



PRELIMINARY IMPACT ANALYSIS

PROPOSAL: This proposal seeks to review Joint Australian New Zealand Standard (AS/NZS) 3500 Plumbing and Drainage Part 1 to include consistent requirements for penetrations in steel framed construction.

Responsible Technical committee: Australian Standard Committee WS-014 Plumbing and Drainage.

NCC REFERENCE:	BCA Volume One: N/A
For revisions or amendments to existing National Construction Code (NCC) referenced documents, provide additional information	BCA Volume Two: N/A
	PCA Volume Three: B1.4, B3.3, B4.2, B5.2, B5.3, B5.4, BS5.1.2, B6.4, B6.5

PROPONENT:	Nominating organisation:	N/A
	Nominating individual:	Fred Reynolds
	Position:	Independent Chair WS-014
	Contact email:	fredreyn@tpg.com.au

DATE OF PIA:	Date:	20 Jan 2020
	Version:	2
	Status:	DRAFT

NATURE AND EXTENT OF THE PROBLEM:

National Association of Steel-Framed Housing (NASH) codes are referenced in the BCA. These standards specify, amongst other requirements, provision of service holes in metal framework including size, number and placement of holes.

AS/NZS 3500 Parts 1 and 4, and the Plumbing Code of Australia (PCA) do not refer to these standards and Clause 5.4.2.1 prescribes a different set of requirements.

These requirements conflict with the NASH standards because:

- most holes in steel framing are installed during the manufacture of the steel stud; and
- the clause does not allow for flared holes; and
- there is no limitation on the maximum size of holes in steel studs; and
- there is no limitation on the number of additional holes.

This is causing confusion in the industry when two sets of requirements apply to a building.

OBJECTIVES:

The objective is to bring AS/NZS 3500.1 requirements for holes in steel framing into line with the Building Code of Australia (BCA) and referenced NASH steel framing codes.

OPTIONS:

Option 1 - Status Quo

This would retain the existing metal framing provisions without any further action.

Option 2 - Non-regulatory

A handbook could be prepared describing the recommended provision of service holes in metal framework. Alternatively, and preferably, an informative reference could be made in AS/NZS 3500 Parts 1 and 4 to the Nash Codes and Handbook

Option 3 - Regulatory

Revise AS/NZS 3500.1 Clause 5.4.2.1 as outlined in Appendix A.

IMPACT ANALYSIS (OF ALL OPTIONS):

Option 1. Status Quo

This would be the zero cost solution, but would still leave the inconsistencies in the NCC referenced documents. It would also continue the uncertainty and potential confusion for plumbers and inspectors on building sites.

Option 2. Non-regulatory solution

This would be a zero cost solution, but since compliance with the NASH standards would not be compulsory there would be little take-up hence retaining the existing inconsistencies and uncertainties. An education and training program could be implemented but it is considered that this would not be successful since there is little incentive. The PCA also contains explanatory information within the relevant sections directing plumbing practitioners of the appropriate sections of the Building Code of Australia (B1 of Volume One and 3.4.2 of Volume Two) for fittings, fixtures and pipework installations in steel framed construction. It is considered that this explanatory information has not prevented or resolved the issues described above.

Option 3. Amend AS/NZS 3500 Parts 1 and 4

A change has been made to Clause 5.4.2.1 of AS/NZS 3500.1 to provide more accurate and comprehensive rules for the provision of service holes in metal framework including size, number and placement of holes. The recommended changes are aligned with existing practice in the steel framing industry as documented in NASH Standards and Handbooks. The change is minor in nature and draws on steel framing industry experience coordinated by NASH and published in NASH Handbook (2009) and in NASH Standard Part 1 Appendix F (Amendment B, 2009).

There were also incorrect Figure references [5.4.2.1(C) and 5.4.2.1(D)] that require amendment.

Amending AS/NZS 3500.1 Clause 5.4.2.1 to reflect the requirements of the NASH standards will benefit plumbing practitioners and plumbing inspectors on construction sites by removing uncertainty and the risk of misinterpretation of the requirements. It will also improve the quality and reliability of hole placement in metal framework with no effect on the cost of plumbing service installation. It also ensures consistency between the BCA and the PCA which would resolve any disputes between building and plumbing contractors through consistent regulatory requirements. It is considered that this may present a reduction in costs associated with disputes and lost productivity time.

The change to AS/NZS 3500.4 is consistent with that of AS/NZS 3500.1.

TRANSITIONAL MEASURES

Transitional measures are not considered necessary. Steel frames normally come pre-drilled and if extra holes are required then the form and placement is clearly specified.

CONSULTATION:

The National Association of Steel Framed Housing Inc. were involved in the original proposal and have provided additional input throughout the project. Standards Australia's WS-014 have agreed to the changes to Clause 5.4.2.1.

The Australian Building Codes Boards (ABCB) Plumbing Code Committee (PCC) have reviewed the project proposal and provided support for the proposed amendment.

CONCLUSION AND RECOMMENDED OPTION:

Option 3, Amending AS/NZS 3500.1 Clause 5.4.2.1 and AS/NZS 3500.4 Clause 4.5 to consistently reflect the NASH standards is the recommended option. It provides the most benefit with no additional cost and with possibly some minor reduction of costs on certain sites.

IMPLEMENTATION AND REVIEW:

The change will be implemented as part of the 2022 NCC revision cycle. NASH have advised WS-014 that the committee will be informed of any future changes to the relevant NASH standards.

LIST OF ATTACHMENTS:
1. Attachment A – Proposed change

1. Attachment A – Proposed change

Attachment A: PROPOSED CHANGE

3500.1

SECTION 5. INSTALLATION OF COLD WATER SERVICES

5.4.2 Concealed piping

5.4.2.1 Walls

Water services located in timber- or metal-framed walls shall be installed as follows:

- (a) *Timber wall framework* — Holes or notches made in timber studs and plates in walls shall be in accordance with the following:
 - (i) The maximum size and spacing of holes or notches in studs shall be in accordance with Figure 5.4.2.1(A) and Table 5.4.2.1.
 - (ii) Where uninsulated pipes are used, a collar of lagging material or a neutral cure silicone sealant shall be used to fill the annular space.
- (b) *Timber beams, bearers and joists* — Holes or notches made in timber beams, bearers and joists in floors shall be in accordance with Figure 5.4.2.1(A) and Figure 5.4.2.1(B).
- (c) *Metal wall framework* — Water services shall be installed in existing preformed holes where possible. Additional holes, where required, shall be no larger than the preformed holes installed by the manufacturer or 32 mm when there are no pre-existing holes. The additional holes shall be placed:
 - (i) with hole centres no further from the centreline of the member than +/- 10% of the member depth;
 - (ii) at a minimum spacing or end distance of 4 times the hole diameter (for single holes); and
 - (iii) at a minimum spacing or end distance of 8 times the hole diameter (for pair-to-pair or single-to-pair holes). See Figure 5.4.2.1(E)

If holes are less than 4 times the hole diameter apart they are considered a pair.

NOTE : An engineered system may have more numerous or closely spaced holes depending on the design.

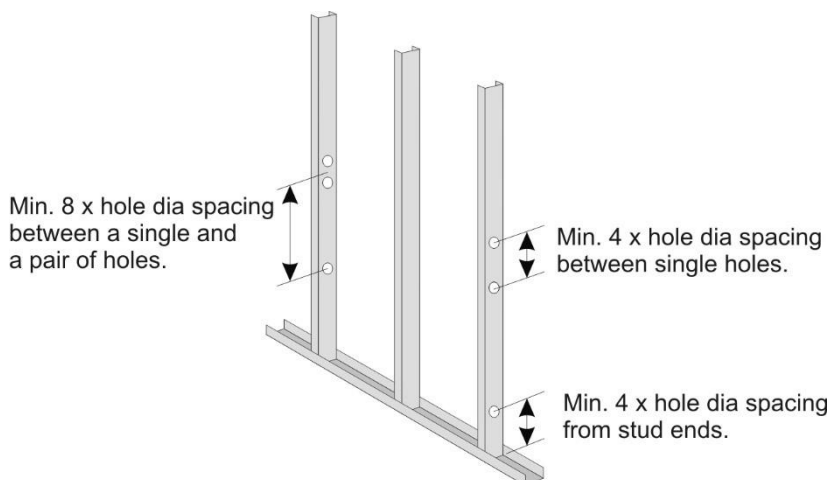


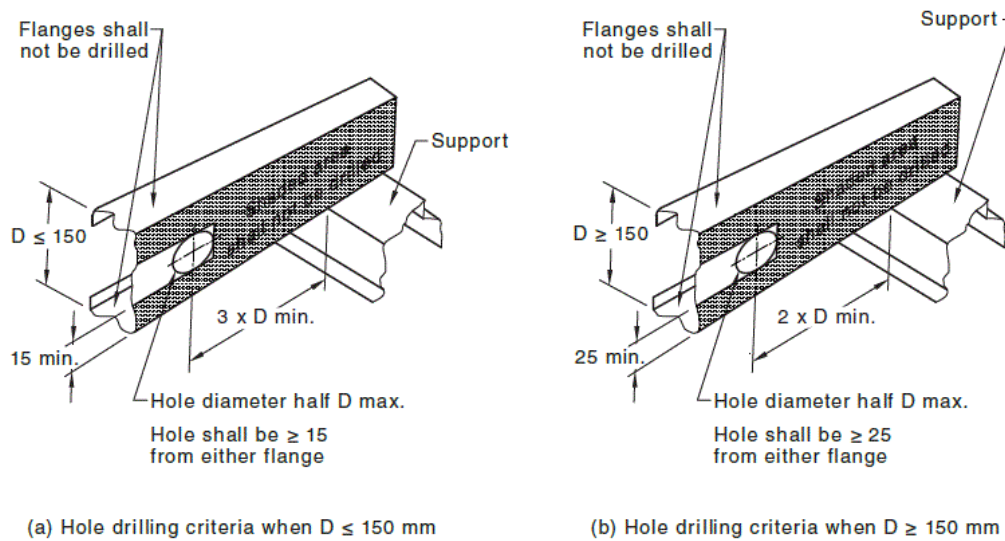
Figure 5.4.2.1(E) Hole spacing in metal wall framework.

Holes may be plain (unflared) or flared. For plain holes, metal and polymer pipes shall be protected from contact with the hole edge. For flared holes, metal pipes shall be isolated from contact with the hole flare. Protection or isolation shall be provided using suitable grommets, insulation or a short sleeve of oversize pipe firmly secured in the framework to be inserted around the pipe. There shall be no direct contact between the pipe and framework and there shall be free longitudinal movement of the pipe through the grommet, lagging or sleeve. Examples are shown in Figure 5.4.2.1(D).

All pipes shall be secured in accordance with Clause 5.6.

- (d) *Metal beams, bearers and joists* – Holes made in metal beams, bearers and joists shall be in accordance with Figure 5.4.2.1 (C).
- (e) Pipes located in cavities shall be installed so as to prevent the transfer of moisture from the outer wall to the inner wall.

NOTE: Care should be taken to ensure that the air cavity moisture barrier within an external wall of any building is not bridged with pipe or pipe duct penetrations and porous pipe insulation materials. A clear air gap is required between the external wall and the pipe insulation material.



DIMENSIONS IN MILLIMETRES

FIGURE 5.4.2.1(C) PENETRATIONS TO STEEL FLOOR JOISTS