

# Lucinda Bulk Sugar Terminal Cyclone Yasi Repair Works



Client	Queensland Sugar Limited
Construction contractor	Abergeldie Complex Infrastructure
Contract Value	\$33.1 million (including GST)
Commencement	20 September 2011
Completion due	June 2012

- Repairs to motors and controls for conveyors, feeders, and ship loader
- Navigation, general jetty and wharf lightings
- Repairs to switchboards.

### Cathodic protection and marine works include:

- Repairs to mooring dolphins, including access stairs and platforms
- Repairs to berthing docks
- Replacement of navigation devices
- Replacement of cathodic protection
- Mooring capstans and winch box repairs
- Repairs to jetty support piles, above and below waterline.

### Structural and mechanical works include:

- Repairs to wharf support piles, above and below waterline
- Replacement of fire services including controls, pumps, electrics
- Structural repairs to tower platforms and link bridges
- Replacement of precast decking slabs
- Removal and replacement of damaged cladding and structural steel, above and below deck.

Nearly all of the works are being carried out at heights, over water, up to 6 km out to sea, and sometimes under water, at a location at least 150 km from the nearest major urban centre.

Safety, access, environmental protection, procurement management, subcontract arrangements, quality assurance and the extremes of Far North Queensland weather conditions are major management issues.

Getting the job done to the high standards demanded and within the time allowed is no small challenge. Throughout the months of February and March, heavy rain disrupted some of the planned work.

Safety restrictions also call for works to be suspended on some parts of the wharf whenever the wind speed exceeds a safety threshold. With the autumn calming of the seasonal tropical weather, work is now in full swing to complete the

Queensland Sugar Limited's 5.8 km long jetty and wharf at Lucinda, 150 km north of Townsville, was severely damaged by Cyclone Yasi in February 2011.

Damage to the wharf structure included displacement of many of the pre-cast concrete decking units and destruction of much of the overlying in-situ poured topping slab. A small number of the supporting piles were also damaged. Parts of the cathodic protection, navigation equipment and berthing facilities were swept away.

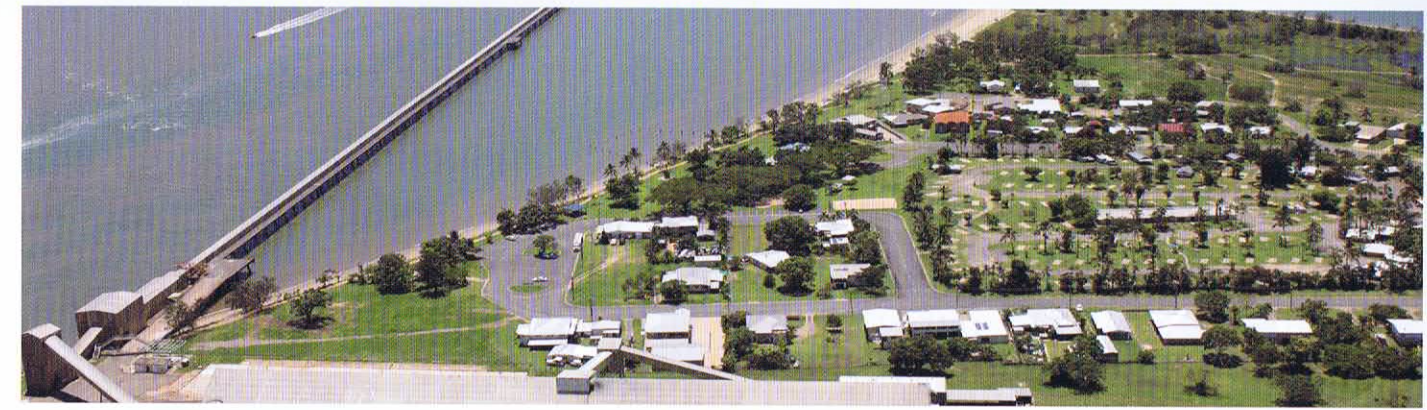
There was minimum damage to the steel structure, however more damage occurred to the electrical systems of the six kilometre long conveyor system, which carries sugar from the on-shore stockpile to the loading facility at the end of the jetty.

### The scope of works is described in the contract under several distinct schedules

- Preliminaries
- Electrical works
- Electrical equipment procurement and installation
- Mechanical works
- Mechanical equipment procurement and installation
- Cathodic protection and marine works
- Cathodic and marine equipment procurement and installation
- Structural works – demolition, repair and reconstruction
- Structural component procurement and fabrication

### The electrical component includes:

- Reconstruction of the wharf transformer bays
- New HV & LV transformers, conduits and cabling



contract by the end of June.

Owing to the extreme marine conditions, specialised marine access, work platform and lifting equipment is being used. The key element is a Sea Lift 4 jack-up barge, with a capacity of up to 250 t, supported by four hydraulic "spud" legs.

The Sea Lift 4 can provide a stable work platform above the high water level in depths up to 36 m. It was delivered to the site by road, in 26 semi-trailer loads.

A 150 t lattice jib crawler crane and two smaller cranes are working from the jack-up barge platform. The list of specialised marine equipment also includes two shuttle barges and the 1,200 HP "Black Panther" 24 m utility vessel to move the barges around.

The tug, barges and cranes have enabled a complex array of gantries and access platforms to be erected to allow access for repairs to the jetty, wharf and decking. These temporary access structures required detailed design to ensure safety and functionality.

Abergeldie's in-house design studio engaged specialist marine design consultants from SMEC to advise on design alternatives, and structural engineering design specialists from Demlakian to carry out detailed load calculations and advise on a safe methodology and sequence of works for fabrication and installation of the temporary access facilities.

Some of the demolition and reconstruction tasks have proved to be more complex than anticipated; others less so. On close inspection, it was found that damaged pilings could be repaired insitu, and did not need to be completely replaced.

Divers are welding steel repair plates below the water line to restore the integrity of steel pile casings, and some new concrete is being poured.

Demolition and replacement of the damaged jetty decking, however, has been a major undertaking.

The variety of equipment and materials to be procured and the large number of trade disciplines involved present major challenges for procurement management, sub-contractor engagement and coordination, document management, quality management and ensuring that sufficient numbers of properly-trained personnel are available.

On any one shift between 50 and 65 personnel are on the

job at various locations along the jetty, wharf structure and conveyor installations.

Trades engaged include fitters, boilermakers, abrasive blasters, riggers, dogmen, scaffolders, crane operators, electricians, divers, under-water welders, boat crew and concrete workers, all under the immediate supervision of at least six Abergeldie leading hands.

On-site project management is being coordinated through Abergeldie's North Queensland office in Townsville, backed by specialist management support from the Brisbane regional office and Sydney head office.

It is the kind of project that highlights what the "complex" in Abergeldie Complex Infrastructure is all about.

### Subcontractors and Suppliers

Jack-up Barge	L4/ Australian Barge Hire
Crane Hire	J & D Rigging
Barge & Vessel Hire	PMG
Structural Steel &	Pacific Coast Engineering
Electrical Engineers	PSG Richard Flanagan
Cathodic Protection	Corrosion Control Engineering
Underwater Welding	Gray Diving
Fire Services	End Fire Engineering
Cladding	SPD Contracting
Mapping/Surveying	Brazier Motti
Labour Hire	NR Engineering & Constructions
Labour Hire	Skilled
Labour Hire	NR Engineering & Constructions



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