# Development and Testing of High / Ultra-High Early Strength Concrete for Durable Bridge Components and Connections

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## Abstract

Accelerated Bridge Construction (ABC) is a widely used and popular technology especially in areas of heavy traffic with the need of minimal traffic disruption, where construction and repair work causes unnecessary delays, detours, and congestions, logistic challenges for workers in a confined area, more fuel consumptions and safety hazards. This gives rise to the necessity for the use of high early strength (HES) concrete to facilitate ABC. In this research, emphasis is being placed on enhancing the early age strength development of concrete with improved durability properties, volume stability and robustness using non-proprietary materials and local available constituents.

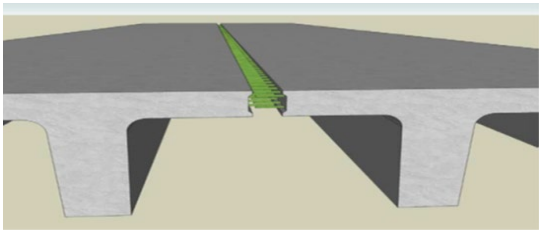

Figure 1: Cast in place longitudinal closure pour connection (FHWA ABC Manual, 2011)

The first objective of this project is to enhance the robustness of current high early strength (HES) concrete. Second to develop a next generation early high strength concrete for sustainable and durable ABC.

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**References**

[1] S. Brena, S. Civjan, S. Castine and G. Ramos, “Development of High Early Strength Concrete for Accelerated Bridge Construction Closure Pour Connections”, NETCR No.13-1, Aug.15, 2018.
[2] Graybeal, B. “Ultra-High Performance Concrete”, Report No. FHWA-HRT-11-038, FHWA, Washington, DC, 2015.
[3] https://cms7.fhwa.dot.gov/