

Buried Reservoir Meets the Challenges of Residential Construction

Aboveground exposed water tanks are meeting with increased resistance from homeowners because they are difficult to screen from view. Buried, concrete reservoir design has helped to overcome this opposition in several communities.

The Contra Costa Water District (CCWD) required additional water storage capacity to provide fire protection and supplement its regular water supply in case of an emergency. Carollo provided design and construction management services for Taylor Reservoir, a 7.5-million-gallon post-tensioned, prestressed concrete reservoir buried on a 2.25-acre hilltop in the middle of a residential neighborhood in Pleasant Hill, California.

Project Features

The reservoir has a nominal water depth of 30 feet. The circular walls are prestressed with high-strength steel, both horizontally and vertically. The floor and roof slabs are constructed of conventional, reinforced, water-stopped concrete. The reservoir is connected to CCWD's water distribution system by a 24-inch water main. The site is in a zone of high seismic risk. This, and the existence of occupied residences downslope, required a particularly careful and thorough analysis and design for seismic loads.



The reservoir site is surrounded on all sides by homes.



Site before construction.

Site after construction. Work involved completely removing the knoll and rebuilding it after reservoir construction.



underground. The roof slab supports a 2-foot-thick layer of soil. The project involved extensive sitework, revegetation, and landscaping to provide screening from view. The top of the reservoir is covered with natural vegetation. Access for maintenance is conveniently hidden in park benches.

Carollo also assisted in mitigating impacts to surrounding residents during construction. Techniques included noise and dust control, as well as restricted working hours and special routine street cleaning.

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"Dedicated to creative, responsive, quality solutions for those we serve."

Carollo was responsible for all design work for this \$3.7 million project, including interagency and property owner coordination and permits, quality and budget control, and scheduling.

A Good Neighbor Design

Because the reservoir is located on top of a knoll in an open space area surrounded by single family residences, aesthetic and environmental concerns dictated building the structure completely

Highlights

- ▼ 7.5-million-gallon, 207-foot diameter buried concrete reservoir.
- ▼ Post-tensioned, pre-stressed concrete design.
- ▼ Strict attention to site aesthetics in a residential neighborhood.
- ▼ Careful and thorough analysis and design for seismic loads.