

ELECTRONIC BLUEPRINT is the principal point of reference and knowledge base for Architects, Engineers and Builders and the only package that fully integrates regulatory & standards requirements with comprehensive, editable specifications, CAD details and approved industry training.

Electronic Blueprint Update CPD for Architects, Engineers & Builders

Dear Building Professional

In a major training initiative, Electronic Blueprint Updates will provide the focus for coordinated Continuous Professional Development Training programs by Distance Learning techniques for practising Architects, Engineers and Builders in conjunction with the following organisations:

- **Archicentre**
- **ACEA NSW, Victoria & Tasmania**
- **MBA (NSW)**

Structured Distance Learning Program – This Month		
May	2007	BCA 2007 for Architects, Engineers & Builders Retaining walls for Architects, Engineers & Builders

[Click here](#) for full 2 year timetable and registration details.

Distance Learning is a program of training carried out in the convenience and comfort of your own home or office. To participate in this CPD Training Program, please [click here](#).

Should you require more information of any of the matters raised herein, please refer to our website www.electronicblueprint.com.au or contact us by email info@electronicblueprint.com.au.

To update your preferred email address for receiving the Electronic Blueprint Updates (including CPD Distance Learning information), **six times per year** [click here](#)

Rod Johnston – Principal Author

Karen Bloomfield – Chief Executive Officer

In this ELECTRONIC BLUEPRINT Update

Breaking News –AS 1170.4 Earthquakes in Australia and AS 3700 Amendment 3 will most likely be referenced in BCA 2008 !!!

Feature Articles in this Issue

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We are conscious that professionals receive large quantities of technical information.

To cease receiving these newsletters (six per year) please email us at info@electronicblueprint.com.au.

Email addresses are never sold nor used for reasons other than **ELECTRONIC BLUEPRINT** notification and information.

Structured Distance Learning Training Program

The **ELECTRONIC BLUEPRINT** Distance Learning Packages allow Architects, Engineers and Builders to upgrade their Continuing Professional Development and obtain the required CPD points.

Non-structured Distance Learning

Architects, Engineers and Builders may select Distance Learning Packages from a comprehensive list to suit their particular needs. The training is carried out at the convenience of the participant, an assignment is submitted and assessed, the Certificate of Completion is issued and the CPD points assigned. (View full list, [click here](#))

Structured Distance Learning Program

Every two months, a coordinated Distance Learning Package consisting of several related topics will be offered. Each package will include an Electronic Update, which summarises the content, and several voiced-over presentations, as follows:

- Specification, detailing and problem solving for Architects
- Structural, civil and/or mechanical/electrical design for Engineers.
- Problems, solutions, and site control for Builders.

Summary of Structured Distance Learning Program		
May	2007	BCA 2007; Retaining walls
July	2007	Sustainability Policy; CodeMark, Sustainability & Electronic Specifications; Masonry
September	2007	Slip Resistance; Floor & wall tiling; Resilient floor coverings; Carpets & soft furnishings
November	2007	Sustainability (Stormwater & Runoff); Paving; Public kerbs, gutters, footpaths etc
January	2007	Affordable Housing; Fencing; Landscaping
March	2008	Sustainability (Energy Efficiency); Windows, doors & glazing; Insulation
May	2008	BCA 2008; Concrete
July	2008	Loading Standards; Structural steelwork; Wall, roof & floor framing; Carpentry, Joinery, Cladding & Floor; Ceiling & wall lining
September	2008	Sustainability (Water Conservation); Drainage & plumbing; Roof cladding; Roof plumbing
November	2008	Sustainability (Air quality & toxicity); Site establishment & preliminaries; Painting & coatings; Cleaning
January	2008	Site establishment & preliminaries; Mechanical ventilation & services; Kitchen; Vehicular doors; Window & door shutters; Metalwork & balustrades
March	2009	Specification and detailing; Electrical installation

Further Assistance

For more help on any subject, participants may contact the tutor by email. The tutor will respond within 48 hours. On completion of the presentation, participants may complete a short assignment and email it to the tutor. The purpose of the assignment is to provide focus for the presentation, and to enable participants to apply the information to practical situations. The tutor will assess it, provide comments and forward a certificate by return email.

To participate in this CPD Training Program, please [click here](#) for more information and registration.

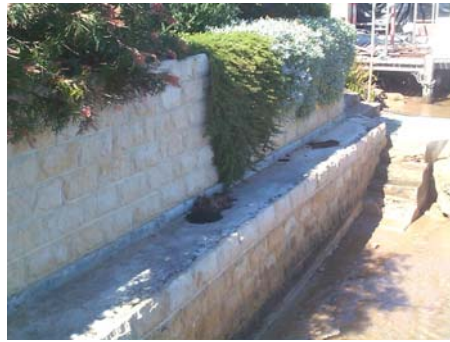
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Architects – Considerations in the Selection of Retaining Wall Systems

This article introduces the training module intended to give an understanding of the architectural design and construction considerations for retaining walls associated with building projects. While the structural design remains the responsibility of the engineer, there are important practical limitations and specifications that must be considered by Architects.



Source: Concrete Masonry Association of Australia

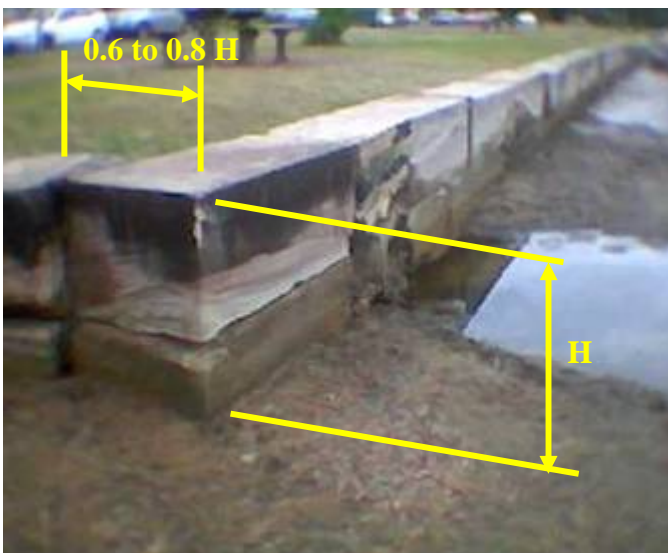


It covers low to medium height retaining walls in common use in the building industry, including:

- Mass Gravity Retaining Walls
- Crib Walls
- Segmental Concrete Gravity Retaining Walls
- Segmental Concrete Reinforced Soils Systems
- Reinforced Concrete Masonry Cantilever Retaining Walls
- Cantilever Post Retaining Walls

Soil Pressure

The following discourse is a very simplified description of the function and behaviour of retaining walls. If unrestrained, a soil embankment will slump to its angle of repose. Some soils, such as clays, have cohesion that enables vertical and near-vertical faces to remain partially intact, but even these may slump under the softening influence of ground water.



Retaining Walls – Geometry To Achieve Stability

The retaining structure must have sufficient weight (including the weight of any soil “captured within”) to resist excessive rotation and sliding. The soil “captured within” includes:

- The reinforced soil block of a reinforced soil system
- The fill contained by the cribs of a crib wall system
- The fill on the heel of a reinforced masonry cantilever wall.

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A very rough guide for good quality soils of low cohesion, without water pressure, is as follows:
THE WIDTH SHOULD APPROXIMATE 0.6 TO 0.8 TIMES THE HEIGHT.

Rock Outcrops

If massive rock formations are present immediately behind the structure, these will restrict the volume of soil which can be mobilized against the wall, and thus reduce the force. The magnitude of the reduced force may be determined by considering a steeper theoretical wedge, which is restricted between a vertical line at the rear of the retaining wall and the rock face.

Water Pressure

If water is trapped behind the retaining structure, it exerts an additional hydraulic pressure. This occurs when:

- Rain water or ground water is permitted to infiltrate into the fill behind a retaining wall,
- Water mains or sewers in the vicinity of a retaining wall burst or leak, or
- There is rapid draw-down of the water level in front of a wall (e.g. a sea wall) leaving water trapped behind.

The presence of ground water also reduces the adhesion and bearing resistance.

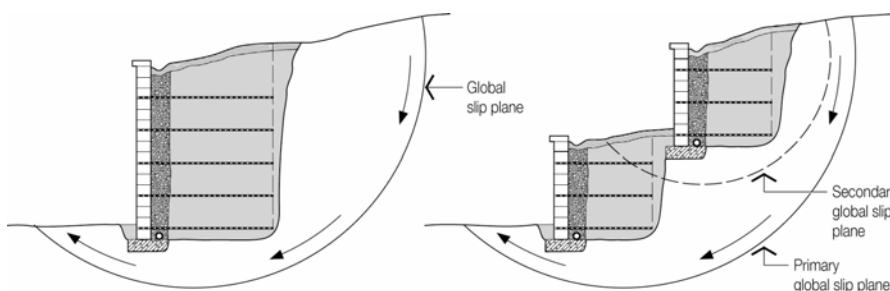


Sloping Retaining Wall

If the interface between the retained soil and the retaining structure slopes (into the embankment) the weight of the soil wedge causing movement is reduced, and the resulting active pressure is reduced.

Global Slip

Retaining walls and embankments must be stable for global slip failure around all potential slip surfaces or circles. Terracing of a site, using multiple retaining walls, will not necessarily reduce the tendency for global slip failure around a surfaces encompassing all or some of the retaining walls.



Source: Concrete Masonry Association of Australia

For the complete package, please refer to website www.electronicblueprint.com.au

For further information on this topic, or for relevant Continuing Professional Development Distance Learning Packages, please contact **ELECTRONIC BLUEPRINT** at info@electronicblueprint.com.au

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Engineers – AS 4678 Earth Retaining Structures

This article introduces the training module intended to give an understanding of AS 4678 *Earth retaining structures*, and an insight into its use to design practical retaining walls in Australia. It is legitimate for engineers and builders to ask the simple question – If we have been designing and building retaining walls for thousands of years, why do we now need a new standard?



Work on developing AS 4678 began in 1991 by the Standards Australia Technical Committee CE/32. Obtaining a consensus position on each of the principal points, proved to be difficult, but not impossible. Some of the more difficult questions included:

- Should the document be a “guide” giving non-mandatory advice, or should it be a “standard”, setting mandatory rules? The result - AS 4678 does both.
- Should the document deal with all competing earth retaining systems, or should it be restricted to one (say reinforced soils). The result - AS 4678 deals with all systems.
- Should the document embrace the modern design approach (limit state design) or rely on the older method (working stress design). The result - AS 4678 adopts limit state design.
- Should the document incorporate loading rules consistent with Australian loading standards AS 1170. The result - AS 4678 adopts (with minor modifications) the rules of AS 1170.

The resulting Australian Standard, AS 4678 *Earth retaining structures* was published in 2002, and has been amended once during the subsequent period. The main innovations of AS 4678 are set out below.

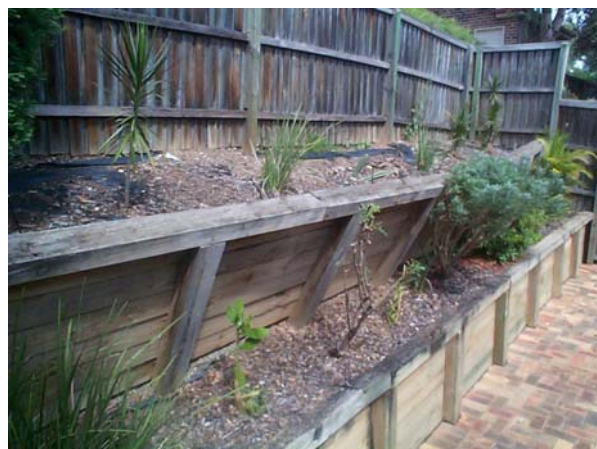
- AS 4678 is compatible with the other major structural standards - AS 1170 (Loads), AS 3600 (Concrete), AS 3700 (Masonry), AS 4100 (Steel) and AS 1720 (Timber).
- AS 4678 identifies the time-dependent properties, such as reinforcement corrosion, geogrid deterioration and creep, and drainage clogging. It provides a practical means for accounting for the changes in these components
- AS 4678 is based on a common reliability for each of the major retaining wall systems.
- AS 4678 provides for a variable reliability, depending on the consequence of failure.
- Each failure mode may be assessed independently by limit state analysis.

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- Permanent loads, imposed loads, earthquake, wind and hydraulic loads can be combined in a realistic way that reflects their various frequencies of occurrence.
- Partial material factors are consistent with confidence associated with each component.
- AS 4678 provides rules for site investigation, construction tolerances and performance monitoring.

Although AS 4678 has made considerable improvements in design methodology, the design of safe/economic retaining walls still relies heavily on the selection of realistic soil properties.

- The design of retaining walls for cohesionless soils (e.g. sands, gravels, sandy silts etc., with a high friction angle around 35°), is considered to be both economical and safe, if correctly constructed.
- On the other hand, the design of economical retaining walls for cohesive soils (e.g. clays, silts etc with a high friction angle below 30°), is difficult. The selection of appropriate values for characteristic friction angle and cohesion for clay soils requires particular attention.



AS 4678 is currently being reviewed, with the following major changes to be considered.

- It is planned to align the load factors in AS 4678 with the those published in the recently revised loading standard, AS/NZS 1170-2002, Parts 0, 1, 2 and 3.
- The design of earth-retaining structures for earthquake loads will be revised to align with draft AS 1170.4-2006.
- A major investigation and calibration of the standard is planned, with particular attention to problems of forward sliding in cohesive soils.
- An investigation of connection strength in reinforced soil structures (RSS) is also planned.

It is expected that these initiatives will lead to a more consistent approach for both cohesive and cohesionless soils.

A comprehensive specification and check list is available free on web site www.electronicblueprint.com.au .

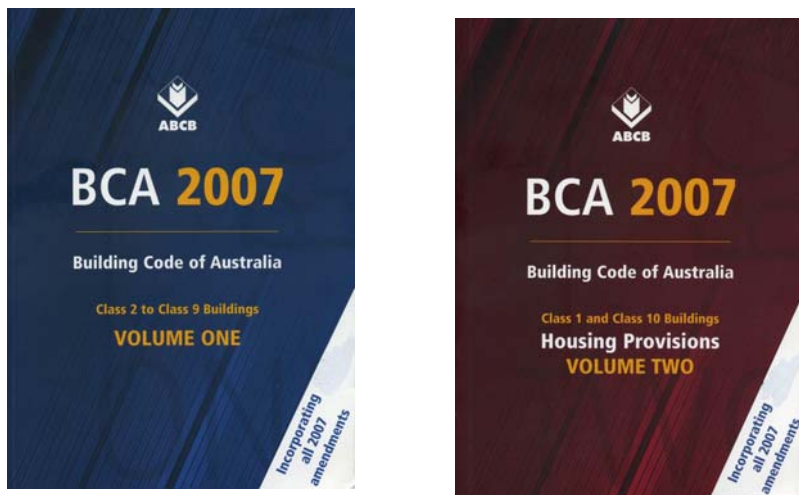
For further information on this topic, or for relevant Continuing Professional Development Distance Learning Packages, please contact **ELECTRONIC BLUEPRINT** at info@electronicblueprint.com.au

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Builders – BCA 2007

This article provides a discourse on “How to Cope with Insufficient Detail on Drawings” in the context of the BCA (Building Code of Australia). It forms part of a more comprehensive training package on the use and changes in BCA 2007, adopted from 1st May 2007.

How should a Builder proceed when there is insufficient or inadequate detail on the contract drawings and specifications? The most obvious option is to seek the appropriate information from the designer, but the following options are also available.



Method 1 - BCA Acceptable Construction Practice

This option involves reading the required detail directly from the BCA. The problem is that only a limited number of simple applications are available.

Method 2 - BCA Acceptable Construction Manuals (Australian Standards etc.)

These provide more comprehensive designs than are normally available in the BCA, although the standards are usually complex and often may be difficult to interpret. Most Australian Standards provide design rules, for use and interpretation by designers, and these are often lacking in the construction detail necessary on site. On the other hand, Industry Manuals may provide more construction-friendly details, although only a small number of such manuals have the status of “Acceptable Construction Manuals”, as defined in the BCA.

Method 3 - Manufacturer’s Details

Manufacturer’s details, when available, provide information applicable to a limited range of particular products. Builders should ensure that the details meet the particular requirements of Australian Building Regulations and Australian Standards, particularly if the product is manufactured or developed overseas. Failure to acquire such assurance could result in installations that do not meet local requirements, and may be liable to rejection. One possibility is to assess the details under the BCA Alternative Solutions option.

Method 4 - Standard Details and Specifications

Industry Associations and organizations such as Electronic Blueprint provide details of specific forms of construction, often free of charge. To download free Electronic Blueprint construction specifications and details, access www.electronicblueprint.com.au Similar to the situation for Manufacturer’s Details, Builders should obtain assurance that the details meet the particular requirements of Australian Building Regulations and Australian Standards, including (if necessary) assessment under the BCA Alternative Solutions option.

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Method 5 - Common Practice

Tradesmen have a wealth of practical experience, but are often unaware of the detailed requirements of particular parts of the BCA or relevant Australian Standards. The Builder must assume responsibility for the work of the trades working under their direction.

Example

Problem: Determine the required size of steel lintel to span 3.3 m while supporting brick veneer.

Solution: The table shows that each of the first three methods provides a different size of lintel.

Caution: The designer (Architect, Engineer or Builder as appropriate) must select with care and be prepared to take responsibility for the choice. To ensure protection to the designer, the providers of Standard Details and Specifications must present all options, and allow designers to choose freely.

Steel lintel required to span 3.3 m while supporting brick veneer		
Source of information	Reference	Required steel lintel size to span 3.3 m
1. BCA Acceptable Construction Practice	BCA-2006 Vol 2 Fig 3.3.3.5	100 x 100 x 8 EA
2. BCA Acceptable Construction Manual	AS 3700 Table 12.8	90 x 90 x 8 EA
3. Manufacturer's Details	Proprietary lintel	150 x 100 x 9.5 kg/m proprietary galvanized angle lintel
4. Standard Details and Specifications	Electronic Blueprint Spec 12	100 x 100 x 8 EA and 90 x 90 x 8 EA. Comparison of the above-mentioned options
5. Common Practice		Varies

A comprehensive specification and checklist is available free on web site www.electronicblueprint.com.au.

For further information on this topic, or for relevant Continuing Professional Development Distance Learning Packages, please contact **ELECTRONIC BLUEPRINT** at info@electronicblueprint.com.au

Changes to Australian Standards

New Standard	Superseded Standard
AS 3958.1-2007 Ceramic tiles - Guide to the installation of ceramic tiles	AS 3958.1-1991
AS 5605-2007 Guide to the safe use of preservative-treated timber	
AS 7240.12-2007 Fire detection and alarm systems - Line type smoke detectors using a transmitted optical beam	

Amended Standards
AS/NZS 1170.3:2003 Structural design actions

These changes are reflected in the updated version of the **ELECTRONIC BLUEPRINT**, which will be available at www.electronicblueprint.com.au. For more information on changes to Australian Standards, visit SAI Global at www.standards.com.au.

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Unstructured Distance Learning Packages

The **ELECTRONIC BLUEPRINT** Distance Learning Packages provide Architects, Engineers and Builders with the opportunity to upgrade their Continuing Professional Development and obtain the required CPD points without being a part of the Structured Program. Each presentation is a Breeze style presentation on CD, complete with full text, audio voice-over and tutoring opportunity.

B - Building Modules – Specifications, Details and Inspections for Builders.

D - Design Modules – Advanced Concepts and Specifications for Architects and Designers.

E - Engineering Modules – Complex design calculations and engineering detailing.

More information may be obtained from the website at;

<http://www.electronicblueprint.com.au/distancelp.html>

Modules Available

1	BCA 2007; Retaining walls
2	Sustainability Policy; CodeMark, Sustainability & Electronic Specifications; Masonry
3	Slip Resistance; Floor & wall tiling; Resilient floor coverings; Carpets & soft furnishings
4	Sustainability (Stormwater & Runoff); Paving; Public kerbs, gutters, footpaths etc
5	Affordable Housing; Fencing; Landscaping
6	Sustainability (Energy Efficiency); Windows, doors & glazing; Insulation
7	BCA 2008; Concrete
8	Loading Standards; Structural steelwork; Wall, roof & floor framing; Carpentry, Joinery, Cladding & Floor; Ceiling & wall lining
9	Sustainability (Water Conservation); Drainage & plumbing; Roof cladding; Roof plumbing
10	Sustainability (Air quality & toxicity); Site establishment & preliminaries; Painting & coatings; Cleaning
11	Site establishment & preliminaries; Mechanical ventilation & services; Kitchen; Vehicular doors; Window & door shutters; Metalwork & balustrades
12	Specification and detailing; Electrical installation

Module Costs

All prices quoted in AUD\$ and include GST	
Unstructured training Modules	\$412.50 each
Master Builders Australia (NSW) discounted price for members	\$371.25
ACEA discounted price for members	\$275

Individual Subjects

Several ancillary subjects are provided as individual 'subjects'.

Cost for these subjects is **\$175 (GST inclusive)**.

Individual Subjects Available at May 2007



Section	Subject Level	Module Content
0 – General Design Considerations	Engineering	AS 1170.4 <i>Earthquake loadings</i>
12 - Masonry	Builder	Anchorage
	Design	Salt Damp in Concrete & Masonry
	Design	Sustainability of Clay Brickwork
	Design	Thermal Performance of Masonry
	Engineering	Repair of Cracked Buildings
	Engineering	Fire Performance of Masonry
	Engineering	House Design to AS 3700
15 – Floor & Wall Tiling	Design	Issues in Measuring Slip Resistance


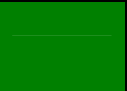


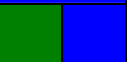













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PRODUCT DIRECTORY - Supplier Table

Enabling specifiers fast access a list of building products that comply with the specific requirements of the **ELECTRONIC BLUEPRINT**.

Key:	
Supplier name	Hyperlink to Product Page for particular Supplier
EB Sections	Electronic Blueprint section listing Supplier product specifications
Spec Type:	 Electronic Blueprint Specification
	 Electronic Blueprint Sustainability Specification

Supplier	Product Details	EB SECTION(S)	SPEC TYPE
Abey Australia Pty Ltd	Wall ties for all environments, including stainless steel cavity ties for use in Marine (R3) and Severe Marine (R4) environments	12	
Ausdrain	Drainage cells for horizontal and vertical applications ; Geotextiles; Protection Boards; Underground rainwater storage & re-use; Stormwater infiltration & filtration; Retention tanks; Septic leach drainage.	2,4,5	
Breezeway Australia Pty Ltd	Energy and cyclone rated louvre windows made from non-corrosive materials complying with AS 2047; Skylights manufactured in accordance with AS2485 and AS1288 and energy rated according to WERS Scheme; Solid timber loft ladders with a high load capacity of 160kg; insulated and dust retardant trap doors	6, 9	
Brunswick Sales	Vertical control joint ties to AS 2699 Part 1. Available fully galvanised or grade 316 stainless steel.	12	
C&M Brick	Retaining wall systems to meet the requirements of AS 4678; Water-repellent masonry blocks	4, 12, 27	
Canterbury Windows & Doors	Timber framed windows and doors.	6	
Complete Leafscreener Services	Gutter protection suitable for bushfire prone areas.	11	
Concrete Colour Systems	Pigments and systems for resurfacing, colouring and stencilling existing and new concrete surfaces	3	
Connolly Key Joint Pty Ltd	Preformed concrete control joints and ancillary products	3	
CVC Centravac	Built -In Vacuum Systems	23	
Easy Living Home Elevators	Home & commercial elevators, dumbwaiters and limited mobility lifts to AS 1735	23	
Electronic Blueprint	Steel mullions for brickwork and blockwork to provide wind and earthquake resistance to the new AS/NZS 1170.2 and AS 1170.4. Resilient ties to comply with BCA Vol 1&2 for the separation of leaves of cavity walls to eliminate the transmission of impact sound	7, 12	
Ensystex Australasia	Termite barriers complying with the requirements of AS 3660.1 Non-toxic, in-ground or above-ground, termite colony elimination and protection system complying with AS3660.2.	3,8,12	
Everbreeze Ventilation	Design, supply, installation and maintenance of quality ventilation systems complying with BCA and AS 1668.2	23, 6, 8	
Fibercon	Steel fibre reinforcement used for enhancing toughness and impact resistance of concrete	3, 27	
Erosion Control Systems	Retaining wall systems up to and over 1500mm for both domestic and commercial applications in accordance with AS 4678 (Including Amendment 1)	4	
Ford Timbers Pty Ltd	Hardwoods with enhanced performance.	8,9,10, 26,28	
Hanson Building Products	Retaining wall systems to meet the requirements of AS 4678; Water-repellent masonry blocks; Concrete block systems, including insulated blocks and acoustic block systems, to meet the BCA requirements; Segmental pavers for roadways, driveways, gardens and pool surrounds to meet AS 3727 Residential pavements Energy Efficient Masonry Housing Systems	4,12	

Helifix (Australia) Pty Ltd	Products to repair cracked or damaged brickwork	12	
Master Builders Association	Construction area safety signage.	1	
Nofire Technologies Australia	A one part non-flammable water based intumescent coating similar in appearance to ordinary latex base paint which immediately foams and swells (intumesces) upon exposure to flame or heat, providing an effective insulation and heat shield to protect the subsurface.	7, 19	
Perpetual Water	Mechanical water saving device for recycling of household grey water	5	
Raven Product Pty Ltd	Sealing Systems, for doors and windows, which are frequently multi-purpose, sealing against a combination of intrusions and leakages including sound (AS 1191), fire (intumescent) & smoke (to AS 1530.4 & AS/NZS 1905.1), rain, draughts, dust, embers, light insects, vermin, and energy inc. heating & air conditioning (to AS 4420.4, AS 4420.5, AS 2047, AS 1939, AS 1530.7)..	6, 18	
Resene Paints (Aust) Ltd	Environmentally friendly (low VOC) paints complying to APAS requirements and Electronic Blueprint Sustainability Specification.	19	
Robert Bosch (Australia) Pty. Ltd.	Commercial and domestic continuous flow gas hot water systems- Hydropower, Pilot & Electronic ignition, available in natural gas & LPG. All gas hot water systems compliant with AS 4552.	5	
RootBarrier	Moisture and tree root shields	3	
Skydome Skylight Systems	Tubular skylights, roof windows, domed skylights, overhead glazing, mechanical roof ventilation	6, 23	
SmartFlo Gutters	Enclosed self-shedding gutter systems.	11	
Stramit Building Products	Cold-rolled galvanised steel products complying with AS 4600 Permanent formwork of cold-rolled steel complying with AS 1538 and AS 1397 Sheet steel metal roof and wall cladding complying with AS 1397 Metal rainwater goods complying with AS 2179.1	3, 7, 8, 10, 11	
Sunplus CPC Solar	Commercial and domestic evacuated tube solar hot water system complying with AS 2712 Solar and heat pump water heaters – Design and construction.	5	
Tripstop Pty Ltd	Concrete construction joints for misalignment and trip hazard control	27	

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