

# Australian/New Zealand Standard

## Plumbing and drainage - Part 4: Heated Water Services

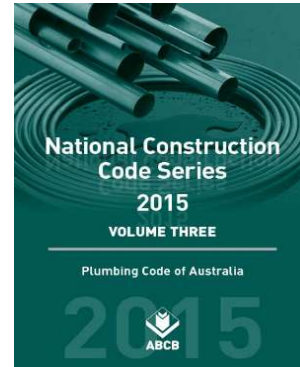
### UPDATED AS/NZS 3500.4:2015

#### What is the scope of this Standard?

AS/NZS 3500.4:2015 details “the requirements for the design, installation and commissioning” of heated water services using drinking water, rainwater or a combination thereof.

Also covered are “aspects of the installation from, and including, the valve(s) on the cold water inlet to any cold water storage tank or water heater and the downstream fixtures and fittings”.

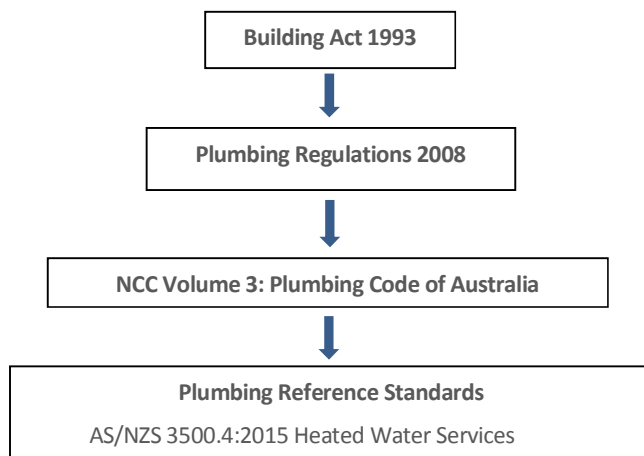
The Standard “applies to new installations as well as alterations, additions and repairs to existing installations”.



The following parts of the PCA reference AS/NZS 3500.4:

- *Part A3.1: Schedule of referenced documents.*
- *Part B2.2 Heated Water Services – General Requirements (c)*
- *Part E1 Heating, Ventilation and Air Conditioning Systems – E1.2 General Requirements (b)*
- *Appendix – Victorian Variations Vic B2.2 (i)(A)*
- *Appendix – Victorian Variations Vic B2.2 (i)(B)*

#### Victorian Plumbing Regulatory Framework



#### Victorian Variations

Victorian Variations relating to AS/NZS 3500.4 are contained within the PCA and for information purposes have been reproduced in full in the Green text boxes found in this information sheet.

#### Where is AS/NZS 3500.4:2015 referenced?

Within the *National Construction Code Series, Volume 3 Plumbing Code of Australia (PCA)*<sup>1</sup>. The Standard is automatically adopted under *Plumbing Regulations 2008, Regulation 9 (2) Modifications to the PCA*<sup>2</sup>.

<sup>1</sup>The PCA is freely available for download from the ABCB website: <https://services.abcb.gov.au/NCCOnline/>

<sup>2</sup> The Victorian Plumbing Regulations 2008 can be found on the VBA website: <http://www.vba.vic.gov.au/practitioners/legislation>

Australian/New Zealand Standard

Plumbing and drainage

Part 4: Heated water services

#### Publication Date

14 December 2015 (replaces AS/NZS 3500.4:2003)

# Plumbing and drainage - Part 4: Heated Water Services

## Class of plumbing work affected

- Water supply work

## Changes and Impact

The Standards Australia Committee has updated **AS/NZS 3500.4** to bring it into line with Australian Building Codes Board (ABCB) protocol for referenced documents and to improve the technical content. Major changes from the updated 2015 version include, but are not limited to, the following:

- The removal of references to manufacturer's specifications, competent people or engineers.
- The requirements in *Section 6 Installation of Solar Water Heaters*
- Section 9 Heated water below 60°C and Section 10 Heated water services for people with disabilities have been deleted.
- Deleting and renumbering of Sections and Clauses.

**NOTE: To avoid confusion over which Clause is discussed within this information sheet, the version of AS/NZS 3500.4 that each Clause is taken from is indicated in brackets: (2003) or (2015).**

## Preface

In line with the changes made to the revised versions of the **AS/NZS 3500** series, **AS/NZS 3500.4: 2015 version** has deleted all specific requirements for practitioners to follow "manufacturer's instructions".

Every Clause that required practitioners to follow manufacturer's instruction has been rewritten.

For example, *Clause 5.3.3 Ventilation and fluing* in **AS/NZS 3500.4:2003** required that practitioners locate fuel-burning water heaters according to the manufacturer's instructions. This clause is no longer mandatory.

However, the revised **AS/NZS 3500.4:2015** encourages practitioners to refer to manufacturer's installation instructions to ensure:

- "the material or product is fit for the application;
- the performance of the system is not degraded;

- the durability of the material or product is not impaired; and
- the manufacturer's warranty remains valid."

## Section 1 Scope and General

### *Table 1.1 Equivalent Pipe Sizes Guide (2003)*

The Note attached to this table allowed practitioners to use alternative sizes of pipe "provided they met the performance requirements of the Standard". This option has been deleted, practitioners must use the sizes specified in the Table.

### *Clause 1.8 Velocity Requirements (2015)*

This Clause has been replaced by a new Table detailing a range of maximum flow velocity depending on the circumstance and material of the installation. Specifically circulatory systems have a substantially reduced maximum allowable flow velocity, particularly where the installation is of copper piping.

## Plumbing Code of Australia (PCA)

### *Victorian Variations*

*After Clause 1.9.2 Sanitary fixtures delivery temperature (2015) insert:*

In this clause 'heated water installation' means either a heated water reticulation heater and a heated water reticulation system or a heated water reticulation system

## Section 2 Materials and Products

### *Clause 2.2 Authorisation (2003)*

Reference to the WaterMark Scheme has been removed as it is contained in the PCA. **Part A2 Acceptance of Design and Construction** of the PCA requires practitioners to install WaterMark certified products where required.

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## Section 4 Installation of cold and heated water piping and controls

### Plumbing Code of Australia (PCA)

#### Victorian Variations

After *Clause 4.2.2.4 Below ground—Communications services (2015)* insert:

The provisions of Clause 5.2.8 of **AS/NZS 3500.1** apply to heated water reticulation

#### *Clause 4.11.2.1 Cold water storage tank - General (c) (2015)*

Practitioners must only install cold water storage tanks intended to supply water to a water heater if they have an outlet made of a suitable material threaded in accordance with the updated Standard **AS ISO 7.1:2008**.

#### *Clause 4.11.2.2 Cold water storage tank - Water storage tank capacity (2015)*

The Clause referring to “Commercial and industrial installations” has been deleted. All remote tanks must now conform to the same requirements.

## Section 5 Installation of water heaters – General Requirements

#### *Clause 5.9.3 Installation of Valves (2015)*

All valve installations must now be protected from freezing in accordance with *Clause 4.10*.

#### *Clause 5.12.1 Temperature/pressure relief valve and expansion control valve drain lines – Size and Material (a) (2003)*

Practitioners may now only use copper for these installations. The reference to “other suitable piping” has been deleted.

## Section 6 Installation of Solar Water Heaters

The content of Section 6 has been extensively revised. Practitioners must consult the updated

**AS/NZS 3500.4:2015** to ensure they are aware of all relevant changes.

#### *Clause 6.3.1 General installation requirements - Performance (2003)*

Practitioners are reminded that there are different requirements for the performance of a Solar Water Heater installed in a new Class 1 building.

A Solar Water Heater installed to fulfil the 6 Star building requirements mandated by the National Construction Code for Class 1 buildings must meet the requirements contained in the Victorian *Plumbing Regulations 2008* Schedule 2, Part 7, Clause 15B. Further information can be found in the VBA Technical Solution Sheets:

- *98.01 : Solar Heated Water – 6 Star Requirements*
- *98.02 : Solar Hot Water Performance Requirements*

A Solar Water Heater that is installed independently of the 6 Star building requirements, or in an existing building must have its performance tested according to **AS/NZS 4234 Heated water systems – Calculation of Energy Consumption**.

#### *Clause 6.3.3 General installation requirements - Location (2003)*

This Clause has been rewritten. Practitioners are required to position the components of the system to “maximise solar gain and minimise energy loss, and shall be positioned to facilitate maintenance”.

Practitioners must still meet the requirements laid out in *Clause 5.3 Installation of Water Heaters – Location* as well as those contained in the Victorian *Plumbing Regulations 2008*, Schedule 2, Part 7, clause 15.

#### *Section 6.4 Installation of Solar Water Heater Container (2003)*

This clause has been deleted and the general requirements affecting collectors and containers are consolidated into new Clauses to provide greater clarity. Specifically:

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## Clause 6.3.3 Structural integrity (2015)

The combined weight of collectors and containers shall not exceed the prescribed maximum load on the roof.

## Clause 6.3.7 Corrosion resistance (2015)

All materials, components and brackets must be given specific treatments to ensure adequate resistance to corrosion for the duration of their intended service life.

## Clause 6.3.8 Entrapped air (2015)

Piping must be installed to eliminate air from the heat transfer fluid circuit.

## Clause 6.3.9 Over-temperature protection (2015)

Over-temperature protection must be in accordance with **AS/NZS 2712 Solar and heat pump water heaters – Design and construction**.

## Clause 6.3.10 Pressure and temperature relief (2015)

Relief valves must have a relief capacity of not less than the total output power of the collectors at 99°C and 1100 W/m<sup>2</sup> and 50°C effective ambient or in accordance with AS/NZS 2712.

## Clause 6.3.11 Drain lines (2015)

Drain lines made from copper pipe crossing a metal roof must be fully insulated with “UV resistant weather proofing”.

## Clause 6.3.13 Mounting (2015)

Practitioners are required to install all mounting frames “across” the slope of the roof. This excludes any products that incorporate mountings that are aligned up the slope of the roof.

Practitioners must also secure all rails and angles through the “upper profile of the roof sheeting”. Supports installed on tiled roofs must be secured to the roof beams with a minimum of three screws per support.

## Clause 6.5.1.1 Installation of Collectors - Shade (2015)

It is now mandatory that collectors be “clear of shade

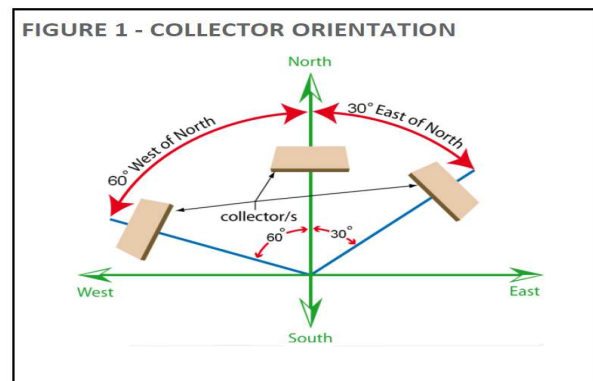
for not less than 3 hours either side of solar noon at any time during the year”.

## Clause 6.5.1.2 Installation of Collectors – Orientation (2015)

Practitioners need to be aware that the orientation of solar collectors must conform to the requirements in the Victorian *Plumbing Regulations 2008* Schedule 2 Part 7, clause 15 (1) (a):

- (1) The solar collectors contained in a solar water heater installed in a building must—
  - (a) be oriented to face between 30 degrees east and 60 degrees west of magnetic north

Refer to Figure 1 below:



## Clause 6.5.1.3 Installation of Collectors – Inclination (2015)

The inclination of solar collectors must conform to the requirements contained in the Victorian *Plumbing Regulations 2008*, Schedule 2, Part 7, clause 15 (1) (b):

- b) have an inclination of 35 degrees plus or minus 20 degrees to the horizontal.

## Clause 6.5.2.1 Precautions - Avoidance of damage (2015)

The collector must be securely covered with an “opaque material” during installation to prevent damage to the unit or heat related injuries.

## Section 9 Heated Water below 60° C (2003)

This Section had been left blank in the 2003 version – and has been deleted entirely in **AS/NZS 3500.4:2015** due to the lack of content.

## **Section 10 Heated water services for people with disabilities (2003)**

This Section is redundant and has been deleted. These requirements are covered in **AS/NZS 3500.4:2015 Clause 1.9.2 Sanitary fixtures delivery temperature** and Part B2 of the PCA.

## **Section 11 Testing and Commissioning (2003)**

This Section has been moved to Section 9.

## **Section 12 Operation and Maintenance (2003)**

This section has been made advisory and renumbered Appendix N – Operation and Maintenance.

## **Appendix B – Water Analysis**

This Appendix has been made advisory. *Clauses B3 Scaling Properties* and *B4 Water pH* have been deleted.

## **Appendix L – Australian Climate Regions**

Table L2 Climate zones for thermal design – city locations (BCA) has been deleted. It is now contained in Volumes 1-3 of the National Construction Code (NCC).

**The VBA strongly encourages practitioners to consult the complete standard in order to ensure they comply with all Deemed-to-Satisfy requirements.**

**The full text of AS/NZS 3500.4:2015 can be found at the SAI Global website:**

**<http://www.saiglobal.com/>**