



HOW TOURLE ST BRIDGE GOT GREAT LEGS

Tremendous skill and superior equipment gave Piling Contractors Pty Ltd the ability to complete piling works for the bridge over Hunter River (South Arm) at Tourle Street Mayfield West ahead of schedule.

Piling Contractors were engaged by Daracon Group Pty Ltd to supply and install 64 no 750 ID mm X 16mm wall thickness Grade 350 steel tubular piles in lengths varying from 19.2 to 35m arranged into seven marine based piers and the two abutments.

“The piling works have a 100 year design life. They incorporate a concrete column which is intended to provide durability after corrosion of the steel tubes. All works were undertaken to RTA specifications, including B204 welding requirements,” said a Company Spokesperson.

“Special challenges overcome in completing this project included the logistical challenges of working in and on a river, with river flow at peak tide giving a maximum flow rate of 3.5 knots. This was resisted by the use of steel tube spuds on the crane barge, and a four point mooring system with two anchor points on each bank was used to move the crane barge.”

Each of the seven marine piers is comprised of eight piles formed in four groups of two piles. This layout enabled a key innovation – the fabrication of a steel working platform on temporary piles making it possible to install each pier’s eight permanent piles concurrently. As each pier was completed, the temporary piles and platform were moved by supply barge to the next work site.

All piles were installed from a dumb barge carrying the driving equipment, utilising the working platform and a supply barge. The piles were generally installed in two lengths and welded in situ working from the platform.

Each pile tube, prefabricated at Mawson Engineering, included an internal welded bead placed prior to delivery to site, at 500mm centres over the top 13 metre concrete plug section to assist their bond to the concrete.

Geotechnical conditions consisted of shallow water up to 3 metres maximum over soft alluvial materials grading into sand with layers of clay overlying bedrock at 20 – 30 metres depth. There was an environmental issue with acid sulphate soils and possible release of sediments and sulphates into the river. To avoid contamination issues arising when

drilling, the spoil from the pier piles was excavated using a Toyo cutter suction pump, then delivered to a desander on the supply barge alongside the working platform.

All piles at one pier were poured simultaneously after cleaning and visual inspection by an RTA superintendent. Concrete was placed by pump where feasible and for pier piles placed by kibbles on the supply barge. Approximately 5m³ was required per pile. Concrete and reinforcement cages were supplied to the platform crane barge via a supply barge and then placed into each pile.

For the Land based abutments, eight steel tube piles (2 x 4) were initially placed into pre drilled holes drilled using Piling Contractor’s mobile truck mounted drill rig, then vibrated to a suitable welding level where the next length was added and then vibrated to close to contract RL from where they were then hammered to set. These piles were then drilled out and concreted using truck mounted drill rigs.

This project also made use of Piling Contractor’s road transportable modular dumb barge, which was assembled in Newcastle, and towed to the site. Their Kobelco BM800 90t crane was walked onto the barge on site. Their workboat was used to pull the supply barge to and from the shore. The pile driving process involved the use of an ICE 14-12 Vibrating hammer for the majority of the depth and piles were then set to capacity using a Juntan HHK9t hammer. Each pier had one pile dynamically tested, also carried out in house with their own equipment.

The work was carried out between November 2007 and July 2008 using a crew of five including foreman, crane operator, dogman and qualified workboat operator and piling hand who brought piling works to completion well before Daracon’s scheduled date for the bridge beams.

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