

Determination 2006/39

Refusal of a code compliance certificate for two buildings with monolithic cladding systems at 3 Paritai Drive and 3 Karori Crescent, Orakei

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 buildings are two separate units on a subdivided site. The applicants are the owners, Mr Turei (Unit 1) and Mr Farmer (Unit 2), and the other party is the Auckland 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 the 3-year-old houses because it was not satisfied that the monolithic cladding complied with clauses B2 “Durability” and E2 “External Moisture” of the Building Code² (First Schedule, Building Regulations 1992) is correct.
- 1.3 The questions to be determined is whether I am satisfied on reasonable grounds that the wall cladding as installed to some of the external walls of the buildings (“the cladding”), complies with the Building Code (see sections 177 and 188 of the Act). By “the 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.

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

2. The buildings

- 2.1 The buildings consist of two three-storey detached houses situated on a sloping stepped site in a very high wind zone for the purposes of NZS 3604³. Both houses have essentially the same design and construction, and occupy a sub-divided corner site, with one house entered from Paritai Drive (“Unit 1”) and the other from Karori Crescent (“Unit 2”).
- 2.2 Construction of the two lower floors of each unit is specifically designed precast concrete and concrete block walls on concrete foundations, with concrete slabs to all three floors. Construction of the upper floors is generally conventional light timber frame, with monolithic cladding and aluminium windows. The north elevation of each unit is fully glazed, with minor cladding areas above and between the large glazing units. The west elevation of each unit has two windows only, which are narrow full height units on either side of a concrete chimney structure that rises to above roof level. The only other window within the cladding is on the east wall of the kitchen of Unit 1. Roofs are flat membrane, with raised sections above the liftwells and 35° lean-tos over the stairwells on the south elevations. Roof parapets have metal cappings that extend over decorative bands that provide eaves projections of about 200mm.
- 2.3 The two upper floors of each unit have tiled concrete decks extending the full length of the north elevations, with those of Unit 2 returning several metres along the east elevation. On the top floor of each unit, glazing and framing sits on a 50 mm high concrete nib that separates the deck floors from interior areas. The deck floors fall to the outer edges, with free drainage beneath the balustrade glazing. Concrete columns support the decks, and continue above the top floor to support timber pergolas on Unit 1, which have ribbon plates fixed through the cladding. In Unit 2, the pergolas have been replaced with proprietary metal louvres.
- 2.4 The expert noted no evidence as to timber treatment. The specification calls for wall framing to comply with NZS 3602, which at the time of construction would permit untreated timber. Based on this evidence, I consider that the external wall framing is unlikely to be treated.
- 2.5 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 20 mm thick solid plaster and a flexible paint coating.
- 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 for the two units to Paritai Developments Ltd. (“the developer”) on 8 February 2001, based on a building

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

certificate issued by Approved Building Certifiers Ltd. (“the certifier”). The building certifier made various inspections during the course of construction, including prior to lining installation and following lining installation, with the units substantially complete by the end of 2002. In a letter to the developer dated 19 June 2003, the certifier provided a list of outstanding items for each unit, which would require completion prior to the issue of a Code Compliance Certificate. It appears that the developer went into liquidation in June 2003, and the units were subsequently sold to individual owners.

- 3.2 It appears that the two owners independently arranged for remedial work to complete the outstanding work itemised in the certifier’s list for each unit, with different builders and solutions used for the work.
- 3.3 No further inspections appear to have taken place until April 2004, when the certifier issued an interim Code Compliance Certificate for both units dated 21 April 2004, which noted “Excludes outer wall cladding outside scope of E2/AS1 NZBC”, and the project was subsequently handed back to the territorial authority for completion of cladding inspections.
- 3.4 Following an inspection on 12 May 2004, the territorial issued a notice to rectify dated 18 May 2004. The attached Particulars of Contravention noted that the territorial authority could not be satisfied on reasonable grounds that the cladding system complied with the Building Code and provided a list of defects in regard to the monolithic cladding, including:
- The lack of sill flashings
 - Inadequate weatherproofing of the deck pergolas to wall junctions
 - Inadequate clearances at the deck to wall junctions

The territorial authority also noted the lack of a “ventilated cavity system, noting:

The Council has recently received information which shows that monolithic cladding systems without a drainage plane/cavity, provision for adequate ventilation, drainage and vapour dissipation will, in the likelihood of leakage and/or the effect of residual moisture, cause irrevocable damage to the structural elements of the building.

- 3.5 The original owner of Unit 1 applied to the Building Industry Authority (“the Authority”) for a determination on 22 June 2004 (“application 1”). It appears that the owner of Unit 2 was unaware of this application.
- 3.6 Progress on the determination was delayed with the death of the original owner and subsequent probate process, and it appears that Unit 1 was sold in May 2005 to the present owner who subsequently elected to proceed with application 1.
- 3.7 In a letter to the owner of Unit 2, dated 25 November 2004, the Authority described the determination situation in regard to Unit 1 and explained that:

...as a Code Compliance Certificate can only be issued for both buildings there is little point in us proceeding with a determination unless you join this application.

- 3.8 The owner of Unit 2 applied to the Department for a determination on 5 August 2005 (“application 2”).
- 3.9 In a letter to the owner of Unit 2 dated 15 November 2005, the Department explained that further inspections were awaiting the return of the owner of Unit 1.
- 3.10 In a letter to the Department dated 30 November 2005, the owner of Unit 1 noted:
- We are pleased to advise that we have returned from overseas and are keen to proceed on the consent etc for our residences.*
- 3.11 I have taken the letter dated 30 November 2005 from the owner of Unit 1 to be confirmation that the he wishes to be treated as a joint applicant with the owner of Unit 2 in the application made on 5 August 2005 (application 2).

4. The submissions

- 4.1 In a letter accompanying application 1, the original owner outlined the history of the building, including the various inspections and additional remedial work undertaken and noted that:

There is no timber or particle board to deteriorate. There is no timber or wood products adjoining or anywhere at all except for the top floor framing.

- 4.2 In a statement titled “Matter of doubt or dispute” in application 1, the original owner noted that the Notice to Rectify issued by the territorial authority was:

... made under unlawful blanket policy regarding ventilated cavities. Determinations state that the lack of a drained and ventilated cavity was not sufficient grounds in itself to withhold a CCC. A case by case assessment applies.

- 4.3 In a statement titled “Matter of doubt or dispute” in application 2, the owner of Unit 2 noted:

The owner of Unit 1 No.3 Paritai Drive has sought a determination. We need to join this application to help speed its resolution. Until a ruling is made we cannot gain our CCC.

- 4.4 The applicants forwarded, under both applications, copies of:

- some of the drawings and specification
- some of the consent documentation
- some of the inspection records
- a “Builder’s review” by Wrightson Construction Ltd. (used for remedial work to Unit 2)
- a “Moisture Report” on Unit 2 by The House Inspection Company (reporting on defects prior to remedial work)

- 4.5 The territorial authority made a submission in the form of a letter to the Authority dated 29 July 2004, which outlined risk factors and noted that:

...based on what we know today the only way of achieving a no or very low risk type policy at minimal cost is by way of a cavity.

The territorial authority also commented on the original owner's submission in application 1 in regard to the territorial authority's completion of cladding inspections due to the limitation of suitable insurance cover for certifiers, noting that:

In most cases the scope of approval of most Certifiers operating throughout the country was limited and excluded all monolithic cladding regardless of whether or not they were approved under the NZ Building Code.

- 4.6 The territorial authority forwarded copies of:

- the Notice to Rectify and Particulars of Contravention with photographs
- various technical reports and other statements

- 4.7 Copies of the submissions and other evidence were provided to each of the parties. No party made any further submissions in response to the submission of the other parties.

- 4.8 In a letter to the Department dated 30 March 2006, the owner of Unit 1 commented on the draft determination in general terms, and noted his intention to replace the timber pagola with metal louvres similar to Unit 2. No items in the draft determination were disputed, so no amendments are considered necessary.

5. The expert's report

- 5.1 The expert inspected the cladding on 10 February 2005, 13 September 2005, 12 January 2006 and 3 February 2006, and furnished a report that was completed on 7 February 2006. The expert noted that some of the defects identified during the first two inspections had been remedied by the date of the last inspection.

- 5.2 The expert noted that the cladding had "...no evidence of cracking, displacement or any irregularities..." and appeared to have been installed to a high standard, with the coating in good condition. Louvre systems had replaced the pergolas to Unit 2 and these appeared weathertight, with flashings and spacers at the junctions with the walls. The expert observed that the kitchen window in the east wall of Unit 1 had been reinstalled with new flashings since the first inspection of 10 February 2005, and now appeared weathertight. The expert also noted that, while the two windows beside the chimneys of each unit lacked sill flashings, these windows were full-height with the sills set above concrete slabs and walls, and appeared weathertight. The expert noted that there were no further windows in the stucco cladding, as the glazing units to the decks were full height and were set onto concrete nibs.

- 5.3 The expert took non-invasive moisture readings through interior linings throughout each house, and all moisture readings were recorded at 14% or below. The expert took no invasive moisture readings.
- 5.4 The expert made the following comments regarding the cladding:
- while the concrete nibs appear to provide adequate separation from the well-drained deck floor to the interior floor, the clearance from the bottom of the stucco to the deck tiles is inadequate, with the plaster butting against the tiles in some areas
 - the pergola to Unit 1 is directly fixed through the cladding, with a planted bead above the ribbon plate but no spacers and poor sealant
- 5.5 The expert also noted that there was no visual evidence of vertical control joints in the east walls and in the cladding above the living room glazing to the north decks, where dimensions exceed the 4 metre length limit recommended in NZS 4251, the Code of Practice for solid plastering.
- 5.6 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, which in this case is 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 antecedents, the Building Industry Authority, have also described weathertightness risk factors in previous determinations (refer to Determination

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.

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 top floors of the buildings:

- are built in a very high wind zone
- are a maximum of one storey high (although situated at a height of 3-storeys)
- have open decks with concrete floors and free-draining balustrades
- are simple in plan and in form
- have monolithic cladding which is fixed directly to the framing
- have eaves projections of about 200 mm above the monolithic cladding
- have external wall framing that is unlikely to be treated, so providing no resistance to the onset of decay if the framing absorbs and retains moisture.

6.2.2 When evaluated using the E2/AS1 risk matrix, these weathertight features show that the elevations of each building demonstrate moderate risk ratings. 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, but some junctions and penetrations are not well-constructed. The areas of concern are described in paragraph 5.4, and in the expert's report, as being:

- the lack of cladding clearance above the deck tiles
- the inadequate weatherproofing of the junctions of the pergolas to the north walls of Unit 1.

6.3.2 I note the expert's comment in paragraph 5.5 regarding the lack of vertical control joints in two areas of wall. However, the seriousness of these omissions is offset to

some extent by the fact that the stucco cladding appears to have been installed according to good trade practice, and has been in place for more than three years with no signs of cracking or moisture entry.

During the period since construction, all drying shrinkage in the concrete plaster and supporting framing will have likely occurred, and the claddings future performance will be governed solely by response to environmental factors such as imposed temperature and moisture effects, wind, earthquake forces and seasonal foundation movements.

With regard to these two buildings, I have considered both the compensating factors that will reduce the effects of these omissions together with the consequences of any future failures. These factors include:

- The buildings have specifically designed rigid concrete structures, with concrete slabs to all three floors, which will resist wind, earthquake, or foundation movement
- The cladding is restricted to the upper floors of each building, with no timber framed walls below
- The external paint coating has high reflectivity, so the cladding is unlikely to experience excessive stress resulting from temperature variations

I have therefore consider that, due to the particular characteristics of these two buildings, to accept the adequacy of the stucco plaster system as installed, without the retrofitting of the omitted control joints that were required in the general case by NZS 4251, the Code of Practice for solid plastering.

6.3.3 Notwithstanding the fact that the backing sheets are fixed directly to the timber framing, thus inhibiting drainage and ventilation behind the cladding sheets, I have noted 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 and to a high standard.
- There are few windows installed within the main cladding areas.
- The cladding is restricted to the upper floors of each building, with no timber framed walls below.

6.3.4 I consider that these factors help to compensate for the lack of a ventilated cavity and can assist the buildings 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 monolithic cladding is adequate because it is preventing water penetration into the buildings at present. Consequently, I am satisfied that the cladding system as installed on the buildings complies with clause E2 of the Building Code.
- 7.2 In addition, the buildings are 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 buildings to remain weathertight. Because the cladding faults on these buildings are likely to allow the ingress of moisture in the future, the buildings do 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 is likely to result in the buildings 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 owners. 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 timber wall framing is untreated, 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 cladding system as installed complies with clause E2 of the Building Code. There are a number of items to be remedied to ensure that the buildings remain weathertight and thus meet the durability requirements of the Building Code. 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 building remaining weathertight, and in compliance with clause B2.
- 8.3 I note that the territorial authority has issued a notice to rectify, which includes a requirement to provide ventilation to the wall framing. The territorial authority should now withdraw this and issue a new notice to fix requiring the owner 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 owners 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 a notice to fix, listing all the items that the territorial authority considers to be non-compliant. The owners should then produce a response to this in the form of a technically robust proposal 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 17 May 2006.

John Gardiner
Determinations Manager