



Guide to Standards - Architecture

**Your snapshot of Australian Standards®
and Certification**

Table of Contents

Introduction..... 5

Building Tolerances 5

Building Contracts 5

Technical Drawings and Architectural Plans 6

 CAD Drawing and Drafting Publications 6

 Technical Drawings..... 6

Structural Design Standards..... 8

 Loads and Forces for Buildings and Structures 8

 Aluminium Structures..... 9

 Composite Structures 9

 Concrete Structures..... 9

 Formwork..... 9

 Glass Structures 10

 Masonry Structures..... 10

 Piling..... 11

 Residential Slabs and Footings 11

 Steel Structures 11

 Timber Structures and Timber Frames 12

Building Practices 13

 Site Investigations and Earthworks..... 13

 Demolishing Buildings..... 13

 Fixed Ladders, Platforms, Walkways and Stairs..... 13

 Fall Arrest Devices, Harnesses and Rope Suspension Systems..... 13

 Portable Ladders 14

 Scaffolding..... 14

 Shoring 14

 Suspended Ceilings..... 14

 Temporary Edge Protection Systems 15

Building Products..... 15

 Cement 15

 Concrete (Ready Mixed) and Concrete Admixtures..... 16

 Concrete Tanks 16

 Doors 16

 Fences and Gates 17

 Glass..... 18

 Masonry 18

 Metals 19

 Steel..... 20

 Aluminium Alloy 21

 Iron..... 22

 Copper..... 22

 Pliable Building Membranes 22

 Roofing and Wall Materials 22

 Skylights 23

 Timbers..... 23

 Windows, Glass Doors, Louvres, Shopfronts and Window Walls 26

Energy Efficient Building Products 26

 Lighting Products 27

 Solar Panels Connected to Hot Water Systems and Heat Pumps..... 27

 Solar Panels (Stand-Alone Products – Not Connected to Hot Water Systems and Heat Pumps) 27

Thermal Insulating Materials.....	27
Water Heaters.....	28
Air Conditioners.....	28
Fire Tests.....	28
Early Fire Hazard Properties for Building Products.....	29
Fire Resistance Levels (FRL) Tests.....	29
Buildings Located In Bushfire Prone Areas.....	29
Smoke Control Doors.....	29
Fire Protection Equipment.....	29
Residential Buildings (Fire Protection Equipment).....	30
Units and Townhouses (Fire Protection Equipment).....	30
Single and Multi-Storey Buildings – Including; Public, Commercial, Industrial, Educational and Healthcare Buildings, Aged Care Buildings, Laboratories, Sporting Stadiums, Car Parks and Food Premises.....	31
Acoustics.....	33
Airborne Sound (Sound Weight Reduction Indices).....	33
Impact Sound Levels.....	33
Sound Pressure Levels.....	33
Disability Access.....	33
Disability Access - Non-Residential Buildings.....	33
Disability Access - Residential Buildings.....	34
Building Facades.....	34
Structural Integrity and Performance Requirements for Building Facades.....	34
Plastering/Rendering.....	34
Painting Facades.....	34
Timber Decks.....	35
Metal Finishing.....	35
Glazing.....	35
Waterproofing Facades.....	36
Landscape Architecture.....	36
Technical Drawings.....	36
Retaining Walls.....	36
Pruning Amenity Trees and Managing Trees On Development Sites.....	36
Soils, Conditioners, Mulches and Potting Mixes.....	36
Pavers.....	37
Outdoor Furniture.....	37
Rocks and Aggregates.....	37
Stairs and Balustrades.....	37
Design Standards.....	37
Disability Access Requirements.....	38
Internal Finishes.....	39
Internal Waterproofing.....	39
Plastering and Rendering.....	39
Carpets - Textile Floor Coverings.....	39
Resilient Floors.....	40
Tiles – Ceramic Tiles.....	40
Natural Stone - Granite and Marble Tiles.....	40
Timber Flooring.....	41
Electrical Wiring.....	42
Communications Cabling and Data Centres.....	42
Security Alarms and CCTV Systems.....	43
Plumbing and Gas.....	43

Greywater Systems.....	44
Rainwater Tanks.....	44
Septic Tanks.....	45
Aerated Wastewater Treatment Systems	45
Lighting.....	45
Natural and Artificial (Electric).....	45
Outdoor Lighting (Road Lighting).....	45
Emergency Evacuation Lighting	46
Floodlighting	46
Ventilation	46
Cooling Towers.....	47
Slip Resistance	47
Buildings Located In Bushfire Prone Areas	47
Earth-Wall (Rammed Earth) Buildings	48
Residential Buildings	48
Planning and Design	49
Units and Townhouses	49
Public, Office and Commercial Buildings	49
Industrial Buildings.....	50
Educational and Training Facilities	51
Medical Centres and Healthcare Facilities.....	52
Aged Care Buildings	53
Childcare Buildings	54
Food Premises.....	56
Sporting Stadiums	57
Laboratories.....	57
Car Parks.....	58
Long Span Structures (Bridges and Tunnels).....	58
Online Resources	60
Building Regulators	61
Customer Service Contacts.....	62

Introduction

This guide provides information on Standards, Certification schemes and other industry specific information that may be of interest to Architects and building designers. A number of the Standards described in this guide are referenced in the Building Code of Australia (see **BCA + Standards** service). Standards may also be enforced under building and environmental legislation administered and enforced by different Australian Government and State regulators.

You can find Standards relevant to the building and construction industry via the SAI Global **InfoStore** Subject Area **Construction materials and building**. Here, the Preface, Table of Contents, Foreword and Scope of most Australian Standards® are available.

Disclaimer: The information contained in these pages is provided by way of indicative guidance only and SAI Global Limited does not represent that it is accurate or complete or suitable for any particular specific purposes. The onus remains with users to satisfy themselves of their requirements and needs for their own particular circumstances.



An invaluable resource for Architects is **HB 50-2004, Glossary of building terms**. This publication provides an alphabetical list of terms covered in relevant building and construction Standards as well as over 80 illustrations of general and specific items used in the building and construction industry.

Building Tolerances

Information on tolerances for building products manufactured from different types of materials is included in **HB 31-2002, Handbook of construction tolerances – Extracts from building products and structural Standards**. This handbook includes extracts **AS 3600-2001, Concrete Structures**.

Information on recommended tolerances for plastering is included in **HB 161-2005, Guide to plastering**. Tolerances for tiling ceramic floors are included in **AS 3958.1-2007, Ceramic tiles – Guide to the installation of ceramic tiles**.

Architects and building designers may be required to draw plans for earth-retaining structures. Tolerances for earth-retaining walls are described in **AS 4678-2002, Earth-retaining structures**.

Building Contracts

Building contracts are covered by the **AS 2124, General conditions of contract Series**, **AS 4000, General conditions of contract Series** and **MP 65-1992, Lump sum contract for building works with administration by proprietor (RAIA ABP-1-1992)**.

The contract for swimming pools and spas is **AS 2160.1-1998, Contract for the supply and construction of a swimming pool or spa – Concrete swimming pool or spa (no carbon copy)**. The carbon edition of the contract is **AS 2160.1/C-998, Contract for the supply and construction of a swimming pool or spa - Concrete swimming pool or spa (with carbon copy)**.



Some of these contracts Standards are available in fully editable format. Please contact SAI Global Copyright Services to request this format and for more information on Licensing.
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Technical Drawings and Architectural Plans

Technical drawings and architectural building plans can be prepared by following the recommendations and example drawings that are included in **AS 1100.301-2008, Technical drawing – Architectural drawing**. This Standard follows the principles and guidelines that are included in **AS 1100.101-1992, Technical drawing – General principles**.

Dimensions and tolerances for technical drawings and architectural plans can be represented by following the information that is included in **AS 1100.101-1992, Technical drawing – General principles**, **AS 1100.301-2008 Technical drawing – Architectural drawing** and **HB 47-1993, Dimensioning and tolerancing to AS 1100.101-1992 and AS 1100.201-1992**.

CAD Drawing and Drafting Publications

Information on Computer-aided drafting (CAD) techniques is included in:

- **AS 13567.1-1999, Technical product documentation – Organization and naming of layers for CAD – Overview and principles**
- **AS 13567.2-1999, Technical product documentation – Organization and naming of layers for CAD – Concepts, format and codes used in construction documentation**

CAD codes for different types of building elements and building products (e.g. floors and windows) are included in **ISO/TR 13567-3:1999, Technical product documentation – Organization and naming of layers for CAD – Part 3: Application of ISO 13567-1 and ISO 13567-2**.

Information on CAD conventions for drawings representing hydraulic and pneumatic equipment are included in **AS 1101.1-2007, Graphical symbols for general engineering - Hydraulic and pneumatic systems**.

Technical Drawings

Electrical, Electronic, Radiocommunications and Telecommunications Equipment

Information on symbols used to represent electrical, electronic, radiocommunications and telecommunications equipment in drawings is included in the **AS/NZS 1102, Graphical Symbols for Electrotechnical Documentation Series**. Information on symbols commonly used by architects is included in **AS/NZS 1102.111:1997, Graphical symbols for electrotechnical documentation – Architectural and topographical installation plans and diagrams**. This Standard also includes examples of symbols for different types of electrical connecting devices (e.g. plugs, cords and transformers).

An overview of the symbols and conventions included in the **AS/NZS 1102 Series** is included in **HB 3:1996, Electrical and electronic drawing practice for students**.

Flowcharts and charts for electrical diagrams can be prepared by following the details described in **IEC 61082-1 Ed 2.0, Preparation of documents used in electrotechnology – Part 1: Rules**.

Engineering Surveys

AS 1100.401-1984, Technical drawing – Engineering survey and engineering survey design drawing sets out recommendations for engineering survey and engineering survey design drawing practice.

Hydraulic and Pneumatic Equipment

Drawings for different types of fluid power systems used on components and in circuit diagrams are included in **AS 1101.1-2007, Graphical symbols for general engineering – Hydraulic and pneumatic systems**.

Mechanical Engineering

Information on conventions used to represent different types of products and materials used by mechanical engineers (e.g. fasteners and gears) is included in **AS 1100.201-1992, Technical drawing – Mechanical engineering drawing**.

Information on tolerances for mechanical engineering drawing are included in **HB 47-1993, Dimensioning and tolerancing to AS 1100.101-1992 and AS 1100.201-1992**.

Plumbing and Ducting

Symbols used to represent different types of plumbing products are included in **AS 1100.301-2008, Technical drawing – Architectural drawing**.

AS 1101.5-1984, Graphical symbols for general engineering – Piping, ducting and mechanical services for buildings includes examples of symbols for commonly used types of pipes and valves. In October 2004 Standards Australia made the decision to change the status of **AS 1101.5-1984** to 'obsolescent'. This term indicates that the information in the Standard is no longer recommended for new equipment or current best practices. This Standard has only been retained in order to provide for those who are servicing existing requirements.

More recent information on practices used to represent plumbing, ducting, ventilation and refrigeration equipment is included in **ASHRAE 134:2005, Graphic Symbols for Heating, Ventilation, Air-Conditioning and Refrigerating Systems**.

Process and Control Instruments

AS 1101.6-1989, Graphical symbols for general engineering – Process measurement control functions and instrumentation specifies symbols and code systems for depicting instruments, instrumentation systems, process computers, and shared display and control functions in the field of process measurement and control in the process industries.

In October 2004 Standards Australia made the decision to change the status of **AS 1101.6-1989** to 'obsolescent'. This term indicates that the information in the Standard is no longer recommended for new equipment or current best practices. This Standard has only been retained in order to provide for those who are servicing existing requirements.

AS 1101.6-1989 is based on information that is included in the **ISO 3511, Process measurement control functions and instrumentation Series**.

IPC 2612-1:2010, Sectional Requirements For Electronic Diagramming Symbol Generation Methodology also provides information on methods that can be used to produce symbols for different types of process and control instrumentation.

Welding

Symbols used to represent different types of welds are included in **AS 1100.301-2008, Technical drawing - Architectural drawing** and **AS 1101.3-2005, Graphical symbols for general engineering – Welding and non-destructive examination**.

Structural Engineering

Information on conventions and practices for representing materials, items and equipment used to design, manufacture and install different types of structures is included in the following paragraphs.

Concrete

Drawings for reinforced and unreinforced concrete structures are included in **AS/NZS 1100.501-2002, Technical drawing - Structural engineering drawing**. Symbols used to represent concrete structures are included in **AS 1100.301-2008, Technical drawing – Architectural drawing**.

Information that should be included in drawings and plans used to represent concrete materials and different types of concrete structures is also included in **AS 3600-2009, Concrete structures** and **CIA Z6-2010, Reinforcement detailing handbook**.

For more information on design, engineering and manufacturing Standards for different types of concrete, see sections [Structural Design Standards - Concrete Structures](#) and [Concrete \(Ready Mixed\) and Concrete Aggregates](#) of this guide.

Earthworks and Footings

Footings can be represented on building plans and specifications by following the recommendations described in **AS/NZS 1100.501:2002, Technical drawing – Structural engineering drawing**. Drawings for earthworks can be prepared by following the information that is included in **AS 3798-2007, Guidelines on earthworks for commercial and residential developments**.

For more information on engineering and design Standards for residential buildings using slabs and footings see the [Structural design Standards - Residential Slabs and Footings](#) section of this guide.

Masonry, Structural Steels and Timbers

Information on methods used to prepare design drawings for masonry structures, masonry materials, structural steels and timber structures is included in **AS/NZS 1100.501-2002**. Symbols used to present these materials are included in **AS 1100.301-2008, Technical drawing – Architectural drawing**.

For more information on design, engineering and manufacturing Standards for these types of products, see the sections please refer to [Structural Design Standards](#) and [Building Products](#) sections of this guide.

Structural Design Standards

Loads and Forces for Buildings and Structures

Most Standards are based on 'limit state design engineering methods' and a definition for this term is included in **AS ISO 8930-2005, General principles on reliability of structures – List of equivalent terms** and **HB 50-2004, Glossary of building terms**.

The structural engineering Standards referenced in the Building Code of Australia (see **BCA + Standards** service) are all based on limit state design engineering methods. Detailed information on concepts concerning limit state engineering are included in:

- **AS/NZS 1170 Set:2007, Structural design actions Set**
- **AS 1170.4-2007, Structural design actions – Earthquake actions in Australia**
- **AS 4055-2006, Wind loads for housing**
- **AS 5104-2005, General principles on reliability for structures**
- **AS ISO 13822-2005, Basis for design of structures – Assessment of existing structures (ISO13822:2001, MOD)**
- **ISO 13823:2008, General principles on the design of structures for durability**
- **ISO 15928-1:2003, Houses – Description of performance – Part 1: Structural safety**
- **ISO 15928-2:2005, Houses – Description of performance – Part 2: Structural serviceability**
- **ISO 15928-3:2009, Houses – Description of performance – Part 3: Structural suitability**

Aluminium Structures

The 'limit state' design Standard for aluminium structures is **AS/NZS 1664.1:1997, Aluminium structures – Limit state design**. The 'allowable stress' design Standard for aluminium structures is **AS/NZS 1664.2:1997, Aluminium structures – Allowable stress design**. Definitions for the terms 'limit state design' and 'allowable stress' are included in **HB 50-2004, Glossary of building terms**.

Thickness levels and mechanical properties for different types of aluminium alloys are included in **AS/NZS 1664.1:1997** and **AS/NZS 1664.2:1997**.

For more information on manufacturing Standards for different types of aluminium alloys please refer to the [Building Products - Metals \(Aluminium Alloys\)](#) section of this guide.

Composite Structures

Steel and concrete beams can be manufactured and designed by following the requirements outlined in **AS 2327.1-2003, Composite structures – Simply supported beams**.

Concrete Structures

Information on requirements for the design and construction of concrete buildings, or members that contain reinforcing steels or tendons are included in **AS 3600-2009, Concrete structures. AS 3600-2001** is still referenced in the Building Code of Australia (see **BCA + Standards** service).

AS 3600-2009 provides some general information on design requirements for pedestals and footings that do not contain reinforcing steels or tendons. Footings supplied with reinforcing steels should be designed by meeting the requirements described in **AS 2870-2011, Residential slabs and footings**. For more information on pedestals and footings refer to the [Structural design Standards - Residential Slabs and Footings](#) section of this guide.

The National Precast Concrete Association of Australia's **NP:PCH-2009, Precast Concrete Handbook** provides detailed information on design requirements for buildings and other types of structures using precast and plain concrete products.

The Concrete Institute of Australia have developed a companion guide **CIA Z6-2010, Reinforcement detailing handbook** to **AS 3600-2009, Concrete Structures**.

Handbooks **HB 64-2002, Guide to concrete construction** and **HB 71-2002, Reinforced concrete design in accordance with AS 3600-2001** are companions to **AS 3600-2001, Concrete structures**.

For more information on technical drawing and manufacturing Standards for different types of concrete, please refer to [Technical Drawings – Structural Engineering - Concrete](#) and [Concrete \(Ready Mixed\) and Concrete Admixtures](#) sections of this guide.

Tilt-Up Panels (Tilt-Up Construction)

Flat reinforced concrete panels can be designed by following the methods described in **AS 3850-2003, Tilt-up concrete construction** and **AS 3600-2009, Concrete Structures**.

Formwork

Information on documentation and surface finishing requirements for formwork is included in **AS 3610.1-2010, Formwork for concrete – Documentation and surface finish**. Photographs illustrating surface finishing requirements for different classes of formwork are also included in this Standard.

Persons working in the building industry requiring information on design, fabrication and erection requirements can follow the details that are included in **AS 3610-1995, Formwork for concrete**. Photographs for formwork conforming to **AS 3610-1995** are included in **AS 3610 Supp 1-1995**,

Formwork for concrete – Blowhole and colour evaluation charts (Supplement to AS 3610-1995).

Glass Structures

The limit state design engineering Standard for buildings using safety glass is **AS 1288-2006, Glass in buildings – Section and installation**.

Tables providing information on thickness levels conforming to limit state design methods for glass are included in **AS 1288 Supp 1-2006, Glass in buildings - Selection and installation (Supplement to AS 1288-2006)**. The information in this Standard is of particular use for glass used on different types of balustrades. **HB 125-2007, The glass and glazing handbook (including guide to AS 1288, Glass in buildings – Selection and installation)** complements **AS 1288-2006**.

Wind speeds for glass can be calculated by following the methods described in:

- **AS 1170.2-1989, Minimum design loads on structures (known as the SAA Loading Code) – Wind loads**
- **AS/NZS 1170.2:2002, Structural design actions – Wind actions**
- **AS 4055-2006, Wind loads for housing**

Masonry Structures

The structural design Standard for buildings using reinforced, unreinforced and prestressed masonry materials is **AS 3700-2001, Masonry structures**. The commentary to this Standard is **AS 3700 Supp1-2004, Masonry structures - Commentary (Supplement to AS3700-2001)** and both these Standards are available in **AS 3700 Set-2007**.

AS 3700-2001 covers different areas of masonry structures:

- Fire resistant tests for masonry units
- Structural design requirements for unreinforced masonry
- Design requirements for reinforced masonry structures and prestressed masonry
- Durability levels for masonry structures - a list of durability requirements for mortar used with masonry
- Simplified methods for designing masonry structures
- Levels for different types of environments that can affect the durability and performance of masonry structures

Earth-retaining structures that are not constructed from mortared joints should be designed to the requirements outlined in **AS 4678-2002, Earth-retaining structures**.

Masonry structures used with residential buildings and small non-habitable buildings (e.g. garages) may be designed and constructed by following the methods outlined in **AS 4773.1-2010, Masonry in small buildings – Design** and **AS 4773.2-2010, Masonry in small buildings – Construction**. The information included in **AS 3700-2001** may also be used to design smaller types of structures that are manufactured from masonry materials.

AS 3700-2001 and **AS 4773.1-2010** are based on limit state engineering design methods. Masonry structures designed to either of these Standards will conform to the loads covered in the **AS/NZS 1170, Structural design actions Series**.

Wind loads for masonry structures used with residential buildings can also be calculated by following the methods outlined in **AS 4055-2006, Wind loads for housing**.

For more information on technical drawing and manufacturing Standards for different types of masonry units please refer to [Technical Drawings – Masonry, Structural Steels and Timbers](#) and [Building Products - Masonry](#) sections of this guide.

Piling

AS 2159-2009, Piling - Design and installation defines the minimum requirements for the design and construction of piled footings for civil engineering and building structures on land or immediate offshore locations. Information on submerged piles is included in **AS 4997-2005, Guidelines for the design of maritime structures**.

Timbers used for piling can be visually graded by following the information that is included in **AS 3818.3-2010, Timber – Heavy structural products – Visually graded – Piles**.

Residential Slabs and Footings

Footings used with different types of buildings and structures should be designed to the requirements in **AS 2870-2011, Residential slabs and footings - Construction**. This Standard provides details for the following types of footings:

- Pad footings
- Rafts
- Waffle slabs
- Strip footings
- Stiffened slabs
- Pier on Slab and Pier on Beam footings.

Steel Structures

AS 4100-1998, Steel structures defines minimum requirements for the design, fabrication, erection and modification of steelwork in structures in accordance with the limit state design method. This Standard also covers engineering applications for buildings, structures, cranes, roadways and pedestrian bridges constructed of steels based on 'limit state design' engineering principles. The commentary to this Standard is **AS 4100 Supp 1-1999, Steel structures - Commentary (Supplement to AS 4100-1998)**.

Persons requiring information on 'allowable stress' (also known as working stress) design methods should purchase **AS 1250-1981, The use of steel in structures (known as the SAA Steel Structures Code) (incorporating Amdt 1)**.

The engineering Standard based on limit-state design engineering methods for buildings and structures using different types of cold-formed steels is **AS/NZS 4600:2005, Cold-formed steel structures**. **AS 1538-1988, Cold-formed Steel Structures Code** refers to 'allowable stress' (also known as working stress) design methods.

Design requirements for heavily engineered structures (e.g. bridges and cranes) are covered by **AS 4100-1998, AS 1418, Cranes, hoists and winches Series** and **AS 5100, Bridge Design Series**.

Connection and welding details for structures using cold-formed steels are also included in **AS/NZS 4600:2005**. Information on welding requirements for structures designed to the details covered by **AS/NZS 4600:2005** are included in:

- **AS/NZS 1554.1:2004, Structural steel welding – Welding of steel structures**
- **AS/NZS 1554.5:2004, Structural steel welding – Welding of steel structures subject to high levels of fatigue loading**

- **AS/NZS 1554.7:2006, Structural steel welding – Welding of sheet steel structures**

Timber Structures and Timber Frames

Timber engineering Standards are all based on limit state design engineering methods. The major types of timber engineering Standards are:

- **AS 1684, Residential timber-framed construction Series** which outlines methods for timber frames designed for single and two-storey residential buildings
- **AS 1720, Timber structures Series** which outlines methods for all other types of structures

There may be instances where engineering and design issues are not covered by the **AS 1684, Residential timber-framed construction Series**. In these types of cases, timber frames should be engineered by following the methods covered in **AS 1720.1-2010, Timber structures - Design methods**.

For more information on manufacturing Standards for different types of timbers, refer to the [Building Products - Timbers](#) section of this guide.

Timber Structures (Timber Framing Design)

Information covering design, installation, fixing and erection requirements for timbers used for structural applications in residential buildings is included in:

- **AS 1684.1-1999, Residential timber-framed construction – Design criteria**
- **AS 1684.2-2010, Residential timber-framed construction – Non-cyclonic areas**
- **AS 1684.3-2010, Residential timber-framed construction – Cyclonic areas**
- **AS 1684.4-2010, Residential timber-framed construction – Simplified – Non-cyclonic areas**

Wind speeds for timber framed buildings can be designed and calculated by following the methods described in either **AS/NZS 1170.2:2002, Structural design actions – Wind actions** or **AS 4055-2006, Wind loads for housing**.

Architects, building designers and other professionals in related fields should also consider the effects snow and earthquake loads can have on the structural integrity of timber-framed buildings. Information on these types of loads and actions on buildings is included in **AS/NZS 1170.3:2003, Structural design actions - Snow and ice actions** and **AS 1170.4-2007, Structural design actions - Earthquake actions in Australia**.

Timber Trusses

Loading requirements for timber trusses are included in the **AS/NZS 1170, Structural design actions Series**, which are also available as **AS/NZS 1170 Set:2007**.

Timber trusses should be installed and braced by following the details that are included in **AS 4440-2004, Installation of nailplated timber roof trusses**. This Standard also includes diagrams for different types of timber trusses.

Building Practices

Site Investigations and Earthworks

Before slabs, footings and piles are laid, site investigations should be undertaken to obtain information on different types of soil types. Persons responsible for undertaking site investigations will need to be familiar with the the Standards listed below:

- **AS 1726-1993, Geotechnical site investigations**
- **AS 1289.5, Methods of testing soils for engineering purposes Series**
- **AS 1289.6, Methods of testing soils for engineering purposes - Soil strength and consolidation tests Series**
- **AS 3798-2007, Guidelines on earthworks for commercial and residential developments**

For information on practices used to represent earthworks and footings on drawings and plans, see the [Technical Drawings – Earthworks and Footings](#) section of this guide. See the section [Residential Slabs and Footings](#) and [Piling](#) in the [Structural Design Standards](#) of this guide for more information on Standards for slabs, footings and piles.

Demolishing Buildings

AS 2601-2001, The demolition of structures sets out requirements and provides guidance to planners, owners, engineers, contractors and interested parties on the planning and procedures for the demolition of a structure.

Fixed Ladders, Platforms, Walkways and Stairs

Tradespeople and specialist workers required to access and egress buildings or machinery that are not regularly accessible to the public should use fixed ladders, platforms, walkways and stairs designed to conform to the requirements specified in **AS 1657-1992, Fixed platforms, walkways, stairways and ladders – Design, construction and installation**.

Fall Arrest Devices, Harnesses and Rope Suspension Systems

Persons working at heights should use appropriate types of rope suspension systems, fall arrest devices and harnesses. These types of devices should be selected, used and maintained by following the methods described in **AS/NZS 1891.4:2009, Industrial fall-arrest systems and devices – Selection, use and maintenance** and **AS/NZS 4488.2:1997, Industrial rope access systems – Selection, use and maintenance**.

Information on the types of harnesses used by persons working on roofs is included in **HB 39-1997, Installation code for metal roof and wall cladding**.

Information on manufacturing requirements for rope suspension systems, fall-arrest devices and harnesses are included in:

- **AS/NZS 1891.1:2007, Industrial fall-arrest systems and devices - Harnesses and ancillary equipment**
- **AS/NZS 1891.2:2001, Industrial fall-arrest systems and devices - Horizontal lifeline and rail systems**
- **AS/NZS 1891.2 Supp 1:2001, Industrial fall-arrest systems and devices - Horizontal lifeline and rail systems - Prescribed configurations for horizontal lifelines (Supplement to AS/NZS 1891.2:2001)**
- **AS/NZS 1891.3:1997, Industrial fall-arrest systems and devices – Fall-arrest devices**
- **AS/NZS 4488.1:1997, Industrial rope access systems – Specifications**

Portable Ladders

Portable ladders manufactured from different types of materials should be selected, maintained and used by following the recommendations that are included in **AS/NZS 1892.5:2000, Portable ladders – Selection, safe use and care**.

Information on manufacturing requirements for portable ladders is included in:

- **AS/NZS 1892.1:1996, Portable ladders – Metal**
- **AS 1892.2:1992, Portable ladders – Timber**
- **AS/NZS 1892.3:1996, Portable ladders – Reinforced plastic**

Scaffolding

AS/NZS 1576.1:2010, Scaffolding – General requirements provides information on design, manufacturing and test method requirements for different types of scaffolding. Suspended scaffolding systems should be tested to meet the requirements outlined in **AS 1576.4-1991, Scaffolding – Suspended scaffolding**.

Scaffolding can be erected and dismantled by following the recommendations described in **AS/NZS 4576:1995, Guidelines for scaffolding**.

Couplers and tubes used with scaffolding should be manufactured and tested to the information included in:

- **AS/NZS 1576.2:2009, Scaffolding – Couplers and accessories**
- **AS/NZS 1576.3:1995, Scaffolding – Prefabricated and tube-and-coupler scaffolding**

AS 6001-1999, Working platforms for housing construction provides information on methods for constructing working platforms from scaffolding equipment, building timber and other equipment typically located on building sites.

AS/NZS 1576.1:2010 provides this warning statement for those importing scaffolding or scaffolding components from overseas:

The use of Standards from another country when importing scaffolding equipment and/or components may not result in compliance with AS/NZS, 1576 Series. Design, performance and/or test criteria may be of a lesser level in other Standards. It is imperative to ensure that a Standard from another country meets all the requirements of AS/NZS, 1576 Series before referencing scaffolding equipment to be in compliance with this Standard.

Shoring

New shoring and trench lining systems manufactured from different types of steels are included in **AS 4744.1-2000, Steel shoring and trench lining equipment – Design**. Information on requirements for timber shoring systems is included in **AS 2159-2009, Piling – Design and installation**.

Suspended Ceilings

Suspended ceilings should be designed and installed by following the details that are included in **AS/NZS 2785-2000, Suspended ceilings – Design and installation**. This Standard also includes a list of areas that should be included in planning, design and tender specifications for suspended ceilings. Information on different types of suspended ceiling systems is included in **HB 39-1997, Installation code for metal roofing and wall cladding**.

Designers of suspended ceilings should review the engineering requirements included in:

- **AS/NZS 1170.0:2002, Structural design actions - General principles**
- **AS/NZS 1170.1:2002, Structural design actions - Permanent, imposed and other actions**
- **AS/NZS 1170.2:2002, Structural design actions - Wind actions**
- **AS/NZS 4600:2005, Cold-formed steel structures or AS 4100-1998, Steel structures**

Recessed luminaires used with suspended ceilings should conform to the details described in:

- **AS 2946-1991, Suspended ceilings, recessed luminaires and air diffusers - Interface requirements for physical compatibility**
- **AS/NZS 60598.2.2:2001, Luminaires - Particular requirements - Recessed luminaires (IEC 60598-2-2:1996, MOD)**

Information on acoustic requirements for suspended ceilings is included in **AS/NZS 2785:2000**. For further information on acoustic Standards for building products, refer to the [Acoustics](#) section of this guide.

Temporary Edge Protection Systems

This section provides information on roof edges and other types of temporary protection systems for those working on the roofs of residential and commercial buildings. It covers roof slopes no greater than 35° to the horizontal temporary edge protection system.



The practices detailed in the Standards in this section are not designed to replace scaffolding or fall-arrest systems that may be used for people who plan on working at heights. For more information please see the [Building Practices - Scaffolding](#) section of this guide.

AS/NZS 4994.1:2009, Temporary edge protection – General requirements sets out requirements for the design, manufacture and testing of equipment that is intended to provide protection at the roof edge to workers installing, altering, repairing or removing cladding on housing and residential buildings having roof slopes of not more than 35° to the horizontal.

Temporary roof edge protection systems can be installed and dismantled by following the methods outlined in **AS/NZS 4994.2:2009, Temporary edge protection – Roof edge protection – Installation and dismantling**.

The objective of **AS/NZS 4994.3:2010, Temporary edge protection – Installation and dismantling for edges other than roof edges** is to improve the safety of people performing any work near openings in floors, near the edges, or other elevated level working surfaces not being roofs of residential or commercial buildings.

Building Products

Cement

Portland and blended cements supplied in Australia and New Zealand should be tested to **AS 3972-2010, General purpose and blended cements**. Laboratory tests for these types of cements are included in the **AS 2350, Methods of testing portland and blended cements Series**.

Supplementary materials (e.g. fly ash) used with cements should be tested to meet the **AS/NZS 3582, Supplementary cementitious materials for use with portland and blended cement Series**.

Concrete (Ready Mixed) and Concrete Admixtures

Laboratory tests for concrete are included in the **AS 1012, Methods of testing concrete Series**.

Information on manufacturing requirements for normal, special class, hardened concrete and plasticized concrete are included in **AS 1379-2007, Specification and supply of concrete**. The commentary to this Standard is **AS 1379 Supp1-2008**. Information on recommended comprehensive strength levels for different types of concrete is included in **AS 1379-2007**.

Sampling procedures used to manufacture concrete are described in **AS 1012.1-1993, Methods of testing concrete – Sampling of fresh concrete**.

Fire tests for concrete products tested to **AS 1379-2007** are included in **AS 1530.4-2005, Methods for fire tests on building materials, components and structures - Fire-resistance test of elements of construction**.

Chemical admixtures used to manufacture concrete should be tested to **AS 1478.1-2000, Chemical admixtures for concrete, mortar and grout – Admixtures for concrete**. Sampling methods for chemical admixtures are included in **AS 1478.2-2005, Chemical admixtures for concrete, mortar and grout – Methods of sampling and testing admixtures for concrete, mortar and grout**.

Concrete Tanks

Concrete tanks which contain liquids can be manufactured and designed to the details outlined in **AS 3735-2001, Concrete structures retaining liquids**. The commentary to this Standard is **AS 3735 Supp 1-2001**. Users of **AS 3735-2001** should also follow the design details that are included in **AS 3600-2009, Concrete structures**.

Information on manufacturing and design requirements for concrete septic tanks is included in **AS/NZS 1546.1:2008, On-site domestic wastewater treatment units – Septic tanks**.

Doors

Standards Australia has no current Standards for timber doors, however information on these types of doors is included in:

- **AS 1909-1984, Installation of timber doorsets**
- **AS 2688-1984, Timber doors**
- **AS 2689-1994, Timber doorsets**

In September 2004 Standards Australia indicated that the status of the above Standards was to be changed to 'obsolescent'. This term indicates that Standards may not be recommended for new equipment or for current best practise. These Standards have only been retained in order to provide for those who are servicing existing equipment or requirements.

Powered Doors for Pedestrians

Powered doors used by pedestrians should be designed, installed and operated by following the information that is included in **AS 5007-2007, Powered doors for pedestrian access and egress**.

Fire Doors

Fire doors used and supplied in Australia and New Zealand should be tested to **AS 1905.1-2005, Components for the protection of openings in fire-resistant walls – Fire-resistant doorsets**. Fire tests for these types of doors are included in **AS 1530.4-2005, Methods for fire tests on building materials, components and structures - Fire-resistance test of elements of construction**. Fire resistance requirements for locksets used with fire doors are also included in both these Standards.

Durability tests for locksets used with fire doors are included in **AS 4145.2-2008, Locksets and hardware for doors and windows - Mechanical locksets for doors and windows in buildings**.

Shutters used with fire doors should be tested to the types of methods that are described in **AS 1905.2-2005, Components for the protection of openings in fire-resistant walls - Fire-resistant roller shutters**.

Aluminium Security Doors and Grilles

The manufacturing Standard for aluminium security doors and window grilles is **AS 5039-2008, Security screen doors and security window grilles**. Aluminium security doors and window grilles can be installed by following the methods outlined in **AS 5040-2003, Installation of security screen doors and window grilles**.

Durability tests for locks used with security doors and grilles is included in **AS 4145.2-2008, Locksets and hardware for doors and windows - Mechanical locksets for doors and windows in buildings**.

Garage Doors

Information on Standards for designing, manufacturing, installing and operating domestic garage doors is covered by:

- **AS/NZS 4504, Domestic Garage Doors - Methods of test Series**
- **AS/NZS 4505:1998, Domestic garage doors**

Fences and Gates

Metal fences can be painted and finished by following the methods prescribed in **AS/NZS 2311:2009, Guide to the painting of buildings** and **AS/NZS 2312:2002, Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings**.

Chain Link Security Fences and Gates

Manufacturing Standards for chain link security fences are included in **AS 1725, Chain link fabric fencing Series**.

Swimming Pool Fences and Gates

Manufacturing requirements for pool fences is included in **AS 1926.1-2007, Swimming pool safety – Safety barriers for swimming pools**. Swimming pool fences should be located by following the methods described in **AS 1926.2-2007, Swimming pool safety – Location of safety barriers for swimming pools**. These Standards are referenced in the Building Code of Australia (see **BCA + Standards** service), as well as in State and Territory building legislation.

The manufacturing Standard for gates used with swimming pools is **AS 2820-1993, Gates units for private swimming pools**.

Glass pool fences should be designed and installed by following the techniques described in **AS 1288-2006, Glass in buildings - Selection and Installation**. The commentary to this Standard **AS 1288 Supp 1-2006** includes span tables that provide information on required thickness details for different types of safety glass. These thickness levels are linked to wind speeds that can be expected in different locations.

Wind speeds for glass used in fences and gates can be calculated by following the methods in:

- **AS 1170.2-1989, Minimum design loads on structures (known as the SAA Loading Code) – Wind loads**
- **AS/NZS 1170.2:2002, Structural design actions – Wind actions**

- **AS 4055-2006, Wind loads for housing**

General information on glazing requirements for pool fences is also included in **HB 125-2007, The glass and glazing handbook (including guide to AS 1288 Glass in buildings – Selection and installation)**.

Electric Fences

The installation Standard for electric fences is **AS/NZS 3014:2003, Electrical installations – Electric fences**.

Glass

Specifications on procedures for the design, selection and installation of glass in buildings is included in **AS 1288, Glass in buildings Series**.

Glass installed to the requirements described in **AS 1288-2006** should be manufactured to the test methods and marking requirements included in **AS/NZS 2208:1996, Safety glazing materials in buildings**. In addition, safety glass manufactured to these Standards should be cut, finished and marked by following the details outlined in **AS/NZS 4667:2000, Quality requirements for cut-to-size and processed glass**.

Glass used on vehicles, buses, trains and trams should be manufactured to the requirements included in **AS/NZS 2080:2006, Safety glazing for land vehicles**.

For more information on design and installation Standards for glass used in buildings, refer to the [Structural Design Standards - Glass Structures](#) section of this guide.

Bullet (Intruder Resistant) Panels

Information on manufacturing requirements for intruder resistant panels is included in **AS/NZS 2343:1997, Bullet-resistant panels and elements**.

Insulated Glass Units

Insulating glass units should be selected and installed by following the methods that are described in **AS/NZS 4666:2000, Insulating glass units**. Installers of these types of units should also follow the practices included in **AS 1288-2006, Glass in buildings – Selection and installation**.

Masonry

Detailed information on definitions for masonry products and diagrams for bricks, blocks and masonry units are included in **HB 50-2004, Glossary of building terms**.

Laboratory tests for different types of products used with masonry structures are included in the **AS/NZS 4456, Masonry units and segmental pavers and flags - Methods of test Series**.

Information on the requirements for different refractory materials is included in:

- **AS 1617, Refractory bricks and shapes Series**
- **AS 1618-2003, Dimensions and preferred sizes for refractory bricks**
- **AS 1774, Refractories and refractory materials - Physical test methods Series**
- **AS 2497.1–2001, Procedures for acceptance testing of refractory products - Batch procedure**
- **AS 2503, Refractories and refractory materials - Chemical analysis Series**
- **AS 2780-2003, Refractories and refractory materials - Glossary of terms**
- **AS 4045, Prepared unshaped refractory materials Series**

- **AS 4359, Insulating refractory ceramic fibres Series**

Portland and Blended Cements (Masonry Cement)

The manufacturing Standard for cement used with masonry structures is **AS 1316-2003, Masonry cement**. Test methods for these types of cements are included in the **AS/NZS 2350, Methods of testing portland and blended cements Series**.

Masonry Units Used for Walls

Masonry units (e.g. bricks) constructed from mortared joints should be tested to align with **AS/NZS 4455.1:2008, Masonry units, pavers, flags and segmental retaining wall units – Masonry units**. Masonry units tested to this Standard should also be designed to meet the requirements specified in **AS 3700-2001, Masonry structures**.

Masonry units used to build earth-retaining structures that are designed to **AS 4678-2002, Earth-retaining structures** should also be tested to the methods described in **AS/NZS 4455.3:2008, Masonry units, pavers, flags and segmental retaining walls - Segmental retaining wall units**. These types of structures are not designed by using mortar connected joints.

Mortar

Mortar used with masonry structures should be tested to align with **AS 2701-2001, Methods of sampling and testing mortar for masonry constructions**. Diagrams illustrating different types of mortar joints are included in **HB 50-2004, Glossary of building terms**. Durability levels for mortars are described in **AS 3700-2001** and **AS 4773.1-2010, Masonry in small buildings - Design**.

Segmental Pavers and Flags

Pavers and flags used for pedestrian and road traffic control purposes should be tested to the methods prescribed in **AS/NZS 4455.2:2010, Masonry units, pavers, flags and segmental retaining wall units – Pavers and flags**. Also included in this Standard is a definition for the term 'flags'.

Wall Ties, Anchors and Lintels

Wall ties used with masonry structures should be designed and manufactured to the requirements specified in **AS/NZS 2699.1:2000, Built-in components for masonry construction – Wall ties**.

Masonry anchors and other types of connecting devices should be designed and manufactured by following the information that is included in **AS/NZS 2699.2:2000, Built-in components for masonry construction – Connectors and accessories**.

Lintels and shelf-angles used with masonry structures should be manufactured and tested to meet **AS/NZS 2699.3:2002, Built-in components for masonry construction – Lintels and shelf angles (durability requirements)**.

Design and durability requirements for wall ties and other types of connecting devices used with masonry structures is also included in **AS 3700-2001** and **AS 4773.1-2010**.

Metals

Yield stress levels for metals conforming to Australian Standards® can be determined by completing the types of tests that are included in **AS 1391-2007, Metallic materials – Tensile testing at ambient temperature**.

There are Australian Standards® for **destructive, non-destructive, mechanical and hardness tests** for different types of metals. Methods used to assess properties for irons and steels are included in the **AS 1050, Methods for the analysis of iron and steel Series**.



The ideal product for organizations requiring comprehensive and up-to date information on metals is [Metals Infobase](#). This helps you stay informed about the vast number of metal grades, referring Standards and suppliers around the world.

Steel

Steels in Australia and New Zealand as well as off-shore should be designated with Workstuff or Unified Numbering System (UNS) numbers. Metals supplied or manufactured outside the United States are commonly designated with UNS numbers. A Workstuff number for steels will start with 1 and it will then have 4 digits eg (1.222). Workstuff numbers can also be used to provide details on suppliers of different types of steels.

A list of UNS numbers, chemical properties for steels and details for Standards referencing UNS numbers is included in **Unified Numbering System Ed.11 (2008), Metals And Alloys In The Unified Numbering System (UNS)**.

Suppliers and purchasers of steels should check to see if the manufacturers of steels supply certificates conforming to the documentation requirements specified in:

- **I.S. EN 10168:2004, Steel Products – Inspection Documents – List of Information and Description**
- **I.S. EN 10204:2004, Metallic Products – Types of Inspection Documents**

Cast and Forged Steels

Information covering manufacturing requirements for cast and forged steels including chemical compositions, mechanical properties and heat treatment conditions for materials used to manufacture cast and forged steels is included in:

- **AS 1448-2007, Carbon steel and carbon-manganese steels – Forgings (ruling section 300 mm maximum)**
- **AS 2074-2003, Cast steels**

Reinforcing Bars Used With Concrete and Masonry

Steel reinforcing materials used with structures should be tested to align with **AS/NZS 4671:2001, Steel reinforcing materials**.

Stainless Steels

Standards Australia has not established any Standards specifying chemical, mechanical, and heat treatment properties for stainless steels. However, a number of Australian Standards® reference **ASTM A240/A240M-11, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications**. Stainless steels used in Australia and New Zealand may have chemical properties, mechanical properties, heat treatment conditions and tolerances conforming to:

- **ASTM A280M/A240M-09a, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications**
- **I.S. EN 10088-1:2005, Stainless Steels – Part 1: List of Stainless Steels**
- **I.S. EN 10088-2:2005, Stainless Steels – Part 2: Technical Delivery Conditions for Sheet/Plate and Strip of Corrosion Resisting Steels for General Purposes**

- **I.S. EN 10088-3:2005, Stainless Steels – Part 3: Technical Delivery Conditions for Semi-finished Products, Bars, Rods, Wire, Sections and Bright Products Of Corrosion Resisting Steels for General Purposes**
- **I.S. EN 10088-4:2009, Stainless Steels – Part 4: Technical Delivery Conditions for Sheet/plate and Strip of Corrosion Resisting Steels for Construction Purposes**

Steels for Pressure Equipment

Material groupings for Australian, **API** and **ASME** Standards used to manufacture pressure equipment are included in **AS 4458-1997, Pressure equipment – Manufacture**. Information on chemical, mechanical, heat treatment properties, dimensions and tolerances for steels used to manufacture pressure vessels is included in **AS 1548-2008, Fine grained, weldable steel plates for pressure equipment**.

Information on Standards for metals used to manufacture pipes and different types of products used with pressure pipes is included in **AS 4041-2006, Pressure piping**.

Structural Steels

Information on chemical and mechanical properties, tolerances and dimensions for different types of structural steels is included in:

- **AS/NZS 1163:2009, Cold-formed structural steel hollow sections**
- **AS 1442-2007, Carbon steels and carbon-manganese steels – Hot-rolled bars and semi-finished products**
- **AS 1397:2001, Steel sheet and strip – Hot-dipped zinc-coated or aluminium/zinc-coated**
- **AS/NZS 3678:1996, Structural steel – Hot-rolled plates, floorplates and slabs**
- **AS/NZS 3679.1:2010, Structural steel – Hot-rolled bars and sections**
- **AS/NZS 3679.2:1996, Structural Steel – Welded I sections**

Wrought Alloy and Hardened Steels

Information on wrought alloy and hardened steels is included in **AS 1444-2007, Wrought alloy steels – Standard, hardenability (H) series and hardened and tempered to designated mechanical properties**. Hardness tests for steels are included in:

- **AS 1815, Metallise materials - Rockwell hardness test Series**
- **AS 1816, Metallic materials - Brinell hardness tests Series**
- **AS 1817, Metallic materials - Vickers hardness tests Series**

Aluminium Alloy

Aluminium alloys should be anodized by following the methods described in **AS 1231-2000, Aluminium and aluminium alloys – Anodic oxidation coatings**. Information on different types of aluminium alloys are included in:

- **AS/NZS 1734:1997, Aluminium and aluminium alloys – Flat sheet, coiled sheet and plate**
- **AS/NZS 1865:1997, Aluminium and aluminium alloys – Drawn wire, rod, bar and strip**
- **AS/NZS 1866:1997, Aluminium and aluminium alloys – Extruded rod, bar, solid and hollow shapes**
- **AS/NZS 1867:1997, Aluminium and aluminium alloys – Drawn tubes**
- **AS 1874-2000, Aluminium and aluminium alloys – Ingots and castings**

Thickness levels and mechanical properties for alloys used for structural purposes are listed in **AS/NZS 1664.1:1997, Aluminium structures – Limit state design** and **AS/NZS 1664.2:1997, Aluminium structures – Allowable stress design**.

Iron

Information on properties for different types of irons is included in:

- **AS 1830-2007, Grey cast iron**
- **AS 1831-2007, Ductile cast iron**
- **AS 1832-2007, Malleable cast iron**
- **AS 2027-2007, Abrasive-resistant cast irons**
- **AS 5049-2007, Cast iron – Designation of microstructure of graphite**
- **AS 5052-2007, Compacted (vermicular) graphite cast irons – Classification**

Copper

There are a number of Standards which relate to products manufactured from different types of copper, which can be found in the **copper** section of the InfoStore. Plumbing products (e.g. taps, pipes and waste fittings) should be manufactured from dezincification resistance (DR) brass. Information on dezincification resistance brass is included in **AS 2345-2006, Dezincification resistance of copper alloys**.

Pliable Building Membranes

Pliable building membranes used with concrete, masonry, slabs and footings should be tested to the requirements covered in **AS/NZS 4200.1:1994, Pliable building membranes and underlays – Materials**. Test methods for building membranes manufactured to this Standard are included in the **AS/NZS 4201, Pliable building membranes and underlays Series**.

Installation requirements for pliable building membranes are included in **AS/NZS 4200.2:1994, Pliable building membranes and underlays – Installation requirements**.

Roofing and Wall Materials

Metal Roofing and Wall Materials – Cladding

Metal sheet materials used for roof and wall cladding should be designed and installed by following the procedures described in **AS 1562.1-1992, Design and installation of sheet roof and wall cladding – Metal**. Materials used to produce cladding products should also comply to this Standard. Test methods for metal cladding are included in the **AS/NZS 4040, Methods of testing sheet roof and wall cladding Series**. Test methods for these types of cladding materials are also described in **AS 1562.1-1992**.

Metal Roofing – Flashings

Flashings used with metal roofs should be manufactured to the requirements described in **AS/NZS 2904:1995 Damp-proof courses and flashings**. Information on requirements for flashings used with metal roofs are also described in **HB 39-1997, Installation code for metal roofing and wall cladding**.

Test methods for damp-proof courses and flashings are included in the **AS/NZS 4347, Damp-proof courses and flashings Series**.

Plastic Roofing and Wall Materials – Cladding

Plastic sheets used with roofing and wall products should be designed and installed by following the details that are included in **AS 1562.3-2006, Design and installation of sheet roof and wall cladding – Plastic**. Test methods for products manufactured to these Standards are included in the **AS/NZS 4257, Plastic roof and wall cladding materials – Methods of test Series**. Manufacturing requirements for plastic materials used to clad roofs and walls are included in:

- **AS 4256.1-2006, Plastic roof and wall cladding materials - General requirements**
- **AS 4256.2-2006, Plastic roof and wall cladding materials - Unplasticized polyvinyl chloride (uPVC) building sheets**
- **AS 4256.3-2006, Plastic roof and wall cladding materials - Glass fibre reinforced polyester (GRP)**
- **AS 4256.4-2006, Plastic roof and wall cladding materials - Unplasticized polyvinyl chloride (uPVC) wall cladding boards**
- **AS 4256.5-2006, Plastic roof and wall cladding materials - Polycarbonate**

Fibre Reinforced Cement and Wall Materials – Cladding

Fibre reinforced materials used to clad roofs and walls should be designed, manufactured and installed to the requirements detailed in **AS/NZS 1562.2:1999, Design and installation of sheet roof and wall cladding – Corrugated fibre-reinforced cement**.

Roofing Tiles

The Australian manufacturing Standard for roofing tiles is **AS 2049-2002, Roof tiles**. Installation requirements for roofing tiles is included in **AS 2050-2002, Installation of roof tiles**.

Skylights

Factory manufactured skylights should be tested to the requirements that are included in **AS 4285-2007, Skylights**. Information on glazing requirements for skylights is included in **AS 1288-2006, Glass in buildings – Selection and installation**.

Timbers

Typically, engineered timber products do not need to be treated with timber preservatives. Manufacturing and test methods for these types of timber products are included in the **AS/NZS 4063, Characterization of structural timber Series**. Framing requirements for these types of timbers are also included in **AS 1684.2-2010, AS 1684.3-2010** and **AS 1684.4-2010**.

For more information on timber flooring, please refer to the [Internal Finishes - Timber Flooring](#) section of this guide.

Timbers used in Australia and New Zealand should be tested to **AS/NZS 1080, Timber – Methods of test Series**. Manufacturing Standards for different types of timbers consist of specific moisture content levels for timbers. Moisture levels for timbers are determined by following the methods outlined in **AS/NZS 1080.1:1997, Timbers – Methods of test – Moisture content**.

Preservative treatment tests for different types of timbers are included in:

- **AS 1604.1-2010, Specification for preservative treatment – Sawn and round timber**
- **AS/NZS 1604.2:2010, Specification for preservative treatment – Reconstituted wood-based products**
- **AS/NZS 1604.3:2010, Specification for preservative treatment – Plywood**

- **AS/NZS 1604.4:2010, Specification for preservative treatment – Laminated veneer lumber (LVL)**
- **AS/NZS 1604.5:2010, Specification for preservative treatment – Glued laminated timber products**

Natural durability levels for timbers can be determined by following the methods described in **AS 5604-2005, Natural durability ratings**. Durability details for timbers used for above-ground and in-ground situations are included in **AS 1684.2-2010** and **AS 1684.3-2010**. Durability levels for timbers are expressed in terms H1-H6 ratings. A table listing natural durability levels for different types of timber species used for framing are included **AS 1684.2-2010** and **AS 1684.3-2010**

Structural Timbers – Timber Framing Applications

Sawn and round timbers used for structural applications requiring preservative treatment, should be either visually (F Grades) or mechanically (MGP) graded timbers. Spans listing sizes for these types of timbers are included in **AS 1684.2-2010**, **AS 1684.3-2010** and **AS 1684.4-2010**.

There are visual grades for softwoods, hardwoods, laminated timbers and plywoods, which are also linked to structural grades for seasoned and unseasoned timbers. Information on methods used to determine strength details for structural grades is included in **AS 1720.1-2010, Timber structures – Design methods**.

Visual grades for timbers for general applications are included in:

- **AS 2082-2007, Timber – Hardwood – Visually stress-graded for structural purposes**
- **AS 2858-2008, Timber – Softwood – Visually stress-graded for structural purposes**

Structural Timbers – Heavily Engineered Timbers

Timbers used to cater for different types of heavy loads requiring preservative treatment should be visually graded by following the details described in **AS 3818, Timber – Heavy Structural Products Series**. Typically, these types of timbers are used for overhead power lines, railway sleepers (railway tracks) and for piling.

Structural Timbers – Mechanically Graded (MGP) Timbers

Information on methods used to determine requirements for mechanically graded (MGP) timbers (requiring preservative treatment) are included in **AS/NZS 1748:2006, Timber – Mechanically stress-graded for structural purposes** and **AS 1720.1-2010, Timber structures – Design methods**.

Structural Timbers - Engineered Wood Products (EWP Timbers)

Engineered wood products not requiring preservative treatment can be used for a wide variety of applications. Manufacturing requirements and information on methods used to determine strengths for these types of timbers is included in:

- **AS/NZS 4063.1:2010, Characterization of structural timber – Test methods**
- **AS/NZS 4063.2:2010, Characterization of structural timber – Determination of characteristic values**

Building practises for engineered wood products are also described in **AS 1684.2-2010** and **AS 1684.3-2010**.

Structural Timbers - Engineered Wood Products (EWP Timbers)

The Standards for different types of plywood not requiring preservative treatment are:

- **AS/NZS 2269.1:2008, Plywood – Structural – Determination of structural properties – Test methods**
- **AS/NZS 2269.2:2007, Plywood – Structural – Determination of structural properties – Evaluation methods**
- **AS/NZS 2272:2006, Plywood – Marine**
- **AS/NZS 2097:2006, Methods for sampling veneer and plywood**
- **AS/NZS 2098, Methods of test for veneer and plywood Series**
- **AS/NZS 2271:2004, Plywood and blockboard for exterior use**
- **AS 6669-2007, Plywood – Formwork**

Structural Timbers – Glued Laminated Timbers

Manufacturing requirements for glued laminated timbers used for structural purposes are included in:

- **AS/NZS 1328.1:1998, Glued laminated structural timber – Performance requirements and minimum production requirements**
- **AS/NZS 1328.2:1998, Glued laminated structural timber – Guidelines for AS/NZS 1328: Part 1 for the selection, production and installation of glued laminated structural timber**

Glued laminated timbers can be treated by following the procedures described in **AS/NZS 1604.5:2010, Specification for preservative treatment – Glued laminated timber products**.

Sawn and Milled Timbers – Appearance Grades

Appearance grades and manufacturing requirements for sawn and milled softwood and hardwood timbers are:

- **AS 2796.1-1999, Timber – Hardwood – Sawn and milled products – Product specification**
- **AS 2796.2-2006, Timber – Hardwood – Sawn and milled products – Grade description**
- **AS 4785.1-2002, Timber – Softwood – Sawn and milled products – Product specification**
- **AS 4785.2-2002, Timber – Softwood – Sawn and milled products – Grade description**

Non-Structural Timbers - Glued Laminated Timbers

Glued laminated timbers not used for structural and engineering applications should be tested to the requirements described in **AS 5067-2003, Timber – Non-structural glued laminated – Performance and production requirements**. Also included in this Standard are typical uses for these types of timbers.

Wood-Based Panels

Australian and New Zealand Standards for different types of wood-based panels are listed below:

- **AS/NZS 1859.1:2004, Reconstituted wood-based panels – Specifications – Particleboard**
- **AS/NZS 1859.2:2004, Reconstituted wood-based panels – Specifications – Dry-processed fibreboard**
- **AS/NZS 1859.3:2005, Reconstituted wood-based panels – Specifications – Decorative overlaid wood panels**
- **AS/NZS 1859.4:2004, Reconstituted wood-based panels – Specifications – Wet-processed fibreboard**

Please consult the [Internal Finishes - Timber Flooring](#) section of this guide for information on Standards for particleboard flooring.

Windows, Glass Doors, Louvres, Shopfronts and Window Walls

AS 2047-1999, Windows in buildings – Selection and installation defines requirements for:

- Windows (Window frames)
- Sliding glass doors
- Adjustable louvers
- Shopfronts
- Window walls with one-piece framing elements

Information on glazing requirements for these types of building products is included in **AS 1288-2006, Glass in buildings - Selection and installation**. Please consult the section **Structural Design Standards - Glass Structures** of this guide for more information on this topic.

Wind ratings for windows used in residential buildings can be determined by following the methods described in **AS 4055-2006, Wind loads for housing**. Wind ratings for windows used in non-residential buildings can be determined by following the details included in **AS/NZS 1170.2:2002, Structural design actions – Wind actions**. Information on methods that can be used to calculate wind speeds for windows is also included in **AS 2047-1999, Windows in buildings – Selection and installation**.

Energy Efficient Building Products

Energy efficiency requirements for different classes of buildings are included in the Building Code of Australia (see **BCA + Standards** service) and the State/Territory legislation adopted under the BCA.

Standards on sustainability and energy efficiency requirements for buildings and building materials, are listed below:

- **ISO 15392:2008, Sustainability in building construction – General principles**
- **ISO 21930:2007, Sustainability in building construction – Environmental declaration of building products**
- **ISO 21931-1:2010, Sustainability in building construction – Framework for methods of assessment of the environmental performance of construction works – Part 1: Buildings**
- **ISO/TS 21929-1:2006, Sustainability in building construction – Sustainability indicators – Part 1: Framework for development of indicators for buildings**
- **I.S. EN 15643-1:2010, Sustainability of Construction Works – Sustainability Assessment of Buildings – Part 1: General Framework**
- **PREN 15978:2009, Sustainability Of Construction Works – Assessment Of Environmental Performance Of Buildings – Calculation Method**
- **SR CEN TR 15941:2010, Sustainability of Construction Works – Environmental Product Declarations – Methodology for Selection and use of Generic Data**

N.B: The European draft Standards are designated with a PREN prefix. The technical reports are provided with a SR CEN TR prefix.

Lighting Products

Energy efficiency levels for interior lighting can be accessed by following the information that is included in **AS/NZS 1680.1:2006, Interior and workplace lighting – General principles and recommendations**. Also included in this Standard, is information on characteristics for different types of lighting systems.

Symbols used to represent different types of lighting products are included in **AS/NZS 1102.111:1997** and **HB 3:1996, Electrical and electronic drawing practice for students**.

Solar Panels Connected to Hot Water Systems and Heat Pumps

Manufacturers of solar panels connected to hot water systems and heat pumps can apply for certificates under the Australian Government's Renewable Energy Certificates Schemes (RECS). In order for certificates to be issued, manufacturers are required to certify their solar panels to the requirements covered in;

- **AS/NZS 2172:2007, Solar and heat pump water heaters – Design and construction**
- **AS/NZS 4234:2008, Heated water systems – Calculation of energy consumption**

Solar water heaters connected to water supplies are also required to be certified to **AS 3498-2009, Authorization requirements for plumbing products – Water heaters and hot-water storage tanks**.

Inverters used with solar panels should be designed and manufactured to the requirements specified in **AS 4777.2-2005, Grid connection of energy systems via inverters – Inverter requirements**. Grid protection devices used with inverters should be tested to the requirements defined in **AS 4777.3-2005, Grid connection of energy systems via inverters - Grid connection requirements**.

Installation Standards for these types of inverters are included in **AS 4777.1-2005, Grid connection of energy systems via inverters – Installation requirements** and **AS/NZS 3000:2007, Electrical installations (known as the Australian/New Zealand Wiring Rules)**. Please consult the section [Electrical Wiring](#) of this guide for more information on electrical wiring Standards.

The installation Standard for all types of solar panels is **AS/NZS 5033:2005, Installation of photovoltaic (PV) arrays**.

Solar Panels (Stand-Alone Products – Not Connected to Hot Water Systems and Heat Pumps)

Standards Australia has not established any Standards covering solar panels that are not connected to hot water and heat pumping systems. However, inverters used with solar panels should be designed and manufactured to the requirements specified in **AS 4777.2-2005**. Grid protection devices used with inverters should be tested to the requirements defined in **AS 4777.3-2005**. Installation Standards for these types of inverters are included in **AS 4777.1-2005** and **AS/NZS 3000:2007**.

Solar panels (also known as photovoltaic arrays – PV arrays) should be installed by following the details that are included in **AS/NZS 5033:2005 Installation of photovoltaic (PV) arrays**.

There are number of **IEC** Standards and **EN** Standards for solar panels that are not connected to hot water and heat pumping systems.

Thermal Insulating Materials

The manufacturing Standard for thermal insulating materials used to insulate walls and ceilings in domestic buildings is **AS/NZS 4859.1-2009, Materials for the thermal insulation of buildings –**

General criteria and technical provisions. Early fire hazard tests for these types of materials are included in **AS/NZS 1530.3:1999, Methods for fire tests on building materials, components and structures - Simultaneous determination of ignitability, flame propagation, heat release and smoke release.** Please see the section [Fire Tests](#) of this guide for more information on Standards covering different types of fire tests.

These types of insulating materials are installed by following the information that is included in **AS 3999-1992, Thermal insulation of dwellings – Bulk insulation – Installation requirements.** Information covering recommended clearance distances between insulating materials and lighting equipment is included in **AS/NZS 3000:2007, Electrical installations (known as the Australian/New Zealand Wiring Rules).**

Water Heaters

The Australian and New Zealand energy efficiency Standard for solar, gas and electric water heaters is **AS/NZS 4234:2008, Heated water systems – Calculation of energy consumption.**

Information on installation requirements for hot water heaters is included in **AS/NZS 3500.4:2003** Information on recommended hot water temperatures for different types of buildings and facilities is included in **HB 263-2004, Heated water systems.** Please consult the section [Plumbing and Gas](#) of this guide for information on different types of plumbing and gas installation Standards.

Before water heaters are installed, manufacturers of water heaters should certify their products under the [WaterMark scheme](#). The [WaterMark](#) certification Standard for these types of heaters is **AS 3498-2009, Authorization requirements for plumbing products - Water heaters and hot-water storage tanks.**

Air Conditioners

Australian energy efficiency levels for single-phase and three-phase air conditioners can be determined by completing tests that are included in:

- **AS/NZS 3823.1.1:1998, Performance of electrical appliances – Airconditioners and heat pumps - - Test methods – Non-ducted airconditioners and heat pumps – Testing and rating for performance**
- **AS/NZS 3823.1.2:2001, Performance of electrical appliances - Airconditioners and heat pumps - - Test methods - Ducted airconditioners and air-to-air heat pumps - Testing and rating for performance**
- **AS/NZS 3823.1.3:2005, Performance of electrical appliances - Airconditioners and heat pumps - Water-source heat pumps - Water-to-air and brine-to air heat pumps - Testing and rating of performance (ISO13256-1, Ed.01 (1998) MOD)e**

Energy labelling and performance requirements for air conditioners are included in **AS/NZS 3823.2:2009, Performance of electrical appliances - Air conditioners and heat pumps – Energy labelling and minimum energy performance standard (MEPS) requirements.** Energy levels for air conditioners can be calculated by following the methods that are described in **AS/NZS 3823.3:2002, Performance of electrical appliances – Airconditioners and heat pumps – Calculation of performance for minimum energy performance standard (MEPS) requirements.**

Fire Tests

Building materials used in Australia should be designed to conform to different types of fire tests.

Definitions for terms described in different types of fire tests are also included in **AS 2484.1-1990, Fire – Glossary of terms – Fire tests** and **HB 50-2004, Glossary of building terms.**

Early Fire Hazard Properties for Building Products

Information on combustibility, flammability, ignitability, heat release and smoke release tests used to measure early fire hazard properties for building products is included in:

- **AS 1530.1-1994, Methods for fire tests on building materials, components and structures – Combustibility tests for materials**
- **AS 1530.2-1993, Methods for fire tests on building materials, components and structures – Test for flammability of materials**
- **AS/NZS 1530.3:1999, Methods for fire tests on building materials, components and structures – Simultaneous determination of ignitability, flame propagation, heat release and smoke release**

Fire Resistance Levels (FRL) Tests

- **AS 1530.4-2005, Methods for fire tests on building materials, components and structures – Fire-resistance test of elements of construction**

Buildings Located In Bushfire Prone Areas

- **AS 1530.8.1-2007, Methods for fire tests on building materials, components and structures – Tests on elements of construction for buildings exposed to simulated bushfire attack – Radiant heat and small flaming sources**
- **AS 1530.8.2-2007, Methods for fire tests on building materials, components and structures – Tests on elements of construction for buildings exposed to simulated bushfire attack – Large flaming sources**
- **AS/NZS 3837:1998, Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter**

Smoke Control Doors

AS 1530.7-2007, Methods for fire tests on building materials, components and structures – Smoke control assemblies – Ambient and medium temperature leakage test procedure.

Australian fire door Standard only references tests that are included in **AS 1530.4-2005**. (N.B: This Standard is not used to complete tests on fire doors that have been manufactured to **AS 1905.1-2005, Components for the protection of openings in fire-resistant walls – Fire-resistant doorsets.**

Fire Protection Equipment

Architects responsible for preparing plans for Public, Office and Commercial Buildings should be familiar with Standards for different types of fire protection equipment. Examples of symbols used to represent different types of fire protection equipment are included in **HB 20-1996, Graphical symbols for fire protection drawings.**

Please consult the section [Technical Drawings and Architectural Plans](#) of this guide for more detailed information on technical drawing Standards.

Maintenance requirements for different types of fire protection equipment are included in **AS 1851-2005: Maintenance of fire protection systems and equipment.**

Audits for fire protection equipment and essential fire services can be completed by following the details that are included in **AS 4655-2005, Fire safety audits.**

Residential Buildings (Fire Protection Equipment)

Information on requirements for fire protection equipment that should be located in new residential buildings, or buildings being renovated and subject to planning approvals is included in the Building Code of Australia (see **BCA + Standards** service). The Building Code is enforced under the regulations listed in the State and Territory Appendices to the Building Code of Australia.

Smoke alarms located in residential buildings should be tested to the requirements that are included in **AS 3786-1993, Smoke alarms**. Smoke alarms that have been tested to this Standard can be installed by following the information that is included in **AS 1670.6-1997, Fire detection, warning, control and intercom systems – System design, installation and commissioning – Smoke alarms**.

Units and Townhouses (Fire Protection Equipment)

Information on requirements for types of fire protection equipment used and located in Units and Townhouses is included in the Building Code of Australia (see **BCA + Standards** service).

Examples of symbols used to represent different types of fire protection equipment are included in **HB 20-1996, Graphical symbols for fire protection drawings**. Please consult the section [Technical Drawings and Architectural Plans](#) of this guide for more detailed information on technical drawing Standards.

Maintenance requirements for different types of fire protection equipment are included in **AS 1851-2005, Maintenance of fire protection systems and equipment**.

Audits for fire protection equipment and essential fire services can be completed by following the details that are included in **AS 4655-2005, Fire safety audits**.

Information on plumbing requirements for different types of fire protection equipment is included in **AS/NZS 3500.1:2003, Plumbing and drainage – Water services**.

Emergency Warning and Intercommunication Systems

Information on design and installation requirements for emergency warning and intercommunication systems located in Units and Townhouses is included in **AS 1670.4-2004, Fire detection, warning, control and intercom systems - System design, installation and commissioning - Sound systems and intercom systems for emergency purposes**.

Fire Doors and Shutters

Fire and smoke doors located in Units and Townhouses should be designed, manufactured and installed by following the information that is included in **AS 1905.1-2005, Components for the protection of openings in fire-resistant walls - Fire-resistant doorsets**.

Fire shutters should be designed, manufactured and installed by following the requirements that are included in **AS 1905.2-2005, Components for the protection of openings in fire-resistant walls - Fire-resistant roller shutters**.

Fire Extinguishers and Fire Blankets

Information on selection and location details for fire extinguishers and fire blankets located in Units and Townhouses is described in **AS 2444-2001, Portable fire extinguishers and fire blankets – Selection and location**. Manufacturing requirements for fire extinguishers are included in the **AS/NZS 1841 Series**. Classification and rating details for fire extinguishers are included in **AS/NZS 1850:2009, Portable fire extinguishers – Classification, rating and performance testing**.

Fire Hose Reels

The Australian installation Standard for fire hose reels located in Units and Townhouses is **AS 2441-2005, Installation of fire hose reels.**

Fire Hydrants

Information on design and installation requirements for fire hydrants located in Units and Townhouses is included in **AS/NZS 2419.1:2005, Fire hydrants installations – System design and commissioning.**

Fire Sprinklers

Fire sprinklers used in Units and Townhouses may be designed and installed to either:

- **AS 2118.4-1995, Automatic fire sprinkler systems – Requirements**
- **AS 2118.6-1995, Automatic fire sprinkler systems – Combined sprinkler and hydrant**

Smoke Alarms

Automatic fire detection systems and smoke alarms used in Units and Townhouses should be designed, installed and commissioned by following the details included in **AS 1670.1-2004, Fire detection, warning, control and intercom systems – System design, installation and commissioning – Fire.**

Smoke Hazards (Mechanical Ventilation Systems)

Fire protection requirements for ventilation systems located in Units and Townhouses is included in **AS/NZS 1668.1:1998, The use of ventilation and airconditioning in buildings – Fire and smoke control in multi-compartment buildings.**

Single and Multi-Storey Buildings – Including; Public, Commercial, Industrial, Educational and Healthcare Buildings, Aged Care Buildings, Laboratories, Sporting Stadiums, Car Parks and Food Premises

Information on requirements for types of fire protection equipment used and located in different types of Single and Multi-Storey buildings (including; public, commercial, industrial, educational and healthcare buildings, aged care buildings, laboratories, sporting stadiums, car parks and food premises) is included in the Building Code of Australia (see **BCA + Standards** service). Provisions under the Building Code of Australia are regulated by the types of State/Territory legislation listed in the Appendices to the Building Code of Australia.

Examples of symbols used to represent different types of fire protection equipment are included in **HB 20-1996, Graphical symbols for fire protection drawings.** Please consult the section **Technical Drawings and Architectural Plans** of this guide for more detailed information on technical drawing Standards.

Maintenance requirements for different types of fire protection equipment are included in **AS 1851-2005, Maintenance of fire protection systems and equipment.**

Audits for fire protection equipment and essential fire services can be completed by following the details that are included in **AS 4655-2005, Fire safety audits.**

Fire Doors and Shutters

Fire and smoke doors located in different types of Single and Multi-Storey buildings should be designed, manufactured and installed by following the information included in **AS 1905.1-2005, Components for the protection of openings in fire-resistant walls - Fire-resistant doorsets**. Fire shutters should be designed, manufactured and installed for these types of buildings by following the details included in **AS 1905.2-2005, Components for the protection of openings in fire-resistant walls - Fire-resistant roller shutters**.

Fire Extinguishers and Fire Blankets

Fire extinguishers located in different types of Single and Multi-Storey buildings should be selected and located by following the details described in **AS 2444-2001, Portable fire extinguishers and fire blankets - Selection and location**. Manufacturing requirements for fire extinguishers are included in **AS/NZS 1841 Series**. Classification and rating details for fire extinguishers are included in **AS/NZS 1850:2009, Portable fire extinguishers - Classification, rating and performance testing**.

Fire Hose Reels

Fire hose reels located and used in different types of Single and Multi-Storey buildings should be installed by following the methods described in **AS 2441-2005, Installation of fire hose reels**.

Fire Hydrants

Fire hydrants located and used in different types of Single and Multi-Storey buildings should be designed, installed and commissioned by following the details described in **AS 2419.1-2005, Fire hydrant installations – System design, installation and commissioning**.

Fire Sprinkler Systems

Information on design and installation details for fire sprinklers located and used in different types of Single and Multi-Storey buildings is included in **AS 2118.1-2006, Automatic fire sprinkler systems – General systems**.

Smoke Alarms

Automatic fire detection systems and smoke alarms located and used in different types of Single and Multi-Storey buildings should be designed, installed and commissioned by following the details included in **AS 1670.1-2004, Fire detection, warning, control and intercom systems – System design, installation and commissioning - Fire**.

Smoke Hazards (Mechanical Ventilation Systems)

Fire protection requirements for ventilation systems located and used in different types of Single and Multi-Storey buildings are included in **AS/NZS 1668.1:1998, The use of ventilation and airconditioning in buildings – Fire and smoke control in multi-compartment buildings**.

Acoustics

Building panels, partitions and floor coverings supplied in different types of buildings should be tested to measure airborne sound (weight reduction indices) and impact sound levels.

Airborne Sound (Sound Weight Reduction Indices)

- **AS/NZS 1276.1:1999, Acoustics – Rating of sound insulation in buildings and of building elements – Airborne sound insulation**
- **AS/NZS ISO 717.1:2004, Acoustics – Rating of sound insulation in buildings and of building elements – Airborne sound insulation**

Impact Sound Levels

- **AS 1191-2002, Acoustics – Methods for laboratory measurement of airborne sound transmission insulation of building elements**
- **AS ISO 140.6-2006, Acoustics – Measurement of sound insulation in buildings and of building elements – Laboratory measurement of impact sound insulation of floors**
- **AS ISO 717.2-2004, Rating of sound insulation in buildings and of building elements – Impact sound insulation**
- **AS/NZS ISO 140.7:2006, Acoustics – Measurement of sound insulation in buildings and of building elements – Field measurement of impact sound insulation of floors (ISO140-7:1998, MOD)**

Sound Pressure Levels

Information on sound levels and reverberation times for areas of occupancy in different types of buildings is included in **AS/NZS 2107:2000, Acoustics – Recommended design sound levels and reverberation times for building interiors**

The **AS/NZS 1269, Occupational noise management Series** provides information on practices that can be used to reduce noise levels in workplaces. These Standards are also available as a set **AS/NZS 1269 Set:2005, Occupational Noise Management Set**.

Disability Access

Architects and builders designing non-residential buildings where persons with disabilities may be present should primarily follow the methods described in the **AS 1428, Design for access and mobility Series**.

Lifts used by persons with disabilities should be designed to the requirements covered in **AS 1735.12-1999, Lifts, escalators and moving walks – Facilities for persons with disabilities**. Information on requirements for lifts used by persons with disabilities is also included in **AS 1428.2-1992, Design for access and mobility – Enhanced and additional requirements – Buildings and facilities**.

Disability Access - Non-Residential Buildings

AS 1428.1-2009, Design for access and mobility – General requirements for access – New building work is used to ensure persons with different types of disabilities have unimpeded access to different types of buildings. This Standard should not be used to ensure single detached residential buildings are designed to cater for persons with disabilities. Information covering this area is included in **AS 4299-1995**. The 2001 and 2009 edition of **AS 1428.1** are both referenced in the Building Code of Australia (see **BCA + Standards** service).

AS 1428.1-2009 includes diagrams illustrating required circulation spaces for parts of buildings that are accessed by persons with disabilities. Detailed information on diagrams for ramps, handrails and stairs used by persons with disabilities to access buildings is included in this Standard. Circulation spaces for sanitary facilities and sanitary compartments are also described in this Standard.

Persons wishing to design buildings by meeting the requirements beyond those covered in **AS 1428.1-2001** can follow the methods described in **AS 1428.2-1992, Design for access and mobility – Enhanced and additional requirements – Buildings and facilities**.

AS 1428.3-1992, Design for access and mobility – Requirements for children and adolescents with physical disabilities defines requirements for facilities not located in private residences that are designed to cater for children and adolescents with physical disabilities. This Standard can be used together with **AS 1428.1-2009**.

Tactile ground surface indicators not located in private dwellings for persons with disabilities should be designed by following the details that are included in **AS 1428.4.1-2009, Design for access and mobility – Means to assist the orientation of people with vision impairment – Tactile ground indicators**. This Standard can be used together with **AS 1428.1-2009**.

AS 1428.5-2010, Design for access and mobility – Communication for people who are deaf or hearing impaired provides information on the types of hearing devices that should be located in non-private dwellings accessed by persons with a hearing impairment.

Disability Access - Residential Buildings

Architects and builders responsible for ensuring residential buildings are newly designed/modified for persons with disabilities can follow the recommendations described in **AS 4299-1995, Adaptable housing**.

Building Facades

Technical drawings and plans for building facades can be prepared by following the conventions described in **AS 1100.301-2008, Technical drawing – Architectural drafting**.

Structural Integrity and Performance Requirements for Building Facades

Information on methods used to evaluate performance requirements for building facades based on 'limit state design' engineering principles is included in **AS/NZS 4284:2008, Testing of building facades**.

Loading requirements for structures should be engineered and calculated by following the details described in the **AS/NZS 1170 Series, AS 1170.4-2007** and **AS 4055-2006**. Please consult section [Loads and Forces for Buildings and Structures](#) of this guide for more information on this topic.

Plastering/Rendering

Information on different types of external plastering and rendering techniques is included in **HB 161-2005, Guide to Plastering**.

Painting Facades

Building facades can be painted using the information included in **AS/NZS 2311:2009, Guide to the painting of buildings**.

Timber Decks

Timber decks can be constructed and installed by following the details in:

- **AS 1684.2-2010, Residential timber-framed construction – Non-cyclonic areas**
- **AS 1684.3-2010, Residential timber-framed construction – Cyclonic areas**
- **AS 1684.4-2010, Residential timber-framed construction – Simplified – Non-cyclonic areas**

Spans for timbers are included in **AS 1684.2-2010** and **AS 1684.3-2010**. Span tables for timbers designed, constructed and installed to the details described in **AS 1684.4-2010** are included in **AS 1684.4-2010**.

Timbers used to construct and install decks can be manufactured and graded to:

- **AS 2796.1-1999, Timber – Hardwood – Sawn and milled products – Product specification**
- **AS 2796.2-2006, Timber – Hardwood – Sawn and milled products – Grade description**
- **AS 4785.1-2002, Timber – Softwood – Sawn and milled products – Product specification**
- **AS 4785.2-2002, Timber – Softwood – Sawn and milled products – Grade description**

Timber decks can be waterproofed by following the information that is included in **AS 4654.2-2009, Waterproofing membrane systems for exterior use – Above ground level – Design and installation**.

Metal Finishing

AS/NZS 2312:2002, Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings provides guidelines for the selection and specification of coating systems for the protection of structural steel work against corrosive environments.

The Standards listed below also include information on the topic of metal finishing;

- **AS 1789-2003, Electroplated zinc (electrogalvanized) coatings on ferrous articles (batch process)**
- **AS 3715-2002, Metal finishing – Thermoset powder coating for architectural applications of aluminium and aluminium alloys**
- **AS 4506-2005, Metal finishing – Thermoset powder coatings**
- **AS/NZS 4680:2006, Hot-dip galvanized (zinc) coatings on fabricated ferrous articles**
- **AS/NZS 4791:2006, Hot-dip galvanized (zinc) coatings on ferrous open sections, applied by an in-line process**
- **AS/NZS 4792:2006, Hot-dip galvanized (zinc) coatings on ferrous hollow sections, applied by a continuous or a specialized process**

Glazing

The Australian design Standard which is based on limit state design engineering methods and is for buildings using safety glass is **AS 1288-2006, Glass in buildings – Selection and installation**. The supplement to this Standard **AS 1288 Supp 1-2006, Glass in buildings – Selection and installation (Supplement to AS 1288-2006)** includes span tables for glass panels that are subjected to different types of wind speeds. The Handbook to this Standard is **HB 125-2007, The glass and glazing handbook (including guide to AS 1288, Glass in buildings – Section and installation)**.

Wind speeds for glass panels should be calculated by following the methods described in, **AS/NZS 1170.2:2002, Structural design actions – Wind actions** or **AS 4055-2006, Wind loads for housing**.

Waterproofing Facades

Waterproofing membranes used for exterior applications should be designed and installed by following the principles outlined in **AS 4654.2-2009, Waterproofing membrane systems for exterior use – Above ground level – Design and installation**

The Australian manufacturing Standard for membranes used to waterproof exterior areas of buildings is **AS 4654.1-2009, Waterproofing membrane systems for exterior use – Above ground level – Materials**.

Landscape Architecture

Technical Drawings

Information on drawing conventions and practices used by landscape architects is included in: **ISO 11091:1994, Construction drawings – Landscape drawing practice** and **EN ISO 11091:1999**. Users of these Standards should also review the information included in **AS 1100.301-2008, Technical drawing – Architectural drawing**.

Retaining Walls

Earth-retaining structures that are not constructed from mortared joints should be designed to the requirements outlined in **AS 4678-2002, Earth-retaining structures**. These types of structures are designed to retain soil, rock and other types of materials. Construction tolerances for earth-retaining structures are also described in **AS 4678-2002**.

Manufacturing requirements for masonry products used with earth-retaining structures are included in **AS/NZS 4455.3:2008**.

Pruning Amenity Trees and Managing Trees On Development Sites

Information on appropriate practices for pruning amenity trees is included in **AS 4373-2007, Pruning of amenity trees**. A table providing information on different types of pruning classifications is included in this Standard.

AS 4970-2009, Protection of trees on development sites provides guidance on the principles for protecting trees on land subject to different types of development.

Soils, Conditioners, Mulches and Potting Mixes

Information on requirements (including labelling) for soils used for landscaping is included in **AS 4419-2003, Soils for landscaping and garden use**. Laboratory and field tests for soils are covered by the Standards within the **AS 1289, Methods of testing soils for engineering purposes Series**.

Soil conditioners, mulches and potting mixes sold and used in Australia and New Zealand should be manufactured and tested to:

- **AS 3743-2003, Potting mixes**
- **AS 4454-2003, Composts, soil conditioners and mulches**
- **AS/NZS 5024(Int):2005, Potting mixes, composts and other matrices – Examination for legionellae**

Pavers

Information on requirements for concrete, segmental and asphalt pavers used for residential applications is included in **AS 3727-1993, Guide to residential pavements**. This Standard also includes diagrams illustrating cross-sectional details for these types of pavers and information on control joints that should be used with different types of pavers.

Foundations and footings used with different types of pavers should be designed to the requirements covered in **AS 2870-2011, Residential slabs and footings - Construction**. Tables listing requirements for footings and foundations that should be used with concrete, segmental and asphalt pavers are included in **AS 3727-1993, Guide to residential pavements**.

Information on gradients for pavements used on residential driveways is included in **AS/NZS 2890.1:2004, Parking facilities – Off-street parking**.

Outdoor Furniture

Milled and glued laminated timbers used to design and manufacture timber furniture should conform to the requirements described in:

- **AS 2796.3-1999, Timber – Hardwood – Sawn and Milled Products – Timber for Furniture Components**
- **AS 4785.3-2002, Timber – Softwood – Sawn and milled products – Timber for furniture components**
- **AS 5067-2003, Timber – Non-Structural Glued Laminated – Performance and Production Requirements**

Information on requirements for outdoor furniture used by persons with disabilities is included in **AS 1428.2-1992, Design for access and mobility – Enhanced and additional requirements – Buildings and facilities**.

Rocks and Aggregates

Rocks and aggregates used for building, engineering and related applications should be manufactured and graded by following the requirements that are included in the **AS 2758, Aggregates and rock for engineering purposes Series**. These Australian Standards® reference test methods that are included in the **AS 1141, Methods for sampling and testing aggregates Series**.

Stairs and Balustrades

Balustrades must adhere to the proper safety requirements as they are capable of causing serious injuries and fatalities. For those who are working with steel, wire, glass, aluminium or timber, there are a number of Standards which can provide assistance.

Stairs should be designed to ensure they have slip resistant nosings. A list of recommended pendulum and ramp slip resistance levels for stairs is included **HB 197-1999, An introductory guide to the slip resistance of pedestrian surface materials**. Also included in this Standard is ramp slip resistance levels for stairs used in commercial and industrial areas. See the section [Slip Resistance](#) of this guide for more information on slip resistance.

Design Standards

Balustrades and stairs located in single residential buildings can be designed by following the information that is included in the Building Code of Australia (see **BCA + Standards** service).

Information on requirements for stairs and balustrades located in these types of premises is also included in **AS 4299-1995, Adaptable housing** and **AS 4226-2008, Guidelines for safe housing design**.

Balustrades should be designed and engineered to conform to the types of loads and safety factors that are included in:

- **AS/NZS 1170.0:2002, Structural design actions – General principles**
- **AS/NZS 1170.1:2002, Structural design actions – Permanent, imposed and other actions**
- **AS/NZS 1170.2:2002, Structural design actions – Wind actions**

Balustrades and stairs located in areas subject to snow and earthquake loads should be designed by applying the load factors included in:

- **AS/NZS 1170.3:2003, Structural design actions – Snow and ice actions**
- **AS 1170.4-2007, Structural design actions – Earthquake actions in Australia**

Balustrades can also be designed by following the methods described in **AS 1657-1992, Fixed platforms, walkways, stairways and ladders – Design, construction and installation**. Applications of this Standard are included in the Building Code of Australia (see **BCA + Standards** service). Relevant information may also be included in Commonwealth and State building and workplace health and safety legislation.

Glass balustrades should be designed by following the methods outlined in **AS 1288-2006, Glass in buildings – Selection and installation**. Span tables for glass panels are also included in **AS 1288 Supp 1-2006, Glass in buildings – Selection and installation (Supplement to AS 1288-2006)**.

Wind speeds for glass used in balustrades can be calculated by following the methods described in:

- **AS 1170.2-1989, Minimum design loads on structures (known as the SAA Loading Code) – Wind loads**
- **AS/NZS 1170.2:2002, Structural design actions – Wind actions**
- **AS 4055-2006, Wind loads for housing**

Please consult the sections [Building Products - Metals](#) and [Building Products - Timbers](#) of this guide for more information on requirements for stairs and balustrades manufactured from specific types of materials.

Disability Access Requirements

Balustrades and stairs used in buildings providing access to persons with disabilities should be designed by following the information included in **AS 1428.1-2009, Design for access and mobility – General requirements for access - New building work**. Persons wishing to go beyond the requirements of this Standard can design stairs by following the details that are included in **AS 1428.2-1992, Design for access and mobility – Enhanced and additional requirements – Buildings and facilities**. **AS 1428.1-2001** is still referenced in the Building Code of Australia (see **BCA + Standards** service).

Tactile ground surface indicators used on stairs and ramps should be located by following the information included in **AS/NZS 1428.4.1:2009, Design for access and mobility – Means to assist the orientation of people with visual impairment – Tactile ground surface indicators**. This Standard is referenced in the Building Code of Australia (see **BCA + Standards** service).

Internal Finishes

Internal Waterproofing

Information on processes used to design and install membranes and flashings located in bathrooms, kitchens and laundries located in residential buildings is included in **AS 3740-2010, Waterproofing of domestic wet areas**. Waterproofing membranes used for these types of applications should be manufactured and tested to **AS/NZS 4858:2004, Wet area membranes**.

Information on methods used to waterproof internal areas of residential buildings is also included in the Building Code of Australia (see **BCA + Standards** service).

Plastering and Rendering

Drywall plastering can be applied by following **AS/NZS 2589:2007, Gypsum lining – Application and finishing**. The manufacturing Standard for gypsum plaster is **AS/NZS 2588:1998, Gypsum plasterboard**.

Detailed information on different types of plastering systems is included in **HB 161-2005, Guide to Plastering**. This Handbook also includes information on recommended mixing ratios for rendered surfaces.

Carpets - Textile Floor Coverings

Carpets used in different types of non-residential buildings are required to meet critical radiant flux fire tests. Critical radiant flux levels for floor coverings are measured by following the methods described in **AS ISO 9239-1:2003, Reaction to fire tests for floor coverings – Determination of the burning behaviour using a radiant heat source**. Critical radiant flux levels for floor covering used in different types of buildings are also listed in the Building Code of Australia (see **BCA + Standards** service).

Alternative fire tests for floor coverings are included in **AS 2404-1980, Textile floor coverings – Fire propagation of the use-surface using a small ignition source**.

Relevant Standards for textile floor coverings (carpets) are:

- **AS/NZS 1385:2007, Textile floor coverings – Metric units and commercial tolerances for measurement**
- **AS/NZS 2111, Textile floor coverings – Tests and measurements Series**
- **AS/NZS 2119:1997, Textiles floor coverings – Machine-made – Sampling and cutting specimens for physical tests**
- **AS 2454-2007, Textile floor coverings – Terminology**
- **AS/NZS 2455.1:2007, Textile floor coverings – Installation practice – General**
- **AS/NZS 2455.2:2007, Textile floor coverings – Installation practice – Carpet tiles**
- **AS/NZS 2914:2007, Textile floor coverings – Informative labelling**
- **AS/NZS 3733:1995, Textile floor coverings – Cleaning maintenance of residential and commercial carpeting**
- **AS 4288-2003, Soft underlays for textile floor coverings**

Resilient Floors

Resilient and Laminate Floors

Standards Australia has not established any specific Standards covering resilient floors. However, Information on recommended practices for laying and maintaining these types of floor coverings is included in **AS 1884-1985, Floor coverings – Resilient sheet and tiles – Laying and maintenance practices**.

In September 2004 Standards Australia indicated that the status of this Standard was to be changed from 'current' to being 'obsolescent' The term 'obsolescent' indicates that a Standard is no longer recommended for new equipment, or for best practices.

Information on installation practices for resilient and laminate flooring is included in:

- **SR CEN/TS 14472-1:2003, Resilient, Textile and Laminate Floor Coverings – Design, Preparation and Installation – Part 1: General**
- **SR CEN/TS 14472-2:2003, Resilient, Textile and Laminate Floor Coverings – Design, Preparation and Installation – Part 2: Textile Floor Coverings**
- **SR CEN/TS 14472-3:2003, Resilient, Textile and Laminate Floor Coverings – Design, Preparation and Installation – Part 3: Laminate Floor Coverings**

Tiles – Ceramic Tiles

Installation

Ceramic tiles should be installed by following the methods described in **AS 3958.1-2007, Ceramic tiles – Guide to the installation of ceramic tiles**.

Manufacturing Standards

The Australian manufacturing Standard for ceramic tiles is **AS 4662-2003, Ceramic tiles – Definitions, classification, characteristics and marking**.

Test methods for ceramic tiles are included in the **AS 4459, Methods of sampling and testing ceramic tiles Series**.

Grouts used with ceramic floor tiles can be manufactured and tested to the **AS 4992, Ceramic tiles – Grouts and adhesives Series**.

Natural Stone - Granite and Marble Tiles

Design and Installation Standards

Standards Australia has not established any Standards covering design and installation of natural stone tiles. However, information covering design and installation requirements for natural stone tiles is included in:

- **BS 5385-1:2009, Wall and floor tiling. Design and installation of ceramic, natural stone and mosaic wall tiling in normal conditions. Code of practice**
- **BS 5385-2:2006, Wall and floor tiling. Design and installation of external ceramic, and mosaic wall tiling in normal conditions. Code of practice**
- **BS 5385-5:2009, Wall and floor tiling. Design and installation of terrazzo, natural stone and agglomerated stone tile and slab flooring. Code of practice**
- **BS 8000-11.2:1990, Workmanship on building sites. Code of practice for wall and floor tiling. Natural stone tiles**

Manufacturing Standards

Standards Australia has not established any Standards covering natural stone tiles. Information covering manufacturing requirements for natural stone tiles is covered in:

- **I.S. EN 12057:2004, Natural stone Products – Modular tiles – Requirements**
- **I.S. EN 12058:2004, Natural Stone Products – Slabs for Floors And Stairs – Requirements**
- **I.S. EN 12059:2008, Natural Stone Products – Dimensional Stone Work – Requirements**

Timber Flooring

Tongued, grooved strip, plywood and particleboard flooring can be installed by following the methods described in:

- **AS 1684.2-2010, Residential timber-framed construction – Non-cyclonic areas**
- **AS 1684.3-2010, Residential timber-framed construction – Cyclonic areas**
- **AS 1684.4-2010, Residential timber-framed construction – Simplified – Non-cyclonic areas**

There are Span tables included in **AS 1684.4-2010** and separate Span tables to **AS 1684.2-2010** and **AS 1684.3-2010**.

Information on recommended moisture levels for timber floors is included in **AS 1684.2-2010** and **AS 1684.3-2010**. Moisture levels for timber floors are described in **AS 1684.4-2010**.

Sanding Timber Floors

Timber floors can be sanded by following the methods outlined in **AS 4786.2-2005, Timber flooring – Sanding and finishing**.

Timber Flooring – Hardwoods

Information on manufacturing requirements for hardwoods used for timber floors is included in:

- **AS 2796.1-1999, Timber – Hardwood – Sawn and milled products - Product specification**
- **AS 2796.2-2006, Timber – Hardwood – Sawn and milled products – Grade description**

Timber Flooring – Softwoods

Grading and manufacturing requirements for softwood timbers used for flooring is included in:

- **AS 4785.1-2002, Timber – Softwood – Sawn and milled products – Product specification**
- **AS 4785.2-2002, Timber – Softwood – Sawn and milled products – Grade description**

Particleboard Flooring

The manufacturing Standard for particleboard flooring is **AS/NZS 1860.1:2002, Particleboard flooring – Specifications**. Test methods for particleboard flooring are included in **AS/NZS 4266 Reconstituted wood-based panels – Methods of test Series**.

Installation requirements for particleboard flooring are also included in **AS 1860.2-2006, Particleboard flooring – Installation**.

Electrical Wiring

Low voltage electrical wiring should conform to the requirements outlined in **AS/NZS 3000:2007, Electrical installations (known as the Australian/New Zealand Wiring Rules)**. There are also a number of Standards covering [electrical supply](#) requirements for buildings, machinery and different types of electrical equipment.

Architects and building designers requiring information on layout drawings for electrical installations can review the details that are included in **AS/NZS 4383.4:1998, Preparation of documents used in electrotechnology – Location and installation documents**

The electrical wiring Standard for work undertaken on construction sites is **AS/NZS 3012:2010, Electrical installations – Construction and demolition sites**.

Low voltage cables should be selected by following the methods outlined in **AS/NZS 3008.1.1:2009, Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical Australian installation conditions**.

Electrical installations can be inspected and tested by following the methods outlined in **AS/NZS 3017:2007, Electrical installations – Verification guidelines**. Electrical wiring can be periodically inspected by following the recommendations described in **AS/NZS 3019:2007, Electrical installations – Periodic verification**.

Portable types of electrical equipment should be tested and tagged by following the information that is included in **AS/NZS 3760:2010, In-service safety inspection and testing of electrical equipment**. Fixed types of electrical equipment can be inspected by following the information that is included in **AS/NZS 3017:2017**. Intervals that should be followed when inspecting and tagging this type of equipment is included in **AS/NZS 3019:2007**.

For more information on Standards related to electrical equipment, you can also refer to the [Guide to Standards – Household Electrical Equipment Guide](#).

Communications Cabling and Data Centres

The ideal product for persons requiring comprehensive information on Standards, handbooks and regulations on communications cabling is the **CCM Package-2007, Communications Cabling Manual Package (Volumes 1 and 2)**.

General information on requirements for different types of communications cabling systems using optical fibres is included in **AS/NZS 3080:2003, Telecommunications installations – Generic cabling for commercial premises (ISO/IEC 11801:2002, MOD)**. Diagrams providing information on basic structures for different types of communications cabling systems are also included in this Standard.

Information on planning requirements for cabling systems used on different types of premises is included in:

- **AS/NZS 3085.1:2004, Telecommunications installations – Administration of communications cabling systems – Basic requirements**
- **ISO/IEC 14709-1:1997, Information technology – Configuration of Customer Premises Cabling (CPC) for applications – Part 1: Integrated Services Digital Network (ISDN) basic access**
- **ISO/IEC TR 14763-2:2000, Information technology – Implementation and operation of customer premises cabling – Part 2: Planning and installation of copper cabling**

AS 2834-1995, Computer accommodation defines requirements for four environmental classes for computer rooms. There are unique lighting, ventilation and building design requirements for these types of computer rooms. This Standard also includes information on recommended temperature and humidity requirements for these types of computer rooms.

Information on planning, ergonomic and environmental issues that should be considered by persons responsible for designing and up-grading data control room is included in:

- **ISO 11064-1:2000, Ergonomic design of control centres – Part 1: Principles for the design of control centres**
- **ISO 11064-2:2000, Ergonomic design of control centres – Part 2: Principles for the arrangement of control suites**
- **ISO 11064-3:1999, Ergonomic design of control centres – Part 3: Control room layout**
- **ISO 11064-4:2004, Ergonomic design of control centres – Part 4: Layout and dimensions of workstations**
- **ISO 11064-5:2008, Ergonomic design of control centres - Part 5: Displays and controls**
- **ISO 11064-6:2005, Ergonomic design of control centres - Part 6: Environmental requirements for control centres**
- **ISO 11064-7:2006, Ergonomic design of control centres - Part 7: Principles for the evaluation of control centres**

Security Alarms and CCTV Systems

Persons responsible for designing, managing and operating security and CCTV systems should be familiar with the information included in **AS/NZS 2201, Intruder alarm systems Series** and **AS 4806, Closed circuit television (CCTV) Series**. These Standards are also available as **AS/NZS 2201 Set:2008, Intruder alarm systems Set** and **AS 4806 Set-2008, CCTV Set**.

Alarm and CCTV systems can be represented by using the symbols that are included in **AS/NZS 1102.111:1997, Graphical symbols for electrotechnical documentation – Architectural and topographical installation plans and diagrams**.

Plumbing and Gas

Architects, building designers and persons working in related fields requiring information on plumbing and gas installations may be interested in in:

- **AS/NZS 3500.0:2003, Plumbing and drainage – Glossary of terms**
- **AS/NZS 3500.1:2003, Plumbing and drainage – Water services**
- **AS/NZS 3500.2:2003, Plumbing and drainage – Sanitary plumbing and drainage**
- **AS/NZS 3500.3:2003, Plumbing and drainage – Stormwater drainage**
- **AS/NZS 3500.4:2003, Plumbing and drainage – Heated water services**
- **AS/NZS 3500.5:2000, National Plumbing and Drainage – Domestic installations**
- **AS/NZS 5601.1:2010, Gas installations – General installations**
- **AS/NZS 5601.2:2010, Gas installations – LP gas installations in caravans and boats for non-propulsive purposes**

The **AS/NZS 5601 SET:2010, Gas installations Set** contains **AS/NZS 5601.1:2010** and **AS/NZS 5601.2:2010**. **AS/NZS 3500 (Parts 0-4), AS/NZS 5601.1:2010** and **AS/NZS 5601.2:2010** are also included in **Plumbing and Gas Set:2011, Plumbing and Gas Installations Set**.

It is important to note that these types of water systems should be installed by following the details outlined in **AS/NZS 3500.1:2003, AS/NZS 3500.3:2003** and the **PCA 2004, Plumbing Code of Australia 2004**.

Please see section [Technical Drawing – Plumbing and Ducting](#) of this guide for information on conventions used to represent plumbing products and plumbing fittings.

Greywater Systems

The Australian manufacturing Standard for greywater diversion devices is **ATS 5200.460-2005, Technical Specification for plumbing and drainage products – Grey water diversion device (GWDD)**.

The Handbook **HB 326-2008, Urban Greywater Installation Handbook for Single Households**, provides detailed information on requirements for different types of greywater diversion (GSD) devices and greywater treatment systems (GTS).

A useful flowchart providing information on recommended procedures for approving, installing and maintaining treatment systems is included in **HB 326-2008**. This Handbook also features diagrams providing information on recommended methods for installing untreated systems using gravity feeds.

Rainwater Tanks

HB 230-2008, Rainwater Tank Design and Installation Handbook provides essential information required by plumbers to approve, install and maintain above-ground, underground and underfloor water tanks located in single households, multi-unit dwellings, community and commercial buildings. It also provides detailed information on recommended practices that should be followed to install tanks, with technical details and specifications for pumps used with rainwater tanks.

As well as general applications for rainwater tanks, this publication also provides information on water tanks that can be used for garden irrigation, pools and spas, fire fighting and cooling towers.



HB 326-2008, Urban Greywater Installation Handbook for Single Households and **HB 230-2008, Rainwater Tank Design and Installation Handbook** are also available as a Set; **Rainwater and Greywater Set – 2009**.

Manufacturing Standards for Rainwater Tanks

Information on manufacturing requirements for rainwater tanks is included in:

- Rotationally moulded plastic rainwater tanks – **AS/NZS 4766:2006, Polyethylene storage tanks for water and chemicals**
- Metal rainwater tanks – **AS/NZS 2179.1:1994, Specifications for rainwater goods, accessories and fasteners – Metal shape or sheet rainwater goods, and metal accessories and fasteners**
- Concrete tanks – **AS 3735-2001, Concrete structures retaining liquids**

Septic Tanks

The manufacturing Standard for septic tanks is **AS/NZS 1546.1:2008**. Septic tanks that have been manufactured and tested to this Standard should be installed by following the methods described in **AS/NZS 3500.2:2003, Plumbing and drainage – Sanitary plumbing and drainage**. The on-site management Standard for septic tanks using primary, secondary and other types of land application systems is **AS/NZS 1547:2000, On-site domestic wastewater management**.

AS/NZS 1546.1:2008

Manufacturing requirements for Septic tanks using treated blackwater and greywater systems and holding tanks including Collection wells and pump wells are included in the Standard **AS/NZS 1546.1:2008, On-site domestic wastewater treatment units – Septic tanks**.

AS/NZS 1547:2000

The Australian/New Zealand on-site management for septic tanks is **AS/NZS 1547:2000, On-site domestic wastewater management** covers the following areas:

- Performance requirements for on-site wastewater management systems
- Management, operation and maintaining requirements for on-site wastewater management systems
- Methods used to demonstrate compliance with performance requirements for on-site wastewater management systems.

Aerated Wastewater Treatment Systems

The Standard for aerated wastewater treatment systems is **AS/NZS 1546.3:2008, On-site domestic wastewater treatment units – Aerated wastewater treatment systems**. Septic tanks used to contain aerated wastewater should be manufactured to meet **AS/NZS 1546.1:2008**.

Aerated wastewater treatment systems should be installed, operated and maintained by following the details prescribed in **AS/NZS 1547:2000**.

Lighting

Natural and Artificial (Electric)

Detailed information on natural light (daylight) and artificial lighting (electric lighting) requirements for tasks undertaken in different types of premises is included in the **AS/NZS 1680, Interior Lighting Series**.

A table listing recommended lighting levels for tasks undertaken in different types of buildings and facilities is included in **AS/NZS 1680.1:2006, Interior and workplace lighting – General principles and recommendations**. Information on recommended lighting levels for stairs and walkways in buildings is included in **AS/NZS 1680.2.1:2008, Interior and workplace lighting - Specific applications - Circulation spaces and other general areas**.

Outdoor Lighting (Road Lighting)

Information on outdoor lighting requirements for roads, pedestrian areas and car parks is included in the **AS/NZS 1158 Lighting for roads and public spaces Series**. These types of Standards are also available as a Set **AS/NZS 1158 Set:2010, Lighting for roads and public spaces Set**.

Emergency Evacuation Lighting

Emergency evacuation lighting for different types of buildings (excluding residential buildings and town-houses) should be designed by meeting the requirements described in **AS 2293.1-2005, Emergency escape lighting and exit signs for buildings – System design, installation and operation**.

Information on inspection and maintenance requirements for emergency lighting is included in **AS/NZS 2293.2:1995, Emergency evacuation lighting for buildings – Inspection and maintenance**. Exit signs and emergency lights should be manufactured by following the details that are included in **AS 2293.3-2005, Emergency escape lighting and exit signs for buildings – Emergency escape luminaires and exit signs**.

Examples of the 'Running Man' emergency exit sign are also included in **AS 2293.1-2005** and **AS 2293.3-2005**.

Floodlighting

AS 4282-1997, Control of the obtrusive effects of outdoor lighting establishes guidelines for the control of obtrusive effects of outdoor lighting and gives recommended limits for the relevant lighting parameters to contain these effects within tolerable levels.

Ventilation

Ventilation, heating and ducting systems can be represented on drawings and plans by following the conventions described in **AS 1101.5-1984, Graphical symbols for general engineering - Piping, ducting and mechanical services for buildings**. An example of a drawing for a ventilation system is included in this Standard. Please see section [Technical Drawings – Plumbing and Ducting](#) of this guide for more information on this topic.

Information on mechanical ventilation and air-flow requirements for different types of buildings are included in **AS 1668.2-2002, The use of ventilation and airconditioning in buildings – Ventilation design for indoor air containment control**. The Building Code of Australia (see **BCA + Standards** service) references **AS 1668.2-1991**, this edition of the ventilation Standard may also be referenced under building and occupational health and safety legislation.



AS 1668.2-1991 has a status of being 'available superseded'. A Standard labelled 'available superseded', indicates that the product has been made available for a period of time although it has been formally superseded by another document. Its availability is maintained where it is referenced in legislation/regulations, such as the Building Code of Australia. Please see Standards Australia's guide **Standards and Other Publications (SG-003)** for more information regarding Standards development.

Information on fire protection requirements for ventilation and exhaust systems is included in **AS/NZS 1668.1:1998, The use of ventilation and airconditioning in buildings - Fire and smoke control in multi-compartment buildings**. This Standard includes information on requirements for fire dampers, different types of pressurization systems, ductwork and kitchen exhaust systems.

Manufacturing and performance requirements for fire dampers are included in **AS 1682.1-1990, Fire dampers – Specification**. Installation requirements for fire dampers are included in **AS 1682.2-1990, Fire dampers – Installation**. Ductwork used with ventilation systems should be manufactured to the types of tests that are included in **AS 4254-2002, Ductwork for air-handling systems in buildings**.

Cooling Towers

Cooling towers used to manage legionella should be designed, installed and maintained by following the details that are included in:

- **AS/NZS 3666.1:2002, Air-handling and water systems of buildings – Microbial control – Design. Installation and commissioning**
- **AS/NZS 3666.2:2002, Air-handling and water systems of buildings – Microbial control – Operation and maintenance**
- **AS/NZS 3666.3:2000, Air-handling and water systems of buildings – Microbial control – Performance-based maintenance of cooling water systems**
- **HB 32:1995, Control of microbial growth in air-handling and water systems of buildings**

These Standards are also available as a Set **AS/NZS 3666 Set:2006, Air-handling and water systems of buildings Set**.

Slip Resistance

Information on pendulum and ramp (R) slip resistance tests for surfaces are included in **AS/NZS 4586:2004, Slip resistance classification of new pedestrian surface materials** and **AS/NZS 4663:2004, Slip resistance measurement of existing pedestrian surfaces**.

The only publication providing information on recommended pendulum and ramp slip resistance ratings for areas in different types of buildings is **HB 197:1999, An introductory guide to the slip resistance of pedestrian surface materials**.

Buildings Located In Bushfire Prone Areas

Buildings located in bushfire prone areas should be designed by following the details covered in the Building Code of Australia (see **BCA + Standards** service), as well as legislation administered and enforced by appropriate State/Territory authorities.

AS 3959-2009, Construction of buildings in bushfire-prone areas provides essential information on construction methods for buildings that may be, or are subjected to, very low, low, moderate, high, very high and extreme bushfire attack level (BAL) categories.

Heat flux levels for materials used to construct buildings subjected to these types of bushfire attack levels are included in:

- **AS 1530.8.1-2007, Methods for fire tests on building materials, components and structures – Tests on elements of construction for buildings exposed to simulated bushfire attack – Radiant heat and small flaming sources**
- **AS 1530.8.2-2007, Methods for fire tests on building materials, components and structures – Tests on elements of construction for buildings exposed to simulated bushfire attack – Large flaming sources**
- **AS/NZS 3837:1998, Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter**, (N.B: This Standard is used to complete tests for different types of timbers)

HB 330-2009, Living in bushfire-prone areas is the companion publication to **AS 3959-2009**. This Handbook contains a list of frequently asked questions for owners of buildings located in bushfire prone areas and a diagram providing information on materials that can be used to construct buildings located in these areas. It also contains information on requirements for fire protection equipment that should be used in buildings located in bushfire prone areas.

Plumbing requirements for buildings located in bushfire-prone areas are included in **AS/NZS 3500.1:2003** and **HB 330-2009**.

Earth-Wall (Rammed Earth) Buildings

Different types of buildings may be manufactured and designed from earthen walls and floors. Persons requiring detailed information on appropriate practices for buildings manufactured from this type of material can refer to **HB 195-2002, The Australian Earth Building Handbook**. Footings used with buildings manufactured from earth-wall materials should be designed by following the information that is included in **AS 2870-2011, Residential slabs and footings**. Please consult the section [Residential Slabs and Footings](#) of this guide for information on Standards for footings.

Residential Buildings

Information on design and planning requirements for residential buildings is included in the Building Code of Australia (see **BCA + Standards** service).

AS 4226-2008, Guidelines for safe housing design provides guidelines for the design of safe dwellings. This Standard describes the factors that should be taken into account to reduce the likelihood of an injurious accident occurring in association with any building element, or fitting, either alone or in association with other elements:

- Access and Egress – Detailed information on requirements for stairs, railings and balustrades used in residential buildings is included in the Standard. The information in this Standard should be read together with the details that are included in the Building Code of Australia (see **BCA + Standards** service).
- Floor Planning – information on recommended layouts for doorways and furniture located in residential dwellings.
- Kitchen Layouts – Detailed diagrams providing information on layouts for different types of kitchens is included in the Standard. Information on location requirements for kitchen units is included in **AS/NZS 4386.2:1996, Domestic kitchen assemblies – Installation** and **AS 5601-2004, Gas installations**
- Hazards for children – A diagram illustrating details for child-resistant catches used with windows and doors is included in **AS 4226-2008**.

Planning and Design

Units and Townhouses

Information on design and planning requirements for residential buildings is included in the Building Code of Australia (see **BCA + Standards** service).

Lighting

Emergency Lighting

Information on design and installation requirements for emergency lighting systems located in Units and Townhouses is included in **AS 2293.1-2005, Emergency escape lighting and exit signs for buildings - System design, installation and operation**.

Information on maintenance details for emergency lighting systems is covered in **AS/NZS 2293.2:1995, Emergency evacuation lighting for buildings - Inspection and maintenance**.

Interior Lighting

General information on recommended lighting requirements for activities and tasks undertaken in different types of buildings is included in **AS/NZS 1680.1:2006, Interior and workplace lighting - General principles and recommendations**.

Lighting requirements for stairs, walkways and public access areas located in Units and Townhouses is included in **AS/NZS 1680.2.1:2008, Interior and workplace lighting - Specific applications - Circulation spaces and other general areas** and **AS/NZS 1680.0:2009, Interior lighting – Safe movement**.

Outdoor Lighting

Standards Australia has not established any Standards covering outdoor lighting levels for Units and Townhouses. Floodlight and spill lighting levels for Units and Townhouses can be assessed by reviewing information that is included in **AS 4282-1997, Control of the obtrusive effects of outdoor lighting**.

Lighting levels for pedestrians and security lighting levels for Units and Townhouses located on different types of roads can be calculated by following the information that is included in the **AS/NZS 1158, Lighting for roads and public spaces Series**. These lighting Standards are also available as a **Set**.

Please see section [Lighting – Car Parks](#) of this guide for more information on Standards covering lighting levels for different types of carparks.

Public, Office and Commercial Buildings

Information on design and planning requirements for Public, Office and Commercial buildings is included in the Building Code of Australia (see **BCA + Standards** service) and appropriate State/Territory legislation.

See the section [Fire Protection Equipment](#) of this guide for more information on Standards for fire protection equipment that may be used in Public, Office and Commercial buildings.

Lighting

Interior Lighting - Public, Office and Commercial Buildings

Architects and building designers required to assess indoor lighting levels in Public, Office and Commercial buildings should review the information that is included in the Standards listed below:

- **AS/NZS 1680.0:2009, Interior lighting - Safe movement**

- **AS/NZS 1680.1:2006, Interior and workplace lighting - General principles and recommendations**
- **AS/NZS 1680.2.1:2008, Interior and workplace lighting - Specific applications - Circulation spaces and other general areas**
- **AS/NZS 1680.2.2:2008, Interior and workplace lighting - Specific applications - Office and screen-based tasks**

A table listing recommended lighting levels for tasks undertaken in different types of buildings and facilities is included in **AS/NZS 1680.1:2006**. Detailed information on areas that should be considered by persons designing and reviewing natural and artificial lighting levels for office related tasks is included in **AS/NZS 1680.2.2:2008**.

Information on indoor lighting levels for stairs and access areas located in Public, Office and Commercial can be assessed by reviewing the information that is included in **AS/NZS 1680.0:2009**.

Outdoor Lighting – Public, Office and Commercial Buildings

Please see section [Lighting – Outdoor Lighting](#) of this guide for more information on Standards covering outdoor lighting.

Ergonomics (Office Workstations)

Standards Australia has not established any Standards covering ergonomic Standards for workplaces. However, ergonomic requirements for screen-based workstations and office chairs can be assessed by reviewing the information that is included in:

- **AS/NZS 4443:1997, Office panel systems – Workstations**
- **AS/NZS 4438:1997, Height adjustable swivel chairs**
- **ISO 6385:2004, Ergonomic principles in the design of work systems**
- **IS EN 1335, Office Furniture – Office Work Chair Series**

Industrial Buildings

Information on design and planning requirements for Industrial buildings is included in the Building Code of Australia (see **BCA + Standards** service) and appropriate State/Territory legislation.

Please see the section [Fire Protection Equipment](#) of this guide for information on Standards for fire protection equipment that may be used in Industrial buildings.

Lighting

Emergency Evacuation Lighting – Industrial Buildings

Please see section [Emergency Evacuation Lighting](#) of this guide for more information on Standards covering emergency evacuation lighting.

Interior Lighting – Industrial Buildings

Architects and building designers required to assess indoor lighting levels in Industrial buildings should review the information that is included in the Standards listed below;

- **AS/NZS 1680.0:2009, Interior lighting - Safe movement**
- **AS/NZS 1680.1:2006, Interior and workplace lighting - General principles and recommendations**
- **AS/NZS 1680.2.1:2008, Interior and workplace lighting - Specific applications - Circulation spaces and other general areas**

- **AS/NZS 1680.2.2:2008, Interior and workplace lighting - Specific applications - Office and screen-based tasks**
- **AS/NZS 1680.2.4:1997, Interior lighting - - Industrial tasks and processes**

A table listing recommended lighting levels for tasks undertaken in different types of buildings and facilities is included in **AS/NZS 1680.1:2006**. Information on recommended lighting levels for different types of industrial tasks is included in **AS/NZS 1680.2.4:1997**.

Information on indoor lighting levels for stairs and access areas located in Industrial buildings can be assessed by reviewing the information that is included in **AS/NZS 1680.0:2009**.

Office and screen-based tasks undertaken in Industrial buildings can be determined by reviewing the information that is included in **AS/NZS 1680.2.2:2008**.

Outdoor Lighting – Industrial Buildings

Please see section [Lighting – Outdoor Lighting](#) of this guide for more information on Standards covering outdoor lighting.

Safety Signs and Line Marking

Architects and building designers responsible for planning and up-grading Industrial buildings can review the information that is included in the Standards below:

- **AS 1318-1985, Use of colour for the marking of physical hazards and the identification of certain equipment in industry (known as the SAA Industrial Safety Colour Code) (incorporating Amdt 1)**
- **AS 1319-1994, Safety signs for the occupational environment**
- **AS 4024, Safety of machinery Series**

Educational and Training Facilities

Information on design and planning requirements for Educational and Training facilities may be included in State/Territory legislation.

Please see the section [Fire Protection Equipment](#) of this guide for information on Standards for fire protection equipment that may be used in Educational and Training facilities.

Lighting

Emergency Evacuation Lighting – Educational and Training Facilities

Please see section [Emergency Evacuation Lighting](#) of this guide for more information on Standards covering emergency evacuation lighting.

Indoor Lighting – Educational and Training Facilities

Architects and building designers required to assess indoor lighting levels in Educational and Training facilities should review the information that is included in the Standards listed below;

- **AS/NZS 1680.0:2009, Interior lighting – Safe movement**
- **AS/NZS 1680.1:2006, Interior and workplace lighting – General principles and recommendations**
- **AS/NZS 1680.2.1:2008, Interior and workplace lighting – Specific applications – Circulation spaces and other general areas**

- **AS/NZS 1680.2.2:2008, Interior and workplace lighting – Specific applications – Office and screen-based tasks**
- **AS/NZS 1680.2.3:2008, Interior and workplace lighting – Specific applications – Educational and training facilities**

Recommended lighting levels for activities and tasks undertaken in Educational and Training facilities are listed in **AS/NZS 1680.2.3:2008**.

Outdoor Lighting – Educational and Training Facilities

Please see section [Lighting – Outdoor Lighting](#) of this guide for more information on Standards covering outdoor lighting.

Medical Centres and Healthcare Facilities

Information on design and planning requirements for Medical Centres and Healthcare facilities is included in the Building Code of Australia (see **BCA + Standards** service) and appropriate State/Territory legislation.

Electro-medical equipment located in Medical Centres and Healthcare Facilities should be installed by following the procedures described in **AS/NZS 3003:2003, Electrical installations – Patient treatment areas of hospitals and medical, dental practices and dialyzing locations**. Please consult section [Electrical Wiring](#) of this guide for general information on electrical wiring Standards.

Information on sterilization requirements for work undertaken in Medical Centres and Healthcare facilities is included in the Standards listed below:

- **AS/NZS 4187:2003, Cleaning, disinfecting and sterilizing reusable medical and surgical instruments and equipment, and maintenance of associated environments in health care facilities** (N.B: This Standard provides information on correct practices for undertaking complex types of surgical procedures)
- **AS/NZS 4815:2006, Office-based health care facilities - Reprocessing of reusable medical and surgical instruments and equipment, and maintenance of the associated environment**

Please see the section [Fire Protection Equipment](#) of this guide for information on Standards for fire protection equipment that may be used in Medical Centres and Healthcare facilities.

Lighting

Emergency Evacuation Lighting – Medical Centres and Healthcare Facilities

Please see section [Emergency Evacuation Lighting](#) of this guide for more information on Standards covering emergency evacuation lighting.

Interior Lighting – Medical Centres and Healthcare Facilities

Architects and building designers required to assess indoor lighting levels in Medical Centres and Healthcare facilities should review the information that is included in the Standards listed below;

- **AS/NZS 1680.0:2009, Interior lighting – Safe movement**
- **AS/NZS 1680.1:2006, Interior and workplace lighting – General principles and recommendations**
- **AS/NZS 1680.2.1:2008, Interior and workplace lighting – Specific applications – Circulation spaces and other general areas**
- **AS/NZS 1680.2.2:2008, Interior and workplace lighting – Specific applications – Office and screen-based tasks**

- **AS/NZS 1680.2.5-1997, Interior lighting - - Hospital and medical tasks**

Lighting levels for medical and hospital activities undertaken in Medical Centres and Healthcare facilities can be determined by following the details included in **AS/NZS 1680.2.5:1997**. General information on lighting levels for tasks undertaken in Medical Centres and Healthcare facilities can be determined by following the details that are included in **AS/NZS 1680.1:2006**.

Information on indoor lighting levels for stairs and access areas located in Medical Centres and Healthcare facilities can be assessed by reviewing the information included in **AS/NZS 1680.0:2009**.

Office and screen-based tasks undertaken in Medical Centres and Healthcare facilities can be determined by reviewing the information included in **AS/NZS 1680.2.2:2008**.

Outdoor Lighting – Medical Centres and Healthcare Facilities

Please see section [Lighting – Outdoor Lighting](#) of this guide for more information on Standards covering outdoor lighting.

Patient Alarms

Hard wired alarm systems used and located in Medical Centres and Healthcare facilities are covered by the information included in **AS 3811-1998, Hard-wired patient alarm systems**. Installation requirements for the types of alarm systems described in this Standard are included in **AS/NZS 3000:2007**. Please consult section [Electrical Wiring](#) of this guide for more information on different types of electrical wiring Standards.

Patient alarms connected to telecommunications networks should be designed to meet the requirements defined in **AS 4607-1999, Personal response systems**.

Aged Care Buildings

Information on design and planning requirements for Aged Care buildings is included in the Building Code of Australia (see **BCA + Standards** service) and appropriate State/Territory legislation.

Please see the section [Fire Protection Equipment](#) of this guide for information on Standards for fire protection equipment that may be used in Aged Care buildings.

Patient Alarms

Hard wired alarm systems used by persons located in Aged Care buildings are covered by the information included in **AS 3811-1998, Hard-wired patient alarm systems**. Installation requirements for the types of alarm systems described in this Standard are included in **AS/NZS 3000:2007**. Please consult section [Electrical Wiring](#) of this guide for more information on different types of electrical wiring Standards.

Patient alarms connected to telecommunications networks should be designed to meet the requirements defined in **AS 4607-1999, Personal response systems**.

Lighting

Emergency Evacuation Lighting – Aged Care Buildings

Please see section [Emergency Evacuation Lighting](#) of this guide for more information on Standards covering emergency evacuation lighting.

Interior Lighting – Aged Care Buildings

Architects and building designers required to assess indoor lighting levels in Aged Care buildings should review the information that is included in the Standards listed below;

- **AS/NZS 1680.0:2009, Interior lighting – Safe movement**
- **AS/NZS 1680.1:2006, Interior and workplace lighting – General principles and recommendations**
- **AS/NZS 1680.2.1:2008, Interior and workplace lighting – Specific applications – Circulation spaces and other general areas**
- **AS/NZS 1680.2.2:2008, Interior and workplace lighting – Specific applications – Office and screen-based tasks**
- **AS/NZS 1680.2.5-1997, Interior lighting - - Hospital and medical tasks**

Lighting levels for medical and hospital activities undertaken in Aged Care buildings can be determined by following the details included in **AS/NZS 1680.2.5-1997**.

Outdoor Lighting – Aged Care Buildings

Please see section [Lighting – Outdoor Lighting](#) of this guide for more information on Standards covering outdoor lighting.

Childcare Buildings

Information on design and planning requirements for Childcare buildings is included in Volume 1 to the 2010 edition of the Building Code of Australia (see **BCA + Standards** service) and appropriate State/Territory legislation.

Please see the section [Fire Protection Equipment](#) of this guide for information on Standards for fire protection equipment that may be used in Childcare buildings.

Lighting

Emergency Evacuation Lighting – Childcare Buildings

Please see section **Emergency Evacuation Lighting** of this guide for more information on Standards covering emergency evacuation lighting.

Interior Lighting – Childcare Buildings

Standards Australia has not established any Standards covering lighting for tasks undertaken in Childcare buildings. General information on lighting levels for tasks undertaken in these types of buildings can be determined by following the details that are included in **AS/NZS 1680.1:2006**.

Information on indoor lighting levels for stairs and access areas located in Childcare buildings can be assessed by reviewing the information that is included in **AS/NZS 1680.0:2009**.

A table listing recommended lighting levels for tasks undertaken in different types of buildings and facilities is included in **AS/NZS 1680.1:2006**. Information on recommended lighting levels for different types of industrial tasks is included in **AS/NZS 1680.2.4:1997**.

Office and screen-based tasks undertaken in Childcare buildings can be determined by reviewing the information that is included in **AS/NZS 1680.2.2:2008**.

Outdoor Lighting – Childcare Buildings

Please see section [Lighting – Outdoor Lighting](#) of this guide for more information on Standards covering outdoor lighting.

Playground Equipment

Standards for different types of playground equipment are listed below;

- **AS/NZS 4422:1996, Playground surfacing – Specifications, requirements and test method**
- **AS/NZS 4486.1:1997, Playgrounds and playground equipment – Development, inspection, maintenance and operation**
- **AS 4685, Playground Equipment Series** lists Standards relating to playground equipment. These Standards are also available as a set **AS 4685 (Set)-2004, Playground Equipment Safety Set.**

Nursery Furniture

Standards for nursery furniture commonly used in Childcare buildings include:

Bunk Beds

- **AS/NZS 4220:2010, Bunk beds and other elevated beds**

Change Tables

- **I.S. EN 1222-1:2008, Changing Units for Domestic Use – Part 1: Safety Requirements**
- **I.S. EN 12221-2:2008, Changing Units for Domestic Use – Part 2: Test Methods**
- **ASTM F2285-04 (2010), Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use**
- **ASTM F2388-09, Standard Consumer Safety Specification for Baby Changing Tables for Domestic Use**

Cots

- **AS/NZS 2130:1998, Cots for day nursery, hospital and institutional use – Safety requirements**

High Chairs

- **AS 4684-2009, High chairs – Safety requirements**

Prams

- **AS/NZS 2088:2009, Prams and strollers – Safety requirements**

For more information on Standards relating to children's products, you can refer to [Guide to Standards – Children's Products](#).

Food Premises

Architects and building designers responsible for preparing plans and layouts for different types of food premises should review the information that is included in **AS 4674-2004, Construction and fit out of food premises**.

Owners of food premises, persons working in food premises and persons responsible for designing and renovating these types of premises may also need to be familiar with food management Standards. The term HACCP (Hazard Analysis Critical Control Points) may also be used to describe these types of Standards. These types of Standards are listed below:

- **AS ISO 22000-2005, Food safety management systems - Requirements for any organization in the food chain**
- **AS ISO 22000 (Int):2006, Food safety management systems – Guidance on the application of AS ISO 22000-2005**

The Australian food safety management system Standards are also available as a Set **SAS ISO 22000 Set-2006, Food Safety Management Set**.

Please see the section [Fire Protection Equipment](#) of this guide for information on Standards for fire protection equipment that may be used in Food premises.

Lighting – Food Premises

Emergency Evacuation Lighting – Food Premises

Please see section [Emergency Evacuation Lighting](#) of this guide for more information on Standards covering emergency evacuation lighting.

Interior Lighting – Food Premises

Standards Australia has not established any Standards covering lighting for tasks undertaken in Food premises. General information on lighting levels for tasks undertaken in these types of buildings can be determined by following the details that are included in **AS/NZS 1680.1:2006**. This Standard includes a listing of recommended lighting levels for tasks undertaken in different types of buildings and facilities.

Outdoor Lighting – Food Premises

Please see section [Lighting – Outdoor Lighting](#) of this guide for more information on Standards covering outdoor lighting.

Ventilation – Food Premises

Information on airflow levels for Food premises is included in **AS 1668.2:2002**. Information on requirements for kitchen exhaust hoods is included in **AS 1668.2-1991**.

AS 1668.2-2002 is not referenced in the Building Code of Australia (see **BCA + Standards** service). However, the **1991** edition of the Standard is referenced in the Building Code of Australia (see **BCA + Standards** service).

Sporting Stadiums

Information on planning and design requirements for sporting stadiums is included in the Building Code of Australia (see **BCA + Standards** service). There may also be separate requirements that are determined by the State/Territory planning and building regulators.

Please see the section [Fire Protection Equipment](#) of this guide for information on Standards for fire protection equipment that may be used in Sporting stadiums.

Lighting – Sporting Stadiums

Emergency Evacuation Lighting – Sporting Stadiums

Please see section [Emergency Evacuation Lighting](#) of this guide for more information on Standards covering emergency evacuation lighting.

Interior Lighting – Sporting Stadiums

Standards Australia has not established any Standards covering lighting Standards for tasks undertaken in Sporting Stadiums. General information on lighting levels for tasks undertaken in these types of buildings can be determined by following the details that are included in **AS/NZS 1680.1:2006**.

Outdoor Lighting – Sporting Stadiums

Information on recommended outdoor lighting requirements for sporting stadiums is included in the **AS 2560, Sports Lighting Series** and the **HB 49-1993, Sporting Facilities Manual Suite** of Handbooks.

For more information on outdoor lighting, please see section [Lighting – Outdoor Lighting](#) of this guide for more information on Standards covering outdoor lighting.

Laboratories

Architects and building designers responsible for designing different types of laboratories can follow the procedures described in **AS/NZS 2982:2010, Laboratory design and construction**. Detailed information on safety requirements for different types of laboratories is included in the **AS/NZS 2243 Series**. Information on planning and design requirements for laboratories is also included in the Building Code of Australia (see **BCA + Standards** service).

Eye wash facilities used with laboratories and other areas where corrosive substances are handled can be tested by following the details described in **AS 4775-2007, Emergency eyewash and shower equipment**.

Information on safety requirements for physical containment (PC) laboratories is included in **AS/NZS 2243.3:2010, Safety in laboratories – Microbiological safety and containment**.

Please see the section [Fire Protection Equipment](#) of this guide for information on Standards for fire protection equipment in that may be used in Laboratories.

Lighting – Laboratories

Emergency Evacuation Lighting – Laboratories

Please see section [Emergency Evacuation Lighting](#) of this guide for more information on Standards covering emergency evacuation lighting.

Interior Lighting – Laboratories

General information on lighting levels for tasks undertaken laboratories can be determined by following the details that are included in **AS/NZS 1680.1:2006**.

Office and screen-based tasks undertaken in Laboratories can be determined by reviewing the information that is included in **AS/NZS 1680.2.2:2008**.

Outdoor Lighting – Laboratories

Please see section [Lighting – Outdoor Lighting](#) of this guide for more information on Standards covering outdoor lighting.

Car Parks

Architects and building designers engaged to plan and design car parks should follow the information that is included in the **AS/NZS 2890, Parking Facilities Series**. These Standards are also available in a Set **SAS/NZS 2890 (Set):2009**.

The Standard for off-street parking facilities is **AS/NZS 2890.1:2004, Parking facilities – Off-street car parking**, diagrams and tables covering circulation spaces for different types of car parking facilities are included in this Standard. Please consult **AS/NZS 2890.6:2009, Parking facilities – Off-street parking for people with disabilities** for information on requirements on parking facilities for disabled persons.

Fixed ladders and platforms used with car parks should be designed to the requirements that are described in **AS 1657-1992, Fixed platforms, walkways, stairways and ladders – Design, construction and installation**.

Please see the section [Fire Protection Equipment](#) of this guide for information on Standards for fire protection equipment that may be used in Car Parks.

Lighting – Car Parks

Lighting levels for open-top car parks are included in **AS/NZS 1158.3.1:2005** Information on recommended lighting levels for roofed top car parks is included in **AS/NZS 1680.1:2006**.

Ventilation – Car Parks

Information on airflow levels for Car Parks is included in **AS 1668.2:2002** and **AS 1668.2-1991** The **2002** edition of **AS 1668.2:2002** is not referenced in the Building Code of Australia (see **BCA + Standards** service). However, the **AS 1668.2-1991** edition of the Standard is referenced in the Building Code of Australia (see **BCA + Standards** service).

Long Span Structures (Bridges and Tunnels)

General information on loading requirements for different types of bridges and tunnels is included in the **AS/NZS 1170, Structural design actions Series**. Bridges manufactured from concrete, or steel should also be designed and engineered by following the details that are included in the Standards listed below:

- **AS 3600-2009, Concrete structures**
- **AS 4100-1998, Steel structures**

Bridges and tunnels can be represented on drawings and plans by following the conventions described in **AS 1100.301-2008, Technical drawing – Architectural drawing** and **AS/NZS 1100.501-2002, Technical drawing – Structural engineering drawing**.

Bridges

Structural Design Standards

Engineering requirements for different types of bridges is included in the Standards listed below. These Standards are also available in the **AS 5100 Set-2007, Bridge Design Set**:

- **AS 5100.1-2004, Bridge design – Scope and general principles**
- **AS 5100.1 Supp 1-2006, Bridge design – Scope and general principles – Commentary (Supplement to AS 5100.1-2004)**
- **AS 5100.2-2004, Bridge design – Design loads**
- **AS 5100.2 Supp 1-2007, Bridge design – Design loads – Commentary (Supplement to AS 5100.2-2004)**
- **AS 5100.3-2004, Bridge design – Foundations and soil supporting structures**
- **AS 5100.3 Supp 1-2008, Bridge design – Foundations and soil supporting structures – Commentary (Supplement to AS 5100.3-2004)**
- **AS 5100.4-2004, Bridge design – Bearings and deck joints**
- **AS 5100.4-2004 Supp 1-2006, Bridge design – Bearings and deck joints – Commentary (Supplement to AS 5100.4-2004)**
- **AS 5100.5-2004, Bridge design – Concrete**
- **AS 5100.5 Supp 1-2008, Bridge design – Concrete – Commentary (Supplement to AS 5100.5-2004)**
- **AS 5100.6-2004, Bridge design – Steel and composite construction**
- **AS 5100.6 Supp 1-2007, Bridge design – Steel and composite construction – Commentary (Supplement to AS 5100.6-2004)**
- **AS 5100.7-2004, Bridge design – Rating of existing bridges**
- **AS 5100.7 Supp 1-2006, Bridge design – Rating of existing bridges – Commentary (Supplement to AS 5100.7-2004)**

Fire Safety

Standards Australia has not established any Standards covering fire protection equipment that should be used with bridges. Information on Standards for fire protection equipment used in tunnels is included in **AS 4825-2011, Tunnel fire safety**. The information in this Standard may be of assistance for persons responsible for designing, upgrading and maintaining different types of bridges.

Lighting

Outdoor lighting requirements for bridges can be determined by following the information that is included in the **AS/NZS 1158, Lighting for roads and public spaces Series**.

Ventilation

Fire safety requirements for ventilation systems used in tunnels is included in **AS/NZS 1668.1:1998**. Information on exhaust and airflow requirements for ventilation systems used in tunnels is included in **AS 1668.2:2002** and **AS 1668.2-1991**. **AS 1668.2:2002** is not referenced in the Building Code of Australia (see **BCA + Standards** service). However, the **1991** edition of the Standard is referenced in the Building Code of Australia (see **BCA + Standards** service).

Online Resources

Do you need online access to the National Construction Code and all the Australian Standards® referenced within it? - [National Construction Code](#)

Do you need online access to the Building Code of Australia and all the Australian Standards® referenced within it? - www.saiglobal.com/BCA

Do you need online access to the Plumbing Code of Australia and all the Australian Standards® referenced within it? - [StandardsWatch - PCA](#)

Do you need guidance on which Australian Standards® or parts thereof are referred to in legislation? - www.saiglobal.com/Newsletters

Would you like to be notified when Standards relevant to you are updated, amended or newly released? - www.saiglobal.com/SW

Do you need online access to the full text of your own customised selection of Australian Standards® as well as optional access to international Standards? - www.saiglobal.com/Select

Do you need to stay current on Australian Legislative, Regulatory and Compliance News? - <http://www.saiglobal.com/compliance/regulatory-news/asiapac/>

Would you like to drive continued organizational success with results-focused training and professional development? - www.saiglobal.com/training

Building Regulators

For a list of online resources used to locate legislation, Government Departments, Law Foundations and Institutes.

Australian Building Codes Board

Website: <http://www.abcb.gov.au/>

NSW Government Department of Planning & Infrastructure

Website: <http://www.planning.nsw.gov.au/>

Victoria Building Commission

Website: www.buildingcommission.com.au

Government of South Australia – Department of Planning and local government

Website: www.planning.sa.gov.au/

Government of Western Australia - Regional Development and Lands

Website: www.rdl.wa.gov.au

Tasmanian Government – Department of Justice

Website: www.wst.tas.gov.au/industries/building

ACT Government - Planning & Land Authority

Website: www.actpla.act.gov.au/

Northern Territory Government - Department of Lands and Planning

Website: www.dpi.nt.gov.au/

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[Product Certification Key Documents](#)