



## PROJECT SUMMARY

### Project:

Pilbara Iron Ore and Infrastructure Project – Cloudbreak Ore Handling

### Organization:

PDC Consultants

### Solution:

Mining and Metals

### Location:

Australia

### Project Objective:

Design and detail the buildings and structures of the Cloudbreak Mine Ore Handling facility to meet market demand and fulfill initial agreements for up to 50 million tons per annum of iron ore

### Products used:

ProSteel®

## Port-Rail-Mine Project: From Construction to Production in Two Years

### 3D Modeling Speeds Design and Detailing Stages for Complex Mechanical Systems

Five years from the date Fortescue Metals Group Ltd was formed to meet China's growing demand for iron ore, the company's first mine in Western Australia achieved project completion by exporting 2 million tons of ore in one month. The production goal marked the beginning of the company's ramp-up to achieve optimal capacity of 55 million tons per annum.

Shipping from the \$2.8 billion project in the Pilbara region commenced on May 15, 2008, just two years after the company broke ground for a port at Anderson Point in Port Hedland. The mining operations include the new Fortescue Herb Elliott Port, open-access rail infrastructure, and the mine site known as Cloudbreak.

Founded on July 18, 2003, with \$3.7 billion in capital, Fortescue has already become Australia's third largest iron ore exporter and an S&P/ASX 50 company. All of Fortescue's customers are in China, which is the world's biggest buyer of iron ore. Cloudbreak's iron ore production capacity may eventually be expanded to 80 million metric tons per annum in response to demand from Chinese steel mills. In March 2009, China's Hunan Valin Iron & Steel Group bought a 17.6 percent stake in the company to fund the next expansion and secure supplies for its own mills.



Train Loadout

Working under pressure to meet this market demand and fulfill initial agreements for up to 50 million tons per annum, contractors on the Pilbara project utilized advanced 3D modeling technology to accelerate the design and detailing stages of the buildings and structures. PDC Consultants got involved early in the design process for the Cloudbreak Mine Ore Handling facilities to help ensure minimal rework during construction.



Screening Building

PDC is headquartered in Perth, Western Australia, and is one of the largest design and detailing companies servicing the mining, oil and gas, process, and industrial sectors. The company has developed a unique 3D modeling process that integrates the capabilities of leading software products such as ProSteel and Autodesk Navisworks. The proprietary system enables PDC to provide accurate, fully intelligent 3D models of project structures, saving up to 50 percent of the time spent in the design and detailing phase.

On the Fortescue project, PDC provided all mechanical and structural shop detailing and modeling for a screening building with 11 product and scalping screen bins, a crushing building with bins and chutes, a stockpile facility, a train load-out facility with bins and chutes, 11 conveyers and associated transfer stations, and a desanding

## FAST FACTS

- PDC provided all mechanical and structural shop detailing and modeling for a screening building with 11 product and scalping screen bins, a crushing building with bins and chutes, a stockpile facility, a train load-out facility with bins and chutes, 11 conveyers and associated transfer stations, and a desanding building.
- The project was completed using ProSteel to model and detail the more complex mechanical items, such as bins, curved trusses, transfer chutes, and liner systems.
- PDC's 3D modeling allowed them to provide accurate, fully intelligent 3D models of project structures, saving up to 50 percent of the time spent in the design and detailing phase.
- ProSteel is PDC's primary modeling software due to the flexibility and ease of use.

*"With companies feeling increasing pressure to advance projects in ever-tightening time frames, our objective is to use this technology and experience to assist clients during the design phase and achieve zero rework during construction."*

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building. All together, the structures represent in excess of 10,000 tons of steelwork.

PDC completed the project using ProSteel to model and detail the more complex mechanical items, such as bins, curved trusses, transfer chutes, and liner systems. The firm adopted ProSteel as its primary modeling software because it is flexible and easy to use, allowing more project team members to be trained and quickly become productive. With just over 100 employees, PDC currently holds 77 licenses for ProSteel.

The firm's 3D modeling process enabled full clash detection in the final design of the Cloudbreak facilities. "PDC's 3D modeling technology is the most advanced of its kind," said PDC Managing Director Martyn Weir. "And with companies feeling increasing pressure to advance projects

in ever-tightening time frames, our objective is to use this technology and experience to assist clients during the design phase and achieve zero rework during construction."

Fortescue's Cloudbreak mine was constructed in record time, allowing the company to satisfy contracts for the initial tonnage and pursue market-driven expansion. Fortescue owns about 4.5 billion tons of resources, including the 1.6 billion tons in reserves that comprise less than 10 percent of the 69,000-square-kilometer Pilbara tenements. With China projected to spend more than \$500 billion on overseas resources in the next eight years, Fortescue is well positioned to supply what Australian journalists have called the "golden age" for iron ore.



*Desands Structure*

#### BE AWARD NOMINEE

Pilbara Iron Ore and Infrastructure Project – Cloudbreak Ore Handling  
Organization: PDC Consultants  
Category: Innovation in Mining and Metals