



EPOXY-COATED STRAND UNDER SURVEILLANCE ON COAST

After 40 years of service, the Hubbard Creek Bridge south of Port Orford was replaced. The salt in the ocean air had saturated the structure and deteriorated the steel in the concrete. Since the replacement bridge would be in the same corrosive environment, the Highway Division decided to provide additional protection to the steel. Thus, an epoxy coating was specified for the reinforcing steel and the prestressing strand.

Epoxy coating encases the steel to protect it from salt. Rebar with epoxy coating has been used for several years but coated prestressing strand is relatively new. There was little doubt the epoxy coating would protect the strand from corrosion. However, the question to be answered was how well the strand would bond with the concrete. The specified strand [FLO BOND (TM)] had grit embedded in an epoxy coating to insure a good bond with the concrete.

A good bond between concrete and steel is needed in prestressed beams to develop the necessary strength. First the steel strand has to be pulled to a specified tension. Then the concrete is poured around it. After the concrete cures, the strand is released. When the Hubbard Creek beams were released, camber was 1-inch greater than expected in every beam, indicating an excellent initial bond. Also, the epoxy coated prestressing strand caused no significant casting or construction problems.

Construction was completed in September, 1985. Coated prestressing strand was \$0.45 per lineal foot compared to \$0.195 per lineal foot for uncoated. Using the coated strand added 4.4% to the total cost of the bridge. The added cost will be justified if the strand doesn't slip or rust and extended life of the bridge is realized. Creep and deflection of the beams are being monitored for any changes in the strand to concrete bond. To date no measurable movement or slippage has occurred.

The bridge will be monitored until 1990. This period is insufficient to evaluate the coating in preventing corrosion, but is long enough to determine any structural performance problems. Evaluating the strand in service is essential to justify the added cost of using coated prestressing strand, especially if it is to be considered for use in future coastal bridges.

Should you need information on epoxy coated prestressing strand contact the Research Section, Oregon Department of Transportation, 1174 Chemeketa N.E., Salem, Oregon 97310 and ask for:

"EVALUATION OF BOND CONTROLLED, EPOXY-COATED PRESTRESSING STRAND ON HUBBARD CREEK BRIDGE, Experimental Feature Interim Report" by Allison Petrak, Research Specialist in collaboration with Richard L. Groff, P.E., Structural Design Engineer IV, and Keith Martin, P.E., Research Coordinator, Oregon State Highway Division, April 1986; OR 84-06.