Benjamin Manaugh

Consultant

Benjamin Manaugh has experience with advanced concrete technologies, including 3D printed concrete (3DPC), ultra-high-performance concrete (UHPC), roller-compacted concrete (RCC), and fiber-reinforced concrete (FRC), spanning mixture design through evaluation of fresh and hardened properties. His master's research focused on developing a rheology-based testing protocol to assess printability of 3DPC mixtures and designing sustainable, low-cement, high-aggregate mixtures for residential construction. In addition, Ben is trained in experimental solid mechanics, nondestructive testing (NDT) methods, and structural design, providing a strong foundation for both applied research and practical engineering solutions.

Representative Project Experience

Mixture Design and Optimization

3D Printed Concrete

- Developed and applied novel fresh property testing for residential 3D printing mixtures, optimizing w/c, paste volume, and aggregate gradation to achieve pumpability, extrudability, and buildability with conventional constituents.
- Performed on-site quality assurance, adjusting mixtures based on fresh property and aggregate moisture measurements, and reverse engineered mixture designs through wet-sieve analysis.

Roller Compacted Concrete

- Designed RCC mixtures using compaction energy data from gyratory compaction testing and evaluated the relationship between split tensile strength and paste content.

Fiber Reinforced Concrete

- Mentored the ACI student chapter at the University of Illinois Urbana-Champaign in developing a fiber-reinforced concrete bowling ball for the ACI Student Competition.

Experimental Solid Mechanics

Verification of Mechanics Simulations of the Split Tension Test

- Performed mechanical testing (modulus, Poisson's ratio, split tensile, modulus of rupture, crack energy release rate) to validate simulations aimed at improving conventional split-tension test calculations.

Structural Design

Data Centers

- Designed structural systems for data centers, including foundations (grade beams, isolated footings, and handrail bases), connection elements (gusset plates, diaphragms, and collectors), and platforms (MEP roof structures and sign supports).

Academic Credentials

Bachelor of Science in Civil and Environmental Engineering,
University of Illinois
Urbana-Champaign, 2023

Master of Science in Civil and Environmental Engineering
University of Illinois
Urbana-Champaign, 2025

Affiliations

American Concrete Institute

Precast/Prestressed Concrete Institute

Contact Information

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