Project Profile
Strength-on-Demand Concrete
I-44 Pavement Repair

The Background
This was a full-depth pavement replacement project along Interstate 44 in Greene, Webster and Laclede counties in Missouri. Substantial penalties would be assessed by the Missouri Department of Transportation for delay in re-opening the highway for traffic. It was necessary to use innovative technologies to minimize the impact on commuters.
The Challenge
The concrete producer had to deliver a total of 1,500 yd³ (1,200 m³) of consistent quality concrete that would achieve a compressive strength of 3,500 psi (24 MPa) in 4 hours after placement. Timing was an important challenge on this job, as the contractor could not begin demolition before 11:00 p.m. each night. The contractor needed to saw-cut and remove the existing pavement sections, clean the placement area and install dowel pins at night, before placing new concrete.

The Solution
MODOT approved the use of BASF’s 4x4 Concrete Technology, a unique method of achieving 400 psi (2.75 MPa) flexural strength in 4 hours or as needed. Concrete producer City Wide Construction Products, and their admixture partner, BASF, developed a modified 4x4 Concrete mixture utilizing Type I cement, fly ash and BASF admixtures that was able to achieve the compressive strength of 3,500 psi (24 MPa) in 4 hours after placement. MasterSure Z 60 workability-retaining admixture was included in the mixture to retain slump thus eliminating the need for re-tempering at the jobsite, which would have compromised the quality of the concrete mixture. The concrete met all the requirements of MODOT, and the highway was re-opened each day at 6:00 a.m. for rush-hour traffic.

Project Facts and Benefits
- Full depth pavement replacement on I-44 in Springfield, MO
- 1,500 yd³ (1,200 m³) of 4x4 Concrete used
- Work began each night at 11:00 p.m. and the highway was re-opened for traffic at 6:00 a.m. the following morning

More Information
The Master Builders Solutions brand brings all of BASF’s expertise together to create chemical solutions for new construction, maintenance, repair and renovation of structures. Master Builders Solutions is built on the experience gained from more than a century in the construction industry.

The know-how and experience of a global community of BASF construction experts form the core of Master Builders Solutions. We combine the right elements from our portfolio to solve your specific construction challenges. We collaborate across areas of expertise and regions and draw on the experience gained from countless construction projects worldwide. We leverage global BASF technologies, as well as our in-depth knowledge of local building needs, to develop innovations that help make you more successful and drive sustainable construction.

The comprehensive portfolio under the Master Builders Solutions brand encompasses concrete admixtures, cement additives, chemical solutions for underground construction, waterproofing solutions, sealants, concrete repair & protection solutions, performance grouts, performance flooring solutions.

Portland Cement Concrete Pavement
High Early Strength Mixture Proportions

<table>
<thead>
<tr>
<th>Material</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I Cement</td>
<td>846 lb/yd³ (502 kg/m³)</td>
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<tr>
<td>Fly ash</td>
<td>150 lb/yd³ (89 kg/m³)</td>
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<tr>
<td>Water</td>
<td>319 lb/yd³ (189 kg/m³)</td>
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<tr>
<td>Calcium Chloride</td>
<td>2% by mass of cementitious materials</td>
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<tr>
<td>w/c</td>
<td>0.32</td>
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*Effective January 1, 2014, the names of BASF’s Master Builders Solutions brand products have changed:

MB-VR became MasterAir VR 10
Glenium 7500 became MasterGlenium 7500
PolyHeed 997 became MasterPolyheed 997
RheoTEC Z-60 became MasterSure Z 60

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