

A chronology of rapid, emergency bridge repair.

Seven days in June

A problem at a Denver & Rio Grande Western bridge at Minturn, Colorado. The structure is on the D&RGW mainline from Kansas City to Salt Lake City. A large section of the concrete bridge pier No. 2 has been discovered to have a severe crack in it. The separated segment has also shifted slightly, being retained only by some of its steel reinforcement.

In spots, the separation is as much as 2-inches wide. Alarming, the crack runs directly under the south bridge bearing area of the pier, leaving only about 30 percent of sound support for the bearing plate. The divorced section has slipped down about ½ inch and the bearing is tipping slightly. Action's needed, and quickly! The clock is running...

DAY 1—With the discovery of the damage, D&RGW bridge people immediately call for a slow order over the bridge. It is decided quickly that epoxy repairs will be the swiftest and at the same time the most cost-efficient solution to the problem. D&RGW Structural Engineer R.E. Davis rushes a call to Osmose Railroad Division's headquarters in Madison, Wisconsin. In the meantime, there's no sitting back until help arrives...

DAY 2—While a fully-mobilized Osmose repair crew is enroute to the site, D&RGW bridge personnel are shipping scaffolding to the bridge. Access to the damage area will be ready and waiting upon arrival of the emergency repair crew...

DAY 3—R.R. team erects scaffolding.

DAY 4—Osmose repair crew and equipment arrives. They and D&RGW team get right to work. The loose section has to be kept from displacing even more during repair. Steel cables are wrapped around the pier, holding the divorced segment firmly. The crack is cleaned; deteriorated and loose concrete removed...

Besides the main crack, there are several smaller fracture branches. All are sealed with an epoxy paste. The sealant cures rapidly, and the main crack is next filled with an epoxy/sand compound—'welding' the crack shut. But more needs to be done to assure the structural integrity of the pier support.

DAY 5—Work begins immediately with the injection to refusal of a special liquid epoxy formula into the crack system and any other voids. Next, at critical locations, 1½-inch

diameter holes are driven right through the divorced section and into the main shaft of the pier. Workmen then place a No. 8 rebar dowel into each of the bored holes, then fix the dowels with epoxy grout. The separated section is thus 'pinned' effectively to the main body of the pier.

Epoxy grout must be used one more time: to top out the bearing surface of the

pier, restoring full bearing to the load plate. Later, test cores reveal that the treatment has given excellent penetration and bonding. Site is cleaned up...

DAY 6—Osmose crew is on its way to another contract...

DAY 7—A slow order is removed by D&RGW. ■



Problem on D&RGW bridge in Colorado: severe split in its second pier.

Cable stays keep loose concrete segment from displacing further during work.



Osmose technician injecting epoxy formulations to 'weld' crack shut.



Quality
Quality
Quality
Quality



***Renovation of
Concrete Structures***

- ★ Epoxy Injection
- ★ Recasting
- ★ Shot-Crete

***Specialized Services
for Timber Bridges***

- ★ Inspection
- ★ In-Place Preservative
Treatment
- ★ Repair

THE BRIDGE PRESERVERS

Railroad Division
P.O. Box 8276
Madison, Wisconsin 53708
608/221-2292 — 800/356-5952