

Determination 2006/60

Refusal of a code compliance certificate for a building with a “monolithic” cladding system at 40 Woodridge Avenue, Browns Bay, North Shore City



1. The dispute to be determined

- 1.1 This is a determination of a dispute under Part 3 Subpart 1 of the Building Act¹ 2004 (“the Act”) made under 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 Green and Ms Kenny (“the owner”), 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 a 6-year-old house because it was not satisfied that the monolithic cladding to the walls of the house complied with clauses

¹ The Building Act 2004 is available from the Department’s website at www.dbh.govt.nz

B2 “Durability” and E2 “External Moisture” of the Building Code² (First Schedule, Building Regulations 1992) is correct.

1.3 The questions to be determined are:

Issue 1: The cladding

Whether I am satisfied on reasonable grounds that the monolithic wall cladding as installed to the walls of the building (“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.

Issue 2: The additional durability considerations

Whether certain building elements, which have 5 and 15-year durability requirements, comply with clause B2 of the building code considering the time that has elapsed since the elements were constructed.

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 a detached house situated on an excavated and stepped site, which is in a median wind zone for the purposes of NZS 3604³. The house is split-level to suit the slope, with the main house two storeys high, and a single storey lean-to garage. Construction is generally conventional light timber frame, with a concrete slab, concrete block foundations and retaining walls, monolithic wall cladding and aluminium windows. The house shape is fairly simple, with a 20° profiled metal gable roof over the main house and a 7° lean-to roof over the garage. The upper roof has eave projections of about 220 mm overall, while the garage lean-to eaves taper from about 200 mm overall to more than 1000 mm, with no verge projections. The eastern verge projections of the upper gable roof taper from about 100 mm to more than 1000 mm, with no verge projections at the western end of the gable. The main entry and back door are both recessed back under the line of the upper floor, and a side door from the garage has a lean-to canopy above.

2.2 A recessed deck, with tiled floor and metal and glass balustrades, is situated under the main roof overhang, above a ground floor bedroom.

2.3 The territorial authority has submitted copies of invoices from the timber supplier indicating that the timber wall framing supplied for the wall framing was “No.1 H1”. Based on this evidence, I consider that the external wall framing is unlikely to be

² The Building Code is available from the Department’s website at www.dbh.govt.nz.

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

treated to a level, which would provide significant resistance to decay if the timber became wet.

- 2.4 The cladding is a monolithic cladding system described as stucco over a solid backing. In this instance it consists of 4.5 mm “Hardibacker” sheets fixed through the building wrap directly to the framing timbers, and covered by a slip layer of building wrap, metal-reinforced 3-coat plaster system and a flexible paint coating.
- 2.5 I have seen no evidence of producer statements or warranties for the cladding on the house.

3. Sequence of events

- 3.1 The territorial authority issued a building consent for the original house on 1 December 1998, and carried out various inspections during construction, including pre-line and post-line. The house appears to have been completed early in 1999.
- 3.2 Following the owner’s request for a code compliance certificate, the territorial authority carried out a final inspection on 27 January 2004 and, after subsequent rechecks, noted no further outstanding items apart from a cladding inspection.
- 3.3 The territorial authority carried out a visual cladding inspection of the house on 24 February 2004. In a letter to the owner dated 4 March 2005, the territorial authority explained its concerns about the weathertightness of monolithic claddings and stated that the Building Code required the building work to remain durable for specific periods of time. The territorial authority also noted that:

As your building is face fixed (monolithic) construction with no cavities we are unable to verify that it fully complies with the Building Code requirements, manufacturer’s details applicable at the time and that it will remain durable for the required period.

The territorial authority concluded that it could not be satisfied on reasonable grounds that the cladding system complied with clauses E2 and B2 of the Building Code.

- 3.4 In a letter to the owner dated 13 July 2004, the territorial authority noted that:
- Council have carried out all inspections and apart from weathertightness/cladding issues are satisfied on reasonable grounds the property at 40 Woodridge Avenue complies with the Building Code.*
- 3.5 The owner arranged for an “indicative moisture check” to be carried by IPI Ltd (“the consultant”). In a letter to the owner dated 12 April 2005, the consultant reported that non-invasive moisture testing of walls throughout the building had indicated no elevated moisture readings. The owner attached the consultant’s letter to a letter to the territorial authority dated 23 May 2005, and outlined his understanding of the new provisions of the Act, concluding with a further request for a code compliance certificate.

3.6 In a letter dated 10 June 2005, the territorial authority responded to the owner's points regarding the provisions of the Act, and concluded by noting that:

...Now that you have had a building consultant check the moisture content of exterior wall framing together with new information Council now have on weathertightness issues, I will organise for a re-inspection of your property.

3.7 The territorial authority carried out a further visual inspection on 21 June 2005, which noted a number of risk factors and defects and the owner was informed that the territorial authority was still unable to issue a code compliance certificate.

3.8 The territorial authority did not issue a notice to fix as required under section 164(2) of the Building Act 2004.

3.9 The owner applied for a determination on 29 July 2005.

4. The submissions

4.1 The owner noted in the application that the "Matter of doubt or dispute" is:

NSCC will not issue a Code Compliance even though house does comply with the Building Code. I feel the Council is not acting appropriately...

4.2 The applicant forwarded copies of:

- the drawings
- some of the correspondence with the territorial authority.

4.3 The territorial authority made a submission in the form of a letter to the Department dated 4 October 2005, which summarised the consent and inspection processes related to the house, and noted that:

In regards to this application for a determination, the matters of doubt are:

- *Whether the installed cladding system complies with clauses B2.3.1 and E2.3.2 of the Building Code.*
- *Whether other building elements, which have 15-year durability requirements comply with clause B2 of the Building Code, considering the age of construction. Specifically roof cladding, external joinery units, flashings, plumbing and piping, showers and internal wet areas.*

4.4 The territorial authority forwarded copies of:

- the specification
- some of the consent documentation
- the inspection records

- some of the correspondence with the owner
- various other invoices, producer statements and other statements from contractors.

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 provided to the parties for comment on 28 November 2005. The applicant accepted the draft on 13 June 2006.

4.7 In its response to the Department dated 8 June 2006 the territorial authority queried apparent differences in meaning between paragraphs 8.4 and 8.5 and submitted that targeted repair, referred to in paragraph 7.3, did not seem appropriate given the general nature of the defects listed in paragraph 6.3.1. I have considered these comments and have made changes as I consider appropriate.

5. The expert's report

5.1 The expert inspected the cladding on 16 August 2005, and furnished a report that was completed on 5 September 2005. The expert noted that the house appeared "well maintained and had been repainted since construction", with adequate clearances from cladding to ground and paving and generally well-sealed penetrations through the cladding. The plaster coating to the cladding appeared generally flat, well adhered and uniform, with no significant discolouration, although there were a number of fine cracks apparent.

5.2 The expert cut away small sections of plaster over a vertical and horizontal control joint to examine the joints. The expert also cut away a small section of plaster at the jamb to sill junction of the garage window to examine the flashings. I accept that the locations opened are typical of similar locations around the building.

5.3 The expert scraped away a small section of coating at the sill to jamb and head to jamb junctions of a window, and noted that the window installation appeared to generally accord with the manufacturer's instructions with sealant at the jamb to sill junction in lieu of corner soakers. I accept that the location opened is typical of similar locations around the building.

5.4 The expert took non-invasive moisture readings through interior linings at skirting level, under windows and other risky areas throughout the house, and noted "borderline" readings below some windows, and elevated readings at the corner of the bedroom under the deck.

A further 8 invasive moisture readings were taken through the wall cladding, and the following elevated moisture contents were recorded in the framing:

- 21% in the sill of the garage window (at the cut-out)

- 25% in the sill of the east window of bedroom 2
- 30% in the corner of bedroom 3 (below the deck)

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:

- while cladding clearances were not in accordance with the requirements of E2/AS1 at the main entrance and the back door, both areas are well drained and are recessed back below the upper floor
- the cladding clearance at the garage doors is less than the requirements of E2/AS1, but the paving has a drainage channel and loose stones – and there is no evidence of moisture penetration
- the window and door joinery is fitted flush with the backing sheets, meaning that the flanges are recessed by the thickness of the plaster. There are no flashings at jambs or sills, with a fillet of sealant applied between the jamb flange and the backing sheet, and the plaster covering the flange edges by about 4 mm. At the cut-out, there was clear evidence of leaking, with wet plaster, wet backing sheet and corroding reinforcing mesh
- the aluminium head flashings do not project beyond the jambs
- the bottom of the stucco does not incorporate the 6 mm clearance from the foundation wall, as shown in the manufacturer's instructions
- the plaster thickness over the Hardibacker is approximately 17 mm, which is less than the 22 mm recommended in the manufacturer's instructions
- there are no vertical control joints in the 7.8 m long north and 7.9 m long south walls to the garage, where dimensions exceed the 4 m length limit recommended in NZS 4251, the Code of Practice for solid plastering
- the cut-out of the vertical control joint showed that the joint did not comply with the manufacturer's instructions, with the reinforcing mesh continuous and no provision allowed for movement
- the cut-out of the horizontal control joint showed that this did not comply with the manufacturer's instructions, with no flashing and no provision allowed for movement
- there are fine cracks which radiate out from window corners, and at positions in line with backing sheet joints at a number of locations
- the metal posts of the deck barrier are fixed through the deck membrane, and the deck drains over the plaster at the deck edge. The deck edge is not flashed

and allows deck water to run over the plaster. High moisture contents were recorded in framing at the corner of the bedroom below the deck

- the ribbon plate of the lean-to canopy over the side door to the garage is hard against the stucco, and is fixed through the cladding with no flashing or evidence of sealing.

5.6 A copy of the expert's report was sent to each of the parties on 21 October 2005.

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 determinations⁵ (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 this house:

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.

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

- is built in a medium wind zone
- is a maximum of two storeys high
- has an enclosed deck situated above a bedroom, and recessed under the roof
- is fairly simple in plan and in form
- has eave projections of about 220 mm, and verges that vary from 0 mm to more than 1000 mm
- has monolithic cladding which is fixed directly to the framing
- has external wall framing that is treated, so providing some limited resistance to the onset of decay if the framing absorbs and retains moisture

6.2.2 When evaluated using the E2/AS1 risk matrix, 2 elevations of the building demonstrate a moderate weathertightness risk and 2 elevations a high 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 according to good trade practice, apart from the faults identified in paragraph 5.5. Some junctions, edges and penetrations are not well constructed, and these areas are as described in paragraph 5.5 and in the expert's report as being the:

- recessed and buried joinery flanges, lack of sill and jamb flashings, poor sealing at jambs, and lack of projections of head flashing past the jambs at windows and doors
- lack of a clearance gap from the bottom of the cladding to the foundation wall
- lack of thickness of stucco plaster over the backing sheets
- lack of control joints on the south and north garage walls
- inadequate formation and weatherproofing of control joints
- cracking to the stucco plaster at a number of locations
- lack of sealing of the deck balustrade fixings
- lack of adequate weatherproofing of the edge of the deck
- lack of sealing or flashing of the junction of the door canopy with the garage wall.

- 6.3.2 I note the expert's comments regarding the drainage and shelter provided by the upper floor above the main entry and back doors, and accept that cladding clearances are adequate at these locations.
- 6.3.3 I note the expert's comments regarding the drainage provided at the garage doors, and accept that that cladding clearance is adequate at this location.
- 6.3.4 I note the expert's comment that the apron flashing on the garage roof has not been inspected, and agree that the territorial authority should check this for compliance.
- 6.3.5 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:
- The cladding generally appears to have been installed to good trade practice.
 - The house has eave and verge projections over some walls, which provide some protection to the cladding areas below them.
 - The enclosed deck is sheltered under a deep roof overhang.
- 6.3.6 I consider that these factors help compensate for the lack of a ventilated cavity and can assist the building 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 is not adequate because it is allowing water penetration into the building at present. Consequently, I am satisfied that the building does 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 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 Subject to further investigations that may identify other faults, I consider that, because the faults that have been recorded with the cladding system occur in identifiable locations, I am able to conclude that satisfactory rectification of the items outlined in paragraph 6.3.1 should be expected to result in the building becoming and remaining weathertight and in compliance with clauses B2 and E2.
- 7.4 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.

- 7.5 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 this building has treatment that will provide limited 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.

Issue 1: The cladding

8. The decision

- 8.1 In accordance with section 188 of the Act, I hereby determine that the monolithic cladding system as installed does not comply with clause E2 of the Building Code. There are a number of items to be remedied to ensure that the house becomes and remains weathertight and thus meets the durability requirements of the code. Consequently, I find that the house does 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 draw to the attention of the territorial authority to the fact that the apron flashings on the garage roof have not been inspected, and are not covered in this determination.

- 8.4 I note that the territorial authority has not issued a notice to fix. A notice to fix should be issued requiring the owners to bring the house into compliance with the Building Code. The notice to fix may list the items to be rectified but it should not specify how compliance is to be achieved as this is for the owner 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.
- 8.5 I would suggest that the parties adopt the following process to meet the requirements of paragraph 8.4. 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.

Issue 2: The additional durability considerations

9. Discussion

- 9.1 I note that 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 “from the time of issue of the applicable code compliance certificate”.
- 9.2 As set out in paragraph 3.3, the territorial authority has concerns about the durability, and hence the compliance with the Building Code, of certain elements within the building, taking into account the completion of the building in 1999. In the draft determination sent to the parties in November 2005 I made an interim decision on the matter of the durability by determining that there be a waiver or modification of the Building Code requirements relating to durability. Since then, I have received some general legal advice on waivers and modifications. As this advice is not clear, I subsequently have sought clarification of some aspects of that advice.
- 9.3 Until I receive the clarification will I suspend making a decision about the additional durability considerations. This will enable me to now determine matters related to the compliance of the cladding so that the steps outlined in paragraph 8.5 can commence. I will issue a second determination limited to the durability considerations as soon as possible.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 29 June 2006.

John Gardiner
Determinations Manager