



**rubix**  
design

Capability Statement

# COMPANY OVERVIEW AND EXPERTISE

Rubix Design is a Perth based Mechanical Engineering firm specialising in Drilling, Mining, Earthmoving, and Transport. Our team have an extensive knowledge of mechanical, structural, hydraulic, and electrical disciplines. Our diverse range of expertise ensures your project is in safe hands.

## Services Provided

- Manufacturing
- 3D Laser scanning
- Drafting
- Design Certification

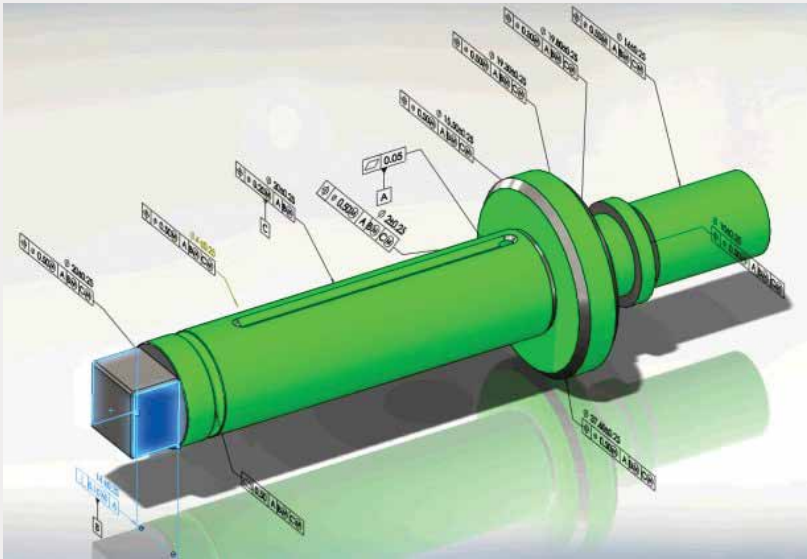
- Co-ordinate measuring (CMM)
- Reverse Engineering
- Verification and Analysis
- Design Engineering

## Some of Our Key Clients



## The Rubix Difference

We leverage technology to minimize overhead and workload. Using advanced methods like laser scanning and probing for dimensional checks or reporting to model-based definition (MBD) manufacturing. By constructing items directly from 3D models, we reduce production and administrative time while gaining more detailed insights into the final product.



Example of a shaft with manufacturing dimensions shown in a 3D view.

Our quality management systems ensure high standards, and for projects that require it, we offer comprehensive manufacturing data reports and inspection test plans.



One of our workshop PC carts, used by the tradesmen on the shop floor.

## SERVICES & FACILITY

Our facility spans a combined 900m<sup>2</sup> and includes a machine shop equipped for precision machining, a fabrication shop dedicated to metal fabrication, and an electronics and assembly clean room to ensure a controlled environment for sensitive electronics and assembly work. We can comfortably handle projects up to 16 meters and 4 tonnes, with the option to call in cranes for larger projects.

All our tradesmen are proficient in SolidWorks and scanning software. Each tradesman also serves as the designer, reducing communication breakdowns and errors. This approach creates an engaging and well-rounded working environment.



**PRESSBRAKE  
BENDING**



**CNC TURNING**



**CNC MILLING**



**CNC ROUTING**



**CNC PIPE  
BENDING**

# SERVICES



**CONVENTIONAL  
WELDING (MIG, TIG)**



**LASER WELDING**



**LASER CLEANING**



**CO2 LASER  
CUTTING/ENGRAVING**



**3D PRINTING**  
CARBON FIBRE, NYLON, PLA, ABS, PETG



**HANDHELD LASER  
SCANNING**



**LONG RANGE  
SCANNING**



**WIRELESS CMM  
TOUCH PROBE**

## FABRICATION AND MACHINING

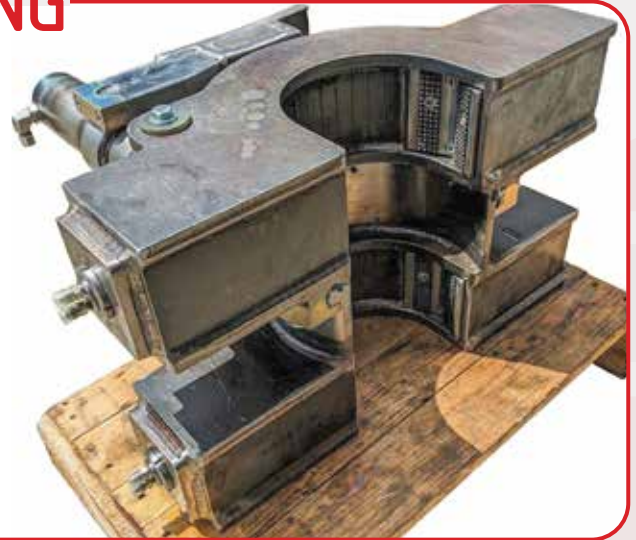
We take pride in our ability to deliver high quality metal fabrication services for mining and other industries. Our welders are fully certified to meet Australian standards encompassing MIG, TIG and flux core processes.

Gas Metal Arc Welding (GMAW)  
Gas Tungsten Arc Welding (GTAW)  
Flux-Cored Arc Welding (FCAW)

Our in-house small-scale machining capabilities enable us to respond to design changes swiftly and iterate efficiently. By maintaining these capabilities internally, we eliminate the need for outsourcing, which not only speeds up the process but also significantly reduces costs.

### Machines include:

CNC Router w/Vacuum Table and side axis  
Mazak CNC Turning Centre 440mm Swing, 600mm DBC.  
Miltronics VM24 CNC Mill 1016mm x 609mm x 609mm.  
ES1550 CNC Flatbed Lathe 380mm Swing x 1250mm DBC



## EMBEDDED ELECTRONICS AND PROGRAMMING

With a proven track record in various industries, we offer a seamless integration of cutting-edge technology and customized support to assist you with any project.

Leveraging our extensive experience in embedded and remote control systems, we ensure your solutions are future-proof, embracing Industry 4.0 and the Internet of Things (IoT).

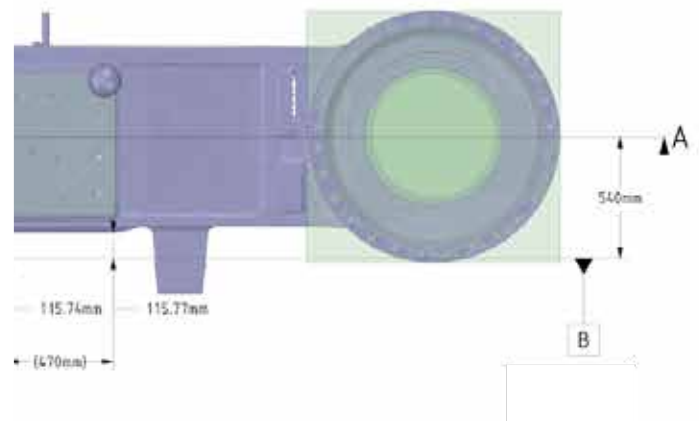


## ADAPTIVE AND REVERSE ENGINEERING

Laser scanning and Coordinate measuring is a staple within Rubix. We've been utilising scanning for reverse and adaptive engineering purposes as well as dimensional reporting since 2015.

It's essential for long distance or difficult to measure scenarios, quality control and documentation.

- Long range scanning can achieve results within 3mm accuracy over 60M.
- Handheld scanning is great for your 200 - 4000mm cubic range with an accuracy of 0.2mm.
- And wireless CMM touch probe can achieve 0.04mm up to 6M.



## BHP Zero Energy Upgrade

We were tasked with rebuilding a Hydrapower Scout Drill Rig and designing and installing a zero-energy system, ensuring that only specific hydraulic functions could be active under certain conditions.

The scope of work also included upgrading the rotation head with a KL400 head, designing and fabricating a head slide plate, pipework, power chain, bulkheads, breakouts, control panel, handrails, and ladders, as well as a hydraulically actuated spin cage and offside's platform



## Drill Support Truck

GRM Drilling approached us to develop a custom support truck. One of the key challenges was creating a tie-down-free system to eliminate the need for securing loads, allowing for a fully flexible setup in terms of tray utilization.

We also designed a unique pullout ladder and handrail system to provide access to the top-mounted toolboxes on the 2200L tank. The project included the design, drafting, and manufacturing of the tray, 8000L water tank, 2200L fuel tank, toolboxes, storage, and the aforementioned ladder system.



## Lightning and Weather Warning Boards

A popular product from Rubix is our managed lightning warning boards. These units integrate with lightning towers provided across the country by WeatherZone. Our system pulls data in near real-time from their API and displays the relevant warning lights, as well as local weather data fed from the Bureau of Meteorology.

Rubix offers this as a fully managed service, covering everything from the SIM card to the WeatherZone subscription. There is no future input required from the customer, nor any difficult configurations—simply plug and play.



## Support Truck Skid

Impact Drilling required a support truck. We collaborated to design a standalone skid system, allowing it to be utilized on a sloop or other methods in the future while enabling the truck to retain its tray for standard cartage purposes.

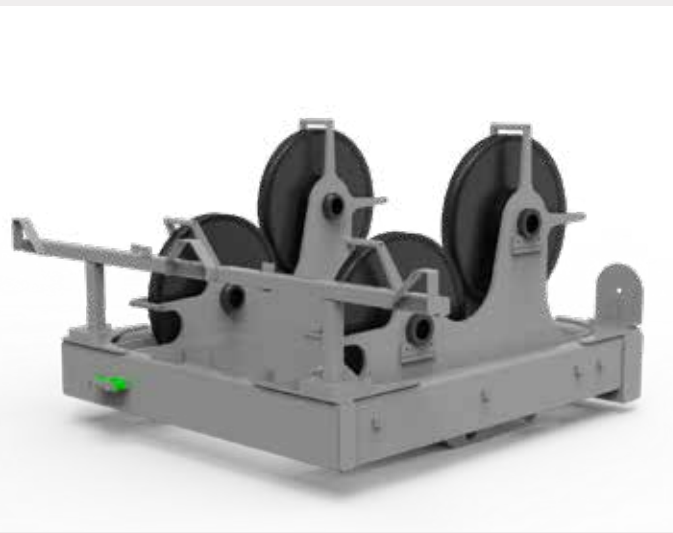
The scope included the design and fabrication of the skid, tanks, rod bin and doors, toolboxes, and drum storage bins. All components were laser cut with the Impact Drilling logo and artwork—because we can! :)





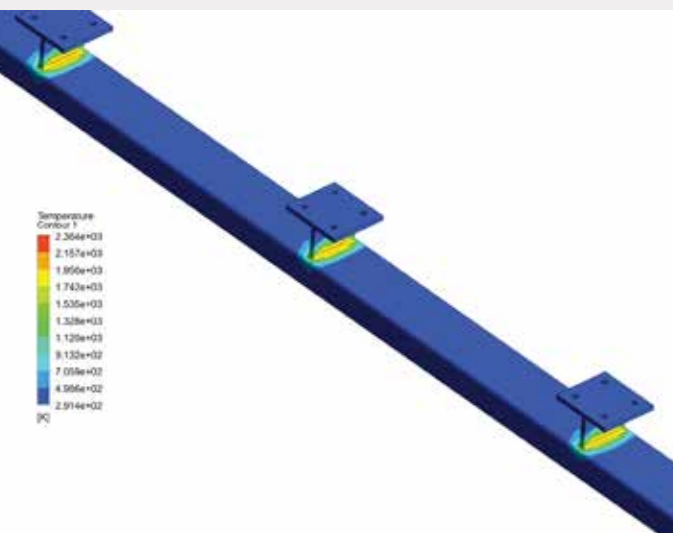
## Workover Rig Access Skid

Ventia approached us for an access skid for their workover rig on Barrow Island. Together, we designed a skid that not only included the access stairs but also utilized the dead space under the stairwell, providing storage and loading zones for other ancillaries such as BOPs. The skid was finished with a two-pack metallic blue paint.



## Pit Viper Dual Sheave Crown Upgrade

Rubix was approached to convert three Atlas Copco Pit Viper masts to a dual sheave crown design. The scope included reverse engineering an existing sample mast, modeling, drafting, and onsite installation. The installation required us to cut out the existing single sheave weldment and repair any cracks and defects in the mast before welding in the new dual sheave fabrication. Dumpy levels and lasers were used to ensure alignment with the lower sheaves.



## Take-up Rails and Guide Rollers

What appeared to be simple 15-meter beams were actually part of an experiment where we performed thermal simulations based on the theoretical input weld energy. This helped us forecast how the beams would deform after welding, allowing us to pre-camber them to ensure they remained straight once welded.

These beams are part of a take-up pulley system at BHP South Flank and also included large guide rollers and hanging brackets.

## Compressor Remote Control System

Large 1500 CFM diesel compressors on some mine sites are located in exclusion zones, with the control panel positioned 50-70+ meters away from the compressor. We developed an RS485 CAN system that allows the driller to control four compressors simultaneously from a single pendant at the drill console. This system eliminates the need for personnel to enter the exclusion zone, speeds up start-up, and allows the driller to throttle the compressor up or down as needed, saving thousands of litres of fuel.

The scope included the design of the circuit boards, programming, housings, wiring, and schematics, as well as the supply, assembly, and installation.

