

Determination 2008/3

Determination regarding a code compliance certificate for a house with monolithic cladding at 680 Papakura-Clevedon Road, Papakura



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, Manager Determinations, Department of Building and Housing (“the Department”), for and on behalf of the Chief Executive of that Department. The applicant is B Gasson (“the applicant”) acting on behalf of the owner of the house, the Gasson Family Trust, and the other party is the Papakura District Council (“the territorial authority”).
- 1.2 This determination arises from the decision of the territorial authority to refuse to issue a code compliance certificate for a 7-year-old house because it is not satisfied that part of the house complies with Clauses B2 “Durability” and 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.

1.3 The matters for determination are:

1.3.1 Matter 1: the monolithic cladding

Whether the monolithic cladding as installed (“the cladding”) on part of the house (“the house wing”) complies with Clauses E2 and B2 of the Building Code. By “the cladding as installed” I mean the components of the system (such as the backing materials, the flashings, the joints and the plaster and/or the coatings) as well as the way the components have been installed and work together.

1.3.2 Matter 2: the durability considerations

Whether the elements that make up the house wing comply with Building Code Clause B2 “Durability”, taking into account the age of the building work to this part of the building.

1.4 The building work to be considered

1.4.1 I note that there are two other outbuildings on the site, neither of which appear to have a building consent (refer paragraph 3.11). However, the applicant has not raised this matter; nor does the territorial authority make any comment on these outbuildings in its notice to fix (refer paragraph 3.13) or in its submission (refer paragraph 4.2). The determination does not therefore consider these outbuildings.

1.4.2 I also note that the garage wing of the building was constructed in 2006 as an approved amendment to the building consent (refer paragraphs 3.8 and 4.2) and has been approved as code complaint. The garage wing is not considered further in this determination.

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

1.6 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.

2. The building

2.1 The building work consists of a large detached house and garage situated on a flat rural site, which is in a high wind zone for the purposes of NZS 3604³. The building comprises a house wing and garage wing. The garage wing is attached to the house wing by a “drive-through” portico.

2.2 The house wing is two-storeys high with most of the upper level accommodated within the roofline. The construction of the house is conventional light timber frame, with a concrete slab and foundations, monolithic cladding and aluminium windows (including a number of hipped roof bay windows). The house is complex in plan and form, with a 45° pitch asphaltic shingle gabled roof that has no eaves or verge

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

projections. The roof incorporates a number of complex roof junctions and intersections, dormer windows and projecting bay windows with lean-to hipped roofs. A 2-storey “turret” accommodates the stairwell adjacent to the entry canopy.

- 2.3 The expert noted that the wall framing he was able to inspect within the roof space did not appear to be treated. Given the date of construction and the lack of other evidence, I consider that the external wall framing is likely to be untreated.
- 2.4 The cladding system to the house wing is what is described as EIFS⁴ monolithic cladding. In this instance, the expert advises that the cladding details are very similar to those specified for “Insulclad” EIFS cladding (refer paragraph 5.3), with purpose-made flashings to windows, edges and other junctions. The cladding consists of 60mm polystyrene backing sheets fixed directly to the framing over the building wrap, and finished with a textured plaster system.
- 2.5 It appears that the first owner (and builder) of the house installed the cladding, and there are no producer statements or warranties for the materials or workmanship. According to the first owner, the plaster is a “Multiplast” system, and the applicant has provided a copy of a letter from Plaster Systems Ltd dated 30 July 2007 indicating that Multiplast plaster systems were used in the past over EIFS claddings.

3. Background

- 3.1 The territorial authority, in its submission (refer paragraph 4.2), has provided a summary of its records of the construction of this building. I have not seen copies of any of these records, and the following paragraphs are taken from the summary of events described by the territorial authority.
- 3.2 The territorial authority issued a building consent (No. BC16353) on an unknown date in 1999, based on a building certificate issued by A1 Building Certifiers Ltd (“the building certifier”).
- 3.3 The building certifier carried out various inspections during construction including pre-line inspections on 27 December 1999 and 2 February 2000. During construction, the first owner decided not to build the garage wing of the building.
- 3.4 As far as I am aware, cladding inspections were not undertaken, and the next inspection was not until 17 May 2002. The building certifier’s inspection report raised concerns about the lack of cladding inspections, noted that some walls had exposed polystyrene, and required a cladding report by an independent specialist.
- 3.5 The building certifier carried out another inspection on 4 July 2002, and sent subsequent letters indicating what further work and inspections were required.
- 3.6 The building certifier’s approval as a certifier expired on 18 September 2002 and the project was handed back to the territorial authority for completion. It appears that no cladding inspection or any of the outstanding items had been completed before the building certifier’s expiry date.

⁴ External Insulation and Finish System

- 3.7 The territorial authority carried out and approved a post-lining inspection on 16 December 2002, and told the first owner that a cladding report by a BRANZ accredited advisor was required.
- 3.8 I am not aware of any further inspections carried out on the house, which was sold to the applicant in July 2006. On 4 October 2006, an amendment to the consent was approved for the construction of the garage wing. The wing included Insulclad cladding over a cavity, and was subsequently approved as code compliant by the territorial authority.
- 3.9 According to the territorial authority, at the time of approving the consent amendments the applicants were advised that there could be issues with regard to the cladding of the house wing when a final code compliance certificate for the entire building was sought.
- 3.10 The applicant engaged specialist consultants (“the consultants”) to investigate the moisture content throughout the house using thermal imaging techniques. The recorded figures ranged from 14% to 17%. The consultants’ report, dated 10 March 2007, concluded that “this dwelling had no issues whatsoever with regard to moisture ingress”.
- 3.11 In a letter to the applicant, dated 23 July 2007, the territorial authority declined the applicant’s request for a code compliance certificate for the building, advised that a notice to fix would be issued and noted that there were two outbuildings on the site that had no building consent.
- 3.12 The consultants provided a further report on the cladding fixing, dated 31 July 2007, which used moisture ingress thermal imaging to record the backing sheet layout, and concluded that the house “appears to be well constructed”.
- 3.13 The territorial authority issued a notice to fix dated 6 August 2007, which stated that the cladding was not an appraised cladding system, had not been inspected during installation, and required the:
- Cladding system to comply with E2/AS1 External Moisture and B2 Durability.
- 3.14 The Department received an application for a determination on 8 August 2007.

4. The submissions

- 4.1 The applicant forwarded copies of:
- Some of the drawings amended to show the work to the garage wing
 - the letter from the territorial authority dated 23 July 2007
 - the notice to fix dated 6 August 2007
 - the consultants’ reports
 - a letter from Plaster Systems Ltd dated 30 July 2007.

4.2 The territorial authority made a submission in the form of a letter dated 17 August 2007, which set out a summary of its records on the construction and inspections of the building (refer paragraph 3.1). The territorial authority noted that the garage wing was constructed in 2006 as an amendment to the original consent, and that it had been approved as code compliant. The territorial authority outlined its concerns about the cladding on the house wing, concluding:

...the primary reason for Papakura District Council in refusing to issue the code compliance certificate is that the cladding reviews Papakura District Council have received do not cover the cladding installation, appropriate flashings being installed, competency of workmanship, type of cladding system, adequacy of the materials used, penetrations, ground clearance and control joints to name a few.

4.3 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.

4.4 The draft determination was issued as a draft to the parties on 26 October 2007. The draft was issued for comment and for the parties to agree a date when the building complied with Building Code Clause B2 "Durability". The parties accepted the draft but they were unable to provide a date when compliance with B2 was achieved. In the absence of such advice I have taken a conservative view of the matter as described in paragraphs 8.6 and 8.7.

5. The expert's report

5.1 As discussed in paragraph 1.5, 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.

5.2 The expert inspected the monolithic cladding on 4 September 2007, and furnished a report that was completed on 13 September 2007. The expert noted that the cladding was "generally straight and fair" and the coating was "generally uniform, well adhered and free from fading, chalking and other deterioration", except for the turret cladding which had an uneven finish.

5.3 The expert noted that the cladding details were very similar to those expected for Insulclad cladding at the time of construction.

5.4 The expert noted a number of variations from the amended consent drawings, including:

- an area on the west elevation of the house wing that was not reclad with "Insulclad rough surface on battens" as shown in the west elevation of the drawings
- the external arch structure on the northwest corner that has not been built
- the roofs to the bay windows that are changed from flat to hipped
- the louvres to the gable ends that have not been installed.

- 5.5 The expert noted that control joints are not specified by the manufacturer as necessary for the dimensions of EIFS used on the walls of the house wing. The expert also noted that ground clearances generally appeared satisfactory; with the face of the backing sheets flush with the foundation wall and the plaster coating carried down over the concrete.
- 5.6 The expert noted that the windows are recessed, with uPVC head flashings and sealant applied at the jambs and sills. The expert removed a small section of plaster at the jamb to sill junction of a window in the covered portico, and noted ribbed uPVC jamb and sill flashings with sealant applied at the junction. The flashings appeared to be installed in accordance with the Insulclad manufacturer's instructions at the time of installation. I accept that the exposed junction is typical of similar locations in the building.
- 5.7 The expert inspected the interior of the house and no evidence of moisture was observed. The expert took non-invasive moisture readings internally around the house and some borderline readings were noted. The expert took 15 invasive moisture readings through the cladding at risky locations, and the following elevated readings were noted:

- 23% and 24% in the bottom plate beneath the west window in the ground floor master bedroom
- 23% in the bottom plate of the turret stairwell on the west elevation.

Moisture levels that vary significantly after cladding is in place generally indicate that external moisture is entering the structure.

- 5.8 Commenting specifically on the cladding, the expert noted that:
- the window sill flanges are sealed to the cladding, with no drainage gap to allow any moisture that may enter from escaping to the outside
 - the west window in the master bedroom is poorly fitted and sealed, with a gap between the glazing bead and the glass. Moisture is apparent below this window, and further investigation is needed to determine and rectify the cause. (I also note that the sealant used at the sill junction is likely to trap moisture that may have entered the window frame)
 - the apron flashings lack adequate kickout flashings, with the ends of gutters and fascias embedded in the plaster and the weatherproofing reliant on sealant to divert water away from the cladding
 - there is a crack in the plaster at the bottom of the apron flashing over the dining room bay window (with 17% moisture recorded in the bottom plate)
 - the junction between the entry canopy and the stairwell turret wall is poorly weatherproofed, and moisture is apparent in the bottom plate of the turret.
- 5.9 The expert made the following additional comments:
- although the cladding was taken down below the paving level in the portico, the area is fully sheltered by the upper floor

- although the presence of a uPVC “Z” flashing at the cladding to foundation junction was not investigated, the clearances appear satisfactory and there is no indication of moisture entry resulting from the base detail.
- 5.10 The expert also commented that the house wing is now about 7 years old, and the age of the construction means that some elements of the cladding system are unlikely to comply with the relevant durability periods required by the building code.
- 5.11 A copy of the expert’s report was provided to each of the parties on 14 September 2007.

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 Solutions⁵, which will assist in determining whether the features of these houses are code compliant. However, in making this comparison, the following general observations are valid:
- Some Acceptable Solutions are written conservatively to 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.
- 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 (for example, Determination 2004/1) relating to cladding and these factors are also used in the evaluation process.
- 6.1.3 The consequences of a building demonstrating a high weathertightness risk is that building solutions that comply with the Building Code will need to be more robust. Conversely, where there is a low weathertightness risk, the solutions may be less robust. In any event, there is a need for both the design of the cladding system and its installation to be carefully carried out.

6.2 Weathertightness risk

- 6.2.1 In relation to these characteristics I find that the house wing of this building:

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.

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

- is built in a high wind zone
- is a maximum of two-storeys high
- is complex in plan and form
- has monolithic cladding fixed directly to the framing
- has no eaves or verge projections
- has external wall framing that is not treated to a level that provides resistance to the onset of decay if the framing absorbs and retains moisture.

6.2.2 The house 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.

6.2.3 When evaluated using the E2/AS1 risk matrix, the weathertightness features outlined in paragraph 6.2.1 show that two elevations of the house wing demonstrate a high weathertightness risk rating and one elevation a moderate risk rating. I note that, in order to comply with E2/AS1, the monolithic cladding on this building would require a drained cavity.

6.3 Weathertightness performance: exterior cladding

6.3.1 Generally the cladding appears to have been installed in accordance with good trade practice and in accordance with the manufacturer's instructions. Taking account of the expert's report, I conclude that remedial work is necessary in respect of the following:

- lack of drainage gaps under the window sill flanges
- inadequate weatherproofing of the master bedroom west window
- lack of inadequate kickouts at the bottom of apron flashings
- inadequately weatherproofed junction of the entry canopy with the turret wall.

6.3.2 I note the expert's additional comments in paragraph 5.9, and accept that these areas are adequate in the circumstances.

6.3.3 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 factors that compensate for the lack of a drained cavity and assist the performance of the cladding in this particular case:

- apart from the noted exceptions the cladding is installed to good trade practice
- apart from several isolated areas, the cladding has been preventing moisture penetration into the building for about 6 years.

- 6.3.4 I consider that these factors will contribute to the building complying with the weathertightness and durability provisions of the Building Code.

Matter 1: the monolithic 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 house wing at present. Consequently, I am satisfied that the house wing does not comply 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 house wing are likely to allow the ingress of moisture in the future, the house wing does not comply with the durability requirements of Clause B2.
- 7.3 Because the faults identified with the cladding system occur in discrete areas, I am able to conclude that satisfactory investigation and rectification of the items outlined in paragraph 6.3.1 will result in the house wing being brought into compliance with Clauses B2 and E2.
- 7.4 I emphasise that each determination is conducted on a case-by-case basis. Accordingly, the fact that particular cladding systems have been established as being code compliant in relation to a particular building does not necessarily mean that the same cladding systems will be code compliant in another situation.
- 7.5 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. 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.
- 7.6 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.
- 7.7 As the external wall framing of the building 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.

Matter 2: The durability considerations

8. Discussion

- 8.1 I note that the garage wing of this building was constructed in 2006 as an amendment to the original consent, and has been approved as code compliant by the territorial authority. The durability considerations outlined in the following paragraphs therefore apply to the house wing part of the building only.
- 8.2 The expert has expressed concerns about the durability, and hence the compliance with the building code, of certain elements of the house wing taking into consideration the completion of most of the building work in 2000.
- 8.3 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).
- 8.4 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.
- 8.5 The 7-year delay between the substantial completion of the house wing and the applicant’s request for a code compliance certificate raises the issue of when all the elements of the house wing complied with Clause B2. It appears most of the building elements were installed by the end of 2000.
- 8.6 The building certifier noted non-compliant matters that appear not to have been fixed before the certifier’s approval expired in September 2003. The territorial authority carried out inspections on 16 December 2002, and told the first owner that a cladding report by a BRANZ accredited advisor was required, which I take to mean that the house wing was substantially complete and that territorial authority was seeking independent verification of this with respect to the cladding.
- 8.7 In the absence of other information on which to base a date for the commencement of Clause B2, and given that the applicant did not own the property during this time, I believe it is reasonable to take a conservative approach to the matter such that compliance with Clause B2 was also achieved on 16 December 2002.

- 8.8 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.
- 8.9 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 the building elements
 - (b) it is reasonable to grant such a modification, with appropriate notification, because in practical terms the house wing is no different from what it would have been if a code compliance certificate for the house wing had been issued in 2002.
- 8.10 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. The decision

- 9.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the cladding does not comply with Clauses E2 and B2 of the Building Code, and accordingly confirm the territorial authority's decision to refuse to issue a code compliance certificate.
- 9.2 I also determine that:
- (a) all the building elements installed in the house wing, apart from the items that are to be rectified, complied with Clause B2 on 16 December 2002.
 - (b) the building consent is 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 16 December 2002 instead of from the time of issue of the code compliance certificate for all building elements, provided that the modification does not apply to the garage wing and to those elements of the house wing which have been altered or modified as set out in Determination 2008/3.
 - (c) following the modification set out in (b) above, the territorial authority is to issue a code compliance certificate in respect of the building consent as amended.
- 9.3 I note that the territorial authority has issued a notice to fix requiring the cladding to comply with E2/AS1, which, in effect, requires the cladding to be installed over a drained cavity. Under the Act, a notice to fix can require the owner to bring the additions into compliance with the Building Code. The Building Industry Authority has found in a previous Determination 2000/1 that a Notice to Rectify (the equivalent to a notice to fix under the Building Act 2004) cannot specify how that compliance can be achieved. I concur with that view.

- 9.4 The territorial authority should now issue a new notice to fix that requires the owners to bring the cladding into compliance with the Building Code, identifying the defects listed in paragraph 6.3.1 and referring to any further defects that might be discovered in the course of rectification, but not specifying how those defects are to be fixed. 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.
- 9.5 I would suggest that the parties adopt the following process to meet the requirements of paragraph 9.4. Initially, the territorial authority should issue the new 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.
- 9.6 I note that changes were made to the house wing that were not recorded as amendments on the consented plans, and I consider that the matters highlighted in paragraph 5.4 also need to be resolved to the satisfaction of the territorial authority.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 17 January 2008.

John Gardiner
Manager Determinations