

Determination 2005/15

Refusal of a code compliance certificate for a building with a “monolithic” cladding system: House 13

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 as amended by section 424 of the Building Act 2004 (“the Act”). The applicants are the owners of the property (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 7-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 that the external wall cladding (“the cladding”), which is applied to the walls of this house, 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.
- 1.6 The house itself is described in paragraphs 2.1 to 2.4, and paragraph 8 sets out my decision.

2 PROCEDURE

The building

- 2.1 The building is a large two-storey detached house, with floors set at 3 different levels. It is situated on a gently sloping site, which is in a medium wind zone in terms of NZS 3604: 1999 “Timber framed buildings”. The house is of conventional light timber frame construction with driven timber pile foundations, except for a double garage, which has a concrete slab on concrete block foundations. The master bedroom is situated over the garage, and includes a small, cantilevered deck. Another larger timber deck extends from the ground floor living areas. The balustrades to both decks are framed and clad on both sides and tops with the same material as the wall cladding. All windows are aluminium, and external walls are sheathed with monolithic cladding. The house shape is reasonably simple in plan, with the 45° pitched roof clad in shingles laid over plywood. The roof is made up of a series of gables and hips, with a number of complex junctions, terminations and wall to roof intersections. Copper gutters are fixed to stained timber fascias mounted over the wall cladding, with no roof projections at eaves and verges.
- 2.2 I have not received any written evidence, by means of invoices or other documentation, on the treatment, if any, of the timber purchased for the house construction. As noted in paragraph 5.3 some evidence was obtained from on-site observation.
- 2.3 The cladding is a monolithic cladding system described as stucco over a solid backing. As indicated in the detail sheets of March 1995 produced by the supplier of the plaster coating system (“the manufacturer’s instructions”), the cladding consists of fibre cement sheets fixed through the building wrap directly to the framing timbers, and covered with a solid screed that is finished with a thin coat of mesh reinforced plaster coating. The manufacturer’s instructions comprise technical data sheets with specifications and typical installation details. The construction details include drawings of typical flashing details for various junctions, but do not cover all of the junctions actually present in the house. 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. All plaster products and the associated components are supplied by the manufacturer, who administers a system of licensed contractors for applying the plaster and

coating system. There is no reference made to requirements for the final paint coating system. An independent organisation carried out an appraisal of the cladding system in 1995 (although the appraisal certificate was withdrawn in July 2004).

- 2.4 The owner has provided “Producer Statements”, dated 28 June 2004 for the supply and application of the plaster and coating system used on the house. The manufacturer notes the date of completion of the work as 8 October 1996.

Sequence of events

- 2.5 The territorial authority issued the building consent number A11235, on 22 August 1996. None of the “Building Consent Conditions” attached to the consent referred to the cladding.

- 2.6 The territorial authority made various inspections during the course of construction, and approved the “Preline Building Inspection” on 4 November 1996, and the “Post Line Inspection” on 16 December 1996. A “Final Building Inspection” of plumbing and drainage was carried out on 15 December 1997, as confirmed by a copy of the “Building Control Officers Field Memorandum 15117” and noted that a number of items required completion.

- 2.7 The house was sold to the current owner in December 2001.

- 2.8 I have not received any evidence of further inspections until the recheck of outstanding plumbing and drainage items on 10 November 2003, as confirmed by a copy of the “Building Control Officers Field Memorandum 45807”. The “Inspectors Field Inspection Sheet” notes that:

A full final is required. Evidence on site of major leaking, confirmed by present owner.

I have not received any advice on why there was the delay in carrying out the final inspection.

- 2.9 The territorial authority carried out a visual inspection on 13 May 2004 which identified a number of issues in regard to the weathertightness of the wall claddings, as confirmed by the “Completed Monolithic Dwellings without a Cavity” form and accompanying photographs of areas of concerns.

- 2.10 The territorial authority wrote to the owner on 26 May 2004, stating:

We have received your request for a code compliance certificate (CCC) for a dwelling at the above address. As well as addressing the weathertight issues below, the Council has significant concerns over the condition of your property and accordingly herewith attached to this letter is a Notice to Rectify.

Before the council can issue a CCC, we must ensure that all building work meets the NZ Building Code requirements. In particular, the building code specifies that building work must remain durable for specific periods of time after the CCC is issued.

You will be aware of the current weathertightness issues often reported in the media. These issues have highlighted the care that must be taken to establish that all building elements, but particularly cladding, is durable before any CCC can be issued.

As your building is face fixed (monolithic) construction with no cavities we are unable to verify that it fully complies with the Building Code requirements, manufacturer's details application (*sic*) at the time and that it will remain durable for the required period...

The letter outlined a list of items covered by the Notice to Rectify, and noted that:

There has been recent information and knowledge that face sealed cladding systems without an adequate drainage and ventilation cavity will cause irrevocable damage to structural elements in the event of leakage and/or the effect of residual moisture.

Council cannot be satisfied that the cladding system as installed on the above building will meet the functional requirements of Clause E2 External Moisture of the New Zealand Building Code and is therefore unable to issue a CCC.

If you still wish to seek a CCC, you may request a determination from the Building Industry Authority as per section 17 of the Building Act 1991...

Attached to this letter was a Notice to Rectify Building Work issued under section 42 of the Act.

- 2.11 The Notice to Rectify referred to Building Consent No. A11235, and noted that the owner was:

notified to rectify building work on the project described above that are not done in accordance with the Building Act 1991 or the New Zealand Building Code as detailed in the attached "Particulars of Contravention".

- 2.12 The "Particulars of Contravention" attached to the Notice to Rectify noted that:

The nature and extent of the defective works is as follows: -

- 1) Ground clearances to exterior wall claddings are non complying
- 2) Evidence of surface damage to cladding which may affect durability and weathertightness
- 3) No flashings to cantilevered deck joists
- 4) Water damage to interior from leaks requires rectification (*sic*)
- 5) Deck barrier has major defects and does not comply with the building code
- 6) Inappropriate transition of cladding from main floor to the basement – cladding adapted to marry together in a manner not compliant with the building code
- 7) Damage to cladding and inadequate sealing at window joints
- 8) Cracking at deck barrier/wall junction
- 9) Major defects with door and window flashings – non-compliance with building code
- 10) Pipe penetrations are not properly sealed
- 11) Outstanding issues still to be cleared on field memo 15117....

The owner was required to:

Rectify the defective building works to comply with the New Zealand Building Code and the conditions of the issued building consent A11235.

The owner was also required to complete the outlined work within:

... 6 months of the date of this notice, i.e. on or before the 10th December 2004.

- 2.13 The owner applied for this determination on 26 July 2004.

3 THE SUBMISSIONS

- 3.1 The owner did not supply a covering letter, but did include a number of notes and statements within the documentation that accompanied the application of 26 July 2004. A note covering the “Matter of doubt or dispute” included:

When the building of this house was completed in 1997, a number of items had to be rectified - (see attached copy) – to obtain a Code (*sic*) Of Compliance.

Unfortunately, the previous owners [named previous owners] delayed doing the work required and when we purchased the property in December 2001 they agreed to complete all work required to obtain a C.C.C.

Although we realise this has taken some considerable time, all such work was completed and a final Building Inspection was carried out in May 2004, but because of the Weathertightness Issue now, a C.C.C. was declined.

As the house was built to meet all council requirements and specifications at the time, we dispute many of the items the North Shore City Council has listed as defective.

We would also like to add, that other than a leak in the garage some time ago which was repaired and has not leaked since, we have experienced no dampness or leaking whatsoever.

The owner also included a statement regarding the treatment of the timber framing which noted that:

We are unable to provide documentation, but the suppliers of the above...
..., advise us that at the time of building the wall frames and trusses were all Boric treated.

The only way to prove this conclusively is to have the material tested which we are happy to do if required.

Included also within the supporting documentation was a statement dated 22 June 2004, from the architect for the consent drawings of the house, who noted that:

...I wish to record that, to the best of my knowledge, the above mentioned house was built in accordance with the plan and the regulations at that time.

Although I did not supervise the construction, the carpentry and the main part of the structure was erected by [named builder], a reputable builder, whom I have subsequently recommended on a number of occasions. He has completed these projects in an exemplary way, one of them being my own home.

The building is clad in plastered [proprietary product], produced by a well-known nationwide company, whose specification underwrote the usage at that time.

- 3.2 The owner also supplied copies of:

- The plans of the house, dated 15 July 1996;

- The territorial authority's inspection documentation;
 - The correspondence with the territorial authority;
 - Producer statements from the manufacturer and applicator of the plaster system;
 - A structural engineer's producer statement construction review, dated 13 November 2001, of the driven pile foundations and concrete slab on grade; and
 - A registered surveyor's letter dated 15 November 2001, confirming the position and height of the house.
- 3.3 In a covering letter to its submission, dated 24 September 2004, the territorial authority noted that:

After assessment of the above consent for a "code compliance certificate" (CCC) Council are unable to ascertain within reasonable grounds that some building work including cladding comply with relevant clauses of the building code.

The territorial authority went on to include the following points within a brief summary of its involvement with the construction of the house:

- Standard council inspections such as footings, preline, postline, and final inspections were undertaken during the period September 1996 to December 1997.
- No specific inspections were recorded for external cladding system. Face fixed cladding systems without cavities were under scrutiny by council at the time and an additional visual inspection was undertaken to address cladding aspects.
- A weathertightness visual inspection undertaken on 13 May 2004. Please refer to photographs to understand some of the problems. More photographs are available in council file.

The territorial authority went on to say;

It is noted that monolithic cladding systems are being continuously tested, improved and detailing revised. New knowledge indicates that monolithic systems should have a drainage cavity to perform its function meeting durability requirements of the Building Code. The issues such as high risk design, installation by licensed installers, selection of approved coating system, coating application by licensed applicators, quality control systems of suppliers, installers and applicators, specific independent inspections during installation have further complicated compliance verification process. New E2 document confirms the importance of the above issues.

Council is unable to be satisfied on reasonable ground that compliance of various other building items, which require 5 and 15 years durability, can be achieved considering the age of construction. Final inspection was undertaken in December 1997. The issue of compliance with clause B2 of the Building Code should be addressed in the determination.

- 3.4 The territorial authority also supplied copies of:
- The consent documentation;

- The territorial authority's inspection documentation up to 15 December 1997;
 - Notes and photographs taken during the visual inspection of 13 May 2004; and
 - The correspondence with the owner.
- 3.5 The 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 B2.3.1 and E2.3.2 of the building code (First Schedule, Building Regulations 1992) is correct. Those provisions of the building code provide:

Clause B2 DURABILITY

B2.3.1

Building elements must, with only normal maintenance, continue to satisfy the performance requirements of this code for the lesser of the specified intended life of the building, if stated, or:

- (a) The life of the building, being not less than 50 years, if:
 - (i) Those building elements (including floors, walls, and fixings) provide structural stability to the building, or
 - (ii) Those building elements are difficult to access or replace, or
 - (iii) Failure of those building elements to comply with the building code would go undetected during both normal use and maintenance of the building.
- (b) 15 years if:
 - (i) Those building elements (including the building envelope, exposed plumbing in the sub floor space, and in-built chimneys and flues) are moderately difficult to access or replace, or
 - (ii) Failure of those building elements to comply with the building code would go undetected during normal use of the building, but would be easily detected during normal maintenance.

Clause E2—EXTERNAL MOISTURE

E2.1 The objective of this provision is to safeguard people from illness or injury, which could result from external moisture entering the building.

E2.2 Buildings shall be constructed to provide adequate resistance to penetration by, and the accumulation of, moisture from the outside.

E2.3.2 Roofs and exterior walls shall prevent the penetration of water that could cause undue dampness, or damage to building elements.

- 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 about acceptable solutions and alternative solutions, which in my view remain valid:
- 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; and
 - Usually, however, 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 Authority commissioned an independent expert (“the expert”) to inspect and report on the cladding. The expert inspected the building and furnished a report, noting that there appeared to be no significant variations in floor layout from the consent drawings and that the quality of finish to the cladding appeared to be generally of average standard.

The expert also took a series of initial interior non-invasive moisture readings around all openings and other areas considered to be high risk in terms of potential water penetration. Areas showing elevated moisture readings were then subjected to further testing through holes drilled through the exterior cladding at more than 40 locations.

At 40 locations readings of 18% and above were recorded, with 6 locations recording readings over 40% and beyond the limits of the moisture meter to measure. Moisture levels of 18% and above recorded after the cladding is in place generally indicate that external moisture is entering the structure, while 30% moisture levels indicate fibre saturation and 40% moisture levels indicate the presence of water in liquid form. The significant readings are included with following specific comments made by the expert in regard to the cladding:

- Readings at the jamb/sill junctions of two adjacent corner windows indicated a moisture level of 40%. Removal of a small section of cladding showed that the corner framing was soaked, although the framing was still solid with no obvious sign of decay;
- From this representative cut, it appeared that the manufacturer’s instructions had been followed in part, with plaster layers thicker than the minimum recommended and the same extrusion used for both sill and jamb flashings as specified at the time of installation. However, the sill flashing did not

extend 20 mm beyond the window as specified to allow moisture collected by the jamb flashings to escape to the outside;

- A total of 20 readings were taken under the corners of windows on all elevations of the house. All readings were over 18% with half of these over 30%, indicating that moisture penetration around windows is widespread and significant. The drilling under one large window showed readings of over 40% and the presence of soft black timber;
- The largest timber deck has spaced timber decking that penetrates the cladding. This has resulted in water penetration and decay of the adjacent boundary floor joist. A moisture reading of more than 40% was recorded in the joist, which is clad in unplastered fibre cement backing sheet with no drip edge. The sheet has also been penetrated by bolt fixings to the deck joists. Water penetration into the boundary joist is evident, with signs of soft wet timber and water staining;
- The small cantilevered deck above the garage shows evidence of water penetration into the wall framing. Moisture readings of 32% and more than 40% were recorded in the wall below the deck. A sheet of lining had been removed by the owner from the adjacent garage ceiling, and this indicated water penetration into the adjacent particleboard flooring and the infill nogs between the cantilevered deck joists. The bottom of the wall below the deck was drilled and advanced decay was indicated by the soft black matter removed from the bottom plate during drilling;
- Cantilevered deck joists penetrate the cladding. Without saddle flashings, the joist/cladding junction is vulnerable to water penetration, and it is likely that this has added to the high moisture levels recorded in both of the deck areas;
- There are no saddle flashings installed where the tops of plastered deck balustrades meet the wall cladding. Although these were not a manufacturers requirement at the time of installation, there are signs of potential water entry developing. The wall stud above one junction recorded a moisture content of 38%. A large crack has developed at another balustrade/wall junction which will allow water to enter the framing;
- Many penetrations through the wall cladding appear to be poorly sealed or not sealed at all. Three fence posts have been nailed directly through the wall cladding, creating areas vulnerable to water penetration through the fixings. In one confined area of wall, the electric meter box has been poorly sealed, the gas meter below is surrounded by unsealed fibre cement backing sheet, the hose tap is poorly sealed, and telephone cabling has left areas of broken unsealed plaster. The moisture level in the bottom plate of this wall area was recorded as 32%;
- In another area, water pipe penetrations were unsealed, and the moisture content below was recorded as over 40%. Other areas of concern were fixings of light fittings, waste pipe penetrations and the bolt fixings of a pergola through the wall cladding;

- The cedar frame of the garage door projects beyond the face of the wall cladding, with no flashing to the head or jambs. Moisture readings at the door head were 24%, while those from the bottom of one trimmer stud was 40%;
- Most wall areas have insufficient clearance from the bottom of the cladding to the adjacent ground or paving levels. Some paving levels are above the bottom edge of the wall cladding, effectively burying the plaster coating. Two such areas are at one side of the garage door where the moisture content was recorded as over 40%, and on either side of the main entry doors where the moisture content was also recorded as over 40%;
- As raised by the territorial authority, one area of wall contains the horizontal junction of two walls at varying vertical planes. The change has been accommodated by bridging the difference with fibre cement. However, although the treatment is unconventional, moisture contents appear to suggest that no water entry has yet occurred; and
- There is one roof to wall junction where a sloping apron flashing terminates within the wall plaster, without any flashing to divert water away from the cladding. There are also areas where fascia boards at internal corners stop clear of the cladding. This may allow water to drain but also exposes the unsealed backing sheets. However, using non-invasive testing only, no indication of raised moisture levels were noted around these areas.

5.2 The expert summarised the areas of water penetration into the wall framing as being associated with:

- the windows and the garage door;
- areas at the main entrance and garage doors where wall cladding has been buried by paving;
- timber decks; and
- various other unsealed penetrations through the wall cladding.

5.3 I noted in paragraph 2.2 that I have seen no written evidence regarding the treatment, if any, of the timber used in this house. However, the expert noted that, during inspections, small sections of the wall framing were accessible. However none of the timber treatment markings were legible, except for the H3 stamps on the cantilevered deck above the garage. From the condition of the framing exposed by the area cut out of the cladding the expert concluded that, despite the lack of markings, framing is likely to have been boric treated as, although there was a considerable amount of moisture present, the timber in that area appeared to be hard and sound.

5.4 The expert also noted, in observing the area of cladding cut out during investigations, that the thickness of all coats of plaster were equal or above the minimum required by the manufacturer. The expert considered that the plaster coating of the house generally showed little evidence of cracking after more than 7 years in place, despite the lack of control joints.

5.5 Copies of the expert's report were provided to each of the parties. The parties made no further comment on 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 B2.3.1 and E2.3.2, 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.

Weathertightness risk

- 6.2 Research data and experience, both internationally and locally, indicates that the impact of weathertightness problems in monolithic clad houses can be minimised if good and effective design and construction practices are followed.
- 6.3 The installation of exterior cladding to manufacturer's specifications and to accepted good trade practice is an important but not the only requirement to ensure good weathertightness performance.
- 6.4 The next priority is to reduce the ability of moisture to get through the cladding by using design measures that minimise the effects of the rain impacting on the walls.
- 6.5 Important matters for consideration are:
- Data show a strong relationship between the width of the eaves and the incidence of wall leaks. An effective deflection mechanism, such as eaves greater than 600 mm wide, has been shown by Canadian data to manage more than 90% of rain incidence;
 - While most reported leaks are substantially caused by defects in the cladding that require little or no wind pressure differential, I believe that buildings in high and very high wind zones (as defined by NZS 3604) are likely to experience wind pressure differentials and thus a higher risk of water ingress;
 - Taller buildings result in an effective increase in the catchment area of the wall. Available data suggests a clear correlation between higher number of storeys and an increased incidence of leaking;
 - Complex roofs and overall envelope shapes where the roofs frequently intersect with the walls on upper floors create opportunities for leaks into the wall; and
 - Recent data also shows that decks and balconies that are exposed in plan and/or cantilevered from the external walls are the most frequent location for water leaks.

6.6 Any likely penetration of moisture through the cladding can then be countered by a combination of effective drainage, ventilation of the drainage cavity and moisture tolerance in the external wall framing timber. In particular:

- The structure should allow water that has penetrated the cladding to drain out as quickly as possible. It is believed that generally a drainage cavity should be provided behind the outer cladding barrier in monolithic construction;
- The design of the outer walls should allow walls to dry to the outside once moisture penetrates the cladding and the moisture barrier. If walls do not dry, decay fungi can become established in as little as 3 months. Until scientific data on the optimum depth and configuration of the ventilation mechanism in New Zealand conditions is available, I believe that the drainage cavity should be not less than 20 mm deep; and
- The external walls should have some degree of decay resistance or moisture tolerance to allow for situations when moisture circumvents the cladding and moisture barriers and moisture levels in the timber rise to more than 18%.

6.7 In relation to these characteristics, I find that this house:

- Has no verge or eave projections to provide protection to the cladding under them;
- Is in a medium wind zone;
- Is a maximum of two storeys high;
- Has exterior joinery units with head flashings, but there is doubt as to the adequacy of the jamb to sill flashing junction because there is significant moisture present in the framing beneath the windows;
- Has an overall envelope that is fairly simple on plan, but with a complex roof system having numerous hip, valley and wall to roof junctions;
- Has two open decks, with the upper deck supported on cantilevered joists. Both decks have framed and clad balustrades, with the plaster coating on both sides and top. Neither of the decks is constructed over a living space;
- Has cladding fixed directly to the framing with no drainage cavity;
- Has cantilevered joists to the upper deck that are H3 treated, as confirmed by the presence of treatment marks on the timber; and
- Has external walls that I consider, on the basis of the expert's observations in paragraph 5.3, are likely to be constructed with H1 Boric treated timber, which may delay but would not prevent the onset of decay if the framing absorbs and retains moisture.

Weathertightness performance

- 6.8 I find that the cladding in general does not appear to have been installed according to good trade practice and to the manufacturer's instructions. As a result, there are a number of identified defects that are set out in paragraph 5.1 and in the expert's report, which have contributed to the penetration of the moisture and decay damage already evident in many areas.
- 6.9 I consider that, as the faults apparent in the cladding are so pronounced, I cannot accept that the cladding complies with the relevant requirements of the building code. The main areas of concern are:
- The failure of the window to wall junctions to prevent significant water penetration into the wall framing, and the onset of decay in several areas;
 - The inappropriate connections of both decks through the cladding, and the lack of flashings at these junctions. Deck timbers have been buried within the plaster coating with no gap to facilitate drainage at this point. Moisture is entering the framing at deck level through the timber deck slats, the joist junction and the connections;
 - The timber framed and fully clad balustrades to the decks are inappropriately connected to the main cladding and lack the protection of saddle flashings to the junction. The condition of the plaster to the tops of the balustrade and the lack of clearance of the balustrade cladding to the adjacent timber deck also present risks of water penetration into the balustrade framing;
 - The lack of adequate clearances between the bottom of the wall cladding and the adjacent paving levels has allowed water penetration into the framing, resulting in very high moisture levels in a number of areas;
 - The inadequate weatherproofing of the garage door frame, resulting in moisture penetration into the surrounding framing; and
 - The inadequate weatherproofing of service penetrations through the cladding together with the fixing penetrations provided by the attachment of fence posts and the pergola to the house framing. These penetrations have allowed moisture penetration into the associated wall framing timbers.
- 6.10 The territorial authority has claimed that it had not undertaken any previous inspections for the cladding. However, I note that, as set out in paragraph 2.6, the territorial authority carried out both "Preline" and "Postline" inspections.
- 6.11 I note that three elevations of the house demonstrate a medium weathertightness risk rating, and one elevation of the house demonstrates a high weathertightness risk rating 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, but must be supplemented at the time of issuing a code compliance certificate by careful inspection of the building as actually built.

7 CONCLUSION

- 7.1 I am satisfied that the performance of the cladding has been reduced because it has not been installed according to good trade practice. In particular, it demonstrates the key defects listed in paragraph 6.9. I have also identified the presence of a range of known weathertightness risk factors in this design. The presence of the risk factors on their own is not necessarily a concern, but they have to be considered in combination with the significant faults identified in the cladding system. It is that combination of risk factors and faults that indicate that the structure does not have sufficient provisions that would compensate for the lack of a drained and ventilated cavity. Consequently, I am not satisfied that the cladding system as installed complies with clause E2.3.2 of the building code.
- 7.2 I find that, because of the extent and apparent complexity of the faults that have been identified with this cladding, I am unable to conclude, with the information available to me, that remediation of the identified faults, as opposed to partial or full re-cladding, could result in compliance with clause E2.
- 7.3 In addition, the building 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 cladding faults in the house will allow the ingress of moisture in the future, the house does not comply with the durability requirements of clause B2.3.1 of the building code.
- 7.4 I note that, once the building has been made compliant with the building code, effective maintenance of its monolithic claddings is important to ensure ongoing compliance with clause B2. 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 Finally, I am concerned that the inspections carried out by the territorial authority did not identify the numerous faults in the cladding system during the construction of the house. I consider that it is paramount that all such inspections are carried out in a proficient manner, so that any faults can be identified and subsequently rectified at an early stage in the construction or life of a building.
- 7.6 I decline to incorporate any waiver or modification of the building code in my 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 comply with clause E2.3.1 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

requirement 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 note that the territorial authority has issued a Notice to Rectify. The owner is 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, with either of the parties entitled to submit doubts or disputes for another determination.
- 8.3 The Authority has in the past issued a public warning about the danger to people caused by moisture-induced timber decay in deck and balcony construction. I reiterate these concerns in regard to the structural integrity and safety aspects of the decks, including balustrade framing, in this house and emphasise the need for a full investigation of their current state, proper rectification and ongoing inspection and maintenance.
- 8.4 Finally, I consider that the cladding on the building will require on-going maintenance to ensure its continuing building code compliance. This is particularly important, as the cladding has now been in place for some 7 years or so.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 14 February 2005.

John Gardiner
Determinations Manager