



Non-Proprietary UHPC Workshop:

Mix Design, Material Properties, and Applications

Date: December 7, 2022

Time: 1:00 p.m. to 5:00 p.m. Eastern

Continuing Education Credit: Attendees will receive a certificate stating that they have attended four hours of continuing educational classes.

Workshop Objectives and Who Should Attend

The objective of this workshop is to familiarize the attendees with locally developed non-proprietary ultra-high performance concrete (UHPC) as a construction material. This will include discussion of mix design development, material properties, structural behavior, and applications, especially applications related to ABC.

The workshop will be taught by researchers affiliated with the ABC-UTC, but tailored to be useful for a broad audience. The workshop material is developed for state DOT officials, bridge design engineers, and contractors who would like to have an introduction to the possibilities available for non-proprietary UHPC, as well as those who wish to have a deeper understanding of how to develop a mix design, use UHPC in structural design, or apply non-proprietary UHPC in projects the field. Finally, the workshop is aimed at providing the attendees with the state of the art in UHPC applications for ABC and non-proprietary UHPC research from across the United States.

Workshop Organizer: Royce Floyd

Workshop Instructors: Royce Floyd, David Garber, Mohamed Moustafa

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The following are tentative topics to be included in the workshop. Complete copies of the materials presented at the workshop will be provided to the attendees.

1- Introduction and Mix Development – Royce Floyd, Ph.D., P.E. (30 minutes)

This portion of the workshop will provide an introduction to UHPC and description of mix design development using the ABC-UTC mix design as an example. This discussion will include considerations for constituent material selection and mix proportioning methods

2- Mixing, Placement, and Curing – David Garber, Ph.D., P.E. (30 minutes)

Requirements for mixers used to mix UHPC, mixing methods, placement methods and considerations, and curing methods and effects will be discussed.

3- Material Properties – Royce Floyd, Ph.D., P.E. (45 minutes)

Material and durability properties of the non-proprietary UHPC mixes examined by ABC-UTC researchers will be discussed. This will include compressive strength, flexural strength, modulus of elasticity, creep, shrinkage, bond behavior with reinforcement and concrete, freeze-thaw, and corrosion behavior, and will include effects of changing fiber type and content.

4- Considerations for Local Materials – David Garber, Ph.D., P.E. (30 minutes)

The experience of ABC-UTC researchers examining the same non-proprietary mix design at different locations and different constituent materials will be discussed. This discussion will include considerations for modifying the mix design for local conditions and lessons learned.

5- Applications for ABC – Mohamed Moustafa, Ph.D., P.E. (30 minutes)

Proven and potential structural applications of non-proprietary UHPC will be discussed. This will include results of laboratory testing on connections and repairs, field implementations, and potential issues related to implementation of non-proprietary UHPC.

6- Testing Methods and Quality Control – Royce Floyd, Ph.D., P.E. (30 minutes)

Methods used for material property and quality control testing will be discussed in the context of modifications to standard methods required for UHPC.

7- Summary of UHPC Work Across the Country – (30 minutes)

A summary of research sponsored by various state DOTs and federal agencies on non-proprietary UHPC will be provided. This will include example mix designs and research results from the literature and known implementation projects using non-proprietary UHPC.