



Determination 2014/013

Regarding the refusal to issue a code compliance certificate for a 13-year-old house with monolithic cladding at 28 Downing Street, Crofton Downs, Wellington



1. The matters to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004¹ (“the Act”) made under due authorisation by me, John Gardiner, Manager Determinations and Assurance, Ministry of Business, Innovation and Employment (“the Ministry”), for and on behalf of the Chief Executive of the Ministry.
- 1.2 The parties to the determination are
 - the owner of the house, J Marks (“the applicant”)
 - Wellington City Council (“the authority”), carrying out its duties as a territorial authority or building consent authority.
- 1.3 This determination arises from the decision of the authority to refuse to issue a code compliance certificate for the 13-year-old house because it was not satisfied that the building work complied with certain clauses² of the Building Code (First Schedule, Building Regulations 1992). The authority’s concerns regarding compliance of the building work relate to the weathertightness of the claddings.
- 1.4 The matter to be determined³ is therefore whether the authority was correct to refuse to issue a code compliance certificate. In deciding this, I must consider whether the external building envelope of the house complies with Clause B2 Durability and Clause E2 External Moisture of the Building Code. The building the envelope includes the components of the systems (such as the monolithic cladding, the windows, the roof claddings, the attached deck and the flashings), as well as the way

¹ The Building Act, Building Code, compliance documents, past determinations and guidance documents issued by the Ministry are all available at www.dbh.govt.nz or by contacting the Ministry on 0800 242 243.

² 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.

³ Under section 177(1)(b) and 177(2)(d) of the Act

the components have been installed and work together. This matter also includes Clause B1 in regard to the upper deck. I consider this in paragraph 6.

1.5 In making my decisions, I have considered:

- the submissions of the applicant
- the report of the building surveyor engaged by the applicant
- the report of the expert commissioned by the Ministry to advise on this dispute (“the expert”)
- the other evidence in this matter.

2. The building work

2.1 The building work consists of a two-storey detached house which is situated on a sloping site in a high wind zone for the purposes of NZS 3604⁴. The house is sited on a level building platform, with a steep slope away from an exterior retaining wall to the east. The house is fairly complex in plan and form and is assessed as having a high weathertightness risk.

2.2 Construction is generally conventional light timber frame, with concrete foundations and floor slab, monolithic wall cladding, and aluminium joinery. The pressed metal tile gabled and hipped roofs have eaves and verges that vary from about 150mm to 300mm, with some lower roofs forming lean-tos against upper walls.

2.3 The expert reported that the applicant had copies of invoices which indicate that the framing timber was H1 treated. However, given the date of framing installation in 1999 and the lack of sample testing to verify the particular level and type of treatment described as ‘H1’ in the invoices, I consider that the wall framing may be treated to a level that provides only limited resistance to fungal decay.

2.4 The deck

2.4.1 A timber framed deck, with timber and glass balustrades, extends to the east from the upper floor master bedroom. The deck drains beneath the balustrades and the floor is clad in 18mm thick plywood, over which an exterior synthetic carpet has been laid. Deck joists and plywood are painted and exposed on the underside and the applicant states that the treated plywood substrate is also painted on the upper surface. This indicates that there is no membrane installed beneath the carpet.

2.4.2 The consent drawings show the deck structure supported on 125mm x 125mm H5 treated posts set into 400mm x 400mm x 900mm deep concrete footings that extend through the fill behind the exterior retaining wall into the original ground level. An engineer’s producer statement (which I have not seen) has apparently been provided for the exterior retaining wall.

2.5 The wall cladding

2.5.1 The wall cladding is a form of monolithic cladding system known as EIFS⁵. In this instance, the proprietary cladding system consists of 40mm polystyrene backing sheets fixed directly to the framing over the building wrap, to which a mesh reinforced plaster coating has been applied. The system includes purpose-made flashings to windows, edges and other junctions.

⁴ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

⁵ Exterior Insulation and Finish System

- 2.5.2 The applicant purchased and installed backing sheets and flashings and states that the plaster coating is a proprietary system installed by an applicator approved by the cladding manufacturer. However, as the materials were not supplied directly to an approved installer, the plaster manufacturer would not provide warranties and a producer statement for the cladding system. The applicant recoated the cladding in 2007, using a system compatible with the original plaster system.

3. Background

- 3.1 The authority issued a building consent (No. SR 53129) on 20 May 1999 under the Building Act 1991. I have not seen a copy of the building consent or records of inspections undertaken by the authority during construction.
- 3.2 Although it appears that the house was substantially completed and occupied in 2000, no further inspections were carried out until the applicant sought a code compliance certificate in 2011.

3.3 The application for a code compliance certificate

- 3.3.1 On 4 February 2011 the authority responded to the request for a code compliance certificate, stating that it could not be satisfied as to compliance of the building work simply because 'too long a period has elapsed since it was built'.
- 3.3.2 The authority stated that if a code compliance certificate was still wanted, then the applicant could provide a full report from a suitably qualified person, noting also that:

The report's brief must extend to full assessment of the current status of compliance for all the work in relation to NZBC. The report must identify all matters of concern, but with specific regard to;

- B1 Structure
- B2 (Durability)
- E2 (External moisture) and
- E3 (Internal moisture).

The assessment must also provide a report on any remedial work required, so that the requirements of the Building Act can be clearly seen to be met.

- 3.3.3 The authority also stated that the applicant may apply for a modification of the original building consent in relation to the durability requirements. The authority stated that such an application would need to be supported by the assessor's report.

3.4 The building surveyor's report

- 3.4.1 The applicant engaged a building surveyor, who visited the house on 14 April 2011 and provided a brief report dated 3 May 2011. The surveyor noted he had carried out a 'visual and limited intrusive inspection' of areas able to be reasonably accessed.
- 3.4.2 The building surveyor carried out non-invasive moisture readings internally, noting that these ranged from 12% to 18%, which were 'within the expected equilibrium moisture content'. The surveyor noted that 'no evidence of degradation of the structure or fabric was identified' during inspection of the interior and exterior.
- 3.4.3 The surveyor also took invasive moisture readings into the exposed deck framing, which ranged from 12% to 18%, noting 'no evidence of excessive moisture in the structure of the deck'. Deck joist penetrations through the EIFS appeared to be well sealed and the balustrades were not fixed through the wall cladding.

- 3.4.4 The surveyor noted that cladding clearances were sufficient, the cladding had been well maintained, penetrations were satisfactorily sealed, and the ends of apron flashings appeared satisfactory with kick out flashings fitted to protect the junctions.
- 3.4.5 The building surveyor concluded that the house had a 'sound performance history' and appeared to comply with Clauses B1, B2, E2 and E3. He considered that a code compliance certificate could be issued if durability provisions commenced from the date of substantial completion in 2000.
- 3.5 The authority carried out a final inspection on 14 July 2011 and identified various cladding defects and documentation to be provided, including the requirement to provide 'a statement from [a representative of the original plaster system manufacturer] confirming cladding system is performing as required'.
- 3.6 An amendment to the consent was granted on 4 August 2011 to modify Clause B2 to the effect that Clause B2.3.1 applies from 1 October 1999 instead of from the time of issue of the code compliance certificate.

3.7 The EIFS cladding

- 3.7.1 The applicant contacted the plaster manufacturer to attempt to resolve documentation for the cladding system. The plaster manufacturer stated that it could not provide documentation for the plaster system, noting that
- the applicant had purchased the materials directly; materials must be purchased by an approved applicator in order to qualify for the standard 10-year warranty
 - the cladding is beyond the standard 10-year warranty period
 - although the original plasterer 'was and still is good' he was not an 'Approved' applicator; the manufacturer went on to note that it had issued a couple of warranties two or three years later which indicated the plasterer was 'up to standard in 2002/2003'
- 3.7.2 The plaster manufacturer also noted that the age of the cladding was beyond the standard warranty period and may need recoating. The applicant advised he had recently recoated the cladding, and provided copies of invoices for the polystyrene and flashings, and various construction photographs.
- 3.7.3 In an email to the applicant dated 27 September 2011, the authority acknowledged the situation and recommended that the recoating manufacturer 'inspect the property and confirm the product has been applied as per the manufacturer specification and that it is compatible with the original plaster system applied to the substrate.'
- 3.7.4 In an email to the applicant dated 7 December 2011, the recoating manufacturer attached specification information on its products, noted the materials provided for the work and stated:
- I viewed the house on Thursday 1st December 2011 and my opinion is, the job is done well and still looks good today. There are no cracks evident.
- 3.7.5 The recoating manufacturer subsequently provided a warranty for its materials and confirmed that the recoating system is compatible with the original plaster system.

3.8 The authority's refusal

- 3.8.1 In a letter to the applicant dated 16 November 2012, the authority noted that its inspection of the cladding on 12 November 2012 had identified (in summary):
- cracks around an upper and a lower north window

- unsealed EIFS behind the gas meter and hot water system
 - additional protection added to the upper deck joist penetrations.
- 3.8.2 As a result of a review of the files for the house ‘due to the age of the consent and weather tightness risk’, the authority stated that it could not issue a code compliance certificate until it was satisfied ‘that the performance requirements of the building code are being met’. The authority required a report from a member of the New Zealand Institute of Building Surveyors in order to confirm the external envelope was compliant with Clause E2.
- 3.8.3 The applicant subsequently arranged for repairs to the plaster behind the gas meter and water heater by an approved applicator for the original plaster system. In a letter to the applicant dated 31 May 2013, the applicator confirmed that the fixtures had been removed and repairs had been carried out using the original coating products.
- 3.8.4 The authority carried out a further final inspection of the house on 7 August 2013 and wrote to the applicant on 15 August 2013. The authority noted that it had sighted the remedial work to the cladding behind the gas meter and water heater and acknowledged the provision of a producer statement for the repairs.
- 3.8.5 However, the authority stated that its letter of 16 November 2012 (see paragraph 3.8.2) had set out the requirement for a building surveyor’s report, which to date had not been provided. The authority therefore continued to refuse to issue a code compliance certificate for the building work.
- 3.9 The Ministry received an application for a determination on 26 September 2013.

4. The submissions

- 4.1 In a submission with the application, the applicant explained some of the background and noted that the building surveyor’s 2011 report confirmed that the cladding complied with Clause E2. The applicant stated that the cracks in the cladding observed by the authority were superficial, with roof framing photographs showing no moisture penetration into lean-to roof framing below the hairline cracks. The applicant also pointed out that the house is 13 years old and repairing minor cracking would be expected as part of normal maintenance.
- 4.2 The applicant forwarded copies of
- correspondence with the authority
 - the building surveyor’s report dated 3 May 2011
 - correspondence with manufacturer of the original plaster system
 - correspondence from the manufacturer of the recoating system
 - various other correspondence, statements and information.
- 4.3 The authority acknowledged the application, but made no submission and provided no records or information on the building work.
- 4.4 A draft determination was issued to the parties for comment on 4 February 2014.
- 4.5 The authority accepted the draft without further comment in a response received on 18 February 2014.

4.6 A response to the draft from the applicant was received on 19 February 2014. The applicant considered the description of the house as ‘fairly complex in plan’ was an overstatement, and submitted that

- the deck is external, the deck timber is treated for external use, and it is exposed underneath
- the upper level overhands the deck by approximately 300mm where the joists enter the cladding, ‘so the joists do not enter directly above the lower level’
- the authority only formally refused the code compliance certificate when the application for determination was made but had assisted the applicant in gaining compliance by requesting additional information and work to be completed
- regular maintenance has been carried out on the cladding, including the resealing of all window joinery and a complete 3-coat repaint in 2007.

4.7 The applicant requested the reference to the statement from the plaster manufacturer be expanded and noted two errors that required correction. The applicant also stated that he could not find the soft spots on the deck.

5. The expert’s report

5.1 General

5.1.1 As mentioned in paragraph 1.5, I engaged an independent expert to assist me. The expert is a member of the New Zealand Institute of Building Surveyors and inspected the house on 4 November 2013, providing a report completed on 22 November 2013. A copy of the report was forwarded to the parties on 18 December 2013

5.1.2 The expert observed that the quality of workmanship was ‘generally to a good tradesman like finish’; apart from the deck structure and a poor quality of finish to sealant to the windows. The expert noted that the EIFS cladding had replaced the fibre-cement weatherboards shown in consent drawings.

5.1.3 Windows and doors are recessed by the EIFS thickness, with sloping reveals at the sills. Destructive investigation revealed proprietary uPVC jamb and sill flashings, with sealant applied at the junction as recommended by the cladding manufacturer at the time of construction. The EIFS had been completely resealed against joinery, with sealant application poorly finished and painted over.

5.2 The deck

5.2.1 The upper deck has a synthetic carpet applied over a plywood substrate supported on underlying deck joists, which penetrate the EIFS cladding. The expert recorded high moisture levels in a joist (26%) and also in the plywood (36%), which was soft in at least one location (at the left hand side of the entry door from the deck).

5.2.2 The deck balustrades are a timber post and frame structure bolted to the sides of the perimeter deck beam. Safety glass forms infill panels to the front faces, with fibre-cement panels to the sides of the balustrades. The expert described the end panels as ‘flimsy and unsafe’ (refer also paragraph 5.4.3).

5.2.3 The expert noted that the timber post and beam structure to the deck has bolted connections and post footings that are located directly behind the exterior retaining

wall. The expert observed that the deck posts appeared to have slumped due to fill settling behind the retaining wall.

5.3 Moisture testing and destructive investigations

5.3.1 The expert inspected the interior and took non-invasive moisture readings, which he compared to a control reading taken on an internal wall. The expert noted only minor variances in the readings and no elevated readings.

5.3.2 The expert also removed small sections of cladding (“the cut-outs”) at four locations to investigate the underlying construction and noted the following (with moisture readings shown in brackets):

- Cut-out 1 at the sill/jamb junction of a south window; uPVC flashings sealed at the sill/jamb intersection and no evidence of water damage (18%).
- Cut-out 2 below the end of the apron flashing to the garage roof; sealant heavily applied to the area but no evidence of water damage (19%).
- Cut-out 3 at the sill/jamb junction of an upper north window; a repaired crack below the junction but no evidence of water penetration or damage (13%).
- Cut-out 4 at the sill/jamb junction of a lower west window; a repaired crack below the junction, with mould growth on the framing (20%).

5.3.3 I note that moisture levels over 18% generally indicate that external moisture is entering the structure and further investigation is required.

5.3.4 Commenting specifically on the external envelope, the expert noted

- the bottom of the apron flashings rely on sealant for weathertightness, with no visible diverters installed to direct water away from the cladding
- there are no spreaders to the downpipes from the upper roof, providing a high risk of water penetration through critical roof to wall junctions
- moisture levels indicate that water has penetrated through joinery junctions in some areas, with mould growth visible at cut-out 4, and further investigation is needed to the windows and doors.

5.3.5 Commenting specifically on the deck, the expert noted

- moisture levels are high in the deck plywood substrate, with the plywood soft in at least one area
- moisture levels are high in at least one of the deck joists; the joists penetrate the cladding and there is potential for moisture penetration into the wall framing
- structural investigation into the deck structure is needed, because
 - varying gaps at the ends of the balustrade indicate the extent of movement to the deck where support post foundations in retaining wall fill have slumped
 - bolted connections are not in accordance with NZS 3604, with incorrect bolts and washers used and connections are too close to timber edges
 - the end panels of the deck balustrade appear ‘flimsy and unsafe’.

5.4 The applicant's response

5.4.1 The applicant provided a submission on 7 January 2014 in response to the expert's report. I have summarised the applicant's comments below and have taken the submission into account in the preparation of this determination:

- There is no evidence to suggest that the original plasterer was not an approved applicator for the plaster manufacturer and the applicant's purchase of products should be irrelevant in terms of a warranty.
- There is no need for another report because the building surveyor's report confirmed that the external envelope met the requirements of Clause E2.
- The description of the deck slump is exaggerated as the deck was designed to incorporate a slope. Balustrades are not unsafe as any movement is due to the lack of fixings through the cladding. Extra fixings were also added to the top of the deck posts for additional strength.
- There is no evidence that the plywood is soft and not durable, as the material is 18mm thick, H3 treated, and has been painted for additional protection.
- The mould growth seen in cut-out 4 is minor and barely noticeable, with any moisture penetration likely to result from silicon sealant peeling slightly away from the aluminium joinery flanges which is a maintenance issue.
- The authority suggested installing the aluminium flashing at the deck/wall junction. The flashing is sealed against the EIFS and extends under the plywood. Any moisture movement from the deck joists would be minimal.
- Water diverters are installed at the ends of the apron flashings, as noted by the building surveyor during his inspection. Additional sealant was added to prevent water pooling, resulting in the diverters not being easily seen.
- The quality of sealant application is purely an aesthetic issue.
- If further investigation of joinery openings was necessary, this should have been carried out during the expert's inspection.
- The reliability of the expert's moisture readings is questionable.
- The expert found no significant weathertightness defects and other areas commented on were 'signed off' by the authority and therefore beyond the scope of the expert's investigation and the determination.

5.4.2 On 23 January 2014 I sought comment from the expert as to the points raised by the applicant. The expert responded in an email of 27 January 2013, which was forwarded to the parties.

5.4.3 The expert stated that

- the plaster manufacturer had confirmed by email that the applicator was never an approved applicator
- the building surveyor's report was based on limited invasive inspection; more invasive testing at cracks and other wall/window junctions was needed to establish compliance
- the deck has a 2.8° slope and the deck handrail framing at the wall cladding has a variable gap; the posts pass through a timber deck at ground level and there is clear indication that the ground level deck has settled

- the end panels of the deck have support posts bolted directly to the deck joists below the plywood decking; the posts have a reasonable amount of movement and although they may not fail additional support is needed
- the end panels are 4.75mm thick cement based board; this should be a minimum of 6mm
- the carpet over the deck will prevent drying; however the plywood is easily replaced and near the end of its expected life
- sealant to the cladding should be at the back face and protected from UV; physical flashings are the best form of protection
- even with minimal moisture being carried back at the deck joists the joists can rot out behind the cladding where it is not visible; this element has a 50 year durability requirement
- there are apron flashings with a stop end with plenty of sealant applied, but there are no water diverters
- poorly finished sealant can create water reservoirs and allows moisture to penetrate the cladding system
- elevated moisture levels maintained over a period of time present a problem, and mould present indicated that moisture has been present for some time

The expert also noted that the investigation carried out was adequate (for the purposes of the determination), and that the moisture meter was re calibrated prior to the readings being taken.

6. Discussion

6.1 The evaluation of building work for compliance with the Building Code and the risk factors considered in regards to weathertightness have been described in numerous previous determinations (for example, Determination 2004/1).

6.2 The external envelope includes the attached upper deck; and the following considers the apparent structural performance of the deck structure together with aspects of the deck associated with weathertightness of the building work.

6.3 Weathertightness risk

6.3.1 This house has the following environmental and design features, which influence its weathertightness risk profile:

Increasing risk

- the house is fairly complex in form and is sited in a high wind zone
- the walls have monolithic cladding fixed directly to the framing
- there are limited eaves and verges to shelter the wall cladding
- there is a deck attached to the upper level

Decreasing risk

- the external wall framing is treated to provide some resistance to decay if it absorbs and retains moisture.

6.3.2 Using the E2/AS1 risk matrix to evaluate these features, the elevations are assessed as having a high weathertightness risk rating. If details shown in the current E2/AS1

were adopted to show code compliance, a drained cavity would be required for all elevations. However, this was not a requirement at the time of construction.

6.4 Performance

6.4.1 Taking account of the expert's report and the building surveyor's report, the external envelope generally appears to have been constructed in accordance with good trade practice and applicable manufacturers' instructions at the time of construction.

However, there are some areas that require further investigation and/or attention.

6.4.2 Taking account of the expert's report and the building surveyors report, I conclude that further investigation and/or remedial work is necessary in respect of the following areas:

- the lack of diverters at the bottom of the apron flashings
- the lack of spreaders to downpipes discharging onto lower roofs
- additional invasive moisture testing to measure moisture levels around the window joinery, with investigation of timber condition and timber treatment levels should high moisture levels be found
- in regard to weathertightness of the upper deck:
 - the apparent lack of a waterproof membrane beneath the carpet, with high moisture levels in the plywood substrate and underlying deck joists
 - investigation into the likely deterioration of the plywood substrate
- in regard to the structure of the upper deck, investigation by a structural engineer into:
 - the slumping of the deck posts
 - the adequacy of connections to the structure.
 - the safety of the timber balustrades.

6.5 Conclusion

6.5.1 I consider the expert's report establishes that the performance of the cladding has largely been adequate over the last 13 years. However, there is some evidence of moisture penetration into the timber wall framing in at least two locations that were observed by the expert. In addition there was moisture penetration into the deck substrate and joists. Consequently I am not satisfied that the external building envelope has complied with Clause E2. I note that the cladding is 13 years through its required 15 year durability period, however any moisture ingress may have an impact on the ability of other building elements, such as framing timber, continuing to comply with 50-year durability requirements.

6.5.2 The expert's report also establishes that the deck structure may not be adequate because there is evidence of slumping of the deck structure, and there was sufficient doubt about the durability of the decking members and its impact of the adjacent wall framing. Consequently, I am not satisfied that the deck structure complies with Clauses B1 and B2 of the Building Code.

6.5.3 Because the identified faults occur in discrete areas, I am able to conclude that satisfactory investigation and rectification of the items outlined in paragraph 6.4.2 will result in the external envelope being brought into compliance with Clauses B1, B2 and E2 of the Building Code.

6.5.4 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 Ministry 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).

7. What happens next?

7.1 A notice to fix should be issued that requires the owners to bring the house into compliance with the Building Code, identifying the areas and investigations listed in paragraph 6.4.2 and referring to any further defects that might be discovered in the course of investigation and rectification.

7.2 I suggest that the parties adopt the following process to meet the requirements of paragraph 7.1. Initially, the authority should issue the notice to fix. The applicant should then produce a response to this in the form of a detailed proposal for the house as to the rectification or otherwise of the specified matters. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

8. The decision

8.1 In accordance with section 188 of the Building Act 2004, I hereby determine that:

- the deck structure does not comply with Building Code Clauses B1 and B2
- the exterior building envelope does not comply with Clauses E2 and Clause B2 of the Building Code

and accordingly, I confirm the authority's decision to refuse to issue a code compliance certificate.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 21 February 2014.

John Gardiner
Manager Determinations and Assurance