

Lab for Advanced Construction Technology

Above: The Ultra High Performance Concrete (UHPC) bridge named as "Hawkeye Bridge" was constructed in collaborations among Buchanan County, Korea Institute of Civil and Building Technology (KICT), and University of Iowa.

The lab helps member institutes and companies develop and implement their innovative new construction technologies in practice by performing objective laboratory testing and field evaluation. Focus areas include developing sustainable asphalt and concrete technologies that yield stronger, more durable, longer-lasting, and lower-cost pavements and bridges; eco-friendly mixes reusing of old materials; and sustainable transportation infrastructures supporting lower fuel consumption and reduced greenhouse gas emissions.

Key Objectives:

- Perform research and testing (both laboratory and field) on emerging construction technologies for member organizations.
- Evaluate advanced construction technologies developed by member organizations for implementation.
- Help member organizations commercialize innovative construction technologies.

Who We Work With

- Asphalt Paving Association of Iowa
- Construction Materials Testing (CMT)
- Korea Institute of Civil Engineering and Building Technology (KICT)
- LL Pelling Co.
- Phoenix Industries
- Namheung Corporation
- Hansoo Road Industry Co.
- Iowa DOT, Cities, and Counties

Lab Expertise



Director: David Lee, P.E.

- PhD: Civil Engineering, University of Texas at Austin
- MS: Civil Engineering, Stanford University
- BS: Civil Engineering, Seoul National University

TECHNOLOGY HIGHLIGHTS

High Performance Thin Overlay (HIPRO): A thin overlay (1.0" to 1.5") utilizing a 3/8" mix with 58-28E+ polymer-modified asphalt. HIPRO is designed with less than 2% air voids with 90% elastic recovery, which makes asphalt pavements extremely strong, dense, flexible, impermeable, and crack-resistant.

High Recycled Asphalt Mix (HRAM): An asphalt mixture with at least 30% recycled asphalt materials. To produce HRAM, rejuvenators such as vegetable oils are added to rejuvenate the old aged asphalt.

Cold In-place Recycling (CIR): An asphalt pavement rehabilitation technique in which the existing pavement is milled and reused in place. The milled asphalt pavements are mixed with foamed or emulsified asphalt.

Warm Mix Asphalt (WMA): Allows the asphalt contractors to lower the temperatures at which the material is mixed and placed on the road. Benefits include lower fuel consumption, reduction in greenhouse gas, better compaction, and open to traffic right after the construction.

Ultra High Performance Concrete (UHPC): Exhibiting ultra-high strength, high ductility, low permeability, and durability. UHPC reduces the construction and maintenance costs of a bridge while extending its service life.

Crumb Rubber Modified Asphalt (CRMA): Produced by blending crumb rubber from recycled waste tires into liquid asphalt cement, pavements built using CRMA are more durable, and longer lasting than roads paved with conventional asphalt.

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SCHEDULE A VISIT

by contacting David Lee at hosin-lee@uiowa.edu



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Hamburg wheel tracking device to measure moisture susceptibility



Foaming equipment which injects water and air into hot asphalt



Dynamic Shear Rheometer to measure shear modulus

