

MORSE LAKE PUMPING PLANT (MLPP) REPLACEMENT PROJECT



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BHC
CONSULTANTS

ReidMiddleton

Seattle
Public
Utilities

PROJECT TEAM

- **Owner** – Seattle Public Utilities
- **Project Management** – BHC Consultants
- **Marine Structures** – Reid Middleton
- **Prime Consultant** – AECOM
- **Pumps/Pipeline** – JACOBS
- **Civil/Channel Work** – CivilTech
- **Electrical** – AECOM

- **CM Team** – KBA/SPU/Otto Roseneau
- **General Contractor** – Orion Marine Group
- **Electrical Contractor** – Valley Electric

Seattle
 Public
Utilities


CONSULTANTS







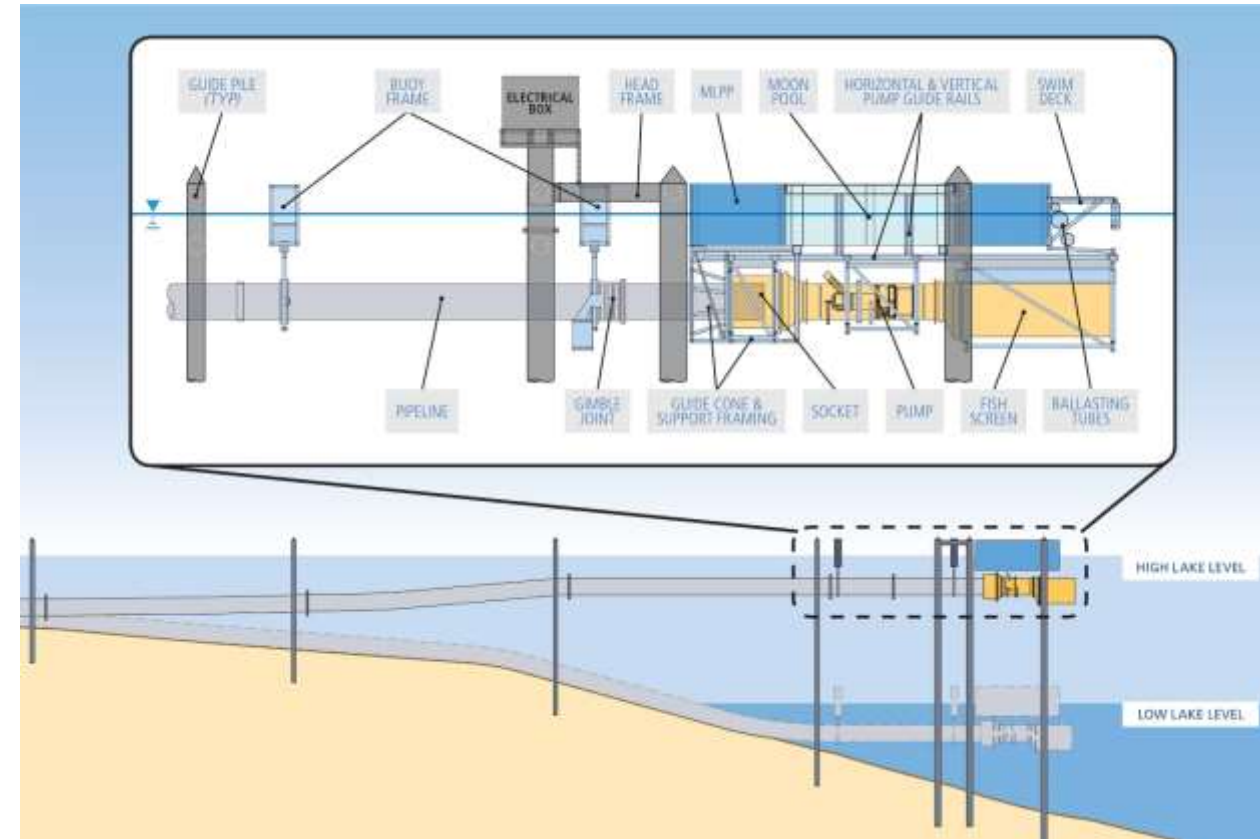




OVERVIEW

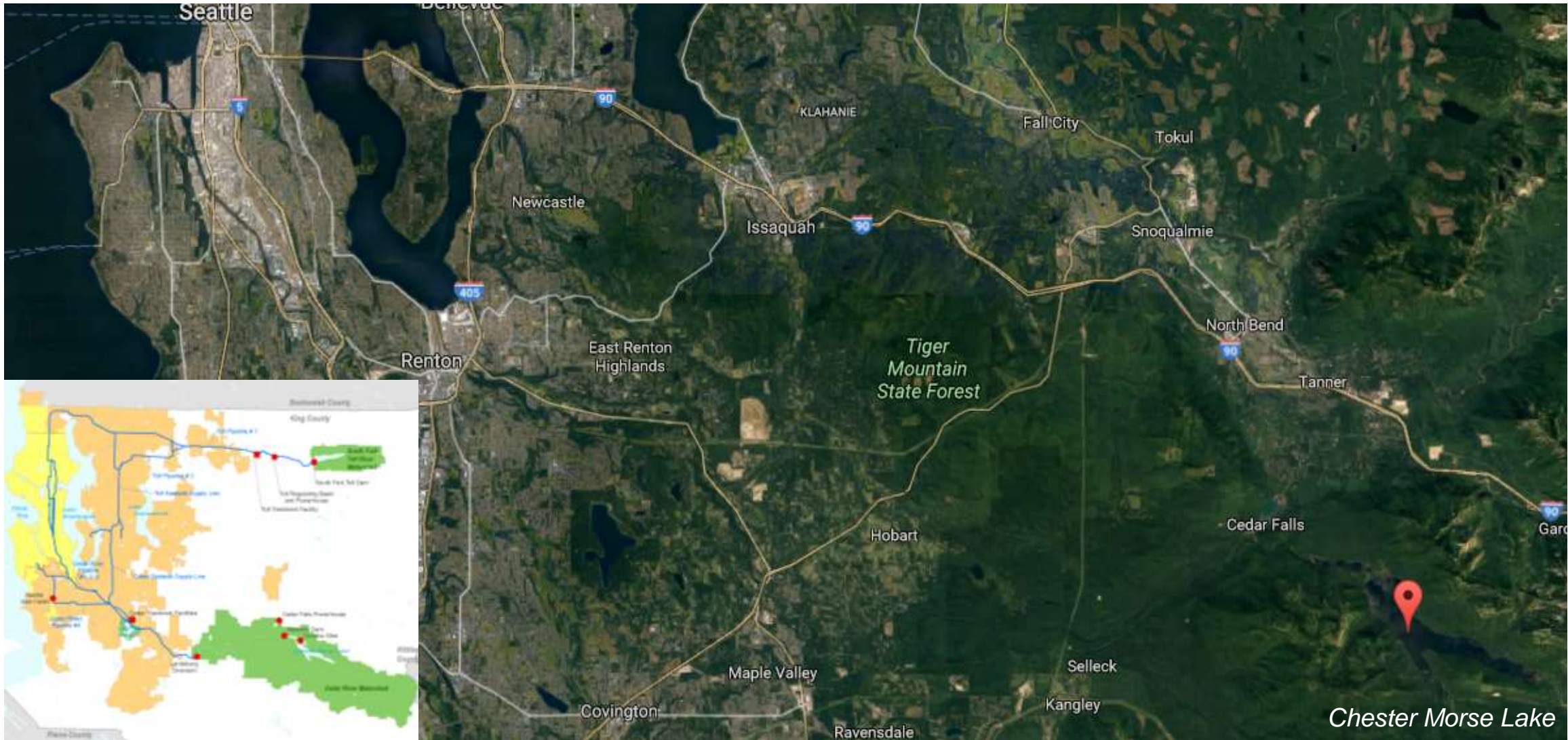
Presentation Outline

- Overview and Project Need
- Pumps and Pipelines
- Power Supply
- Marine Structures
- Construction Constraints
- Lessons Learned



OVERVIEW

Project Location



OVERVIEW

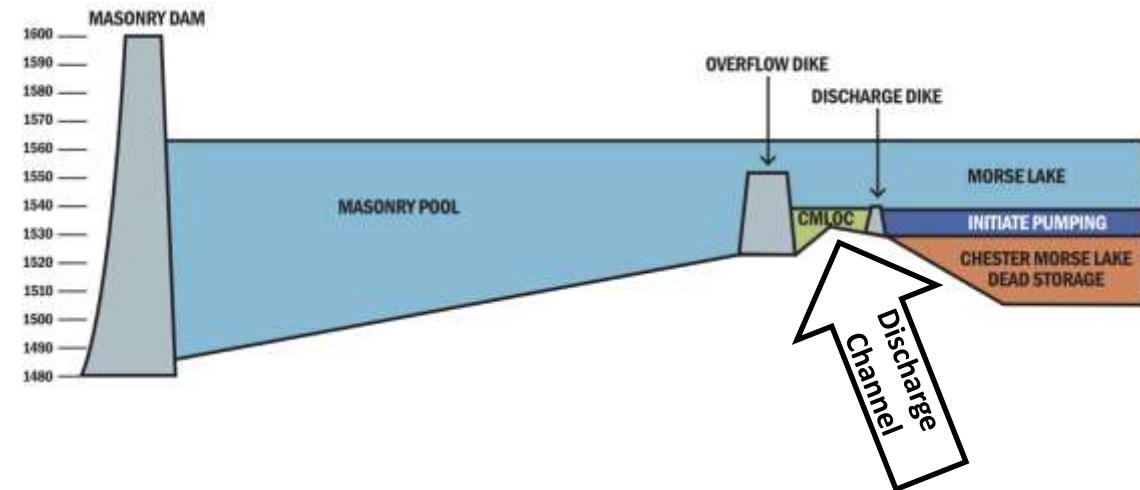
Project Objectives

- Lake Features

- Lake Dead Storage
- Discharge Dike
- Chester Morse Lake Outlet Channel (CMLOC)
- Overflow Dike
- Masonry Dam

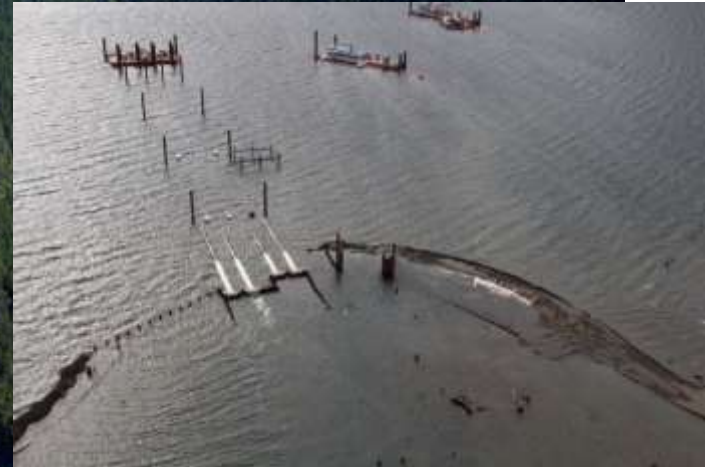
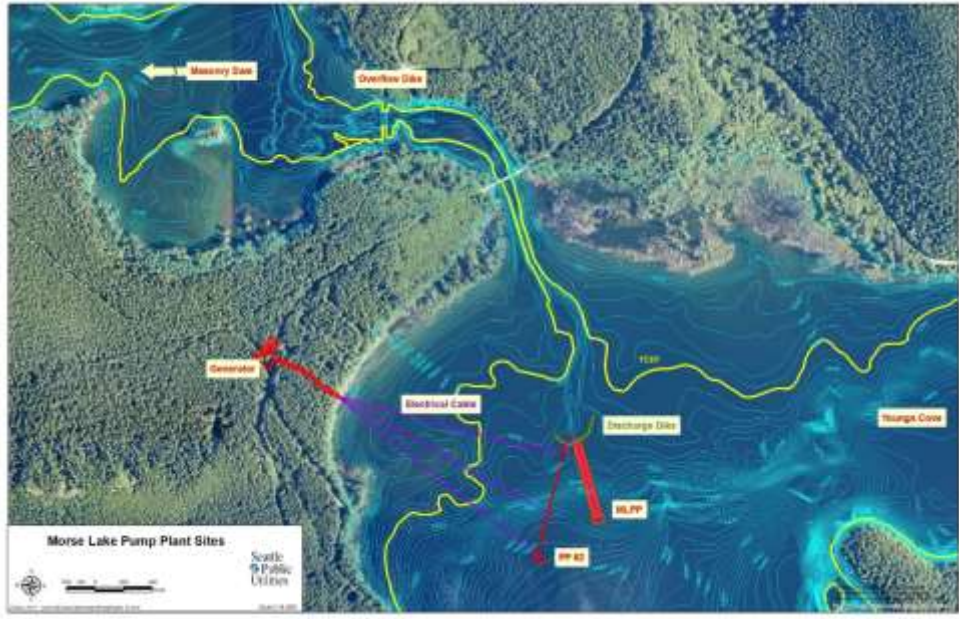
- Primary Objective - Replacement

- Pump 240 MGD from Morse Lake into Masonry Pool
- Access to Stored Water to satisfy in-stream flow commitments on the Cedar River (EL 1532'-1538')
- Provide access to stored water (< EL 1532')
- Replace existing pumping plant
- Upgrade CMLOC to allow flow



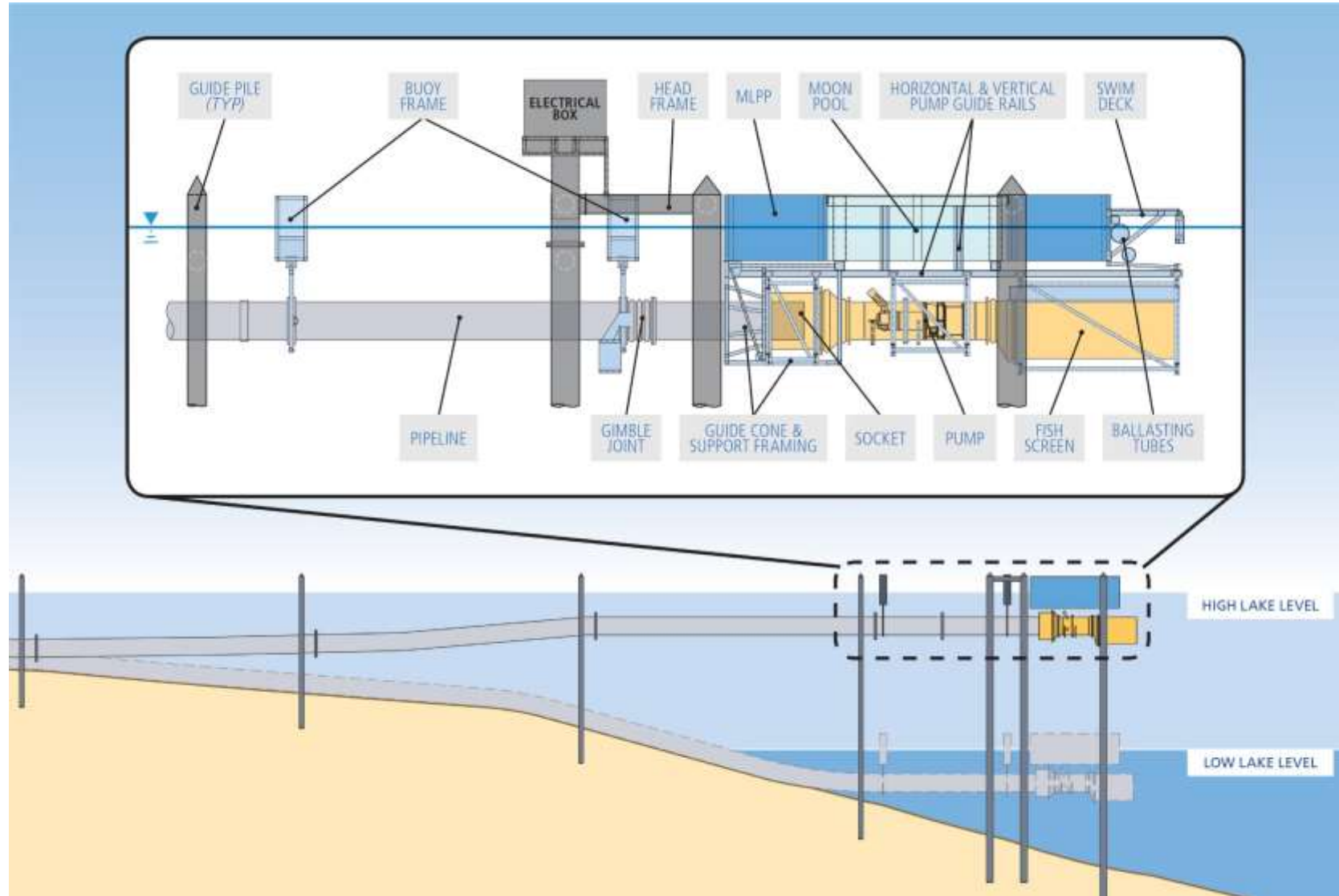
OVERVIEW

MLPP System



OVERVIEW

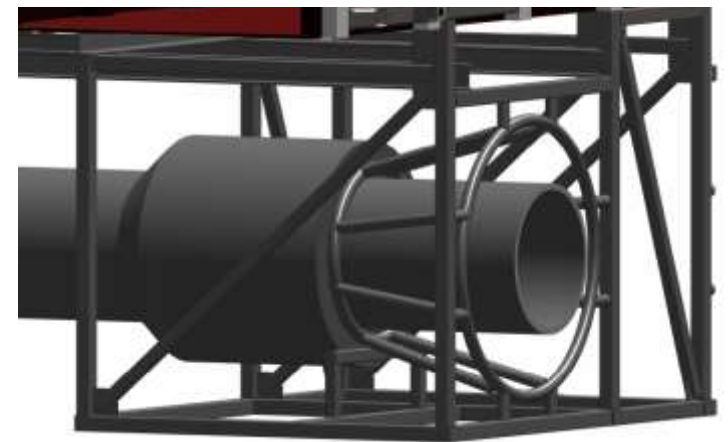
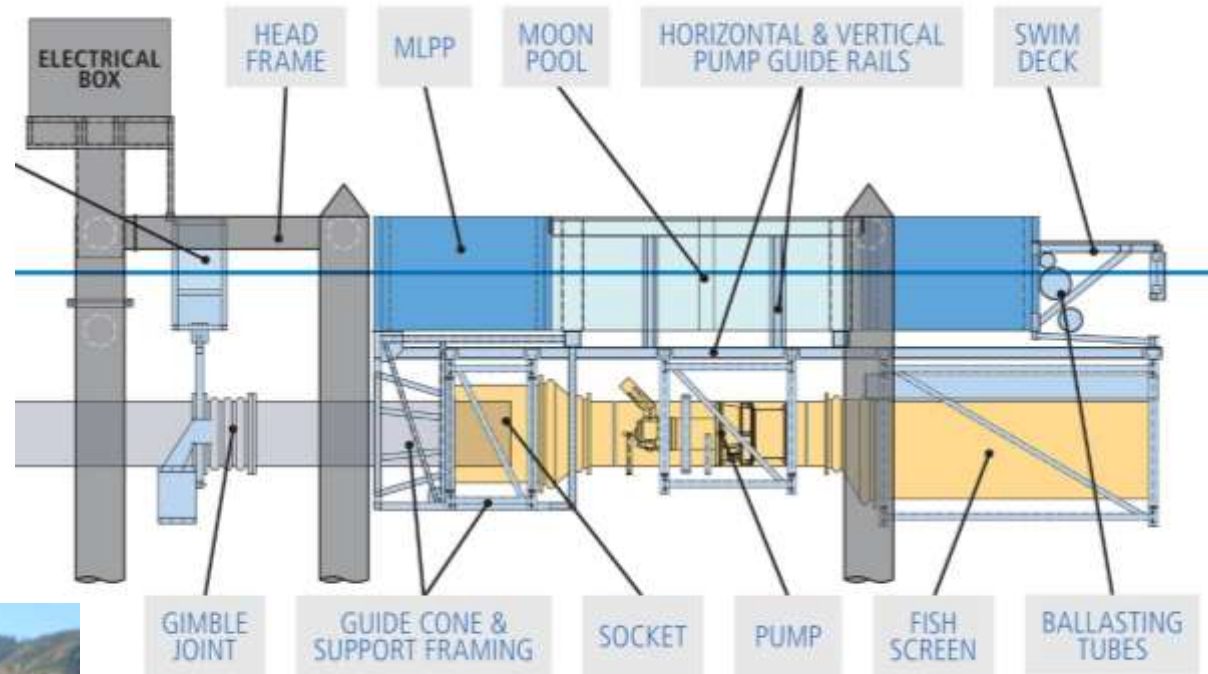
MLPP System



PUMPS AND PIPELINES

Pump System Features

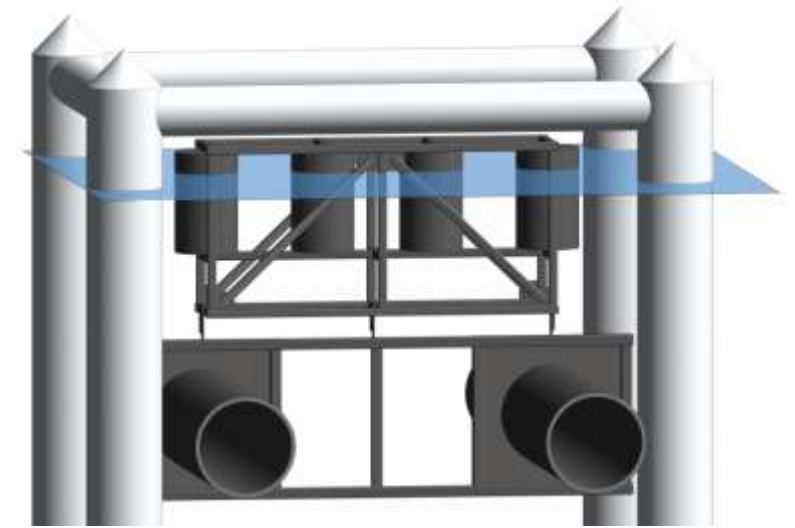
- Submerged Axial Flow Pumps
- Intake Screens
- Pipeline Socket Mating System
- Guide Cone
- Swim Deck



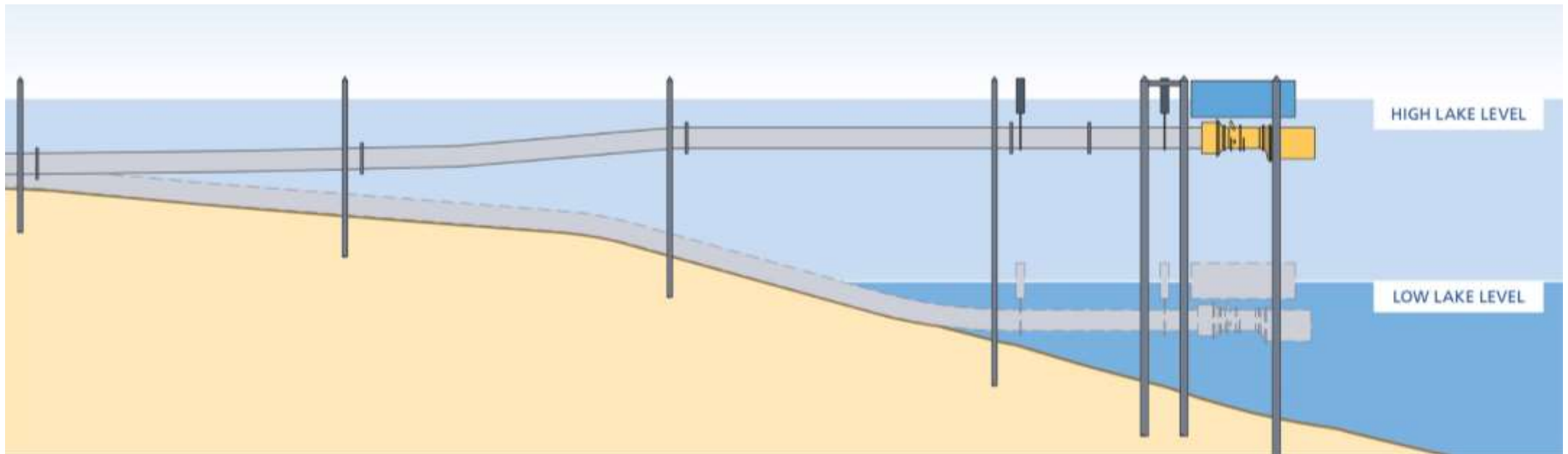
PUMPS AND PIPELINES

Pipeline Features

- (4) 48" Diameter HDPE Pipelines
- Submerged - Neutrally Buoyant
- Buoy Frames & Ballasting
- Flexible Linkages



Pipeline Buoy Frame



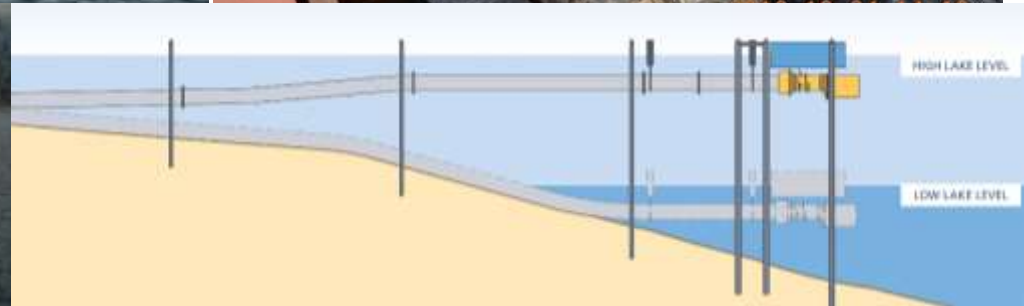
PUMPS AND PIPELINES

Pump Assembly



PUMPS AND PIPELINES

Pipelines



POWER SUPPLY

Electrical System Summary

- Unit Substation Trailer
- Generators & Fuel
- Cables
- Electrical Equipment Enclosure



POWER SUPPLY

Substation Trailer, Generators & Fuel



POWER SUPPLY

Cables



POWER SUPPLY

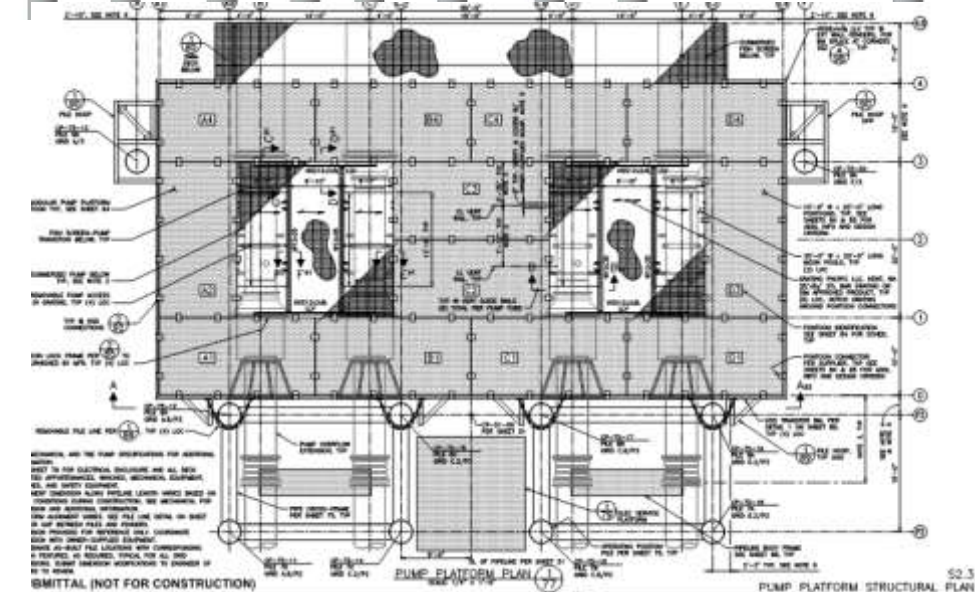
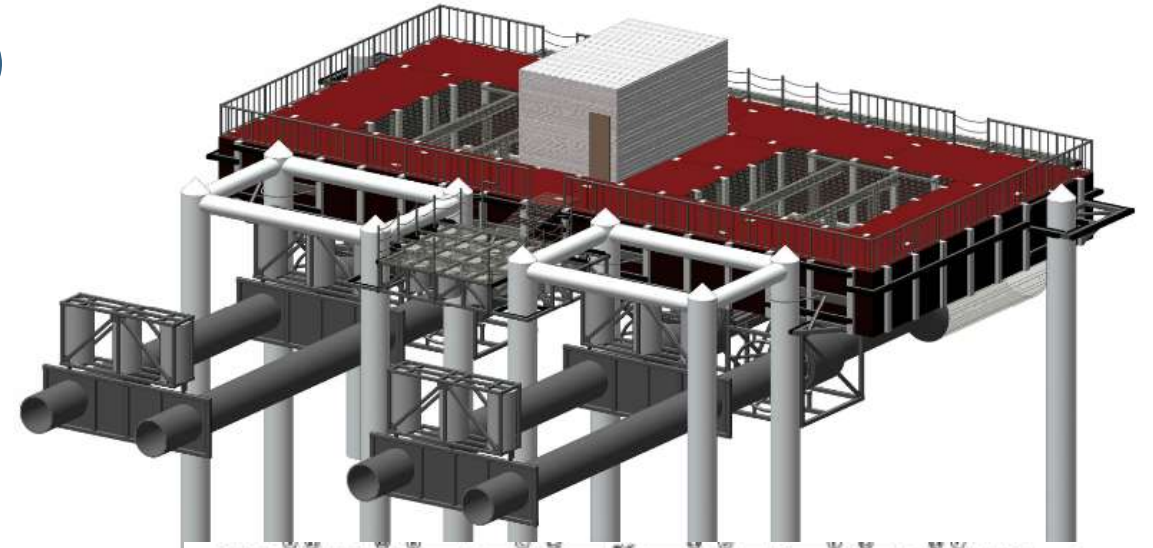
Pump Platform



MARINE STRUCTURES

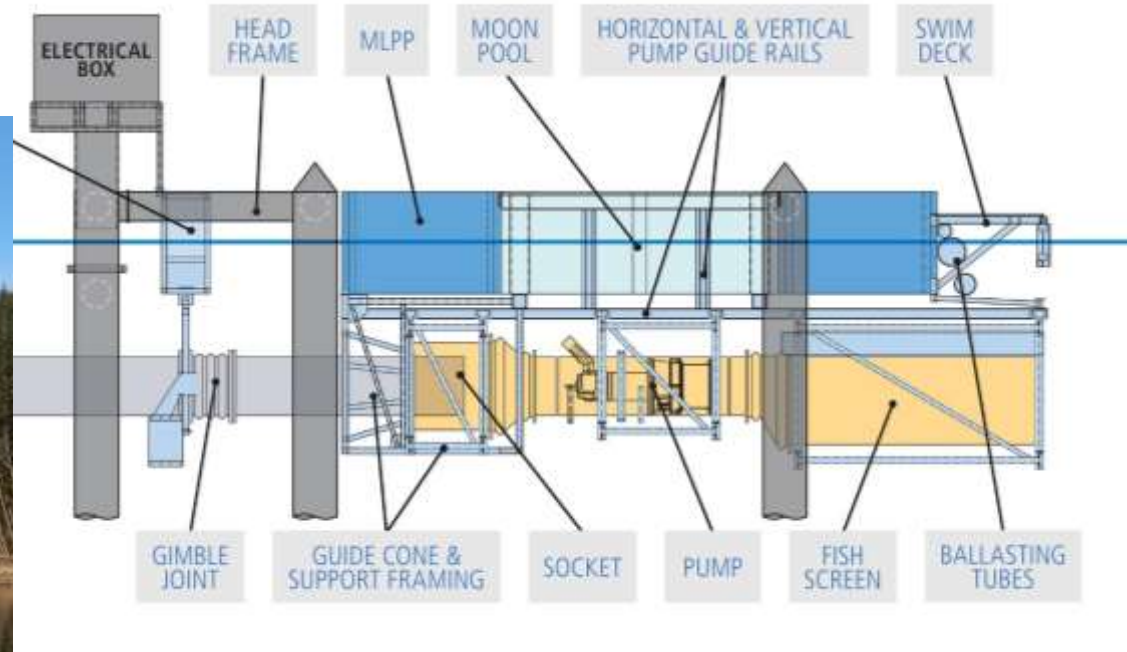
Pump Platform, Buoy Frames and Anchorage

- 40'x80' Footprint (Modular pontoons)
- Moon Pools
- Subframe & Guiderails
- Electrical Equipment Enclosure
- Anchorage Piles
- Pipeline Buoy Frames



MARINE STRUCTURES

Pump Platform



MARINE STRUCTURES

Platform Features



CONSTRUCTION CONSTRAINTS

Trucks and Disinfection



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CONSTRUCTION CONSTRAINTS

Equipment on Floating Platforms



CONSTRUCTION CONSTRAINTS

Half-acre of Floating Construction Platforms



CONSTRUCTION CONSTRAINTS

Divers to Assist in Underwater Work



CONSTRUCTION CONSTRAINTS

Water Levels



CONSTRUCTION CONSTRAINTS

Weather



LESSONS LEARNED

Team Approach

- One off Projects
 - Expect them to be difficult
 - Out-of-the-box solutions and cascading effects
- Maintain collaborative team approach
 - Uncommon level of collaboration between owner, contractor and design team was essential to the success of this project.
- Alternative contracting options



QUESTIONS?



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