

Swanson Dock East Berths Remediation and Strengthening

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Summary

McConnell Dowell was engaged in 2017 by Port of Melbourne Operations Pty Ltd to remediate and strengthen the Swanson Dock East Berths 1 and 2 within the Port of Melbourne. This paper describes the Early Contractor Involvement (ECI) process undertaken as part of the detailed planning and engineering for the project and some of the key innovations developed.

Keywords: wharf infrastructure, Early Contractor Involvement, collaboration, temporary works, safety



Introduction

In 2017 Port of Melbourne Operations (PoM) engaged McConnell Dowell to remediate and strengthen the Swanson Dock East Berths 1 and 2 within the Port of Melbourne.

The project was awarded progressively in four stages, with McConnell Dowell involved in the design and constructability phase which included development of price, program and construction methodologies for approval by the PoM board.

The scope of work included installation of new steel piling and reconstruction of sections of the existing reinforced concrete deck, concrete fender beam rehabilitation and wharf deck repairs, and the replacement of existing crane rail.

The final contract involved the installation of new 150T bollards on Swanson Dock East Berth 3 and Swanson Dock West Berth 3 including on-shore bollards on new steel piled foundations.

The project was conducted within Australia's busiest container terminal facility within a terminal with fully operational stevedoring activities.

This paper outlines the key features and challenges of the project and some of the innovations developed during the project.

Collaborative Contracting

Each stage had two distinct phases: the Early Contractor Involvement (ECI) phase which included early procurement engagement, and the site construction phase. All works were undertaken under a collaborative, construct only contract, working closely with PoM, and their engineering consultant AECOM.

During each ECI phase McConnell Dowell worked closely with the client's project team to identify construction innovations. These market leading innovations resulted in significant project benefits in cost, program and safety.

Complex Construction and Sequencing

A key deliverable established during planning of each ECI stage, was that construction works were to be undertaken and sequenced so they would ensure safety, cost and program KPI's are achieved.

To achieve this goal, the project team regularly engaged with the various stakeholders including PoM and the terminal operator to develop the construction program. This agreed program was then strictly adhered to by the project team.

By honouring the commitments made during the ECI phase, McConnell Dowell was able to maintain and foster a positive relationship with the project stakeholders.

Innovations

During the Phase 1 ECI process, it was determined that the deck could not be loaded with heavy construction equipment for a significant period of the project. This created a significant challenge as to how the through deck piles would be installed with this restriction.

McConnell Dowell's temporary works designers, in conjunction with AECOM, and the piling subcontractor; developed a grillage beam arrangement that transferred the loading from the piling temporary works onto strong points. Through this approach, the works would remain confined to the site footprint and achieve the program objectives.



To rehabilitate the concrete fender beams, McConnell Dowell developed and engineered a fender access platform that provided a safe working platform across a 15m x 4m footprint. The platforms provided safe access from land to the front, soffit and rear faces of the fender beams, to allow hydro-demolition works, reinforcement replacement and augmentation, and shotcrete spraying of the fender beams.



The reusable platforms were designed so all the elements of the works could be undertaken from a single set-up. The platform also included removable mid-level decks to provide safe access to the full fender depth and underside of the wharf.

The McConnell Dowell in-house engineering team won the 2019 WorkSafe Victoria "Best Solution to a Specific Workplace Health and Safety Issue" award for the fender access platform development.

Other innovations and construction solutions will be included in the presentation.

Conclusion

As Australia's port infrastructure ages, there will be a growing need to extend the life of wharf and other infrastructure whilst minimising interruption to port and terminal operations. This paper demonstrates how careful planning and execution can meet both program objectives and achieve best results.

Acknowledgements

While this paper is solely the views of MCD, we thank and acknowledge Port of Melbourne Operations (PoM) for permission to publish this paper and their valuable contribution to the project.