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BIM improves design process

Engineering consultancy GHD engaged the steel detailer in the design phase of Fraser Coast Cultural Centre currently under construction in Queensland. This approach was facilitated by building information modelling (BIM), particularly Revit, Tekla and Navisworks software.

The single-storey steel-framed building will house a regional art gallery, visitors and discovery centre, cafe and administration area. It has been designed to complement a convention facility that is planned to be built in the future. The \$4.9 million facility is scheduled to open to the public in August 2013.

GHD provided architecture, and structural, civil, mechanical, electrical and building hydraulics engineering services. Jackson Roxborough is the

steel detailer. The main contractor is PBS Building and the steel fabricator is East Coast Welding and Fabrication.

GHD engineers modelled the building in Revit and then created a model which the detailer imported to Tekla. The detailer then developed a new model, which was imported into Revit and Navisworks to check for clashes. "At no stage were official drawings transferred between us and the steel detailer - everything was transferred via the model," Brenden Picton, GHD BIM structural manager said.

According to GHD, the overall shape and form of the building meant that no structural elements were regular and there was little repetition of structural members and connections. The most challenging component was the external soffit

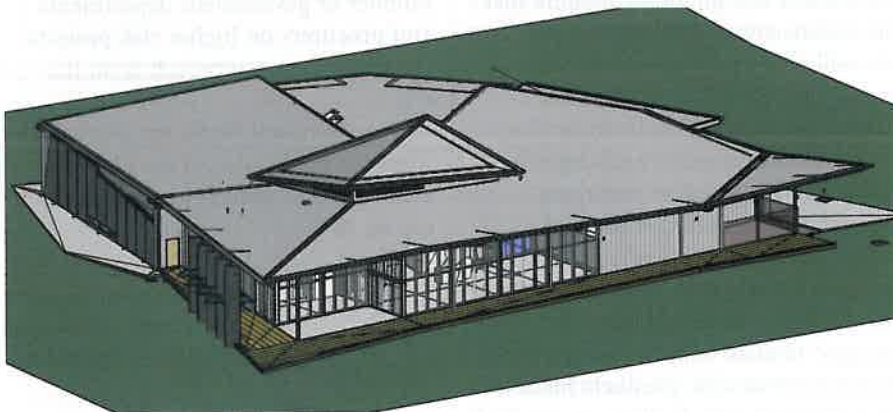
framing, which would be supported by a steel framework. "Setting out of the steel framing was crucial, and this element was aided tremendously by the delivery method of a 3D model directly," Picton said.

"Traditional delivery of 2D drawings with setting out dimensions for each member would have proved to be a significant challenge, fraught with opportunity for error, which was completely eliminated by the delivery method utilised.

So much so, that during construction, the only 'on-site' modification needed to the steel frame was the alteration of one bolt hole which had been drilled incorrectly in the fabrication shop."

GHD said this approach resulted in less documentation and decreased construction time as the contractor is issued with drawings that can be fabricated straight away. Involving the detailer in the design process also produced more refined costs for steel with less risk of variations.

"The communication between us and the steel detailers is paramount. We tried to do as much as we could through the model. Because the way in which the program ran, we had not completely finished modelling each section of the building as we sent the models to the detailer," Picton said. ■



Building information modelling allowed engineers and architects to work with steel detailers on the design of the Fraser Coast Cultural Centre in Queensland.