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GHD is one of the world's leading engineering, architecture and environmental consulting firms. Established in 1928, GHD employs more than 6000 people across five continents and serves clients in the global markets of water, energy and resources, environment, property and buildings, and transportation.

Wholly-owned by its people, GHD is focused on client success. Our global network of engineers, architects, planners, scientists, project managers and economists collaborate to deliver sustainable outcomes for our clients and the community.

Our core values of Teamwork, Respect and Integrity help create enduring relationships that deliver exceptional results.

GHD is recognised for its commitment to innovation, safety and sustainable development. We care for the wellbeing of our people, communities and the environments in which we operate.

A member of the World Business Council for Sustainable Development, GHD operates under a Practice Quality Management System, ISO 9001:2008 and an Environmental Management System, ISO 14001:2004 which are certified by Lloyds Register Quality Assurance.

mine expansion

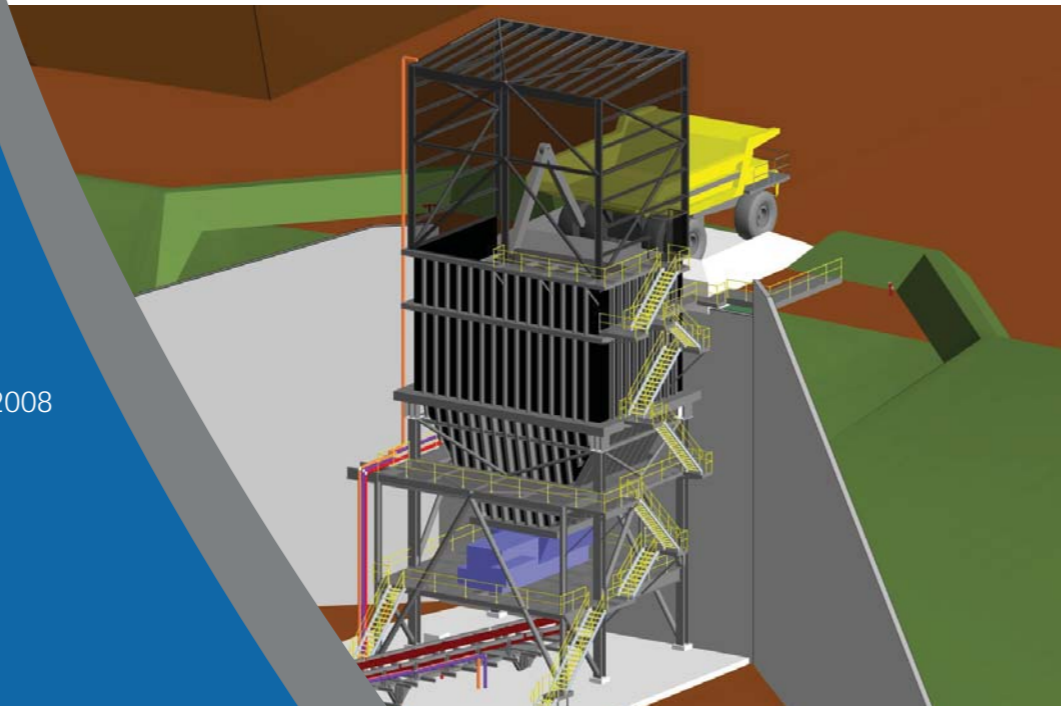
feasibility upgrade study

Our client proposed to upgrade the capacity of an existing Coal Mine from 1.5Mtpa to 6.5Mtpa of product coal and contracted GHD to complete the concept design and costing for the "Mine Expansion Feasibility Study".

GHD's main focus was to create the infrastructure design to estimate the capital and operating costs for the upgrade to an acceptable degree of accuracy.

The deliverables of the project included preliminary design of the Coal Handling Plant, site layout and building infrastructure along with the services to support mine operations with minimum disruption to the existing operations.

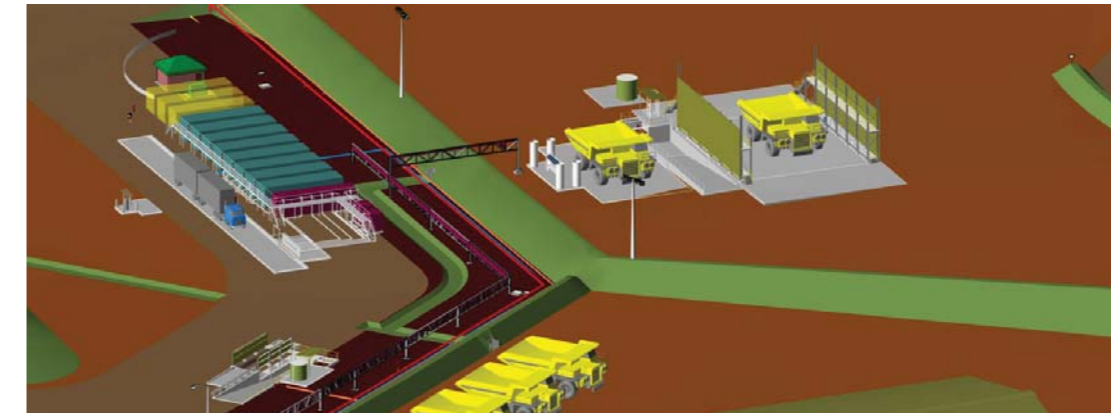
The design included a new rail link and train-loading loop of 18 km incorporating a 1.1km long viaduct plus bridges and large culverts together with a 20km long road diversion



The project budget and timeframe warranted a non-traditional engineering design solution. A number of options were considered to facilitate the management of project delivery including:

- 1 - Traditional 2d Drafting using AutoCAD,
- 2 - GIS + AutoCAD
- 3 - NavisWorks + various modeling software;

Each option has advantages and disadvantages. GHD chose to use NavisWorks due to the ability to import various file formats thus streamlining coordination. The solution did also not require extensive training, further broadening its appeal.



Navisworks brought new design and management benefits including:

- Effective presentation tool demonstrating GHD's understanding of the project to both technical and non-technical people via detailed 3D visualisation.
- Facilitation of better communication, especially to third parties who are not familiar with the project.
- Increased internal coordination amongst the various disciplines to meet the tight project schedule.
- Streamlined the review process as engineers and architects can regularly obtain progress 'snapshots' as the model is updated.
- Reduced the number of drawings produced as it is part of the final delivery saving time on the rework involved from both the drafter and engineer/architect.

Navisworks was the vehicle used to bring together digital information models from a number of different disciplines and software types including Revit Architecture, Bentley Systems, 12D and Solidworks.

The Mine Expansion Project using NavisWorks proved to be a successful exercise for both GHD and the client. It allowed GHD to demonstrate to the client a clear understanding of the project scope by using a 3D digital information model as a presentation tool.

This digital model made communication with the client much clearer than using the traditional 2D drawings to convey understanding of the project.

The project timeframe and deadlines were extremely tight and by using NavisWorks the documentation reduced the number of drawings from a traditional package of estimated 700 documents to 270 documents.

Effective communication is the key driver behind the use of NavisWorks. Its use ensured continuous, clear and constructive understanding within the design teams as well as with the client.

Using NavisWorks accelerated collaboration within project teams, which lead to reduced costs, improved profitability and consequently better time management and improved customer/client relationships.

