

Flinders Ports Berth 6 and 7 Crane Rail Repairs



Client	McMahon Services
Location	Adelaide, SA
Value	\$280,000
Duration	Mar 2016 - Jun 2016

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. It remains one of South Australia's earliest settlements and the site became South Australia's first state heritage area in the 1980s.

Following extensive condition surveys, Flinders Ports identified that approximately 96m of existing 86kg/m crane rail was showing signs of deterioration. McMahon Services were engaged by Flinders Ports to remove and replace eight 12m sections of existing crane rail. Following the successful delivery, Ballestrin were engaged to replace a further 60m of rail.

Works comprised of removing loose concrete and grout around the top portion of the rail to access the fixing bolts, cutting of the existing fixings and the crane rail section to suit the new replacement rail to a 12m section, and the removal of existing crane rail.

The next step was to hydro-excavate (high pressure blasting) the area at a controlled pressure to ensure no over excavation occurred. 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.

Ballestrin then cut down the remaining exposed bolts, and then set up new base plates to support the new crane rail, enabling easy replacement in the future. The next step was coring new fixing holes for holding down bolts and cleaning out holes followed by the installation of HD bolts and epoxy into position. Final levelling of the supporting rail base plates was achieved with levelling equipment. The new crane rail was installed. During high temperature events, the rail was 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. The infill of epoxy grout had a fast set time in order to infill all voids around the underside of the crane rail.

Placement and compaction of bitumen occurred a few days after the epoxy had time to cure, and infill of the void between the level of the epoxy (at the base of the rail) and the existing pavement level was achieved.

'Epirez' epoxy grout was nominated by Flinders Ports for use in the repair works. Ballestrin 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 provided a significant base cost saving of 50%.

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 and mechanical means. This refinement ensured that each section was completed within the timeframe available.

In order to ensure a straight vertical rail cut, Ballestrin 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.

Due to limited site availability between shipping movements, each section of works was demolished and reinstalled within a within a 3-day wharf shutdown window. Ballestrin developed a construction methodology capable of delivering the works within this short construction timeframe and continued to refine the methodology as sections were completed. Berth availability fluctuated based on shipping schedules and Ballestrin were provided a minimum of 72 hours' notice to mobilise to site and commence a section of rail repairs.