

Determination 2005/111

Refusal of a code compliance certificate for a building with a “monolithic” cladding system at 46 Mainston Road, Remuera, Auckland – House 96

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 a 2-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 a two-storey house, situated on a gently sloping site in a medium wind zone in terms of NZS 3604: 1999 “Timber framed buildings”. The external walls of the house are of conventional light timber frame on concrete foundations, and have monolithic cladding and aluminium windows. The house is a reasonably simple “L” shape, with the 20° clay tile roof made up of a series of gables, hips valleys and more complex wall to roof junctions. A small partially cantilevered deck, with a membrane floor, is recessed into the corner of the “L” shape above the main entrance, and is fully covered by a roof projection. This deck has curved monolithic-clad wing walls and balustrades, with a centre section of side-fixed metal balustrades. There are no verge projections at gable ends, while eave projections are more than 450 mm overall, except where a monolithic-clad chimney structure passes through the eaves.
- 2.2 The specification calls for external wall framing to be H1 boric treated. However, the expert commissioned by the Department reports that the wall framing appears to be untreated. No other evidence has been provided as to what timber treatment, if any, was applied to the external wall framing.
- 2.3 The cladding is a monolithic cladding system described as stucco over a solid backing. In this instance it consists of 4.5 mm fibre cement sheets fixed through the building wrap directly to the framing timbers, and covered by a slip layer of building wrap, metal-reinforced 20 mm thick solid plaster and a flexible paint coating. An independent organisation carried out an appraisal of the cladding system in 1995 (although the appraisal certificate was voluntarily withdrawn in July 2004). For the purposes of this determination, the manufacturer of the plaster and coating system is regarded as the manufacturer of the cladding system; despite the fact that the fibre cement backing sheets are proprietary to another manufacturer.
- 2.4 There is no evidence of warranties or “Producer Statements” for the cladding system.

Sequence of events

- 2.5 The territorial authority issued a building consent on 5 July 2001.
- 2.6 The territorial authority made various inspections during the course of construction, including preline, postline and an inspection of plastering on 22 April 2002, which

noted a “pass” on fixing, jointing, flashings to openings, base flashing and cladding ground clearance.

2.7 The territorial authority carried out a further site cladding inspection on 14 October 2004, and in a letter to the owner dated 8 November 2004, regretted that the building may not comply with the building code in a number of respects. The territorial authority attached a Notice to Rectify also dated 8 November 2004 to this letter, together with a set of photographs illustrating items of non-compliance. The “Particulars of Contravention” attached to the Notice to Rectify listed requirements under the following headings:

1. Items not installed per the manufacturer’s specifications.
2. Items not installed per the acceptable solutions of the building code, (no alternative solutions had been applied for).
3. Items not installed per accepted trade practice.
4. Ventilated cavity system.

2.8 The owner was also required, amongst other items, to:

1. Provide adequate ventilation to the monolithic cladding and into the wall frame space by means of either a ventilated cavity or alternate approved system...

2.9 The owner applied for this determination on 18 November 2004.

3 THE SUBMISSIONS

3.1 In the application for a determination the owner noted that all the work required in the Notice to Rectify could be undertaken, except the requirement for a cavity behind the wall cladding.

3.2 The owner also forwarded copies of:

- The plans and specifications;
- The Notice to Rectify; and
- The correspondence with the territorial authority.

3.3 In a covering letter to the Department dated 14 January 2005, the territorial authority described the Particulars of Contravention and noted that:

Specific construction defects may be grouped into the following areas:

- Ground clearances
- Control joints
- Expansion joints
- Flashings
- Sealed junctions

- Waterproofing
- Horizontal gaps
- Drip edges
- Penetrations
- Insufficient means for dissipation of water where the water passes through the exterior cladding.

3.4 The territorial authority forwarded copies of;

- The plans and specifications;
- The building consent documentation;
- The building inspection records;
- Various producer statements;
- The Notice to Rectify; 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 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 2 May 2005 and furnished a report that was completed on 4 May 2005. The expert noted that the plaster is smooth and even, the sealing of services and plumbing penetrations appears weathertight, the cladding forms a continuous weathertight surface behind all obstructions and the base of the cladding is finished as per the manufacturer's instructions, with clearances to ground or paving generally adequate.
- 5.2 The expert removed a small section of plaster at a vertical control joint, and noted that the joint accorded with the standard and good trade practice. The expert also removed plaster at the jamb to sill junction of one window in order to inspect the flashings. I am satisfied that the sites chosen for this destructive testing are typical examples of their kind.
- 5.3 The expert took non-invasive moisture readings at interior linings of exterior walls throughout the house. Two readings were noted as "borderline". Nine invasive readings were taken in the exterior walls and roof framing. One reading of 22.6% was recorded below a window, while the other readings ranged from 9.5% to 17.7%. 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:
- The paint finish is extensively discoloured with some areas flaking, and the coating appears brittle and poorly adhered to the plaster indicating a non acrylic paint had been used;
 - There are no horizontal control joints in the walls, although the height of some walls is greater than the 4 metres specified in the standard (NZS4251);
 - There are a number of hairline cracks in the plaster to the two-storey walls on the west elevation and the framed chimney structures, some of which have had a sealer applied. However, there is no evidence of moisture relating to the cracking, and sealing of the cracks, together with an improved paint coating and regular maintenance should prevent moisture penetration;
 - There is insufficient clearance from the paving to the base of the stucco at the sides of the garage doors, and the moisture content of one stud at the doors was elevated at 17.7%, suggesting some moisture penetration. There is also insufficient cladding clearance near the rear door, although this area is well-drained and sheltered under the projecting upper floor;
 - The windows are recessed with a separate sill over-flashing butted against the sill flange of windows and crudely sealed against the plaster jambs. There is also a hidden sill flashing beneath the window frame, the vertical leg of which finishes behind the stucco plaster rather than extending to the outside;
 - The sill to the kitchen bi-fold window is missing the sill over-flashing;

- There is insufficient clearance from the bottom of the cladding to apron flashings at roof to wall junctions, with kick outs at the gutter ends lacking;
- The top of the two-storey gable end wall on the east elevation has no verge projection and appears to be inadequately weatherproofed, with a moisture reading of 22.6% recorded in the bedroom wall below. Indications were that the moisture level was a result of crack in the verge pointing directly above and the repair to the crack was as yet incomplete;
- There are areas where the required offset of cladding against the foundation walls is less than 6 mm, but there is no evidence of moisture penetration;
- The membrane of the small deck above the main entrance is dressed around the projecting plywood edge, with no drip edge; and
- The tops of the two short sections of monolithic-clad deck balustrades are flat, although there is no evidence of moisture penetration.

5.5 Copies of the expert's report were provided to each of the parties and both accepted the report.

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:

- Has no verge projections, but has eave projections that greater than 450 mm over most walls, which provide moderate protection to the wall cladding;
- Is built in a moderate wind zone;
- Is a maximum of two storeys high;
- Is reasonably simple in plan, although there are some complex roof and roof to wall junctions;

- Has a small partially cantilevered enclosed deck over an habitable area that is fully protected by a roof overhang;
- Has external windows that have aluminium head flashings;
- Has monolithic cladding which is fixed directly to the framing with no drainage cavity; and
- Has 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 surfaces, 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 questionable quality and type of the paint finish to the wall cladding;
- The lack of horizontal control joints to the two-storey wall areas;
- The cracking of the plaster;
- The insufficient clearance from the cladding to paving near the garage door;
- The vulnerability created by the hidden sill flashings terminating behind the plaster cladding and the junction of the sill over-flashing with the plaster jamb;
- The unprotected plaster sill of the kitchen window;
- The insufficient clearance of the base of the cladding above apron flashings;
- The lack of kick-outs to the gutter ends of the apron flashings; and
- The poor weatherproofing of the gable end on the two-storey east wall.

6.4 I note the expert's comments regarding:

- The lack of clearance near the rear door, and accept that this limited area is sheltered by the projecting upper floor and is well-drained away from the walls;
- The insufficient offset of cladding against the foundation walls in some locations, but accept that this is unlikely to cause moisture penetration in this case;
- The lack of a drip edge to the deck, but consider that the projection of the deck floor edge should be sufficient to provide protection to the cladding below; and
- The flat tops to the two short lengths of solid balustrade, but accept that these are less than 1 metre long and are sheltered by the roof above.

6.5 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.

6.6 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 not adequate because it is allowing water penetration into the wall framing in at least one location at present. Consequently, I am not satisfied that the cladding system as installed 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 in this building currently allow, or are likely to allow in the future, the ingress of moisture, 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 being 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 cladding system as installed does not with clause E2 of the building code. There are a number of items to be remedied to ensure that the house becomes and 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 issued a Notice to Rectify requiring provision for adequate ventilation, drainage and vapour dissipation. Under the Act, a notice to fix can require the owners to bring the house into compliance with the building code. The Authority has already found in a previous determination (2000/1) that the Notice to Rectify cannot specify how that compliance can be achieved. I concur with that view. A new notice to fix 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.
- 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 an expert, 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. I would also like to add that 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 for a ventilated and drained cavity or equivalent.
- 8.5 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 25 July 2005.

John Gardiner
Determinations Manager