

Determination 2006/32

Refusal of a code compliance certificate for a building with a “monolithic” cladding system at 19 Peter Terrace, Castor 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 Morrison (“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 a relocated house because it was not satisfied that the monolithic cladding to some of the walls of the house 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 some of the external 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. I note that the territorial authority has not referred to the weatherboard cladding as being an issue for this house. Accordingly, consideration of the weatherboard cladding does not form part of this determination.
- 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 two storey detached house situated on a sloping site, which is in a medium wind zone in terms of NZS 3604³. The upper floor is split-level and consists of an older weatherboard-clad house (originally occupying the site), which has been relocated and lifted to allow the construction of a new basement level. The original windows have been replaced with aluminium windows, and the weatherboards to the walls on the north elevation have been replaced with monolithic cladding. Construction of the new basement is conventional light timber frame, with concrete foundations, minor areas of timber pile foundations, stepped concrete block retaining walls, and monolithic cladding to the new framing above the concrete block walls. The house shape is fairly simple, with 5° profiled monopitched roofs that rise to provide a clerestory wall. Eaves projections vary from about 400mm above the clerestory wall to 700mm elsewhere, and verge projections are less than 100mm.
- 2.2 A split-level deck extends to the north and east from the upper floor. The lower level section of deck sits above the ground floor office - and has a tiled floor and a monolithic clad balustrade with a timber capping. Timber steps lead up to a spaced timber deck to the north, which has open timber balustrades.
- 2.3 I have received no evidence as to the age of the original house, which now forms the upper level of the house. However it appears to be more than 20 years old, and I therefore consider it likely that the timber framing used in the external walls in the upper level of this house is likely to be boracic treated.
- 2.4 The applicant has submitted copies of invoices from the timber supplier, which indicate that the external wall framing supplied for the lower level of the house 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 lower level of this house, I am unable to determine the particular level and type of treatment that is described as “H1” in

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

the invoices from the timber supplier. I therefore consider that the wall framing of the lower walls of this house is unlikely to be treated to a level that will provide resistance to fungal decay.

- 2.5 The cladding system to some of the external walls of the building is what is described as monolithic cladding, and 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.
- 2.6 I have seen no evidence of producer statements or warranties for the cladding.

3. Sequence of events

- 3.1 The territorial authority issued a building consent on 31 March 2003. Inspections during construction were undertaken by Approved Building Certifiers Ltd (“the building certifier”). Management of the project on the applicants’ behalf was undertaken by Almara Holdings Ltd (“the project manager”).
- 3.2 The building certifier made various inspections during the course of construction, including prior to lining installation. The final inspection which appears to have taken place on 12 March 2003, identified a number of outstanding items but noted no defects in regard to the cladding. The inspection report noted “Your early attention to the completion of the work is required and upon this a further inspection will be carried out.” However no further inspections by the building certifier appear to have taken place, and no building certificate was issued.
- 3.3 In a letter dated 4 December 2004, the territorial authority notified the applicants that the building certifier’s approval as a building certifier had expired on 8 September 2004, and the territorial authority was therefore required to:
- ...undertake any outstanding inspections and to issue the Code Compliance Certificate (CCC) if all work is found to be code compliant.
- 3.4 It appears that the territorial authority carried out no inspections until 27 April 2005, when the owner applied for a code compliance certificate. The final inspection record noted “weathertightness inspection required” and identified two other outstanding items, which were subsequently checked and noted as “OK” on 2 May 2005. At the latter visit, the applicants were given a standard letter dated 2 May 2005, in which the territorial authority explained that a weathertightness inspection was required as:
- Consented building works in North Shore City Council clad with any type of monolithic cladding without a cavity will be reviewed on a case by case basis before determining if a code compliance certificate (CCC) can be issued.
- 3.5 Following a visual inspection, the territorial authority wrote to the applicants on 23 May 2005, explaining 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 a list of 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.

3.6 In a letter to the territorial authority dated 9 November 2005, the project manager described the history of the project, outlined inspections undertaken and noted that:

While I understand the concerns with respect to water tightness, I feel this property providing regular maintenance inspections are followed, should provide no concerns to either the Council or any future purchaser.

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

3.8 The applicants' application for a determination was received by the Department on 11 January 2006.

4. The submissions

4.1 In a letter to the Department which accompanied the application, the applicants outlined the history of the project, explaining that they had expected the code compliance certificate to be issued following the successful completion of the final inspection by the building certifier in March 2003, that they were unaware of any problems until the territorial authority's notification in December 2004, and noting that:

We appreciate the fixed monolithic cladding system we used at the time has been revised in the building code recently. However, we are confident that we took every measure to ensure it was of the highest standard and totally within the envelope at the time.

4.2 The applicants forwarded copies of:

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

4.3 The territorial authority made a submission dated 27 February. This included a covering letter with a short summary of events and the matters in doubt, consent documentation and a report of a council weathertightness inspection.

4.4 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.

5. The expert's report

- 5.1 We commissioned an expert on 7 February to carry out an inspection of the monolithic cladding on the house although at that time we had not received the submission from the Territorial Authority.
- 5.2 The expert inspected the claddings of the building on 3 March 2006, and furnished a report that was completed on 6 March 2006. The expert noted there were number of variations from the drawings, including the omission of a pergola above the north deck and the cladding of upper north walls with Harditex. The expert noted that penetrations appeared to be adequately sealed, cladding clearances were generally adequate, windows generally appeared satisfactory and roof flashings were to a "normal contemporary standard".
- 5.3 The expert inspected the sill to jamb junctions of sliding doors and noted that sealant extended behind jamb flanges. The expert also scraped away a small section of coating at the sill to jamb junction of the east garage window 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.
- 5.4 The expert took non-invasive moisture readings through linings of exterior walls throughout the house, and noted one elevated reading within the concrete block wall at the corner of the basement office. An invasive moisture reading was taken near the latter, which recorded no elevated reading in the timber framing.

The expert noted that "caution is required in interpretation because the measurements were taken at the end of a dry summer". Seven invasive moisture readings were taken through the monolithic cladding at risky locations. All readings were 12% or below, except for the balustrade framing at the junction with the family room northeast corner, which was recorded as 16%, with no adjustment for timber treatment. As I consider that this timber is likely to be treated to H3 (as discussed in paragraph 2.4), the adjusted reading is likely to be higher, possibly as high as 19% which would indicate the presence of moisture in the balustrade framing.

- 5.5 The expert made the following specific comments on the cladding:
- there are no vertical control joints in the 12.7m lower east and the 8.2m upper north walls, where the dimensions exceed the 5.4 m limit for Harditex recommended by the manufacturer, and a number of cracks have developed in line with backing sheet joints
 - the backing sheets have joints that line up with window and door jambs at various locations, and cracks have developed at some of these positions
 - there is no flashing or offset at the junction of the Harditex with the plastered concrete block walls, and horizontal cracks have developed on the east elevation

- a downpipe at the northeast corner of the study is offset around timber and the upper joint is leaking, leading to damp retaining wall timber butting against the concrete block wall, where elevated moisture was recorded
- the sill of the family room doors is poorly finished, with cracks and exposed fibre cement evident
- the end of the apron flashing above the family room has been sealed with mortar against the upper cladding of the lounge
- the junction of the solid balustrade with the family room wall is not flashed or sealed, and there is evidence of moisture penetration into the deck framing
- the junction of the timber balustrade capping with the Harditex balustrade cladding is unsealed, with gaps and unsealed fibre cement evident
- the junction of the solid balustrade with the higher level timber deck framing is not weatherproofed, with bare timber directly in contact with the Harditex
- the joists of the timber deck penetrate the cladding with no evidence of flashings or seals

5.6 The expert also noted that, while the cladding clearance to the paving beside the garage door is minimal, the area is well-drained and reasonably sheltered and there is no evidence of associated water penetration.

5.7 The expert also noted that, while not inspected in any detail, some flashings over weatherboard joints in the original walls were in poor condition.

5.8 Copies of the expert's report were provided to each of the parties.

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.

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.

- 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 monolithic clad wall faces of this building:

- are built in a medium wind zone
- are a maximum of one storey high
- are simple in plan and form
- have eaves projections of 700 mm and verge projections of less than 100mm
- have monolithic cladding which is fixed directly to the framing
- have external wall framing 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 low 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.

6.2.3 I note that fibre-cement sheet cladding without a cavity could be an acceptable solution under E2/AS1 for the wall faces of this building, given the low risk described above, but I consider that some of the manufacturer's detailed instructions at the time of installation could preclude parts of this cladding system from complying with E2/AS1.

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 vertical control joints in the lower east wall and upper north wall
- the cracks in the cladding below window and door jambs and other areas
- the lack of weatherproofing of the junction of the cladding with the concrete block walls below
- the leaking downpipe at the corner of the family room
- the poor weatherproofing of the sill of the family room doors
- the end of the apron flashing above the family room
- the junction of the solid balustrade with the family room wall
- the junction of the timber capping with the cladding of the solid balustrade
- the junction of the solid balustrade with the timber deck
- the penetration of the timber deck joists through the cladding

6.3.2 I note the expert's comments on the clearance of the cladding to the paving at the garage door and accept that the clearance is likely to be adequate in this case, as the paving is well drained and reasonably sheltered.

6.3.3 I also note the expert's comment on the poor condition of some of the joint flashings in the original weatherboards, and draw this to the attention of the territorial authority.

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:

- The monolithic cladding is applied to simple, one storey wall faces

- The house has eaves projections that provide good protection to the monolithic cladding areas below them.

6.3.5 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 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 should be expected to result in the building becoming and remaining weathertight and in compliance with clauses B2 and E2.

7.4 I note that effective maintenance of claddings is important to ensure ongoing compliance with clause B2 of the Building Code. That maintenance is the responsibility of the building owner. The code assumes that the normal maintenance necessary to ensure the durability of the cladding is carried out. For that reason clause B2.3.1 of the Building Code requires that the cladding be subject to “normal maintenance”. That term is not defined and I take the view that it must be given its ordinary and natural meaning in context. In other words, normal maintenance of the cladding means inspections and activities such as regular checking, cleaning, re-painting, replacing sealants, and so on.

7.5 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.

7.6 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.

7.7 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 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, to the approval of the territorial authority, along with any other faults that may become apparent in the course of that work, is likely to result in the house becoming and remaining weathertight, and in compliance with clauses B2 and E2.
- 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, without specifying the features that are required to be incorporated. 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.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 27 April 2006.

John Gardiner
Determinations Manager