

Determination 2005/174

Refusal of a code compliance certificate for a building with a “monolithic” cladding system at 123A Tiverton Road, Avondale

1. The dispute to be determined

- 1.1 This is a determination of a dispute under Part 3 Subpart 1 of the Building Act 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 applicant is the owner, Mr Patel (“the owner”), and the other party is the Auckland City Council (“the territorial authority”). The application arises because no code compliance certificate was issued by the territorial authority for this 2-year-old house.
- 1.2 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 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 sheets, the flashings, the joints and the plaster and/or the coatings) as well as the way the components have been installed and work together.
- 1.3 In making my decision, I have not considered any other aspects of the Act or the Building Code.

2. Procedure

2.1 The building

- 2.1.1 The building work consists of a detached house situated on a sloping site, which is in a low wind zone for the purposes of NZS 3604:1999 “Timber framed buildings”. The house is two-storeys high, except for a number of single-storey ground floor projections. The construction is conventional light timber frame, with concrete slab, concrete block retaining walls and foundations, and aluminium windows. Monolithic wall cladding is used on upper walls, with brick veneer on lower walls. The house

shape is fairly simple in plan, with 30° pressed metal tile roofs over upper and lower roofs. Roofs are a combination of hips, gables and mono-pitches, with a mono-pitched roof extending from the upper level to form an entrance canopy. Eave and verge projections are generally 575 mm wide, except for several areas at 425 mm. An enclosed deck, which opens from the master bedroom, is situated above the kitchen has a membrane floor, and monolithic-clad balustrades and wing walls. Two open timber decks, linked with steps, extend to the west from the ground floor living room and sunroom.

- 2.1.2 The builder, Mr Russell of “Harmony Homes” (“the builder”) maintains that all exterior wall framing supplied for this house was LOSP treated to H3.1, and this is confirmed in a letter dated 25 July 2005 from the timber supplier, Henderson Timbers Ltd. The expert commissioned by the Department to inspect the cladding (“the expert”) noted an odour from the timber that indicated LOSP treatment. Based on this evidence, I accept that the external wall framing used on the house is LOSP treated to H3.1.
- 2.1.3 The cladding system to upper walls of the building is what is described as monolithic cladding, with the lower walls clad with brick veneer. The monolithic cladding is a “Harditex” system with 7.5 mm thick fibre cement sheets fixed directly to the framing timber over the building wrap and finished with a “Multiplast” textured coating system.
- 2.1.4 Plaster Systems Ltd provided a “Producer Statement” dated 10 November 2003, for the “Multiplast” coating, noting that the coating was completed by 5 November 2003. I have seen no evidence of warranties for the cladding.
- 2.1.5 I note that all elevations of the building demonstrate a medium weathertightness risk rating as calculated using the E2/AS1 risk matrix. 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.
- 2.1.6 Accordingly I consider this face fixed fibre-cement cladding to be an alternative solution (refer to paragraph 4.2).

2.2 Sequence of events

- 2.2.1 The territorial authority issued a building consent on 30 April 2003, and apparently carried out various inspections during the course of construction.
- 2.2.2 On 2 May 2005, the territorial authority carried out a cladding inspection, which identified several defects in window flashings and the lack of control joints to the Harditex cladding.

2.2.3 On 10 May 2005 the territorial authority issued a notice to fix under sections 164 and 165 of the Act, which noted the defects in window flashings and the lack of control joints to the Harditex cladding. The territorial authority also noted that:

The construction methods used in this building do not allow the water to drain away. There is only limited ability for air circulation in the wall framing to ensure that damp timber can dry out. Additionally no early warning detection system has been installed that will alert the building owner that timber framing is wet.

To remedy this either:

- A method for ensuring that external water can drain away and the timber framing dry out, or
- Install an early warning device that will alert the building owner that external water has entered into the wall and the timber framing is wet and that it may rot as a result if no maintenance is undertaken.

2.2.4 The owner applied for a determination on 4 August 2005.

3. The submissions

3.1 The owner stated that the matter of doubt were the defects included in the notice to fix, and included a letter from the builder, dated 25 July 2005, which described various details of the house construction, including the following:

Prior to the installation of the aluminium joinery Protecto sill flashing tape was installed along all window sills and a minimum of 300mm up both jambs. Inseal 3109 compressible foam was installed between the window flange and the cladding.

Gorilla Nailpower expandable foam was used to create an air seal between the window jambs, heads and sills and the timber framing.

All parapet walls and deck handrails were constructed with a minimum of 15° slope and the top surfaces were bandaged with EIFS tape from Protecto prior to texturing.

3.2 The builder also noted that:

All regulatory inspections were carried out and passed during construction by Auckland City Council.

3.3 The owner forwarded copies of:

- the drawings
- the notice to fix
- the letter from the builder
- the letter from the timber suppliers
- the producer statement for the coating on the cladding.

3.4 The territorial authority forwarded copies of:

- some of the drawings
- site meeting notes dated 17 November 2004
- the report on the cladding inspection of 2 May 2005
- the letter to the owner of 10 May 2005
- the notice to fix
- various producer statements and other statements.

3.5 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.

3.1 In a letter to the Department dated 23 November 2005, the territorial authority commented on aspects of the draft determination:

“Over the last year the Department has issued a number of determinations relating to the code compliance of cladding as installed. In Council's experience, the matter in dispute has been inaccurately documented. In practice the matter in dispute is whether the scope of work necessary to achieve code compliance is that documented in Council's Notice to Fix or as identified by the department's assessor. Council's view is that to provide clarity and certainty for the applicant, the matter in dispute should be amended to reflect this. This change would need to be approved by the applicant as well as Council.”

3.6 In particular, the territorial authority is concerned that paragraphs 8.3 and 8.4 indicate a scope of work required to make the house code compliant. The territorial authority claims that this is not part of the determination.

3.7 The builder wrote to the department on 28 November noting:

ambiguity between Clause 5.5 of the draft determination and Clause 6.6 of the experts cladding report in relation to the installation of control joints

This item was referred back to the expert for clarification and was found to be an incorrect reference. The requirement for vertical control joints was confirmed to be 5.4m

4. The relevant provisions of the Building Code

4.1 The dispute for determination is whether the territorial authority's decision to refuse to issue a code compliance certificate because it was not satisfied that the cladding complied with clauses B2.3.1 and E2.3.2 of the Building Code (First Schedule, Building Regulations 1992) is correct.

- 4.2 There are no Acceptable Solutions that have been approved under section 22 of the Act that cover the monolithic cladding as installed on this house. The cladding is not currently certified under section 269 of the Act. I am, therefore of the opinion that the cladding system as installed must now be considered to be an alternative solution.
- 4.3 In several previous determinations, the Department has made the following general observations, which in my view remain valid in this case, about Acceptable Solutions and alternative solutions:
- 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.

5. The expert's report

- 5.1 The expert inspected the cladding on 15 September 2005, and furnished a report that was completed on 20 September 2005. The expert noted that the cladding generally appeared have been installed with “reasonable care” in accordance with the manufacturer’s instructions, with penetrations sealed and the Harditex coating appearing in good condition. The expert noted no visible cracks in the cladding, although there were signs of recent repairs to the deck walls and roof to wall junctions.
- 5.2 The expert cut away a section of Harditex at the head to jamb junction of a ranchslider and two small sections of interior linings at the sill to jamb junctions of two windows to inspect the flashings, and noted that the sill framing to window openings had tape to the top. The expert took invasive moisture readings in framing timber (at these exposed positions only) and noted no elevated readings. I accept that the windows opened up in this way are typical of similar windows around the building.
- 5.3 The expert took non-invasive moisture readings at the base of exterior walls through interior wall linings and at doors, windows, and other risky areas, and noted no elevated readings. Further non-invasive readings were taken through the exterior cladding, and the following elevated readings were noted:
- 22%, 27% and 35% under the windows of the master bedroom
 - 21% to 25% at the tops of wing walls and barriers around the upper deck
 - 27% to 45% through the outer cladding of wing walls and barriers around the upper deck

- over 30% through the deck side of the cladding of wing walls and barriers around the upper deck

5.4 The expert noted that these readings indicated that moisture was penetrating into the fibre cement backing sheets.

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

- although windows appear to have tape over sill framing, no sill flashings or air seals were observed
- in the master bedroom ranchslider, the building wrap does not lap over or seal to the head flashing upstand, and no drainage gap is provided between the Harditex and flashing slope
- doors and windows have been face-fixed onto unsealed fibre cement backing sheets, with no Inseal tape or sealant under jamb flanges. Sealant has been applied as a fillet onto the cladding after the window installation, rather than behind the window flanges as per the manufacturer's instructions. The bottom of the window flange has been sealed with no drainage gap provided
- there are no vertical control joints in walls on the north, east and west elevations (although shown on the drawings), where the lengths of Harditex exceed the 5.4 m limit recommended by the manufacturer
- a polystyrene band covering the horizontal control joint under the upper gable has no slope to the top and has been installed over unsealed fibre cement
- there is inadequate ground clearance beneath brick veneer outside the workshop, lounge and study, and ground levels slope towards the walls at some locations around the building
- there is inadequate clearance from the Harditex to the bedroom deck membrane
- there is no capping over the tops of deck wing walls and barriers, and there are signs of moisture entry into the fibre cement backing sheets
- junctions between Harditex and roof flashings lack drainage gaps as recommended in the manufacturer's instructions
- the kickout on the roof junction adjacent to the master bedroom directs water towards the cladding, and there are signs of moisture penetration on the soffit and cladding below the junction
- there are a number of down pipes over lower roofs, which lack spreaders
- A number of roof to wall junctions are crudely constructed, and are heavily reliant on sealants for weatherproofing

- junctions of Harditex to brick veneer, and brick veneer to concrete block seem suspect at some locations, lacking capillary breaks, flashings or Inseal.

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

6. Discussion

6.1 General

6.1.1 I have considered the submissions of the parties, the expert's report and the other evidence in this matter. The approach in determining whether building work complies with clauses B2 and E2 is to examine 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 Building Industry Authority and the Department have described the weathertightness risk factors in previous determinations (Refer to Determination 2004/01 et al) relating to monolithic cladding, and I have considered these comments in this determination.

6.2 Weathertightness risk

6.2.1 In relation to these characteristics I find that the house:

- is built in a low wind zone
- is a maximum of two storeys high
- has an enclosed deck, with monolithic clad barriers and wing walls, which is situated above a living area
- is fairly simple in plan, but with two different types of cladding and a number of complex roof to wall junctions
- has eave and verge projections of 425 mm and 575 mm
- has monolithic cladding which is fixed directly to the framing
- has external wall framing that is treated, so providing a good resistance to the onset of decay if the framing absorbs and retains moisture.

6.3 Weathertightness performance

6.3.1 Generally the cladding appears to have been installed according to good trade practice, but some junctions, edges and penetrations are not well constructed. These areas are all as described in paragraph 5.5 and in the expert's report as being the:

- lack of sealing between joinery jamb flanges and cladding, lack of overlap or sealing at the top of the head flashing upstands, lack of drainage gaps at heads and sills, lack of air seals, and unsealed fibre cement behind joinery flanges

- lack of vertical control joints on three walls (although shown on drawings)
- unsealed fibre cement under polystyrene bands over horizontal control joints
- lack of clearance from the ground to the base of brick veneer at some locations
- lack of ground slope away from exterior walls at some locations
- lack of clearance from the deck membrane to the Harditex base
- poor weatherproofing of the tops of deck barriers and wing walls
- lack of drainage gaps between Harditex and roof flashings
- poor weatherproofing of roof to wall junctions in some locations
- lack of spreaders on down pipes above roofs
- lack of weatherproofing at junctions of Harditex to brick veneer, and brick veneer to concrete block at some locations.

6.3.2 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 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 walls that provide reasonable protection to the cladding areas below them
- has external wall framing that is treated, so providing a good resistance to the onset of decay if the framing absorbs and retains moisture.

6.3.3 I consider that these factors help compensate for the lack of a ventilated cavity and can assist the house 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 not adequate because it is allowing water penetration into the cladding at a number of locations, and into the building at one location at present. Consequently, I am not satisfied that the cladding system as installed on the building complies 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 is likely to result in the building remaining weathertight and in compliance with clauses B2 and E2.
- 7.4 I note that effective maintenance of monolithic 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 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.
- 7.6 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 remaining weathertight and in compliance with clauses B2 and E2.
- 8.3 I note that the territorial authority has issued a notice to fix, 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 owner to propose and for the territorial authority to accept or reject.

- 8.4 I would suggest that the parties adopt the following process to meet the requirements of paragraph 8.3. Initially, the territorial authority should issue the 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 technically robust 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.
- 8.5 Finally, I consider that the cladding will require on-going maintenance to ensure its continuing code compliance.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 23 December 2005.

John Gardiner
Determinations Manager