



MINING & ENERGY

excellence in engineering





Rubb's innovative mining and energy facilities are custom designed to suit our clients' needs.

Rubb Buildings Ltd is a leading provider of tailor-made mining and energy facilities. We work closely with end users to ensure our building designs incorporate the most efficient use of available space.

Rubb has delivered many high quality solutions across mining and energy industries around the world.

Rubb's tensioned fabric structures are strong, durable, reliable and cost effective. Our products feature the highest quality materials. Hot dip galvanized steel frames and premium quality PVC ensure that our fabric facilities are built to last.

Rubb buildings meet the high demands of the mining and energy sectors - they are robustly engineered to stand up to tough climatic conditions and can be erected quickly at remote locations. Rubb offers a wide range of facilities suitable for temporary or permanent building solutions.

Rubb structures have unparalleled engineering and design capability to provide customized solutions to complex project needs including high wall buildings and liftable buildings. They are ideal for use as a base during construction, for warehousing of vehicles, machinery and equipment, for bulk storage and on-site workshops.

www.rubbuk.com

Rubb has the capability and experience to design, manufacture, deliver and install custom structures.

With Rubb, you can be sure everything is under control from concept to completion—including cost, quality and delivery.

While we generally have the right standard structure available to meet project needs, Rubb can also design custom solutions to meet special requirements. We have the in-house resources to provide a cost effective solution customised to our clients' needs.

Design

Using proven engineering software, we can tailor the project to the specific requirements of the site, type of operations and logistical needs.

Production

Steel and membrane components are fabricated with proper equipment and quality control.

Installation

Pre-engineered and pre-fabricated to make on-site installation by a Rubb crew—or your crew—go smoothly and efficiently.

Structure doors

Rubb offers a variety of different door solutions. They can be selected and designed to suit many size and opening requirements. This flexibility ensures that our clients get the best option for their selected Rubb building type, depending on their operational needs.



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Advantage Points



Low maintenance and costs

Our high-quality membrane materials and post-production galvanized welded frames deliver durability over time, making the cost of maintaining Rubb buildings more economical compared to conventional structures.



Energy-efficient roof membranes

Translucent membranes allow natural daylight to illuminate the workspace while the white roof surface reflects heat. Optional Thermohall® insulation minimises heat transfer, prevents condensation and virtually eliminates thermal bridging and air infiltration.



Structure quality

All structures are code compliant, designed to meet wind and snow loadings of its geographical location. Rubb PVC fabric cladding has a manufacturer's warranty of 10 years. Steelwork is hot dip galvanized in post production to eliminate any chance of corrosion, and comes with a 25-year warranty.



Multiple door options

Rubb offers a variety of different hangar door solutions. They can be selected and designed to suit many size and opening requirements. This flexibility ensures that our clients get the best option for their selected Rubb building type, depending on their operational needs.



Complete environmental control

The membrane cladding of a Rubb building is continuously sealed to provide a weather-tight shell. The buildings can be insulated, heated or air-conditioned as required. Rubb structures are uniquely suited for use as dehumidified facilities.



Reduced time on-site

Our established supply chain streamlines coordination of delivery and installation. Pre-fabricated elements and the ability to construct our buildings in a variety of weather conditions speeds up the construction process.



Rapid construction, installation and relocation

Rubb buildings can be quickly erected, dismantled and relocated due to module pre-fabrication. Rubb can provide site supervisors or fully dedicated construction teams to complete any custom project. Structures are transportable by land, sea and air.



Flexible and cost-efficient foundation systems

Rubb buildings can accommodate many foundation options such as concrete up-stand, ballast weights, and ground anchors into an existing surface. Rubb's co-ordination with the groundwork contractor is key for the client to reach the most cost-effective solution.



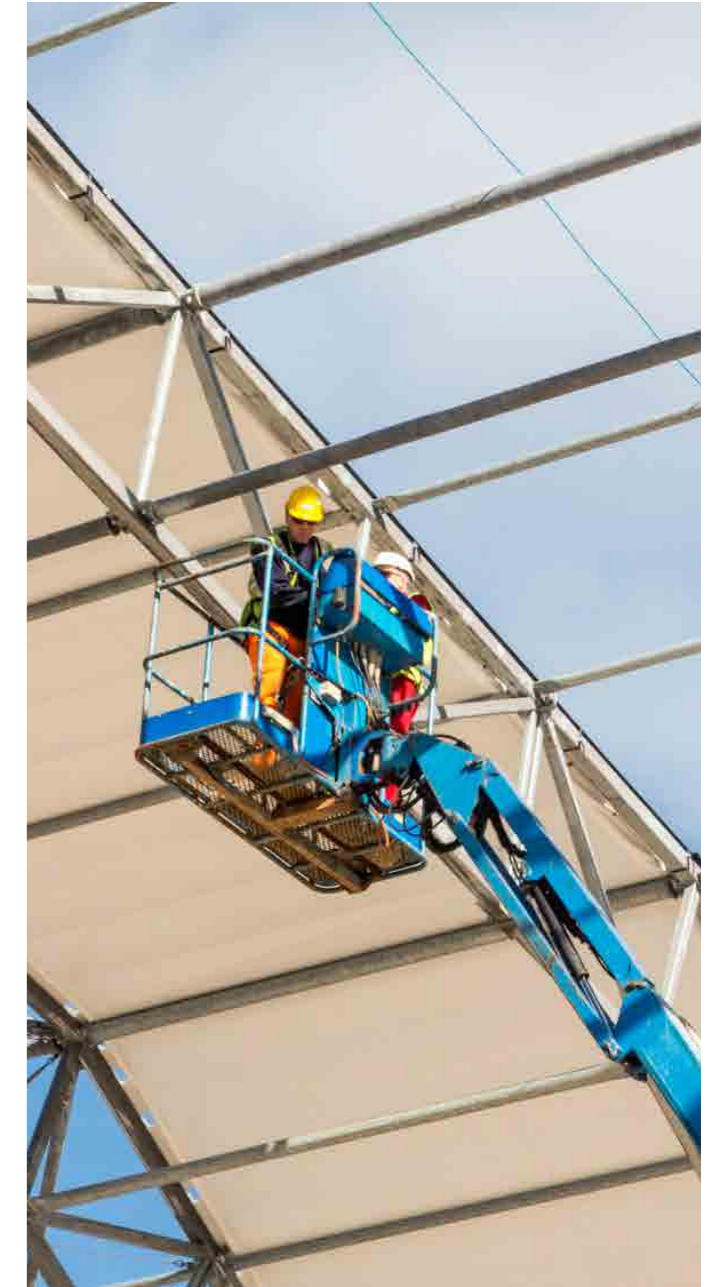
Customisable features

Buildings can accommodate all types of door, ventilation and other systems. They can safely support high loads imposed by overhead cranes, ceiling-mounted HVAC and fire-suppression systems, fall-protection equipment and other superimposed loads.



Comprehensive long-term service

Rubb personnel are on hand to provide help and support, from initial contact and quotation, to installation and beyond. Rubb's commitment to customer service continues after project completion and forms the basis for long-term customer satisfaction.



Renewable

Wind Turbine Maintenance

22.3m (73ft) span x 20m (65.5ft) long BVI
North Sea, UK

The building was transferred via crane from the dockside onto an offshore vessel, and supports improvement and upgrade operations to wind turbine blades off the Kent coast in the outer Thames Estuary.

This offshore building project was a direct request from a company which delivers integrated solutions for the offshore industry via a fleet of vessels which support offshore wind installations.

Rubb provided a solution by designing and constructing a bespoke structure on board the specially designed vessel. The new blade improvement facility was fully constructed on the dockside, then lifted with a 1000-tonne crane into position onto a specially designed platform.

The Rubb custom designed building measures 22.3m (73ft) span x 20m (65.5ft) long x 5.5m (18ft) high. This bespoke offshore structure is designed in line with SOLAS to specific wind and snow loads to withstand the extreme conditions of the North Sea. The facility comes complete with three 2-tonne AFT doors to create a climate controlled internal production area. The doors will allow three 58.8m (193ft) long B58 wind turbine blades to protrude at 19m (62.5ft) from the end of the building, whilst maintaining a weather-proof seal.

To enhance the internal working environment, the structure is insulated with Rubb's 150mm thick Thermohall® cladding. High Lux level lighting has been installed along with a suitable heating and ventilation system to ensure a temperature performance of +18 to +25 °C and to make sure humidity will not exceed 80%.



E.ON Energy Biomass Facility

31.5m (103ft) span x 137.5m (451ft) long BVC
Ironbridge Power Station, Shropshire, UK

Rubb worked with energy giant E.ON to provide a biomass fuel processing and storage facility to energy giant E.ON UK.

The 31.5m (103ft) span x 137.5m (451ft) long building at Ironbridge Power Station, Shropshire, UK, has an apex height of 21m (69ft). The roof provides rigidity with minimal deflection, providing stability and support for a 200 ton roof-mounted conveyor system used for the dispersal of biomass fuel products. The wood pellet processing facility features a roof pitch of 35° which was designed around the angle of repose of the biomass materials. Ironbridge was previously a coal fired power station that has been converted to run on biomass fuel. It is the first of its kind in the UK.

The UK based Rubb team was readily available to provide advice, support, recommendations, site visits and ongoing solutions regarding the challenges that arose during the project. These included structure height, weight loadings, access and custom door designs. The company also met with E.ON's requirements that all elements of the biomass facility were to be designed and manufactured in the UK.

The steel framework of the building is hot dipped galvanized to protect it from corrosion. galvanizing is the process of metallurgically bonding a tough coating of zinc to the steel surface. The frame is clad with polyester woven base cloth covered on both sides by PVC and coated by a PVDF finish.



Marshall Industries Truck Facility

15m (49ft) span x 18m (59ft) long BVE
Labrador City, Labrador NF, Canada

Rubb was contacted by Marshall Industries, a mining support contractor based in Ontario, who needed a flexible structure for a truck maintenance and assembly facility.

The types of vehicles to be housed in the structure are very large mining dump trucks and, because of their sheer size, the building had to meet very specific design criteria including high sidewalls, a large service door, and the ability to move.

Rubb's engineering team went to work designing a 15m (49ft) wide by 18m (59ft) long BVE structure with a sidewall height of 8m (26ft). In addition to the extreme design loads (primarily ground snow load), the structure needed to move along an I-beam foundation utilizing Hilman Rollers.

Additional features include full insulation package with inner liner, personnel doors and a large roller shutter door measuring 10m (34ft) wide by 8.5m (28ft) tall.



Aker Solutions Offshore Shelter

9.1m (30ft) span x 13.6m (44.5ft) long RDS
North Sea, UK

Rubb stepped up to design and build a Rapid Deployment Shelter on an offshore oil platform for Aker Solutions and end user Statoil.

The insulated structure provides a warm, secure and comfortable welfare facility for offshore employees.

Aker Solutions specialises in products, integrated systems and services across the oil and gas industry in countries worldwide. The firm contacted Rubb looking for an insulated structure to be installed on an oil rig off the coast of Peterhead, Scotland. End user, energy giant Statoil, delivers oil, gas and wind power to millions of people around the globe.

The 9.1m (30ft) span x 12.6m (44.5ft) long RDS shelter was designed for rapid deployment and erection using a minimum workforce and without the aid of mechanical handling equipment. The shelter provided can be easily installed in the most challenging of locations. The Rubb site supervisor participated in a number of rigorous training sessions ahead of the installation on the platform located in the North Sea.

Ståle Sagvaag, Offshore Completion Manager, Mariner Project, at Statoil said: "We are very happy with the Rubb structure. Traditionally we use covered scaffolding, which is both more expensive and requires servicing every 14 days. This alternative solution, including adherence to local regulations, would be great to roll out across this industry sector. The comfort levels are significantly better than what we were previously using."



Petrofac Shelter

9.1m (30ft) span x 18.9m (62ft) long RDS
Aberdeen, UK

Leading FTSE 100 company Petrofac provides integrated services across the oil and gas industry in 29 countries worldwide.

The firm's Aberdeen branch contacted Rubb looking for a solution to provide 3,800 site employees with accessible facilities where they can relax and recharge.

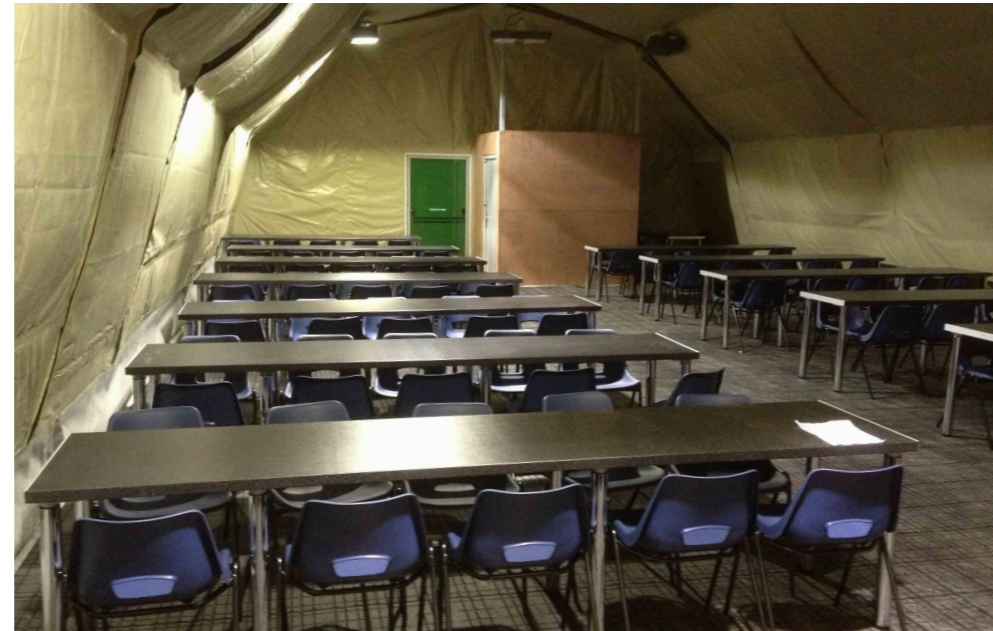
The 9.1m (30ft) span x 18.9m (62ft) long RDS shelter has been designed for rapid deployment and erection using a minimum workforce and without the aid of mechanical handling equipment.

The shelters provided can be easily connected together using access links. These can be incorporated into the gable ends and the sidewalls of other buildings.

The building features our standard galvanized steel frame covered in light grey PVC. This particular shelter was designed to suit the high wind loads of the Shetland Islands

and has been such a success we have since received orders for a further two buildings.

As the project developed Rubb worked very closely with Petrofac to adapt the design to best suit their needs and this proved very successful.



Nuclear Waste Processing Facility

13.8m (45ft) span x 12.8m (42ft) long BVR
Berkeley, UK

Rubb UK continues to support Cavendish's Berkley Power Station with a nuclear waste processing facility.

The 13.8 (45ft) span x 12.8m (42ft) long BVR is custom designed to aid in the recovery and processing of "sludge canisters"—packaged mobile waste currently stored within Berkley's vaults. Around 1,400 of these canisters are currently stored, so the processing and packaging structure needs to be up to the task.

For the project to be a success, safety was of the utmost importance.

Rubb was tasked with developing a design which can be easily decontaminated, as the processing facility's equipment must be disposed of with conventional methods once the project reaches completion. As a result, Rubb had to design the structure with smooth surfaces and minimal

contamination traps in mind.

Additional protection for personnel and equipment is provided by a 150mm Thermohall® insulation, ensuring no interference from the elements.

A 3.5m (11.5ft) x 3.5m (11.5ft) electrically operated roller shutter door was added to allow easy access for the nuclear waste canisters.

Rubb was thrilled at the opportunity to demonstrate the adaptability of Rubb structures, showing that Rubb can meet the requirements of the most challenging and safety-conscious projects.



Lydian Mining Warehouse

30m (98.5ft) span x 30m (98.5ft) long FXG
Yermuk, Armenia

When Lydian International needed an insulated warehouse near the remote town of Yermuk in Armenia, they called on Rubb to supply a rugged FXG Thermohall®.

The 30m (98.5ft) x 30m (98.5ft) steel framed, fabric clad structure was constructed at an altitude of 3000m (9842.52ft). This insulated warehouse is designed for a full 3.4 kN/m2 snow load, and a 1.0 kPa wind pressure.

Lighting, doors, destratification fans, and exhaust ventilation were designed and delivered along with the hot-dip galvanized steel structure and insulated Rubb Thermohall® cladding.

The Rubb building was ordered in February 2017. Delivery took place on schedule in April, and a two-man Rubb team completed the assembly in just 18 days in May.

Lydian Construction Manager Yelena Kirakosyan wrote: "We were very much impressed by Rubb's flexibility, ability

to take the initiative and make decisions to ensure timely and effective implementation of the project. [...] The team demonstrated a high sense of responsibility and a disciplined safety culture, which made our co-operation easy and highly productive.

"We are also very pleased with technical characteristics and overall quality of the Rubb product. The high quality pre-fabricated steel structure was easy to assemble, which ensured a complete facility installation within the shortest time frame and with minimum resources."

In line with Lydian's intention to keep a 'light footprint' at the site, the Rubb designed foundation system, consisting of prefabricated concrete blocks, was specially fabricated to allow for removal at a later date. The Rubb Thermohall® will provide a climate controlled, reliable storage building for the critical phases of the fast track development of the mine.



Protech Mining Truck Shelter

15.24m (50ft) span x 18.3m (60ft) long BVE
Fermont, Quebec, Canada

A mining company in Quebec Province, Canada, needed an easily placed maintenance/assembly structure for its large, ore-carrying trucks.

Protech Mechanical, Inc, a mining support company in Newfoundland, Canada approached Rubb, Inc. for a solution to provide an all-weather shelter in which to assemble and maintain these large trucks.

Rubb designed a crane-liftable structure measuring 15.24m (50ft) wide by 18.3m (60ft) long with 6m (19.7ft) sidewalls that could easily be moved and placed by crane over trucks that need to be assembled or maintained, particularly in the harsh winter weather in Central Quebec Province.



Thermohall® Insulated Fabric

Rubb's patented Thermohall® features a flexible insulated fabric system which offers major advantages over other insulating systems:

- Non-combustible glass wool is encapsulated in air and water tight pockets
- Insulation thickness from 50mm to 150mm
- No air gaps in the cladding, which reduces heat loss and helps eliminate condensation
- Buildings are fully relocatable

Development of Thermohall® started several years ago, with the goal of a new and eco-friendly insulation system. Thermohall® is now fully developed and patented. Thermohall® offers great energy savings and is environmentally friendly, both in fabrication and operation.

- Rubb uses a heavy duty PVC fabric with a long, useful life and high density, non-combustible glass wool insulation
- All the materials are recyclable. Steel can be recycled through various means and PVC can be recycled through initiatives which are part of the Serge Ferrari operational supply chain and environmental partnerships. The insulation material that Rubb uses is processed from recycled glass
- Rubb Thermohall® structures combine the best properties of both conventional buildings and fabric buildings, high thermal insulation and full relocatability. All Thermohall® buildings can be delivered to suit our customers' insulation requirements

The outer membrane of a Thermohall® building is manufactured using the same high strength PVC coated polyester material used on Rubb's uninsulated buildings. These materials have a self cleaning exterior finish and feature coated weights ranging from 850g/m² to 950g/m² for most applications.

PVC battens are welded to the outer cladding panels at regular intervals and then to the inner fabric panels to create closed cells to hold the insulation. The +/-550 g/m² inner fabric is white, with a self-cleaning coating on the inside face.

Glass wool insulation sections are enclosed within the completed PVC assembly, which is then sealed to prevent movement of insulation and moisture from entering the cladding system.

Specification

Outer layer Flame retardant heavy duty PVC fabric

Core High density glass wool insulation

Inner layer Self-cleaning, PVC fabric

U-Values (R-Values) US approximate equivalent

Thickness	U Value (SI) W/m2K	R Value (US) ft2-°F-hr/BTU
50mm	0.67 W/m2K	R11
100mm	0.36 W/m2K	R19
150mm	0.25 W/m2K	R27





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