

Determination 2005/130

Refusal of a code compliance certificate for a building with a “monolithic” cladding system at 265 Trig Road, Tuakau – House 111

1 THE DISPUTE TO BE DETERMINED

- 1.1 This is a determination of a dispute referred to the Chief Executive of the Department of Building and Housing (“the Chief Executive”) under section 17 of the Building Act 1991 (“the Act”) as amended by section 424 of the Building Act 2004. The applicant is the owner, Mr Schut (referred to throughout this determination as the “owner”), and the other party is the Franklin District Council (referred to throughout this determination as the “territorial authority”). Both the builder and the designer were designated as persons with a right or obligation, as defined in section 16(e) of the Act. The application arises from the refusal by the territorial authority to issue a code compliance certificate for an 8-year-old house, unless changes are made to its monolithic cladding system.
- 1.2 My task in this determination is to consider whether I am satisfied on reasonable grounds that the external monolithic wall cladding as installed on the timber framed first and second floor external walls, the gables and the columns of the house (“the cladding”), complies with the building code (see sections 18 and 20 of the Act). By “external monolithic wall cladding as installed”, I mean the components of the system (such as the backing sheets, 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 This determination is made under the Building Act 1991 subject to section 424 of the Building Act 2004. That section came into force (“commenced”) on 30 November 2004, and its relevant provisions are:

“ . . . on and after the commencement of this section,—

- “(a) a reference to the Authority in the Building Act 1991 must be read as a reference to the chief executive; and

- “(b) the Building Act 1991 must be read with all necessary modifications to enable the chief executive to perform the functions and duties, and exercise the powers, of the Authority . . . ”

It should be noted that the new legislation does not amend the determination process set out under the 1991 Act, other than to transfer the power to make a determination from the Building Industry Authority (“the Authority”) to the Chief Executive.

- 1.4 This determination refers to the former Authority:
- (a) When quoting from documents received in the course of the determination, and
 - (b) When referring to determinations made by the Authority before section 424 came into force.
- 1.5 In making my decision, I have not considered any other aspects of the Building Act or the building code.

2 PROCEDURE

The building

- 2.1 The building is a three-storey detached house, with the steeply sloping roof areas forming the upper storey, situated on an excavated sloping site in a high wind zone in terms of NZS 3604: 1999 “Timber framed buildings”. The lower level of the house, which is generally below ground level, has concrete block external and retaining walls. The first floor level has conventional light timber frames constructed on an intermediate proprietary concrete floor slab. The infill gable walls to the roof are also light timber framed and are constructed on the timber-framed second floor. All the timber framed external walls, gables, and columns are sheathed with monolithic cladding. The house is of a fairly simple shape but with some complex features and the pitched roof has valley and wall-to-roof junctions. Two large dormer windows with projecting eaves and monolithic-clad gables are set into the main roof areas. The eaves are framed up to form projecting internal gutters and the external gutter framing is monolithic-clad. Generally, there are no significant projections to the verges. I note that the internal gutter formation differs from the eaves details shown on the consented plans.
- 2.2 The first floor slab is cantilevered to form two open balconies and each of these has a metal balustrade. Two recessed balconies are set into the gable ends of the upper floor and these have monolithic-clad timber-framed balustrades with a metal handrail fixed to the tops of them. The roof eaves over these recessed balconies are 1200mm wide. The roof is also extended over the main entrance and this extension is supported by two timber-framed monolithic clad columns.
- 2.3 The owner claims that Boric treated timber was used for the external wall framing with the exception of the bottom plates, which are tanalised. The owner provided invoices from the timber supplier describing the wall framing that was supplied for

the house construction as being Boric treated. Other invoices indicate that some tanalised timber was purchased that could have been used for the wall framing.

- 2.4 The cladding system to the first and second floor level exterior walls, the gables, and the columns of the house is what is described as monolithic cladding and consists of 7.5mm thick tanalised plywood sheets fixed directly to the framing over the building wrap, over which 7.5 mm thick “Harditex” fibre-cement backing sheets are attached. The “Harditex” is finished with a Plaster Systems Ltd sponge finish “Ezytex” plaster system that has been applied by the owner. The plaster is finished with a two-coat acrylic paint coating system.

Sequence of events

- 2.5 The territorial authority issued a building consent on 25 November 1994. The consent noted that the territorial authority required notice to undertake certain inspections, some of which involved the cladding.
- 2.6 According to the owner, work started on the house in 1995 and the plastering of the backing sheets commenced in the summer of 1997. The house was substantially completed by 1999.
- 2.7 The territorial authority carried out various inspections throughout the construction of the house. The territorial authority passed the pre-line building inspection on 31 October 1996,
- 2.8 The owner wrote to the territorial authority on 1 November 2004, stating that he had never been notified that the house had to be completed within a certain time frame. The owner set out the construction timeframe and noted that the outside walls were clad with 7mm tanalised plywood, which was then covered with “Harditex”. The exterior wall bottom plates were tanalised. The owner also noted that the house had been repainted in late 2003.
- 2.9 The territorial authority carried out a final inspection on 12 November 2004 but did not approve the house. The territorial authority wrote to the owner on 15 November 2004, noting that following the November final inspection, eight items required attention before a code compliance certificate could be issued. The items relating to the cladding were:
- Item 1, ground clearances
 - Item 2, the lack of a slope to the tops of the balustrade
 - Item 3, the grip rail fixings
 - Item 8, the issues of appropriate drainage, ground clearances, reinforcing, control joints, and flashings.
- 2.10 In a letter to the owner dated 1 March 2005, the territorial authority stated that items 1, 2, 3, and 8 mentioned in the territorial authority’s letter to the owner of 15 November 2004 were still outstanding. The territorial authority noted that it had

assessed the house as being a high-risk construction and that a redesign of the building envelope would be a prudent option. The risk factor was exacerbated by the lack of a drainage and ventilated cavity. The territorial authority also stated that the issuing of a Certificate of Acceptance under the Building Act 2004 was not an option in this case.

- 2.11 The territorial authority did not issue a Notice to Rectify as required by section 43(6) of the Act.
- 2.12 The owner applied for a determination on 15 March 2005.

3 THE SUBMISSIONS

- 3.1 The owner wrote to the Department on 14 March 2005, providing a history of the construction and inspection processes involving the house. The owner noted that, following discussions with the territorial authority, four issues remained to be resolved. The owner listed these as being the wind rating, the slope to the top of the balcony balustrades, the interior balcony grip rail and the cladding. The owner commented on each of these issues.
- 3.2 The owner provided copies of:
- the building plans and specifications
 - the consent and inspection documentation
 - the correspondence with the territorial authority
 - the timber supplier's invoices
 - some manufacturer's information sheets.
- 3.3 In a letter to the Department that was received on 15 April 2005, the territorial authority noted that it did not consider that the bracing used in the house was an issue. However, the territorial authority doubted that the cladding met the requirements of clauses B2 and E2. The house had been constructed over a long period of time and had been clad using methods that are not acceptable at the present time.
- 3.4 Copies of the submissions and other evidence were provided to each of the parties. Neither the owner nor the territorial authority made any further submissions in response to the submissions of the other party.

4 THE RELEVANT PROVISIONS OF THE BUILDING CODE

- 4.1 The dispute for determination is whether the territorial authority's decision to refuse to issue a code compliance certificate because it was not satisfied that the cladding

complied with clauses B2 and E2 of the building code (First Schedule, Building Regulations 1992) is correct.

- 4.2 There are no Acceptable Solutions that have been approved under section 49 of the Act that cover this cladding. The cladding is not accredited under section 59 of the Act. I am therefore of the opinion that the cladding system as installed must now be considered to be an alternative solution.
- 4.3 In several previous determinations, the Department has made the following general observations, which remain valid in this case in my view, about acceptable solutions and alternative solutions:
- 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.

5 THE EXPERT'S REPORT

- 5.1 The Department commissioned an independent expert ("the expert") to inspect and report on the cladding. The expert inspected the building on 2 June 2005 and furnished a report that was completed on 22 July 2005. It stated that the appearance of the cladding is generally straight and flat with only minor variations in line and level. The general impression was that the house had been constructed with care and diligence. Many features are in excess of minimums and genuine attempts have been made to rectify errors of construction. The expert had some concerns regarding control joints and the "Harditex" sheet layouts, but was of the opinion that these are offset by the additional layer of plywood that stiffens up the building envelope. There was no evidence of any cracking in the cladding. The expert removed the plaster at the sill of the kitchen window and found that sill flashings are not installed and that the external joinery units are adequately sealed. The expert also removed cladding at one balustrade location and at the ensuite dormer apron flashing. The report made the following specific comments on the cladding:
- there is insufficient clearance and overlap to the base of the cladding adjacent to the concrete balcony decks. The owner has provided additional protection but these areas are still of concern
 - the internal gutter/parapet flashings have been installed prior to the sealing and finishing of the "Harditex"
 - the ends of the apron flashings to the ensuite dormer lack kick-outs
 - the bottom edges of the window sills are fully sealed and no sill end drainage is provided

- the tops of the upper balcony balustrades lack cross-falls
- only one outlet has been provided to each of the upper balcony decks and those installed are of an inadequate size
- one of the bottom mitres of the kitchen window has failed.

5.2 The expert also recommended that the junctions of the barge tiles should be checked and repaired as necessary and that spreaders should be installed to the ends of the downpipes at these locations.

5.3 The expert carried out a series of moisture tests to the interior of the house using a non-invasive meter and two elevated readings of 23% at the dining room access door and 40% at the sill liner of the kitchen window were found. Further invasive readings were then taken through the exterior of the cladding. The following readings over 18% were recorded:

- 22.0% and 22.4% at the upper balcony balustrades
- from 22.6% to 24.8% at the base of the cladding above the lower balcony decks
- 25.0% to 28.0% at the cladding below the gutter flashings
- 27.0% at the facing overhang at the bedroom 1 balcony
- over 40% at the soffits adjoining where the apron flashings join the parapet/gutter above the lounge.

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

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

6 DISCUSSION

General

6.1 I have considered the submissions of the parties, the expert's report and the other evidence in this matter. The approach in determining whether building work complies with clauses B2 and E2 is to examine 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 Building Industry Authority and the Department have described the weathertightness risk factors in previous determinations (Refer to Determination 2004/01 *et al*) relating to monolithic cladding, and I have taken these comments into account in this determination.

Weathertightness risk

6.2 In relation to the weathertightness characteristics, I find that the house:

- has projecting eaves gutter projections, 1200mm wide eaves projections over the upper balconies, and a projecting roof-line over the entrance, which all provide good protection to the cladding areas below them
- is in a high wind zone
- is three storeys high
- is of a fairly simple shape on plan but with some complex features and with the roof having valley and wall-to-roof junctions
- has two open balconies and two enclosed balconies
- has external wall framing that is likely to be treated to a level that would help prevent decay if it absorbs and retains moisture.

Weathertightness performance

6.3 Generally, the cladding appears to have been installed according to reasonable trade practice, but some junctions, edges, and penetrations are not well constructed. These areas are described in paragraph 5.1, and in the expert's report, as being:

- the insufficient clearance and overlap to the base of the cladding adjacent to the concrete balcony decks
- the internal gutter/parapet flashings having been installed prior to the sealing and finishing of the "Harditex"
- the lack of kick outs to the ends of the apron flashings to the ensuite dormer
- the fully sealed bottom edges of the windows
- the lack of cross-falls to the tops of the upper balcony balustrades
- the insufficient size and number of outlets to each of the upper balcony decks
- the failed bottom mitre of the kitchen window.

6.4 Notwithstanding the fact that the backing sheets are fixed directly to the timber framing, thus inhibiting drainage and ventilation behind the cladding sheets, I find that there are compensating factors that assist the performance of the cladding in this particular case:

- the cladding appears to have been installed according to good trade practice

- the house has eaves, verge and roof projections that help protect the cladding below them
- the house has external wall framing that is likely to be treated to a level that would help prevent decay if it absorbs and retains moisture.

I find that these factors help compensate for the lack of a drainage and ventilation cavity and can assist the house to comply with the weathertightness and durability provisions of the building code.

- 6.5 I also accept the expert's opinion that the lack of control joints and the incorrect sheet layout to some areas of the cladding is offset in this particular case by the inclusion of the plywood substrate, which introduces an additional bracing factor to the external walls of the building.
- 6.6 I note that one elevation of the building demonstrates a low weathertightness risk rating, one elevation demonstrates a medium risk, and the remaining two elevations demonstrate a high risk as calculated using the E2/AS1 risk matrix. 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.

7 CONCLUSION

- 7.1 I am satisfied that the current performance of the monolithic cladding on the building is not adequate because it is allowing water penetration into the building at several locations, which could affect the cladding. Consequently, I am not satisfied that the cladding system as installed on the building complies with clause E2 of the building code.
- 7.2 In addition, the building also is 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 building to remain weathertight. Because the monolithic cladding faults on the building have already allowed the ingress of water, or will allow the ingress of moisture in the future, it does not comply with the durability requirements of clause B2 of the building code.
- 7.3 Subject to further investigations during the remediation process that may identify other faults, I consider that, because the faults that have been identified with this cladding occur in discrete areas, I am able to conclude that satisfactory rectification of the items outlined in paragraph 6.3 together with the barge tile defects, is likely to result in the building being weathertight and in compliance with clauses B2 and E2.

- 7.4 I note that effective maintenance of monolithic claddings is important to ensure ongoing compliance with clause B2 of the building code. That maintenance is the responsibility of the building owner. The code assumes that the normal maintenance necessary to ensure the durability of the cladding is carried out. For that reason clause B2.3.1 of the building code requires that the cladding be subject to "normal maintenance". That term is not defined, and I take the view that it must be given its ordinary and natural meaning in context. In other words, normal maintenance of the cladding means inspections and activities such as regular cleaning, repainting, replacing sealants, and so on.
- 7.5 It is emphasised that each determination is conducted on a case-by-case basis. Accordingly, the fact that a particular cladding system has been established as being code compliant in relation to a particular building does not necessarily mean that the same cladding system will be code compliant in another situation.
- 7.6 I decline to incorporate any waiver or modification of the building code in this determination.

8 THE DECISION

- 8.1 In accordance with section 20 of the Building Act 1991, I hereby determine that the cladding system as installed on the building does not comply with clause E2 of the building code. There are also a number of items to be remedied to ensure that it remains weathertight and thus meet the durability requirement of the code. Consequently, I find that the building 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, together with the barge tile defects, to the approval of the territorial authority, along with any other faults that may become apparent in the course of that work, will consequently result in the house being weathertight and in compliance with clauses B2 and E2.
- 8.3 I note that the territorial authority has not issued a Notice to Rectify. The territorial authority should now issue a notice to fix, and the owner is then obliged to bring the house up to compliance with the building code. 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 I would suggest that the parties adopt the following process to meet the requirements of clause 8.3. Initially, the territorial authority should issue the 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 technically robust 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. As indicated earlier in this determination, the Chief Executive might

already have decided upon some of the issues that may be raised by the territorial authority in its notice to fix, including the territorial authority's requirement, if any, for a ventilated and drained cavity or equivalent.

- 8.5 Finally, I consider that the cladding will require ongoing maintenance to ensure its continuing code compliance.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 5 September 2005.

John Gardiner
Determinations Manager