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EBMUD presents council with update on Lafayette Reservoir Tower

By Lou Fancher

The city council on May 8 heard an update on the Lafayette Reservoir Tower Seismic Retrofit Project. Presented by a team of directors and engineers from East Bay Municipal Utility District, director John A. Coleman said feedback received from the council and members of the public in response to the report given in January was appreciated. He and his department agreed with many points concerning the tower's aesthetics and said the design team's new ideas had drawn inspiration from the community and had led to implementing some of them in the updated designs.

Coleman emphasized that while retrofitting the tower in such a way that it fit into the aesthetics of the environment was vital, upgrades and changes at the dam must always be enacted without compromising safety.

EBMUD Engineering Manager Elizabeth Bialek followed, reviewing the functions and important features of the tower. The overall facility has a "fair" rating from the state's Division of Safety of Dams (DSOD), largely due to the tower that functions as a vital spillway at the dam. However, studies conducted in 2005 revealed the tower's extended, above-water height, if left unaddressed and subject to forces from a large earthquake, could suffer damage or complete structural failure. If damaged extensively, the tower would not be able to operate as a spillway or outlet for the reservoir, especially during heavy rainfalls.

Alterations to the tower proposed in 2017 included some measures not approved by DSOD and one, shortening the tower, that did meet industry safety standards. The designs for the shortened tower received significant pushback from the council and the community, mostly due to the possible loss of the iconic "house" that had long stood as an emblem for the city. Lafayette resident Matt Bertics, a structural engineer who specializes in seismic design, said in written public comment that he supports EBMUD's decision to remove the seismically deficient portion of the tower, but believes a tall but lightweight steel replacement tower that honors the original iconic tower can be designed.

Bialek emphasized that the mandated retrofit will ensure the dam and the tower will remain viable in the event of all situations, including a major earthquake. She reviewed the current seismic deficiencies: modeling and comparative studies indicate a large earthquake would bend and fracture rebar in the tower and render it inoperable. A comprehensive study using state-of-the-art finite element analysis showed that reducing the height of the tower to an elevation of 460 feet would move the tower from a level of risk that is presently "marginal" to a level where failure was not a primary concern.

Additionally, a conduit retrofit she described will provide improved safety underneath the tower, with new steel liners added to a 150 foot expanse of the conduit downstream of the tower. The liners will ensure shearing occurring from the force of a major earthquake will not render the conduit entirely dysfunctional. Also, because the conduit is 100 years old, an entire section of the underground structure will be remediated. "We want to make it last another 100 years, if not more," she said.

Fortunately, the work can be done onsite at the foot of the tower. Bialek said EBMUD has sought this and other highly suitable safety upgrades throughout the retrofit project because, "you know, people's lives are at stake here."

The tower retrofit itself has involved consideration of a large range of designs and approaches, according to Bialek. Outreach efforts she said resulted in useful design input and the department has taken steps to address the feedback. Parapet design options she introduced included a light, aluminum metal structure that has graphic options-arches, grasses, fish-and an altered profile that was re-designed to limit the visibility of cranes and other operational materials stored in the "house" atop the tower. A sliver, gray, low-reflect aluminum material was suggested for this part of the tower because it mimics the previous buffed-sheen concrete aesthetics of the house while providing a modernized profile that meets weight and other specifications.

Council Member Wei-Tai Kwok asked about what the public will see when they visit the reservoir. Bialek said target elevation is set at 440 feet as per standards mandated, but might vary according to season and the amount of rainfall. Council Member Susan Candell asked if the retrofit to the conduit would extend the project's timeline. Bialek said it would not.

Public input and council questions revolved around preserving the tower's original aesthetics, as well as discussion of the safety features, the option to use steel instead of aluminum for the tower house, the retrofit's overall timeline, and the breadth of outreach keeping the public apprised of the project and its progress. The EBMUD team will gather additional input and return at a future meeting.

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