



Determination 2017/033

Regarding the refusal to issue a code compliance certificate for a 13 year old monolithic clad dwelling at 305 Evans Bay Parade, Hataitai, Wellington



Summary

This determination concerns the compliance of a 13 year old dwelling with monolithic cladding. The determination considers the authority's reasons for refusing to issue the code compliance certificate, and whether the external cladding complies with the requirements of the Building Code.

1. The matter to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004¹ ("the Act") made under due authorisation by me, John Gardiner, Manager Determinations and Assurance, Ministry of Business, Innovation and Employment ("the Ministry"), for and on behalf of the Chief Executive of the Ministry.
- 1.2 The parties to the determination are:
 - the owner of the building, E Aharoni ("the applicant") acting through an agent ("the agent")
 - Wellington City Council ("the authority"), carrying out its duties as a territorial authority or building consent authority.
- 1.3 This determination arises from the decision of the authority to refuse to issue a code compliance certificate for the 13 year old dwelling. The refusal arose because the authority is not satisfied that the building work complies with certain clauses² of the Building Code (First Schedule, Building Regulations 1992).

¹ The Building Act, Building Code, compliance documents, past determinations and guidance documents issued by the Ministry are all available at www.building.govt.nz or by contacting the Ministry on 0800 242 243.

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

- 1.4 The matter to be determined³ is whether the authority's exercise of its power of decision in its refusal to issue a code compliance certificate for the external envelope was correct. In deciding this matter, I must consider whether the external envelope of the building complies with Clause B2 and Clause E2 of the Building Code that was in force at the time the consent was issued.
- 1.5 In making my decision, I have considered the submissions of the parties, the report of the independent expert commissioned by the Ministry to advise on this dispute ("the expert") and the other evidence in this matter.
- 1.6 I also note that the applicant will be able to apply to the authority for a modification of durability provisions to allow the durability periods specified in Clause B2.3.1 to commence from the date of substantial completion in February 2004. I leave this matter to the parties to resolve in due course.

2. The building work

- 2.1 The building work considered in this determination is the construction of three townhouses, which have since been converted to one dwelling, on a flat site, and located in a very high wind zone for the purposes of NZS 3604⁴. The two storey dwelling has concrete slab foundations, and timber wall and floor framing. The dwelling is primarily clad with a direct-fixed proprietary EIF⁵ cladding, with direct-fixed plywood sheet cladding on the ground floor to the east elevation.
- 2.2 The timber treatment was noted in the specification as "H1", which would have been sufficient to meet the requirements of NZS3602⁶ at the time of construction. The laboratory samples indicated that the timber was untreated kiln-dried. This level of treatment only prevents insect attacks, and does not seek to prevent rot and fungal decay.
- 2.3 The pitched roofs are clad with a bituminous torched-on membrane, falling to internal membrane gutters, and are constructed from a combination of timber trusses and rafters. The roofs have parapets on all elevations that are clad with EIFS and have metal cappings.
- 2.4 The consented drawings show the ground floor of each townhouse contains a garage, bathroom, two bedrooms and one ensuite. The first floor contains the lounge, kitchen, dining space, and a bedroom.
- 2.5 There are two decks leading from the living spaces on the first floor, with varying cantilevered decks to the east, north-west and south elevations. The first floor decks of all three units on the eastern side have been enclosed with glazing, and it is unclear when this work was carried out, and it is outside the scope of building consent No. SR102283. The decks on the west elevation are constructed with timber boards overlaid over a butyl rubber membrane, and have enclosed timber balustrades clad with plywood sheet cladding. The enclosed balustrades are capped with timber and the timber handrail is fixed through the capping with stainless steel brackets.
- 2.6 In 2004 further building work was consented and carried out to alter the three individual units into one household unit, including the construction of ground floor timber decks to the east elevation. That building work to the interior is not

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

⁴ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

⁵ Exterior insulation and finish system

⁶ New Zealand Standard NZS 3602:1995 Timber and wood-based products for use in building

considered in this determination because a code compliance certificate has been issued for that building consent.

3. Background

3.1 The authority granted the building consent No. SR102283 for “three new townhouses” on 26 August 2003. The following inspections were carried out by the authority:

- foundation inspection on 18 September 2003
- drainage within the concrete slab inspection on 1 October 2003, with the notation that it required “relief gullys (sic) to all units finish height of 20mm above drive height [and] 50mm below slab height
- pre clad inspection on 5 November 2003, in which “timber treatment” was passed
- postclad inspection on 6 January 2004 that does not appear to be completed, which included the following comments:
 - Nobody – no documents on site only painters.
 - Texture coating applied to front, both ends to be completed to the rear (East)?
- drainage inspection on 14 January 2004
- final inspection on 20 January 2004⁷ with the comment that a code compliance certificate was being sought for “for exterior cladding, roof and foundations”.

3.2 The authority issued an interim code compliance certificate for the townhouses on 2 February 2004 that stated:

This interim Code Compliance Certificate does not cover:

B1 Structure
 F7 Warning systems
 G9 Electricity
 G11 Gas as an energy source
 G12 water supplies
 G13 Foul water
 Internal wall linings

This interim Code Compliance Certificate covers the following:

E2 external moisture
 Frames

3.3 At some point a building consent was applied for, and issued under SR112232 for the three townhouses to be altered to one dwelling. I am of the understanding that these alterations have a code compliance certificate and therefore are not included in the matter to be determined.

3.4 On 23 August 2016 the applicant applied for a code of compliance certificate for building consent No. SR102283.

⁷ The inspection record is incorrectly dated 20 January 2001.

Inspection outcome

- 3.5 The authority carried out an inspection of the property and informed the applicant of the outcome in a letter dated 23 June 2016. The letter stated:
- the authority needed to be satisfied that the “structural timber and associated elements” met the requirements of the Building Code.
 - a report from a registered building surveyor was required to confirm the performance requirements of the relevant building code clauses are being met for the “external envelope...including the roof, external walls, decks with membranes and enclosed safety barriers and the timber deck structure”
- 3.6 The letter stated the following items observed and that required further work during the inspection:
- Enclosed safety barriers – timber caps with top fixings
 - “Cracking” evident in some areas of the external wall cladding
 - Some damage to the texture coating was evident in some areas
 - A lack of separation between the wall cladding and ground level in some areas
 - Some of the [plywood sheet] cladding has been affected by moisture ingress
 - No separation between the timber deck on the seaward elevation
 - The performance of the membrane and various penetrations on the roof
 - Some of the skylights have been removed
 - Some of the timber decking has been affected by moisture ingress
 - Hose tap penetration is not sealed
 - Lagging to the hot water pipes requires UV protection
 - The 65mm diameter pipe penetration requires vermin proofing
- 3.7 The authority required “adequate testing” to be carried out by a building surveyor to support the report. Also a repair schedule would be required for “any proposed remedial work”, noting that “any building code failures(s) identified will require a new building consent for the remediation work”.
- 3.8 The authority requested the following information:
- a completed application for code compliance certificate
 - an application for an amendment of Clause B2, noting that the description of the amended work should “make reference to the reduced scope of work of this consent and the work approved under SR 112232
 - electrical safety certificate or appraisal from a registered electrician confirming compliance and safety of electrical work associated with the building consent.
- 3.9 On 7 September 2016 the agent contacted the authority informing it that the code compliance certificate application was submitted, and requested an update on the status of the certificate issue. The authority responded on the same day informing the agent that the application has been suspended “until the remedial items (noted recently) have been addressed to the [authority’s] satisfaction.”
- 3.10 The Ministry received an application for a determination on 27 October 2016.

4. The submissions

- 4.1 The agent disputes the authority's inspection outcome because it identifies the external envelope which they believe was already covered under the interim code compliance certificate.
- 4.2 The agent included copies of the following documents with the application:
- approved consented architectural drawings and specification
 - inspection records
 - interim code compliance certificate dated 2 February 2004
 - inspection outcome letter dated 23 June 2016
 - application for code compliance certificate dated 23 August 2016
 - producer statement (PS1) – Design and structural engineering calculations for the three townhouses
 - correspondence between the parties.
- 4.3 The authority acknowledged the determination on 12 December 2016 but made no submission in response.
- 4.4 A draft determination was issued to the parties for comment on 26 April 2017.
- 4.5 On 10 May 2017 the authority accepted the draft determination without comment.
- 4.6 On 17 May 2017 the agent accepted the draft determination without comment.

5. The expert's report

5.1 General

- 5.1.1 As mentioned in paragraph 1.5, I engaged an independent expert to assist me. The expert is a member of the New Zealand Institute of Building Surveyors and inspected the house on 13 February 2017. The expert's report was received on 21 March 2017, and was sent to the parties on the next day.
- 5.1.2 The expert noted his report was to provide information to the Ministry and was based on visual observations, non-invasive and invasive measurement of moisture content and the removal of framing samples for laboratory analysis.
- 5.1.3 The expert noted that the layout of the building is generally in accordance with the drawings in building consent No. SR102283 and as amended by SR112232, but differs in the following areas:
- Glazing was installed to enclose the first floor decks on the east elevation
 - Metal roof parapet cappings were installed instead of EIFS cappings
 - Various skylights were "blocked in" after construction.

5.2 Moisture investigations

- 5.2.1 The expert carried out a non-invasive inspection of the internal linings, visually observing no signs of moisture ingress. The moisture content readings of the internal linings of the external walls underneath the windows were inconsistent, with some low and others elevated.

5.2.2 Invasive moisture readings were carried out in various locations, including the areas where the non-invasive readings were elevated. The following readings were observed:

- East elevation – readings at the bottom plates between 14% - 27%, and underneath the window sill at 13%
- North elevation – readings ranging from 16% - 22%
- West elevation – readings ranging from 14% - 33%
- South elevation – one reading at 21%.

5.2.3 The expert's test results showed a variety of from 13% - 43%. The moisture content bands are defined⁸ as:

- Up to 18% - generally this level will not support timber decay
- 18% - 24% - indicate that problems exist, and a warning that remedial action is required
- 24% and above – readings of 24% - 35% will allow decay to initiate depending on the treatment of the timber. Once decay is established, there is a significant probability that ongoing decay can occur in the 18% - 24% range.

5.2.4 The expert noted that the readings were taken during summer, which generally results in lower results because of the “drying effect” of the warmer temperatures, and that winter readings were certain to be higher. Subsequently, the readings within the low band (up to 18%) do not necessarily indicate compliance with Clause E2.

5.2.5 The expert took four samples for analysis from areas adjacent to defects, but the two samples from north and west elevations were rotten and “crumbled into small pieces”. He also sent samples for analysis and the laboratory report dated 7 March 2017 noted the following:

- The fungal and decay types identified in the two samples suggest that the timber had been exposed to moisture conditions that “are inconsistent with sound building practice and/or weather-tight design” and recommended remediation.
- Sample 4 (taken from the bottom plate in the south elevation) contained “advanced decay” that often occurs beyond the sample and had “probably caused loss of the bulk of the original structural integrity in affected areas”. The report stated that replacement is typically recommended for timber framing in this condition.
- Sample 1 (taken from the bottom plate in the east elevation) contained “early stages of brown rot”. The report noted that untreated wood with brown rot “typically comes from framing with more serious decay very close by”
- Based on observations the conditions of the samples was consistent with exposure to at least “6-18 months of elevated moisture conducive to decay”.

⁸ Refer *Weathertightness: Guide to the Diagnosis of Leaky Buildings* (May 2011), Department of Building and Housing

5.3 Clauses E2 External moisture and B2 Durability

Base details

- 5.3.1 The expert observed that the EIFS cladding system was installed with a perforated plastic extrusion at the base. The clearance from the base of the cladding to the ground level was adequate on parts of the north and south elevations. However, there was “little or no clearance” to the ground or deck in other areas. Invasive testing to the framing in these areas resulted in elevated moisture readings over 20% indicating moisture ingress, which is likely due to the lack of clearance. The lack of clearance results in failure of the cladding to comply with the requirements of Clause E2.
- 5.3.2 The bottom edge of the plywood cladding had almost no clearance from the deck on the east elevation. The expert noted that the cladding was “soft and rotten in places”. From this location Sample 1 was obtained, and the presence of brown rot indicated a failure to comply with Clauses B2 and E2, and a risk of failure with Clause B1 if unrepaired.

Joinery details

- 5.3.3 The windows and doors in the EIFS cladding system were recessed and constructed in accordance with the manufacturer’s details. The expert observed that low uniform moisture readings were obtained from beneath the windows, and there is a “reasonable margin” for the moisture content in the timber to increase during the wetter months without it reaching a level at which decay will occur. The expert was satisfied that this was sufficient evidence that the window details were adequately performing in the EIFS cladding.
- 5.3.4 The doors installed in the plywood sheet cladding had aluminium head flashings installed. The jamb was installed overlapping the cladding but has not been sealed. The expert noted that the absence of an “effective seal” likely contributed to the elevated moisture content measured with a reading of 24%. This level is such that decay is likely and suggests that the jamb detail does not comply with Clauses E2 and B2.

Cladding junctions

- 5.3.5 The junction between a concrete blockwork retaining wall and the base of the EIFS cladding on the north elevation was invasively investigated. There was no indication of flashing to the junction, and the moisture content reading was elevated at 23%. The expert made a cut out which revealed “obvious water ingress...[and] rot in the bottom plate and bottom of a stud”.
- 5.3.6 This junction is failing to comply with Clauses E2 and B2, and the expert suggested the defects could have been caused by the construction of the retaining wall above the base of the cladding, and/or because the deck balustrade junction above was not sealed (see paragraph 5.3.12).
- 5.3.7 The vertical junction where the EIFS cladding abuts the concrete foundation because of a step down in level was investigated. The moisture content reading from the bottom plate in the interior was elevated at 21%, and this was where sample 4 was located. The advanced brown rot clearly indicates a failure to comply with Clauses E2 and B2.
- 5.3.8 The expert noted the failure was probably caused by the vertical junction of the EIFS cladding to the concrete foundation, and/or the deck balustrade junction above was not sealed (see paragraph 5.3.12).

- 5.3.9 The expert recommended that further investigation to both these areas would be necessary to clarify the contribution of these defects to the moisture ingress and establish the extent of the damage.

Sheet joints and cracks

- 5.3.10 Generally the expert observed that horizontal joint at midfloor level was constructed in accordance with the manufacturer's detail, with a bead of sealant applied outside the joint. The joint appears to have been adequate to accommodate thermal or moisture movement, as it was mostly free from cracks. However, the expert did identify cracks at each end of the staircase window on the south wall, and noted they would require further investigation.

Decks

- 5.3.11 The expert investigated the enclosed decks on the north-west and south elevations and the enclosed balustrades. Moisture readings taken from underneath the timber balustrade capping were elevated and the sample removed was rotten, crumbling during the extraction. The expert identified that the cause of the moisture ingress was likely to be the inadequate sealing of the handrail bracket fixing bolt through the capping.
- 5.3.12 Another defect identified was the lack of sealant or flashing to the junction of the enclosed balustrades to the EIFS cladding. The expert noted that the decay previously observed at the junctions were at locations directly below these deck balustrades, and moisture ingress from similar unsealed junctions is likely to have contributed to the elevated moisture levels and decay.

Roof

- 5.3.13 The roof had recently been overlaid with a new layer of membrane, which was carried out as part of the maintenance of the building. The applicant acknowledged that there was "at least one leak" and the expert observed stains on the ceiling below.
- 5.3.14 The expert identified that the slope on the roof and gutters towards the outlet was more than 1°. There were no "obvious bubbles or debonded areas" although it is too early to assess whether the bonding to the original layer is adequate. The expert noted that a bead of bitumen had extruded from the new lap joints in many locations, which indicates that it was heated sufficiently to melt the bitumen and achieve "good adhesion at the joints".
- 5.3.15 However, the expert identified that there were elements of the membrane roof and parapet construction that would not be considered good practice. The expert noted that some of the elements originated from the original construction of the roof. He recommended further investigation to demonstrate whether moisture ingress and possibly damage has been caused by past leaks and possible leaks in concealed locations because of details which do not comply with good practice.

5.4 Expert's conclusions

- 5.4.1 The expert concluded that the authority was correct to not issue a code compliance certificate because there are elements of the construction that have not met the requirements of the Building Code.
- 5.4.2 The expert stated that in order to bring the building into compliance with the Building Code the following repairs will be required:

- recladding and framing repairs to the whole of the east elevation at ground level
- recladding and framing repairs to parts of the north and south walls – extent to be determined by further investigation
- recladding and framing repairs to some or all of the cantilevered deck balustrades – extent to be determined by further investigation.

5.4.3 The expert noted that further investigation was necessary to identify:

- the extent of the failure at other locations where there is construction is similar to the following areas previously discussed:
 - inadequate separation between the base of the cladding and the deck/ground
 - inadequate sealing of the door jambs to the plywood sheet cladding
 - unflushed junctions between the retaining wall and the EIFS cladding
 - vertical junction between the EIFS cladding and the concrete foundation with no flashing and/or sealant
 - inadequate sealing of brackets fixed through the timber capping of the balustrade barrier walls
- any damage as a consequence of moisture ingress from roof defects prior to the additional membrane being laid
- any damage as a consequence of moisture ingress from parapet defects prior to repair
- any damage as a result of the cracks either side of the staircase window on the south elevation
- any damage to the deck framing which may have resulted from leaks to barrier walls.

6. Discussion

6.1 General

6.1.1 I note that the building consent considered in this determination was issued under the former Act, and accordingly the transitional provisions of the current Act apply when considering the issue of a code compliance certificate for work completed under this consent. Section 436(3)(b)(i) of the transitional provisions of the current Act requires the authority to issue a code compliance certificate only if it 'is satisfied that the building work concerned complies with the building code that applied at the time the building consent was granted'.

6.1.2 In order to determine whether the authority correctly exercised its power in refusing to issue a code compliance certificate for this house, I must therefore consider whether the house complies with the provisions of the Building Code that was in force when the consent was issued.

6.1.3 An application can be made to the authority for a modification of durability requirements to allow durability periods to commence from the date of substantial completion in February 2004. Although that matter is not part of this determination (see paragraph 1.6), I have taken the anticipated modification into account when considering the compliance of the house.

6.2 Compliance with Clause E2, B2 and B1

6.2.1 The evaluation of building work for compliance with the Building Code and the risk factors considered in regards to weathertightness have been described in numerous previous determinations (for example, Determination 2004/1).

6.2.2 This house has the following environmental and design features, which influence its weathertightness risk profile:

Increasing risk

- the house is in a very high wind zone
- walls are mostly clad in monolithic cladding that is directly fixed to the framing
- external wall framing is not treated to provide resistance to decay if it absorbs and retains moisture
- the roof to wall junction is fully exposed because of the parapets
- enclosed decks are located on the first floor

Decreasing risk

- the house has a relatively simple form.

6.2.3 Using the E2/AS1 risk matrix to evaluate these features, the elevations are assessed as having a high weathertightness risk rating. If details shown in the current E2/AS1 were adopted to show code compliance, a drained cavity would be required for the EIFS cladding for all elevations. However, this was not a requirement at the time of construction.

6.2.4 I consider the expert's report establishes that the current performance of the building envelope is not adequate because there is evidence of moisture penetration into several areas of the timber framing. Consequently, I am not satisfied that the cladding complied with Clause E2 of the Building Code that was current at the time the building consent was issued.

6.2.5 Given the damage to the timber framing, and the laboratory analysis, I am satisfied that the cladding has not complied with Clause E2 for an extended period of time. The level of obvious decay to the bottom plate and the likelihood of further hidden damage to untreated framing behind linings brings into question whether the building complies with Clause B1.

6.2.6 The house is required to comply with the durability requirements of Clause B2, which requires a building to satisfy all the objectives of the Building Code throughout its effective life. The durability requirements of Clause B2 include a requirement for wall claddings to remain weathertight for a minimum of 15 years and for timber framing to remain structurally adequate for a minimum of 50 years.

6.2.7 Although the wall claddings are now 13 years old, the expert's investigations revealed evidence of moisture ingress over an extended period. Because of the decay damage apparent to the bottom plate and the likelihood of further undiscovered damage, I am therefore satisfied that the timber framing has not complied with Clause B2 insofar as it applies to Clauses B1. The evidence of current and past moisture penetration also satisfies me that the wall claddings have not complied with Clause B2 insofar as it applies to E2.

6.3 The remaining authority's concerns

6.3.1 Taking account of the expert's report, Table 1 summarises my conclusions on the compliance matters identified for this house by the authority:

6.4 Table 1: Conclusions on compliance matters

Area of concern	Comments	Conclusion
Enclosed safety barriers – timber caps with top fixings	<ul style="list-style-type: none"> Rotten framing found underneath the timber capping Potential loss of rigidity depending on the extent of the rotten framing 	Investigation and repairs required
"Cracking" evident in some areas of the external wall cladding. Some damage to the texture coating was evident in some areas	<ul style="list-style-type: none"> Cracking to the staircase window and skylights were observed 	Further investigation required
Some of the [plywood sheet] cladding has been affected by moisture ingress	<ul style="list-style-type: none"> Inadequate separation between the deck and the cladding 	Investigation and repairs required
No separation between the timber deck on the seaward elevation	<ul style="list-style-type: none"> Inadequate separation between the deck and the cladding. The deck at the ground level is shown on the building consent documents for SR 112232 (a code compliance certificate has been issued for this work) 	Outside this determination as the work has code compliance certificate
The performance of the membrane and various penetrations on the roof	<ul style="list-style-type: none"> The roof has been constructed not in accordance with good practice Repairs have been carried out as the roof leaked 	Further investigation required
Some of the skylights have been removed	<ul style="list-style-type: none"> No indication that the skylights that were blocked in are failing 	The consent will need to be amended through a formal amendment or minor variation
Some of the timber decking has not been affected by moisture ingress	<ul style="list-style-type: none"> Ground floor deck to the east is outside the scope of the determination as a code compliance certificate has been issued 	Outside this determination as the work has code compliance certificate
Hose tap penetration is not sealed	<ul style="list-style-type: none"> Not sighted by the expert If not sealed, it will require sealing to prevent moisture ingress 	Further work required
Lagging to the hot water pipes requires UV protection	<ul style="list-style-type: none"> Not sighted 	Further work required
The 65mm diameter pipe penetration requires vermin proofing	<ul style="list-style-type: none"> The expert agrees that vermin proofing is required 	Further work required

7. What happens next?

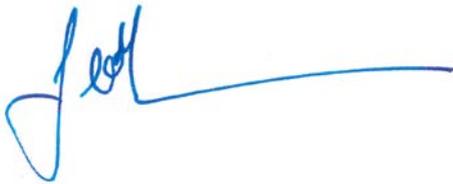
7.1 The applicants should produce a detailed proposal to address the matters of non-compliance and investigation for the areas identified herein, produced in conjunction with a suitably competent person. Any items of disagreement can then be referred to the Chief Executive for a further binding determination.

7.2 A code compliance certificate will be able to be issued once these matters have been rectified and the matter of amending the building consent to modify Clause B2.3.1 has been resolved.

8. The decision

- 8.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the building envelope to the dwelling does not comply with the Building Code that was current at the time the consent was issued in respect of Clauses E2 and B2. Accordingly, I confirm the authority's decision to refuse to issue a code compliance certificate for the dwelling.
- 8.2 There is insufficient evidence to determine whether the timber framing of the building complies with Clause B1 Structure.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 23 May 2017.



John Gardiner
Manager Determinations and Assurance