Integrated 3D meets export ore rush

Advanced 3D modeling technology accelerated the design and detailing stages of the buildings and structures for Fortescue Metals to get the Group's first mine in Western Australia off the ground to meet demand from foreign steelmakers.

Shipping from the $2.8 billion project in the Pilbara region commenced in mid 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 Cloudbreak mine site.

The fast development time allowed the new mine to achieve project completion by exporting two million tonnes of ore in one month just five years from the date the Group was formed to meet growing export demand for iron ore and marked the beginning of the company's ramp-up to achieve optimal capacity of 55 million tonnes per annum.

Working under pressure to meet market demand and fulfill initial agreements for up to 50 million tonnes per annum, contractors on the Pilbara project utilised advanced 3D-modeling technology to accelerate the design and detailing stages of the buildings and structures.

Perth-based PDC Consultants got involved early in the design process for the Cloudbreak Mine Ore Handling facilities to help ensure minimal rework during construction.

ASI-member PDC is one of the largest design and steel detailing companies servicing the mining, oil and gas, process and industrial sectors. The company has developed a unique 3D modeling process that leverages the full capabilities of Building Information Modeling (BIM) and integrates the capabilities of leading software products such as *ProSteel, Tekla, Strucad* and *Autodesk Navisworks*.

The proprietary BIM system enabled PDC to provide accurate, fully-intelligent 3D models of project structures that could be utilised during the design and construction phases, saving up to 50 percent of the time spent in the design and detailing phase and achieving significant cost and schedule savings during construction.

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 loadout facility with bins and chutes, 11 conveyers and associated transfer stations and a desanding building. All together, the structures represent in excess of 10,000 tonnes of Australian steelwork.

PDC completed the project using *ProSteel, Tekla* and *StruCad* and specifically used *ProSteel* to model and detail the more complex mechanical items, such as bins, curved trusses, transfer chutes and liner systems. With over 110 employees and an experienced team of subcontractors, PDC provides flexibility and capacity to large resource projects to ensure they are delivered in the tight time frames required.

The firm's 3D modeling process enabled full clash detection in the final design of the Cloudbreak facilities.

"With companies feeling increasing pressure to advance projects in ever-tightening timeframes, our objective is to use this technology and experience to assist clients during the design phase and achieve zero rework during construction," said PDC's Managing Director, **Martyn Weir**.

PDC completed their detailing work in late October 2008 with construction complete early in 2009.

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 tonnes of resources, including the 1.6 billion tonnes in reserves that comprise less than 10 percent of the 69,000-square-kilometre Pilbara tenements.