Florida Department of Transportation Research

Evaluation of FDOT Corrosion Prevention and Control Programs

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BE725

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Current Situation

The Florida Department of Transportation (FDOT) manages a network of over 6,500 bridges, many of which are in severe corrosive environments. Corroding bridges in Florida have proven costly for FDOT. The State implements various corrosion prevention and control systems to extend the service life of bridges, including durability-based design requirements for new bridges and rehabilitation efforts for existing ones. FDOT has implemented many of these systems on its bridges with varying degrees of success.

Research Objectives

This research reviewed commonly used materials and systems to evaluate and compare multiple practices and systems used across the State in terms of durability, cost, and long-term performance. Additionally, this project summarized current FDOT design requirements and specifications regarding corrosion control for reinforced concrete bridge structures with a focus on substructure elements.

Sections of the fiberglass jacket installed to prevent corrosion have broken off of this pile.

Project Activities

After a literature review, the research team studied 12 bridge corrosion protection systems, construction materials, and practices. The team field-tested four locations, including eight individual bridges, to evaluate these corrosion prevention and control systems.

While all corrosion prevention and control systems weren't evaluated, the most commonly used systems were. This includes concrete cover, supplementary cementitious materials, epoxy coating, and cathodic protection (metalized, impressed current, and galvanic).

Project Conclusions and Benefits

Galvanic pile jackets are an effective method of mitigating corrosion on pile elements and can extend the service life of pile elements by 20 years or more depending on the quality of installation, environment, and maintenance efforts. Similarly, conventional impressed current jackets powered by rectifiers are also effective at mitigating corrosion in larger substructure elements, however, these systems require periodic maintenance and adjustments.

The research also discovered additional benefits and limitations of numerous treatments and corrosion prevention methods. This information will help engineers create bridges that are more resistant to corrosion and to preserve and extend the lives of those that are already in service.

For more information, please see *fdot.gov/research*.