

Determination 2007/10

Refusal of a code compliance certificate for additions to a building with timber weatherboards, profiled metal and monolithic cladding systems at 283 Maitai Valley Road, Nelson



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 applicants are the owners, Mr Dawson and Fox Stevens (“the applicants”), acting through an agent, Mr Hislop of Building Solutions Ltd, and the other party is the Nelson City 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 2-year-old additions to a house is correct. The territorial authority declined the application because it was not satisfied that the cladding systems as installed to the

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

walls of the house complied with clause B2 “Durability” and clause E2 “External Moisture” of the Building Code² (First Schedule, Building Regulations 1992). By “the cladding systems as installed” I mean the components of the systems (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 substantial additions and alterations to a 1980’s two-storey detached house situated on a rural sloping site, which is in a high wind zone for the purposes of NZS 3604³. The building work considered in this determination consists of a two-storey extension to the south (to add a garage and new living room), a new upper floor over part of the house (to add two bedrooms), a new roof over most of the house, and recladding of most exterior walls. The resulting house is conventional light timber frame, with a concrete slab, concrete block retaining walls, some original timber-framed sub-floor area, profiled-metal roof cladding and aluminium windows with timber facings. The house is fairly complex in plan and form, with the new 45° pitch multi-gable roof intersecting with lower pitched verandahs and the original roof area. The eaves projections are generally 600mm overall and verges are about 450mm. The wall claddings are a mixture of monolithic cladding, horizontal rusticated cedar weatherboards and horizontal corrugated metal.
- 2.2 A new timber deck, with spaced decking and metal and timber balustrades, forms an infill between an original bedroom and the new living room on the southwest elevation. Further decking extends from an original timber deck along the northeast and southeast elevations. At the south end of this deck, the garage wall projects out by about 1200mm as a separated lean-to roof beneath the deck level.
- 2.3 I have received no evidence as to the treatment, if any, of the timber wall framing. Given the lack of evidence and the date of construction of the additions, I consider that the new external wall framing is unlikely to be treated.
- 2.4 The cladding system to about half of the new walls is a monolithic cladding system described as stucco over a solid backing. In this instance it consists of 4.5 mm fibre-cement “Hardibacker” sheets, which are covered by a slip layer of building wrap, metal-reinforced 20mm thick solid plaster and a flexible paint coating. The Hardibacker sheets are fixed over a 20mm deep cavity formed from H3 treated vertical timber battens fixed over the building wrap to the framing timbers.
- 2.5 The plastering contractor provided a “Producer Statement” dated 22 January 2004, for the stucco system, which stated that the plasterer held a trade certificate, had

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

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

more than 10 years experience in plastering, the solid plastering complied with the building code, and it had been installed in accordance with NZS 4251⁴.

3. Sequence of events

- 3.1 The territorial authority issued a building consent on 4 July 2003, based on a building certificate (dated 3 July 2003) issued by Prime Building Compliance Ltd (“the building certifier”) for the purposes of gaining a building consent.
- 3.2 The building certifier carried out inspections during the course of construction including an “external pre-plaster” inspection on 22 January 2004, which noted that the flashings had been satisfactorily installed, the metal mesh was well-fixed; and also stated “Don’t forget control joints every 4.0m”.
- 3.3 The building certifier carried out the final inspection on 4 November 2004, with a subsequent inspection of outstanding items on 21 November 2004 – which noted “All items now complete and ready for issue of Code Compliance Certificate once all documentation provided”.
- 3.4 Under cover of a letter to the territorial authority dated 29 March 2005, the building certifier provided a final building certificate dated 24 March 2005 and an amended scope of engagement that excluded “Exterior cladding outside scope of E2/AS1 (Coloursteel and solid plaster)” and handed the project to the territorial authority for completion of cladding inspections.
- 3.5 In a letter to the applicants dated 7 June 2005, the territorial authority noted that the certifier’s final building certificate excluded the profiled metal and solid plaster wall cladding; and explained that a code compliance certificate could not be issued for the building work as:

Nelson City Council cannot be satisfied on reasonable grounds that the work complies as we have not carried out any inspections of the work as it progressed as would normally be required.

The territorial authority also noted that the house was considered to have a high weathertightness risk, and suggested that a determination be sought on the code compliance of the exterior cladding.
- 3.6 The building certifier’s approval as a building certifier expired on 25 November 2005.
- 3.7 The territorial authority did not issue a notice to fix as required under section 164(2) of the Building Act 2004, and I am not aware of any further communication that may have taken place between the applicants and the territorial authority.
- 3.8 On 14 August 2006, the Department received an application for a determination from the owners.

⁴ New Zealand Standard NZS 4251: Solid plastering; Part 1: 1998 Cement plasters for walls, ceilings and soffits

4. The submissions

4.1 Within the application, the applicants described the background to this application for a determination and said:

Prime Building Compliance acted as building certifier undertaking all inspections but are unable to issue the Code Compliance Certificate due to changes in the certifier's scope of approval. Documentation handed back to Council. Council has declined to issue the Code Compliance Certificate as detailed in the attached letter dated 7 June 2005.

4.2 The applicants forwarded copies of:

- some of the consent drawings and specification
- some of the consent documentation
- some of the building certifier's inspection records
- the final building certificate dated 24 March 2005
- the correspondence from the territorial authority
- the producer statement from the plasterer.

4.3 A copy of the applicants' submission was 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 20 November 2006. The parties accepted the draft without comment.

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 claddings of the building on 26 and 27 September 2006, and furnished a report that was completed on 29 September 2006. The expert noted that "the building appears to be sound and true and workmanship is generally of a good standard, with "consideration given to flashings and sealing" in most areas. The expert noted that roof flashings appeared satisfactory (with adequate cladding clearances and kickouts to apron flashings) and penetrations through wall claddings generally appeared adequately sealed. The expert noted no visible evidence that control joints had been installed in the solid plaster.

5.3 The expert noted that the vermin-proofing at the base of the cavity under the stucco appeared satisfactory, and also that the owner had shown him photographs taken during construction of the additions, which showed the cavity battens.

- 5.4 The expert investigated window flashings in the different wall claddings, and I accept that the areas opened up are typical of similar locations around the building. The expert removed:
- a section of solid plaster and noted the metal jamb flashing overlapping the sill flashing, which extended to the back of the cavity and projected about 100mm past the jamb with no end upstand
 - timber facing boards at the jamb and sill of a window in the timber weatherboards, and noted that the weatherboards butted against the window frame, with the timber facing board rebated over the frame to cover the junction. The metal sill flashing projected past the jamb to overlap the full width of the timber sill facing board. The head flashings projected past the jambs to overlap the full width of the head facing board
 - timber facing boards at the jamb and sill of a window in the corrugated metal cladding, and noted that the metal jamb flashing overlapped and was sealed to the metal sill flashing, which projected past the jamb to overlap the full width of the timber sill facing board. The jamb facings were sealed against the metal cladding with corrugated foam, and the head flashings projected beyond the jambs to overlap the full width of the head facing board.
- 5.5 The expert also investigated corner flashings and inter-cladding flashings between different wall claddings, and noted that satisfactory back flashings and saddle flashings had been installed. The expert also noted that, at the junction of the wall with the timber decking, a flashing extended from behind the cladding to overlap the deck ribbon plate, with another flashing extending from behind the plate to overlap the lower cladding.
- 5.6 The expert took non-invasive moisture readings through internal linings of exterior walls throughout the additions, and no elevated readings were noted. Invasive moisture readings were taken through the wall cladding, at the jamb to sill junctions of windows in the three claddings, and moisture levels of 12% or less were recorded.
- 5.7 The expert made the following specific comments on the cladding:
- The clearance from the bottom of the stucco cladding to the adjacent ground is inadequate in some locations.
 - There are several isolated shrinkage cracks in the stucco.
 - The window head flashings in the stucco are sealed against the plaster, with no drainage gaps.
 - The timber facings over the window jambs are inadequately sealed against the weatherboards (with no rustic plugs installed).
 - The corrugated foam between the jamb facing boards and the metal cladding is unpainted.

- There are some areas where builder's and plaster debris has not been cleaned out from drainage gaps and clearances.
- The small lean-to garage roof under part of the southeast deck lacks a gutter, and the fibre-cement sheet wall cladding is unpainted.
- The downpipe fixing brackets are not sealed against the metal wall cladding.

5.8 The expert made the following additional comments:

- Although the exposed rafters lack saddle flashings, they are well protected beneath the steeply-sloping eave.
- Although the meterbox lacks a head flashing, it is well-sealed and protected under the eaves.
- Although the flashings at the junction between the soffit and the profiled metal cladding at the southeast gable end overlaps the soffit lining, the junction is well-sealed and protected under the roof overhang.
- Although the window sill flashings in the stucco cladding lack stopends, there is no sign of associated water entry and the framing is protected by the cavity.

5.9 The expert also observed that the original part of the southeast wall (now supporting three storeys) appears to lack a foundation beam, and considered that this required structural investigation.

5.10 A copy of the expert's report was provided to each of the parties on 4 October 2006.

5.11 The applicants responded to the report in a letter to the Department dated 9 October, noting their concern that, if the report is not sufficiently comprehensive, then the determination process may fail to achieve its objectives of establishing code compliance of the building work. I have considered the comments in the preparation of this determination, and note that the expert's report is intended to be but one part of the evidence examined in reaching a conclusion as to the compliance of this building (see paragraph 1.3).

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 Solution⁵, 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:

⁵ 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.

- Some Acceptable Solutions cover the worst case, so that they may be modified in less extreme cases and the resulting alternative solution will still comply with the Building Code.
- Usually, when there is non-compliance with one provision of an Acceptable Solution, it will be necessary to add some other provision to compensate for that in order to comply with the Building Code.

6.1.2 The approach in determining whether building work is weathertight and durable and is likely to remain so, is to apply the principles of weathertightness. This involves the examination of the design of the building, the surrounding environment, the design features that are intended to prevent the penetration of water, the cladding system, its installation, and the moisture tolerance of the external framing. The Department and its antecedent, the Building Industry Authority, have also described weathertightness risk factors in previous determinations⁶ (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.

6.1.4 I note that the previous Acceptable Solution E2/AS1, which was in force when the consent for this work was issued, did not require a cavity to be provided. The previous Acceptable Solution E2/AS1 required that solid plaster was to be installed in accordance with NZS 4251.

6.2 Weathertightness risk

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

- are built in a high wind zone
- are a maximum of three storeys high
- are fairly complex in plan and form, with three types of wall cladding
- have spaced timber deck areas on three elevations
- have eaves of 600mm and verge projections of 450mm over most walls
- have monolithic cladding that is fixed over a drained cavity
- have profiled metal and timber weatherboard cladding that is fixed directly to the framing

⁶ Copies of all determinations issued by the Department can be obtained from the Department's website.

- 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, all elevations of these additions demonstrate a high weathertightness risk 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 5.7, and in the expert's report.

6.3.2 I note the expert's additional comments in paragraph 5.8, and accept that these parts of the house are adequate under the particular circumstances described.

6.3.3 I also note that the expert was unable to verify that control joints had been installed in the solid plaster walls. However, given the specific direction from the building certifier following the pre-plaster inspection (refer paragraph 3.2) and the good workmanship apparent in the plaster cladding applied to the additions, I am prepared to accept that it is likely that adequate control joints were installed in the solid plaster. I note that control joints are provided firstly, to allow for shrinkage and movement when the plaster is curing, and secondly, to allow for thermal cycling and building movement throughout the life of the building. The performance of the plaster cladding since it was installed in 2004 provides strong evidence that the plaster is performing satisfactorily.

6.3.4 Notwithstanding the fact that the profiled-metal and weatherboard 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:

- Apart from the noted exceptions the cladding is installed in accordance with good trade practice, with well-executed window and inter-cladding flashings.
- The additions has eaves and verge projections over most walls, which provide good protection to the cladding below them.
- The claddings are currently preventing moisture penetration into the framing.

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 consider that the expert's report establishes 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 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 additions to remain weathertight. Because the cladding faults on the building are likely to allow the ingress of moisture in the future, the additions do not comply with the durability requirements of clause B2.
- 7.3 I find that rectification of the items outlined in paragraphs 5.7 to the approval of the territorial authority, along with any other faults that may become apparent in the course of that work, will consequently result in the additions remaining weathertight and in compliance with clauses B2 and E2.
- 7.4 I note the expert's comment in paragraph 5.9, and draw this to the attention of the territorial authority. I acknowledge that the applicants did not seek a determination on the matter of compliance with clause B1 Structure, but it would be improper for me to ignore the concerns of the expert, especially when the potential consequences of failure of the foundation system could be injurious to health and safety as well as to the applicants' property.
- 7.5 I consider that a structural investigation is required to ensure that the original footing on the southeast wall is adequate to support the additional load imposed by the new building work. I have received no evidence as to the structural adequacy of the original footing and, in the absence of such assurance, cannot be satisfied that the building work complies with clause B1 Structure.
- 7.6 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.
- 7.7 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.

7.8 As the external wall framing of these additions is not treated to a level that will resist the onset of decay if it gets wet, periodic checking of its moisture content should also be carried out as part of normal maintenance.

8. The decision

- 8.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the building work does comply with clause E2 of the Building Code. However, I also determine that the building work does not comply with clause B2 of the Building Code, and accordingly I confirm the territorial authority's decision to refuse to issue a code compliance certificate.
- 8.2 On the evidence available to me, I am unable to determine whether the building work complies with clause B1 of the Building Code. I consider that a structural investigation of the original footing is now required, with appropriate remedial work undertaken if recommended by the structural engineer.
- 8.3 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, and the applicants are then obliged to bring the building up to compliance with the Building Code. It is not for me to decide directly how the defects are to be remedied and the building work 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.
- 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 owner should then produce a response to this in the form of a detailed proposal, produced in conjunction with a competent and suitably qualified person, as to the rectification or otherwise of the specified issues. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 25 January 2007.

John Gardiner
Determinations Manager