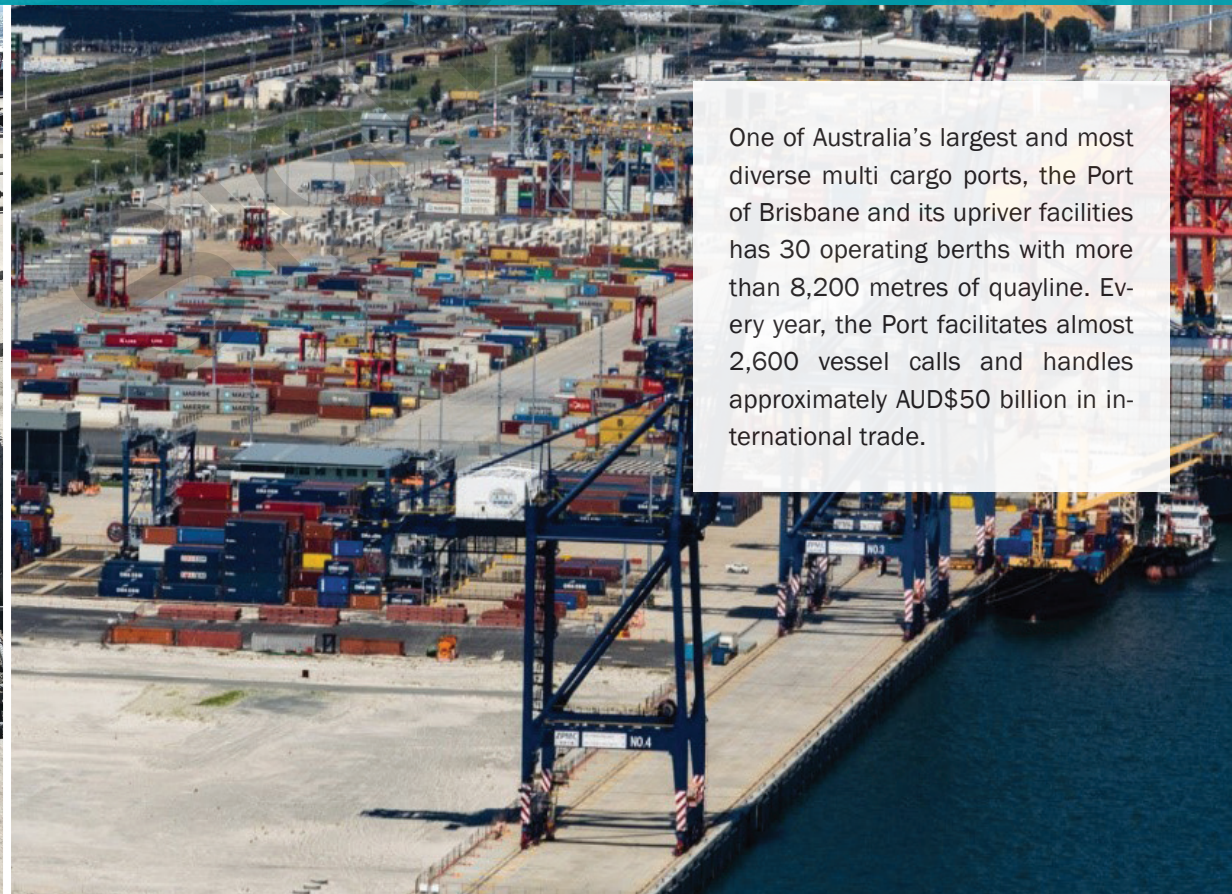


SOLUTIONS | Case Study

Stitching of Wharves 5 & 5 Extension
Port of Brisbane, DP World Terminal
Queensland, Australia

Product: Five Star Structural Concrete® ES



One of Australia's largest and most diverse multi cargo ports, the Port of Brisbane and its upriver facilities has 30 operating berths with more than 8,200 metres of quayline. Every year, the Port facilitates almost 2,600 vessel calls and handles approximately AUD\$50 billion in international trade.

Stitching of Wharves 5 & 5 Extension, Port of Brisbane



DATE OF PROJECT: August/September 2019

PROJECT OWNER: Port of Brisbane, DP World Terminal

PROJECT CONTRACTOR: McMahon Services Australia (Main Contractor), Freyssinet Australia (Nominated Sub-Contractor)

PROJECT ENGINEER: KBR

MARKET/ENVIRONMENT: Infrastructure – Ports

SUBSTRATE: Prepared Concrete

SIZE OF PROJECT: 16.3m³

The Challenge

As part of an ongoing expansion project, Wharves 5 & 5 Extension needed to be “stitched” together to function as one. This called for sixteen stress bars to be installed and stressed in order to join them together. Working on exposed decks in hot, windy conditions required a high-performing product.

Five Star® Solution

Five Star Structural Concrete ES was chosen for this job because of its **long 25-minute working time** and ability to reach a **40 MPa compressive strength in 3 days**. Also critical to the installation was the product's **pump grade consistency** due to the amount and layout of the reinforcement in the respective pockets.

Large rectangular pockets were cut out on either side of the existing joint and the water main ducts. Slots and pockets then needed to be broken out on either side of these recesses for the stress bars, stressing jacks and stress bar anchors. Ducts for the stress bars were then slid underneath the top deck reinforcing. Once the ducts and stress bars were in place, the main broken back areas needed to be reinstated up to deck level with Structural Concrete ES. This excluded the jacking and anchor pockets, which were to be filled after the stressing was complete.

The large volume of each pocket meant the Structural Concrete ES needed to be extended +/- 50% by weight with a 10mm aggregate. Once the placed Structural Concrete ES had achieved a compressive strength of approximately 40 MPa the bars were stressed. The jacks and stressing chairs were then removed and the remaining recesses were filled with Structural Concrete ES to complete the project.

The project was a great success and was completed efficiently and effectively with ZERO cracking by dedicated teams from McMahon Services, Freyssinet Australia, Quakewrap Australia (pump supplier and operator), and Five Star Products.

Five Star Structural Concrete® ES

Extended Working Time

Structural Concrete® ES is a high early strength, single component, permanent concrete repair material with a **25-minute working time**. The extended set facilitates deep/large volume pours up to six cubic yards in a single lift. Five Star Structural Concrete® ES produces a repair which is dimensionally stable, develops an integral bond to existing concrete, and restores structural integrity within hours of placement. This product also provides increased corrosion protection of steel reinforced structures with migrating corrosion inhibitor technology and very low chloride ion permeability.

- High 6-hour strengths
- Pumpable
- Facilitates equipment rebuilds in under 24 hours
- Course aggregate extension up to 80%

FIVE STAR® SERVICES

- Design-A-Spec™ engineering specification assistance
- Pre-placement meetings
- On-call center with experienced engineering and technical support
- Field support representatives for on-site consultation



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For worldwide availability, additional product information and technical support, contact your local Five Star® licensee, distributor, local sales representative, or you may call the Five Star Products' Engineering and Technical Service Center at 1-800-243-2206.

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