Oroville Dam spillway project – Oroville, California, USA

Project overview

When devastating amounts of erosion were discovered on the Oroville Dam's spillway, thousands of lives were at risk. MAPEI's ***Planigrout® 755*** construction grout was utilized to fill voids in the concrete and strengthen the repaired structure.

Project information

Project category:	Infrastructure – Tunnel/Waterproofing
Years of original construction:	1961-1968
Year of MAPEI involvement:	2017-2018
MAPEI coordinator:	Rob Dyer
Project owner:	California Department of Water Resources
MAPEI distributor:	USC Supply, Inc.
Original designer:	U.S. Army Corps of Engineers
Photographer:	Rob Dyer

MAPEI products used

- *Planigrout 755*

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MAPEI helps strengthen dam structure, saving town

The state of California had a massive problem. Decades had passed with public funds being diverted away from infrastructure projects, resulting in deteriorating freeways and roads, rusting bridges and – as the normally drought-ridden state learned during one rainy winter – crumbling dams.

February of 2017 was an unusually rainy season, soaking Northern California to saturation and beyond. On February 7 as the water continued to pour down, state engineers noticed concrete erosion on the flood-control spillway at the Oroville Dam.

In operation since 1968, the Oroville Dam is an earth-fill embankment dam located on the Feather River just east of the city of Oroville, California (population 19,895), in Butte County (population 220,400) within the scenic Sierra Nevada foothills. At 770 feet (235 m) high and 6,920 feet (2 109 m) long with a volume of 78,000,000 cubic yards (59 635 278 m^3), the Oroville Dam is not only the tallest dam in the United States, it is the only thing separating Lake Oroville from the thousands of people living downstream in Oroville.

As additional storms were being predicted, engineers inspected the spillway further and uncovered more erosion. Finally, the California Department of Water Resources stopped the spillway flow and the worst was revealed: The structure was badly damaged and in need of immediate repair.

An emergency spillway was created and the water flow was diverted to it. Rocks were carried by helicopter to the damage site to help shore up the erosion; but, like a scene from a nightmare, the effort was no match for the rising water.

At that point, state officials issued evacuation orders for 200,000 people living downstream. The idea of the dam failing and sending Lake Oroville crashing downhill over everything in its path – including the town of Oroville – was turning into more of a reality. California's massive problem had become a state of emergency.

Heavy equipment and construction workers were called in from around the state. As water continued to pour from the emergency spillway, over 125 crews worked around the clock in an attempt to lower the lake level. Finally, by February 17 (10 days after the erosion was first noticed), the crews were ready to begin pouring concrete – and MAPEI was there to help.

MAPEI products on the jobsite

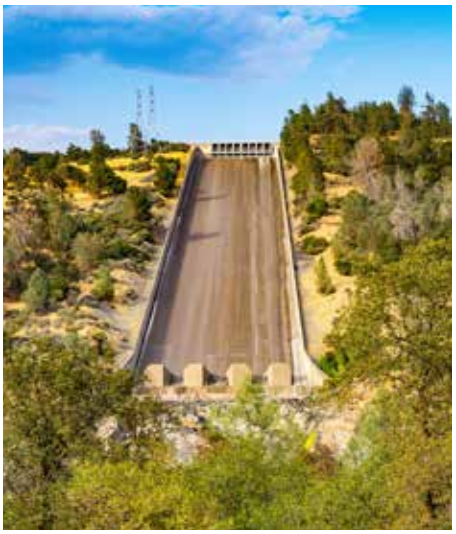
"There was one product for this job," said Rob Dyer, the MAPEI coordinator on the project. "They knew it would work. We knew it would work. And so, there was a lot of ***Planigrout 755*** delivered to this jobsite."

The specifications called for the installation of about 8,000 pieces of #10 rebar on the spillway to reinforce the heavily eroded structure. "Each piece of rebar was sized between 15 and 25 feet [4.57 and 7.62 m] in length," Dyer said. Because *Planigrout 755* is a one-component, nonshrinking, cementitious grout, it was excellent for use as nonshrink grouting for rebar placement.

About 8,000 cores were drilled; rebar was then placed into the cores. "We pumped the *Planigrout 755* in to fill the voids between the pieces of rebar and the outer wall of the core," Dyer said. "We used about 16,000 bags of 50-lb. [22.7-kg] product during the entire project."

Fortunately, Mother Nature cooperated, the rains held off and the water levels in the lake dropped during the repair process. "This minimized the possibility of a dam failure during the quick fix on the damaged spillway and then on the repair/replacement that immediately followed," Dyer said.

Dyer then summed up the incredible experience. "This was a great project to be a part of. How often do you get the chance to help save an entire town?"



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