

Determination 2024/042

Regarding the compliance of external timber wall cladding

107a Main Road, Fairfield, Dunedin

Summary

This determination considers the compliance with Building Code Clauses B2 *Durability* and E2 *External Moisture* of vertical shiplap Siberian larch timber wall cladding installed on a residential dwelling.

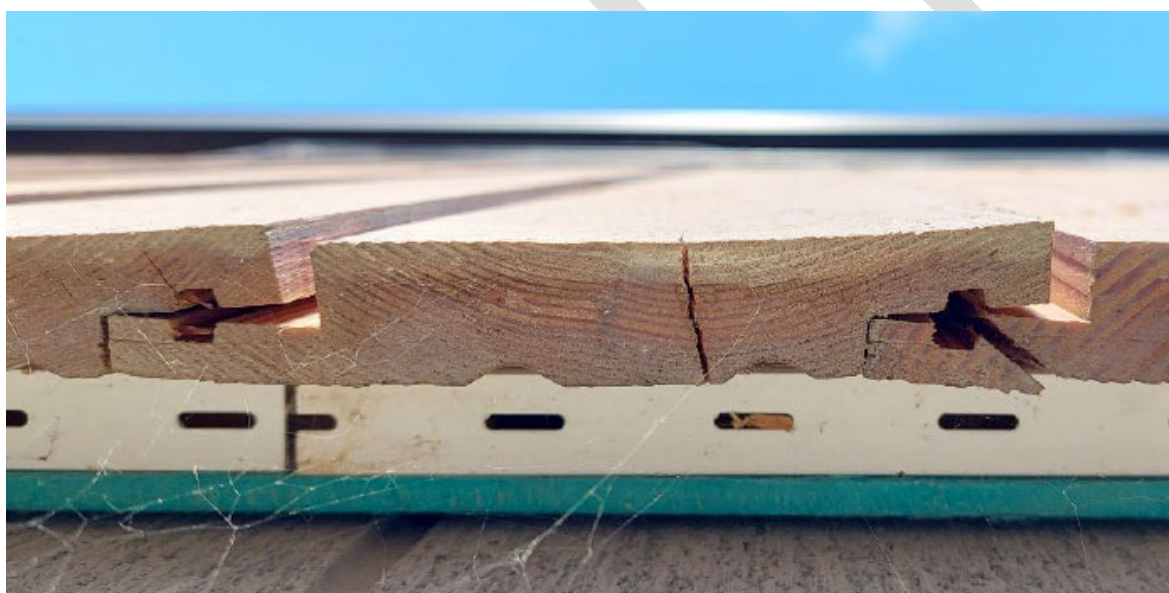


Figure 1: View of underside of cladding, west elevation

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, Andrew Eames, Principal Advisor Determinations, 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. A Abeynaike and T Y Chan, the current owners of the property who applied for this determination (“the owners’)
 - 1.2.2. Dunedin City Council, carrying out its duties as a territorial authority or building consent authority (“the authority”)
 - 1.2.3. C J Flaws of CJF Ideas Limited, who was the owner of the property when the building work was carried out, and the licensed building practitioner who carried out and supervised the building work (“the first LBP”)
 - 1.2.4. C Cockburn, the second LBP who carried out the installation of the wall cladding (“the second LBP’).
- 1.3. This determination arises from defects to the external vertical shiplap timber wall cladding (“**the cladding**”) installed on the dwelling at 107a Main Road, Fairfield, Dunedin, pursuant to building consent ABA-2020-1331. Refer to figure 1.²
- 1.4. The matter to be determined, under section 177(1)(a), is the compliance of the as-built cladding with Building Code Clauses B2 *Durability* and E2 *External Moisture*.
- 1.5. In deciding this matter, I have considered the installation of the cladding, the timber finish used, and its ongoing performance.

Issues outside this determination

- 1.6. I have not considered the following issues:

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

² Figure 1 has been reproduced from photographs taken by the owners in November 2023.

- 1.6.1. The authority's decisions in granting the building consent and issuing a Code Compliance Certificate.
- 1.6.2. The other building work detailed in the building consent not related to the matter.
- 1.6.3. Any civil, contractual, or financial arrangements between the parties.

2. The building work and background

- 2.1. The property is a back section in a residential area of Dunedin. On 13 July 2020, the first LBP applied to construct a part two-storey detached dwelling on the property.
- 2.2. The building consent specified the use of 165mm wide x 21mm thick vertical shiplap Siberian larch weatherboards on 20mm thick castellated cavity battens, and a fibre-cement rigid air barrier fixed to the external timber framing. The weatherboards were to be fixed to all four elevations. The building consent plans show minimal eaves projections and a porch over a deck to the north end of the dwelling.
- 2.3. The building consent specifications referred to the weatherboards being 'Dressing grade to NZS 3631³, to NZS 3617⁴ for profile and treated to NZS 3602⁵, table 2, reference 2.A1' to achieve 15-year durability. The weatherboards were to be treated with a proprietary wood primer and two layers of semi-gloss acrylic coating.
- 2.4. Included with the building consent was a 'Producer Statement – Weatherboard Cladding'⁶ from the manufacturer of the weatherboards. This referred to compliance for 'direct and cavity' fixed cladding, and Acceptable Solutions B2/AS1 and E2/AS1, as well as NZS 3602, NZS 3604⁷, NZS 3617, and NZS 3631.
- 2.5. The building consent was granted and issued by the authority on 9 September 2020, and the building work to install the cladding was completed between March 2022 and July 2022.
- 2.6. The weatherboards installed measured 135mm wide x 21 mm thick and incorporated two warp control grooves to the rear face.⁸ They have been fixed

³ New Zealand Standard NZS 3631:1988 *New Zealand Timber Grading Rules*. For the purposes of this determination, I have assumed the Siberian larch timber used falls into Group III: Exotic softwoods (New Zealand Grown and Imported).

⁴ New Zealand Standard NZS 3617:1979 *Specification for Profiles of Weatherboards, Fascia Boards, and Flooring*.

⁵ New Zealand Standard NZS 3602:2003 *Timber and Wood-based Products for Use in Building*. Table 2 – 'Requirements for wood-based building components to achieve a 15-year durability performance', reference 2A.1 'Weatherboards', level of treatment 'none' for larch.

⁶ Dated 3 April 2018.

⁷ New Zealand Standard NZS 3604:2011 *Timber-framed buildings*.

⁸ I note the manufacturer's 'Timber Cladding Selection [and] Price Guide' refers to Siberian larch being dressed at 28mm thick, and New Zealand larch at 21mm thick. The same guide also requires re-application of an oil stain after about four years and then every five to six years thereafter.

using 75mm silicone bronze rose-head annular groove nails, except at the corner junctions, where 'gun nailed fixings' with smaller heads were used to create plain butt joints.

- 2.7. The manufacturer applied one coat of proprietary wood oil to all surfaces of the timber in the factory, and a second coat was applied on site.
- 2.8. The authority issued a code compliance certificate on 16 September 2022, and the owners purchased the property in September 2022. In February 2023, the owners became aware of issues with the cladding on all elevations of the dwelling, including (but not limited to):
- cupping⁹ and delamination of the weatherboards
 - long cracks and splits on the edges and down the centre of the boards, with some extending through the full thickness of the weatherboard
 - knots with splits and holes wider than 2mm, bark and resin pockets in the wood, loose and missing knots, and some holes that extend through the weatherboards
 - the construction of the external corners did not comply with the building consent documentation, there are cracks and splitting in the butt joints, and incorrect type and location of the fixings used.
- 2.9. The owners engaged the services of a building surveyor ("the building surveyor") to inspect the cladding and assess its compliance with the Building Code.¹⁰ The building surveyor reported numerous defects in the cladding (similar to those noted by the owners) and raised concerns that its installation had not followed the building consent, and best practice in some areas. The building surveyor concluded (in summary):
- the defects had the "potential to allow moisture entry at the laps, joints and junctions which will accelerate deterioration of the surrounding materials"
 - the "splitting and knot failure noted are now considered to be 'at risk' areas for weathertightness failure and likely premature deterioration of the timber"
 - the detail of the corners as constructed "is not considered to be robust and will be more susceptible to cupping and bowing" creating a higher risk of weathertightness issues and reducing durability.
- 2.10. The authority inspected the property¹¹, and considered the cladding had been "installed to a reasonable standard" and "was in good condition with few obvious

⁹ NZS 3631 defines 'cup' as 'a concave curvature across the grain, that is, across the width of the face'.

¹⁰ The building surveyor conducted inspections on 27 February 2023 and 19 September 2023. The surveyor's report is dated 15 March 2023 with an addendum added in or about September 2023.

¹¹ On 26 June 2023.

defects". The manufacturer also inspected the cladding and stated the cladding was "performing very well".

3. Submissions

The owners

3.1. The owners submit (in summary):

- 3.1.1. At 21mm thick, the weatherboards are thinner than what the manufacturer's product brochure states is required for stability, making them more likely to "crack and split".
- 3.1.2. There are issues of non-compliance with NZS 3602 (eg the weatherboards were not painted¹², and all holes, resin and bark pockets shall be excluded¹³).
- 3.1.3. There are issues of non-compliance with NZS 3631 (eg presence of loose knots, and tight encased knots greater than 15mm in diameter, and surface checks longer than 100mm¹⁴).

The authority

3.2. The authority submits (in summary):

- 3.2.1. The 21mm thick shiplap weatherboards may not comply with NZS 3602, however, compliance with the standard is not necessary to achieve building code.
- 3.2.2. At the time of the authority's final inspection on 1 September 2022 the cladding was performing as expected.
- 3.2.3. The building consent details were not followed for the installation of the weatherboards at the corners.

The first LBP

3.3. The first LBP submits (in summary):

- 3.3.1. The cladding was stored on-site in a dry cool garage until it was installed.

¹² Paragraphs 111.2.1 and 111.2.5 of NZS 3602.

¹³ Paragraph 111.2.3 (a) of NZS 3602.

¹⁴ The owner referred to page 63 of NZS 3631 (section 4.4), for "dressing grade" timber. NZS 3631 defines a 'check' as 'a separation of the fibres along the grain forming a fissure, but not extending through the piece'.

- 3.3.2. The second coat of stain finish applied on-site to the installed cladding included sealing of all end grains.
 - 3.3.3. Confirmed the fixings had been installed in accordance with NZS 3604.
 - 3.3.4. The cladding is compliant in all aspects, and the manufacturer has since confirmed it was behaving as expected.
- 3.4. The first LBP provided a copy of the product data sheet for the wood oil applied to the timber. This states a maintenance coat (ie a third coat) is required 12 months from the date the second coat is applied.

The second LBP

- 3.5. The second LBP confirmed the fixings and coating used.

4. Discussion

- 4.1. The matter to be determined is the compliance of the cladding with Building Code clauses B2 and E2.

Legislation

- 4.2. Section 17 states that all building work must comply with the Building Code to the extent required by this Act.
- 4.3. The performance clauses of the Building Code relevant to this determination are B2.3.1 (b) and (c), and E2.3.2. The limits on application of B2.3.1 applies from the time the code compliance certificate is issued.

Compliance of the cladding

- 4.4. The cladding on the owners' dwelling has been installed over a drained and vented cavity. This is an alternative solution ie it is not included in Acceptable Solution E2/AS1,¹⁵ nor in any other Acceptable Solution or Verification Method. Clause E2.3.2 states 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 Building Act or Building Code. However, "undue dampness" has been considered in previous determinations¹⁶ "to be a level of moisture that has, or will, result in detrimental effects on building elements, or the building occupants, or both". It also found that

¹⁵ Acceptable Solution E2/AS1 (third edition, amendment nine, effective 27 June 2019 to 3 November 2021).

¹⁶ For example, Determination 2023/012 "Regarding the decision to issue a code compliance certificate for alterations to an existing dwelling" (26 May 2023).

“damage” such as decay in framing, did not need to have occurred to satisfy the test of “undue dampness”.

- 4.6. Similarly, I note the terms “undue dampness” and “damage” as it relates to clause E2, were also considered by the High Court in *Minister of Education v H Construction North Island Limited (formerly Hawkins Construction North Island Limited)*¹⁷
- 4.7. The cladding must also meet the durability requirements of clause B2; for external wall claddings this is 15 years with only normal maintenance (ie clause B2.3.1(b)). Acceptable Solution B2/AS1 states normal maintenance is work generally recognised as necessary to achieve the durability for a given building element.¹⁸ Normal maintenance can include (but not be limited to) following a manufacturer’s recommendations, washing down surfaces, and re-coating of exterior protective coatings.
- 4.8. In correspondence provided by the owner, the cladding manufacturer refers to re-application of an oil stain ‘after about four years’. This is notwithstanding the manufacturer’s product data sheet for the wood oil refers to a maintenance coat 12 months after the second coat is applied.
- 4.9. Regardless, the owners first became aware of the defects with the cladding approximately five months after the issue of the code compliance certificate; this is before the timeframes for normal maintenance recommended by the manufacturers of the cladding and the wood oil.
- 4.10. The evidence made available to me by the owners and building surveyor indicate a range of defects with the cladding (refer to paragraphs 2.8 and 2.9). These defects allow water to enter into the cavity space behind the cladding and are situated across wide areas of the cladding leading me to conclude there will be significant water ingress beyond what would be expected from small gaps requiring normal maintenance. For example, there are full depth holes in the weatherboards and cupping of the timber opening the vertical joints. Similar defects also allow for the entry and absorption of water that is likely to accelerate the premature deterioration of the weatherboards, for example, where the timber is split, and this will exacerbate the problem of water ingress.
- 4.11. Further, although the building consent documentation refers to compliance of the cladding with NZS 3602 and NZS 3631 (see paragraphs 2.3 and 2.4), evidence indicates this has not been met. For example, holes, resin and bark pockets are evident in the weatherboard’s contrary to clause 111.2.3 of NZS 3602, and some surface checks exceed 100mm in length contrary to section 4.4.1.1 of NZS 3631.
- 4.12. Neither the owner, nor the first or second LBP, have provided further evidence to support an alternative solution approach to compliance. I have considered the

¹⁷ CIV-2013-404-1504 [2018] NZHC 871, Downs J, paragraphs [61] to [63] and [113] to [121] inclusive.

¹⁸ Acceptable Solution B2/AS1 (second edition, amendment 12, effective 28 November 2019), section 2.1 ‘Normal maintenance’.

condition of the cladding against the test in E2.3.2. The nature and extent of the various defects are such the exterior walls of the dwelling do not prevent the penetration of water that will cause undue dampness and damage to building elements. This includes the potential for the absorption of external moisture into the open checks, holes, and splits in the cladding that is likely to affect the durability of the timber to the extent compliance with clause B2.3.1(b) will not be satisfied without additional building work beyond what would be expected for normal maintenance.

4.13. Accordingly, I conclude the as-built external wall cladding does not comply with Building Code clauses B2 and E2.

5. Decision

5.1. In accordance with section 188 of the Building Act 2004, I determine the cladding at 107a Main Road, Fairfield, Dunedin, does not comply with Building Code clauses B2 and E2.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 20 August 2024.

Andrew Eames

Principal Advisor Determinations