



Determination 2011/004

Refusal to issue a code compliance certificate for a 10-year-old house at 8 Remu Place, Greenhithe, Auckland



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, L Homburg (“the applicant”) and the other party is the Auckland Council² (“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 and to issue a notice to fix for a 10-year-old house because it was not satisfied that it complied with certain clauses³ of the Building Code (First Schedule, Building Regulations 1992). The authority had concerns about the compliance of the building work relating primarily to the weathertightness of the exterior building envelope.

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 After the application was made, and before the determination was completed, North Shore City Council was transitioned into the Auckland Council. The term authority is used for both.

³ 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 determined⁴ is therefore whether the authority was correct to refuse to issue a code compliance certificate and to issue the notice to fix dated 18 April 2005. 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 board and batten 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: 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 The notice to fix also cited a contravention of Clause F4 Safety from falling. The item identified in the notice to fix is included in paragraph 7.1.

1.5 In making my decision, I have considered the submissions of the parties, the ‘MDC House Evidential Report’ dated 6 May 2010 (which provided the results of monitoring the moisture detection system installed by the applicant), the report of the expert commissioned by the Department to advise on this dispute (“the expert”) and the other evidence in this matter.

2. The building work

2.1 The building work consists of a two-storey house situated on a sloping excavated site in a wind zone that is assumed to be medium for the purposes of NZS 3604⁵. Apart from some specifically engineered elements, construction is generally conventional light timber frame, with concrete foundations and floor slabs to the south and west and timber pole foundations to the remaining area.

2.2 The house has a mix of monolithic and timber board and batten wall claddings, aluminium windows, and profiled metal roof cladding. The plan is a fairly simple ‘L’ shape, with a 40° pitch gabled and hipped roof that extends down over projecting ground floor walls on the east elevation. Eaves are more than 600 mm overall, with no verges above the eastern projections. The house is assessed as having a low to high weathertightness risk (see paragraph 6.2).

2.3 A cantilevered deck, with a liquid-applied membrane floor and open metal balustrades, extends to the north from the upper level master bedroom. The deck structure is formed from cantilevered steel beams, timber infill framing and a plywood substrate.

⁴ Under section 177(b)(i) of the Act (prior to 7 July 2010)

⁵ New Zealand Standard NZS 3604:1999 Timber Framed Buildings.

2.4 The expert provided evidence from a technologist that samples taken from the exterior framing contained no detectable treatment and were 'most likely untreated perishable radiata pine'. Given this evidence and the date of construction in 1999, I consider that the exterior wall framing is untreated.

2.5 The wall claddings

2.5.1 The wall cladding to the east, south and west lower walls and to the two-storey wall at the north garage is a monolithic cladding system described as stucco plaster over a solid backing. In this instance it consists of 4.5mm fibre-cement sheets fixed through the building wrap directly to the framing timbers, and covered by a slip layer of building wrap, metal-reinforced solid plaster and a flexible paint coating.

2.5.2 The remaining walls are clad in cedar boards and battens, with bevel backed weatherboards installed below the two north gable ends. The cladding is fixed through the building wrap directly to the framing timbers. Cedar boards are used as facings around all windows and doors. A cedar trellis screens the upper part of the two-storey-high void in the main entry porch, above a cedar-clad flying beam.

3. Background

3.1 The authority issued a building consent (No. A13999) for the house to the original owner on 8 February 1999 under the Building Act 1991.

3.2 The authority carried out various inspections during construction, including footing inspections in March 1999, pre-line and pre-plaster inspections in July 1999. The last construction inspections were post-line during August 1999. A weathertightness inspection was carried out on 31 March 2005.

3.3 The notice to Fix

3.3.1 In a letter to the original owner dated 19 April 2005, the authority attached a notice to fix dated 18 April 2005 and stated that the notice 'sets out required remedial work for issues identified during a building inspection carried out on 31 March 2005'.

3.3.2 The notice to fix stated that the 'Particulars of contravention or non-compliance' were:

- Defects with cedar facings and plaster cladding junctions
- Missing control joints
- Meter box not flashed
- Pipe and cable penetrations not sealed
- Head flashing missing to garage door jamb

In summary, there are many defects, but even with these remedied, Council believes the cladding system as installed will not achieve compliance with clauses E2 or B2 of the New Zealand Building Code. Therefore you are required to forward an amended plan application to reclad the stucco areas.

3.3.3 The notice to fix also outlined some other areas requiring attention along with outstanding documentation, including items identified during a final plumbing and drainage inspection carried out on 18 March 2005. Areas associated with the matters considered in this determination related to finished grounds levels and the barrier to the internal stairs.

3.4 The remedial work

3.4.1 Following correspondence and discussions with the authority, on 15 June 2005 the original owner submitted proposals for some remedial work to the stucco cladding (“the repair details”). I have seen no records of the authority’s response.

3.4.2 The original owner apparently met with the authority to discuss the repair details and to present a case that the stucco cladding did not need to be replaced. I have seen no record of the authority’s response to that meeting.

3.4.3 The situation remained unresolved until the original owner planned to sell the house in 2009 and commenced the remedial work. According to the applicant, the original owner met with the authority in April 2009 and:

...was verbally advised that should a determination prove that the solid plaster cladding system as installed, complete with enclosed rectification works, was satisfactory, a Code of Compliance would be forthcoming.

3.4.4 The applicant purchased the house in June 2009 and it appears that the remedial work commenced by the original owner was then completed, with photographs taken during and following the repairs. Based on the repair details and the photographs, the repairs appear to have included:

- windows and doors in the stucco cladding:
 - facings removed, new sill flashings installed to windows
 - liquid membrane product applied to the fibre-cement backing sheets and over the sill flashing upstands
 - silicon sealant applied to backing sheet/stucco junctions
 - timber facings replaced or reinstalled, using adhesive
 - copper flashing installed to the garage door head
- control joints (visible in photographs)
 - vertical control joints installed to the south and west ground floor walls, in line with window jambs
 - horizontal control joints installed at the garage door head and the north deck doors
- penetrations through the stucco
 - head flashing to top of meter box and sealants to sides
 - uPVC pipe covers glue-fixed at cladding penetrations
 - deck handrail fixings to walls sealed
- some ground levels lowered to increase cladding clearances
- all stucco cladding repainted.

3.5 The moisture detection system

- 3.5.1 The applicant engaged a company to install a moisture detection system in the framing. This involved the installation of permanent moisture detection units (“MDUs”) in the stucco-clad walls only. Twenty-four probes were inserted into the bottom plates of ground floor walls and seven probes in the first floor stucco-clad north wall of the master bedroom. The probes record moisture content at about 4mm from the outer face of the bottom plates.
- 3.5.2 The probes are periodically monitored and provide information on the moisture content of the timber at those locations. The moisture detection company reported on the results in a ‘House Evidential Report’ dated 6 May 2010, which noted the following general moisture readings:
- 8% to 11% on the north and west elevations
 - 14% to 17% on the south elevation
 - 14% to 19% on the east elevation (the dining room wall).
- 3.6 The Department received an application for a determination on 1 July 2010.

4. The submissions

- 4.1 In a letter and summary statement accompanying the application, the applicant outlined his understanding of the background to the situation noting the ‘lengthy and spasmodic approach’ to resolving code compliance issues prior to his purchase of the house. The applicant noted that the ‘slightly elevated’ moisture levels to the south were due to the proximity of a high retaining wall and trees, while those beside the dining room doors had been rectified by altering steps to clear the cladding.
- 4.2 The applicant forwarded copies of:
- the consent drawings and specifications
 - the authority’s inspection summary
 - the notice to fix dated 18 April 2005
 - some correspondence from the original owner to the authority
 - the moisture monitoring report dated 6 May 2010
 - photographs taken during and following cladding repairs
 - various producer statements and other information.
- 4.3 The authority made no submission in response to the application.
- 4.4 The draft determination was issued to the parties for comment on 16 September 2010. The applicant accepted the draft without comment. The authority accepted the draft determination in a response received on 28 January 2011. The response included a copy of the weathertightness inspection report dated 31 April 2005, and the ‘Inspectors Field Inspection Sheet’ which recorded all completed inspections. The submission also noted some typographical errors. I have amended the determination accordingly.

5. The expert's report

5.1 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. The expert inspected the house on 23 July 2010 and provided a report dated 27 August 2010.

5.2 General

5.2.1 The expert noted that the house generally appeared to be constructed in accordance with the consent drawings, taking into account amended elevations dated 24 June 2010. The expert also noted that the house appeared to be generally well maintained. (I note that the stucco was repainted following the recent remedial work.)

5.2.2 Apart from items outlined in paragraph 5.7, the expert noted that the claddings were in 'reasonable condition', with the cedar cladding 'well constructed' except at joinery openings. The expert also noted that the copper flashing at the inter-storey junction between the board and battens and the stucco appeared satisfactory.

5.3 Windows and doors – stucco cladding

5.3.1 The windows and doors are face-fixed against the fibre-cement backing sheets and bordered with cedar facings fixed to the backing sheets and flush with the plaster surface. The expert removed facings from the south bathroom window to observe the underlying construction. The edge of the solid plaster at the junction with the facing boards is trimmed with a galvanised metal strip, with sealant applied at the junction of the strip with the backing sheets.

5.3.2 The retro-fitted sill flashing underlaps the sill flange, overlaps the backing sheets at the sides and butts against the metal edge strip to the plaster, with silicon applied at the junctions. The remedial membrane was liquid-applied over the fibre-cement and the flashing upstand. The sill facing is fixed against the sill flashing upstand, with the flashing extending to overlap the lower plaster.

5.3.3 The head flashing underlaps the upper backing sheet and overlaps the jamb facings, finishing in line with the outer edges of the jamb facings. The head facing is fixed over the flashing and projects beyond the jamb facings.

5.3.4 The expert removed a small section of plaster at the bottom plate below the jamb to sill junction of the window, noting mould and stains on the back of the cladding and visible decay in the framing. A sample was sent to a testing laboratory, which reported that the timber contained 'advanced decay that had caused loss of the bulk of the original structural integrity'.

5.4 Windows and doors – board and batten cladding

5.4.1 The joinery in the board and batten cladding is face-fixed against the boards, with the battens butting into cedar facings bordering the windows. The expert removed the facings from the south kitchen window to observe the underlying construction.

5.4.2 The expert observed seals behind the jamb flanges and the metal head flashing underlapping the upper boards. The window sill flange overlaps the lower boards, with the sill facing board fixed directly below the window flange.

- 5.4.3 A sample was taken from the bottom plate at the external corner below the jamb to sill junction of the window and forwarded to a testing laboratory for decay and preservative analysis. The laboratory reported that the timber contained 'incipient brown rot' and was 'marginal in terms of replacement'.

5.5 The deck

- 5.5.1 The expert noted that the liquid-applied deck membrane sloped towards the wall, with an internal gutter leading to an outlet. The uprights to metal balustrades at the curved deck edge are fixed vertically through the substrate, with the membrane extended over the top of the base fixing plates.
- 5.5.2 The expert removed a section of the tongue-in-groove soffit lining to observe the underlying deck framing and substrate. The expert noted that the deck was supported on cantilevered steel beams with timber infill framing. The expert observed water staining on the timber and the underside of the plywood substrate.

5.6 Moisture levels

- 5.6.1 There were no obvious signs of moisture penetration inside the house. At the request of the applicant, the expert limited invasive moisture testing to eight areas that he considered to be at high risk of moisture penetration. Readings were recorded between 16% and 26% as follows:

Windows and doors

- 20% and advanced decay in the bottom plate under the south bathroom window (stucco cladding), with 16% below both jamb to sill junctions
- 26% beside the east dining room doors (stucco cladding)
- 21% and incipient decay in the bottom plate at the southeast corner under the jamb to sill junction of the kitchen window (board and batten cladding)

The cantilevered deck

- 21% in the plywood substrate, with water stains apparent
- 19% below the deck to wall junction of the lower north west deck, with 16% in the bottom plate below.

Moisture levels above 18% generally indicate that external moisture is entering the structure and further investigation is required.

- 5.6.2 The presence of decay and fungal growth in the two samples (see paragraph 5.3.4 and paragraph 5.4.3) also indicate prolonged exposure to moisture and decay that requires investigation.

5.7 Commenting specifically on the wall claddings, the expert noted that:

Windows and doors – stucco cladding

- junctions between the fibre-cement backing sheets and the metal edge strip to the plaster are reliant on sealant for weatherproofing
- the upstand of the retro-fitted sill flashing overlaps the backing sheets beside the jambs and the ends butt against the plaster edge guide, with junctions reliant on sealants for weatherproofing
- the facing at the sill has a flat top and is glue-fixed directly to the flashing upstand, allowing moisture to penetrate and to be trapped behind the board
- the metal head flashings lack turn-ups at the ends and allow trapped moisture to track to the ends and penetrate behind the backing sheets
- the retro-fitted head flashing to the garage door is likely to have similar defects and requires further investigation
- the extent of decay beneath the windows requires further investigation

Cantilevered deck – stucco cladding

- the stucco beside the bedroom doors butt against the deck membrane and the deck edge to wall junctions lack saddle flashings, with moisture levels elevated in the framing below
- the deck membrane is deteriorating, with stress movement apparent at substrate joints and signs of moisture apparent in the deck framing
- the balustrade uprights are fixed directly into the deck framing, and moisture movement is apparent at backing sheet joints at the deck edge

Board and batten cladding

- some penetrations are unsealed
- the cedar-clad flying beam above the entry porch has a flat top, with gaps that allow moisture to penetrate behind the boards
- the timber facing at the window heads and sills have flat tops, allowing moisture to penetrate and to be trapped behind the boards
- the metal head flashings lack end turn-ups and allow moisture trapped behind the head facings to track to the ends and then to penetrate behind the boards
- the extent of decay beneath windows requires further investigation.

5.8 The expert commented on the items identified in the notice to fix, and I have included these comments with my conclusions in paragraph 7.1

5.9 A copy of the expert's report was provided to the parties on 3 September 2010.

Matter 1: The external envelope

6. Weathertightness

6.1 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 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 high
- although fairly simple in plan and form, the house has two claddings and some complex junctions
- there is an enclosed cantilevered deck to the upper level
- some walls have monolithic cladding fixed directly to the framing
- 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 low to medium wind zone
- the deck is supported on cantilevered steel beams, with timber infill framing
- most walls have eaves to shelter the cladding.

6.2.2 Using the E2/AS1 risk matrix to evaluate these features, two elevations of the house are assessed as having a low weathertightness risk rating, one elevation a medium rating and one elevation a high rating. If the details shown in the current E2/AS1 were adopted to show code compliance, a drained cavity would be required for the stucco cladding at all risk levels. However, I note that this was not a requirement at the time the house was constructed.

6.3 Weathertightness performance

The stucco cladding

6.3.1 It is clear from the expert's report that the stucco cladding is unsatisfactory in terms of its weathertightness performance, which has resulted in moisture penetration and decay to some of the framing. Taking into account the expert's report, I conclude that the areas outlined in paragraph 5.7 require rectification.

6.3.2 Considerable work is required to make these walls weathertight and durable. Further investigation is necessary, including the systematic survey of all risk locations, to determine causes and full extent of moisture penetration, timber damage and the repairs required.

The board and batten cladding

- 6.3.3 The board and batten cladding generally appears to have been installed in accordance with good trade practice. However, taking account of the expert's report, I conclude that remedial work is necessary in respect of the relevant areas included in paragraph 5.7. That remedial work should include investigation into timber damage that may be associated with moisture penetration from the identified defects.

6.4 Weathertightness conclusion

- 6.4.1 The expert's report establishes that the current performance of the building envelope is not adequate because there is evidence of moisture penetration and decay in at least two areas of the untreated timber framing. Consequently, I am satisfied that the house does not comply with Clause E2 of the Building Code. In addition, the extent of any damage to the structural framing needs investigation to determine the building's compliance with Clause B1 Structure.
- 6.4.2 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 for the monolithic-clad walls to the house 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 stucco cladding in particular, and in exploring various options that may be available when considering the upcoming work required to the house.

7. The notice to fix

- 7.1 The following table summarises the expert's comments and my conclusions on the items identified in the notice to fix:

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

Notice to fix item	Expert's comments	My conclusions	Paragraph references
Cedar facings to plaster junctions	Moisture penetrating at junctions.	Remedial work required.	Paragraph 5.6
Missing control joints	No visible control joints.	Adequate (visible in repair photos)	Paragraph 3.4.4
Meter box not flashed	No flashings.	Adequate (visible in repair photos)	Paragraph 3.4.4
Unsealed pipe and cable penetrations	Penetrations through stucco adequately sealed.	Adequate	
No head flashing to garage door	Head flashing retro-fitted, but likely to have similar problems to other windows and doors .	Investigation required.	Paragraph 5.3
Finished ground levels	Ground levels are sufficient.	Adequate	
Deck membrane Producer Statement	Deck membrane deteriorating – moisture penetrating into substrate and framing.	Remedial work required. (PS provided)	Paragraph 5.5
Stair barrier toe holes	Plastic sheeting installed at landing to prevent toe holes.	Adequate	

7.2 I note that some items have been remedied since the notice was issued on 18 April 2005. However, some of the remedial work has not been adequate, as evidenced by the continuing moisture penetration into the framing.

7.2 I am satisfied that the authority made an appropriate decision to issue the notice to fix. However, I am of the view that some items identified in the notice are now adequate and I have also identified some additional items that need to be addressed, so the notice should be modified accordingly (refer to paragraph 9.2).

Matter 2: 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 house during 1999.

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, that is agreed to by the parties and that, if there are matters that are required to be fixed, they are discrete in nature.

8.4 Because of the extent of further investigation required into the timber framing and therefore the house’s 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 I note that the notice to fix required the walls with stucco cladding to be reclad. Under the Act, a notice to fix can require the owner to bring the house into compliance with the Building Code. The Building Industry Authority has found in a previous Determination (2000/1) that a notice to rectify (the equivalent to a notice to fix under the Building Act 2004) cannot specify how that compliance can be achieved. I concur with that view.
- 9.2 The notice to fix should be modified and reissued to the owner to take account the findings of this determination, identifying the items listed in paragraph 5.7 and the investigations in paragraph 6.3.2 and referring to any further defects that might be discovered in the course of investigation and rectification, but not specifying how those defects are to be fixed. It is not for the notice to fix to stipulate directly how the defects are to be remedied and the house brought to compliance with the Building Code. That is a matter for the owner to propose and for the authority to accept or reject. It is important to note that the Building Code allows for more than one means of achieving code compliance.
- 9.3 I suggest that the parties adopt the following process to meet the requirements of paragraph 9.2. Initially, the authority should revise and reissue the notice to fix. The applicant should then produce a response to this in the form of a detailed proposal for the house as a whole, produced in conjunction with a competent and suitably qualified person, as to the 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 envelope does not comply with Clauses E2 and Clause B2 of the Building Code, and the damaged timber framing does not comply with Building Code Clauses B1, and accordingly I confirm the authority's decision not to issue a code compliance certificate
 - the authority is to modify the notice to fix, dated 18 April 2005, to take account of the findings of this determination.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 31 January 2011.

John Gardiner
Manager Determinations