



Determination 2010/034

The refusal to issue a code compliance certificate for a six-year-old house with corrugated steel and plywood claddings at 1244 Paerata Road, Pukekohe



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 applicants are the owners, N and R Kraakman (“the applicants”) and the other party is the Franklin District 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 six-year-old house because it was not satisfied that the

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.

house complied with certain clauses² of the Building Code (First Schedule, Building Regulations 1992).

1.3 The matter to be determined³ is therefore whether the authority's decision to refuse to issue a code compliance certificate was correct. 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 plywood and metal wall claddings, the windows, the roof claddings, the junctions 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 7.)

1.4 I note that the authority issued an 'interim Notice to Rectify' dated 31 March 2004. This determination only considers matters relating to the external envelope of the house. I have not considered other matters included in the notice, as I am not aware of any dispute or unresolved matters related to them.

1.5 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 single-storey detached house situated on a level rural site in an undetermined wind zone, but was assumed by the expert to be high. Construction is generally conventional light timber frame, with a concrete slab and foundations, sheet plywood and corrugated steel wall claddings, aluminium windows and profiled metal roofing. The house is assessed as having a low weathertightness risk (refer paragraph 6.4)

2.2 The house is fairly simple in plan and form; with the 25° pitch gabled roof providing verge projections of 220 mm and eaves of about 550 mm overall, except where the roof extends to form verandahs. A timber-framed 'chimney' structure projects out from the plywood-clad northwest wall, extending up through the verge of the gable.

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.

³ Under section 177(b)(i) of the Act

2.3 The claddings

- 2.3.1 Most of the walls are clad in colour-coated horizontal corrugated steel, which is fixed through the building wrap to the framing, with colour-coated flashings at junctions including at the inter-cladding junctions.
- 2.3.2 The framed ‘chimney’ is clad in vertical corrugated steel and the remaining walls are clad in plywood sheets fixed through the building wrap to the framing, with timber battens fixed over the vertical joints.
- 2.4 The expert noted no evidence as to timber treatment. Given the date of construction in about 2003 and the lack of other evidence, I consider that the exterior wall framing is unlikely to be treated to a level that will provide resistance to fungal decay.

3. Background

- 3.1 I have not seen copies of consent documentation nor inspection records for the construction of this house. However, construction appears to have taken place in 2002 or 2003, as the authority carried out a final inspection early in 2004.
- 3.2 The only correspondence that I have seen is a letter from the authority to the owners dated 1 April 2004. This letter was entitled ‘Interim Notice to Rectify No. 4767 dated 31 March 2004’ and comprised a list of 29 outstanding items that required attention prior to a re-inspection of the building work. Several items related to the claddings, including item 14 which stated ‘Metal cladding has no cavity; a determination from the BIA is required.’
- 3.3 The Department initially received an application for a determination on 4 August 2009 and sought further information, which was received on 11 November 2009.

4. The submissions

- 4.1 In a letter dated 5 November 2009, the applicants requested a determination on the authority’s decision not to issue a code compliance certificate due to the lack of a drained cavity behind the cladding. The applicants explained that the plans had been approved with the cladding direct-fixed, and they had not been informed of any change to requirements during construction of the house.
- 4.2 The applicants forwarded copies of:
- the drawings
 - the letter from the authority dated 1 April 2004, entitled ‘Interim Notice to Rectify No. 4767 dated 31 March 2004’
 - various photographs and some other information.
- 4.3 The authority made no submission.
- 4.4 I do not believe that this is acceptable, nor do I regard a note stating ‘metal cladding has no cavity’, with a requirement to seek a determination as providing adequate explanation. It is important that should an owner be declined a code compliance

certificate, they be given clear reasons why as required by Section 95(a) of the Act. The owners can then choose to act on those reasons or to apply for a determination if they dispute them.

- 4.5 A draft determination was issued to the parties on 19 March 2010. The draft was issued for comment and for the parties to agree a date when the house, with the exception of those items that are to be fixed, complied with Building Code Clause B2 Durability.
- 4.6 The parties accepted the draft without comment and agreed that compliance with Clause B2 Durability was achieved on 1 April 2004.

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 Architects. The expert inspected the house on 9 December 2009 and provided a report that was completed on 18 December 2009. The expert noted that the house was generally built according to the drawings, except that corrugated steel and plywood claddings have been used in lieu of plastered fibre-cement.

5.2 General

- 5.2.1 The expert noted that the overall standard of workmanship generally appeared to be good except for the items outlined in paragraph 5.5, with well-sealed penetrations and satisfactory clearances below the bottom of the claddings.
- 5.2.2 The corrugated metal cladding appeared to have been 'installed by an experienced builder', with flashings 'uniformly fixed plumb, square and in plane, with square cuts, neat mitres and regularly spaced rivets'.

5.3 Windows and doors

The metal cladding

- 5.3.1 The windows are face-fixed over the cladding, with metal head, jamb and sill flashings. Using a cladding manufacturer's recommendations as 'a bench mark of contemporary good practice', the expert noted that the window installation appeared satisfactory, apart from lacking seals behind jamb flanges.
- 5.3.2 The over-flashings at the jambs are about 90 mm wide, with profiled compressible foam strips sealing against the cladding corrugations. The jamb flashings overlap the metal sill flashings with a riveted mitre joint, while the head flashings under-lap the upper cladding and project beyond the jambs.
- 5.3.3 The expert loosened the bottom of the cladding beside the garage door and was able to see L-shaped back-flashings. I accept that the other windows and doors in the metal cladding are likely to incorporate similar back-flashings.

The plywood cladding

- 5.3.4 The expert noted that windows within the plywood cladding are face fixed, with metal head flashings, and no jamb or sill flashings. A bead of sealant has been

applied to the edge of the jamb flanges, with the sill flange left unsealed to allow for drainage.

5.4 Moisture levels

5.4.1 The expert inspected the interior of the house and noted some lining cracks, which he considered likely to be caused by drying shrinkage. Interior non-invasive moisture readings showed one area with elevated moisture readings. However invasive readings in the same area were low, so the expert considered the possible cause to be ants within the insulation.

5.4.2 The expert took 15 invasive moisture readings of the exterior wall framing at areas considered at risk and recorded moisture levels from 11% to 15%. The expert noted that his inspection was within one week of heavy rain in early summer. Although readings are expected to be higher in winter months, the expert considered moisture contents unlikely to reach levels at which decay could occur in the framing.

5.5 Commenting specifically on the claddings, the expert noted that:

- there is no kick out to the end of the apron flashing above the garage
- no seals are installed between the joinery jamb flanges and jamb over-flashings
- two windows in the plywood cladding are exposed in gable end walls and lack stop ends to the ends of the head flashings
- the sides of the meter box are not weathertight, with no overlap or seals against the over-flashing to the corrugated metal
- some battens to the plywood cladding are cupping, and require re-fixing.

5.6 A copy of the expert's report was provided to the parties on 26 January 2010.

Matter 1: The external envelope

6. Weathertightness

6.1 The approach taken in determining whether building work is weathertight and durable, and is likely to remain so, is to apply the principles of weathertightness. This involves the examination of the design of the building, the surrounding environment, the design features that are intended to prevent the penetration of water, the cladding system, its installation, and the moisture tolerance of the external framing. The Department and its antecedent, the Building Industry Authority, have also described weathertightness risk factors in previous determinations (for example, Determination 2004/1) relating to cladding and these factors are also used in the evaluation process.

6.2 The consequences of a building demonstrating a high weathertightness risk is that building solutions that comply with the Building Code will need to be more robust. Conversely, where there is a low weathertightness risk, the solutions may be less robust. In any event, there is a need for both the design of the cladding system and its installation to be carefully carried out.

6.3 I have evaluated the house using the risk matrix in E2/AS1. The risk matrix allows the summing of a range of design and location factors applying to a specific building design. The resulting risk level can range from 'low' to 'very high' and is applied to determine what claddings can be used on a building in order to comply with E2/AS1. Higher risk levels will require more rigorous weatherproof detailing.

6.4 Weathertightness risk

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

Increasing risk

- there are limited verge projection over the gable end walls
- the house is in a assumed high wind zone

Decreasing risk

- the house is single-storey
- the house is fairly simple in plan and form
- there are eaves to shelter most of the cladding
- although there are two types of wall cladding, the inter-cladding junctions are limited to corners
- there are no decks attached to the house.

6.4.2 When evaluated using the E2/AS1 risk matrix, these features show that the elevations of the house demonstrate a low weathertightness risk rating. If the details shown in the current E2/AS1 were adopted to show code compliance, a drained cavity would be required for the horizontal corrugated metal wall cladding. However, this was not a requirement when this house was constructed.

6.5 Weathertightness performance

6.5.1 Generally the claddings appear to have been installed in accordance with good trade practice. However, taking account of the expert's comments in paragraph 5.5, I conclude that remedial work is necessary in respect of the following:

- The lack of a kick out at the end of the apron flashing.
- The lack of seals installed under the joinery jamb flanges.
- The lack of stop ends to the head flashings of two exposed windows.
- The lack of seals to the sides of the meter box.
- The cupping of some battens to the plywood cladding.

6.5.2 Notwithstanding the fact that the horizontal corrugated metal wall cladding is fixed directly to the framing, thus inhibiting free drainage and ventilation behind the cladding, I have noted certain compensating factors that assist the performance of the cladding in this particular case:

- There is no evidence of moisture penetration after more than six years.

- The cladding is generally installed according to good trade practice, in accordance with recommended practices at the time of construction.

These factors can assist the building to comply with the weathertightness and durability provisions of the Building Code.

6.6 Weathertightness conclusion

6.7 I consider the expert's report establishes that the current performance of the building envelope is adequate because it is preventing water penetration through the claddings at present. Consequently, I am satisfied that the house complies with Clause E2 of the Building Code.

6.8 However, 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.

6.9 Because the faults identified with the claddings occur in discrete areas, I am able to conclude that satisfactory rectification of the items outlined in paragraph 6.5.1 will result in the building envelope being brought into compliance with Clauses B2 and E2 of the Building Code.

6.10 Effective maintenance of claddings is important to ensure 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: The durability considerations

7. Discussion

7.1 There are concerns regarding the durability, and hence the compliance with the building code, of certain elements of the house taking into consideration the age of the building work completed in early 2004.

7.2 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).

7.3 These durability periods are:

- 5 years if the building elements are easy to access and replace, and failure of those elements would be easily detected during the normal use of the building

- 15 years if building elements are moderately difficult to access or replace, or failure of those elements would go undetected during normal use of the building, but would be easily detected during normal maintenance
- the life of the building, being not less than 50 years, if the building elements provide structural stability to the building, or are difficult to access or replace, or failure of those elements would go undetected during both normal use and maintenance.

7.4 In this case the six-year delay since the completion of the building work has raised concerns that various elements of the building are now well through or beyond their required durability periods, and would consequently no longer comply with Clause B2 if a code compliance certificate were to be issued effective from today's date. I have not been provided with any evidence that the authority did not accept that those elements complied with Clause B2 at a date in 2004.

7.5 It is not disputed, and I am therefore satisfied, that all the building elements, with the exception of those items that are to be fixed, complied with Clause B2 on 1 April 2004. This date has been agreed between the parties, refer paragraph 4.6.

7.6 In order to address these durability issues when they were raised in previous determinations, I sought and received clarification of general legal advice about waivers and modifications. That clarification, and the legal framework and procedures based on the clarification, is described in previous determinations (for example, Determination 2006/85). I have used that advice to evaluate the durability issues raised in this determination.

7.7 I continue to hold that view, and therefore conclude that:

- (a) the authority has the power to grant an appropriate modification of Clause B2 in respect of all the building elements.
- (b) it is reasonable to grant such a modification, with appropriate notification, as in practical terms the building is no different from what it would have been if a code compliance certificate for the building work had been issued in 2004.

7.8 I strongly suggest that the authority record this determination and any modifications resulting from it, on the property file and also on any LIM issued concerning this property.

8. What is to be done now?

8.1 I note that the Interim Notice to Rectify No. 4767, dated 31 March 2004, identified the lack of a cavity to the metal wall cladding and required the applicants to seek a determination on this matter. As discussed in paragraph 1.4, this determination has not considered the other items included in the notice and, providing those items are now completed, the authority should withdraw the Notice to Rectify.

8.2 The authority should then issue a notice to fix that requires the owners to bring the house into compliance with the Building Code, identifying the defects listed in paragraph 6.5.1 and referring to any further defects that might be discovered in the

course of rectification, 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.

- 8.3 Once the minor matters set out in in paragraph 6.5.1 have been rectified to its satisfaction, the authority may issue a code compliance certificate in respect of the building consent amended as outlined in paragraph 7.

9. The decision

- 9.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the external envelope does not comply with Clause B2 of the Building Code and accordingly, I confirm the authority's decision to refuse to issue a code compliance certificate.

- 9.2 I also determine that:

- (a) all the building elements installed in the house, apart from the items that are to be rectified, complied with Clause B2 on 1 April 2004
- (b) the building consent is hereby modified as follows:

The building consent is subject to a modification to the Building Code to the effect that, Clause B2.3.1 applies from 1 April 2004 instead of from the time of issue of the code compliance certificate for all the building elements, except the items to be rectified as set out in paragraph 6.5.1 of Determination 2010/034.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 27 April 2010.

John Gardiner
Manager Determinations