

Determination 2006/67

Refusal of a code compliance certificate for building additions with a monolithic cladding system at 863 Beach Road, Browns Bay



1. The dispute 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, Determinations Manager, Department of Building and Housing, for and on behalf of the Chief Executive of that Department. The applicants are the owners, Mr and Mrs Willson (“the applicants”), and the other party is the North Shore City Council (“the territorial authority”).
- 1.2 The dispute for determination is whether the territorial authority’s decision to decline to issue a code compliance certificate for 2-year-old additions to an existing house because it was not satisfied that the monolithic cladding to some of the walls of the additions complied with clauses B2 “Durability” and E2 “External Moisture” of the Building Code² (First Schedule, Building Regulations 1992), is correct.

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 The question to be determined is whether I am satisfied on reasonable grounds that the monolithic wall cladding as installed to the external walls of the additions (“the cladding”), complies with the Building Code (see sections 177 and 188 of the Act). By “the monolithic wall cladding as installed” I mean the components of the system (such as the backing materials, the flashings, the joints and the coatings) as well as the way the components have been installed and work together.
- 1.4 In making my decision, I have considered the submissions of the parties, the report of the 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. I have not considered any other aspects of the Act or the Building Code.

2. The building

- 2.1 The building work consists of additions to an existing detached house situated on a sloping site, which is in a very high wind zone in terms of NZS 3604³. The original house was 2-storeys high, with a concrete block part basement and a brick veneer upper level. The additions consist of a single storey extension, with new decks to the original upper level and a roof addition to form a new upper level. The resulting house is 3-storeys high on the north and east elevations, 2-storeys high on the south and 1-storey on the west. Construction of the new additions is conventional light timber frame, with a timber-framed floor to the west extension, aluminium windows, and monolithic cladding to the new exterior walls. The existing brick veneer has been plastered to match the monolithic cladding and new windows have been installed to various existing walls, with some original openings closed in with framing and monolithic cladding. The house shape is reasonably complex, with 20° pressed metal tile hipped roofs at varying levels. Eaves projections vary from about 200mm above several walls to about 400mm elsewhere, and there are no verge projections.
- 2.2 The original deck has been extended, and runs along the north and east elevations at the middle level, continuing over the basement study at the western end and part of the garage at the southern end. These latter areas have membrane deck floors, overlaid with spaced timber slats on battens. The timber decking continues between the two ends, where it is supported on steel beams and a timber post at the northeast corner. The northern side of the deck has open timber balustrades, while the east side has a monolithic clad balustrade with a metal capping and a gap beneath the cladding to allow drainage from the solid deck floor above the garage.
- 2.3 The expert reports that the original house framing is a mixture of boric treated and native timbers. The applicant has submitted copies of invoices from the timber supplier, which indicate that the external wall framing supplied for the new additions was H1 treated, with the deck and balustrade framing H3 treated. Based on this evidence, I consider that the deck and balustrade framing used on the house is H3 treated. However, given the date of construction of the additions, I am unable to determine the particular level and type of treatment that is described as “H1” in the

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

invoices from the timber supplier. I therefore consider that the wall framing of the new additions is likely to be treated to a level that will provide only limited resistance to fungal decay.

- 2.4 The cladding system is what is described as monolithic cladding, and is a 40mm “Insulclad” polystyrene system, fixed directly to the framing over the building wrap, to which a “Ezytex” sponge finish plaster system has been applied. The system includes purpose-made flashings to windows, edges and other junctions. The balustrade cladding is a “Harditex” system with 7.5 mm thick fibre cement sheets fixed through the building wrap to the framing, and finished with an applied textured coating system. The sub-floor framing to the west extension is clad with fibre cement sheets, with uPVC joint mouldings. At the time of the expert’s inspection the cladding had not been painted.
- 2.5 Plaster Systems Ltd provided a 15-year “Materials Components Guarantee” and “Workmanship Guarantee” (both dated 27 May 2004 and noting the completion of the cladding as July 2003) relating to the “Insulclad” and “Ezytex” systems, which carried exclusion clauses, whereby Plaster Systems Ltd did not accept responsibility for consequential damage of any kind to any building component that has occurred as a result of the use of untreated timber.

3. Sequence of events

- 3.1 The territorial authority issued a building consent on 19 December 2002, and carried out various inspections during construction, including pre-line and post-line. The additions appear to have been completed during 2003, although the final inspection, which identified several outstanding items, was not undertaken until 21 May 2004. The last “recheck” inspection took place on 27 October 2005, and the territorial authority’s inspection summary notes that a weathertightness inspection was required.
- 3.2 The territorial authority carried out a visual inspection and wrote to the applicants on 8 November 2005, stating 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. The territorial authority listed certain weathertightness risk factors identified with the building, together with several defects and stated that, due to the risk factors and defects, it could not be satisfied on reasonable grounds that the cladding system complied with clauses E2 and B2 of the Building Code.
- 3.3 The territorial authority did not issue a notice to fix as required under section 164(2) of the Building Act 2004.
- 3.4 The applicants’ application for a determination was received by the Department on 24 February 2006.

4. The submissions

4.1 In a letter to the Department dated 21 February 2006 which accompanied the application, the applicants outlined the history of the project, explaining that all required inspections had been carried out with faults identified during inspections rectified, and that no mention had been made of the cladding during the final inspections, noting that:

It is very difficult for us to understand what more we could have done to obtain Compliance, we had followed all the rules, obtained a building permit, followed the plans and specifications, had all the required inspections, used a Master Builder, ensured that all timber used was treated to the correct grade for its intended purpose and finally ensured that a registered Licensed Applicator was used for the cladding.

4.2 The applicants forwarded copies of:

- the building plans, specification and consent documentation
- some of the inspection records
- the letter from the territorial authority
- various invoices, warranties, producer statements and other statements.

4.3 The territorial authority made a submission in the form of a letter to the Department dated 24 April 2006, which noted that:

The matters to be determined are:

- Whether the installed cladding system complies with clauses B2.3.1 and E2.3.2 of the Building Code.

4.4 The territorial authority forwarded copies of:

- some of the consent documentation
- the final inspection checklist and summary record
- the weathertightness inspection record
- the letter to the applicants.

4.5 Copies of the submission 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 sent to the parties for comment on 8 June 2006. The applicant accepted the draft on 28 June 2006.

4.7 The territorial authority responded to the draft determination in correspondence to the Department dated 8 June 2006, noting that:

The draft does not appear to address the expert's concerns about the course of cut tiles at the top of each roof intersection with the exterior walls.

I have considered this comment and have amended the draft as I consider appropriate (refer paragraph 5.6).

5. The expert's report

5.1 The expert inspected the claddings of the building on 12 April 2006, and furnished a report that was completed on 20 April 2006. The expert noted that “detailing of the various parts of the building was very minimal in the drawings, especially in respect to the external envelope and details for the beams”. The expert noted that the cladding appeared “generally straight and flat with only minor variations to line and level”. The expert noted that penetrations appeared to be adequately sealed, cladding clearances were generally adequate, cladding flashings appeared to be “carefully installed, and the wall areas present in this house are of dimensions that do not require control joints in order to comply with the manufacturer’s instructions. However the expert also noted that there appeared to have some “lack of thought or guidance in respect to junctions of different materials and the interfaces of the various trades”, and that some of the work appeared “poor like the application of the liquid applied membrane and the installation of the decks and balustrades.”

5.2 The expert scraped away a small section of coating at the sill to jamb junction of a window in the EIFS cladding and noted that the window installation appeared to accord with the manufacturer’s instructions. I accept that the location opened is typical of similar locations around the building.

5.3 The expert took non-invasive moisture readings through linings of exterior walls throughout the additions, and noted a number of elevated readings. However, when invasive readings were taken in the same areas, readings were recorded at less than 12%, so I consider that the former readings did not result from external moisture.

5.4 The expert also noted a number of elevated readings associated with the deck and balustrades. The following non-invasive readings were recorded:

- 27% to 29% in the plywood to the deck over the basement study
- 19% to over 50% around new windows in the concrete block basement walls
- 32% to over 40% in the exposed plywood in the garage under the east deck
- 27% to over 50% in the Harditex clad balustrade on the east elevation.

Moisture levels above 18% recorded after cladding is in place generally indicate that external moisture is entering the structure.

5.5 The expert made the following specific comments on the cladding:

- the cladding has not yet been painted
- soil covers the lower edge of the fibre cement cladding to the subfloor framing of the west extension

- at the deck areas, the bottom of the cladding is unfinished and does not adequately overlap the basement concrete block walls
- some of the roof apron flashings have the upstand finishing over the cladding and appear to be unsealed and poorly weatherproofed
- the downpipes from the upper roofs lack spreaders
- the junctions between the cladding and the brick veneer or concrete block lack adequate movement joints in some locations. Cracks have appeared at some locations where original openings have been closed with EIFS cladding and plastered with a continuous coating over the cladding and the brick veneer
- there is cracking to the cladding in some locations, particularly at lower corners and sills to windows, and at internal corners
- the junction of the edge of the deck with the top of the concrete block walls appears poorly weatherproofed, with the unpainted boundary joist fixed hard against the blockwork and handrail uprights fixed through the joist
- the liquid-applied deck membrane is allowing moisture penetration into the framing and walls below, as it has been poorly applied, with inadequate weatherproofing at edges – and shows evidence of cracking, peeling and damage from deck nailing.

5.6 The expert also commented that:

- the heads to the new windows in the concrete block walls will require high levels of maintenance to reduce susceptibility to rain penetration
- the corrosion protection to the exposed steel beams appears inadequate
- the tiles at the roof to wall junction have been cut (requiring a high level of skill to form the upstand) and the weathertightness of this junction on the reduced pitch is questionable, given the site exposure
- the frieze board to the east wall of the lounge appears to be sagging, which may indicate some structural deficiency.

5.7 A copy of the expert's report was provided to each of the parties on 28 April 2006.

5.8 The applicants responded to the expert's report in a letter to the Department dated 10 May 2006, and made detailed comments on a number of items within the report – including that most items had been inspected and approved by the territorial authority during construction. I have considered the applicants' comments with regard to the expert's report in this determination.

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 Solution⁴, in this case E2/AS1, which will assist in determining whether the features of this house are code compliant. However, in making this comparison, the following general observations are valid:

- Some Acceptable Solutions 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 (refer to Determination 2004/1 *et al*) relating to cladding and these factors are also used in the evaluation process.

6.1.3 The consequences of a building demonstrating a high weathertightness risk is that building solutions that comply with the Building Code will need to be more robust. Conversely, where there is a low weathertightness risk, the solutions may be less robust. In any event, there is a need for both the design of the cladding system and its installation to be carefully carried out.

6.2 Weathertightness risk

6.2.1 In relation to these characteristics I find that the additions and alterations result in a building that is:

- built in a very high wind zone
- a maximum of three storeys high
- fairly complex in plan and form
- has junctions with existing brick veneer or concrete block walls
- has eaves projections of about 400mm above most walls

⁴ An Acceptable Solution is a prescriptive design solution approved by the Department that provides one way, but not the only way, of complying with the Building Code. The Acceptable Solutions are available from the Department's website at www.dbh.govt.nz.

- has two areas of deck that are above basement areas
- has monolithic cladding to some walls, which is fixed directly to the framing
- has external wall framing to the new walls that is unlikely to be treated to a level that will provide resistance to the onset of decay if the framing absorbs and retains moisture.

6.2.2 When evaluated using the E2/AS1 risk matrix, the monolithic-clad wall faces of the building demonstrate a high weathertightness risk. 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 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

6.3.1 Generally the cladding appears to have been installed in accordance with reasonable trade practice. However, some junctions, penetrations and edges are not well constructed, and these areas are as described in paragraph 5.5 and in the expert's report as being the:

- lack of paint coatings to the cladding
- soil covering the lower edge of the fibre cement subfloor cladding
- the bottom of the cladding at the deck areas
- junctions of some of the roof apron upstands to the upper cladding
- lack of spreaders to the downpipes discharging onto lower roofs
- lack of adequate joints at junctions between the cladding and the brick veneer
- cracking to the cladding in some locations
- poor weatherproofing of the deck edge to the top of the concrete block walls
- poor application and poor condition of the liquid-applied deck membrane.

6.3.2 I also note the expert's additional comments in paragraph 5.6, and draw these to the attention of the territorial authority for its consideration.

6.3.3 I also note the expert's comment with regard to the lack of cladding details in the drawings, and I consider that this inadequacy may have contributed to some of the defects noted in paragraph 6.3.1.

6.3.4 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:

- most of the monolithic cladding (including the windows) has been installed in accordance with good trade practice and to the manufacturer's instructions
- the house has eaves projections that provide some protection to most of the monolithic cladding areas below them
- most of the exterior walls of the existing house have brick veneer with a ventilated cavity.

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

7. Conclusion

7.1 I am satisfied that the current performance of the cladding (including the decks) is not adequate because it is allowing water penetration into the building at present. Consequently, I am satisfied that the additions do not comply with clause E2 of the Building Code.

7.2 In addition, the building is also required to comply with the durability requirements of clause B2. Clause B2 requires that a building continues to satisfy all the objectives of the Building Code throughout its effective life, and that includes the requirement for the house to remain weathertight. Because the faults on the additions 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 Subject to further investigations that may identify other faults, I consider that, because the faults that have been identified in the additions occur in discrete areas, I am able to conclude that satisfactory rectification of the items outlined in paragraph 6.3.1 should be expected to result in the additions becoming and remaining weathertight and in compliance with clauses B2 and E2.

7.4 Effective maintenance of claddings (in particular of monolithic cladding) 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.

7.5 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 shall 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.

7.6 As the external wall framing of the new walls of this building is unlikely to be treated to a level that will provide resistance to fungal decay, periodic checking of its moisture content should also be carried out as part of normal maintenance.

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

7.8 In the circumstances, I decline to incorporate any waiver or modification of the Building Code in this determination.

8 The decision

8.1 In accordance with section 188 of the Act, I hereby determine that the cladding systems and the deck as installed do not comply with clause E2 of the Building Code. There are a number of items to be remedied to ensure that the additions become and remain weathertight and thus meet the durability requirements of the code. Consequently, I find that the additions do not comply with clause B2. Accordingly, I confirm the territorial authority's decision to refuse to issue a code compliance certificate.

8.2 I also find that rectification of the items outlined in paragraph 6.3.1 will consequently result in the house being weathertight and in compliance with clauses B2 and E2. Work to correct these items may expose additional associated defects that are not yet apparent. All rectification work is to be completed to the approval of the territorial authority.

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 a 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 21 July 2006.

John Gardiner
Determinations Manager