PNWS-AWWA | Spring Conference

Elevating the City of Lacey's Water System with the Terry Cargil Reservoir

Presented by:
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Puna Clarke, PE | City of Lacey, WA

murraysmith

CITY OF LACEY

AGENDA

01 Project Background

02 Design Considerations

03 Site Layout

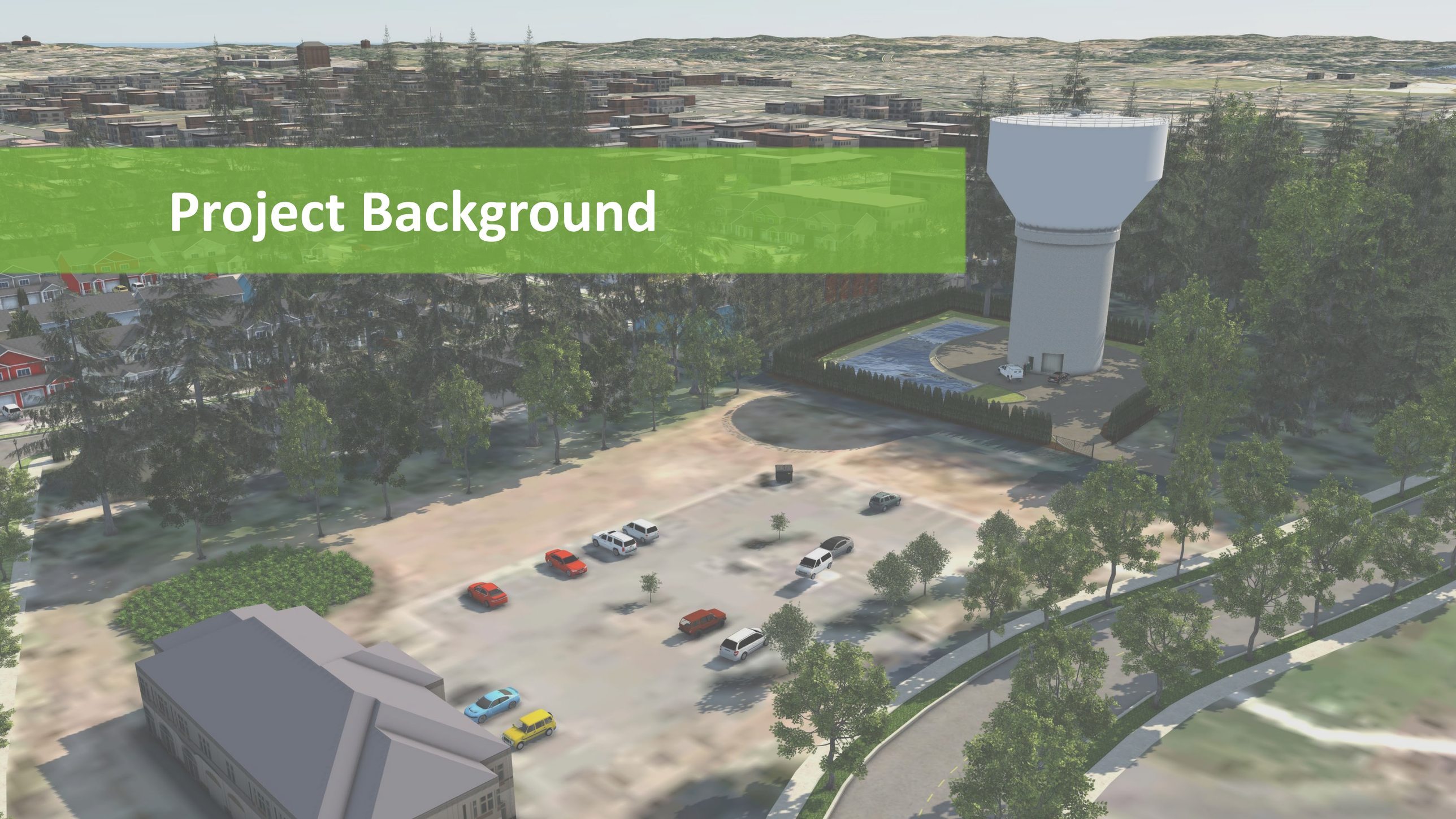
04 Public Outreach

05 Project Status

06 Project Team

07 Questions

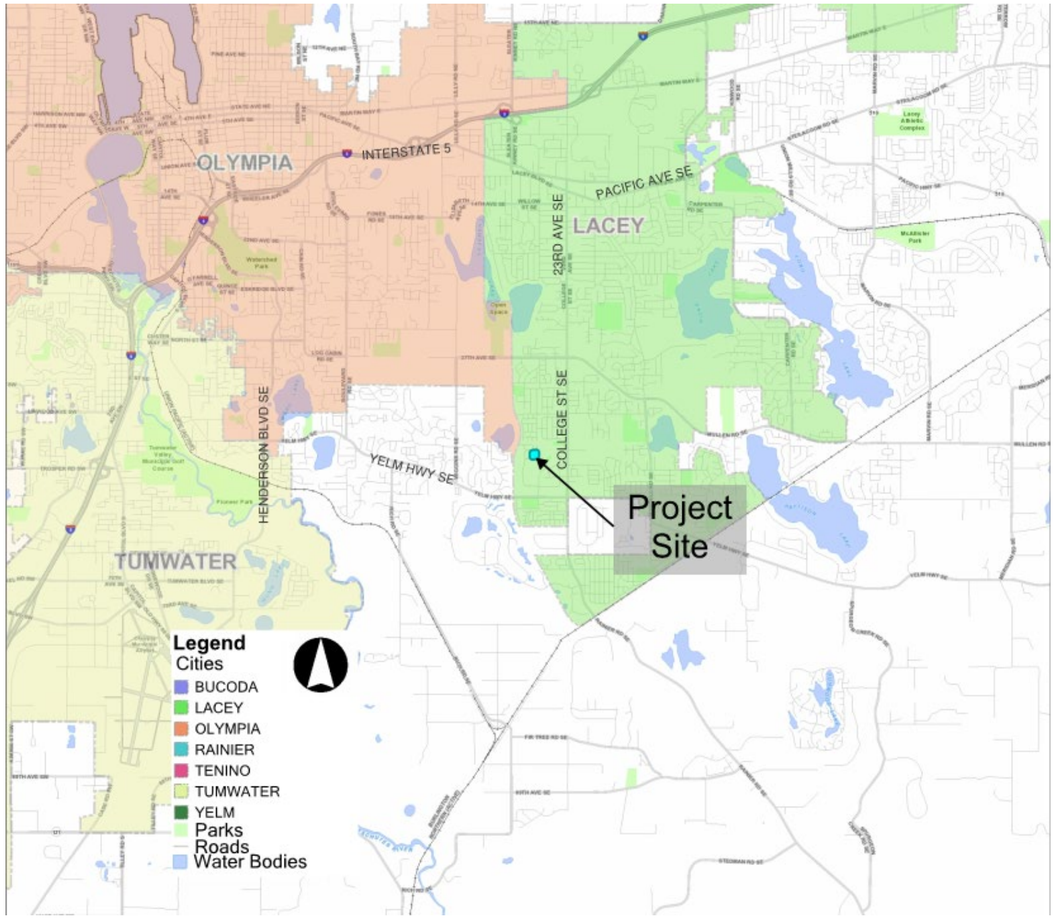
Project Background



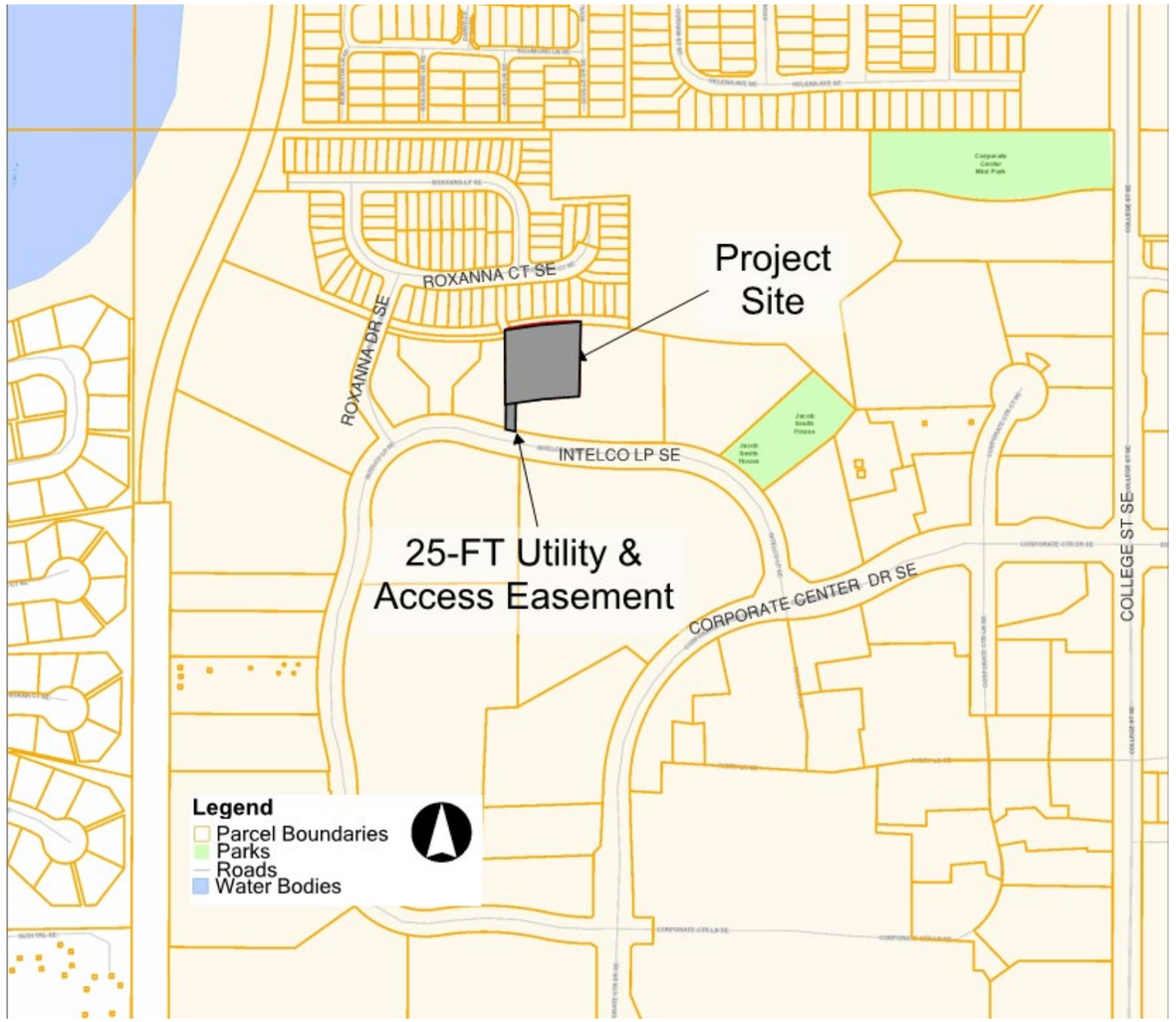
Project Overview

- ***Drivers – Storage and fire flow***
- Design, permitting, and construction of a 1.25 million gallon (MG) Composite Elevated Tank
- Style, Sizing, and Siting Analysis
- Hydraulic Analysis
- Public Outreach

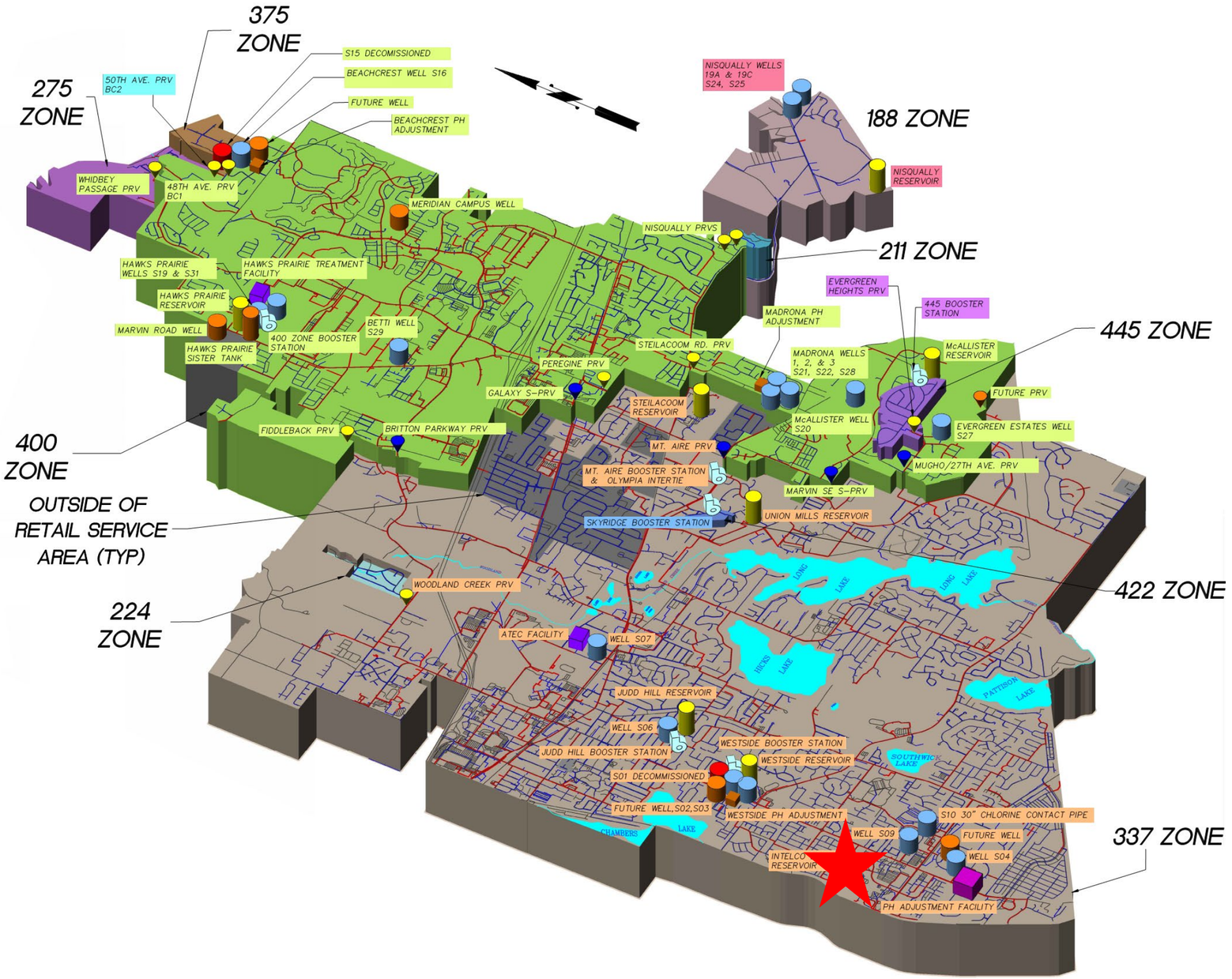
Project Background



Project Location



Critical Elements



- Water System Overview
- City Project Goals

LEGEND			
	STORAGE FACILITIES		SCADA CONTROLLED PRV (S-PRV)
			PRESSURE REGULATING VALVE (PRV)
	BOOSTER STATION		TREATMENT FACILITY
	PH ADJUSTMENT FACILITY		SUPPLY WELL
	FUTURE PH ADJUSTMENT FACILITY		DECOMMISSIONED WELL
	FUTURE STORAGE FACILITY		FUTURE WELL
	FUTURE PRV		WATER LINES ≥ 10"
	WATER LINE < 10"		

Site Constraints

- City purchased site, largest available site, but still small while being the highest elevation in pressure zone
- Adjacent to residential and business park
- Currently undeveloped

Terry Cargil

- Long-time City Water Dept. Employee
- Reservoir Name

Design Considerations

Design Considerations

Triple Bottom Line Analysis

Design Considerations

Triple Bottom Line Analysis

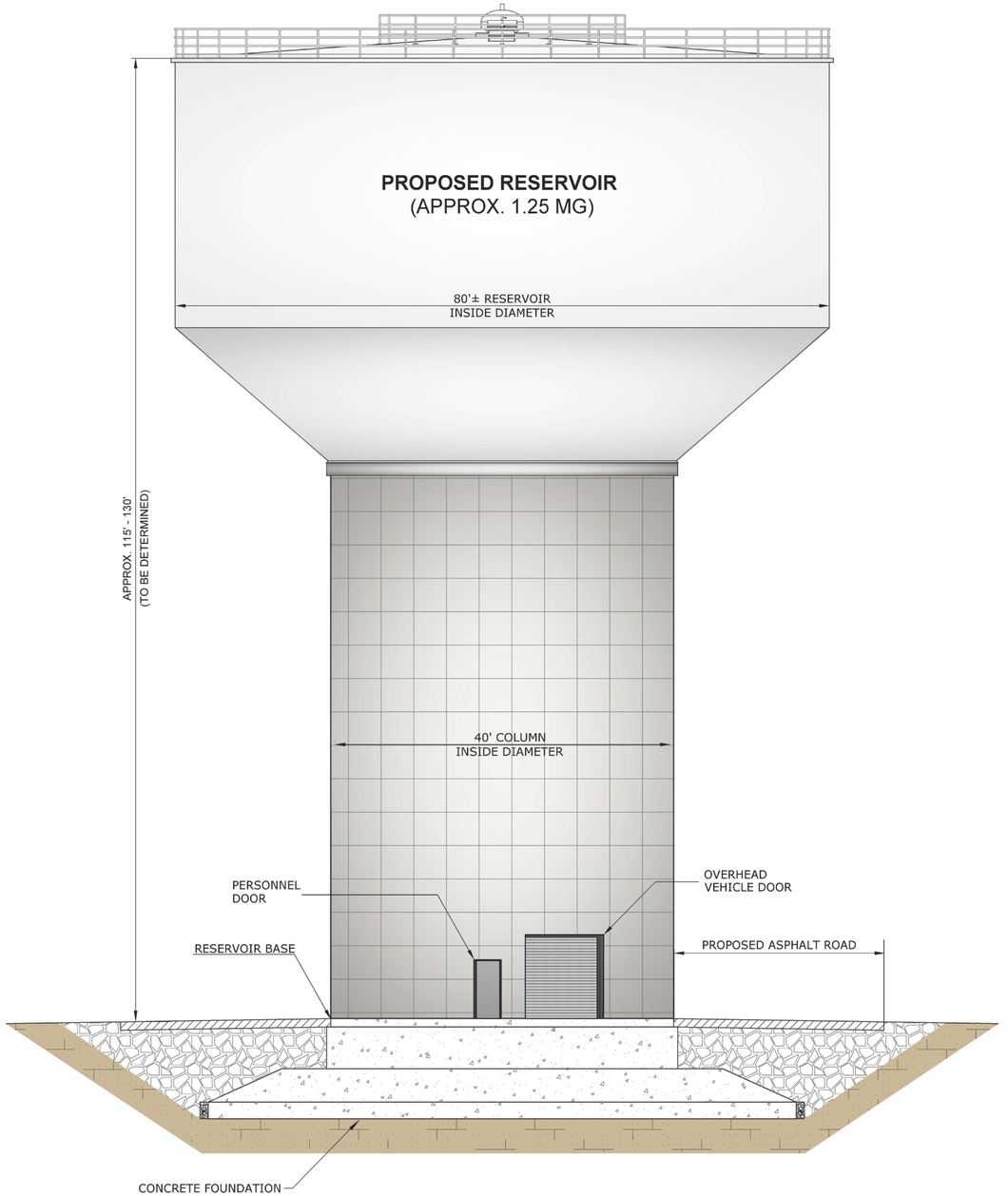
Criteria	(A) Criteria Weight (1 - 3)	Composite Elevated Tank Alternative 1		Pedisphere Alternative 2		Hydropillar Alternative 3	
		(B) Score (1 - 3)	Weighted Score (1 - 9)	(B) Score (1 - 3)	Weighted Score (1 - 9)	(B) Score (1 - 3)	Weighted Score (1 - 9)
Financial							
F1 Minimize Life Cycle Costs	3	3	**9**	2	**6**	1	**3**
F2 Minimize Potential Repair Costs	1	1	**1**	3	**3**	3	**3**
Social							
S1 Height/Volume Constraints	2	3	**6**	2	**4**	3	**6**
S2 Maintenance Access	2	3	**6**	1	**2**	3	**6**
S3 Minimize O&M Requirements	2	2	**4**	2	**4**	1	**2**
S4 Safety for Employees	3	3	**9**	1	**3**	3	**9**
S5 Minimize Taste and Odor Impacts to Residents	0	3	**0**	3	**0**	3	**0**
S6 Minimize Negative Visual Impacts to Residents	1	2	**2**	2	**2**	2	**2**
S7 Minimize Construction Duration	1	3	**3**	3	**3**	3	**3**
S8 Minimize Potential Water Quality Issues	2	3	**6**	1	**2**	2	**4**
S9 Provide System Wide Reliability/Emergency Respo	3	3	**9**	2	**6**	3	**9**
S10 Minimize Fluctuation in Customer Pressures During	1	3	**3**	2	**2**	3	**3**
S11 Maximize Pressures of Usable Storage	2	3	**6**	3	**6**	3	**6**
S12 Maximize Use of Site for other City Needs	2	2	**4**	3	**6**	2	**4**
S13 Maximize Tank Security	2	3	**6**	3	**6**	3	**6**
Environmental							
E1 Minimize Environmental Impact	1	2	**2**	1	**1**	1	**1**
E2 Minimize Amount of New Coating	1	2	**2**	1	**1**	1	**1**
(C) **Total Weighted Score**		**Alt 1 =**	**78**	**Alt 2 =**	**57**	**Alt 3 =**	**68**

(A) **Criteria Weight Factors:**
1 = Least important
2 = Average importance
3 = Most important

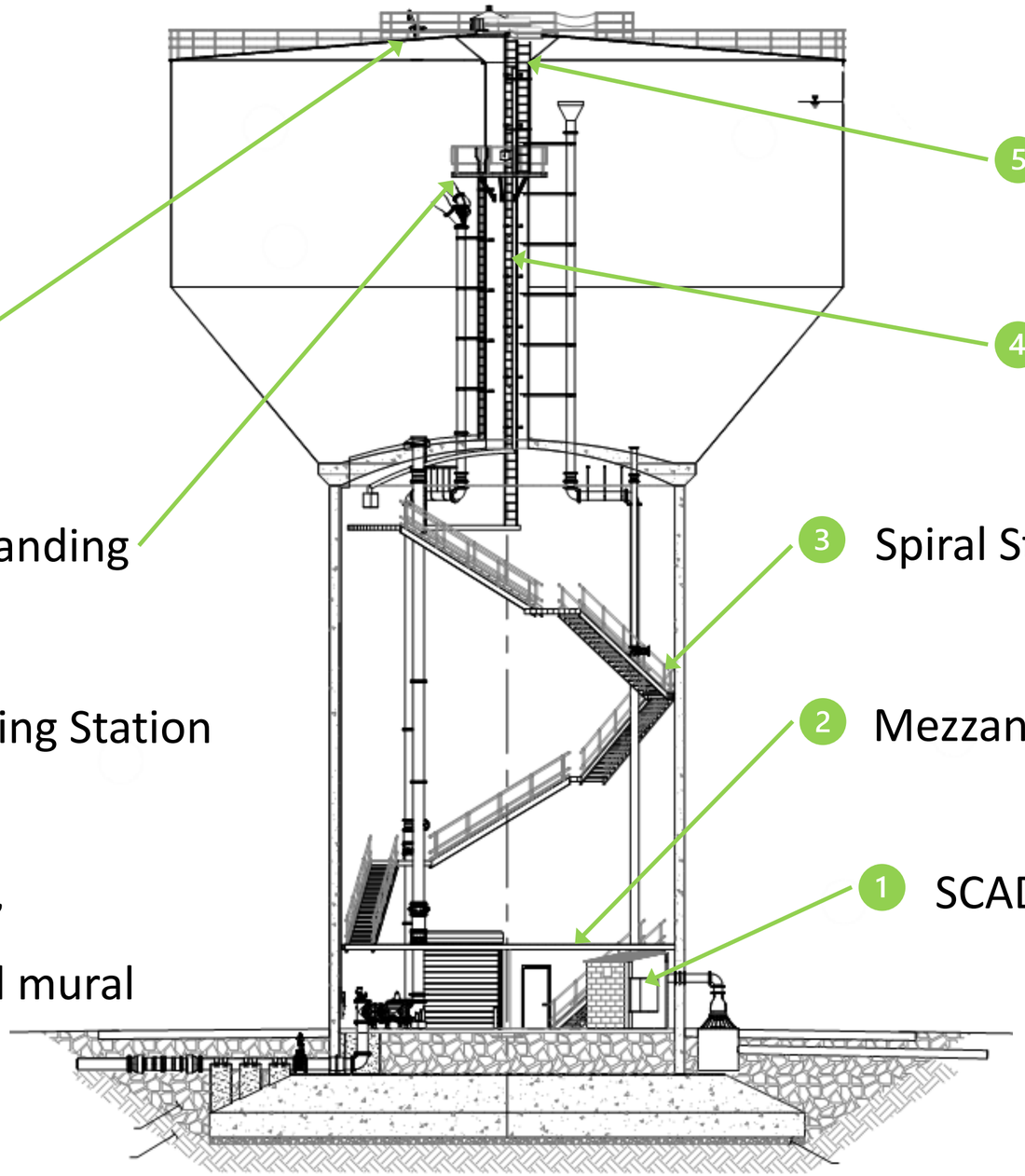
(B) **Criteria Scoring Approach:**
Financial: 1 = highest cost, 2 = similar cost, 3 = lowest cost
Social: 1 = least satisfies criteria, 2 = somewhat satisfies criteria, 3 = mostly satisfies criteria
Environmental: 1 = least satisfies criteria, 2 = somewhat satisfies criteria, 3 = mostly satisfies criteria

(C) **Evaluation Results:**
Highest Total Weighted Score is associated with the alternative that best meets the criteria

Design Considerations



Design Features



6 Lighting

7 Hoist System

8 Diver's Landing

9 Sampling Station

10 Future additions,
i.e., conduits and mural

5 Fan/Ventilation

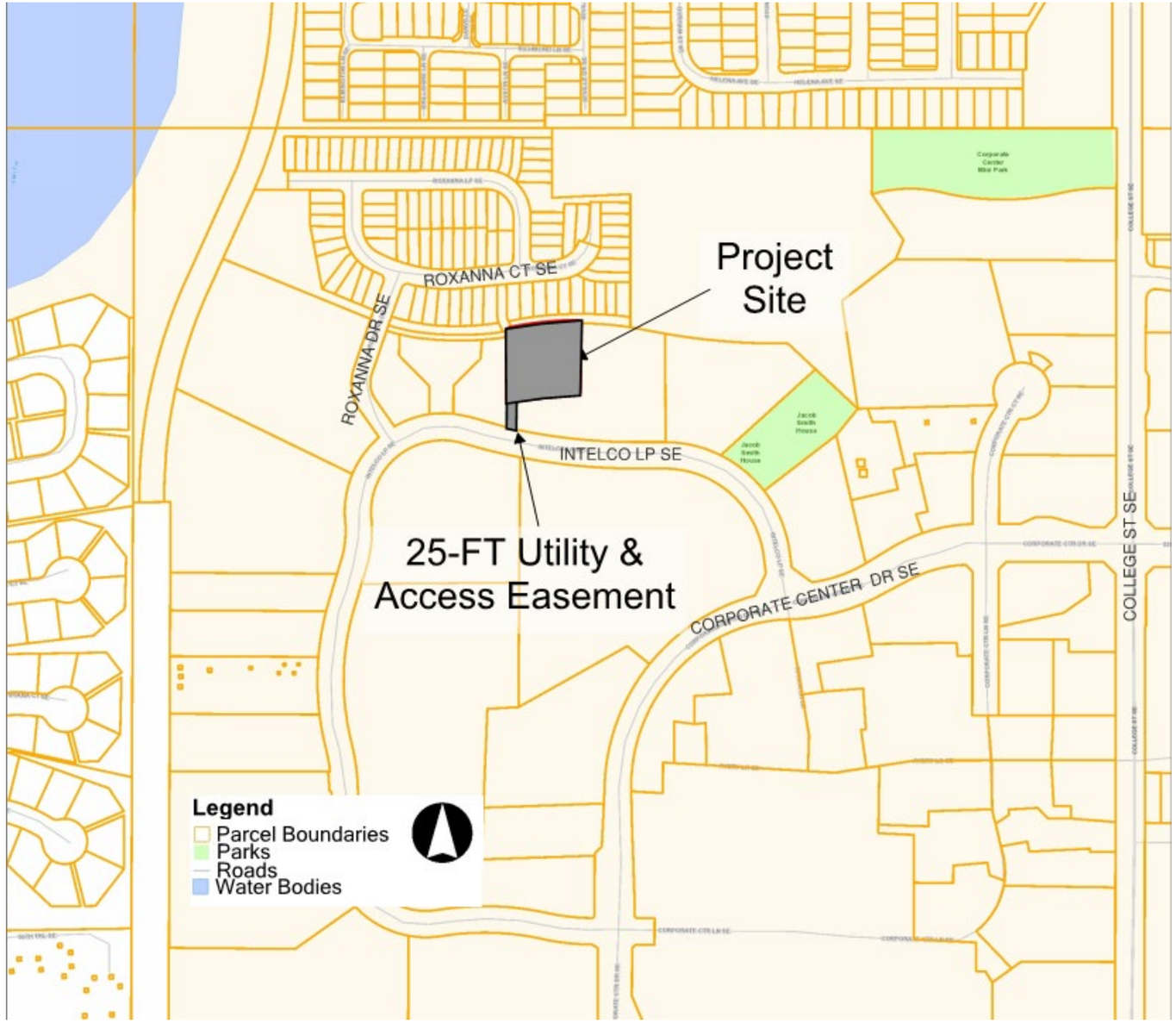
4 Fall Protection

3 Spiral Staircase

2 Mezzanine

1 SCADA/Electrical Room

Design Challenges

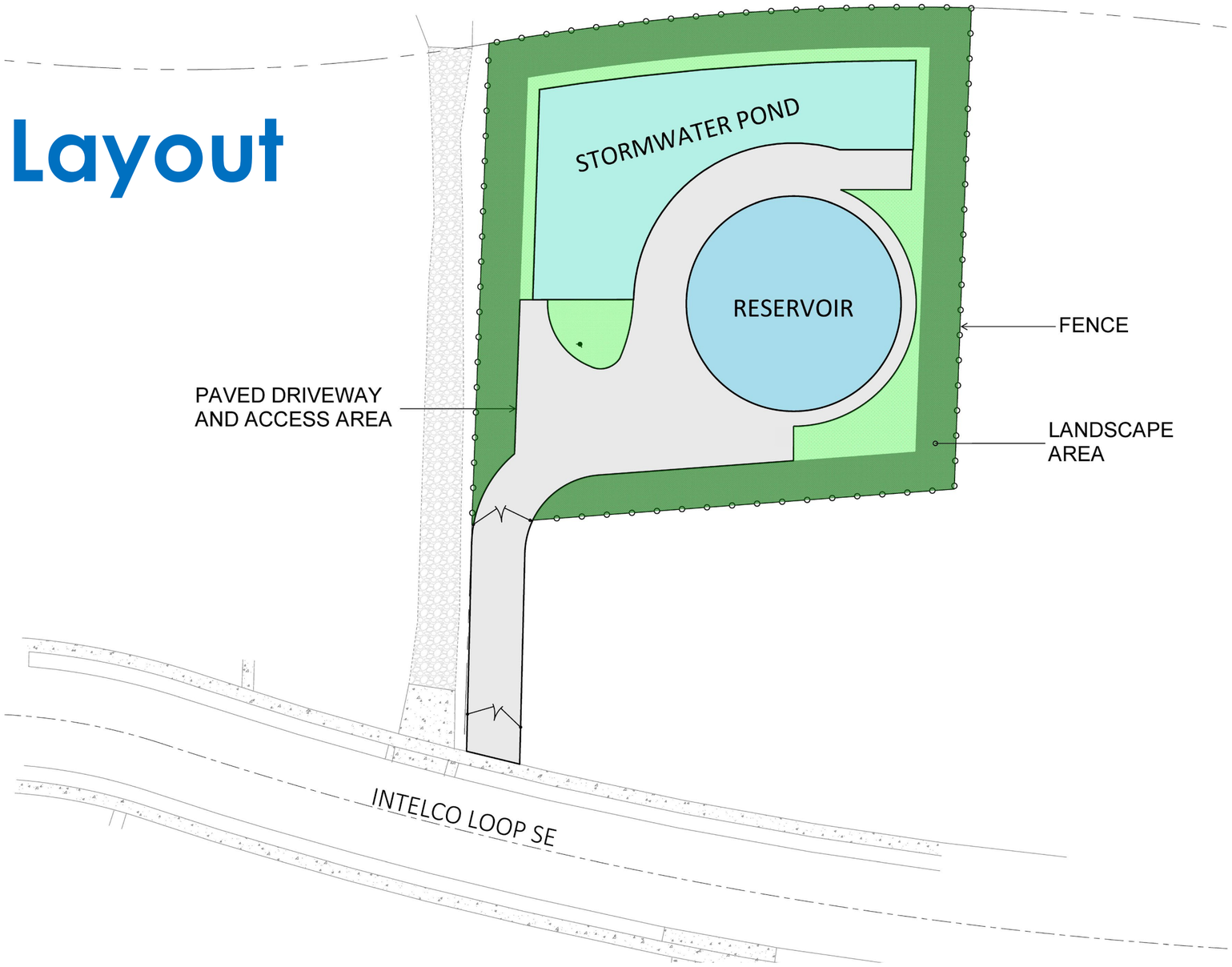


- Public concerns
- Stormwater system
- HOA Buffer
- Aesthetics
- Naming of reservoir
- FAA Height Restriction
- Construction material supply and demand
- Site Constraints

Site Layout

Site Layout

Site Layout



Public Outreach

Public Outreach

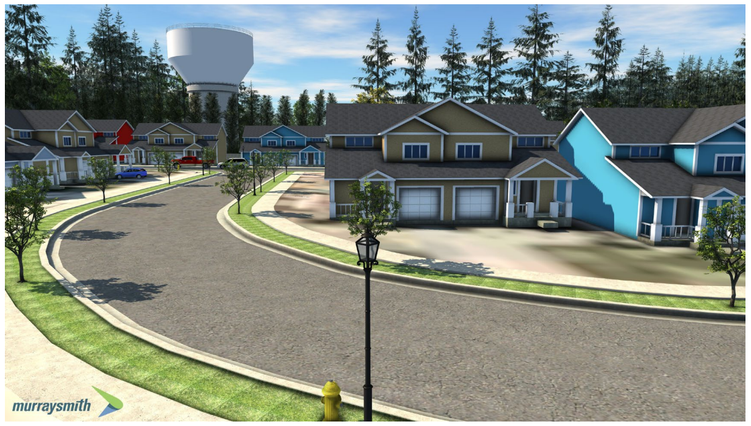
Before

After

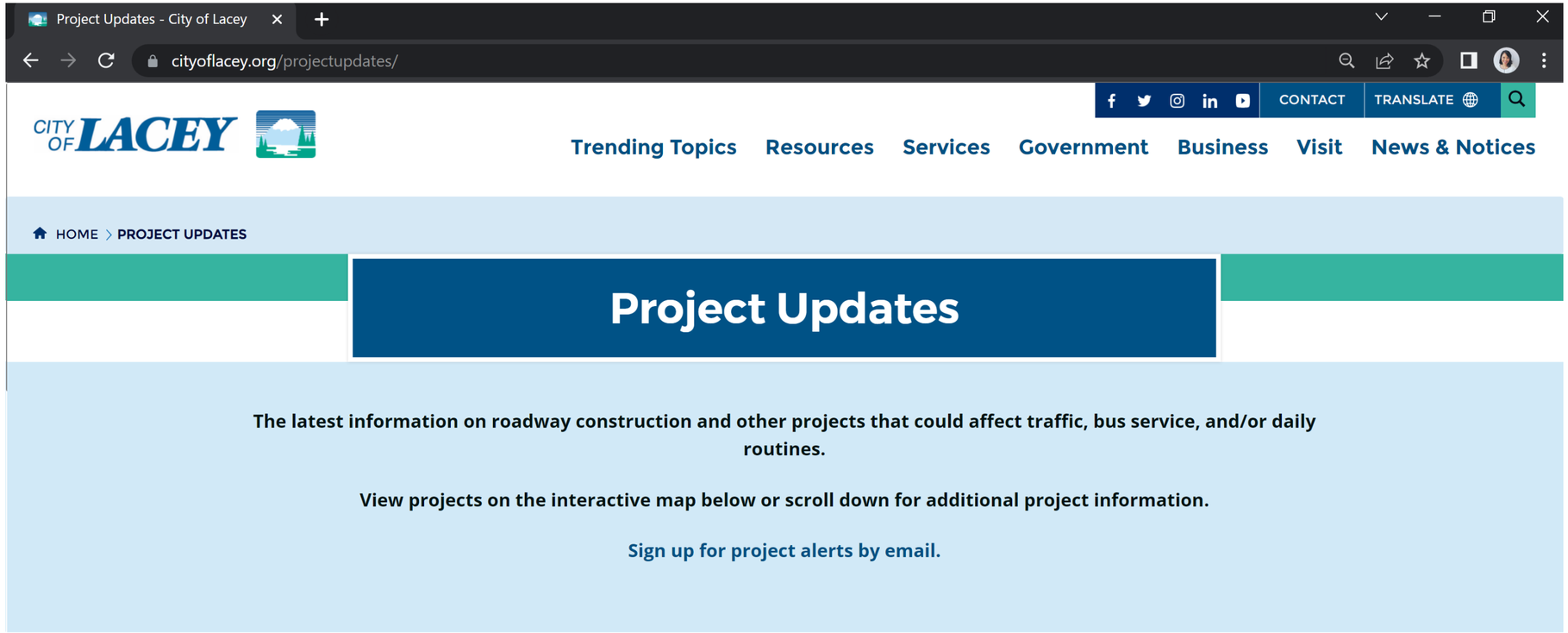
- Renderings and Shadow Analysis
- Public Meeting
- Hearing Examiner/permitting
- Customer Calls/Letters
- HOA/buffer
- City Public Notification and Alert System

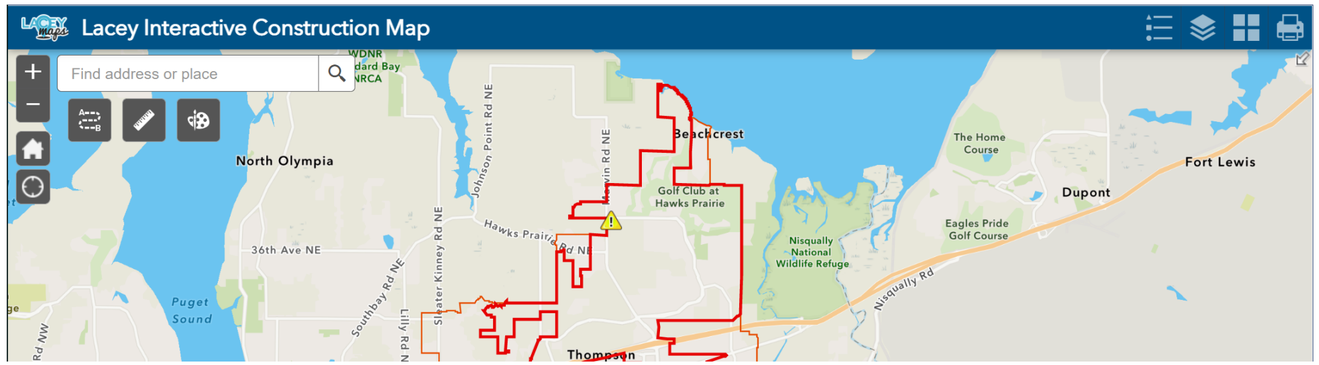
Before

After



Project Updates





https://cityoflacey.org/projectupdates/

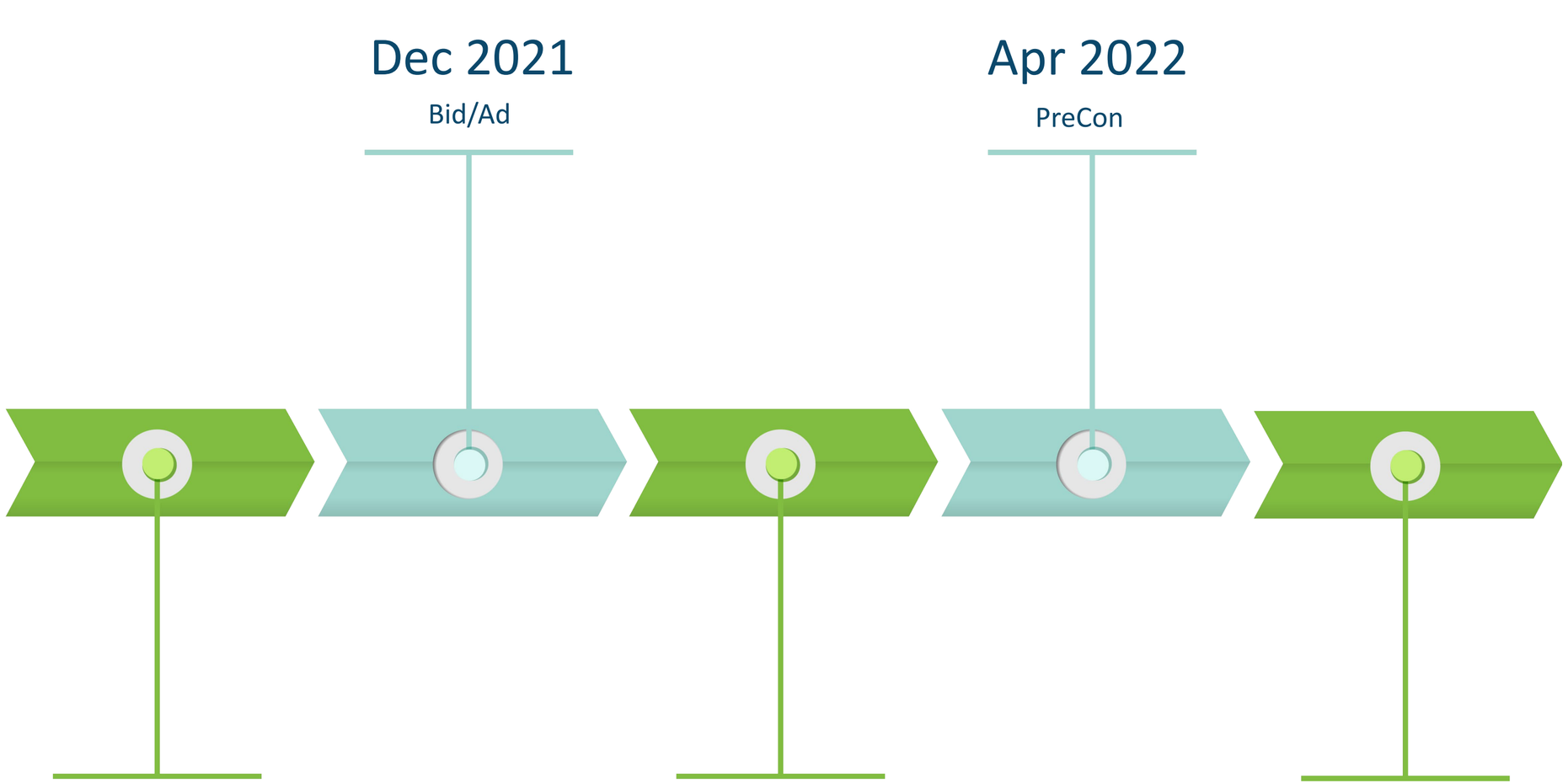
Major Takeaways

Major Takeaways

- Early Public Outreach and Communicate Often
- Engage O&M Staff
- Flexibility within Designs
- Require Tank Manufacturer to be Prime
- Steel Cost Adjustment and Technical Memo

Project Status

Schedule


Dec 2021
Bid/Ad
Apr 2022
PreCon
Oct 2021
Wrapped up Design
Feb 2022
Open Bids
May 2022 to Apr 2024
Est Construction

Project Team

City of Lacey's Team – THANK YOU!

Puna Clarke, PE
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Brandon McAllister, PE
Ed Andrews
Lance Sponberg
Justin Bellis
Terry Cargil
Aubrey Collier, PE, SE
Justin Knox, PE
Scott Egger, PE

Public Works – Water Resources Division
Public Works – Engineering Division
Public Works – Operations
Community & Economic Development-Planning Division
City Council Members & Mayor & Deputy Mayor & City Manager

Murraysmith Team– THANK YOU!

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Q&A

Thank you!