

Determination 2005/84

Refusal of a code compliance certificate for a building with a “monolithic” cladding system: House 74

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 territorial authority and the other party is one of the joint-owners (referred to throughout this determination as “the owner”). The application arises from the refusal by the territorial authority to issue a code compliance certificate for a 4-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 work consists of additions at three separate locations to an existing two-storey (plus a developed basement) detached house, situated on a sloping site in a medium wind zone in terms of NZS 3604: 1999 “Timber framed buildings”. The additions are of conventional light timber frame construction on existing and new concrete ground floor slabs, and all external walls are sheathed with monolithic cladding. Monolithic cladding has also been applied over the original vertical cedar weatherboards to the upper level, with plaster over the lower level masonry veneer and concrete block foundation walls. The existing metal tile hipped roof, with eaves of 600 mm, has been retained, and the two areas of new flat roof have capped parapets and are clad in liquid-applied membrane.
- 2.2 The south addition is a simple one-storey extension to the garage, which has a tiled deck above, with open metal balustrades and monolithic-clad upstands, and a pergola above the adjacent main entry.
- 2.3 The north addition is a two-storey addition, which provides a family room and bedroom on the ground floor level, a master bedroom on the first floor level, with a new deck over the bedroom below, and a partially lined workshop area in the sub-floor space. The tiled deck has a curved monolithic-clad balustrade.
- 2.4 The east addition to the upper level is an extension over an original enclosed deck to provide new kitchen, dining and living areas and a reduced tiled deck area, which has metal balustrades above upstands and a short length of monolithic-clad balustrade.
- 2.5 The builder has confirmed that the deck and roof plywood substrate and balustrade framing is H3 treated. The expert commissioned by the Department reported that the deck and sub-floor framing appears to be H3 treated, and that the owner advised him that the wall framing was untreated.
- 2.6 The cladding system is what is described as monolithic cladding. Except for the sub-floor workshop, which has some fibre cement sheet cladding with uPVC jointers, new exterior timber framed walls are clad in EIFS “Insulclad”, 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.
- 2.7 The plasterer issued a producer statement dated 25 March 2002 and a “workmanship guarantee” dated 29 October 2002 in respect of the plastering applied to the cladding. The manufacturer issued a “materials components guarantee,” dated 8 October 2004. The latter two documents specifically excluded any consequential damage arising from the use of untreated framing timber.

Sequence of events

- 2.8 The territorial authority issued a building consent on 2 November 2000.
- 2.9 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 5 December 2001 which noted no outstanding building items although a number of engineering producer statements were to be completed (these appear to have been submitted before the end of December 2001). One minor plumbing item remained outstanding until early 2004.
- 2.10 The territorial authority wrote to the owner on 8 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 noted the following items:
- 1) No previous Council inspections for cladding
 - 2) High wind zone (one of the risk factors)
 - 3) No evidence of expansion control joints
 - 4) Timber treatment unknown
 - 5) No producer statements, warranties available
- 2.11 The territorial authority did not issue a Notice to Rectify as required under section 43(6) of the Act.
- 2.12 Following a site cladding inspection on 22 September 2004 the territorial authority wrote to the owner on 6 December 2004, describing its concerns in regard to weathertightness and durability in regard to monolithic cladding systems and identifying weathertightness risk factors for the house. The territorial authority noted the following defects in regard to the cladding:
- Front deck cladding in contact with tiles.
 - Tops of front deck columns and curved pergola beam to be sloped as per manufacturers specifications.
- The territorial authority went on to say:
- As discussed previously, with regard to your case, Council have agreed to apply to the Department of Building and Housing as per section 17 of the Building Act 1991, to determine the following compliance requirements.
1. compliance of the installed cladding system with the relevant clauses of the New Zealand Building Code.
- 2.13 The territorial authority applied for this determination on 20 January 2005.

3 THE SUBMISSIONS

- 3.1 In a covering letter to the Department dated 20 January 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.
- 3.2 The territorial authority forwarded copies of:

- The building consent documentation;
- The building inspection records;
- The correspondence with the owner; and
- Various producer statements, invoices and other statements.

3.3 In a covering letter to the Department dated 11 February 2005, the owner explained the delay in seeking a Code Compliance Certificate, noting that this was due to:

...an outstanding re-check on the plumbing of a sink in the rumpus room which was not needed or used by us at the time. When we finally did install the sink and apply for our Code of Compliance (as promised by the building inspector) we found they had changed the rules with respect to the cladding of the house – nothing to do with the plumbing – and would not issue a Code of Compliance although we had already passed all their inspections with flying colours.

The Council has listed as “defects identified” that the tops of the front deck columns and the pergola beam are not sloped – when in fact they are.

The owner went on to say that:

...the cladding of the lower two levels of the house is solid plaster OVER existing brick or concrete block and that the cladding of the third level of the house is similarly Insulclad OVER the existing stained cedar cladding. In fact it is only a very small percentage of the exterior cladding that is not over existing cladding.

3.4 The owner also forwarded copies of:

- Extracts from the cladding manufacturer’s technical information; and
- A letter from the window manufacturer regarding the window flashings.

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 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 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 15 April 2005 and furnished a report that was completed on 21 April 2005. The expert noted that the finish to the cladding was generally good, with the plaster smooth and with no evidence of cracking or discolouration. The sealing of services and plumbing penetrations appeared weathertight, and the cladding was observed to form a continuous weathertight surface behind all obstructions. There are no control joints in the cladding, as the manufacturer's instructions did not require these 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 textured finish at the jamb to sill and jamb to head junctions of one new window to examine the flashings, and noted that purpose made uPVC jamb, purpose-made junction soakers, and sill flashings have been used in accordance with the manufacturer's instructions. The windows were fitted with aluminium head flashings, while the doorframes incorporated rebated flanges that served as flashings by allowing protected laps behind the cladding.
- 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. Six invasive readings were taken in the exterior walls and roof framing of the new additions, and these ranged from 9.8% to 15.6%. One reading of 23.3% was recorded in the exposed sub-floor timber of the workshop. 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 are short lengths of wall, near the main entrance and the garage doors, which have limited clearance between the bottom of the cladding and the paving. However there is no indication of moisture penetration;
 - There are locations where the EIFS cladding on the deck upstands and clad balustrades has no clearance from the deck tiles;
 - The tops of monolithic-clad deck upstands and balustrades are sloped at less than 5°, which is flatter than the slopes recommended by the manufacturer;
 - The metal balustrade supports have been fixed through the top of the deck upstands, with no evidence of sealant to these, or to the side fixings;
 - The overflow openings in deck upstands and balustrade are weatherproofed with the deck membrane, and the bottom of timber above the opening of the south deck is exposed and shows signs of moisture damage. However, readings indicated no current moisture penetration and visual inspection showed no signs of moisture penetration into the wall framing below;
 - The sill to the staircase window butts against, and is sealed to, the tiles of the north deck with no provision for a membrane upstand behind the sill flange;
 - The rafters of the entrance pergola penetrate the EIFS wall and laminated beam cladding, with no evidence of flashing or sealing;

- Water staining is evident on the inside face of the fibre cement cladding of the sub-floor workshop, where soil is against the sheets, and a moisture content of 23.3% was recorded in the timber (which appears to be H3 CCA treated);
- The quality of the membrane coating to the new flat roof areas appears poor, with the texture of the fibreglass reinforcing mesh clearly visible;
- There is evidence of water ponding in the membrane-lined parapet gutter above the dining room;
- At the intersection between the new flat roof and the existing metal tile roof above the dining room, the upstand is inadequate, and the adjacent parapet capping is at the same level as the roof membrane with sealant at this junction;
- The decorative band at the upper floor level is formed from EIFS over a timber plate that is not protected by a flashing at the top edge;
- The timber soffit of the small canopy over the laundry door on the south elevation is water-stained around the downpipe penetration and there is water ponding in the membrane gutter above; and
- There is no provision for drainage of the cavity behind the plastered brick veneer, as the original weepholes have been filled with plaster.

5.5 Copies of the expert's report were provided to each of the parties and both accepted the report. The owner subsequently reported that the soil heaped against the fibre-cement cladding of the sub-floor workshop had been removed and the ground level lowered to a level below the bottom plates of the wall. The owner submitted photographic evidence of the removal of the soil.

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 medium wind zone;
- is effectively (including the developed basement) a maximum of three storeys high;
- is reasonably simple in plan;

- has three enclosed decks over habitable and garage areas;

I find that the additions:

- have parapets which provide no protection to the lower wall cladding, although the original walls have 600 mm eaves;
- have flat roofs incorporating a number of complex junctions with the original roof;
- have external windows that have aluminium head flashings and purpose made uPVC jamb and sill flashings;
- have monolithic cladding which is fixed directly to the framing with no drainage cavity; and
- have untreated external wall framing that is unlikely to resist 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 fixing of the metal balustrades through the EIFS cladding;
- The exposed timber at the outlet opening in the south deck;
- The poor weatherproofing of the sill to the staircase window at the north deck;
- The lack of sealing of the entrance pergola rafters where they penetrate the cladding at the wall and the curved beam;
- The soil against the unprotected fibre cement cladding, and the consequent water penetration through the cladding and into the timber of the sub-floor workshop;
- The questionable quality of the membrane roofing;
- The ponding in the parapet gutter above the dining room;
- The poor weatherproofing of the intersection of the membrane roof and parapet capping with the existing roof tiles;
- The lack of protection to the top of the timber plate behind the decorative band;
- The ponding and poor weatherproofing of the outlet from the gutter in the canopy above the laundry door; and
- The lack of provision for drainage of the cavity behind the plastered brick veneer.

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 clearance near the entry and garage doors, but accept that these limited areas are well-drained away from the walls;
- the lack of clearance to deck tiles in some locations, but accept that the deck membrane upstand, the accessibility of sealants for maintenance and the adequate drainage of the decks combine to limit the risk of water penetration;
- the limited fall to tops of deck upstands and solid balustrades, but accept that the slopes provided should allow adequate drainage in this case.

6.6 I note that the elevations of the house demonstrate a moderate to 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. In reaching that conclusion I am accepting that the cause of the high moisture reading obtained in the sub-floor workshop was the moisture bridge of soil heaped against the exterior of the wall, and that the soil has now been removed by the owner. Consequently, I am satisfied that the cladding system as installed on the new additions 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, and not already rectified, 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 Rectify. 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 15 June 2005.

John Gardiner
Determinations Manager