

## **Determination 2008/95**

8 October 2008

### **Refusal to issue a code compliance certificate for alterations and additions to a house at 7A Greenfield Drive, Western Heights, Hamilton**



#### **1. The matter to be determined**

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004<sup>1</sup> (“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, Y Martin (“the applicant”), and the other party is the Hamilton City Council, carrying out its duties and functions as a territorial authority or building consent authority (“the authority”).
- 1.2 This determination arises from the decision of the authority to refuse to issue a code compliance certificate for 3 to 9-year old alterations and additions to a house because it is not satisfied that the building work complies with certain clauses of the Building Code<sup>2</sup> (First Schedule, Building Regulations 1992).

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<sup>1</sup> The Building Act 2004 is available from the Department’s website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

<sup>2</sup> The Building Code is available from the Department’s website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

1.3 The matters for determination are:

**1.3.1 Matter 1: The drainage**

Whether the surface water and foul water drainage systems, as installed in the alterations, comply with Clause E1 Surface Water and Clause G13 Foul Water of the Building Code.

**1.3.2 Matter 2: The cladding**

Whether the cladding as installed on the addition (“the cladding”) comply with Clause B2 Durability and Clause E2 External Moisture of the Building Code. By “the cladding as installed” I mean the components of the system (such as the backing sheets, the coatings, the flashings, and the joints) as well as the way the components have been installed and work together.

**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 additions.

1.4 In making my decisions, I have considered the following evidence:

- the parties’ submissions
- the report by a specialist property inspection company (“the inspection company”) commissioned by the applicant (refer paragraph 3.6)
- the drainage report of an independent expert (“the first expert”), commissioned by the Department to advise on the drainage (refer paragraph 5)
- the cladding report of a second independent expert (“the second expert”), commissioned by the Department to advise on the cladding (refer paragraph 7)
- the other evidence in this matter.

With respect to the cladding, I have evaluated the information using a framework that I describe more fully in paragraph 8.1.

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 building work consists of extensive alterations to an existing detached house situated on a sloping site which is in a low wind zone for the purposes of NZS 3604<sup>3</sup>. The original 2-storey house was built in the 1960’s, with light timber frame construction, concrete foundations and slab, concrete block basement and retaining walls, brick veneer upper walls and a hipped roof.

2.2 The house lies along the north-sloping site, and is 2-storeys high on the north elevation with driveway access to the basement garages. The south elevation is single-storey, with retaining walls to the south and parts of the east and west walls.

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<sup>3</sup> New Zealand Standard NZS 3604:1999 Timber Framed Buildings

2.3 The original house appears to have been extensively altered over the years and, prior to the most recent building work, accommodated 5 bedrooms on the upper level and an extensive garage and workshop space in the basement, with a deck wrapping around the north-eastern corner. At some stage the block and brick exterior walls have been plastered and painted.

## **2.4 The alterations and additions**

2.4.1 The 1999 alterations consist of a small addition to the northeast corner and extensive alterations to the interiors of both levels. The construction of the addition is conventional light timber frame, with clear-finished cedar windows and monolithic claddings and provides a new entrance canopy, foyer and stairs to the upper level.

2.4.2 The original deck has been altered and extended, with the entrance canopy supported from monolithic-clad columns and beams. The area beneath the former deck now provides a new entrance foyer and stairwell, and the entire deck is tiled, with new monolithic-clad balustrades. A cedar “conservatory”, covering the stairwell at deck level, forms a lean-to structure above monolithic-clad upstand walls that form a continuation of the deck balustrades.

2.4.3 The interior alterations to the basement level include the conversion of garage and workshop areas into a rumpus room, with a new bedroom, ensuite bathroom, and laundry at the eastern end. The bathroom and laundry sit beneath the deck area.

2.4.4 The interior alterations to the first floor level include the conversion of two former bedrooms into a new master bedroom at the eastern end, with a new dressing room and ensuite bathroom. The living areas have been replanned, with new kitchen and bathroom areas and a timber deck to the south.

## **2.5 The cladding**

2.5.1 The wall cladding system to the addition is what is described as monolithic cladding; with 7.5 mm thick fibre-cement sheets fixed through the building wrap to the framing, and finished with an applied textured coating system.

2.5.2 The expert has noted that he was unable to confirm whether the wall framing is treated. Given the date of construction in 1999 and the lack of other evidence, I consider that the external wall framing is likely to be untreated.

## **2.6 The drainage**

2.6.1 The sewer drainage above ground is formed from uPVC pipework, with underground pipes leading from the building to the site boundary. The surface water drainage discharges into uPVC downpipes, then through pipes laid under the driveway to an outlet set into the roadway kerbing.

2.6.2 The new laundry and bathroom in the basement are connected, via a new pipe, to the existing foul water drain.

### 3. Background

- 3.1 The authority issued a building consent (99/1766) for the alterations on 16 September 1999, under the Building Act 1991. I have not seen a copy of the building consent.
- 3.2 The authority carried out a foundation inspection on 17 September 1999 and a pre-line plumbing and building inspection on 8 October 1999. However, there is no record that any drainage inspection was carried out. I also note that no inspections prior to cladding the addition or tiling the extended deck have been recorded.
- 3.3 No further inspections were carried out, and it appears that the alterations were not completed when the house was sold in March 2003. I note that the applicant has described the house as being “halfway through renovations” at the time of purchase.
- 3.4 According to the applicant, the building work was completed and a final inspection was requested. The authority inspected the work on 23 March 2005 and identified a list of items that required attention, including “confirmation of drainage inspections” and the requirement to “provide a cladding report”. I have no information as to why there was the delay in carrying out the final inspections.
- 3.5 The applicant commissioned the inspection company to report on the condition of the exterior cladding. The inspection company inspected the cladding and reported to the applicant in a letter dated 19 January 2006. I assume that the letter was incorrectly dated (as 2005) as I note that it was copied to the authority, which recorded it as received on 20 January 2006.
- 3.6 The inspection company reported that a visual inspection was undertaken, so no conclusion could be reached on possible defects in the underlying construction. No weathertightness defects were identified and no signs of moisture penetration recorded. I note that no moisture testing was undertaken, and the report noted:
- Signs of water ingress were looked for, however this report cannot give any waterproofing guarantee as it is not readily possible nor required to create simulated conditions to induce water ingress.
- 3.7 The authority’s internal memorandum record notes on 19 January 2006 that the “exterior cladding report appears okay”. The record also notes that progress on the remaining outstanding items was followed up with the applicant at various times during 2006, prior to a final recheck inspection on 20 December 2006.
- 3.8 In a letter to the applicant dated 3 January 2007, the authority advised that, following the inspection of 20 December 2006, it accepted that all the outstanding work had been completed. However, it appeared that some of the required inspections had not been requested or made and, due to the age of the building consent, the authority was not prepared to issue a code compliance certificate.
- 3.9 The application for a determination was received by the Department on 7 April 2008.

- 3.10 The Department sought additional information on whether the matter to be determined was restricted to the age of the building work. Following correspondence with the authority, a visual inspection of the drainage system was arranged (refer paragraph 5).
- 3.11 Following completion of the drainage report on 28 May 2008, further discussions with the authority lead to the conclusion that a further inspection was required to assess the condition of the monolithic cladding on the addition, and a second expert was commissioned to carry out a cladding inspection (refer paragraph 7).

#### **4. The submissions**

- 4.1 In a covering letter to the Department dated 2 April 2008, the applicant set out some background information and noted that the authority had informed her that, due to the age of the building work, the authority was not prepared to issue a code compliance certificate.
- 4.2 The applicant forwarded copies of:
- some of the as-built plans
  - part of the inspection company's report on the cladding
  - some of the authority's inspection notes
  - some of the correspondence with the authority.
- 4.3 The authority informed the Department by email on 20 May 2008, that it had concerns with Clauses B2 and E2, given the age of the building. The authority also noted that drainage inspections, which formed part of the consent conditions, had not been "called for". While it had received an as-laid drainage plan, the authority could not verify the drainage system as it had not inspected it.
- 4.4 The authority forwarded copies of:
- some of the authority's inspection notes
  - the general memorandum dated 3 July 2006
  - the letter to the applicant dated 3 January 2007.
- 4.5 Copies of the submissions and other evidence were provided to each of the parties.
- 4.6 The draft determination was sent to the parties on 12 August 2008. The draft was issued for comment and to agree a date when the building complied with Building Code Clause B2 Durability.
- 4.7 Both parties accepted the draft and agreed that compliance with Clause B2 was achieved in 1 April 2005.

## **5. The first expert's drainage report**

- 5.1 As discussed in paragraphs 1.4 and 3.10, I engaged an independent expert, who is a member of the New Zealand Institute of Architects, to provide an assessment of the drainage elements associated with the alterations. The first expert inspected the drainage on 26 May 2008 and furnished a report that was completed on 28 May 2008.
- 5.2 The first expert noted that he was unable to comment on the route of the drainage below ground or the presence of additional rodding provisions. The path of the original sewer drain from the property was pointed out to the expert.
- 5.3 The first expert made the following comments, regarding the sewer drains:
- The lowest situated toilet flushed normally, there were no signs of backup from the toilet or shower, and there were no odours present.
  - The outside connection was normal and included an access bend.
  - The external pipework above the ground appeared to be normal and there was no evidence of leaks or overflows or odours.
- 5.4 The first expert made the following comments, regarding the surface water drains:
- The roof gutters were correctly connected through a normal downpipe system and there was no evidence of overflows, leaks or other inadequacies.
  - The drains discharged through a roading kerb outlet that, while it had silted at its base, was not blocked.
  - There were no odours or other sign of contamination from the sewer drains.
- 5.5 The first expert noted that there was no evidence to suggest that the underground systems had not adequately drained the outflows from the building to date, and concluded that the visual examination did not identify any inadequacy in the current function of the drainage systems.
- 5.6 A copy of the first expert's drainage report was provided to each of the parties on 30 May 2008.

## **Matter 1: The drainage**

### **6. Discussion**

- 6.1 The majority of the original drainage systems appear to remain in use, but new surface water drainage from the deck and new foul water drains for the new basement bathroom and laundry were installed. A new gully trap has been installed, which appears to connect to the existing drain beneath the paving to the east of the basement.
- 6.2 The expert has noted that the lower toilets flushed adequately and there were no signs or any indications of leakage. I also note that the plumbing pre-line inspection was undertaken almost 9 years ago, and the drainage is likely to have been connected

shortly after that. The systems have therefore performed adequately for more than 8 years.

6.3 Taking account of the expert's assessment of visible components of surface water and foul water drainage and the adequate performance over the past 8 years, I consider that there are reasonable grounds to come to the view that the drainage system complies with the provisions of the relevant code clauses.

6.4 I accordingly consider that the drainage system complies with Clauses E1 and G13 of the Building Code.

## **7. The second expert's cladding report**

7.1 As discussed in paragraphs 1.4 and 3.11, I engaged a second independent expert to examine the authority records and provide an assessment of the condition of the claddings on the addition. The expert is a member of the New Zealand Institute of Building Surveyors. The second expert inspected the house on 2 July 2008 and furnished a report that was completed on 9 July 2008.

7.2 The expert noted that the quality of the consent drawings was poor, and there were "major differences between consent drawings and the way the building was constructed that would impact appreciably on E2 and B2 aspects".

7.3 The expert located the as-built drainage plan, but noted that it only showed surface water drainage. The foul water pipe connecting the basement gulley trap to the original foul water pipe was below concrete for about 5m in all directions, so connection points were unable to be located.

7.4 The expert noted the construction of the addition was generally of poor quality with the cladding "finished to a less than good standard" and critical flashings omitted.

7.5 The expert noted that the cedar windows were recessed back from the cladding face, with clad reveals and sills that were almost flat. No sill or head flashings are visible and there are no drip edges provided to stop water from tracking back to the cedar joinery.

7.6 The expert carried out non-invasive moisture testing and thermal imaging of the external walls and deck, which indicated severe moisture intrusion into areas below the deck. As all of the readings were over 40%, the expert did not consider it necessary to carry out invasive moisture testing to confirm the moisture penetration.

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

- there is likely to be decay and damage to the underlying deck construction, beams and columns that will require investigation and replacement work
- there are some cracks in the cladding and blisters in the textured coating
- the recessed cedar windows are ineffectively weatherproofed, with no visible head flashings, no sill flashings and almost flat monolithic-clad sills

- the clear-finished cedar windows require recoating, with black water stains indicating the water is penetrating into the timber
- there are no clearances from the bottom of the cladding to the ground and paving in some areas
- there is no clearance from the bottom of the balustrade and upstand cladding to the deck, with the deck tiles turned up against the cladding
- the flat uncapped tops of the balustrades and conservatory upstands are not adequately weatherproofed, with the metal handrails fixed through the tops of the balustrades, and there is evidence of moisture penetration. There is also no indication that saddle flashings have been installed at junctions with the walls, as is required by good trade practise.

7.8 The expert concluded that the cladding was likely to require major remedial work, as it had not been installed in “a tradesman like manner” in accordance with the manufacturer’s instructions.

7.9 A copy of the expert’s report was provided to each of the parties on 26 June 2008.

7.10 The applicant responded in a letter to the Department dated 25 July 2008, noting that the walls around the deck are the original brick veneer walls and the extension to the deck was limited to the area above the entrance.

## **8. Evaluation for code compliance of the cladding**

### **8.1 Evaluation framework**

8.1.1 In evaluating the design of a building and its construction, it is useful to make some comparisons with the relevant Acceptable Solutions<sup>4</sup>, 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.

8.1.2 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, and 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<sup>5</sup> (for example,

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<sup>4</sup> 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](http://www.dbh.govt.nz).

<sup>5</sup> Copies of all determinations issued by the Department can be obtained from the Department’s website.



Determination 2004/1) relating to cladding and these factors are also used in the evaluation process.

- 8.1.3 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.

## **8.2 Weathertightness risk**

8.2.1 In relation to these characteristics I find that this addition:

- is built in a low wind zone
- is a fairly complex, 2-storey structure
- has monolithic cladding fixed directly to the framing
- has 600mm eaves projections, provided by the original house
- has an enclosed deck on the upper level, with clad balustrades, that sits partly above basement rooms below
- has external wall framing that is not treated to provide resistance to the onset of decay if the framing absorbs and retains moisture.

8.2.2 The addition 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 level of risk can range from 'low' to 'very high'. The risk level is applied to determine what cladding 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 a particular type of cladding to be installed over a drained cavity.

8.2.3 When evaluated using the E2/AS1 risk matrix, the weathertightness features outlined in paragraph 8.2.1 show that all elevations of the addition demonstrate a high weathertightness risk rating, and would require a drained cavity to comply with the current requirements of E2/AS1.

## **Matter 2: The cladding**

### **9. Discussion**

9.1 Taking into account the expert's report, I am satisfied that the current performance of the cladding installed on the high risk addition to this house is inadequate because it has not been installed according to good trade practice or to manufacturer's recommendations at the time of construction. In particular, the monolithic cladding demonstrates the systemic defects listed in paragraph 7.7 that show non-compliance with the manufacturer's recommendations has resulted in an inadequate cladding installation. As a result there is moisture penetration into the deck structure, walls and columns through these defects, which in turn may have led to widespread decay.

Consequently I am not satisfied that the cladding system as installed complies with either Clause B2 or Clause E2 of the Building Code.

- 9.2 I find that, because of the extent and apparent complexity of the faults that have been identified with the cladding, I am unable to conclude, with the information available to me, that fixing the identified faults, as opposed to partial or full re-cladding, could result in compliance with Clauses B2 or E2. I consider that final decisions on whether code compliance can be achieved by either localised repairs or re-cladding, or a combination of both, can only be made after a more thorough investigation of the cladding. This will require a careful analysis by an appropriately qualified expert. Once that decision is made, the chosen repair option should be submitted to the territorial authority for its consideration and approval.
- 9.3 I note that the Department has produced a guidance document<sup>6</sup> on weathertightness remediation, and I consider that this guide will assist the owner in understanding the issues and processes involved in remediation work, and in exploring the various options that may be available to her when considering the upcoming work required to the building work.
- 9.4 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 3: The durability considerations**

#### **10. Discussion**

- 10.1 As set out in its correspondence, the authority has concerns about the durability, and hence the compliance with the Building Code, of the alterations taking into consideration the issuing of the building consent in 1999. I note that the first final inspection did not take place until March 2005, although the building work may have been substantially completed at some earlier date.
- 10.2 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).
- 10.3 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

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<sup>6</sup> External moisture – A guide to weathertightness remediation

- 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.
- 10.4 In this case the 8-year delay between the commencement of the building work and the applicant's request for a code compliance certificate raises the matter of when all the elements of the building complied with Clause B2. 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 2005, although the building work may have been substantially completed at some earlier date. The sequence of events outlined in paragraph 3.1 to 3.3 does not give me a clear indication when the durability periods for the building work should commence.
- 10.5 It is not disputed, and I am therefore satisfied, that all the building elements complied with Clause B2 on 1 April 2005, refer paragraph 4.7.
- 10.6 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.
- 10.7 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, because 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 at some earlier date.
- 10.8 I strongly recommend 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.

## **11. What is to be done now?**

- 11.1 A notice to fix should be issued that requires the owner to bring the building work into compliance with the Building Code, identifying the defects listed in paragraph 7.7 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 specify how the defects are to be remedied and the unit brought to compliance with the Building Code. That is a matter for the owner to propose and for the authority to accept or reject.
- 11.2 I suggest that the applicant and the authority adopt the following process to meet the requirements of paragraph 11.1. Initially, the authority should issue the notice to fix. The owner should then produce a response to this in the form of a detailed proposal,

together with suitable amendments to the plans and specifications, 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.

## **12. The decision**

12.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the building work complies with Clauses E1 and G13 but does not comply with Clauses E2 and B2 of the Building Code, and accordingly I confirm the authority's decision to refuse to issue a code compliance certificate.

12.2 I also determine that:

- (a) all the building elements installed in the building work, apart from the items that are to be rectified, complied with Clause B2 on 1 April 2005.
- (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 2005 instead of from the time of issue of the code compliance certificate for all building elements, provided that the modification does not apply to the cladding to the addition as set out in Determination 2008/95.
- (c) the territorial authority, once the matters set out in paragraph 7.7, together with any other matters arising from a more extensive investigation, have been rectified to its satisfaction, is to issue a code compliance certificate in respect of the building consent as amended.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 8 October 2008.

John Gardiner  
**Manager Determinations**