UHPC or UHPFRC
Ultra High-Performance Fiber-Reinforced Concrete

Celik Ozyildirim, Ph.D., P.E.
Research Council, VDOT

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UHPC HISTORY
- 1994: Development of Bouygues, Lafarge, and Rhodia, France
- 1997: Sherbrooke, Canada Footbridge
- 2001: Bourg lès Valence, France Highway Bridges
- 2002: Seoul, Korea Footbridge of Peace

UHPC
- Compressive strengths ≥ 30,000 psi
- High ductility
- Very low permeability
- Lighter, thinner, and more durable structural sections
- High shear capacity in bending

- Two of the primary sources for these enhancements:
  - Finely graded and tightly packed nature of concrete constituent materials (no coarse aggregate)
  - Steel or synthetic fibers

- Bus shelter in Tucson, AZ
UHPC

- Light rail transit station, Calgary, Canada
- Canopies 20 mm (0.8 in) thick

UHPC

- 6x10 ft panel, 1-inch thick carries 2,000 lb car.

UHPC AT TFHRC

Sherbrooke Bridge, Canada, 1997

- 1.25-in thick deck
- 6 Pre-Cast Segments of 10m Total 60 m span

Footbridge of Peace Seoul, Korea, 2002

Bourg lès Valence Bridges, France

Opened in 2001, UHPC Beams
UHPC, Wapello County, Iowa

• Three 110-ft beams, 27'-2” ft wide deck
• Beams cast in Canada in 2005
• Opened to traffic in 2006

UHPC Beams

• Route 624 over Cat Point Creek, Richmond County, Virginia
• 10 spans: 81 ft 6 in each
• Five 45-in bulb-T beams per span
• One span with UHPFRC

UHPC

UHPC Compressive Strength

<table>
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<tr>
<th>Test</th>
<th>psi (average of 3)</th>
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<tbody>
<tr>
<td>1</td>
<td>30,456</td>
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<tr>
<td>2</td>
<td>30,747</td>
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<tr>
<td>3</td>
<td>30,492</td>
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<td>27,275</td>
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Flexural Strength Test

UHPC
UHPC

Thank You