

AP5 Wharf Extension, Australia

Fortescue Metals Group awarded the BAM Clough Joint Venture (BAM Clough) the design and construction contract for a fifth iron ore loading berth at its Anderson Point Facility (AP5) in Port Hedland, Western Australia.

The works included the design and construction of a 306-metre long wharf extension, seven berthing dolphins, and the supply and installation of wharf conveyor modules, with the existing berths remaining fully operational.

As BAM Clough's in-house designer DMC was responsible for the detailed design and the overall design management of this project. By applying fast track design processes that went beyond individual engineering disciplines, we were able to meet the total design and construct period of less than a year between contract award and project delivery. The fully integrated design and construct set-up, was essential in successfully achieving the challenging milestones.

Main client

Fortescue Metals Group

Client

BAM Clough JV

Type of contract

Design & Construct

Completion

2014

Location

Anderson Point, Port Hedland, Western Australia

Construction costs

Euro 72 mio

Consultancy Fees

Category 5 (see page 2)

Services

Design Management

Detailed Design

Site Engineering

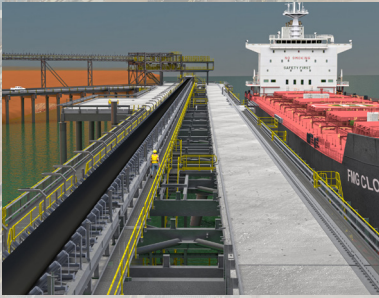
PDA Pile Testing

Scope

Marine Facilities



AP5 Wharf Extension



Scope of work

The new AP5 wharf is an extension of the existing AP4 wharf and allows one shiploader to travel over both wharfs.

An elevated conveyor bridge and access roadway were constructed from shore to the south end of the AP5 wharf, where a prefabricated modularised transfer station was installed.

The seven independent berthing dolphins were designed to handle a varying range of iron ore carriers over the large tidal range in Port Hedland.



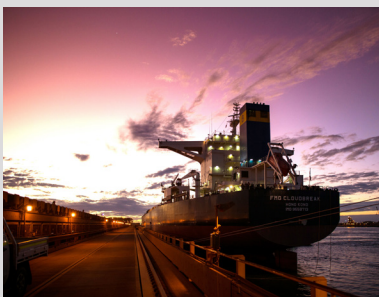
Construction Schedule

To mitigate the tight schedule constraints the steel topside modules were delivered to site fully prefabricated with a transfer station, precast concrete deck panels and conveyor structures, stretching the transportation and installation limits in order to reduce on-site installation works. All modules were successfully placed in-situ, allowing the site team to immediately work on the mechanical fit-out. Piling cycle time was optimised by using a custom, in-house designed raker piling template capable of 'walking' over the vertical piles, making it independent from tidal restrictions and requiring minimal handling to move to the next piling location.



Design Involvement

As marine designer and as integrated design manager, DMC was responsible not only for the design but also for technical client interaction, subcontract management/integration and site/fabrication support. In this role we were able to maximise interaction between the various disciplines, shorten lines of communication and accelerate design processes.



Fast Track

The design process was characterised by multiple parallel activities and processes. 3D modelling and shop detailing was performed in parallel with the structural design works, which made it possible to provide the fabrication yards with the first shop drawing packages only a few weeks after contract award. The design process was highly transparent which allowed the client to comment/review 'on the job', in many cases allowing a full review cycle of a package of less than a week. Every effort was made at keeping everyone informed and avoiding surprises with any of the stakeholders.

Construction Support

The design services extended to the construction site and the fabrication yards, where hands-on support was provided. Design Engineers were present during all the critical lifts and installations, providing ad-hoc resolutions for any site issues that might have otherwise led to delays.

Pile Driveability Analysis

DMC also performed PDA testing and on-site analysis, and was therefore able to immediately correlate test results with the detailed design assumptions, ensuring early identification of any problems and implementing risk mitigation measure where required.

Consultancy Fees: 1: 50.000€ 2: 50 - 150.000€ 3: 150 - 300.000€ 4: 300 - 600.000€ 5: > 600.000€



Delta Marine
Consultants