Determination 2008/11

Refusal to issue a code compliance certificate for additions to a house at 38 Kauri Point Road, Laingholm, West Auckland

1. The matters to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004[1] ("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, Ms C Basham ("the applicant") and the other party is the Waitakere City Council ("the territorial authority").

1.2 This determination arises from the decision of the territorial authority to refuse to issue a code compliance certificate for an 11-year old house, and its two subsequent 3 and 5-year old staged alterations, because it was not satisfied that the alterations complied with the Building Code[2] (First Schedule, Building Regulations 1992).

1.3 The matter for determination is whether the cladding, as installed, complies with the relevant Building Code clauses (see sections 177 and 188 of the Act). By "the cladding as installed" I mean the components of the system (such as the backing

[1] The Building Act 2004 is available from the Department's website at www.dbh.govt.nz.
[2] The Building Code is available from the Department's website at www.dbh.govt.nz.

materials, the flashings, the joints and the coatings) as well as the way the components have been installed and work together.

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.

1.5 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.

2. The building work

2.1 The altered house is two-storeys high and is situated on a sloping site, which is in a high wind zone for the purposes of NZS 3604[3]. The house is relatively simple in shape and form but with complex roof features and is of timber framed construction built on timber-framed floors. The house generally has timber pole foundations and the ground floor garage has a concrete slab. The main corrugated steel covered roof is partially convex and has main internal gutters and a plastic gutter at the east elevation. The roof has eaves and verge projections that vary from 600mm to 1000mm wide.

2.2 Two slatted board timber-framed decks are constructed at the upper floor level and are supported on timber posts and beams. Each deck has mesh balustrades fixed between timber posts. One small deck is situated at the north elevation and a large deck, which has a partially curved shape on plan, is situated for the full length of the north and east elevations. There are access steps constructed at each deck. Two small timber-framed and boarded open decks are also constructed at the lower level.

2.3 Based on the tested samples of the external wall framing timber, I am of the opinion that it is likely to be boron treated.

2.4 The external wall cladding is corrugated "colorsteel" fixed horizontally and directly to the framing over building paper.

3. Sequence of events

3.1 On 10 July 1996, the territorial authority issued a building consent (No. 1996/2172) ("the first consent") under the Building Act 1991 ("the former Act") to the original owner, for a new house.

3.2 The territorial authority carried out a series of inspections of the house during construction and passed a pre-line inspection on 10 January 1997.

3.3 On 13 September 2001, the original owner gave permission for the consent to be transferred to the applicant, who had purchased the house. At that stage, the building work was not fully completed.

3.4 In October 2001, the territorial authority issued a second building consent (No 2001/2703) ("the second consent") for additions to the house. This consent was amended in December 2001 and the amended consent was described as being for "two bedrooms/family room/garage to basement".

[3] New Zealand Standard NZS 3604:1999 Timber Framed Buildings

3.5 On 25 March 2003, the territorial authority approved further amendments to the second consent for further additions to the house.

3.6 On 21 September 2007, in a letter to the applicant, the territorial authority noted that there were outstanding inspections remaining in respect of building consents Nos 1996/2172 and 2001/2703.

3.7 On 25 September 2007, the applicant wrote to the territorial authority, stating that she was not proceeding with the "last part of my approved extension…" and now wished to organise a final inspection of the work that had been completed. The applicant also noted that a territorial authority official had inspected the property.

3.8 On 18 October 2007, following a site inspection of the altered house, the territorial authority wrote to the applicant. The territorial authority stated that there were areas of concern regarding the cladding and the deck balustrade. Accordingly, as the territorial authority was not satisfied that the property was code-compliant, it was refusing to issue a code compliance certificate.

3.9 On 18 October 2007, the territorial authority issued a notice to fix but only in relation to the second consent. The notice stated that the additions did not comply with Clause E2. However, I note that the particulars set out below relate to code clauses additional to E2. The particulars of contravention or non-compliance were listed as:

> 1. The exterior cladding system does not contain a 20mm cavity to adequately provide for ventilation, drainage and moisture dissipation.

I note that in a previous notice to fix six other items were listed as being non-compliant. However, the territorial authority confirmed to me on 18 December 2007 by email that the cladding is now its only matter of concern.

3.10 On 9 November 2007 the Department received the application for a determination.

4. The submissions

4.1 In a covering letter to the Department dated 5 November 2007, the applicant provided a background to the dispute and noted that the house had been inspected by the territorial authority during its construction. The applicant also stated that the house is mostly 11 years old and shows no signs that it is leaking.

4.2 The applicant forwarded copies of:

- the plans
- building consent No 1996/2172 and other consent application information
- some territorial authority inspection documentation
- the notice to fix of 18 October 2007
- the correspondence with the territorial authority and the designer of the house
- some material supply invoices.

4.3 A copy of the applicant's submission was supplied to the territorial authority and all other evidence has been provided to each party. Neither party made any submissions in response to the information that was provided. On 15 January 2008 the territorial authority informed me that it did not wish to make a submission or comment on the expert's report (see paragraph 5.8).

4.4 The draft determination was issued to the parties for comment on 30 January 2008. Both the parties accepted the draft without comment.

5. The experts' report

5.1 As mentioned in paragraph 1.4, I engaged an expert, who is member of the New Zealand Institute of Building Surveyors, to provide an assessment of the condition of those building elements subject to the determination.

5.2 The expert inspected the property on 21 and 30 November 2007 and furnished a report that was completed on 12 December 2007. The expert removed three sections of the wall cladding and one section of vertical cladding adjoining the roof to expose the installed details. I am prepared to accept that the details revealed at these locations would apply to similar situations throughout the building.

5.3 The expert took non-invasive readings at the interior of the external walls and some slightly elevated readings were recorded. Moisture readings were taken where the cladding was removed and one higher reading of 24% was recorded at a south elevation bottom plate. Moisture levels that vary significantly from the average base level at the installed cladding generally indicate that external moisture is entering the structure. The expert also observed signs of water staining to the framing and building wrap at some locations.

5.4 The expert removed samples of the external wall framing from the three locations where the cladding had been removed and forwarded them to a biodeterioration consultant for testing. The tests showed that each sample had large numbers of fungal hyphae attached to them, some of which had been recently active. The results suggested that moisture had recently been present in each of the samples.

5.5 Commenting specifically on the wall cladding and decks, the expert noted that:

- the overlap of the cladding sheets is inadequate at some locations
- at least one external corner flashing is missing
- the sills of both the timber and metal exterior joinery units lack tape, trays and air seals
- the junction between the cladding and the decks is not adequately flashed at some locations
- deck balustrades are not to the required height and have gaps larger than 100mm in them.

5.6 Commenting specifically on the roofing details, the expert noted that:

- Some areas of the roof do not meet the minimum 8 degree pitch recommended by the manufacturer
- the junctions between the underside of the roofing at the eaves or verge overhangs and the wall cladding are inadequately sealed
- the junctions between the roofing and the higher areas of the wall cladding are inadequately sealed
- the butynol rubber membrane is not properly sealed into the rainwater heads
- the end of one false rafter at the west elevation is not fixed to the structure.

5.7 Comparing the as-built house with the relevant consented plans, the expert noted only minor differences.

5.8 A copy of the expert's report was provided to each of the parties on 17 December 2007. On 15 January 2008 the territorial authority stated that it did not contest the findings of the report (see paragraph 4.3).

5.9 In a letter dated 30 December 2007, the applicant noted that the house did not leak and that there were no mould and/or water marks anywhere in the house. In addition, the house had never "experienced high winds". The white marks noticed by the expert on the master bedroom ceiling were the result of cleaning activities undertaken by the applicant. The applicant would replace damaged "planks"

6. Evaluation for code compliance

6.1 Evaluation framework

6.1.1 In evaluating the design of a building and its construction, it is useful to make some comparisons with the relevant Acceptable Solution[4], in this case E2/AS1, which will assist in determining whether the features of this house are code compliant. However, in making this comparison, the following general observations are valid:

- Some Acceptable Solutions are written conservatively to cover the worst case, so that they may be modified in less extreme cases and the resulting alternative solution will still comply with the Building Code.
- Usually, when there is non-compliance with one provision of an Acceptable Solution, it will be necessary to add one or more other provisions to compensate for that in order to comply with the Building Code.

6.1.2 The approach 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[5] (for example, Determination 2004/1) relating to cladding and these factors are also used in the evaluation process.

6.1.3 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.

6.2 Weathertightness risk

6.2.1 In relation to these characteristics I find that the altered house:

- is two-storeys high
- is situated in a high wind zone

[4] An Acceptable Solution is a prescriptive design solution approved by the Department that provides one way, but not the only way, of complying with the Building Code. The Acceptable Solutions are available from The Department's Website at www.dbh.govt.nz.
[5] Copies of all determinations issued by the Department can be obtained from the Department's website.

- has wide eaves and verge overhangs that provide excellent protection to the claddings beneath them
- has decks at both levels
- has external wall framing that is treated to a level that provides some resistance to the onset of decay if the framing absorbs and retains moisture.

6.2.2 The house has been evaluated using the E2/AS1 risk matrix. The risk matrix allows the summing of a range of design and location factors applying to a specific building design. The resulting risk rating can range from 'low' to 'very high'. The risk rating is applied to determine what claddings can be used on a building in order to comply with E2/AS1. Higher levels of risk will require more rigorous weatherproof detailing; for example, a high risk level is likely to require particular types of cladding to be installed over a drained cavity.

6.2.3 When evaluated using the E2/AS1 risk matrix, the weathertightness features outlined in paragraph 6.2.1 show that two elevations of the house demonstrate a moderate weathertightness risk and the remaining two elevations a high risk. I note that, in order to comply with E2/AS1, the wall cladding of this building would require a drained cavity.

6.3 Weathertightness performance

6.3.1 Generally the cladding appears to have been installed in accordance with good trade practice. However, based on the expert's opinion, I accept that remedial work is necessary in respect of the following:

- The inadequate overlap of the profiled steel wall cladding.
- The lack of at least one external corner flashing.
- The lack of tape, trays and air seals to the sills of both the timber and metal exterior joinery units.
- The inadequately flashed junction between the cladding and the decks at some locations.
- The inadequate pitch at some areas of the roof.
- The inadequately sealed junctions between the underside of the roofing at the eaves or verge overhangs and the wall cladding.
- The inadequately sealed junctions between the roofing and the higher areas of the wall cladding.
- The improperly sealed butynol rubber membrane at the rainwater heads.
- The unfixed end of one false rafter at the west elevation.
- Any other defects discovered during the rectification process.

6.3.2 Notwithstanding the fact that the cladding is fixed directly to the timber framing, thus limiting drainage and ventilation behind the cladding, I have noted that:

- the cladding is installed to reasonable trade practice
- the house has wide eaves and verge overhangs that provide excellent protection to the claddings beneath them

- the house has external wall framing that is treated to a level that provides some resistance to the onset of decay if the framing absorbs and retains moisture.

6.3.3 I consider that these factors help compensate for the lack of a drained cavity and can assist the building to comply with the weathertightness and durability provisions of the Building Code.

7 Discussion

7.1 I consider the expert's report establishes that the current performance of the cladding is not adequate because it is allowing some water penetration into the building at some locations at present. Consequently, I am satisfied that the building does not comply with Clause E2 of the Building Code.

7.2 In addition, the building 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 building are likely to continue to allow the ingress of moisture in the future, the house does not comply with the durability requirements of Clause B2.

7.3 Because the faults identified with the cladding and roofing systems occur in discrete areas, I am able to conclude that satisfactory rectification of the items outlined in paragraph 6.3.1 will result in the building remaining weathertight and in compliance with Clauses B2 and E2.

7.4 I note that the expert commented that part of the roof is at a slope of less than 8^{o}. In the case of this curved roof, that part of the continuous long run roof cladding that is at the top of the curve has no slope. However the fact that the roof material is continuous means there are no lap joints in locations that would normally require a slope in the roof to protect them from water entry. Consequently I do not consider the slope of the long run roofing to be significant in this case. The roof will drain effectively and will meet code requirements.

7.5 I emphasise that each determination is conducted on a case-by-case basis. Accordingly, the fact that a particular cladding system has been established as being code compliant in relation to a particular building does not necessarily mean that the same cladding system will be code compliant in another situation.

7.6 Effective maintenance of claddings is important to ensure ongoing compliance with Clause E2 (and consequently B2) 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).

7.7 The expert has stated that height of the deck balustrades is inadequate and that there are gaps in the balustrades that are larger than 100mm. Notwithstanding the territorial authority's confirmation that its concerns are limited to compliance with Clause E2 of the Building Code (see paragraph 3.9) I draw this matter to the attention of the territorial authority as a matter requiring investigation.

8 The Decision

8.1 In accordance with section 188 of the Building Act 2004, I determine that the building work does not comply with Clauses B2 and E2 of the Building Code, and accordingly confirm the territorial authority's decision to refuse to issue a code compliance certificate.

8.2 I note that the territorial authority has issued a notice to fix that also required provision for adequate ventilation, drainage and moisture dissipation. Under the Act, a notice to fix can require the owner to bring the additions 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 1991) cannot specify how that compliance is to be achieved. I concur with that view.

8.3 The territorial authority should now issue a new notice to fix that requires the owners to bring the building up to compliance with the Building Code, identifying the defects listed in paragraph 6.3.1, but not specifying how those defects are to be fixed. That is a matter for the applicants to propose and for the territorial authority to accept or reject. It is important to note that the Building Code allows for more than one method of achieving compliance.

8.4 I suggest that the parties adopt the following process to meet the requirements of paragraph 8.3. Initially, the territorial authority should issue the notice to fix. The owner should then produce a response to this in the form of a technically robust proposal, produced in conjunction with a competent and suitably qualified person, as to the rectification or otherwise of the specified issues. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 26 February 2008.

John Gardiner
Manager Determinations