BUILDING PERFORMANCE

# Determination 2025/035

## Compliance of horizontal rusticated weatherboard wall cladding as-built with double-nail fixings with Clauses B2 and E2

## 2 Ngake Street, Orakei, Auckland


**Summary**

This determination considers compliance with Building Code Clauses B2 *Durability* and E2 *External Moisture* of horizontal rusticated cedar weatherboard wall cladding in respect of the as-built double-nail fixing pattern of the weatherboards.

In this determination, unless otherwise stated, references to "sections" are to sections of the Building Act 2004 ("the Act") and references to "clauses" are to clauses in Schedule 1 ("the Building Code") of the Building Regulations 1992.

The Act and the Building Code are available at www.legislation.govt.nz. Information about the legislation, as well as past determinations, compliance documents (eg, Acceptable Solutions) and guidance issued by the Ministry, is available at www.building.govt.nz.

# 1. The matter to be determined

1.1. This is a determination made under due authorisation by me, Rebecca Mackie, for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment ("the Ministry").[1]

1.2. The parties to the determination are:

1.2.1. F Wu, the owner of the building who applied for this determination ("the owner")

1.2.2. Auckland Council, carrying out its duties as a territorial authority or building consent authority ("the authority")

1.2.3. D Jin, the Licenced Building Practitioner builder concerned with the relevant building work ("the LBP builder") who installed the weatherboards and fixings.

1.3. This determination arises from a dispute between the owner and the authority regarding, among other matters, the fixing of horizontal rusticated cedar weatherboard cladding installed on a recently constructed detached dwelling, and whether the cladding with respect of the as-built double-nail fixings complies with Clauses B2 *Durability* and E2 *External Moisture*.

1.4. The as-built weatherboards have been fixed using a pattern of double nails, ie one nail above an another (refer to Figure 2). The authority has not accepted the fixing arrangement because the cladding has not been installed in accordance with the manufacturer's specifications, which relies on a single nail fixing arrangement.

1.5. Accordingly, the matter to be determined, under section 177(1)(a), is whether the horizontal rusticated cedar weatherboard cladding in respect of the as-built double-nail fixings, complies with clauses B2 and E2.

1.6. The authority has raised other concerns related to the construction of the weatherboards; for example, some weatherboards are short of the corners and the gaps are completed with a filler or sealant product, plus some external corners and roof to wall junctions have not been constructed in accordance with the building

[1] The Building Act 2004, section 185(1)(a) provides the Chief Executive of the Ministry with the power to make determinations.

consent documentation. However, these other concerns are not in dispute, and it appears the owner has already committed to addressing them; therefore, they have not been considered further in this determination.

# 2. The building work and background

2.1. The owner's property is a three-storey (in parts) detached dwelling located east of Auckland.

2.2. The building consent for the construction of the dwelling including the cladding was granted and issued by the authority on 6 June 2018, and building work commenced in August 2018. During construction, a minor variation was approved by the authority[2] to install 18mm thick horizontal rusticated cedar weatherboards to replace the previously specified pine bevel-backed weatherboards. The change in weatherboards is recorded in plans dated 10 July 2019. The weatherboards are detailed fixed to 45 x 20mm H3.2 treated vertical timber cavity battens at 600mm centres, over a proprietary building wrap, on H1.2 treated timber framing.

2.3. The plans specified the use of a single "75 x 3.25mm…Flat Head Annular Grooved Shank 3.16 Stainless Steel Nail" for securing each weatherboard into the cavity battens. The use of a single fixing is set out in the weatherboard manufacturer's installation instructions[3] as well as the manufacturer's product appraisal and product certificate[4] (refer to Figure 1).

2.4. Sometime between July 2019 and October 2019, the weatherboards were installed.

2.5. On 4 July 2024, an authority inspection record noted 'Cladding fixings….Pass' and 'sighted 1x fixings used for their Rusticated cedar. Using [stainless steel] flat head nail at 75mm' long in accordance with the manufacturer's specifications. However, the overall inspection outcome was 'Fail' and a further 'Full cladding inspection [is] required'; the reason for the failure appears to be because the building work was incomplete.

2.6. A further inspection by the authority on 18 July 2024 noted 'sighted double nailing on boards. Confirmation required on double nailing from manufacturer'.[(5)(6)]

2.7. The fixing of the weatherboards as-built, and subject of this determination, is described in Figure 2.

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[2] As noted in an authority inspection record dated 31 July 2019, and separately on 4 July 2024. The decisions by the authority to grant the minor variations are outside the scope of the determination.

[3] Dated June 2017.

[5] The overall outcome of the inspection was recorded as 'Fail' and included other items of concern related to the as-built weatherboards (refer to paragraph 6 above).

[6] I note I have been given conflicting information by the parties as to who installed the double nail fixings and when. The owner refers to double nail fixings being installed in October 2019, but this is not supported by the authority inspection record dated 4 July 2024 which refers to single nail fixings.

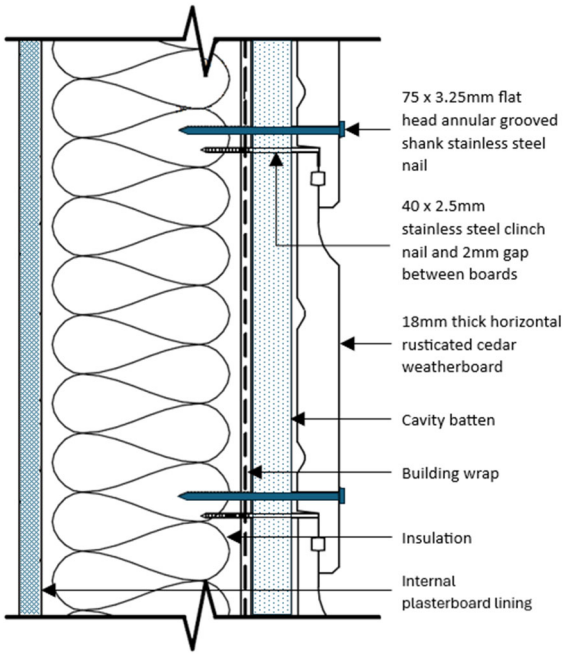


**Figure 1: building consent detail (not to scale)**

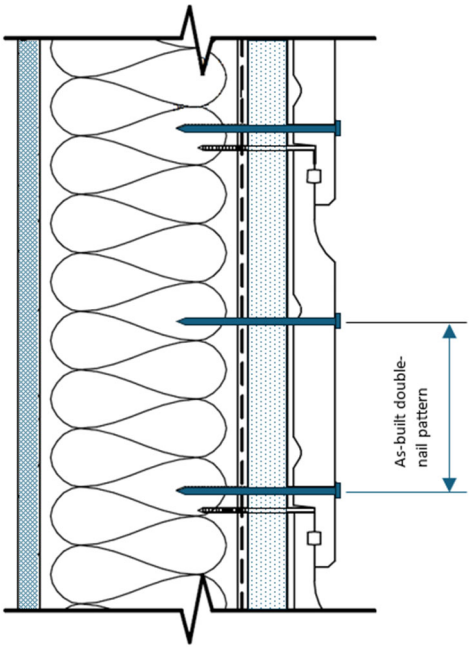


**Figure 2: as-built construction (Indicative and not to scale)**

2.8. It is not clear whether the weatherboards, as-built, have been installed with clinch nails and a 2mm gap between boards for expansion. I have not been provided with information to suggest that the cavity construction has not been constructed in accordance with the building consent detail (refer Figure 1).

# 3. Submissions

## The owner

3.1. The owner[7] submits (in summary):

3.1.1. The "alternative method of double nailing…meets the weathertightness and durability requirements of the building code". The "exterior wall complies with clause E2.3.2".

3.1.2. They "did not notice any leaks in the house or any issues arising from the cladding" since it was constructed 4 to 5 years ago and it "is in a stable and good condition".

3.1.3. The weatherboard manufacturer confirmed "the weatherboard has been installed outside the scope of the system" and provided several options to remediate the situation with double nailing, such as removing or punching through the additional fixing and included the weatherboards "may have to be replaced". Regardless, the manufacturer agreed and stated, "that the

[7] Either via their agent, building surveyor or architect.

weatherboard has probably done all the moving it is going to and the double nailing is probably inconsequential".

3.1.4. Regarding "the cupping, or bulging" of the weatherboards the manufacturer stated, "this is a pretty common occurrence with this sort of profile especially when coated in a dark colour".

3.1.5. The building surveyor has made the following comments and statements: The second nail, in the 'double nail' configuration, is of no consequence. The reasons to avoid the double nailing are entirely based on allowing for frame and cladding movement in the early years after completion. After 5 years, the frame and cladding have reached a state of equilibrium, and no further movement will occur other than from seasonal changes in humidity. There is no impact on the weathertightness or durability of the weatherboard cladding.

3.1.6. The weatherboards have been coated with a proprietary exterior wood oil product.

3.1.7. The aim is "to replace all problematic ceder boards and to repaint the entire cladding once the cladding inspection [by the authority] passed. This planned maintenance approach…ensures the long-term performance of the cladding system".[8]

## The authority

3.2. The authority submits (in summary):

3.2.1. "Because the cladding has not been installed as per the manufacturer's specifications" the authority "will not sign it off".

3.2.2. The authority inspection report dated 18 July 2024 included references to "cracks on boards" and "most boards [were] bulging".

3.2.3. It conducted a further inspection on 25 November 2024. The authority noted it had observed splits in some weatherboards (several at or near to mitres or weatherboard ends), some fixings had been driven below the surface of the weatherboards, and there were instances where the weatherboards were "cupping", and evidence of "poor maintenance" (eg "stain and or coating deterioration"). The splitting and/or cupping allows "possible moisture entry" and "decay".

3.2.4. "The current construction of the weatherboard cladding system does not comply" with clause E2.3.2 because the double nailing of weatherboards is outside the product manufacturers specifications. The issue or potential

[8] The owner provided copies of documents from the manufacturers of the weatherboards and exterior wood oil that gave details about the specific maintenance instructions for both products.

issue is the likelihood of reducing thermal movement and increasing the risk of further splitting, particularly to the northern elevation.

3.2.5. In respect of clause B2, split weatherboards, double nail fixing and overdriven fixings have the potential for increasing current splits or further splits and/or moisture retention in the face of the weatherboard. Further, dark stain with an unknown Light Reflectance Value may have contributed to the cupping of weatherboards.

3.2.6. "An unreasonable amount of maintenance [is] required to maintain the claddings to meet the intended lifespan due to the installation methods used". The weatherboard cladding is "Unlikely to meet the minimum 15 year durability…as required by…building code clause B2".

3.2.7. "There has been no detailed site investigation / survey to confirm if moisture has penetrated the external envelope of the building, however defects are apparent as noted in the site visit photos[9]. The weatherboard cladding would require significant maintenance and or replacement in order to perform as intended".

## The LBP builder

3.3. The LBP builder submits (in summary):

3.3.1. The double nailing of the weatherboards was not based on a "specific plan, product specification or installation guide". The rationale behind the decision was the "ceder weatherboards are relatively soft and have previously exhibited cupping issues in other projects. To mitigate this risk and ensure the long-term performance of the cladding, the architect instructed the use of two nails per board".

[9] Dated 24 November 2024.

# 4. Discussion

4.1. The matter to be determined is whether the horizontal rusticated cedar weatherboards, in respect of the as-built double-nail fixing arrangements, comply with Clauses B2 and E2 of the Building Code. The authority is concerned with the fixings and subsequent condition of the weatherboards resulting in possible moisture entry and the extent of maintenance required to meet the minimum durability lifespan of the weatherboards.

## Relevant legislation and Building Code clauses

4.2. Sections 16 and 17 of the Act require that all building work must comply with the performance criteria of the Building Code. The Building Code sets out functional requirements that a building is required to perform and the performance criteria that are to be complied with. If the performance criteria are not satisfied, the building work will be non-compliant with that Building Code clause. The Building Code clauses in dispute are B2 *Durability* and E2 *External Moisture.*

4.3. Building Code clause E2, the objective and functional[10] requirements state:

**Objective**

E2.1 The objective of this provision is to safeguard people from illness or injury that could result from external moisture entering the *building*.

**Functional requirement**

E2.2 *Buildings* must be constructed to provide *adequate* resistance to penetration by, and the accumulation of, moisture from the outside.

4.4. The relevant performance criteria E2.3.2[11] states:

**Performance**

….

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

4.5. The terms ‘undue dampness’ and ‘damage’ are not defined in the Act or the Building Code. I note the terms ‘undue dampness’ and ‘damage’ as it relates to clause E2, were considered by the High Court in *Minister of Education v H Construction North Island Limited (formerly Hawkins Construction North Island Limited)*.[12]

[10] Clause A2 ‘Interpretation’ defines ‘adequate’ as meaning ‘adequate to achieve the objectives of the building code’.

[11] Clause A2 ‘Interpretation’ defines ‘building element’ as ‘any structural or non-structural component and assembly incorporated into or associated with a building’.

[12] CIV-2013-404-001504 [2018] NZHC 871, Downs J, paragraphs [61] to [63] and [113] to [121] inclusive.

4.6. Clause E2.3.2 does not require the prevention of all water penetration as 'some water may be able to harmlessly escape'[13], rather, a breach of clause E2.3.2 is penetration of water that could cause 'undue dampness' or damage to building elements or both.

4.7. The term 'undue dampness' has been considered in previous determinations[14] "to be a level of moisture that has, or will, result in detrimental effects on building elements, or the building occupants, or both". This determination also agreed with a previous determination that also found that 'damage' such as decay in framing did not need to have occurred to satisfy the test of "undue dampness".

4.8. I also note, the exterior wall in this case also incorporates other building elements directly behind the weatherboards that are intended to form a part of the overall cladding system designed to prevent the penetration of water; these include the cavity battens and building wrap.

4.9. The weatherboard cladding must also satisfy the durability requirements of clause B2, in respect of the other objective, functional and performance requirements of the Building Code, in this case that is in respect of code clause E2, and in particular E2.3.2. The objective and functional requirements of clause B2 state:

> **Objective**
>
> B2.1 The objective of this provision is to ensure that a *building* will throughout its life continue to satisfy the other objectives of this code.
>
> **Functional requirement**
>
> B2.2 *Building* materials, components and *construction* methods shall be sufficiently durable to ensure that the *building*, without reconstruction or major renovation, satisfies the other functional requirements of this code throughout the life of the *building*.

4.10. The relevant performance criteria B2.3.1 states:

> **Performance**
>
> ….
>
> **B2.3.1** *Building elements* must, with only normal maintenance, continue to satisfy the performance requirements of this code for the lesser of the *specified intended life* of the *building*, if stated, or:
>
> …
>
> (b) 15 years if:
>
> (i) those *building elements* (including the *building* envelope, exposed plumbing in the subfloor space, and in-built chimneys and flues) are moderately difficult to access or replace, or

[13] CIV-2013-404-001504 [2018] NZHC 871, Downs J, at paragraph [120]

[14] For example, Determination 2023/012 *"Regarding the decision to issue a code compliance certificate for alterations to an existing dwelling"* (26 May 2023).

(ii) failure of those *building elements* to comply with the *building code* would go undetected during normal use of the *building*, but would be easily detected during normal maintenance.

4.11. In this case, clause B2.3.1(b) requires the weatherboards (as building elements part of the building envelope), with the double-nail fixing arrangement, must remain durable for a minimum period of 15 years in order to satisfy or continue to comply with clause E2.3.2, with only normal maintenance.

4.12. The term 'normal maintenance' is not defined in the Act or the Building Code. Previous determinations[15] have considered the term is work generally recognised as necessary to achieve the expected durability for a given building element.[16] Normal maintenance can include (but not be limited to) following a manufacturer's recommendations, washing down surfaces, and re-coating of exterior protective coatings.

4.13. Performance criteria B2.3.1 is subject to a 'limits on application' which states "Performance B2.3.1 applies from the time of issue of the applicable *code compliance certificate*". In this case, the authority has not issued a code compliance certificate for the weatherboards, so the weatherboards will need to remain durable for a period of at least 15 years from when the authority issues the code compliance certificate. Many previous determinations[17] have considered the issue where there is some delay between the practical completion of building work (weatherboards in this case) and the issuing of a code compliance certificate. An authority has the power to grant a modification of clause B2.3.1, altering the time from which performance B2.3.1 applies from the point of practical completion, if requested by an owner.

## Compliance of the weatherboards as-built with double-nail fixings

4.14. The weatherboards as-built with double-nail fixings must, with only normal maintenance, remain durable for a durability period of not less than 15 years to meet the performance criteria of clause E2.3.2 (prevent the penetration of water that could cause undue dampness or damage or both).

4.15. The authority is concerned with the double-nail fixing arrangement and overdriven fixings, visible splits and cupping of the weatherboards (particular on the north elevation), and the weatherboard stain and or coating deterioration, all of which could allow water penetration and retention. Further, the double-nail fixing could

[15] For example, Determination 2007/089 *"Dispute about code compliance for alterations and additions conducted under four building consents"* (dated 16 August 2007), at paragraph 8.3 to 8.5 inclusive.
[16] See also Acceptable Solution B2/AS1, paragraph 2.1.1.
[17] For example, Determination 2015/038 "*Regarding the refusal to issue a code compliance certificate for a 17 year-old house with stucco wall cladding*" (dated 14 June 2015) at paragraph 6.4.3.

result in further splits, cupping and water retention of the weatherboards, especially in the face of the weatherboard.

4.16. The evidence provided by way of photographs[18] show:

4.16.1. the weatherboards have been installed with a double-nail fixings arrangement,

4.16.2. the fixings are not uniform in some areas,

4.16.3. in some limited areas, the presence of a third fixing and/or over-driven fixings,

4.16.4. a dark stain finish/coating has been used on the weatherboards,

4.17. In respect of the condition and integrity of the weatherboards, the photos show:

4.17.1. cupping (the curling up of the lower edge) of the weatherboards in many places (shadows formed by the cupping show this effects portions of the elevations rather than isolated boards),

4.17.2. small splits in the weatherboards at some mitres and ends of boards,

4.17.3. the stain finish/coating of the weatherboard has deteriorated exposing the parts of the weatherboard and no longer protecting the weatherboard, predominantly on the north elevation, or at some corner junctions,

4.17.4. The north elevation of the building has the most splits, cupping and deterioration of the stain finish/coating, and

4.17.5. some weatherboards have been replaced and installed with single fixings.

4.18. The fixing arrangement of timber weatherboards and the ability of the weatherboards to expand and contract under changes in moisture content and climatic conditions is an important consideration[19], particularly in order to maintain the weatherboard's material integrity for the weatherboards to perform their E2.3.2 function over the minimum required durability period.

4.19. The photos show the weatherboards clearly have a range of defects, especially along the north elevation, and some weatherboards have already been replaced due to these defects. I consider the combination of the double-nail fixing arrangement, the dark stain finish/coating, and lack of maintenance via the deterioration of the stain finish/coating have contributed to and resulted in the splits and cupping of the boards. This arrangement has restricted the expansion and contraction ability of the weatherboards, forming splits and cupping. Further, the

[18] Taken by the authority and show the weatherboards at a close distance, dated 24 November 2024.
[19] In considering the impact of double fixings of timber weatherboards I have considered BRANZ Bulletin number 468 *Fixing Timber Weatherboards,* dated December 2005

dark stain has likely impacted the boards by increasing the range of expansion required to be performed by the weatherboards, which is supported by an increased amount of defects along the north elevation where the most sun exposure and heat absorption occurs.

4.20. In respect of performance criteria of clause E2.3.2, the splits visible on the boards do not appear to extend the full depth of the board. Given this, there is no direct pathway for water to penetrate past the weatherboard and therefore I do not consider the nature and extent of the splits have resulted in the weatherboards failing to satisfy clause E2.3.2 to date.

4.21. However, in respect of the cupping, the photos show the nature and extent of the cupping has impacted the integrity of the weatherboard and will allow water to penetrate the boards and into the wall cavity construction. The nature of the cupping has not formed large enough gaps in the weatherboarding to allow direct entry of water into the cavity, however, from the current extent of the gaps I consider an increased amount of water will penetrate through the boards over time. The cavity construction will contribute to the management (through drainage and drying) of the increased amount of water, however the more water that is absorbed in the weatherboard over time the larger (or additional) the gaps in the splits and cupping will occur and will result in the penetration of water that could cause undue dampness or damage.

4.22. Accordingly, a more critical matter is relevant, that is clause B2.3.1(b) and the requirement that the weatherboards maintain their integrity or durability in order to perform their E2.3.2 function for the minimum required durability period of 15years.

4.23. I have observed that the weatherboards have a number of defects by way of splitting and cupping, and this has occurred over an approximately 6-year period. The issue then is whether the weatherboards will remain sufficiently durable (to prevent the penetration of water that could cause undue dampness or damage) for the remaining 9-year[20] minimum period, with only normal maintenance. These defects allow water to penetrate and soak into the weatherboards themselves in locations where the splits and cupping have occurred. The increased penetration of water in these areas will lead to, if not accelerate, further deterioration of the integrity and durability of the weatherboards to the extent the weatherboards will fail to meet E2.3.2. I note also that some boards have also already been replaced within the 6-year period.

4.24. In addition, the coating of the weatherboards has not been maintained and has worn away in areas, where this has occurred the coating is no longer providing protection to the weatherboards, and a dark coloured coating has been used. I consider these will also contribute to the further deterioration of the weatherboards by allowing further water penetration and continued expansion and

[20] Refer to paragraph 4.13 for when the durability period could start.

contraction, increasing the nature and extent of the defects, particularly the cupping.

4.25. As a result of the above, the integrity or durability of the weatherboards has been comprised to date in those areas where cupping and splits have occurred, and these will also accelerate over time. For the weatherboards in areas of these defects, to prevent the penetration of water that could cause undue dampness or damage for a further 9-year period will require more than normal maintenance. Consequently, I am satisfied that the weatherboards, in areas where cupping and slitting has occurred, have failed to meet their minimum required durability period (B2.3.1(b)) and will result in the premature failure of the weatherboards performing their E2 function for that minimum period.

4.26. I note effective maintenance of the weatherboards where defects have not occurred to date is important to ensure ongoing compliance with clauses B2 and E2 and is the responsibility of the owner.

4.27. In forming my conclusions, I have taken into consideration the features of the building and therefore the weathertightness risk and how these might impact the performance of the wall cladding. These include the building is in a low or medium wind zone, the weatherboards are fixed over a drained cavity with H3.2 treated cavity battens and building wrap, there are weather grooves and warp control grooves in the profile of the weatherboards, and the external wall framing is treated to H1.2. The 3-storey height of the dwelling, the width of the eaves, multiple roof to wall intersections, multiple joints and junctions of the weatherboards, the decks, results in the overall weathertightness risk[21] assessment across all four elevations to be between 17 to 19.

*Other matters*

4.28. The owner, via their building surveyor, noted previous determinations have considered similar situations where double-nail fixings were installed.[22] Firstly, I emphasise that each determination is considered on a case-by-case basis. I consider those determinations are not comparable and therefore not relevant as they consider: different weatherboard profiles and subject to different expansion and contraction, different exterior wall construction where more robust features are included (for example including a rigid air barrier), maintenance of weatherboard coatings had been undertaken, and the extent of damage is not in a comparable condition as in this case.

[21] In accordance with Acceptable Solution E2/AS1 as a means to establish weathertightness risk and appropriate exterior wall cladding design.

[22] For example, Determination 2019/014 *The refusal to issue a code compliance certificate due to concerns about weatherboard fixings to a house* (dated 30 April 2019).

# 5. Decision

5.1. In accordance with section 188 of the Building Act 2004, I determine the horizontal rusticated cedar weatherboards as-built with double-nail fixing pattern, does not comply with clause B2.3.2(b) in respect of clause E2.3.2 for the minimum required durability period in those areas where splitting and cupping has occurred.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 28 July 2025.

**Rebecca Mackie**

**Principal Advisor Determinations**