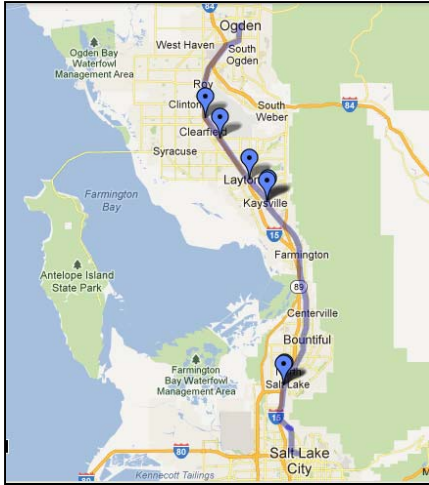


## Repairing the Bamberger Railroad (Highway) Bridge

By Tom Lundgren, MAPEI CRS Representative



In 1892 the Salt Lake & Ogden Railway became a part of the life of Davis County, Utah with rail being laid as far as Bountiful in that year, and finally reaching from Salt Lake City to Ogden by 1908. Simon Bamberger, a Utah coal-mine operator and railroad entrepreneur, started the railroad in 1891 to transport coal from his mine in Farmington to SLC. He switched it from steam power to an electrified line in 1910. The railroad was an established commuter line for Utah passengers as it stopped at most of the small towns between the two major cities.

The Bamberger Railroad Bridge was built in 1934 and converted to a highway

bridge in the late 60's or early 70's by the Utah Department of Transportation (UDOT). The Bamberger Railroad used and maintained the bridge in Bountiful, Utah, until Sept. 15, 1952, when the last passenger train crossed it. Some cargo was carried by the Bamberger Railroad until 1958, but in that year the company became defunct.



The Bamberger Bridge was constructed when bridges were designed to be aesthetic show pieces as well as functional structures. (Note the ornate stepped beams and the elaborate railing as evidence of the architectural values of the period.)

Over the years, the bridge had become structurally unsound due to water intrusion, freeze-thaw damage and active corrosion cells in the concrete beams and columns.



Repairs on the bridge began in July 2011 when Gerber

Construction began installing temporary shoring to support beams and columns during the removal of deteriorated concrete. After the shoring was in place, damaged concrete was removed, reinforcing



steel was either cleaned or replaced as needed, and forming was tightly fitted against the beams and columns to maintain the unique contours and shapes originally cast into the bridge.



Because of its elaborate design, Chris Weight, project manager, Gerber Construction, elected to use *Planitop*<sup>®</sup> 15 form-and-pour mortar because of its mechanical properties as well as its ability to flow long distances without segregating. Per the International Concrete Repair Institute (ICRI) Guidelines, forms were filled with water to saturate the areas to be repaired. After a thorough saturation for 24 hours, the forms were drained and the repair mortar placed.



Due to the depth and volume of the voids, *Planitop* 15 was extended with 25 lbs. of washed pea gravel per 50-lb. sack and modified with *Mapecure SRA* shrinkage-reducing additive. The mixed mortar was then poured into the forms via head boxes strategically placed at the top of each of the forms. To ensure complete flow into voids as well as to the



outer most reaches of the forms, they were lightly vibrated. In some areas, the mortar had to flow over 4 feet from the head box.

In all cases, when forms were stripped after three days of cure time, *Planitop* 15 had achieved 100% bond to the existing concrete structural elements and was effectively working homogeneously with the existing beam or column in carrying dynamic loads. It is important to note that the Gerber Construction crew and the UDOT inspector checked each repair for any defects and sounded them for hollow areas. There was not a single hollow area or honeycomb in the area filled by the 600 bags used in the repair.



While the *Planitop* 15 was curing, the Gerber crew took care of smaller repairs using *Planitop X* – a non-sag, fast-setting, ‘sculptable’ repair mortar.

Chris Weight, Gerber Construction Project Manager, was extremely pleased with the workability and performance of *Planitop* 15 and indicated that he would have his crew use it on any future projects requiring a form-and-pour mortar.