

Determination 2007/4

Refusal of a code compliance certificate for a building with a monolithic cladding system at 44B Carlisle Road, Browns Bay



1. The matter to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004¹ (“the Act”) made under due authorisation by me, John Gardiner, Determinations Manager, Department of Building and Housing (“the Department”), for and on behalf of the Chief Executive of that Department. The applicant is the original owner, Mr Withers (“the applicant”), a related party is the current owner Mr Ball (“the owner”), and the other party is the North Shore City Council (“the territorial authority”).
- 1.2 The matter for determination is the territorial authority’s decision to decline to issue a code compliance certificate for an 9-year-old house because it was not satisfied that:

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

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

1.3 The questions to be determined are:

Matter 1: The cladding

Whether the monolithic wall cladding as installed to the external walls of the building (“the cladding”), complies with the Building Code (see sections 177 and 188 of the Act). By “the monolithic wall 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 durability considerations

Whether the building elements that make up the building work, other than the elements that are to be rectified, 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. With regard to Issue 1, I have evaluated this information using a framework that I describe more fully in paragraph 6.1. I have not considered any other aspects of the Act or the Building Code.
- 1.5 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 detached house situated on a sloping and excavated site, which is in a medium wind zone for the purposes of NZS 3604³. The house is two-storeys high, with single storey projections to the north and east. Construction of the house is conventional light timber frame, with a concrete slab, concrete block foundations and retaining walls, 3° pitch profiled metal roofs, monolithic wall cladding and aluminium windows and doors. The house shape is fairly simple in plan and form, with metal-capped parapets to all walls. Wide projecting monolithic-clad bands (formed over timber framing) are used at corners and parapets except for the central sections of the north and south walls, where the parapet top forms a curve. An entrance canopy is set into a corner on the west elevation, with a timber-capped parapet angled across the front. Set above the canopy roof is a decorative timber pergola that slopes back from the timber capping to the main walls.

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

- 2.2 On the east elevation, a tiled deck sits above the ground floor dining area, with the lower walls extending up to form the lower half of the deck balustrade. This upstand is clad on the deck side with tiles, and has a timber capping that supports a timber and glass upper balustrade.
- 2.3 The expert noted no evidence as to timber treatment, but considered that the time of construction made it likely that the framing was boracic treated. The specification calls for wall framing to be treated to H1, and the owner maintains (refer paragraph 4.1) that the framing is “Boric Number 1 Wet Frames”. Based on this evidence, I accept that the external wall framing is likely to be boracic treated.
- 2.4 The cladding system to the building is what is described as monolithic cladding, and is a “Harditex” or similar system with 7.5 mm thick fibre-cement sheets fixed through the building wrap to the framing, and finished with an applied textured coating system. The projecting decorative bands are formed from the cladding applied over timber framing.
- 2.5 I have received no copies of producer statements or warranties for the cladding.

3. Sequence of events

- 3.1 The territorial authority issued a building consent on 13 February 1997 and made various inspections, although I have seen no records of pre-line or post-line inspections. The house appears to have been more-or-less completed during 1997.
- 3.2 It appears that the house was sold to the current owner in April 2003, with some provision made in the sales agreement (refer paragraph 3.5) for the completion of items necessary to gain a code compliance certificate for the construction.
- 3.3 The territorial authority carried out a final inspection on 28 April 2003, and the inspection record lists a number of items that were outstanding. A re-check inspection was not undertaken until 29 April 2004, when the outstanding items in the inspection record appear to have been ticked off as completed.
- 3.4 In response to a request for a code compliance certificate, the territorial authority carried out a visual inspection of the house. In a letter to the owner dated 23 June 2004, the territorial authority explained that the Building Code required the building work to remain durable for specific periods after the code compliance certificate is issued. The territorial authority also noted that weathertightness concerns had led to the inspection process for monolithic claddings being changed since the time that the building consent for the house was processed. The territorial authority listed certain weathertightness risk factors and defects identified in the building; and stated that, due to the risk factors and defects, it was unable to issue a code compliance certificate as it could not be satisfied on reasonable grounds that the cladding system complied with clauses E2 and B2 of the Building Code.
- 3.5 In a letter dated 15 July 2005 to the applicant’s solicitors, Greg Dunning and Associates (“the applicant’s lawyer”), the owner’s solicitor Mr O’Neill (“the owner’s lawyer”) attached the territorial authority’s letter of 23 June 2004 and noted that the

applicant (as vendor of the house) had objected to some of the requirements identified in the final inspection of 28 April 2003, concluding:

With respect, we believe it is incumbent upon the vendor to ensure that the Code Compliance Certificate is issued. Two years have now elapsed since settlement. We require your advice as to the vendor's specific proposals to have this matter satisfactorily completed as soon as possible.

- 3.6 Under cover of a letter dated 18 July 2005, the applicant's lawyer forwarded the owner's letter to the applicant.
- 3.7 An application for a determination was received by the Department on 16 May 2006.

4. The submissions

- 4.1 Within the application, the applicant noted that the "Matter of doubt or dispute" was "No code compliance certificate. Cause due to the age of the consent". The applicant's submission outlined some of the history of the project, stated the treatment of the framing, and commented on the items identified in the territorial authority's letter of 23 June 2004. The applicant noted that the items had been approved in the consent and inspected by the territorial authority, concluding:

As I can see all the requirements have been met according to North Shore City Council's permit in February 1997.

- 4.2 The applicant forwarded copies of:
- the drawings
 - some of the inspection records
 - the correspondence from the lawyers
 - the letter from the territorial authority dated 23 June 2004
 - various other information.
- 4.3 The territorial authority made no submission.
- 4.4 The territorial authority forwarded copies of:
- the specification
 - the building consent documentation
 - various other statements.
- 4.5 Copies of the submissions and other evidence were provided to each of the parties. Neither party made any further submission in response to the submission of the other party.

4.6 A copy of the first draft determination was forwarded to the parties for comment on 31 August 2006.

4.7 In a letter to the Department dated 14 September 2006, the applicant's lawyer responded to the draft determination, suggesting that (as an alternative to the territorial authority issuing a notice to fix) the applicant would undertake to the owner and the territorial authority to:

...produce a detailed proposal to the Council in terms of clause 8.3 of the draft determination.

I have made no change to the requirement for a notice to fix to be issued, as I consider that a notice to fix is the appropriate mechanism under the Act for requiring compliance with the building code.

4.8 The territorial authority responded to the draft determination on 19 September 2006, noting:

Although the remedial work is likely to include cladding and some timber framing, we are concerned about the durability of all other building elements, which also need a waiver for the start date for durability.

4.9 I have noted the territorial authority's concern, and issued the second draft determination to the parties on 26 October 2006. The draft was issued for the parties to agree a date when all the building elements installed in the house, apart from items that are to be rectified, complied with the Clause B2 Durability.

4.10 The parties accepted the second draft determination and in correspondence received by the Department on 20 December 2006 and 12 January 2007, agreed that compliance with clause B2 was achieved in 1 January 1998.

Issue 1: The cladding

5. The expert's report

5.1 The expert inspected the claddings of the building on 12 and 13 July 2006, and furnished a report that was completed on 18 July 2006. The expert noted a number of variations from the consent drawings, including the tiling of the deck floor and inner faces of the balustrade upstand. The expert noted that a number of areas showed "poor workmanship" and considered that recent repainting may be covering some underlying faults in the wall cladding.

5.2 The expert noted that the windows were face-fixed with metal head flashings and no sill flashings and removed a small section of coating at the sill to jamb junction of a window to inspect the installation. I accept that the location opened is typical of similar locations around the building.

5.3 The expert took non-invasive moisture readings through interior linings of exterior walls throughout the house, and noted a number of elevated readings, although no signs of moisture damage. About 100 invasive moisture readings were taken through

the wall cladding, at parapets, balustrades window sills, bottom plates and other risky areas, and more than 80 readings above 21% were noted. The expert also removed a number of sections of cladding where signs of decay were apparent. The expert noted that if readings were corrected for treated timber, the adjusted figures would be about 3% lower. Unadjusted readings recorded at more than 21% (equivalent to adjusted readings of about 18%) included the following:

Parapets and parapet bands

- 4 at 22%, 5 at 24%, 26%, 28%, 32%, 34% and 38% at the corner framing on the roof side of the parapets with signs of decay in some areas.
- 22% (with soft timber) and 2 at more than 40% (with severe decay) below junctions of the curved to horizontal sections on the north and south elevation.
- 24% to 26% at various parapet bands.
- 22%, 38% and more than 40% at lower parapets to wall junctions.

Deck

- 2 at more than 40% (with decay) below the deck upstand to wall junctions.
- fully decayed balustrade framing and severe fungi growth at a cut out below the timber capping at the southwest corner of the deck.
- 34% in southwest corner framing of the wall below the decay.

Entrance canopy

- 3 at more than 40% below the timber parapet capping.
- 2 at more than 40% below the parapet to wall junctions.

Windows

- 22%, 24%, 2 at 26%, 32%, 2 at 34%, 36% and 2 at 38% below sill to jamb junctions of various windows in the upper walls.
- 23%, 38% and 40% at head flashing projections of windows in the upper walls.
- 4 at 22%, 23% and more than 40% below sill to jamb junctions of windows in the lower walls.

Bottom plates

- 2 at 22%, 5 at 23%, 26%, 28%, 38% and 3 at more than 40% in the bottom plate of the ground floor walls (including beside door sills).
- 26% and 28% at the sides of the garage door.
- 2 at more than 40% in the bottom plate of the upper south wall.

Rainwater heads

- 27%, 30% and more than 40% below various rainwater heads.

Moisture levels above 18% (equivalent to unadjusted readings of 21%) recorded after cladding is in place generally indicate that external moisture is entering the structure.

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

- There are no horizontal control joints in the two-storey walls contrary to the recommendations of the manufacturers of cladding of this type.
- There are no vertical control joints in the numerous upper and lower walls where the dimensions exceed the 5.4 m limit recommended by manufacturers of this type of cladding.
- There are a number of cracks in the cladding, with signs of repairs (or over-painting) of past cracks.
- The clearances from the bottom of the cladding to the paving at the garage door and to the east bark garden are inadequate and moisture is penetrating the cladding.
- The clearance from the bottom of the cladding to the deck floor is inadequate, as the tiles are extended as an upstand against the cladding.
- The clearance from the bottom of the cladding to the flat flashing over the projecting concrete block retaining walls to the north is inadequate, and the flashing joints are unsealed and poorly weatherproofed.
- The base of the cladding lacks the recommended 6mm anti-capillary gap from the concrete foundation.
- Most of the window head flashings have inadequate projections beyond the jambs, and the cutouts for the projections are poorly sealed in some areas.
- There are no seals between the window jamb flanges and the cladding, and some mitre joints in the windows may have failed.
- The parapet cappings have flat tops and poorly weatherproofed joints, and the roof-side parapet cladding is cracked, with unfinished and unsupported cladding joints in some areas.
- The framed projecting bands are poorly weatherproofed, with high levels of moisture penetration into the timber and severe decay apparent in some areas.
- The tops of the curved sections of the north and south parapets were originally monolithic clad and have been retrofitted with metal cappings, which are poorly fitted with open cuts to the curve and no overlaps at the junctions with the main parapets ends – with moisture penetration and decay apparent.
- The cappings of the lower parapets butt against the upper walls with no back flashings and sealants only at the junctions – and moisture penetration, with decay to adjacent timber framing, is apparent at most of the junctions.

- The parapet at the entry canopy has a flat timber capping, with the pergola fixed through the capping, which has no underlying flashings. There are high levels of moisture penetration into the parapet and walls, with decay of the adjacent boundary joist and particle board floor (exposed at a cutout of ceiling lining).
- The timber capping to the deck upstand lacks underlying flashings and butts against the cladding – leading to leaks at wall junctions and corner mitre joints, which has resulted in severe decay at the deck corners, parts of the top plates and at the junctions with the upper level walls.
- The deck paving lacks adequate falls, and water is ponding on the tiles.
- The rainwater heads to the deck and parapets are poorly weatherproofed, with unsealed membrane at the openings, gaps and no drip edges – and moisture is penetrating into the framing, with signs of decay in the wall framing.
- A number of penetrations and fixings through the cladding are unsealed or poorly sealed, and the meterbox lacks a head flashing.

5.5 A copy of the expert's report was provided to each of the parties on 21 July 2006.

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 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:

- 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

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.

risk factors in previous determinations⁵ (refer to Determination 2004/1 *et al*) relating to cladding and these factors are also used in the evaluation process.

- 6.1.3 The consequences of a building demonstrating a high weathertightness risk is that building solutions that comply with the Building Code will need to be more robust. Conversely, where there is a low weathertightness risk, the solutions may be less robust. In any event, there is a need for both the design of the cladding system and its installation to be carefully carried out.

6.2 Weathertightness risk

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

- is built in a medium wind zone
- is a maximum of two storeys high
- is fairly simple in form, but incorporates a number of complex features
- has parapets above all walls
- has a deck with partly clad balustrades, which is over a living area
- has monolithic cladding to the walls, which is fixed directly to the framing
- has external wall framing that is likely to be treated, so providing some resistance to the onset of decay if the framing absorbs and retains moisture.

- 6.2.2 When evaluated using the E2/AS1 risk matrix, three elevations of this house demonstrate a high weathertightness risk rating and one a moderate risk rating. 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 It is clear from the expert's report that the monolithic cladding installed on the house is unsatisfactory in terms of its weathertightness risk and performance perspectives and considerable work is required to make the building code compliant. That is likely to include extensive replacement of decayed timber and re-cladding of the house. The high levels of moisture ingress and evidence of decay in the timber framing of the parapets, the deck balustrades, the framed bands and the main wall framing are major concerns. Further investigation is urgently required to establish the extent of decay and to ensure that the structural integrity of the affected elements has not been compromised.

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

- 6.3.2 I note that a large number of elevated moisture readings were recorded in the deck upstand balustrade and removal of the cladding at one of the corners has revealed extensive decay to the framing timbers. I recommend that the territorial authority urgently investigate this deck to ensure its continuing structural integrity.
- 6.3.3 The investigations described in paragraphs 6.3.1 and 6.3.2 will result in the development of a comprehensive list of repair work. That list will form either the basis for an application for a new building consent or an amendment to the existing consent

7. Conclusion

- 7.1 I am satisfied that the current performance of the monolithic cladding is inadequate because it has not been installed according to good trade practice and is allowing significant water penetration into the walls through numerous defects at present. In particular, it demonstrates the key defects listed in paragraph 5.4. I have also identified the presence of a range of known weathertightness risk factors in this house. The presence of the risk factors on their own is not necessarily a concern, but they have to be considered in combination with the extent and significance of the faults identified in the cladding system. It is that combination of risk factors and faults that indicate that the structure does not have sufficient provisions that would compensate for the lack of a drained and ventilated cavity. Consequently, I conclude that the cladding system as installed 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 building are currently allowing, or will allow the ingress of moisture in future, the house does not comply with the durability requirements of clause B2.
- 7.3 Based on the information available to me on the extent and apparent complexity of the faults identified with this cladding, I am of the opinion that remediation of the identified faults (as opposed to partial or full re-cladding) is unlikely to result in compliance with clause E2. However, I consider that final decisions on whether code compliance can be achieved by either remediation or re-cladding, or a combination of both, can only be made after a more thorough investigation of the cladding. This will require a careful analysis by an appropriately qualified expert. Once that decision is made, the chosen remedial option should be submitted to the territorial authority for its comment and approval. If the territorial authority rejects the proposal, then the applicant is entitled to seek a further Determination.
- 7.4 Once the cladding of this house is code compliant effective maintenance of the claddings (in particular of monolithic claddings) is important to ensure ongoing compliance with clauses B2 and E2 of the Building Code. This 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.

Matter 2: The durability considerations

8. Discussion

8.1 As set out in paragraph 4.8, 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 completion date of the building in 1997.

8.2 The building was substantially completed during 1997 and was subject to a final inspection on 28 April 2003 and a re-check inspection on 29 April 2004. However, it was not until the last inspection had been completed that the territorial authority raised the question of the age of the building.

8.3 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).

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 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 January 1998. This date has been confirmed by both the applicant and the territorial authority, refer paragraph 4.10.

8.6 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.

8.7 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 the elements of the building, apart from the items that are to be rectified, 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 1998.

8.8 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.

9 The decision

9.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the monolithic cladding system as installed does not comply with clauses B2 and E2 of the Building Code, and accordingly confirm the territorial authority's decision to refuse to issue a code compliance certificate.

9.2 In 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 January 1998
- (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 January 1998 instead of from the time of issue of the code compliance certificate for all building elements except those elements set out in paragraphs 6.3.1 and 6.3.2 of Determination 2007/4.

- (c) once the repair work described in paragraph 6.3.3 of this determination has 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.

- 9.3 I note that the territorial authority has not issued a notice to fix. The territorial authority should now issue a notice to fix requiring 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 this 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.
- 9.4 I would suggest that the parties adopt the following process to meet the requirements of paragraph 9.3. 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 18 January 2007.

John Gardiner
Determinations Manager