



2014

AUSTRALIAN CONSTRUCTION
ACHIEVEMENT
AWARD SUBMISSION

CAPE LAMBERT MARINE WORKS

THE CAPE LAMBERT PORT B PROJECT HAS BEEN CRUCIAL FOR THE RESOURCES INDUSTRY IN AUSTRALIA

INTRODUCTION

The project has involved construction of a new port facility adjacent to the existing Cape Lambert Port, 40 km east of Karratha. This complex project involved construction of new train unloading facilities, associated infrastructure, stockyard, new ship-loading facilities and associated dredging.

John Holland was contracted to construct the new 1 km approach jetty, and 480 m dual berth wharf. This included all associated roadways and conveyor systems.

Working over the marine environment with heavy engineering equipment can be fraught with problems for workers and the natural environment alike. With this in mind, John Holland sought to find safer, more efficient and environmentally-friendly ways to deliver an outstanding product.

The project, which is worth more than \$400M, has achieved a number of feats across areas including health and safety, environment and construction innovation. Further, there have been significant cost savings made through using false-works and sponge abrasive blasting. John Holland has established itself as a market leader in Australian heavy jetty and wharf structure construction.



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OUTCOMES ACHIEVED AGAINST PLANNED TARGETS FOR KEY PROJECT PARAMETERS

John Holland has taken an innovative and consistent approach to every task completed on the Cape Lambert Port B project, no matter how big or small.

Construction in a marine environment, over water with heavy and critical lifts, takes specialist skills to mitigate safety risks to the workforce. John Holland's tailored safety systems, delivered by our experienced construction personnel, have ensured the highest standards of safety performance without compromising productivity. The project has maintained an excellent safety record, working 1,833,743 man hours as at 31 August 2013 with just 11 recordable injuries and three lost time injuries, giving a life of project TRIFR of 6.

The Cape Lambert Port B project faced a significant challenge with the award of the contracts for the 290 and 360 mt phased expansions resulting in the project duration being extended by 2.5 months to May 2014. Controlling plant costs proved to be a challenge, with more than 330 individual plant items used in some way over the project's duration. Despite this, the first stage of work finished on time and on budget in September 2013. Quality control was undertaken through consistent monitoring and supervision to ensure compliance to client procedures and conformance to Australian Standards.

The management of incoming materials proved very successful for identifying incoming material defects and then recovering the associated rework costs. Approximately 1% of the total project turnover cost in incoming material rework costs has been recovered.

The project has not had any significant or reportable environmental or heritage incidents. Given the environmental significance of the Port Walcott area, the project implemented specific measures to protect marine mammals and turtles during piling including:

- Exclusion zones surrounding marine works.
- Soft start-up piling procedures.
- Restrictions to daylight hours during turtle nesting.
- For abrasive blasting work, multiple sponge blast machines were purchased to minimise the generation of controlled waste. Within Australia, John Holland has pioneered the use of sponge blasting on marine structures.

A number of innovations were implemented, including:

- Off-shore cranes fitted with purpose-built portable bunds to catch leaks and spills.
- Dedicated permanently banded transport cages for the transport of used oil over water.

- Purpose-manufactured portable tarp bunds installed around marine grouting to capture and collect wastes that could be sucked up, pumped into lined bins, brought on-shore and disposed to licensed facilities.

All construction activities were conducted responsibly in a sustainable fashion. As the project draws towards completion, significant false-work components have been decommissioned and stored for re-use on future marine projects. Recycling of waste materials has been conducted throughout the project.

As a result, our client delivered its first load of ore under the 290 mt expansion ahead of schedule. Stakeholder satisfaction was extremely important from the outset and maintained through regular meetings with RioTinto to ensure KRAs were being met and good working relationships were highlighted. This included close liaison with the local Indigenous community and community members.

John Holland's industrial performance was exemplary, with no lost time due to industrial activity. This outcome is credited to the experienced management team and proactive employee engagement.

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COMPLEXITY, DIFFICULTY AND OPTIMISATION OF THE CONSTRUCTION TASK

THE PROJECT REQUIRED THE EXECUTION OF A SERIES OF COMPLICATED LOGISTICS IN ORDER TO SUCCESSFULLY MEET DEADLINES. SIGNIFICANT CHALLENGES WERE FACED AND OVERCOME DUE TO THE REMOTE LOCATION, THE INTRICATE NATURE OF MARINE WORKS OVER OPEN WATER AND THE VOLATILE WEATHER, WITH THE PROJECT LOCATED IN ONE OF AUSTRALIA'S MOST ACTIVE CYCLONE ZONES.

Challenges included:

- Utilising specialised heavy lift vessels capable of accurately placing 50 to 1000 ton modules.
- Delivery of wharf foundation materials via barge and multi-cat vessels – maintaining vessel stability whilst loading or lifting required a proactive design.
- Numerous tropical cyclones halted operations for days at a time.
- Inclement weather created sea states that influenced marine deliveries and progress.

The supply of permanent materials to the project site was predominately via marine deliveries. A total of eight heavy lift vessel deliveries were used to transport the 11 wharf top side modules and 18 dolphin modules to site. Close integration of the construction and shipping schedules was essential to the project's success.

John Holland's marine package to construct a jetty and wharf was part of a larger port development by RioTinto. Externally, there was heavy

daily interface with existing port operations, and other contractors constructing on-shore train unloading facilities, new stock yards, stacker/reclaimer machines, and ship loaders. Electrical fit-out was also a heavy interface during construction activities.

Internally, John Holland closely orchestrated the daily transfer of materials from on-shore to the off-shore work fronts. Close interfacing between marine logistics crews and work fronts was required to successfully achieve just-in-time deliveries in front of site progress.

To limit the impact to the local community, time and noise limits were placed on piling work, with noise monitors at Point Samson used to determine when work needed to cease. Initiatives included:

- Utilisation of indigenous liaison coordinators to interact with the local aboriginal community.
- Employees visited local schools on a number of occasions to discuss our project and to promote further education and traineeships.

- A skin cancer screening machine was donated to the local doctor.

Another form of community engagement has been extensive volunteer work. Cape Lambert employees were encouraged to volunteer with the following organisations and events:

- Youth Development Plan 2013
- NAIDOC Week 2013
- Cossack Community Day.

In an effort to increase and retain Aboriginal and Torres Strait Islander staff, Career Development Plans (CDP) were developed for all the Indigenous employees at the CLB site. The CDPs are a strategy to collaborate with Indigenous staff to map out their career goals and identify training and development needs. In addition to working with staff to identify goals and development, the plans will improve organisational capacity and retention.

LEADERSHIP AND MANAGEMENT OF THE PROJECT DELIVERY

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John Holland employed its signature 'Top Side' construction methodology to construct the wharf and jetty, supported by two jack-up barges.

The project's scale presented the opportunity to further develop and refine what John Holland believes is the most efficient and risk adverse approach to the construction of exposed off-shore marine structures.

The project designed, fabricated, assembled and installed temporary structures and false work to provide support and access to each element of the works during construction. This innovative approach provided multiple program, safety, quality, budget and environmental benefits. This false work included:

- Jetty canti-traveller
- Wharf construction rigs
- Dolphin supports and access
- Clamp-on work boxes
- Two-tier platforms and connecting walkways
- Cantilevered man boxes
- Jetty headstock platform
- Secondary Load-out Wharf.

The cantilevered, self-launching truss system, complete with a 400 tonne crawler crane, enabled progression with the jetty work front by launching and driving jetty piles. The benefit of the canti-traveller is it progresses with construction and establishes a roadway linking it to the shore, thus eliminating the need for access and deliveries by marine vessels and eliminating delays due to poor sea conditions and weather.

For the hammering of piles, the project sought the largest hammers available and practicable. Cape Lambert Port B is the first John Holland project to use 28-tonne hammers on a marine project. The benefit of

using this size hammer was to minimise the number of strikes of a pile and thereby reducing noise impacts to the marine environment. In addition the hammers are fitted with elastomer cushions to reduce noise.

Safety Leadership Workshops were conducted involving senior management and supervisors to foster a benchmark for behaviour and focus. The Project Leadership Team participated in a workshop designed to hone the collective focus towards delivering a quality on time and on budget completed project.

Health, safety and environmental management responsibilities were written into all management and supervision position descriptions on the project to ensure that these are focal points for all personnel.

The Project adopted eight Health, Safety and Environment (HSE) Absolutes. These rules are intended to ensure familiarity with HSE requirements and to create a consistent compliance culture as well as set the expected behaviour of all personnel.

To better deliver this, the project has employed a full time Training Coordinator. Prior to commencing work on-site, all site personnel are trained in:

- Working at height permit awareness and working over water awareness.
- Grid mesh and checker-plate installation and removal.
- Electrical, barricading and signage.

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EVALUATION CRITERIA, PART B

Project Team

Name	Role	Responsibilities
Shammi Fernando	John Holland Senior Project Manager	Manage the Project
Warwick Lind	John Holland Construction Manager	Management of Work Force
Daniel Dick	John Holland Deputy Construction Manager	Management of Work Force
Cameron Green	John Holland Lead Engineer – Wharf	Management of temporary works and site engineering related to the wharf.
Michael McIlveen	John Holland Lead Engineer – Jetty	Management of temporary works and site engineering related to the jetty.
Furgo Seacore	Supply of Jackup Barges and Drilling Gear	

