

Self-Consolidating Concrete

Rosenthal Center for Contemporary Art



All photos courtesy of CAC

The Lois and Richard Rosenthal Center for Contemporary Art in downtown Cincinnati, Ohio, the new home of Cincinnati's Contemporary Arts Center (CAC), has been designed to "embody the institution's ongoing role as a promoter of daring and farsighted artistic strategies." Internationally-acclaimed architect Zaha Hadid has created an exciting, open-ended structure that was "conceived as a large floating plane that slopes gently upward toward the back of the building, the ground level transforms into a series of ramps that lead up to the galleries." The 80,000 square foot (7,430 m²) space is five stories high and sits snugly between existing structures in the downtown landscape.

Project:

Rosenthal Center for Contemporary Art

Location:

Cincinnati, OH

Owner/s:

Lois & Richard Rosenthal Center for Contemporary Art

Concrete Producer:

Hilltop Basic Resources

Construction Manager:

Turner Construction

Concrete Contractor:

Baker Concrete Construction, Inc.

Architect:

Zaha Hadid

Requirements:

Compressive Strength:
3,000 psi (21 MPa) @ 3 days
6,000 psi (42 MPa) @ 28 days

Products Used:

MasterGlenium[®] 3030
high-range water-reducing admixture

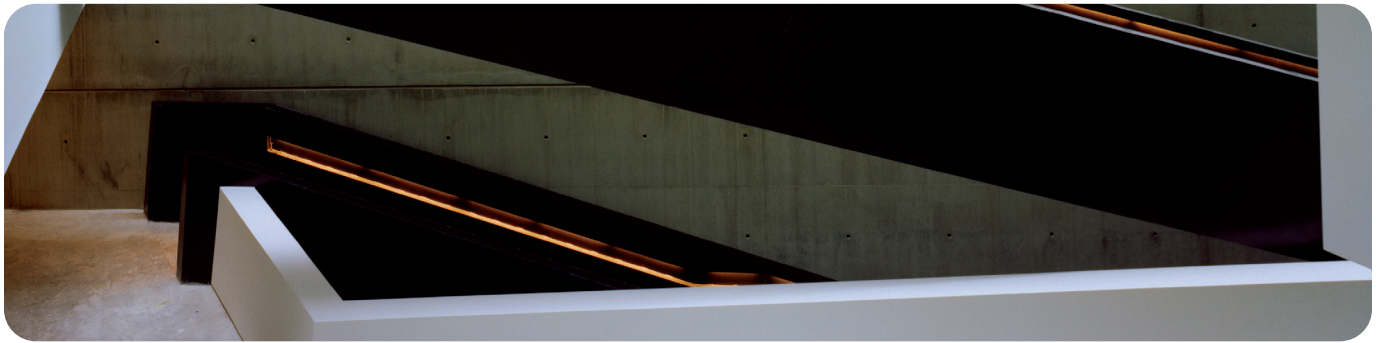
MasterMatrix[®] VMA 358
viscosity-modifying admixture

Market Sector:

Ready-mixed concrete

Project Profile

Rosenthal Center for Contemporary Art



Because of the unique design, contractors faced major construction challenges trying to ensure proper consolidation of concrete for structural integrity and improved aesthetics. In this application, self-consolidating concrete made with Master Builders Solutions brand MasterGlenium and MasterMatrix VMA admixtures provided the necessary flow and stability to ensure a perfect finish that is...well...a work of art!

The Challenge

One component of the design of this building was a roll-up that resembled a 96 ft (29.3 m) skateboard ramp and connected the wall to the floor. The form for this curved roll-up provided very little access for internal vibration.

Formwork for structural diamond shaped columns consisted of square column forms with plywood inserts to create their diamond shape. The form detail resulted in “dead areas” on two sides that restricted access for proper vibration of the concrete.

The Solution

In order to ensure proper consolidation and to minimize surface blemishes, self-consolidating concrete, using a blend of aggregates, was selected for both the roll-up section and the diamond-shaped columns.

SCC Mixture Proportions

Cement, Type I	750 lb/yd ³ (445 kg/m ³)
Coarse Aggregate, #57	1,000 lb/yd ³ (593 kg/m ³)
Coarse Aggregate, #8	500 lb/yd ³ (297 kg/m ³)
Fine Aggregate	1,500 lb/yd ³ (890 kg/m ³)
Water	300 lb/yd ³ (178 kg/m ³)
w/cm	0.40
s/a	0.50

Admixtures

MasterGlenium 3030	12.0 fl oz/cwt (780 mL/100 kg)
MasterMatrix VMA 358	1.5 fl oz/cwt (100 mL/100 kg)

About Master Builders Solutions

Master Builders Solutions is a leading global manufacturer of concrete admixtures, as well as other sustainable solutions for the construction industry, focussed on delivering its vision: **Inspiring people to build better**. Master Builders Solutions provides value-added technology and market-leading R&D capabilities to improve the performance of

construction materials and to enable the reduction of CO₂ emissions in the production of concrete. Founded in 1909, Master Builders Solutions has ca. 1600 employees operating 35 production sites globally, supporting their customers in mastering their building challenges of today – for a decarbonised future.

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