MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HIKINA WHAKATUTUKI

Determination 2015/046

Regarding the refusal to issue a code compliance certificate for an 18-year-old house with monolithic cladding at 12 Mariners View Road, Beach Haven, Auckland

1. The matters to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004[1] ("the current 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 owners of the house, D and J Harrison ("the applicants")
- Auckland Council ("the authority"), carrying out its duties as a territorial authority or building consent authority[2].

1.3 This determination arises from the decision of the authority to refuse to issue a code compliance certificate for an 18-year-old house because the authority was not satisfied that the building work complied with certain clauses[3] of the Building Code (First Schedule, Building Regulations 1992). The authority's concerns about the compliance of the building work relate primarily to the weathertightness and durability of the exterior cladding, given the building's age and history.

1.4 The matter to be determined[4] is therefore whether the authority was correct to refuse to issue the code compliance certificate for the reasons given in its letter dated

[1] The Building Act, Building Code, compliance documents, past determinations and guidance documents issued by the Ministry are all available at www.building.govt.nz or by contacting the Ministry on 0800 242 243.
[2] Before this application was made, North Shore City Council was transitioned into Auckland Council. The term authority is used for both
[3] 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.
[4] Under sections 177(1)(b) and 177(2)(d) of the Act

18 November 2013. In deciding this matter, I must consider whether the exterior building envelope of the house complies with Clause B2 Durability and Clause E2 External moisture of the Building Code that was in force at the time the consent was issued. The exterior envelope includes the components of the walls (such as the monolithic wall cladding, the decks, the junctions with the roofs and the windows) as well as the way the components have been installed and work together.

1.5 Matters outside this determination

1.5.1 When refusing to issue the code compliance certificate, the authority noted the lack of a handrail to the external side steps. The applicants advised the expert that the authority has withdrawn that concern and this determination does not consider that issue further.

1.5.2 I note that the applicants will be able to apply to the authority for a modification of durability provisions to allow the durability periods specified in Clause B2.3.1 to commence from the date of substantial completion in 1997. I leave this matter to the parties to resolve in due course.

1.6 In making my decision, I have considered:

- the submissions of the parties
- the applicants' proposal for rectification dated 17 August 2005
- Determination 2004/78 issued on 16 December 2004 ("the 2004 determination") in respect of the authority's refusal in 2004 to issue a code compliance certificate
- 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 to three-storey high detached house with floors set at 5 different levels, which is situated on an excavated landscaped sloping site in a high wind zone for the purposes of NZS 3604[5]. The house includes some complex junctions and is assessed as having a high weathertightness risk.

2.2 Construction is generally conventional light timber frame, with concrete foundations and floor slabs, reinforced concrete block lower walls, monolithic-clad timber-framed upper walls, aluminium windows and concrete tile roofing.

2.3 The 22^{o} pitched roofs are set at various levels with hip, valley and wall to roof junctions. The roofs have eaves of about 550mm overall with the exception of one length at a lower level roof where the fascia is fixed directly to the cladding.

2.4 The specification calls for timber to be Boric treated and the owner has supplied invoices that verify that H1 Boric treated timber was supplied for the house wall framing. The expert forwarded moisture-damaged samples of framing timber for laboratory testing, which detected no preservative in two of the samples and limited boron[6] in the third. Given the date of framing installation in 1998, I consider that the

[5] New Zealand Standard NZS 3604:1999 Timber Framed Buildings
[6] Likely to have been treated to Hazard Class 1 of MP3640:1992 where primary risk was defined as insect attack.

external framing is unlikely to be treated to a level that will provide ongoing resistance to fungal decay.

2.5 The decks

2.5.1 There is a large timber-framed two-level deck to one elevation at the first floor level ("the lower deck"), which is partially cantilevered and partially supported on timber beams and columns. The deck floor is spaced timber boarding and the framed balustrades are clad with EIFS[7] on both sides and the top.

2.5.2 A smaller deck set into the roof at the upper floor level ("the upper deck") is predominantly built over a living space, with a 600mm wide cantilevered projection and EIFS-clad balustrades. The upper deck has a butyl rubber membrane fixed over a plywood substrate and the membrane is dressed into an internal gutter.

2.5.3 A series of exterior timber framed platforms and steps are constructed at ground levels around the rear and sides of the house.

2.6 The claddings

2.6.1 The primary wall cladding is a form of monolithic cladding system known as EIFS. In this instance, the system consists of 40mm polystyrene backing sheets fixed directly to the framing over the building wrap, to which a proprietary mesh-reinforced plaster system has been applied that extends over the lower level concrete block walls. The manufacturer's instructions include purpose-made flashings to windows, edges, and other junctions.

2.6.2 The installer supplied a 'Producer Statement', dated 17 July 2004 covering the entire cladding system. The cladding supplier issued a 'Workmanship Guarantee' and a 'Materials Components Guarantee', both dated 2 June 2004, each of which contain the qualification that the proprietor will not accept responsibility for damage resulting from the use of untreated timber. I note that both guarantees refer to a 'batten cavity system', whereas the backing sheets in this instance are fixed directly to the framing.

3. Background

3.1 I have used information taken from the 2004 determination to inform the background to the dispute as outlined in the following paragraphs. The authority issued building consent no. B 10810 on 26 November 1996 under the Building Act 1991 ("the former Act").

3.2 On 1 May 1997, the builder submitted revised drawings and bracing calculations and notified the authority that there was a change to the cladding. Although I have not seen a formal amendment to the consent, I note that amended drawings showing the EIFS cladding were stamped and endorsed by the authority on 30 May 1997.

3.3 The original construction

3.3.1 The authority carried out various inspections during construction, including a pre-line inspection on 23 June 1997 and a post-line inspection on 7 July 1997. The house was substantially completed in 1997 but no final inspection was carried out.

[7] Exterior Insulation and Finish System

3.3.2 The authority carried out a final inspection on 15 January 2004, which was apparently satisfactory and the applicants have advised me that the request for a code compliance certificate was made at the time of 'the final inspection sign off'.

3.3.3 The 2004 determination stated that the authority 'noted after the inspection that the cladding as installed differed from that on the consent documentation and that a further investigation may be required of the cantilevered deck joists through the cladding'.

3.3.4 In regard to the cladding change, I note that this had been approved in 1997 and paragraph 2.10 of the 2004 determination stated:

> I accept that the territorial authority was notified of, and approved the change to, the cladding system that was installed.

3.3.5 In regard to the cantilevered deck joists, I also note that paragraph 2.8 of the 2004 determination stated:

> In a letter dated 21 January 2004, the owner stated that a galvanised flashing strip approximately 3.5 inches (90mm) wide had been installed along the whole length of the deck where it met the main building.

3.4 The 2004 refusal to issue a code compliance certificate

3.4.1 The authority responded to the applicants' request for a code compliance certificate on 12 March 2004, noting that 'visual inspection' had revealed (in summary):

- a wall cladding change to EIFS
- the lack of cladding inspections
- deck joists penetrating the EIFS
- no evidence of saddle flashings at balustrade/wall junctions.

3.4.2 The authority concluded:

> [The authority] 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 code compliance certificate…

3.5 Subsequent correspondence

3.5.1 In a letter to the authority dated 26 April 2004 the applicants attached documentation of the approved cladding change and informed the authority that the cladding manufacturer had inspected the property and the cladding, which had been installed seven years previously, was found to be 'watertight, sound and in order'.

3.5.2 The applicants also attached a copy of a letter dated 21 April 2004 from the cladding manufacturer, outlined in paragraph 2.11 of the 2004 determination as follows:

- The plans had been amended to show the new cladding;
- The [authority] did not require inspections of the cladding at the time of installation. However, the cladding had been installed by a "very competent licensed contractor";
- The cantilevered joists were flashed appropriately;
- A saddle flashing to the handrail/wall junctions was never a requirement [at the time of construction], and routine maintenance would ensure that there was no cause for concern; and

- The cladding is in good condition, and as the territorial authority had stated that there have been no leaks, the cladding is performing the function for which it was intended.

3.6 The 2004 determination

3.6.1 The authority did not issue a notice to rectify[8] and, failing to get a response from the authority, the applicants applied for a determination in July 2004. Determination 2004/78 was issued on 16 December 2004.

3.6.2 Paragraph 4 of the 2004 determination set out the performance requirements of Clauses B2 and E2 and stated in paragraph 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.

3.6.3 The 2004 determination instructed the authority to issue a notice to rectify and, in paragraph 6.8, identified items as follows:

- The cracking to the cladding where the lower deck balustrade meets the northeast wall cladding, and also around the downpipe bracket fixings;
- The cracking evident around the cantilevered joists that penetrate the cladding and the inadequate sealing at these points;
- The lack of a Z-shaped flashing to the base of the cladding on the southeast elevation where the cladding taken down onto the paving;
- The area of unfinished cladding at the exterior of the bathroom wall on the southeast elevation, including the requirement for subsoil drainage and the removal of soil from this area;
- The gap to the eaves soffit outside the family room and unsealed gutter/wall junction at this location;
- The lack of an overflow provision for the upper deck;
- The lack of sealant at the downpipe bracket fixings; and
- The need to recoat the cladding.

3.7 The coating company's repair recommendations

3.7.1 In a letter to the authority dated 22 February 2005, the applicants noted the findings of the 2004 determination and requested the authority 'either issue the Notice to Rectify or advice us what steps you wish us to take.'

3.7.2 Failing to receive a response from the authority, the applicants arranged for the cladding to be assessed by the plaster systems company ("the coating company"), which visited the site and also apparently discussed the EIFS with the authority.

3.7.3 The company recommended repairs to the cladding and the applicants provided a proposal on 17 August 2005 'for rectification of items identified in Determination 2004/78'; summarised in Table 1.

Table 1: The 2005 proposed repairs

Items in 2004/78 Determination	Applicants' remedial proposal
Cracking at lower deck balustrade/ wall cladding.	Remove plaster to install waterproof membrane flashing at junction, then replaster.
Cracking at downpipe bracket fixings	Remove brackets, repair cracks, replaster

[8] The equivalent of a notice to fix under the current Act

Items in 2004/78 Determination	Applicants' remedial proposal
Cracking around cantilevered joists penetrations	Clean out joints, apply recommended sealant
Lack of flashing to base of cladding on southeast elevation where cladding taken down onto paving	Remove 1 metre length of concrete path and provide sufficient ground clearance.
Incomplete cladding to southeast bathroom wall, including need for subsoil drainage and removal of soil from this area	Remove soil to allow sufficient ground clearance and clad in fibre cement board.
Gap to eaves soffit outside family room and unsealed gutter/wall junction	Apply recommended sealant
No overflow provision to upper deck	Fit appropriate overflow
No sealant to downpipe fixings	Apply recommended sealant
The need to recoat cladding	Cladding to be recoated and painted.

3.7.4 It appears that the authority did not respond to the proposal and I have seen no evidence of further correspondence between the parties until the applicants again sought a code compliance certificate in 2013.

3.8 The 2013 refusal to issue a code compliance certificate

3.8.1 In a letter to the authority dated 12 September 2013, the applicants explained the background and the determination in 2004; noting that they had submitted a proposal for approval in 2005. The applicants stated:

> In the absence of any response from [the authority] and order to maintain the integrity of our property we carried out the works as recommended in the Determination.

3.8.2 The authority carried out a cladding inspection on 5 November 2013 during which, according to the applicants, the authority was 'still under the impression that we had changed the cladding without consent'. The authority wrote to the applicants on 18 November 2013, giving notice under section 95A of the Act that the authority would not issue a code compliance certificate. The authority stated that:

> Following the site inspection and subsequent 'peer review' process, [the authority] could not be 'satisfied on reasonable grounds' that building works comply with the NZ Building Code, or that it is performing as intended.

3.8.3 The authority noted that its 'areas of concern' included, but were not limited to:

1. Elevated moisture readings noted at openings at ranch slider and at sill level in the bedroom 1, further investigation will be required.
2. Cracks in cladding at balustrade to cladding junction and holes in cladding.
3. Deck joists to cladding junctions.
4. Meter box flashing detail.
5. Balustrade penetrations into cladding.
6. Cladding to joinery junctions.
7. Insufficient wash down gap at wooden deck to cladding junctions.
8. Cavity under head flashing noted.
9. Unknown sealing of cladding at barge/fascia board to cladding junction, it appears as if some of the barge/fascia board has penetrated the cladding.
10. Deck post to cladding junctions.

11. Joinery to joinery junctions.
12. The lack of kick out flashings.
13. Deck overflow pipe.
14. Sufficient deck falls not achieved.
15. Vermin proofing of pipe penetrations.
16. Handrail required to external stairs at side of dwelling.
17. Downpipe fixings into cladding.
18. Sub soil drainage at exterior of bathroom, SE elevation.
19. Revised detail required with regards to the cladding change from harditex to insulclad.
20. Please confirm if any remediation has been undertaken in terms of paragraph 6.8 of Determination 2004/78, and if so, by whom and is there any supporting documentation?

3.8.4 The authority also recommended that:

> ... you engage the services of a suitably qualified individual who is qualified in Weather Tight assessment and Remedial Design.
>
> This person must further investigate the performance of this building, also taking into account the items below and provide a 'scope of works' and any recommendations to [the authority] for further review.
>
> Note: Please do not commence any remedial work until approved by [the authority, this work may require an application for a new building consent.

3.9 Subsequent correspondence

3.9.1 The applicants responded to the authority's refusal in an email dated 26 November 2013, noting that the cladding change (item 19) had been submitted for approval with amended drawings (see paragraph 3.1) and asking for a list of 'suitably qualified' companies as required by the authority. As requested, the applicants also described remedial work already undertaken (item 20), which is summarised in Table 2.

Table 2

Items in 2004/78	Remedial work undertaken
Cracking at lower deck balustrade/ wall cladding. Cracking at downpipe bracket fixings	Filled crack and repainted area. Filled cracks and repainted.
Cracking around cantilevered joists penetrations	Cracks were all filled prior to repainting.
Lack of flashing to base of cladding on southeast elevation where cladding taken down onto paving	Removed concrete and soil from area adjacent to wall to provide required clearance.
Incomplete cladding to southeast bathroom wall, including need for subsoil drainage and removal of soil from this area	Soil removed and framing clad to seal in the wall insulation.
Gap to eaves soffit outside family room and unsealed gutter/wall junction	Areas of concern were sealed.
No overflow provision to upper deck	A plastic drain outlet has been fitted.
No sealant to downpipe fixings	Fixings have all been resealed and repainted.
The need to recoat cladding	All cladding has been repainted.

3.9.2 The applicants subsequently engaged a building surveyor to 'carry out an inspection of the area noted under item 1' (in regard to the elevated moisture readings). The surveyor visited the site on 21 December 2013 and emailed the applicants the following day, noting that he had limited his investigation to non-invasive moisture readings of the specified area on instruction from the applicants. He pointed out that the authority had requested invasive testing and noted that:

> It would be ideal to remove a section of plaster board wall lining under the side window to ascertain the underlying timbers condition, and measure moisture and take photos.

3.9.3 The applicants forwarded the surveyor's advice in an email to the authority dated 10 January 2014, noting that the expert's inspection in 2004 had included invasive testing of the particular area of wall and 'nothing untoward' had been found. The applicants had therefore not considered invasive testing to be required again.

3.9.4 The applicants also carried out additional work in regard to some of the other items identified in the authority's letter of 18 November 2013. The applicants described that work as follows (in summary, with the item number shown in brackets):

- Revised balustrades/handrails to remove cladding penetrations (item 5).
- Created wash down gaps at wooden decks (item 7).
- Sealed around all window and door frames (item 6).

3.10 The parties failed to resolve the dispute and the applicants applied for a new determination on 10 February 2015. The Ministry sought further information from the applicants, which was received on 25 February 2015.

4. The submissions

4.1 In a statement dated 8 February 2015, the applicants outlined the background to the situation and described the events and repair work following the issue of the 2004 determination. In addition to documentation provided for the 2004 determination, the applicants provided copies of:

- Determination 2004/78, dated 16 December 2004
- letters to the authority following the documentation
- the proposal for rectification, dated 17 August 2005
- in response to the request for further information:
  - the authority's refusal dated 18 November 2013
  - other correspondence with the authority in 2013 and 2014
  - a letter to the Ministry dated 23 February 2015, which described repairs undertaken since the 2004 determination.

4.2 The authority had provided documentation on the construction of the house for the earlier 2004 determination, and provided no further information in response to this application.

4.3 A draft determination was issued to the parties for comment on 27 May 2015. The authority accepted the draft without comment on 2 June 2015.

4.4 The applicants' response to the draft determination

4.4.1 The applicants commented on the draft determination in a letter to the Ministry dated 2 June 2015. The applicants clarified some of the background to the dispute and I have incorporated that explanation where I consider appropriate.

4.4.2 The applicants explained that the moisture damage to the wall below the apron flashing had been investigated and 'a rectification plan is imminent', with the deck balustrade framing considered to be 'of lesser priority than the wall in the family room, but will be attended to in due course.'

4.4.3 The applicants believed that the 'whole epic seems to have revolved' around the 2004 incorrect assumption that the cladding had been changed without approval and the lack of responses by the authority to the applicants' attempts to progress the matter following the 2004 determination.

4.4.4 The applicants noted that issues identified in the 2004 determination were addressed, and included the following additional comments:

- The building complied with the Building Code at the time the consent was issued and there was and still is no reason to withhold a code compliance certificate. The fact that the authority was 'scrutinising face fixed cavity systems in 2004 is irrelevant to our request'.
- The lack of a kick out flashing was irrelevant 'because it was not required at the time. Cladding inspections and saddle flashings were also not required at the time and 'the cantilevered joists were flashed appropriately.'
- The building had been constructed correctly to approved drawings and to the Building Code as it was in 1997.

4.5 My response to the applicants' comments

4.5.1 In response to the above, I note that the performance requirements for Clauses B2 and E2 of the Building Code have not changed since the building was constructed, and there were no Acceptable Solutions deemed to comply with the code for EIFS claddings until 2005.

4.5.2 Paragraph 4.1 of the 2004 determination set out the relevant performance requirements of Clauses B2 and E2, and paragraph 4.2 stated:

> 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.

4.5.3 The decision reached in paragraph 8.1 of the 2004 determination stated:

> 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 also a number of items to be remedied to ensure that the house 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.

4.5.4 In 2004 the Acceptable Solution E2/AS1 was developed based on wide industry consultation on a draft document. When the applicants sought a code compliance certificate in 2004, the authority needed to consider all information available at that time, including the draft E2/AS1 and its supporting research, and not just the

information that had been available when the original building consent was issued in 1997. When considering compliance of a building that was constructed some time ago the evidence of in-service performance can also be taken into account.

4.5.5 I acknowledge the applicants' position that they have not done 'anything wrong during the process' and I also do not condone the lack of response to their attempts to resolve the situation following the 2004 determination. Notwithstanding that, as outlined in paragraphs 6.4.1 and 6.4.2 the EIFS cladding did not and still does not comply with performance requirements of the Building Code that was current at the time the consent was issued.

5. The expert's report

5.1 As mentioned in paragraph 1.6, I engaged an independent expert to assist me who is a member of the New Zealand Institute of Architects. The expert inspected the house on 10 February 2015, providing a report completed on 2 March 2015. The parties were provided with a copy of the report on 20 May 2015.

5.2 General

5.2.1 The expert noted that the scope of his inspection was to provide an opinion about items identified in the authority's refusal dated 18 November 2013 and to assess compliance of the EIFS cladding with Clauses B2 and E2.

5.2.2 Because the cladding was 18 years old and beyond the 15 year durability required by the Building Code, the expert noted that the focus of his investigation was whether the cladding had provided and would continue to provide 'adequate protection for the framing and other elements' with a required minimum durability period of 50 years.

5.2.3 The expert observed the following variations from the consent drawings:

- the lower deck extended to line up with the southwest dining room wall
- the upper deck extended to line up with the northeast bedroom wall
- the deck balustrades clad with EIFS to both sides and top, with no handrail
- open slat staircase and landing added outside the laundry.

5.2.4 The expert noted that the EIFS cladding was 'generally sound and free from cracks or other signs of deterioration and most of the house was free from signs of moisture penetration'. Clearances were generally satisfactory in the circumstances. However, the expert found some evidence of moisture penetration and timber damage in one area, which is described below.

5.3 Moisture testing and destructive investigations

5.3.1 The expert inspected the interior, observing that external wall linings were 'free from mould, stains, swelling or other signs of moisture ingress' and non-invasive moisture readings were low. The expert also took 15 invasive moisture readings using long probes from the inside at sample locations considered at-risk, with 13 of the 15 readings ranging from 13% to 16%.

5.3.2 On the southwest elevation, the expert recorded 20% and 30% in the family room bottom plate below the bottom of an apron flashing. The expert removed a small section of lining from the inside of the wall ("the cut-out") to observe the underlying timber. The expert took a timber sample from the bottom plate and observed:

- deteriorated building wrap fallen away from the polystyrene
- black decay to the top of the bottom plate
- black face to the outside of the nog above the cut-out
- water stains to the side of the adjacent stud.

5.4 Timber analysis

5.4.1 The expert took the following timber samples:

- Sample 1 from the bottom plate to the southwest lounge at the cut-out.
- Sample 2 via an electrical outlet below the southwest lower balustrade/wall junction and an at-risk mitre corner to the windows, which showed no visual evidence of decay.
- Sample 3 from exposed underside of bottom plate to lower deck balustrade.

5.4.2 The expert forwarded the samples for analysis and the laboratory report dated 23 April 2015 noted that preservative analysis suggested that Sample 2 was treated with boron to Hazard Class 1 of MP3640:1992. No preservative was detected in Samples 1 and 3, which suggested either untreated radiata pine or the loss of boron due to leaching of the preservative over a prolonged period.

5.4.3 Taking account of the high moisture levels in framing around Sample 1 (below the defective apron flashing) and the 18-year exposure of the underside of the bottom plate around Sample 3 (below the lower deck balustrade), I concur with the expert that leaching from ongoing moisture penetration to those locations is the most probable cause of the lack of preservative remaining in Sample 1 and Sample 3.

5.4.4 The laboratory report noted that:

- Sample 1 contained 'advanced decay that had probably caused loss of the bulk of the original structural integrity in affected areas.'
- Sample 2 contained fungal growths, but 'no structurally significant decay'.
- Sample 3 contained 'suspected incipient brown rot'.

5.4.5 The report noted that the decay such as that identified in Sample 1 typically has important implications for the building in general and it is therefore 'important to establish the limits of fungal infection and/or decay and to establish the causes, and apply appropriate remediation'. The laboratory report concluded that:

> The fungal morphology, its distribution and the fungal and decay types identified suggested that all of the samples examined had been exposed to moisture conditions that are inconsistent with sound building practice and/or weathertight design and that appropriate remediation is needed to correct this.

5.5 Windows

5.5.1 Windows and doors are recessed by the cladding thickness with aluminium head flashings. The expert noted that the lower part of uPVC sill flashings were visible and appeared to be installed in accordance with the manufacturer's instructions at the time. He considered it likely that uPVC jamb flashings were similarly satisfactory.

5.5.2 The eight invasive moisture readings taken below windows or doors ranged from 13% to 16% and timber drillings showed no visual signs of decay; which provided the expert with reasonable evidence that the joinery junctions had performed satisfactorily over the past 18 years.

5.6 Roof/wall junctions

5.6.1 The expert observed that roof/wall junctions are protected with lead apron flashings dressed over adjacent concrete tiles. At sloping aprons the lead is dressed over the first crest of the tile profile. The junctions generally appeared satisfactory and in accordance with manufacturers' instructions at the time of construction, except at the bottom of the sloping apron flashing at the southwest lounge wall.

5.6.2 The moisture penetration and extensive damage revealed at the cut-out beneath the junction is outlined in paragraph 5.3 and 5.4; and the expert considered that the leaks were likely due to:

- the lack of a kickout to the flashing to direct water into the gutter, and/or
- the installation of the gutter and fascia prior to the plastering, as shown in the owners' construction photo.

(I also note that the lead apron flashing extends over an open gap between the gutter and the fascia, which would allow heavy rain to enter the gap and possibly penetrate the exposed backing sheets.)

5.7 The decks

5.7.1 The expert noted that the butyl rubber membrane to the upper deck floor is in good condition and 'free from signs of premature deterioration, debonding of laps or ponding', and moisture levels at the deck perimeter were all low, indicating satisfactory performance of the various junctions.

5.7.2 The lower deck has an open timber floor with monolithic-clad balustrades. The expert assessed the deck floor to wall junction and noted that:

- a galvanised steel flashing extends from behind the upper EIFS and over the lower EIFS infill cladding between the cantilevered deck joists, with the joist penetrations sealed at the junctions
- there is no evidence of current moisture penetration and the junction accords with the EIFS manufacturer's detail at the time
- the joists are supported over the lower level concrete block walls and the steel lintel to the garage door, meaning that the 'primary structure' is durable
- some timber between joists was visible via a temporary services cut-out left open, and timber above the steel lintel appeared free of signs of moisture
- sealant around joist penetrations was installed following the authority's recent letter and will need to be maintained in good condition to protect the underlying framing.

5.7.3 The expert also assessed the clad balustrades, noting that:

- the balustrade generally accords with the EIFS manufacturer's detail at the time, except that the 6^{o} top slope is below the 15^{o} shown in the detail

- there is no evidence of current moisture penetration, with moisture readings of 15% and 16% in top plates to the northwest and northeast balustrades
- Sample 2 from framing below the balustrade/wall junction and mitred corner window was boron treated and contained fungal growths but no established decay or need for replacement, which indicated adequate performance
- Sample 3 was taken from the underside of the balustrade bottom plate, which is adjacent to exposed posts and joists and would frequently be subject to rain
- analysis of Sample 3 identified no treatment and suspected incipient brown rot, with a probable requirement for replacement – which suggests that the framing may not be durable for the required period of a further 32 years.

5.8 The expert made the following additional comments:

- Clearance from EIFS to the southeast wall is reduced at the step in floor level. Polythene membrane was laid over the clay bank when the adjacent lower bathroom was recently refurbished and the owners' construction photos show no 'obvious signs of wetting or decay' in exposed framing. The area appears to be performing satisfactorily in these circumstances.
- At the 'linked' windows to the southwest middle and upper walls, a standard uPVC sill flashing continues across the double opening, with the vertical leg exposed for about 50mm. An invasive moisture reading of 14%, taken below one of the junctions indicated that any moisture that might have entered behind the flashing upstand was draining harmlessly back to the outside. (I also note that regular sealant application as part of normal maintenance should limit the risk of any moisture entering in the future.)
- Although the balustrade tops have slopes lower than recommended by the manufacturer and no evidence of saddle flashings at wall junctions, moisture levels in the framing are low and providing balustrades and junctions are properly maintained the cladding is likely to continue to protect the framing for the further 32 years required.
- Despite limited membrane falls, cladding clearances of 20mm and 'poorly finished' membrane to the gutter outlet, moisture levels to framing in the upper deck were all low and the membrane is in good condition, indicating satisfactory performance in the circumstances.

5.9 The authority's list of concerns

5.9.1 The expert also assessed the list of concerns identified by the authority in its refusal to issue the code compliance certificate; and Table 3 summarises the expert's responses.

Table 3

Areas of concern per S95A refusal		Comment	Relevant paragraphs
1	Elevated moisture readings at ranch slider and sill level in the bedroom 1, with further investigation required	Invasive moisture readings indicate adequate performance	5.3.1 0
2	Cracks in cladding at balustrade to cladding junction and holes in cladding	From original determination - area repaired prior to repainting EIFS	3.9.1 Table 2

Areas of concern per S95A refusal		Comment	Relevant paragraphs
3	Deck joists to cladding junctions	From original determination – junctions sealed prior to repainting	3.9.1 5.7.2 Table 2
4	Meter box flashing detail	Not required as installed on concrete block wall	2.2
5	Balustrade penetrations into cladding	Low invasive moisture readings – satisfactory if maintained	5.7.3
6	Cladding to joinery junctions	Invasive moisture readings indicate adequate performance	0
7	Insufficient wash down gap at wooden deck to cladding junctions	Lower walls are concrete block Timber moved to provide gap	2.2
8	Cavity under head flashing noted	Invasive moisture readings indicate adequate performance	0
9	Unknown sealing of cladding at barge/fascia board to cladding junction – barge/fascia board has penetrated the cladding	Remedial work required to junction above family room	5.6.2 5.3.2 5.10.1
10	Deck post to cladding junctions	Remedial work required to exposed balustrade bottom plate	5.3.2 5.10.1
11	Joinery to joinery junction	Satisfactory in circumstances if maintained	5.8
12	The lack of kick out flashings	Remedial work required to junction above family room	5.6.2 5.3.2 5.10.1
13	Deck overflow pipe	Maintenance required to loose membrane	6.3.4
14	Sufficient deck falls not achieved	Satisfactory in circumstances if maintained	5.7.1
15	Vermin proofing of pipe penetrations	Not identified	
16	Handrail required to external stairs at side of dwelling	Authority has withdrawn item	1.5.1
17	Downpipe fixings into cladding	From original determination – fixings sealed prior to repainting EIFS	3.9.1 Table 2
18	Sub soil drainage at exterior of bathroom, SE elevation	From original determination - area repaired prior to repainting EIFS	3.9.1 Table 2
Comments			
19	Revised detail required with regards to the cladding change from harditex to insulclad	Amended drawings submitted and approved on 30 May 1997	3.1
20	Confirmation of any remediation undertaken in response to Determination 2004/78, and if so, by whom and is there any supporting documentation?	Submitted to authority on 26 November 2013 Expert's assessment included in report.	3.9.1 Table 2

5.10 Summary

5.10.1 The expert concluded that the following areas required further investigation and/or remedial work to comply with Clause E2 and B2 of the Building Code:

- moisture penetration and timber damage to the framing below the end of the apron flashing and gutter/wall junction above
- the lack of treatment and damage to exposed bottom plates to lower balustrades
- further investigation to resolve doubts about treatment in the wall framing.

6. Compliance of the external envelope

6.1 I note that the building consent was issued under the former Act, and accordingly the transitional provisions of the Act apply when considering the issue of a code compliance certificate for work completed under this consent. Section 436(3)(b)(i) of the transitional provisions of the current Act requires the authority to issue a code compliance certificate if it 'is satisfied that the building work concerned complies with the building code that applied at the time the building consent was granted'.

6.2 In order to determine whether the authority correctly exercised its powers of decision in refusing to issue a code compliance certificate for this house, I must therefore consider whether the EIFS cladding complies with the weathertightness and durability provisions of the Building Code.

6.3 Weathertightness performance

6.3.1 I note that an application can be made to the authority for a modification of durability requirements to allow durability periods to commence from the date of substantial completion in 1997. Although that matter is not part of this determination (see paragraph 1.5.2), I have taken the anticipated modification into account when considering the weathertightness performance of the claddings as many areas of the claddings have continued to perform for the 15 years required.

6.3.2 One area has not remained weathertight, as there is evidence of moisture penetration and consequential timber damage resulting from defects that have existed since completion of the house. Given the level of damage found, I consider it likely that moisture has been penetrating into that area over an extended period.

6.3.3 Taking account of the expert's report and the age of the house, the EIFS generally appears to have been installed in accordance with the manufacturer's instructions at the time of construction. However, some areas require further investigation and/or repair and I conclude that the following areas require attention:

- additional investigation and sample testing to:
  - establish the full extent of moisture damage to the family room wall below the bottom of the apron flashing and gutter/wall junction
  - identify treatment levels in wall and balustrade framing
  - establish the extent of damage to lower deck balustrade bottom plates
- following investigation, repairs and replacement of all damaged framing
- remedial work to the bottom of the apron flashing and gutter/wall junction

6.3.4 I note the expert's comments in paragraph 5.8, and accept that, given appropriate maintenance, these areas are likely to be satisfactory in the circumstances. I also

consider that although the poorly adhered membrane to the deck outlet requires attention, this can be repaired as part of normal maintenance.

6.4 Weathertightness conclusion

6.4.1 I consider the expert's report establishes that the current performance of the building envelope is not adequate because there is evidence of moisture penetration over an extended period of time into some of the timber framing. Consequently, I am satisfied that the cladding does not comply with Clause E2 of the Building Code and also did not fully comply with Clause E2 for the period required by Clause B2 of the Building Code since the time of completion.

6.4.2 Clause B2 includes the requirement for wall claddings to remain weathertight for a minimum of 15 years. Although the EIFS cladding is now 18 years old, laboratory test results have indicated that moisture had penetrated into one of the tested samples over an extended period, resulting in significant decay and damage to the framing from identified defects at a junction above. I take the view that such moisture penetration indicates that the cladding did not meet the minimum life required by the Building Code and I am therefore satisfied that the building envelope did not comply with the durability requirements of Clause B2.

6.4.3 Because the identified moisture penetration and cladding faults occur in discrete areas, I am able to conclude that satisfactory investigation and rectification of areas outlined in paragraph 6.3.3 will result in the EIFS cladding being brought into compliance with Clauses E2 and B2 of the Building Code.

6.4.4 It is emphasised that each determination is conducted on a case-by-case basis. Accordingly, the fact that a particular cladding system has been established as being code compliant in relation to a particular building does not necessarily mean that the same cladding system will be code compliant in another situation.

6.5 Maintenance

6.5.1 Although a modification of durability provisions to allow provisions to commence from substantial completion in 1997 means that most of the cladding has already met the minimum life required by the Building Code, the expected life of the underlying structure is considerably longer and careful maintenance will be needed to ensure that claddings continue to protect the underlying structure for the further 32 years required to meet its minimum life of 50 years.

6.5.2 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 I note that the building consent was issued to the current owners of the house, and a notice to fix is therefore able to be issued by the authority. A notice to fix should therefore be issued that identifies the areas and investigations outlined in paragraph 6.3.3 and refers to any further defects that might be discovered in the course of investigation and rectification, and requires the owners to bring those items into compliance with the Building Code.

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 applicants should then produce a response to this in the form of a detailed proposal produced in conjunction with a competent person with suitable experience in weathertightness remediation and should be submitted to the authority for its consideration and approval prior to undertaking any further remedial work. 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 exterior building envelope does not comply with Clauses E2 and Clause B2 of the Building Code that was current at the time the building consent was issued, 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 13 July 2015.

John Gardiner
Manager Determinations and Assurance