

## Determination 2009/42

### Determination regarding the code compliance of a ten year old commercial building at 6-8 South End Avenue, Whangarei



#### 1. The matters 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 the Department. The applicant is the owner, Mr I Walker of Lakeland Property Trust (“the applicant”). The other party is the Whangarei District Council (“the authority”) carrying out its duties and functions 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 because it is not satisfied the building work complies with the Building Code<sup>2</sup> (First Schedule, Building Regulations 1992).

<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 I take the view that the matters to be determined, in terms of sections 177(a) and 177(b) of the Act, are:

**Matter 1: The claddings**

Whether the claddings as installed on the building comply with Building Code Clause B2 “Durability” and Clause E2 “External Moisture”. By the “claddings as installed” I mean the components of the system (such as the materials, the flashings, and/or the coatings) as well as the way the components have been installed and work together.

**Matter 2: The durability considerations**

Whether the building work complies with Building Code Clause B2 Durability, taking into account the age of the building work.

- 1.4 In making my decision, I have considered the submissions of the parties, the report from an independent expert (“the expert”) commissioned by the Department to advise on this dispute, and the other evidence in this matter. I have evaluated this information using a framework that I describe more fully in paragraph 6.1.
- 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 a two storey commercial building which contains workshops, offices, and accommodation. The timber framed building is in a medium wind zone for the purposes of NZS 3604<sup>3</sup>. The building is built on a concrete slab with poles supporting the structure. There is a mezzanine floor, which is timber framed and supported on steel frames.
- 2.2 The building is clad in two different cladding types. The walls are generally clad with horizontal corrugated steel, and there are feature panels of monolithic cladding, which are described as fibre-cement sheets that are texture sprayed. Both cladding types are direct fixed to the timber frame over building paper. There are a number of large signs that have been fitted directly onto the faces of the fibre-cement cladding. Window and door flashings are aluminium and the roller door is colour steel.
- 2.3 The roof is clad with colour steel and has parapets to most elevations that have been lined on the inside with fibre-cement and fully flashed. The building has no eave projections, but a first floor balcony provides shelter to the bi-fold ground floor doors on the north-west (front) elevation.
- 2.4 The first floor balcony is constructed on a steel frame. The timber-framed solid barrier balustrade is also clad in fibre-cement with a sloped top edge. The deck walls and substrate have been covered in a waterproof membrane. No overflow drain has been provided.
- 2.5 The structural poles have been confirmed as “Tana poles”. It was not confirmed whether the other timber was treated, however, given the date of construction and the lack of other evidence, I consider the external wall framing to be untreated.

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

### 3. The background

- 3.1 A building consent for the work (no 30626) was issued by the authority on 1 October 1998.
- 3.2 It is unclear exactly when the building work was carried out, but the applicant has stated that the building was completed in 1998. I have not seen any records of inspections carried out during construction.
- 3.3 It appears that the applicant applied to the authority for a code compliance certificate some time in 2006. On 29 June 2006, the authority wrote to the applicant advising that a code compliance certificate was unable to be issued as the authority did not believe that the building complied with Clause B2 and Clause E2 of the Building Code.
- 3.4 On 9 May 2008, the authority wrote to the applicant explaining that a code compliance certificate had not been issued for building consent 30626, and that the owner was required to check the status of the building work, and, depending on the situation, apply for a code compliance certificate, a certificate of acceptance, an amendment to the consent, or a cancellation of the building consent. The applicant confirmed the building work was completed and requested a final inspection.
- 3.5 On 28 July, 31 July, and 16 September 2008 the authority carried out final inspections. The first final inspection was a general inspection, the second was a roof and cladding inspection, and the third was a general inspection. The authority's main concerns appeared to be the compliance of the cladding with Clause E2 and Clause B2 of the Building Code.
- 3.6 The inspection notes arising from the first final inspection also show a number of minor items that required rectification. These were not referred to on the notice to fix (refer to paragraph 3.7). However, the notes from the third final inspection refer to two items from the first final inspection that still require rectification, 'Fit cover flashing to top of deck barrier' and 'Provide overflow to enclosed deck off upstairs unit'.
- 3.7 On 12 August 2008, after the first and second final inspections, the authority issued a notice to fix:
- Non compliance with E2 (External Moisture) of the New Zealand Building Code with regards to face fixed exterior cladding E2.2 NZBC 1992.
  - Multiple cracks and areas with high moisture content readings (26% plus) in face fixed [fibre-cement] cladding.
  - Flashing systems for horizontal face fixed corrugated iron do not appear to be shedding water to cladding exterior.
  - Flashings over doors are face fixed.
- 3.8 In about September 2008, the owner commissioned an inspection of the fibre cement cladding. A representative of the cladding manufacturer made some recommendations for rectification and maintenance work, including recoating of the fibre cement panels.
- 3.9 The Department received an application for determination on 1 December 2008.

## **4. The submissions**

- 4.1 The application for determination stated that the problem was “weathertightness relating to the fibre-cement cladding fitted in 1998 prior to the new cavity requirements”. The applicant also noted that the authority did not believe the building complied with Clauses E2 and B2 and so could not issue a code compliance certificate.
- 4.2 The applicant forwarded copies of:
- the consented plans
  - correspondence between the applicant and the authority
  - the inspection records from the final inspections
  - the notice to fix
  - the specification for the recoating of the fibre cement panels.
- 4.3 Copies of the submissions and other evidence were provided to the parties. Neither party made any further submissions.
- 4.4 A draft determination was issued to the parties for comment on 21 April 2009. The draft was issued for comment and for the parties to agree a date when the building work complied with Clause B2 “Durability”.
- 4.5 In response to the draft determination, both parties agreed that compliance with B2 was achieved on 1 April 1999.

## **5. The expert’s report**

- 5.1 As discussed in paragraph 1.4, I engaged an independent expert to provide an assessment of the condition of those building elements subject to the determination. The expert is a member of the New Zealand Institute of Building Surveyors. The expert inspected the building on 12 March 2009 and furnished a report that was completed on 19 March 2009.

### **5.2 Moisture levels**

- 5.2.1 The expert recorded non invasive moisture readings varying between 10%-15%, and invasive moisture readings at high risk locations, including the balcony which varied between 13%-16%. Moisture levels that vary significantly generally indicate that external moisture is entering the structure and further investigation is required.
- 5.2.2 The framing showed good resistance to drilling, indicating the framing was showing no signs of loss of fibre strength.
- 5.2.3 The expert observed that the sign boards have been fitted directly to the fibre cement cladding.

### **5.3 The cladding systems**

- 5.3.1 The expert noted that the ground clearance levels were generally satisfactory. The expert observed that the fibre cement cladding had no visible control joints, either vertically or horizontally. However, the expert noted there were no signs of movement or damage that could be attributed to this omission and that the cracks observed could be attributed to other faults.

- 5.3.2 The fibre-cement sheet joints have been installed using a tape reinforced flexible jointing system and the layout of the fibre cement sheets appears to be in accordance with the manufacturers instructions.
- 5.3.3 Where the fibre cement cladding has been placed above the corrugated steel cladding, the fibre cement sheets have been cut to shape and packed off the framing to over flash the corrugated cladding, which creates a cavity between the framing and fibre cement cladding, although this is not drained it will provide for a degree of drying.
- 5.3.4 The corrugated steel cladding is generally well fitted.
- 5.3.5 The expert observed all roof flashings have been well executed including aprons, parapets, and ventilated skylights and that window and door flashings are generally of good workmanship and are performing.
- 5.3.6 The balcony has been well constructed, with adequate clearance of cladding at the wall to deck junction. There is a good slope to the top surface of the balustrade.
- 5.3.7 Commenting specifically on the cladding, the expert noted that:

**The walls**

- there are large cracks and damaged sheets of cladding around the window frames at the north eastern elevation. The applicant advised the expert that his project engineer had inspected the cracking, and concluded that some settlement may have occurred at the corner of the building causing the cracks.
- some crazing to the texture paint system of the fibre cement sheets has occurred
- there are minor cracks evident in the fibre cement sheets
- the signs have been direct fixed to the cladding without a frame for support and stand off brackets

**Windows and doors**

- the head flashings fitted under the corrugated steel sections of cladding need to extend to the end of the jamb flashings
- the top flashings at the roller doors do not carry past the jamb flashings

**The balcony**

- there is no cover flashing to the top of the deck barrier or saddle flashings to the wall junctions
- there is no overflow.

5.4 **Other code clauses**

- 5.4.1 The expert inspected the building with respect to a number of Building Code Clauses, other than E2 and B2 and noted no matters of non compliance.
- 5.5 A copy of the expert's report was provided to the parties on 30 March 2009.

## Matter 1: The claddings

### 6. Weathertightness

6.1 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<sup>4</sup> (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 Weathertightness risk

6.3.1 In relation to these characteristics, I find that the building:

##### **Features tending to increase risk**

- has no eaves
- has two storeys
- has parapets on some elevations
- is very simple in plan and form but has two cladding types
- has an exposed deck at first floor level

##### **Features tending to decrease risk**

- is in a medium wind zone.

6.3.2 The building 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.

6.3.3 When evaluated using the E2/AS1 risk matrix, the weathertightness features outlined in paragraph 6.3.1 show the building demonstrates a high weathertightness risk rating. I note that, although a drained cavity is now required by E2/AS1 for fibre-cement cladding at a high risk level, this was not a requirement at the time the building was constructed.

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<sup>4</sup> Copies of all determinations issued by the Department can be obtained from the Department's website.

## 6.4 **Weathertightness performance**

6.4.1 Taking into account the expert's report and comments as outlined in 5.3.7, I conclude that the following items require rectification with respect to:

- the cracks and damaged cladding
- the crazing to the textured paint of the fibre-cement
- the signs that have been direct fixed to the cladding
- the head flashings under the corrugated steel sections of cladding
- the top flashings at the roller doors
- the flashings to the top of the deck barrier
- the lack of overflow to the balcony

6.4.2 I note the statement in the notice to fix stating recorded moisture readings of '26% plus', however, this appears to be a reading of the moisture content of the fibre-cement cladding. As discussed in paragraph 5.2.1, the expert took non invasive and invasive moisture readings of the framing and recorded no elevated results.

## 6.5 **Weathertightness conclusion**

6.5.1 I consider the expert's report establishes that the current performance of the cladding is adequate because it is preventing water penetration into the building at present. Consequently, I am satisfied that the building work complies with Clause E2 of the Building Code.

6.5.2 In addition, the building work 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 building to remain weathertight. Because the faults on the cladding are likely to allow the ingress of moisture in the future, the building work does not comply with the durability requirements of Clause B2.

6.5.3 Because the faults identified with the cladding occur in discrete areas, I am able to conclude for reasons set out in paragraph 6.5.4, that satisfactory rectification the items in 5.3.7 will result in the cladding being brought into compliance with Clause B2, despite the absence of control joints in this instance.

6.5.4 I have had regard to the following factors with respect to control joints and whether the cladding can be brought into compliance without them

- After 10 years the building complies with Clause E2
- I note the majority of the building is clad with horizontal corrugated steel.
- The fibre-cement cladding is applied to walls that are less likely to be affected by the movement of the building. (I observe that Verification Method B1/VM4 prescribes limits on the differential settlement of a structure, and, by implication, a cladding must be able to accommodate at least part of movement resulting from settlement.)
- The presence of control joints is unlikely to have prevented the cracking close to the end of the wall.

- Parts of the external wall are unlined and the cladding has been fixed over a cavity to align it with the Colorsteel cladding. This has had the effect of providing some benefit to the cladding.
- The residual cladding life (of the original 15 years required by B2) is 5 years and the benefits of a control joint retrofit are likely to be small compared to the risk of damage to the cladding.
- This is a commercial building as opposed to a residential one, although the building includes a residential dwelling. The effects of non compliance are potentially different in terms of the building's overall function and use.

I am therefore of the view that, in this case, the absence of control joints has not caused the cladding to be non-compliant, subject to ongoing maintenance as set out in paragraph 6.5.5.

- 6.5.5 Effective maintenance of claddings is essential 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 Concern has been expressed about the age of the consent, and hence the compliance with the building code of certain elements of the building work, taking into account the completion of the work in 1999.
- 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 The 9-year delay between the substantial completion of the building work consented in 1999 and the application for determination raises the matter of when all the elements of the building, with the exception of the items that are to be rectified as described in this determination, complied with Clause B2.

- 7.5 It is not disputed and I am therefore satisfied, that all the building elements, apart from those items that are to be rectified, complied with Clause B2 on 1 April 1999, refer paragraph 4.5.
- 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, 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 in 1999.
- 7.8 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.

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

- 8.1 A notice to fix should be issued that requires the owner to bring the building into compliance with the Building Code, identifying the items listed in paragraphs 5.3.7 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 stipulate directly how the defects are to be remedied and the building brought to compliance with the Building Code. That is a matter for the owner to propose and for the authority to accept or reject.
- 8.2 I would suggest that the parties adopt the following process to meet the requirements of paragraph 8.1. 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, based on further investigation as necessary and 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.
- 8.3 I also note that there were a number of items listed on the final inspection notes, particularly on the notes dated 28 July 2008 (refer paragraph 3.5). Other code clauses are referred to in paragraph 5.4.1. All the items listed on the final inspection notes were not stated in the notice to fix, and it is not clear from subsequent inspection notes, or from the notice to fix whether these items have been rectified. I leave it to the authority to confirm that these items have been rectified to its satisfaction.
- 8.4 Once the matters set out in 5.3.7 and 8.3 have been rectified to its satisfaction, the authority may issue a code compliance certificate in respect of the building consent, as amended.

## **9. The decision**

9.1 In accordance with section 188 of the Building Act, I determine that the cladding does not comply with Clauses E2 or Clause B2, and accordingly I confirm the authority's decision not to issue a code compliance certificate.

9.2 I also determine that:

- a) all the building elements, apart from the items that are to be rectified as described in this determination, installed in the building complied with Clause B2 on 1 April 1999
- 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 1999 instead of from the time of issue of the code compliance certificate for the building elements, except the items that are to be rectified, as described in Determination 2009/42.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 11 June 2009.

John Gardiner  
**Manager Determinations**