

# Silverlake Headworks East Reservoir Trial

Los Angeles, CA



Project Profile (2014)



## Project Summary

In order to protect drinking water sources and comply with EPA regulations, LADWP began construction on two 55 MG enclosed reservoirs to contain water that currently is stored in the open Silverlake and Ivanhoe reservoirs. The first reservoir (East) was completed in 2014 while the second (West) reservoir is scheduled to start construction in 2015. Combined total water storage is 110 million gallons.

Shrinkage cracks were a concern from the onset of the project, given the geographic history of shrinkage issues. Additional concern was warranted since the on-going drought in California made it imperative that no water was lost due to leakage. Also, given the size and shape of the structures, the California State Division of Safety of Dams required regulatory oversight on the measurement and repair of all concrete cracks. Despite the exhausted efforts and expertise of all parties involved, the leak test performed after the completion of the East Reservoir resulted in a measured 20,000 gallons/day water loss, requiring divers to make costly repairs for weeks.

Looking to make improvements for the next (West) Reservoir, LADWP decided to try different crack mitigation technologies to see if they could make an improvement over their current situation. The East Reservoir roof slab was utilized as a real-life testing area to measure improvement in shrinkage cracking as well as impact on placeability, workability, and batching process.



Typical roof deck shrinkage cracking (without the use of PREVENT-C).



Repair of full-depth shrinkage cracking on the underside of the roof deck.

**Owner:** Los Angeles Department of Water and Power (LADWP)  
**Engineer:** Los Angeles Department of Water and Power (LADWP)  
**Concrete Contractor:** SSC Construction, Inc.  
**General Contractor:** WOL (Webcor - Obayashi - Lyles ) Joint Venture  
**Ready-Mix Producer:** Cal Portland Company  
**Products:** PREVent-C® Shrinkage-Reducing/Compensating Admixture

PREVent-C was incorporated into two roof deck slabs. Each slab was 25' x 25' x 2.5' deep. The concrete mix utilized in the entire East Reservoir incorporated 1/2 gallon of convention shrinkage reducing admixture (liquid glycol ether). For the PREVent-C test slabs, the liquid SRA was removed and 5% PREVent-C admixture was added to the mix.

The two test slabs with PREVent-C demonstrated a drastic improvement over the typical shrinkage cracking the rest of the roof deck and structure was experiencing. One PREVent-C roof deck slab showed no shrinkage cracks requiring repair, while the second slab showed very minimal cracking. Most shrinkage cracks were eliminated with the use of PREVent-C, while the ones that occurred were much thinner, reducing repair cost and time.

Because of the success of the East Reservoir roof deck trials, PREVent-C is being considered for use in some, if not all, of the concrete for the West reservoir.



Typical roof deck slab showing extensive full-depth shrinkage cracks. These cracks are shown after epoxy injection repair and skim coating. Other minor cracking occurred but is not visible.



Test roof slab with 5.0% PREVent-C (above) shows no cracking needing repair.



PREVent-C....the most effective admixture in mitigating concrete shrinkage cracking and curling.



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