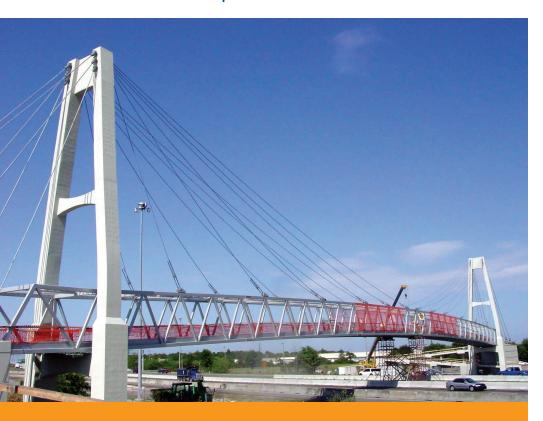




# **Project Profile**

# **Self-Consolidating Concrete**

I-4 Pedestrian Overpass



Officials in Seminole County, Florida, involved with the construction of a new pedestrian overpass spanning Interstate 4 wanted a structure that would be functional, but also attractive. When Florida Department of Transportation engineers specified a concrete mixture that was virtually impossible to vibrate, the ready-mix producer and contractor on the project knew that aesthetics would be compromised. The solution was self-consolidating concrete made using innovative Master Builders Solutions brand admixtures to create a highly flowable, yet strong, concrete mixture that would properly fill the forms, and ensure a smooth, visually appealing finished product.

Project:

Pedestrian Overpass (I-4)

Location: Orlando, FL

Owner/s:

Seminole County

Engineer:

Harding ESE (a Matec Company)

**Concrete Producer:** 

RMC Ewell

Contractor:

Martin K. Eby Construction Co, Inc.

Requirements:

DOT Class IV concrete mixture 5,500 psi (37.9 MPa) @ 28 days 3 in. (75 mm) maximum slump

**Products Used:** 

MasterGlenium® 3030 high-range water-reducing admixture

MasterMatrix® VMA 362 viscosity-modifying admixture

MasterPozzolith® 80 water-reducing admixture

**Market Sector:** 

Ready-mixed concrete



# The Challenge

Anchor block sections measuring 22 ft (6.7 m) high, 1 ft 10.5 in. (0.6 m) wide and 58 ft (17.7 m) long were constructed as a cable support base for a new pedestrian overpass spanning Interstate 4 in Orlando, Florida. The anchor block form contained two steel channel sections, located near the top, that ran the entire length of the block. A 3 in. (75 mm) maximum slump concrete mixture, specified by the Florida DOT, made it virtually impossible to use an immersion vibrator for proper consolidation of the concrete.

### **The Solution**

The contractor proposed using self-consolidating concrete to properly fill and consolidate the concrete for this reinforced concrete structure. The only change to the specification was eliminating the slump requirement thereby allowing the use of self-consolidating concrete.

#### **SCC Mixture Proportions**

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Cement	520 lb/yd³ (309 kg/m³)
Fly Ash	130 lb/yd³ (77 kg/m³)
Coarse Aggregate	1,152 lb/yd³ (684 kg/m³) #57 542 lb/yd³ (322 kg/m³) #89
Fine Aggregate	1,277 lb/yd³ (758 kg/m³)
Water	278 lb/yd³ (165 kg/m³)
w/cm	0.43
s/a	0.41
MasterGlenium 3030 high-range water-reducing admixture	15 fl oz/cwt (980 mL/100 kg)
MasterMatrix VMA 362 viscosity-modifying admixture	2 - 3 fl oz/cwt (130 - 195 mL/100 kg)
MasterPozzolith 80 water-reducing admixture	0.5 - 1.5 fl oz/cwt (35 - 100 mL/100 kg)

- Engineered cold joint at 11ft (3.4 m)
- SCC allowed to free fall 15 ft (4.6 m)
- Slump Flow: 24 28 in. (610 710 mm)
- During one delay, SCC in excess of 90 °F placed @ 23" spread into pump hopper was already near 90 minutes old. The mix maintained workability in the pump line for another 60 minutes before the next truckload arrived
- Compressive Strength @ 24 h: 1,800 psi (12.4 MPa)

@ 30 h: 2,500 psi (17.2 MPa) @ 28 days: 7,460 psi (51.5 MPa)

#### **Benefits**

- · SCC flowed easily into place
- **Excellent aesthetics**
- · No mechanical vibration needed
- · Reduced labor requirement

## **Master Builders Solutions**

The Master Builders Solutions brand brings expertise to create chemical solutions for construction using experience gained from more than a century in the construction industry.

The know-how and experience of a global community of 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 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, fiber reinforcement solutions and waterproofing solutions.

# **Project Facts**

- Haul time was approximately 30 45 minutes
- 22 ft (6.7 m) high walls, 58 ft (17.7 m) long





