

A Soaring High-Rise with Innovation at Its Core

ADVA® 408 high-range water reducing admixture selected for high-rise project.



Project	Spire, Denver, CO
Owner	Nichols Partnership Inc., Denver, CO
Architect	RNL Design, Denver, CO
General Contractor	JE Dunn Construction, Denver, CO
GCP Solution	ADVA® 408 High-range water-reducing admixture

Project Profile

Building impressive residential towers

One of the tallest residential towers in the Western United States, Spire is a \$175 million residential high-rise building standing 41 stories high with 503 condominium units. At the building's heart are two massive concrete cores that structurally support concrete elevated decks and house the elevator units. With the thick core walls containing heavy steel reinforcement, it created an ideal application for self-consolidating concrete (SCC) – a highly flowable concrete that can be placed without vibration and segregation.

"With SCC we didn't have to vibrate the concrete and saved time with continuous pours rather than pouring separate lifts for each core wall form."

Eric Snelling,

JE Dunn

Ensuring an outstanding surface finish

The high-rise contains two massive concrete cores with walls up to three-feet thick, which were created using approximately 8,000 cubic yards of SCC and a new state-of-the-art admixture technology, ADVA®408 high-range water reducing admixture.

To get the job done right, general contractor JE Dunn requested that a high-performance SCC be used to ensure complete consolidation while producing an outstanding surface finish. At the same time, the SCC had to be consistent from batch to batch with no segregation, and provide a range of high compressive strengths. At the time of project inception, conventional superplasticizers were used to achieve the desired performance characteristics. However, during the project's construction, GCP launched a new chemical admixture technology, ADVA®408, a product that promised greater consistency with improved hardened properties. After an initial evaluation, the choice was clear and JE Dunn made the switch to ADVA®408.

The overall benefits were wide ranging, including improved consistency from batch to batch, improved consolidation and surface finish, increased compressive strength, and improved water tolerance and pumpability. In addition, the in-place cost to provide the SCC was reduced, and ADVA®408 enabled the SCC mixture to have consistent 120-minute flow-ability from the concrete plant to the job site.

"ADVA® 408, a product that promised greater consistency with improved hardened properties."

Reducing concrete labor and placing costs

"The use of this SCC helped reduce labor and placing costs," said Eric Snelling, general superintendent of the Spire project for JE Dunn. "Our ready mix suppliers were able to deliver a consistent SCC product to our jobsite." That kind of consistency adds up on a job like this, with two massive core walls up to three feet thick requiring 80 core wall pours at 100 cubic yards a piece. Conventional concrete would have required far more pours and far more manpower and equipment.

Using SCC with ADVA®408 increased the concrete's compressive strength to over 13,000 psi and improved consistency as well as slump retention. With the Spire building promising to bring new vitality to downtown Denver, this residential high-rise is an important part of the city's transformation. The construction team is pleased that it's built around a strong core.

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Because every project, large or small, deserves the best level of protection.

"The use of this SCC helped reduce labor and placing costs."

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Last Updated: 2021-06-16

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