



How to Cost Effectively Add Reliability to an Aging WTP

The Chehalis Experience

Kenny Packard
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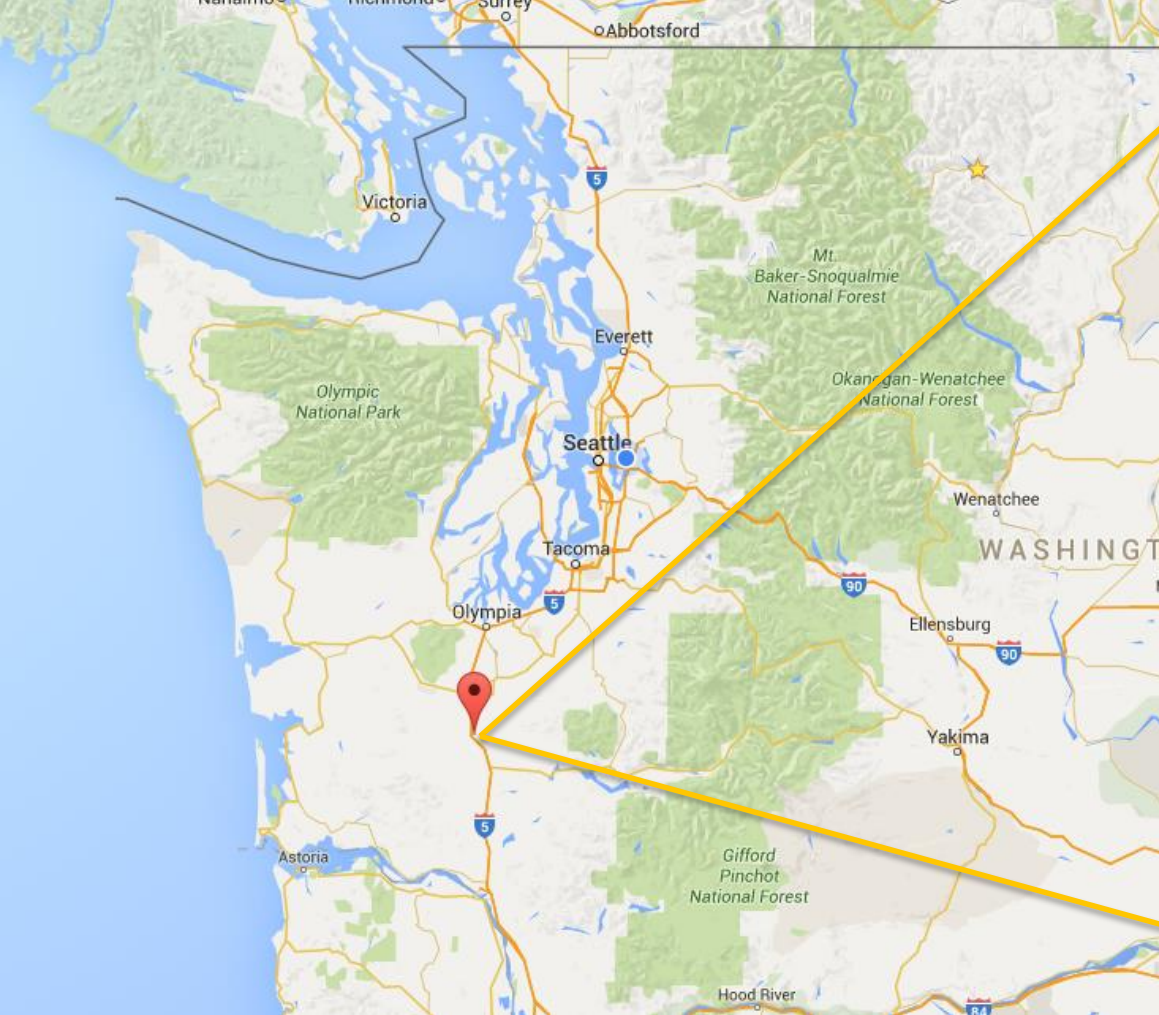


01 Existing WTP

02 Required Upgrades

03 Design Development

04 Project Challenges



Project Location:
City of Chehalis, WA
Population: 7,300



Major Unit Processes

- (1) Rapid Mix Basin
- (1) Two-Stage Flocculation Basin
- (1) Presedimentation Basin
- (2) Sedimentation Basins
- (2) Rapid Sand Filters

Chemical Systems

- Calcium Hypochlorite Saturator
- Gas Chlorine Backup
- Sumaclear 801B

Existing Water Treatment Plant

Built in 1961

2012 Comprehensive Performance Evaluation

- Third party study on the behalf of Washington State Department of Health.
- Identified short circuiting and other items to increase plant capacity.
- Identified flocculation as limiting unit process.

Capacity:



Demand (approx. MDD):



Funding:

Drinking Water State Revolving Fund

- Grant application and award in 2014.



The Project

A new pretreatment train

- Redundant Rapid Mix, Flocculation, and Presedimentation Basins.
- New chemical feed systems.
- Ability to operate in parallel with or independently from existing.
- Sized to match existing train.



Basin	Hydraulic Retention Time
EX Rapid Mix	30 seconds
EX Flocculation	(2) at 10 minutes each
Ex Presedimentation	13 minutes



Locating the Improvements

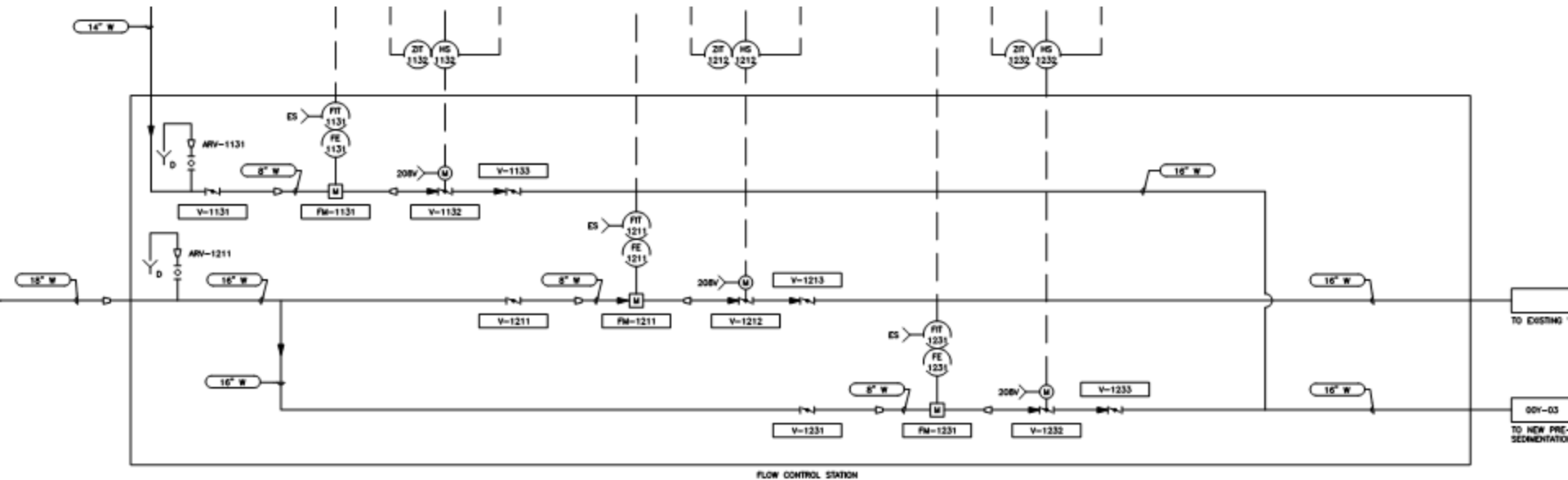


SE Par

Flow Control Building

- Automatically distributing flow from either forcemain to either rapid mix basin.

- Prefabricated building vs. below grade vault.



Geotechnical Information

Findings:

- Entire site is on fill.
- Fill is not adequate to support new basins.

Recommendations:

- Basins should be pile supported.
- Differential settlement will occur.



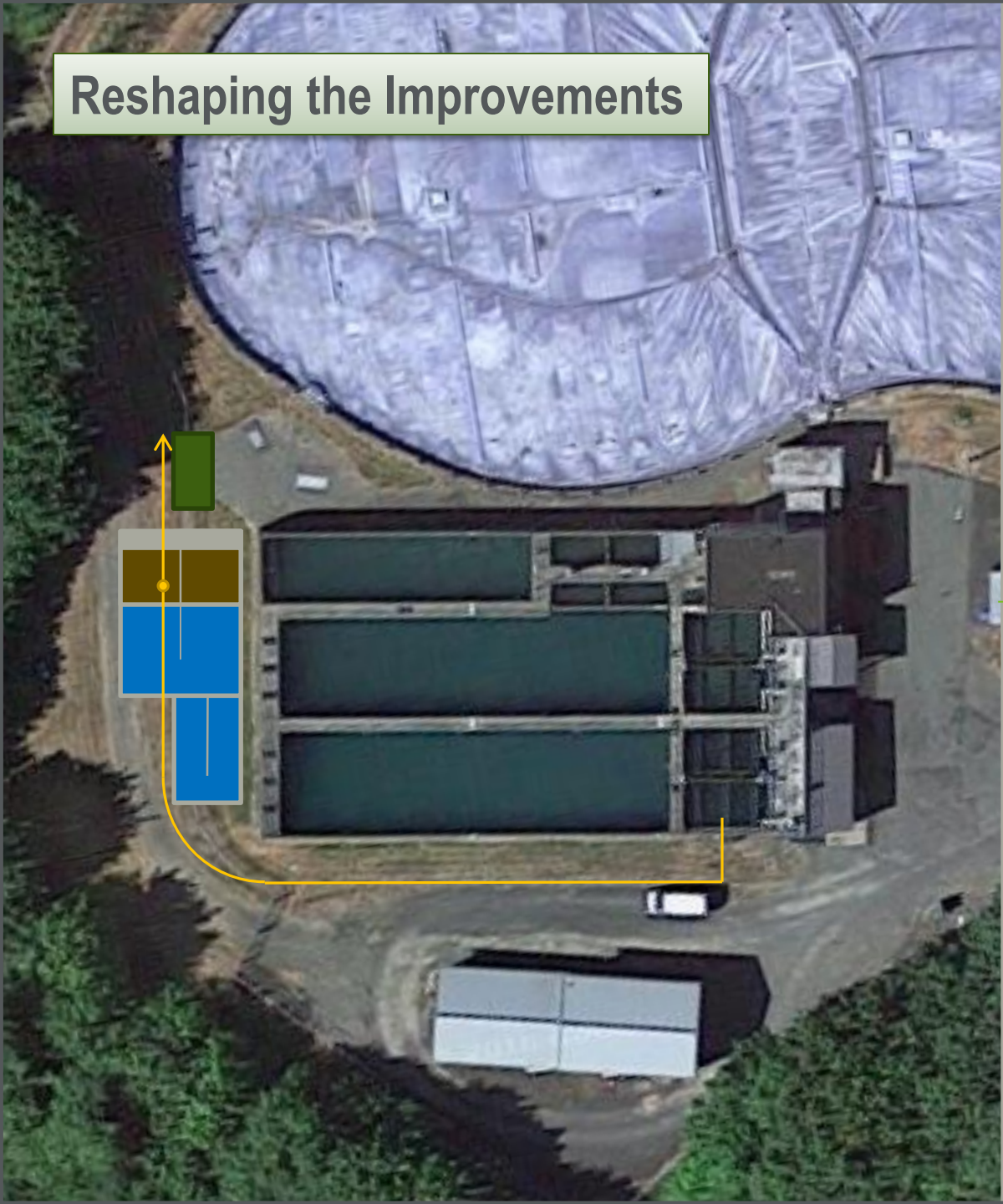
Pilings

- **(42)** 24-inch-diameter auger cast pilings.
- Each are 40 FT deep.

Drove the need for cost reductions



Reshaping the Improvements

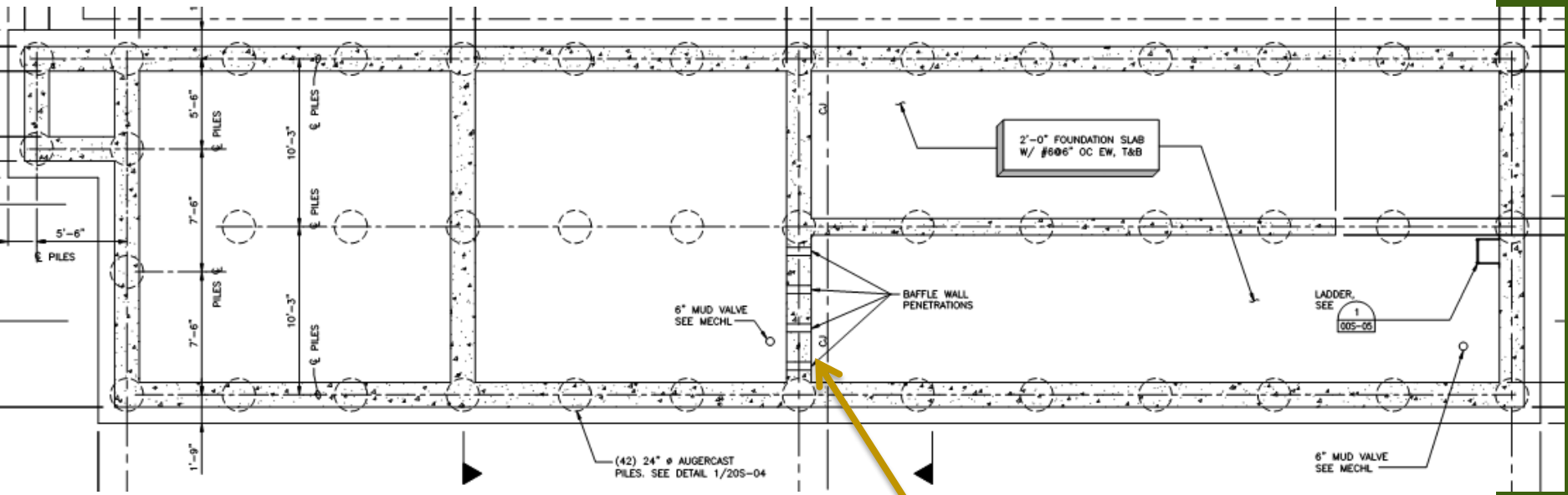


New Basin

Existing Basin

Reducing Footprint

- Baffling and short circuit prevention.

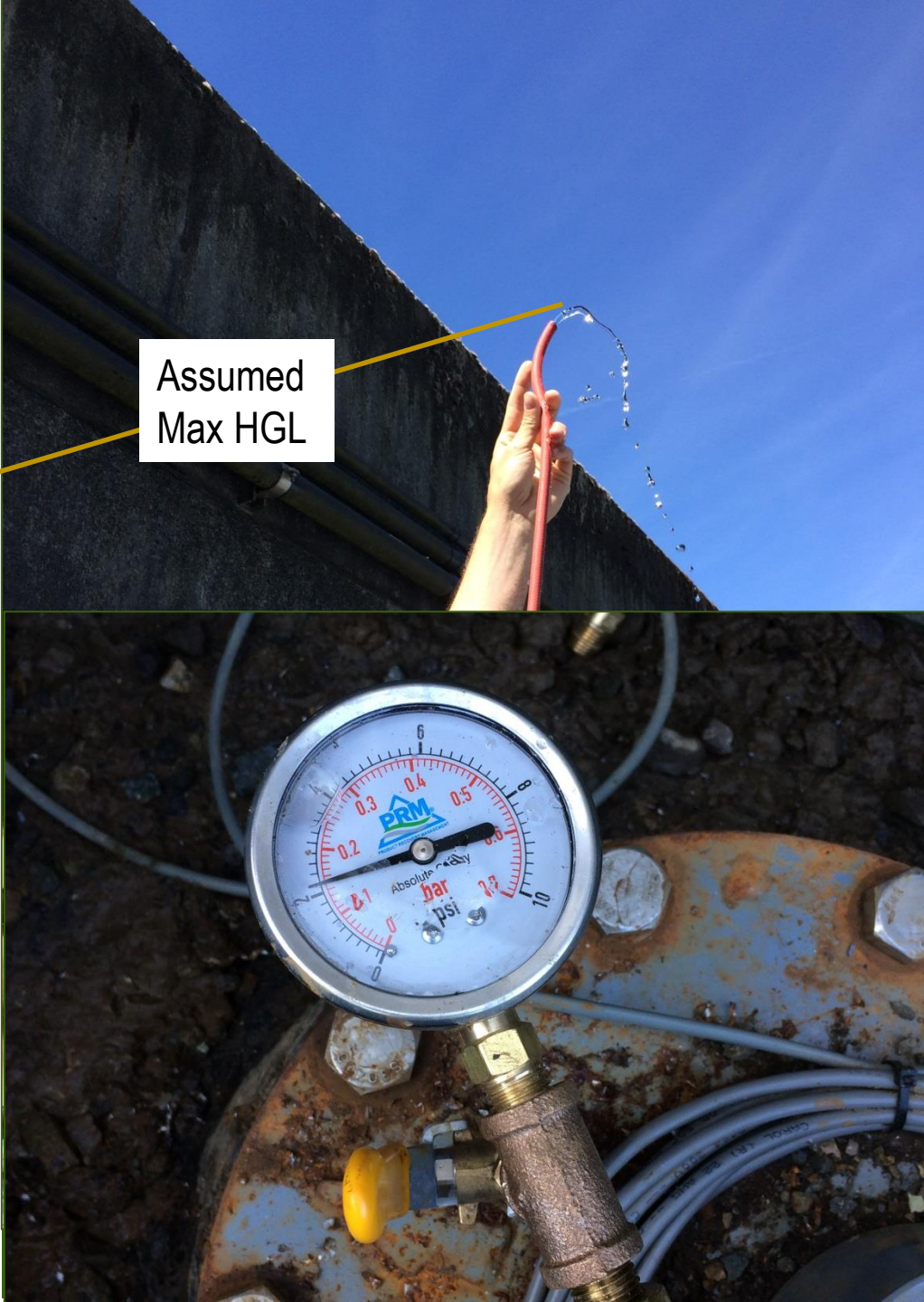
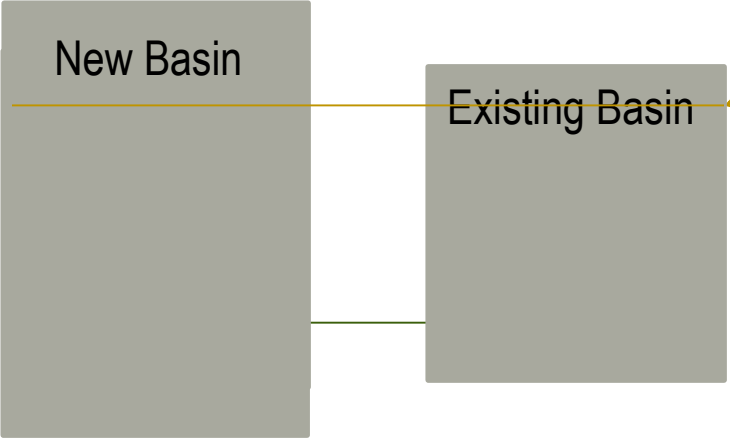


(40) 6-inch diameter openings

Chehalis River Forcemain

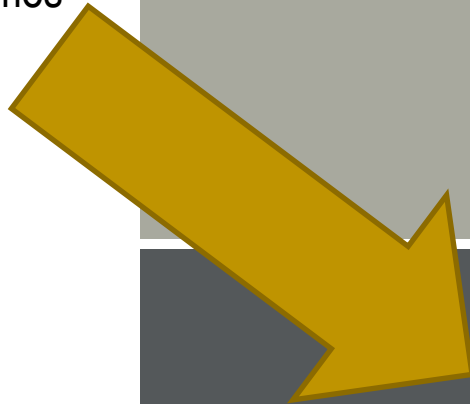
Manually operated pump station.

No pressure monitoring.



Project Check-in

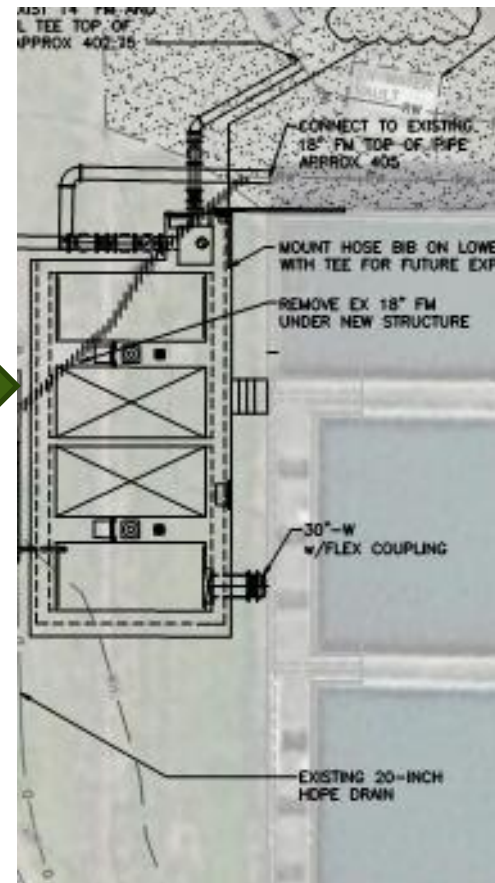
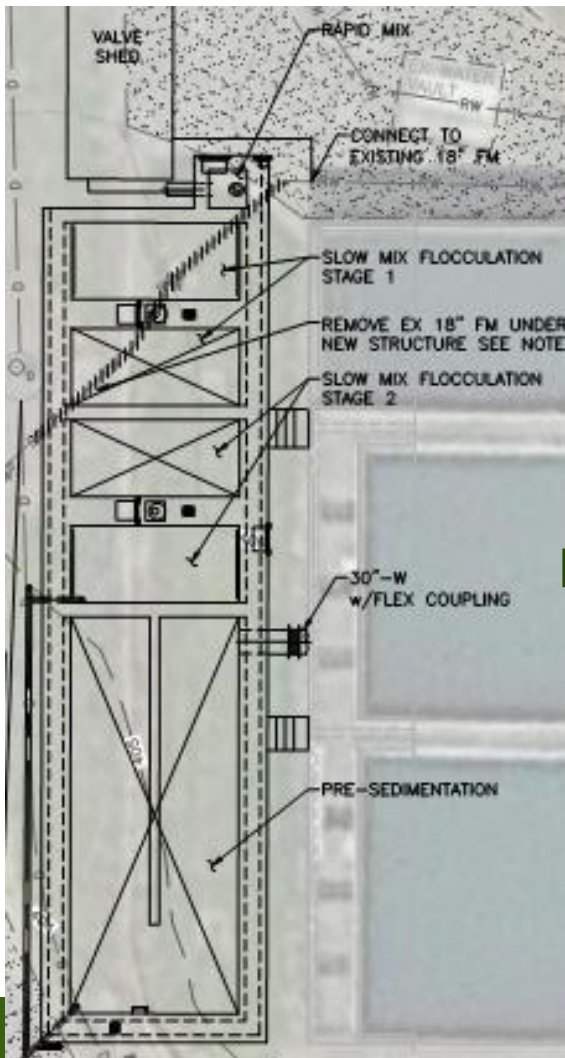
- Large concrete basins
- Auger cast pilings
- Complex, automated flow control schemes



Cost Reduction Efforts

Remove Presedimentation Basin

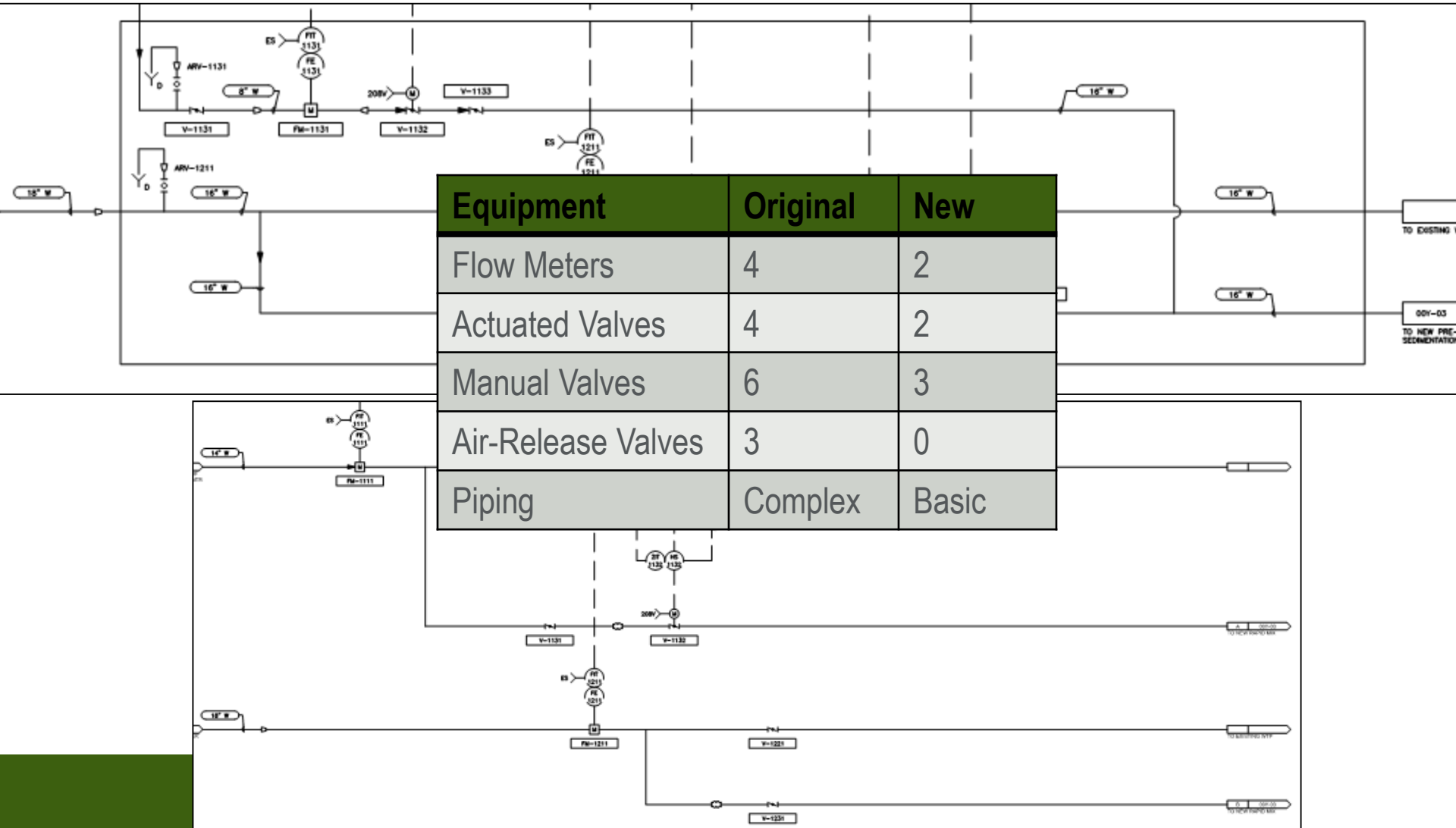
- Removal of Presedimentation Basin removed 19 pilings from the project.
- Decrease the overall footprint by 50%.
- Removed complex diffuser wall.



Cost Reduction Efforts

Reconfigure flow control

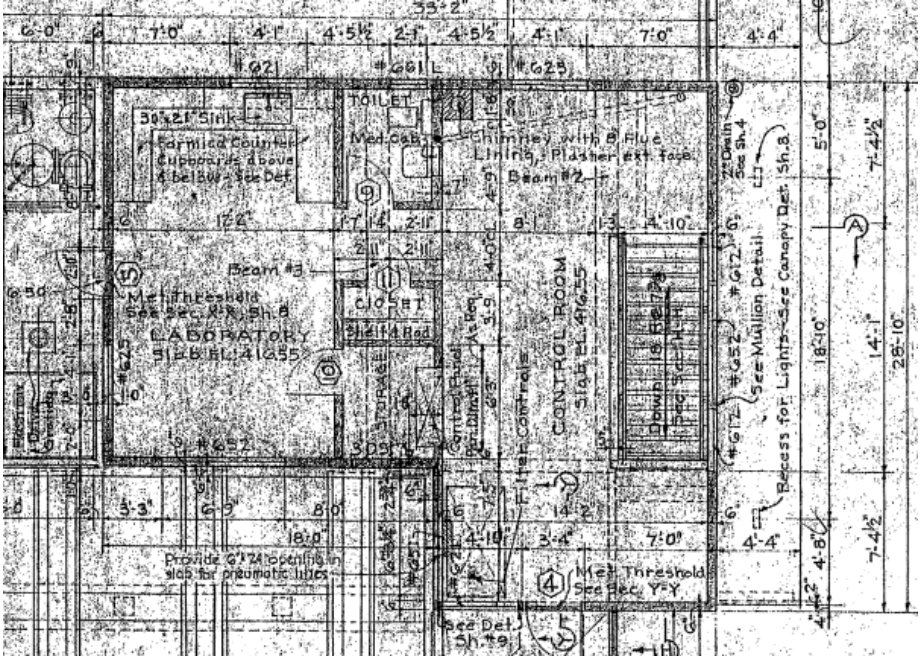
- Automated flow control on a manually operated pump station.



Equipment	Original	New
Flow Meters	4	2
Actuated Valves	4	2
Manual Valves	6	3
Air-Release Valves	3	0
Piping	Complex	Basic

Other Project Challenges

- As-builts from 1961



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Other Project Challenges

OUR BASINS ARE ON PILINGS????

- High potential for differential settlement.
 - Flexible HDPE piping for inter-basin connections
 - Flexible joints on yard piping connections



Next Steps:



- **Finalize Bid Documents**
- **Bid in Late May**

Thank you!

Any Questions?