

# Modern Technology for a Historic Structure: The Story of Malpas Creek Bridge

CARMEL, CALIFORNIA

SUBMITTED BY VECTOR CONSTRUCTION, INC.

The historic Malpas Creek Bridge, completed in 1935, is an open spandrel reinforced concrete parabolic single span arch bridge that is 210 ft (64 m) in length. Malpas Creek Bridge is one of seven concrete arch bridges that cross deep, wide ravines and canyons hundreds of feet above the Pacific Coastline in Monterey County. Collectively, the seven bridges are known as the Big Sur Arches.



*Malpas Bridge: pre-construction*

Situated adjacent to California’s Pacific Ocean, the Malpas Creek Bridge has been subjected to airborne chloride exposure for 80 years. Once chloride-induced corrosion initiated, it began to cause progressive concrete damage. Given the historic nature of the bridge, the preferred corrosion intervention was a solution that could passivate

active corrosion and extend the life of the structure, while minimizing any long-term visual impact.

During the 2014-2015 rehabilitation project, the Malpas Creek Bridge’s reinforced concrete spandrel columns, arch-spans, and struts were treated with a process referred to as Electrochemical Chloride Extraction (ECE). With ECE, a temporarily applied electric field reduces chloride levels and increases the alkalinity around the reinforcing steel. The ECE treatment directly addresses the cause of the corrosion. No permanent system is left in place and the bridge maintains its original appearance, a key benefit for historic bridge preservation.

A total area of 7,931 ft<sup>2</sup> (737 m<sup>2</sup>) was treated by ECE, leaving Malpas Creek Bridge in an extremely passive condition while maintaining the structure’s aesthetic appeal. By utilizing a modern corrosion mitigation technology, the owner has taken a major step in reducing future maintenance concerns on this beautiful and historic bridge.



*Malpas Bridge: bottom of arch tightly wrapped*

**The Story of Malpas Creek Bridge**

**OWNER**  
Caltrans District 5  
*Monterey, CA*

**GENERAL CONTRACTOR**  
Truesdell Corp – GC  
*Tempe, AZ*

**CORROSION SUBCONTRACTOR**  
Vector Construction, Inc.  
*Fargo, ND*

**TECHNOLOGY SUPPLIER**  
Vector Corrosion Technologies, Inc.  
*Wesley Chapel, FL*