

TECH NEWS

TECHNOLOGY NEWS

May–June 2005

Wapello County will build first-in-the-nation bridge

The Bridge Engineering Center (BEC) at InTrans is leading the design, construction, and evaluation of an ultra-high performance concrete (UHPC) bridge to be built in Wapello County. Sponsored by the FHWA, the Iowa DOT, and Wapello County, the bridge will be the first in the United States constructed with UHPC beams.

Ultra-high performance concrete is much stronger than standard concrete, for several reasons. The mixture contains a unique combination of highly engineered fine aggregate. Excluding the coarse aggregate normally found in concrete makes the concrete denser and therefore stronger. Also, UHPC includes small stainless steel fibers that "bridge the gaps" between fine aggregates and increase the concrete's tensile strength.

The cost of materials for UHPC is higher than standard concrete. Labor costs, however, may be reduced, because large steel reinforcing bars, which must be placed in a specific orientation by hand, are eliminated.

After laboratory testing is completed, the bridge will be built on a secondary road over Little Soap Creek in Wapello County. It will replace a severely deteriorated, 73-year-old truss bridge.



Site of new UHPC bridge to be constructed in Wapello County

Photo courtesy of Ken Dunker, Iowa DOT

Shear strength test

An ultimate shear strength test of the Wapello County UHPC beam was conducted early in June in ISU's Structural Engineering Research Laboratory. The shear strength of the beam exceeded expectations, allowing the project team to finalize the design of the Wapello County Bridge with confidence. Following construction, the bridge will be monitored for a period of at least two years.

For more information

Contact Brent Phares, associate director of the BEC and associate director for bridges and structures at InTrans, 515-294-5879, bphares@iastate.edu.
