Florida Department of Transportation Research

Synthesis of galvanized steel reinforcement corrosion performance

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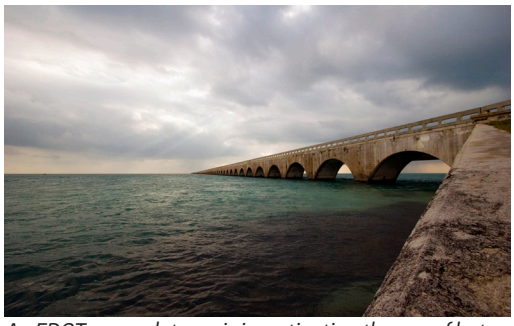
Current Situation

Being in a peninsular state, the Florida Department of Transportation (FDOT) is always looking for ways to reduce corrosion in aggressive marine environments.

Hot dipped galvanized steel rebar (HDGR) is an alternative to plain carbon steel, which corrodes faster. The added zinc-rich layer on galvanized steel serves as a sacrificial coating that protects the underlying carbon steel.

However, there is the question of its suitability for the marine splash zone in Florida structures. While some information reports benefits from increased chloride threshold and reduced corrosion rates, there is uncertainty about just how effective galvanized steel is against splash zones. Existing evidence on HDGR corrosion performance needed to be thoroughly evaluated before it is approved and implemented in marine environments of interest to FDOT.



An FDOT research team is investigating the use of hot dipped galvanized steel rebar (HDGR) in the marine splash zone of Florida structures such as bridges.

Research Objectives

This research was a synthesis of technical literature to help determine whether to allow the use of HDGR to increase durability.

Project Activities

This review and synthesis, conducted by the University of South Florida, focused on splash zone conditions and was restricted to traditional HDGR production material. The team framed the review as answering key questions on characteristics and behavior of the material in anticipated service: potentials benefits or negative consequences of its deployment; whether there is at present enough documentation to allow specification by FDOT or not; and, if documentation is not enough, what could be a path forward toward making that determination.

Project Conclusions and Benefits

There is a need for further field exposure and experimental testing prior to including HDGR in the FDOT Standard Specifications for Roads and Bridges. While some potential benefits of specifying HDGR are attractive, the immediate deployment of HDGR, especially in Florida's highly aggressive marine substructure service, are not recommended at this time. Instead, a phased approach is advised, including targeted testing and incorporation as an experimental feature of selected components in coming FDOT bridge projects.

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