



Oroville (California)

OROVILLE DAM SPILLWAY

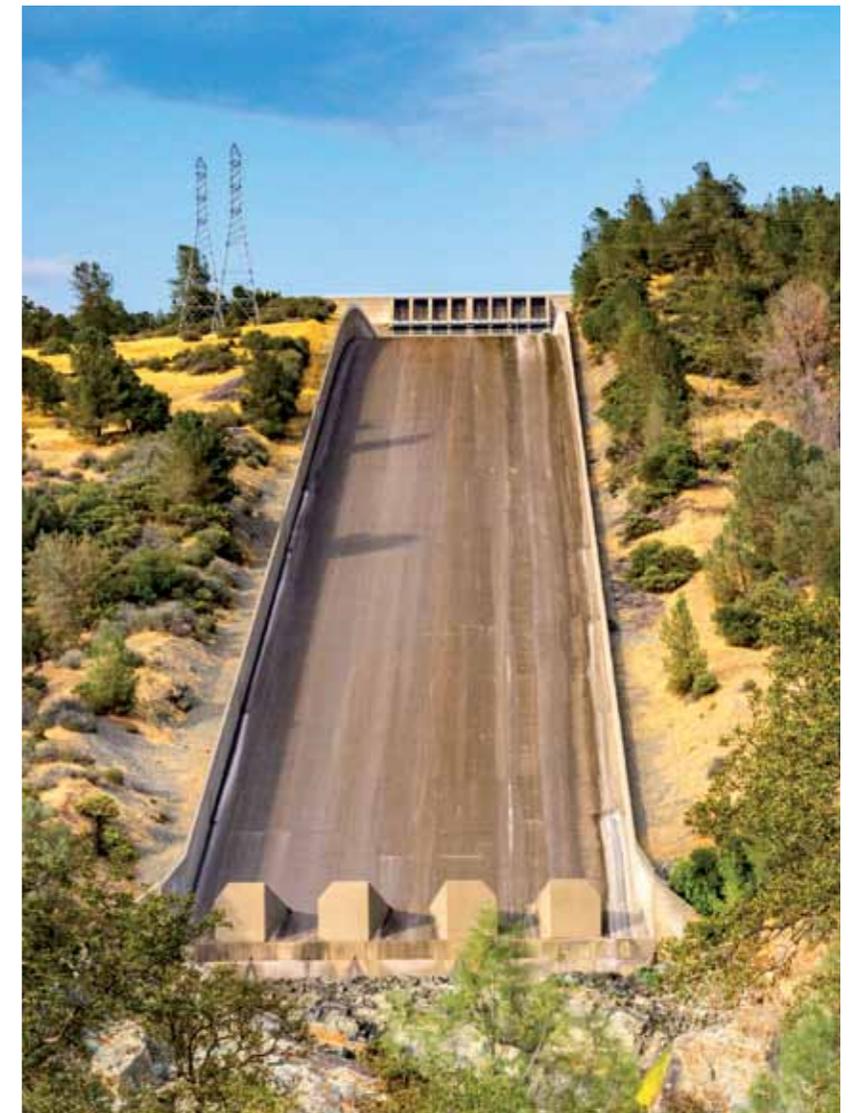
MAPEI PRODUCT HELPED TO STRENGTHEN A DAM'S STRUCTURE AND SAVE A CITY

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 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

RIGHT. In operation since 1968, the Oroville Dam is an earth-fill embankment dam just east of the city of Oroville, California, in the scenic Sierra Nevada foothills.

LEFT. On February 7, 2017, as the rain water continued to pour down, California state engineers noticed concrete erosion on the flood-control spillway at the Oroville Dam in California. Strengthening and repair work was completed thanks also to PLANIGROUT 755.



Problems and solutions

When devastating amounts of erosion were discovered on the Oroville Dam's spillway, thousands of lives were at risk. The dam had to be reinforced before the rains began again and the water levels in the lake started to rise. Mapei Corp.'s PLANIGROUT 755 grout (whose counterpart on the international market is called MAPEFILL) was utilized to fill voids in the concrete and strengthen the repaired structure which contributed to help the town.

located on the Feather River just east of the city of Oroville, California (population 19,895) in Butte County (population 220,400) in the scenic Sierra Nevada foothills. At 235 m high and 2,109 m long with a volume of 59,635,279 m³, 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 Corporation, the U.S. subsidiary of the Group, was there to help.

PLANIGROUT 755: Dam right

"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 no. 10 rebar on the spillway to reinforce the heavily eroded structure. "Each piece of rebar was sized between 4.57 and 7.62 m in length," Dyer said. PLANIGROUT 755 is a one-component, non-shrinking, cementitious grout. This product is manufactured and distributed on the U.S. market by Mapei Corp. (its counterpart on the international market is called MAPEFILL). The product was excellent for use as non-shrink grout for rebar placement. About 8,000 cores were drilled. Rebar was then placed into the cores.

"We pumped 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 22.7-kg product during the entire project."

Fortunately, 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?"

This article was taken from Realtà Mapei North America, no. 30, the in-house magazine published by Mapei Corp., whom we would like to thank.



ABOVE. PLANIGROUT 755 was pumped in to fill the voids between the pieces of rebar and the outer wall of the core.

MAPEFILL

High-flow, non-shrink, cementitious grout for precision anchoring of machinery and metallic structures.

FIND OUT MORE



TECHNICAL DATA
Oroville dam spillway,
 Oroville (California, USA)
Period of original
construction: 1961-1968
Original designer: U.S.
 Army Corps of Engineers
Period of the Mapei

intervention: 2017-2018
Intervention by Mapei:
 supplying a grout to install
 about 8,000 pieces of rebar
Client: California
 Department of Water
 Resources
Mapei distributor: USC

Supply, Inc.
Mapei coordinator: Rob
 Dyer, Mapei Corp. (USA)
Photos: Rob Dyer
MAPEI PRODUCTS
 Placing rebar:
 Planigrout 755*

*This product is
 manufactured and
 distributed on the U.S.
 market by Mapei Corp., the
 U.S. subsidiary of the Group
 For further information
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Gibe III Hydro-Electric Project, Ethiopia

Image courtesy of Salini Impregilo

