

Project Profile

Flinders Ports Crane Rail Repairs



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| Client | Flinders Ports |
| Location | Outer Harbor, SA |
| Duration | 3 months |
| Contract | Outer Harbor Berth 6 and 7 Container Crane Rail Repairs |
| Cost | \$280,000 |

Project Overview

Flinders Ports is South Australia's leading privately owned port operator with seven ports located across the state. Founded 175 years ago, Port Adelaide is the main maritime gateway for South Australia. One of South Australia's earliest settlements the site became South Australia's first state heritage area in the 1980s.

McMahon Services were engaged by Flinders Ports, the state's leading privately-owned port operator, operating seven ports in South Australia to undertake crane rail repairs at the Flinders Adelaide Container Terminal in Outer Harbor.

Following extensive condition surveys Flinders Ports identified approximately 96m of existing 86kg/m crane rail which was showing signs of deterioration. Works needed to occur in a short timeframe in order to ensure there were no Container Ships needing to dock into the wharf during the works.

The project scope included the following:

- › Mobilisation of personnel, plant and equipment
- › Site preparation, survey and clean up required for works to commence

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- › Removal of loose concrete and grout around the top portion of the rail to access the fixing bolts
- › Cutting of the existing fixings and also the crane rail section to suit the new replacement rail to a 12 metre section
- › Removal of existing crane rail
- › Hydro-excavate (high pressure blasting) and vacuum truck to a controlled pressure, to ensure no over excavation occurred;
- › Cut down remaining exposed bolts
- › Set up new base plates to support the new crane rail, enabling easy replacement in the future
- › Core new fixing holes for holding down bolts and clean out holes
- › Installation of HD bolts and epoxy into position
- › Final levelling of the supporting rail base plates with levelling equipment
- › Installation of new crane rail
- › Installation of infill of epoxy grout that has a fast set time in order to infill all voids around the underside of the crane rail
- › Placement and compaction of bitumen a few days after the epoxy had time to cure, and infill the void between the level of the epoxy (at the base of the rail) and the existing pavement level.

Innovations

Innovative Excavation Techniques

The McMahon Services construction methodology utilised hydro-demolition techniques to excavate around the existing crane rails. This technique was selected to ensure that no over excavation occurred and the integrity of the remaining substrate was sound.

Alternative Grout

'Epirez' epoxy grout was nominated by Flinders Ports for use in the repair works. McMahon Services proposed an alternative epoxy 'Masterflow 622' which provided superior curing and shrinkage characteristics and required a smaller minimum fill depth. The use of Masterflow 622 also provided a significant base cost saving of 50%.

Refinement in Works Methodology

During replacement works of the first section, it was found that the hydro demolition operation precluded any adjacent works taking place. In order to expedite work it was decided to change the demolition methodology and demolish the top layer by hand / mechanical means. This refinement ensured that each section was completed within the timeframe available.

Development of Specialist Technology

In order to ensure a straight vertical rail cut McMahon Services developed and fabricated a modified bracket to fit the rail saw. This modification ensured that the resultant cut was well within the tight tolerance necessary to ensure rail integrity.

Project Challenges

Project Completion Timeframe

Due to limited site availability between shipping each section was to be demolished and reinstalled within a within a three day wharf shutdown window. McMahon Services developed a construction methodology capable of delivering the works within this short construction timeframe and continued to refine the methodology as sections were completed.

Workzone Availability

Berth availability fluctuated based on shipping schedules and McMahon Services were provided a minimum of 72 hours' notice to mobilise to site and commence a section of rail repairs. McMahon Services maintained a flexible working relationship, working with Flinders Ports to undertake works when the opportunity of a Berth shutdown occurred.

Access controls Port Security

The works were undertaken in an operational international maritime Port environment. All staff were required to undertake comprehensive Client site inductions and need to be escorted by client Personnel at all times. To reduce the requirement for McMahon Services personnel to exit the workzone, a mobile trailer mounted ablution was located within the workzone.

Thermal Expansion

During high temperature events, the rail is subject to thermal expansion. In order to ensure a controlled member length rail sections were covered or cooled to control expansion and ensure new sections fitted correctly.

Community and Stakeholder Engagement

McMahon Services worked with Flinders Ports to ensure that operational requirements were not impacted by the works. This included flexible scheduling to undertake works when Flinders Ports could offer a Berth Shutdown, working around Shipping Times.



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