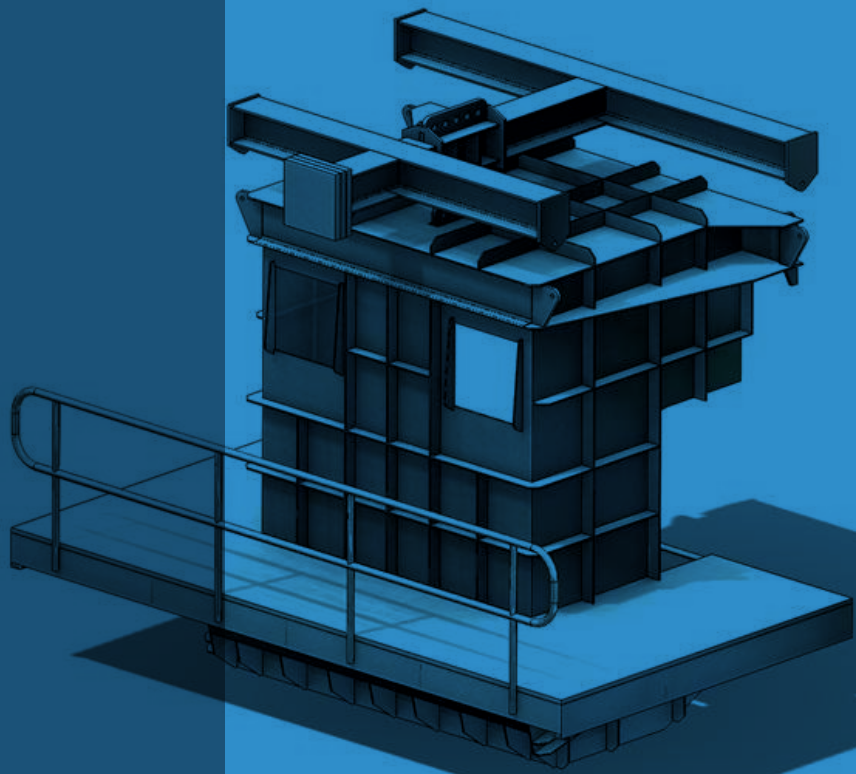


Mining Project Modules



Carnot is a Melbourne based engineering firm with extensive experience in the design of plant and equipment for the mining industry. The projects they have been involved in range from the design of turnkey systems through to specialised transport and equipment handling tools. Below is a small selection of mining related design projects we have delivered.

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- » Project 1 - Modular Underground Processing Plant
- » Project 2 - Modular Ore Sorting Plant
- » Project 3 - Filter press and balance of plant
- » Project 4 - Conveyor Roller Transport Pallet
- » Project 5 - Modular Transport Frames
- » Project 6 - Ore Scraper
- » Project 7 - Countershaft Removal Tool
- » Project 8 - Spreader Bar
- » Project 9 - Tyre Rim Storage Frame
- » Project 10 - Rigger Training Frame
- » Project 11 - Steel Bench

The Carnot Group.
Creating clever engineering
outcomes, for a diversity of
clients across multiple industries.

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Project 1

Modular Underground Processing Plant

The brief was to design a complete modular ore processing plant for use underground. The plant had to be easy to maintain and also fit within the tight envelope of a typical mine tunnel. The plant consisted of a static grizzly, jaw crusher, VSI and wet and dry screens along with interconnecting conveyors.



Figure 1 Modular Underground Ore Processing Plant

Project 2

Modular Ore Sorting Plant

The brief was to design a modular ore sorting plant for R&D purposes. The plant had to be easy to relocate from site to site. A standard 40' shipping container was used as the form factor for the modules. The conveyors were also modular.



Figure 2 Modular Ore Sorting Plant

Project 3

Filter Press and Balance of Plant

The brief for this problem was to analyse the client's process and provide advice on a solution to a number of operation issues. A contributing factor to the client's difficulties was the inability to separate fines ($<50\mu\text{m}$). A filter press was sourced and the design of the installation and balance of plant (slurry surge tank, filter cake handling, filter house, etc) was provided.



Figure 3 Large filter press and associated support structure and balance of plant

Project 4

Conveyor Roller Transport Pallet

The brief was to design a means to safely transport and store conveyor rollers. The pallets are easily stacked using a forklift in the laydown yard to minimise storage footprint. The pallets can also be positioned using a crane via the four lifting lugs.

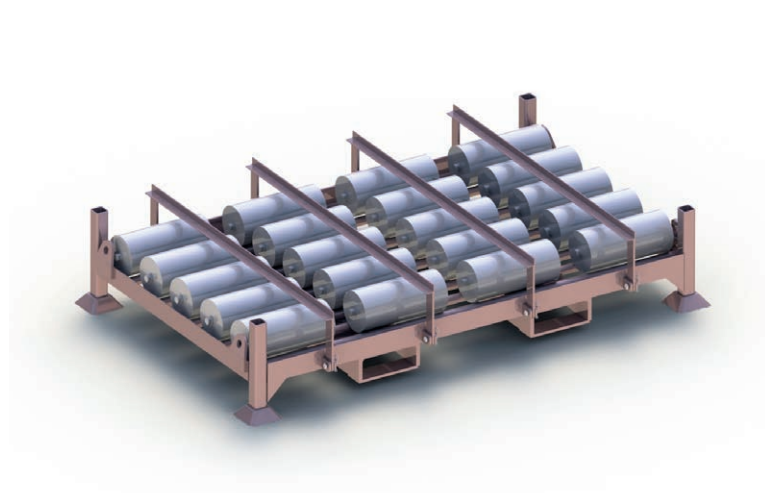


Figure 4 Roller Transport Pallet

Project 5

Modular Transport Frames

The design of transport and storage frames for carrying large steel and rubber wear assemblies. The design brief required three wear assemblies to be carried to site and to meet strict transport regulations and once on site each frame had to be transported by a forklift.



Figure 5 Modular Transport Frames

Project 6

Ore Scraper

The design of an ore scraper that may be attached to a mine vehicle to scrape excess ore from a loaded train carriage. The scraper is fitted with a standard telehandler connection.



Figure 6 Ore Scraper

Project 7

Countershaft Removal Tool

The design of a tool used to remove and replace the countershaft in an ore crusher. The tool was designed with a counter weight and multiple lifting lugs to enable it to maintain a horizontal position both when attached to and detached from the countershaft.



Figure 7 Countershaft Removal Tool

Project 8

Spreader Bar

The design of a spreader bar used to remove and replace a hood. There was limited head room between the hood and nearby structure so the spreader bar was designed with a counter weight to keep it horizontal.

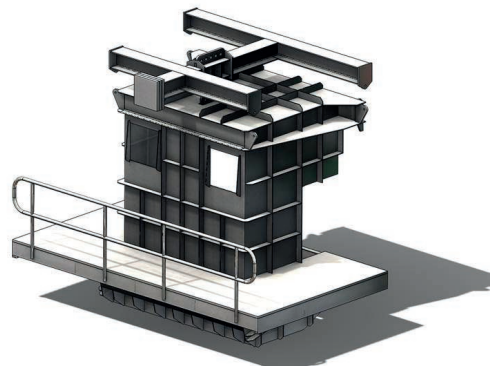


Figure 8 Spreader Bar

Project 9

Tyre Rim Storage Frame

The design of a heavy duty tyre rim storage frame. The rack was designed to be fabricated off site but also minimise transport costs.



Figure 9 Tyre Rim Storage Frame

Project 10

Rigger Training Frame

The design of a frame to carry 'dead' weights used to train riggers. The system is fitted with various types of connections to simulate lifting scenarios encountered on a typical mine site.

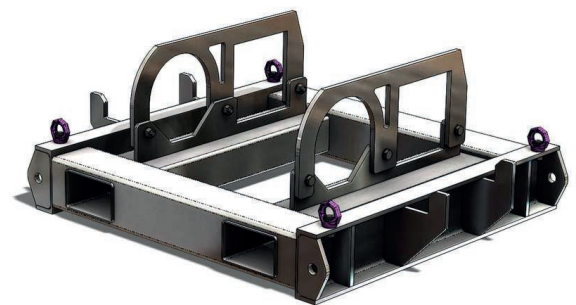


Figure 10 Riggers Training Frame

Project 11

Steel Bench

The project brief was to check the strength of a large steel bench. The bench is fitted with forklift tyne pockets so that it can be easily relocated.

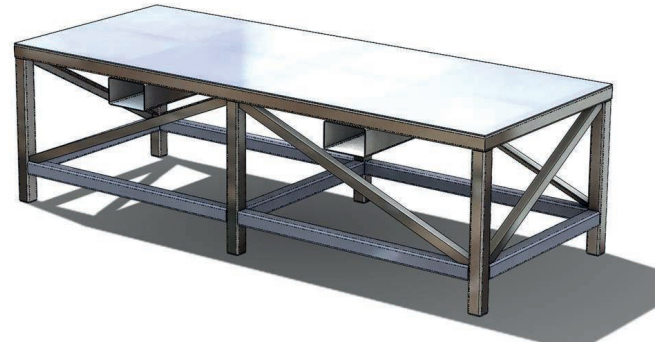


Figure 11 Steel Bench

Design Capabilities

- » 3D model issued for review and comment (Solidworks E-drawing)
- » Set of machine shop drawings for review/manufacture
- » Design Report – typically the results of Finite Element Analysis
- » Risk Assessment
- » Compliance plaques
- » CAD conformed Microstation drawings
- » Full traceability of all deliverables

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