

Second International Interactive Symposium on Ultra-High Performance Concrete  
Extended Abstract (no paper submission)

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Bridges/ABC

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**Extended Abstract**

In this presentation a novel concept in Accelerated Bridge Construction (ABC) is being introduced. ABC sets its goal to minimizing onsite construction with a focus on durability, safety, and cost. The superior material properties, like durability and early high strength, of Ultra High Performance Concrete (UHPC) conforms to goals of ABC and has been widely used in ABC projects. Also, using UHPC as protective material for bridge elements has shown promising results by improving structural performance and durability of the structure.

The main concept of this research is using prefabricated UHPC shell as stay-in-place formwork for bridge columns. Prefabricated stay-in-place formworks reduce the scaffolding and falseworks, and reduces on-site construction time. The UHPC shell tube, which envelops the column, will act as a durable protection layer against environment for regular reinforced concrete. This layer of UHPC affects the structural performance of the member, the investigation of which is the objective of this study.

In this construction approach, after placing the column reinforcement cage, the prefabricated UHPC shell is brought and positioned at the location of column reinforcement. The UHPC shell act as stay in place formwork for placing the normal strength concrete and as a protection for the service life of the element. In the next step, a small portion of UHPC will be cast at the footing connection with adequate detailing. After the UHPC is hardened, the column normal strength

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concrete will be cast. This will result into a UHPC composite concrete filled tube. At the last step prefabricated cap-beam element will be connected to the column using moment connection developed in this research.

This presentation focuses on performance of concrete filled UHPC tube as bridge column, and their connection details with other bridge elements (Footing and Cap-beam).

