



Determination 2020/014

Regarding the authority's refusal to grant an amendment to a building consent for a revised timber remediation methodology and window joinery flashing system at 42 Stanmore Bay Road, Auckland

Summary

This determination considers the authority's refusal to issue a building consent for a revised timber remediation methodology and window joinery flashing system. The determination considers whether sufficient information was provided to the authority during the building consenting process.

1. The matter to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004 ("the Act") made under due authorisation by me, Katie Gordon, Manager Determinations, Ministry of Business, Innovation and Employment ("the Ministry"), for and on behalf of the Chief Executive of the Ministry.¹
- 1.2 The parties to the determination are:
 - the owner of the building, P Hallowes ("the owner"), with a building consultancy firm acting on their behalf ("the agent")
 - Auckland Council ("the authority"), carrying out its duties as a territorial authority or building consent authority, and which applied for the determination.
- 1.3 This determination arises from the decision of the authority to refuse to issue an amendment to a building consent. The refusal arose because the authority is not satisfied that the building work complies with Clauses B1 Structure, B2 Durability and E2 External moisture² of the Building Code (First Schedule, Building Regulations 1992).
- 1.4 The matter to be determined³ is whether the authority was correct to refuse to grant an amendment to the building consent for a revised timber remediation methodology and window joinery flashing system for windows that will remain in place. In making this decision, I have considered whether sufficient information was provided to the authority for it to make a decision under section 49 of the Act.

¹ The Building Act and Building Code are available at www.legislation.govt.nz. The Building Code is contained in Schedule 1 of the Building Regulations 1992. Information about the Building Act and Building Code is available at www.building.govt.nz, as well as past determinations, compliance documents and guidance issued by the Ministry.

² In this determination, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.

³ Under sections 177(1)(b) and 177(2)(a) of the current Act.

- 1.5 In making my decision, I have considered the submissions of the parties and the other evidence in this matter.

Matters outside the determination

- 1.6 I have not considered the compliance of the proposed remediation and design. Due to incomplete information the authority has not had the opportunity to assess the compliance of the complete proposal.
- 1.7 The authority since refusing the amendment to the building consent engaged a consultant to assess the remediation methodology. I have not considered the consultant's report as it did not form part of the authority's reasoning for refusing to grant the application for an amendment to the building consent. I note the agent may wish to take the consultant's findings into consideration.

2. The building work

- 2.1 The subject building is now a three storey timber-framed residential building. The amendment to the building consent subject of this determination incorporates a revised timber remediation methodology and a proposed window flashing system for the existing window joinery.

2.2 The proposed window flashing system

- 2.2.1 The existing windows are to be left in place (instead of being removed and reinstalled as per the original building consent) with a custom recessed window flashing system proposed ("the flashing system") to be installed around the joinery. To install the flashing system without removing the joinery head, sill, and jamb timber framing is proposed to be chamfered back (refer Figures 1 and 2).
- 2.2.2 The flashing system is shown below:

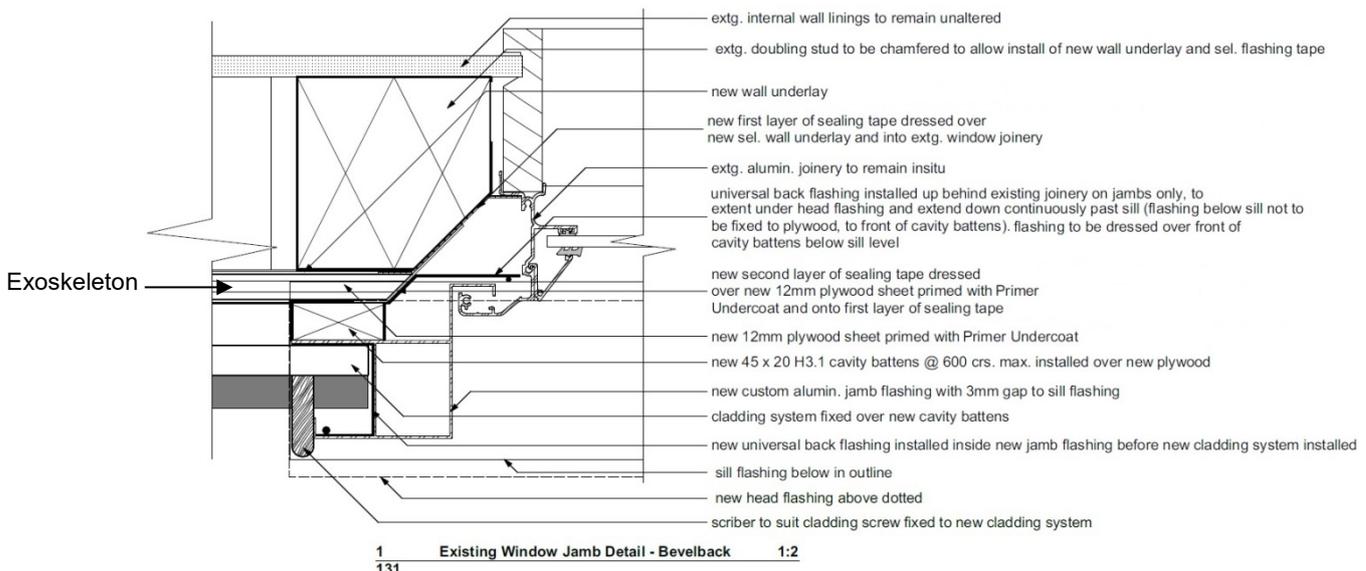


Figure 1: Jamb detail showing the flashing system (not to scale)

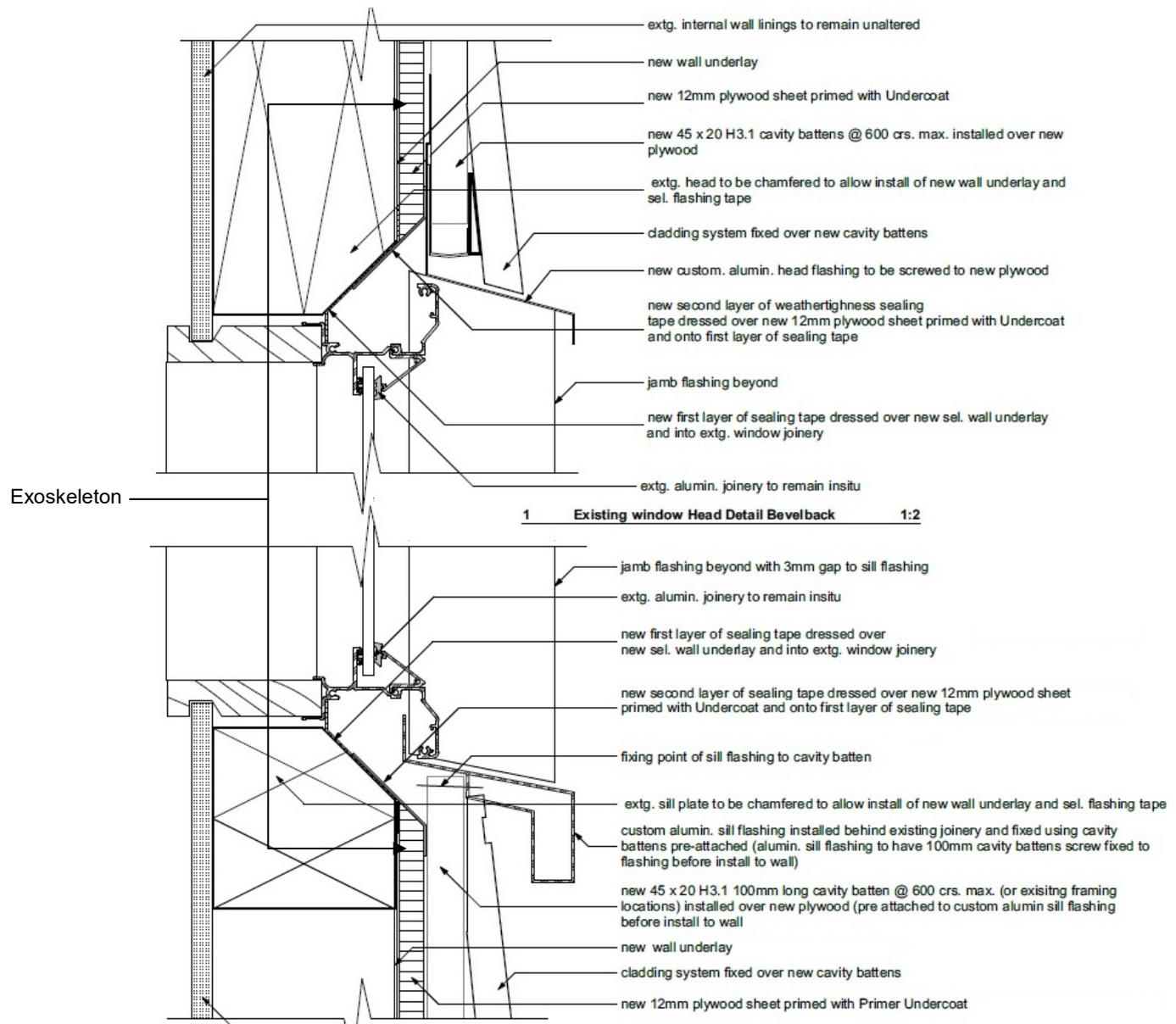


Figure 2: Head and sill detail showing the flashing system (not to scale)

2.3 The remediation methodology

- 2.3.1 The timber remediation methodology proposed is described by the agent as an “alternative process to the standard remediation guidelines^[4]”. Some water damaged timber wall framing would remain in place. The in-situ timber would be reduced to no greater than 45mm thick in order for the chemical treatment products to penetrate and eradicate any existing bacteria.
- 2.3.2 Plywood sheets fixed to the remaining timber wall framing will act as an ‘engineered exoskeleton’, which is intended to replace the structural performance of the timber framing. The proposal to remove the framing would be solely for the eradication of

⁴ While unspecified the agent could be referring to *Weathertightness: Guide to remediation design* <https://www.building.govt.nz/building-code-compliance/e-moisture/e2-external-moisture/weathertightness-guide-to-remediation-design/>

as much of the mould as possible prior to the application of the anti-mould agent. The timber wall framing would not be replaced.

2.3.3 I have summarised the proposed timber remediation methodology (“remediation methodology”) as follows:

Stage	Description
1: Remove exterior cladding	Apply protective tape to aluminium joinery. Remove exterior cladding, underlay, and insulation. Professionals involved: Contractor
2: Inspection of timber and linings	Inspect and mark up all water damaged timber framing and mould on internal linings. Identify whether new timber framing needs to be installed to support the exoskeleton or internal linings. Professionals involved: Consultant from the agent, structural engineer, building surveyor and contractor
3: Removal and treatment of existing framing and internal linings	Cut all water damaged timber from existing framing, with a minimum of 20mm of framing left against the existing interior linings for inspection. Wipe off all mould from the internal linings and the remaining timber wall framing, and apply a coat of proprietary anti-mould treatment. Apply proprietary timber preservative to the framing timber. If structural damage has occurred to external wall framing where a roof structure terminates in that wall frame then an engineer must be notified to design a suitable structural solution. Professionals involved: Contractor
4: Inspection of timber framing and internal linings	Building surveyor to confirm all damaged and/or mould infected timber material has been removed or all mould destroyed from material within interstitial space. Structural engineer to finalise and document exoskeleton support framing requirements. Professionals involved: Agent, structural engineer, building surveyor, authority, and contractor
5: Remediation of interior linings	All internal linings that have damage to the interstitial face but not damaged on the finishing face are to be re-plastered. Remove or repair any linings that have deteriorated through to the finishing face. Install any additional 75x35mm timber framing needed to support the internal linings by fixing it to existing timber framing. Professional involved: Contractor
6: Remediation of framing timbers	Install framing as identified by structural engineer for exoskeleton support. Alter all framing timber required to support the recessed window system. Install additional blocking where building surveyor deems necessary. Install the insulation. Professional involved: Contractor
7: Framing and insulation inspection	Inspect framing installed to support the exoskeleton and the insulation Professionals involved: Agent, structural engineer, authority officer, and contractor

8: Install building wrap	Install proprietary building wrap and seal to windows in accordance with E2/VM1 ⁵ . Test the air seals to the windows by undertaking blower door ⁶ test and smoke generator. Professional involved: Contractor
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⁵ Verification Method E2/VM1 for New Zealand Building Code Clause E2 External moisture.

⁶ A blower door is a machine used to measure the airtightness of buildings.

9: Inspect building wrap	Inspect building wrap to ensure compliance with Clause E2 prior to installation of the exoskeleton. Professional involved: Contractor, authority
10: Install exoskeleton, flashings and cavity battens	Install exoskeleton as per engineer's instructions, complete window flashing system as detailed in building consent drawings and install cavity battens. Professionals involved: Contractor
11: Pre-cladding inspection	Inspect exoskeleton fixings, cavity battens and window/door joinery flashings. Professionals involved: Contractor, structural engineer, authority
12: Install cladding	Install the cladding in accordance with building consent plans and specification. Professional involved: Contractor
13: Inspect cladding	Inspect the cladding is installed as per building consent plans and specification. Professional involved: Contractor and authority

2.3.4 The remediation methodology notes the outcome for Stage 3 is to remove and or treat all existing mould within the interstitial space of the wall framing as per BRANZ Weathertightness remediation guide. The methodology also includes a reference to the remediation guide:

Timber that is shown by testing to have lost strength as a result of decay must be cut out and replaced...NZS 3604^[7] does not allow the jointing of studs, so any rot-affected studs need to be replaced.

2.3.5 However, the remediation methodology states because an engineered exoskeleton will replace the structural component of the timber framing, the contractor will not need to satisfy the requirements of NZS 3604. Therefore, the removal process is only to eradicate as much of the mould as possible before the application of a mould killing agent. The methodology continues on to state while it is not a strict requirement of the Building Code to treat the framing from further decay because the timber framing is no longer structural, this will help prevent any future bacterial growth on the framing.

2.4 The draft weathertightness test report of the proposed window flashing system

2.4.1 The flashing system underwent testing in an IANZ accredited testing facility and a draft report was provided to the authority. The draft report outlined the scope of the testing:

...to assess the performance of a retrofit window flashing system, where windows in existing cladding were augmented with the addition of a surrounding system designed by [the designer].

2.4.2 The following wall samples with the flashing system installed were tested to the procedures set out in Verification Method E2/VM1, which references AS/NZS 4284⁸ testing (refer Appendix A):

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

⁸ Joint Australian/New Zealand Standard AS/NZS 4284:2008 Testing of building facades.

- Sample A – bevelback weatherboard clad wall with a “door-size” aluminium window (W1)
- Sample B – unclad wall with two aluminium windows (W2 and W3) and a smaller uPVC window (W4), and a plywood rigid air barrier
- Sample C – uPVC clad wall with an aluminium window (W5)
- Sample D – bevelback weatherboard clad wall with an aluminium window (W6).

2.4.3 The report noted during the air infiltration tests:

Air could be felt coming through the gap at the sill trimmer, indicating that air was bypassing the trim cavity sealing

2.4.4 The E2/VM1 water penetration testing results were as follows:

- Water penetration test 1 of sample B and one window failed (Series 1).
- Water penetration test 2 of sample A and B (excluding the window that had originally failed) where two windows failed during this cycle (Series 2).
- Water penetration test 3 of sample C and D (Series 1 – 3), which all windows “passed”.

2.4.5 The report concluded:

The performance of the system indicated that there was further work required to obtain a system that was consistently weathertight and adaptable to different cladding types.

3. Background

3.1 The two storey timber-framed building was constructed in 1951. In 2000 a building consent was issued for renovations to the building, which included recladding the building (“the original building consent”). The cladding was not installed in accordance with the building consent, and an inspection identified signs of systemic failure to the wall cladding.

3.2 The original building consent involved significant alterations and additions to the building, including recladding the entire building. A code compliance certificate was sought for the building work in 2016. The code compliance certificate was refused by the authority in a section 95A refusal letter dated 8 April 2016. The authority referenced a number of code clauses, including Clauses B1 Structure and E2 External moisture.

3.3 An inspection in 2017 identified that the cladding system differed from the consented system (it is unclear whether this inspection was carried out by the authority or the agent).

3.4 On 12 December 2017 a building consent was lodged by the agent for “alterations to existing dwelling (Stage 1 Double garage, laundry and bedroom)”. On 8 March 2018 the authority issued the building consent (BC010259941) for Stage 1.

3.5 The Stage 1 building consent (among other things) specified the existing aluminium window and door joinery would be removed, refurbished and then reinstalled with new uPVC head flashings, new packers and new air seals over backing rods. The new wall cladding was to comprise: 12mm plywood sheet with new wall underlay over the plywood sheet, cavity battens, and plywood sheet cladding.

3.6 On 28 March 2018 the building consent for Stage 2 was lodged by the agent for “[r]enovations to existing floors of house and new upper level added with kitchens, laundry and deck. New cladding over entire existing building.”

3.7 A durability report dated 21 June 2018 by the agent identified that the building showed signs of failure under Clause E2 External moisture.

3.8 On 14 August 2018 the authority issued the building consent (BC010259941-1).

3.9 On 8 November 2018 an amendment to the Stage 2 building consent was lodged with the scope of works specified as (refer to paragraph 2.1):

change the windows from being removed to remaining in place with a head, sill and jamb flashing system and air seal with a VM1 certification.

In addition to this description, the amendment also proposed to revise the remediation methodology and install an ‘engineered exoskeleton’, refer paragraph 2.3.

3.10 On 14 November 2018 the authority sent a request for further information to the agent, which included the following items:

b) No supporting technical literature for the amendment application was provided.

...

c) Clarify how adequate inspection of existing timber framing to window opening will be achieved if window not removed.

d) Technical literature for [the proprietary tape product] confirms that the adhesion of the tape to the window joinery is excluded from the product appraisal. Provide independent documentation which demonstrates this method will perform for the required 15 year durability period.

f) Demonstrate how the proposed design is in accordance with sections...of the product appraisal.

g) Product literature and product appraisal indicate [the proprietary tape product] is only for use around head and jams.

h) Product appraisal states that [the proprietary tape product] is to be used in conjunction with flashings and air seals, not as a replacement for these features.

....

3.11 The authority continued to send reminder letters regarding the outstanding requested information from 28 November 2018 to 27 March 2019, with the last reminder letter including the following additional item:

Please demonstrate how the proposed window flashing system achieves compliance with the NZBC specifically clauses E2, B1, B2. Please address how the installation of this system into the existing structure ensures compliance with B1, B2 is maintained

3.12 On 5 April 2019 the authority sent a final reminder letter for the requested information and advised that the application would be refused under section 50 of the Act if no response was received.

3.13 On the same day the authority received a response from the agent to the 27 March 2019 request for information, the letter stated:

The purpose of the amendment is to alter the original building consent’s methodology of remediation to [the proposed timber remediation methodology]. Most of the detailing for this project is from [Acceptable Solution E2/AS1⁹], those details

⁹ Acceptable Solution E2/AS1 for Clause E2 External moisture.

that are specifically concerned with the window flashing system ...of the project is from [Verification Method E2/VM1]. The [weathertightness test report] is still in draft form but we have attached the draft report so that [the authority] can continue with the processing on the condition that the consent cannot be issued until the final report has been received by [the authority].

- 3.14 The response included a report that outlined the remediation methodology dated 4 April 2019 (see paragraph 2.3) and included a draft weathertightness test report of the flashing system (refer paragraph 2.4).
- 3.15 On 8 April 2019 the authority advised the agent that it required finalised E2/VM1 testing results, and if the information was not provided the application would be refused.
- 3.16 On 15 April 2019 the authority did not receive the requested information and refused the amendment to the building consent stating:
- Unable to demonstrate how the proposed window flashing system achieves compliance with NZBC specifically clauses E2, B1, B2. Please address how the installation of this system into the existing structure ensures compliance with B1, B2 is maintained...
- 3.17 On 10 June 2019 the parties held a meeting to discuss the proposal, but could not resolve the matter.
- 3.18 The Ministry received an application for a determination on 29 July 2019.

4. The submissions

- 4.1 The authority included a submission with its application that outlined its concerns regarding the proposal (in summary):
- The authority was concerned that the application failed to demonstrate compliance with the Building Code. The authority was of the view the proposed alternative methodology is not only untested but deviates from the Ministry's guidance and industry best practice.

Windows

- The draft E2/VM1 report provided was generic and not site specific. The report lacked detail on how compliance would be achieved if the windows were left in place.
- Despite assurances from the agent that the test had been successful, the draft weathertightness test report advised the system required further work (refer paragraph 2.4.5) and the testing was incomplete.

Engineered exoskeleton

- The agent proposed to use an exoskeleton to replace the structural element of the timber wall framing, and therefore the framing does not need to satisfy NZS 3604. The removed mould-infected timber framing would not be replaced. However, not all timber is to be removed and 'failed' framing will remain in the building with an engineered exoskeleton encasing it.
- The agent did not provide site-specific information as to the design or construction of the exoskeleton or its performance. The agent did not demonstrate a suitable compliance pathway to demonstrate Building Code compliance.

Water damaged timber remaining in-situ

- The agent stated the proposal to leave in-situ timber no greater than 45mm, which is then chemically treated to eradicate any remaining mould, had been confirmed by a research institute that specialises in wood products. However, the agent did not provide any supporting documentation from the research institute to show their confirmation of this approach.
- The agent believes the framing will “not get wet again” from external moisture or reactivate any faster from internal moisture than compliant H1.2¹⁰ timber framing. The agent’s belief was based on the research institute’s position and the fact the design is “fully compliant” with E2/VM1 cladding system and has a “4284¹¹-barrier system”. However, the authority is of the view there has been no empirical evidence to confirm this position.
- The authority is not satisfied that compliance with the Building Code has been demonstrated based on the lack of detail and supporting documentation.

4.2 The authority included copies of the following documents with its application:

- timeline of key events
- amendment to the building consent application
- report analysing the remediation methodology
- draft weathertightness report
- remediation methodology
- correspondence between the parties.

4.3 The agent did not make a submission.

4.4 A draft determination was issued to the parties for comment on 25 November 2019.

4.5 On 9 December 2019 the authority responded accepting the decision in the draft determination.

4.6 On 23 January 2020 the Ministry sent a reminder to the agent requesting a response to the draft determination and extended the period to respond.

4.7 On 6 March 2020 the Ministry again contacted the agent requesting a response to the draft determination. The Ministry has not received a response from the agent.

5. Discussion

5.1 Legislation

5.1.1 Section 49 states an authority must grant a building consent:

...if it is satisfied on reasonable grounds that the provisions of the building code would be met if the building work were properly completed in accordance with the plans and specifications that accompanied the application.

5.1.2 Section 50 sets out the form that an authority’s refusal to grant a building consent must take:

¹⁰ H1.2 refers to the level of timber treatment.

¹¹ The agent is referring to Joint Australian/New Zealand Standard AS/NZS 4284:2008 Testing of building facades.

If a building consent authority refuses to grant an application for a building consent, the building consent authority must give the applicant written notice of—

- (a) the refusal; and
- (b) the reasons for the refusal.

5.1.3 When refusing an application for a building consent the authority must have turned its mind to the compliance of the building work and impact on the existing building.

5.1.4 The authority in its refusal letter stated that it could not be satisfied the proposal to leave the windows in place would comply with Clauses E2, B1, and B2. The authority also required evidence of how the installation of the window flashing system into the existing structure would maintain compliance with Clauses B1 and B2. There appears to be no reference to the remediation methodology in the authority's refusal letter.

5.1.5 I note the following regarding the information provided to the authority (which is not an exhaustive list):

- While the building consent application relied on expert opinion to confirm the weathertightness and structural compliance for the novel flashing system and remediation methodology, the evidence was either not provided or incomplete when provided. For example, the authority was unable to assess the expert opinion regarding the structural exoskeleton because it did not appear to have been provided.
- The E2/VM1 test results provided were in draft form, incomplete, and the authority raised concerns regarding the testing procedure. The draft conclusion stated the flashing system needed further work to ensure it was consistently weathertight. It is also not clear whether the samples reflect what is actually proposed for the subject building (refer paragraph 2.4.2).
- The remediation methodology provided is novel, not site-specific and lacks detail as to how it is to be implemented for the subject building.
- The remediation methodology states that the exoskeleton, which appears to consist of 12mm plywood sheets, is “to replace the structural component” of the timber framing. There is a lack of specificity whether the plywood is the exoskeleton.
- The application also lacks information to verify how the exoskeleton will comply with Clause B1. There is no explanation as to how the plywood sheets will resist vertical and horizontal loads when the timber wall framing in affected areas will not be replaced.
- There was no evidence provided to show it was suitable to leave water damaged timber in-situ, or that the proposal to eradicate the mould would be adequate.

5.1.6 The authority identified a number of valid concerns regarding the compliance of the proposed building work with Clauses B1, B2, and E2. I am of the view that the agent provided insufficient information to the authority, as outlined in paragraph 5.1.5. The authority could not be satisfied under section 49 due to the lack of information that the building work would comply with the Building Code.

6. The decision

- 6.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the authority was correct to refuse to grant an amendment to the building consent and I confirm that decision.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 14 July 2020.

Katie Gordon
Manager Determinations

Appendix A

A.1 E2/VM1 testing procedures:

COMMENT:

The use of borescopes and cameras requires care to achieve these requirements, but may be the most appropriate option in situations such as when other AS/NZS 4284 tests are to be performed on the same specimen, or to help resolve doubts about whether the replacement of a proportion of the *lining* or *underlay* with a transparent material will affect the performance of the *cladding*.

Amend 8
Nov 2018

1.4 Test procedure

The Verification Method shall consist of the extended water penetration test methodologies of AS/NZS 4284, following a preconditioning pressure loading exposure.

Amend 5
Aug 2011

1.4.1 Preconditioning

Apply a preconditioning loading to the external face of the test sample for a period of 1 minute of positive pressure, followed by a period of 1 minute of negative pressure (suction). The loading shall be 1515 Pa.

COMMENT:

As the ventilated cavity is subjected to the same applied pressure, it is necessary that the material serving as the *air seal* is able to sustain the same applied loading.

Where the test wall is utilising a permeable *wall underlay* or *membrane*, the internal wall *lining* will be required to sustain the serviceability limit state (SLS) wind pressures.

1.4.2 Series 1 Static Pressure Water Penetration

The water penetration test by static pressure shall be conducted in accordance with Clause 8.5 of AS/NZS 4284 and at the maximum test pressure of 455 Pa.

1.4.3 Series 1 Cyclic Pressure Water Penetration

The water penetration test by cyclic pressure shall be conducted in accordance with Clause 8.6 of AS/NZS 4284 and to the cyclic pressure of 455 – 910 Pa at the prescribed Stage 3, with the Stage 1 and Stage 2 tests deleted.

1.4.4 Series 2 'Water Management Testing'

Paragraphs 1.4.2 and 1.4.3 shall be repeated, following the formation of 6 mm diameter holes through the *wetwall* as allowed in AS/NZS 4284 Clause 9.9 in at least 4 places, as noted below:

- a) Through the window/wall joint at 3/4 height of both window/door jambs,
- b) Immediately above the head *flashing*,
- c) Through the external sealing of the horizontal and vertical joints, and
- d) Above any other *wetwall* penetration detail.

The introduction of defects is intended to simulate the failure of the primary weather-defence/sealing. It must only penetrate to the plane of the back of the *wetwall* so the water management of the cavity can be assessed.

1.4.4.1 Immediately upon the conclusion of the Water Management Tests (within 30 minutes) (Paragraph 1.4.4), the layers behind the *wetwall* that support air pressure (including sealing in the window trim cavity) shall be removed, and any evidence of non-compliance (as defined in Paragraph 1.5) noted.

Amend 5
Aug 2011

1.4.5 Series 3 'Wetwall Test'

1.4.5.1 Repeat Paragraph 1.4.2 with an air pressure of 50 Pa, applied across the *wetwall* only, for 15 minutes.

Amend 8
Nov 2018

Amend 8
Nov 2018

1.5 Non-compliance

1.5.1 Non-compliance shall be the presence of water (as defined in Paragraph 1.5.2), or evidence of any water, either:

- a) On the removed surfaces of the cavity after carrying out the tests in Paragraphs 1.4.2 and 1.4.3, and the subsequent 'water management' tests in Paragraph 1.4.4, and/or
- b) During or after the test in Paragraph 1.4.5.

1.5.2 Water which is able to penetrate to the back of the *wetwall* through introduced defects and joints shall be controlled. It may contact battens and other cavity surfaces,

Amend 8
Nov 2018