



FOLSOM DAM AUXILIARY SPILLWAY – CRITICAL CONTROL STRUCTURE

Project Type:

Infrastructure

Application:

Grouting

Location:

Folsom, CA

Project Date:

February 2014

Project Owner:

United States Bureau of Reclamation

Engineer:

U.S. Army Corps of Engineers

Contractors:

Granite Construction and
Kiewit Infrastructure West

Product:

Komponent®

The Folsom Dam Auxiliary Spillway project, a \$900-million cooperative effort between the U.S. Army Corps of Engineers and the U.S. Department of the Interior, Bureau of Reclamation, began in 2012. The new spillway was constructed to safely release water from Folsom Lake when water levels are elevated to protect communities during a flood.

Granite Construction of Watsonville, Calif., was awarded a \$125.9 million contract in May 2012 to construct the spillway during phase three, followed by Kiewit Infrastructure West, who was awarded a \$255.1 million contract in May 2013 to complete construction on the new spillway at Folsom Dam during phase four.

The spillway includes an 1,100 ft (335 m) long approach channel that will funnel water from the lake into the spillway. A control structure with six submerged gates was constructed to operate in coordination with the gates on the Folsom Dam to control water releases. A 3,027 ft (923 m) long spillway chute transports water from the control structure to the American River. A stilling basin slows the flow of released water to normal flow levels that the river channel can safely withstand.

The control structure is the central component used to prevent dam failure and risk of flooding. To ensure long-term performance of the control structure, a Komponent expansive cement admixture designed to create shrinkage-compensating grout was specified

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for use around the curved, stainless steel gate supports. This critical application area requires long-term dimensional stability of the grout material to ensure the gates open and close properly. Shrinkage and cracking of the cementitious grout material would prevent the gates from closing properly and leave gaps that result in leakage. Over time, the resulting volume change and movement would increase leakage points and ultimately accelerate deterioration and potential failure of the control structure.

Komponent® expansive cement additive was chosen for the project due to its proven performance in shrinkage-compensating concrete and non-shrink grout designs. Komponent is engineered to achieve a net zero drying shrinkage, prevent drying shrinkage cracking, and ensure long-term dimensional stability.

For this project Komponent was used at a 16% dosage rate, which replaced 16% of the total portland cement content in the original mix design. Fly ash was also used in this high-performance mix design. The dosage rate was determined based on ASTM C806 and C878 testing used to ensure designed expansion was achieved. The dosage rate is evaluated to ensure it provides sufficient expansion to compensate for the anticipated shrinkage of the portland cement in the mix.

Due to site conditions and construction concerns, ready mix delivery of the grouting material was not viable. Job site batching was required. To meet these project requirements, the Komponent additive was provided in 90 lb. bagged units and introduced into the grout mix as a slurry, using a high-velocity slurry mixer. The shrinkage-compensating grout material was then pumped into the stainless steel gate supports and finished.

The Komponent non-shrink grout material achieved the 7,000 psi design requirement and the designed shrinkage-compensating expansion. Gate installations were completed successfully. Two years after installation, Jared Thornton, Project Engineer, noted the Komponent® non-shrink grout is meeting design expectations.

The communities serviced and protected by the Folsom Dam Auxiliary Spillway Control Structure can enjoy peace of mind on a job well done by the entire project team.

For information on how Komponent can be used to provide a high-performance shrinkage-compensating concreting or grouting solution on your next project, contact a member of the CTS Cement Engineering Team at (800) 929-3030 or info@CTScement.com.

