

BEYOND THE SURFACE:

Design Innovation with UHPC and HPC Facades

AIA PROVIDER: #T110

PROGRAM: U-HPC-25

LENGTH: 1 HOUR

CREDIT: 1.0 LU/HSW

High Performance Concrete (HPC) and Ultra High Performance Concrete (UHPC) are transforming what's possible in modern facade design.

With significantly enhanced durability, strength, and workability, these materials allow architects to achieve thinner profiles, sharper details, and more complex geometries than traditional precast.

Much like cast iron defined 19th-century facades, UHPC is revolutionizing the 21st-century building envelope with its aesthetic flexibility and structural performance.

This course explores the characteristics of HPC and UHPC, compares them with conventional concrete and outlines how early collaboration and customization open the door to cost-effective, design-driven solutions.

Real-world case studies demonstrate how these materials perform under demanding architectural and environmental conditions—balancing innovation with constructability.

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LEARNING OBJECTIVES

1. Understand the material performance characteristics of HPC and UHPC, including how custom mix designs are tailored to meet aesthetic and structural needs.
2. Discover how to differentiate between conventional precast concrete and high/ultra high-performance concrete systems in terms of composition, performance, and architectural application.
3. Identify design strategies enabled by HPC/UHPC, including lightweight rainscreen systems, deep reliefs, and thin, complex geometries.
4. Learn how to evaluate a project's feasibility for incorporating HPC or UHPC based on budget, design intent, and technical constraints.
5. Review case studies where HPC and UHPC were successfully integrated into facade systems, illustrating performance, sustainability, and architectural impact.



APC / HPC/ UHPC
OVERVIEW



COMPLEX
GEOMETRIES



DESIGN
STRATEGIES



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