Department of Building and Housing
Te Tari Kaupapa Whare

# Determination 2011/103

# The issue of a notice to fix for a 7-year-old house at 48A Penzance Road, Mairangi Bay, 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 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 owner, M Craig ("the applicant"), and the other party is the Auckland Council ("the authority"), carrying out its duties as a territorial authority or building consent authority.

1.2 This determination arises from the decisions of the authority to refuse to issue a code compliance certificate and to issue a notice to fix for the 7-year-old house because it is not satisfied that the building work complies with the requirements of certain clauses of the Building Code[2] (First Schedule, Building Regulations 1992). The authority's concerns regarding the compliance of the building work relate primarily to the weathertightness of the exterior building envelope; and the applicant disputes the inclusion of five of the items on the notice to fix (refer paragraph 3.9).

1.3 The matter to be determined[3] is whether the authority was correct in its decision to issue the notice to fix including the disputed five items. In deciding this I must consider whether the five items under dispute are required to be remedied for the building to achieve compliance with the Building Code.

### 1.4 Matters outside this determination

1.4.1 The notice to fix outlined requirements for durability of building elements and stated that the applicants may apply to the authority for a modification of the requirements to allow durability periods to commence from the date of substantial completion of the building work. I therefore leave this matter to the parties to resolve once the claddings have been made code-compliant.

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[1] The Building Act, Building Code, compliance documents, past determinations and guidance documents issued by the Department are all available at www.dbh.govt.nz or by contacting the Department 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 sections 177(1)(b) and 177(2)(f) of the Act.

1.4.2 The notice to fix identifies non-compliance with Clause B1 Structure and Clause E1 Surface Moisture of the Building Code. However I have not seen any evidence as to the specific reasons for the authority considering that the building work is not compliant with those clauses of the Building Code. I do not consider clauses B1 and E1 further in this determination.

1.5 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 other evidence in this matter.

## 2. The building work

2.1 The building work consists of a double storey house with an attached internal access garage, situated on a sloping site in an established urban residential location. The site is considered to be in a low wind zone for the purposes of NZS 3604[4].

2.2 The building is relatively complex in shape and form, is of light timber-framed construction, and has been predominantly clad with a mixture of timber weatherboards and stucco plaster over a non-rigid backing on a 20mm cavity. The timber weatherboards are fixed directly to the framing.

2.3 The joinery is aluminium throughout, and has been either recessed into the stucco plaster cladding or fixed over the external faces of the weatherboards. The expert has noted from invasive and destructive testing that the timber framing used for the window sill surrounds has been protected with a bituminous wrap.

2.4 The main roof of the building is a simple mono-pitch roof and is clad in a proprietary metal sheet roofing material. A 450-600mm soffit has been provided on three elevations of the two-storey portion of the building. There are no eaves on part of the west elevation of the second level of the building and on the garage and the large bedroom on the northeast corner of the building, which have a deck/roof above them. A glazed canopy has been constructed over the main entrance to the building.

2.5 Exposed decks, which double as roofs, extend above the living area/garage and a bedroom. The decks have a butyl rubber membrane floor over a plywood substrate, with kwila timber forming the finished surface.

2.6 The expert took a timber sample from a cavity batten beneath a sill/jamb junction and forwarded it to a testing laboratory for analysis. The consultant's analysis confirmed that the sample timber was H3.2 treated. The applicant has supplied a statement from the timber suppliers that the external framing timber is treated with LOSP to H3. I therefore consider that the wall framing is treated to a level that will resist decay.

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

## 3. Background

3.1 In November 2003, the authority issued building consent (No. BC1011781) for the construction of the building under the Building Act 1991. I have not seen a copy of this consent. An amendment was subsequently issued, however I have not seen a copy the amended consent and I am therefore unable to confirm the nature of the work it related to or the date the amendment was issued.

3.2 The authority undertook eleven inspections of the building work between 1 December 2003 and 31 March 2004. All of these inspections passed, except for the pre-line inspection on 8 March 2004.

3.3 On 20 December 2005 the authority carried out a final inspection of the building work, which failed. A number of items were found to contravene Building Code requirements, including matters related to clauses E2, B1 and F4, and the authority also required some documentation to be provided.

3.4 On 18 January 2006 the authority undertook a weathertightness and general external inspection of the building work and, in a letter to the applicant dated 25 January 2006, provided details of the results and listed a number of defects that required remedial work to bring the building into compliance with the Building Code.

3.5 It appears that an amendment to the consent was issued for re-cladding work at some time between 2006 and 2008 (refer paragraph 3.1).

3.6 On 1 April 2008 the authority carried out a 'final recheck' inspection of the building work completed under consent No. BC1011781, and noted that the following outstanding items needed to be rectified and reinspected in order to meet the requirements of the Building Code including:

- outstanding issues have not been addressed in the amended plans for the recladding work
- window sill flashings need to be installed for windows abutting the weatherboard cladding, and the appropriate gap at head flashings needs to be achieved.

3.7 On 4 April 2011 the authority carried out a further final inspection of the building work, and wrote to the applicants on 23 May 2011 attaching a notice to fix. The authority stated that it was not satisfied that the building work complied with the Building Code in a number of respects, recommending that:

> ... [the applicant] engage the services of a suitably qualified person to review the attached [notice to fix] and to develop a proposed scope of work, which in their view would address all the areas of contravention. [The authority] will then review this proposal and if it agrees with it, will then advise [the applicant] as to whether a building consent needs to be applied for.

3.8 The notice to fix (No. 3568) issued for the amended building consent stated that the authority was not satisfied that the building work complied with building consent BC1011781, and with the following clauses of the Building Code:

- B1 Structure

- B2 Durability
- E1 Surface moisture
- E2 External moisture
- F4 Safety from falling.

(As noted in paragraph 1.4.2 Clause B1 and E1 are not considered in this determination.)

3.9 The "details of the contravention" attached to the notice identified various defects associated with the building work, of which the five that the applicant disputes are listed below:

| Item | The authority's requirement |
|---|---|
| 2.1 a) | All control joints shall be installed in accordance with the manufactures (*sic*) specifications and in accordance with E2/AS1 of the New Zealand Building Code and BRANZ Good Stucco Practice. |
| 2.1b) | All head flashings shall be installed in accordance with the manufactures (*sic*) specifications and in accordance with E2/AS1 of the New Zealand Building Code and BRANZ Good Stucco Practice. |
| 2.2 d) | Raised removable surfaces of tiles or timber shall be provided over the underlying weathertight deck surface. Access to the underlying surface must be provided for cleaning and maintenance. … |
| 2.2 h) | … [the authority] must be satisfied on reasonable grounds that no moisture has entered the building where the sloping head flashing terminates over the sloping window. |
| 2.2 m) | The bottom edge of the cladding system is to finish a minimum 100mm above paved surfaces and 175mm above unpaved surfaces. The cladding has been taken closer than these measurements. |
| 3.1 a) | In the approved building consent documents, the architect has designed the windows with sill trays[5]; these have not been installed and therefore do not comply with the approved building consent documents. … |

3.10 The authority also noted a number of outstanding items identified as non-compliant during the inspection of 18 January 2006 had yet to be addressed.

3.11 The applicant engaged a building consultant to prepare a scope of works, to address the notice to fix, which was subsequently provided to the authority on 29 June 2011.

3.12 The Department received an application for a determination on 20 July 2011.

3.13 On 23 September 2011 the authority wrote to the applicant in regard to the scope of works; noting that it accepted the proposed scope of works in principal but, only in respect of the five disputed items, it required the following information:

| Item | The authority's requirement |
|---|---|
| 2.1 a) and b) Control joints and head flashings | Manufacturers specifications to be provided at the time of lodgement for a the new building consent, so compliance can be determined. |

[5] The plans provided with the application do not show sill tray to windows.

| | |
|---|---|
| 2.2 d)<br>Deck | Detail of proposal to install removable sections, so the underlying membrane can be accessed for repairs and maintenance. Furthermore, an inspection of the membrane by a suitably qualified expert on its condition is required. |
| 2.2 h)<br>Head flashing | All flashing must be in accordance with the Building Code and manufacturer's specification. |
| 2.2 m)<br>Clearance | Require detail to be included with the plans at the time of lodgement. |
| 3.1 a)<br>Sill trays | [The authority acknowledged the applicant's decision to apply for a determination on this matter] |

## 4. The submissions

4.1 In a memorandum dated 17 July 2011 which accompanied the application for determination, the applicant outlined the background events and noted that 'many of the items in the notice to fix have been completed'. The applicant requested that the determination 'reduce the scope of work required' in respect of five items (listed below) so a code compliance certificate could be issued:

- '[The remedial plaster system] be accepted [by the authority] without the need to install flashings behind the newly installed control joints on the [stucco plaster].'
- 'Remove the need to alter the decks.'
- 'Remove the need to prove water is not entering the building thorough the sloping head flashing.'
- 'The area of concrete too high will be cut away rather than removed completely.'
- 'That sill trays are not required under the windows [to] the weatherboard [cladding].

I note that the applicant initially sought a sixth item regarding the opening to a flight of stairs, but subsequently submitted that a determination was no longer required on that matter.

4.2 The applicant forwarded copies of:

- the consented plans for the property
- the notice to fix dated 23 May 2011
- copies of correspondence between the parties
- other evidence pertaining to the matter.

4.3 On 14 November 2011 the Department sought information from the authority to further clarify the situation regarding the items under dispute and the authority's acceptance or otherwise of the proposed scope of works. The authority provided a copy of its letter to the applicant dated 23 September 2011 (refer paragraph 3.13) but made no further submission.

4.4 The draft determination was issued to the parties for comment on 16 November 2011. The applicant accepted the draft but sought clarification of the meaning of last bullet point in paragraph 6.5. I have amended paragraph 6.5 accordingly.

4.5 The authority responded to the draft in a submission to the Department dated 24 November 2011. The submission said, in summary:

- control joints should be installed in the plaster cladding in accordance with the manufacturers specifications
- some windows to the weatherboard-clad walls 'are well down the face of the building and therefore not protected by the soffits'
- it was not realistic to expect an owner to 'deconstruct the deck … for the purpose of maintenance …'
- in respect of the sloping head flashing 'the use of sealant to stop moisture from penetrating behind the cladding is not a means of compliance'
- the authority disagreed with the expert's opinion of the effect of water ingress noted in paragraph 5.4 saying that 'any moisture entering the wall / ceiling cavity, regardless of timber treatment levels' will have a detrimental effect on building elements.

4.6 In response to the authority's submission I note the following:

- Some significant areas of plaster have not cracked in the period since this cladding was installed in 2004, and the biggest effects of movement that a building will experience occur immediately following construction. There would appear to be little benefit in now installing control joints to walls that appear to be sound (refer paragraph 6.5).
- The provision of access inspection points to the deck is the owner's choice to make; I do not believe the authority can require these to be provided.
- The draft determination found that the application of sealant to the sloping head flashings does not comply with Clause B2 (refer paragraph 6.4, item 2.2 h)
- Compliance with Clause E2 does not require that buildings never allow the ingress of moisture; it requires that the level of ingress that does occur does not cause undue dampness, and damage to building elements, etc. I accept the expert's opinion in this instance.

## 5. The expert's report

5.1 As mentioned in paragraph 1.5, 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. The expert inspected the building work on 18 August 2011 and on 15 September 2011, and provided a report which was completed on 13 October 2011.

5.2 The expert noted that it appears the building has generally been constructed in accordance with the consented documentation.

5.3 The expert provided with his report a copy of the biodeterioration consultant's timber analysis report.

5.4 The expert inspected the interior of the building and observed that there was evidence of moisture ingress on the ceiling above the internal stairs and at the base of the western wall of the garage. The expert noted however that the latter 'does not appear to represent a significant issue'.

5.5 The expert took a total of 14 invasive moisture readings in the exterior walls at areas considered at risk (specifically: at six locations in the plaster cladding, and at eight locations in the timber weatherboard cladding), and noted slightly elevated readings or signs of moisture (all in plaster cladding locations) at both the right and left-hand side of the sill of both the first and second ground floor office window on the north elevation. The expert noted that if corrections were made for timber treatment the readings would have been within acceptable levels at the time of the investigation.

5.6 The expert removed an L-shaped plaster cladding panel cut around the jamb and sill, leaving the upper panel at the head-to-jamb junction intact. I accept that the exposed underlying construction is typical of similar areas elsewhere in the building.

5.7 The expert took timber samples for testing by a timber biodeterioration laboratory. The laboratory reported that the samples 'contained fungal growths, some of it recently active, but no structurally significant decay was detected' and that '[f]raming in a similar condition can typically be left in situ provided that the samples were representative of the worst case in the areas sampled'.

5.8 Commenting specifically on the weathertightness of the external envelope, the expert noted:

- the windows installed in the stucco plaster have jamb and sill flashings. However, the flashings incorporate separate angle beads that are butt-jointed and are unsealed (i.e. not stop-ended), allowing a pathway for moisture to enter the cavity at this location. The sill flashings do not extend beyond the face of the stucco plaster
- the heads of the windows do not allow for water to freely drain away from the window/cladding junction
- two windows (weatherboard cladding) have sloped head flashings without stop ends. This increases the risk for moisture ingress at these locations
- the plaster cladding system appears to comprise a two-coat, rather than a three-coat application, and the system has been inadequately reinforced
- there is no evidence of control joints to stucco plaster at locations where these should have been installed. There is evidence of extensive cracking to the plaster cladding
- the cappings above the balustrade walls have been inadequately formed, and lack saddle flashings
- the frame supporting the front entrance canopy penetrates the plaster cladding without the inclusion of flashings to prevent moisture ingress.

5.9 Commenting specifically on the timber decking on the first floor decks, the expert observed that although the timber decking is nail fixed as opposed to screw fixed this does not prevent the timber panels from being easily removed to provide access for maintenance purposes to the timber below.

5.10 The expert noted that sill trays have not been provided to the windows to the weatherboard cladding and that there is no protection in the event the joinery units themselves leak. The expert also noted that

> From the additional invasive testing completed [the expert] recorded that there were no raised moisture content readings recorded and that the probability for decay damage at the sills would be significantly reduced due to the installation of a bituminous wrap [refer paragraph 2.3].

5.11 The expert also noted that the applicant proposed to over-clad part of the existing stucco. However, I believe the expert incorrectly identified the remedial plaster system in his report: the product to be used is Sto Armat Plaster System as described in BRANZ Appraisal Certificate No. 488 (2006). The remedial plaster system is a thin-coat acrylic plaster reinforced with fibreglass mesh, which would appear suitable for this application.

5.12 Commenting on the remaining aspects of the remedial plaster system, the expert noted that:

> [The remedial plaster system will] not rectify the defective jamb and head flashing junctions.
>
> … there is no information … that details how [the remedial plaster system] would rectify …:
>
> - Exposed [cavity] battens on the north-western external corner of the garage door opening.
> - A lack of vertical and horizontal control joints ….
> - Extensive cracking [to the stucco plaster].
> - Unprotected penetrations, and penetrations that lack adequate flashings, such as the front entrance canopy beams.

5.13 With respect to other Building Code clauses the expert noted that the tensioned steel cables installed as a vertical barrier in the balustrade on the deck above the bedroom incorporate openings of greater than the maximum permissible width of 100mm, and as such the balustrade does not meet the requirements of Clause F4 Safety from falling.

5.14 A copy of the expert's report was provided to the parties on 14 October 2011.

5.15 In further advise to the Department in response to 'Item 2.2 m) Clearance' (refer paragraph 3.13) the expert considered that the clearance from the cladding to the ground was generally satisfactory with some exceptions where the clearances need to be remedied; in particular either side of the garage door opening and the main entrance door, and a short return wall on the West elevation.

5.16 The applicant provided a response to the expert's report in an email to the Department dated 17 October 2011. The applicant requested the determination consider:

- 'Is it necessary to install flashings below the 3 windows ([the authority] is not requesting this to be done)'?
- Is it necessary to install more control joints in the [plaster] cladding'?
- If more control joist are required 'is it necessary to install flashings under these control joints'?

5.17 The applicant was of the opinion that the expert's report supported his contention with respect to sill trays to windows in the weatherboard cladding, the need for removal decking, and the need for work to the sloping head flashings.

5.18 Regarding stair risers; the applicant noted that he was now aware how compliance can be met, and as such the matter was no longer in dispute (refer also paragraph 4.1).

## 6. Discussion

6.1 I have considered the five items in terms of compliance of the external building envelope ("the claddings") in respect of Clause E2 External Moisture and Clause B2 Durability. The claddings include the components of the systems (such as the wall claddings, the windows, the roof claddings and the flashings, as well as the way the components have been installed and work together.

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

6.3 Taking into account the expert's report, I consider remedial work is necessary in respect of the matters described in paragraph 5.8.

6.4 Regarding the other items in dispute I conclude that:

### 2.2 d) [Removable decking]

I accept the expert's opinion that the deck planking can be easily removed for maintenance if required and I consider there is no need to alter the decks in advance of this eventuality. However, I note that any over-cladding of the stucco walls adjacent the decks will impact on the minimal clearance between the timber deck members and the cladding.

### 2.2 h) Head flashing [to sloping windows]

I consider water has not entered the building through the head flashings to date, and in this respect the head flashings comply with Clause E2 External moisture. However, the work is also required to comply with Clause B2 Durability, and I consider that the degree to which these flashings rely on sealant to perform means that compliance with Clause B2 has not been achieved.

### 2.2 m) [Ground] Clearance

I consider remedial work is necessary in respect of ground clearance to the areas identified in paragraph 5.15. The remedial work can be confined to lowering the immediate ground level at these locations.

### 3.1 a) Sill trays [to windows to weatherboard cladding]

I note that the expert's findings indicate that the windows are weathertight and have been performing to date. The expert noted there is the potential for future moisture ingress if the joints in the aluminium window joinery should start to leak, and that installation of sill flashings would mitigate this. I note that the relevant windows are beneath eaves, and it is my view that the windows will continue to meet the requirements of the Building Code without the addition of sill flashings. I therefore consider the sill trays to the windows in the weatherboards are not required.

6.5 In respect of the applicant's request that the proposed remedial plaster system be accepted without flashing behind the newly installed control joints, I note the following:

- As described in the expert's report the stucco plaster shows extensive cracking to some elevations, while areas (typically the two-storey stucco 'panels') have performed much better. I consider that different repair methodologies may well be appropriate to the stucco plaster depending on the level of current performance.
- Any cracking to the stucco plaster is likely to have occurred shortly after the installation of the system, further cracking is unlikely to occur now. I consider there is limited value in installing control joints to any areas of stucco cladding that is to remain.
- The decision to be made between replacement of the stucco plaster, targeted repairs, application of the remedial plaster system, or a mix of all the options, is the applicant's choice to make. I note that if the remedial plaster system is to be used, allowance will need to be made by the parties for the manner in which it is to be applied as the manufacturer's details may not be appropriate.

6.6 I note that the expert has identified other items of non-compliance. Though the authority has made no submission to the determination it appears from the authority's letter of 23 September 2011 that the applicant is planning to apply for building consent for the remedial work. It is my view that the parties should take into account the information provided within the expert's report when considering whether the remedial work will bring the building into compliance with the Building Code.

## 7. What is to be done now?

7.1 The notice to fix should be modified and reissued to the owner to take into account the findings of this determination in respect of items 2.1 a) and b), 2.2 d), 2.2 h), 2.2 m) and 3.1 a). The notice to fix can require the owner to bring the building work into compliance with the Building Code but, as noted in previous determinations, I consider that a notice to fix cannot specify how compliance is to be achieved.

7.2 In response to the modified notice to fix, the owner should engage a suitably qualified person to undertake a thorough investigation of the building work, to determine the extent of the defects and any damage that may have occurred, and produce a detailed proposal describing how the defects are to be remedied. The

proposal should be submitted to the authority for approval. 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 Act, I hereby determine that although the authority was correct to issue the notice to fix, the notice is to be modified to take account of the findings of this determination.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 12 December 2011.

John Gardiner
**Manager Determinations**