

Woolworths Group Ltd.'s Moorebank Distribution Centers

Moorebank, New South Wales, Australia (2024)

PRODUCT USED:
Hard-Cem®

OWNER:
Woolworths Group Ltd.

ARCHITECT:
BELL Architecture Pty. Ltd.

ENGINEER:
Costin Roe Consulting Pty. Ltd.

CONTRACTOR:
Richard Crookes Constructions

DISTRIBUTOR:
Krystol Group Pty. Ltd.

BACKGROUND

As Australia's largest and most preferred supermarket, Woolworths soon found that their customer demand had outgrown their current product capacity. Even with over 1,000 store locations across Australia, the supermarket franchise was struggling to keep up. It led the franchise owner, Woolworths Group Ltd., to look into upgrading some of their existing distribution centers. But the infrastructure for each had aged significantly, making them incapable of supporting the current and future growth that Woolworths Group Ltd. wanted to prepare for.

To remedy the situation, Woolworths Group Ltd. chose to replace their distribution centers in Minchinbury, Yennora, and Mulgrave with two new centers, a regional and a national one. Both would operate in a new location around Moorebank using cutting-edge automation to build pallets designed for specific aisles at specific locations. As a result, they'd require less manual work, making the workspace there a safer environment for employees. And more importantly, they'd ensure that Woolworths could restock shelves faster and reduce store congestion.

Of course, customer demand, worker safety, and work speed weren't the only things that Woolworths Group Ltd. kept in mind. They also considered sustainability, aiming to build both centers to a five-star Green Star design and As Built certification. Part of that would involve building green features such as a solar power system, LED lighting, and rainwater harvesting.

It was all in service of catering to increasing customer demand in an eco-friendly way, but the construction for it could have easily been halted without the right concrete hardener. After all, such construction required high bays and high load areas, which would need a hardener to withstand the wear and tear of the heavy distribution activity around them.



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SOLUTION

Woolworths Group Ltd.'s team chose to tackle the concrete hardening concern first during the regional facility's construction. Initially, they had gone ahead with a dry shake hardener. But the product had been time-consuming and difficult to apply. Even when the construction team had gotten the application to work, they had to worry about worksite safety due to the dry shake hardener's use of silica dust. With that material in use, there was a risk that nearby workers would inhale it, which could lead to serious health concerns, such as lung cancer, kidney disease, and chronic obstructive pulmonary disease. All of which made it more likely that the hardener would seriously impact construction team efforts and slow down the construction of the two distribution centers.

Recognizing that, the construction team's engineer, Costin Roe Consulting Pty. Ltd., chose to specify and approve a different concrete hardener: Kryton's Hard-Cem. As an integral hardening admixture, Hard-Cem is faster and easier to apply, and it doesn't come with toxic silica dust. All that's needed is to add it to the desired concrete mix.

Once there, it will strengthen the concrete's cement paste and consequently, the concrete itself. The admixture does that by supporting the cement paste's chemical microstructure. On its own, the paste has a microstructure of interconnected pores and capillaries, which makes it strong in compression but also gives it a number of potential failure planes that are vulnerable to tension and abrasive and erosive forces. But with Hard-Cem, the paste's chemical microstructure gains an amorphous quality, which has no such weaknesses, making it easier for the concrete to resist deformation.

That allows Hard-Cem to increase the concrete's resistance against abrasion and erosion, making it possible to double the concrete's wear life even under harsh conditions. It was even proven to do so when examined by Boral Construction Materials, revealing that Hard-Cem-treated concrete exceeds the AR0.5 abrasion class, which is the highest abrasion resistance level required by Australian standards. As a result, it would be perfect for enhancing the wear resistance of the Australian distribution centers' high bays and high load areas.

It gave the construction team the confidence to apply around 4,000 m² (43,056 ft²) of Hard-Cem to those areas for the regional distribution center and around 14,000 m² (150,695 ft²) of Hard-Cem to those areas for the national distribution center. That resulted in better wear-resistant concrete for sections of the two distribution centers, ensuring they stay standing for years to come despite the heavy activity in the area.

