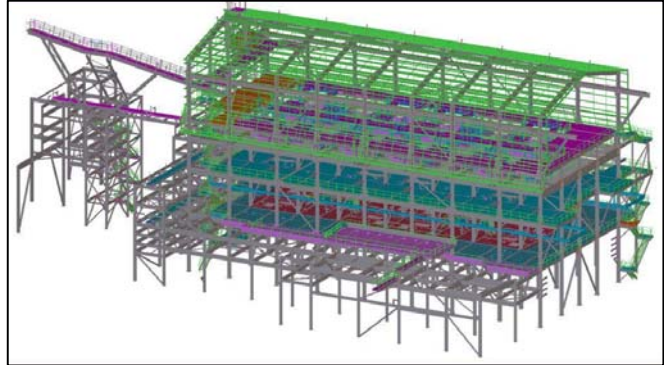


# Market Sector Use

## Mining

### Alcoa Pinjarra Efficiency Upgrade Filtration Building 44

Filtration Building 44 consisted of 1350 tonnes of mainly heavy steelwork. The structure was about 32 metres tall and consisted of three main floors of steelwork with a portal framed "lid" with purlins and girts sitting above level 3. Level 1 was covered in floor plate, level 2 was covered with grating and level 3 had a concrete slab poured over steel structural decking.



3D model view of the completed complex

The structure was designed using Bentley Plant Space and the designers provided an SDNF model to Universal Drafting, who imported it into their Tekla Structures detailing software where the model was checked and all connections modelled.

At the end of each phase, the model was exported back to the designers who would import it back into their software for clash checking. By utilizing the very powerful colour coding identification feature in Tekla Structures the detailer was able to carefully track revisions, which showed members that had changed from previous imports as well as new members that had been introduced.

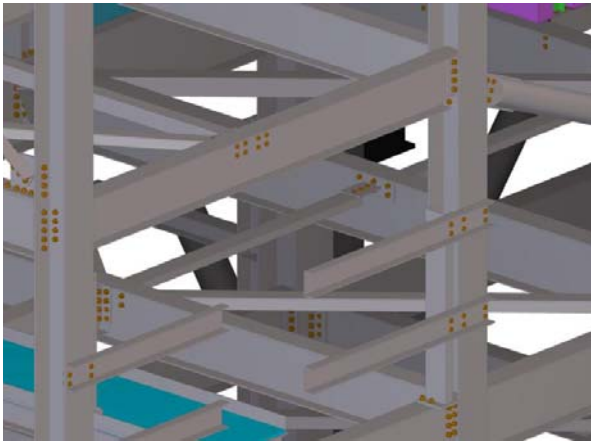
Once connections had been added and modelling was complete, the model was submitted back to engineer in PML format and they imported this into their model for clash testing. The designers also had a copy of Tekla Structures so each phase was imported by the engineer and approved using the software. All deliverables on the project were electronic.

The connections were designed to minimise welding and maximise beam line fabrication so clip angle beam connections were utilised extensively. Any brace cleats that were required were fabricated with bolt-on plates and sent to site separately from the beams.

The detailer provided NC files and DXF files to the fabricator to enable automated fabrication. This meant that all the beams were fabricated entirely on the beam line with holes and occasional notching only. Apart from a few necessary exceptions, the only welding on the project was baseplates to columns, tongue plates into the circular hollow bracing and the bracing cleat assemblies.

By using electronic transfer of data from design through to fabrication, and by designing the connections so that almost all fabrication was done on the beam line, the chance of fabrication mistakes was basically eliminated. Whilst this methodology meant additional bolting on site, a lot of this was done on the ground prior to lifting the steelwork and in the end all the reports from the erectors were quite favourable.

Part of the scope of work was to also provide the 2D "design" drawings showing member sizes, which were provided in AutoCAD format.



View of connections from the detailer's 3D model



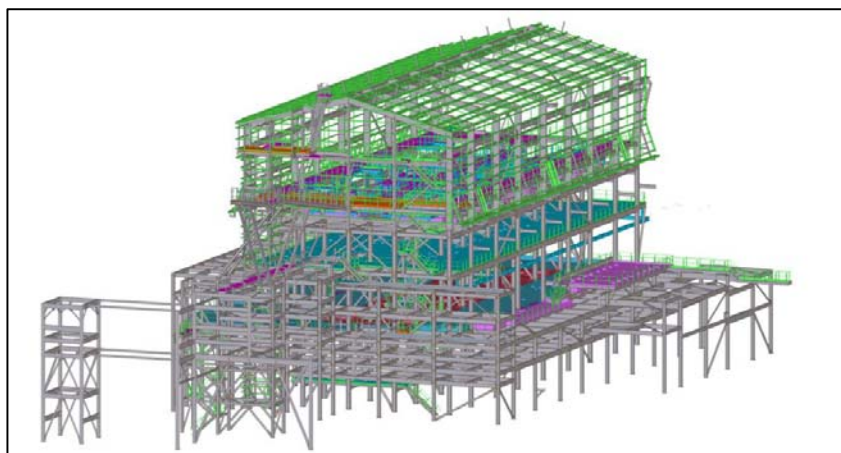
Clip angle beam connections were utilised extensively



The project utilised 1350 tonnes of mainly heavy steelwork



Many of the framing sections were preassembled on the ground prior to being lifted into position



The detailer's 3D model was exported back to the designer's model for clash checking