

# The Cairns foreshore development built on piles

THE CAIRNS Foreshore Promenade is a joint Queensland Government and Cairns City Council project that will substantially upgrade the present parkland along the Esplanade complete with boardwalk and themed nodes covering the culture, history and environment of the region. The Foreshore Promenade extends from Aplin to Minnie Street.

North of Minnie Street a regional playground facility is proposed.

The combined projects are planned to help revive the city heart and to create a unified vision of public accessibility and recreational amenity. They will offer diverse experiences for all people.

The project includes an esplanade and foreshore promenade component. The esplanade project incorporates a swimming lagoon to provide a year-round safe swimming and recreation area with lifeguards, nature viewing areas and increased open parkland. The foreshore promenade plans include a boardwalk, playground, landscaping and pavilions devoted to the region's history, culture and natural environment.

Structurally the swimming lagoon and associated structures represent the great-

est challenge. The foreshore comprises 3m of reclaimed silty sand overlying mud, and the lagoon is actually a 4000m<sup>2</sup> concrete structure built on a platform of around 175 400mm diameter piles at 5m centres. Frankipile installed the round piles that support the 230mm thick slab that forms the floor of the lagoon.

The lagoon tapers from a walk-in entry at beach level to 1500mm depth at the deepest end, so the floor actually slopes and as a consequence the piles needed to be broken off at different height. The exposed reinforcing from the pile was tied in to the reinforcing of the floor. The lagoon will be surrounded by sandy beaches and will have ledges for sitting.

Complicating the construction was a 5m wide 2m deep box culvert running under the lagoon, and carrying run-off from the stormwater drains of the city and the soon-to-be reconfigured Pier car park. The box drain itself rests on 75 600mm diameter piles.

The method used by contractor Seymour Whyte to trim the piles was quite novel. Project manager Darryl Gregory was aware of specialist hydraulic pile trimming tools but as there were none available for hire in North Queensland he realised that these machines could only be justified on projects with a substantial number of piles and reasonable continuity of work.

The lagoon project represented just such an opportunity, and a Taets type 314 circular pile breaker with infil links was hired from Sydney firm Steelcom Pty Ltd. A 22t excavator was plumbed to provide the hydraulic power for the breaker, which weighed around 500kg and hung from the dipper arm. Hydraulic cylinders on the breaker drive opposing chisels into the concrete pile.

The breaking force built up this way always seeks the shortest way through the concrete so the result is a perfect horizontal fracture. This stage of the breaking process takes about 25 seconds.

Once the fracture is made, the chisels penetrate further into the concrete. Due to the shape of the chisel, in combination with the reaction forces of the concrete, the concrete will break in pieces and can be easily lifted off the pile. The spoil is retained within the unit and is

easily moved to a convenient location.

There is little digging due to small dimensions and low cut off level. There are no cracks below cut off level and the reinforcement remains fully intact. There is no flying debris, noise or vibrations so the process is safer and quieter than the jackhammer method.

The handling and maintenance of the pile breaker is simple and does not require special skills. Pile breakers are durable and safe, and Steelcom provides excellent support.

Gregory's previous experience with pile breaking is that it takes six to seven

man-hours per pile to do this manually.

The hydraulic breaker was able to do this in 15 minutes, and a further half hour of trimming with a breaker was required. Ideally the machine should be used every day but even using the breaker every third day Gregory was well ahead compared to using hand-held breakers. This comparison does not take into account the health and safety advantages of using the hydraulic breaker.

The project is proceeding to schedule in a demanding environment, and will dramatically reshape the seaward face that Cairns presents to the world. ■



A Taets hydraulic pile breaker was used to trim piles to size and expose reinforcing

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