

Please find enclosed Amendment 7, effective 30 November 2018, to the Acceptable Solutions and Verification Methods for Clause G13 Foul Water of the New Zealand Building Code. The previous amendment to the G13 Acceptable Solutions and Verification Methods (Amendment 6) was in January 2017.

<b>Section</b>	<b>Previous amendment</b>	<b>November 2018 Amendment 7</b>
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## Document Status

The most recent version of this document (Amendment 7), as detailed in the Document History, is approved by the Chief Executive of the Ministry of Business, Innovation and Employment. It is effective from 30 November 2018 and supersedes all previous versions of this document.

The previous version of this document (Amendment 6) will cease to have effect on 31 March 2019.

People using this document should check for amendments on a regular basis. The Ministry of Business, Innovation and Employment may amend any part of any Verification Method or Acceptable Solution at any time. Up-to-date versions of Verification Methods and Acceptable Solutions are available from [www.building.govt.nz](http://www.building.govt.nz)

<b>G13: Document History</b>			
	<b>Date</b>	<b>Alterations</b>	
First published	July 1992		
Amendment 1	September 1993	pp. vii–viii, References p. xi, Definitions	p.25, Figure 3 p. 31, Figure 7
Reprinted incorporating Amendment 1		October 1994	
Amendment 2	1 December 1995	p. viii, References	
Amendment 3	28 February 1998	p. ii, Document History p. viii, References	p. 1, 1.0.1 p. 21, 1.0.1
Second edition published 1 July 2001	Effective from 1 October 2001	Document revised – second edition issued	
Amendment 1	Published March 2007 Effective from 23 June 2007	p. 2, Document History, Status p. 6, Contents pp. 7–8, References	pp. 9–10, Definitions p. 52A, AS3 1.0, 1.0.1, 1.0.2 p. 55, Index
Erratum 1	Effective from 23 June 2007	pp. 5–6, Contents pp. 33–34, AS1 8.0, 8.1	pp. 50–51, AS2 7.0, 7.1
Amendment 2	Effective from 21 June 2007	p. 2, Document History, Status pp. 3, 4, 4A, Building Code Clause p. 6, Contents	p. 8, References p. 52A, VM4 p. 54, Index
Amendment 3	Published 30 June 2010 Effective from 30 September 2010	p. 2, Document History, Status pp. 7–8, References p. 11, G13/VM1 1.0.1 p. 13, G13/AS1 Table 1 p. 32, G13/AS1 6.1.1 p. 33, G13/AS1 6.2.2, 6.3.1, 6.3.2, 7.1.2, Table 7	p. 37, G13/AS2 Table 1 p. 42, G13/AS2 5.1.2 p. 50, G13/AS2 6.1.2 p. 51, G13/AS3 1.0.1 pp. 54–55, Index
Amendment 4	Effective from 10 October 2011 until 14 August 2014	p. 2, Document History, Status p. 8, References	p. 10, Definitions p. 37, G13/AS2 Table 1
Amendment 5	14 February 2014 until 30 May 2017	p. 2A, Document History, Status pp. 7–8, References p. 9, Definitions p. 35, G13/VM2 1.0.1	p. 44, G13/AS2 5.6.1 p. 51, G13/SA2 1.03 p. 52A, 1.1.2
Amendment 6	Effective 1 January 2017 until 31 March 2019	p. 8, References p. 31 G13/AS1 5.8.2, 5.8.3 p. 33 G13/AS1 6.4.1	p. 37 G13/AS2 Table 1 p. 51 G13/AS3 2.0.1, 2.0.2
Amendment 7	Effective 30 November 2018	p. 8 References p. 33 G13/AS1 7.1.3	p. 50 G13/AS2 6.1.3 p. 51 G13/AS3 2.0.1
<b>Note: Page numbers relate to the document at the time of Amendment and may not match page numbers in current document.</b>			



# References

For the purposes of New Zealand Building Code (NZBC) compliance, the Standards and documents referenced in these Verification Methods and Acceptable Solutions (primary reference documents) must be the editions, along with their specific amendments, listed below. Where these primary reference documents refer to other Standards or documents (secondary reference documents), which in turn may also refer to other Standards or documents, and so on (lower-order reference documents), then the version in effect at the date of publication of these Verification Methods and Acceptable Solutions must be used.

Amend 4  
Oct 2011Amend 5  
Feb 2014Amend 5  
Feb 2014

## Where quoted

### Standards New Zealand

Amend 3  
Sep 2010

NZS 3501: 1976 Specification for copper tubes for water, gas, and sanitation  
*Amends: 1, 2, 3*

AS1 Table 1,  
AS2 Table 1Amend 5  
Feb 2014

NZS 3604: 2011 Timber framed buildings

AS2 5.6.1

Amend 5  
Feb 2014

NZS 4229: 2013 Concrete masonry buildings not requiring specific engineering design

AS2 5.6.1

NZS 4442: 1988 Welded steel pipes and fittings for water, sewage and medium pressure gas

AS2 Table 1

Amend 3  
Sep 2010

### British Standards Institution

BS 437: 2008 Specification for cast iron drain pipes, fittings and their joints for socketed and socketless systems

AS2 Table 1

Amend 3  
Sep 2010

BS EN 12056-2:2000 Gravity drainage systems inside buildings. Sanitary pipework, layout and calculation

VM1 1.0.1

### Standards Australia

Amend 3  
Sep 2010

AS 1579: 2001 Arc welded steel pipes and fittings for water and waste water

AS2 Table 1

AS 1589: 2001 Copper and copper alloy waste fittings

AS1 Table 1

Amend 3  
Sep 2010

AS 1646: 2007 Elastomeric seals for waterworks purposes

AS2 Table 1

Amend 3  
Sep 2010

AS 2887: 1993 Plastic waste fittings

AS1 Table 1

Amend 3  
Sep 2010

AS 3571: 2009 Plastic piping systems – Glass reinforced thermoplastics (GRP) systems based on unsaturated polyester (UP) resin – pressure and non-pressure drainage and sewerage (ISO 10467: 2004 MOD)

AS2 Table 1

Amend 4  
Oct 2011

		Where quoted	
Amend 3 Sep 2010	AS 4139: 2003 Fibre reinforced concrete pipes and fittings	AS2 Table 1	
	<b>Australian/New Zealand Standards</b>		
Amends 3 and 4	AS/NZS 1260: 2009 PVC-U pipes and fittings for drain, waste and vent applications	AS1 Table 1, AS2 Table 1	
Amends 5 & 6	<i>Amends: 1, 2</i>		
Amends 2 and 5	AS/NZS 1547: 2012 On-site domestic wastewater management	VM4 1.1.2	
	AS/NZS 2032: 2006 Installation of PVC pipe systems	AS1 6.1.1, 6.2.2, 6.3.1, 7.1.2	
	<i>Amend: 1</i>	AS2 5.1.2, 6.1.2, 7.0.1, Table 1	
Amend 3 Sep 2010		AS3 1.0.1	
Amend 4 Oct 2011	AS/NZS 2033: 2008 Installation of polyethylene pipe systems	AS1 Table 1	
	<i>Amend: 1, 2</i>		
Amends 5 & 6	AS/NZS 2280: 2014 Ductile iron pipes and fittings	AS2 Table 1	
	<i>Amend: 1</i>		
Amend 4 Oct 2011	AS/NZS 2566.2: 2002 Buried flexible pipelines – installation	AS2 Table 1	
Amend 6 Jan 2017	<i>Amend: 1</i>		
Amend 1 Jun 2007	AS/NZS 3500:- Plumbing and drainage	AS1 7.1.3,	
	Part 2: 2015 Sanitary plumbing and drainage	VM2 1.0.1 Comment, AS2 6.1.3, AS3 1.0.2	Amend 7 Nov 2018
Amends 5,6 & 7	<i>Amend: 1, 2</i>		
	AS/NZS 3518:2013 Acrylonitrile butadiene styrene (ABS) compounds, pipes and fittings for pressure applications	AS2 Table 1	
Amend 6 Jan 2017			Amend 1 Nov 2007
	AS/NZS 4058: 2007 Pre cast concrete pipes (pressure and non pressure)	AS2 Table 1	
	AS/NZS 4130: 2009 Polyethylene (PE) pipe for pressure applications	AS2 Table 1	
	<i>Amend: 1</i>		
Amend 3 Sep 2010	AS/NZS 4401: High density polyethylene (PE-HD) pipes and fittings for soil and waste discharge (low and high temperature) systems inside buildings	AS1 Table 1	
	2006		
Amend 3 Sep 2010	AS/NZS 4936: 2002 Air Admittance valves for use in sanitary plumbing and drainage systems.	AS1 5.8.2, Table 1	Amend 6 Oct 2016
	AS/NZS 5065: 2005 Polyethylene and polypropylene pipe and fittings for drainage and sewerage applications	AS2 Table 1	
Amend 4 Oct 2011	<i>Amend: 1</i>		
	<b>European Standards</b>		
	EN 12380: 1999 Air admittance valves for drainage systems – Requirements and test methods	AS1 5.8.2, Table 1	
	<b>American Society of Sanitary Engineers</b>		
	ASSE 1050: 1991 Performance requirements for air admittance valves for plumbing DWV systems stack type devices	AS1 5.8.2, Table 1	
	ASSE 1051: 1992 Performance requirements for air admittance valves for plumbing drainage systems	AS1 5.8.2, Table 1	

## 6.2 Pipe supports

**6.2.1** Pipes shall be supported at centres not exceeding those in Table 7.

Amend 3  
Sep 2010

**6.2.2** For PVC-U pipes carrying discharges of greater than 60°C, support for the pipe shall be in accordance with Paragraph 6.3.2 of AS/NZS 2032.

Amend 3  
Sep 2010

**COMMENT:**

Supports are required to ensure that the pipe gradient does not fall below minimum values given in Paragraph 4.2.1.

## 6.3 Thermal movement

**6.3.1** The *plumbing system* shall accommodate without failure the expected longitudinal movement in pipes resulting from temperature changes. All copper and PVC-U pipes shall incorporate expansion joints. The provisions described in Section 6.4 of AS/NZS 2032 shall be used for PVC-U pipes.

Amend 3  
Sep 2010

Amend 3  
Sep 2010

**6.3.2** At supports, and at wall and floor penetrations not incorporating expansion joints, movement shall be accommodated using pipe sleeves or a durable and flexible lagging material.

**COMMENT:**

1. Thermal expansion will cause a 10 m length of PVC-U to extend 0.8 mm for each 1°C rise of pipe temperature.
2. Provision for thermal movement by correctly locating expansion joints, with fixed and sliding supports, prevents damage to pipes and *fixtures*.

Amend 3  
Sep 2010

## 6.4 Fire separation

**6.4.1** Fire stopping shall be fitted to pipes passing through fire separations in accordance with C/AS2-6 Paragraph 4.4.

Amend 6  
Jan 2017

## 7.0 Watertightness

### 7.1 Test methods

**7.1.1** All above ground sanitary plumbing pipework shall be tested by water test or air test to verify that the system is watertight.

**7.1.2** Water test: The method described in AS/NZS 2032 may be used for ensuring watertightness of above ground sanitary plumbing pipework.

Amend 3  
Sep 2010

**7.1.3** Air tests may be carried out in accordance with either clause 15.3 of AS/NZS 3500.2 or paragraph 8.3 of E1/VM1.

Amend 7  
Nov 2018

Erratum 1  
Jun 2007

**Table 7: Distances Between Supports**  
Paragraph 6.2.1

Material	Pipe diameter (mm)	Maximum distance between supports (m)	
		Vertical pipe	Graded pipe
Copper pipes	32 to 50	3.0	2.5
	greater than 50	3.5	3.0
PVC-U pipes	32 to 50	1.0	0.5
	65 to 100	1.2	1.0
	greater than 100	1.8	1.2

Amend 3  
Sep 2010





**5.8 Additional requirements for drains installed under buildings**

**5.8.1** Drains installed under buildings shall be:

- a) Straight and of even gradient,
- b) Separated from the building foundation by at least 25 mm, and
- c) When passing through concrete, sleeved or wrapped in a durable and flexible material to allow for expansion and contraction.

**5.8.2** Drains passing beneath buildings with a concrete slab on the ground floor shall have in addition to Paragraph 5.8.1:

- a) 50 mm clearance from the top of the pipe to the underside of the slab, and
- b) Junctions beneath the building joining at an angle of not more than 45° (see Figure 13).

**COMMENT:**

Drains located under buildings must meet the Durability Performance requirement of B2.3.1 (a), that is the life of the building being not less than 50 years.

**5.9 Access to drains under buildings**

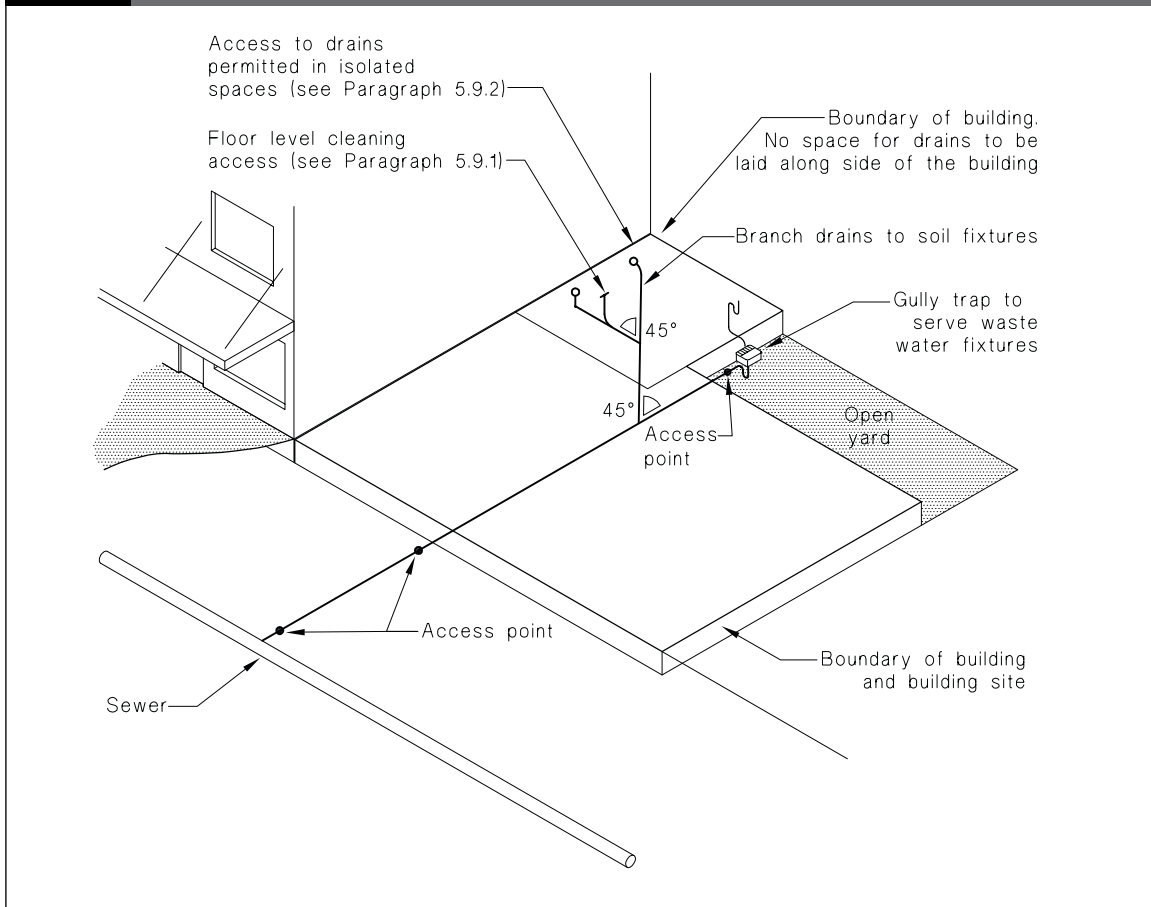
**5.9.1** Where two or more soil fixtures are connected to a branch drain beneath the building, access for cleaning shall be provided by a sealed floor level rodding point located downstream of the highest fixture connection to the branch drain (see Figures 10 and 13).

**5.9.2** Access points located within a building shall be in an area that complies with the isolation and ventilation requirements for spaces in which soil fixtures are located.

**COMMENT:**

Refer to G1/AS1 "Personal Hygiene" and G4/AS1 "Ventilation".

**Figure 13: Drains under buildings**  
Paragraphs 5.8.2 and 5.9.1



**5.9.3** *Access points* may be located in a space containing a *soil fixture*.

## 5.10 Disused drains

**5.10.1** Where a *drain* or part of a *drain* is no longer required, it shall be disconnected from the *foul water drainage system* at the junction with the live *drain* or at the property boundary.

**5.10.2** The live *drain* shall be sealed by either of the following *methods*:

- a) Purpose made junctions sealed with a tight-fitting plug that is fixed securely in place and does not protrude into the live *drain*, or
- b) In in-situ formed junctions, where disused branch *drains* which have been inserted into an existing length of pipe, these shall be cut off as close as practicable to the junction and sealed with a purpose made cap, plug or stopper. Alternatively, the length of pipe into which the branch *drain* was inserted may be replaced.

### COMMENT:

The unsatisfactory disconnection of old branch *drains* from live *drains* can lead to a source of major infiltration of ground water into the drainage system.

## 6.0 Watertightness

### 6.1 Testing

**6.1.1** All sections of the drainage system shall be tested by water test or air test to ensure watertightness.

### COMMENT:

Testing should be undertaken before backfilling for the easy identification of any leaks.

### 6.1.2 Water test

Amend 3  
Sep 2010 | AS/NZS 2032 Section 11 gives an acceptable method for ensuring watertightness of below ground PVC-U drainage pipework.

Amend 3  
Sep 2010 |

Amend 7  
Nov 2018 | **6.1.3** Air tests may be carried out in accordance with either clause 15.3 of AS/NZS 3500.2 or paragraph 8.3 of E1/VM1.

**6.1.4** Where a disused *drain* is being reinstated, the disused *drain* shall be tested to verify that the *drain* is sound.

Erratum 1  
Jun 2007

# Acceptable Solution G13/AS3 Plumbing and drainage

## 1.0 Installation of PVC-U pipe

**1.0.1** AS/NZS 2032 is an Acceptable Solution for the installation of PVC-U pipe and fittings, but may exceed the performance criteria of NZBC G13.

Amend 3  
Sep 2010

## 2.0 AS/NZS 3500.2

**2.0.1** AS/NZS 3500.2, Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, and 16, as modified by paragraph 2.0.2, is an Acceptable Solution for plumbing and drainage.

Amend 7  
Nov 2018

Amend 6  
Jan 2017

### 2.0.2 Modifications to AS/NZS 3500.2

**Clause 2.2** Delete and replace with "Materials and products shall comply with NZBC B2 and G13/AS1 Paragraph 2.0 Materials".

Amend 6  
Jan 2017

**Section 3.19** Delete section.

Amend 6  
Jan 2017

**Section 4.4** Replace "inspection shafts" with "access point" in this section.

**Clause 4.6.6** This applies only to *Housing*.

**Clause 5.6** Delete and replace with "Drains in other than stable ground shall be subject to specific design."

Amend 5  
Feb 2014

Amends  
1 & 6

