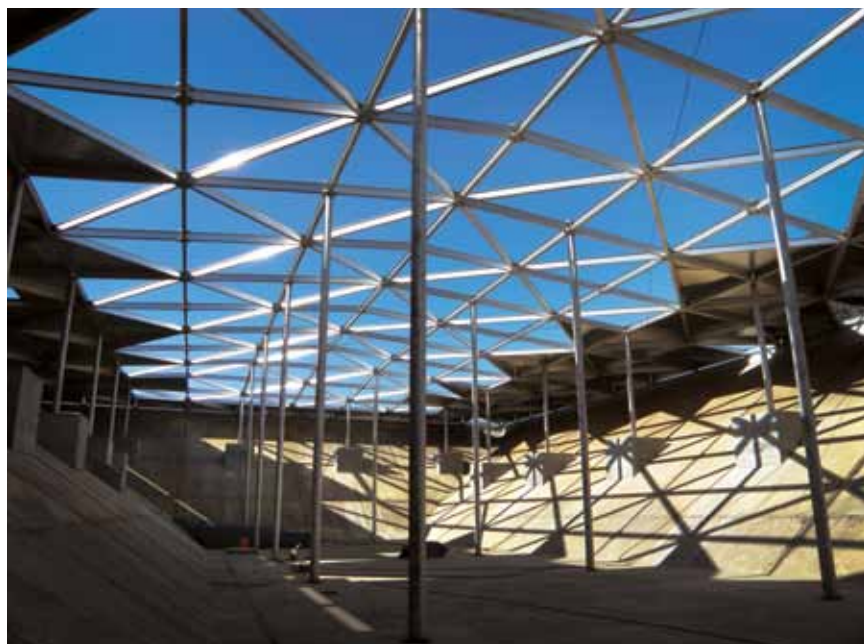


California Reservoirs Retrofitted With Aluminum Covers



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A New Plan

In March 2007, following a significant rainfall event, a reservoir roof experienced a localized failure and collapsed due to ponding water. This required an emergency repair and heightened awareness of the need for improvements. It was determined that the reservoirs' concrete shells were in good condition and would allow retrofitting, potentially saving the district \$25 million.

A five-year business plan created in 2008 identified five reservoirs that required immediate attention and secured the funds necessary for the improvements. The plan included the replacement of old roofs with new aluminum covers, extending the life of the reservoirs and bringing them into compliance with current building and seismic codes.

Optimal Solution

In the past, aluminum geodesic cover manufacturers Temcor and Conservatek (now CST Covers) had provided domes for some of the district's water reservoirs, so the district was familiar with this technology. The challenge was to verify whether aluminum dome technology could be applied to non-circular shapes. The solution was to design a low-profile, triangulated aluminum roof supported by

stainless steel columns. The new roofs also incorporated concrete shear walls designed to current seismic standards.

Because aluminum is inherently corrosion-resistant, it requires little to no maintenance. The covers CST had provided the district in the past had performed well, and required a quick construction process.

The Padre Dam MWD also was attracted by the aesthetics of the new low-profile reservoir covers—because residential neighborhoods have grown around the reservoirs, aesthetics were important. Installation of the aluminum covers also would have less impact on local residents than other material options.

During the retrofit and upgrade process, the water district planned ahead and designed the aluminum covers to support additional loads, such as solar panels, at some point in the future.

To date, CST Covers has replaced the aging roofs on three in-ground reservoirs with new low-profile aluminum covers. The fourth in-ground reservoir required complete replacement, so a prestressed circular concrete tank and cover were utilized. The fifth reservoir will involve the largest retrofit to date, including an aluminum cover from CST, and will be designed to accommodate storage of 8 million gal. **w&w**

Padre Dam Municipal Water District (MWD) provides drinking water, wastewater, recycled water and recreation services to 100,000 residents in nine suburbs in San Diego County. The district imports 100% of its potable water supply and treats 2 million gal per day of wastewater at its Ray Stoyer Water Recycling Facility.

As part of the district's original infrastructure built in the 1960s, five in-ground reservoirs were constructed with built-up wood framing and corrugated metal covers supported by reinforced concrete columns. As the existing covers fell into disrepair, continual maintenance was required to keep the reservoirs in good operating condition and in compliance with California Department of Environmental Health regulations. The district's 2001 Integrated Facilities Plan recommended that all five be replaced at a cost of more than \$40 million.



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