

Determination 2007/9

Refusal of a code compliance certificate for a building with a monolithic cladding system at 1758 Cust Road, Canterbury



1. The matter 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 (“the Department”), for and on behalf of the Chief Executive of that Department. The applicant is the owner, Mr Campbell (“the applicant”), acting through the building designer, Mr Spiers (“the agent”) and the other party is the Waimakariri District Council (“the territorial authority”).
- 1.2 The matter for determination is whether I am satisfied on reasonable grounds that the territorial authority’s decision to decline to issue a code compliance certificate for a 1-year-old house is correct. The territorial authority declined the application because it was not satisfied that the coating to the monolithic cladding as installed to the walls of the house complied with clause B2 “Durability” and clause E2 “External Moisture” of the Building Code² (First Schedule, Building Regulations 1992). By

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.

“the monolithic cladding as installed” I mean the components of the system (such as the backing materials, the flashings, the joints and the plaster and coatings) as well as the way the components have been installed and work together.

- 1.3 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.

2. The building

- 2.1 The building work consists of a detached house situated on a flat rural site, which is in a high wind zone for the purposes of NZS 3604. The house is two storeys high; and construction is conventional light timber frame, with a concrete slab, aluminium windows and monolithic wall cladding. The house plan is a fairly simple cruciform shape, with the partial upper floor accommodated within the steeply pitched 50° pitch pressed metal tile gable roof. The roof has small hipped sections over the upper part of the main gable ends to the west and east. Eaves and verge projections are generally 450mm wide, except for several deeper recesses. Dormer windows, with 200mm verge projections, face towards the north and south.
- 2.2 The two north-facing dormers open onto small decks, with paved floors and open metal balustrades, which are recessed into the roof slope.
- 2.3 The expert has noted that he found no evidence of treatment on timber he was able to inspect. The specification calls for the wall framing and cavity battens to be H3 treated. I have received no other written evidence as to the treatment of the external wall framing timber, but I note that the latter would have been required to be treated to a minimum level of H1.2 at the date on which the building consent was issued. Given the date of construction, I consider that the external wall framing is likely to be treated to a level that will provide resistance to fungal decay.
- 2.4 The cladding system is what is described as monolithic cladding, and is a “Harditex cavity” system, with 7.5 mm thick fibre-cement sheets fixed through 20mm timber battens and the building wrap to the framing, and finished with a “Cemix Proflor” filler over mesh-reinforced joints and an applied textured plaster system. The 20mm timber battens form a cavity between the cladding sheets and the building wrap.
- 2.5 I have received no evidence of producer statements or warranties for the cladding. The owner has stated that the cladding was installed in accordance with James Hardie Building Products details as at 1 September 2004.

3. Sequence of events

- 3.1 It appears that the territorial authority issued a building consent (No. 040100) on 29 July 2004, based on plans stamped as approved by Prime Compliance Ltd (“the building certifier”). The building certifier’s scope of engagement dated 14 February 2005 included all plan processing and field inspections.

- 3.2 It appears that the applicant managed the construction of the house, engaging subcontractors as necessary and completing the finishing work himself.
- 3.3 The building certifier carried out various inspections during construction, including a pre-cladding inspection on 2 March 2005. (The record of this inspection is the only inspection record, prior to the final inspection, that I have seen).
- 3.4 It appears that the applicant was unable to secure an applicator for the jointing and coating to the cladding, so purchased materials and completed the work himself. According to the agent, the applicant was unable to purchase the proprietary Harditex product as he was not a licensed applicator, so he used a different product instead.
- 3.5 The building certifier's approval as a building certifier expired on 25 November 2005, and it appears that Prime Compliance Ltd subsequently became a contractor providing building regulatory services to the territorial authority ("the contractor").
- 3.6 The contractor carried out a final inspection on 13 January 2006 and the inspection record ticked all construction items as complying, and "passed" the inspection.
- 3.7 In a letter to the applicant dated 23 January 2006, the contractor outlined outstanding documentation needing to be completed before a code compliance certificate could be issued. The requirements included the provision of:
- ...a Producer Statement from the exterior coating system applicator stating that the system has been done in accordance with the Hardie Technical Specifications.
- 3.8 The applicant corresponded with the supplier of the joint filler, Cemix Construction Products, and received assurance that his described use of the filler in conjunction with fibreglass mesh was "an appropriate use" of the product – which was "similar or better than many of those proprietary applications available on the market". It appears that the applicant subsequently supplied the contractor with information on the coating system.
- 3.9 In a letter to the applicant dated 28 February 2006, the contractor requested:
- ...confirmation from James Hardie Technical Division that the system you have used will meet compliance for weathertightness when used in conjunction with the Harditex Cladding System.
- 3.10 The applicant submitted information on the cladding to James Hardie, and the Technical Support Manager responded with a facsimile dated 6 June 2006, which included the following points:
- Harditex sheets were required to be jointed and texture coated with a proprietary texture coating and jointing system in accordance with their manufacturer's recommendations as per Harditex technical literature Dec. 2003.
 - To satisfy the requirement of Prime building compliance regarding E2, the warranties on the jointing and texture coatings needs (sic) to be provided by the texture coating applicators or manufacturers.
 - Harditex sheets installed and finished as per Harditex technical literature are covered under the standard product warranties.

- 3.11 It appears that the contractor and the territorial authority refused to accept a producer statement from the owner. The territorial authority did not issue a notice to fix as required under section 164(2) of the Building Act 2004.
- 3.12 On 26 September 2006, the Department received an application for a determination from the agent on behalf of the applicant.

4. The submissions

- 4.1 In a letter accompanying the application, the agent described the history of the project, the cladding system and the background to the dispute. The agent stated that the territorial authority would not discuss or suggest any solution to the coating issue, and noted:

I am not sure where to go with this application as it does not leak and the finish is acceptable. The council does not question the workmanship or Harditex installation as it has been installed according to Harditex sheet-cavity construction technical specification and has been inspected and signed off.

- 4.2 The applicants forwarded copies of:
- the consent drawings and specification
 - some of the inspection records
 - some of the correspondence with the building certifier/contractor
 - cladding manufacturer's details dated 1 September 2004
 - various other statements, correspondence and technical information.
- 4.3 Copies of the applicants' submission were provided to the territorial authority, which made no submission in response.
- 4.4 A copy of the draft determination was sent to the parties for comment on 4 December 2006. Both parties accepted the draft.

5. The expert's report

- 5.1 As discussed in paragraph 1.3, I engaged an independent expert capable of providing an assessment of the condition of those building elements subject to the determination. The expert is a member of the Institute of Building Surveyors.
- 5.2 The expert inspected the cladding of the building on 16 November 2006, and furnished a report that was completed on 19 November 2006. The expert noted that the cladding sheet installation generally appeared reasonable, but the textured coating was not "finished to a standard expected by a contractor specialising in such work".

- 5.3 The expert noted that the owner would not permit invasive moisture testing or removal of sample sections of cladding, which limited the expert's ability to inspect the underlying construction and confirm flashing details. The expert tested for moisture levels only using a non-invasive meter. I do not consider non-invasive meters to be sufficiently reliable for me to rely solely on them to form a view as to code compliance.
- 5.4 The expert noted that the windows were face-fixed with metal head flashings and no sill flashings, with compressible foam tape under the sill flanges. The coating had been applied after the window installation. The expert also noted that he could not verify whether air seals had been installed.
- 5.5 The expert took non-invasive moisture readings through internal linings of exterior walls throughout the house, and noted no elevated readings. As the owner would not permit invasive moisture testing, the expert took non-invasive moisture reading through the exterior cladding at windows and risky roof to wall junctions, and noted that all readings were within the "dry zone". He was also able to express a view that his visual inspection did seem to confirm the non-invasive readings.
- 5.6 Commenting specifically on the cladding the expert noted that there is no evidence of vertical control joints to the east and west walls, where the horizontal cladding length exceeds the 5.4m limit recommended by the manufacturer as the maximum distance between such joints. The expert also observed that:
- the inter-storey junctions at the gable ends have been filled with joint filler and coated over, which is not in accordance with the manufacturer's instructions
 - joints in the backing sheets line up with the jamb of one north window and with the left jamb of the north garage door (where the joint has cracked), which is not in accordance with the manufacturer's instructions
 - at internal corners, the sheets are butt-jointed with no evidence of a sealant-filled joint as required in the manufacturer's instructions
 - the coating is uneven and very thin in some areas (with some flaking and degradation apparent), and unsealed fibre-cement is showing below and behind the gutters, at the bottom edges of sheets, and beneath the projections of window head flashings
 - the clearances from the bottom of the cladding to the ground and paving are inadequate in some areas on the south elevation
 - the cladding is sealed over the slope of the window head flashing, with no gap provided to allow the upper cavity to drain to the outside, which is not in accordance with the manufacturer's instructions. The head flashing projections are inadequately sealed on the undersides in some areas, and the lack of end turndowns will allow water to track along the underside

- the bottoms of the apron flashings are inadequately weatherproofed, with no kickouts, and gaps showing, and the ends of the gutters butt against unsealed fibre-cement
- the clearances from the bottom of the cladding to the apron flashing at the roof to wall junctions are inadequate, as the cladding butts against the apron without an anti-capillary gap
- the flashings around the dormer windows and at the deck edges are crudely installed (with inadequate junctions and gaps showing in some areas), and the cladding has cracked at one of the south dormers
- the meterbox is poorly weatherproofed, with no head flashing, inadequate sealants and the coating taken over the metal box.

5.7 A copy of the expert's report was provided to each of the parties on 21 November 2006. The owner responded in a letter date 30 November 2006. He commented that the report was comprehensive but felt it did not focus on the main point, the external stopping to the fibre-cement sheets and noted that the sheets are fixed over a cavity on H3 treated framing.

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 Solution³, 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

³ 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.

risk factors in previous determinations⁴ (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:

- is built in a high wind zone
- is a maximum of two storeys high
- is fairly simple in plan and form
- has two upper floor decks, which are recessed into the roof
- has eaves and verge projections of 450mm over most walls
- has monolithic cladding that is fixed over a drained cavity
- has external wall framing that is 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, three elevations of this house demonstrate a moderate weathertightness risk rating and one a high rating. The matrix is an assessment tool that is intended to be used at the time of application for consent, before building work has begun and, consequently, before any assessment of the quality of the building work can be made. Poorly executed building work introduces a risk that cannot be taken into account in the consent stage but must be taken into account when the building as actually built is assessed for the purposes of issuing a code compliance certificate.

6.3 Weathertightness performance

- 6.3.1 Generally the cladding appears to have been installed in accordance with good trade practice. However, some junctions, edges and penetrations are not well constructed, and these are as described in paragraph 5.6, and in the expert's report.

- 6.3.2 I note the expert's comments in paragraph 5.3 on the lack of invasive testing and opening up of the cladding, and accept that some installation details cannot be verified by visual inspection. Although invasive moisture testing was not conducted, I am prepared to accept, on balance, and subject to the following rider, that the external wall framing is likely to be within acceptable moisture limits at this time. However, this acceptance is reliant on the provision that as the defects identified in

⁴ Copies of all determinations issued by the Department can be obtained from the Department's website.

paragraph 5.6 are being repaired they must be inspected for signs of associated moisture penetration. If this inspection reveals any indication of moisture entry, further investigations will be required. This Determination does not depend solely on moisture measurements for assessment of Code compliance.

- 6.3.3 I also note that the contractor's concerns appear to have been restricted to the weathertightness of the jointing and coating system applied to the cladding (refer paragraph 3.9). However I consider that, while the products used appear satisfactory from the information available to me, the defects apparent in their application (and in other areas of the cladding) are more important to the ongoing weathertightness performance of the building.

7. Conclusion

- 7.1 I consider that the expert's report establishes, having regard to the limitations of the moisture measurement test method, that there is no evidence of external moisture entering the building, and accordingly, that the wall claddings do comply with clause E2 at this time.
- 7.2 However the house 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 I also find that rectification of the items outlined in paragraph 5.6 to the approval of the territorial authority, along with any other associated faults that may become apparent in the course of that work, will consequently result in the house remaining weathertight and in compliance with clause 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 should 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 It is emphasized 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 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 Building Act 2004, I hereby determine that the building work does not comply with clause B2 of the Building Code, and accordingly confirm the territorial authority's decision to refuse to issue a code compliance certificate.
- 8.2 I note that the territorial authority has not issued a notice to rectify or a notice to fix. The territorial authority should now issue a notice to fix (to include those items outlined in paragraph 5.6) and the applicant is then obliged to bring the building up to compliance with the Building Code. It is not for me to decide how the defects are to be remedied and the cladding brought to compliance with the Building Code. That is a matter for the applicants to propose and for the territorial authority to accept or reject. It is important to note that the Building Act allows for more than one method of achieving Code compliance.
- 8.3 I would suggest that the parties adopt the following process to meet the requirements of paragraph 8.2. Initially, the territorial authority should issue a notice to fix, listing all the items that the territorial authority considers to be non-compliant. The owner should then produce a response to this in the form of a detailed proposal, produced in conjunction with a competent and suitably qualified person, as to the rectification or otherwise of the specified issues. Any outstanding items of disagreement can then be referred to the Chief Executive for a further determination.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 24 January 2007.

John Gardiner
Determinations Manager