



Florida Department of Transportation Research

Corrosion Characteristics of Post-Tensioning Strands in UngROUTED Ducts

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To prevent corrosion of post-tensioning strands, FDOT construction specifications currently require post-tensioning ducts to be grouted within seven calendar days of strand installation. This period challenges construction schedules on large projects and may be unnecessarily brief in mild service environments. A literature review indicated that the seven-day limit is a common specification among transportation agencies, but some allow periods up to 40 days for mild environmental conditions.

In this project, researchers placed untensioned strands in near full-scale ducts for periods of 1, 2, 4 and 8 weeks. Strands were subjected to one of four treatment conditions: (1) dry duct, both ends closed, no corrosion inhibitor; (2) dry duct, one end open, no corrosion inhibitor; (3) water in duct, both ends closed, no corrosion inhibitor; and (4) water in duct, both ends closed, treated with water-based, vapor-phase corrosion inhibitor. Experiments were conducted at both inland and seaside locations to observe the effects of salt air.

After each testing period, strands were examined visually using a visible corrosion rating scale developed in a similar California project. Strands were also mechanically tested to determine if they had been weakened by treatment.

All strands in the project, except the 8-week strand in seaside treatment group 3, were found to be in acceptable condition by both visual and mechanical tests.

Based on these findings, researchers made a series of recommendations for adjustments to current FDOT specifications with respect to strands installed in ungrouted ducts.



The experimental set-up for this project tested tensioning strands in wet and dry conditions at both inland and seaside locations.