

# **Lafayette Reservoir and Outlet Tower Seismic Retrofit Project**

**City of Lafayette**

**January 9, 2023**

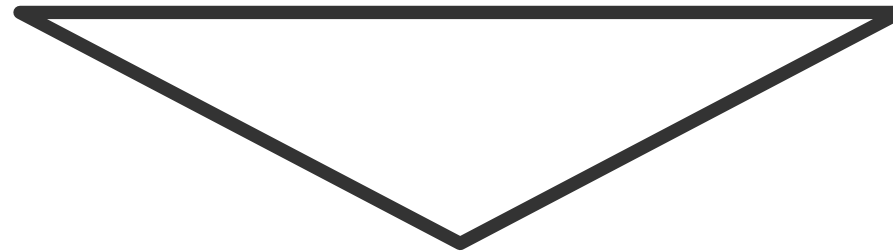
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# Lafayette Reservoir



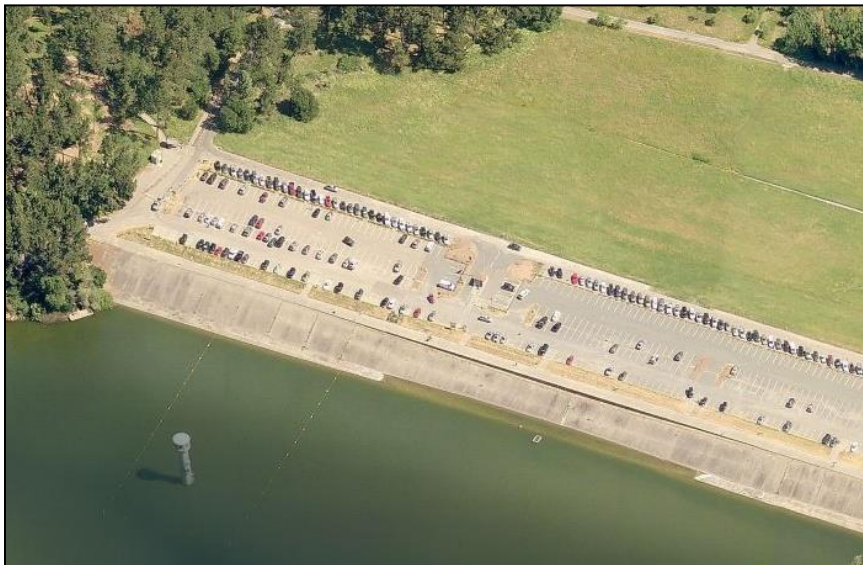
Regulator



Stakeholders



# Lafayette Dam



- Constructed in 1927
- The reservoir is not part of the District's water supply
- The dam was evaluated in 2005. Findings were:
  - In a large earthquake, the crest could settle 2 to 3 feet.
  - The dam has a freeboard greater than 15 feet.
- DSOD has approved the findings and the conclusion that the dam is stable.

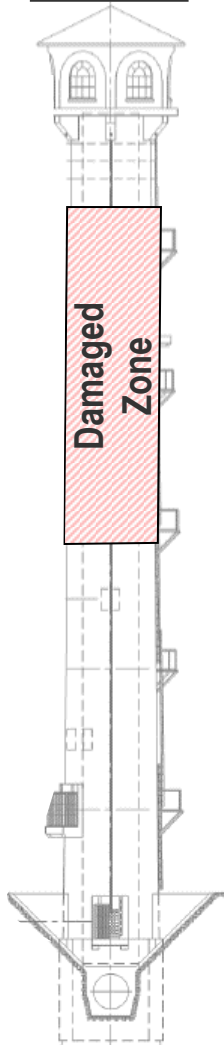
# Lafayette Reservoir Tower



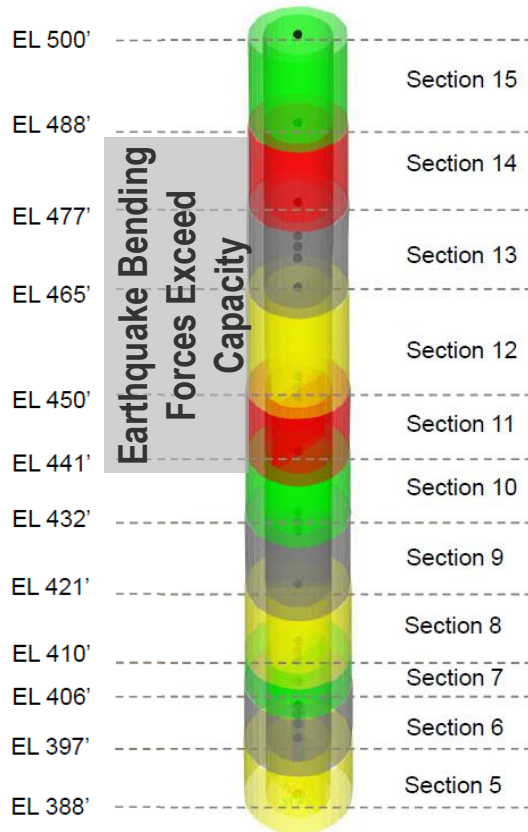
- 170 feet tall, 8 feet inside diameter, and functions as outlet & spillway.
- The tower is 40 feet higher than necessary because the original dam failed during construction and the dam was built 33 feet lower than planned.
- Studies indicate that the tower is vulnerable during an earthquake and retrofit is required.
- DSOD rated Lafayette “fair”, restricted the reservoir elevation, and mandated tower upgrades. All other EBMUD dams are rated “satisfactory.”
- Objectives of the project:
  - Safeguard dam safety following a Maximum Credible Earthquake
  - Allow the tower and conduits to remain functional following an Earthquake

# Tower Seismic Deficiencies

Tower

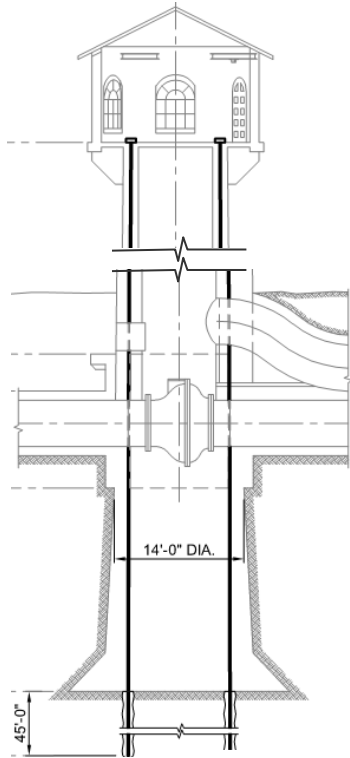


Computer Model

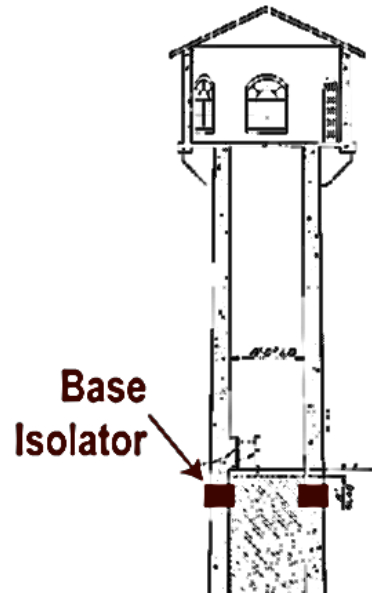


- A large earthquake will induce high bending forces in the tower.
- The bending force will exceed the bending capacity over part of the tower.
- The bending force will likely fracture and break the rebar in the concrete.
- The tower will likely be severely damaged.
- The damaged tower likely would not be able to function as spillway or outlet.

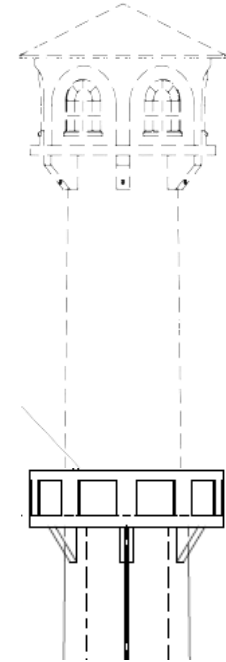
# Tower Retrofit Alternatives



Post Tensioned Anchors



Base Isolators



Tower Shortening

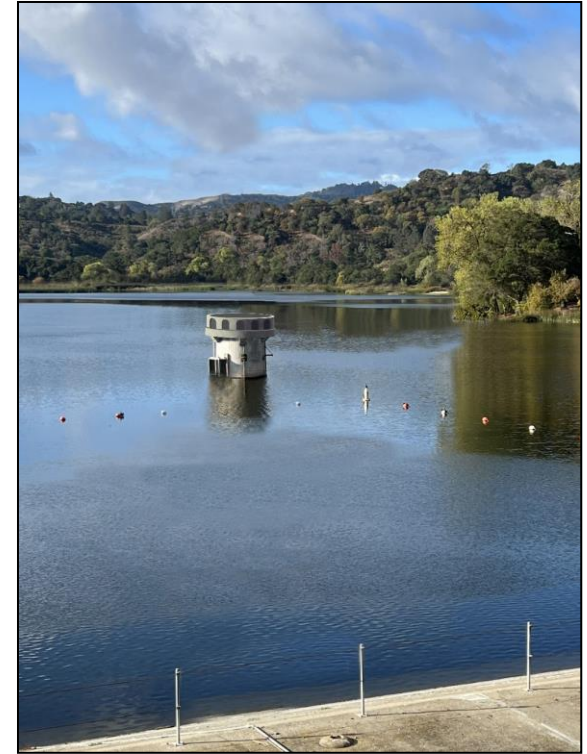
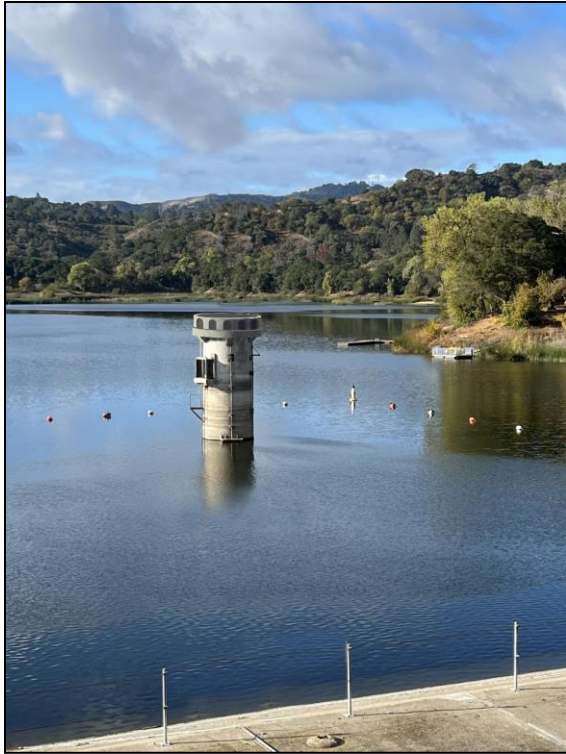
Tower Shortening most reliably addresses the seismic concern and does not have long-term risks – it is the safest way to address the seismic hazard

# Current Rendering



- Tower is being shortened by 40 feet, to an appropriate level for the height of the dam, while providing an adequate spillway elevation and removing the seismic hazard
- Current concept includes aesthetic treatment for the top of the tower, including an access platform with a beveled support to match aesthetic of other District towers.

# Current Draft Renderings



**Water Surface Elevation:**

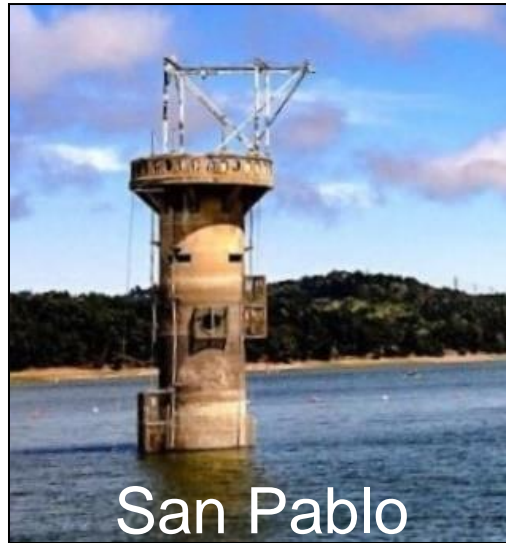
433 feet

440 feet

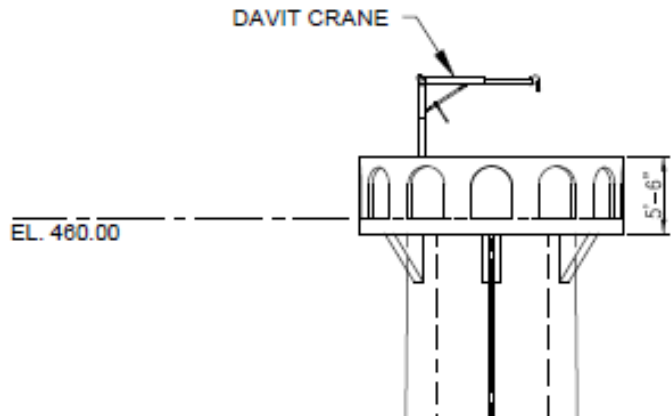
449 feet



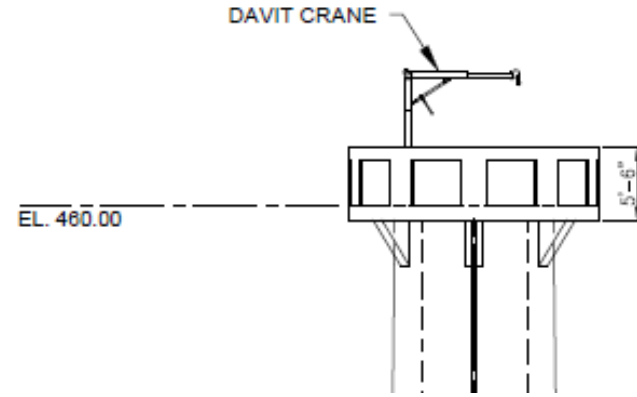
# District Reservoir Towers



# Tower Platform Architectural Options



**Option A**



**Option B**

# Site Layout



# Construction Activities

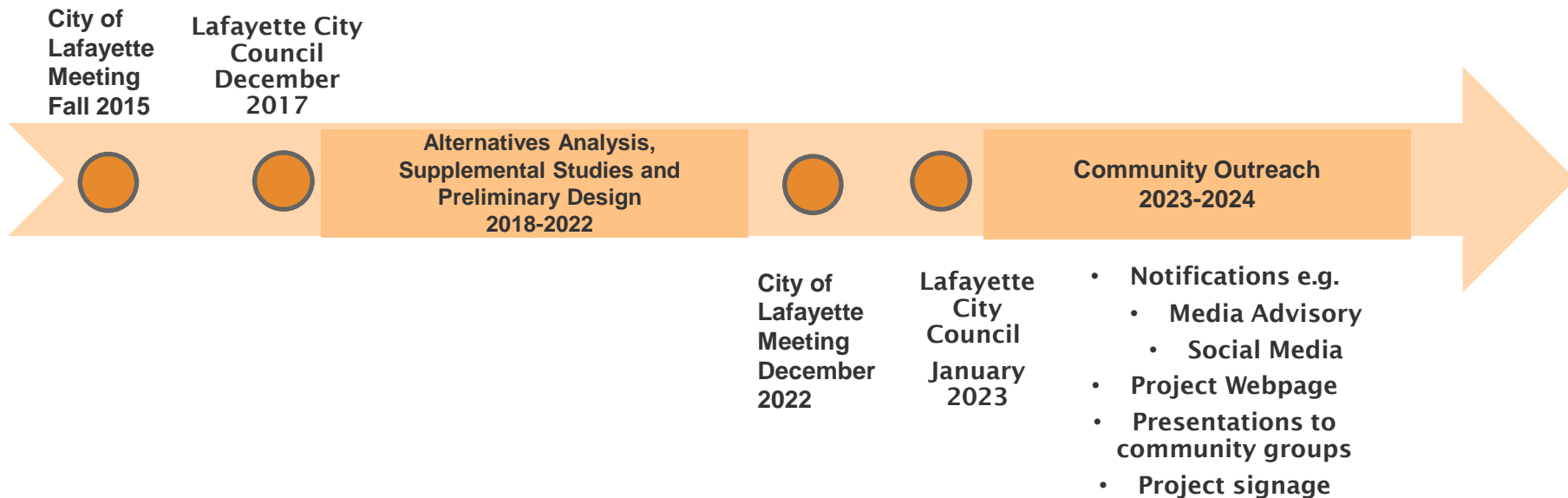


Four phases:

- I. Temporary platform installation
- II. Tower sealing and dewatering
- III. Selective demolition to remove top of tower safely
- IV. Platform construction

Reservoir lowering is not required.

# Lafayette Tower Seismic Retrofit Outreach



# QUESTIONS AND DISCUSSION