

Determination 2006/47

Refusal of a code compliance certificate for a building with a “monolithic” cladding system at 24 Max Short Drive, Pukekohe



1. The dispute 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, for and on behalf of the Chief Executive of that Department. The applicant is one of the joint owners, Mr Potter (“the applicant”), and the other party is the Franklin District Council (“the territorial authority”).
- 1.2 The dispute for determination is whether the territorial authority’s decision to decline to issue a code compliance certificate for a 3-year-old house because it was not satisfied that the monolithic cladding complied with clauses B2 “Durability” and E2 “External Moisture” of the Building Code² (First Schedule, Building Regulations 1992) is correct.

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 question to be determined is whether I am satisfied on reasonable grounds that the 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 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.
- 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 inspect the house (“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. I have not considered any other aspects of the Act or the Building Code.

2. The building

- 2.1 The building work consists of a two storey detached house situated on a flat site, which is in a medium wind zone in terms of NZS 3604³. Construction is conventional light timber frame, with concrete foundations, profiled metal roof cladding, aluminium windows, and monolithic wall cladding to all walls. The house shape is a moderately complex “boomerang” shape, with an upper level above the centre portion. The roofs of the single storey wings are 30° gables, with eaves that generally vary between 600mm and 750mm and verge projections of 300mm. The two-storey section has a curved roof with eaves and verge projections of about 200mm. A small section of roof to the south elevation forms a lean-to against the upper wall with eaves and verges projections provided only by the gutter and fascia.
- 2.2 An enclosed deck, with membrane floor and monolithic-clad balustrades, extends from an upper floor bedroom over a ground floor bedroom. A ground level timber deck extends from the east wall of the dining area.
- 2.3 The expert noted no evidence as to timber treatment, and I have received no written evidence as to the treatment, if any, of the external wall framing timber. I note that at the time of construction (during 2002) the use of untreated timber was common. Based on this evidence, I consider that the external wall framing is unlikely to be treated.
- 2.4 The cladding system applied to the exterior walls is what is described as monolithic cladding and consists of 60mm “Thermaclad” polystyrene backing sheets fixed directly to the framing over the building wrap, and coated with an “Ezytex” sponge finish plaster system. The plaster is finished with a flexible acrylic paint system. Although the expert was not able to verify the profile of the backing sheets, the manufacturer’s technical information indicates that vertical grooves are formed in the back of the polystyrene sheets.
- 2.5 Plaster Systems Ltd provided a “Producer Statement” dated 20 September 2002, for the “Thermaclad Plaster” system. It also provided a 15-year “Materials Components

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

Guarantee” and a 5-year “Workmanship Guarantee”, both dated 23 November 2004, relating to the “Thermaclad” and “Ezytex” systems. Both guarantees also carried an exclusion clause, whereby Plaster Systems Ltd did not accept responsibility for consequential damage of any kind to any building component that has occurred as a result of the use of untreated timber.

3. Sequence of events

- 3.1 The territorial authority issued a building consent on 19 February 2002, based on drawings stamped as approved by A1 Building Certifiers Ltd.
- 3.2 The building certifier carried out various inspections during construction including inspections of the cladding backing sheets, plaster and coating systems on 21 and 25 June 2002. It appears that the project was subsequently handed back to the territorial authority for completion, as there were no further inspections undertaken by the certifier. The territorial authority carried out various inspections during the remaining period of construction, including “preline” and “gibnail”.
- 3.3 The territorial authority carried out a final inspection on 3 November 2004, and the inspection record noted the status as “does not comply”. I have received no copy of a Notice to Rectify, but it appears that one was issued as the inspection record notes “Scope NTR 5458” followed by a list of outstanding items and defects, including an item noting “BIA determination required plaster system”.
- 3.4 An application for a determination was received by the Department on 25 November 2005.

4. The submissions

- 4.1 The applicant noted in the application that the “Matter of doubt or dispute” is that:

The plaster system (“Thermaclad”) was completed to the Council standards at the time, but the standards have since changed i.e. although the system we have installed has a form of cavity behind it, it does not comply with the revised standards.

- 4.2 The applicant forwarded copies of:

- some of the building plans and consent documentation
- some of the inspection records
- technical data for the cladding
- various warranties and producer statements.

- 4.3 The territorial authority made a submission in the form of a letter dated 2 November 2005, which noted that the matter for determination related to the compliance of the

monolithic cladding with clauses B2 and E2 of the building code, as the territorial authority became involved in the project after the building envelope was enclosed, when the building certifier could not continue with inspections. The territorial authority also noted that, although the building certifier inspected the cladding during installation:

...the weathertightness of the monolithic cladding did not seem to be addressed.

That has raised a doubt as to its compliance with Clause B2 and E2 of the Building Code.

- 4.4 The territorial authority forwarded copies of the inspection summary.
- 4.5 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.
- 4.6 A draft determination was forwarded to the parties for comment on 31 March 2006.
- 4.7 The owner accepted the draft. The territorial authority also accepted the draft, but in a letter to the Department dated 10 April 2006, it asked that the determination provide:

...the granting a waiver or modification of Clause B2 – Durability of the Building Code that provides for the commencement of the period of durability of all building components, including the cladding, from the date on which the building was materially completed, that date usually coinciding with the occupation of the building.

Council is concerned that the durability period of the building componentry will be extended unnecessarily if such a waiver or modification is not included in the Determination.

- 4.8 I note that the durability issue was not one of the matters to be determined by the applicant, nor was it raised by the territorial authority when it made its original submission on the application for determination in November 2005.
- 4.9 Irrespective of the point at which the durability issue was raised, I note that the house is only three years old, and consider that there has not been an excessive length of time elapsed since the elements were constructed.
- 4.10 A second draft determination was forwarded to the parties on 4 May 2006 which responded to matters raised by the territorial authority in its letter dated 10 April 2006, namely that the durability period be modified. I declined that request. The applicant accepted the second draft.
- 4.11 The territorial authority accepted the second draft but added the proviso that:

[All] remedial work is completed within 6 months from the date of determination and a code compliance certificate is issued at the conclusion of all remedial works.
- 4.12 The applicant agreed with the proposed timing but suggested that the 6-month period commence from the date of the notice to fix that the territorial authority would issue in response to paragraph 8.3.

- 4.13 The territorial authority appears to have asked me to set a 6-month time limit on the completion of the remedial work described in this Determination. I have no power under the Act to impose times for settling the determined issues. Nonetheless I observe that fixing the building as soon as possible will clearly be to the advantage of all parties and the response made by the applicant to the territorial authority's proposed timing seems highly appropriate.
- 4.14 I note that if the remedial work is not completed expeditiously then doubts about the future performance of items required by the Building Code Clause B2.3.1 to have 5 and 15 year durability periods may adversely affect the territorial authority's decision to issue the code compliance certificate.

5. The expert's report

- 5.1 The expert inspected the claddings of the building on 21 February 2006, and furnished a report that was completed on 24 February 2006. The expert noted that the cladding generally appeared to conform to the manufacturer's instructions, with the components of the system "used consistently" and the coating appearing "uniform, generally well-adhered" with no significant discolouration. Apart from one small crack at a corner, there was no evidence of cracking in the cladding. The expert noted that penetrations were generally well-sealed, roof to wall junctions appeared to be adequately flashed, cladding clearances to paved areas were generally adequate and metal head flashings to windows and doors appeared satisfactory. The expert noted that the wall areas present in this house are of dimensions that do not require control joints in order to comply with the manufacturer's instructions. The expert also noted that the pergola shown in the consent drawings had not been constructed, and that the timber deck was not attached to the building.
- 5.2 The expert scraped away a small section of plaster at the sill to jamb junction of a window and noted that jamb and sill flashings appeared to have been installed in accordance with the manufacturer's instructions.
- 5.3 The expert drilled a hole through the upper deck balustrade to allow inspection of framing below the junction with the wall, and noted that there was no evidence of water penetration into the framing.
- 5.4 The expert took non-invasive moisture readings through the linings of exterior walls throughout the house, and noted no elevated readings. Four invasive moisture readings were taken through the cladding and no elevated moisture readings were recorded, with the highest recorded at less than 14%.
- 5.5 The expert made the following specific comments on the cladding:
- there is no drainage gap between window sill flanges and the coating
 - the fascia above the ground floor bathroom has been fixed directly over the polystyrene backing sheets, which does not conform to the manufacturer's requirements for a 50mm overlap to the plaster coating

- there is a small crack in the cladding at one corner
- the plaster butts against the meterbox with no head flashing and no visible sealant
- the upper deck lacks a drainage overflow
- the top of the monolithic clad balustrade has a slope of 10°, which is less than the 15° slope recommended by the manufacturer
- the timber slats of the lower deck butt against the cladding, with no drainage gap.

5.6 The expert also made the following observations on the cladding:

- While the base of the cladding is close to the paving at the entry and beside the garage doors, the entry paving is sheltered by a canopy, the garage wall has generous eaves; and both areas are well drained.
- At the junctions of the lower gables roofs with upper walls, the clearance of the cladding to the apron flashings is only 15mm, but the pitch of the roofs provides a rapid run-off of rainwater so the reduced clearance is unlikely to lead to moisture penetration.

5.7 Copies of the expert's report were provided to each of the parties.

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

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.

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 building:

- is built in a medium wind zone
- is a maximum of two storeys high
- is reasonably complex in plan and form
- has eave and verge projections from 200mm to 750mm over most walls
- has an enclosed deck, with monolithic clad balustrades, that is set above a lower level bedroom
- has monolithic cladding which is fixed directly to the framing
- has external wall framing that is unlikely to be treated, so providing no resistance to the onset of decay if the framing absorbs and retains moisture.

- 6.2.2 When evaluated using the E2/AS1 risk matrix, these factors show that two elevations of the building demonstrate a high weathertightness risk and two elevations a moderate weathertightness 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 as being the:

- lack of a drainage gap under the window sill flanges

- lack of overlap of the fascia onto the coating at the ground floor bathroom
- inadequate sealing of the meterbox
- lack of drainage overflow to the upper deck
- inadequate slope to the top of the upper deck balustrade
- lack of a drainage gap at the junction of the timber deck with the cladding

6.3.2 I note the expert's comments in paragraph 5.6, and accept that:

- the clearance of the cladding to paving, as provided at the entry and garage door, is likely to be adequate as these areas are well-drained and sheltered under roof projections
- the clearance of the cladding to apron flashings of lower roofs is likely to be adequate in this case, as the apron flashings are steeply pitched to facilitate rapid dispersal of water away from the cladding.

6.3.3 Notwithstanding the fact that the backing sheets are 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:

- The cladding appears to have been installed to good trade practice.
- The house has eaves projections above most walls that provide good protection to the cladding areas below them.
- The cladding has grooves to the back of the polystyrene backing sheets that will facilitate some drainage behind the cladding sheets.

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

7. Conclusion

7.1 I am satisfied that the current performance of the cladding is adequate because it is preventing water penetration into the building at present. Consequently, I am satisfied that the cladding system as installed on the building complies 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

likely to allow the ingress of moisture in the future, the house does 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 with the cladding system occur in discrete areas, I am able to conclude that satisfactory rectification of the items outlined in paragraph 6.3.1 is likely to result in the building 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 shall 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 this building is likely to be untreated, periodic checking of its moisture content should also be carried out as part of normal maintenance.
- 7.7 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.
- 7.8 In the circumstances, I decline to incorporate any waiver or modification of the Building Code in this determination.

8 The decision

- 8.1 In accordance with section 188 of the Act, I hereby determine that the monolithic cladding system as installed complies with clause E2 of the Building Code. However, there are some items to be remedied to ensure that the house remains weathertight and thus meets the durability requirements of the code. Consequently, I find that the house does not comply with clause B2. Accordingly, I confirm the territorial authority’s decision to refuse to issue a code compliance certificate.
- 8.2 I also find that rectification of the items outlined in paragraph 6.3.1 will consequently result in the house being weathertight and in compliance with clause B2. Work to

correct these items may expose additional associated defects not yet apparent. All rectification work is to be completed to the approval of the territorial authority.

- 8.3 The territorial authority should now issue a notice to fix that requires the owners to bring the cladding into compliance with the building code, without specifying the features that are required to be incorporated. 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.
- 8.4 Finally, I consider that the cladding will require on-going inspection, maintenance and moisture monitoring to ensure its continuing code compliance.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 24 May 2006.

John Gardiner
Determinations Manager