

# Project Profile

## 4x4 Concrete Mainline Paving I-75 Rehabilitation Project



The Chemical Company

### Project:

I-75 Rehabilitation  
Project

### Location:

Kentucky/Ohio border

### Owner:

Kentucky DOT

### Concrete Producer:

Hilltop Basic Resources

### Construction Contractor:

The John R. Jurgensen  
Company

### Requirements:

- Target compressive strength: 3,500 psi (24 MPa) at 6, 12 or 24 hours
- Target air content: 6%
- Target slump: 3-1/2 in. (90 mm)

### Products:

- RheoTEC™ Z-60 workability-retaining admixture
- Glenium® 7500 high-range water-reducing admixture
- Micro Air® air-entraining admixture
- Pozzolith® NC 534 accelerating admixture



### Background

A portion of Interstate 75 on the Kentucky-Ohio border needed to be replaced because of unsafe pavement conditions caused by the unstable ground under the existing pavement. This required removal and replacement of 26,000 yd<sup>3</sup> (19,900 m<sup>3</sup>) of concrete on Interstate 75 cut into the hill. This was the first concrete paving project for the contractor, who traditionally uses asphalt.



### Challenge

To minimize lane closure time on this high-traffic interstate highway, the contractor had to remove and replace approximately 1,600 yd<sup>3</sup> (1,230 m<sup>3</sup>) of concrete each weekend for a period of sixteen weeks. All old concrete had to be removed on Friday evening, followed by base stabilization, placement of new concrete and striping of lanes prior to reopening to traffic by 5 a.m. on Monday. For every hour of delay, the contractor was required to pay a penalty of \$50,000.

Logistically, the accelerating admixture could not be added at the job site because of space constraints, as this portion of the highway is cut into the hill. Hence, all the admixtures had to be dispensed at the concrete batch plant to avoid dosing admixtures in the dangerous and crowded construction zone.

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### Solution

To accommodate these strict requirements, KY DOT 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. With this technology, BASF and the concrete producer Hilltop Basic Resources developed a concrete mixture that was able to achieve the required compressive strength of 3,500 psi (24 MPa) at 6, 12 or 24 hours by simply adjusting the dosages of the admixtures. The concrete met all the plastic and hardened performance criteria set by the contractor and the KY DOT, and permitted the lanes to be reopened to traffic on schedule. Hilltop Basic Resources used RheoTEC Z-60 workability-retaining admixture in the 4x4 Concrete mixture to maintain the concrete slump for up to one hour, even with the addition of the Pozzolith NC 534 accelerating admixture at the batch plant, instead of at the jobsite as is typically done. With all the admixtures being added at the batch plant, Hilltop Basic Resources was able to avoid storing and dispensing admixture at the constricted construction site.

### High-Early-Strength Concrete Mixture Proportions:

Type I Cement	800 lb/yd <sup>3</sup> (475 kg/m <sup>3</sup> )
Water	256 lb/yd <sup>3</sup> (152 kg/m <sup>3</sup> )
w/c	0.32

### Project Facts and Benefits:

- Full depth, 4x4 Concrete mainline paving replacement
- Sixteen weekends to complete
- Slip-form paving application
- 26,000 yd<sup>3</sup> (19,900 m<sup>3</sup>) of 4x4 Concrete is being placed
- All admixtures dispensed at the batch plant
- Required slump of 3-1/2 in. (90 mm) maintained for up to one hour
- Pavement open to traffic quickly with minimal inconvenience to motorists

### Additional Information

For additional information, contact your local sales representative.

*The Admixture Systems business of BASF's Construction Chemicals division is a leading provider of innovative admixtures for specialty concrete used in the ready-mixed, precast, manufactured concrete products, underground construction and paving markets throughout the North American region. The Company's respected Master Builders brand products are used to improve the placing, pumping, finishing, appearance and performance characteristics of concrete.*

**BASF Corporation**  
Admixture Systems

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