



Determination 2010/041

Refusal to issue a code compliance certificate for a 6-year-old house with monolithic cladding at 10 Gold Street, Albany, North Shore



1. The matters 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, Department of Building and Housing (“the Department”), for and on behalf of the Chief Executive of that Department. The applicant is the owner, Jurassic Properties Ltd (“the applicant”), and the other party is the North Shore City Council (“the authority”), carrying out its duties as a territorial authority or building consent authority.
- 1.2 This determination arises from the decision of the authority to refuse to issue a code compliance certificate for a 6-year-old house because it was not satisfied that it complied 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 Department are all available at www.dbh.govt.nz or by contacting the Department on 0800 242 243.

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

1.3 The matter to be determined³ is therefore whether the authority was correct to refuse to issue a code compliance certificate. In deciding this, I must consider:

1.3.1 Matter 1: The external envelope

Whether the external claddings to the house (“the claddings”) comply with Clause B2 Durability and Clause E2 External Moisture of the Building Code. The claddings include the components of the systems (such as the monolithic wall cladding, the windows, the roof cladding and the flashings), as well as the way the components have been installed and work together. (I consider this matter in paragraph 6.)

1.3.2 Matter 2: Compliance with other Building Code requirements

Whether certain other building elements comply with Clause B1 Structure, taking into account the findings on Matter 1; and Clause E3 Internal Moisture, regarding concerns identified by the authority. (I consider these in paragraph 7.)

1.3.3 Matter 3: The durability considerations

Whether the elements that make up the building work comply with Building Code Clause B2 Durability, taking into account the age of the house. (I consider this matter in paragraph 8.)

1.4 In making my decision, I have considered the submissions of the parties, the report of the expert commissioned by the Department to advise on this dispute (“the expert”) and the other evidence in this matter. I have evaluated this information using a framework that I describe more fully in paragraph 6.1.

2. The building work

2.1 The building work consists of a two-storey house with an attached single-storey garage, which is situated on a gently sloping site in a medium wind zone for the purposes of NZS 3604⁴. Construction is generally conventional light timber frame, with a concrete slab, monolithic wall cladding, aluminium windows and bituminous shingle roofing. The house has a moderate weathertightness risk (see paragraph 6.2).

2.2 The house is L-shaped in plan, with the corner angled at 45°. A two-storey high entry canopy, supported on monolithic-clad columns, extends from the internal corner of the ‘L’. The house has 28° pitch hipped and gabled roofs that have eaves and verges of more than 600mm overall, with the roof of the single-storey garage intersecting with upper walls. A free-draining timber deck is attached to the ground floor north wall of the living areas and extends around the northeast corner.

2.3 The cladding system to the walls is a form of monolithic cladding system known as EIFS⁵. The proprietary EIFS system consists of 40mm polystyrene backing sheets fixed over polystyrene battens to the framing over the building wrap and finished with a proprietary coating system. The 20mm thick grooved polystyrene battens form a cavity between the cladding sheets and the building wrap. The cladding system includes purpose-made flashings to windows, edges and other junctions.

³ Under section 177(b)(i) of the Act

⁴ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

⁵ Exterior Insulation and Finish System

- 2.4 The expert was able to sight the wall framing at the entry canopy gable wall, noting that markings indicated that the timber was kiln-dried untreated radiata pine. The expert also took timber samples from exterior wall framing and forwarded them to a testing laboratory for analysis, and the biodeterioration consultant's analysis confirmed that the samples were untreated. Given this evidence, I consider that the wall framing of this house is not treated.

3. Background

- 3.1 The authority issued a building consent (No. BB/08322/02) on 21 October 2002 under the Building Act 1991 to a development company. The consent conditions required certain inspections, including for the foundations and floor slab.
- 3.2 The inspection records indicate that the floor slab and foundations were constructed during November 2002. It appears likely that the framing was erected during December 2002.
- 3.3 It appears that construction then stopped, with the timber wall and roof framing left exposed to the weather until the applicant purchased the property in May 2003. Construction is likely to have recommenced in about July 2003, as the earliest record I have seen is that of a pre-line plumbing inspection on 25 August 2003.
- 3.4 Based on the above assumptions, it is likely that the timber framing was left exposed to the weather for at least six months. It appears that the authority's inspectors were concerned about the exposure, as the inspection record for the pre-line building inspection on 8 September 2003 includes a requirement to 'provide certification of condition of timber framing'. There is no record that certification was provided.

3.5 The final inspections

- 3.5.1 The authority carried out a final inspection on 21 November 2003, with the inspection records listing 8 items for the plumbing and drainage inspection and 17 outstanding items for the building inspection ("field memos 45924+45925").
- 3.5.2 No further inspections were carried out until 2007, when the authority re-inspected the building work on 6 July 2007. The plumbing and drainage inspection record noted that 4 items were still outstanding, while the building inspection record noted:

1. Field memos 45924+45925 not completed.
2. A separate water tightness inspection will also be required – see letter.
3. A letter from a timber consultant is required in relation to the timber framing.
4. Supply further producer statement for internal waterproofing, external waterproofing.
5. Electrical certificate required.
6. Bathroom upstairs is showing signs of water ingress to the framing – floor to be remedied.

(I assume that item 3 refers to the timber framing left exposed during construction.)

- 3.5.3 Although I have not seen a copy, the letter referred to in item 2 above is likely to be a standard letter given to the applicant to explain the reasons that this particular

authority requires a weathertightness inspection for any building with any type of monolithic cladding without a cavity.

- 3.5.4 I am not aware of any further correspondence until the applicant sought a code compliance certificate in 2009, and the authority carried out its weathertightness inspection of the house on 26 February 2009.

3.6 The authority's decision

- 3.6.1 In a letter to the owner dated 23 March 2009, the authority seemed to consider the EIFS to be 'direct fixed monolithic' cladding. The authority explained that the 'allowance of moisture ingress, together with the use of untreated timber framing, has become a major problem to the structural integrity of buildings' and it now usually required 'invasive moisture testing and investigation' in order to be satisfied about the compliance of direct fixed monolithic cladding systems.

- 3.6.2 The authority listed 15 risk factors identified with the building. I note that one risk factor incorrectly referred to the lack of a cavity, despite the list of defects that followed referring to a 'cavity closer'. Another risk factor incorrectly referred to 'eaves width', despite the roof projections being more than 600mm overall.

- 3.6.3 The authority stated that its inspection had identified the following defects:

1. Cavity closer missing at bottom of column
2. PVC base channel missing at bottom of column
3. Timber framing exposed at bottom of column
4. The cladding is damaged in places, with unsealed holes
5. Some cladding is in contact with finished paved areas
6. Finished ground levels are too high in places, relative to floor level
7. Seal around meter box is failing
8. No scribe has been fitted to garage hinged door/blockwork junction
9. Extensions to bottom of garage door jambs are in contact with the concrete drive surface
10. Clearance is inadequate between decking and cladding in places
11. Exhaust duct grille is not protected by a weather cowl
12. Some silicone sealant has not been painted over
13. Spouting has dropped at external corner outside bedroom 4.

The authority also identified the sealing of shower linings as requiring attention, which relates to Clause E3.

- 3.6.4 The authority concluded that, due to the risk factors, the identified defects and the age of the building, it was:

...not satisfied on reasonable grounds that the installed cladding systems comply with clause E2 External Moisture and clause B2 Durability of the New Zealand Building Code, or that all other elements comply with B2, considering the age of construction.

- 3.6.5 As a 'way forward', the authority advised the engagement of an 'appropriately qualified and experienced consultant' to investigate the weathertightness of the cladding, identify any elevated moisture levels in the exterior framing and propose remedial work if necessary. The authority stated that, providing all required remedial work was satisfactorily completed within a year, a code compliance

certificate would be issued that applied from the date of substantial completion (suggested as 1 December 2003).

3.6.6 The authority noted that if the applicant chose not to follow the above process, an application for a determination could be made, noting:

The matters for determination would be compliance with E2 External Moisture for the cladding systems as installed, and B2 Durability for all elements of your building.

3.7 The Department received an application for a determination on 20 November 2009.

4. The submissions

4.1 The applicant made no submission and forwarded copies of:

- the drawings and specification
- the building consent documentation
- some of the inspection records
- the letter dated 23 March 2009 from the authority.

4.2 The authority made no submission.

4.3 A determination was issued to the parties for comment on 9 April 2010. The applicant accepted the draft on 14 April 2010, based on that acceptance being 'without prejudice as further testing is to be carried out' which may influence the extent of remedial work needed.

4.4 The authority accepted the draft determination on 1 May 2010, providing copies of:

- the inspection records
- the weathertightness inspection report
- various other statements and information.

4.5 I have considered the above information and amended the determination as I consider appropriate.

5. The expert's report

5.1 As mentioned in paragraph 1.4, I engaged an independent expert to assist me. The expert is a member of the New Zealand Institute of Building Surveyors. The expert inspected the house on 20 January and 5 February 2010 and provided a report that was completed on 10 February 2010.

5.2 General

5.2.1 The expert noted that the overall quality of the cladding appeared generally good except for items noted in paragraph 5.6, with the cladding surface having no apparent cracking and a 'good even texture and paint coating'.

- 5.2.2 The expert noted the following changes from the consent drawings:
- 60mm EIFS replaced with 40mm EIFS fixed over 20mm battens.
 - Pressed metal roof tiles replaced with fibre reinforced bitumen shingles.
 - Concealed fascia gutter system replaced with conventional gutters.
 - Changes to the size and shape of the timber deck.
- 5.2.3 Although the expert noted no visible evidence that that control joints had been installed, I note that there are no walls beyond the limits specified for control joints by the manufacturer of the particular EIFS cladding called for in the specification.
- 5.2.4 The expert noted that the framing had been left exposed for a prolonged period during construction, and observed water stains to roof framing. At the cut-outs described in paragraph 5.4, the timber appeared greyish and weathered.

5.3 Windows and doors

- 5.3.1 The curved window head above entry doors has a metal head flashing, but is sheltered beneath the entry canopy. The remaining windows and doors have proprietary uPVC head flashings, with slots to vent and drain the cavity above.
- 5.3.2 The expert removed a small section of coating at the sill to jamb intersection of the south office window, noting that proprietary jamb and sill flashings were installed, with soakers at the junctions (although limited overlaps were provided).

5.4 Cladding cut-outs and decay analysis

- 5.4.1 The expert also removed small sections of cladding (“cut-outs”) from a number of areas to inspect the underlying construction, the condition of the framing timber and to take timber samples from bottom plates suspected to have decay.
- 5.4.2 Cut-outs were made at the following areas:
- cut-out 1: below the gas water heater (sample 1)
 - cut-out 2: below the electrical meter box (sample 2)
 - cut-out 3: to the right of the garage door (sample 3)
 - cut-out 4: to the right of the lounge north doors (sample 4)
 - cut-out 5: to the right of the laundry door (sample 5, which contained ‘some obvious decay’ and was therefore not tested further).
- 5.4.3 Samples 1 to 4 were forwarded to a testing laboratory for decay and preservative analysis. The report dated 9 February 2010 noted that no treatment was detected in the two samples tested for preservative.
- 5.4.4 The laboratory’s report also found that:
- sample 2 contained minor fungal growth but no established decay.
 - samples 1, 2 and 4 contained brown rot and ‘would have lost structural integrity due to fungal decay and should be replaced’.

5.5 Moisture levels

- 5.5.1 The expert inspected the interior of the house and took non-invasive moisture readings, with no 'significantly elevated moisture readings showing', although minor rust to carpet fixings in the upstairs lounge was noted.
- 5.5.2 However the expert noted moisture damage at the shower/wall junction in the ensuite bathroom and lifted the carpet edges on the other sides of the interior walls, noting rusted carpet fixings in the master bedroom and the corridor.
- 5.5.3 The expert also took invasive moisture readings through the cladding into the framing at areas considered at risk and noted that most readings were low, which he considered to be due to the 'prolonged dry summer period'. The expert also took cut-outs from various areas and evidence of current or past elevated moisture levels was as follows (corrected for untreated radiata pine):
- 33% in the bottom plate at the garage door, with decay confirmed in sample 5
 - 21% in the bottom plate at the laundry door, with visible decay in sample 3
 - 15% in the bottom plate below the gas heater, but decay confirmed in sample 1
 - 17% in the bottom plate below the meter box, but fungi noted in sample 2
 - 15% in the bottom plate at the lounge doors, but decay confirmed in sample 4.
- 5.5.4 Moisture levels above 18% generally indicate that external moisture is entering the structure. However, the dry weather combined with the presence of decay and fungal growth in samples with moisture levels below 18% indicated that some currently 'low' readings are likely to be elevated during winter periods.
- 5.6 Commenting specifically on the external envelope, the expert noted that:
- there are insufficient clearances from the cladding to the ground or paving beside the garage door, the entry door and the rear laundry door
 - unsealed holes and damage to the cladding in some areas
 - some maintenance is needed to the roof, including additional sealants to the ends of the apron flashings and gutters cleared of debris.
- 5.7 Commenting on compliance with Clause E3 Internal Moisture, the expert noted that:
- the shower cubicle to the ensuite bathroom is leaking, with signs of damage to the linings and corroded carpet fixings to the other sides of adjacent walls
 - the cause of the decay found beside the laundry door needs investigation, as it may be the result of a plumbing leak rather than exterior moisture.
- 5.8 The expert did not report on the defects identified by the authority in paragraph 3.6.3.
- 5.9 A copy of the expert's report was provided to the parties on 10 February 2010.

Matter 1: The external envelope

6. Weathertightness

6.1 The approach in determining whether building work is weathertight and durable and is likely to remain so, is to examine the design of the building, the surrounding environment, the design features that are intended to prevent penetration of water, the cladding system, its installation, and the moisture tolerance of external framing.

6.2 Weathertightness risk

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

Increasing risk

- the house is two-storeys over about three quarters of the plan
- although fairly simple in plan and form, there are some complex junctions
- the external wall framing is not treated to a level that provides resistance to decay if it absorbs and retains moisture

Decreasing risk

- the house is in a medium wind zone
- the only deck is free-draining and attached to the ground floor
- the walls have monolithic cladding fixed through battens to the framing
- the walls have eaves and verges to shelter the cladding.

6.2.2 When evaluated using the E2/AS1 risk matrix, these features show that all elevations of the house demonstrate a moderate weathertightness risk rating. I note that the cladding to this house is installed over a cavity, in accordance with the current general requirements of E2/AS1. I also note that a drained cavity for EIFS cladding was not a requirement of E2/AS1 at the time of construction of this house.

6.3 Weathertightness performance

6.3.1 Despite the relatively minor type and extent of defects identified by the authority and the expert, the significant level of timber damage to the framing indicates that the external envelope is currently (and/or has been in the past) unsatisfactory in terms of its weathertightness performance.

6.3.2 While the cladding is installed over a cavity and appears to generally accord with the manufacturer's recommendations at the time, I have the following concerns about the condition of the underlying wall framing:

- High levels of current and recent moisture entry to the bottom plates are apparent, despite low moisture readings in some areas.
- In three areas, fungal decay has been confirmed along with a loss of structural integrity of the timber samples, indicating that replacement is necessary.

- In another area, decay was visually obvious with no need for further testing.
- At all areas where cut-outs were made, dark, weathered timber with water marks and timber damage was apparent.
- The full extent and level of decay in adjacent and other areas is unknown (refer also paragraph 7.1).

6.3.3 The significant level of damage apparent to the framing indicates either:

- the damage was initiated during the prolonged exposure of the framing, and/or
- the damage is due to a systemic failure of the cladding system.

6.3.4 Further work will be necessary to investigate the over all condition of the framing and which of the above items in paragraph 6.3.3 is the main cause of the damage. Extensive investigation should include a systematic survey of all risk locations, to determine the full extent of moisture penetration, timber damage and the repairs required. Depending on the cause considerable work may be required to make the building code compliant.

6.4 Weathertightness conclusion

6.4.1 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 and established decay in at least four areas. Consequently, I am satisfied that the house does not comply with Clause E2 of the Building Code.

6.4.2 In addition, the building envelope is also required to comply with the durability requirements of Clause B2. Clause B2 requires that a building continues to satisfy all the objectives of the Building Code throughout its effective life, and that includes the requirement for the house to remain weathertight. Because the cladding faults on the house are likely to allow the ingress of moisture in the future, the building work does not comply with the durability requirements of Clause B2.

6.5 I consider that final decisions on whether code compliance can be achieved by either remediation or re-cladding, or a combination of both, can only be made after a more thorough investigation of the cladding and the condition of the underlying timber framing. This will require a careful analysis by an appropriately qualified expert, and should include a full investigation of the extent, level and significance of the timber decay to the framing. Once that decision is made, the chosen remedial option should be submitted to the authority for its approval.

6.6 I note that the Department has produced a guidance document on weathertightness remediation⁶. I consider that this guide will assist the owner in understanding the issues and processes involved in remediation work to the EIFS cladding in particular, and in exploring various options that may be available when considering the upcoming work required to the house.

6.6.1 I also note that the expert has raised several items of ongoing maintenance to the external envelope. Effective maintenance of claddings is important to ensure

⁶ External moisture – A guide to weathertightness remediation. This guide is available on the Department's website, or in hard copy by phoning 0800 242 243

ongoing compliance with Clauses B2 and E2 of the Building Code and is the responsibility of the building owner. The Department has previously described these maintenance requirements, including examples where the external wall framing of the building may not be treated to a level that will resist the onset of decay if it gets wet (for example, Determination 2007/60).

Matter 2: Compliance with other Building Code requirements

7. The structure and internal moisture

7.1 The condition of the framing

- 7.1.1 Taking into account the expert's report and the results of the decay analysis of samples as outlined in 5.4, I am satisfied that parts of the exterior framing of the house have lost structural integrity due to fungal decay.
- 7.1.2 I note the concerns raised by the authority about the prolonged exposure of the timber framing during the pre-line inspection in 2003 (refer paragraph 3.4) and the request for verification of the condition of the timber framing sought at that time. I consider this was a reasonable request to make. In addition I note that parts of the internal framing may also be damaged by the effects of internal moisture (refer paragraph 7.2).
- 7.1.3 As discussed in paragraph 6.3.2, the cause(s), extent, level and effect of the timber damage is not known and considerable investigation and remedial work is required. I therefore conclude that the timber wall framing does not comply with the requirements of Clause B1 Structure.
- 7.1.4 In addition, the building structure must also comply with the durability requirements of Clause B2 and continue to comply with the structural requirements throughout its effective life, which in the case of the framing is 50 years. Because the damage to the timber framing may also affect its structural performance in the future, the building work does not comply with the durability requirements of Clause B2.

7.2 Internal moisture

- 7.2.1 I also note the expert's comments in paragraph 5.7, I consider that the following items require attention:
- the inadequate waterproofing of the ensuite show cubicle
 - the possible plumbing leak within the laundry wall.
- 7.2.2 I therefore conclude that the house does not comply with the requirements of Clause E3 Internal Moisture.

Matter 3: The durability considerations

8. Discussion

- 8.1 The authority has concerns about the durability, and hence the compliance with the Building Code, of certain elements of the building taking into consideration the completion of the building work during 2003.
- 8.2 The relevant provision of Clause B2 of the Building Code requires that building elements must, with only normal maintenance, continue to satisfy the performance requirements of the Building Code for certain periods (“durability periods”) “from the time of issue of the applicable code compliance certificate” (Clause B2.3.1).
- 8.3 In previous determinations (for example Determination 2006/85) I have taken the view that a modification of this requirement can be granted if I can be satisfied that the building complied with the durability requirements at a date earlier than the date of issue of the code compliance certificate, the date being one that is agreed between the parties. However, in conjunction with this I also need to consider the nature and extent of the defects, the length of time that they may have been evident, and their consequential impact on the building’s compliance with other Building Code clauses, particularly Clauses B1 Structure and E2 External Moisture.
- 8.4 Because of the extent of further investigation required into the building’s timber framing and therefore its structure, and the potential impact of such an investigation on the external envelope, I am not satisfied that there is sufficient information on which to make a decision about this matter at this time.

9. What is to be done now?

- 9.1 The authority should re-inspect the house and issue a notice to fix that requires the owners to bring the house into compliance with the Building Code, including the defects identified in paragraphs 5.6, 7.1.3 and 7.2.1 and confirming any defects remaining from the authority’s identified defects (see paragraph 3.6.3), but not specifying how those defects are to be fixed. It is not for the notice to fix to specify how the defects are to be remedied and the building brought to compliance with the Building Code. That is a matter for the owners to propose and for the authority to accept or reject.
- 9.2 In addition, the notice to fix should require a full investigation into the cause(s) of the confirmed and likely decay in the timber framing, referring to the issues identified in paragraph 6.3.2. The notice should also refer to the need for laboratory testing of framing samples to establish the full extent, levels and structural significance of decay to the framing.
- 9.3 I suggest that the parties adopt the following process to meet the requirements of paragraph 9.1. Initially, the authority should issue the notice to fix. The applicant should then produce a response to this in the form of a detailed proposal, produced in conjunction with a competent and suitably qualified person, as to the investigation and rectification or otherwise of the specified matters. Any outstanding items of

disagreement can then be referred to the Chief Executive for a further binding determination.

10. The decision

10.1 In accordance with section 188 of the Building Act 2004, I hereby determine that:

- the external building envelope does not comply with Building Code Clauses E2 and B2 (insofar as it applies to E2)
- the timber framing does not comply with Building Code Clauses B1 and B2 (insofar as it applies to B1)
- the house does not comply with Clause E3 of the Building Code

and accordingly, I confirm the authority's decision to refuse to issue a code compliance certificate.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 11 May 2010.

John Gardiner
Manager Determinations