



Determination 2009/16

Determination regarding the code compliance of a 13-year-old monolithic-clad addition to a house at 56 Shelbourne Street, Nelson



1. The matters 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, Manager Determinations, Department of Building and Housing (“the Department”), for and on behalf of the Chief Executive of that Department. The applicants are the owners, J and V Reid (“the applicants”), and the other party is the Nelson City Council (“the authority”), carrying out its duties as a territorial authority or building consent authority.
- 1.2 This determination arises from the decision of the authority to refuse to issue a code compliance certificate for a 13-year-old addition to a house because it was not satisfied that it complied with Clause B2 Durability and Clause E2 External Moisture of the Building Code² (First Schedule, Building Regulations 1992).

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.

In this determination, unless otherwise stated, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.

1.3 The matters for determination are:

1.3.1 Matter 1: The cladding

Whether the cladding as installed on the house (“the cladding”) complies with Clauses B2 and E2 (see sections 177 and 188 of the Act). By “the cladding as installed” I mean the components of the system (such as the backing materials, the plaster, the flashings and the coatings), as well as the way the components have been installed and work together.

1.3.2 Matter 2: The durability considerations

Whether the building elements comply with Clause B2 Durability of the Building Code, taking into account the age of the building work.

1.4 In making my decision, I have considered the submissions of the parties, the report of the expert commissioned by the Department to advise on this dispute (“the expert”), and the other evidence in this matter. With regard to the cladding, I have evaluated this information using a framework that I describe more fully in paragraph 6.1.

2. The building work

2.1 The building work consists of a garage addition of approximately 8.6 by 5 metres to a 90-year-old 2-storey house, which is situated on a flat site in a low wind zone for the purposes of NZS 3604³. The garage addition is single-storey, but includes a small mezzanine level with a narrow raised gabled roof area providing dormer windows for the upper level. Construction is generally conventional light timber frame with a concrete slab and foundations, monolithic cladding and timber windows with timber facings to match the windows of the existing house.

2.2 The addition is fairly simple in plan, but has a complex roof form. The pressed metal tile hipped and monopitched roofs to the lower level have no eaves or verge projections, while the raised gable roof has eaves projections of about 500mm overall and verge projections of 200mm. The original lean-to roof of the existing house has been altered to accommodate the new garage roof construction and includes an area of flat membrane roof, with additional valley gutters to either side.

2.3 The south wall of the addition is a fire-rated boundary wall that extends up to form a parapet with a metal capped top and an internal membrane-lined gutter behind. The wall extends beyond the east wall and then steps down to become a timber-framed boundary fence, which has monolithic cladding to each side and to the top.

2.4 The expert has noted that the timber framing is CCA treated pinus radiata. Given this, and the date of construction in 1995, I accept that the external wall framing is likely to be treated.

2.5 The monolithic cladding is a system described as solid plaster 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,

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

under metal-reinforced 25mm to 30mm thick solid plaster with a flexible paint coating. The plaster is finished with a heavily textured “rough-cast” surface to match the stucco on the existing house.

3. Background

- 3.1 The territorial authority issued a building consent for the house (No. 941197) on 27 October 1994, under the Building Act 1991. I have not seen a copy of the consent.
- 3.2 I have seen no records of what, if any, inspections were carried out during construction of the addition, but it appears to have been completed early in 1995.
- 3.3 The house was sold in 2000, and in 2005 the (then) owner sought a code compliance certificate for the garage addition.
- 3.4 In a letter to the owner dated 18 January 2006, the authority noted that the durability requirements of the Building Code commenced from the time of issue of the code compliance certificate, concluding that it would not issue a code compliance certificate due to the time elapsed since the work was undertaken, as it could not:
- ...be satisfied on reasonable grounds that the work now meets all the requirements of the building code, especially B2 durability and E2 external moisture.
- 3.5 I am not aware of any further correspondence between the then owner and the authority, and the applicant purchased the house in October 2006.
- 3.6 The Department received an application for a determination on 22 September 2008 and sought further information on the building work, which was received on 7 October 2008.

4. The submissions

- 4.1 The applicant forwarded copies of:
- some of the consent drawings
 - some of the consent application documentation
 - the letter from the authority dated 18 January 2006.
- 4.2 The authority acknowledged the application, but made no submission.
- 4.3 A copy of the applicant’s submission was provided to the territorial authority, which did not respond.
- 4.4 A draft determination was issued to the parties for comment on 23 December 2008. The draft was issued for comment and for the parties to agree a date when the house complied with Building Code Clause B2 Durability.
- 4.5 Both parties accepted the draft and agreed that compliance with B2 was achieved on 1 June 1995.

5. The expert's report

5.1 As mentioned in paragraph 1.4, I engaged an independent expert to provide an assessment of the condition of those building elements subject to the determination. The expert is a member of the New Zealand Institute of Building Surveyors. The expert inspected the house on 26 November 2008 and furnished a report that was completed on 2 December 2008.

5.2 The expert noted the following variations from the consent drawings:

- A window has been added to the west wall.
- Stairs to the mezzanine level have replaced the ladder shown in the drawings.

5.3 The expert noted that construction appeared to be “of an average quality”, with the cladding generally showing that “there has been poor consideration given to sealing and weathering of the stucco cladding to prevent water entry at junctions and service penetrations”. The expert also noted that the paint finish had not been well maintained, and appeared to be original.

5.4 The expert noted that the timber windows and doors were installed in a traditional manner, with timber facings and metal head flashings over the head facings. The expert removed a section of facing at the jamb to sill junction of a north window and noted that the facing satisfactorily overlapped the stucco to protect the junction, with the underlying timber clean and dry. I accept that the exposed junction is typical of similar locations elsewhere in the addition.

5.5 The expert also noted that, despite the cracks noted in paragraph 5.7, the stucco is very dense and not “drummy”. The thickness is 25mm to 30mm, with the mesh satisfactorily embedded into the scratch coat of the plaster.

5.6 The expert took 4 invasive moisture readings through the cladding at areas considered at risk, and these were all elevated as follows:

- more than 40% in the top of the south boundary fence (refer paragraph 2.3), with the underlying framing very wet
- more than 30% at the junction of the boundary fence with the south boundary wall, with the fire-rated plasterboard interior linings damp
- 19% in the bottom plate of the south boundary wall
- 19% in the lintel above the west window.

Moisture levels above 18% recorded after cladding is in place generally indicate that external moisture is entering the structure.

5.7 Commenting specifically on the wall cladding, the expert noted that:

- there is no evidence of control joints in the cladding, although all shrinkage issues should have occurred by now.
- there are many cracks in the cladding and the paint coating is in poor condition, with a small area of unpainted plaster at the top southeast corner

- the paintwork to the timber is also in very poor condition
- the bottom of the stucco lacks drip edges and there is no clearance from the paving or ground, allowing moisture to “wick up” to the framing
- the timber reveals to the garage door butt against the paving, and are decaying at the bottom
- the top of the boundary fence is severely cracked and allowing moisture into the fence framing and the adjacent boundary wall, with high moisture levels apparent, damage to fire-rated linings and possible decay in wall framing
- the capping to the boundary wall parapet has insufficient cover to the cladding, has corroded on the gutter side, and the gutter membrane is not dressed into the outlet at the end
- the sloping barge board on the east wall penetrates the stucco at the southeast corner, directing moisture into the plaster, and the end of the gutter on the west wall also penetrates the stucco
- the timber fascia to the short south wall and the southwest downpipe are partly embedded in the plaster
- a barge board to the raised gable roof is decaying at the bottom, where the timber is against the membrane
- the light fitting at the southwest corner is unsealed.

5.8 A copy of the expert’s report was provided to the parties on 9 December 2008.

Matter 1: The cladding

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 Solutions⁴, 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 one or more other provisions to compensate for that in order to comply with the Building Code.

⁴ An Acceptable Solution is a prescriptive design solution approved by the Department that provides one way (but not the only way) of complying with the Building Code. The Acceptable Solutions are available from The Department’s Website at www.dbh.govt.nz.

6.2 Evaluation of the building for E2 and B2 Compliance

6.2.1 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 determinations⁵ (for example, Determination 2004/1) relating to cladding and these factors are also used in the evaluation process.

6.2.2 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.

6.3 Weathertightness risk

6.3.1 The addition to this house has the following environmental and design features which influence its weathertightness risk profile:

Increasing risk

- the addition is 2-storey high in part
- although simple in plan, the addition has a complex roof form, with varying roof materials and slopes and complex junctions
- there are no eaves and verge projections above the lower walls
- the walls have monolithic cladding fixed directly to the framing
- the addition has a monolithic-clad parapet wall.

Decreasing risk

- the building is in a low wind zone
- the raised gable has eaves of more than 500mm and verges 200mm deep
- the external wall framing is treated to a level effective in resisting decay if it absorbs and retains moisture.

6.3.2 The addition has been evaluated using the E2/AS1 risk matrix. The risk matrix allows the summing of a range of design and location factors applying to a specific building design. The resulting level of risk can range from 'low' to 'very high'. The risk level is applied to determine what claddings can be used on a building in order to comply with E2/AS1. Higher levels of risk will require more rigorous weatherproof detailing; for example, a high risk level is likely to require a particular type of cladding to be installed over a drained cavity.

⁵ Copies of all determinations issued by the Department can be obtained from the Department's website.

6.3.3 When evaluated using the E2/AS1 risk matrix, the weathertightness features outlined in paragraph 6.3.1 show that the elevations demonstrate a moderate weathertightness risk rating. I note that, although a drained cavity is now required by E2/AS1 for all risk levels, this was not a requirement at the time the addition was constructed.

6.4 Weathertightness performance: exterior cladding

6.4.1 Generally the cladding appears to have been installed in accordance with reasonable trade practice. However, taking account of the expert's report, I conclude that remedial work is necessary in respect of:

- the cracks in the cladding and the deteriorating paint coating
- the lack of clearances from the bottom of the stucco to paving or ground
- the lack of drip edges to the bottom of the stucco
- the lack of weatherproofing at the top of the boundary fence and at the junction with the boundary wall, and the likely impact of water ingress into the fence on the adjacent boundary wall
- the corrosion of the parapet capping and inadequate cover over the cladding
- the inadequate weatherproofing to the end of the parapet gutter
- the penetration into the stucco of the east barge board and west gutter
- the embedment into the stucco of the south fascia and southwest downpipe
- the deteriorating paintwork to the exterior timber
- the lack of clearances and decay at the bottom of the garage door reveals
- the lack of clearance and decay at the bottom of a barge board to the raised gable roof
- the lack of sealing of the southwest light fitting.
- the likely damage to the fire-rated linings of the boundary wall and the possible damage to the framing, which requires further investigation.

6.4.2 Notwithstanding the fact that the cladding is fixed directly to the timber framing, thus limiting drainage and ventilation behind the cladding, I have noted certain compensating factors that assist the performance of some of the cladding in this particular case. With the exception of the boundary wall, these are:

- Apart from the noted exceptions the cladding is installed to reasonable trade practice.
- The windows appear to be installed satisfactorily, with no associated moisture penetration
- Moisture penetration seems limited to areas where defects have been identified
- The external wall framing is treated to a level effective in resisting decay.

6.4.3 Apart from the boundary wall, I consider that these factors help compensate for the lack of a drained cavity and can assist the building to comply with the weathertightness and durability provisions of the Building Code.

Matter 1: The wall cladding

7. Discussion

- 7.1 I consider the expert's report establishes that the current performance of the cladding is not adequate because it is allowing water penetration into the addition at present. Consequently, I am satisfied that the addition does not comply with Clause E2 of the Building Code.
- 7.2 In addition, the building work 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 addition may allow the ingress of moisture in the future, the building work does not comply with the durability requirements of Clause B2.
- 7.3 With respect to the boundary wall, and the adjacent boundary fence, I consider that further investigation is necessary to determine the extent of the moisture penetration and the severity of any damage. The investigation may require the removal of linings and claddings.
- 7.4 Because the faults identified with the cladding on the remainder of the addition occur in discrete areas, I am able to conclude that satisfactory rectification and investigation of the items outlined in paragraph 6.4.1 will result in the addition, with the exception of the boundary wall, being brought into compliance with Clauses B2 and E2.
- 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 The expert has noted the lack of maintenance to the addition. Effective maintenance of claddings is important to ensure ongoing compliance with Clauses B2 and E2 of the Building Code and is the responsibility of the building owner. The Department has previously described these maintenance requirements, including examples where the external wall framing of the building may not be treated to a level that will resist the onset of decay if it gets wet (for example, Determination 2007/60).

Matter 2: The durability considerations

8. Discussion

- 8.1 There are concerns about the durability, and hence the compliance with the Building Code, of certain elements of the building taking into consideration the completion of the building work during 1995.
- 8.2 The relevant provision of Clause B2 of the Building Code requires that building elements must, with only normal maintenance, continue to satisfy the performance requirements of the Building Code for certain periods ("durability periods") "from the time of issue of the applicable code compliance certificate" (Clause B2.3.1).

8.3 These durability periods are:

- 5 years if the building elements are easy to access and replace, and failure of those elements would be easily detected during the normal use of the building
- 15 years if building elements are moderately difficult to access or replace, or failure of those elements would go undetected during normal use of the building, but would be easily detected during normal maintenance
- the life of the building, being not less than 50 years, if the building elements provide structural stability to the building, or are difficult to access or replace, or failure of those elements would go undetected during both normal use and maintenance.

8.4 In this case the delay between the completion of the building work in 1995 and the applicant's request for a code compliance certificate has raised concerns that various elements of the building are now well through or beyond their required durability periods, and would consequently no longer comply with Clause B2 if a code compliance certificate were to be issued effective from today's date.

8.5 The 12-year delay between the substantial completion of the building work consented in 1994 and the authority's refusal of a code compliance certificate raises the matter of when all the elements of the building complied with Clause B2. I have not been provided with any evidence that the authority did not accept that those elements complied with Clause B2 at a date in 1995.

8.6 It is not disputed, and I am therefore satisfied, that all the building elements complied with Clause B2 on 1 June 1995, refer paragraph 4.5.

8.7 In order to address these durability issues when they were raised in previous determinations, I sought and received clarification of general legal advice about waivers and modifications. That clarification, and the legal framework and procedures based on the clarification, is described in previous determinations (for example, Determination 2006/85). I have used that advice to evaluate the durability issues raised in this determination.

8.8 I continue to hold that view, and therefore conclude that:

- (a) the territorial authority has the power to grant an appropriate modification of Clause B2 in respect of all the building elements.
- (b) it is reasonable to grant such a modification, with appropriate notification, because in practical terms the building is no different from what it would have been if a code compliance certificate for the addition had been issued in 1995.

8.9 I strongly recommend that the territorial authority record this determination and any modifications resulting from it, on the property file and also on any LIM issued concerning this property.

9. What is to be done now?

9.1 A notice to fix should be issued that requires the owner to bring the addition into compliance with the Building Code, identifying the items listed in paragraph 6.4.1,

along with the detailed investigation of the boundary wall as outlined in paragraph 7.2. The notice shall refer to any further defects that might be discovered in the course of rectification, but shall not specify how those defects are to be fixed. It is not for the notice to fix to stipulate directly how the defects are to be remedied and the house 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.

- 9.2 I would suggest that the parties adopt the following process to meet the requirements of paragraph 9.1. Initially, the territorial authority should issue the notice to fix. 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.
- 9.3 I note that the expert has identified some variations between the consent drawings and the addition as constructed, and I leave that matter to the authority to resolve with the owners as it considers appropriate.
- 9.4 Once the matters set out in paragraph 6.4.1 and paragraph 7.2 have been investigated and rectified to its satisfaction, the authority is to issue a code compliance certificate in respect of the building consent as amended.

10. The decision

- 10.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the addition does not comply with Clauses E2 and B2 of the Building Code, and accordingly confirm the authority's decision to refuse to issue a code compliance certificate.
- 10.2 I also determine that:
- (a) all the building elements installed in the addition, apart from the items that are to be rectified as described in this determination, complied with Clause B2 on 1 June 1995
 - (b) the building consent is hereby modified as follows:

The building consent is subject to a modification to the Building Code to the effect that, Clause B2.3.1 applies from 1 June 1995 instead of from the time of issue of the code compliance certificate for all the building elements, except the items to be rectified as set out in paragraphs 6.4.1 and 7.2 of Determination 2009/16.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 11 March 2009.

John Gardiner
Manager Determinations