

Maintain Ferry Wharves on Sydney Harbor

Two of the first ferry wharves in a 10 year upgrade program have been completed along Sydney's waterways.

In December 2011, Waterway Constructions was contracted to replace the Neutral Bay and Rose Bay wharves on behalf of Roads and Maritime Services. The work involved included the demolition of the existing timber ferry wharves and the construction of new steel and concrete wharves with steel pontoons, as a part of the Sydney Wharf Upgrade Program. The managing contractor is Hansen Yucken, while the architect is Group GSA. Engineer on the project is SMEC.

In the 10 year program, 47 commuter wharves will be upgraded by 2022. In Package 1: 2010 – 2016, 12 wharves are being upgraded in an approximately \$90 million package.

Construction work commenced on Neutral Bay in February and was completed late-August. Rose Bay construction commenced in April and was completed late-September.

Neutral Bay Wharf has been upgraded to provide safer facilities, improved weather protection and easier access for customers who use mobility aids. With the previous wharf and jetty structure completely demolished, 75m of new jetty was constructed from the shore outwards, followed by the installation of a pontoon, which was manufactured off-site.

The location of the wharf provided a challenging environment for a work site due to the difficult tidal environment and constrained construction space.

The upgraded wharf features include a safe ramp and turning space for customers using mobility aids. Objectives of the project are compliance to DSAPT (disabled access) by 2022, as well as reduced ongoing maintenance costs.

Underpinning principles include a design life of 50 years, with the wharves constructed using durable materials for the aggressive environment. The material choice was made to minimise on-going maintenance costs, and ensure it was able to withstand significant forces (berthing).

Within the concrete section of the wharf structure, VRod (GFRP) 16mm bar was used in the "topping slab" for the new jetty at Neutral Bay. V-Rod is the registered trademark name for Pultrall's composite rebar product; a Glass Fiber Reinforce Polymer (GFRP). V-Rod is covered in bonded silica sand covering which allows for a mechanical and chemical matrix to be formed with the concrete. Cure ratio of the polymer matrix is a significant consideration of the designer and builder when specifying GFRP. A high cure ratio 98% is mandatory for GFRP to be corrosion resistant.

GFRPs will not rust, and is impervious to the action of salt ions, chemicals, and the alkalinity inherent in concrete. This makes them almost perfect in the maritime environments, in other areas of high salinity like mining operations and for infrastructure where ground water is close to the surface. It is impervious to the chloride ingress that AS3600 expects within the coastal zones in Australia. Concrete cover for reinforcement protection is no longer a critical design factor.

The mechanical properties of FRP reinforcing bars differ from those of conventional steel rebar in a number of areas. As a result, several issues arise in the development of a design methodology for concrete structures reinforced with such bars. Designers must place aside their steel design software and support programs. Designing with GFRP is different. There are however a number of companies that have experience in designing and building with V-Rod both in Australia and in Canada. Companies such as TTW (Sydney), SP Smith Engineering, AECOM, SMEC, Cardno and others have designed with V-Rod in Australia.

This \$8.3 million new wharf was officially opened on 20 August 2012.

The new Rose Bay Wharf opened to ferry customers on Wednesday 26 September 2012. The new \$6.3 million wharf was designed to have a consistent look and feel with other wharves that will be upgraded as part of the Sydney Harbor Wharf Upgrade Program.

Rollout program for the remainder of Package1 includes Balmain (Thames Street): 2012/13; Huntley's Point: 2012/13; Mosman: 2012/13 next year, while Double Bay: 2013/14; McMahons Point: 2013/14; Cremorne Point: 2013/14; and Balmain East: 2013/14 will follow the year after. Watsons Bay: 2014/15 and Birchgrove: 2014/15 (Dec 2015) will complete Package 1.

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<http://www.rms.nsw.gov.au/projects/sydney-inner/balmain-east/index.html>

<http://www.rms.nsw.gov.au/projects/sydney-inner/drummoyne-wolseley-street/index.html>