

E2 External Moisture

Verification Method E2/VM2

**Cladding systems for buildings up to
25 m in height – including junctions with
windows, door and other penetrations**

SECOND EDITION | EFFECTIVE 29 NOVEMBER 2021



Preface

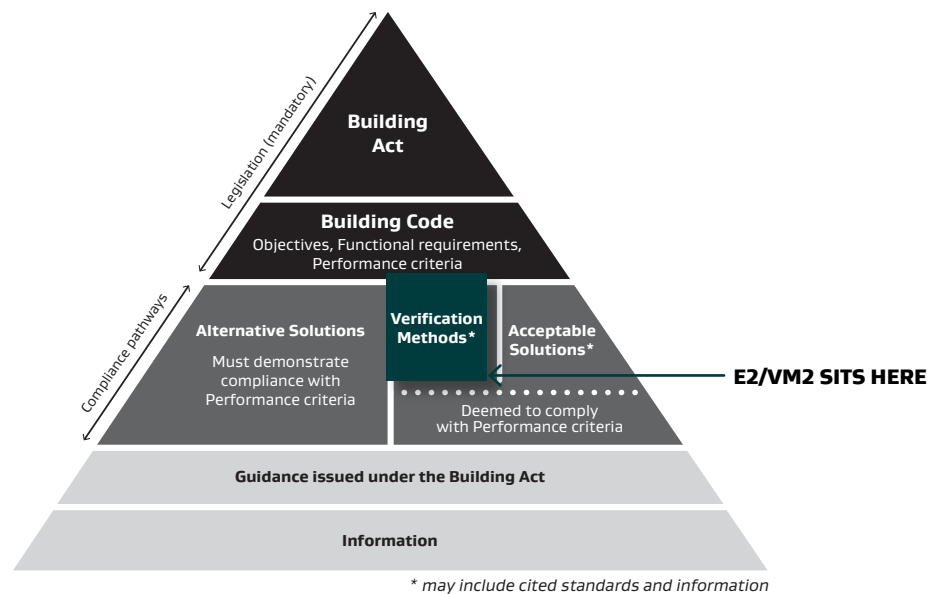
Document status

This document (E2/VM2) is a verification method issued under section 22 (1) of the Building Act 2004 and is effective on 29 November 2021. It does not apply to building consent applications submitted before 29 November 2021. The previous Verification Method E2/VM2 First Edition can be used to show compliance until 2 November 2022 and can be used for building consent applications submitted before 3 November 2022.

Building Code regulatory system

Each verification method outlines the provisions of the Building Code that it relates to. Complying with an acceptable solution or verification method is a way 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 verification method relates to is clause E Moisture and specifically E2 External moisture. Further information on the scope of this document is provided in [Part 1. General](#).



Further information about the Building Code, the objectives, functional requirements and performance criteria provisions that it contains, and other acceptable solutions and verification methods are available at www.building.govt.nz

Main changes in this version and features of this document

Main changes in this version

This is the second edition of E2/VM2. The main changes from the previous version are:

- › The document layout has been revised to improve clarity with additional information on the document and its scope provided in [Part 1. General](#).
- › Reference to the BRANZ EM7 test method for evaluating cladding performance has been amended to the most recent version of the document (version 3) in [Appendix A](#).
- › The new edition allows cladding systems that have already demonstrated compliance under the previous edition to be used without retesting as stated in [Part 2. Cladding systems](#).

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

Features of this document

- › For the purposes of Building Code compliance, the standards and documents referenced in this verification method 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 verification method are part of, and have equal status to, the verification method. Text boxes headed 'COMMENT' occur throughout this document and are for guidance purposes only.

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Part 1. General

1.1 Introduction

1.1.1 Scope of this document

1.1.1.1 E2/VM2 is a means of testing and demonstrating that a wall *cladding system* will prevent the penetration of water to the extent required by clause E2.3.2 of the Building Code.

1.1.1.2 E2/VM2 applies to buildings that fit within the scope of BRANZ EM7.



COMMENT: BRANZ EM7 applies to buildings of certain height, forms of construction and structural behaviour. It also has limitations on Inter-storey deflections and peak positive wind pressures on the *cladding system*. Building consent authorities should accept building consent applications from designers who can demonstrate that the building in the application falls within those limitations. BRANZ EM7 does not have any limits on the negative pressure on the *cladding system*.

1.1.2 Items outside the scope of this document

1.1.2.1 E2/VM2 does not demonstrate the water penetration resistance of window and exterior door units used with the wall *cladding system*.



COMMENT: E2/VM2 assesses the junctions of window and exterior door units with other elements of the *cladding system*, but not the units themselves. Instead it relies on the units having been manufactured to resist water penetration when subject to the relevant design parameters for the building.

Although there is currently no verification method or acceptable solution for the window and exterior door units for mid-rise buildings, window suppliers may be able to demonstrate, through testing, water penetration resistance of the windows when subject to:

- › Peak positive and peak negative wind pressures acting on the window or exterior door unit (typically calculated in accordance with AS/NZS 1170.2 including all local pressure factors and internal pressures relevant to the location of the window on the building); and
- › The maximum in-plane horizontal movement to which the window or exterior door could be subject.

1.1.2.2 E2/VM2 does not advise quality assurance or inspection procedures to be followed during construction.



COMMENT: As with other building work, a building consent authority should approve appropriate inspection procedures when issuing a building consent for *cladding systems* whose compliance is based on E2/VM2.

General

1.1.3 Compliance pathway

1.1.3.1 This verification method is one option that provides a means of establishing compliance with Building Code clause E2.3.2.



COMMENT: Building Code clause E2.3.2 is reproduced below:

E2.3.2 Roofs and exterior walls must prevent the penetration of water that could cause undue dampness, damage to building elements, or both.

1.1.3.2 Options for demonstrating compliance with the performance criteria of Building Code clause E2 External Moisture through the acceptable solutions and verification methods are summarised in [Table 1.1.3.2](#). Compliance may also be demonstrated using an alternative solution.



COMMENT: In addition to demonstrating that the requirements of this Verification Method are met, its users will need to identify how the building work addresses the following requirements of clause E2:

- › Requirements for roof *cladding systems*, including requirements for shedding water (E2.3.1) and water penetration (E2.3.2).
- › Requirements to address moisture absorbed or transmitted due to ground contact or proximity (E2.3.3).
- › Requirements to address the effects of moisture in subfloor spaces (E2.3.4).
- › Requirements to prevent moisture problems in concealed spaces (E2.3.5).
- › Requirements to address construction moisture (E2.3.6).
- › Requirements to make due allowances for consequences, uncertainties and variations (E2.3.7).



COMMENT: Other Building Code clauses may be relevant to the cladding system in addition to clause E2, including clauses:

- › B1 Structure (for the *cladding system* as well as the building's primary structure)
- › B2 Durability
- › C1 – C6 Protection from fire
- › E3 Internal moisture
- › F2 Hazardous building materials
- › G6 Airborne and impact sound
- › H1 Energy efficiency

Technical information provided by the suppliers of wall *cladding systems* should include information that explains how compliance can be achieved.

Building Consent Authorities should accept building consent applications from designers who can demonstrate that the requirements of all relevant Building Code clauses have been integrated into the design proposal for a *cladding system*.

General

TABLE 1.1.3.2: Demonstrating compliance with E2 External Moisture through acceptable solutions and verification methods

Paragraph 1.1.3.2

| Performance clause | Applies to | Relevant acceptable solutions and verification methods |
|------------------------------------|--|--|
| E2.3.1 Shedding water | All roofs, except for buildings where external moisture is unlikely to cause significant impairment | <p>For timber framed buildings up to 3 storeys, within specific limitations: E2/AS1.</p> <p>For single- and two-storey concrete roofs and decks with membranes, within specific limitations: E2/AS3.</p> <p>For light steel framed buildings up to 3 storeys, within specific limitations: E2/AS4.</p> |
| E2.3.2 Penetration of water | All roofs and exterior walls, except for buildings where external moisture is unlikely to cause significant impairment | <p>For wall <i>cladding systems</i> of timber framed buildings up to 3 storeys, within specific limitations: E2/VM1 Paragraph 1.0.</p> <p>For pitched roofing systems above a roof space, within specific limitations: E2/VM1 Paragraph 2.0.</p> <p>For wall <i>cladding systems</i> of buildings up to 25 m in height, within specific limitations: E2/VM2.</p> <p>For timber framed buildings up to 3 storeys, within specific limitations: E2/AS1.</p> <p>For earth building within specific limitations: E2/AS2.</p> <p>For single- and two-storey concrete and concrete masonry construction within specific limitations: E2/AS3.</p> <p>For light steel framed buildings up to 3 storeys, within specific limitations: E2/AS4.</p> |
| E2.3.3 Ground contact or proximity | All walls, floors and structural elements in ground contact or proximity, except for buildings where external moisture is unlikely to cause significant impairment | <p>For timber framed buildings up to 3 storeys, within specific limitations: E2/AS1.</p> <p>For earth building within specific limitations: E2/AS2.</p> <p>For single- and two-storey concrete and concrete masonry construction within specific limitations: E2/AS3.</p> <p>For light steel framed buildings up to 3 storeys, within specific limitations: E2/AS4.</p> |
| E2.3.4 Suspended floors | All building elements susceptible to damage, except for buildings where external moisture is unlikely to cause significant impairment | <p>For timber framed buildings up to 3 storeys, within specific limitations: E2/AS1.</p> <p>For earth building within specific limitations: E2/AS2.</p> <p>For single- and two-storey concrete and concrete masonry construction within specific limitations: E2/AS3.</p> <p>For light steel framed buildings up to 3 storeys, within specific limitations: E2/AS4.</p> |

General

| Performance clause | Applies to | Relevant acceptable solutions and verification methods |
|--------------------------------------|---|---|
| E2.3.5 Concealed spaces and cavities | Building elements associated with concealed elements and cavities, except for buildings where external moisture is unlikely to cause significant impairment | <p>For timber framed buildings up to 3 storeys, within specific limitations: E2/AS1.</p> <p>For earth building within specific limitations: E2/AS2.</p> <p>For single- and two-storey concrete and concrete masonry construction within specific limitations: E2/AS3.</p> <p>For light steel framed buildings up to 3 storeys, within specific limitations: E2/AS4.</p> |
| E2.3.6 Construction moisture | All building elements, except for buildings where external moisture is unlikely to cause significant impairment | <p>For timber framed buildings up to 3 storeys, within specific limitations: E2/AS1.</p> <p>For earth building within specific limitations: E2/AS2.</p> <p>For single- and two-storey concrete and concrete masonry construction within specific limitations: E2/AS3.</p> <p>For light steel framed buildings up to 3 storeys, within specific limitations: E2/AS4.</p> |
| E2.3.7 Due allowances | All building elements, except for buildings where external moisture is unlikely to cause significant impairment | <p>For timber framed buildings up to 3 storeys, within specific limitations: E2/AS1.</p> <p>For earth building within specific limitations: E2/AS2.</p> <p>For single- and two-storey concrete and concrete masonry construction within specific limitations: E2/AS3.</p> <p>For light steel framed buildings up to 3 storeys, within specific limitations: E2/AS4.</p> |

Part 2. Cladding systems

2.1 Test specifications

2.1.1 Demonstrating compliance

- 2.1.1.1 BRANZ EM7 is a means of demonstrating that a wall *cladding system* meets the performance requirements of Building Code clause E2.3.2.



COMMENT: BRANZ EM7 prescribes a series of tests from AS/NZS 4284 with specific nominated values for the performance levels.

- 2.1.1.2 E2/VM2 testing must be carried out by a facility that has IANZ or equivalent accreditation for AS/NZS 4284 testing procedures.

2.1.2 Existing verification certificates

- 2.1.2.1 Wall *cladding systems* that meet the requirements of the previous version of E2/VM2, and for which the test certificate was issued during the period in which that version of E2/VM2 was in force, meet the performance requirements of Building Code clause E2.3.2.
- 2.1.2.2 Any verification certificates issued under E2/VM2 after 2 November 2022 must be under E2/VM2 Second Edition.



COMMENT: Retesting is not required for wall *cladding systems* which have already passed testing in accordance with the previous version of E2/VM2.

References and Definitions

Appendix A. References

For the purposes of Building Code compliance, the standards and documents referenced in this verification method must be the editions, along with their specific amendments, listed below.

Standards New Zealand

AS/NZS 4284: 2008 Testing of building facades

Where quoted

[2.1.1.2](#)

This standard can be accessed from www.standards.govt.nz

BRANZ

BRANZ EM7 [version 3, Evaluation Method 7 – Performance of mid-rise
June 2020] cladding systems

[1.1.1.2](#), [2.1.1.1](#)

This document can be accessed from www.branz.co.nz

Appendix B. Definitions

| | |
|------------------------|---|
| Cladding | The exterior weather-resistant surface of a building. It includes any supporting substrate and, if applicable, surface treatment. |
| Cladding system | The outside or exterior weather-resistant surface of a building; including roof <i>cladding</i> and roof underlays, wall <i>cladding</i> and wall underlays, and cavity components, rooflights, windows, doors and all penetrations, flashings, seals, joints and junctions. This verification method requires the <i>cladding system</i> to include a drained cavity. |

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