

## Determination 2008/31

### Determination regarding a Notice to Rectify for additions and alterations to a house at 75 Patteson Avenue, Mission Bay, Auckland



#### 1. The matters to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004<sup>1</sup> (“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 builder, Mr K Bisman (“the builder”), acting on behalf of the owner of the property, the de Lacey Family Trust (“the owner”) and the other party is the Auckland City Council (“the territorial authority”).
- 1.2 This determination arises from the decision of the territorial authority to issue a Notice to Rectify for 5-year-old additions and alterations to a house because it is not satisfied that the building work complies with Clauses B2 and E2 of the Building Code<sup>2</sup> (Schedule 1, Building Regulations 1992). I note that the application for determination refers to a refusal to issue a certificate, which in the present case

<sup>1</sup> The Building Act 2004 is available from the Department’s website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

<sup>2</sup> The Building Code is available from the Department’s website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

would be a code compliance certificate. However, I have not received any evidence that a code compliance certificate was applied for or that the territorial authority refused to issue one.

- 1.3 I consider that the matter for determination is whether the upper deck and the claddings as installed to the walls and roof of the additions comply with Clauses B2 and E2 (see sections 177 and 188 of the Act). By “the claddings as installed” I mean the components of the systems (such as the backing materials, the flashings, the joints and the coatings) as well as the way the components have been installed and work together.
- 1.4 In making my decision, I have considered the submissions of the parties, the report of the expert commissioned by the Department to advise on this dispute (“the expert”), and the other evidence in this matter. I have evaluated the information on the claddings using a framework that I describe more fully in paragraph 6.1.
- 1.5 In this determination, unless otherwise stated, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.

## **2. The building**

- 2.1 The building work consists of a single-storey extension and an upper level addition, including extensive associated alterations, to an existing detached house situated on a gently sloping site, which the bracing calculations have identified as being in a low wind zone for the purposes of NZS 3604<sup>3</sup>. The original house was built during the 1930’s and then later extended in 1968 and 1995 to provide an L-shaped single storey building with conventional light timber frame construction, suspended timber-framed floors, weatherboard claddings, timber windows, hipped roofs and a large timber deck to the rear.

### **2.2 The additions**

- 2.2.1 The recent extensions consist of an upper floor over the southern end of the house and a large garage/laundry area to infill the northeast corner of the original “L”. The extensions are timber-framed, with a concrete slab to the garage addition, monolithic and weatherboard claddings and aluminium windows.
- 2.2.2 On the ground floor, the original bevel-backed timber weatherboard cladding has been maintained on the south elevation and west elevations, with new matching weatherboards installed to part of the north elevation and the upper south wall. Monolithic cladding is installed elsewhere (including over some original walls). The monolithic-clad walls extend up to form roof parapets.
- 2.2.3 The hipped roofs over the extensions are 30° pitch asphaltic shingles and the remaining original roofs have been reclad to match, with butyl rubber membrane applied to flat areas that link the original construction with the new. A long narrow link roof forms a wide “gallery”, with a raised gabled skylight above. The link roof extends to the east to form an entry canopy.

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<sup>3</sup> New Zealand Standard NZS 3604:1999 Timber Framed Buildings

- 2.2.4 A paved deck extends from the new upper floor bedrooms, along the west elevation and part of the north elevation, and is supported on timber posts and beams above the original ground floor deck. The deck has a monolithic-clad balustrade with timber capping and handrail.
- 2.3 The expert noted that he was unable to inspect any of the concealed timber framing, but also observed that the colour of the deck framing indicated that it was treated. The builder has stated that the deck framing and bottom plates were H3 treated, with the remaining wall framing untreated kiln-dried timber. Given the date of construction in 2002 and the lack of other evidence, I accept that the deck framing is treated and that most of the exterior wall framing in the alteration work is untreated.
- 2.4 The monolithic cladding system is what is described as EIFS (external insulation and finish system), and is a 40mm “Insulclad” polystyrene system fixed directly to the framing over the building wrap. A sponge finish plaster system has been applied over the polystyrene system. The system includes purpose-made flashings to windows, edges and other junctions. The cladding applicator, Plaster Systems Ltd, has provided a “Producer Statement” dated 8 October 2007, for the Insulclad system.

### **3. Background**

- 3.1 On 10 May 2001, the territorial authority issued a building consent (No BLD36011099701) for the building work, although construction did not commence until February 2002. I note that the consent was issued under the Building Act 1991 (“the former Act”).
- 3.2 The building work was carried out in two stages; the upper floor addition during 2002 and the garage addition during 2003. For both stages, pre-line, post-line and plastering inspections were undertaken and passed by the territorial authority. The last inspection was recorded on 3 July 2003.
- 3.3 I have seen no records of any further inspections until 5 May 2004, when the inspection summary noted “monolithic cladding both levels without a cavity”. The territorial authority subsequently undertook a cladding inspection on 9 July 2004, during which a number of weathertightness risks were identified and photographed.
- 3.4 In a letter to the owner dated 26 July 2004, the territorial authority noted that recent information on the weathertightness risk of buildings with monolithic claddings had led to significant changes to the requirements for those buildings since the time of the building consent. The territorial authority stated:
- The Council cannot be satisfied that the cladding system as installed on the above building meets the Functional Requirement of Clause E2 of the Building Code...
- 3.5 The attached Notice to Rectify, also dated 26 July 2004, included a photographic record of cladding defects, and “particulars of contravention or non-compliance”, which listed requirements regarding the following matters:
1. Items not installed per the manufacturers specifications.

2. Items not installed per the acceptable solutions (no alternative solutions have been applied for, other than for the cladding system previously approved).
3. Items not installed per accepted trade practice.
4. Amended plans.
5. Ventilated cavity system.

The notice included the requirement to:

Provide adequate ventilation to the monolithic cladding and into the wall frame space by means of either a ventilated cavity or alternate approved system; and ensuring all issues relating to the above are resolved.

- 3.6 I have seen no record of any further correspondence for the following two years. In June 2006 the builder wrote to the territorial authority and responded in detail to each item identified in the Notice to Rectify – noting work that had been completed, providing as-built drawings and further information about some items, and including proposals to remedy other items.
- 3.7 The territorial authority replied in a letter to the builder dated 13 June 2006 and accepted the as-built drawings submitted by the builder. However, the territorial authority did not accept the builder’s assurances, or required further information, with regard to the other matters listed in the Notice to Rectify, concluding:
- It seems that many of the proposals in your scope to rectify the work or a solution to meet Council requirements are based on a visual overview with no supporting evidence such as; moisture readings or intrusive investigation. Council need to be reasonably satisfied that the building and its components are performing as required under the code.
- 3.8 I am not aware of any further communication between the builder and the territorial authority, and an application for a determination was received from the builder on 21 November 2007. The Department sought authority from the owner for the builder to act on its behalf, and this was received on 28 November 2007.

## **4. The submissions**

- 4.1 In a statement accompanying the application, the builder provided some background to the building work, describing the construction and the cladding systems. The builder described the weathertightness of the claddings and noted that there were “no leaks detected” in those areas outlined in the Notice to Rectify.
- 4.2 The builder forwarded copies of:
- the consent drawings
  - the territorial authority’s inspection summary
  - the correspondence with the territorial authority
  - the Notice to Rectify dated 26 July 2004
  - various other producer statements, photographs and other statements.

- 4.3 The territorial authority forwarded a CD-Rom entitled “Property File” that contained documents pertinent to this determination.
- 4.4 Copies of the submissions and other evidence were provided to each of the parties. Neither party made any further submissions in response to the submission of the other party.
- 4.5 A draft determination was issued to the parties on 1 April 2008. Both parties accepted the draft without comment.

## **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 building on 5 February 2008 and furnished a report that was completed on 21 February 2008, which noted that the EIFS cladding quality was generally good with the finish showing a “consistent even texture and paint finish”, although some installation deficiencies were evident (particularly at the upper deck area). The expert noted that control joints are not specified by the manufacturer for the dimensions of EIFS used on the walls of the additions. The expert also noted that, although appearing “untidy”, the roof apron flashings appeared to be effective.
- 5.3 The expert noted that the windows and doors in the EIFS cladding are recessed with uPVC head flashings and sealant applied at the jambs and sills. The expert removed a small section of plaster at the jamb to sill junction of a window in the ensuite, and noted uPVC jamb and sill flashings with a soaker at the junction. I accept that the exposed junction is typical of similar locations in the building.
- 5.4 The expert noted that windows in the weatherboard cladding were face-fixed, with metal head flashings and scribes at the jambs. Several upper floor windows on the south elevation had timber facings at the jambs. The original timber windows in the south elevation had been replaced with aluminium windows installed within the original timber facings, with the original flashings unchanged.
- 5.5 The expert inspected the interior of the house, taking non-invasive moisture readings internally. Although no elevated moisture readings were noted, the corrosion of carpet fixings near the upper deck doors indicated some moisture problems. The expert took 44 invasive moisture readings through claddings at high risk positions, and 7 elevated readings were noted as follows:
- 17% to 24% in the solid balustrade to the upper deck
  - 40% in the beam beneath the upper deck
  - 17% and 18% beneath the east bedroom window.

Most readings ranged from 8% to 12%, indicating the likely equilibrium moisture levels in the framing. Moisture levels that vary significantly after cladding is in place generally indicate that external moisture is entering the structure. The expert

also noted that his inspection followed an extended dry spell, and considered that moisture levels would increase at other times of year.

5.6 Commenting specifically on the wall claddings, the upper deck, and the roof claddings, the expert noted that:

#### **The walls**

- there is insufficient clearance from the bottom of the EIFS cladding to the paving at parts of the east elevation
- there is a small crack in the EIFS cladding above the upper master bedroom wardrobe window on the north elevation
- there is no drainage gap provided beneath the window and door sill flanges
- some pipe penetrations through the weatherboards into the subfloor space are unsealed
- some electrical cable penetrations through the EIFS are unsealed.

#### **The upper deck**

- there is insufficient clearance from the bottom of the EIFS wall cladding to the deck tiles
- there is no or minimal clearance from the bottom of the EIFS cladding on the balustrades to the deck tiles of the upper deck
- the flat timber capping to the balustrade has cracked and split, the timber handrails are rebated into the timber, there is no underlying flashing over the balustrade framing timber and no saddle flashings at the junctions with the wall – and water is penetrating into the framing
- the deck outlets rely on sealant for weatherproofing, with water stains beneath the deck indicating that the underlying deck membrane may not be adequately dressed into the outlet pipe
- the deck has insufficient fall, with marks on the tiles indicating ponding
- the high (40%) moisture content near the central beam under the deck suggests a possible problem with the deck membrane under the tiles
- there is no drip edge at the bottom of the EIFS cladding on the outer side of the deck balustrade.

#### **The roof**

- there is no or minimal clearance from the bottom of the weatherboard cladding on the upper floor to the lower lean-to roofs
- the joints in the metal cappings to the roof parapets are poorly weatherproofed, with unsealed and corroding rivets and patches of flexible flashing tape applied in some areas (presumably to stop past leaking)
- the ends of the skylight gable over the gallery are clad in butyl rubber with no corner flashing over the window flanges – so the junctions are unlikely to remain weathertight

- a vent pipe through the roof lacks a boot flashing, and is reliant on sealant only for weatherproofing.
- 5.7 The expert also noted that, although there is only 25mm overlap of the weatherboards over the concrete foundation wall on the north wall of the garage, the bottom of the cladding is well above the adjacent ground level and the lack of overlap is unlikely to lead to moisture penetration.
- 5.8 Commenting on the original construction on the lower walls of the south elevation, the expert noted that:
- some original window head flashings are corroding or have reverse falls
  - a subfloor vent has been partly blocked by gravel
  - the eastern end of the original gutter is holding water
  - there are signs of decay at the sill of the corner window at the western end.
- 5.9 A copy of the expert's report was provided to each of the parties on 26 February 2008.
- 5.10 The builder wrote to the Department on 18 March 2008, and commented as follows:
- The upstairs deck handrail uprights are only checked into the capping and the ends of the handrail do not penetrate the wall. The consent as issued did not include a slope to the handrail capping.
  - The driveway slopes away from the locations where the base of the cladding at the garage lacks ground clearance.
  - Minor work is underway to ensure that the deck drainage outlets are not leaking.
  - A leak in the roof above the upstairs bedroom patio doors has been rectified and there is no evidence of further leaking.
  - "Insulclad" products were used throughout the project.

## 6. Evaluation for code compliance

### 6.1 Evaluation framework

- 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<sup>4</sup>, which will assist in determining whether the features of this house are code compliant. However, in making this comparison, the following general observations are valid:

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<sup>4</sup> 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](http://www.dbh.govt.nz).

- Some Acceptable Solutions 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 some other provision 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<sup>5</sup> (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 these extensions:

- are built in a low wind zone
- are two storeys high (in part)
- result in a house that is complex in plan and in form
- have monolithic cladding and weatherboards fixed directly to the framing
- have a paved upper level deck with solid balustrades
- have internal gutters to the roof parapets
- have external wall framing that is not treated to a level that provides resistance to the onset of decay if the framing absorbs and retains moisture.

6.2.2 The building work 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 When evaluated using the E2/AS1 risk matrix, the weathertightness features outlined in paragraph 6.2.1 show that one elevation of the building work demonstrates a

<sup>5</sup> Copies of all determinations issued by the Department can be obtained from the Department's website.



moderate weathertightness risk rating and the remaining elevations a high risk rating. I note that, if the details shown in E2/AS1 were adopted to show code compliance, the monolithic cladding on this building work would require a drained cavity.

### **6.3 Weathertightness performance: exterior cladding and upper deck**

6.3.1 Taking account of the expert's report, I conclude that remedial work is necessary in respect of:

- the inadequate clearance from the bottom of the EIFS cladding to the paving at parts of the east elevation
- the small crack in the EIFS above the upper window on the north elevation
- the lack of drainage gaps at window and door sill flanges
- the unsealed pipe penetrations through the weatherboards into the subfloor
- the unsealed electrical cable penetrations through the EIFS
- the inadequate clearances from the bottom of the EIFS wall and balustrade claddings to the deck tiles
- the inadequately weatherproofed timber balustrade capping, including at the junctions with the wall
- the inadequately weatherproofed deck outlets
- the lack of adequate slope to the deck
- the inadequate deck membrane under the tiles
- the lack of drip edge at the bottom of the EIFS cladding on the outer side of the deck balustrade
- the inadequate clearance from the bottom of the weatherboard cladding on the upper floor to the lower lean-to roofs
- the inadequately weatherproofed joints in the roof parapet cappings
- the inadequately weatherproofed ends of the skylight gable
- the inadequately weatherproofed vent pipe penetration through the roof.

6.3.2 I note the expert's additional comments in paragraph 5.7, and accept that the weatherboard overlap is adequate in this particular circumstance.

6.3.3 I also note the expert's comments in paragraph 5.8 regarding the maintenance of the original construction. While I draw these matters to the owner's attention, I note that they do not form part of the consented building work.

6.3.4 Notwithstanding the fact that the EIFS 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 cladding performance in this particular case:

- apart from the noted exceptions the cladding is installed to good trade practice according to the manufacturer's instructions

- the moisture penetration appears to be limited to the upper deck area.

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

## **7. Discussion**

7.1 I consider the expert's report establishes that the current performance of the upper deck and the wall and roof cladding is not adequate because they are allowing water penetration into the building at present. 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 extension to remain weathertight. Because the faults on the house are likely to allow the ingress of moisture in the future, the building work does not comply with the durability requirements of Clause B2.

7.3 Because the faults identified with the upper deck and the wall and roof cladding systems and 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 work being brought into compliance with Clauses B2 and E2.

7.4 It is emphasised that each determination is conducted on a case-by-case basis. Accordingly, the fact that particular systems have been established as being code compliant in relation to a particular building does not necessarily mean that the same 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).

## **8. What is to be done now?**

8.1 I note that the territorial authority has issued a Notice to Rectify under the former Act. Under that Act, a Notice to Rectify could require the owner to bring the house into compliance with the Building Code. The Building Industry Authority has found in a previous Determination 2000/1 that a Notice to Rectify could not specify how that compliance was to be achieved. I concur with that view with respect to a notice to fix, which is the equivalent notice under the Act.

8.2 I suggest that the territorial authority withdraw the Notice to Rectify and issue a notice to fix that requires the owners to bring the extension into compliance with the Building Code, referring to the defects listed in paragraph 6.3.1 and referring to any

further defects that might be discovered in the course of rectification. It is not for the notice to fix to specify directly how the defects are to be remedied and the extension 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.

- 8.3 I suggest that the parties adopt the following process to meet the requirements of paragraph 8.2. Initially, the territorial authority should issue the notice to fix. The owner should then produce a response to this in the form of a technically robust 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. The decision**

- 9.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the upper deck and the wall and roof claddings do not comply with Clauses E2 and B2 of the Building Code, and accordingly confirm the territorial authority's decision to issue a Notice to Rectify.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 7 May 2008.

John Gardiner  
**Manager Determinations**