

Project:

I-77 / I-64 Turnpike Lane Replacement

Location:

Beckley, West Virginia

Owner/s:

West Virginia Turnpike

Concrete Producer:

Boxley Materials, Inc.

Concrete Contractor:

West Virginia Paving, Inc.

Requirements:

High-early strength concrete

Compressive Strength: 2,000 psi
(13.8 MPa) @ 4-6 hours

Target air content: 4.5 - 9.5%

Products Used*:

MasterAir® VR 10 – air-entraining
admixture

MasterSet® DELVO – extended set-
controlling admixture

MasterGlenium® 3030 – high-range
water-reducing admixture

MasterPolyheed® 997 – mid-range
water-reducing admixture

MasterSet AC 534 – accelerating
admixture

Market Sector:

Paving

Project Profile

Strength-on-Demand Concrete

Interstates I-77 and I-64 Lane Replacement



The Challenge

Several stretches of the I-77/I-64 West Virginia turnpike were in need of replacement. The turnpike commission was interested in a fast-track replacement of the deteriorated lanes to minimize inconvenience to motorists. Boxley Materials, Inc., a local ready-mixed concrete producer, was asked to develop a mixture that would achieve the required compressive strength even in the cool springtime ambient temperatures.

Interstates I-77 and I-64 Lane Replacement



The Solution

To meet the turnpike requirements for minimizing the time the lanes were to be closed during replacement, Boxley Materials, Inc. developed a quality, high-early compressive strength concrete mixture using the patented 4x4 Concrete system from BASF. The first phase of the project began at approximately 7:00 p.m. with removal of the deteriorated pavement sections and preparation of the subgrade for fresh concrete.

The high-early strength concrete was then delivered, placed, and cured by 1:30 a.m. The target of 2,000 psi (13.8 MPa) compressive strength was easily achieved and the lane was reopened to traffic by early morning in time for rush hour traffic.

High-Early Strength Concrete Mixture Proportions

Cement	700 lb/yd ³ (445 kg/m ³)
w/cm	0.35
s/a	0.41

Plastic Properties

Slump	5 in. (125 mm)
Air Content	5.8%
Unit Weight	142.6 lb/yd ³ (85 kg/m ³)

Project Facts and Benefits

- 1,000 yd³ (765 m³) concrete for lane repairs
- Haul time was approximately 30 minutes
- A roller screed was used to level and consolidate the concrete
- Typical compressive strength:
 - Type I Cement – 2,000 psi (13.8 MPa) @ 4 hours
 - Type III Cement (used around toll booths) – 3,500 psi (24.1 MPa) @ 4 hours
- Joints cut every 15 ft (4.6 m) over the 100 ft (30.5 m) section
- Lane replacement took only 10-12 hours from start to finish
- Pavement open to traffic quickly with minimal inconvenience to motorists

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.

*Effective January 1, 2014, the names of BASF's Master Builders Solutions brand products have changed:
MB-VR became MasterAir VR 10
Delvo became MasterSet DELVO
Glenium 3030 NS became MasterGlenium 3030
PolyHeed 997 became MasterPolyheed 997
Pozzolith NC 534 became MasterSet AC 534

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