Determination 2008/41

Refusal of a code compliance certificate for an 11-year-old house with monolithic cladding at 158B Otonga Road, Rotorua

1. The matter to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004[1] ("the Act") made under due authorisation by me, John Gardiner, Manager Determinations, Department of Building and Housing ("the Department"), for and on behalf of the Chief Executive of that Department. The applicant is the current owner P Punita ("the applicant"); acting through a firm of Barristers and Solicitors ("the solicitors"), and the other party is the Rotorua District Council ("the territorial authority").

1.2 This determination arises from the decision of the territorial authority to refuse to issue a code compliance certificate for a 11-year-old house because it is not satisfied that the building work complies with Clauses B2 "Durability" and E2 "External Moistures" of the Building Code[2] (Schedule 1, Building Regulations 1992).

[1] The Building Act 2004 is available from the Department's website at www.dbh.govt.nz.
[2] The Building Code is available from the Department's website at www.dbh.govt.nz.

1.3 The matters for determination are:

1.3.1 Matter 1: The wall and roof cladding

Whether the cladding as installed on the house ("the cladding") complies with Clause E2 "External Moisture" of the Building Code. By "the cladding as installed" I mean the components of the system (such as the backing materials, the flashings, the joints and the plaster and/or the coatings) as well as the way the components have been installed and work together.

1.3.2 Matter 2: The durability considerations

Whether the elements that make up the construction comply with Building Code Clause B2 "Durability", taking into account the age of the building work.

1.4 In making my decision, I have considered the submissions of the parties, the report of the independent expert ("the expert") commissioned by the Department to advise on this matter, and the other evidence in this matter. I have evaluated this information using a framework that I describe more fully in paragraph 6.

2. The building

2.1 The building work consists of a detached house with a partial basement situated on an excavated sloping site, which is in a medium wind zone for the purposes of NZS 3604[3]. The house is 1-storey high (with an undeveloped subfloor) on the south and west elevations, and 2-storeys high on the north and east elevations. The basement level is specifically engineered, with a concrete slab, concrete block walls and foundations, and a precast concrete first floor slab. The upper level is conventional light timber frame construction, with a 22.5^{o} pitch concrete tile hipped and gabled roof, monolithic cladding and aluminium windows (with planted bands at the window heads). A large window in the north gable end has an arched top. About half of the walls have 600 mm eaves, with the remaining walls having no eaves or verge projections. A monolithic-clad "chimney" structure penetrates the roof at the west end of the living room north wall.

2.2 A large upper level deck, with a tiled concrete floor, sits above the northern and eastern end of the garage. The basement concrete block walls are extended up to form the deck balustrades, which are plastered and fitted with metal handrails. An open timber framed deck, with timber slat flooring and open timber balustrades, extends from the south end of the concrete deck around the southeast corner and timber steps provide deck access from the western end.

2.3 The expert observed no evidence as to timber treatment and I have received no evidence as to the treatment of the exterior timber framing. Although the specification calls for the framing timber to be treated, given the date of the 1997 building work, I am unable to determine the particular level and type of treatment that is described as H1. Given the date of construction and the lack of other

[3] New Zealand Standard NZS 3604:1999 Timber Framed Buildings

evidence, I consider that the external wall framing is unlikely to be treated to a level that will provide resistance to fungal decay.

2.4 The cladding system is what is described as monolithic cladding. In this case, it is EIFS[4], consisting of 40 mm polystyrene backing sheets fixed directly to the framing over the building wrap, to which a textured plaster system and acrylic paint has been applied. The system includes purpose-made flashings to windows, edges and other junctions. I have received no evidence of producer statements or warranties for the cladding.

3. Background

3.1 The territorial authority issued a building consent (No. 96/0437) to the original owner on 19 August 1996, and carried out eight inspections during construction, including a pre-line inspection on 21 April 1997. It appears that the building work was completed during 1997, although no final inspection was carried out and the last inspection was recorded as a drainage inspection on 5 August 1997.

3.2 In a pro-forma letter to the original owner dated 1 October 1998, the territorial authority noted that the building consent had not been "signed off" and requested the owner to contact it to organise an inspection of the building, stating:

> Failure to do this could result in the above Consent being Lapsed or Cancelled. This could possibly jeopardise any future sale of your property.

3.3 In a second pro-forma letter dated 17 December 1998, the territorial authority notified the original owner that, under Section 41 of the Building Act 1991, the building consent had lapsed due to insufficient progress on the building work. The territorial authority noted:

> You should therefore be aware that the inspection card held by the Building Officer will now be filed away on the property file as a cancelled consent and could jeopardise any future sale of your property

3.4 I am not aware of any further correspondence between the original owner and the territorial authority and the applicant purchased the house in February 2005, apparently unaware of the lack of a code compliance certificate.

3.5 In a letter to the solicitor dated 16 December 2005, the territorial authority noted that it had not carried out a final inspection, nor had the owner requested a code compliance certificate. The territorial authority referred to a previous letter received from the solicitor (which I have not seen). The solicitor's letter had apparently referred to an independent report that had raised the possibility of weathertightness issues, and the territorial authority stated:

> Obviously, if such issues exist, the Council will not be issuing a Code Compliance Certificate.

3.6 It appears that the applicant subsequently arranged for some repairs and remedial work to be carried out, and sought a final inspection and code compliance certificate from the territorial authority.

[4] External Insulation & Finish System

3.7 Following a telephone discussion on 17 April 2007, the territorial authority wrote to the applicant on 19 April 2007 acknowledging her concerns about the lack of a code compliance certificate for the house. The territorial authority outlined the history of the building work, and stated:

> You will be aware that almost 10 years has now passed since the last recorded inspection. Your solicitor will also be aware the Council's liability under the Building Act has a limit of 10 years and that liability period is almost up. Because of this, Council will not issue a Code Compliance Certificate as this could invoke a further 10 years of liability.
>
> However, you can apply to the Department of Building and Housing for a Determination in terms of possibly backdating the Code Compliance Certificate to say the date of the last inspection. That Determination would be binding on Council and would solve your problem.
>
> Council has no reason to believe that the dwelling does not comply with the Building Consent and the inspections recorded that everything was done in accordance with the Consent and the Building Code. But as stated, Council will not revisit for the reason mentioned above.

3.8 On 17 July 2007, the Department received an initial application for a determination from the solicitor on behalf of the owner, and application matters were finalised by 30 August 2007. The Department sought advice from the solicitor with regard to acknowledgement of the application from the other party, and the solicitor confirmed that documentation had been forwarded to the territorial authority on 14 September 2007. Work on the determination commenced, limited to addressing durability considerations arising from the building's age.

3.9 However, it appears that the territorial authority carried out an inspection of the cladding on 17 September 2007 despite its earlier assertion that it believed the building was code compliant (refer paragraph 3.7). The territorial authority's undated report and photographs (refer paragraph 4.4) included the following matters:

- A number of weathertightness concerns were identified.
- Investigation had revealed that the house had leaked in the past.
- Remedial work had been carried out without the territorial authority's involvement or approval.
- The cladding had been changed from the building consent documents.

3.10 In a facsimile to the Department dated 24 September 2007, the territorial authority advised that:

> We now have reservations around the building's ability to comply with E2 and B2. (After a site visit last week).

3.11 Due to the apparent conflict between the matters outlined in paragraph 3.7 and 3.10, the Department asked the territorial authority for clarification on the matters to be determined. In an email to the Department dated 25 September 2007, the territorial authority stated:

> Once we had notification a determination had been applied for, we thought it prudent to visit the site to assess for ourselves the level of compliance with the code as the time since we last visited the building was over 10 years.

3.12 On 1 October 2007 the Department received documentation from the territorial authority, which clarified the matters to be determined (refer paragraph 4.3).

4. The submissions

4.1 In a letter to the Department dated 4 July 2007, the solicitor explained that the applicant had realised that the house did not have a code compliance certificate following its purchase and noted:

> The Rotorua District Council will not now issue a Code of Compliance Certificate but it has been suggested to our client that she make this application for determination in terms of backdating the Code of Compliance Certificate to 15 August 1987 being the last date of inspection.

4.2 The solicitor forwarded copies of:

- the plans and specification
- the building consent application
- the territorial authority's inspection summary
- some of the correspondence with the territorial authority.

4.3 In a letter to the Department dated 27 September 2007 (refer paragraph 3.12), the territorial authority stated that the inspection of the cladding had supported:

> ...the Rotorua District Council's belief that the building at the above address doesn't meet clauses E2 and B2 of the New Zealand Building Code.

4.4 The territorial authority forwarded copies of:

- the plans
- a cladding inspection report (undated), with attached photographs.

4.5 Copies of the submissions and other evidence were provided to each of the parties. Neither party made any further submission in response to the submission of the other party.

4.6 The draft determination was sent to the parties on 7 November 2007. The draft was issued for comment and for the parties to agree a date when the building complied with Building Code Clause B2 "Durability".

4.7 Both parties accepted the draft without comment (the applicant's response was not received until April 2008).

4.8 The territorial authority submitted that compliance with Clause B2 was achieved in December 1997. The applicants have agreed with this date.

5 The expert's report

5.1 As discussed in paragraph 1.4, I engaged an independent expert to provide an assessment of the condition of those building elements subject to the determination. The expert is a member of the New Zealand Institute of Building Surveyors.

5.2 The expert inspected the wall and roof claddings on 15 October 2007, and furnished a report that was completed on 17 October 2007. The expert observed that some new flashings had been installed, some repairs had been carried out, and the house had been recently repainted. The expert noted that the building work was "generally fair", with the finishing and paintwork of an acceptable standard. However, the expert also noted that the cladding had been "poorly installed with little thought given to weatherproofing" and the flashings showed that "little thought has been given to weatherproofing details". I note that control joints are not specified by EIFS manufacturers as necessary for the dimensions of cladding used on this house.

5.3 The expert observed a number of variations from the amended consent drawings, noting that:

- the cladding was changed from solid plaster to EIFS
- the timber pergola above the garage door has not been built
- a timber slat deck, with steps, has been added adjacent to the concrete deck
- no step down from the interior to the concrete deck has been provided
- the overflow to the concrete deck has not been provided
- various remedial flashings have been added.

5.4 The expert noted that the windows are recessed, with no head flashings (except at one arched-top window). The expert also noted that only two of the doors had head flashings. The expert removed a small section of coating at the jamb to sill junction of 2 windows, and noted uPVC jamb and sill flashings with no sealant or soakers at the junction. I accept that the exposed junctions are typical of similar locations in the building.

5.5 The expert inspected the interior of the house and subfloor and observed evidence of moisture under the stairs in the main entry, in the garage below an unsealed deck drain and in the unventilated subfloor area. The expert took non-invasive moisture readings internally around the house. Where elevated readings were noted, invasive readings were taken into the framing and 4 elevated readings were recorded. The expert also took 17 invasive moisture readings through the cladding at risky locations, and 11 elevated readings were recorded. The following was noted:

- 21% in the bottom of the strapped concrete block walls of the basement ensuite.
- 22% in the bottom of the strapping in the corner of the basement studio.
- 22% into the timber sill reveal of the master bedroom deck door.
- 22% into the timber sill reveal of the living room deck door.
- 22% in the framing under the north window of bedroom 2.
- 18% at the junction of the concrete block balustrade with the wall.
- 25% in the bottom plate of the southeast corner of the dining room.
- 40% in the bottom plate of the south wall of the dining room.
- 18% at the jamb of the south wall of the bathroom.

- 40% in the bottom plate of the northwest corner of bedroom 2.
- 40% in the bottom plate of the northwest corner of the wardrobe.

I note that the lower moisture content figures generally varied between 11% and 14%, representing the likely equilibrium moisture levels in the framing. Moisture levels that vary significantly from equilibrium moisture levels after cladding is in place generally indicate that external moisture is entering the structure.

5.6 Commenting specifically on the walls, the expert noted that:

- the tanking over the concrete block retaining walls is unprotected
- there is insufficient overlap of the cladding over the lower concrete block walls
- most of the windows and doors lack head flashings, the window jamb flashings butt into the sill flashings with no seals or soakers at the junctions and there is no drainage gap provided at the sill flanges
- there is no step down from the inside to the outside decks, the door frames sit directly onto the concrete slab and debris building up against the wall is allowing water to penetrate at the timber sill reveals
- although remedial flashings have been installed at the concrete deck to wall junction, these are butted against the metal door flanges, with sealant at the joint, and there are gaps at the door jambs that allow moisture penetration into the wall
- the concrete deck has little fall, the drainage outlet above the garage is unsealed and the deck has no provision for overflow drainage at the northwest end
- the concrete block balustrade butts against the master bedroom wall, with no flashing at the junction
- the timber deck floor is level with the interior floor and the timber slats butt against the cladding, with no drainage gap provided
- the chimney capping is not flashed
- the ends of fascias are embedded into the coating in some areas, and there are gaps apparent at the wall to gutter soffits in some areas
- there is a small triangular section of unsealed cladding above the east wall of the master bedroom, which sits on top of the roof tiles without an apron flashing.

5.7 Commenting specifically on the roof, the expert noted that:

- the verges are finished with metal fascias that are not over-flashed against the roof tiles, resulting in perished underlay and wet framing
- there is evidence of vermin entry through gaps at eaves and verges (with nest debris in several areas), and concealed gutters are allowing moisture penetration in some areas
- a tile at the top of the verge above bedroom 2 has lifted.

5.8 The expert also noted that there are no anti-ponding boards below the eaves tiles.

5.9 A copy of the expert's report was provided to each of the parties on 23 October 2007.

6 Evaluation for code compliance

6.1 Evaluation framework: exterior cladding

6.1.1 In evaluating the design of a building and its construction, it is useful to make some comparisons with the relevant Acceptable Solutions[5], which will assist in determining whether the features of the building work are code compliant. However, in making this comparison, the following general observations are valid:

- Some Acceptable Solutions are written conservatively to cover the worst case, so that they may be modified in less extreme cases and the resulting alternative solution will still comply with the Building Code.
- Usually, when there is non-compliance with one provision of an Acceptable Solution, it will be necessary to add one or more other provisions to compensate for that in order to comply with the Building Code.

6.1.2 The approach in determining whether building work is weathertight and durable and is likely to remain so, is to apply the principles of weathertightness. This involves the examination of 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 Department and its antecedent, the Building Industry Authority, have also described weathertightness risk factors in previous determinations[6] (for example, Determination 2004/1) relating to cladding and these factors are also used in the evaluation process.

6.1.3 The consequences of a building demonstrating a high weathertightness risk is that building solutions that comply with the Building Code will need to be more robust. Conversely, where there is a low weathertightness risk, the solutions may be less robust. In any event, there is a need for both the design of the cladding system and its installation to be carefully carried out.

6.2 Weathertightness risk

6.2.1 In relation to these characteristics I find that this house:

- is built in a medium wind zone
- is two storeys high in part
- is fairly complex in plan and form
- has monolithic cladding fixed directly to the framing, with concrete block walls to the basement level
- has a concrete slab floor to the upper level
- has no verge projections, with eaves projections of 600 mm above most walls

[5] An Acceptable Solution is a prescriptive design solution approved by the Department that provides one way (but not the only way) of complying with the Building Code. The Acceptable Solutions are available from The Department's Website at www.dbh.govt.nz.
[6] Copies of all determinations issued by the Department can be obtained from the Department's website.

- has an upper level deck with a concrete floor and concrete block balustrades, situated above garage areas
- has an attached open timber deck with spaced timber decking
- has external wall framing, most of which is unlikely to be treated to a level that provides resistance to the onset of decay if the framing absorbs and retains moisture.

6.2.2 The house has been evaluated using the E2/AS1 risk matrix. The risk matrix allows the summing of a range of design and location factors applying to a specific building design. The resulting level of risk can range from 'low' to 'very high'. The risk level is applied to determine what claddings can be used on a building in order to comply with E2/AS1. Higher levels of risk will require more rigorous weatherproof detailing; for example, a high risk level is likely to require a particular type of cladding to be installed over a drained cavity.

6.2.3 The weathertightness features outlined in paragraph 6.2.1 show that two elevations of this house demonstrate a low weathertightness risk rating and two elevations a moderate risk rating. I note that, in order to comply with E2/AS1, the monolithic cladding on this building would require a drained cavity to the north and east elevations.

6.3 Weathertightness performance: exterior cladding

6.3.1 Generally the cladding and the roofing do not appear to have been installed in accordance with good trade practice, and I accept the expert's opinion that remedial work is necessary in respect of:

- the lack of protection for the tanking to the concrete block retaining walls
- inadequate overlaps of the cladding over the concrete block walls
- the lack of window head flashings, the inadequate jamb to sill junctions and the lack of provision for drainage at window sill flanges
- the lack of a step down from the interior floor to the deck floors, resulting in poor weatherproofing of the deck to wall junctions and moisture penetrating the bottom plate adjacent to joinery
- inadequate weatherproofing of the remedial deck to wall flashings
- the lack of overflow drainage and the unsealed drains in the concrete deck
- inadequate weatherproofing of the junction of the concrete block balustrade with the wall
- the lack of provision for drainage between the cladding and the timber decking
- the lack of flashings at the chimney capping
- the embedded fascia ends and the gaps along some metal soffits
- the unsealed and unflashed section of cladding above the master bedroom
- the lack of flashings at the verges

- the gaps at eaves and verges in some areas, allowing vermin entry
- the inadequate weatherproofing of some concealed gutters.

6.3.2 I note the expert's comment in paragraph 5.8 about the lack of anti-ponding boards below the eaves tiles. However the roof pitch to this house is 22.5°, and E2/AS1 does not call for anti-ponding boards to be installed for roof pitches over 17°.

6.3.3 Notwithstanding the fact that the cladding is fixed directly to the timber framing, thus limiting drainage and ventilation behind the cladding, I have noted certain compensating factors that assist the performance of the cladding in this particular case:

- two of the elevations are assessed as having a low weathertightness risk, and would not require a drained cavity in order to comply with E2/AS1
- the lower level walls are concrete block and the upper floor is concrete
- the house has eaves overhangs that provide good protection to about half of the upper walls
- the moisture penetration appears limited to areas where defects have been identified.

6.3.4 I consider that these factors help compensate for the lack of a drained cavity to the walls, and can assist the building work to comply with the weathertightness and durability provisions of the Building Code.

Matter 1: The wall and roof cladding

7 Discussion

7.1 I consider the expert's report establishes that the current performance of the cladding is not adequate because it is allowing water penetration into the building at present in isolated instances associated with joinery installation. Consequently, I am satisfied that the building work does not comply with Clause E2 of the Building Code.

7.2 In addition, the building work 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 on the building are likely to continue to allow the ingress of moisture in the future, the house does not comply with the durability requirements of Clause B2. I have given further consideration to the question of B2 compliance under Matter 2 of this determination.

7.3 Because the faults identified with the cladding system occur in discrete areas, I am able to conclude that satisfactory rectification of the items outlined in paragraph 6.3.1 will result in the building becoming and remaining weathertight and in compliance with Clauses B2 and E2.

7.4 I emphasise that each determination is conducted on a case-by-case basis. Accordingly, the fact that particular cladding systems have been established as being code compliant in relation to a particular building does not necessarily mean that the same cladding systems will be code compliant in another situation.

7.5 Effective maintenance of claddings is important to ensure ongoing compliance with Clauses B2 and E2 of the Building Code and is the responsibility of the building owner. The Department has previously described these maintenance requirements, including examples where the external wall framing of the building may not be treated to a level that will resist the onset of decay if it gets wet (for example, Determination 2007/60).

Matter 2: The durability considerations

8 Discussion

8.1 There are concerns about the durability, and hence the compliance with the building code, of certain elements of the building taking into consideration the age of the building work completed in 1997. However I note that the territorial authority's inspection records indicate that no final inspection was undertaken in 1997 to verify compliance with Clause B2 at that time.

8.2 The relevant provision of Clause B2 of the Building Code requires that building elements must, with only normal maintenance, continue to satisfy the performance requirements of the Building Code for certain periods ("durability periods") "from the time of issue of the applicable code compliance certificate" (Clause B2.3.1).

8.3 These durability periods are:

- 5 years if the building elements are easy to access and replace, and failure of those elements would be easily detected during the normal use of the building
- 15 years if building elements are moderately difficult to access or replace, or failure of those elements would go undetected during normal use of the building, but would be easily detected during normal maintenance
- the life of the building, being not less than 50 years, if the building elements provide structural stability to the building, or are difficult to access or replace, or failure of those elements would go undetected during both normal use and maintenance.

8.4 The 10-year delay between the substantial completion of the building work in 1997 and the applicant's request for a code compliance certificate raises the matter of when all the elements of the building complied with Clause B2. I have not been provided with any evidence that the territorial authority did not accept that those elements complied with Clause B2 at a date in 1997.

8.5 It is not disputed, and I am therefore satisfied, that all the building elements complied with Clause B2 on 1 December 1997. This date has been agreed between the parties, refer paragraph 4.8.

8.6 In order to address these durability issues when they were raised in previous determinations, I sought and received clarification of general legal advice about waivers and modifications. That clarification, and the legal framework and procedures based on the clarification, is described in previous determinations (for example, Determination 2006/85). I have used that advice to evaluate the durability issues raised in this determination

8.7 I continue to hold that view, and therefore conclude that:

(a) the territorial authority has the power to grant an appropriate modification of Clause B2 in respect of all the building elements.

(b) it is reasonable to grant such a modification, with appropriate notification, because in practical terms the building is no different from what it would have been if a code compliance certificate for the building work had been issued in 1997.

8.8 I strongly recommend that the territorial authority record this determination and any modifications resulting from it, on the property file and also on any LIM issued concerning this property.

9. What is to be done now?

9.1 I note that the territorial authority has not issued a notice to fix. The territorial authority should now issue a notice to fix that requires the owners to bring the building into compliance with the Building Code, incorporating the defects listed in paragraph 6.3.1 and referring to any further defects that might be discovered in the course of rectification. The notice to fix should not specify how those defects are to be fixed. That is a matter for the owner to propose and for the territorial authority to accept or reject.

9.2 I suggest that the parties adopt the following process to meet the requirements of paragraph 9.1. Initially, the territorial authority should issue the notice to fix. The owner should then produce a response to this in the form of a detailed proposal, produced in conjunction with a competent and suitably qualified person, as to the rectification or otherwise of the specified issues. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

9.3 I note that changes were made to the house that are not recorded as amendments on the consented plans, and I consider that the matters highlighted in paragraph 5.3 need to be resolved to the satisfaction of the territorial authority.

10 The decision

10.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the house does not comply with Clauses E2 and B2 of the Building Code. Accordingly, I confirm the territorial authority's decision to refuse to issue a code compliance certificate.

10.2 I also determine that:

(a) all the building elements installed in the alterations and extensions, apart from the items that are to be rectified as described in this determination, complied with Clause B2 on 1 December 1997.

(b) the building consent is hereby modified as follows:

> The building consent is subject to a modification to the Building Code to the effect that, Clause B2.3.1 applies from 1 December 1997 instead of from the time of issue of the code compliance certificate for all building elements constructed under the original building consent except those items to be rectified as described in paragraph 6.3.1 of Determination 2008/41 and contained in the notice to fix arising from the determination.

(c) the territorial authority is to issue a code compliance certificate in respect of the building consent as amended, once the matters set out in paragraph 6.3.1, have been fixed to its satisfaction.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 27 May 2008.

John Gardiner
Manager Determinations