



# NATSPEC Product Partners

Quality Reputation Support



Case Studies and Articles

# Welcome



In today's construction climate, a wise owner engages a designer with appropriate risk management skills. A key element in managing risk is communication. The quality and timeliness of communication can help to greatly reduce misunderstandings and potential disputes. Clear definition of client expectations, the designer's intent and acceptable performance, and identification of potential 'gaps' where all these items meet can ensure that all parties are viewing the project from a similar frame of reference.

A specification reduces the number of potential variations, or extras, by enabling a clear understanding of the acceptable level of quality for the project. NATSPEC has developed this booklet to assist designers in their quest for good product information. The case studies demonstrate manufacturers' willingness to work with designers to provide the most appropriate solution to meet their client's needs and desires.

NATSPEC continues to develop branded worksections with our Product Partners using the latest regulations and standards for inclusion in the National Building Specification. Branded worksections include a wide range of products and systems and are freely available to NATSPEC subscribers and non-subscribers to use as part of a project specification.

Branded worksections can be downloaded for free from [www.natspec.com.au](http://www.natspec.com.au).

**Richard Choy**  
Chief Executive Officer  
NATSPEC // Construction Information

## Product Partners Programme

The NATSPEC Product Partners programme was developed to provide manufacturers with an opportunity to place a branded worksection in the National Building Specification. The objective is to allow design and construction industry professionals to easily access a proprietary specification from manufacturers offering reputation, quality to Australian Standards and support. Selection of products is also easier, saving you time and reducing your risk.

NATSPEC is the trading name of Construction Information Systems Limited, ABN 20 117 574 606.

NATSPEC, founded in 1975, is a not-for-profit organisation that is owned by the design, build, construct and property industry through professional associations and government property groups. It is impartial and is not involved in advocacy or policy development.

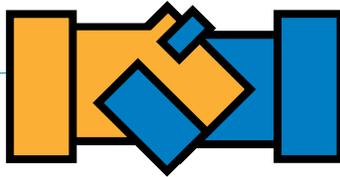
NATSPEC's major service is the comprehensive national specification system endorsed by government and professional bodies. NATSPEC, the National Building Specification, is for all building structures with specialist packages for architects, interior designers, landscape architects, structural engineers, service engineers and domestic owners. AUS-SPEC is the Local Government specification system for the life-cycle management of assets. Packages include Urban and Open Space, Roadworks and Bridges, Public Utilities, and Maintenance. NATSPEC is also responsible for the National BIM Guide and its associated documents.

NATSPEC's objective is to improve the construction quality and productivity of the built environment through leadership of information.

## Stakeholders

Air Conditioning and Mechanical Contractors' Association of Australia  
Australian Council of Built Environment Design Professions  
Australian Elevator Association  
Australian Institute of Architects  
Australian Institute of Building  
Australian Institute of Building Surveyors  
Australian Institute of Quantity Surveyors  
Chief Minister, Treasury and Economic Development Directorate (ACT)  
Construction Industry Engineering Services Group  
Consult Australia  
Department of Finance (Federal)  
Department of Finance (WA)  
Department of Housing and Public Works (QLD)  
Department of Infrastructure (NT)  
Department of Planning, Transport and Infrastructure (SA)  
Department of Treasury and Finance (TAS)  
Department of Treasury and Finance (VIC)  
Engineers Australia  
Master Builders Australia  
Office of Finance and Services (NSW)  
Standards Australia





## NATSPEC//ProductPartner



Branded Worksections have been completed by NATSPEC and our Product Partners using the latest regulations and standards. Download for free at [www.NATSPEC.com.au](http://www.NATSPEC.com.au)



## 01 General

0181p *BOSTIK in adhesives, sealants and fasteners*  
0181p *MAPEI in adhesives, sealants and fasteners*  
0184p *ENSYSTEX termite management*  
0184p *TERMGUARD termite management*  
0191p *ACCULINE sundry items*  
0192p *ANCON structural steel components*  
0194p *RAVEN door seals and window seals*  
0195p *DTAC tactile indicators and stair nosings*

## 02 Site, urban and open spaces

0242p *OXWORKS in landscape fences and barriers*

## 03 Structure

0310p *AFS wall systems in concrete combined*  
0311p *FIELDERS KingFlor in concrete formwork*  
0341p *FIELDERS purlins and girts in structural steel*  
0341p *GALVSPAN® STEEL purlins and girts in structural steel*  
0345p *DULUX steel protective paint coatings*  
0345p *VALSPAR - WATTYL in steel protective paint coatings*  
0381p *TLB TIMBER in structural timber*  
0383p *TLB TIMBER in sheet flooring and decking*

## 04 Enclosure

0411p *MAPEI waterproofing external and tanking*  
0411p *PARCHEM waterproofing – external and tanking*  
0423p *ASKIN® XFLAM performance panel roofing*  
0423p *COLORBOND® and ZINCALUME® STEEL in roofing – profiled sheet metal*  
0423p *FIELDERS roofing – profiled sheet metal*  
0423p *REVOLUTION ROOFING in profiled sheet metal*  
0424p *FIELDERS roofing – specialised sheet metal*  
0428p *DANPALON roof glazing*  
0429p *SOLATUBE tubular daylighting devices and skylights*  
0434p *ALUCOBOND cladding*  
0434p *ASKIN® XFLAM performance panel cladding*  
0434p *DANPALON translucent façade cladding*  
0434p *FIELDERS cladding – specialised panels*  
0436p *COLORBOND® and ZINCALUME® STEEL cladding – profiled sheet metal*  
0436p *FIELDERS cladding – profiled sheet metal*  
0451p *ALSPEC aluminium windows and doors*  
0451p *AWS aluminium windows and doors*  
0453p *CS Cavity Sliders in doors and access panels*  
0456p *SAFETYLINE JALOUSIE louvre windows*  
0461p *VIRIDIAN glazing*  
0471p *CSR BRADFORD in thermal insulation and pliable membranes*  
0471p *GI BUILDING SCIENCES in thermal insulation and pliable membranes*  
0471p *KINGSPAN in thermal insulation and pliable membranes*  
0472p *CSR Bradford in acoustic insulation*  
0473p *DAMTEC acoustic floor underlays*  
0473p *REGUPOL acoustic floor underlays*

## 05 Interior

0511p *KEYSTONE ACOUSTICS in lining*  
0524p *STUDFORM in partitions – glazed*  
0525p *STUDFORM in cubicle systems*  
0528p *ASKIN® XFLAM performance panel partition system*  
0531p *AMF AUSTRALIA in suspended ceilings*  
0531p *ASKIN® XFLAM performance panel ceilings*  
0531p *STUDFORM in suspended ceilings – combined*  
0541p *ASP access floors*  
0554p *MODDEX steel handrails, guardrails, balustrades and other barriers*

## 06 Finish

0612p *MAPEI cementitious toppings*  
0612p *POLYFLOR KIESEL self-levelling cementitious toppings*  
0621p *MAPEI in waterproofing – wet areas*  
0621p *PARCHEM waterproofing – wet areas*  
0651p *KARNDEAN in resilient finishes*  
0651p *POLYFLOR resilient finishes*  
0651p *REGUPOL in resilient finishes*  
0657p *PARCHEM in resin based seamless flooring*  
0671p *DULUX painting*  
0671p *RESENE painting*  
0671p *TAUBMANS painting*  
0671p *VALSPAR - WATTYL in painting*  
0672p *VALSPAR - GRANOSITE textured and membrane coatings*

## 07 Mechanical

0731p *FANTECH fans*  
0745p *FANTECH attenuators and acoustic louvres*  
0746p *AIROCLE natural ventilation in air grilles*  
0751p *VICTAULIC in mechanical piping*  
0752p *ARMAFLEX in mechanical piping insulation*  
0752p *SEKISUI FOAM AUSTRALIA mechanical piping insulation*  
0762p *ASKIN® XFLAM performance panels in cool rooms*

## 08 Hydraulic

0815p *BILLI boiling, chilled and filtered water dispensers*  
0823p *ARMAFLEX in cold and heated water*

## 09 Electrical

0911p *LEGRAND in cable support and duct systems*  
0937p *EATON ELECTRICAL uninterruptible power supply*  
0943p *ERICO in switchboard components*  
0951p *LEGRAND in lighting*  
0971p *LEGRAND in emergency evacuation lighting*  
0979p *ERICO in lightning protection*

Branded Worksections can be downloaded for free from  
[www.natspec.com.au](http://www.natspec.com.au)



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## GETTING HELP

### INTRODUCTION

This TECHnote summarises the variety of ways in which NATSPEC provides help to specification writers.

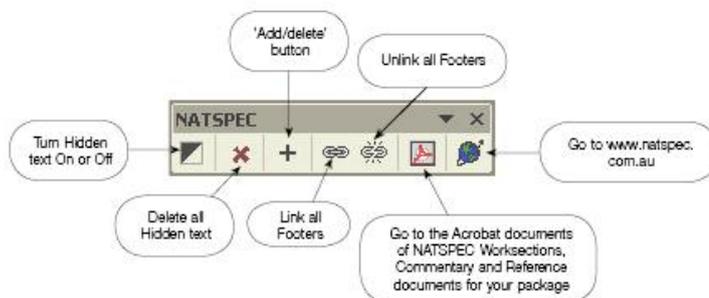
### NATSPEC Guidance

NATSPEC worksections include extensive *Guidance* text with suggestions on filling in prompts, alternatives, and background material. *Guidance* is in hidden text format which can be turned on or off, and appears like this:



If you work with an office master, you may find it convenient to add your own guidance notes using NATSPEC's hidden text styles.

Hidden text and other features that can help you in your specification writing are accessed via the NATSPEC toolbar.



### NATSPEC Optional text

Some worksections contain *Optional text in this font (blue with a grey background)* that covers items specified less frequently. It is provided for incorporation into *Open* text where it is applicable to a project.

### NATsource

*NATsource* contains a list in excess of 1200 documents cited in the specification packages. Use this to check document titles, currency, content and publishers. Access *NATsource* via SPECbuilder Live/Resource material/Standards Information on the NATSPEC website.

### NATSPEC TECHnotes and TECHreports

NATSPEC *TECHnotes* contain guidance of a more general nature that either relates to several worksections, or does not fit into the normal worksection and classification structure.

*TECHreports* provide more detailed information on specification issues, such as *Specifying ESD*, *NATSPEC for refurbishment and adaptive re-use*, and *Specifying design and construct mechanical services*.

*TECHnotes* and *TECHreports* are constantly developed and updated. The latest versions are available in the Technical Resources or Subscriber Resources areas of the NATSPEC website or via the Resource material/ TECHnotes link in SPECbuilder Live.

### NATSPEC Website

NATSPEC's website contains a range of material including:

- Details of NATSPEC specification packages including abstracts of worksections.
- A link to SPECbuilder Live.
- Links to Product Partners' websites arranged by worksection.
- Notification of latest changes to standards affecting NATSPEC worksections.
- Information on publications relating to specification writing.

### NATSPEC Training

NATSPEC provides training in specification writing related subjects.

Subscribers are notified of upcoming training courses.

### Relevant Publications



*Specifying Architecture - a guide to professional practice*

### NATSPEC assistance

NATSPEC does not provide a design or specification service but we can assist with information on matters such as provisions in Australian Standards, specification writing techniques and dealing with problems using SPECbuilder Live and NATSPEC in Microsoft Word. If you have problems finding what you want, feel free to contact us directly.

### Website

[www.natspec.com.au](http://www.natspec.com.au)

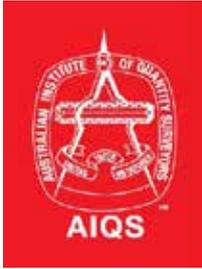
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As a founding shareholder of NATSPEC, the AIQS is proud to continue to be associated with the important work carried out by NATSPEC on the National Building Specification.

Quality documentation is one of the most important aspects of ensuring a project finishes on time, on budget and meets the clients expectations of quality. Without the guidance of NATSPEC and the inclusion of quality specifications for a project, there is great risk placed on not achieving a positive time, cost, quality outcome.

Former AIQS CEO, Michael Manikas.



Acculine Architectural Systems specialise in Building Protection from the Inside Out. Australian owned and operated, Acculine are small enough to care, while offering manufacturing, supply and installation capacities for larger more complex projects. Products include indoor wall, door and corner protection, handrails, signage systems, cubicle tracks and fabrics, and expansion joints from InProCorp. For outdoor protection, contact Acculine for specifications on a full range of louvres, sunshades and ventilation grilles from our in-house manufacturing division, allowing scope for custom products to meet specific design requirements. [www.acculine.com.au](http://www.acculine.com.au)



AFS Systems Pty Ltd® has over 18 years experience in supplying the construction industry with proprietary wall and framing systems. During this time AFS quickly earned a reputation for the manufacture and supply of innovative, permanent formwork walling solutions. So much so that CSR, the name behind some of the market's most trusted and recognised brands chose to acquire AFS.

To date AFS has completed in excess of 1,000 projects, including 30,000 multi-residential units, solidifying its position as a leading supplier of permanent formwork wall solutions.

Whether it be a builder, developer, architect or engineer AFS has earned a reputation throughout Australia and abroad for supplying innovative walling solutions coupled with a genuine commitment to service excellence. [www.afswall.com.au](http://www.afswall.com.au)



For over 90 years, AIROCLE has provided the building industry with effective and environmentally friendly solutions for natural building ventilation and smoke hazard management. AIROCLE has substantial expertise, experience and an absolute dedication to satisfying ventilation and smoke hazard management needs and expectations to deliver a comprehensive range of natural air, smoke, heat and pressure ventilation, and smoke hazard management. The result is some of the most reliable, effective and energy efficient solutions available for commercial, industrial and community projects. [www.airocle.com.au](http://www.airocle.com.au)



Established in 1974, ALSPEC are the market leaders in the design and distribution of innovative, high performance aluminium systems to the architectural, industrial and home improvement markets. Our extensive range of window and door systems is suitable for all commercial applications and is complemented by our Carinya residential range and our Invisi-Gard Stainless Steel Mesh Security System. ALSPEC systems are synonymous with excellence in design and superior performance. [www.alspec.com.au](http://www.alspec.com.au)





Alucobond® is a lightweight composite material consisting of two aluminium cover sheets and a core made of polyethylene. This simple but extremely versatile product concept has been developed to provide a façade material with a host of distinct advantages for architects. It is stable yet flexible, has a smooth durable surface and is available in a number of standard or individual colours. It is weather resistant, unbreakable, shock resistant, vibration absorbent and easy to install. [www.alucobond.com.au](http://www.alucobond.com.au)



AMF is owned by KNAUF, a global market leading material manufacturer with approx. 23,000 employees and annual revenue of \$7 billion. AMF began production of mineral fibre ceiling units in 1963 using a patented manufacturing process. Through expansion and investment AMF now attains an operating capacity of 60 million m<sup>2</sup> of ceiling units per year and is a technological leader in performance ceiling systems. All AMF mineral fibre ceiling units and grid systems are manufactured at its head office and manufacturing plant in Germany. AMF's near 100% automated operating production facilities have enabled it to create the most advanced mineral fibre ceiling unit and steel grid production plant in the world, producing the world's first washable fleece finished acoustic ceiling unit with an RH of 100%, AQUATEC. [www.knaufamf.com.au](http://www.knaufamf.com.au)



Ancon Building Products designs and manufactures high integrity steel products for use in masonry and concrete construction and has earned a reputation for quality and technical expertise. The company operates from advanced manufacturing facilities and supplies projects worldwide ranging from small-scale residential developments to major infrastructure projects. [www.anconbp.com.au](http://www.anconbp.com.au)



Armacell is a global innovator in foam technologies and the world leader in the market for flexible technical insulation solutions. Our market coverage is second to none, with 19 manufacturing sites in 13 countries; including a facility located in Dandenong Victoria.

Half a century ago, Armacell were the first to develop an elastomeric insulation product. Armacell since then has had a focus on continuous innovation, supported by research and development teams across the globe, ensuring the ARMAFLEX range continues to deliver excellence in performance and quality.

Armacell provides insulation solutions for mechanical piping, tanks in both commercial and industrial applications including solar, ducting, refrigeration and hot or cold water.. [www.armacell.com.au](http://www.armacell.com.au)



ASKIN® is a leading manufacturer and installer of insulated architectural facade systems, roofing systems and temperature controlled facilities in Australasia. We embrace a customer first approach in delivering sustainable, lifetime value. With a network of 12 sites throughout Australia and New Zealand, ASKIN®'s vast experience has been built upon a strong foundation dating back to 1964. ASKIN®'s culture of customer first, constant improvement, quality and safety assurance is supported with our technical expertise and ISO 9001 accreditation. [www.askin.net.au](http://www.askin.net.au)

# Liverpool Public Hospital

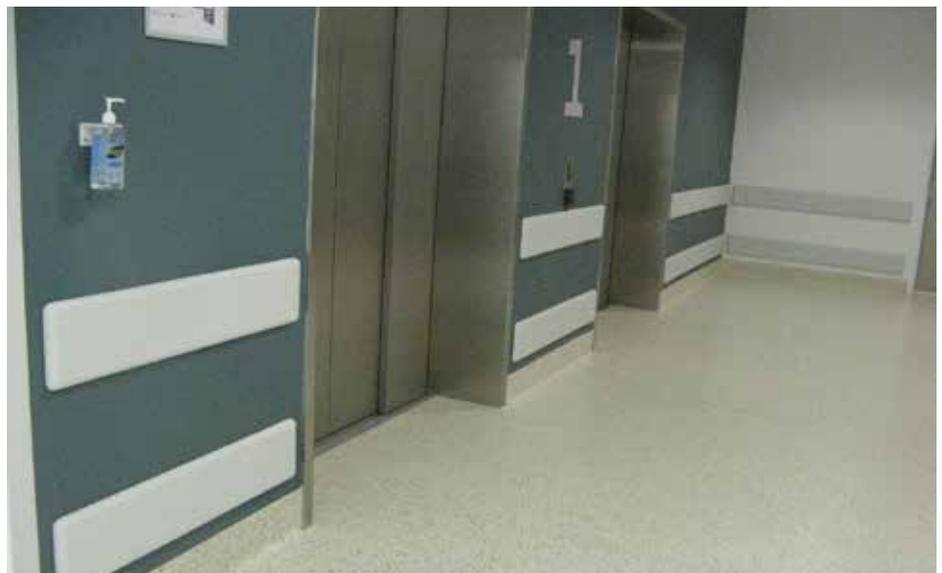


The scope was broad, including door protection panels, very particular handrails, corner guards, wall protection, bed locators and door frame wraps, all over several floors, from the front door to the back. The new Liverpool Public Hospital needed it all, and quick. Other suppliers had lead times of around 12-16 weeks, and Acculine were able to more than halve this wait time, at no extra cost.

David Bishop of Homebrook Pty Ltd is a specialist contractor that installs building protection products in NSW. He needed a fair price for his products, meeting all the required standards and specification requirements, and quickly. His tender had to be competitive and achievable.

Acculine was able to meet all David's needs to supply and install on this project, more cost effectively than others. We supplied what he needed, in the stages that made it manageable on site, to minimise issues with sorting stock. Everything was carefully packaged and labelled. Communication from the first quote to the last check at handover was high priority, ensuring our business partnership was successful and long lasting.

Several years later, and with more projects to do, our partnership has become strong. David can rely on Acculine, and we can rely on David. An excellent project for all partners on the project. No call backs, no late deliveries, no faulty or damaged products, and no headaches.





we put you in front

# Aspect Apartments, Brunker Rd, Potts Hill NSW

This impressive Brunker Road site consists of five apartment blocks, totalling 96 units over five levels.

Minutes from Bankstown and Lidcombe and conveniently located nearby to Parramatta, Strathfield and Liverpool the development offers a tranquil lifestyle environment with easy access to the hustle and bustle of city centres.

AFS Systems worked closely with Architects throughout the design stages of the project in order to develop the most efficient and cost-effective structure, whilst achieving fast floor-to-floor cycles with minimal on-site mess and waste.

Such developments are well-suited to the AFS LOGICWALL® system as a load-bearing wall option, utilising the AFS150 and AFS162 as deep-beam transfer walls, as opposed to traditional methods of concrete construction. This allows for considerable, demonstrable savings in both slab thickness and concrete.

Apartment party walls utilised the AFS162 wall, which greatly simplified the conventional reinforced slab design, whilst providing fire and acoustic separation and a durable fibre-cement surface.

AFS150 was used for external walls, providing a building envelope of high structural capacity along with a slender wall footprint. In addition to this AFS150 was used for lift and stair shafts and other core elements of the building.

With the adopted structure consisting of a combined total of 12,000 m<sup>2</sup> of AFS LOGICWALL®, the builder achieved an overall 13-week completion of the structure.



Aspect Apartments completed



Aspect Apartments project under construction demonstrated AFS LOGICWALL's fast floor cycles



0310p AFS WALL SYSTEMS in concrete - combined

[www.afswall.com.au](http://www.afswall.com.au)

# A change in the air for Donaldson

Airocle™



Donaldson Filtration Solutions are one of the largest filtration manufacturers - a worldwide provider of filtration systems and replacement parts, with distribution locations in more than 40 countries.

Many of Donaldson's processes generate heat resulting in the atmosphere of the building being uncomfortable for operators to work in. To improve conditions, the asbestos roof was replaced with an insulated metal roof incorporating one of Airocle's effective passive ventilation systems. The ventilators selected had to be able to provide adequate levels of airflow in the process areas that generate heat.

## Points to Note:

The Airocle 2 Series ventilator was selected. It is a ridge ventilator which is engineered for any environment demanding reliable ventilation for a wide range of heat loads and provides effective and efficient performance for all external and internal environments. The 2 Series ventilator has been CSIRO tested to AS 2428 and has proven design advantages over other 'vented ridge' designs in the market.

Donaldson were able to use the selected ventilator to perform dual functions. Firstly, the thermostatically controlled opening and closing dampers maintain operator comfort. Secondly, the ventilator operates as a compliant smoke hazard management ventilation system. In the event of fire it provides for smoke clearance that maintains the integrity of the ESFR sprinkler system. The ventilation system is also connected to the buildings smoke detection system, and has fail-safe thermal release links to comply with NCC E2.2C.

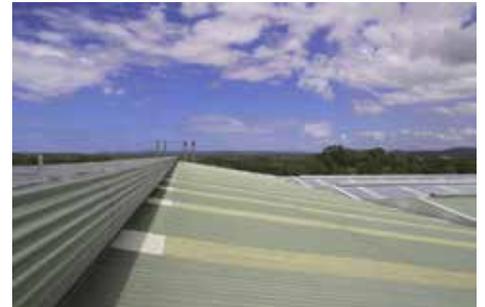
Several operators in the Donaldson production facility have commented on noticeable increases in airflow and comfort levels during summer this year. Donaldson are also looking forward to improved comfort levels during winter this year when the vents can be closed and process heat can be used to warm the building.

## Client Comment:

"The team at Airocle are passionate about what they do. They have a large range of innovative products that can provide practical solutions for ventilation & shade in industrial buildings."

## Scope of Works:

- Site area appraisal.
- Design and engineering consultancy.
- Product selection.
- Product application & detailing.
- Installation assistance & support.



# Fraser Suites, Perth - high performance windows and doors

Embracing views of the Swan River, the city and the Darling Ranges, Fraser Suites is the first all-suite apartment hotel to be built in East Perth in over a decade. Located within the Queens Riverside precinct, this 18 storey tower features 236 contemporary residences targeted at the extended stay executive traveler as well as vacationing families.

The building required a range of high performance window and door systems to complement the modern up-market look of this apartment hotel. The design featured slab-to-slab glazing with the addition of large awning windows and sliding doors capable of providing superior structural and water performance for the residences and commercial space.

ALSPEC was chosen as the preferred Window and Door System supplier for this project. A high level of communication and design review between the architect (Jones Coulter Young), builder (Diploma Construction), fabricator (Supreme Windows) and ALSPEC's design and product development team ensured that the selected glazing systems provided the most aesthetically satisfying, durable and cost effective solution without compromising the structural requirements of the building.

Commercial Framing included the ALSPEC 100mm and 150mm Hunter Flush Glazed Framing Systems in both single and double glazed options. The ALSPEC slab edge sub-head and sub-sill was used to deliver exceptional weather performance while also allowing for the ability to cover the slab edge, thereby enhancing the overall appearance of the building.

The ALSPEC ProGlide High Performance Sliding Door provides the perfect mix of performance and function for the apartments. In addition, the use of the ProGlide for access between the indoor heated pool and the external timber deck has provided a robust, yet easy to operate solution for this very high usage area.

ALSPEC's ProTilt High Performance Awning Window, utilising multi-point locking and a proprietary winder, was the preferred choice of window for



Fraser Suites, Perth

the apartments. The ProTilt features overlapping internal and external seals with a choice of glass thickness options ranging from 5mm to 28mm allowing the system to be configured for excellent thermal and acoustic performance. With the choice of multi-point locks the ProTilt awning window can be specified to sash heights of up to 2000mm and sash widths of up to 1500mm while also maintaining excellent structural, water penetration and air infiltration outcomes.



Right: ALSPEC ProTilt Awning Window



ALSPEC ProGlide Sliding Door and Hunter Flush Glazed Framing

Photo credits: Tyrone Branigan Productions

# Global Switch Data Centre, Sydney



*Excellent formability allowing ALUCOBOND® to be bent or curved to meet specific design requirements*

Global Switch, a leading wholesale data centre provider, required a \$300 million dollar expansion to their Sydney location.

Designed by DEM Architects, the 34,000 m<sup>2</sup> stage one expansion is one of a small number of buildings in the world targeting a Leadership in Energy and Environmental Design (LEED) Platinum rating. The centre boasts site tri-generation, mixed mode economy cycle air conditioning, grey and roof water capture and reuse, and heat recovery from critical plant.

The building's exterior, clad with ALUCOBOND® PLUS naturAL Brushed, Silver Metallic and Dark Grey Metallic, carried on the environmental and sustainable theme. Supporting external and internal environmental conditions, ALUCOBOND®, in conjunction with the building cavity, minimises the heat transfer through the building envelope, reducing heating and cooling costs.

As a fully recyclable aluminum composite material, ALUCOBOND® provides longevity and at the same time all excess core materials can be recycled back into the manufacturing process.

Showcasing ALUCOBOND®'s naturAL surface range on the front of the building, the naturAL Brushed surface amplifies the natural beauty and character of aluminum whilst at the same time complementing the surrounding architecture of Darling



*With a high-quality fluoropolymer coil coated paint finish, ALUCOBOND® withstands chemical, industrial and marine environments*

Harbour, creating a standalone striking building. A unique feature of the naturAL range is the finely textured surface that scatters light for a close up visual effect. Used to complement the naturAL Brushed surface, the Silver Metallic and Dark Grey Metallic colours from ALUCOBOND®'s standard range provide a slight contrast to the design of the building.

The colours selected for this project provide an interesting design element. When viewed from different angles the facade has the capacity to change appearance depending on weather and light conditions providing a reflective finish. With a high-quality fluoropolymer coil coated paint finish, ALUCOBOND® withstands chemical, industrial and marine environments. It offers excellent UV resistance and long-term performance in the harsh Australian environment.

ALUCOBOND®, with its 5005 marine grade

alloy and superior fire performance, was ideal for this project with its close proximity to salt water. With excellent product qualities such as exceptional flatness and rigidity, low weight, excellent formability, weather resistance, simple fabrication and ease of cleaning, ALUCOBOND® met all expectations.

A design challenge in constructing the building was the need to fold and bend elements of the façade. The flexibility that ALUCOBOND® delivers allowed this design challenge to be met, as the ALUCOBOND® can be bent or curved to meet specific requirements.

With high environmental and sustainable design requirements stipulated by DEM Architects, ALUCOBOND® was chosen for its environmentally friendly qualities, providing a reduction in CO<sub>2</sub> emissions and ease of formability during the construction stage.



*ALUCOBOND® offers excellent UV resistance and long term performance*



# 1 William Street, Brisbane



Knauf AMF's German-made high performance acoustic ceilings played a pivotal role in delivering William Street's first 5 Star Green Star office building.

CBUS Properties' new \$160 million 1 William Street will serve as the headquarters to the Queensland Government and represent one of the premier A-grade office buildings in Brisbane. Designed by Woods Bagot and delivered by Brookfield Multiplex, 1 William Street is a tribute to innovation and sustainability.

Knauf AMF were engaged to supply an advanced acoustic ceiling system for the base building fit-out which included 44 levels of premium office space. Knauf AMF specialises and produces mineral fibre acoustic ceiling panels, made in Germany since 1963. As part of Knauf Group worldwide established in 1932, Knauf AMF provides performance ceiling systems including suspension grid to the 8.5 billion dollar/pa multinational group.

Each panel features a smooth white fleece faced finish, made from products found only in nature including bio-soluble mineral wool resulting in a product that is 100% recyclable at end use.

A 1500 x 300mm tile unit was chosen with 'modular' aluminium top-hat grid system to enhance the visual linear aspect and provide de-mountability of every tile, critical to maintenance and servicing of the building. The accuracy and smoothness of aluminium grid along with AMF's premium grade acoustical fleece membrane ensured the ceiling tiles achieved a perfect flush finish with the grid system, preventing any shadow gaps or other visual imperfections. AMF's near 100% automated production process ensures that tiles are uniform in colour, texture and finish throughout the project.

1 William Street sits comfortably alongside Knauf AMF's other A-grade projects including 1 Bligh Street, Chifley Centre, 111 Eagle Street, Brookfield Place and BHP's striking Melbourne based headquarters, 171 Collins Street. With an impressive portfolio of projects under their belt, Knauf AMF has truly established itself in the Australian commercial market, through use of state-of-the-art technology, sustainably sourced raw material alongside a high quality, high performance product – Knauf AMF provides the winning edge over competitors through technology, innovation and German engineering.



# Ancon supports the attractive brick façade on Orange Hospital



ANCON has designed and manufactured the bespoke stainless steel brickwork support system on the new 350-bed Orange Hospital in New South Wales.

A key design feature of this project is the bold brick façade and in particular the attractive brick canopies which greet hospital visitors arriving by either the East or West entrances.

These striking entrances are constructed using a combination of special shelf angles, soffit angles and stitching rods, fixed to the underside of the structural steel beam by an innovative bolt. All these Ancon fixings are completely hidden from view, invisibly supporting the brickwork from above, helping to create the building's clean architectural lines.

## Key Benefits of Ancon Brick Shelf Angles:

- Create continuous architectural façades.
- Eliminate exposed structural edge beams.
- Maintenance-free fixing solution.
- Cost-effective system design.

## Ancon MDC Shelf Angles

Ancon MDC is a continuous shelf angle which is designed to suit the specific masonry load and cavity width of a project. Brackets are welded to the angle to facilitate fixing back to the structure and the material content of both angle and bracket is optimised to ensure the most economical solution is manufactured. These bracketed shelf angles are supplied in a variety of configurations to support special masonry features including curves and arches.

On the Orange Hospital, the MDC bracket allows the location of the shelf angle to project below the line of the structural frame. The bricks below the support level are then fixed by Ancon Soffit Angles. Ancon Stitching Rods are used to span the soffit angle and support the bricks in-between.

## Ancon Steelgrip Fixing

The innovative Ancon Steelgrip simplified the fixing of the shelf angles and soffit angles to the hollow steel section, where access was only available from one side. Steelgrip



*ANCON shelf angles support external brick cladding to create a continuous architectural façade*

is a high performance fixing, only available for use with Ancon systems. It features a serrated washer that corresponds with the serrations on all Ancon brackets. The serrated surfaces interlock, and as the head is tightened to the correct torque the sleeve expands against the steelwork. The Ancon Steelgrip consists of a zinc plated sleeve and cone, and a stainless steel screw and serrated washer.

## Ancon Design Service

As part of Ancon's free design service, plans were produced that illustrated the location and reference of all the fixings required, for sign-off by the project team. Ancon's project management service then ensured all products were designed, manufactured and delivered to suit the contractors' progress on site.

## ASSDA Accredited Fabricator

Ancon has been awarded Accredited

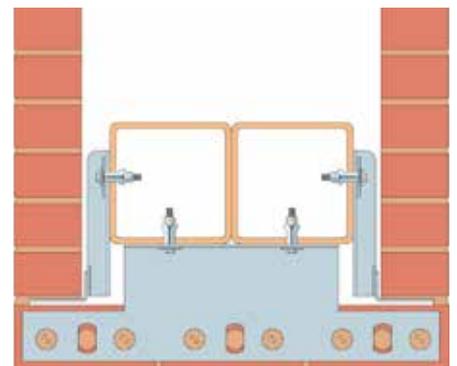
Fabricator status from the Australian Stainless Steel Development Association; a mark of knowledge, experience and quality in stainless steel fabrication.

Stainless steel has unique properties and requires specialist knowledge to ensure the material performs as required. Ancon has a wealth of experience in working with a range of types and grades of stainless steel. The company manufactures stainless steel components for a wide range of industries from building and civil engineering to water treatment and mining.

Ancon brick support is manufactured from grade 1.4301 (304) stainless steel which is suitable for most building applications. In particularly corrosive environments, or where part of the support will be visible, Ancon offers systems manufactured from grade 1.4401 (316).



*Brick Entrance Arch*



*MDC Shelf Angle and Soffit Support*





NATSPEC fulfils a critical role in the building and construction industry in the provision and dissemination of information which not only assists those in the supply chain to conduct their day to day activities, but also assists in the standardisation of practices across the industry that produce better building quality outcomes, as well as outcomes in value for money delivery, health and safety and innovation. I congratulate NATSPEC on the quality provision of service it has delivered for the last 40 years, and look forward to working collaboratively with NATSPEC to continue to provide value driven services for our combined membership for many years to come. Consult Australia takes great pride in our founding membership of NATSPEC, and highly recommends NATSPEC documents to our industry.

Consult Australia CEO, Megan Motto



ASP Access Floors Pty Ltd is a leading global company specializing in the manufacture, distribution and installation of access floors. ASP floor systems are suitable for general office areas, computer rooms, data centres, and other specialty applications. They are available in a number of loadings from medium grade to super industrial grade. The panels are available prefinished or also with a bare finish. Our ASP mission is to provide clients with exceptional products and service. [www.aspfloors.com.au](http://www.aspfloors.com.au)



Architectural Window Systems (AWS), is one of Australia's leading suppliers of aluminium window and door systems. AWS offers an extensive range of locally designed aluminium window and door suites for residential and commercial applications. AWS designs, tests, finishes and supplies aluminium window and door systems under the Vantage and Elevate™ brands to more than 130 licenced manufacturers throughout Australia.

Vantage Aluminium Joinery is the residential aluminium systems brand which has become the preferred choice of residential Architects and Building Designers. The innovative performance and design features of the Vantage range deliver outstanding outcomes in residential construction.

[www.awsaustralia.com.au](http://www.awsaustralia.com.au)



BILLI Pty Limited is Australia's own filtered water system. Leading the way for over 20 years, it has maintained a commitment to leadership and innovation. The result is a range of uncompromising quality.

Award-winning BILLI water systems are specified by Australian designers and architects for their timeless styling and space-saving design. Offering energy and water efficiency benefits, BILLI is Australia's touchstone for filtered water systems and sensor tap technology. [www.billi.com.au](http://www.billi.com.au)



BlueScope is a leader in the provision of high quality metallic coated and painted steel products for the building and construction sector in Australia. Our most notable brands are COLORBOND® steel and ZINCALUME® steel.

BlueScope products are now an integral part of both new and retrofit housing, commercial and industrial projects. [www.bluescopesteel.com](http://www.bluescopesteel.com)

# Barangaroo International Towers



Lend Lease's International Towers will stand at the entrance to the Barangaroo Commercial Precinct. Comprising 300,000 m<sup>2</sup> of general office use ASP Steel Cementitious Ultra Fix and High Pressure Laminate Rigid Grid systems, the three International Towers will showcase the latest innovative and sustainable design. Barangaroo will be the largest access flooring project ever undertaken in Australia.

ASP Access Floors received CarboNZero and CEMARS Certification in response to the work they have undertaken with regards to Barangaroo and its environmental requirements. The designs for the International Towers Sydney were to achieve a minimum 5 Star NABERS Energy rating and 6 Star Green Star Office Design and As Built (V3) Rating. We are committed to working with the Green Building Council of Australia through our production of products with low VOC content and high recycled material content.

## Access Floor System Used:

Steel Cementitious Ultra Fix System with a 3.0Kn loading at 150 mm FFH  
Product Code: SC-3.0-UF

The SNA Series SC-3.0-UF is a Medium Grade Access Floor System that has been designed for general office applications, and is widely used for power and data cable management.

Steel Cementitious HPL Rigid Grid System with a 4.5kN loading at 150 mm FFH  
Product Code: SC-4.5-RG-HPL

The SNA Series SC-4.5-RG-HPL is a Heavy Grade access floor system that has been designed for Computer/Data Centre environments, or similar, and can be used for mapping and distributing cabling, data and other electrical services in the sub floor.

Steel Cementitious HPL Rigid Grid System with a 6.0kN loading at 150 mm FFH  
Product Code: SC-6.0-RG-HPL

The SNA Series SC-6.0-RG-HPL is an Extra Heavy Grade access floor system that has been designed for Computer/Data Centre environments, or similar, and can be used for mapping and distributing cabling, data and other electrical services in the sub floor.

Calcium Sulphate Interlock System at 150 mm FFH

Product Code: CS-IL

The SNA Series CS-IL is an access floor system that has been designed for applications where stone or tile finishes are to be applied.

## Project Features and Highlights:

Greater adaptability from 150 mm access floors allowing easy reconfiguration of work areas for fit out flexibility and connectivity.



# Bendigo Library - Architectural Window Systems

Originally built in 1983, Bendigo Library in Victoria was a concrete block and structure, due for a revamp. By drawing inspiration from the Town Hall adjacent to the library and other historical features in the area, the library has maintained the heritage of Bendigo whilst also being architecturally modern in its design.

MGS Architects had to ensure that the interplay of light throughout the building was enhanced. Natural light encourages creativity and productivity within a building, essential for a creative space such as a library. A cut out of the first floor from the previous library, known as the hexagonal lantern, creates a focal point and directs people upstairs by connecting the two floors. A skylight which wraps around the hexagonal lantern was introduced to encourage the movement of light throughout the building. It dynamically changes the feel of each space and the nature of the building.

Architectural Window Systems (AWS) fabricator ACME1 Windows and Doors, located in Bendigo, were chosen to complete the extensive glazing for this

project. ACME1 Windows and Doors were able to ensure MGS Architects received the perfect glazing solution to their unique design by custom making all the products. The project required a high quality window and door system that allowed for large span glazing whilst remaining durable. The Elevate™ Aluminium Joinery range of aluminium windows and doors were specified for this project due to their durability and flexibility. Series 626 Double Glazed, Front Glazed framing was used to frame the external glazing that surrounds the building. This commercial framing alongside double glazing has ensured minimal artificial heating and cooling in this extreme weather climate. Series 400 Single Glazed, Centre Glazed framing was used for internal glazed floor to ceiling windows and doors.

Colour invigorates and inspires us. The outside of the library hosts bright yellow features which immediately lift the spirits of the visitor about to walk in. You feel enlightened and get an uplifting sense of possibility, not only an endless array of books and stories to get you excited but a building worth exploring and talking about.

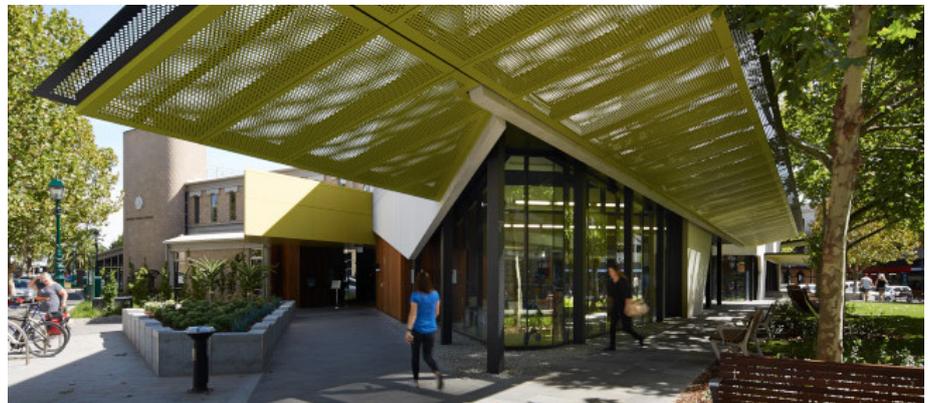
Throughout the building, different spaces are not broken up by walls, they are differentiated by different ceilings and design. A café was implemented to support the idea of the library being a community lounge room. A children's area, complete with children's books and lounges perfect for storytelling was also incorporated into the design. Community spaces and meeting areas perfect for collaboration and group assessments also support the idea of a community lounge room.

Since the upgrade, over 55,000 people have passed through the library each month, an increase in 25 per cent. Memberships went up 268 per cent which included new members but also people re-joining. This proves that the revamp was a sensible development for Bendigo.

At the Australian Institute of Architects' Victorian Awards in 2014, Bendigo Library won the Regional Prize and received a commendation for the Public Buildings category. This building remains a strong feature in Bendigo which will continue to inspire all who enter it.



Fabricator: ACME1 Windows & Doors



Architect: MGS Architects. Photography: Andrew Latreille

# Wollongong Central expansion



The GPT Group's \$200 million expansion of the Wollongong Central shopping complex, was the first project in the country to use BlueScope's new structural steel decking product, Low Glare Coated (LGC) DECKFORM® steel.

The construction project delivered 19,000 m<sup>2</sup> of new retail space to the Wollongong CBD over three levels and was completed in late 2014. GPT Group partnered with BlueScope to ensure as much steel as possible from the nearby Port Kembla Steelworks could be used in the project.

GPT Group Wollongong Central development manager, Steven Turner said GPT's decision to use the product is part of a partnership strategy designed to foster a long-term relationship and maximise economic and social outcomes for the local region.

BlueScope fast-tracked development over 30,000 m<sup>2</sup> LGC DECKFORM® steel for use in the Wollongong Central Project. BlueScope also supplied steel members for the roofing, floor and wall structures. Over 1500 linear metres of Z&C purlins and girts made from GALVSPAN® steel help form the project's skeleton.

BlueScope products also adorn Wollongong Central's exterior. Over 2000 m<sup>2</sup> of HA250 XLERPLATE LITE® steel has been cut to form 750 decorative blades for the project's southern facade. These are finished in iron oxide-style paint. BlueScope invested more than three years and \$300,000 to ensure that LGC

DECKFORM® steel would meet or exceed the in-situ performance of galvanised DECKFORM® steel.

BlueScope product development portfolio leader, Andrew Collins said, "We embarked on extensive internal and independent testing that verified the product's performance in a number of key categories covering glare reflectance, surface friction, chemical bonding with concrete, shear stud welding, coating preservation and fire retardation."

BlueScope engaged independent testing for two critical performance areas expected of all permanent formwork: concrete bonding and shear stud welding. BlueScope also engaged Advanced Technology Testing and Research to determine LGC DECKFORM® steel's slip resistance is in the same class as plywood formwork (Class X, AS4586:2004).

Steel decking products used for concrete formwork are referred to as permanent because, unlike plywood, they are not removed once the concrete has cured. They therefore also provide tensile reinforcement - combining with concrete's compressive strength for an all-round stronger slab.

BlueScope marketing manager – Coated and Industrial Products Australia, Gregory Moffitt, said LGC DECKFORM® steel is a safer and healthier material to work with compared to standard galvanised steel decking.

"By reducing reflected glare you are

improving the safety outcome, because there's less potential for glare to affect formworkers' vision and orientation," Mr Moffitt said.

BKH Group Contractors Supervisor, Joe Pavlovic said his crew preferred working with the low-glare product. "The guys prefer it because it's much easier on the eyes and it's more comfortable to work on - especially on hot days."

Hansen Yuncken project manager, Sturt Hodgson said speed-of-construction was another key consideration in specifying the Kingflor® steel formwork. "You save a lot of time because you don't have to strip steel decking once the concrete is formed. Also, it's quicker to lay because you can run longer spans. Across this job, we had beam centres at 8.7-metre intervals and the spans running from beam edge to beam edge, so the average span length was about eight metres."

LGC DECKFORM® steel had many advantages compared with standard galvanised steel decking. It improved safety outcomes by reducing glare, UV radiation and heat. An added safety benefit of the low-glare coating is that it reduced slip potential when walking on it. The product also provided increased speed-of-construction benefits.

The project was awarded two 2015 Architizer A+Awards, competing with more than 3000 entries from 80 countries to be awarded the Juror's Choice and Popular Choice A+Awards in the Shopping Centre category.



This project was awarded two 2015 Architizer A+Awards: Juror's Choice and Popular Choice in the Shopping Centre category



BlueScope's Low-Glare Coated (LGC) DECKFORM® steel, which was fast-tracked for first-time use in the Wollongong Central Project



## Design solutions for healthcare facilities

The new Royal Adelaide Hospital (nRAH) is the latest example of how Bradford™ Insulation and Gyprock® plasterboard are delivering effective solutions for the healthcare market.

CSR Brands Gyprock® plasterboard and Bradford™ Insulation were specified to meet the internal lining requirements of the nRAH, billed as one of the single biggest infrastructure projects undertaken in SA's history. The nRAH will be Australia's most advanced hospital, incorporating innovations from hospitals around the world and providing world-class care for the patients.

The Gyprock® and Bradford™ brands, which are synonymous with excellence in walls, ceilings and insulation were able to offer practical and innovative design solutions for this state-of-the-art facility, meeting the high performance standards specified by SA Health and enabling energy efficient, increased comfort and safety solutions to be designed into the building. With the added complexity of the facility being nominated as Critical Infrastructure and being built in a seismic zone, the technical resources of CSR's DesignLINK™ team were required to provide fully supported wall and ceiling solutions that would meet the Deemed-to-Satisfy Provisions of the NCC.

With numerous economically sustainable initiatives incorporated into its design, the nRAH will be one of Australia's greenest hospitals and Gyprock®'s EC08™ Complete, which is certified by GECA, will assist the landmark healthcare project in meeting Green Star requirements. EC08™ Complete was selected for the wall and ceiling linings throughout the nRAH, and as Australia's first environmental plasterboard with mould resistance, it is ideal for specialised construction projects such as Health and Aged Care where mould, moisture and impact resistance is imperative. The low VOC board is manufactured to AS/NZS 2588 and its broad attributes also meant that primarily one plasterboard type was used throughout the entire project, removing the potential for installation errors and offering ease of Construction Quality Assurance.



*Artist's impression of the new Royal Adelaide Hospital*

Additionally, CSR Bradford™'s Acoustigard Glasswool insulation rolls and semi-rigid Glasswool Supertel boards were used to fill the interior partitions and walls internally and externally. Acoustigard is specifically made in various densities and thicknesses to suit different cavity in-fill applications and to concurrently provide acoustic and thermal performance, complying with the stringent requirements of the nRAH, which had added complexity due to being in a seismic zone.

Design of the external walls dictated that structural steel elements would be placed in an unconventional size at 300 mm apart. CSR Bradford™ was able to supply Supertel boards in custom 300 mm wide strips; which assisted in making the overall assembly of the walling system more cost effective and allowed a faster installation. Moreover, the Supertel range was also used for HVAC linings (Heating, Ventilation and Air Conditioning), which helped to streamline the number of suppliers in this area. In early consultation

with the acoustic engineer, an effort was made to try and streamline the range of products used to reduce complexity for the installation team, whilst still ensuring that the acoustic walling requirements, for over 50 wall types, could be achieved with the reduced range.

Bradford's Safebridge purlin roofing system was also used as one of the main roof systems. Unlike conventional roof spacer systems, the Safebridge purlin roofing system does not raise the height of the roof and allows for a lower roof line whilst still ensuring even insulation recovery across the entire roof to achieve BCA Section J thermal insulation values.

The nRAH is the largest Health Care project that CSR has been involved in to date. The integrated system selected through sister CSR companies Gyprock® and Bradford™ assured optimal performance and could be confidently specified as a fast and effective solution for such a landmark health care project.



*Aerial view of the nRAH*

# The Village Coorparoo in Brisbane



CS Cavity Sliders recently completed works with McNab Construction on Stage Two of the Village Coorparoo in Brisbane, a 58 unit independent living complex. This high quality, multi-level development is the only integrated retirement living community on the south/east city fringe of Brisbane.

Nestled among leafy streets and perched on elevated grounds, the Village Coorparoo delivers much more than an integrated retirement lifestyle for over 65s. Architect-designed, luxury apartments within a sought after inner-city southern suburb offer spacious living and recreational areas.

S3 Architects completed the master planning, architecture, and interior design for the project.

S3 was established in 2009 and is widely recognised as being at the leading edge of contemporary Australian architecture and delivery. S3 pride themselves on the philosophy of creating meaningful and challenging architecture and this can be clearly seen in the delivery of the Village Coorparoo project.

The Village Coorparoo has won several prestigious Urban Development Institute of Australia awards including:

- 2014 – Winner Queensland Best Seniors Living.
- 2014 – Winner Queensland Best Medium Density Development.

CS Cavity Sliders provided a range of product to the project including our standard CS TimberFormed units for single door leaves. CS TimberFormed is a high quality architectural cavity sliding door system engineered to fulfil the requirements of today's modern building designs. The original design has been improved continuously since 1986 and this product is currently our most widely used unit. There are a number of detail options available to customise this unit to suit your requirements.

Being an aged care facility, the utilisation of space is very important. Residents want to have a feeling of open areas and relaxing

surrounds that are often bought about by flow between different spaces. This is where the use of sliding doors become invaluable as space is opened easily through doors going back into wall cavities as opposed to hinging against a wall and encroaching on the usable space.

Floor area is key to any multi-level development and the Village Coorparoo is no different. Returns are calculated per square metre of space. By having doors slide back into wall cavities, space is more efficiently utilised. In the case of the Village development, the bedroom walls can, in effect, be opened up through the use of floor to ceiling corner meeting sliding doors. This negates the spatial effect of harsh corners as the door leafs slide back into the cavity pocket giving a more open feel to the area. The Corner Meeting detail enables you to easily open up a wide area providing flow throughout a design, stylishly and effectively.

CS products are manufactured from high quality, one-piece aluminium extrusions and timber jambs which means we have the ability to provide systems that minimise the risk of using floor to ceiling doors. CS TimberFormed is made to measure for

door sizes up to and including 3000 mm high x 3500 mm wide.

The beauty of the corner meeting units, especially floor to ceiling, is that half of two walls can be opened to eliminate corners, create large spaces, and keep the use of the floor area and walls. The cavity pockets, using the three cell split jambs, stay true and rigid and eliminate the risk of flex in your walls. The full height finish has a small gap between top of door leaf and underside of ceiling and fits neatly into the ceiling space with a 38mm requirement from underside of gyprock.

The continuing quest to create open space in smaller footprint means architects, designers, developers, and builders are continually looking for ways in which to open up areas. The flexibility and practicality of cavity sliding doors achieves this with no risk to structural strength. Floor area is retained and enhanced and flow throughout spaces is dynamically achieved. The open feeling of space achieved through the use of full height sliding doors helps create a positive mood for people in their latter years residing in modern, upmarket retirement villages such as the Village Coorparoo.



DAMTEC® is one of the world's leading suppliers of high quality and eco-friendly acoustic underlays for the treatment of Impact Noise under all types of floor coverings and also forms part of the Kraiburg group (Est. 1947) which is one of the world's largest rubber recycling manufacturers. All products are engineered and manufactured in Germany.

DAMTEC® have carried out extensive and compliant laboratory testing for all types of flooring applications (i.e. tiles, timber, vinyl and carpet) in accordance with the relevant ISO/BCA regulations and hence comply with Part F5 of the Building Code of Australia (BCA). We have also carried out various verification tests on-site to the prevailing site conditions over many years in order to verify compliance of our underlays when installed in-situ.

Part F5 of the BCA states that for compliance the tested floor system MUST achieve an LnTw + Ci rating of 62 or less to be compliant. Remember that the lower the number, the better the performance.

We conducted on-site testing at the luxurious Martha Cove Development for Hickory Developments where our DAMTEC® Standard 2 mm acoustic underlay was installed under a Direct Stick Tile application.

The floor/ceiling composition which is also an important and often overlooked component of the overall performance of the floor system, consisted of a 160 mm thick slab with a 230 mm cavity and a typical 10 mm plasterboard ceiling on the underside.

When tested on-site by an independent acoustic consultant, it was noted that the acoustically treated floor achieved an LnTw + Ci rating of 51 dB and was easily complying with the BCA requirements.

We have also tested our DAMTEC® Standard 3 mm underlay installed under a Direct Stick Timber flooring application at the HM@S building in Melbourne. In this particular instance, there was a 220 mm concrete slab with only a 50 mm ceiling cavity. We achieved an LnTw + Ci rating of 46dB which is compliant with the BCA for Impact Noise.

"Whilst as a company we understand our responsibility is to provide our clients with compliant, laboratory test data for all of our acoustic underlay products under all possible floor finishes, we have noticed an even greater need to also provide the market with specific and individual case study findings to ensure that the Impact Sound performance of a floor system incorporating a DAMTEC® acoustic underlay actually conforms to each and every site specific development and specification due to the varying nature of floor/ceiling construction types and performance criteria from one site to another."

- Costa Varsos, National Senior Acoustics Manager



Martha Cove



Direct Stick timber application over the DAMTEC® Standard underlay



Bostik Australia is supported by a worldwide research and development resource keeping it at the forefront with new and innovative technologies. The company is committed to providing sustainable and innovative solutions that combine technological performances, ease of use, cost effectiveness and respect for the environment.

Bostik actively integrates green building initiatives through developing products that have minimal impact on the built and natural environment. Bostik Australia has over 100 products that meet Green Building Council Australia low VOC criteria. [www.bostik.com.au](http://www.bostik.com.au)



Established in 1934, Bradford Insulation (CSR) is a leading manufacturer of premium energy-saving insulation products. With a vast manufacturing and distribution network across Australia and New Zealand, Bradford provides thermal and acoustic solutions for residential, commercial and industrial applications including glasswool, rockwool, foil and specialty products designed for commercial buildings. Delivering the best building science solutions for your home, commercial or industrial projects. [www.bradfordinsulation.com.au](http://www.bradfordinsulation.com.au)



CS Group started out in 1986 manufacturing CS Cavity Sliders. Our mission is to engineer and manufacture the best and most innovative door solutions. Over the years we have continued to rapidly develop new products, including track systems, wardrobe sliders, aluminium door leaves and most recently, automated cavity sliders. [www.cavitysliders.com.au](http://www.cavitysliders.com.au)



DAMTEC is part of the KRAIBURG Group (Est. 1947), an organization rich in tradition with over 2000 employees worldwide and an annual sales volume of approximately AUD 500 million. They are an internationally acknowledged and recognized manufacturer of ready-to-install products for impact sound reduction. [www.damtec.com.au](http://www.damtec.com.au)



Danpalon is a patented glazing snap-connection system with concealed fasteners that provides for 100% watertightness; free structural and thermal movement within a flexible system; structural properties that allow for a significantly reduced substructure; quick and easy installation; the elimination of gaskets and sealants; the elimination of fixing penetrations through the sheet and 99.9% UV protection with the protection coating co-extruded with the sheeting, eliminating any chance of delamination. [www.danpalon.com.au](http://www.danpalon.com.au)



# Golden Grove Lutheran Primary School

Golden Grove Lutheran Primary School recently enclosed their central courtyard area with a spectacular curved canopy. The aim was to weatherproof the outdoor space while still offering abundant natural daylight to the surrounding classrooms. The 17 m length panels of Danpalon polycarbonate roofing used have a reflective grey tint that provides comfortable diffused light at all times of the year with minimal heat transfer and no glare. The design and specification process was greatly simplified through the use of a new framing system known as SpaceTruss™.

This relatively lightweight pre-engineered framework utilizes two aluminium extrusions separated by pairs of steel fish plates to form a self-supporting frame. Once bolted together, the combination of aluminium and steel components forms a composite system strong enough to span up to 45 m in non-cyclonic wind regions of Australia. Nominating a self-supporting proprietary product eliminated the need to accurately engineer, document and co-ordinate fabrication of a complicated steel frame with appropriate corrosion protection.

Installation costs and time on-site were reduced, since the pre-assembled rafters are significantly easier to handle and erect than conventional steel roof framing. The SpaceTruss™ system also provides a spectacularly clean visual effect as there are no purlins or bracing members required. The panels are simply clipped into the trusses once they are installed at 1040 mm centres and no further framing is necessary. Manufacturing the panels to the exact length required eliminated the need for unattractive step joints in the roof, as well as reducing costs and material wastage.

The unique standing-seam connection system of the Danpalon panels ensures a 100% waterproof joint that is fully impact resistant (ensuring that safety mesh is not required) while still providing free thermal movement. There are no fixings into the polycarbonate, eliminating stress on the material and ensuring maximum longevity. Danpalon panels have a 15 year warranty and have a proven life expectancy in the Australian market of over 30 years.

A combination of Danpalon together with any other roofing material can be applied to the SpaceTruss™ system. Purlins can attach to the trusses to provide lateral

support for standard roofing products, allowing the trusses to be spaced up to 3 metres apart.



Golden Grove Lutheran Primary School's central courtyard area with a spectacular curved canopy

# DTAC - the trusted name in floor tactiles and stair edging

# DTAC®

TACTILES, STAIR TREADS  
& EDGING SOLUTIONS

When it comes to the design, supply and installation of tactile indicators, stair treads and edging, DTAC has been the trusted name in the industry for 15 years. The company pioneered the architectural floor tactile industry in Australia, taking an unattractive compliance product and transforming it into a design feature that complements the ground surface or floor in a building.

DTAC's work can be seen on iconic sites across Australia. Recent work includes the new NAB building on Bourke St, Melbourne, Hawthorn Town Hall, The MFB Complex and Yarra Valley Water headquarters.

Among the company's latest projects was the Deakin University Burwood Highway Frontage Building, where it installed a variety of DTAC "TGSIs" in many areas of the site.

DTAC started the project in December, with the majority of works completed after the Christmas break from January until the project was finished in early April 2015. The site works were completed by three DTAC trained installers who were supported by the DTAC sales team.

"We installed over 43,000 DTAC tactiles including our thermoplastic urethane tactiles in black and the DTAC 316 stainless steel tactiles. We also installed the DTAC integrated rubber tactile mats in some of the utility areas within the building," DTAC Operations Manager, Michael Moulding said.

Almost a kilometre of DTAC's designer edge, Pleat stair edging in black anodised went in to the Deakin University project using a combination of DTAC edging profiles to suit the stair areas. A late change to the specification of one of the stairs saw DTAC work closely with Hansen Yuncken to provide a solution to an unusual angled stair riser. "We also had an unusual request where we installed our brass tactiles on the concrete roof of the building as markers for infrastructure," Michael added.

"Working in with these changes is part and parcel of what we do," Michael said. "We believe it is the workmanship, expertise



*DTAC 316 Stainless Steel Tactile Installation*

and commitment to a project that is important."

DTAC's specialist knowledge, combined with its focus on detail and quality sees it continually chosen for tactile, stair tread and edging compliance requirements on both large and small construction projects across Australia. Being the industry leader, DTAC delivers the most aesthetic NCC compliant solutions available. In addition, all DTAC installers complete an 18-step DTAC accreditation process before going

on site. This means our clients can be assured that the DTAC installation team has the knowledge and expertise when it comes to tactile and edging compliance and an aesthetic understanding," Michael adds.

DTAC products are designed to meet Australian standards, as well as National Construction Code and Disability Discrimination Act (DDA) requirements whilst ensuring an aesthetically pleasing and long lasting solution.



*DTAC Pleat Stair Edging in Black Anodised*



# TRITHOR™ Termite Protection for Churchill North Shopping Centre, SA

For termite protection on major projects, a Codemark Certified product that is adaptable and flexible to suit a range of building designs and options is essential; as is an installation team that has the proven ability to work with project managers to ensure on time completion of the installation, without affecting other trades.

Complete Pest Control of South Australia are the leaders in installing termite protection systems for new buildings in South Australia, and for the above reasons, were chosen by Hansen Yuncken to install the TRITHOR™ Termite Protection System for this major project at Churchill North.

TRITHOR™ Termite Protection offers an environmentally responsible (Ecospecifier Listed), cost competitive solution that is renowned for its ease and speed of installation. This is particularly important in major projects of this nature, which typically involve numerous site visits to coincide with the various concrete pours; in this case over a period of 7 months.

Churchill North Shopping Centre involved the protection of several hundred pipe penetrations and over 3,000 lineal metres of concrete construction joints. The flexibility provided by TRITHOR™ coupled with its rugged design enabled faster installation and complete integration with other trades people who appreciated not having to wait around while it was installed, as is often the case with other systems.

Specifiers and architects are also understandably concerned at the warranty aspects of termite protection with these major projects. TRITHOR™ has this fully covered with an unlimited, 50 year warranty provided. Some of the complexities of the installation and the solutions presented with TRITHOR™ are shown in the accompanying photographs.

TRITHOR™ Termite Protection and Complete Pest Control have worked with Hansen Yuncken previously, and protected many other high profile sites

in South Australia including the Lyell McEwin Hospital, Gilles Plains Shopping Centre (currently under construction), the Repatriation Hospital at Daw Park, Mount Gambier Prison, the University South Australia (New Campus currently under construction), Lutheran Homes Aged Care at Loxton (currently under construction), the City Of Marion's new Council Buildings, Aldi's South Australian Distribution Centre (currently under construction), and the Southern Cross and Resthaven Aged Care facilities at Mount Barker and Wayville respectively.



*TRITHOR™ laid to protect the edge of the slab and concrete construction joints*



*TRITHOR™ Collars are used to protect pipe penetrations*



*Churchill North Shopping Centre, South Australia*



# Lightning protection for the 'Brown Paper Bag'

# ERICO®

In 2009, famed Canadian – American architect Frank Gehry visited an old Dairy Farmers site in Ultimo and scribbled a design for a building shaped like a tree house. Six years later, on opening the building in Sydney, Australia, Governor General, Sir Peter Cosgrove described it as, "The most beautiful squashed brown paper bag I have ever seen."

The 'Brown Paper Bag' is officially titled the Dr. Chau Chak Wing Building and is part of the Business School at the University of Technology Sydney (UTS). Construction started in November 2012 with the \$180 million building coming in on time and on budget.

The 12-storey building has only one straight column and the length of the longest unbroken column is only 13.78 metres. Another notable feature is the undulating façade made up of 320,000 bricks, which created one of the biggest construction challenges, said Patrick Woods, UTS Deputy Vice Chancellor.

Among those challenges was providing a functional lightning protection system. Many conventional lightning protection designs utilise columns about the perimeter to provide multiple down conductors, connecting the air terminal network at the top of the building to the earthing system that will safely dissipate the lightning discharge.

Another option would be to utilise the façade, if it were metallic. However, the Dr. Chau Chak Wing Building has none of these features. A conventional approach would therefore require dedicated down conductors to be installed, which would usually be placed on the exterior of the building. In this case, installed down conductors would present further challenges and likely detract from the appearance of the building.

Nonetheless, another option was available; Install a more advanced lightning protection system with proven technology, ERICO® SYSTEM 3000. This system comprises an enhanced air terminal, the ERICO® DYNASPHERE, with a single insulated ERICO® ERICORE screened down conductor. The other benefit of this down conductor arrangement is the

reduced risk of side flash and prospect of induced voltages within the building as a result. Another benefit of the system is that it can be installed in any riser or cavity that does not have electrical services which would be running parallel. In the case of the Dr. Chau Chak Wing Building, it was placed in one of the mechanical risers.

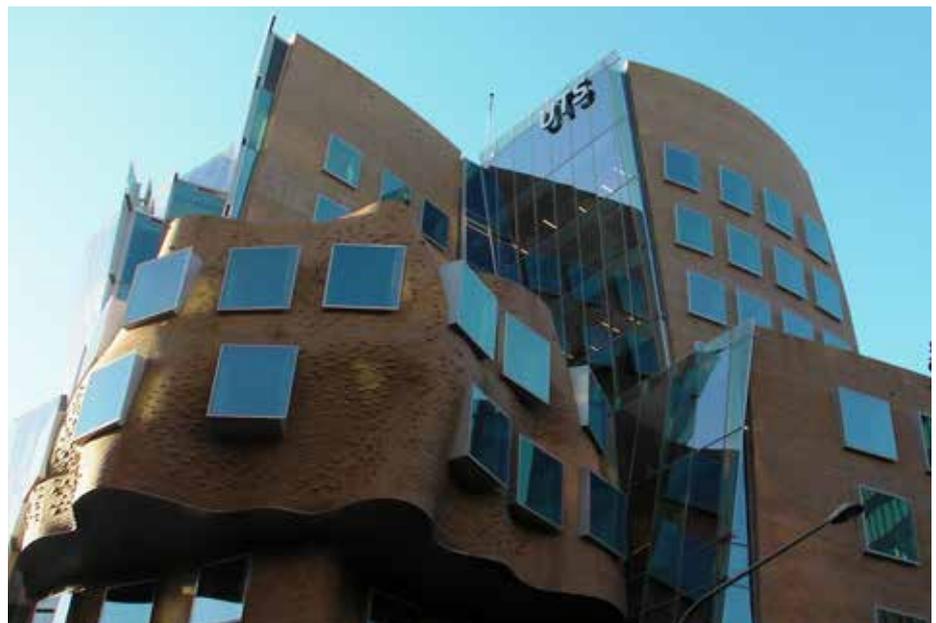
The ERICO SYSTEM 3000 is a technically advanced lightning protection system. The unique features of this system allow the

achievement of reliable lightning capture and control.

The ERICO DYNASPHERE air terminal provides a preferred point for lightning discharges which would otherwise strike and damage an unprotected structure and/or its contents. The ERICO DYNASPHERE is optimally connected to an ERICO ERICORE down conductor and low impedance grounding system to provide a totally integrated system.



*Dynasphere Mk IV Air Terminal*



*Lightning protection in place - Dr Chau Chak Wing Building, University of Technology Sydney*





The quality and productivity of the building and construction industry is enhanced by the work of the National Building Specification (NATSPEC). For more than 30 years NATSPEC has provided professional and specialty packages for all sectors of the industry and all building structures. NATSPEC is highly regarded by industry stakeholders in both the private and public sectors and is strongly supported by Master Builders Australia.

Master Builders Australia CEO, Wilhelm Harnisch

## DTAC®

TACTILES, STAIR TREADS  
& EDGING SOLUTIONS

DTAC is an Australian company with over twelve years experience in design and manufacturing excellence, all backed by industry leading support. DTAC comprises a specialist team of professionals that prides itself on offering beautiful, BCA compliant, architectural tactile ground surface indicators and stair and joinery edging products. DTAC's range also includes urban landscape edge protection and more. DTAC's unequalled attention to detail enables architects, designers and builders to make the right choice for aesthetic and functional conformance in every project. [www.dtac.com.au](http://www.dtac.com.au)



DuluxGroup is an Australian publicly listed company. The company has been involved with the manufacture and marketing of paint and related systems in Australia since 1918 and is the largest manufacturer of decorative paint products in Australia. DuluxGroup is the manufacturer of iconic Australian brands which consists of Dulux, Selley's, Yates and Cabot's, Feast Watson, Intergrain, Toby. DuluxGroup is also Australia's largest manufacturer and marketer of surface coatings with well known brands such as Dulux Decorative, Dulux Protective Coatings, Dulux Powder Coatings, Dulux Acratex Texture Coatings, Berger, British Paints, Levene, and Walpamur brands. [www.dulux.com.au](http://www.dulux.com.au)



Eaton is a global leader in electrical systems and components for power quality, distribution and control. Eaton offers the largest selection of power management and protection solutions available in the industry, delivered under the Powerware and MGE Office Protection Solution brands. Powerware branded products include a full line of AC and DC power systems, Power Distribution Units, Surge Protection, connectivity options, power conversion products, power management software, remote monitoring, turnkey integration services and site support. Eaton offer service on every step of installation projects from detailed design to a full installation. [www.eatoncorp.com.au](http://www.eatoncorp.com.au)



Ensystemx is a global, research-based company with the vision to be 'the first choice for environmentally responsible, effective, long-term termite management solutions'. The company's key brands for protecting new buildings are the **NOVITHOR™ Pesticide-Free Termite Protection System** and **TRITHOR™ Termite Protection**. Both Systems hold ABCB Codemark Accreditation.

Ensystemx has the largest technical sales support team of any innovation based termite protection company in Australia, and we are present in all States to assist you. [www.ensystemx.com](http://www.ensystemx.com)



The Australian Institute of Building Surveyors (AIBS) endorses The National Building Specification published by NATSPEC.

Concern with the emerging issues of non-conforming products in the market place gives our professionals and the community assurance the quality, durability and longevity, safety of products and systems used in construction industry is inherited under adoption of minimum standards referenced in national specifications from the design and into construction specification on site. These national specifications meet the minimum performance requirements in the National Construction Code adopted by the Australian and respective State and Territory legislation.

AIBS fully supports the National Building Specification from NATSPEC.

AIBS National President, Jeffrey Brooks



ERICO is a global manufacturer and marketer of electrical products and technical solutions for lightning protection, surge protection and earthing. ERICO provides solutions in a wide range of market segments including Power Utilities, Telecommunications, Building Services, Water Utilities, Defence and Government. Products are marketed under the ERICO product brand. [www.erico.com](http://www.erico.com)



Fantech has been at the forefront of fan and acoustics technology by developing and implementing new and innovative products of virtually every air movement and ventilation need, as well as noise attenuation. With AS/NZS ISO 9002 accreditation since 1992 and more recently, AS/NZS ISO 9001 accreditation, Fantech maintains high standards of manufacturing and a continuous improvement culture. With modern manufacturing plants in Melbourne, Sydney and Brisbane and warehouses throughout Australia and New Zealand, Fantech provides unmatched delivery performance and customer service. [www.fantech.com.au](http://www.fantech.com.au)



Fielders have been synonymous with quality and strength for over 100 years in an industry where success is reliant on satisfaction. Initially providing roofing materials, the company has now extended its product range and reach across Australia to include purlins, door frames, carports, verandahs, fencing, sheds and composite steel formwork. This ensures comprehensive product offerings and support for all aspects of building construction. Utilising their progressive culture, specialised resources and market leadership position, Fielders has won a reputation for its innovative approach to manufacturing and installation.

Being at the forefront of international cold formed steel products Fielders have attracted the loyalty of many architects, engineers, roofers, formworkers and builders who have experienced the benefits of reduced logistical, labour and time expenditures. With these and many other new developments, Fielders will continuously strive for growth through superior products, convenience, quality and service. With Fielders, you will always 'Finish On Top'. [www.fielders.com.au](http://www.fielders.com.au)



GI Building Sciences is the next step in the evolution of the Green Insulation that was founded almost 15 years ago. GI Building Sciences today continues to follow a strong heritage in innovation and research to deliver a range of insulation and other products that specifically address the challenges presented by the modern world including building affordability, sustainability and social responsibility.

We believe everyone deserves smarter, safer and healthier options in building, design and lifestyle. [www.gibuildingsciences.com.au](http://www.gibuildingsciences.com.au)



## Medical research comes to the fore in Adelaide

As the heart of a new medical precinct on Adelaide's North Terrace, the South Australian Health and Medical Research Institute (SAHMRI) is a beacon of innovation and collaboration.

The purpose-built facility is home to more than 600 scientists who conduct research in the areas of: cancer; heart health; infections and immunity; mind and brain; nutrition and metabolism as well as aboriginal health and healthy mothers, babies and children. Together they work to translate medical research from the laboratories into better treatments and cures for the wider community.

Teamwork is one of five core values of the institute, and a key driver for the design brief was that the building foster collaboration between researchers and enable interactive community engagement and education programs. Furthermore, SAHMRI's vision was to provide a fully integrated solution across all building services, facilities and functional areas.

The Federal Government contributed \$200 million towards building a medical research institute in South Australia. Architect Woods Bagot utilised their global team, working around the clock to develop the design. The Adelaide studio led the project with input from designers in Woods Bagot's New York and Melbourne studios. Construction started in February 2010.

Watson Fitzgerald & Associates was the successful mechanical services contractor. Peter Spencer, one of the company directors, confirmed their involvement in the project well before the construction phase on site.

"Revit BIM software was used throughout the project to ensure the design met the client's brief, and piping and equipment clashes on site were avoided," he said. "Fantech's drawings were available through the Fans by Fantech Selection Program, and could be exported directly to the software program saving us time and effort."

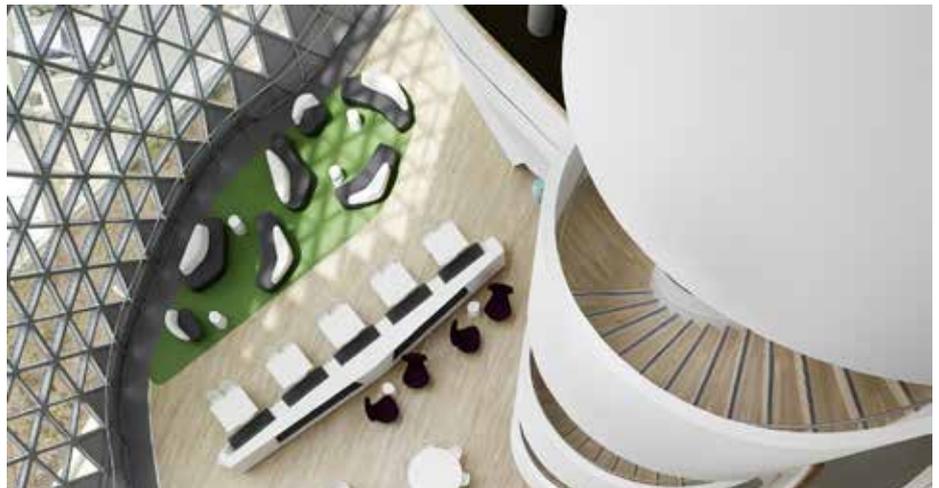
"Another main focus was scheduling of equipment to meet the construction milestone dates. Fantech supplied a variety

of fans, including Axial Flows for car park; Smoke Spill and general exhaust systems; centrifugal fans for built up air handling units; and high pressure blowers for the cyclotron (a type of particle accelerator). These were delivered on time helping us to stay on track with project milestones," he said.

The building has a total floor area of 30,000 m<sup>2</sup>, over nine stories. The iconic triangular-panelled façade features sunshades, designed and orientated for optimum thermal and light efficiency. Two internal atria with an interconnecting spiral staircase on the eastern atrium allow a visual connection between floors. The floor space and research modules are flexible and include: a Molecular Imaging Therapy and Research Unit accommodating a

cyclotron; Physical Containment (PC2) and Quarantine Containment Level 2 (QC2) laboratories; a Bio resources laboratory; public spaces; and areas designated for interaction between researchers, public, education and IT.

Peter said the building control systems had been integrated to provide real time measurement of energy and water consumption of the building. Monitoring this data will allow the institute to ensure it operates at optimal efficiency and would have contributed to the Leadership in Energy and Environmental Design (LEED) Gold rating. The USA certification program promotes design and construction practices that reduce the environmental impact and improve occupant health and well-being.



# KingFlor® reigns strong across Australia's construction industry



In a market where on-time completion of a commercial development can hinge on factors such as the versatility and strength of structural formwork, Fielders KingFlor® is proving paramount to the success of a variety of high-level developments across Australia during 2015.

KingFlor® composite steel formwork is the flooring system used between levels on multiple-storey buildings, which has risen to become the largest range of trusted formwork in the construction industry.

National Commercialisation Manager at BlueScope Building Components, Nathan Jack, says the adaptability of the flooring system is the reason it has recently been the product of choice for several notable developments during the first quarter of the year. "We're currently working with architects and builders to supply KingFlor® to a range of projects across the country, from high-rise office and residential buildings, to car parks and education facilities, with the product consistently improving project efficiencies due to reduced concrete, labour and propping requirements," said Nathan.

"One of the key advantages specifiers have recognised is the versatility in the different deckings available, with five individual profiles including two trapezoidal, two re-entrant profile and a deep deck profile, meaning we're able to deliver an effective

solution regardless of the demands of the project," he added.

The manufacturer has recently been contracted to provide 20,000 m<sup>2</sup> of KingFlor® CF210 decking for the prominent \$200 million Meriton residential tower in North Sydney, the first high-rise residential building in Australia to be constructed purely from structural steel, eliminating the use of the traditional concrete frame building method.

"Historically, the traditional steel construction depth varies from 450 mm to 650 mm which has generally precluded the use of steel framed structures in apartment building design given the increase in the overall height of the building and therefore the associated construction costs."

"Through the use of the innovative CF210 SlimFlor system, we are able to reduce the construction depth of the flooring down to 290 mm which now competes favourably with concrete framed buildings and will contribute to a significantly faster construction time and reduced costs for Meriton," said Mr Jack.

Adding to the portfolio of projects currently utilising the KingFlor® profile, Fielders has also been contracted by Crown International to supply 70,000 m<sup>2</sup> of KingFlor® KF40® material at the V by Crown apartment complex in Parramatta.

Currently in construction, the \$309 million development will be Parramatta's tallest building. Standing at 29 storeys high and accommodating 500 ultramodern apartments, the tower will boast sweeping views of the Sydney skyline and be superbly finished in a luxurious glazed mirrored exterior.

"KF40® was chosen for this project in Parramatta due to its trapezoidal shape with unique SquashCut™ ends, saving the project the equivalent of 16 mm of concrete across the entire project of 70,000 m<sup>2</sup> and optimal spanning capabilities under construction loading. The unique design with wider coverage will not only save on preparatory costs, it also allows for the floor laying to be executed faster," said Nathan.

Both projects in North Sydney and Parramatta are currently in supply and are expected to be completed in 2015 within a positive timeframe thanks to the improved project efficiencies that KingFlor® delivers.

As part of the KingFlor® offering, Fielders offer a full comprehensive suite of technical design software and tools to support the architect, engineer and builders in planning and implementation, allowing the most challenging of structural designs to become a reality.



0311p FIELDERS KingFlor in concrete formwork, 0341p FIELDERS purlins and girts in structural steel, 0423p FIELDERS roofing - profiled sheet metal, 0424p FIELDERS roofing - specialised sheet metal, 0434p FIELDERS cladding - specialised panels, 0436p FIELDERS cladding - profiled sheet metal

[www.fielders.com.au](http://www.fielders.com.au)



*Karndean LooseLay | Providence | LLP108*

The researchers, educators, clinicians and innovators at the Australian Hearing Hub are enjoying their new state-of-the-art facility, thanks to the collaborative work of Taylor Construction Group Pty Ltd and Geyer Architects.

An initiative of Macquarie University, the Australian Hearing Hub brings some of the country's leading hearing and healthcare organisations together with research universities to collaborate on world-leading research projects.

Tasked with a brief to create offices in a shared working space, Ben Cauchi, project coordinator at Taylor Construction Group Pty Ltd, looked to bring the client and architect's vision to life.

The design team opted for the soft blonde highlights and distinctive grain patterns of

Providence from the LooseLay collection. Adding to the light wood interior motif, Karndean LooseLay was used to zone off different work spaces while retaining its open plan brief.

What's more, the client needed a floor that could offset noise and impact sounds in an open plan office. Karndean LooseLay was the perfect solution as its acoustic backing reduces noise levels in rooms below and its 59 decibel rating is compliant with the National Construction Code for minimum acoustic requirements.

Ben commented: "The brilliant acoustic properties of Karndean LooseLay was a key factor in the architect's selection. Across a multi-level building, LooseLay is a quiet alternative to a hard flooring surface."

"In a design process, there can be changes at short notice. Karndean LooseLay was a great solution for us going forward. It was quick to install and allowed us to get the job over the line to our agreed program."

"The client is very happy with the finished product."



# Caulfield Grammar School Malvern Campus Learning Centre

Designed by Hayball Architects the Malvern Campus Learning Centre is a statement that the old can co-exist with the new as an innovative learning space for generations to come.

The facade of the Learning Centre required a product of strength and timeless aesthetic appeal to keep up with the enduring characteristics of this century old institution.

Equitone Tectiva (Colour: TE10-Beige) was the preferred material for the Learning Centre facade. Equitone is the 'Blue Ribbon' of the compressed fibre cement family; whilst sharing the same characteristics and strengths of the standard CFC material, it has none of the flaws commonly associated with the standard CFC product. It is manufactured and developed by the oldest and largest FC manufacturer in the world.

#### Benefits of Equitone:

- Integral through colour
- No ongoing maintenance
- Flexible and diverse in both design and method of installation
- Material is Hydrofabated so it naturally repels water
- Colour pallet with over 30 colour available in Tectiva and Natura types

Hayball Architects and CSP Architectural employed the capabilities of Keystone; working together we were able to take the concept into reality.

Hayball Architects vision of introducing filtered light into the learning space gave rise to Keystones' expertise. Incorporating multiple perforations of varying sizes into a dense material such as Equitone requires precision cutting and Keystone has the technology and know-how to produce a clean and fracture free perforation; an imperative manufacturing skill that places Keystone in high regard to produce a quality product. Equitone was designed by architects, for architects.





Karndean Designflooring was founded back in 1973 and is a global supplier of commercial and residential luxury vinyl flooring.

Karndean International, Inc. is a UK based company, with operations in Australia, has a reputation for creating unique vinyl floor designs that are inspired by natural materials such as ceramic, glass, slate, limestone, wood, and marble. [www.karndean.com](http://www.karndean.com)

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For more than 40 years, Keystone Acoustics, an Australian owned and operated company, has been redefining its processes and machinery to create patterned, perforated and slotted panelling solutions, engineered for optimum performance.

Showcased in many of Australia's iconic buildings, Keystone Acoustics' solutions combine the widest range of quality substrates with the latest in innovative finishes to deliver acoustic performance, durability and design versatility. Panels are engineered to suit diverse applications - from contemporary office fitouts to exemplary facades. [www.keystoneacoustics.com.au](http://www.keystoneacoustics.com.au)

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Kingspan Insulation manufactures AIR-CELL® thermo reflective insulation, and Kooltherm®, a CFC/HCFC-free rigid thermoset insulation with zero Ozone Depletion Potential (ODP). The Kingspan Insulation range delivers innovative, high performance solutions in roof, wall and underfloor applications for both residential and commercial buildings. Kingspan Insulation's technical experts can provide thermal solutions for Section J, Green Star and 6 Stars. [www.kingspaninsulation.com.au](http://www.kingspaninsulation.com.au)

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Numerous projects executed all around the world are testimony to the outstanding quality of Mapei products that are preferred by architects, designers and building contractors.

Mapei products are manufactured in Brisbane and distributed through an extensive network of distributors. [www.mapei.com.au](http://www.mapei.com.au)



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Parchem Construction Supplies is a leading manufacturer and supplier of products and equipment to the Australian and New Zealand concrete and construction markets. Through all of its divisions and heritage, Parchem has built over 50 years' experience in servicing the construction, civil, and concrete industries. Parchem brings experience and technical expertise in the supply and manufacture of construction and decorative concrete products, equipment and tools. [www.parchem.com.au](http://www.parchem.com.au)



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Raven's door and window sealing systems have become synonymous with quality, value and reliability backed by service excellence which is why it is the brand that architects, specifiers and builders can rely on.

Raven's world class testing facility means that we are constantly developing new ways to respond to the rapid advances in the building industry. [www.raven.com.au](http://www.raven.com.au)



# The Green, Melbourne

The Green residential apartment complex is the first five-storey timber framed building in Australia. Developed and built by Australand, using their hybrid construction methodology, The Green showcases numerous design and material innovations, all interlinked to provide a faster and more efficient construction method. The building took approximately 12 months to complete, according to Australand's Estimating Manager Kase Jong.

Using a timber frame design based on a structure first approach, which considers the engineering capacities of timber to define design parameters, the building was constructed in layers, with the floor of each level dropped in using largely prefabricated 2.7 m x 8 m flooring cassettes that weigh just over a tonne.

"After we have set the floors down, there is no propping of any sort required underneath because the floors span from load-bearing wall to load-bearing wall," Jong says.

"We are able to come in on the floor below and start roughing in all the services while work continues on the floor above. Workers were also able to install walling systems while the structure of the levels above were being completed. Kase Jong says most walls were made using prefabricated frames of 3.6m lengths."

Walls included the new Exsulite®-Kooltherm® Thermal Façade System, which Jong describes as a rigid cladding system with a high performance thermoset insulation core, fixed to the timber framing with metal or timber battens.

Developed jointly by Kingspan Insulation and Dulux® AcraTex®, Exsulite®-Kooltherm® Thermal façade System is a proprietary CodeMark accredited walling product that includes high-performance insulation characteristics, lightweight rigidity, and outstanding thermal efficiency. The Kooltherm® K5 boards in the Exsulite®-Kooltherm® Thermal Façade System are fixed and coated with Dulux® AcraTex® weatherproof coating system. The Exsulite®-Kooltherm®



*The Exsulite®-Kooltherm® Thermal Façade System provides a lightweight, high performance, aesthetic finish*

Thermal Façade System helps buildings achieve exceptional thermal efficiency, achieving  $R_T 4.6$  in a timber-framed wall, with a 20mm cavity, using just 80 mm of Kingspan Kooltherm® K5 External Wall Board and no added wall batts. Total system R-Values of up to  $R_T 7.0$  (heat flow in) can be achieved by adding R 2.5 wall batts. Australand confirm that apartments in The Green have an average performance rating of 7 Stars. High-performance glazing (10.38 mm) also enhances acoustic and energy efficiency.

## THE FUTURE IS PREFABRICATED

According to Jong, there are significant benefits and savings associated with the use of prefabricated technologies and building techniques, allowing for greater design flexibility, ease and speed of installation, and excellent thermal and acoustic performance; savings are also derived by extracting the cost benefits of engaging the domestic labour force and supply chain to deliver hybrid buildings.

Further consideration is the speed in



*The Exsulite®-Kooltherm® batten system ready for fixing of the Kooltherm® K5*

construction and reduced materials costs, enhanced by superior performance from new-generation products and building systems. Another important feature of prefabrication is worker safety. Hazards associated with the construction of floor joists, for instance, are mostly averted through the use of drop in floor cassettes, having a direct positive effect on worksite safety.

"For Australand, hybrid building construction methods apply to about 50% of our medium-density houses/apartments. Our goal and our preference has always been to introduce more five storey timber buildings in the designated activity centers in the middle and hopefully outer suburbs. We believe this approach to the construction of these homes makes more sites economically viable that otherwise weren't previously...[enabling] Australand to provide more affordable housing ... This saving will revolutionise the supply of medium rise apartments as it creates a price point that people can afford to buy."



*Dulux® AcraTex® render system being applied onto the Kooltherm® K5*



Regupol (Australia) Pty Ltd is the Australasian office and distribution network for the Regupol® and everroll® sustainable flooring product brands. The company has been operating in the region for over 25 years offering solution based products and technical services for all kinds of sustainable flooring and soundproofing solution based projects. The company is conveniently located at Smeaton Grange, NSW and offers nationwide distribution of the Regupol® and everroll® product lines. [www.regupol.com.au](http://www.regupol.com.au)



For over 60 years, Resene have forged a reputation of excellence and quality in manufacturing products designed to meet the demanding standards of architectural and building industry professionals. The Resene product range includes paint and specialist coatings for residential and commercial buildings. To help building professionals keep abreast of new developments in our product range Resene has an innovative range of architectural services and reference materials, including technical and specification manuals, the Resene Total Colour System, samples and online information. Sophisticated tinting technology enables Resene to produce durable colour options that remain true to colour long after they have been applied. Interlinked systems for decorative and high performance coatings allow you to achieve the same spectrum of colours in a wide variety of products. [www.resene.com.au](http://www.resene.com.au)



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Since the opening of Revolution Roofing, our range has grown to include all the latest roofing profiles, gutters, fascias, ridge cappings, valleys, flashings, verandahs and even a customised sheet metal fabrication department.

We are working with building professionals to further develop new and unique roofing and walling products, which is evident in our latest release of the exclusive True Oak series of profiles.

[www.revolutionroofing.com.au](http://www.revolutionroofing.com.au)



Safetyline Jalousie is a leading louvre window brand with a history of more than 50 years in Europe. Since its arrival in the Australian market in 2009 Safetyline Jalousie has quickly established itself as high quality option for building specifiers looking for a louvre window system that delivers wide louvre spans (up to 1.4m), impenetrable building security and weatherproof seals. Safetyline Jalousie is distributed by SMR Designs who have been involved in the Australian home improvement and commercial building market for more than 20 years with its other external louvre product Vergola. [www.safetylinejalousie.com.au](http://www.safetylinejalousie.com.au)



Sekisui Foam Australia products applicable to this worksection include Thermobreak Sheet, Thermobreak Tube, Thermacoil, Fi-Block, Thermaloc, and Thermobreak Hi-Temp.

Sekisui Foam Australia is the leading Australian manufacturer of crosslinked polyolefin foams and composites. We have been manufacturing in Sydney Australia since the 1970's. Sekisui Foam Australia is committed to total quality, and protection of the environment. The AS /NZS ISO 9001 standard forms the basis of the company-wide quality system. [www.sekisuifoam.com.au](http://www.sekisuifoam.com.au)



# A well-written specification

## An up-to-date master

*your* **NATSPEC** is the

*“Unfortunately the level of quality that can be policed in the construction stage cannot be higher than that which is spelt out in the contract. If the building contract documents permit a sow’s ear, then all the quality control in the world cannot demand a silk purse.”*

Bryce Mortlock  
NATSPEC founder, 1975  
AIA Gold Medalist

**A well written specification helps you get the quality and results you want. When preparing the specification, ask yourself:**

- Does it address the client’s **brief**?
- Does it address the NCC and other **statutory** requirements?
- Is it consistent with the method of **procurement**?
- Does it cover all **project elements**?
- Is the **structure** logical and easy to navigate?
- Does it **fit** with the drawings, schedules and contract?
- Does it address all **users** of the specification?
- Has it been **proofed**?
- Will it be **enforced** on site?



# tion reduces risk r specification saves time

## e National Master Specification

As a master specification, NATSPEC will not contain all the technical requirements for every project. For each project, the specifier will need to:

- **Select** the appropriate **NATSPEC worksections**.
- Consider using a **NATSPEC branded worksection**.
- **Delete** material which is not appropriate.
- Complete **prompts** where provided, include **options** or delete **schedules** if not relevant.
- **Add** new material required for the project if not included by NATSPEC. Use **NATSPEC style**.
- **Edit** NATSPEC text where it conflicts with required project quality.
- Check **cross references**, coordinate with the **drawings** and **proof read**.

*“The measure of the efficiency of a master specification is the extent to which it presents a complete reference for project specification. No master can be expected to contain 100% of every project’s technical requirements, but with intelligent feedback, it will gradually get closer to the ideal.”*

Douglas A Norman  
Specifications, 1983



# New Children's Hospital

In July 2011, the Western Australian Government announced the Stage One Managing Contract to design and construct a new \$1.2 billion children's hospital which was awarded to John Holland Pty Ltd.

Electro-technology company Nilsen were awarded the 298 bed, New Children's Hospital (renamed Perth Children's Hospital) by John Holland in April 2013. The award was preceded by a period of Design Assist during which Nilsen worked hand in hand with John Holland and the consultants, Norman Disney Young, to provide cost estimates and proposals to reduce costs for the electrical works. Nilsen commenced on site in July 2014. It has a fast track schedule with completion planned for June 2015.

The project is designed using Cablofil 3D modelling or BIM. Cablofil by Legrand Australia provided a complete fire-resistance rated solution achieving WS5X classification (under AS/NZS 3013:2005).

Due to the FAS (Fast Assembly System) solution provided Nilsen, the Western Australian government has been able to match the most critical aspect of the project: meet expected construction completion date.

The Project Manager overlooking the job estimated that Cablofil allowed them to reduce installation time by at least 50% in comparison with standard solutions available in the market (Ladder, etc.).

The key challenge for Legrand Australia was to be able to deliver in time, in Western Australia, a complete cable management solution from the Sydney National Distribution Centre where most of the Bracketing Systems were customised on demand.

On this project, Legrand Australia has demonstrated their potential and expertise in engineering, manufacturing and delivering over 40 km of Wire Mesh Cable Tray.

Three different Fire Tests were carried out over the project to match commitments and adapt to changes and variations of

design. This highlighted the customer orientation and dedication of all the Legrand Team.

### Key Features

- 40 km of Cablofil FAS System.
- Full Wire Mesh Cable Tray Solution by Cablofil (Power / Comms / Services).
- Protection against fire conditions rating of WS5X (to AS/NZS 3013:2005) up to 150 kg/m.
- Seismic Rating Solution by partnership Cablofil / Gripplle.
- Reducing installation time by 50% (Estimated by Project Manager).



Cablofil used on the New Children's Hospital project

# Hawthorn Arts Centre



Since its opening in 1888, the Hawthorn Town Hall has been an iconic fixture of Glenferrie Junction. In 2008, The City of Boroondara's adopted Arts and Cultural Strategy 2008 – 2013 identified the vision 'for a city of harmony where citizens can celebrate, share, express and experience a rich arts and cultural life whilst preserving the heritage of the town hall.'

To fulfill this vision, the redevelopment of the Hawthorn Town Hall as a key Boroondara Arts and Cultural facility was recommended and construction was completed in September 2013 at a cost of \$16 million.

The Hawthorn Arts Centre, incorporating the Town Hall Gallery, is a venue full of possibilities that works toward celebrating and servicing the community through a vibrant and diverse program of performing and visual art, and providing accessibility for hire of spaces for meetings, conferences and events.

D. Borthwick & Sons were contracted to install over 2400 m<sup>2</sup> of timber flooring throughout the Town Hall. Floor91 were contracted to repair any damaged concrete, waterproof the wet areas in the kitchen and amenities, install screeds in the amenities and level all areas where the carpet and vinyl were installed.

The subfloor was repaired using Mapei's Nivorapid and in some areas plywood was installed. The plywood was lightly sanded and 2000 m<sup>2</sup> of solid timber planks were installed using Mapei's Ultrabond P990 1K solvent-free, ready-to-use elastic polyurethane timber adhesive.

In addition to the solid timber flooring, contractors also installed over 400 m<sup>2</sup> of Tallowwood parquetry in the main and foyer areas using Ultrabond P990 1K timber adhesive.

All installed timber was coated with Ultracoat Premium Base primer coat and then once dry was finished with two coats of Ultracoat High Traffic.

Floor91 contractors repaired the concrete flooring prior to the installation of the carpet, carpet tiles and vinyl using



*Timber flooring planks installed using Mapei's Ultrabond P990 1K solvent-free polyurethane adhesive*

Planiprep FF to smooth out any levelling differences in the subfloor.

The existing concrete floors were primed using Primer G and Eco Prim T prior to the installation of the levelling and smoothing compounds. UC Leveller was pumped onto the concreted areas where the flooring levels needed to meet adjoining levels. UC Leveller is a fast hardening, levelling and smoothing compound especially formulated for pumping onto large areas to use as a bulk filling underlayment from 3 to 70mm. Ultraplan self-levelling compound was then installed over the top of the UC Leveller to form a smooth layer for installing the vinyl.

Floor91 installed over 1000 m<sup>2</sup> of carpet tiles using Ultrabond Eco Tack. This pressure sensitive adhesive is a solvent-free, non-staining adhesive ideal for the installation of carpet tiles. Ultrabond Eco Tack is designed to create a permanent tacky film when dry allowing the removal and replacement of carpet tiles when required.

Ultrabond Eco 350 was used to install the Altro and Pacific Floors vinyl in the kitchen and corridor areas. Ultrabond Eco 350 is ideally suited for the installation of solid vinyl sheet. It is easy to apply, low-odour and perfectly suited for the installation of flooring in occupied environments. Rollcoll was also used to install the vinyl sheeting on the walls where required. Rollcoll is a universal adhesive for the installation of vinyl, needlepunch, PVC and cork wall coverings. This is a fast-setting adhesive that can be applied by trowel, roller or spray in a single application.

Floor91 also installed all the carpeted areas in the Town Hall and utilised Mapei's Mapecontact to adhere the carpet to the many flights of stairs throughout the building. Mapecontact is a double-sided, reinforced adhesive strip for laying profiles, skirting-boards, covings and resilient and textile coatings on steps and is available in 35 mm, 65 mm, 85 mm and 240 mm wide lengths.



*Timber flooring sealed with Mapei's Ultracoat High Traffic for protection against wear and abrasion*



# Lesmurdie Senior High School, Western Australia

Moddex were selected for the supply of compliant barrier protection for stairs, ramps and the perimeter of new classrooms at Lesmurdie Senior High School, Western Australia.

Situated in the Shire of Kalamunda, Lesmurdie Senior High School caters for students from year 7 through to year 12. As part of the State Government's transition of Year 7 students to secondary school, Lesmurdie Senior High School procured new classrooms that required barrier protection for approaching pathways, ramps and stairwells.

**Modular Assistrail barrier configurations to Australian Standard AS 1428.1-2009**

Moddex modular barrier designs are preconfigured to connect as a system for level, rake or stair requirements. Available off the shelf for immediate installation, Assistrail AR30 and AR40 configurations were identified for compliance with the

Disability Discrimination Act (DDA) and AS 1428.1-2009 for schools across designated pathways, ramps and stairwells.

**On-site compliance advice and adjustment recommendations**

During the initial on-site consultation, Moddex consultants offered expert advice on adjustments to initial architectural drawings for compliance with Australian Standards. Several areas with either a sheer drop of over one metre, or close proximity to rocky terrain were identified as potential hazards for students. To achieve compliance, architectural drawings were adjusted on our recommendation to include additional fall protection.

**Minimise custom fabrication**

Moddex consultants were able to identify off-the-shelf Assistrail configurations for 95% of the school's requirements, reducing custom fabrication to rake and flat transitions across landings and rest

areas only. As a result, fabrication lead times and costs were heavily reduced. Custom and off-the-shelf components were delivered together within the school's tight Year 7 transition scheduling for immediate installation.

**Why Moddex?**

Through selecting Moddex, Lesmurdie Senior High School controlled custom fabrication costs and lead times to an absolute minimum. Assistrail configurations designed and pre-engineered for compliance, together with custom fabrication components, combined to deliver a fast and effective solution consistent with the architect's aesthetic design.

**Design & Technical Support**

Our Technical Engineers worked closely with Robinson Build-tech to ensure compliance with Australian Standards and the Disability Discrimination Act (DDA).



*Compliant barrier protection for Lesmurdie Senior High School, Western Australia*



*Additional barriers for hazard protection and compliance to Australian Standards*



Invented in Australia, and patented in 1986, the first Solatube Tubular Daylighting Device was sold in 1991. Since then, Solatube has introduced a range of innovative products and features and has become a global company. Solatube has continued to refine its technology for superior performance and durability, earning the prestigious ENERGY STAR® energy-efficiency rating as well as the rigorous Cyclone approval for high-velocity rain and wind zones (including the Darwin “deem to comply” approval). [www.solatube.com.au](http://www.solatube.com.au)



Studform Pty Ltd originally started as a small ceiling and partition contracting company in Adelaide in the early 1980s. Today, Studform manufactures and distributes doors, access panels, aluminium ceiling systems, and aluminium partitioning systems to the Australian and New Zealand construction markets. [www.studform.com.au](http://www.studform.com.au)



Taubmans is one of the oldest paint brands in the market. Taubmans has been painting Australian homes for over 110 years. Back in the early 1900s, George Taubman built the company on a foundation of technical superiority. Since its inception, Taubmans has grown to become a major player in the Australian Architectural Coatings Market. It is also responsible for launching well known and innovative consumer paint brands such as Endure with Nanoguard, Living Proof Silk with Teflon, Easycoat with Microban and All Weather with Dirt Shedding Technology. [www.taubmans.com.au](http://www.taubmans.com.au)



The Termguard Reticulation Systems have been extensively tested and successfully used over the past two decades, and have been specifically designed to offer long-term termite management and damage prevention systems. Together with today's environmentally acceptable termite control agents, Termguard's termite reticulation systems have been the perfect partner to provide an effective replenishable barrier, yet minimise the total impact on the environment. [www.termguard.com.au](http://www.termguard.com.au)



TLB Timber specialises in supplying the Australian Timber Industry with high strength, low shrinkage, durable, fire and insect resistant hardwood timbers and plywood which can be used in both internal and external applications. TLB Timber's extensive product range of tropical hardwoods includes merbau, kwila, hopea, rosewood and plantation mahogany, plus hardwood plywoods (CD Structural F14+ and appearance grade) and plantation sourced hoop pine plywoods (CD Structural F14+ and appearance grade). [www.tlbtimber.com.au](http://www.tlbtimber.com.au)



Azure Blue Integrated Living is a retirement, community and residential aged care project, located on a 4 hectare greenfield site at Carina in Brisbane. Cockram's aim was to create a modern care precinct and a luxury retirement living precinct where residents' amenities include a swimming pool, café, library, function room, car parking and media room.

The \$60m+ project consists of a 128-bed High Care aged care facility and 98 Independent Living Units (ILUs) comprising 22 apartments, 70 units and six single storey villas (duplexes).

Being on a high traffic thoroughfare (Richmond Road), they required an architectural boundary fencing which aesthetically provided both privacy and security for the residents of Azure Blue.

**Solution:**

Oxworks' Aluminium Tubular fencing (Picket Style) was used to secure all gardens and utility entrances while still accommodating the overall design of the project.

Oxworks' custom face welded Aluminium Angle Screens were used to provide an impressive façade to the entire 4 hectare property and provide privacy and security to the residents.

"We chose Oxworks' custom angle screens for their aesthetic appeal and strong, long lasting finish. With safety at the forefront of our design, both their Custom Screens and Aluminium Garden fencing (which exceeded Pool Fencing standards) tied in very well with the colours and modern styling of the build. The quality of their manufacturing and powder coating is second to none ensuring we had no troubles with their systems which we found to be ideal for our requirements."  
 - Greg Hosking, Director of Fencebuild Australia - Fencing Installers for Cockram.

**Products:**

- Custom Angle Screening & Boundary Fencing
- Aluminium Tubular Fencing – Picket Style
- Metalwork Fabrication



*Custom Face Welded Angle Screens including Automated access gates*



*Picket Style Custom Aluminium Tubular Fencing*



*Custom Face Welded Angle Screens providing security and privacy*

# Schofields Railway Station – Electrical Substation



Schofields is located in the rapidly expanding North West Growth Centre region of Sydney. It is serviced by the Richmond railway line, which links the area to the work districts of Parramatta, the Sydney CBD and North Sydney. Within the coming decades an extra 200,000 people will move into this region, increasing the population to over 600,000. To cater for this population expansion, the NSW State Government initiated the Richmond Line Duplication Project to increase the capacity of rail services to the area. As part of this project, the existing Schofields Railway Station was relocated. This involved the construction of a new station including lift access, 230 car spaces, a bus interchange, as well as an upgrade to the electricity supply and electrical substation.

The project requirements were:

- To keep the substation structure completely dry against the anticipated flood level to protect the important electrical substation components which are crucial for the functioning operation of the railway line.
- To ensure waterproofing integrity to the top of the existing concrete piles under the structure. Due to the existing blinding slab and pile caps being poorly laid, it was impossible to terminate a traditional membrane on to the existing piles, whilst waterproofing the top of the pile caps, without the need for significant rectification works.

## Solution

Fosroc Proofex Engage preapplied waterproofing membrane system was the ideal solution for this project, meeting the project requirements and addressing all of the site specific issues.

The contractor Galdar Waterproofing used 300 m<sup>2</sup> of Fosroc Proofex Engage to waterproof the substation floor slabs, upturns and the top of pile caps. The membrane was placed over the existing blinding slab by hand and then detailed using compatible jointing ancillaries. Reinforcing steel was then set in place, with the concrete floor of the substation poured directly over the membrane.

The unique mesh design of Fosroc Proofex Engage gives a permanent, tenacious, mechanical bond to freshly placed concrete. This bond is not dependent on

any chemical reaction and can be assured each time concrete is cast. The heavy duty mesh design and properties result in a robust, proven membrane which is ideally suited for on-site conditions.

## Benefits of solution

The benefits of using the Fosroc Proofex Engage system included the ability to provide a watertight structure, combining total encapsulation of the structure itself whilst being able to detail and waterproof the concrete piles below - something that is unachievable using traditional membrane technology.

Fosroc Proofex Engage provided a simple, effective long term solution, as well as saving the client from carrying out expensive and time consuming rectification works to resolve existing site issues.



0411p PARCHEM waterproofing - external and tanking, 0621p PARCHEM waterproofing - wet areas, 0657p PARCHEM resin based seamless flooring

[www.parchem.com.au](http://www.parchem.com.au)

# Royal North Shore Hospital

The \$721m Royal North Shore Hospital (RNSH) at the old hospital site in St Leonards, is a healthcare building that didn't want to look like a healthcare building.

Designed by BVN Architecture and constructed by Thiess Construction, the hospital is a standout building that doesn't shriek "hospital". Despite having the very best and newest in medical technology, 6500 rooms and 110,000 m<sup>2</sup> of flooring, BVN associate Geoff Cooke says the aim was "to create a space that did not look like a hospital."

To that end, his team deliberately moved away from colours and finishes associated with healthcare buildings - apricot, yellow or pinks. They chose finishes that could be found in any new commercial or educational building.

This design decision meant the flooring had to be the same or similar tones throughout, unlike many healthcare buildings where different areas are colour-coded, with patterns and colours on the floors. This is where Polyflor's expertise came into play. 90% of the rooms in RNSH have vinyl flooring.

### Technical challenges and stringently level floors

While the colour requirements were limited, there were other technical factors that had to be considered in flooring the building; sustainable slip resistance, low VOC, static dissipation properties, GreenTag™ LCA environmental certification and the need for extremely level floors. Perfectly level floors are essential in operating rooms and equipment rooms, especially for cardiac catheter labs and magnetic resonance imaging (MRI). Add to this the challenge of the hospital's AGVs (automated guidance vehicles).

Thiess Project Manager, Raz Favotto said "getting the floors right was one of the biggest challenges in the hospital construction". Polyflor was able to supply a full system for these floors from the concrete all the way to the vinyl. In the service corridors, a cementitious levelling compound – Kiesel P200 Plus Levelling compound was used, capable of withstanding the 500kg point loads of the AGVs.

### Useability, durability, reliability

Polyflor Australia won the tender to provide the RNSH flooring after recommendation

from Thiess Construction, and comparative studies of other healthcare floorings in situ by Cooke's team at BVN, to compare how well they were wearing. "The decision to use vinyl over the alternatives was based on the history of that product in the Australian healthcare market," Cooke explains. "We were looking for a single supplier of resilient flooring with a range broad enough to cover all the flooring requirements for the different areas in the hospital, including slip resistance, antistatic, cushioning and AGV safe". "Architecturally we were looking for a vinyl that wears well, resists scuffing and marking, and can be maintained to a high standard. We also wanted a colour with natural warmth, steering away from colours traditionally used in health facilities." Cooke also added, "We have been pleased with how well it looks in the space. It has surpassed our expectations."

Favotto said an emphasis on durability and ease of maintenance were important factors. "We wanted to select a vinyl flooring with a really good lifecycle, good floor products that would be easily maintained and durable. Polyflor had the best products to last the next 28 years - a very good lifecycle to minimise cleaning and good durability."



# Townsville Hospital ensure compliance with Raven



Raven produces Australia's most comprehensive and innovative range of door and window seals and is one of the most trusted brands in the building hardware industry. Raven's leading range is backed by unequalled industry knowledge and certified testing which is why Raven was the supplier of choice for the Townsville Hospital project.

Raven supplied a variety of door bottom seals, perimeter seals and threshold plates for the Townsville Hospital project providing complete door sealing systems that were designed to meet a variety of sealing requirements. Raven seals were required to perform across multiple levels from the exclusion of fire, smoke and weather through to acoustic attenuation and the containment of energy.

"Most projects, but particularly those in the healthcare industry like the Townsville Hospital, require every component to meet strict regulations and standards. They also require certified testing to back this up. Raven's leading range of tested and certified sealing systems is why we see our products chosen time and time again," said National Account Manager, Luke Read.

Luke explained that with projects such

as the Townsville Hospital, certification of products and their performance is a critical requirement to ensure compliance of the project, not just for now but into the future. Raven's extensive ranges of NCC compliant sealing systems are backed by NATA accredited test certificates. Raven is also independently certified to international quality standards ISO9001 ensuring you get the best products, at the best price, backed by the best service every time.

In addition to strict testing and certification requirements, the Townsville Hospital project also required Raven seals to be easy to install, made to withstand heavy duty use, require minimal maintenance and to meet the aesthetic requirements of the architect.

As an Australian family owned and operated business, Raven was able to deliver on all points as well as provide vital technical support to the architects and builders including certifying authorities as required on completion of the project.

One of the biggest challenges for Raven on the Townsville Hospital project was accommodating the Bariatric Hoist System which ran throughout the hospital. The rail system was installed on the ceiling passing through doorways, meaning

Raven needed to deliver a sealing system to accommodate the hoist, whilst ensuring a compliant and high performing solution. Raven's extensive range coupled with its unequalled industry knowledge and expertise meant a sealing system was quickly designed in conjunction with the architect and builder to meet this requirement.

"Another challenge of this project was working against strict and often tight deadlines. Our streamlined distribution systems and legendary near perfect picking rate meant our products were onsite and on time as needed. The design of our products also meant that installation was highly efficient, with many products easily adjustable to ensure the perfect fit and optimum seal every time" said Luke.

Raven invented and developed the first door seals in Australia and is celebrating 65 years in business whilst continuing to remain at the forefront of the industry here and overseas. With in-house NATA accredited testing facilities and a professional team of engineers and designers, Raven can quickly develop new and innovative ways to respond to advances in the building industry here in Australia and around the world.



Raven RP38Si Automatic Door Bottom Seal with Raven RP122 Intumescent Meeting Stile Seal



Raven RP38Si Automatic Door Bottom Seal with Raven RP78Si Perimeter Seal



## An end-to-end, end-of-trip solution for 145 Ann Street, Brisbane

PFL Spaces, widely recognized as the leading expert in end-of-trip facilities across Australia, have provided a first class facility for 145 Ann Street, Brisbane.

Conveniently located in the historic King George Square, the 27 level contemporary office building stands side-by-side with one of Queensland's oldest churches, the Ann Street Presbyterian Church. Sustainably designed by ML Design Brisbane, the property is awarded with the world-leading 6 Star Green Star – Office Design and As Built v2 rating by the Green Building Council of Australia. With the featured benefit of an end-of trip facility, this building represents good health for tenants and their employees.

145 Ann Street is a property encouraging people to be more active by making available first class end-of-trip amenities. The increase of cycling, walking, jogging and use of public transport within our communities will provide a healthy and happier population.

End-of-trip facilities have been required under the Queensland Development Code 4.1 Sustainable buildings (QDC 4.1) since 26th November 2010. With safety being part of best-practice in design, PFL Spaces had to ensure the flooring they put forward was fit for purpose, safe and durable. They also had to ensure that the product was

sustainable and PVC free, adding to the buildings environmental status.

For the flooring they chose everroll® rubber flooring by Regupol (Australia) Pty Ltd. The everroll® met all of the design criteria and was proven in the industry under harsh conditions. Bike cleats can be punishing to any surface and to reduce the noise they create you need a floor that is tough and absorbent enough. The floor also has to endure the off-the-street run in of dirt and water from bikes and footwear and this is where the everroll® is put through its test. everroll® has been used in tough environments for more than 20 years. The floor can be maintained

sustainability with minimal ongoing costs. The non-laminated homogenous flooring product means the surface wear layer is continual the service life of the product. The product is available from 4 mm and up to 12 mm thickness and offers exceptional comfort and durability.

The 0651 *REGUPOL in resilient finishes* Branded Worksection includes eight product ranges with more than 40 colours to choose from. A Level A, Good Environmental Choice Australia certified sustainable product manufactured from post-consumer and pre-consumer rubber makes everroll® a preferred choice for sustainable building design.



*The durable anti-slip rubber flooring services locker facilities*



*Rubber flooring to bike parking area provides safety for riders*

# Landmark of colour Waterview Wharf Workshops



the paint the professionals use



*Waterview Wharf Warehouses sitting on Sydney Harbour*

Originally a ship repair yard from 1905 to 1970, the Waterview Wharf Workshops are now an iconic landmark of Sydney Harbour and are listed as an item on the State's Environmental Register. These heritage buildings are large and prominent forms on the harbour foreshore that have been conserved and adapted for creative businesses such as architecture, interior design, photography, sound recording and advertising. The interiors are open-plan with hardwood post and beam construction, featuring the original industrial machinery and fittings and a character of the Edwardian era.

The buildings needed repainting as the exterior paintwork had deteriorated, presenting the opportunity for a new colour scheme. The intention was to transform the tired appearance and highlight their form on Sydney Harbour, while reflecting the creative environment of the occupants.

The traditional green and cream colour scheme although safe, was bland, tired and outdated and the buildings were in need of revitalising. Similar heritage sites and waterfront warehouse were researched from around the world including Trondheim, Norway and Nyhavn, Denmark, as well as numerous sites in Italy and South America. They used bright and colourful palettes highlighting unique building forms that are internationally recognised. So, a similar approach to colour was adopted for Waterview.

Over a hundred different Resene testpots were applied to various buildings and responses to the sample colours were sought from a number of the occupants, including architects and designers. As a

result, the final colour scheme, Resene Biscay (stormy blue), Resene Clockwork Orange (bold orange), Resene Awol (willow green), Resene Silver Aluminium (sliver metallic), Resene Galliano (sweet yellow) and Resene White trims, brought into account the views of a wide community.

All the buildings are colourful except the last building which is a modern steel and glass structure that is less prominent and recedes from the harbour. It is painted primarily black and Resene Silver Aluminium.

The building fabric is galvanised iron and the buildings sit directly on the waterfront with a westerly aspect. The sun causes the galvanised iron to heat and woodwork to deteriorate at a quicker rate than normal. The work involved extensive preparation and replacement of timber components, requiring a carpenter and painter working as a team, at height on scaffolding. Resene paint was recommended and on sampling, the painters advised it had

superior body and coverage. Resene Hi-Glo gloss waterborne paint was used due to the operation of the elements, with Resene Sonyx 101 semi-gloss waterborne paint on trims.

The striking colour combination won Waterview Wharf Workshops the Resene Total Colour Master Nightingale Award and the Resene Total Colour Commercial Exterior Award. The judges described this project as "simply outstanding. A beautiful juxtaposition of colour; unique and strong. Prior to painting, the old warehouses simply blended into the landscape and scarcely rated a second glance; now they are eye-catching and are a new landmark on the harbour. A perfect example of how to make paint colour work for you."

The success of the new colour scheme has been overwhelming. Waterview Wharf Workshops have received countless emails from passers-by and the new colours have received accolades from various people in the local area.



*The colourful Waterview Wharf Warehouses*



0671p RESENE painting

[www.resene.com.au](http://www.resene.com.au)

## Marion Holiday Park

The stunning two storey pool-side apartments at Marion Holiday Park are a clever combination of boldness and elegance, with a sense of serenity and style.

Revolution Roofing's striking Maxline 340 was the ideal exterior cladding for the project. It's aesthetics and design achieve a long lasting impression.

The unique installation system of Maxline 340 makes it the first choice for specifiers, who appreciate its toughness and durability. The patented, free span technology of Maxline 340 allows self-spanning up to 1500 mm without the need for backing.

To soften the tone of the bolder Maxline 340, True Oak Superior Corrugated profiles were used to complement the exterior of the apartments. The deep curves of True Oak Superior Corrugated add a touch of charm and class to the wall cladding, creating a visual connection to the interior of the apartments.

The roof is True Oak 'Deep' 21 mm, 40% stronger than shallow corrugated, whereas the walls were clad in True Oak 'Mid' 10 mm.

The Revolutionary True Oak Superior Corrugated profiles, in combination with Maxline 340, achieved the perfect balance for the building's identity, style and charm.



# Maximum Ventilation for New Sport Centre



Interior of the new sports centre for William Clarke College in Kellyville

Timothy Moon Architects were engaged to design a new sports centre for William Clarke College in Kellyville NSW.

## Objectives

The primary objective for the design of this sports centre was to achieve maximum natural ventilation. While the architects were familiar with the benefits of specifying louvre windows to achieve the desired cross ventilation for the building, they were keen to find a louvre window product that also met some of their other key objectives which were:

- A wide louvre span.
- A high quality, robust product.
- An aesthetically pleasing window.
- Impenetrable security.
- Ability to integrate with the Building Management System.

## Product Suitability

Given that maximum louvre span was

important, Safetyline Jalousie louvre windows were the perfect choice as they offer one of the widest louvre windows available (up to 1.4 m) to the Australian market.

They needed a high quality product that was not only robust, but also aesthetically pleasing. Safetyline Jalousie fit the bill demonstrating both these attributes.

The other features that appealed to the architects were the inbuilt security that comes with all Safetyline Jalousie louvre windows and the impressive automation system that integrates well with Building Management Systems (BMS). This Sports Centre is fully automated and has a keyless entry system. Safetyline Jalousie's automation system was seamlessly integrated to the overall BMS.

The use of Safetyline Jalousie windows in school sports halls such as this one

is becoming increasingly popular across Australia.

## Project Specifications

Quantity supplied: 88 frames with 5 & 18 louvre blades.

Height: Varying heights from 739 to 2448 mm.

Width: Varying widths from 700 to 1400 mm.

Colour/Finish: 25 micron clear anodised.

Louvres: 6 mm EVantage grey toughened glass.

"Safetyline Jalousie was the perfect solution for this building project. While generating the desired cross-flow ventilation was the most important objective for us, we were impressed that their louvre windows were able to meet a range of other objectives we had established."

Craig Stephen, Architect, Timothy Moon Architects.



Left: Achieving maximum natural ventilation with Safetyline Jalousie's louvre windows

Above: Exterior of the new sports centre



# The Cheesecake Shop

The Cheesecake Shop recently completed their new headquarters located in an office and warehouse complex at Villawood in Western Sydney. A stunning daylighting feature, designed by PTI Architecture, in the central stairwell was the focus of Solatubes 2013 ICE awards.

The office restoration involved building a double storey square platform. An open plan design was selected and aimed to maximise natural lighting to the first and ground floor of the office. A large atrium was created in the middle of the “square” with a stair linking the two floors.

## Objective

The architect wanted to create a feature that celebrated the freedom and equality of daylight, but at the same time was functional. The product used to achieve this feature had to comply with the Building Code of Australia section J requirements.

## Products Used

- 24 x 750DS Solatube Daylighting Systems

## Solution

The Architect selected the SolaMaster 750 DS being a large skylight capable of providing enough daylight for commercial applications. To achieve the spectacular display in the atrium, they created a “swiss cheese” effect, by using multiple Solatube Daylighting Systems in a purpose built architectural feature. With careful planning and positioning of the daylighting units, the architect achieved daylight penetration to every corner of the room below from a central location.

## Testimonial

“In order to maximise sunlight while satisfying Section J of BCA, we sought a skylight system that would serve our purposes without losing internal heat during winter. Solatube provided the perfect answer. The features of the Solatube product allowed the architects to create not only a functional and beautifully lit space but an aesthetically pleasing effect appreciated by the staff and admired by all visitors for its allegorical representation of The Cheesecake Shop business”.

- Warwick Konopacki, Managing Director, The Cheesecake Shop





As one of the earlier members of NATSPEC, the Air Conditioning and Mechanical Contractors' Association have long recognised and supported NATSPEC's vision to improve the construction quality and productivity of the built environment, through leadership of information. Whether you are a home builder, local government, commercial contractor or consultant, the range of products, training and other resources available through this not-for-profit organisation is extensive and up to date.

We congratulate NATSPEC the organization and all of its staff and industry supporters for its work and ongoing success.

AMCA National Executive Director, Christopher Rankin.



VICTAULIC is a worldwide leader in mechanical piping solutions. Since pioneering grooved end technology for mechanical pipe joining in 1925, VICTAULIC has been providing customers the world over with innovative, reliable piping systems solutions for multiple applications and markets.

[www.victaulic.com](http://www.victaulic.com)



Viridian is Australia's number one glass provider and the only manufacturer of float glass and hardcoat performance glass products in Australia. Being a part of CSR Building Products, and with a long history of glass making in Australia, Viridian is able to offer comprehensive glass and glazing solutions across Australia and New Zealand.

Viridian was created in 2007 when CSR acquired Pilkington Australia and DMS Glass. This enabled CSR to strengthen its already impressive range of building and construction products by adding glass and glazing capabilities.

Both Pilkington and DMS have proud histories of new and innovative ideas. Viridian continues that tradition of innovation and our goal is to help the building industry to use glass in extraordinary ways.

The Viridian brand will continue the Pilkington and DMS tradition of providing ingenious and environmentally sustainable glass solutions for our truly unique environment. Viridian Glass, in all of its forms, will bring us light, views, warmth and a sense of space. At the same time it will offer protection from noise, dust, pollution, glare, intruders and onlookers. Viridian offers glass that transmits light yet blocks heat, and glass that can clean itself. [www.viridianglass.com](http://www.viridianglass.com)



#### **Wattyl® - Trusted by Australians since 1915**

Wattyl is an iconic brand that has been providing professional Australian coating solutions for 100 years. Its range covers preparatory products, top-coats, sealers, stains, oils and varnishes; offering both interior and exterior coating solutions to suit many applications, across residential, commercial, industrial, marine and speciality buildings.

Wattyl is manufactured by The Valspar Corporation, one of the world's largest global coatings manufacturers. In Australia, Valspar's Leading Paint Brand portfolio also includes Solver® and Granosite®. [www.wattyl.com.au](http://www.wattyl.com.au)



# Studform's Seismic Ceiling Grid at the new Royal Adelaide Hospital

A critical design criterion for the new Royal Adelaide Hospital (new RAH) was continuity of building service post-disasters. Today, improved engineering practices ensure buildings structurally survive earthquakes, although they are generally evacuated due to the hazards created by the failure of non-structural elements. These hazards include exposed services (such as electricity, water & gas), dislodged fixings (i.e. lights, ceiling grid and tiles) & non-fixed elements (ie cabinets and storage lockers). Many of these elements can render hospital facilities useless when needed most with debris, unknown substance leaks, unhygienic conditions and an unworkable environment.

To make sure the new hospital was prepared for anything the design team set out in search of Australian examples of best practice in withstanding disasters, and found themselves looking overseas for suitable applications. Upon review of the data collected they were forced to revisit all construction elements and put a callout to suppliers to exceed the accepted industry standards of performance and strictly adhere to AS 1170.4 to meet this new hospital's post disaster.

Studform was already in the ceiling grid market with the Kwikloc ceiling grid system and took up the challenge. By collaborating with seismic experts, major product improvements were developed and then rigorously tested in the USA. The Kwikloc Seismic ceiling grid was born and the design far exceeded the new RAH requirements.

Studform won the contract to supply 16 hectares of ceiling grid. The unique elements of the patented design were the floating wall angles (and the seismic bracket) opposite fixed wall angles: this provides the ceiling with a strong anchor to two walls while allowing the ceiling to move freely on the horizontal plane.

The application of the Kwikloc Seismic system also ensures the following benefits in a hospital environment:

- Hygiene Performance – Accurately nested ceiling tile to grid interface ensure an ultimate hygiene outcome.
- Even Plane – All grid sections including



Eastern Piazza

grid to wall angle connections maintain a flat even plane throughout the system without joggling of components on to others which averts sag pressure commencing with the tiles.

- Kwikloc connection system – The grid connects quickly together reducing installation times.
- Minimised bracing requirement - With the host of services required in ceiling/soffit cavities in today's hospitals the Kwikloc Seismic Solution allows for minimal bracing up to 81 m<sup>2</sup>> an excellent and essential alleviation to these congested areas.
- Technically advanced – Sustains forces up to 3G with 100% vertical uplift. This is 30% above other available systems on today's market.



New RAH Inpatient bedroom - services installed



New RAH Inpatient bedroom – complete

# Inspiring Istana interiors with Taubmans Pure Performance



The Istana project in A'Beckett Street, Melbourne is a short walk from the iconic Victoria Market and oriented to make the most of the heritage-listed green space opposite.

The Istana's architect, CK Designworks, working with owner Magna Prima Berhad, considered it particularly important to ensure the Istana's 320-apartment tower sat comfortably within its heritage surrounds. To achieve this, it was designed with a strong massing and façade treatment – a blend of precast texture surfaces and art faced perforated podium façade panels – coupled with striking vertical elements.

Equally, the interiors of the one, two and three-bedroom apartments, and the two-story penthouses, required the same sophisticated treatment. To achieve this objective and appeal to the luxury buyer, the right interior finishes and coatings were crucial. Typical interiors employ a palette of soft and contrasting feature colours for walls and ceilings, combined with Jarra and Tallowwood flooring.

Construction company Hickory Group chose Taubmans as their interior paint partner for the luxury 25-floor apartment tower. Taking advantage of their extensive colour palette, the Taubmans team helped articulate the interiors, by discussing colour options and recommending a high-tech formula product that provides maximum hiding power and superior coverage, while delivering excellent application efficiency.

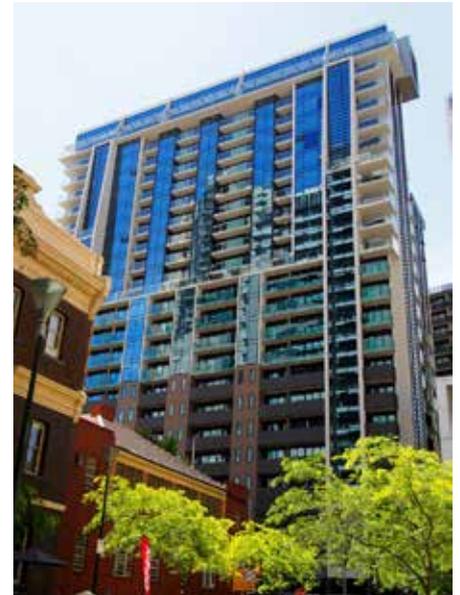
Taubmans Pure Performance, which is low in volatile organic compounds (VOCs) for maximum indoor air quality, was used. It is exclusively engineered with Microban® antibacterial protection, which inhibits the growth of harmful bacteria, mould, mildew and fungus, enabling a cleaner fresher and safer home environment. Designed for easy-living spaces, it is also scruff resistant, highly washable and approved by the National Asthma Council Australia's Sensitive Choice program, which helps people identify asthma- and allergy-aware products.

To complete the project, Taubmans also commissioned specialised paint products for the entry doors. "These were highly

unique three panel entry doors," Hickory Group Project Manager Rino Colaci explains. "They were taller than normal, with stained timber on the outside, copper weave inserts, and a painted finish on the inside, facing the apartment. It was critical that these elements were perfectly finished to create a positive first impression as you enter the apartment space."

Colaci said he appreciated not only the high quality and technical performance of Taubmans product but also the professionalism and service provided by their team, who undertook monthly quality inspections throughout the six months taken to complete the painting task.

*Right: The 25-storey residential and commercial mixed use building was completed in 2014 and is located in Melbourne's CBD*



*The Istana's 320 luxury apartments were designed to be modern and simple, with finishes of the highest quality*



*Taubmans Pure Performance paint, used throughout Istana's interiors, is low in VOCs and odour*

## Termguard synergy with modern architectural design

The structure was purpose designed for the Latter Day Saints church patrons in Campbelltown, south-west Sydney. The church is 2460 m<sup>2</sup> in total area and consists of 14 separate slab pours that are supported on concrete footings and brick work.

Termguard Reticulation Systems are considered a primary Termite Management System, because they prevent concealed termite entry by preventing access to the slab edges. All physical Termite Management Systems force termites to a point of visual identification after the termites have made entry into the building cavity.

The stigma of the word 'chemical' has been the greatest challenge for Termguard Sydney Pty Ltd (Termguard). As explained with any Termguard System there is no opportunity for airborne chemical drift or contamination, or danger due to the direction hose pump tank connection to the Termguard Reticulation Systems fill points.

### Objective

The structure was designed and engineered in house by Latter Day Saint Church Architects and Engineers. The project was then sent out for tender with Richard Crookes Construction securing the tender. As part of the tender process, Termguard was approached to design a Termite Management System that would satisfy the regulatory authority requirements and be integrated within the design.

Highly reactive soils were a major consideration for the Engineers, and this impacted the design and specifications of the Termguard Management System. The Engineers required a 50 mm void form to be installed under each of the slabs. The Termguard Management System easily accommodated this requirement and assisted in the breaking down of the cardboard void form material as requested by the Engineers, while effectively distributing the Termiticide to the relevant areas.

A major benefit of the Termguard System is that it is very cost effective and easily adapted in various construction methods.

### Termguard Products Used

- 14 single Termguard Ultimate Systems.
- Dual internal Termguard Reticulation Lines.
- Dual Termguard Perimeter Reticulation Systems.

### Solution

The final design of the Termguard Reticulation System consisted of 14 single Ultimate Systems with various square meter coverage to accommodate each of the slab dimensions. In addition to the Ultimate Systems, dual internal Termguard Reticulation Lines were installed to effectively treat the various footings. The final aspect of the Termguard System was to install a dual Termguard Perimeter Reticulation System as part of the landscape design. The total area protected by the Termguard Ultimate

System was 2400 m<sup>2</sup> with additions of 624 linear meters of Termguard Pipe being installed against footings, both internally and externally.

Not only were all works completed without delay to build time, we also managed to come in under budget at \$56,000.

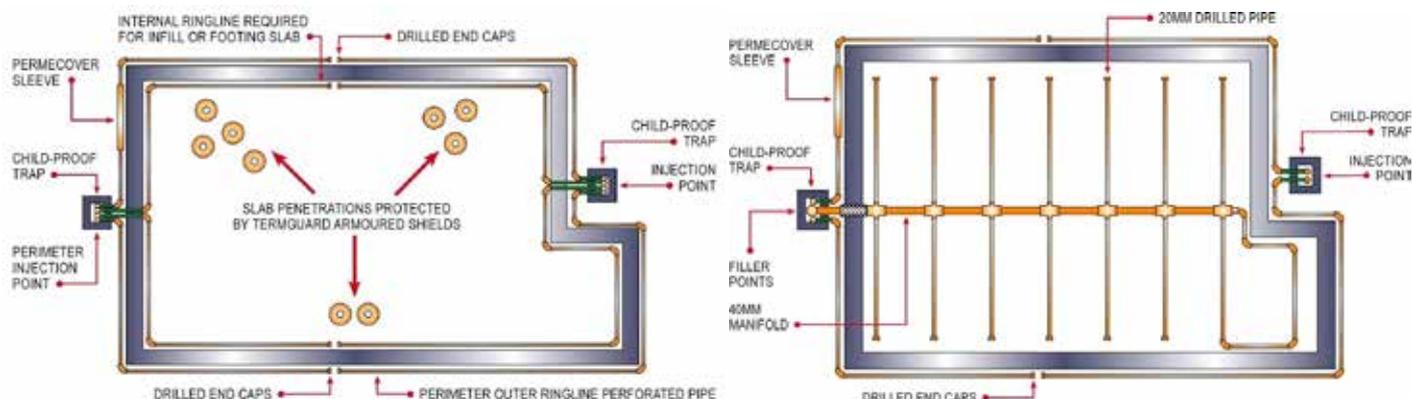
Termguard has been providing ongoing maintenance for this property for the past 12 years without complication or complaint.

### General Consensus

The general consensus from builders is that the Termguard Reticulation System is the most cost effective system on the market today which does not impact on build times or cause delays with other trades.

As with any Termite Management System, it is inevitable that some systems will fail and allow concealed termite entry into the property. Termguard has received no claim made against them in regards to the effectiveness of the system to deliver chemical emulsion, as required by the relevant Standard for termite protection for new building works.

The Termguard System is supported by a 50 year product warranty.



# NCI's Super Computer Runs on Victaulic Solutions



The Australian Federal Government invested \$50 million for the Climate HPC Centre Project, \$25.3 million of which was for the construction of the National Computational Infrastructure's (NCI) purpose-built data centre, at the Australian National University in Canberra. The facility houses the most powerful computer systems available to researchers in Australia. The supercomputer debuted in 2012 and ranked #24 worldwide on the "Top 500" list of best supercomputers.

The NCI facility is a unique development spread across 4,000 m<sup>2</sup> and provides high performance data storage and cloud computing services that enable researchers to process large volumes of data that would otherwise take years to complete. The aim of the centre is to raise the ambition, impact, and outcomes of Australian research through access to advanced computational and data-intensive methods, support, and high-performance infrastructure.

Construction of the facility commenced in July 2011 with a team of professional consultants from Benmax Group. One of the critical factors during the build of NCI was the complex engineering design of the centre. Careful consideration needed to be given to the design conditions, so that the external appearance does not reflect an industrial complex. The complexity and uniqueness of the design presented

several unprecedented challenges. Key considerations included meeting demanding schedules, ease of installation and maintenance, project coordination, cleanliness, aesthetics, and reduced mechanical room footprint. Switching from welding to grooved-end mechanical pipe-joining systems proved to be the solution that met all the owner's criteria.

To address these requirements, Benmax selected Victaulic roll grooved piping systems for the HVAC system. A complete range of Victaulic couplings and fittings were installed with ease, with only a small number of equipment and tools required on site, making it the perfect piping solution for the mechanical room at NCI's facility.

The ease and speed of installing the 13 pump sets with Victaulic pump dressing products helped Benmax Group deliver the project safely and on schedule. The use of suction diffusers freed up a lot of space for a greater number of computers and equipment to be installed.

The Victaulic pipe-joining solution was quick to install and reduced the field man-hours at every stage of project management while eliminating liquidated damages. The fundamental design of the Victaulic method allowed for the majority of pipework to be cut and grooved in the Benmax workshop and delivered ready

for installation. Compared to traditional pipe joining methods, such as flanging or welding, using a grooved-end pipe joining installation was faster, easier and simpler, saving both time and money.

The Victaulic grooved pipe joining method also eliminated the safety concerns associated with open-flame pipe joining methods, meaning that workers were not exposed to dangerous fumes.

Scott Polsen, Director of Benmax explained, "We look for suppliers who can deliver good quality products that are easy to use and are relatively quick to install and in this instance, Victaulic has given us that with their HVAC solution. Various OHS requirements were eliminated by using Victaulic roll grooved piping systems, making the job a lot safer and a hassle-free."

Easy installation and maintenance, elimination of jobsite fire hazards, integrated systems and value-added services aided the owner, contractor and engineer of the ANU to meet construction deadlines and save on costs. By using Victaulic piping products on the HVAC systems, the vision of Australia's national research computing facility was realised despite various engineering and design challenges.



*"We look for suppliers who can deliver good quality products that are easy to use and are relatively quick to install. . . Victaulic has given us that with their HVAC solution"*



# SKYWALKER Macquarie Group Global Headquarters, Sydney

Inspired glazing sets the tone for the interior of Macquarie Group new global headquarters.

Engineered glass skybridges star amongst the feature elements of a reworking of this aged, former bank. It is now not only high-tech but also fully considerate of the well-being and outlook of the employees.

Architects Johnson Pilton Walker's (PTW) design is a stellar blend of new and old, light and shadow. The project is a 6 Star Green Star building and a great example of converting a building almost 100 years old to demonstrate design leadership and sustainability.

Comprising nine levels within the existing building envelope, cutting-edge offices surround a central atrium. It was important to Macquarie that the roof makes a statement and expresses itself to the surrounding city.

Macquarie requested more natural light and improved workplace connectivity. The atrium is now really the workplace heart. On the upper levels, the client and conference spaces within the roof, and foot-bridges form an important part of the circulation pattern and arrival sequence. Visitors arrive from the glass lifts onto the glass bridges. There they look into the atrium and can see the way the whole organization fills the building. The footbridges needed to be designed in a way that minimised their impact on natural light falling down into the atrium.

Viridian was called to share their skills, experience and ability to design. There is a certain inevitability about the need for glass for this particular use that helped people to get on board very easily.

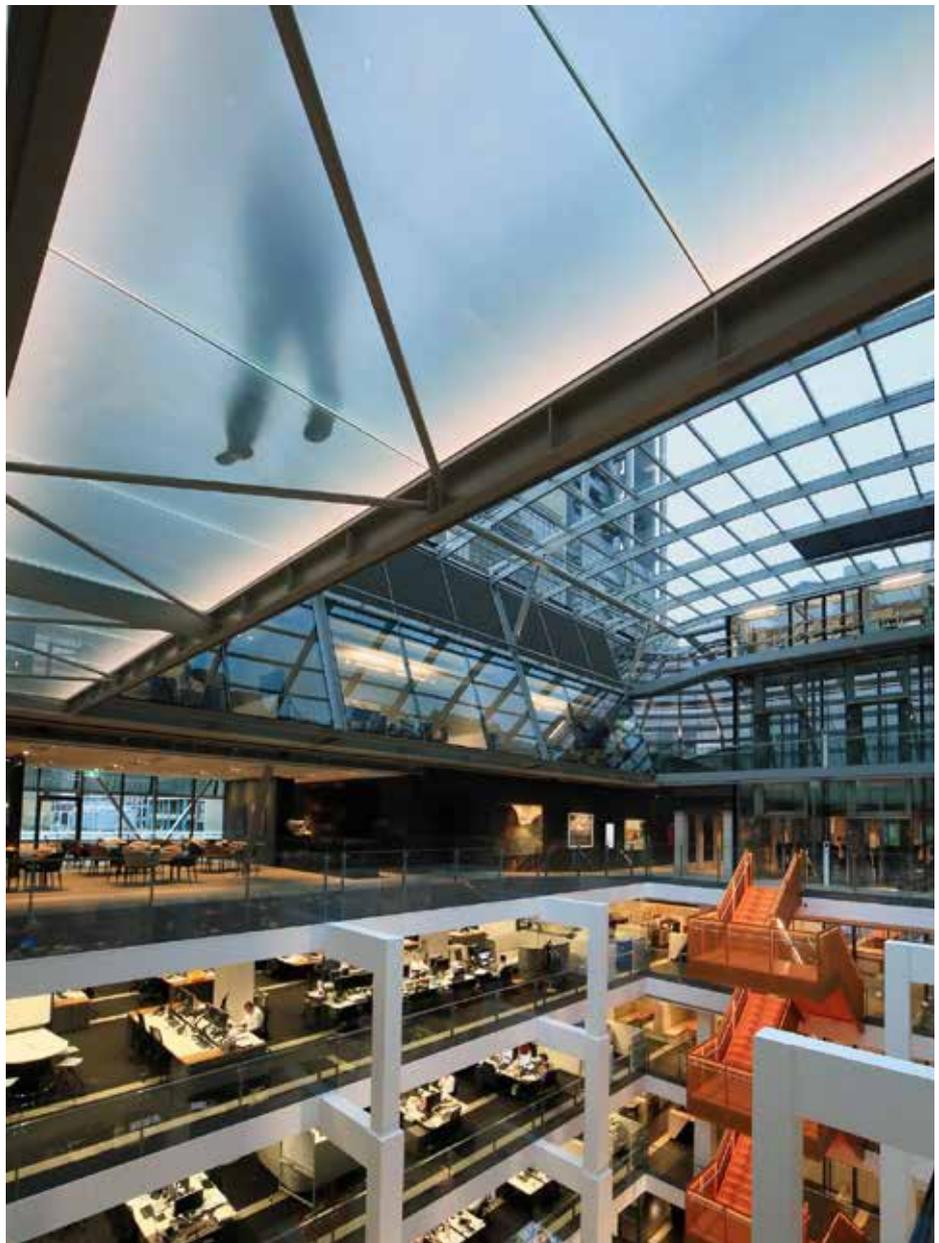
Matthew Morel from PTW explains: "There was a long discussion about the glass needed for this project; all the different types of frits, build-ups, types of glass. There is a significant amount of testing required for frit, light transmission, side-lighting and so on. At the end, the glass selected was a frit for the top surface that was a combination of two different patterns and thicknesses resulting in a bespoke custom laminate make up."

There were also a lot of considerations in selecting Viridian translucent glass. Vertigo was one, but also visual privacy for people standing on the bridges. Slip resistance and ease of cleaning influenced the decision. The architect also wanted large sections of glass to minimize joints and to edge-light the glass. That needed a lot of testing by the Viridian glass specialist and engineer.

"These Viridian glass types respond in a really interesting way to changing light. You

can see that at different times of the day, glass becomes this wonderful, luminous surface that you either walk under or on it. It creates unexpected light and shadow", explains Matthew.

For this project, the glazing contractor made the choice to work with the Commercial & Design division of Viridian. Viridian Commercial & Design focuses on serving the market for purpose-processed glass and glazing systems, including design install services.



Macquarie Bank Headquarters, 50 Martin Pl, Sydney NSW 2000 – Viridian Glass Footbridge

# Charles Perkins Centre



Charles Perkins Centre at the University of Sydney is a purpose-built research and teaching facility dedicated to easing the burden of obesity, diabetes and cardiovascular disease and their related conditions. It provides state-of-the-art facilities and technology for more than 1,500 students and over 900 researchers. The building has a striking full height atrium which allows natural light into the interior. There are wet and dry teaching spaces and laboratories, patient facilities, and an auditorium.

Many of the laboratories required coatings with extremely high levels of durability and serviceability. Over 20 colours were selected. The coating systems were also required to have low VOC emission values. Wattyl worked closely with the architect (FJMT) and the builder (Brookfield Multiplex) to develop paint specifications to suit the interior requirements of this building, coating approximately 90,000 m<sup>2</sup>. Wattyl i.d Interior Design and the new Solver® Ultra Clean Air were used on most of the walls and ceilings. Wattyl Aqua Trim water based enamel was used on the doors and trims, and the walls of many of the laboratories and research facilities.

Wattyl also worked closely with the painter to ensure that paint was supplied to suit the construction schedule and helped to see the project completed ahead of schedule in December 2013.



Wattyl was chosen to coat approximately 90,000 m<sup>2</sup> of the Charles Perkins Centre



0345p VALSPAR - WATTYL steel protective paint coatings, 0671p VALSPAR - WATTYL painting, 0672p VALSPAR - GRANOSITE textured and membrane coatings

[www.wattyl.com.au](http://www.wattyl.com.au)

## PRODUCT SPECIFYING AND SUBSTITUTION

### PROPRIETARY SPECIFYING

In NATSPEC *Proprietary* means identifiable by naming the manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.

### GENERIC SPECIFYING

The aim of the specification writer in customising NATSPEC for a project is to describe performance as follows:

- Measurable outcomes in terms of:
  - Conformance to a standard.
  - Product tolerance.
  - Construction tolerance.
  - Delivery and energy use.
  - Durability.
  - Compatibility with existing systems.
- Comparable outcomes in terms of:
  - Colour and texture.
  - A benchmark description.

Evaluation criteria include:

- Type tests.
- Evidence of conformance to a recognised certifying body such as JAS-ANZ.

### SUBMISSIONS

NATSPEC has provisions for specifying particular requirements for submissions. Provision is also made for specifying time and program constraints for submissions. The clause relating to information submissions for building products (under the 0171 *General requirements* worksection SUBMISSIONS heading) is:

#### Requirement

Products: Products and materials data, including manufacturer's technical specifications and drawing, evidence of conformance to product certification schemes, type test reports, performance and rating tables and installation and maintenance recommendations.

### NATSPEC POLICY ON SUBSTITUTION

In order to maintain the contractor's contractual responsibility in regard to supply, NATSPEC allows for substitution within the 0171 *General requirements* worksection. The following italicised text is taken from the PRODUCTS clause:

#### Substitutions

*Identified proprietary items: Identification of a proprietary item does not necessarily imply exclusive preference for the item so identified, but indicates the necessary properties of the item.*

*Alternatives: If alternatives to the documented products, methods or systems are proposed, submit sufficient information to permit evaluation of the proposed alternatives including the following:*

- *Evidence that the performance is equal to or greater than that specified.*
- *Evidence of conformity to a cited standard.*
- *Samples.*
- *Essential technical information, in English.*
- *Reasons for the proposed substitutions.*
- *Statement of the extent of revisions to the contract documents.*
- *Statement of the extent of revisions to the construction program.*
- *Statement of cost implications including costs outside the contract.*
- *Statement of consequent alterations to other parts of the works.*

*Availability: If the documented products or systems are unavailable within the time constraints of the construction program, submit evidence.*

*Criteria: If the substitution is for any reason other than unavailability, submit evidence that the substitution:*

- *Is of net enhanced value to the principal.*
- *Is consistent with the contract documents and is as effective as the identified item, detail or method.*

*Optional text (from Guidance):*

*Costs: Pay the cost of submissions and of evaluations and tests of proposed alternatives, whether subsequently accepted as a variation or not. The costs will be calculated at the current charge-out rates of the relevant consultant(s).*

### NATSPEC PRODUCT PARTNERS



A NATSPEC Product Partner is a building product manufacturer with an agreement with NATSPEC to include a purpose edited worksection in NATSPEC. See branded worksection.

A NATSPEC branded worksection is a technical worksection produced in NATSPEC format in conjunction with a Product Partner. Branded worksections provide specifiers with an alternative to the generic worksection where a particular product has been selected at the design stage.

The research prior to the selection of a product or system is filtered, both formally and informally, to eliminate inappropriate choices. The requirements of the client, regulators, standards, and the designer all affect whether the selection is presented as a generic or a proprietary item. The NATSPEC worksections facilitate the recording of both types.

All manufacturers are acutely aware of the problem of substitution by the contractor. It is being exacerbated by the lure of cheap and sometimes fake imports. Consultants are also affected as they spend considerable time and effort selecting a product, finish or electrical/mechanical system as part of their design responsibilities.

(Italicised text on the left is from the NATSPEC *General requirements* worksection.)

#### Relevant worksection

0171 *General requirements*

#### Related TECHnotes

GEN 014 Submissions and testing

## Scope for improvement? Risks of deficient specifications

ashurst



By Steve McKinney, a partner at Ashurst who specialises in procurement and construction projects.

In drafting and negotiating construction contracts, the focus is often on the allocation of risk between the parties and legal terms and conditions. However, the specifications and other scoping documents play a fundamental role in defining the work actually required to be performed. The specifications and legal terms (ie the conditions of contract) are part of the same contract and therefore need to “speak with the same voice”. Any uncertainty or ambiguity in the specifications, or any inconsistency between the specifications and the rest of the contract is dangerous and can result in dispute and litigation.

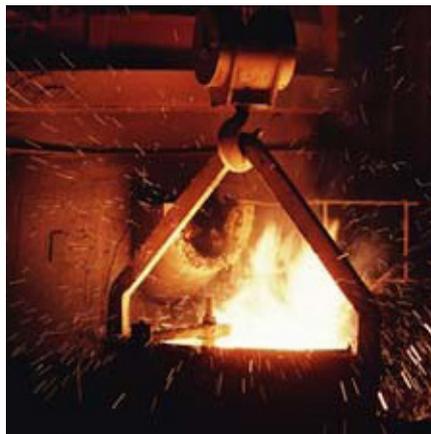
These risks are highlighted in the cases outlined below.

### **Mainteck Services Pty Ltd v Stein Hurtey SA**

BlueScope Steel engaged Stein Hurtey to supply and install furnaces and Stein Hurtey entered into a subcontract with Mainteck. The subcontract was unclear as to what Mainteck was required to deliver. It stated that the “scope of supply and services to be performed by each party” was set out in the technical specification in the head contract. However, the head contract technical specification did not divide the work between Stein Hurtey and Mainteck.

Mainteck argued that the scope of work should be limited to the Bill of Materials attached to the contract, read in light of the various “Scope Meetings”. However, Stein Hurtey argued that the subcontract was inextricably linked to the head contract and Mainteck’s scope should be defined by reference to the head contract. It noted that the head contract pricing schedule specified a “Maintech Portion”. The Court found in favour of Stein Hurtey.

The Mainteck case highlights the difficulty that can arise when the exact scope of work has not been made abundantly clear. This uncertainty resulted in a major dispute and the Court was required to go to significant effort (and consider all of the surrounding circumstances) to determine what was the actual scope of work.



### **Cable v Hutcherson Bros Pty Ltd**

Cable engaged Hutcherson to construct, install and maintain a bulk storage and handling plant. Cable had prepared drawings and specifications for the bulk storage units, but these did not cover the design of the foundations. Hutcherson submitted a foundation design as part of its tender and this was accepted as a contract drawing. After substantial completion of the work, it was discovered that the foundations were unsuitable for the site.

The High Court concluded that the contract only required Hutcherson to

build to the drawings (which included Hutcherson’s foundation design) and the specifications. As the specifications did not describe the requirements for the foundations, Hutcherson could not be held responsible for the failure (even though it was Hutcherson’s design).

The Cable case shows what can happen if the specifications are not drafted to cover all of the work required to be undertaken under the contract.



### **How to avoid risks relating to the specifications/scope of work:**

- Carefully review the specifications to ensure consistency with the rest of the contract
- Avoid using inconsistent terminology between specifications and rest of the contract
- Do not include in the specifications any matters already covered in the contract
- Avoid including legal and risk allocation terms in the specifications (these should only be in the conditions of contract)
- Avoid including additional documents in the contract (eg from the contractor’s tender) which may conflict with the specifications
- Ensure there is an appropriate order of precedence clause (setting out what happens if there is inconsistency between different contract documents)

## SUBMISSIONS AND TESTING

### INTRODUCTION

This TECHnote addresses the specification of the various contractor's submissions and tests that may be required during the construction process.

### SUBMISSIONS

#### Contractual

Submissions requiring approval before work can proceed create hold points in the contract. Submissions which typically create hold points include:

- Authority approvals
- Building penetrations
- Calculations
- Certification
- Design
- Drawings
- Execution details
- Fire hazard properties
- Maintenance manuals
- Marking and labelling
- Materials
- Products
- Prototypes
- Records
- Samples
- Shop drawings
- Specifications
- Subcontractors
- Technical data
- Tests
- Warranties

Requesting these submissions requires the contract administrator to perform a duty and accept responsibility for that duty.

#### For information only

If submissions are required for information only, they are witness points, intended to assist the contract administrator. Submissions which typically form witness points include:

- Non-contractual construction programs
- Inspection and testing plans
- Accident reports
- Type test reports
- Site photographs
- Environmental management proposals
- Product certification and manufacturers' data

Do not request submissions indiscriminately. Fewer should be required under a quality assurance scheme.

#### Submission approval and acceptance

NATSPEC, as a generic technical specification, does not contain

management systems to handle the approval process. If an approval is required before implementation, consider nominating a hold point, to eliminate ambiguity. Consider documenting approval criteria and the acceptance procedure.

### TESTS

Inspection and testing of the works can be requested in the documentation.

Testing and laboratory services may be procured by one of the following methods:

- Principal appointment, employment and payment.
- Principal appointment and employment but contractor payment.
- Contractor appointment, employment and payment.

NATSPEC worksections, which address the contractor, assume the third option applies.

It is the prerogative of the contract administrator to call for an inspection that may involve a hold point. Indicate in the technical worksections which tests, if any, are hold points and make sure the affected parts are not concealed, until directed.

Minimise the number of these tests as late approval can lead to delay claims.

#### Testing authorities

If NATA accredited authorities are required for particular site tests, say so in the appropriate technical worksection. Otherwise, the contractor may carry out site tests. If the testing authority must also be independent, say so in the appropriate technical worksection or, in the 0171 *General requirements* worksection if it is a global requirement. NATA publishes a register of accredited testing authorities.

#### Product certification schemes

If JAS-ANZ accreditation is required for a particular product, say so in the appropriate technical worksection. JAS-ANZ has an online register of certified organisations, Conformity Assessment Bodies (CABs) and products.



#### Product certification schemes

Include:

- ActivFire Scheme
- The Australian Gas Association (AGA)
- The Australian Communications and Media Authority (ACMA)
- The CodeMark Product Certification Scheme
- Forestry Chain of Custody (AS 4707)
- StandardsMark-SAI Global
- WaterMark Certification Scheme (WMCS) (MP 52 or AS 5200)
- Water Efficiency Labelling and Standards (WELS) Scheme

#### Relevant websites



National Association of Testing Authorities, Australia  
[www.nata.asn.au/](http://www.nata.asn.au/)

Joint Accreditation System for Australia and New Zealand  
[www.jas-anz.com.au](http://www.jas-anz.com.au)

#### Related worksection

0171 *General requirements*

#### Related TECHnotes

GEN 006 *Product specifying and substitution*  
 GEN 009 *Hold points and witness points*

# Litigation in the building and construction industry resulting from poor specification



Keith Redenbach, Partner, Atanaskovic Hartnell

## Introduction

The specification of any contract in the building and construction industry is essential, being one of the key component parts to any binding and sensible contract. Parties that do not turn their mind to including a robust and appropriate specification will do so at their own peril, in particular increasing the risk of legal disputation. This article addresses some of the key legal issues when it comes to the specification.

## Background

There are three essential parts to any building contract:

1. A formal part or instrument of agreement, ensuring the contract is able to be executed properly
2. A set of general terms and conditions, setting out the essential provisions which apply to the bargain of the parties
3. The specification, which sets out the essential parts of the scope of the work

Much litigation has taken place in the building and construction industry in relation to all of these parts, noting that recently “security of payment” legislation has also entered the contractual fray. It is the order and effect of the third of these critical pieces to which I now turn.

## Order of precedence of the specification

I was involved in a Supreme Court dispute relating to what order of precedence each of these parts had, since each of them contained a clause putting the document in which they were located as the highest order. Hence, there were three possible highest orders of precedence. The parties obtained special rulings about this issue, before other issues were able to be ventilated to resolve the underlying dispute.

Cases involving inadequate precision within specifications also occupy much court time. One matter I was involved in took the rather unfortunate turn of having to look at ambiguities between parts of a specification. The parties had reached agreement about the specification, but parts of it were inconsistent and ambiguous. The owner party argued that the generality of the specification included implied items such as landscaping of uncovered areas – the builder party stated that unless specifically mentioned, items such as these would be priced as a variation and extra time and costs awarded to it. In the end, after many thousands of dollars in legal costs, only the general conditions were able to resolve this, as they contained an ambiguity provision which assisted to resolve the inadequacy of the specification.

## Impact of a specification on the scope of work

The specification will determine the amount of work that will be provided for

a lump sum contract. A failure to clearly specify items within the scope of work will open the owner up to costly variation claims, as well as the builder potentially having to mount costly legal arguments about the variations.

In one matter I was involved in, two parties to a contract for the construction of several residential building towers had priced several items as provisional sums, without enumerating the items clearly. When the works took the builder longer than anticipated (for other reasons), it began to look closely at the fine print to short cut what it had to do to complete the work. A dispute erupted about waterproofing, with the builder arguing it was not specified that a membrane the owner (who was obliged to third parties to waterproof the external areas with a specific membrane) needed to be applied to external areas. Finally, the parties briefed lawyers, who in turn pointed to the general conditions, allowing the superintendent to issue instructions as to valuation, and a variation was then ordered for reasonable costs.

## Conclusion

In most if not all cases, poorly worded specification will lead to legal complexities and, then, the possibility of long running legal cases. Adopting a clear specification increases the chance of an “on time, on budget” completion.



## HOLD POINTS AND WITNESS POINTS

### INTRODUCTION

*Hold points* and *Witness points* are construction stages which may need additional inspection, verification and documentation to make sure of:

- The safety of the personnel, environment and the public, before proceeding.
- The technical quality and any legal requirements have been satisfied.
- The next stage in the construction process can be completed.

Verification measures will vary with the specification method. For performance specifying, verification involves testing. For specifying by reference, verification is to a standard, or through third-party certification to that standard. Verification procedures are documented in the specification as *Hold points* and *Witness points*.

### HOLD POINT

A *Hold point* is a mandatory verification point beyond which a work process cannot proceed without authorisation by the contract administrator. *Hold points* are usually assigned to those critical aspects of the work that cannot be inspected or corrected at a later stage because they will no longer be accessible. The relevant work cannot proceed until the contract administrator is able to verify the quality of the completed work and releases the *Hold point*.

*Hold points* can be nominated by:

- The principal, in the contract documents.
- The contract administrator, with a Non-conformance or Corrective action report.

Use *Hold points* sparingly as each potentially affects project duration and cost.

### WITNESS POINT

A *Witness point* is an identified point in the work process where the contract administrator may review, witness, inspect or undertake tests on any component, method or process of works. The contractor is required to notify the contract administrator who may or may not take the opportunity. The subsequent activity however, may proceed.

### CONTRACTOR'S ROLE

The contractor is responsible for satisfying the documented contract requirements and planning, developing and maintaining a system assuring the detection of non-conformances and control of their resolution. The issue of a Non-conformance report or a Notice of non-conformance automatically creates a *Hold point*.

### AUS-SPEC APPROACH

AUS-SPEC is a specification system for the life-cycle management of assets. In AUS-SPEC Templates, *Hold points* are part of:

- 0161 *Quality (Construction)* and 0167 *Integrated management* worksections. The Quality plan for the works incorporates checklists, inspections, testing and documentation to make sure that the works comply with the contract documents. *Hold points* and *Witness Points* are included in the checklists. Examples of submissions include a quality plan or soil compaction test results for a prepared sub-base.
- The summary of *Hold points* and *Witness points* in each construction worksection provides a checklist for programming sequential activities and communication obligations.
- A Maintenance management plan combines the requirements of the Technical specifications, Quality manual and the Quality plan, for assuring quality in construction projects. The Maintenance management plan covers policy, organisation, selected procedures, maintenance planning and Activity specifications for maintenance activities. The Activity specifications form the core of the document which includes the nominated *Hold points*. For example, test results confirming compliance of materials like asphalt or requirements of the work order for the proposed maintenance work.

AUS-SPEC TECHguides provide further guidance on the use of *Hold points* and *Witness points* for the AUS-SPEC specifications. For more information on AUS-SPEC visit [www.natspec.com.au](http://www.natspec.com.au).

### NATSPEC APPROACH

NATSPEC Templates do not nominate *Hold points* in *Open* text. The **INSPECTION** clause in individual worksections includes *Guidance* text for nominating *Hold points* where they may be appropriate for inclusion in a project specification, e.g. inspecting formwork and reinforcement prior to placement of concrete, or waterproofing.

NATSPEC Templates use **INSPECTIONS**, **Notice** in lieu of *Witness points*.

### AUS-SPEC definitions:

**Hold point:** A defined position in the different stages of the contract beyond which work cannot proceed without mandatory verification and acceptance by the Superintendent.

**Witness Point:** A nominated position in the different stages of the Contract where the option of inspection or review may be exercised by the Superintendent, after notification of the requirement.

**Non-conformance report (NCR):** A mandatory (standard format) report submitted by the contractor that details the nonconforming work and the contractor's proposed disposition of the non-conformance.

**Notice of non-conformance (NNC):** Formal instruction from the superintendent regarding product non-conformance to that specified.

**Corrective action:** Measures, including preventative measures, taken to rectify conditions which have caused or might cause nonconformity.

**Corrective action request (CAR):** A formal advice/instruction from the superintendent regarding departures from the Quality system or methods as approved in the Quality plan.

**Disposition:** Action to be taken to resolve non-conformance.

### NATSPEC definitions:

**Hold point:** An activity cannot proceed without the approval of the contract administrator.

NATSPEC defines **Hold points** in *Optional* text in the *General requirements* worksection along with *Guidance* text on minimising contractor intervention of this kind to *accord with principles of quality assurance and risk allocation*.

**Contract administrator:** Has the same meaning as 'architect' or 'superintendent' and is the person appointed by the 'owner' or 'principal' under the contract.

### Relevant documents

0134 *General requirements (Supply)* (AUS-SPEC)

0135 *General requirements (Services)* (AUS-SPEC)

0136 *General requirements (Construction)* (AUS-SPEC)

0161 *Quality (Construction)* (AUS-SPEC)

0167 *Integrated management* (AUS-SPEC)

0171 *General requirements* AUS-SPEC TECHguides

Austrroads AGPD03/14 *Guide to project delivery – Part 3 Contract Management*.

# Four tips to avoid disputes with standards and specifications



Disputes involving standards and specifications are common in the construction industry. A major area of uncertainty and, therefore, dispute is the applicability of standards, particularly when determining whether a professional duty has been discharged negligently or in breach of contract.

Take the following examples of the obligations imposed on construction and engineering professionals at law.

- **WB Jones Staircase and Handrail Pty Ltd v Richardson [2014] NSWCA 127** concerned a balustrade which failed due to non-compliance with AS 1720.1- Timber Structures Code. The building company tried to argue that it was a “general builder” and as such had an overall knowledge of building requirements, but not the requirements of specialist sub-trades. The court accepted that some types of builders might not be expected to be aware of every standard applicable to the construction of a home (eg the standard applicable to a specialist trade such as that of an electrician), but considered that AS 1720.1 was an important standard that it should have been aware of. Accordingly, the builder was held to be liable.
- **BHP Coal Pty Ltd and Ors v O and K Orenstein and Koppel AG and Ors [2008] QSC 141** concerned the collapse of a mining excavator following repair works designed by an engineer. The engineer tried to argue that he had complied with a relevant international standard. The Court held that this was not reasonable in circumstances where the international standard had been at the relevant time the subject of a critical review by the issuing authority. Accordingly, the engineer was held to be liable.
- **Industrial Conveying (Aust) Pty Ltd v SKM Recycling Pty Ltd [2012] VSC 278** concerned the design and construction of a waste recycling plant. A key question was whether there was an implied contractual obligation to comply with applicable Australian Standards? The Court

held that where there was a statutory obligation to comply with Australian Standards, a corresponding contractual term would ordinarily be implied.

In contract, it is common for there to be uncertainty about whether standards provide the baseline for measuring performance. For example, standards do not necessarily have application without statutory or contractually sourced obligation. In residential projects, standards are often incorporated by statute. But in a commercial context, there can be great uncertainty about whether a standard applies and who is responsible for achieving it. Particular problems arise when standards are superseded.

Many such disputes can be avoided by taking these simple steps.

1. **Clarity:** Make sure the contract specifications clearly set out all requirements in respect of voluntary standards and codes. If you are a downstream party, like a contractor, subcontractor, engineer, architect, supplier or other consultant, this may require you to issue clarifications, deviations or qualifications, or to otherwise amend the contract prior to entry. If you are the upstream party, like a government agency, principal or financier, you should use a risk and opportunity matrix to check that the specifications (and balance of contract) match your expectations and requirements. It is useful to get a qualified independent person to perform a final sanity check.
2. **Discrepancies:** Make sure that there is a way of resolving inconsistencies, ambiguities and other issues between parts of the specification or between the specification and other contractual or extra-contractual documents. For example, if there are two applicable standards and one requires a higher level of performance, check that the contract prescribes which one needs to be complied with.
3. **Changes:** Make sure that the contract clearly states the obligations of and

consequences for all parties where standards, codes or other relevant guidelines are created, amended or discontinued. Check not only that the contract specifies the correct versions of standards or codes but also how the contract caters for changes occurring before, during or after the performance of works. In some contracts, this can be achieved by defining voluntary specifications and codes as legislative requirements.

4. **Maintain Currency:** Implement a system of ensuring you are up to date with the current standards. The specification of an obsolete standard, or pricing on an obsolete standard is a common error in the construction and engineering industry. Avoid being caught by this expensive error.

These are just a few methods to reduce the risk of uncertainty emerging from loose definition of applicable standards in specification. There is no substitute, however, for diligent analysis and review of contract documents.



Julian Mellick, Senior Associate

**BRANDED vs GENERIC WORKSECTIONS**

**BRANDED OR GENERIC?**

The foundation of the NATSPEC specification system is the worksection. NATSPEC worksections are selected and customised by the specifier to produce a project specification. In some instances, the specifier can choose between a generic worksection and a branded worksection when compiling the specification. This TECHnote defines the alternatives and outlines their advantages.

BRANDED WORKSECTION	GENERIC WORKSECTION
<p><b>Definition</b> A NATSPEC branded worksection is developed by NATSPEC in conjunction with the manufacturer, known as a NATSPEC Product Partner. It is a MS Word document <i>Template</i> which follows NATSPEC style and format and can be customised by the specifier.</p>	<p><b>Definition</b> A NATSPEC generic worksection is a MS Word document. It is a comprehensive <i>Template</i> which the specifier must customise by completing prompts, adding relevant material and deleting material which is not applicable to the particular project.</p>
<p><b>Classification</b> Each branded worksection is based on the associated NATSPEC generic worksection and shares the same classification number.</p>	<p><b>Classification</b> NATSPEC worksections are classified and sequenced in a logical order corresponding to common Australian construction industry sequence.</p>
<p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Provides an alternative to a generic worksection where a particular product has been selected at the design stage. Associated generic material not manufactured by the Product Partner is still provided.</li> <li>• Minimal customising required as the <i>Template</i> has been approximately 90% pre-edited in conjunction with the Product Partner.</li> <li>• Current product information is readily available and accessible via hyperlinks between the <i>Template</i> and the Product Partner's website reducing research time and facilitating early decision making.</li> <li>• The possibility of product substitution by the contractor may be reduced as the unique performance characteristics of the product are clearly specified.</li> </ul>	<p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Provides comprehensive coverage of a particular work area.</li> <li>• Adaptable for open proprietary specification where more than one brand or model number is acceptable.</li> <li>• Adaptable for closed proprietary specification where a branded worksection is unavailable.</li> <li>• Useful where the inclusion of brand names is not permitted.</li> <li>• The <i>Template</i> can be modified to create a new worksection where a NATSPEC worksection is not available.</li> </ul>

Regulations, standards, client and designer requirements will all have some influence on whether a generic or branded worksection is appropriate.

**SUBSTITUTION**

Manufacturers are aware of the problem of substitution by the contractor. To maintain the contractor's contractual responsibility in regard to supply, NATSPEC allows for substitution. However, text in the 0171 *General Requirements* worksection requires the contractor to provide the designer with the appropriate technical information to make an informed decision regarding the proposed substitution.

**Worksection Structure**

Each worksection is divided into:

**GENERAL** - applies to the worksection as a whole and includes cross referencing, standards, interpretation, tolerances, submissions and inspections.

**PRODUCTS** - describes the basic materials, components and fabricated items.

**EXECUTION** - sets out the construction performance criteria to prepare the substrate, assemble materials to produce an installation and carry out the works.

**SELECTIONS** - contains schedules that refer to the selection of proprietary products or to generic products by their properties.



**Open specifications**, such as descriptive, performance or reference specifications, can be satisfied by more than one product. An open proprietary specification is where there is more than one acceptable brand or model number.

**Closed specifications** can be satisfied by only one product. A single brand or model number may be nominated. However, some specifications which seem open are actually closed as only one product on the market will satisfy the criteria specified.

**Related TECHnotes**  
NATSPEC TECHnote GEN 006 *Product specifying and substitution* sets out the difference between proprietary and generic specifying, and explains the policy and means of managing contract variations related to requests for substitution.

**Related Worksection**  
0171 *General Requirements*

# Defective work in infrastructure projects - time limits



Defects are a major cause of disputes in construction projects. This article focusses on latent defects which are those defects not apparent at the completion of a project but which arise at some point in time in the future.

The time that a party is liable for these defects is limited dependent upon factors including the law relevant to the project, the Limitation Acts and other legislation of the relevant State or Territory, the type of instrument governing the relationship of the parties, and the cause of action being pursued.

The respective Limitation Acts around Australia provide that the limitation period for a claim based on a breach of contract or tort is six years (three years for torts in the NT) and a cause of action for breach of a deed is 12 years (15 years in VIC and SA) from the date on which the cause of action first accrues.

Accordingly, the critical date is the time when the cause of action 'accrues'. This becomes a very complex issue when considering latent defects as sometimes such defects cannot be seen at all, or can only be identified superficially in nature, appearing in advance of the full extent of the full latent defect. A number of cases have considered this question and the common position held have been when the defects become manifest or are otherwise discovered (*Cyril Smith & Associates Pty Limited v The Owners-Strate Plan 64970* [2011] NSWCA 181 (6 July 2011)).

The fact that the limitation period begins

to run only when the defects become apparent could mean that persons involved in infrastructure projects are exposed to litigious risk for a significantly long period of time, and perhaps even indefinitely. Recognising this as an issue, various States and Territories (other than QLD and WA) have introduced a 'long stop' limitation period of 10 years for damage arising out of works such as building work irrespective of whether the defect has actually become manifest. The relevant States and Territories have differing definitions of 'building works' and the event from which time runs. The following table sets out the relevant time periods for when time starts to run for each State and Territory:

It is relevant to note that all States and Territories, except for VIC, have the same interpretation of the application of the limitation period for which the respective 'long stop' provisions relate.

In all States and Territories except for VIC, 'long stop' provisions do not extend any period of limitation under the respective Limitation Acts. In other words, NSW adopts the 'long stop' interpretation being that a claim with respect to defects arising from building works must be brought either:

- within six years from when the action first accrues; or
- if the action does not so accrue then in any event within 10 years from the last date that building work was inspected by a certifying authority, or if no inspection, the date that part of the building is first occupied or used.

However, in VIC, the replacement approach is adopted. This means that time starts to run for 10 years from the date of issue of the occupancy permit in respect of building work, or if an occupancy permit is not issued, the date of issue of the Certificate of Final Inspection. Therefore in effect, the limitation period of Six years from when the breach accrues is not relevant for building work in VIC.

In conclusion it is essential that parties to a construction project, whether they are owners, developers, contractors, subcontractors or financiers, understand the extent and duration of their liability and rights in respect of the building work carried out. This will be determined by the jurisdiction adopted and the instrument chosen to carry out the works.



Scott Alden, Marketing Manager, DLA Piper

State/ Territory	Legislative Provision	Time Runs From
NSW	Environmental Planning and Assessment Act 1979, section 109ZK	Last date that building work was inspected by a certifying authority, or if no inspection, the date that part of the building in which the building work was carried out is first occupied or used.
VIC	Building Act 1993, section 134	Date of issue of occupancy permit in respect of building work, or if an occupancy permit is not issued, the date of issue of Certificate of Final Inspection.
SA	Development Act 1993, section 73	Date of completion of the building work.
TAS	Building Act 2000, section 255 and 256	Date of issue of occupancy permit in respect of that building, or if permit is not issued, the date of first occupation, or if not occupied, two years after the issue of a building permit relating to that building. If the building is occupied and there is no occupancy permit, on the date the work is completed.
ACT	Building Act 2004, section 142	Date of certification of completion, or if no certification, date of last inspection, or if no inspection, date that the building was first occupied or used.
NT	Building Act 1993, section 160	Date of issue of occupancy permit, or if no occupancy permit, the date of first occupation after completion of the work.

## SPECIFYING NCC REQUIREMENTS

### INTRODUCTION

NATSPEC provides worksection *Templates* for specifications that reflect industry practice. This TECHnote explains how NATSPEC incorporates the National Construction Code Series (NCC) requirements within these standard *Templates*.

The NCC includes: *Volume One - Building Code of Australia (BCA) Class 2 to Class 9 Buildings*, *Volume Two - Building Code of Australia (BCA) Class 1 and Class 10 Buildings*, and *Volume 3 - Plumbing Code of Australia (PCA)*.

### THE NCC

*The goal of the NCC (BCA and PCA) is to enable the achievement of nationally consistent, minimum necessary standards of relevant safety (including structural safety and safety from fire), health, amenity and sustainability objectives efficiently.*

As a performance-based code the NCC gives the option of designing to the deemed-to-satisfy provisions or designing to alternative solutions meeting the performance requirements. Clauses A0.8 and 1.0.8 explain compliance requirements for adopting the alternative solutions option and the documents which may be required to support the solution are listed in the introduction.

### NCC DOCUMENTS ADOPTED BY REFERENCE

The referenced documents (listed in Specification A1.3 of Volume One, Table 1.4.1 of Volume Two and Table A3.1 of Volume Three) support the technical provisions of the NCC and provide a detailed means of complying with its requirements. A document which is referenced by the NCC becomes part of the building regulatory framework.

### SUPERSEDED EDITIONS REFERENCED BY THE NCC

As it can take years for the updated edition to be adopted and the documents referenced within the NCC are continually updated independently, the NCC may cite superseded documents.

### HOW NATSPEC MAKES REFERENCE TO THE NCC

NATSPEC includes:

- Mandatory NCC specifications and referenced standards.
- Annual updates to the revised NCC requirements.

NATSPEC does not include:

- Administrative requirements of local government authorities.
- NCC state or territory variations or additions.

NATSPEC references the relevant NCC requirements within the appropriate technical worksection by the following methods:

- Direct reference: Service penetration fire-stopping systems: To BCA C3.15.
- Deemed-to-satisfy document reference: Tactile indicators: To AS 1428.4.1.

While NATSPEC is generally based on the deemed-to-satisfy provisions of the NCC, it also uses alternative solutions as follows:

- In some instances, the worksection is designed around current industry practices that are alternative solutions. In these worksections, *Guidance* is offered on the deemed-to-satisfy provisions and an explanation on why the worksection is oriented towards an alternative solution.
- In some cases, alternative solutions that are widely used in the industry are included in the *Guidance* text for specifier selection, if appropriate.

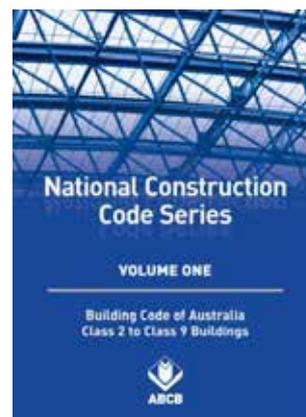
If the NCC references a superseded document, NATSPEC considers both the NCC referenced edition and the latest edition of the document. NATSPEC gives *Guidance* where a conflict exists between the NCC cited and current editions. The specifier may choose the deemed-to-satisfy superseded standard or the alternative solution, the current standard.

### NATSPEC REFERENCED DOCUMENTS

In *Guidance*, at the end of each worksection *Template*, NATSPEC lists all documents cited, including their number, date and title. These are grouped by their location either in the *Template* or *Guidance* text. If an NCC clause is cited within the worksection *Template* it will be included in this list.

### Relevant NCC edition

The annual edition of the NCC takes effect on the 1<sup>st</sup> May of each year. The specifier needs to comply with the relevant NCC edition at the time. Development Applications and Building Applications or Construction Certificates may rely on different NCC editions.



### NCC on relevant references

A reference in a *Deemed-to-Satisfy Provision* to a document under **A1.2** refers to the edition or issue, together with any amendment, listed in **Specification A1.3** and only so much as is relevant in the context in which the document is quoted. BCA A1.3(a)

Similar in BCA 1.1.3(a) and  
PCA A1.3(a)

### NCC on superseded editions

Where the BCA references a document under **A1.2** which is subject to publication of a new edition or amendment not listed under **Specification A1.3**, the new edition or amendment need not be complied with in order to comply with the *Deemed-to-Satisfy Provisions*. BCA A1.3(d)

Similar in BCA 1.1.3(d) and  
PCA A1.3(d)

### Relevant websites

[www.abcb.gov.au](http://www.abcb.gov.au)

### Relevant documents

NCC - Volumes One, Two and Three

### Relevant worksection

0171 *General requirements*

# Building disputes - the potent cocktail

MinterEllison



Phillip Greenham, Partner, Minter Ellison

Owners and builders alike have always approached construction disputes with a great deal of trepidation and hesitation. Delay, cost and uncertainty all conspire to make a cocktail that most would not care to sip.

Over recent years the challenges of such disputes have increased – the cocktail has become more potent.

A number of factors have conspired to add to this potency – high rise developments, class actions, proportionate liability and foundation failures are just a few worthy of mention.

There has been an explosion in the construction of high rise apartments in Melbourne and Sydney with a more gentle growth elsewhere. Two particular concerns have emerged from this frenzy of activity – waterproofing and fire resistance.

A number of high rise residential developments have suffered from poor waterproofing. Failure of membranes on balconies and inappropriate sealing between joints and penetrations are not an uncommon feature. The cause of such failures is often the subject of varying expert opinion as is the most appropriate

rectification strategy. Many experts, granted with the benefit of hindsight, lament that a little more care and thought in the design and construction of these buildings would prevent the problems arising and avoid considerable angst and expense at a later time.

Worryingly, we have seen one fire in a high rise residential tower which seems to have been aggravated by inappropriate cladding materials. Whilst the full investigation into this matter is not yet complete we are already seeing positioning amongst builders, designers and building surveyors as to where responsibility might lie.

These two issues, particularly in the context of high rise residential developments, fuel the second potent ingredient – class actions. The interest in class actions as a means to hold the corporate world accountable is now spreading to supporting the members of Owner's Corporations in their attempts to hold contractors, developers, designers and vendors accountable. The marshalling together of sometimes hundreds of residents to bring an action and determine a common strategy and acceptable outcome adds a level of complexity, delay and uncertainty to these actions which builds upon the complexity, delay and uncertainty inherent in any construction dispute.

The potential involvement of contractors, developers, designers and vendors

in these disputes raises the third ingredient – proportionate liability. Proportionate liability has now been with us for over a decade. It is a means of dividing responsibility amongst those participants who contributed to the underlying cause of the difficulty. It applies throughout Australia but does so differently in each State. It is a complex area of law which can force an owner to chase all possible participants or face the risk of failing to recover full compensation. This adds a level of stress to the choices which must be made by owners and a further level of complexity to any proceedings which might arise.

Foundation failures are the last ingredient in this mix. The issue of a building suffering damage by reason of inappropriate foundations, usually in the context of a challenging soil environment, is not new. However it seems that, as with many professions, each generation must learn from its own mistakes. In the face of rapid outer urban development we are seeing an increase in the number of houses suffering from such damage. The courts have strongly supported the owners in these cases and, in some instances, have awarded damages on the basis of the demolition and reconstruction of the building.

So, this paints a sombre picture; however, not one without hope. A little more time invested in planning and design can save significant risk, worry and expense for all those involved.



Membrane failure

Photos provided by Mark Alexander of Alexander and Associates



## SPECIFICATIONS

### WHY HAVE A SPECIFICATION?

The primary function of the drawings and specification is to give effect to design decisions. Many design decisions cannot be expressed in graphic form and therefore rely on words for their expression. Other decisions would be too tedious or impractical to be conveyed in graphic form. The drawings and specification complement each other.

### THE IMPORTANCE OF A SPECIFICATION?

The quality of a building project is dependent on the documentation provided. The contract documentation includes the conditions of contract, the drawings, the schedules and the specification. Whilst the specification is a multi-purpose document, its primary function is to define precisely and succinctly the quality required and the processes necessary for achieving it. Its role includes, but extends beyond, the selection of materials by providing the criteria for acceptable quality of construction.

### THE ROLES OF THE SPECIFICATION

The specification has many roles including being:

- a written record of design decisions taken.
- a document demonstrating compliance with statutory requirements.
- an estimating document.
- a tendering document.
- a legal (contractual) document.
- an on-site working document.
- a dispute settlement document.
- a project management tool.

### THE FORM OF A SPECIFICATION

NATSPEC specification worksections are classified, numbered and sequenced in a logical order, which responds to the Australian construction industry. There are recognised methods of specification writing. These include specifying by:

- **Reference:** Where an identifiable printed and published document is incorporated by reference to it. These may be Australian Standards or manufacturer's technical manuals.
- **Performance:** That is, by stating a desired end result and the criteria by which the result will be judged for its acceptability.
- **Description:** Detailing the materials, workmanship and installation procedures to be used.
- **Direct/Proprietary:** Specification stating a proprietary trade name product.

Typically each worksection is divided into General, Products, Execution and Selections:

- **General** includes cross referencing, standards, interpretation, tolerances, submissions and inspection requirements.
- **Products** includes details of materials and components.
- **Execution** deals with the fabrication, installation, erection and completion as part of a project.
- **Selections** may be made within the text, in schedules within the worksections or provided separately. With simple projects, all selections may be on the drawings.

NATSPEC is the trading name of Construction Information Systems Limited, ABN 20 117 574 606.

NATSPEC, founded in 1975, is a not-for-profit organisation that is owned by the design, build, construct and property industry through professional associations and government property groups. It is impartial and is not involved in advocacy or policy development.

NATSPEC's major service is the provision of the comprehensive national specification systems endorsed by government and professional bodies. NATSPEC, the National Building Specification, is for all building structures, with specialist packages for architects, interior designers, landscape architects, structural engineers, service engineers and domestic owners. AUS-SPEC is the Local Government specification system for the life-cycle management of assets. Packages include Urban and Open Spaces, Roadworks and Bridges, Public Utilities, and Maintenance.

NATSPEC's objective is to improve the quality of construction in Australia through its updating services and via the provision of information, tools, products and other services.

#### Stakeholders

- Air Conditioning and Mechanical Contractors' Association of Australia
- Australian Council of Built Environment Design Professions
- Australian Elevator Association
- Australian Institute of Architects
- Australian Institute of Building
- Australian Institute of Building Surveyors
- Australian Institute of Quantity Surveyors
- Chief Minister, Treasury and Economic Development Directorate (ACT)
- Construction Industry Engineering Services Group
- Consult Australia
- Dept of Finance (Federal)
- Dept of Finance (WA)
- Dept of Housing and Public Works (QLD)
- Dept of Infrastructure (NT)
- Dept of Planning, Transport and Infrastructure (SA)
- Dept of Treasury and Finance (TAS)
- Dept of Treasury and Finance (VIC)
- Engineers Australia
- Master Builders Australia
- Office of Finance and Services (NSW)
- Standards Australia

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# Costly implications of inadequate specification



*Rob Buchanan, Partner, works in the Construction and Engineering team at Norton Rose Fulbright in Sydney*

The specification forms part of all properly-prepared building and construction contracts. It performs the crucial function of setting out, in detail, the manner in which the works are to be carried out, materials to be used, testing procedures, workmanship requirements, and the standards with which the works must comply. Contemporary “output specifications” can simply require the completed works to have a certain capacity; beds in hospitals for example.

A common mistake made during the tender and negotiation process is to consider the terms of the contract and the specification in isolation of each other. Similarly, there is often a rush to finalise the specification and crystallise the commercial terms of the contract which can possibly lead to incomplete or inadequate specification. Whilst such efforts to finalise the contract might result in a successful tender, the consequences of a poorly prepared specification may be significant and costly, both on the project and the specifier.

## Price uncertainty

The most obvious area of risk associated with inadequate specification is that the contract sum may not be reflective of the contractor’s actual scope of work. Lack

of detail and clarity in a specification may create ambiguity as to what the contract works are, which may result in an increased number of disputed variations. In order to alleviate this risk, a specification should contain the detail required to ensure clarity around the contractor’s obligations and price certainty. Understanding the level of detail needed can be a difficult balance, best achieved by the engagement of experienced construction professionals.

## Inconsistent obligations

Issues may also arise when a specification calls for compliance with conflicting standards. For example, the general conditions of a contract may require compliance with an Australian Standard, whereas the specification may require compliance with an international standard which may be more onerous on the contractor. This can lead to disputes about what is, as a matter of contractual interpretation, the standard to which the contractor is required to perform the works.

This can be somewhat resolved by having an order or precedence clause in the contract to the effect that where the general terms of a contract are inconsistent with the specification, one would prevail over the other. Ideally however, any inconsistencies between standards should be resolved prior to entering into the contract.

## Works not fit for purpose

It is standard practice for building and construction contracts to contain a fitness for purpose provision. In any event, even in the absence of such an express provision, in Australia a fitness for purpose warranty will generally be implied.

A situation may arise where the contract works have been carried out in accordance with the relevant specification, but are not fit for their intended purpose.

Historically, provided the works were carried out in accordance with the specification, a contractor would generally not be liable for any issues relating to fitness for purpose.

However, there has been a shift in recent times by other common law jurisdictions which could see contractors fall foul of a fitness for purpose warranty notwithstanding that the works are within specification. For example, the High Court in England held that an “existence of an express warranty of fitness for purpose by the contractor can trump the obligation to comply with the specification even though that specification may contain an error” (see *MT Højgaard a/s v E.ON Climate And Renewables UK Robin Rigg East Ltd and Ors* [2014] EWHC 1088 (TCC)). Whilst the decision was recently overturned by the Court of Appeal, the principle remains that a “such a contract, if worded with sufficient clarity, may impose a double obligation upon the contractor. He must as a minimum comply with the relevant specifications and standards. He must also take such further steps as are necessary to ensure that he achieves the specified result. In other words he must ensure that the finished structure conforms with that which he has warranted.” (see *MT Højgaard A/S v E.ON Climate and Renewables UK Robin Rigg East Limited* [2015] EWCA Civ 407).

## Consultants

Given their technical nature, specifications are often prepared by third-party consultants such as engineers and architects. Specifications prepared by third-party consultants may not be indicative of the contractor’s skill and judgement in the performance of the works and consultation should be held with the contractor to make sure that the obligations in the specifications can be met.

Consultants’ duties of reasonable skill and care will extend to preparation of the specification. With that in mind, the specifier needs to ensure that they are well-briefed on the characteristics of the project and where the specification required is novel (i.e. an output specification), proper due diligence resulting in an audit trail, is completed prior to the document ending up in a construction contract.

## NATSPEC'S USE OF STANDARDS

### QUALITY AND STANDARDS

*'... the level of quality that can be policed in the construction stage cannot be higher than that which is spelt out in the contract. If the building contract documents permit a sow's ear then all the quality control in the world cannot demand a silk purse ... True quality control starts with the documentation for a project and in the project specification in particular ...'*

*'... for many years an army of experts has been producing minimum quality standard specifications for reference in a variety of industries, including the building industry, and in regulations relevant to those industries.'*

*'Nothing could be more necessary, more logical, more timely or more useful in today's building industry or more responsive to the call for quality control than a specification system tied to relevant Australian standards. That is what NATSPEC sets out to be.'*

### NATSPEC AND AUSTRALIAN STANDARDS

*'The NATSPEC method of using relevant published standards is to incorporate them by reference and not to quote, transcribe, repeat or paraphrase the text of the standards. To do so would not only interfere with copyrights but would also breed errors of transcription. It would also increase the physical size of NATSPEC and its derivative specifications, unnecessarily.'*

*'NATSPEC deliberately avoids blanket referencing of standards, the system by which specifiers expect contractors to allow for every conceivable and inconceivable standard in the world.'*

*'NATSPEC provides a checklist of possible relevant standards. It also provides a means of exercising options contained in standards. It also allows for manufacturer's recommendations to be referenced or 'called-up' in the same way as standards. NATSPEC recognizes the need for care in the specifying of standards.'*

- Bryce Mortlock, RAIA Practice Division Report, August, 1989.

### STANDARDS IN NATSPEC

NATSPEC continues to incorporate standards by reference to the standard's number. Where there are options in standards and decisions to be made, NATSPEC provides prompts and guidance. NATSPEC, with research and feedback from subscribers and industry, fills gaps that the consensus approach can leave out of standards.

### NATSOURCE

The publication NATsource includes all NATSPEC cited standards, and their abstracts. It is provided to subscribers as part of their package, as well as being available for purchase.

### STANDARDS TO OWN

The following should be considered:

- Design standards cited in the BCA and other regulations, with which you are legally bound to comply.
- Design standards that relate to your discipline and project type.
- Standards and handbooks that relate to construction.
- Lists of suggested standards for the offices of architects, landscape architects, structural, mechanical, hydraulic and electrical engineers are provided in the paper *Specification writing* on the NATSPEC website, under suggested standards for offices.

Whether the owning of a standard should be regarded as essential is a matter of professional judgement. Standards relating only to product manufacture or type testing may be considered non-essential provided compliance can be demonstrated by other means, such as certificates of compliance, or the use of StandardsMark, CodeMark or similar certification and labelling schemes.

### KEEPING STANDARDS CURRENT

- Each month NATSPEC publishes *Standards revising NATSPEC* in the Subscriber Resources area of the SPECbuilder Live.
- Every three months, NATSPEC lists the most important of these standards in SPECnotes, which is also available on the SPECbuilder Live.
- Every six months, in April and October, NATSPEC issues updated specification material to its subscribers via CD and SPECbuilder Live.

Some National and International standards cited by NATSPEC



Australian Standards.



British Standards Institution.



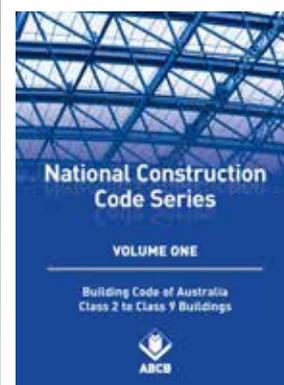
American Society for Testing and Materials.



International Organization for Standardization.



Bryce Mortlock - Father of NATSPEC, RAIA Gold Medallist.



### Relevant Websites

[www.specbuilder.natspec.com.au/](http://www.specbuilder.natspec.com.au/)

BCA  
[www.abcb.gov.au/](http://www.abcb.gov.au/)

Acts and regulations  
[www.austlii.edu.au/](http://www.austlii.edu.au/)

SAI GLOBAL  
[www.saiglobal.com/](http://www.saiglobal.com/)

# The role of Standards in building and construction



*"Standards Australia is proud to be a member and shareholder of NATSPEC, a key partner of the construction sector. The focus on quality and productivity in the construction sector is of substantial benefit to the sector. Additionally, the NATSPEC team contribute to the ongoing maintenance and development of Australian Standards with objective insights focused on making the construction system better."*



*Dr. Bronwyn Evans, Standards Australia CEO*

## What are Standards and why do they matter?

In Australia, Standards are published documents based on consensus, which can take the form of specifications, procedural requirements, or handbooks. They are living documents which are updated to suit the changing needs of the economy and community.

Government regulators and public health authorities often turn to standards in their regulation to provide a baseline level of safety requirements for houses, buildings, machinery and everyday objects. Standards are everywhere in your daily life, from the buildings you live in to street lighting to the way seatbelts operate in your car.

In the world of building and construction, standards help to codify best practices, methods and technical requirements to create a safe and sustainable built environment for the community.

## Standards and the National Construction Code

The Australian Building Codes Board (ABCB) develops one national building code that has been adopted by each state and territory.

The National Construction Code is a good example of performance-based regulation. Simply put, the NCC provides performance requirements for many aspects of building and construction which are based on outcomes. For example, the ABCB may call for all buildings and fittings to be constructed in a way that is efficient, effective, and habitable, with specific requirements on materials,

design, accessibility, and above all, safety. These requirements are laid out in the NCC, which may then refer to Australian Standards as one way for builders to meet these requirements.

Standards Australia works closely with the ABCB and stakeholders from the government, industry and community to develop Standards related to building and construction, which are referenced in the NCC.

We are a developer of Standards; we do not enforce, regulate or certify compliance with these Standards. What we do is to form technical committees on building and construction by bringing together relevant parties and stakeholders. Through a process of consensus, these committees develop standards and technical documents for Australia's net benefit.

## Australian Standards for Termite Management

One example of recent work by our technical committees has helped homeowners and building managers get rid of unwanted visitors in the basement.

Standards Australia published in November 2014 two revised Australian Standards for termite management, AS 3660.1:2014 Termite Management, Part 1: New Building Work and AS 3660.3:2014, Termite Management, Part 3: Assessment criteria for termite management systems.

The two documents have been developed for use in the National Construction Code and as a tool to assist builders, designers, regulators, manufacturers, installers, and assessors to manage termite risk in constructions.

AS 3660.1:2014 Termite Management, Part 1: New Building Work provides a range of options for termite management that can be implemented during the construction of buildings.

AS 3660.3:2014 Termite Management, Part 3: Assessment criteria for termite management systems provides new requirements and pass/fail criteria that will enable manufacturers and system proposers to assess their products and methods. It provides a clear path for compliance with AS 3660.1:2014.

These standards were developed by Standards Australia Technical Committee BD-074. The committee is now working on updating the Australian Standard on the post-construction management of termites.

## International Work

On the global level, it is equally important for countries to work together to share best practices and technology. International standards development bodies such as the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) have brought together people from all over the world to develop important standards for building and construction. Closer to home, the Pacific Area Standards Congress (PASC) convene yearly to discuss standardisation issues specific to the Asia-Pacific region.

In line with Standards Australia's goal is to develop internationally-aligned standards as far as possible, we are proud to represent Australia at international meetings at ISO, IEC and PASC.



## SPECIFYING QUALITY

### INTRODUCTION

Communicating the requirements for quality is the main technical function of the specification. This TECHnote outlines how the NATSPEC specification system may be used to promote quality in construction projects.

### DEFINING QUALITY

Quality must be defined; it cannot be managed if it is not defined. Quality can have different meanings for different people in different situations. In construction this problem is amplified as the responsibility for a project is divided between many different people, within many organisations. Therefore, agreement on a defined quality level between all parties, and how it is to be measured, is key to achieving the desired quality and the satisfaction of the principal.

### QUALITY LEVEL

Several factors drive the desired quality level of a project and its components; the main factor being anticipated life. It would be a false economy to poorly construct something which must last for many years or over design something which may only be required to last a number of weeks.

Other factors that influence the desired quality level include:

- The purpose of the building - Prestige or utility, flexibility or permanence.
- Required functional performance - Design repetition or one-offs, environmental.
- User perception - Convenience, comfort, ease of maintenance and repair.

### WHEN CAN QUALITY BE ACHIEVED?

There is a common misconception that the quality of a project can be completely controlled during the construction stage. However, the level of quality that can be demanded during construction cannot be higher than that which is specified in the contract documentation, without additional cost.

The quality of a project is therefore dependent on documentation and supervision. The contract documentation includes the conditions of contract, the specification, the drawings and the schedules.

To achieve quality, care must be taken in material selection, documentation, workmanship and supervision. This does not necessarily increase time and cost, however these factors must be considered and balanced when defining the quality level required. Failure to take care may lead to poor quality and increased costs with greater rework, repair and maintenance required.

### ROLE OF THE SPECIFICATION

Whilst the specification is a multi-purpose document, its primary role is to define precisely and succinctly the quality required and the processes necessary for achieving it. This also includes, but is not limited to, defining clear acceptance criteria for any item of work.

If specified acceptance criteria match the agreed defined quality level, then ultimately, conformance with the specification will achieve quality.

### USING NATSPEC TO ACHIEVE QUALITY

The NATSPEC worksection *Templates* include the construction processes required for each particular item of work and also define clear industry standard acceptance criteria in the form of tolerances, performance requirements and testing requirements. All can be modified if necessary to suit the defined quality levels agreed for each individual project and its components.

NATSPEC promotes the achievement of quality through coordination of the contract documents. Guidance text discourages duplication of information included on the drawings within the specification, to avoid potential discrepancies and ambiguity. Duplication of information within the specification is minimised by reference to relevant worksections.

NATSPEC references and monitors updates to relevant Australian and International standards, including those cited within the BCA. Where standards define alternative levels of service, NATSPEC provides prompts to be completed by the specifier. It is essential that the specification defines the requirement, as blanket references to standards may not achieve the desired quality.

NATSPEC and AUS-SPEC also cover the requirements of project Quality Management Systems based on AS/NZS ISO 9001 and the provision of project Quality Plans in the **Relevant worksections** listed in the sidebar.



Poor quality timber construction – Split base-plate used.



*"...If the building contract documents permit a sow's ear then all the quality control in the world cannot demand a silk purse....."*



Inspection to confirm quality level achieved.



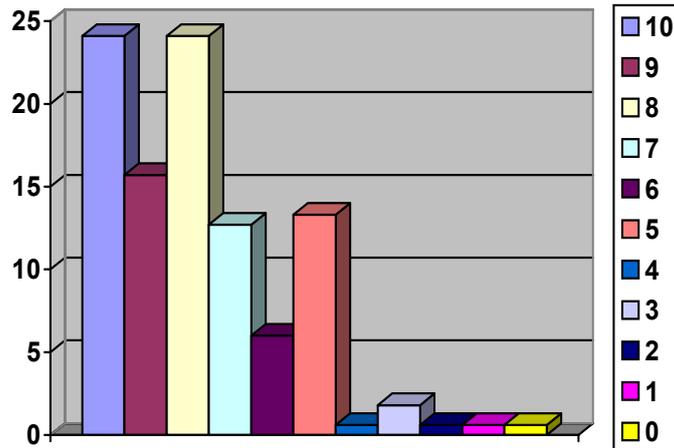
Poor quality concrete – Honeycombing and timber.

#### Relevant worksections

- 0010 *Quality requirements for design (AUS-SPEC).*
- 0160 *Quality.*
- 0161 *Quality (Construction) (AUS-SPEC).*
- 0162 *Quality (Supply) (AUS-SPEC).*
- 0163 *Quality (Delivery) (AUS-SPEC).*

# Subscriber Feedback

Many Government departments, contractors, consultants and architects are NATSPEC subscribers. When subscribers were asked how likely they would be to recommend NATSPEC on a scale of 1 to 10, over 60% responded with an 8, 9 or 10.



*"I do not have any reason not to recommend NATSPEC. I would choose NATSPEC over any alternative specification system"*

*"I am satisfied with the current service and would happily recommend it to my colleagues"*

*"I already recommended NATSPEC, and am very happy with the service provided"*

*"It's already a great service / product"*

*"Keep doing what you are doing"*

- NATSPEC subscribers



David Parken

“A practice should have as a minimum three control documents: the BCA, their QA system, and NATSPEC.”

David Parken  
Australian Institute of Architects  
CEO

“...Hence, the courts and others often look to the specification in particular to determine the message conveyed by the contract documents to those who work with them.”

AIA Practice Note AN04.101 April 08



## Government departments and clients prefer NATSPEC

In the majority of Australian States and Territories, NATSPEC specifications are required for building projects. Government Departments and clients prefer NATSPEC specifications so that they are assured of a baseline level of project quality. Whilst drawings and schedules only provide the form and materials, it is a properly constructed specification that outlines the quality desired. For over 35 years NATSPEC has been trusted to deliver quality results.

## Consultants prefer NATSPEC

The number of regulations that change each year continues to increase. Pressures on consultant's fees and the time required to design do not allow for individual organisations to monitor all the regulatory changes. NATSPEC provides the economies of scale to keep consultants up-to-date. Consultants know that NATSPEC is comprehensive and provides a clear outline of the quality of materials and tolerance of construction required. NATSPEC specifications save litigation and support the teams desire for successful projects.

## Contractors prefer NATSPEC

It is a competitive world and as the industry continues to consolidate, greater emphasis is being placed on the cost of a project. Contractors want to compete on an even footing and a NATSPEC specification means that the job will not be lost to someone who will cut the quality of construction. NATSPEC is independent and does not favour one party over another.

## Project managers prefer NATSPEC

When all parties are clear on the expected outcome the project progresses quickly and without undue confrontation. NATSPEC's template specifications are written in simple plain English without duplication or contradiction so that Project Managers do not waste time clarifying project requirements.

# **NATSPEC**

the national building specification

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