

UHPC Overlays for Highway Bridge Decks: Bond Behavior, Durability, and Structural Performance

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Abstract

UHPC is emerging as an innovative, viable option for use as an overlay for highway bridge deck repair and rehabilitation. Since 2016, the structural concrete research group at FHWA's Turner-Fairbank Highway Research Center (TFHRC) has been actively researching some of the critical aspects related to the behavior and performance of UHPC overlays for concrete bridge decks. This research has included both laboratory-based studies and field testing of an in-service bridge with a UHPC overlay. This presentation will cover the key findings from these research endeavors with a specific focus on the bond behavior of UHPC overlays. Best practices for achieving good bond between UHPC overlays and substrate deck concrete will also be discussed. The presentation will also highlight new UHPC overlay research that is currently ramping up at TFHRC. This new line of research will investigate some of the durability aspects of UHPC overlays and the structural performance of overlaid concrete deck systems.



Figure 1. UHPC-Concrete Bond Test Samples After Testing

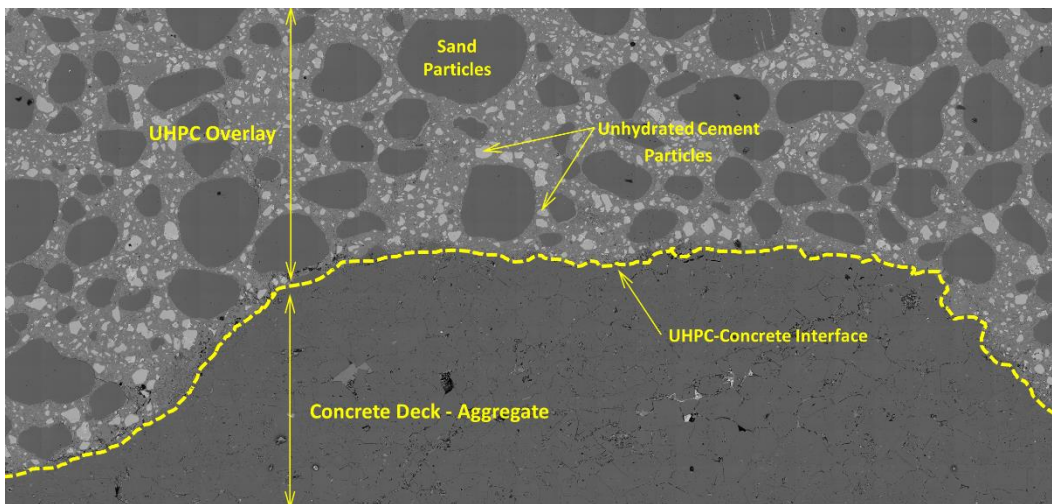


Figure 2. Scanning Electron Micrograph of the UHPC-Concrete Interface