

# GCP Designs Custom Solution for ION Orchard Shopping Mall

Unique construction mixture designed specifically for commercial building

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Project

Ion Orchard

GCP Solutions

ADVA® concrete admixtures, MONOKOTE® fireproofing, DARATARD® set controller

## Project Profile

### Designing an impressive shopping mall

ION Orchard, a 218-meter tall, 56-story retail and residential development, is set to redefine luxury lifestyle and high-end retail experiences in Singapore. This award-winning shopping mall houses more than 400 shops and restaurants, an art gallery, a residential tower topped with an observation deck, and the largest sheltered public event space in the region.

It is strategically located above the Orchard Mass Rapid Transit Station, and will benefit from underground connectivity to other nearby commercial buildings. With its magnetic presence and unrivaled location at the heart of one of the world's premier shopping districts, ION Orchard will strengthen Singapore's allure as a global retail design destination and cultural center.

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## Building within the city

The ION Orchard shopping mall required substantial underground digging right in the heart of the city, within a very tight construction schedule. Speed was of the essence for the retail design, without compromising the quality of work needed for the foundation, which included up to four basement levels. Therefore, a diaphragm wall of at least 70 meters was required all around the site for casting of the base structure. To ensure proper placement and address any issues with vibration or compacting, this deep retaining structure required the concrete mix be workable for up to eight hours.

Similarly, application speed was an important consideration when selecting the fireproofing material for the commercial building structure's steel columns and beams. To meet the construction schedule, the application of fireproofing needed to be carried out around the clock.

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## Achieving maximum strength and workability

To meet the exacting slump retention requirement of eight hours for the retail design, GCP worked with the concrete producer to develop a mix using a combination of superplasticizing and special set control admixtures for extended slump retention.

The high range water-reducing admixture, a product within the ADVA® family, provided excellent slump retention and water reduction.

GCP also supplied DARATARD®, a specially developed set controller for mixes requiring very good slump retention. This approach produced concrete that would withstand delays in setting time and yielded high strengths with superior workability and pumpability, without exhibiting any segregation due to high initial slump. It was perfect for the shopping mall.

The final concrete mix was developed in close collaboration with the customers, and underwent lab and field trials to ensure its stability for a commercial building.

In addition, GCP supplied MONOKOTE® MK-6®/HY® and Z-106/HY fireproofing for the project, based on its proven track record for in-place performance and fast and efficient application, even for very large projects. Using patented injection technology, MONOKOTE® achieved a pumping rate of more than 100 bags in eight hours, enabling the contractor to meet the construction schedule.

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Project briefcase



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Last Updated: 2019-09-19

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