

E2 External Moisture

Acceptable Solution E2/AS2

**External moisture provisions for earth
buildings**

FOURTH EDITION | EFFECTIVE 28 JULY 2025

Preface

Preface

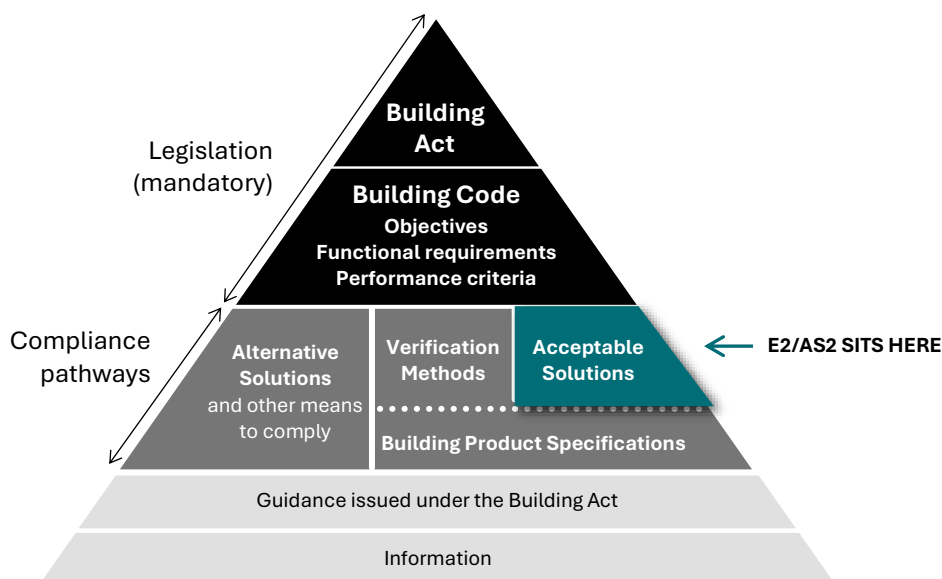
Document status

This document (E2/AS2) is an acceptable solution issued under section 22 (1) of the Building Act 2004 and is effective on 28 July 2025. It does not apply to building consent applications submitted before 28 July 2025. The previous Acceptable Solution E2/AS2 Third Edition, as amended, can be used to show compliance until 31 July 2026 and can be used for building consent applications submitted before 1 August 2026.

Building Code regulatory system

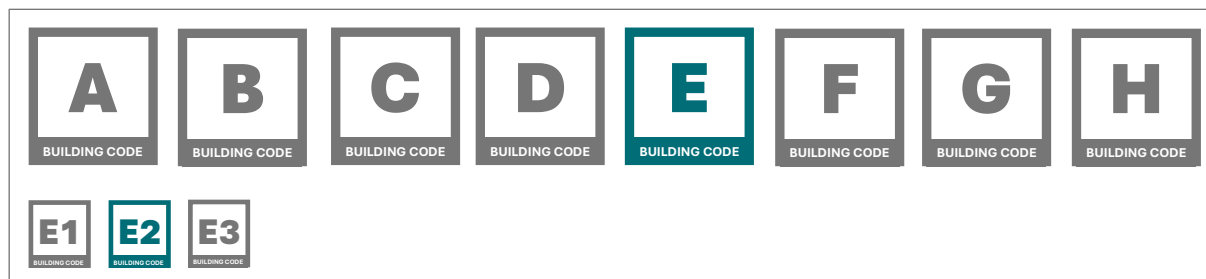
Each acceptable solution outlines the provisions of the Building Code that it relates to. Complying with an acceptable solution or verification method are ways of complying with that part of the Building Code. Other options for establishing compliance are listed in [section 19 of the Building Act](#).

Schematic of the Building Code system



A building design must take into account all parts of the Building Code. The Building Code is located in Schedule 1 of the Building Regulations 1992 and available online at www.legislation.govt.nz.

The part of the Building Code that this acceptable solution relates to is clause E2 External Moisture. Information on the scope of this document is provided in [Part 1. General](#).



Further information about the Building Code, including objectives, functional requirements, performance criteria, acceptable solutions, and verification methods, is available at www.building.govt.nz.

Main changes in this version and features of this document

Main changes in this version

This acceptable solution is the fourth edition of E2/AS2. The main changes from the previous version are:

- The document has been published in a standalone format and the layout has been revised to improve clarity. This includes using a common structure for headings and text throughout the acceptable solution.
- Minor amendments have been made to correct typos, grammar, cross-references, punctuation, wording, and formatting of the document. This includes changes to headings, paragraphs, tables and figures, table and figure notes, and definitions. These amendments do not affect the level of performance required in the document but may assist in the interpretation of the requirements.
- A title has been provided to the document to reflect the general scope of the acceptable solution. Additional information on the document and its scope has been provided in [Part 1. General](#).
- References have been revised to reflect the documents cited in this acceptable solution in [Appendix A](#).
- Definitions have been revised to reflect the terms used in this acceptable solution in [Appendix B](#).

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 acceptable solution or verification method at any time. Up-to-date versions of acceptable solutions or verification methods are available from www.building.govt.nz.

Features of this document

- For the purposes of Building Code compliance, the standards and documents referenced in this acceptable solution must be the editions, along with their specific amendments listed in [Appendix A](#).
- Words in *italic* are defined at the end of this document in [Appendix B](#).
- Hyperlinks are provided to cross-references within this document and to external websites and appear with a [blue underline](#).
- Appendices to this acceptable solution are part of, and have equal status to, the acceptable solution. Text boxes headed 'COMMENT' occur throughout this document and are for guidance purposes only.
- A consistent number system has been used throughout this document. The first number indicates the Part of the document, the second indicates the Section in the Part, the third is the Subsection, and the fourth is the Paragraph. This structure is illustrated as follows:

2	Part
2.5	Section
2.5.3	Subsection
2.5.3.1	Paragraph
2.5.3.1(a)	Paragraph (as a portion of the relevant paragraph)
2.5.3.1(a)(i)	Paragraph (as a portion of the relevant paragraph)

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General

Part 1. General

1.1 Introduction

1.1.1 Scope of this document

- 1.1.1.1 This acceptable solution can be used for the external moisture provisions for earth *buildings* complying with NZS 4299 as modified by this acceptable solution.

1.1.2 Items outside the scope of this document

- 1.1.2.1 Where *buildings* are based on NZS 4299 but require specific structural engineering design input, the structure must be of at least equivalent stiffness to the provisions of NZS 4299. Such designs are outside the scope of this acceptable solution.

1.1.3 Compliance pathway

- 1.1.3.1 This acceptable solution is one option that provides a means of demonstrating compliance with the functional requirements and performance criteria in Building Code clause E2 External Moisture. It can be used to demonstrate compliance with performance clauses:
- a) E2.3.1 for shedding water; and
 - b) E2.3.2 for the penetration of water; and
 - c) E2.3.3 for contact with or proximity to the ground; and
 - d) E2.3.4 for suspended floors; and
 - e) E2.3.5 for *concealed spaces* and cavities; and
 - f) E2.3.6 for *construction* moisture; and
 - g) E2.3.7 for the due allowance for:
 - i) the consequences of failure, and
 - ii) the uncertainties in *construction*, and
 - iii) variations relating to the materials and the site.
- 1.1.3.2 If this acceptable solution cannot be followed in full, an alternative means to demonstrate compliance.

1.2 Using this acceptable solution

1.2.1 Modifications of standards

- 1.2.1.1 This acceptable solution contains modifications of NZS 4299 in order to achieve compliance with the Building Code. The modifications are given for the relevant clauses and figures of the standard.

Earth buildings

Part 2. Earth buildings

2.1 Demonstrating compliance

2.1.1 Overview

2.1.1.1 Earth buildings shall comply with NZS 4299 subject to the modifications shown for:

- materials in Section 2.2; and
- footings in Section 2.3; and
- walls in Section 2.4; and
- wall openings and fixings in Section 2.5.

2.2 Materials

2.2.1 Damp proof protection for timber

2.2.1.1 In NZS 4299, add a new clause:

“2.1.8.5 Install a damp proof course (DPC) to separate timber from concrete, cement stabilised earth and lime stabilised earth. DPC material must be bituminous paint or sheet material as specified in Clause 4.9.1.”

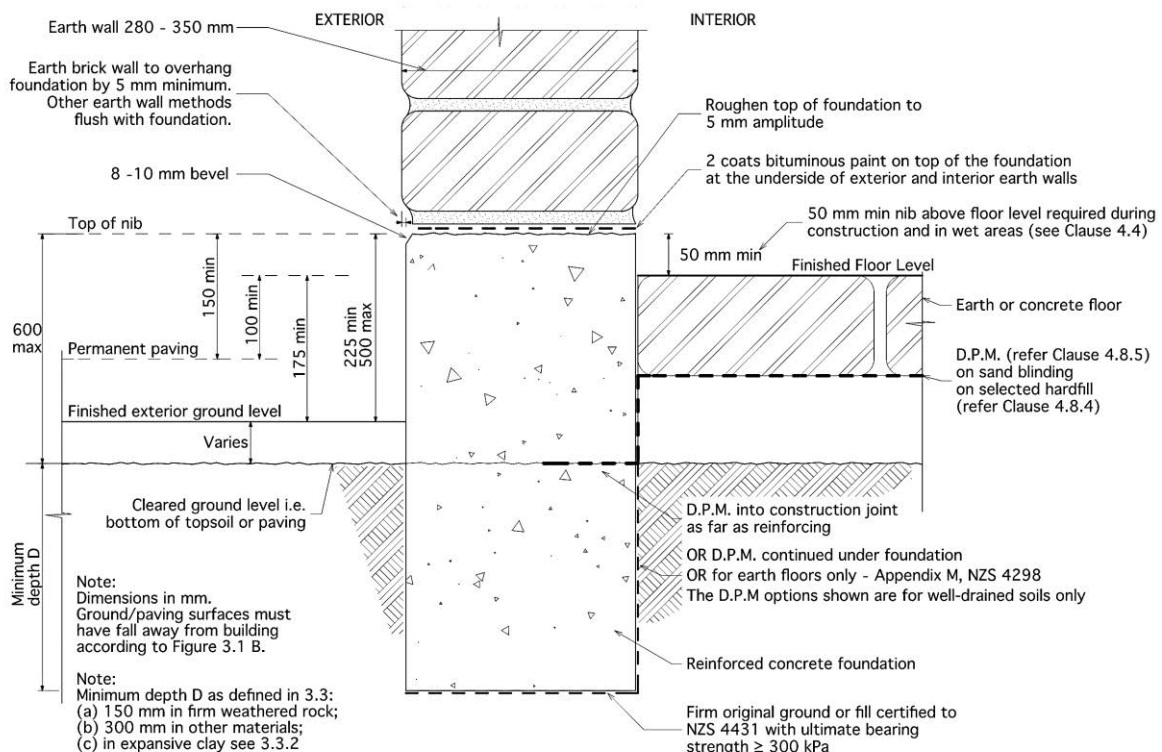
2.3 Footings

2.3.1 Footing dimensions and general details

2.3.1.1 In NZS 4299, replace Figure 4.1 with Figure 2.3.1.1.

Figure 2.3.1.1: Footing dimensions and general details

Paragraph 2.3.1.1 forming part of the modifications to NZS 4299 for Figure 4.1



Earth buildings

2.4 Walls

2.4.1 External surface of earth walls

2.4.1.1 In NZS 4299, add a new clause and new commentary clause:

“5.1.8 The external surface of earth walls must be finished in accordance with Clauses 2.2.3.5, 2.2.4.2 and 2.2.4.3 of NZS 4298. The external surface of earth walls must be free from features, such as horizontal protrusions, that could cause water to become trapped or directed towards the inside of the building.”; and

C5.1.8 Water must be able to flow downwards and off the external surface of earth walls. External earth wall surfaces are not required to have a surface coating to meet this acceptable solution. The use of surface coatings does not replace or diminish the need for eaves as required by Clause 2.10.

2.4.2 Soffit to wall junction

2.4.2.1 In NZS 4299,

a) add a new clause

“5.12 Soffit to wall junction

The junction between the soffit and the earth wall must be constructed as shown in Figure 5.11.”; and

b) add [Figure 2.4.2.1](#) as Figure 5.11.

2.4.3 Timber-framed gable walls

2.4.3.1 In NZS 4299,

a) add a new clause:

“5.13 Timber-framed gable wall

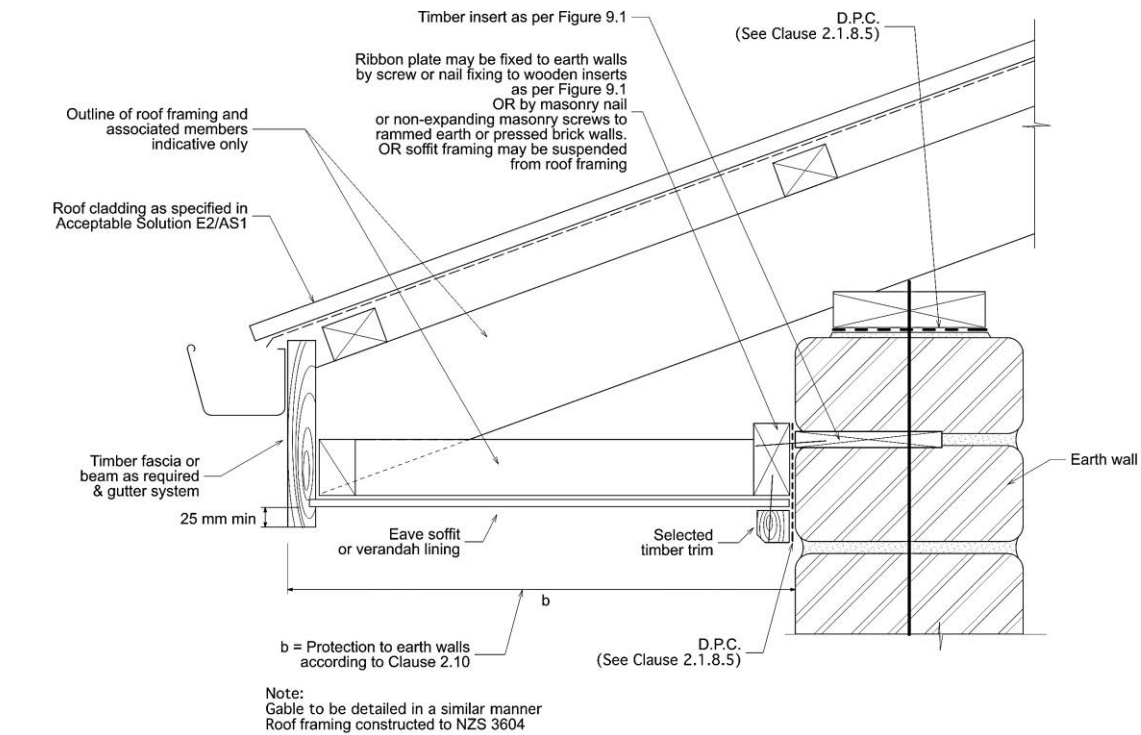
The junction between timber-framed gable walls and earth walls must be constructed as shown in Figure 5.12.”; and

b) add [Figure 2.4.3.1](#) as Figure 5.12.

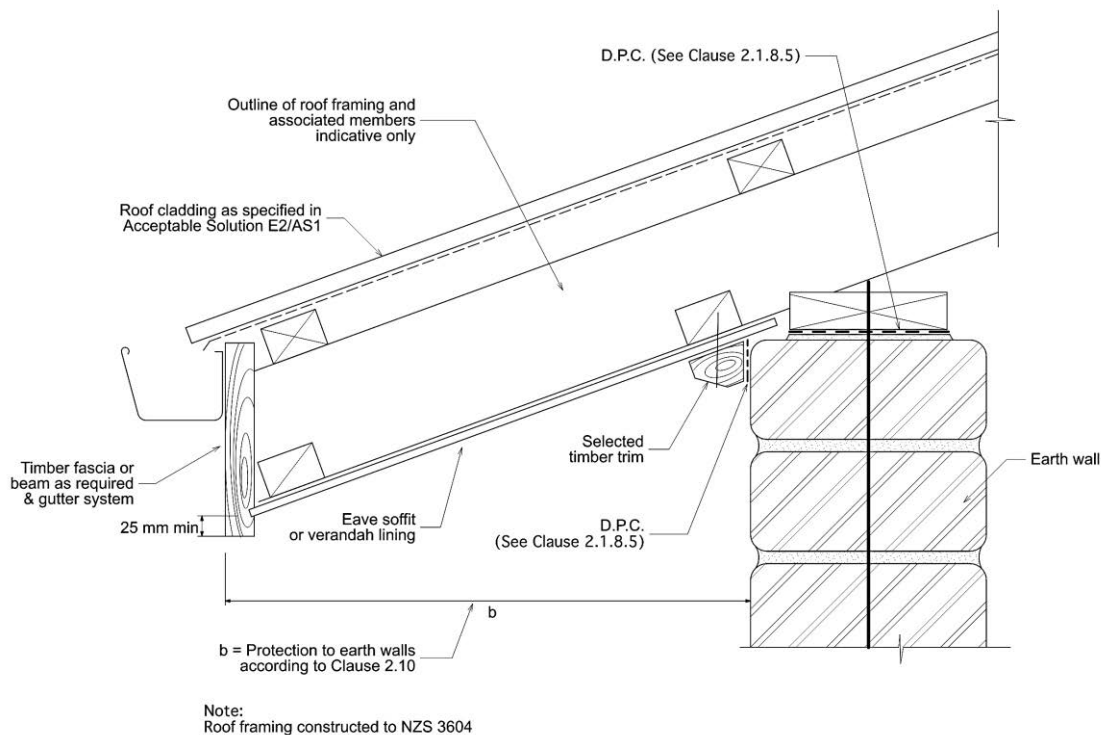
Earth buildings

Figure 2.4.2.1: Soffit to wall junction

Paragraph 2.4.2.1 forming part of the modifications to NZS 4299 for Clause 5.12



(a) Flat soffit

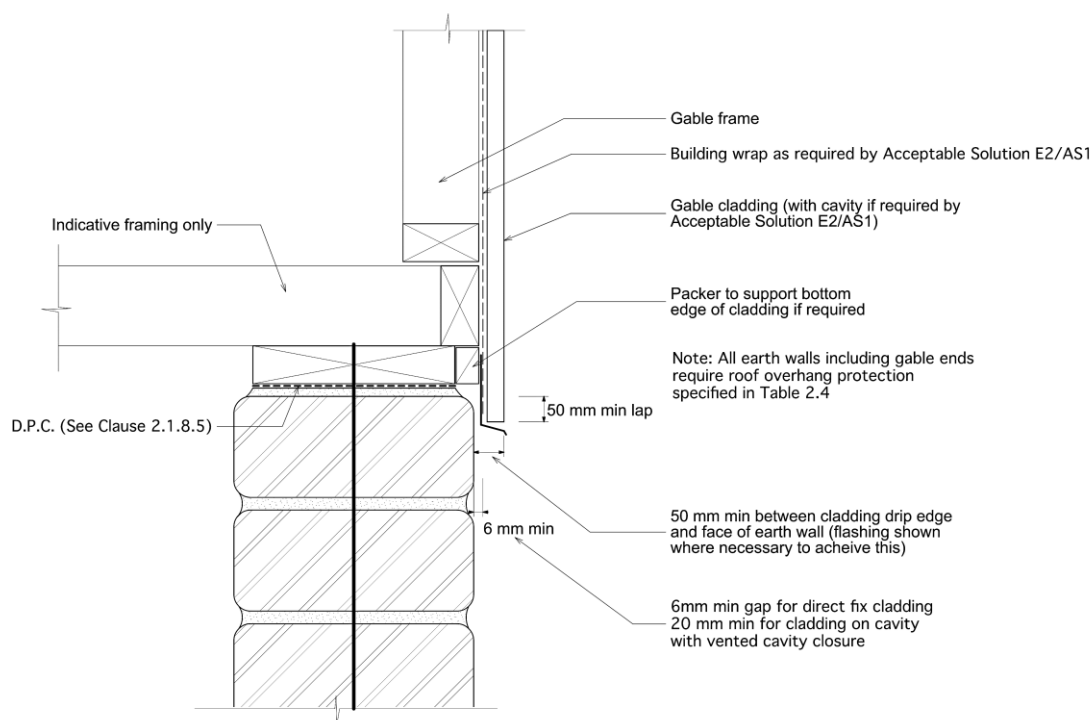


(b) Angled soffit

Earth buildings

Figure 2.4.3.1: Timber-framed gable to earth wall

Paragraph [2.4.3.1](#) forming part of the modifications to NZS 4299 for Clause 5.13



2.5 Wall openings and fixings

2.5.1 Door and window details

2.5.1.1 In NZS 4299:

- a) add the following new paragraph to end of Clause 9.2: “Windows and doors with arched or sloping heads are outside the scope of this Standard”; and
- b) add the following new paragraph to end of commentary Clause C9.2:

Requirements for window and door joinery are not included in this acceptable solution. For more information, designers may refer to:

- NZS 3504:1979 Specification for aluminium windows
- NZS 3610:1979 Specification for profiles of mouldings and joinery
- NZS 3619:1979 Specification for timber windows.

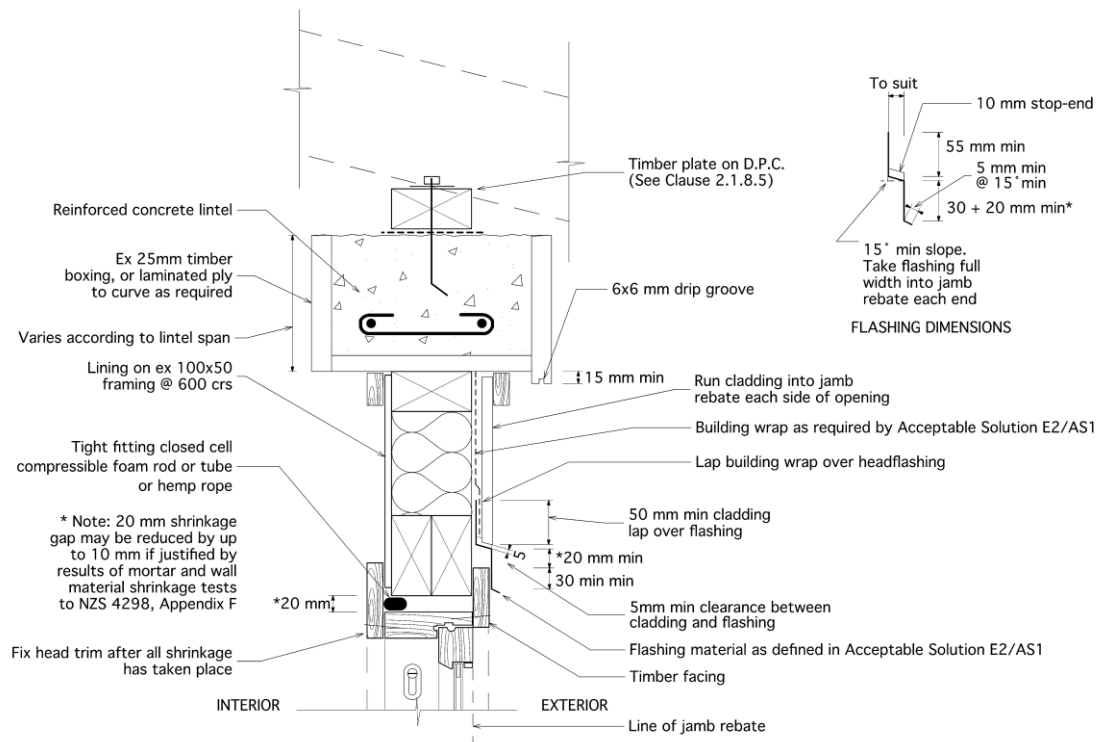
2.5.1.2 In NZS 4299,

- a) replace Figure 9.2 with [Figure 2.5.1.2A](#); and
- b) replace Figure 9.3 with [Figure 2.5.1.2B](#); and
- c) replace Figure 9.4 with [Figure 2.5.1.2C](#).

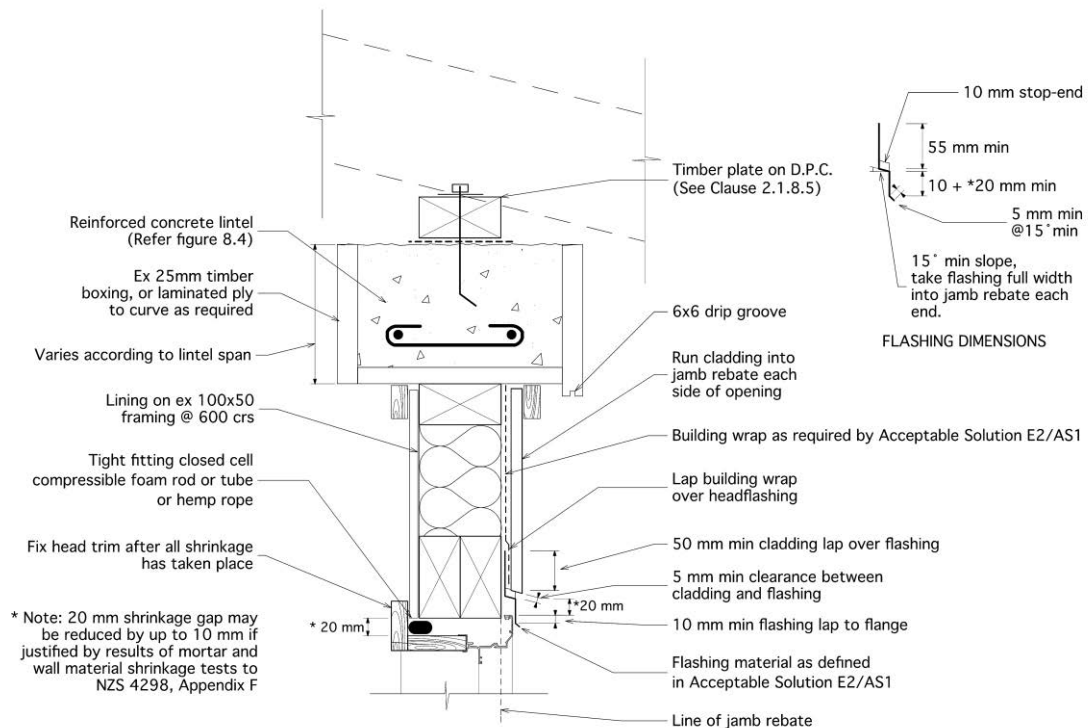
Earth buildings

Figure 2.5.1.2A: Head details (continued on next page)

Paragraph 2.5.1.2(a) forming part of the modifications to NZS 4299 for Figure 9.2



(a) Timber joinery with timber-framed wall insert

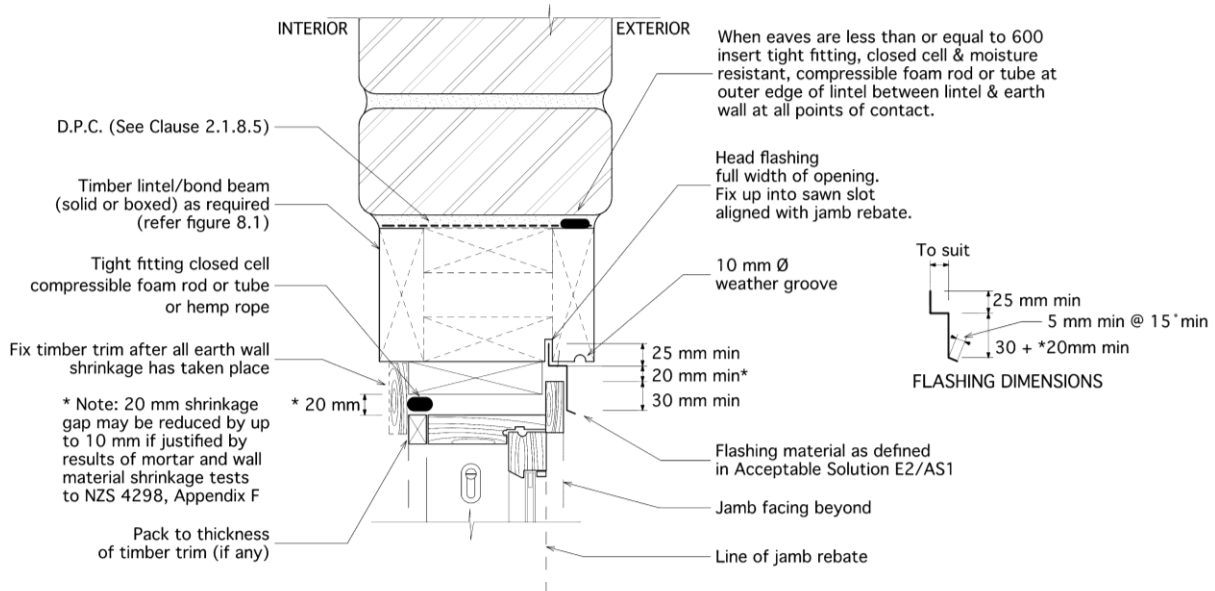


(b) Aluminium joinery with timber-framed wall insert

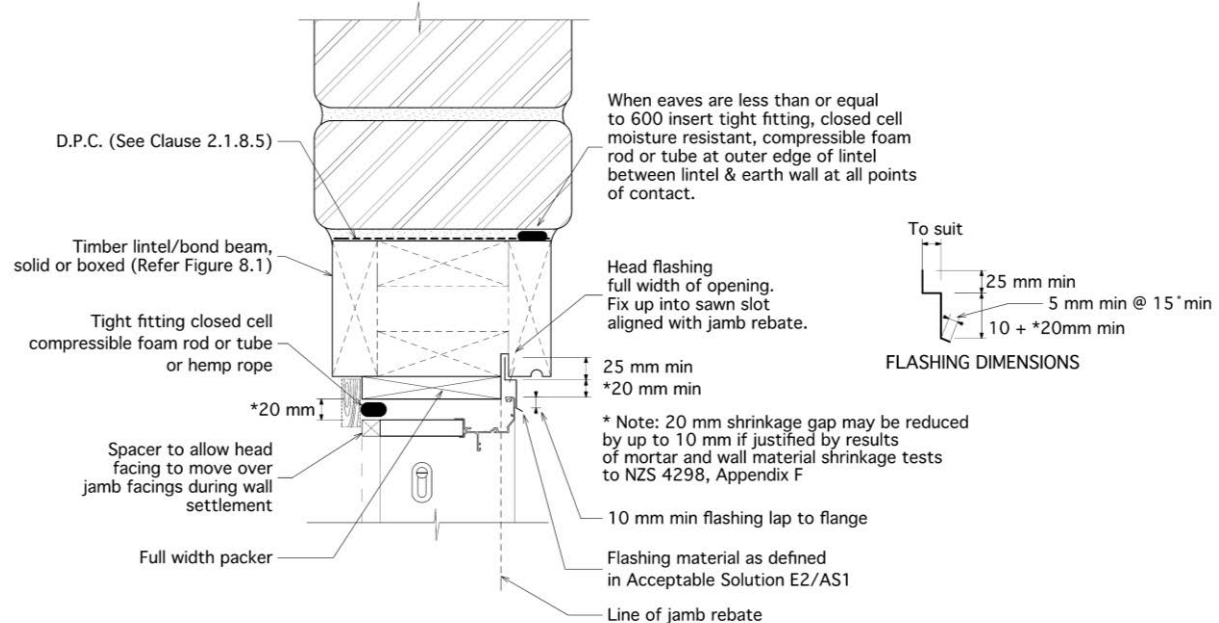
Earth buildings

Figure 2.5.1.2A: Head details (continued from previous page)

Paragraph 2.5.1.2(a) forming part of the modifications to NZS 4299 for Figure 9.2



(c) Timber joinery with timber lintel

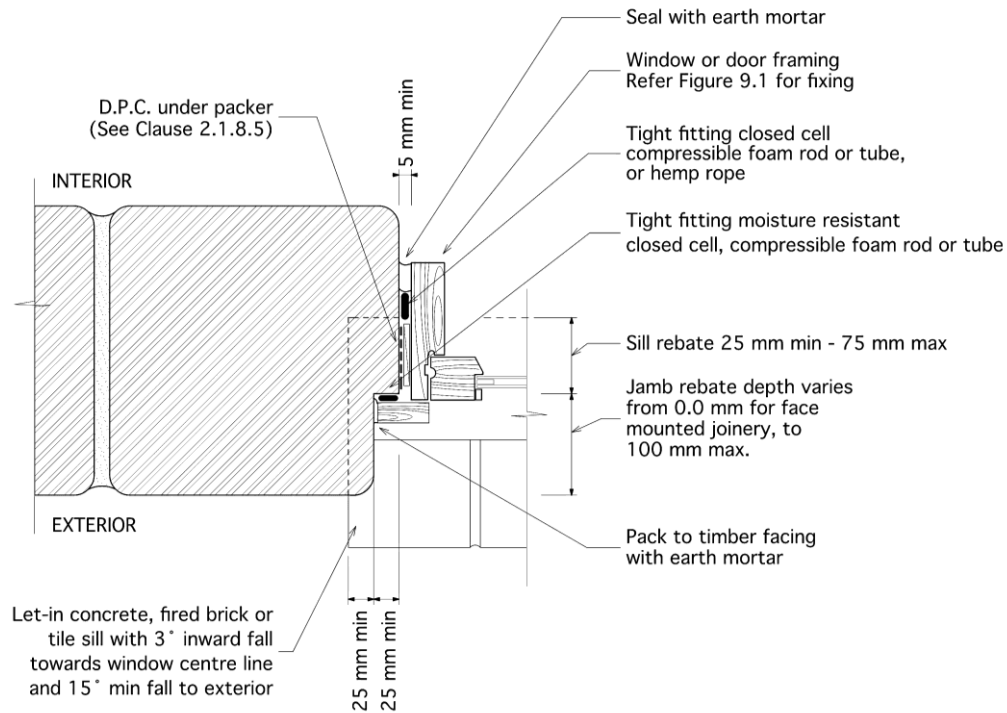


(d) Aluminium joinery with timber lintel

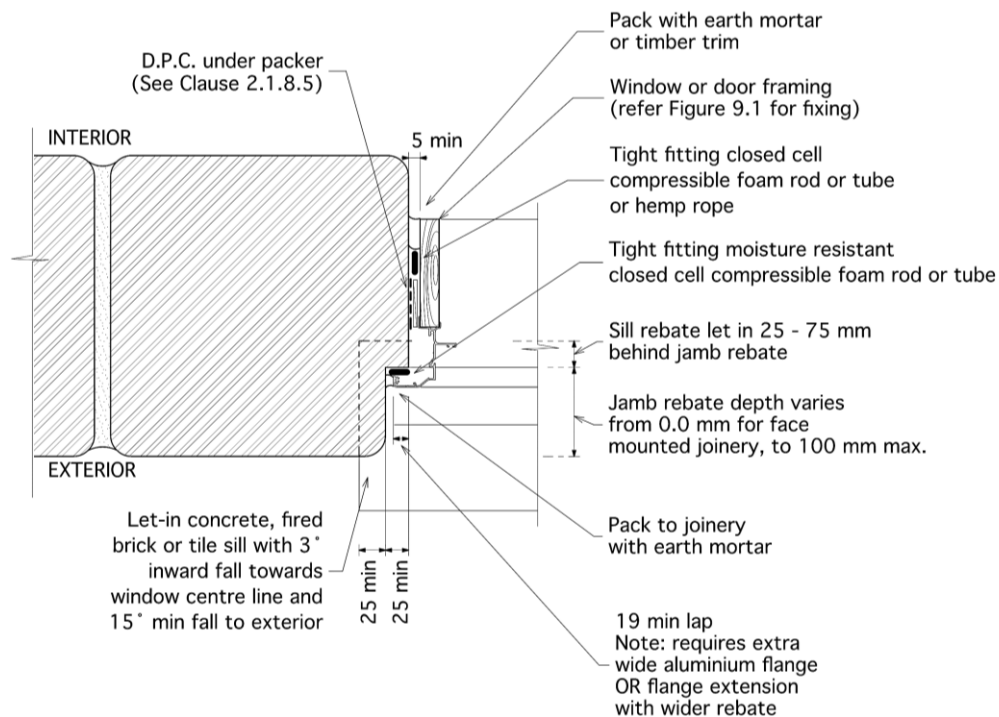
Earth buildings

Figure 2.5.1.2B: Jamb details

Paragraph 2.5.1.2(b) forming part of the modifications to NZS 4299 for Figure 9.3



(a) Timber joinery

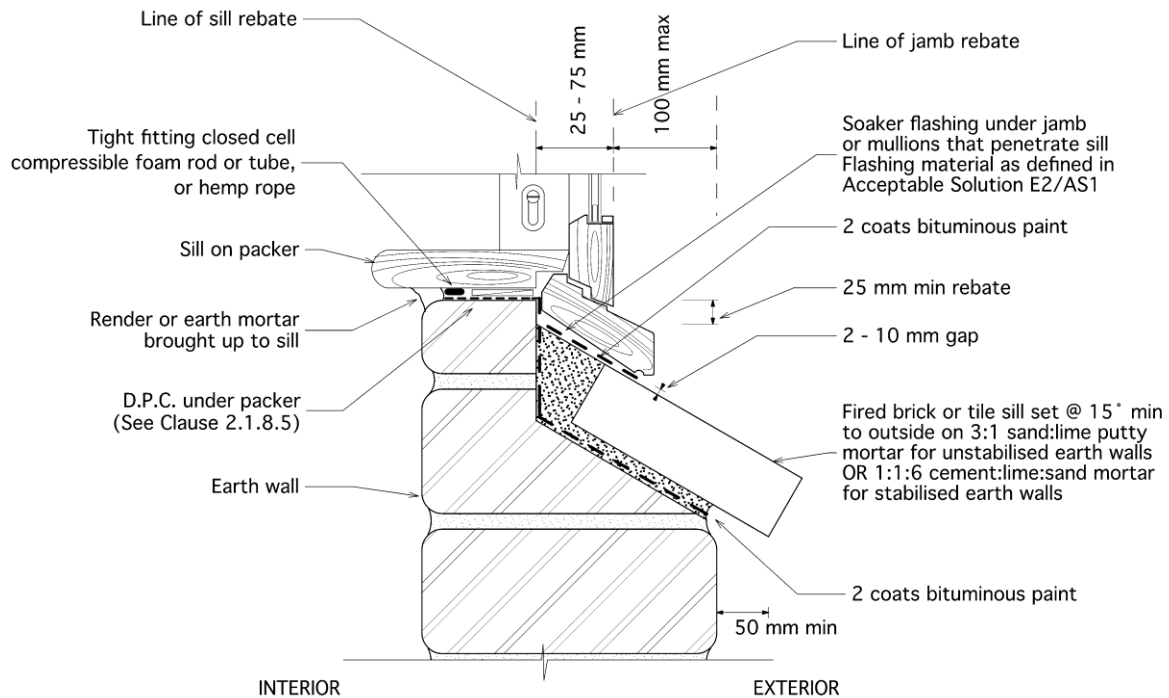


(b) Aluminium joinery

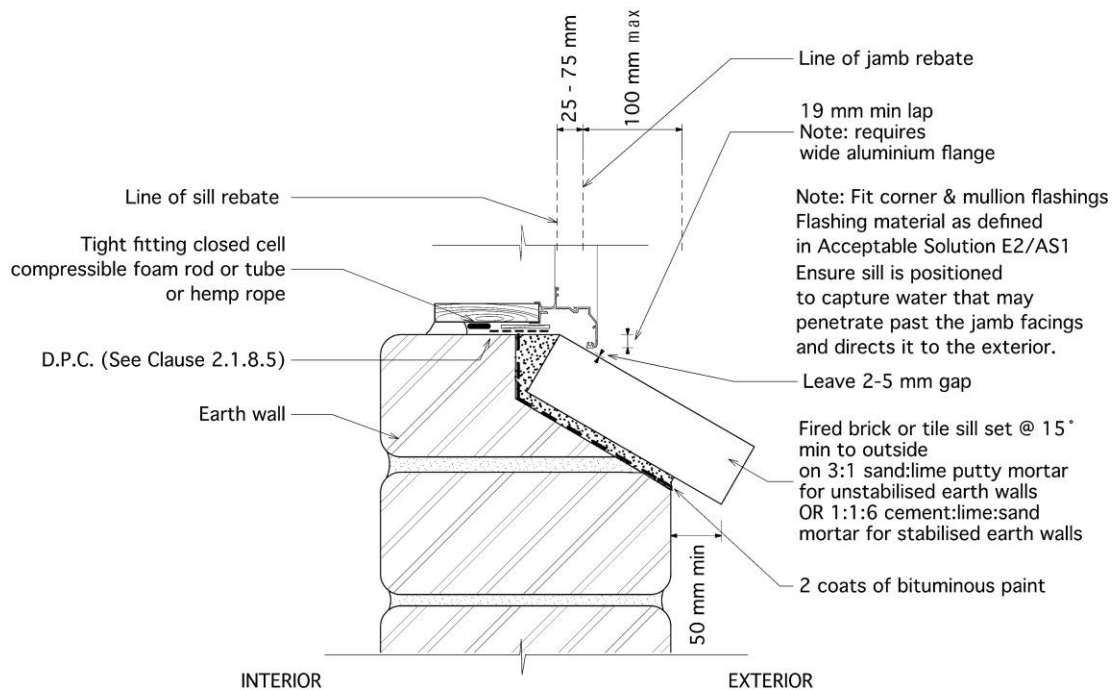
Earth buildings

Figure 2.5.1.2C: Sill details (continued on next page)

Paragraph 2.5.1.2(c) forming part of the modifications to NZS 4299 for Figure 9.4



(a) Timber joinery with brick or tile sill

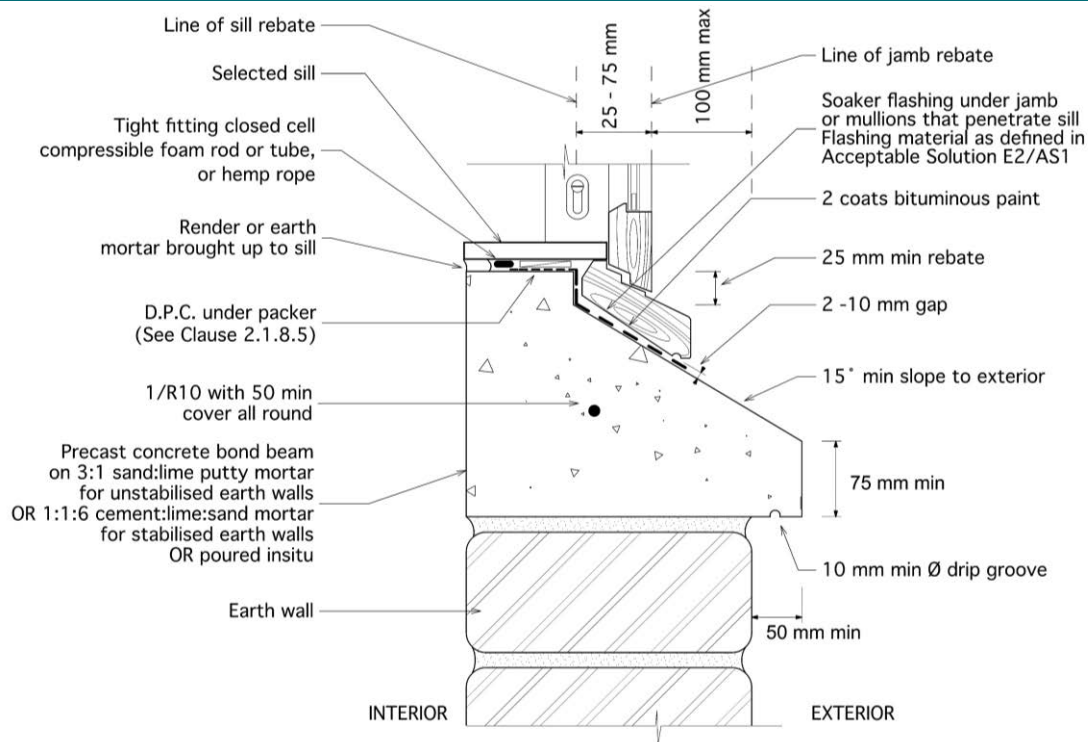


(b) Aluminium joinery with brick or tile sill

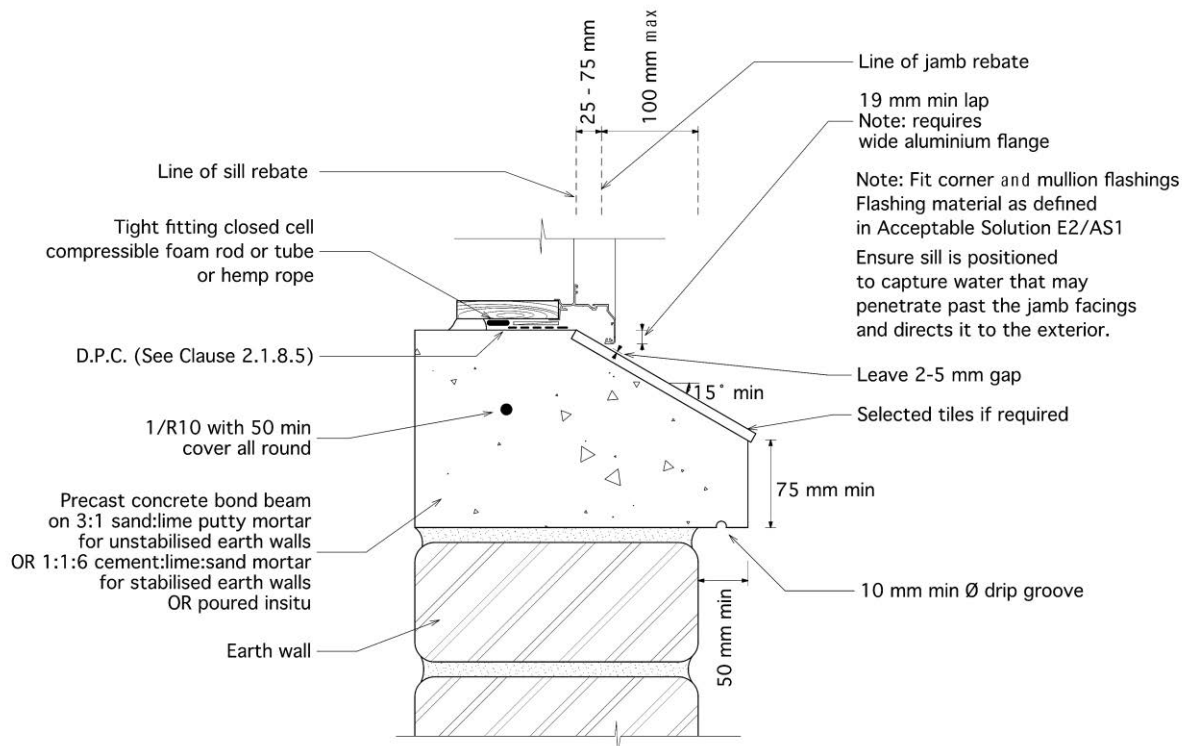
Earth buildings

Figure 2.5.1.2C: Sill details (continued from previous page)

Paragraph 2.5.1.2(c) forming part of the modifications to NZS 4299 for Figure 9.4



(c) Timber joinery with concrete sill



(d) Aluminium joinery with concrete sill

Earth buildings

2.5.2 Penetrations

2.5.2.1 In NZS 4299, add the following new clauses and commentary clauses:

“9.7 Penetrations

9.7.1 The upper surface of elements (e.g. pipes and meterboxes) that penetrate external walls must be sloped downwards to the exterior to direct moisture away from the wall and to discharge it clear of the wall surface.

C9.7.1 Penetrations should be located where they are sheltered from wind-driven rain – this may be achieved by positioning the penetration in a sheltered location or as high as practical under eaves on the wall.

9.7.2 Penetrations less than 200mm wide must meet the requirements of NZS 4298 Clause 2.1.12 and must be sealed all round with a tight-fitting moisture resistant compressible closed cell foam rod or tube that is finished 25 mm behind the wall surface, with the resulting gap filled with:

- a) for unstabilised earth construction, a compatible unstabilised mortar
- b) for stabilised earth construction, a compatible stabilised mortar.

C9.7.2 Generally sealants do not adhere well to earthen surfaces with the possible exception of dense stabilised rammed earth or pressed earth brick.

9.7.3 Penetrations more than 200mm wide (e.g. meterboxes) must be anchored as required in Clause 9.1 and must meet the following requirements:

- a) where the depth of the penetration is more than 1/3 of the wall depth, the penetration must incorporate head, jamb and sill details similar to those required for windows.
- b) where the depth of the penetration is less than 1/3 of the wall depth, the penetration must be sealed all round with a compatible mortar as required by Clause 9.7.2.”

References and Definitions

Appendix A. References

For the purposes of Building Code compliance, the standards referenced in this acceptable solution must be the editions, along with their specific amendments, listed below.

Standards New Zealand		Where quoted
NZS 3504:1979	Specification for aluminium windows	2.5.1.1
NZS 3610:1979	Specification for profiles of mouldings and joinery	2.5.1.1
NZS 3619:1979	Specification for timber windows	2.5.1.1
NZS 4298:1998	Materials and workmanship for earth buildings Amendment: 1	2.4.1.1
NZS 4299:1998	Earth buildings not requiring specific design Amendment: 1	1.1.1.1 , 1.1.2.1 , 1.2.1.1 , 2.1.1.1 , 2.2.1.1 , 2.3.1.1 , 2.4.1.1 , 2.4.2.1 , 2.4.3.1 , 2.5.1.1 , 2.5.1.2 , 2.5.2.1

These standards can be accessed from www.standards.govt.nz.

Appendix B. Definitions

These definitions are specific to this acceptable solution. Other defined terms italicised within the definitions are provided in clause A2 of the Building Code.

Term	Definition
Building	Has the meaning given to it by sections 8 and 9 of the Building Act 2004.
Concealed space	Any part of the space within a <i>building</i> , excluding <i>protected shafts</i> , that cannot be seen from an <i>occupied space</i> .
Construct	In relation to a <i>building</i> , includes to design, build, erect, prefabricate, and relocate the <i>building</i> ; and construction has a corresponding meaning.

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