

UHPC Bridge Deck Overlay – Impact of Key Design Variables

Sri Sritharan, Ph.D. * (corresponding author) – Wilkinson Chair Professor, Iowa State University, 813 Bissell Road, Ames, Iowa 50011 USA, Phone: 515-294-5238, Email: sri@iastate.edu

Liang Zhong – Laboratory Research Assistant, Iowa State University, 813 Bissell Road, Ames, Iowa 50011 USA, Phone: 515-294-5238, Email: sri@iastate.edu

Enrique Rubio-Delgado – Graduate Research Assistant, Iowa State University, 813 Bissell Road, Ames, Iowa 50011 USA, Phone: 515-708-4173, Email: enriquer@iastate.edu

Philipp Hadl, Ph.D. – UHPC Solutions, 433 Broadway – Suite 604, New York, 10013 NY USA, (212) 691-4537, Email: philipp.hadl@uhpcsolutions.com

Application/Projects
Bridges

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Extended Abstract

As part of a recent UHPC bridge deck overlay project in Iowa, several mock-up bridge decks were cast with the overall dimensions of 8 ft (length) x 6 ft (width) x 9.25 in. (height). The construction of the slabs used a normal concrete base and varying thickness of UHPC overlay (i.e., 1.25 in, 1.75 in., and 2.0 in.). Each half of the overlay was placed first followed by the second half at a different time, replicating the lane-by-lane construction in the field. To ensure a robust joint between two adjacent lanes, different joint details were used. With the 2 in. UHPC overlay, an additional layer of reinforcement was included to investigate the strength gain associated with a reinforced UHPC overlay. In each case the last 0.25 in. UHPC was placed for the entire slab with reduced amount of steel fibers. In addition, a reference concrete slab was also cast.

The mock-up slabs were then cut into 2 ft wide, 8 ft long strip and are being subjected to positive and negative flexural moment tests. A total of eight tests have been planned. The presentation will cover a summary of results from the tests and their performance under positive and negative moments. The presentation will conclude the influence of different UHPC overlay thickness, impact of different joint details, and strength gain resulting from incorporating reinforcement within the overlay.

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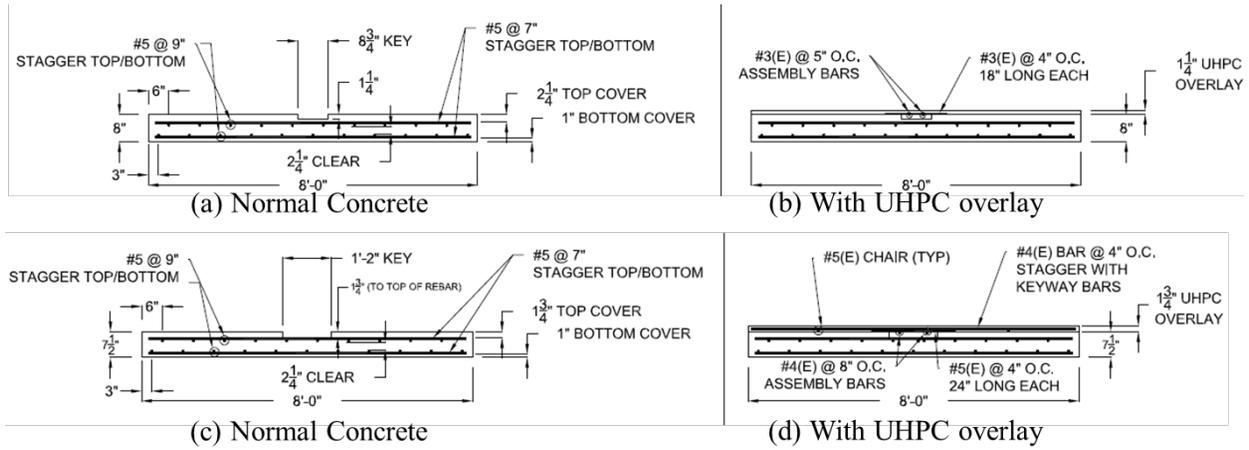


Figure 1. Details of two mockup slabs



Figure 2. Details of two different connections



Figure 3. Mockup slabs before and after placing UHPC