

**Project:**

*Intersection Replacement*

**Location:**

*Highway 140 and Applegate Road,  
Merced County, CA*

**Owner/s:**

*CalTrans, California*

**Concrete Producer:**

*Allied Concrete Supply, Modesto, CA*

**Contractor:**

*R.E. Serrano, Inc.*

**General Contractor:**

*W. Jaxson Baker, Inc.*

**Requirements:**

*High-early strength concrete*

*400 psi (2.8 MPa) flexural strength to  
open to traffic*

**Products Used\*:**

*MasterSet® DELVO – extended set-  
controlling admixture*

*MasterGlenium® 3030 – high-range  
water-reducing admixture*

*MasterSet AC 534 – accelerating  
admixture*

**Market Sector:**

*Paving*

## Project Profile

### Strength-on-Demand Concrete

#### Highway 140 Intersection Replacement



The name 4x4 Concrete originates from concrete that attains at least 400 psi (2.8 MPa) flexural strength within four hours of placement.

### The Challenge

General Contractor, W. Jaxson Baker Inc., was challenged with replacing an entire asphalt intersection with concrete within one week. The challenge was issued by CalTrans to minimize disruption to traffic flow and lane closures.

# Highway 140 Intersection Replacement

## The Solution

To meet the aggressive schedule, CalTrans approved the use of BASF's patented 4x4 Concrete system. Concrete Contractor R.E. Serrano Inc. had successfully used the 4x4 Concrete system on other projects and felt that it was an appropriate solution for this challenge because of its user-friendly placement and high-early strength characteristics.

## High-Early Strength Concrete Mixture Proportions

Type III Cement	800 lb/yd <sup>3</sup> (475 kg/m <sup>3</sup> )
Water	280 lb/yd <sup>3</sup> (166 kg/m <sup>3</sup> )
w/cm	0.35
s/a	0.40

## Plastic Properties

Slump	7 in. (180 mm)
Air	Non-air-entrained

## Project Facts

- Four intersection quadrants, one replacement per day
- Beams cast and tested to ensure flexural strength
- 30 minute haul time between plant and jobsite – concrete had sufficient working time to consolidate consecutive loads
- 250 yd<sup>3</sup> (190 m<sup>3</sup>) concrete for each of four intersection quadrants
- 1,000 yd<sup>3</sup> (765 m<sup>3</sup>) concrete for entire intersection
- Average flexural strength = 420 psi (2.9 MPa) in 4 hours
- For truck clean up, 32 fl oz (945 mL) of MasterSet DELVO was used with 20 gallons (76 L) of water to stabilize hydration until the truck returned to the plant for complete washout – this procedure kept the trucks clean

## Benefits

- The 4x4 Concrete system was very user friendly and easy to place
- Exceptional high-early concrete strength permitted rapid opening to traffic and minimized lane closures
- Project was completed in only four days
- CalTrans saved over \$250,000 in traffic control costs
- 4x4 Concrete system allowed concrete to be used in lieu of asphalt

## 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.



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Effective January 1, 2014, the names of BASF's Master Builders Solutions brand products have changed:  
Delvo became MasterSet Delvo  
Glenium 3030 NS became MasterGlenium 30300  
Pozzolith NC 534 became MasterSet AC 534

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