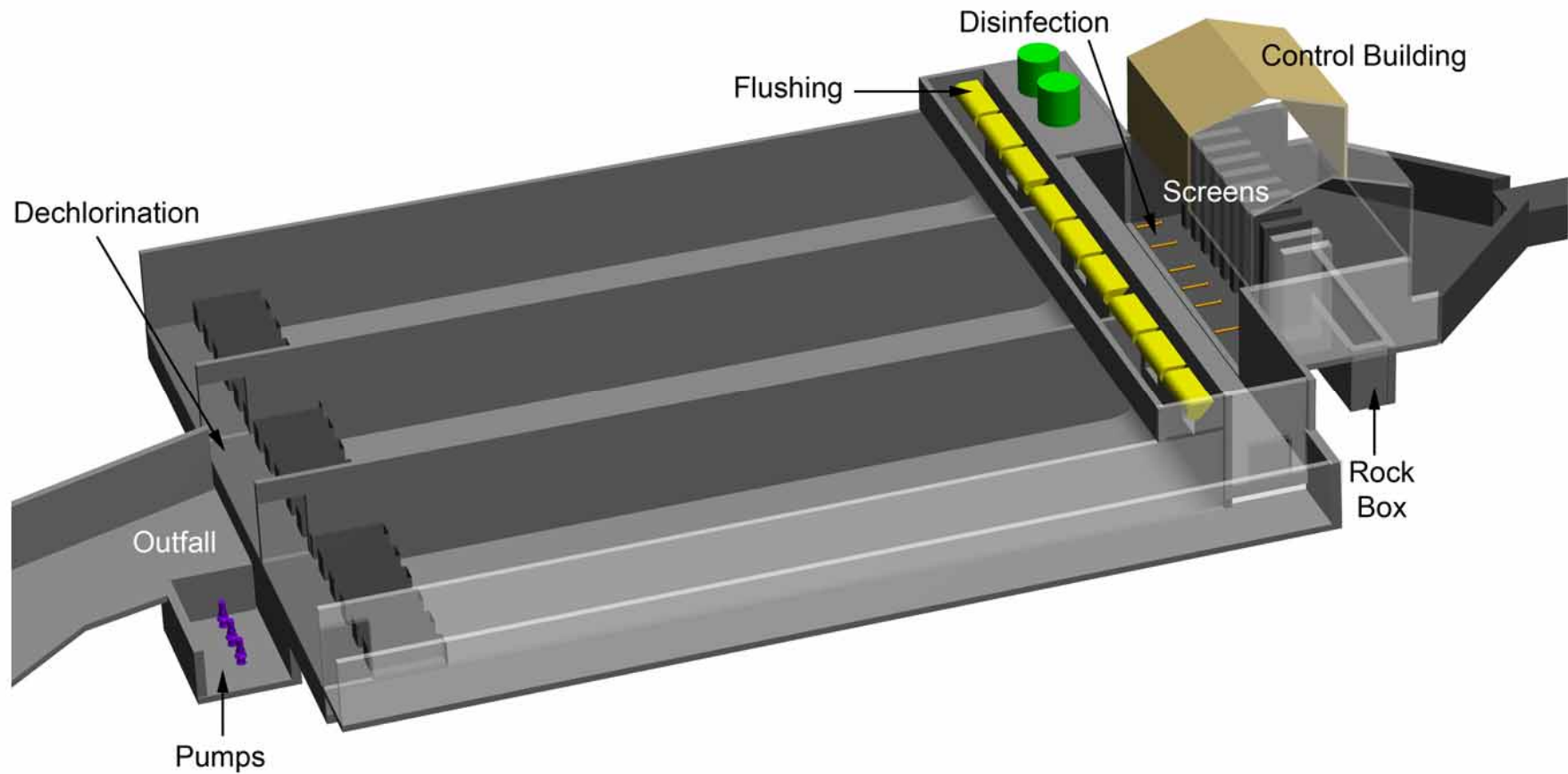




Project Overview

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What is an RTB?



Saddle Creek RTB Facility

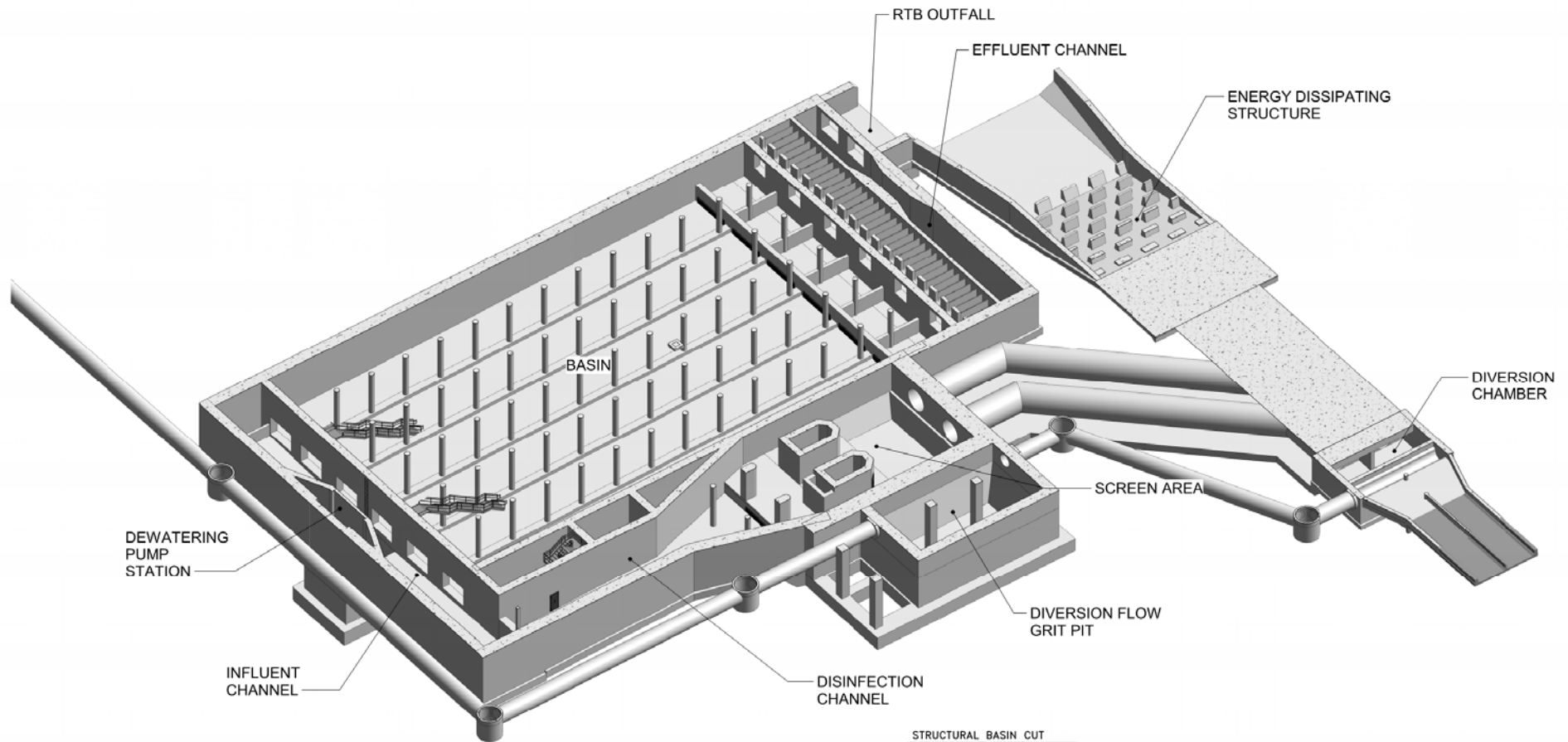


Site Plan





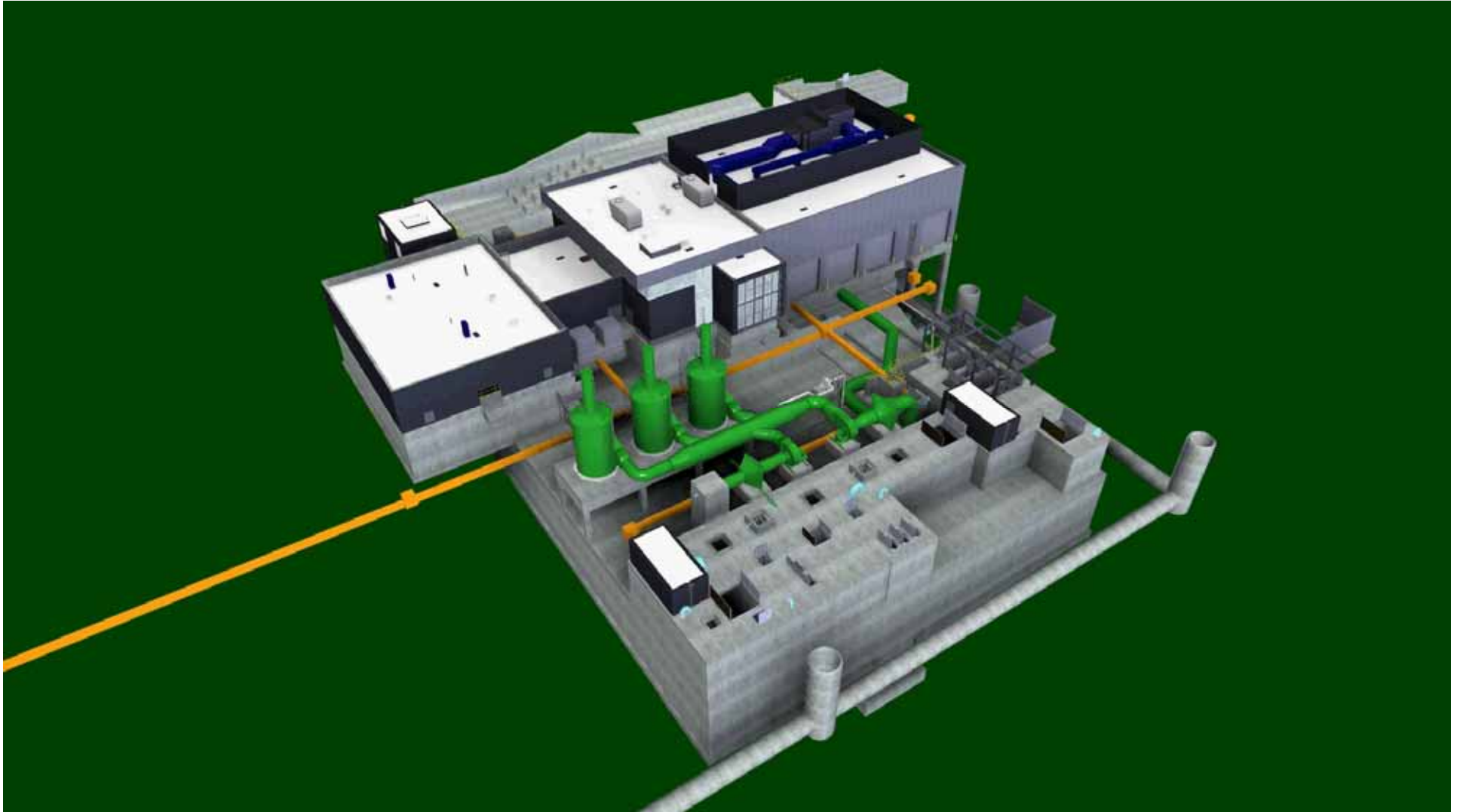
Underground Tank Compartments



Facility Fly Over



Facility Walk Through



Design Schedule

- 90% Design May 2018
- Prequalification June/July 2018
- 100% Design September 2018
- Advertise for Bid October 2018
- Bids Due December 2018

Construction Schedule

- Construction NTP April 2019
- Substantial Completion December 2022
- Final Completion June 2023



Project Requirements

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City of Omaha Requirements

- Contracting License
 - Class A or B required
- Sales Tax Exemption
- Economic Equity and Inclusion Plan (EEIP)
 - <https://humanrights.cityofomaha.org/economic-inclusion>



Economic Equity Inclusion Plan

- Small and Emerging Small Business Participation
- Workforce Opportunities for Working Age Students and Adults
- Youth Engagement



Federal Loan Requirements

- WIFIA and SRF Funding
- DBE Participation Goals Anticipated
 - 6% MBE
 - 8% WBE
 - Will be confirmed prior to bid by EPA
- Buy American Iron & Steel
- Davis Bacon Wages

Project Requirements

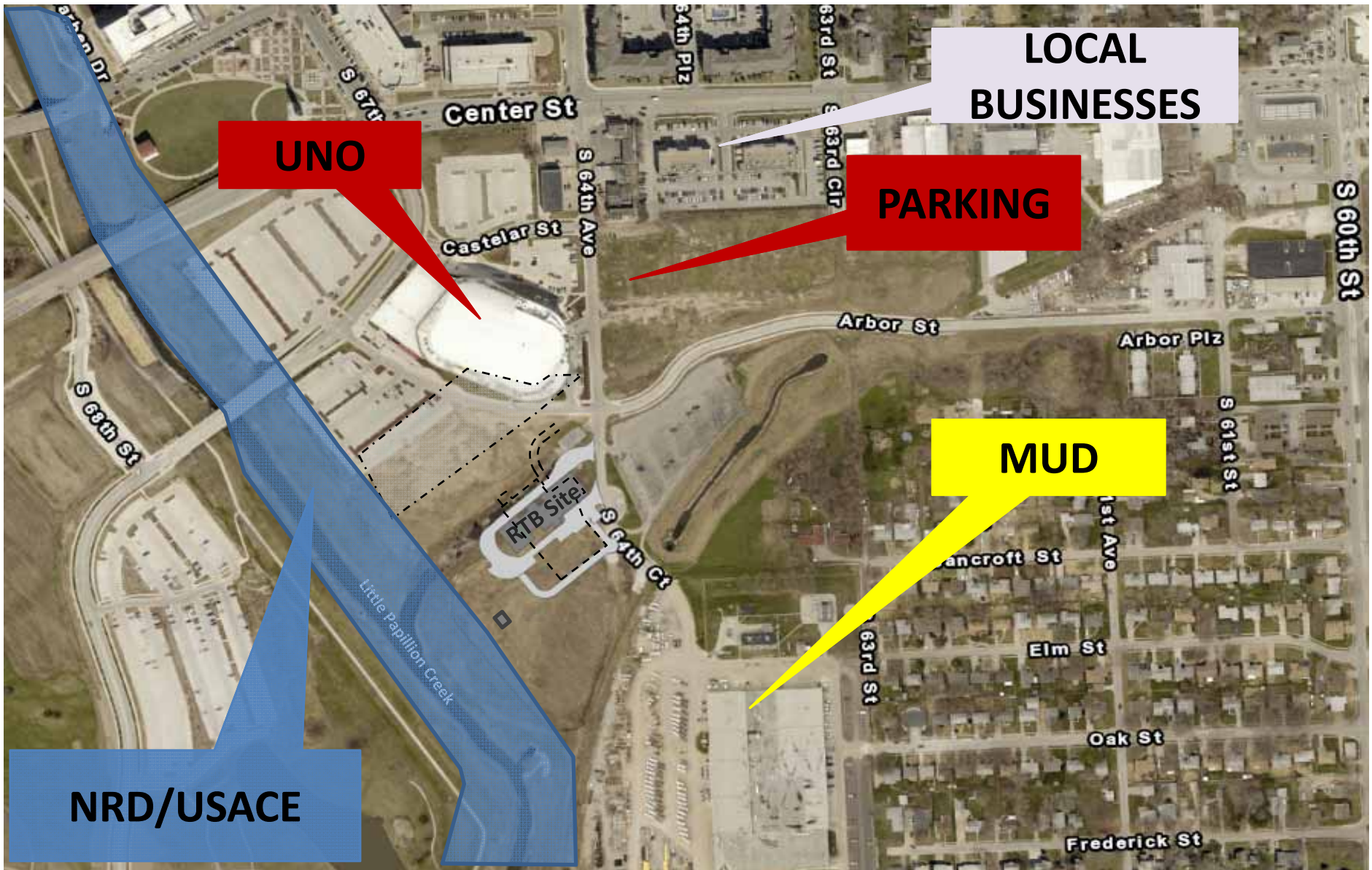
- General Contractor Self-Performance Requirement
- Escrow of Bidding Documents
- Retainage
- Allowances
- Partnering Meetings
- Value Engineering



Stakeholders

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Utilities and Stakeholders



Metropolitan Utilities District



Omaha Public Power District



University of Nebraska-Omaha



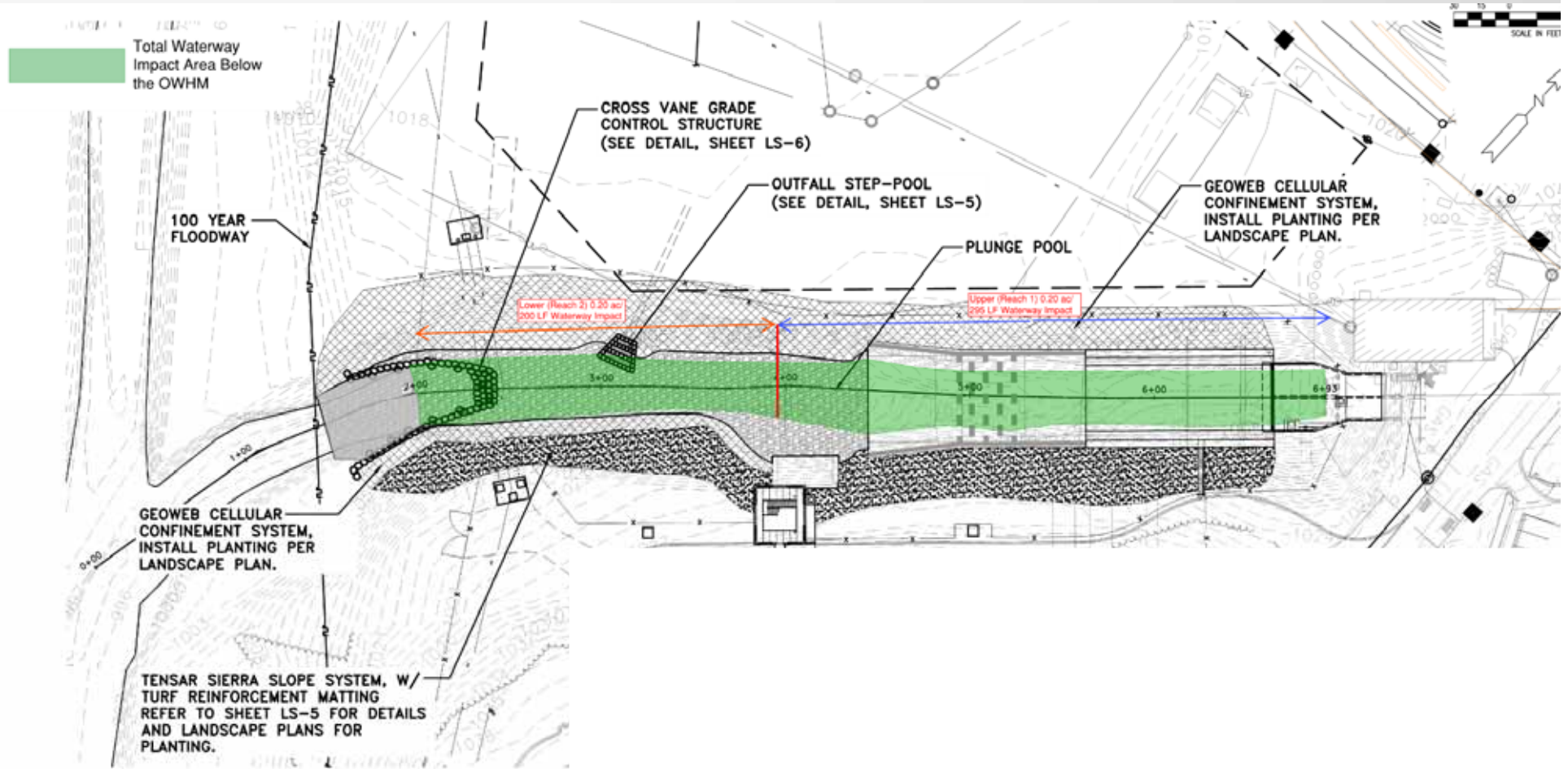
Papillion Creek – NRD



US Army Corps of Engineers



US Army Corps of Engineers



Other

- Nebraska Department Environmental Quality
- City of Omaha Street Maintenance Division
- City of Omaha Environmental Services
- City of Omaha Planning Department
- Douglas County – DOTCOMM
- State Fire Marshall



Procurement Approach

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Procurement Approach

- Step 1 – Prequalification
- Step 2 – Lowest Responsible Bid with Pre-Qualified Prime Contractors

Prequalification Submittal

- Candidate Information
- Part 1 – Required Information
- Part 2 – Mandatory Criteria
- Part 3 – Project References
- Part 4 – Technical Criteria

Part 1: Required Information

- Organizational Structure
- History of the Business and Organizational Performance
- Financial Information
- Certification of Surety
- If a JV, Part 1 Applies to Each Entity of JV

Acceptance Criteria

- Meet Part 2, 3 and 4 Minimum Requirements
- If approved, added to Specification as a Prequalified Prime Bidder



Part 2: Mandatory Criteria

- 7 Questions on Mandatory Requirements
- Pass/Fail Criteria
- If a JV, Criteria Applies to Each Entity of JV

Part 2: Mandatory Criteria

- Denied performance and bonds from failure to perform adequately
- Terminated for cause by an Owner
- Ineligible to bid on or be awarded a public works contract because of prevailing wage or Apprenticeship Program violations
- Convicted of crime involving bidding, award, or performance of government contract

Part 2: Mandatory Criteria

- Liable in court for false claims, material misrepresentation, dishonesty, or fraud against public entity
- Legally debarred from bidding on or being awarded public work or government project
- Bankruptcy

Part 3: Project References

- Three (3) Relevant Projects within Last 10 Years, at least 75% Complete
- Includes Work addressing at least of 3 or 4 of the 8 Technical Criteria (From Part 4)
- Reference Questionnaire Validated by the Owner
- If a JV, Criteria Applies to Each Entity of JV

Part 4: Technical Criteria

- Experience in 8 Technical Areas
- Submit Project References or Principal Staff References
- Pass/Fail Criteria
- If a JV, Criteria Applies to the Combined Experience of the JV

Part 4: Technical Criteria (cont.)

- Single project experience in the construction of water or wastewater treatment plants in excess of \$30M
- Single project experience with multi-disciplined heavy-civil construction contracts in excess of \$60M
- Structural and mass concrete in excess of 15,000 CY within 24 months
- Staged and retained deep excavation such as braced sheet pile, lagged wall, or concrete secant wall construction; with more than 10,000 SF of retained excavation at depths of over 25 vertical feet

Part 4: Technical Criteria (cont.)

- Single project involving more than 10,000 VF of foundation piling (H-pile, auger cast, drilled pier, micropile, etc.)
- Single project that involves a 2 MG or larger concrete storage reservoir or tank
- Projects requiring stream or flow diversion
- Projects with groundwater dewatering for excavations deeper than 25 feet

Prequalification Schedule (Tentative)

Finalize Pre-qualification Documents	05/23/18
Advertise and Issue RFQ Documents (*)	06/06/18
Orientation Meeting and Site Visit	06/13/18
Questionnaire Submittals Due	07/11/18
Issue Notice of Approvals	08/08/18

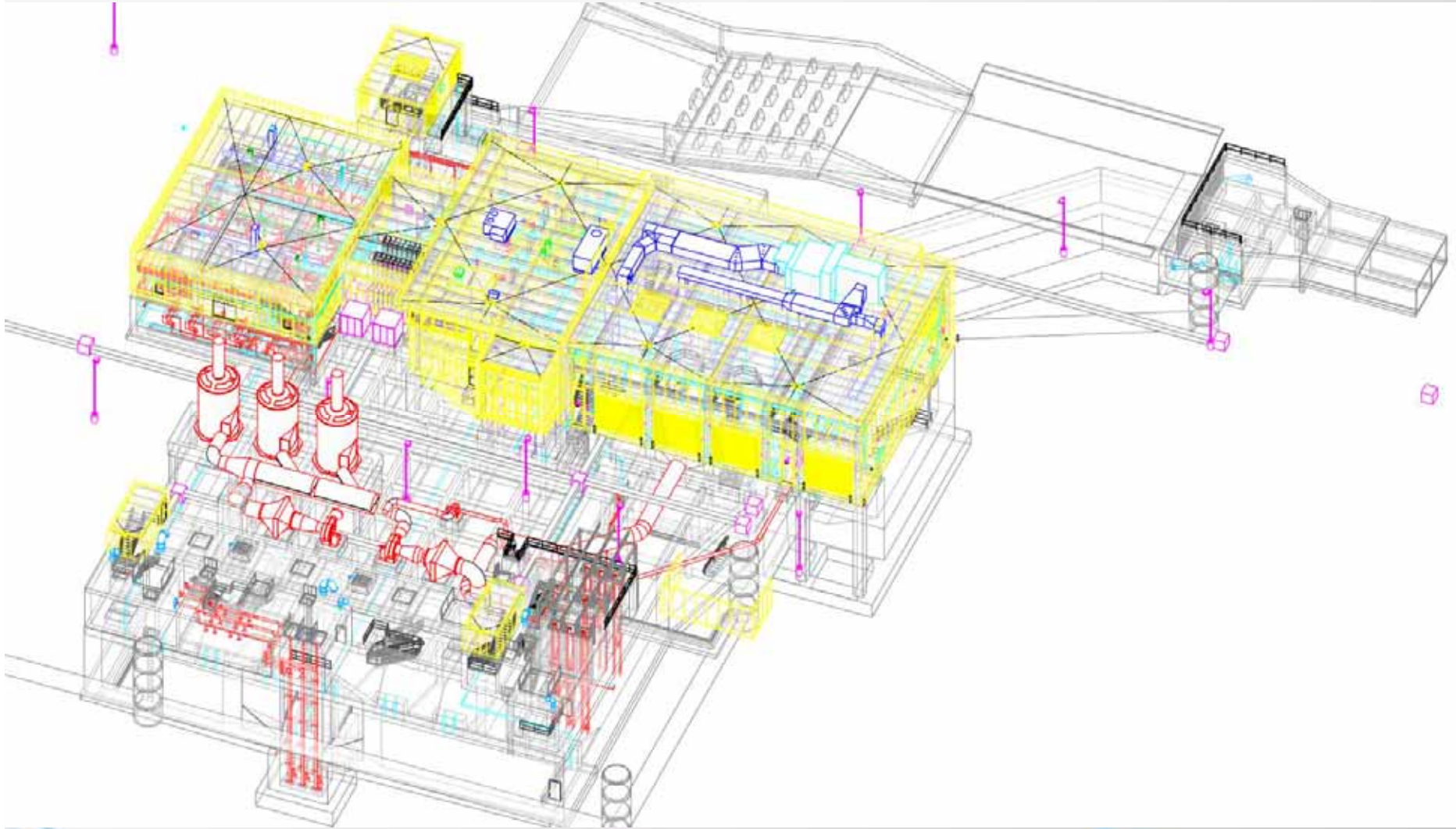
* 90% Documents provided

Step 2: Lowest Responsible Bid

- Pre-Qualified Prime Contractors
- Project Advertisement
- Pre-Bid
- Question and Answers
- Potential Addendums
- Public Bid Opening



BIM Model Available



Bidding Schedule (Tentative)

- Advertise for Bid October 24, 2018
- Pre-Bid Meeting November 7, 2018
- Bids Due December 19, 2018



Site Conditions

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1952 Aerial



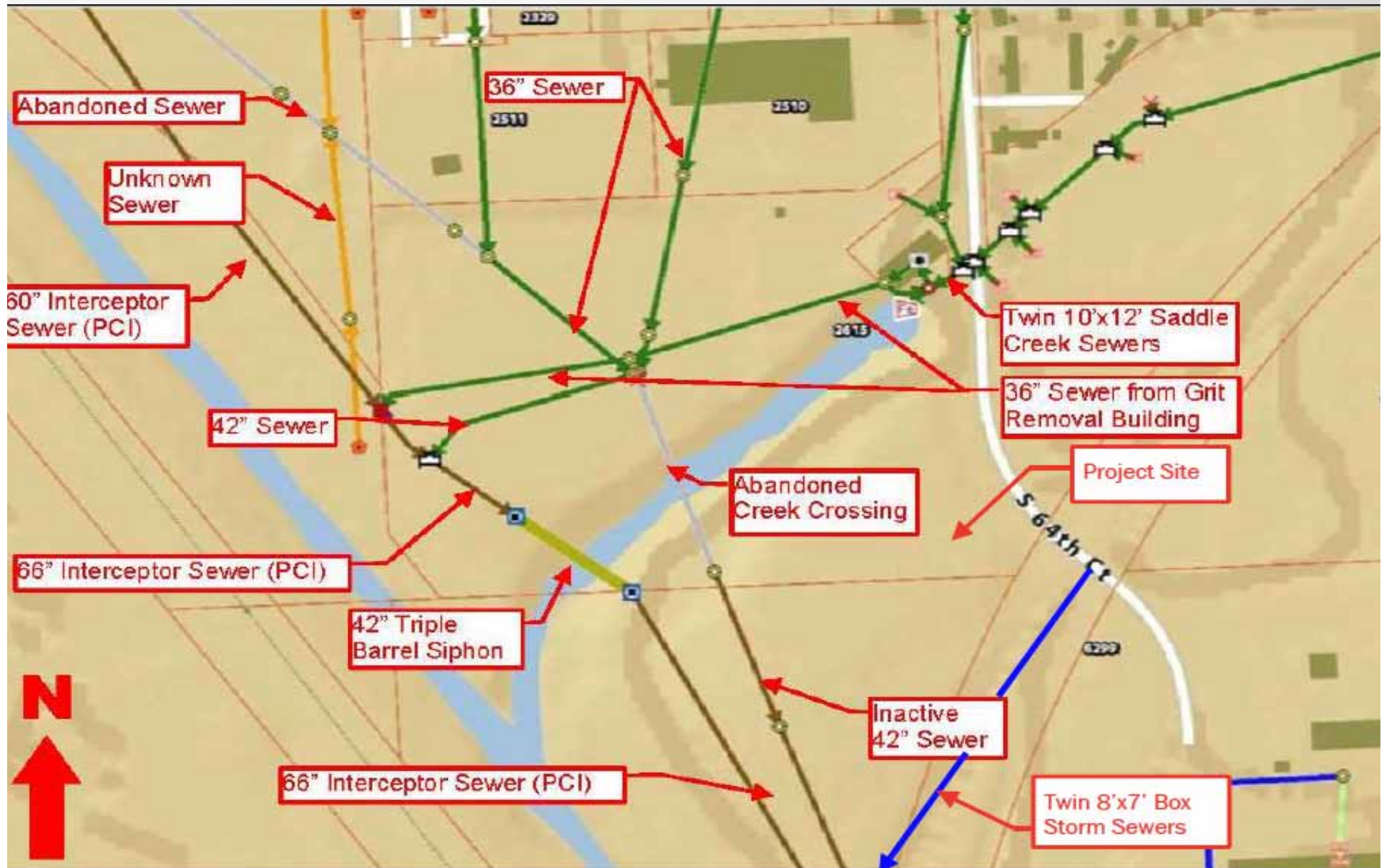
1975 Aerial



Current Site Conditions

- Active Sewers
- Existing Facilities
- Floodplain
- Geotechnical Conditions

Active Sewers



Existing Grit Facility



[illegible]

Existing Grit Facility



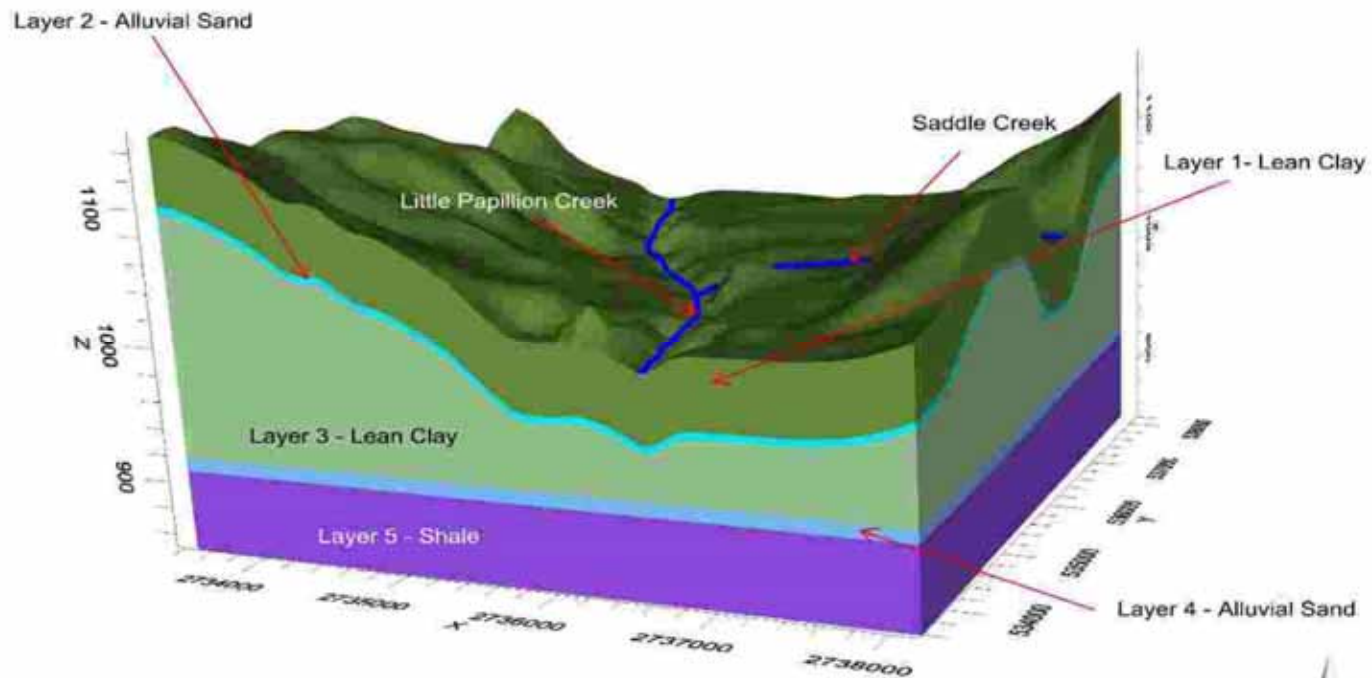
Active Floodplain



Soil Borings



Groundwater



Prior Investigations

- Phase I Environmental Site Assessment and Limited Subsurface Investigation
- Asbestos Survey, Lead-Based Paint Screening, and Hazardous Building Materials Assessment Report
- Wetland Delineation and Waters of the U.S. Determination
- Biological Survey Update

Prior Investigations (Cont.)

- Geotechnical Engineering Report
- Construction Dewatering Assessment
- Geotechnical Report – 64th Avenue Reconstruction

Site Preparation

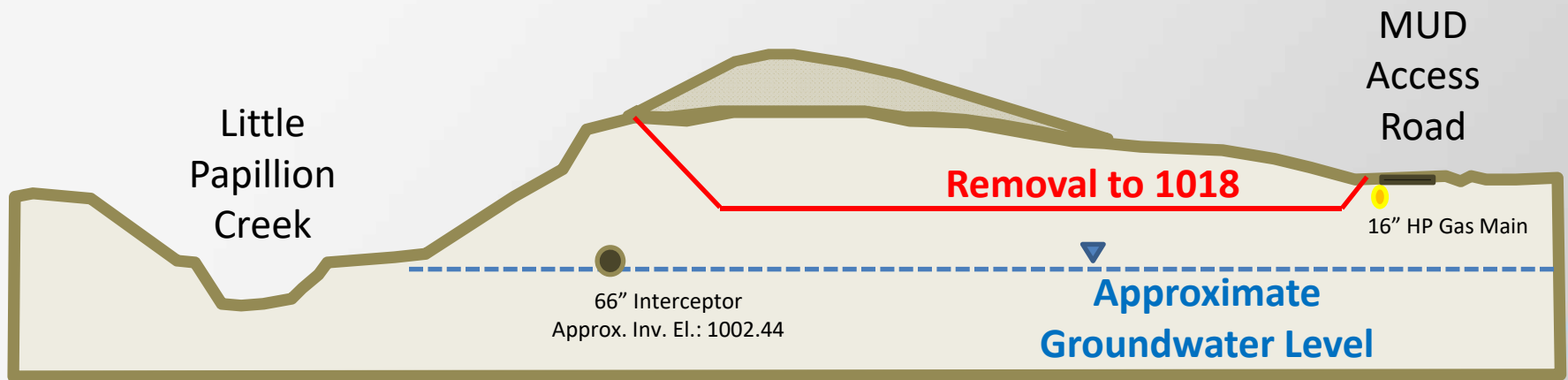
- Tree Removal
- Construction & Debris (C&D) Removal



Site Preparation



Site Preparation





Risk Elements

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Major Project Revisions/ Risk Mitigation

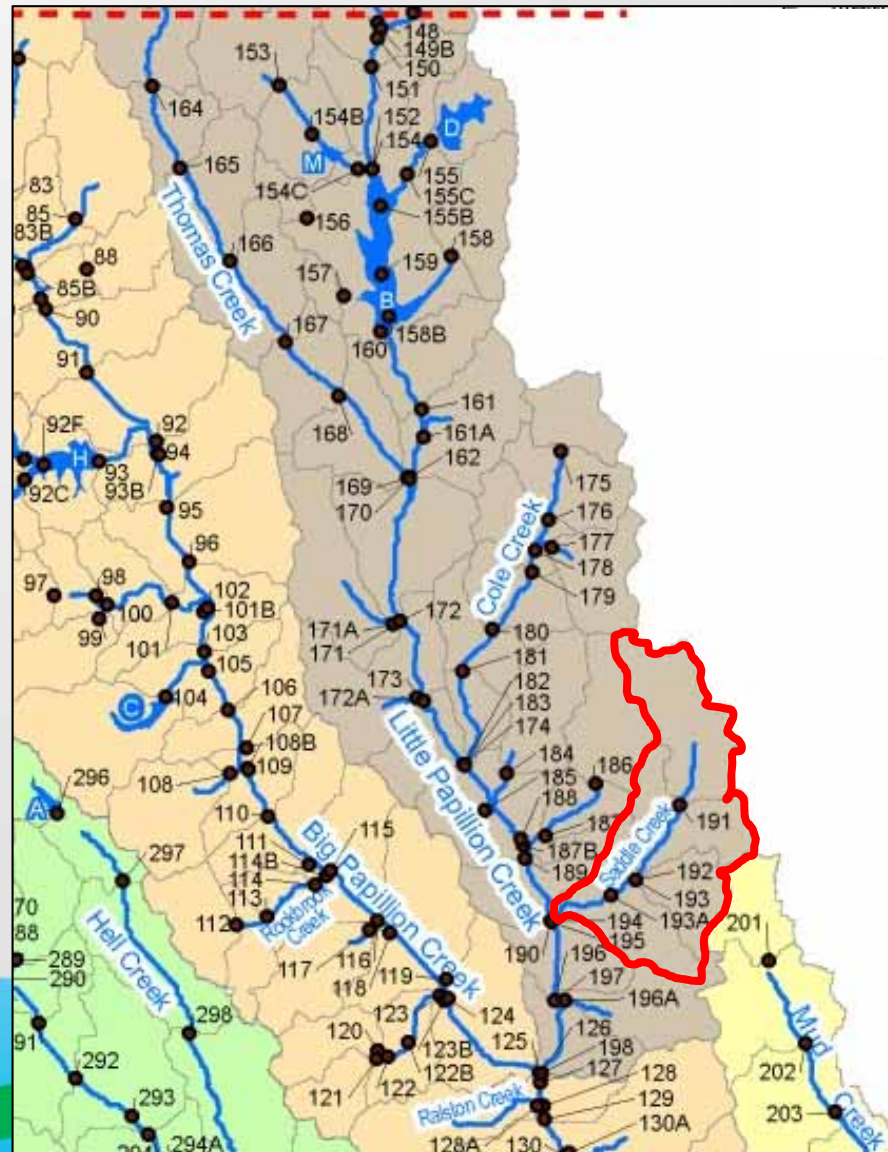
- C&D Landfill Debris Removed
- 50% Reduction in Tank Size and Layout Adjusted
- Dewatering Pump Station Within Main Tank
- Storm Event Start Up Testing by Owner
- Backup Power by Dual Feed
- HVAC System Simplified
- Extended the Performance Period

Risk Elements

- Costs
- Schedule
- Underground Conditions
- Mass Concrete Management
- Work in a Floodplain
- Maintenance of Sewer Flows

Little Papio Creek Watershed

- Long, narrow watershed
- Tributary area 55 mi²
- Time to peak: approximately 2 hours



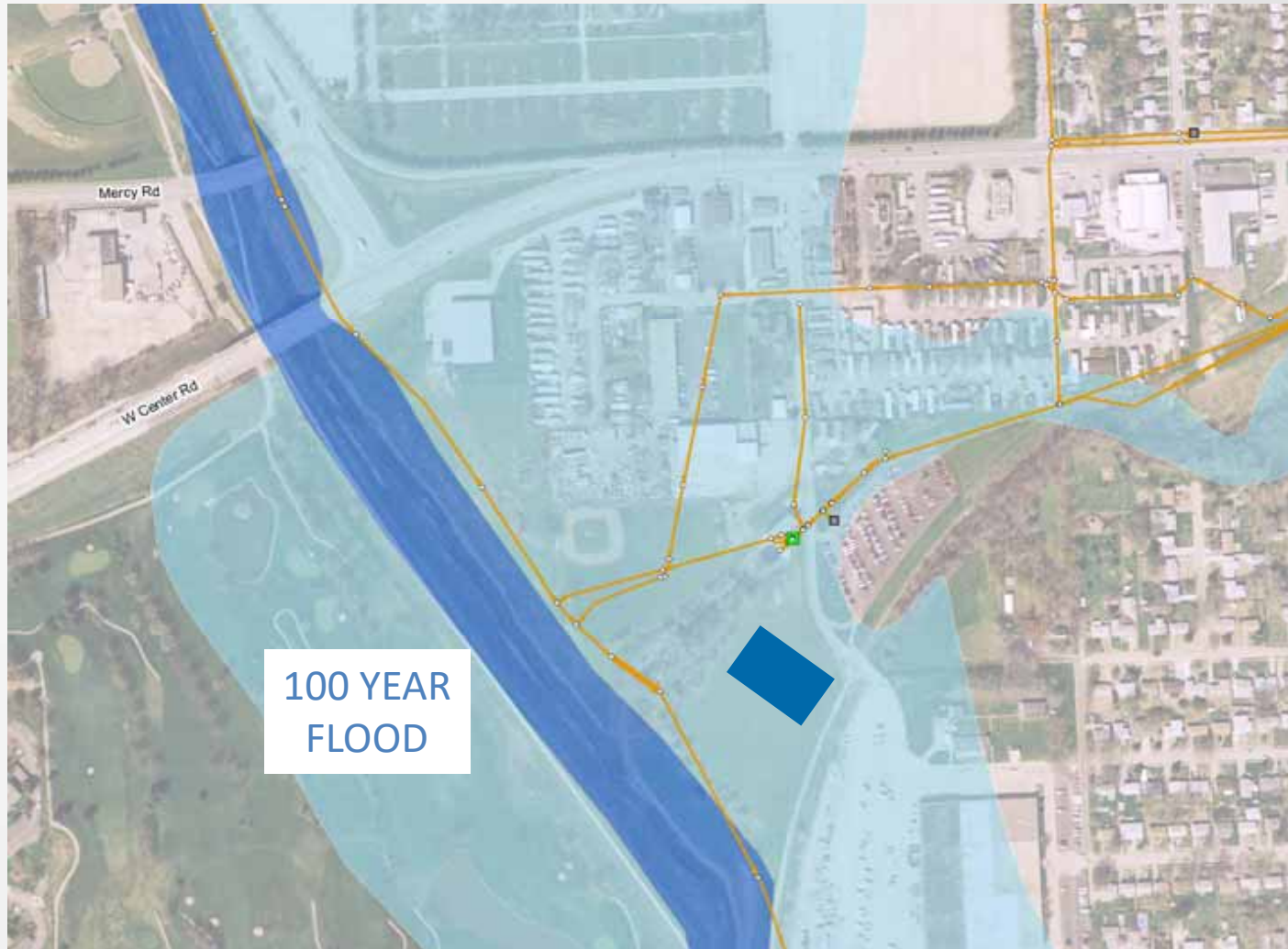
1 Year Flood



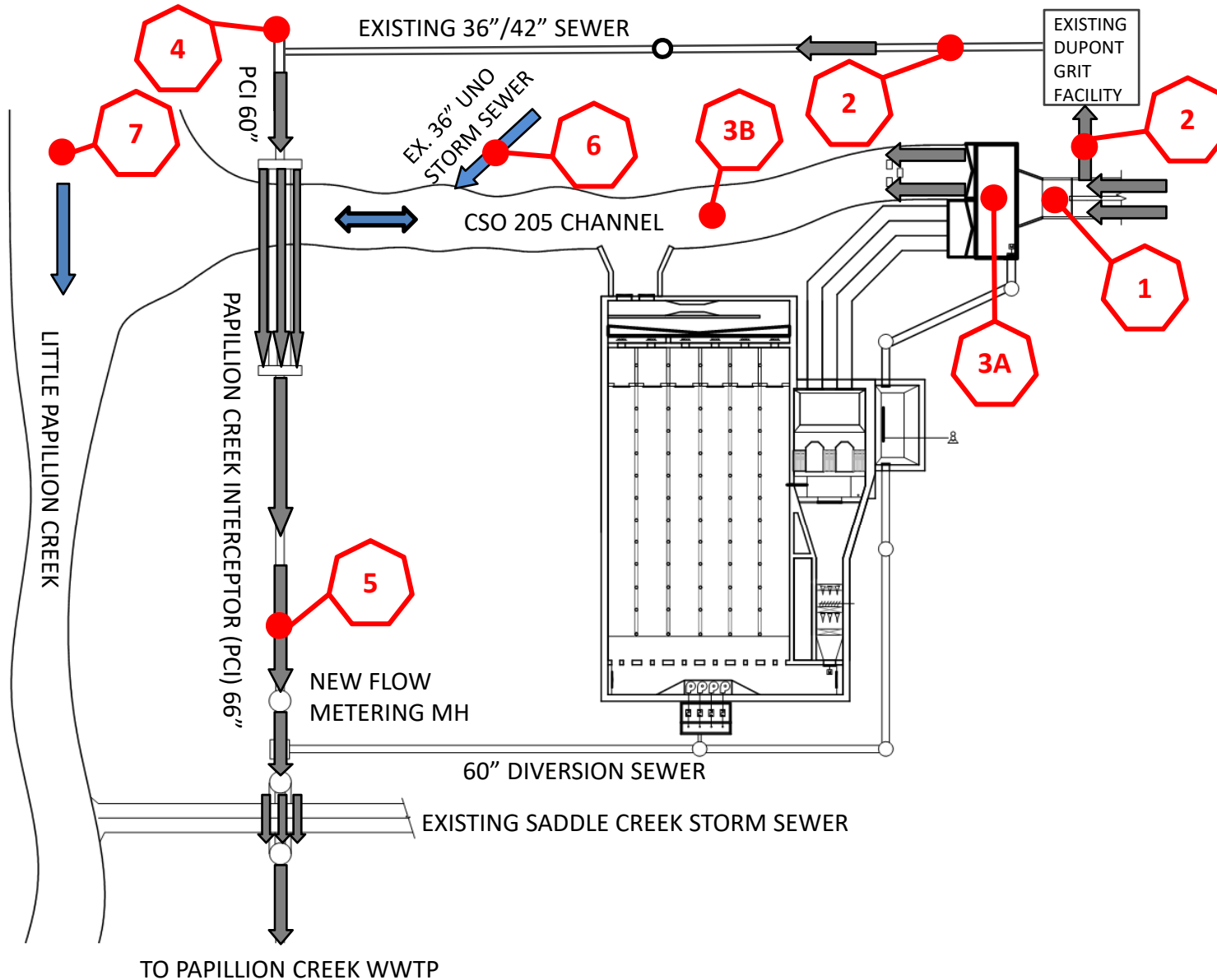
10 Year Flood



100 Year Flood



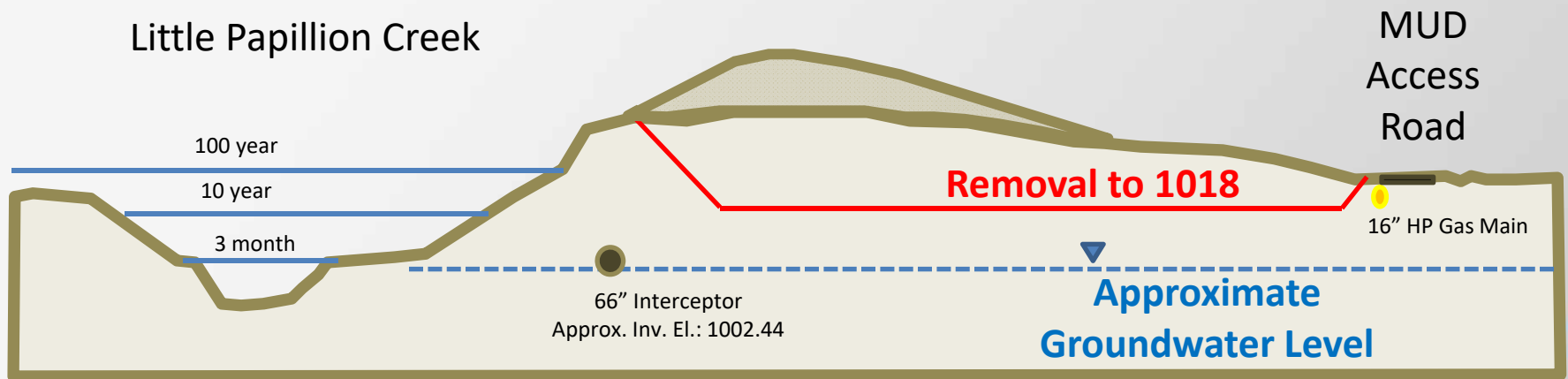
Flow Management



Flows and Levels

	Description	Dry Weather Flow			Wet Weather Flow		
		Condition	Flow (MGD)	Depth	Condition	Flow (MGD)	Depth
				(ft)			(ft)
1	CSO 205 Box Sewers Upstream of Diversion Weir – 2@ 10'x12'	Min.	3.8	0.2	Min.	≥9.0	≥1.0
		Avg.	6.4	0.5	Avg.	79	2.5
		Peak	<9	<1.0	TY Peak	874	5.7
					10 Yr	1,850	Surcharged
2	Dupont Grit Pit, 36" and 42" Outlet Sewer	Min.	3.8	0.5	Min.	≥9	≥1.5
		Avg.	6.4	1	Avg.	16	2.25
		Peak	<9	<1.5	Peak ⁽²⁾	40	3.5
3A	CSO 205 Outfall – 2 @ 10'x12'	Min.	N.A.	N.A.	Min.	0.1	0.1
		Avg.	N.A.	N.A.	TY Avg.	116	1.4
		Peak	N.A.	N.A.	TY Peak	846	5.7
					10 Yr	1,810	10
3B	CSO 205 Channel	Min.	N.A.	⁽¹⁾	Min.	0.1	0.1
		Avg.	N.A.	⁽¹⁾	TY Avg.	116	7.2
		Peak	N.A.	⁽¹⁾	TY Peak	846	10.2
					10 Yr	1,810	13.2
4	Papillion Creek Interceptor - 60" (upstream of 42")	Min.	3	0.2	Min.	≥11.0	≥0.8
		Avg.	8	0.6	Avg.	30	2.5
		Peak	<11	<0.8	Peak ⁽²⁾	65	5
5	Papillion Creek Interceptor - 66" (downstream of 42")	Min.	6.8	0.6	Min.	≥20.0	≥1.2
		Avg.	14.4	1	Avg.	32	2.1
		Peak	<20	<1.2	Peak ⁽²⁾	84	5
6	UNO Storm Sewer – 36"	Min.	N.A.	N.A.	Min.	0.1	0.1
		Avg.	N.A.	N.A.	Avg.	10	1.5
		Peak	N.A.	N.A.	Peak ⁽²⁾	22	3
7	Little Papillion Creek	Min.	3	1.6	Min.	≥ 10	≥ 1.9
					3 Month ⁽³⁾	1,400	9.3
		Avg.	7	1.8	1 Yr ⁽³⁾	3,400	14
		Peak	<10	<1.9	10 Yr ⁽³⁾	10,300	26
					100 Yr ⁽³⁾	16,500	34

Flood Levels




Flooding Protection Plan

- Means and methods to protect the site, stored materials, equipment and work areas
- Design flood protection measures to a Threshold Event
- Sequencing and scheduling details
- Procedures for monitoring weather and flood levels
- Communications protocol
- Cleaning and restoration plans

Flow Maintenance Plan

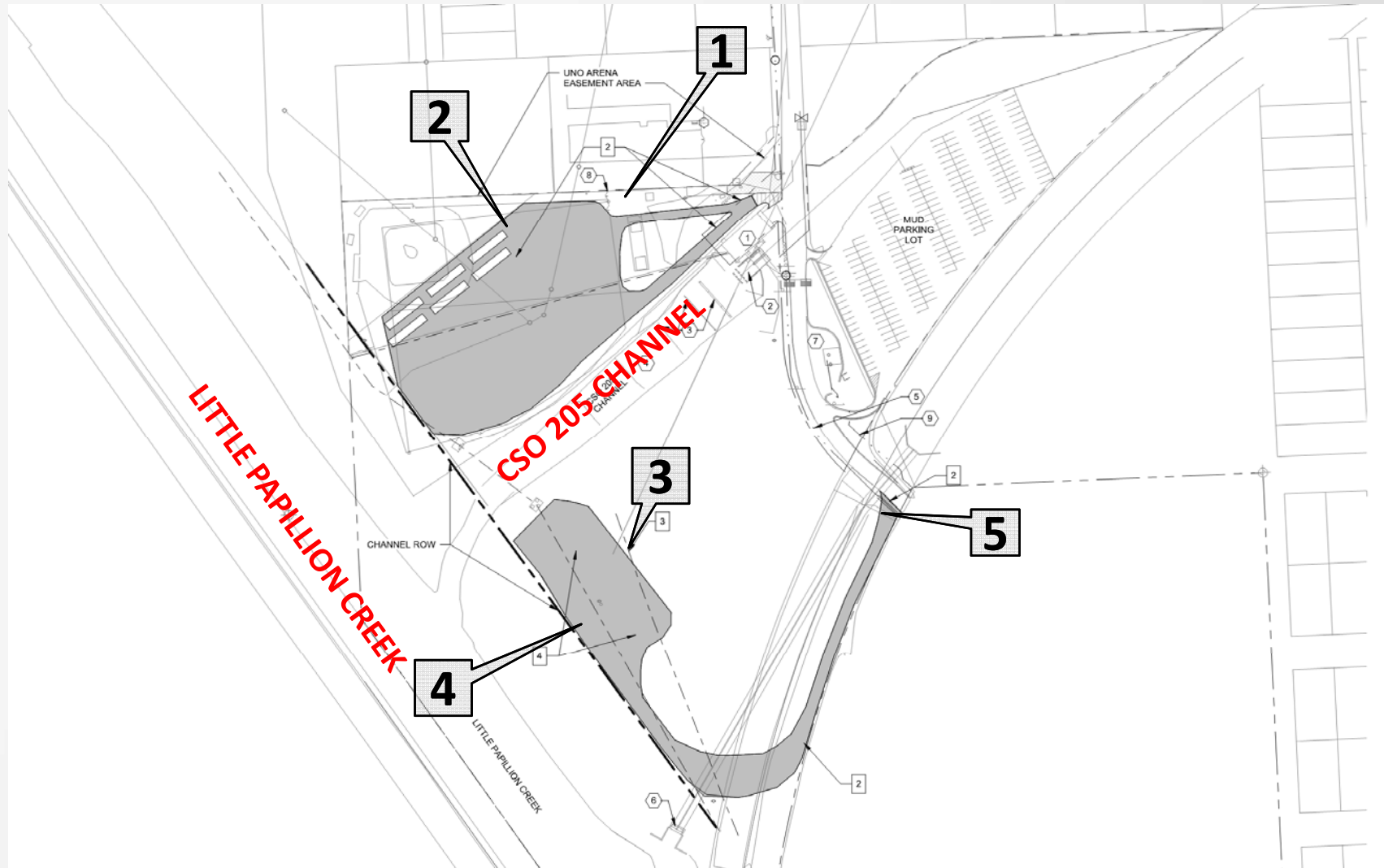
- Means and methods to maintain dry and wet weather flows through Work areas
- Sequencing and scheduling details
- Procedures for monitoring weather/flows/levels until the measures are removed
- Erosion control or other protection measures
- Communications protocol
- Cleaning plans before and after



Suggested Construction and Sequencing Considerations

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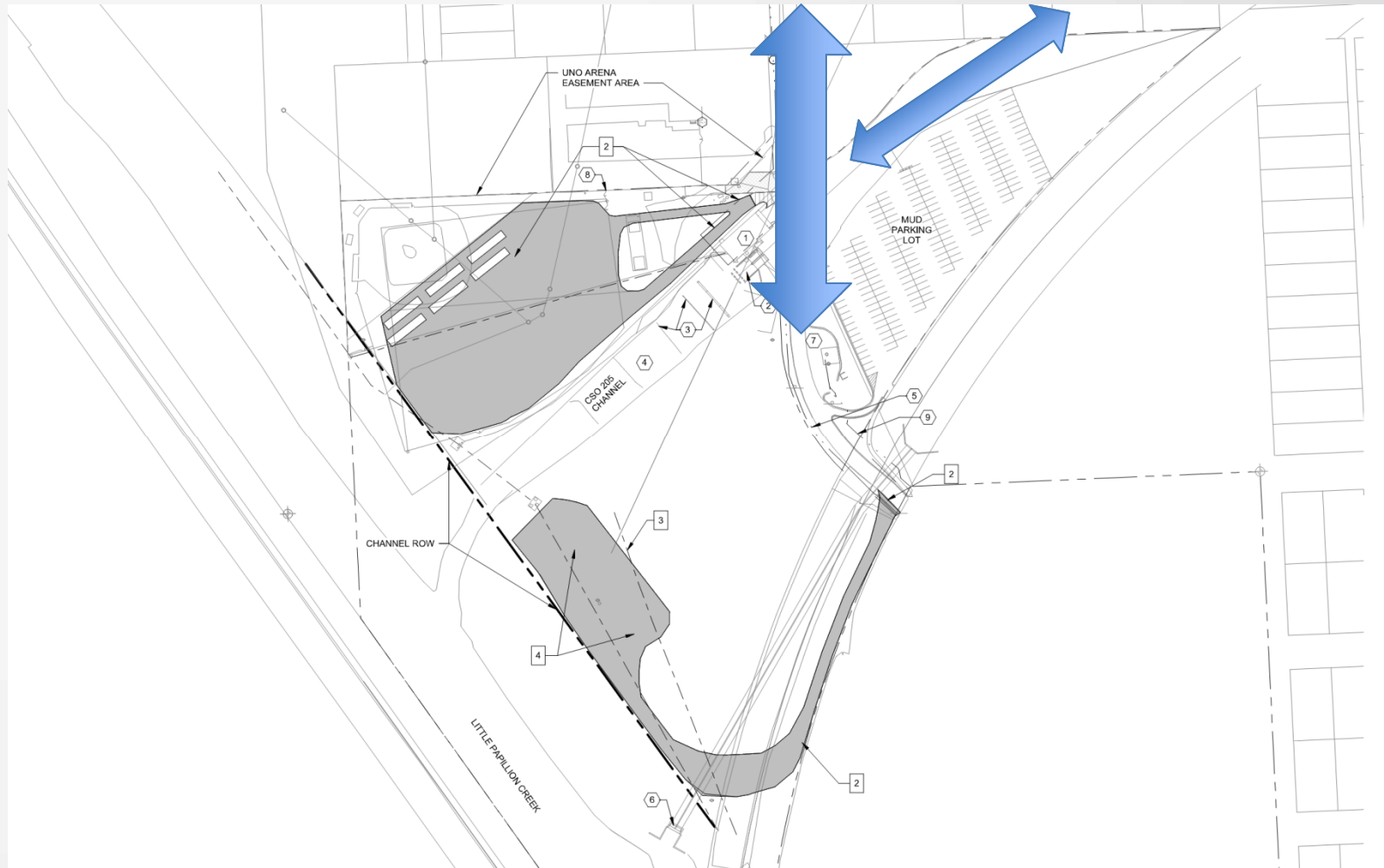
Mobilization



Working Area



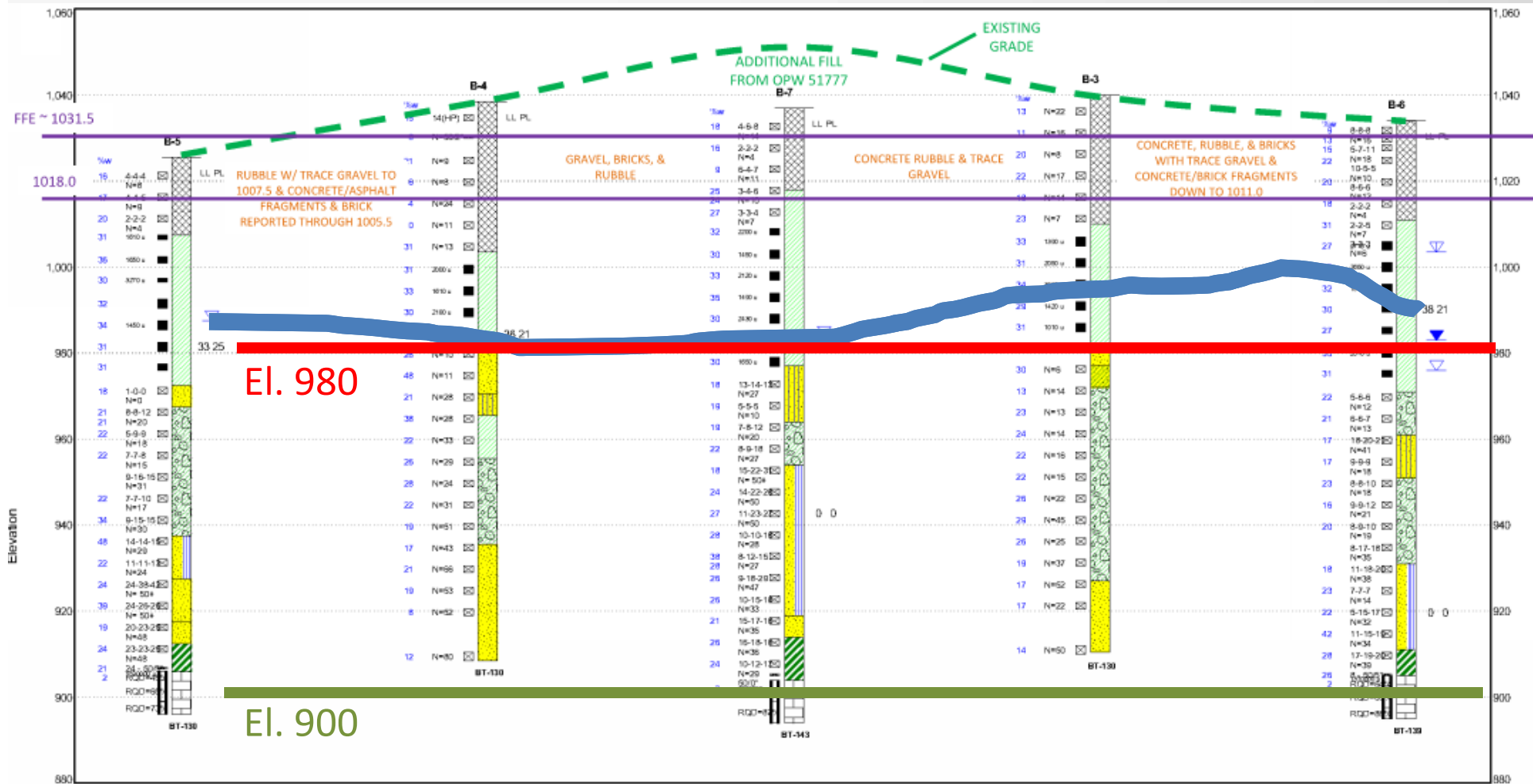
Access and Haul Routes



Heavy Civil Elements

- Dewatering
- Temporary Earth Retention System
- Excavation
- Piling and Rock Anchors
- Foundation and Basin Structures
- Backfill

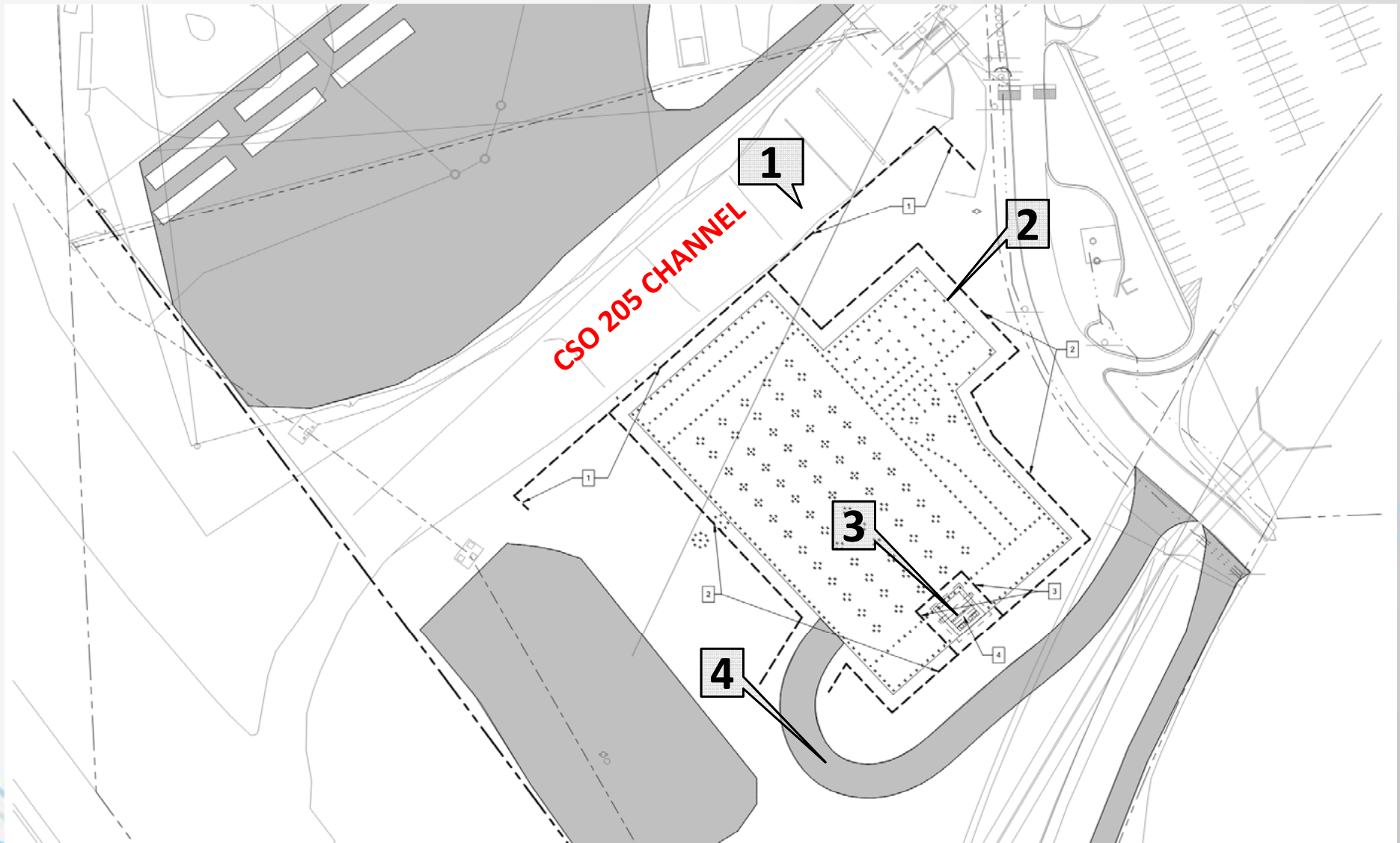
Ground Conditions



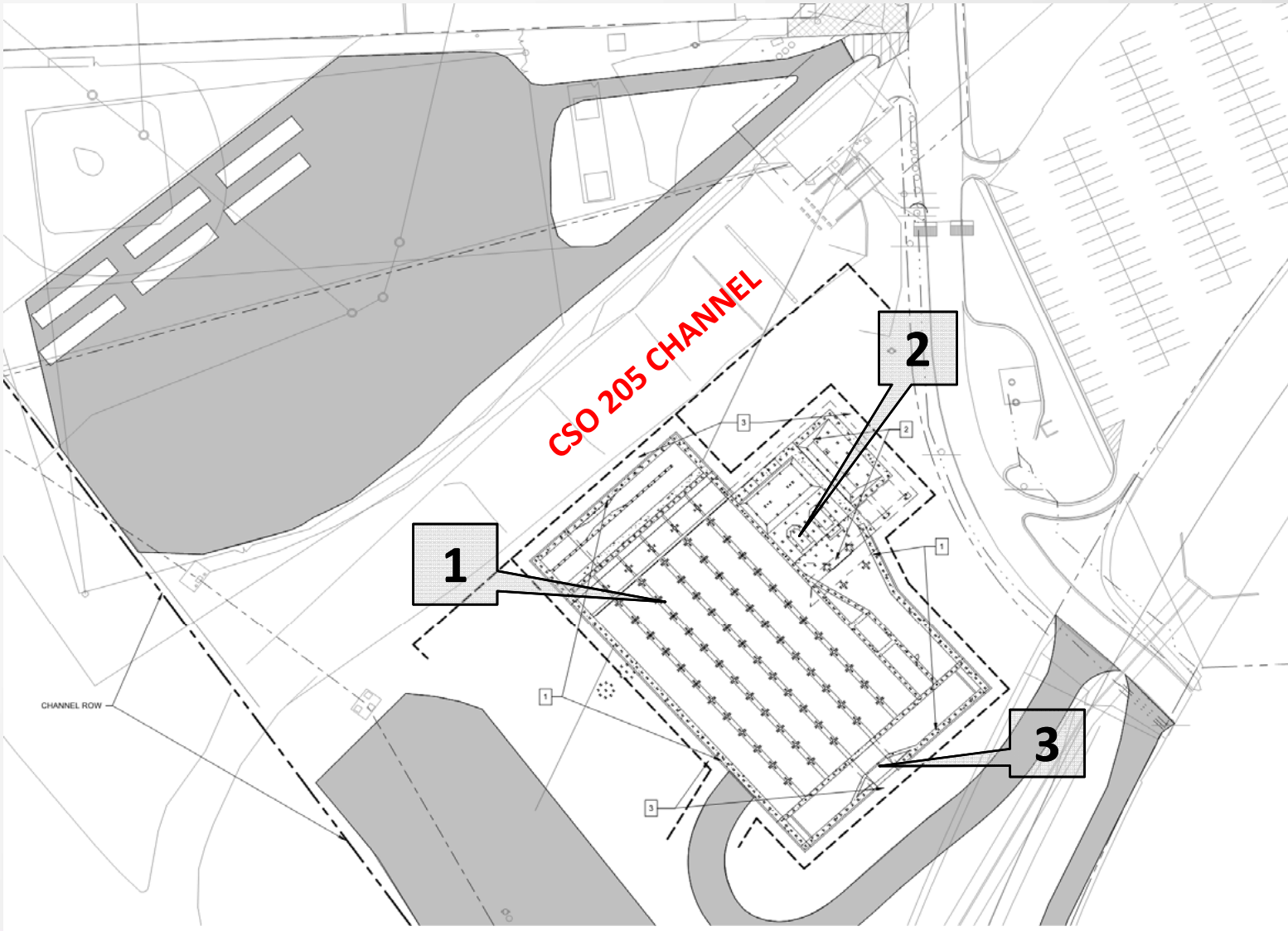
Hauling and Disposal of Excavated Soils

- Placed on the north staging area to elevate for floodplain control
- Reuse for backfill if determined as suitable
- Dispose off site
 - Approved landfill
 - Approved industrial site
- Environmental allowance for any contamination project

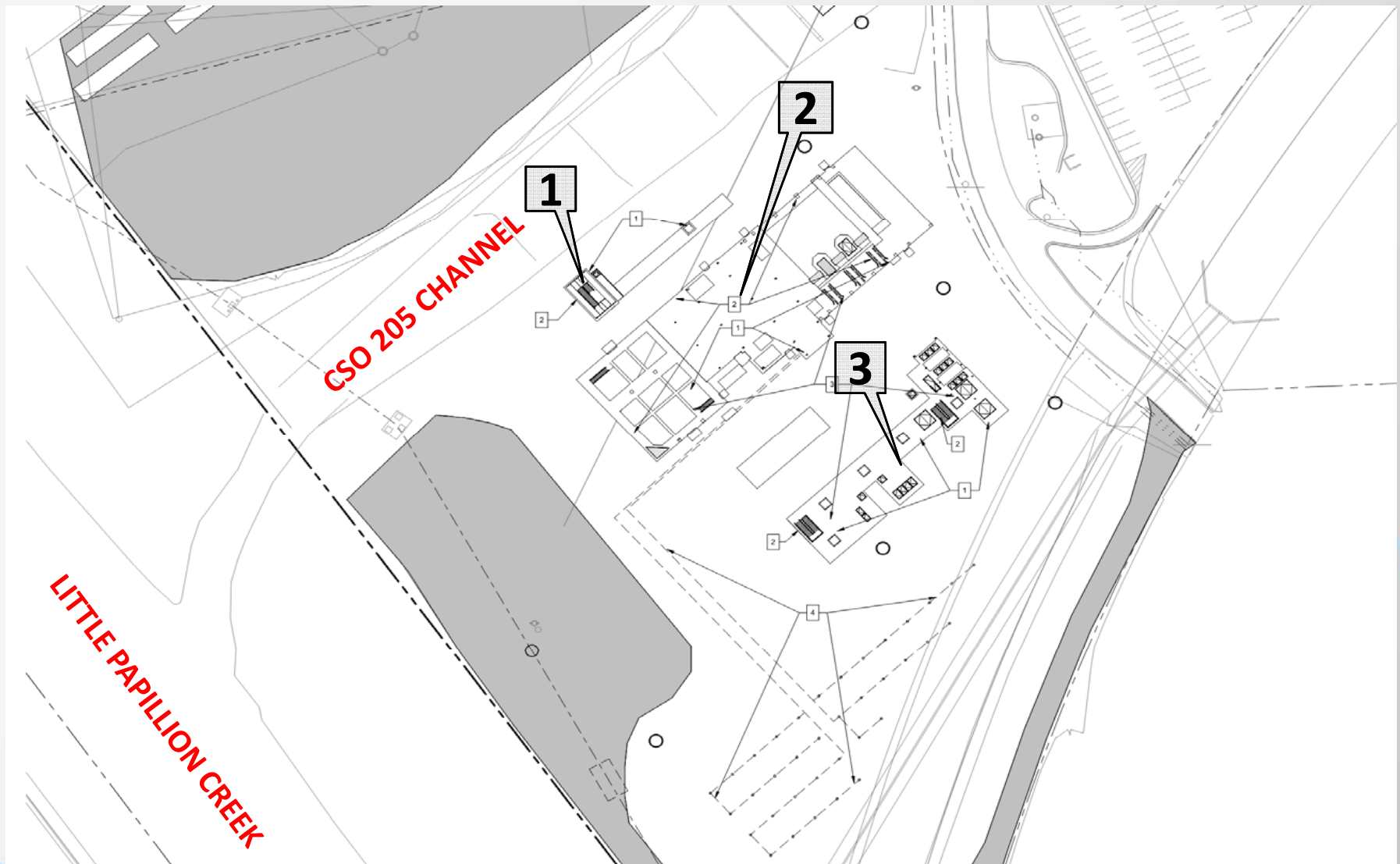
TERS and Excavation



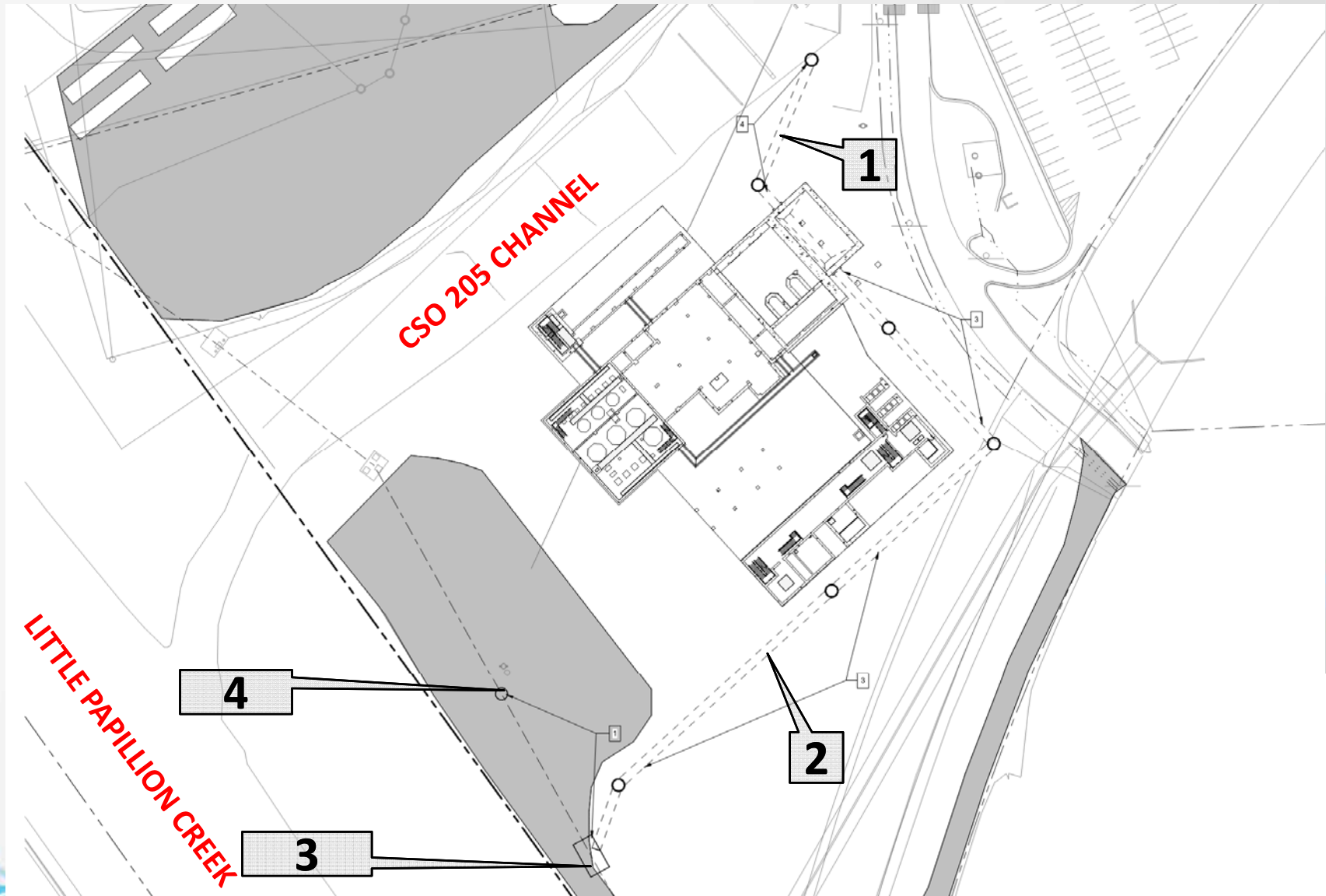
Foundations and Base Slab



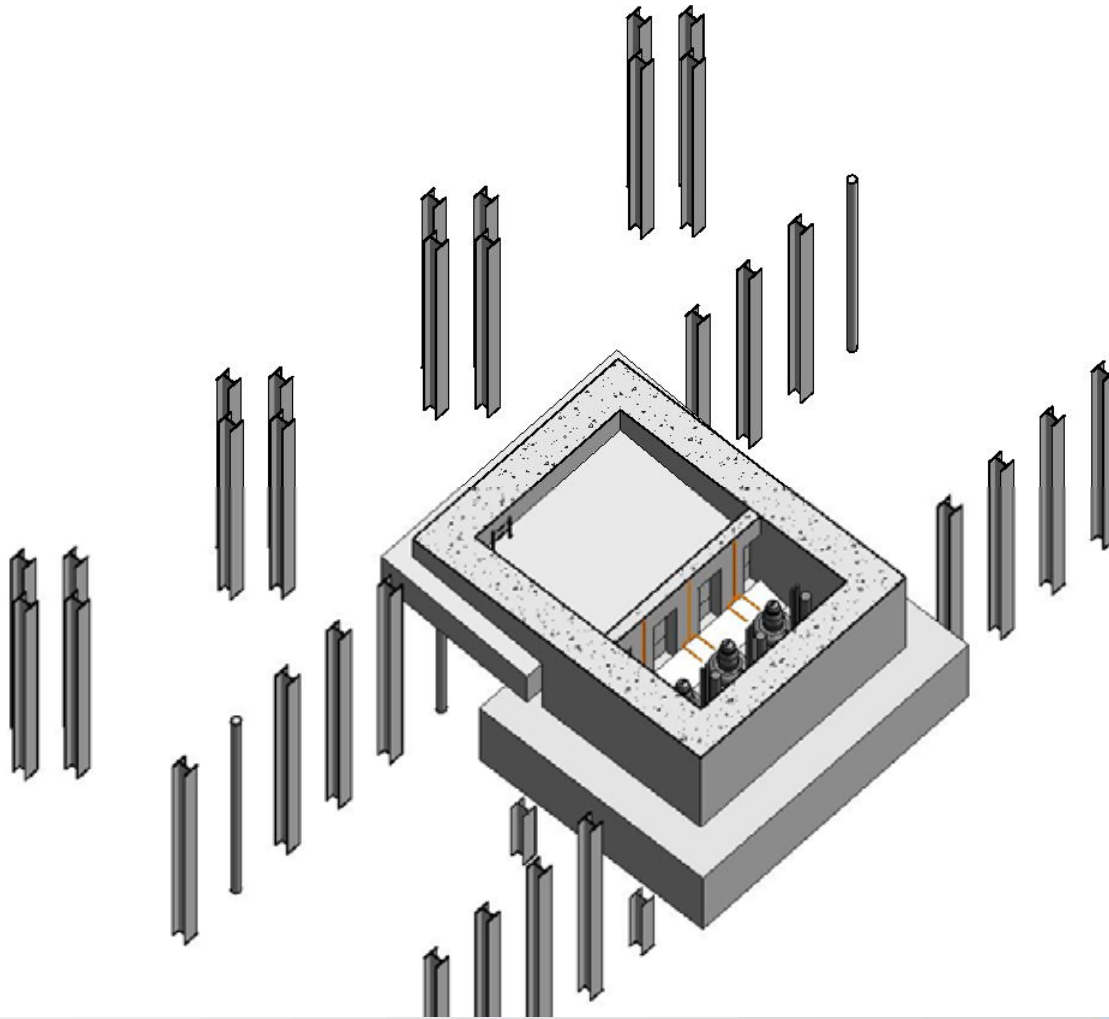
Intermediate Structures



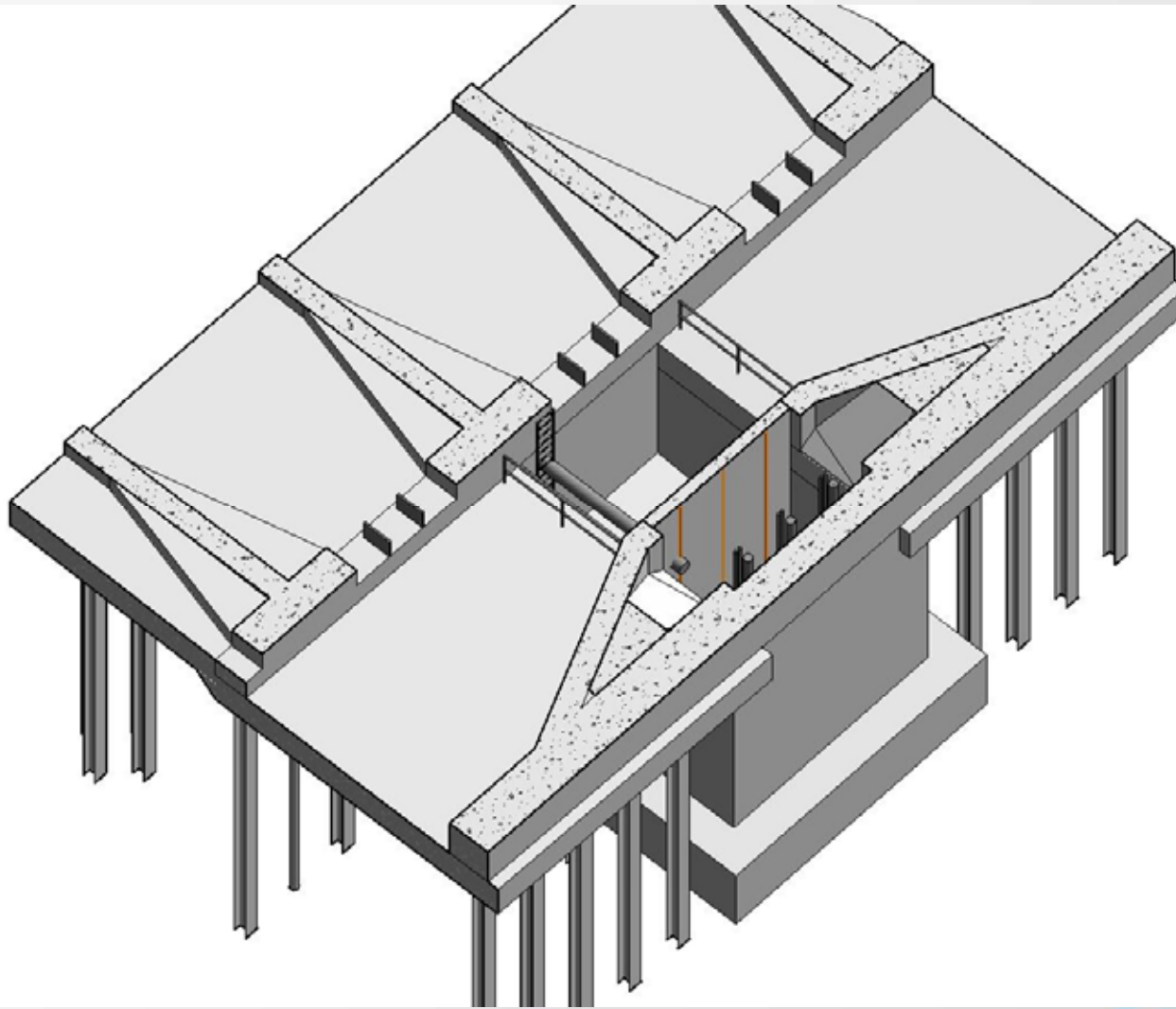
Diversion Sewer



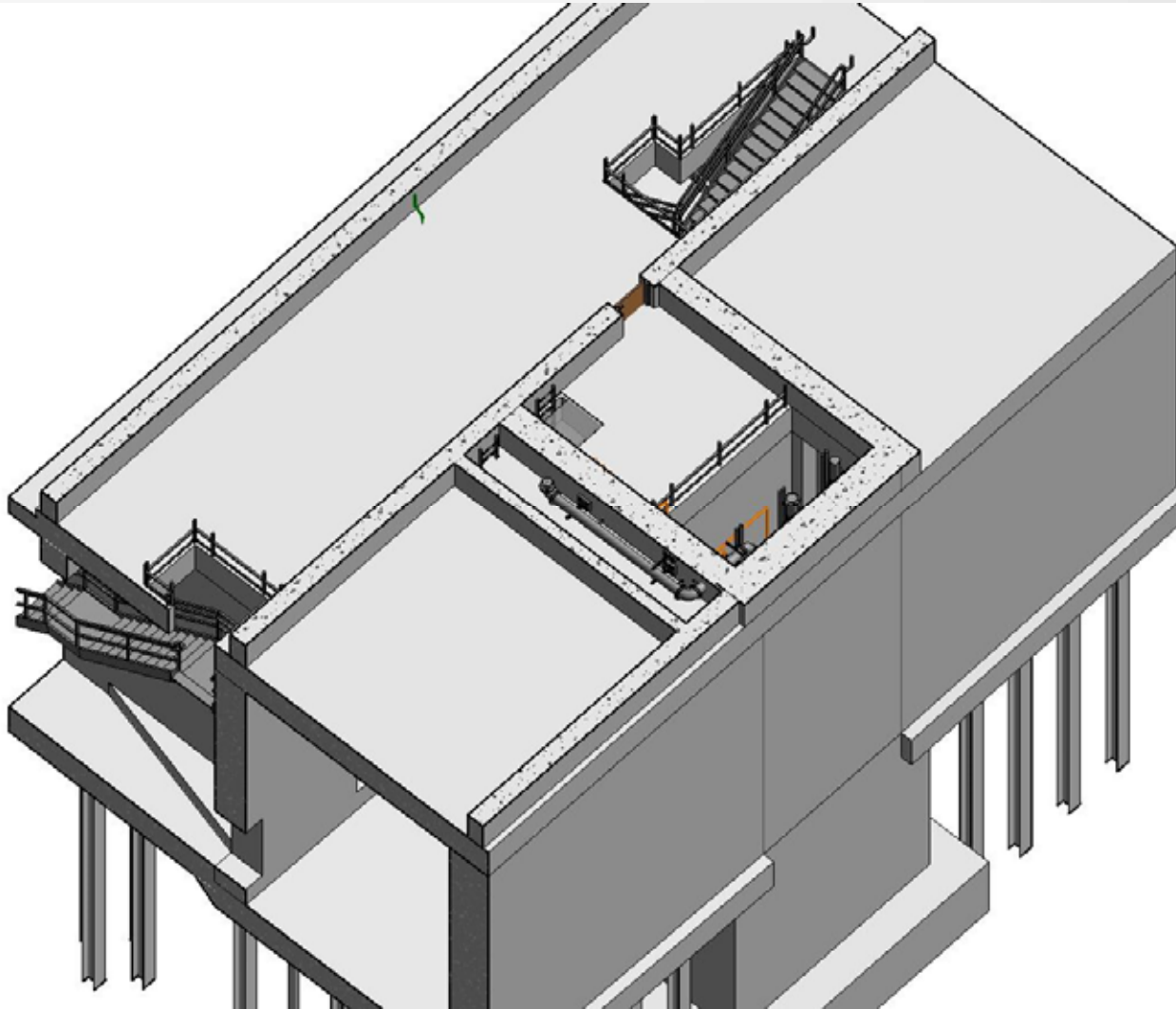
Pump Station - Foundation



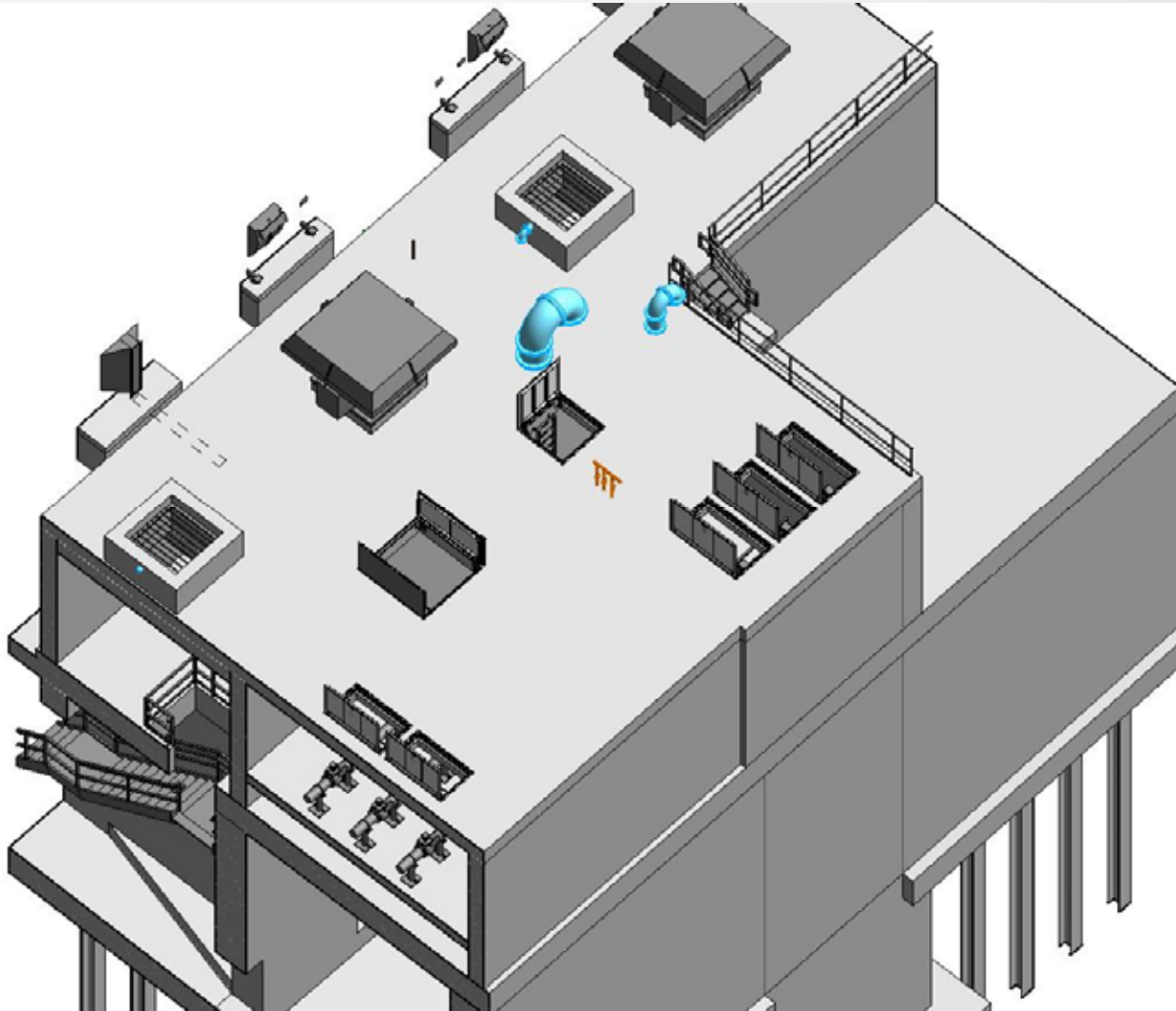
Pump Station at Basin Floor



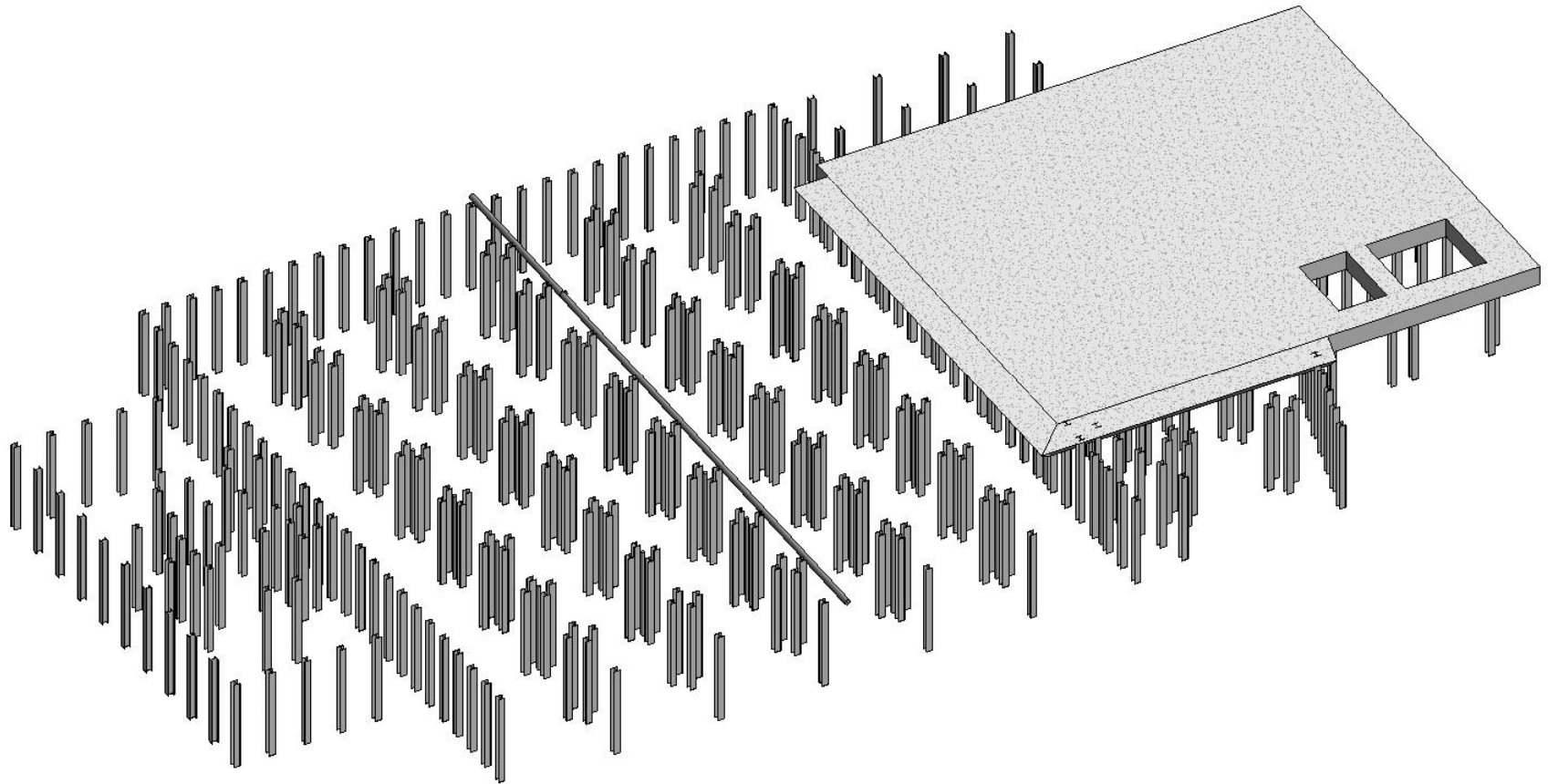
Pump Station at Top of Basin



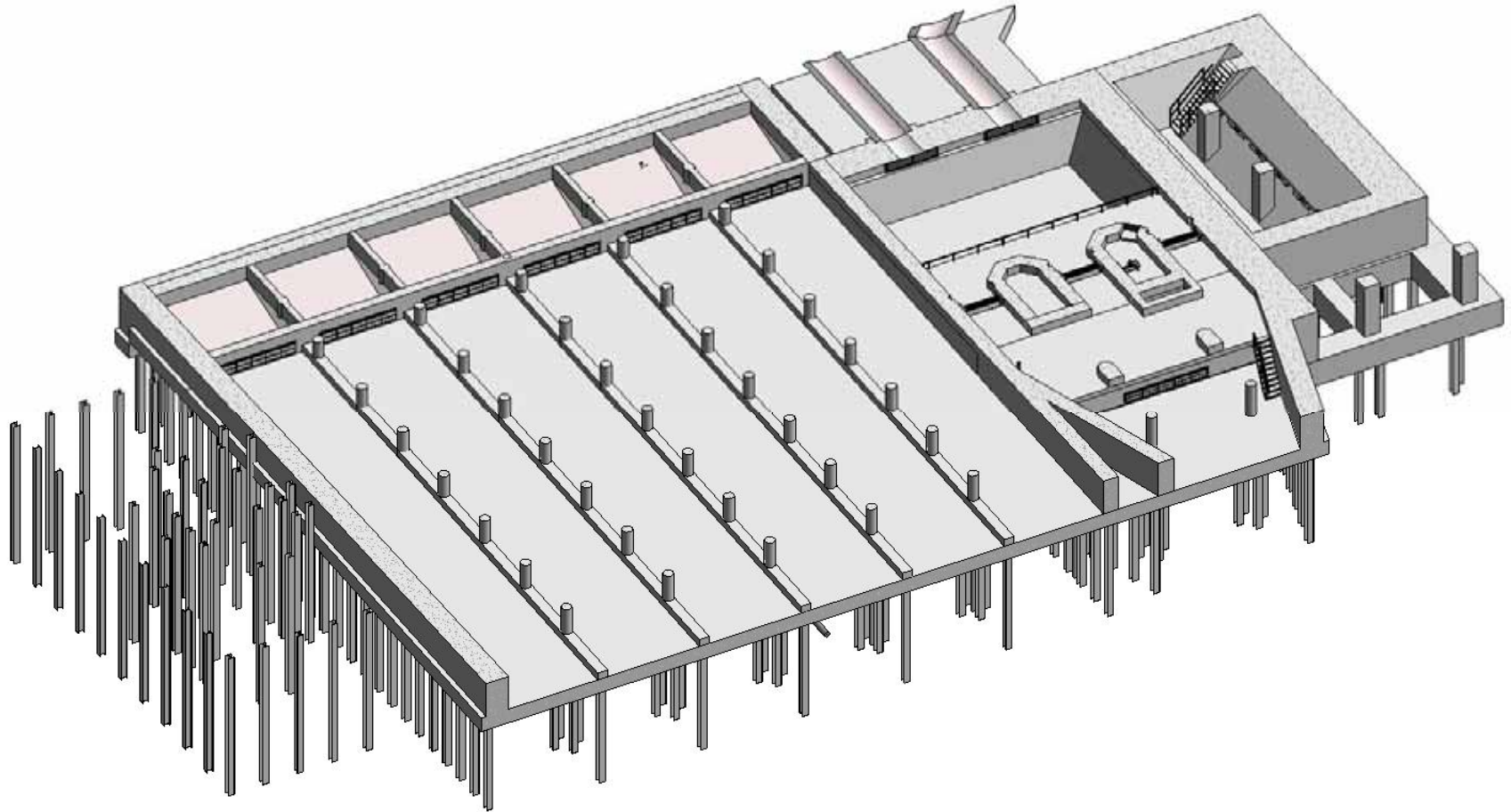
Pump Station at Grade



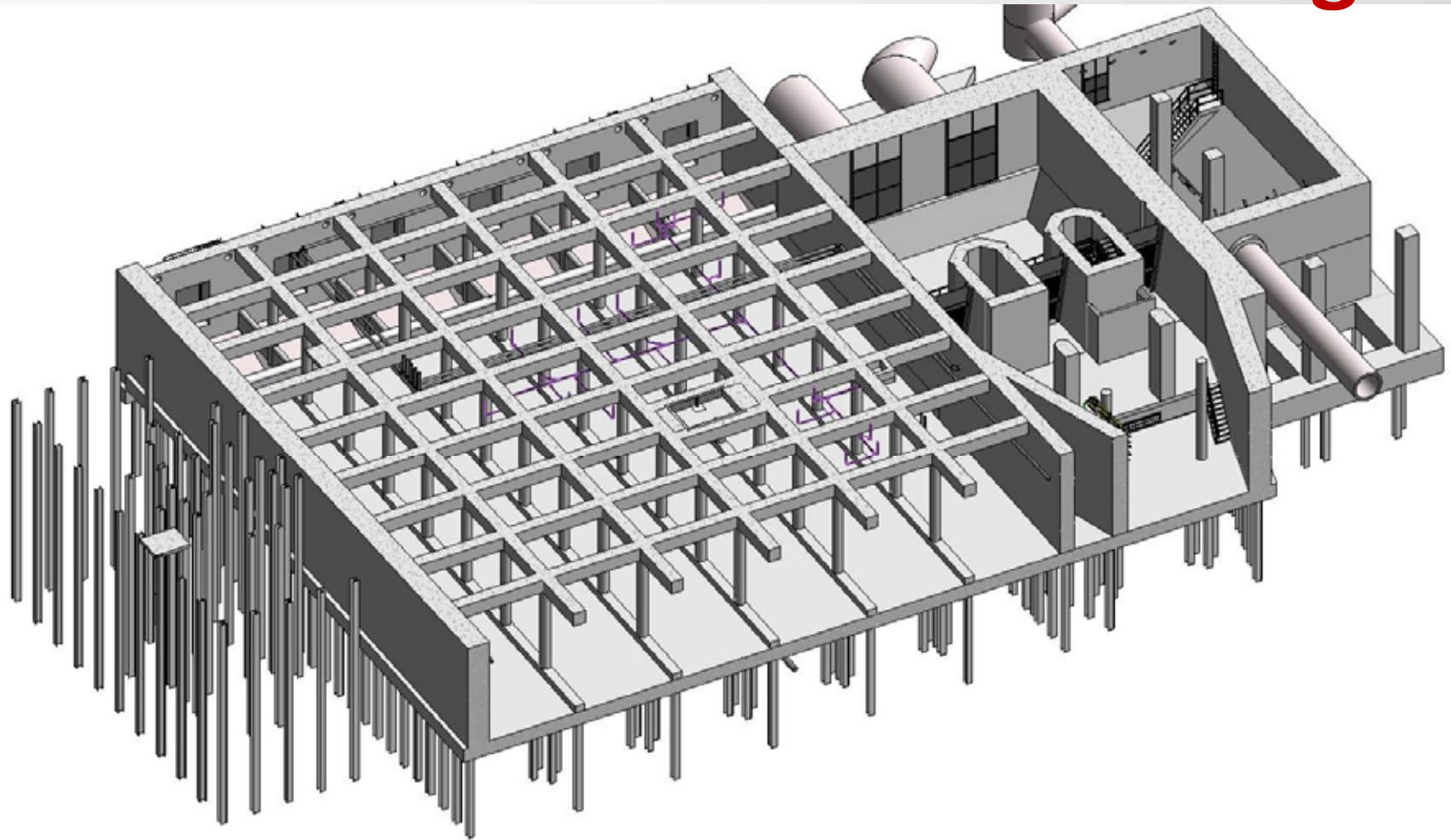
Foundation Below Buildings



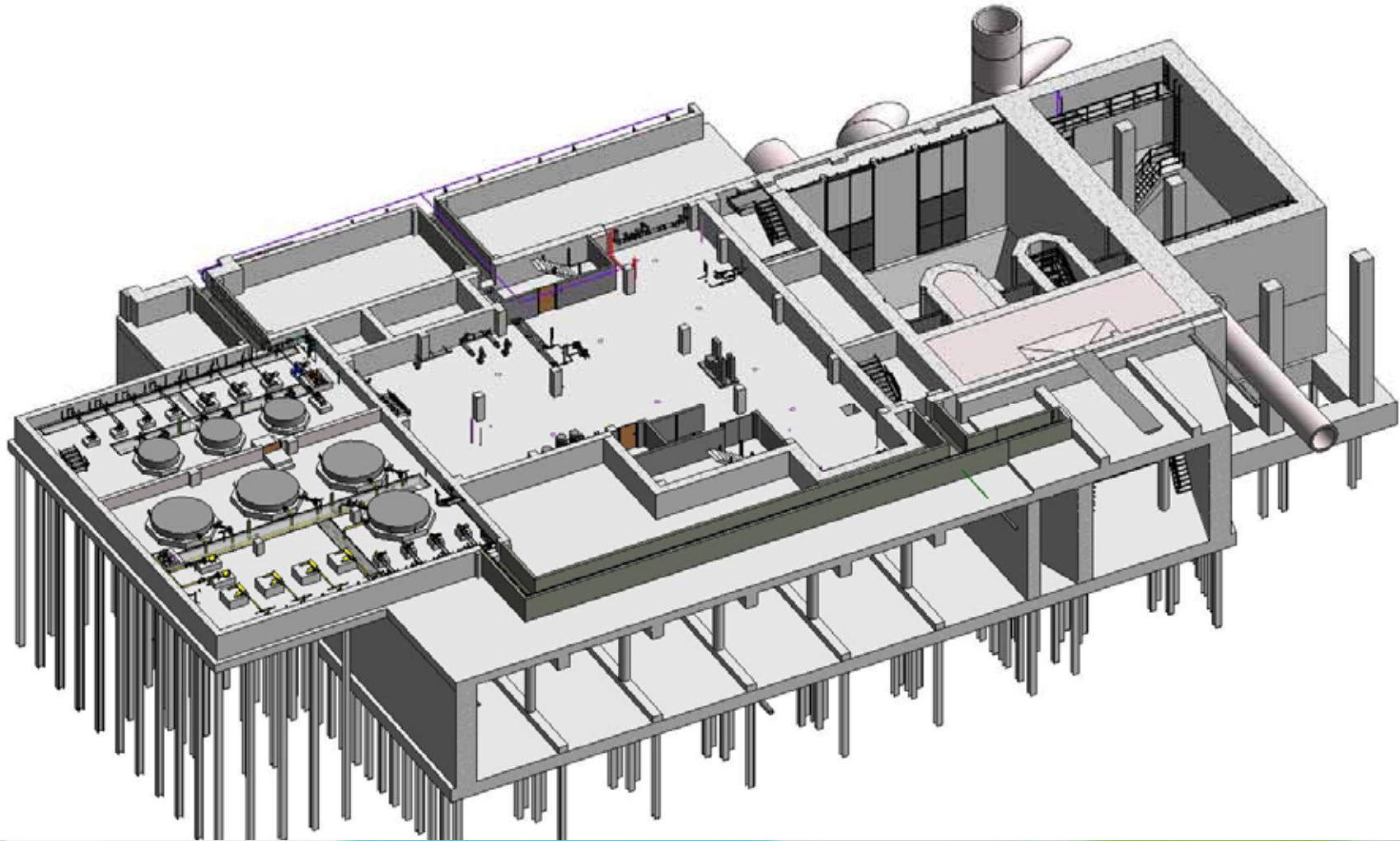
Basin Slab Below Buildings



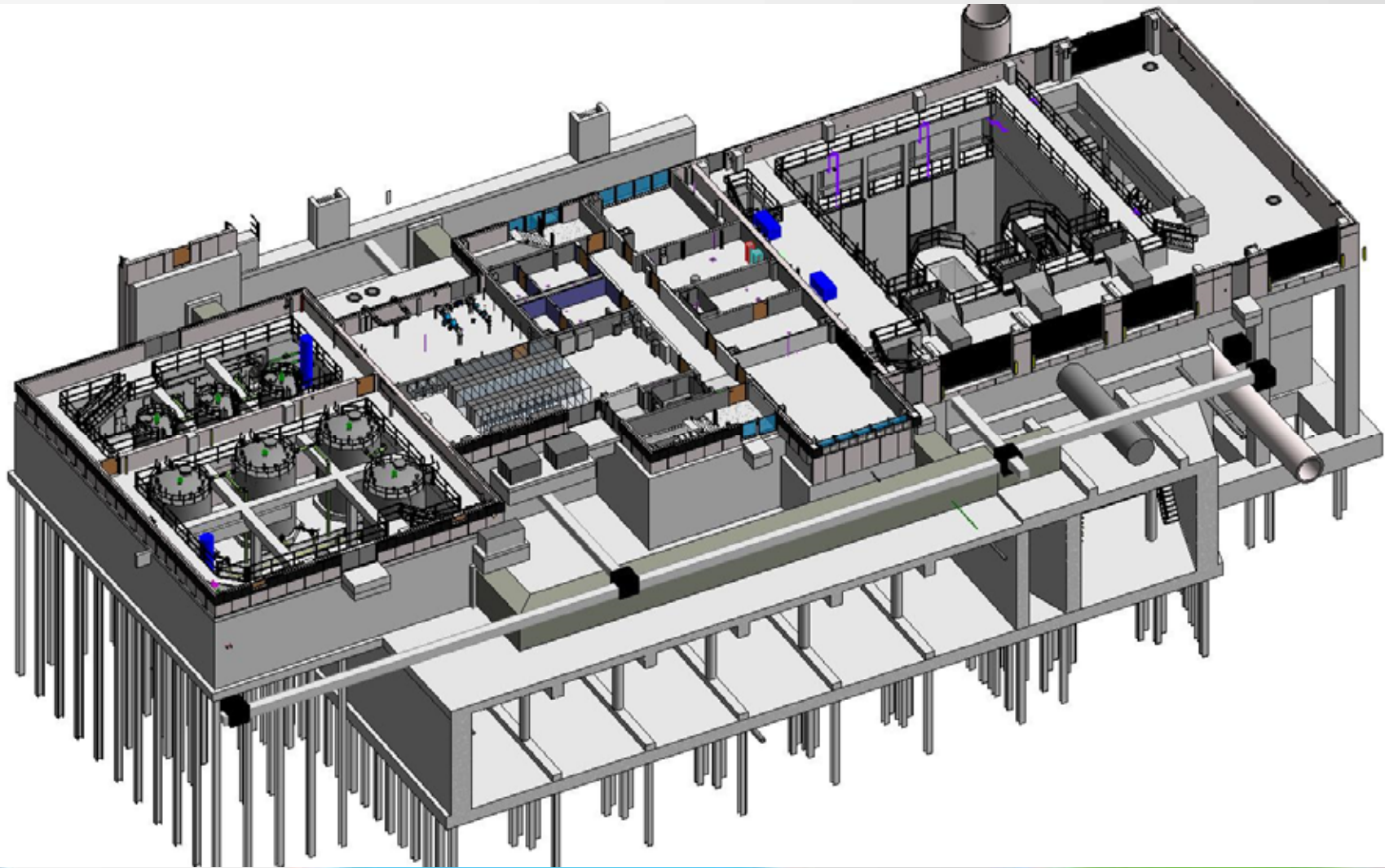
Main Basin Areas Below Buildings



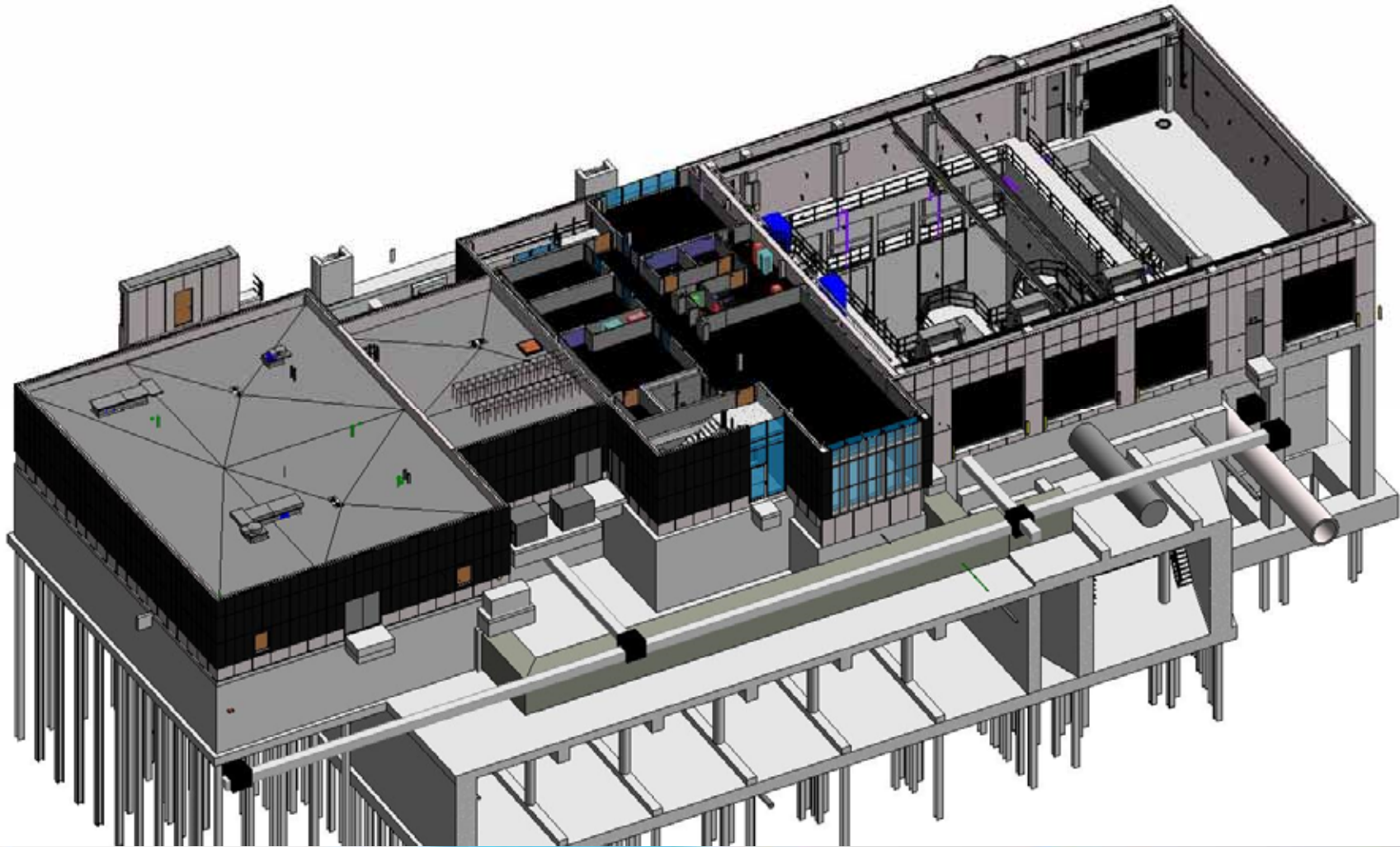
Building Basement Floors



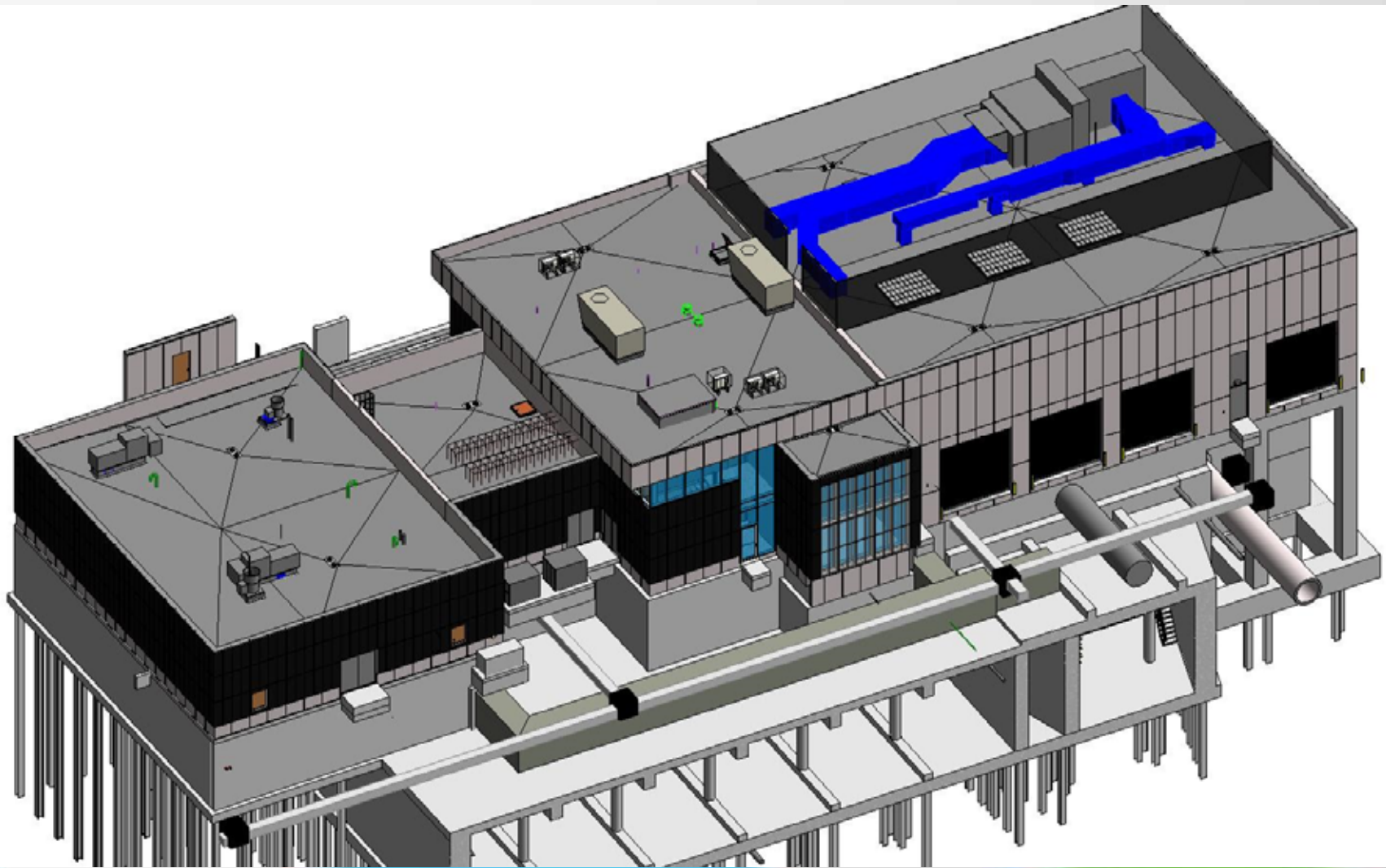
Building Intermediate Levels



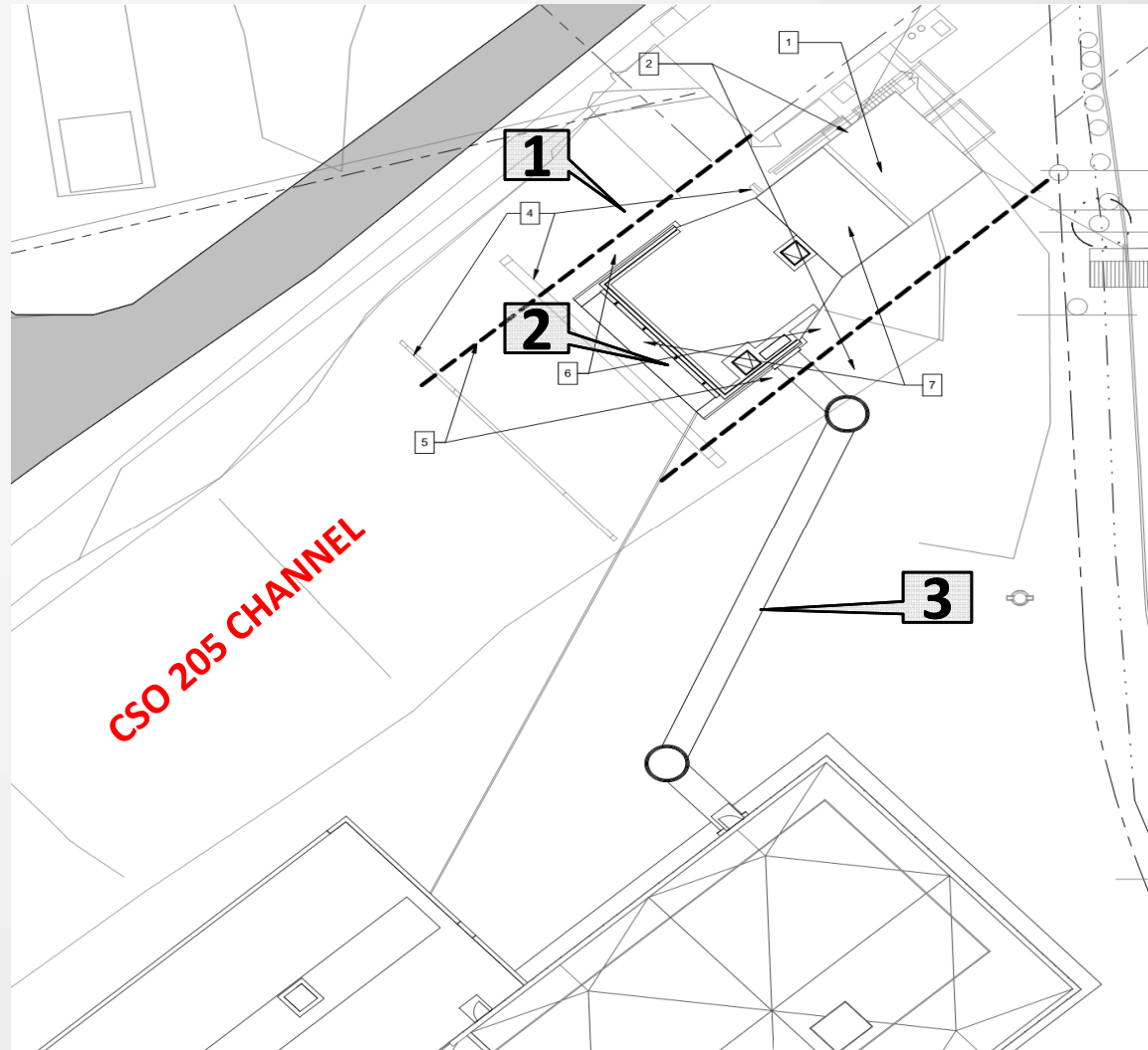
Building Intermediate Levels



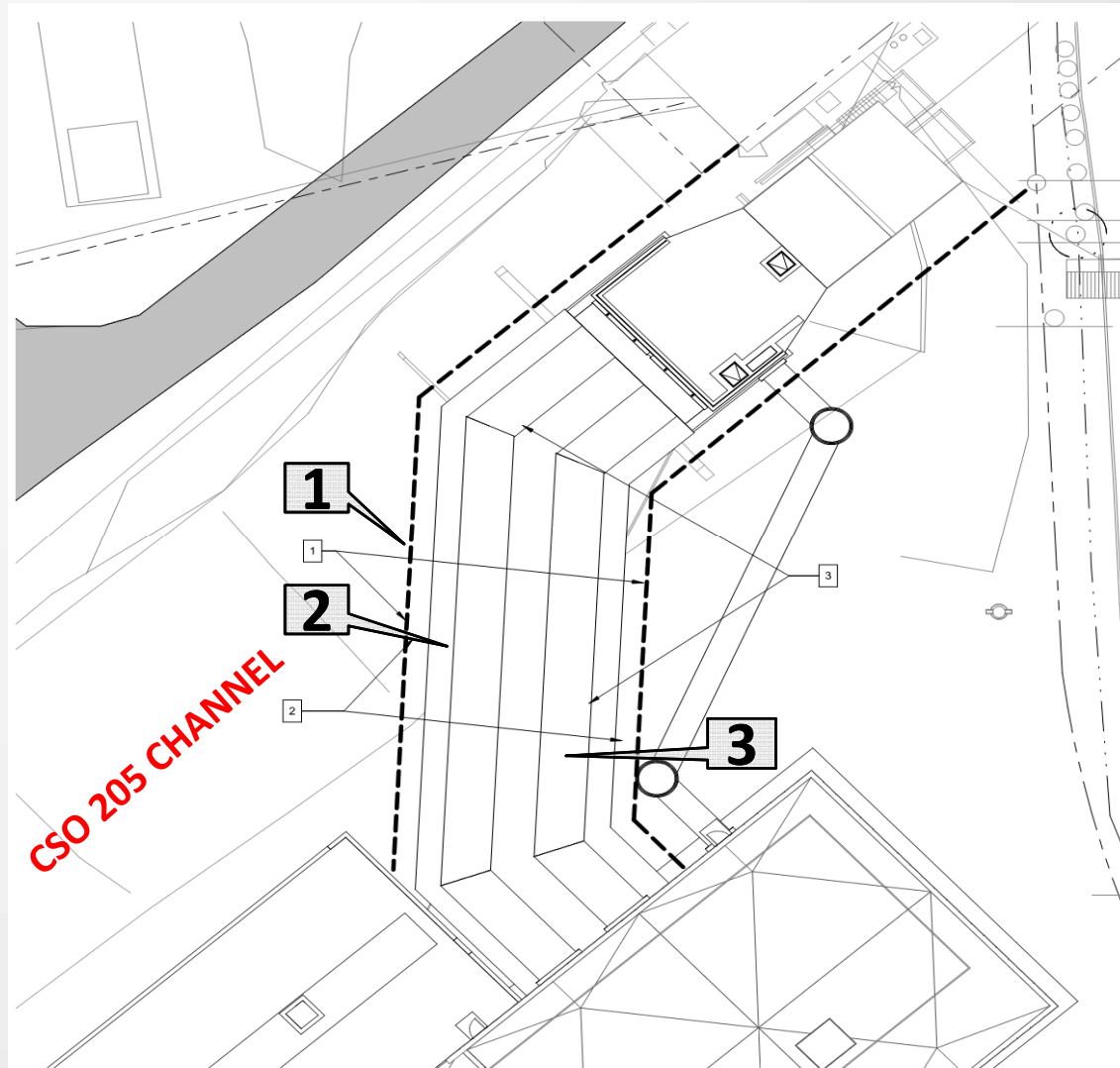
Buildings Complete



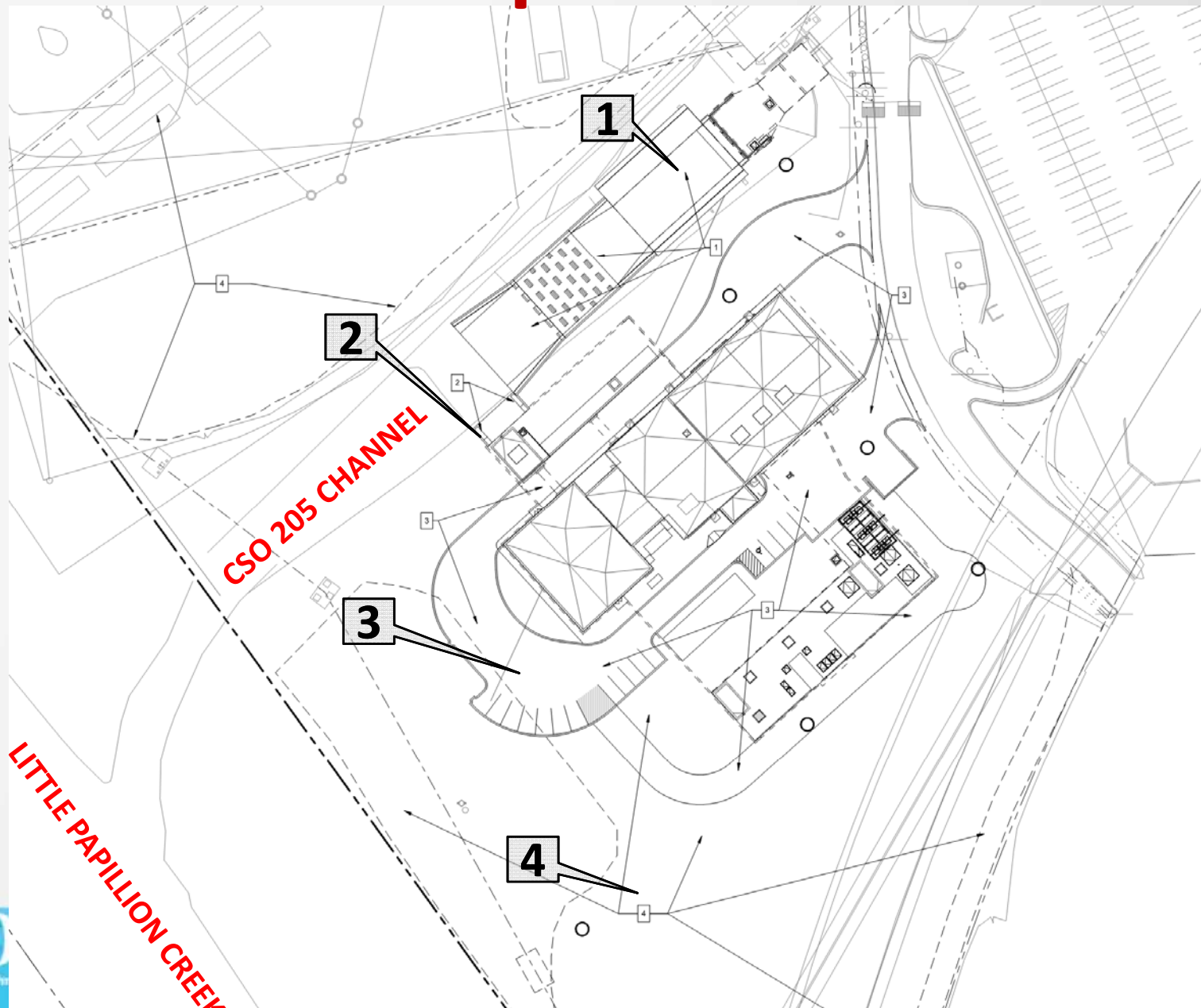
Diversion Structure



Influent Sewers



Site Improvements

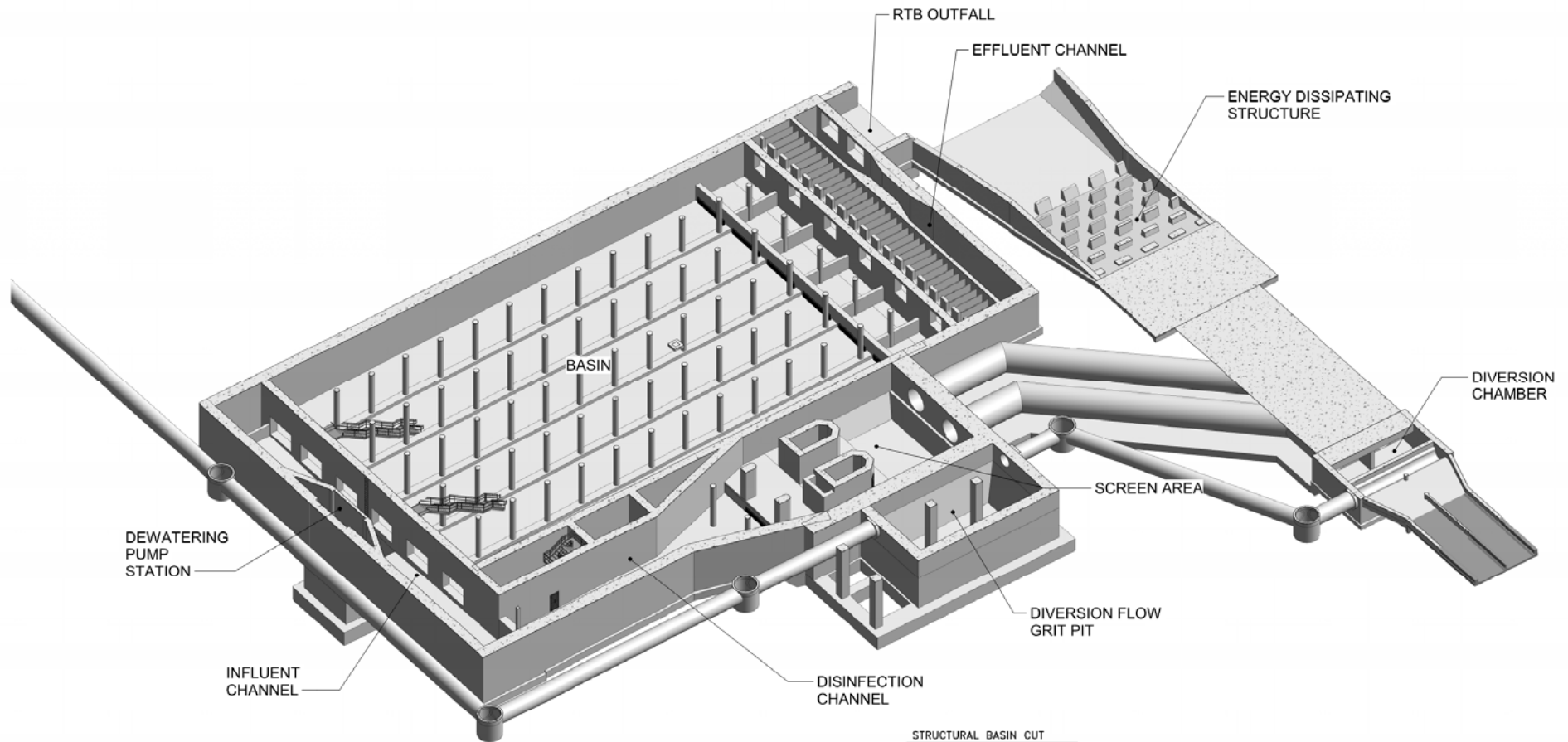




Concrete Work

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Concrete Placements



Concrete

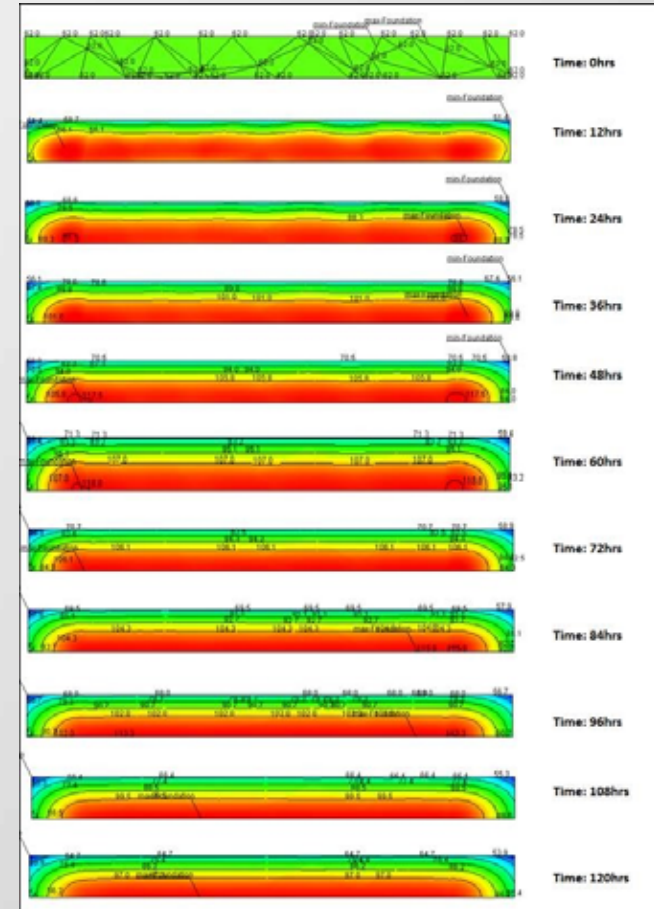
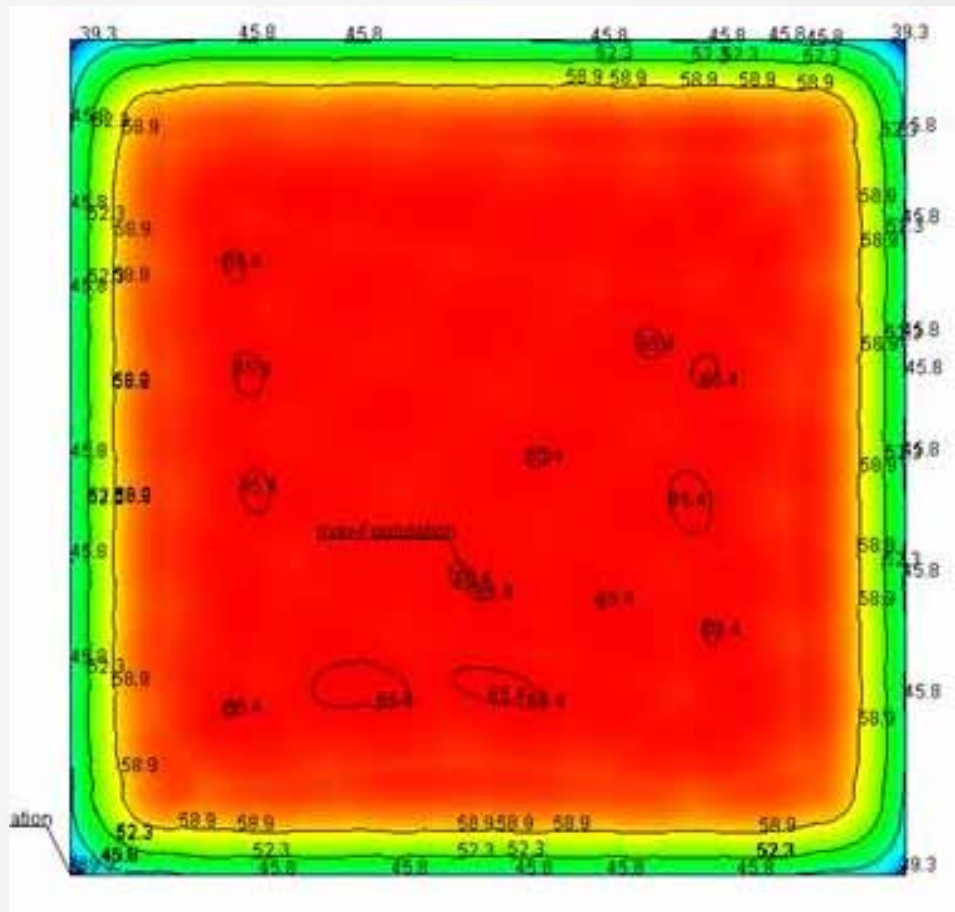
- Requirements for Water Containing Structures
 - ACI 350
 - Crack Control
 - Durability
 - Joint Spacing
 - Finish Requirements



Mass Concrete

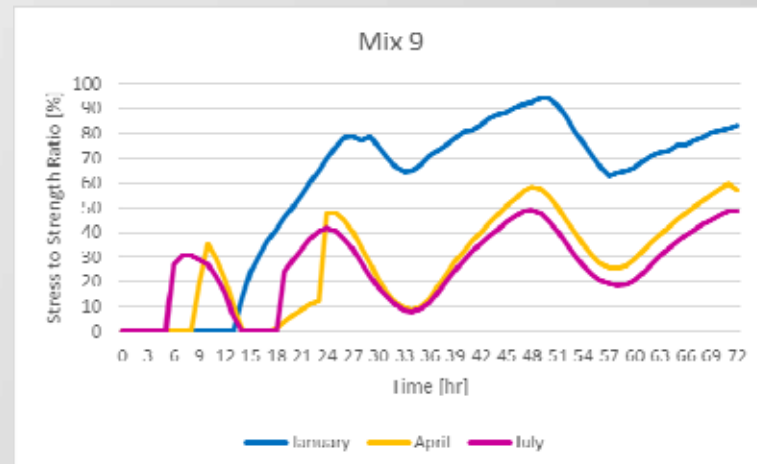
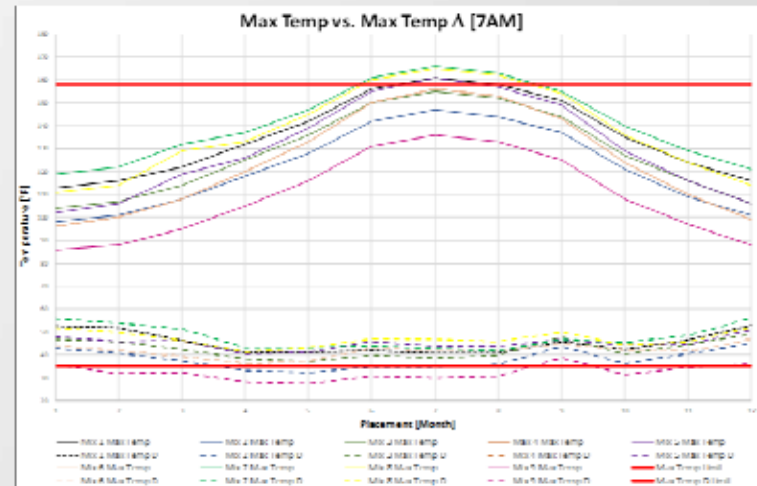


Mass Concrete Temperature Control



Mass Concrete Design

- Mix Design Optimization
- Temperature Limitations
- Cracking Sensitivity
- Performance Criteria



Mass Concrete Performance Criteria

- Water cement ratio ~ 0.42
- Strength requirement of 5000 psi, 56 days
- Required SCM's
 - 25% to 50% Class F fly ash
 - 40 to 75% GGBFS; or combination
- Temp limits
 - Max temp in concrete during cure ~ 158 degrees
 - Temp differential ~ 35 degrees
 - Max temp of concrete at placement – 90 degrees
- Shrinkage limits

Thermal Control Plan

- Mix Design
- Thermal Modeling
- Placement Plan
- Monitoring Procedures
- Methods for Field Control of Temperatures



Concrete Supplier Outreach



Concrete Testing

- Owner Field QA Testing
- Contractor QC Testing
- Contractor Thermal Monitoring
- Hydrostatic Leak Testing



Summary of Thermal Crack Control

- Monitor and Limit Differential and Max temperature
- Limit Thermal Cracking
 - Mix Design
 - Mix temp at placement
 - Insulation
 - Post-placement cooling
 - Placement constraints

Crack Allowance





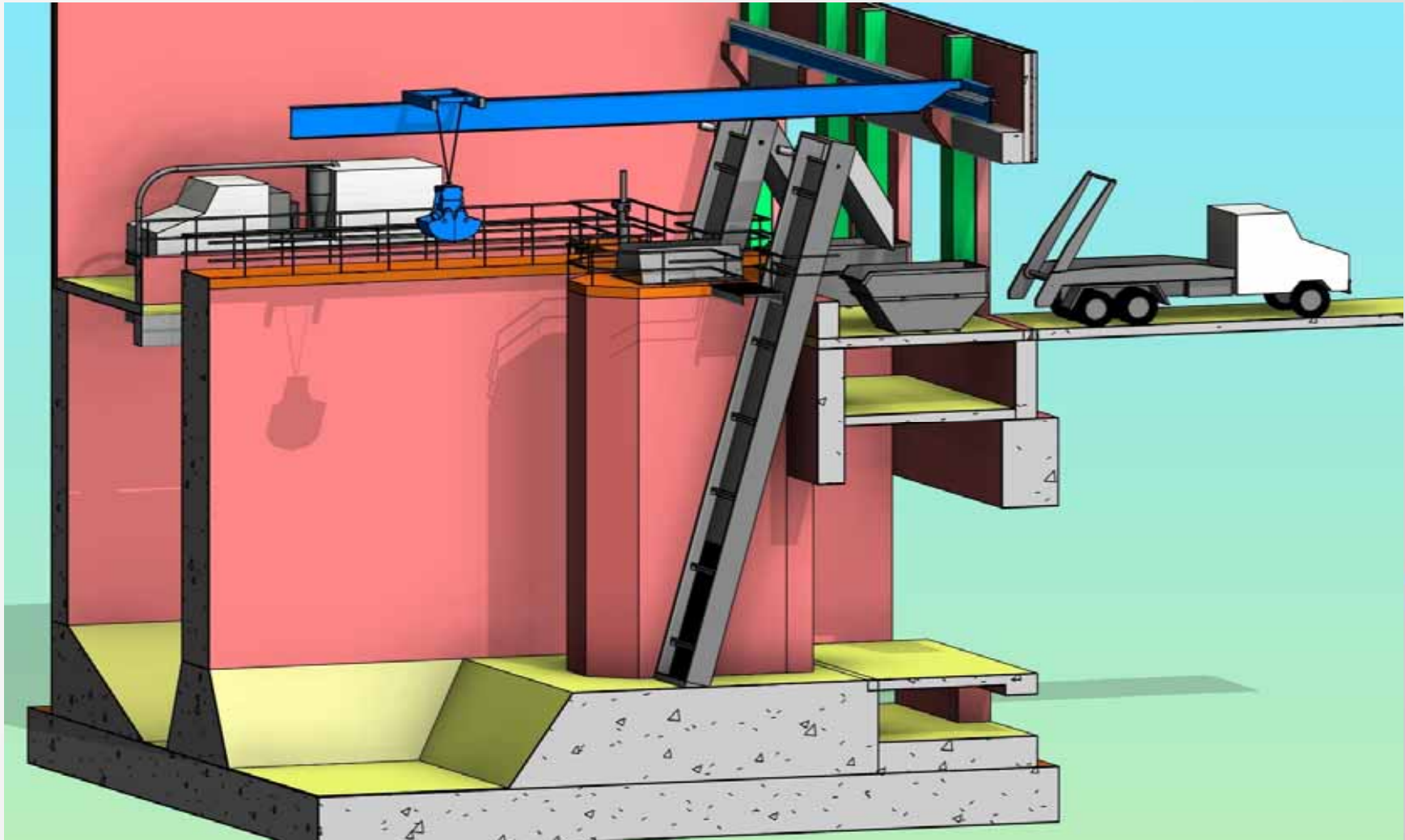
Process Overview and Equipment Requirements

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Process Equipment

- Gates – Isolation and Backwater
- Screens
- Clam Shell
- Chemical Storage, Feed Pumps and Mixers
- Flushing Gates
- Pumps
- Ventilation Fans
- Odor Control Fans and Units

Headworks Operations



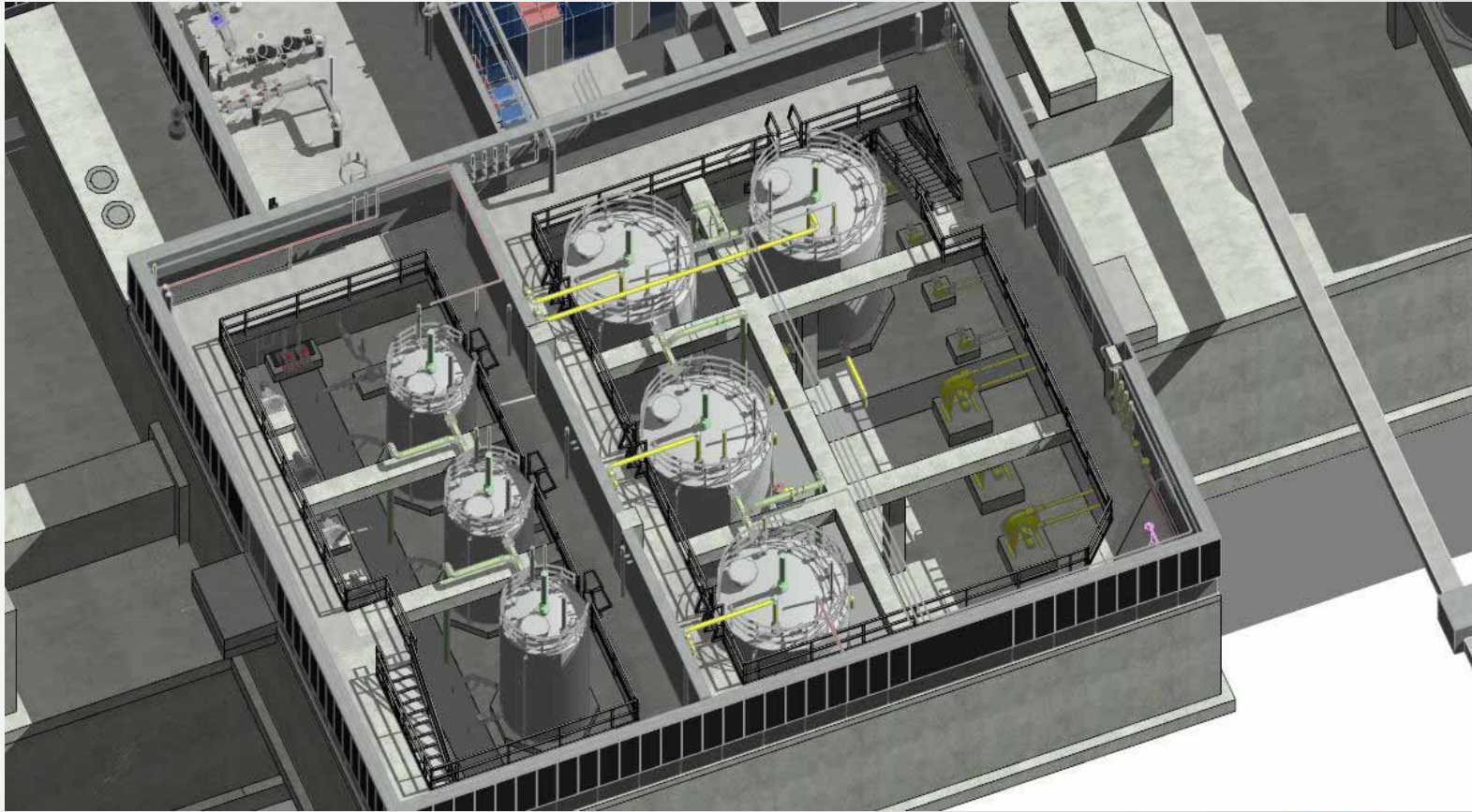
Screens



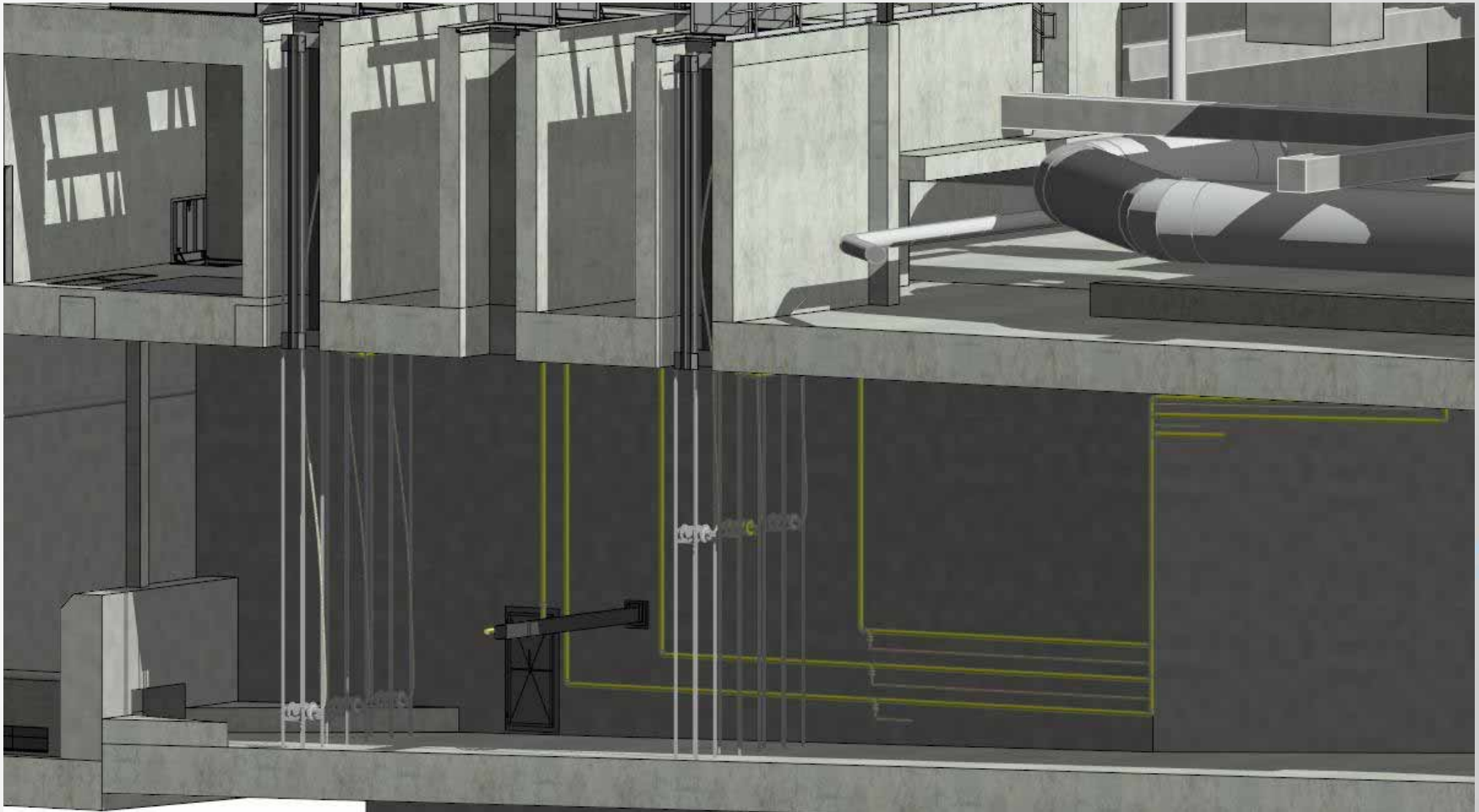
Lugger Containers



Chemical Storage



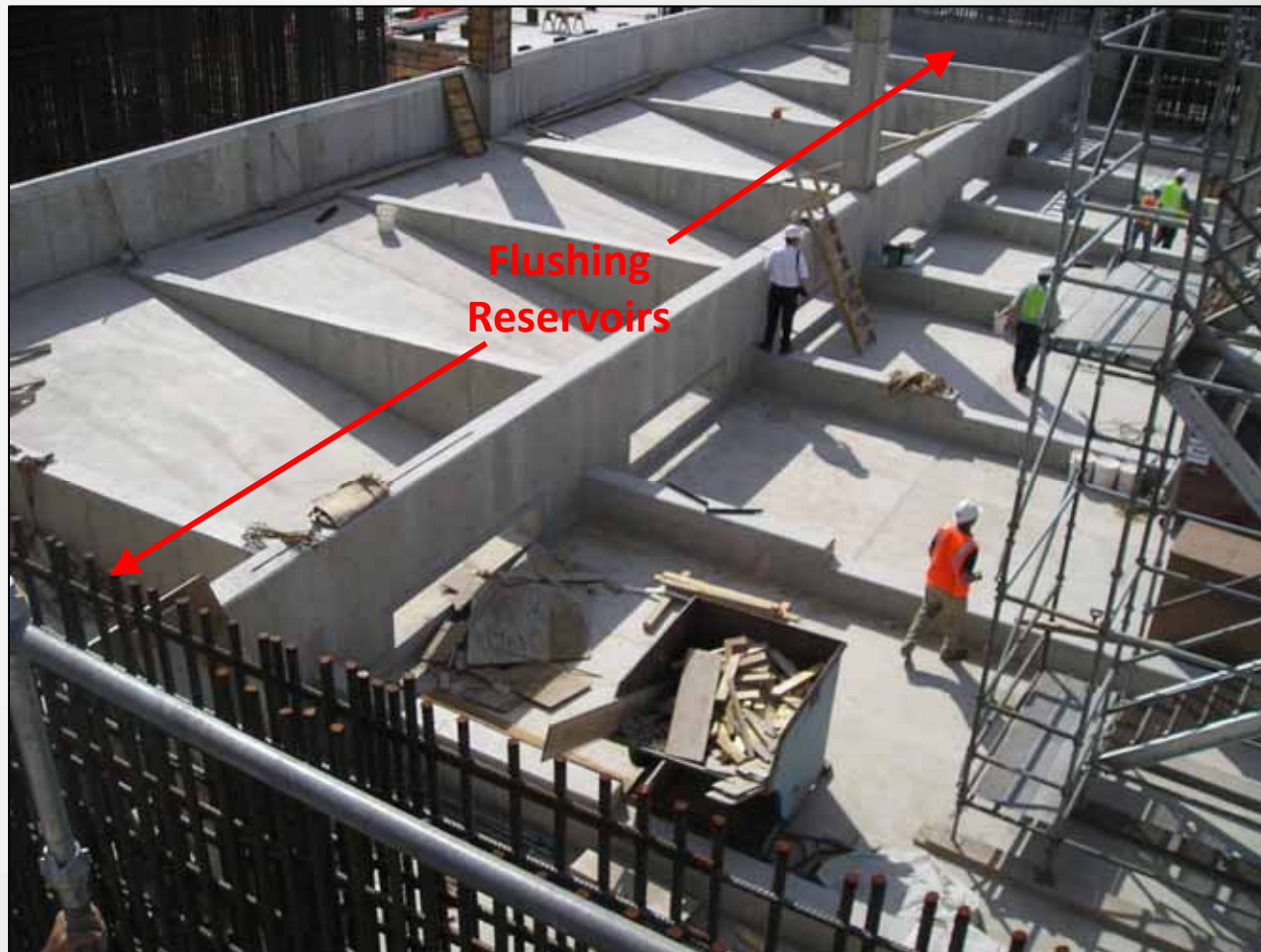
Chemical Feed System



Pumping Equipment



Flushing Gates



Flushing Gates



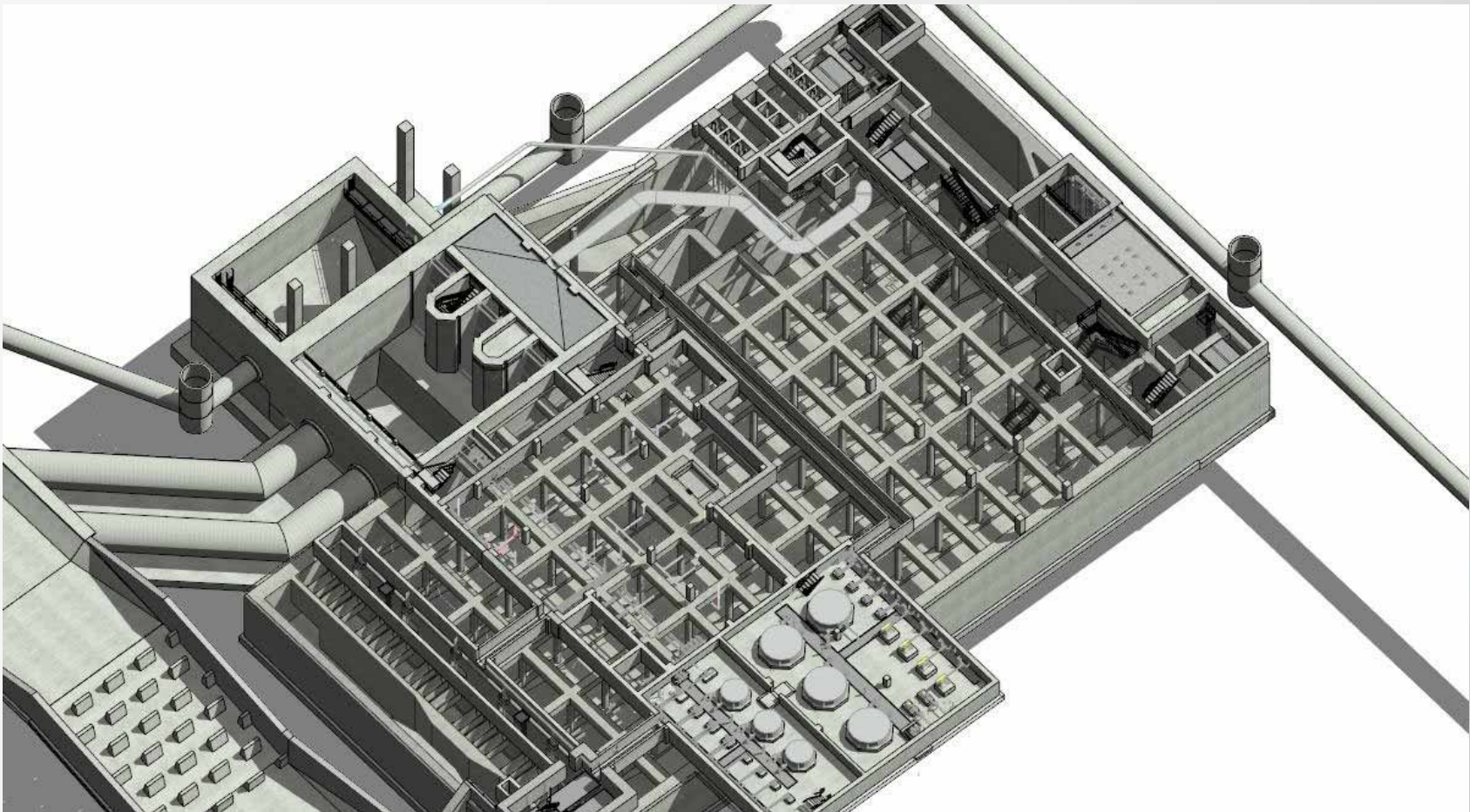
Flushing Gates



Odor Control



Ventilation Fans and Louvers



Integration Scope of Services

- Sole Source Procurement Assigned to Prime
- Labor
- Equipment (PLC and Instrumentation)
- Hardware and Software
- Programming Services
- Testing and Commissioning Support

Facility Startup/Testing

- Off Site Simulated PLC Testing
- Functional Equipment Check Out
- On-Site Simulated Control System and Equipment Functional Testing

Clean and Dirty Water Facility Performance Testing

- Clean Water Test
- Dirty Water Test
 - Diversion System
 - Dry Weather Grit Pit
 - Dewatering Pumping System
 - Flushing Systems

Owner Wet Weather Startup/Testing

- By Owner, after Substantial Completion
- Using Real Chemicals
- During Real Storm Events
- Overall assessment of the system working performance and ability to meet permit requirements

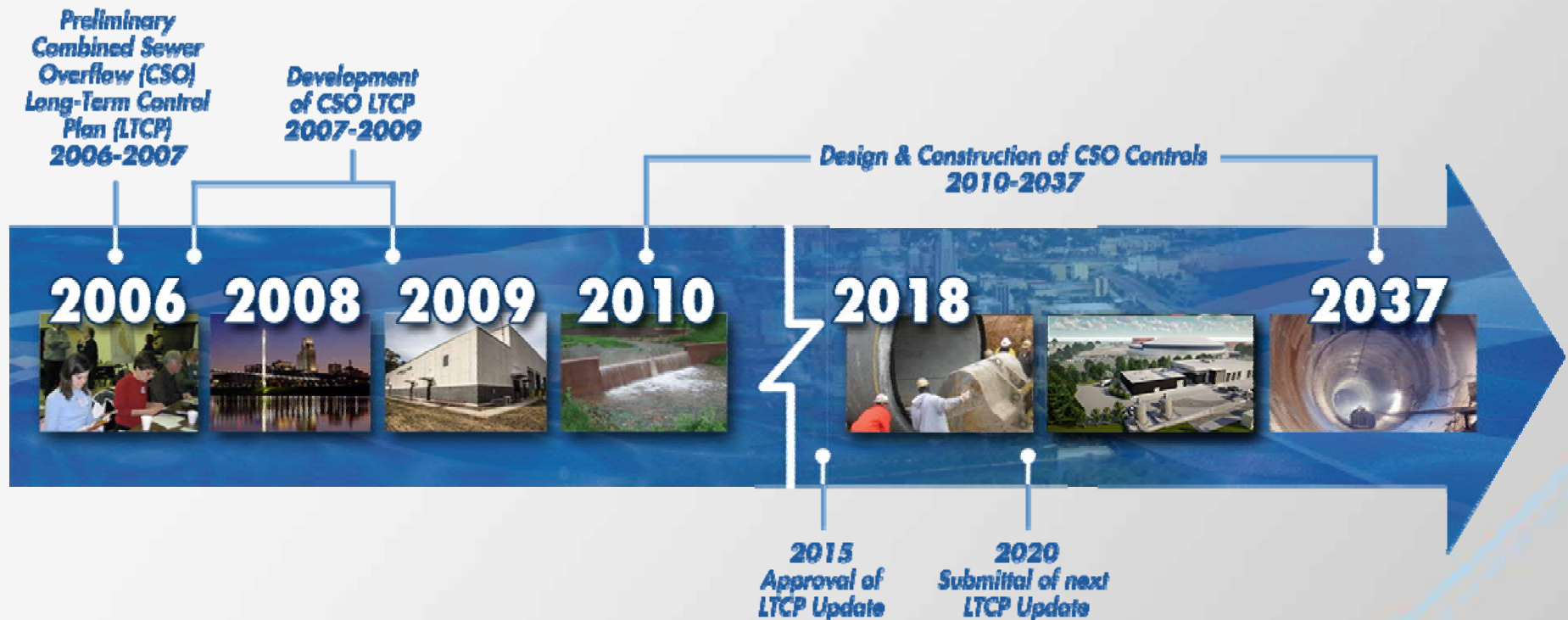
NOT IN
CONTRACT



Upcoming CSO Program Work

CSO!
Clean Solutions for Omaha

CSO Program Schedule



<http://omahacso.com/resources/contractors-corner/>

CSO Program Progress

- Program Implementation Started in 2009
- Current Program Estimated Cost is \$2B

Categories	April 2018 Costs
Completed Projects	\$287,314,669
Projects in Bid/Construction	\$118,904,702
Projects in Design	\$209,100,345
Paid Out for Construction To-Date	\$377,313,898

Additional CSO Facility Projects

2018

- April 2018 – Burt-Izard Lift Station
- July/Aug 2018 – Riverview Lift Station
- 3 other sewer separation projects

Future Facility Projects

- Monroe Lift Station Improvements
- Deep Tunnel Diversion/Grit Facilities
- Deep Tunnel Lift Station
- Deep Tunnel RTB
- CSO Storage Tanks



Other Facility Projects

- City of Omaha Master Plan for the WRRFs
- MRWRRF (Missouri River Water Resource Recovery Facility) Improvements
- PCWRRF (Papillion Creek Water Resource Recovery Facility) Improvements



OmahaCSO.com Contractor's Corner

WELCOME!

The CSO Program is designed to improve the water quality in our local rivers and streams.

Today, approximately 52 times each year, raw sewage mixed with stormwater flows into the Missouri River and the Papillion Creek. Through the CSO Program, we will reduce that number.

WORK IN YOUR AREA

Visit the [Omaha CSO Interactive Project Map](#) for specific information for CSO Program projects in or around your neighborhood.

CURRENT PROGRAM HIGHLIGHTS

- The [Spring Lake Park Green Infrastructure Project](#) has received another regional award from the Central States – American Society of Landscape Architects awards program. The project previously received a Merit Award in the Planning and Analysis category. This year, the completed phase-one project won an award in the Built Project category. Congratulations to the City, Program Management Team and design team partners on receiving this award!
- Contractor engagement during final design for [Riverview Lift Station](#) was completed this month. This included meetings with several general contractors to detail the upcoming construction bid opportunity.
- Substantial completion for the [Gilmore Avenue Sewer Separation](#) was achieved in December, 2017.
- Design proposals are under review for [Papillion Creek North 210 Sewer Separation Project](#) and for the [18th and Fort Street Sewer Improvement Project](#). Selection of design consultants will occur in the next few months.

UPCOMING EVENTS

[Nicholas Street Sewer Separation Phase](#)

[3](#)

Public Meeting

Thursday, April 19, 2018

6:30 – 8 p.m.

The Union for Contemporary Art

2423 North 24th Street

Omaha, NE

[Saddle Creek Retention Treatment Basin](#)

Industry Day

Thursday, April 26, 2018

10 a.m. – 3 p.m.

Scott Conference Center

6450 Pine Street Omaha, NE 68106

[Preliminary Agenda](#)





Questions and Open Discussion

CSO!
Clean Solutions for Omaha

Project Website:
<http://www.omahacso.com/projects/saddlecreekrtb/>

Project Factsheet and Contractor's Corner Sheets

Saddle Creek Retention Treatment Basin Contractor's Corner



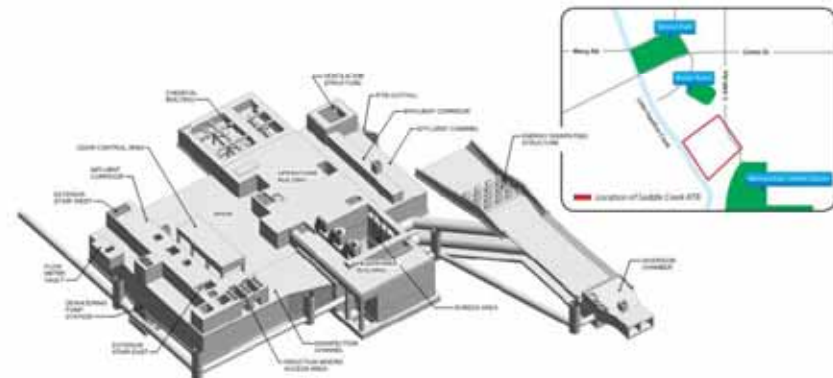
Introduction and Background Information

This project involves construction of the OPW 52049 City of Omaha Saddle Creek Retention Treatment Basin (RTB). The proposed facility will be located just south of 64th Avenue and Dupont Street near a Metropolitan Utilities District (MUD) facility and the University of Nebraska-Omaha (UNO) Baxter Arena.

This project was originally bid in 2015 as a 315 MGD facility. The City of Omaha elected not to proceed with construction of the facility at that time due to budgetary constraints. A Value Engineering process was completed in 2016 and the project is now in design to incorporate cost savings recommendations.

Facility Description

The RTB project is basically a treatment plant for combined sewage. When in operation, all combined sewage entering the Saddle Creek RTB will receive grit and screenings removal, disinfection, solids settling, and dechlorination before being discharged to the Little Papillon Creek (LPC). Captured volume in the tank will be pumped into the Papillon Creek Interceptor and conveyed to the Papillon Creek Water Resource Recovery Facility (PCWRRF) for full secondary treatment. The facility will result in a significant reduction in the volume of untreated CSO, total suspended solids (TSS), and E. coli bacteria entering the LPC. Flows in excess of the facility capacity will be routed around the RTB and discharged into the LPC.



The figure above provides an overview of the underground Saddle Creek RTB features. At the diversion structure, the facility will divert wet weather flow from the existing combined sewage channel to the facility headworks where large grit and floatable solids are removed via the grit pit and mechanical screens. At this point in the process disinfection will take place to eliminate bacteria. The disinfection channel will convey flows from the headworks area to the settling basin. An effluent channel is provided for discharge of stored combined sewage flow back to the CSO 205 outfall in the Papillon Creek.

The RTB will use pumps to empty the facility after a storm event ends. Dewatering pumps will convey captured combined sewage volume into the downstream Papillon Creek Interceptor sewer for subsequent treatment at the PCWRRF. A separate 60-inch diversion sewer is also provided with an independent grit removal facility for mostly dry weather flows, which are also sent directly to the Papillon Creek Interceptor.

Questions / Contacts

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Site Visit

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