

World's Largest Circular Water Reservoir Cover Added to Record Breaking Tank

CST COVERS DOME TOPS
\$4.5 MILLION RESERVOIR
UPGRADE PROJECT

The Alderwood Water and Wastewater District

Formed in 1931, the Alderwood Water and Wastewater District serves the southern part of Snohomish County in western Washington with Sultan River water purchased through the city of Everett. The District serves a customer base of 35,000, representing a population of approximately 200,000. Water is stored in several man-made reservoirs, constructed with a combination of steel and prestressed concrete. In 1963, construction was completed on the District's largest open-top concrete reservoir in the suburban-Seattle city of Lynnwood. At the time of its completion, reservoir #1 held the distinction of being the world's largest prestressed concrete reservoir. The reservoir contains 335 miles of prestressed wire and has a storage capacity of 28 million gallons.

The Project

In 1998, the District outlined a \$4.5 million seismic upgrade and improvement project for reservoir #1 and retained Tetra-Tech/KCM, Inc. as the design consultant for the project. In addition to the seismic reinforcement a roof for



the reservoir was specified. Since 1943, Tetra Tech/KCM, Inc. has specialized in the design of water and waste water facilities, fisheries and more worldwide, and the company has been a long-time consultant for the Alderwood Water and Wastewater District for more than a decade.

Reservoir #1 is critical to the District's operation and could not be taken out of service until after Labor Day, and must be back in service by May 1. To accommodate this operation, Tetra Tech divided the project into two bid Schedules. Bid Schedule A, the seismic upgrades, was bid and awarded to IMCO General Construction of Bellingham, Washington. The seismic upgrades included reinforcing the tank walls and floor. This work included 1,040 cubic yards of shot crete, 1,660 cubic yards of cast-in-place

concrete, and 200 tons of rebar. Finally to resist seismic shear loads, 142 stainless steel bent plates, each measuring 8 feet x 2 feet 4 inches were bolted to the wall and floor.

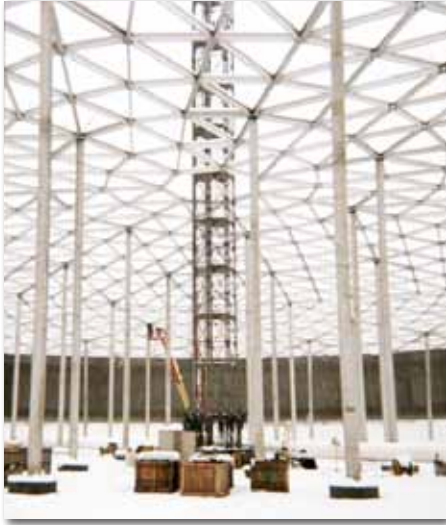
CST Covers

Only two companies were acceptable to the design consultant to build the type of reservoir roof specified for this project: it had to be light weight, low maintenance and low profile. One of the two qualified companies, CST Covers of Gardena, California has a long history in the industry and has built thousands of flat covers and domes, clear-span and column-supported for water and wastewater facilities worldwide. "Both of the acceptable companies bid on the covering portion of the improvement project," said Lowell Warren, project manager for

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Tetra Tech/KCM. The bid specified that the manufacturer/supplier also had to be responsible for the erection. "CST Covers' bid was not the lowest, but they were awarded the contract based on their ability to complete the project as specified."

At 375' in diameter, the cover is the largest circular water reservoir cover in the world - a fitting topper for the record-breaking tank. "Covering the reservoir not only protected the water, but drastically reduced the required maintenance. Before the cover was installed, the reservoir had to be drained and cleaned yearly," said Tom Fahey, CST Covers' project manager.

There were a number of requirements for the roof. It had to be lightweight because of its great size. It had to be relatively low maintenance and it needed to have a long life; the District wanted a roof that would last for decades.

And for aesthetic reasons, the cover had to have a very low rise so as not to intrude on the surrounding landscape.

CST Covers' clear-span, column- or truss-supported roofs, in virtually any shape are inherently compatible with water treatment processes. Their all-aluminium construction does not rust, rot, spall or solar degrade and is resistant to the chlorine vapors found in the potable water environment. They have a long life span and are virtually maintenance-free.

To meet the requirement of that low profile, the cover was designed with a rise of only 4% (15' 8"). A clear-span dome of that diameter would have required a 70' rise, so to accomplish the required low rise, the roof would need to be supported by 85 stainless steel support columns.

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CST Covers Domes

CST Covers is a leading manufacturer and installer of custom-designed aluminum covers.

The company's broad product offering includes aluminum geodesic domes, extruded and formed flat covers, truss and joist supported cover structures and custom architectural cover designs for use in a wide variety of applications.

CST Covers are used for storage tank applications in water, waste water and petroleum as well as large dome structures for the storage of dry bulk materials. CST Covers' design, engineering and construction excellence are acknowledged throughout the cement industry and the world.

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