

## Determination 2007/27

### Determination regarding a code compliance certificate for a house at 32A Masterton Road, Rothesay Bay, North Shore



#### 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, Determinations Manager, Department of Building and Housing (“the Department”), for and on behalf of the Chief Executive of that Department. The applicant is the owner, Mr Sakai (“the applicant”), acting through the builder, Harmony Homes Ltd (“the builder”), and the other party is the North Shore 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 a 4-year-old house because it is not satisfied

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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).

that it complies with clauses B2 “Durability” and E2 “External Moisture” of the Building Code<sup>2</sup> (First Schedule, Building Regulations 1992).

- 1.3 The matter for determination is whether the claddings as installed on the house (“the claddings”) comply with clause E2 “External Moisture” of the Building Code. By “the claddings as installed” I mean the components of the systems (such as the backing materials, the flashings, the joints and the plaster and/or 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 independent 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.
- 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

- 2.1 The building work consists of a two-storey detached house, situated on a sloping excavated site, which is in a high wind zone for the purposes of NZS 3604<sup>3</sup>. The house is conventional light timber frame construction, with concrete slabs, concrete block retaining walls, aluminium windows, and monolithic fibre-cement sheet, and profiled metal, claddings. The house is split-level between two sections; the north section accommodating living areas with bedrooms above, and the south section housing the garage with a separately accessed bedroom above. The shape is fairly complex in plan and form, with 3° pitch profiled metal mono-pitched roofs at varying levels. The upper level of the north section overhangs the lower level by 800mm or more. Except for several projections, the upper roof of the north section has eaves of more than 800mm, with exposed rafters and oblique eaves to the east elevation. Other eaves and verge projections to the north section are about 450mm.
- 2.2 The south section of the house has no eaves projections to the west, and parapets above the east and south walls. An enclosed deck sits above the south end of the garage, with the east roof parapet continuing around the corner to form the clad balustrades, then stepping up beside a small flat-roofed area adjoining the deck.
- 2.3 Although the specification calls for the wall framing to be “boric treated or chem free”, the builder wrote to the territorial authority on 19 December 2005 stating that the framing timber is H3 LOSP treated. I am therefore prepared to accept that the external wall framing is likely to be treated to a level that will provide resistance to fungal decay if it becomes wet and cannot dry out.
- 2.4 The monolithic cladding system to the lower walls of the north section of the house is what is described as monolithic cladding, and consists of 7.5 mm thick fibre-cement sheets fixed through the building wrap to the framing, and finished with an

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

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

applied textured coating system. The upper walls of the house, and part of the lower walls of the garage section have horizontal corrugated “Zincalume” metal cladding, and the remaining garage walls have painted fibre-cement sheet cladding, with timber battens covering the horizontal and vertical joints. The expert notes that the 3mm joints appear to be formed over compressed Inseal strips, and the battens have double weather-grooves on their undersides.

2.5 I have received no evidence of producer statements or warranties for the cladding.

### **3 Sequence of events**

3.1 The territorial authority issued a building consent number BB/4911/02 on 14 March 2002 and carried out various inspections during construction, including a pre-line inspection on 2 September 2002 and post-line on 18 September 2002.

3.2 A final inspection was undertaken on 7 August 2003, and outstanding items were identified. Several recheck inspections were subsequently carried out and the inspection summary notes “All OK” at an inspection on 22 July 2005.

3.3 It appears that the applicant subsequently sought a code compliance certificate and the territorial authority carried out a visual “weathertightness inspection” on 3 August 2005, which identified 26 weathertightness defects. I observe that this inspection took place less than two weeks after the “All OK” inspection on 22 July 2005.

3.4 In a letter to the owner dated 25 January 2006, the territorial authority stated that the Building Code required the durability of the cladding to be 15 years and that of the timber framing to be 50 years. The territorial authority also noted that the inspection process for monolithic claddings had changed since the time that the building consent for the house was processed, including the selection of cladding systems to suit the weathertightness risk of the design. The territorial authority listed certain risk factors identified with the building, together with a list of defects and outstanding items, and stated that, due to the risk factors, defects and other compliance requirements, it could not be satisfied on reasonable grounds that the cladding system complied with clauses E2 and B2 of the Building Code.

3.5 The territorial authority did not issue a notice to fix as required under section 164 of the Building Act 2004.

3.6 The Department received an application for a determination on 27 July 2006.

### **4 The submissions**

4.1 Within the application, the applicant noted that the matter for determination was “Compliance with E2 External Moisture and B2 Durability”.

- 4.2 The applicant forwarded copies of:
- the drawings and specification
  - the building consent documentation
  - some inspection records
  - various producer statements and other statements.
- 4.3 The territorial authority made a submission in the form of a letter to the Department dated 10 October 2006, which noted that the matters for determination were:
- Whether the installed cladding systems comply with clauses B2.3.1 and E2.3.2 of the New Zealand Building Code.
- 4.4 The territorial authority forwarded copies of:
- the summarised record of inspections
  - the Weathertightness Report dated 3 August 2005
  - the letter to the applicant dated 25 January 2006.
- 4.5 Copies of the submissions and other evidence were provided to each of the parties. Neither party made any further submissions in response to the submission of the other party.
- 4.6 A copy of the draft determination was forwarded to the parties for comment on 7 February 2007. Both parties accepted the draft determination, with the applicant making two comments that did not impact on the determination itself.

## **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.
- 5.2 The expert initially visited the house on 4 September 2006, and notes that no items raised in the territorial authority's weathertightness report had been attended to at that time. After consulting the owner and builder, the expert agreed to return when the builder advised him that the items were completed. Following several further visits, the expert inspected the claddings of the house on 18 December 2006, and furnished a report that was completed on 19 December 2006.
- 5.3 The expert noted that the building work conformed to the consent drawings, the house was "well constructed with little fault" and the "straightness and finish of the texture coated areas is of a good standard". The expert noted that the batten-jointed fibre-cement had recently been repainted in a light colour. The expert also noted that clearances from the bottom of claddings to the ground, paving or roof cladding were acceptable, control joints had been adequately provided and formed in the flush-finished fibre-cement cladding, the deck appeared to be adequately drained and flashed, and penetrations through the claddings were satisfactory.

- 5.4 The expert noted that the windows had been face-fixed against the flush-finished fibre-cement or the battens, with metal head flashings and no sill or jamb flashings (and perimeter sealant applied at the edge of the window flanges).
- 5.5 The expert noted that the metal cladding (including the windows) appeared to be installed in accordance with the BRANZ Good Practice Guide recommendations for this cladding, with satisfactory flashings and profiled compressible foam used at window jambs and other vertical junctions.
- 5.6 The expert inspected the interior of the house and (except for the retaining wall noted in paragraph 5.7) no evidence of moisture was noted. The expert took non-invasive moisture readings through claddings of exterior walls, and no elevated readings were recorded. A further 3 invasive moisture readings were taken through the wall cladding below window sills, and moisture levels were recorded as less than 13%.
- 5.7 Commenting specifically on the cladding, the expert said that:
- the windows lack seals between the jamb flanges and the cladding or battens (contrary to the recommendation of the cladding manufacturer)
  - there are gaps at the junctions of the cover battens with the fibre-cement sheets
  - the vertical battens over the fibre-cement sheets butt against the horizontal battens, with no allowance for drainage of any moisture in the weather-grooves
  - there is a minor 120mm-long crack below the upper stair west window
  - moisture is penetrating through the garage west retaining wall, indicating a defect in the below ground damp-proofing.
- 5.8 The expert also noted that a timber trim has been installed at the junction of the soffits and the metal cladding, with the fascia cut and fitted around the exposed rafters (implying that the flashing upstand would also be cut and sealed). The expert was concerned that reliance on sealant around the rafters could be risky at the penetrations under the oblique eaves (oblique eaves being those that slope down to the wall).
- 5.9 A copy of the expert's report was provided to each of the parties on 21 December 2006.

## **6 Evaluation for code compliance**

### **6.1 Evaluation framework: exterior cladding**

- 6.1.1 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 these houses are code compliant. However, in making this comparison, the following general observations are valid:

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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).

- Some Acceptable Solutions 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 some other provision 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<sup>5</sup> (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 this house:

- is built in a high wind zone
- is a maximum of two storeys high
- is fairly complex in form, with three types of wall cladding, roofs at varying levels, oblique eaves and exposed rafters
- has monolithic, fibre-cement sheet and horizontal profiled metal claddings that are fixed directly to the framing
- has parapets and no eaves to the south section, with the north section having upper eaves of more than 800mm, and lower eaves and verge projections of 450mm or more above most other walls
- has an enclosed deck with clad balustrades, which is situated over the garage
- has external wall framing that is likely to be treated to a level that is effective in helping resist decay if it absorbs and retains moisture.

6.2.2 When evaluated using the E2/AS1 risk matrix, these weathertightness features show that all elevations of this house demonstrate a high weathertightness risk rating. The matrix is an assessment tool that is intended to be used at the time of application for consent, before the building work has begun and, consequently, before any

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

assessment of the quality of the building work can be made. Poorly executed building work introduces a risk that cannot be taken into account in the consent stage but must be taken into account when the building as actually built is assessed for the purposes of issuing a code compliance certificate.

### **6.3 Weathertightness performance: the exterior cladding**

6.3.1 Generally the claddings appear to have been installed in accordance with good trade practice. However, taking into account the expert's report, I consider that remedial work is necessary in respect of the following:

- the lack of seals behind the window jamb flanges
- the lack of provision for drainage from the weather-grooves in the battens
- the gaps at the junctions of the cover battens with the fibre-cement sheets
- the small crack below the upper stair west window
- the moisture penetration through the garage concrete block retaining wall
- any other building elements associated with the above that are consequently discovered to be in need of rectification.

6.3.2 I note the expert's comment in paragraph 5.8, with regard to the potential vulnerability of the exposed rafters at the oblique eaves. However, I note that the 3° pitch roof is very low-pitched (with the outer fascia providing a drip edge to deflect moisture) and the eaves projection is more than 800mm above these penetrations. I consider that the junctions are well sheltered, with minimal slope toward the junctions, and will therefore be adequate in these circumstances.

6.3.3 Notwithstanding the fact that the cladding is fixed directly to the timber framing, thus limiting drainage and ventilation behind the cladding, I note the following compensating factors that assist the performance of the claddings in this particular case:

- apart from the noted exceptions, the claddings are installed to good trade practice
- the monolithic cladding is limited to low risk, single storey wall faces
- the north section of the building has roof projections that provide good protection to the cladding areas below them.

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

## **7 Discussion**

7.1 I consider that the expert's report establishes there is no evidence of external moisture entering the building and, accordingly, that its cladding does comply with clause E2 at this time.

- 7.2 However, 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 building to remain weathertight. Because the cladding faults on the building are likely 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 system 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 clause B2.
- 7.4 I emphasise that each determination is conducted on a case-by-case basis. Accordingly, the fact that particular cladding systems have been established as being code compliant in relation to a particular building does not necessarily mean that the same cladding systems will be code compliant in another situation.
- 7.5 I decline to incorporate any waiver or modification of the Building Code in this determination.
- 7.6 Effective maintenance of claddings (in particular of monolithic claddings) is important to ensure ongoing compliance with clauses B2 and E2 of the Building Code and is the responsibility of the building owner. Clause B2.3.1 of the Building Code requires that the cladding be subject to "normal maintenance", however that term is not defined in the Act.
- 7.7 I take the view that normal maintenance is that work generally recognised as necessary to achieve the expected durability for a given building element. With respect to the cladding, the extent and nature of the maintenance will depend on the material, or system, its geographical location and level of exposure. Following regular inspection, normal maintenance tasks should include but not be limited to:
- where applicable, following manufacturers' maintenance recommendations
  - washing down surfaces, particularly those subject to wind-driven salt spray
  - re-coating protective finishes
  - replacing sealant, seals and gaskets in joints.

## **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 clause B2 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 not issued a notice to fix. A notice to fix should be issued that requires the applicant to bring the building work into



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 applicant 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.

- 8.3 I would suggest that the parties adopt the following process to meet the requirements of paragraph 8.2. Initially, the territorial authority should issue the new notice to fix, listing all the items that the territorial authority considers to be non-compliant. The owner should then produce a response to this in the form of a detailed 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 5 March 2007.

John Gardiner  
**Determinations Manager**