

Determination 2005/101

Refusal of a code compliance certificate for a building with a “monolithic” cladding system: House 89

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 one of the joint-owners (referred to throughout this determination as “the owner”), and the other party is the territorial authority. 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 The question to be determined is whether on reasonable grounds the monolithic wall cladding as installed to the timber-framed external walls of the house (“the cladding”), complies with the building code (see sections 18 and 20 of the Act). By “the 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 Act or the building code.

2 PROCEDURE

The building

- 2.1 The building is a large detached house situated on an excavated and stepped sloping site in a high wind zone in terms of NZS 3604. The house is on five levels, with the front of the house being two storeys high while the rear is three storeys high.. Construction of the house is conventional light timber frame, with concrete block retaining walls, foundations and a concrete slab. Windows and doors are aluminium, the roof is of corrugated steel and the walls are sheathed in monolithic cladding. The house shape is fairly complex in plan, while the curved roof is reasonably simple with a limited number of roof to wall intersections. Eave and verge projections vary from 500 mm to 700 mm, except where a monolithic-clad chimney structure passes through a verge.
- There are three enclosed decks with liquid-applied membrane floors, curved framed and clad balustrades and side-fixed metal handrails. The two lower decks are located partially over living and garage spaces, and supported on monolithic clad beams and columns at the outer limits. The upper deck is over habitable spaces below.
- 2.2 The owner supplied copies of timber invoices to the expert commissioned by the Department. These indicated that boron treated and H3 tanalised timber has been used for the wall and deck framing of the house.
- 2.3 The cladding system is what is described as monolithic cladding. The cladding is EIFS “Thermexx”, which incorporates 40 mm thick polystyrene backing sheets fixed through the building wrap directly to the wall framing and finished with a proprietary mesh reinforced plaster system. The system includes purpose-made flashings to windows, edges and other junctions.
- 2.4 The manufacturer issued a Producer Statement dated 15 July 2003.

Sequence of events

- 2.5 The territorial authority issued a building consent on 3 February 1997.
- 2.6 The territorial authority made various inspections during the course of construction, including prior to lining installation and following lining installation, with a final inspection on 6 May 2002 which noted several outstanding items.

2.7 Following a site cladding inspection on 23 April 2004, the territorial authority wrote to the owner on 28 April 2004 advising that it was unable to issue a code compliance certificate as it could not be satisfied, on reasonable grounds, that the monolithic cladding would comply with clause E2. The territorial authority described its concerns in regard to weathertightness and durability in regard to monolithic cladding systems and noted the following defects in regard to the cladding:

1. Highrisk design features and exposure
2. Ground levels too high and cladding buried
3. Deck barriers have flat tops
4. Some cracks to deck beams/soffit sections
5. Cladding changed from approved plans and no amended plans submitted.

2.8 The territorial authority did not issue a Notice to Rectify as required under section 43(6) of the Act.

2.9 The owner applied for this determination on 25 January 2005.

3 THE SUBMISSIONS

3.1 In an attachment to the submission, the owner responded to the issues raised by the territorial authority and included the following points:

- A consent was issued for the design, which includes large roof overhangs.
- Ground level problems were rectified following an earlier inspection, but the issue of clearance below the cladding was never raised as a problem.
- Earlier inspections accepted the flat tops to deck barriers, with the proviso that the metal handrail was not fixed through the top.
- The cracks to deck beams and soffit sections were superficial paint cracks which have now been rectified.
- There has been no change in the type of cladding, as the approved plans indicated EIFS cladding.

The owner went on to conclude:

This building had been given consent, complied with the building codes and passed the inspections at the time, (including the exterior cladding requirements) between 1997 & 2003 – until the comments given at the final re-check on 22nd April '04. How can there be a non-compliance to a building that has already complied?

3.2 The owner also forwarded copies of:

- The building inspection records;
- Elevations of the building;
- The correspondence with the territorial authority
- Extracts from the cladding manufacturer's information; and
- Various producer statements and other statements.

3.3 In a covering letter to the Department dated 4 March 2005, the territorial authority outlined the events leading up the refusal to issue a Code Compliance Certificate, the risk factors and defects for the house, and the matter for the determination:

In regards to this application for a determination, specifically in this case the matter of doubt is:

- Whether the installed cladding system complies with clauses B2.3.1 and E2.3.2 of the Building Code.
- Whether building elements, which have 5 and 15-year durability requirements comply with clause B2 of the building code, considering the age of construction.

3.4 The territorial authority forwarded copies of;

- The building consent documentation;
- The building inspection records; and
- The correspondence with the owner.

3.5 Copies of the submissions and other evidence were provided to each of the parties.

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 B2.3.1 and E2.3.2 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 can be considered to be an alternative solution.

4.3 In several previous determinations, the Authority has made the following general observations, which in my view remain valid in this case, about acceptable solutions and alternative solutions:

- Some acceptable solutions cover the worst case, so that in less extreme cases they may be modified 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 5 May 2005 and furnished a report that was completed on 10 May 2005. The expert noted that the

finish to the cladding was generally good, with the plaster smooth, uniform, well-adhered and with no evidence of cracking or significant discolouration. Deck areas were well drained and cladding clearances were generally adequate. There are no control joints in the cladding, and the expert is of the opinion that these are not required for walls of the dimensions used in this house. The expert could see no evidence of any stress in the cladding arising from the absence of control joints.

- 5.2 The expert removed a small section of the plaster at the jamb to sill junction of a window to examine the flashings and noted that purpose made uPVC jamb and sill flashings have been used, which appear to be installed correctly. The doors and windows are fitted with aluminium head flashings, which extend beyond the jambs.
- 5.3 The expert took non-invasive moisture readings at interior linings of exterior walls throughout the house. All readings were found to be at an acceptable level. Nine invasive readings were taken at potentially vulnerable areas in exterior walls, with all readings recorded at 13% or less, except for a reading of 17.1% in a balustrade and a reading of 20.4% in the bottom plate of a decorative buttress on the east elevation. Moisture levels above 18% 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 is no return to the end of the apron flashing on the lean-to roof above the stairwell, and building paper and polystyrene are exposed at this point;
 - From photographs taken during construction, the framed and EIFS clad decorative buttresses appear to have been constructed over the main wall polystyrene with the sheets continuous behind the buttress, and likely to protect the main wall framing from any moisture penetration into the buttress framing.
 - One of the decorative buttresses on the east elevation has soil over the bottom of the cladding. The other eastern buttress, where the moisture content was measured at 20.4%, has had the soil level recently lowered and the elevated moisture content may be due to residual moisture;
 - The uPVC base flashing to the bottom of the cladding is missing on the cladding to the decorative buttresses;
 - The wall and column cladding extends down below the paving level at the entrance and garage area. However, there is no evidence of moisture penetration and the area is well sheltered by the deck overhang above;
 - The plate behind the gas regulator has pulled away from the wall, exposing the unsealed pipe penetration through the wall cladding;
 - While the other service penetrations through the cladding have been sealed and painted, the sealant is deteriorating and is failing in some areas;
 - Although any sealant around rafter penetrations will be aging, there is no indication of moisture penetration and the timbers slope away from the wall and are well sheltered under the verge and eave projections;

- The EIFS clad balustrades have flat tops, so the wall cavity, where a moisture content was recorded at 17.1%, was visually inspected. There was no mould, decay or other evidence of moisture penetration into the balustrade framing;
- Cladding clearances to deck surfaces are generally adequate, except for the 15 mm clearance under the northeast corner living window. However, there was no signs of water entry, and moisture content was recorded at 9.9%; and
- The liquid-applied deck membrane surfaces showed signs of roller drag and raised ridges at substrate sheet edges, although the membrane surface appeared sound and weathertight. There is an area of blistering adjacent to the north windows of the living room. However, visual inspection revealed no signs of current or past moisture penetration into the plywood or deck framing.

5.5 Copies of the expert's report were provided to each of the parties. The territorial authority did not respond and the owner commented by letter to the Department on 22 May 2005. The owner noted that the property address was Fitzwilliam Drive, the cladding was shown as Insulclad on the consented plans and the 30mm plaster referred to by the builder was a typing error.

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 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 these characteristics I find that the house:

- is built in a high wind zone;
- is a maximum of three storeys high;
- is complex in plan, although it has a simple roof shape;
- has eave and verge projections, varying between 500 mm and 700 mm, above all walls;
- has three enclosed decks, with curved clad balustrades, over habitable areas;
- has external windows and doors that have aluminium head flashings and purpose made uPVC jamb and sill flashings;

- has monolithic cladding which is fixed directly to the framing with no drainage cavity; and
- has treated deck and external wall framing that will offer some resistance to the onset of decay if the framing absorbs and retains moisture.

Weathertightness performance

- 6.3 Generally the cladding appears to have been installed according to good trade practice, but some junctions, edges, and penetrations are not well constructed. These areas are all as described in paragraph 5.4 and in the expert's report as being:
- The end of the apron flashing to the roof over the stairwell;
 - The soil against the bottom of the cladding of the eastern decorative buttress;
 - The repairs and sealing required to the gas regulator;
 - The deterioration and failure of the sealant around service penetrations;
 - The flat tops to the deck balustrades; and
 - The blistering of the deck membrane near the living room windows.
- 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 do not accept that the lack of a drainage and ventilation cavity in itself prevents the house from complying with the weathertightness and durability provisions of the building code.
- 6.5 I note the expert's comments regarding:
- the lack of base flashings to the decorative buttresses, and accept that the continuous polystyrene sheets behind are likely to prevent moisture penetration into the main wall framing;
 - the lack of clearance near the entry and garage doors, and accept that these areas are well sheltered by the deck overhang above; and
 - the lack of clearance to the deck surface in one location, and accept that the sealing appears adequate, with the ease of access for maintenance and good deck drainage combining to limit the risk of water penetration in future.
- 6.6 I acknowledge the territorial authority's concern regarding the age of the house but consider that if the items outlined in paragraph 6.3 are rectified satisfactorily, and if the house continues to be well maintained, the cladding is likely to meet the durability requirements of the building code.
- 6.7 I note that the elevations of the house demonstrate a high weathertightness risk rating 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 constructed is assessed for the purposes of issuing a code compliance certificate.

7 CONCLUSION

- 7.1 I am satisfied that the current performance of the cladding is adequate because it is preventing water penetration into the wall framing at present. I am therefore satisfied that the cladding system as installed complies with clause E2 of the building code.
- 7.2 However, 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 in this 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 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 is likely to result in the building remaining weathertight and in compliance with clauses B2 and E2, notwithstanding the lack of a ventilated cavity.
- 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, re-painting, replacing sealants, and so on.
- 7.5 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 20 of the Building Act 1991, I hereby determine that the monolithic cladding system as installed complies with clause E2 of the building code. There are a number of 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, to the approval of the territorial authority, along with any other faults that may become apparent in the course of that work, is likely to result in the house being weathertight and in compliance with clauses B2 and E2, notwithstanding the lack of a ventilated cavity.
- 8.3 I note that the territorial authority has not issued a Notice to Fix. A Notice should be issued 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 dictate how the defects are to be remedied. How that is done is a matter for the owner to propose and for the territorial authority to accept or reject, with either of the parties entitled to submit doubts or disputes to the Chief Executive for another determination.

- 8.4 Finally, I consider that the cladding will require on-going maintenance to ensure its continuing code compliance.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 8 July 2005.

John Gardiner
Determinations Manager