

Determination 2008/2

Determination regarding a code compliance certificate for a house with a small area of monolithic cladding at 51 Gulf View Road, Murrays Bay, North Shore City



1. The matter to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004¹ (“the Act”) made under due authorisation by me, John Gardiner, Manager Determinations, Department of Building and Housing (“the Department”), for and on behalf of the Chief Executive of that Department. The applicants are the owners of the house, E and J Wallace (“the applicants”) 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 that it complies with Clauses B2 “Durability” and E2 “External Moisture” of the Building Code² (First Schedule, Building Regulations 1992).

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.

1.3 I note that the independent expert (“the expert”) commissioned by the Department to advise on this dispute has discussed this matter with compliance officers of the territorial authority, who advised that the only outstanding issue with regard to the compliance of this house was “verification that the direct fixed monolithic claddings would meet the performance criteria of the New Zealand Building Code” (refer paragraph 5.2). I therefore consider the matter to be determined is the weathertightness of the monolithic cladding. I also note that the expert has identified the possible diminished condition of the timber framing, resulting from extended exposure to the weather, as a matter that may impact on the durability of the house. I have therefore added this as a matter to be determined.

1.4 The matters for determination are therefore whether:

1.4.1 Matter 1: the monolithic cladding

The monolithic cladding as installed on the upper level of the house (“the cladding”) complies with Clauses E2 and B2 of the Building Code. By “the cladding as installed” I mean the components of the system (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.

1.4.2 Matter 2: the timber wall framing

The timber wall framing in the house complies with clause B2 of the Building Code.

1.5 In making my decision, I have considered the submissions of the parties, the expert’s report (refer to paragraph 5) and the other evidence in this matter. I have evaluated this information using a framework that I describe more fully in paragraph 6.1.

1.6 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 large detached house situated on a sloping site, which is in a high wind zone for the purposes of NZS 3604³. The house is one storey high on the southeast garage side, and 3-storeys high to the northeast, with the living areas accommodated on the upper level. The construction of the house is conventional light timber frame, with a concrete slab, concrete block foundations and retaining walls, aluminium windows, monolithic cladding to the northeast of the top level and brick veneer elsewhere. The house is complex in plan and form, with 45° pitch asphaltic shingle mansard roofs and membrane flat roofs. Eaves projections are provided by parapet bands that project 900 mm from the wall faces at the upper level.

2.2 A large enclosed deck, recessed into the mansard roofline, wraps around the northeastern upper level living area, and is situated partly over bedroom areas below. The deck floor is tiled, with an edge upstand and structural glass balustrades over stainless steel cappings. The deck upstand extends down to form a band clad with

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

fibre-cement sheet, similar to the upper roof parapet, which provides eaves projections above the lower level brick veneer cladding.

- 2.3 The expert has noted no evidence as to timber treatment. The inspection company's report outlined in paragraph 3.4 notes that the exposed wall framing timber was marked as "Origin Timeframe – KD, 01/10/01". Given the date of construction and the other evidence, I conclude that the external wall framing is untreated.
- 2.4 The monolithic cladding systems include purpose-made flashings to windows, edges and other junctions.
 - 2.4.1 The wall cladding to the upper northeast level (totalling some 24 square metres in area) is "Insulclad" EIFS⁴ with 60 mm polystyrene backing sheets, as an inherent feature of this system, fixed directly to the framing over the building wrap, and finished with a textured modified plaster system. Vertical drainage channels are formed in the back of the polystyrene sheets.
 - 2.4.2 The roof parapets and bands under the decks are clad in 7.5 mm thick fibre-cement sheets fixed through the building wrap to the framing, and finished with a textured coating system. The soffits are also lined with fibre-cement sheet.
- 2.5 The manufacturer provided to the plasterer a "Producer Statement" dated 20 December 2006, for the "Insulclad" system. According to the applicants, it has also provided warranties that have not been supplied to the applicants by the plasterer, due to a dispute regarding payments.

3. Background

- 3.1 It appears that the territorial authority issued a building consent (No. BB/01940/01) on 7 August 2001, based on a building certificate (No. C/2000-3174) issued by A1 Building Certifiers Ltd ("the first building certifier"). I have not seen copies of the building consent or the building certificate.
- 3.2 The first building certifier carried out various inspections of the slab and foundations during October and November 2001, with the last inspection recorded on 13 November 2001. According to the first building certifier, the timber framing was erected in November and remained exposed to the weather for more than 6 months.
- 3.3 When the builder reactivated the project, the first building certifier expressed concerns about the exposure and possible damage of the untreated framing and requested a report on its condition.
- 3.4 The applicants arranged for a specialist inspection company ("the inspection company") to undertake an inspection of the framing. The inspection company inspected the framing on 25 June 2002 and submitted a report to the owners dated 5 July 2002, which noted that the framing timber was marked as "Origin Timeframe – KD, 01/10/01". The report also noted that the roof had been installed in February

⁴ EIFS - External Insulation and Finish System

2002 and the windows in April 2002, with the building wrap replaced at least twice during the exposure period. The inspection company identified:

- some risky details and recommended that these should be reconsidered and amended
- recommended that a timber preservative be applied to all the timber framing
- advised replacement of some possibly damaged timbers and plywood.

The report noted:

As a general comment I am surprised that more serious effects of the framing being exposed to the elements were not evident and can only put this down to the builder doing his best to wrap up the framing with the Tyvek building wrap since December 2001.

3.5 The inspection company also removed timber samples from the framing (at two locations that appeared most susceptible to decay) and forwarded them to a testing laboratory for analysis. The analysis confirmed that:

No evidence of wood decay was seen in either of the samples received.

3.6 On receipt of the report, the owners were apparently happy for construction to proceed, and the applicants noted:

We were also comforted by the fact that [the builder] did implement the key recommendations such as fully replacing the Tyvec building wrap around the whole building and corrected the direction of this and other sealing details so that water could not come inside the house.

3.7 The builder subsequently sought further advice from the timber merchant, who arranged for an inspection to be undertaken by the timber supplier. An inspection was carried out on 27 July 2002, attended by the owner, the builder, the merchant and the supplier.

3.8 In a letter to the merchant dated 16 August 2002, the supplier reported on the results of the inspection and noted that, although the timbers appeared weathered and grey, moisture readings indicated that most timbers ranged from 18% to 25% (with only one bottom plate higher than 30%) and there was no sign of any mould or decay fungi. The supplier suggested that there were no major problems with the timbers in question, and:

...having inspected the framing timbers in the building considers that, when the moisture content in the pre-mentioned areas has returned to 20% or less, the interior lining of the walls can begin.

3.9 In a letter to the builder dated 20 August 2002, the first building certifier expressed concerns that the supplier offered no guarantees with the report and the framing inspection had been visual only, with no testing for hidden decay. The building certifier stated that on the basis of the information supplied she was not prepared to accept the report, and that the options were to:

- Replace the bottom plates with H3 framing (or)

- Conduct further testing on the framing and submit this information together with a written guarantee confirming compliance (which [the certifier was] under no obligation to accept), (or)
- . . . you can take this information to someone else to approve.

3.10 The supplier re-inspected the framing on 22 August 2002 to assess the moisture content and condition prior to lining and, in a letter to the merchant dated 27 August 2002, noted that a total of 242 satisfactory readings had been taken and concluded:

Moisture content of the timbers is sufficiently low enough to inhibit any mould or fungal development

That [plasterboard] lining may proceed

I note that both the supplier's reports contained the proviso that technical support only was offered, and the supplier would not be held liable for any damage resulting from any future moisture entry into the building.

3.11 It appears that the first building certifier took advice from an independent timber grading expert and told the builder that the supplier's reports were not accepted and further tests were required on the framing and the flooring of the building. The builder then advised the building certifier to issue an interim code compliance certificate for the work up to the slab stage and to hand the file to the territorial authority.

3.12 In an email to the territorial authority dated 29 August 2002, the first building certifier explained the situation and gave notice that all documentation on the project would be returned for completion.

3.13 On 29 August 2002, the first building certifier supplied a progress report on work completed to date, issued an interim code compliance certificate "to floor slab stage only" and formally advised the territorial authority that:

A1 Building Certifiers Limited have withdrawn their involvement upon mutual request. A1 Building Certifiers will not accept timber framing report (due to independent advice received).

3.14 On 4 September 2002, Approved Building Certifiers Ltd ("the second building certifier") was engaged to complete the building inspections, and issued a building certificate dated 4 September 2002 stating that:

The building work complied with the listed provisions of the building code on the date of certification.

3.15 I have received no records of any inspections undertaken by the second building certifier, but the applicants have stated that the remaining inspections were undertaken and accepted by the territorial authority, with the house completed by December 2002.

3.16 In the New Zealand Gazette No. 144, notice was given that the builder was placed into liquidation on 8 October 2003 and, in a facsimile to the territorial authority dated 30 October 2003, the appointed managers of the liquidated builder advised that they were taking over responsibility for completing outstanding items in order to gain a

code compliance certificate for the house and were seeking advice on how best to proceed.

3.17 The applicants have stated that the territorial authority carried out a final inspection of the house (refer paragraph 4.2), and:

...everything has passed inspection. The only item outstanding is the Producer Statement for the Insulclad cladding on the top floor.

3.18 In a letter to the territorial authority dated 30 April 2006, the applicants explained difficulties in obtaining a producer statement and warranties for the EIFS cladding due to non-payment of the plasterer by the original builder (now in liquidation). The territorial authority subsequently approved amended drawings on 10 August 2006 which included changes to the upper level cladding and balustrades.

3.19 I have received no further records of correspondence between the applicants and the territorial authority. On 13 June 2007 the Department received an application for a determination from the owner. In order to complete the determination the Department sought further information, which was received on 4 October 2007 (refer paragraph 4.2).

4. The submissions

4.1 In a covering letter to the Department, dated 7 June 2007, the applicants briefly summarised the history of the project and explained the difficulties experienced in obtaining from the plasterer the documentation that the territorial authority required.

4.2 In a subsequent letter to the Department dated 3 October 2007, the applicants provided a copy of the specialist inspection company's report, expanded on the territorial authority's involvement in the project, clarified the reasons for seeking a determination (refer paragraph 5.11), and concluded:

We have now been living in our house for about 4 years, with no signs of any water leaks or problems. The recent inspection by [the expert] (that included a good look around our property, inside and outside) confirms this and that the workmanship was done correctly and to a high standard,

4.3 The applicants forwarded copies of:

- the drawings
- the report of the specialist inspection company dated 5 July 2002
- the letter to the territorial authority dated 30 April 2006.

4.4 The territorial authority made no submission.

4.5 The draft determination was sent to the parties for comment on 7 October 2007.

4.6 Both the applicants and the territorial authority accepted the draft without comment. The applicants advised they were arranging to have the remedial work attended to. In a telephone conversation with staff of the Department one of the applicants advised, that while most of the recommendations in the inspection company's report

had been implemented (refer paragraph 3.4), the timber framing had not been treated with timber preservative.

5. The expert's report

- 5.1 As discussed in paragraph 1.5, 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 gathered relevant documentation about the project from the territorial authority's file, and I have used this information in outlining the background to the dispute. The expert also discussed the project with compliance officers of the territorial authority, and noted that he was advised that the only outstanding issue with regard to the compliance of this house was "verification that the direct fixed monolithic claddings would meet the performance criteria of the New Zealand Building Code" (refer paragraph 1.3).
- 5.3 The expert inspected the building in July and August 2007, and furnished a report that was completed on 26 August 2007. The expert noted that the "*general quality and standard of workmanship and finish was high*" and the cladding was "*straight with an unblemished finish*" and "*tidy and effective*" flashings. The expert also noted maintenance was carried out "*at large to a high standard*". The expert noted that the building work generally conformed to the consent drawings.
- 5.4 The expert noted that control joints were not required for the areas of cladding used in this house. The expert also noted that the parapet and deck upstands were adequately protected with stainless steel cappings over the membrane deck and roof upstands. The tiled deck had adequate falls and drainage, with no evidence of ponding and the apron roof flashings had kick-outs at the bottom.
- 5.5 The expert removed a small section of EIFS cladding at the jamb to sill junction of one window, and noted that the flashings appeared to be installed in accordance with the manufacturer's instructions. The expert also noted that jamb flashings were visible at the sill level of the deck doors.
- 5.6 The expert inspected and took non-invasive moisture readings throughout the interior of the upper floor and no evidence of moisture was noted. The expert took invasive moisture readings through the cladding at the bottom plate below a window jamb and through the cut-out at the sill to jamb junction, and recorded moisture levels of 15% and 16%.
- 5.7 Commenting specifically on the claddings, the expert noted that there were several fine cracks only at the joints of the fibre-cement sheets to the roof parapets and deck bands and also to a soffit.
- 5.8 The expert concluded that, if the cracks to the monolithic cladding were repaired, the cladding would continue to be weathertight.

- 5.9 The expert noted the possibility that the reported prolonged exposure of the timber framing to the weather could have led to its deterioration, and as a result, its condition may need further examination.
- 5.10 A copy of the expert's report was provided to each of the parties on 27 August 2007.
- 5.11 In a letter to the Department dated 3 October 2007 (refer paragraph 4.2) the applicants included comments on the expert's statements regarding the territorial authority's offer of inspections of the monolithic cladding, explaining that (after the application for a determination had been made) an offer had been received:
- ...suggesting we could go through the council. As we had already started the process with the DBH and had been in discussion with the North Shore City Council for over a year on this issue without resolution, we decided to continue with the DBH for a definitive resolution leading to us receiving the Code Compliance Certificate . . . for our house.

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 Solutions⁵, 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:
- 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 determinations⁶ (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

⁵ 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.

⁶ Copies of all determinations issued by the Department can be obtained from the Department's website.

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 upper area of this house:

- is in a high wind zone
- is three storeys high
- is fairly complex in plan and form
- has monolithic cladding that is fixed directly to the framing
- has eaves projections of about 900mm above most walls
- has a tiled deck, with a monolithic-clad edge band, which is recessed into the mansard roof area
- has external wall framing that is not treated to a level that provides 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 level of risk can range from 'low' to 'very high'. The risk level 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 a particular type 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 the three elevations of the upper level of this house demonstrate a high weathertightness risk rating. I note that, in order to comply with E2/AS1, the monolithic cladding on this building would require a drained cavity.

6.3 Weathertightness performance: exterior cladding

6.3.1 Generally the cladding appears to have been installed in accordance with good trade practice and in accordance with the manufacturer's instructions. Taking account of the expert's report, I conclude that remedial work is necessary in respect of the following:

- the fine cracks to the flush-finished fibre-cement cladding

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 certain compensating factors that assist the performance of the cladding in this particular case:

- Apart from the noted exception the cladding is installed to good trade practice.
- The EIFS cladding is generally sheltered by generous roof overhangs.

- The EISF cladding has vertical grooves set into the back of the polystyrene sheets, and, while these do not fully compensate for the lack of a cavity, they do provide some drainage facility.
- The monolithic cladding has been in place for more than 4 years, with no evidence of moisture penetration.

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 Matter 1: the monolithic cladding

7.1.1 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.

7.1.2 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 allow the ingress of moisture in the future, the house does not comply with the durability requirements of Clause B2.

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

7.1.4 I emphasize 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.

7.1.5 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).

7.2 Matter 2: the timber framing

7.2.1 The expert noted the possibility that the prolonged exposure of the timber framing to the weather had led to its deterioration, and as a result, its condition may need further examination. The expert made this observation having not seen the inspection company's report referred to in paragraph 3.4. In that report a number of recommendations were made, including the application of preservative to the timber

framing. All the recommendations appear to have been followed with the exception of the application of the preservative.

7.2.2 I note that the following evidence with regard to this matter:

- The inspection company's report on the condition of the framing, supported by the test results on two samples.
- The reports by the timber supplier.
- The implicit acceptance of the timber condition by the second building certifier and the territorial authority.
- The lack of any current problems with the framing.

7.2.3 The examination of the timber framing by the inspection company was unusual in that all the framing was exposed for inspection and the samples taken were from timber believed to be most at risk. During the time it was exposed, the timber was well ventilated and was therefore able to dry out more quickly than if it had been enclosed in a completed wall assembly.

7.2.4 The building was closed in shortly after the investigation by the inspection company.

7.2.5 Given the recommendation of the expert (refer paragraph 5.9), the findings of the inspections company (refer paragraph 3.4) and the verbal advice from the applicants that the timber had not been treated with preservative (refer paragraph 4.6), I commissioned the expert to revisit the property to take a further selection of samples of framing timber and have them tested for signs of decay. Four samples were taken from selected sites and submitted for laboratory testing.

7.2.6 The results of these tests were consistent with the timber having been exposed to the weather. On three samples there was initial fungal invasion at the surface but no cell wall damage detected. On a fourth sample there had been some fungal invasion throughout the sample and signs of potential soft rot but no cell wall damage. Soft rot decay would require considerable levels of moisture before it would develop. The framing appears to have been dry since the walls were clad and provided the recommended work in paragraph 6.3.1 and ongoing maintenance is carried out the framing should continue to remain at moisture levels below 18%.

7.2.7 I therefore believe the conclusions reached by the inspection company remains valid as, despite the signs of weathering and surface indications, decay did not develop between the date of inspection and the closing in of the framing.

7.2.8 In my view, provided the framing remains dry, the house will continue to meet the durability requirements of the building code.

8. The decision

8.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the cladding complies with Clause E2 of the Building Code. However, the fibre-cement

cladding does not comply with Clause B2, and accordingly I confirm the territorial authority's decision to refuse to issue a code compliance certificate.

- 8.2 I also determine that the timber framing complies with Clause B2 of the Building Code, provided that the cladding is rigorously maintained for the life of the building, and the moisture content of the framing is regularly monitored to ensure that it does not rise to levels that would foster fungal growth.
- 8.3 I note that the territorial authority has not issued a notice to fix. A notice to fix should be issued that requires the owners to bring the cladding into compliance with the Building Code, identifying the defect listed in paragraph 6.3.1 and referring to any further defects that might be discovered in the course of rectification, but not specifying how those defects are to be fixed. It is not for me to decide directly how the defects are to be remedied and the cladding brought to compliance with the Building Code. That is a matter for the owner to propose and for the territorial authority to accept or reject.
- 8.4 I would suggest that the parties adopt the following process to meet the requirements of paragraph 8.3. Initially, the territorial authority should issue the new notice to fix. 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 16 January 2008.

John Gardiner
Manager Determinations