

URBAN DENSIFICATION AT THE NORTSHORE HAMILTON – A CASE STUDY

The re-development of brownfield sites from industrial to residential or commercial property is becoming more popular in the rise of urban renewal, particularly in Australia's major capital cities. The reuse of brownfield sites can have substantial impact on the shaping/reshaping of cities and the quality of life of local residents.

Many brownfield site projects such as the Docklands and Federation Square in Melbourne, Darling Harbour in Sydney and the Northshore Hamilton in Brisbane are under construction as part of an urban renewal drive throughout Australia.

The Northshore Hamilton is the largest waterfront urban renewal project in Queensland which presented a number of challenges requiring innovative thinking starting from the demolition stage. During the tender process there was a general consensus that the wharf could support excavator loads to enable the efficient removal of the sub-structure timbers. However, when the client requested Liberty Industrial, who had been awarded the contract, to undertake a more detailed structural assessment to confirm this, it was found that the wharf was in a state of disrepair. Therefore, the largest excavator able to work from the deck was only eight tonne.

This required a complete re-think of the method while meeting the client's key requirement to reach project completion within the same time frame. Liberty Industrial developed a method utilising large crawler cranes that could reach to the full length of the wharf while sitting behind the revetment wall and on the land side. Detailed lift studies were undertaken so that concrete panels and

header beams could be cut and lifted in large sections to reduce preparation and rigging times. Chemset bolts were set into the slabs to enable lifting and lifts in excess of 30 tonnes were achieved. Complex rigging of the sub-structure timber was also undertaken so that large sections of the structure could be removed in single lifts.

Given that some sections of the wharf were derelict there was a serious risk of wharf collapse as the works progressed. This required the slab cutting to be completed in a methodical and staged manner so the entire wharf stability would be maintained throughout the works. A detailed cut plan and strategy was developed with some sections of wharf sub-structure being pre-secured to the underside of the slabs to prevent them from collapsing into the water during lifts. This was a critical aspect of the project due to the number of commercial and recreational boat movements nearby the site.

The original demolition method allowed for the piles to be removed via a barge mounted crane with a vibrating head attachment. The works took place on the Brisbane River, known for its strong tidal flows and significant flooding. In this section of the river commercial ships including large cruise liners frequently pass and turn. Shipping access was a key consideration and given that approximately 1600 piles were being removed from a fairly steep bank, geotechnical stability was also a factor. However, upon a geotechnical assessment undertaken by the client it was decided that removal of the pile would cause unnecessary risk to the stability of the river.

As an alternative, it was decided that all piles needed to be cut one metre below the existing river bed to retain ongoing bank stability and allow for future shipping navigation while keeping to the original program completion date. Liberty Industrial commenced discussion with a specialised dive contractor to undertake these works. Approximately 150 of the 1600 piles were steel cased piles filled with reinforced concrete. The cutting of these piles, approximately eight metres below the water, was a critical consideration to ensure works could be completed on time.

Liberty Industrial, in consultation with the dive sub-contractor sourced a specialised underwater, hydraulically driven wire saw. These works needed to progress ahead of the slab deck and superstructure removal due to safety considerations and therefore approximately 30 diamond wire cables were acquired. This enabled the dive crew to move ahead of the works and leave the cables in-situ around the piles on the river bed (still joined to the superstructure). After the superstructure was removed the cables could be recovered and process repeated. Due to the tight program requirements Liberty Industrial mobilised three separate dive crews so works could progress efficiently. As a result, the project was handed over to the client three weeks ahead of the original program.

