Spantech designs and constructs specialised buildings for Defence

Spantech is recognised as a world leader in the design and construction of high quality defence buildings including the Spantech Explosives Storehouse (ESH).

Spantech has developed revolutionary construction technology that ensures all buildings are safe, operationally efficient and internationally cost competitive.

The company has an extensive range of proven standard designs for explosives storehouses, hardened aircraft shelters, specialised earth covered buildings and other defence applications.

Spantech has the expertise and resources to design individual buildings or complete Defence facilities to meet clients’ requirements.

Spantech defence buildings comply with the Building Code of Australia, Australian Standards and where applicable, the additional specifications of our clients.

Results of full scale explosive tests prove Spantech Explosives Storage buildings also comply with NATO standards and are among the safest available.

Construction in remote locations can be challenging. Spantech’s mobile rollforming technology has been proven in some of Australia’s most remote areas from Woomera to Cape York and overseas.

With comprehensive project experience and a number of international offices, Spantech provides high quality design and construction services throughout the world.
The international defence construction specialist

Spantech guarantees:

- The latest technology in specialised defence construction
- The Spantech ESH meets NATO specifications
- Superior operational performance
- Used extensively by Defence Forces in a variety of regions
- A range of safety and design features
- High quality construction
- Remote construction capabilities
The Spantech Construction System

The company has developed and patented the Spantech Construction System which is an integral component of Spantech’s unique range of Defence buildings.

The Spantech Construction System features straight and curved steel panels that are rollformed on site in continuous lengths. This process maximises panel performance while reducing transport, waste and overall costs.

Panels clip together without screws or bolts saving time and eliminating leaks or corrosion to form unsupported spans up to 30 metres [300 Series] and 40 metres [370 Series].

For defence buildings, the Spantech panel is used as permanent formwork providing a self supporting arch that supports layers of reinforced concrete and earth.

The result is a hardened or earth covered permanent arched structure that can be used in a wide range of Defence applications.

The use of the Spantech Construction System eliminates internal columns, significantly increasing the useable floor and storage space. It also provides safety benefits such as anti-spalling, a faraday cage and a reduction in operating and maintenance costs.

The Spantech Construction System ensures efficient design, fast construction, low cost and the highest possible safety and quality standards.

Independent research by Queensland University of Technology and Australian Department of Defence has verified the performance of the Spantech system and earth covered buildings.
Whole of life costs

Project experience demonstrates cost savings are achieved during construction and throughout the operational life of Spantech’s defence buildings:

- patented construction technology and improved construction techniques that reduce construction time and provide earlier delivery
- a reduction in construction resources and waste
- reduced construction labour force
- effective quality assurance
- efficient use of land reducing infrastructure costs such as roads, services and security
- flexible storage options, particularly for explosives
- low ongoing maintenance costs
Spantech has designed and constructed over three hundred specialised defence buildings in Australia, New Zealand, Malaysia and the United Arab Emirates.

Each type of building meets or exceeds the demanding expectations of our defence force clients, in particular the operational requirements of the Australian Defence Force.

With this extensive experience, Spantech also works directly with clients and end-users to develop new designs or modify existing proven Spantech designs to suit our client’s individual specifications or requirements.

Spantech’s extensive range operationally proven by the ADF
Hardened Aircraft Shelters
Protection for any modern fighter aircraft. Options include integrated weapon storage, maintenance facilities, or air crew accommodation and jet reflux provisions for Rapid Response Shelters.

Command Centres
Command Centres and buildings of strategic importance, designed to resist specified explosive impact and security requirements. Ideal for extended habitation during conflict, these structures can be constructed at or below natural ground level.

Personnel Protection Facilities
Infantry and civilian shelters designed for short term habitation. Below ground options may be designed to withstand specified aerial attack.

Essential Service Buildings
Protection for essential communications, security, electrical substations, water purification equipment and the like.

Buildings may be designed at ground level or below natural ground level depending on the application and level of access required. Structures can include multiple entrances, or direct access for trucks and forklifts.

Weather Protection Structures
Maximise the performance of fighter aircraft, helicopters, armoured vehicles and other equipment operating in harsh environments.

Buildings illustrated have been constructed by Spantech. Artist’s impressions are provided for security reasons.
Spantech Explosives Storehouse

Spantech ESH features a functional design developed in close consultation with the ADF

Spantech designed its first Explosives Storehouse to meet NATO specifications and the operational requirements of the Australian Department of Defence.

Spantech's technology was fully tested and proven in a series of full scale trials.

Standard designs are available with nominal internal dimensions of 13m x 13m, 23m x 15.6m and 23m x 25m.

A wide range of variations to these standard designs are available, including: the overall size of the structure; types and configuration of doors; types of ventilation, security and lightning protection systems; incorporation of pallet racking or internal cranes.

Spantech's in-house design team has tailored the Spantech ESH to suit the individual requirements of defence forces in Malaysia, UAE, New Zealand and Saudi Arabia.

The Spantech ESH can be licensed to store up to 75,000kgs of HD 1.1 at minimal NATO inter-magazine distances. This high degree of HD 1.1 licensing, combined with reduced separation distances, can significantly reduce a depot's overall real estate requirements.

The result a substantial reduction in the cost of purchasing or holding land, the initial cost of roads, services and other infrastructure, and a reduction in the ongoing costs of maintenance and staff.

The Spantech Explosives Storehouse is the most efficient explosives storage solution available.
Unique features

**Safety**
- Low fragmentation spread
- Anti-spalling internal lining
- Protection from lobbed explosives
- Anti terrorist protection to vents
- Bar-7 blast resistant doors
- Emergency communications

**Optional Items**
- Single or double blast doors
- Separate personnel doors
- Manual or electric door openers
- Anti-spark floor finish
- Lightning protection
- Fire prevention equipment
- Erosion membrane
- Passive or active ventilation
- Air conditioning
- Pallet racking
- Gantry crane
- Active blast resistant valves
- Individual perimeter fences
- Range of security monitoring options

**Operational Advantages**
- No internal columns to restrict storage or forklift access
- Variety of stacking configurations
- Rapid out-scaling
- Direct forklift access
- Low maintenance structure
- Low maintenance fittings
- Excellent natural ventilation
- Internal and external lighting
- Guaranteed waterproofing

**Cost Saving Features**
- Reduced real estate requirements
- Fast economical construction
- Low maintenance costs
- Minimisation of road, security, fire and services costs
- Reduced staffing levels

SPANTECH 23m EXPLOSIVES STOREHOUSE
South Australia, Australia
Spantech designs and constructs major defence projects

One such project is the Australian Army’s expansion of its key wholesale munitions depot.

Spantech customised the design of the 23m ESH specifically for the project and was the nominated subcontractor responsible for the construction of the 34 buildings. The project was completed within budget in just fifty (50) weeks.

Accelerated construction time minimised disruption to the operation of the remainder of the on-line facility, while significantly reducing construction costs.

During the project’s opening ceremony Chief of General Staff, Lt. General J.C. Grey AO described the project as, “A major milestone in the upgrade and streamlining of base logistics in the Australian Army.”

“The innovative and technologically advanced design of the Spantech ESH is an international standard product of which the Australian Army can be justifiably proud.”

Lt. General Grey congratulated Spantech on a project well done, concluding, “You have provided the Army with a world class facility of technical and practical excellence. Your commitment and expertise have enabled the project to be completed quicker than originally planned and well under budget, without compromising quality or usefulness.”

Spantech was awarded the Australian Department of Defence Industry’s Quality and Achievement Award in the inaugural Facilities category. This prestigious recognition confirms Spantech’s ability to successfully deliver major Defence construction projects.
A D4 dozer pushes soil over a Spantech 23m ESH demonstrating the simplicity, efficiency and incredible strength of Spantech’s design.
Spantech can deliver the entire contract

Spantech has completed an impressive number of projects in Australia, New Zealand, Malaysia and United Arab Emirates.

Spantech’s scope of works ranges from design and construction of green-field facilities and individual Spantech buildings, to refurbishing existing Spantech buildings or conventional structures constructed by others.

Spantech also supplies key components of the buildings. The company manufactures blast doors and imports life support systems and blast valves under licence.

Spantech has completed work at most Australian Defence Bases or related facilities including:
- 2 Army bases
- 7 Airforce bases
- 4 Naval bases
- 2 Defence related facilities

Spantech has the experience and financial capacity to provide these services as a Principal Contractor or Nominated Contractor.

Design, Construct, Supply, Maintain

SPANTECH 23m EXPLOSIVES STOREHOUSES
Western Australia
Design and construct the facility, 1996
Refurbish and upgrade the facility, 2010
In 1991 Spantech constructed its first explosives depot (above). Spantech was a nominated subcontractor supplying 8 No. 13m ESH.

Spantech was contracted as the Principal Contractor to design and construct 5 No. 23m ESH under a negotiated single-select contract.
Spantech ESH proven in full scale trials

Spantech Explosives Storehouses have been subjected to seventy-five thousand kilogram (75,000 kg) blasts within minimal NATO separation distances.

A comprehensive series of full scale donor and receptor trials were conducted in 1991 and 1992 at the Woomera testing range in South Australia.

The aim was to determine the ability of the cost effective Spantech designs to provide satisfactory protection for their contents and prevent propagation to adjacent storehouses in the event of an accidental explosion occurring within the NATO inter magazine safety distances.

The trials were conducted by the Australian Department of Defence in conjunction with the United Kingdom Ministry of Defence and a division of the United States Army Corps of Engineers.

The Spantech ESH is now the benchmark for ESH projects undertaken by the Australian Department of Defence and New Zealand Defence.
Test Overview

The key stages of the tests were:

**Stage I**

Three Spantech 13m ESH [receptors] constructed at D3 and D4 distances from a UK Double Bay Igloo donor. The donor contained 75,000 kilograms of HD 1.1 wired for instantaneous detonation.

All three receptor buildings survived.

**Stage II**

Three Spantech 13m ESH [receptors] were subjected to an open air blast with 75,000 kg of explosives placed on an adjacent concrete slab.

All receptors survived.

**Stage III**

A Spantech 13m ESH [donor] was filled with 75,000 kg of explosives wired for instantaneous detonation. A new Spantech 23m ESH [receptor] was constructed for Stage III.

All receptors survived.

**Stage IV**

A Spantech 13m ESH (donor) was subjected to a series of HD 1.2 burns. The largest burn featured over five thousand 105mm shells in a stack comprising 160 pallets.

The donor building suppressed the series of explosions and all buildings survived.

**Results**

The Australian Ordnance Council advised, “the Spantech 13m and 23m Spantech Explosives Storehouse designs are acceptable for use and qualified for use as Bar 7 igloos.”

In particular:

- During all stages of testing the Spantech ESH survived the force of the blast and proved to be able to satisfactorily protect the contents to a serviceable standard.

- The fragmentation spread of the Spantech ESH was significantly lower than comparable structures, with the fragmentation spread remaining within the recommended NATO safety guidelines.
Spantech has designed and constructed a number of ammunition preparation buildings (APB) to NATO specifications.

The design of the traversed buildings feature an extensive use of the Spantech Construction System to achieve economies in structural design and construction time.

Spantech also designs and manufactures the blast proof doors for personnel and/or forklift access to the various explosives working areas within these structures.
BOMB PREPARATION BUILDING
Queensland, Australia
A traversed Spantech building
Protection for essential services and critical equipment

Spantech has a range of hardened buildings to protect the essential services of any Defence Base.

Designs are based on the extensively tested and proven Spantech Explosives Storehouse.

Spantech has delivered essential services projects to a number of Defence clients which include the following types of applications:

- emergency power stations
- electrical substations
- communications facilities
- sensitive equipment buildings
- security buildings

In some cases, buildings are designed and constructed in two stages; initially Spantech constructs a Quonset style building that meets the immediate needs of the defence force. This structure is then hardened and earth covered when security needs change or budgets allow.
ORDNANCE ASSEMBLY BUILDING
Victoria, Australia
(above and right)
Consultation delivers superior outcomes

Spantech designed and constructed its first indoor weapons training facility for the New Zealand Defence Force, Army in 2007.

Spantech worked closely with FATS, the developers and suppliers of the interactive training system, during the design phase to ensure the facility incorporated all of the features required to fully exploit the capabilities of the system. Careful consideration was given to hardware and software being installed now and into the future.

Similarly, Spantech consulted with New Zealand Defence to ensure the facility was functional, manageable and affordable.

The result is a unique building that allows NZ Defence to easily re-configure the terrain and scenarios to maximise the effectiveness of training.

The building includes two separate twelve-lane firing positions, an open terrain course with sloping floors and fox holes, air conditioning, weapons storage, general training rooms, offices and amenities.
Spantech also provides a wide variety of non-hardened buildings for Defence related applications:

- Administration buildings
- Supplies and equipment stores
- Maintenance facilities
- Barracks
- Recreational facilities, including:
  - indoor sports centres
  - indoor swimming pools
  - gymnasiums
  - shaded basketball courts

Selected Spantech buildings can be designed and constructed with the option of future hardening.
Spantech operates an Integrated Management System to eliminate or control the risks associated with safety, quality and the environment.

The safety components of the system are designed to protect individuals, quality elements protect the interests of our clients, while the environmental elements protect the community as a whole.

**Quality Assurance**

The system was first implemented in 1997 as a Quality Management System that complied with AS/NZS ISO 9001. Constant improvement to the system is testament to Spantech’s commitment to quality.

Spantech is a recognised supplier to the Australian Department of Defence and has been awarded a number of Defence Quality Awards in both Australia and New Zealand.

Spantech is also committed to maintaining the quality of its technology with an on-going research and development program.

**Workplace Health and Safety**

Spantech has a lost-time injury record well below the industry benchmark.

The safety elements of the integrated management system are independently audited and certified by NCSI as being compliant with AS/NZS 4801.

**Environmental Management**

Spantech maintains an impeccable environmental record.

The company’s integrated management system includes comprehensive environmental management procedures.

Environmental Plans which meet the demands of the ADF and all regulatory requirements are prepared and implemented for each project.
Contacts

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