

Determination 2007/8

Refusal of a code compliance certificate for building additions with a monolithic cladding system at 28B Howard Road, Northcote, North Shore



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 and Mrs Hayward-Ryan (“the applicants”), and the other party is the North Shore City Council (“the territorial authority”).
- 1.2 The matter for determination is whether the territorial authority’s decision is correct with regard to declining to issue a code compliance certificate for 9-year-old additions to an existing house because it was not satisfied that:
- certain elements of the additions comply with clauses B1 “Structure” of the Building Code

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

- the monolithic cladding to some of the walls of the additions complied with clauses B2 “Durability” and E2 “External Moisture” of the Building Code² (First Schedule, Building Regulations 1992)
- other elements of the additions comply with clause B2.

1.3 The questions to be determined are:

Matter 1: The cladding

Whether I am satisfied on reasonable grounds that the monolithic cladding as installed to the walls of the alterations (“the cladding”), complies with the Building Code (see sections 177 and 188 of the Act). By “the monolithic cladding as installed” I mean the components of the system (such as the backing materials, the flashings, the joints and the coatings) as well as the way the components have been installed and work together.

Matter 2: The deck structure

Whether the deck, including the balustrades and foundations, complies with clause B1 of the building code.

Matter 3: The durability considerations

Whether the building elements, other than the elements that are to be rectified under Matter 1 and Matter 2, that make up the building work comply with clause B2, taking into account the age of the building.

1.4 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. I have evaluated this information using a framework that I describe more fully in paragraph 6.1.

1.5 Apart from those mentioned above, I have not considered any other aspects of the Act or the Building Code.

Other Matters: Deck barrier, windows stays, and gas fire

1.6 In their application for a determination the owners listed some items additional to those discussed in paragraph 1.2. These were:

- the height of the deck barrier
- the deck barrier toe-holds
- the permanent window stays
- the gas fire installation.

1.7 In a letter dated 11 May 2006 accompanying the application the owners said that no application for determination was sought in respect of the permanent window stays

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

or the gas fire installation. As I consider that letter to form part of the application I have taken it that I am justified in not considering those matters further in this determination.

- 1.8 In the same letter the owner sought from the Department a waiver of the Building Code in respect of the deck barrier height and the deck barrier toe-holds. I have received no evidence that the owner has sought a waiver from the territorial authority in respect of those items, or that such a waiver has been refused. Under section 67 of the Act an application for a waiver of the Building Code should be made to the territorial authority in the first instance. Should such an application be declined the applicant may then seek a determination on the matter under section 177(c). I have therefore not considered these matters further in this determination.

2. The building

- 2.1 The building work consists of additions to an existing detached house situated on a sloping site, which is in a high wind zone in terms of NZS 3604³. The original house was constructed in the late 1980's, and was apparently designed to be extended at a later date. The additions consist of alterations and an extension to the study on the lower level and small extensions to the upper level of the southeast elevation, to expand three bedrooms. The extension of the master bedroom replaces an original deck. The additions match the original construction, with conventional light timber framing, concrete block perimeter foundation walls, timber framed floors, aluminium windows, monolithic cladding to the exterior walls and 25° pitch pressed metal tile roofs. The house shape is reasonably complex in plan and form, and the hipped and gabled roofs are at two levels, with eaves and verge projections of about 600mm.
- 2.2 A small original deck has been extended along the full length of the lower southeast elevation, with steps included to provide varying levels. The deck is timber framed with spaced timber slats and open timber balustrades.
- 2.3 The expert noted that he was shown invoices by the owner that showed that the framing for the additions was "H1 KD". Given the date of construction of the additions, and the description in the invoices from the timber supplier, I consider that the wall framing of the new additions is unlikely to be treated to a level that will provide resistance to fungal decay. However, given the date of construction of the original house, I consider that the original framing is likely to be boracic treated. The applicants have supplied a statement and invoices from the builder, Mr Smith ("the builder"), which note that the timber used in the deck structure is H4 treated.
- 2.4 The cladding system to the extension is what is described as monolithic cladding, and is a "Harditex" system (to match the earlier cladding) with 7.5 mm thick fibre-cement sheets fixed through the building wrap to the framing, and finished with an applied textured coating system.
- 2.5 I have received no copies of producer statements or warranties for the cladding.

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

3 Sequence of events

- 3.1 Based on the stamp on the consent drawings, it appears that the territorial authority issued a building consent (B 11061) on 17 October 1996. I have received no evidence of inspections undertaken by the territorial authority during construction, but it appears that the work was completed during 1997.
- 3.2 It appears that in 2003, the owners became aware that a final inspection had not taken place and asked the territorial authority to inspect the work. The territorial authority carried out a final inspection on 11 December 2003, and the inspection record notes “Provide written confirmation of deck structure (not as per plans...)”.
- 3.3 The territorial authority subsequently carried out a further visual inspection and wrote to the applicants on 1 April 2006, stating that “[the] Building Code requires that the exterior cladding provide a fifteen-year durability and the timber framing [a] fifty year durability”. The territorial authority also noted that the inspection process for monolithic claddings had changed since the time that the building consent for the house was processed. The territorial authority listed certain weathertightness risk factors identified with the building, together with defects and outstanding documentation (including an engineer’s report on the deck), and stated that, due to the risk factors and defects, it could not be satisfied on reasonable grounds that the cladding system complied with clauses E2 and B2 of the Building Code.
- 3.4 The territorial authority did not issue a notice to fix as required under section 164(2) of the Building Act 2004.
- 3.5 The application for a determination was received by the Department on 17 May 2006. I note that in applying for the determination the applicant sought a certificate of acceptance rather than a code compliance certificate, however, the transitional provisions of section 437 do not apply in this particular case.
- 3.6 In a letter to the applicants dated 29 May 2006, the Department outlined how the determination would be processed and requested further information to support the application. The Department also advised the applicants to obtain an engineer’s report on the deck structure.
- 3.7 In a letter to the Department dated 1 June 2006, the applicants supplied copies of the drawings, advised that an engineer’s report on the deck would be supplied and requested that the deck be included within the determination.
- 3.8 The applicants subsequently commissioned an inspection and report from Mr Dwyer, a structural engineer (“the engineer”) with regard to the foundations and deck. Under cover of a letter to the Department dated 14 August 2006, the applicants supplied copies of the engineer’s report and a statement and invoices from the builder (refer paragraph 2.3).
- 3.9 The engineer’s report noted where certain bearer, joists and fixing details required upgrading and described how they might be made compliant. He also indicated certain foundation dimensions that required verification. The builder subsequently submitted a PS3 producer statement confirming footing dimensions were achieved.

4 The submissions

4.1 In a letter to the Department dated 11 May 2006 which accompanied the application, the applicants outlined the history of the project, described the construction, noted that the builder of the original house had been used for the additions, commented on items in the territorial authority's letter of 1 April 2006 and stated that they wished to have a determination made on the weathertightness of the additions and on aspects of the new deck barrier.

4.2 The applicants forwarded copies of:

- the consent drawings
- some of the correspondence from the territorial authority
- the engineer's report dated 8 August 2006
- various producer statements, invoices and other statements.

4.3 The territorial authority made no submission.

4.4 A copy of the applicants' submission was provided to the territorial authority, which made no submission in response.

4.5 A copy of the first draft determination was sent to the parties for comment on 26 September 2006. The applicant accepted the draft.

4.6 In a letter to the Department dated 10 October 2006 the territorial authority advised that it did not accept the determination and submitted that the determination did not address the durability of the wall cladding that would not be the subject of remedial work, saying in particular:

In a targeted repair approach this leaves the question of durability for the existing cladding (including the roof and its flashings) unaddressed.

There are two matters to be addressed with the wall cladding. These are:

- The compliance with E2 and B2 before remediation and
- The durability of the existing cladding after remediation.

I considered these comments and amended the first draft determination accordingly.

4.7 A copy of the second draft determination was forwarded to the parties on 17 October 2006. The second draft was issued for comment and for the parties to agree a date when all the building elements installed in the house, apart from items that have to be rectified, complied with the Clause B2 Durability.

4.8 In an email to the Department dated 22 November 2006, the applicants proposed a date of 3 July 1997. On 11 January 2007 the territorial authority advised the Department that it accepted the second draft determination but noted one typographical error. It also advised that agreement had been reached with the applicants (in a telephone conversation held on 10 January 2007) that compliance with B2 was achieved on 1 August 1997.

5 The expert's report

5.1 The expert inspected the claddings of the building on 19 June 2006, and furnished a report that was completed on 21 June 2006. The expert noted that the cladding to the additions generally appeared to be “consistent with good trade practice”, with adequate cladding clearances, base overlaps and sealed penetrations. The expert also noted that the downpipe from a small internal gutter behind the chimney (which initially appeared to penetrate the cladding) is well flashed under with lead flashing that wraps over the top of the cladding.

5.2 The expert noted various variations from the consent drawings, including:

- the omission of a bay window to the study
- the omission of an upper window to the southwest elevation
- a change to the deck layout
- the omission of a concrete block perimeter wall under the study extension.

5.3 The expert noted that the windows appeared to be installed in accordance with the manufacturer's instructions, and were face-fixed with seals between the window flanges and the fibre-cement backing sheets, and no sill flashings.

5.4 The expert took non-invasive moisture readings through linings of exterior walls throughout the additions, and noted two elevated readings. However, when invasive readings were taken in the same areas, readings were recorded at 15%, indicating the previous non-invasive readings did not result from external moisture. The expert also took a number of other invasive moisture readings and the following elevated readings were noted:

- 20% in the bottom plate at the south corner of the living room
- 20% below the “shoulder” of the framed chimney structure.

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

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

- There are no horizontal control joints to the two-storey end walls of the living room, and there are signs of peaking at the interstorey joint.
- There are no vertical control joints in the southeast upper walls, where the dimensions exceed the 5.4 m limit beyond which the manufacturer recommends such a joint should be constructed.
- The cladding continues over the sloping shoulder of the chimney and moisture levels of up to 20% were recorded in the framing below.
- There are gaps between the cladding and the barges at both ends of the living room, with bare fibre-cement showing at the gaps.

- The seal under the jamb flange of the window to bedroom 2 appears to be loose.
- There are several minor cracks in the cladding.
- The roof apron flashing at the northeast end of the living room is poorly sealed with gaps and unsealed fibre-cement showing.
- The ribbon plate of the new deck framing is fixed directly against the cladding, and the timber deck slats butt against the cladding, with no drainage gap provided.
- The deck storage shed is built over the deck slats, leading to moisture in the bottom plate of the shed (however the bottom plate appears to be treated).

5.6 The expert also commented that:

- the height of the original deck balustrade is only 600mm, with the new deck level dropped to provide a generally code compliant balustrade. However, at the steps, the balustrade height is reduced to less than 1m
- the upper level windows have had window stays fitted, which should be adjusted to provide a maximum opening of 100mm
- the base overlap of the cladding over the basement concrete block at the southeast is reduced to about 30mm and there is no capillary gap provided, but the framing is dry and the junction is sheltered by the eaves above.

5.7 Although the structure of the deck was not part of his inspection and would be covered by the engineer's report, the expert made the following observations:

- The block wall intended to support the study extension has not been built.
- The joist ends under the study extension are not supported by joist hangers.
- There are areas of decay in the original deck slats and balustrade.

5.8 A copy of the expert's report was provided to each of the parties on 26 June 2006.

6 Matter 1: The cladding

6.1 Evaluation framework for compliance with code clause E2

6.1.1 In evaluating the design of a building and its construction, it is useful to make some comparisons with the relevant Acceptable Solution⁴, 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:

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.

- 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 determinations (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 the additions and alterations result in a building that is:

- built in a high wind zone
- a maximum of two storeys high
- fairly complex in plan and form
- has roof projections of more than 600mm above most walls
- has a spaced timber deck attached to the building
- has monolithic cladding, which is fixed directly to the framing
- has external wall framing to the new walls that is unlikely to be treated to a level that will provide resistance to the onset of decay if it absorbs and retains moisture.

6.2.2 When evaluated using the E2/AS1 risk matrix, one elevation of the additions demonstrates a high weathertightness risk and the others a moderate risk. The matrix is an assessment tool that is intended to be used at the time of application for consent, before the building work has begun and, consequently, before any assessment of the quality of the building work can be made. Poorly executed building work introduces a risk that cannot be taken into account in the consent stage but must be taken into account when the building as actually built is assessed for the purposes of issuing a code compliance certificate.

6.3 Weathertightness performance

6.3.1 Generally the cladding appears to have been installed in accordance with good trade practice. However, some junctions, penetrations and edges are not well constructed, and these areas are as described in paragraph 5.5 and in the expert's report. I accept the expert's opinion that remedial work is necessary in respect of the following:

- the lack of horizontal and vertical control joints
- the cladding over the sloping "shoulder" of the chimney structure
- the gaps between the cladding and the living room barges
- the loose jamb seal to the window of bedroom 2
- the minor cracks in the cladding
- the poor weatherproofing of the apron flashing at the living room wall
- the lack of drainage between the cladding and the deck framing and slats
- any other building elements associated with the above that are consequently discovered to be in need of rectification.

6.3.2 I also note the expert's comment in paragraph 5.6 on the reduced overlap and lack of capillary gap at the junction of the cladding with the concrete block, and accept that the junction is well above ground level and is sheltered by the eaves above. I therefore consider that this junction is 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 compensating factors that assist the performance of the cladding in this particular case:

- Most of the monolithic cladding (including the windows) has been installed in accordance with good trade practice and to the manufacturer's instructions.
- The house has eaves projections that provide good protection to most of the monolithic cladding areas below them.
- With the exception of two areas, the cladding has been weathertight for the nine years since the additions were constructed.

6.3.4 I consider that these factors help compensate for the lack of a ventilated cavity and can assist the additions to comply with the weathertightness and durability provisions of the Building Code.

7 Discussion

- 7.1 I am satisfied that the current performance of the cladding is not adequate because it is allowing water penetration into the building at two areas at present. Consequently, I am satisfied that the additions do 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 faults on the additions 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 Subject to further investigations that may identify other faults, I consider that, because the faults that have been identified in the additions occur in discrete areas, I am able to conclude that satisfactory rectification of the items outlined in paragraph 6.3.1 should be expected to result in the additions becoming and remaining weathertight and in compliance with clauses B2 and E2.
- 7.4 Effective maintenance of claddings (in particular of monolithic cladding) 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 As the external wall framing of the additions to this building is unlikely to be treated to a level that will provide resistance to fungal decay, periodic checking of its moisture content should also be carried out as part of normal maintenance.

Matter 2: The deck structure

8 Discussion

- 8.1 I note the expert’s comment in paragraph 5.6 on the inadequate barrier (balustrade) height at the changes in the deck levels. I also note the applicants’ comments regarding the original balustrade being lower than the heights applying at the level

changes, but I observe that the deck is several metres above the ground at these areas. As I said in paragraph 1.7, the owner is seeking a waiver of the Building Code with respect to matters related to the deck barrier but the application for a waiver should be made to the territorial authority in the first instance.

- 8.2 I also note the expert's observations on the deck structure in paragraph 5.7, and the subsequent recommendations in the engineer's report dated 8 August 2006 (refer paragraph 3.9). I consider that the engineer's report outlines the remedial work required for compliance with the structural provisions of the Building Code.

Matter 3: The durability considerations

9 Discussion

- 9.1 As set out in paragraph 1.3, the territorial authority has concerns about the durability, and hence the compliance with the building code, of certain elements of the building, taking into consideration the apparent completion date of the building in 1997.
- 9.2 The building was substantially completed sometime during 1997. The territorial authority carried out a final inspection on 11 December 2003. The territorial authority subsequently carried out a further visual inspection and wrote to the applicants on 1 April 2006. No further inspections were carried out by the territorial authority.
- 9.3 The relevant provision of clause B2 of the Building Code recognises 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).
- 9.4 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.
- 9.5 It is not disputed, and I am therefore satisfied, that all the building elements installed in the house, apart from items that have to be rectified as described in paragraph 6.3.1, complied with clause B2 on 1 August 1997. This date has been confirmed by both the applicant and the territorial authority, refer paragraph 4.8.

- 9.6 In order to address these durability issues, I sought some clarification of general legal advice about waivers and modifications. I have now received that clarification and the legal framework and procedures based on this clarification are described in previous determinations (for example, Determination 2006/85) and are used to evaluate the durability issues raised in this determination.
- 9.7 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 of the elements of the building if the applicant applies for such a modification.
 - (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 had been issued sometime in 1997.
- 9.8 I strongly recommend that the territorial authority record this determination and any modification resulting therefrom, on the property file and also on any LIM issued concerning this property.

10 The decision

- 10.1 In accordance with section 186, I hereby determinate that the cladding system as installed does not comply with clause E2 of the Building Code. There are a number of items to be remedied to ensure that the additions become and remain weathertight and thus meet the durability requirements of the code. Consequently, I find that the additions do not comply with clause B2. Accordingly, I confirm the territorial authority's decision to refuse to issue a code compliance certificate. I find that the rectification of the items outlined in paragraph 6.3.1 will consequently result in the house being weathertight and in compliance with clauses B2 and E2.
- 10.2 I determine that the deck structure does not comply with clause B1 of the Building Code. There are a number of items to be remedied to ensure that the deck meets the structural requirements of the code. I find that rectification, to the territorial authority's satisfaction, of the items outlined in the engineer's report will consequently result in the deck being in compliance with clause B1.
- 10.3 I also determine that:
- (a) all the building elements installed in the house, apart from the items that are to be rectified, complied with clause B2 on 1 August 1997
 - (b) should the applicant so request, the territorial authority must modify its decision to issue the building consent to the effect that the building consent is amended 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 August 1997 instead of from the time of issue of the code compliance certificate for all building elements except those elements set out in

paragraph 6.3.1 of Determination 2007/8 and those relating to the rectification of the deck.

- (c) once the defects set out in paragraph 6.3.1 and 8.2 of this determination and those relating to the deck have been fixed to its satisfaction, and following the request and modification set out in (b) above, the territorial authority is to issue a code compliance certificate in respect of the building consent as amended.

10.4 I note that the territorial authority has not issued a notice to fix. A notice to fix should be issued that requires the owners to bring the house into compliance with the Building Code. The notice to fix may list the items to be rectified but it should not specify how compliance is to be achieved as that is for the owner to propose and for the territorial authority to accept or reject. It is important to note that the Building Code allows for more than one method of achieving compliance.

10.5 I would suggest that the parties adopt the following process to meet the requirements of paragraph 10.4. 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 23 January 2007.

John Gardiner
Determinations Manager