



Determination 2010/022

The code compliance of proposed remedial work to two small tiled decks to a 12-year-old house at 21 George Gee Drive, Lower Hutt



1. The matter 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, Department of Building and Housing (“the Department”), for and on behalf of the Chief Executive of that Department.

1.2 The parties to the determination are:

- the owners, P Huy & K Channtha (“the applicants”), acting through a registered architect as their agent (“the architect”)
- the Hutt City Council (“the authority”), carrying out its duties and functions as a territorial authority or building consent authority.

1.3 The matter for determination in terms of section 177(1)(a) of the Act is whether the proposed work will comply with Clause² E2 External Moisture of the Building Code (Schedule 1, Building Regulations 1992).

¹ The Building Act 2004, the Building Code the Compliance Documents, past determinations, and guidance documents issued by the Department are available from the Department’s website at www.dbh.govt.nz or by contacting the Department on 0888 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

- 1.4 I note that the parties have not raised any other matters relating to other clauses of the Building Code or other parts of the building work. Therefore, this determination is restricted to Clauses B2 Durability and E2 External moisture of the Building Code in respect of the two upper level decks only.
- 1.5 I also note the application is in respect the authority's decision to issue a notice to fix for the remedial work. The authority advises that the notice to fix was issued; but as neither the architect nor the authority have been able to provide a copy of this document, I have taken the matter to be determined to be as that described in paragraph 1.3.
- 1.6 In making my decision, I have considered the submissions of the parties and the other evidence in this matter.

2. The building work

- 2.1 The building is a two-storey detached house situated in a very high wind zone for the purposes of NZS 3604³. The house is relatively complex in plan and form. The construction is a combination of structural steel members and conventional light timber framing, constructed on concrete slabs and timber-framed floors, built on multiple levels with mono-pitch skillion roofs and 520mm eaves to most elevations.
- 2.2 A building consent was issued by the authority for work necessary to address areas of non-compliance with E2 and B2. This resulted in some changes, including the removal of three of the original five upper level decks and modifying the original roof. The walls of the house are now clad in compressed fibre-cement sheets and weatherboards. Both cladding materials are fixed over a rigid air barrier.
- 2.3 The two upper level decks that are the subject of this determination are partly completed. The membrane has been laid and the appropriate flashings installed with the tiling yet to be completed. Both decks are partially sheltered by roof projections.
- 2.4 "Deck A" measures approximately 3.4x2.0 metres (area 6.8m²) and has double doors opening from the house, partial solid balustrades to the decks ends, and a glass balustrade to the remaining free-draining edges to the deck. Deck A is located partly over the garage, and partly cantilevered over open air.
- 2.5 "Deck B" measures approximately 1.0x1.5 metres (area 1.5m²) and has double doors opening from the house and solid balustrades to all sides. Deck B is located fully over a habitable space.
- 2.6 As it is now proposed, both decks will consist of:
- 20mm compressed fibre-cement sheet screw-fixed to timber framing, not laid to falls
 - a liquid-applied waterproof membrane ("the membrane") comprising a two-part microfiber reinforced acrylic membrane applied to the compressed fibre-cement sheet
 - a screed to the deck providing 1:60 falls to outlets, or to the free-draining edges to the deck
 - a second liquid-applied waterproof membrane applied to the screed

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

- ceramic tiles fixed with adhesive to the second waterproof membrane.
- 2.7 The edges of the deck membrane terminate at:
- the solid balustrade and walls with an upstand to the membrane running 150mm up behind the cladding
 - the aluminium doors and window joinery with an 80mm upstand from the top of the tiles to the underside of the sill
 - the free draining edges of the deck at a purpose made aluminium flashing that has a 50mm down-turn to the cladding to the deck edge.
- 2.8 The membrane, accessories (reinforcement, primers, etc), and tile adhesive are to be supplied by the one specialist manufacturer (“the manufacturer”) and installed by a ‘certified installer’. The membrane is a two-part product applied in two layers to provide a minimum thickness of 1.5mm thick. 140mm wide reinforcing is provided at corners and junctions.
- 2.9 The manufacturer’s literature advises that the membrane meets the relevant Australian and New Zealand standards and is suitable for use in this situation. However, the literature specifies that the membrane is to be applied over any screed installed to provide falls, with the tiles fixed to the membrane.

3. Background

- 3.1 The original building consent was issued by the authority in 1997 with construction occurring during 1997 and 1998. An application for a code compliance certificate was first made in August 2005. The authority refused to issue a code compliance certificate because it was not satisfied that the house complied with Clauses B2 and E2 of the Building Code.
- 3.2 The building was subsequently the subject to two determinations (2007/40 and 2009/72) in respect of the authority’s refusal.
- 3.3 Some remedial work was undertaken between the first and second determinations, but the second determination concluded that the building still did not comply with code clauses E2 and B2.
- 3.4 In order to address the compliance issues, the architect applied for a building consent to rectify the building by recladding, reroofing and removing three of the decks, and fixing the remaining two decks. The authority issued the consent (No BC091140) on 5 February 2010 under the Building Act 2004.
- 3.5 During the course of the building work the architect applied to amend the building consent with respect to the two decks (referred to by the authority as “Amendment 1”). Amendment 1, granted by the authority on 28 June 2010, was for work described as:
- Substituting Compressed 20mm sheet & Liquid Flash 2 Pack
 - Waterproofing with Tiles over for Butynol to Decks-
 - Installed by Certified Tiler
- 3.6 It appears that work on the decks proceeded prior to any amendment being issued. The authority inspected the work that was undertaken and issued a stop work notice (which I have not seen) noting that:

- no approval had been given regarding a raised entry door sill
- the fall in the deck in one location was inadequate
- the down-turn of the aluminium flashing over the cladding to the free-draining edges to Deck A was 50mm and not 70mm.

3.7 It appears that the architect applied to the authority to have the details accepted as an alternative solution. The authority did not accept the details and issued a notice to fix (which I have not seen).

3.8 The Department received an application for a determination on 16 September 2010.

4. The submissions

4.1 The architect forwarded copies of:

- two A3 drawings detailing the decks as proposed in Amendment 1
- photographs of the deck as currently constructed
- a letter of explanation.

4.2 The letter of explanation detailed the remedial work being carried out to the building envelope and, in respect of the decks, advised that:

- the reduced sill upstand dimension (100 to 80mm) should be treated as an alternative solution
- the authority had rejected the proposal to place a screed providing falls over the membrane and apply the tiles to that. It was therefore proposed to apply a further membrane over the screed and fix the tiles to that.
- the cavity to the cladding should enable the reduced flashing dimension.

4.3 The authority forwarded copies of:

- the original consent documentation for the remedial work to the house (in respect of the external envelope to the house)
- amendment 1 to the original consent (in respect of Decks A and B)
- amendment 2 to the original consent (in respect of a separate deck)

4.4 The architect later forwarded further photographs to demonstrate that water did not pond on the decks during heavy rain.

4.5 A draft determination was issued to the parties for comment on 20 January 2011. The architect accepted the draft on 31 January 2011 noting similar work he had successfully completed throughout the country.

4.6 The authority responded to the draft determination on 1 February 2011. The submission sought clarification of the screed that was to be used to provide falls to the tiling. This matter was referred to the architect who made no response.

5. Discussion

5.1 Generally

5.1.1 The authority's concerns appear to arise from:

- sill upstands and flashing dimensions being less than that described in the Acceptable Solution for Clause E2, E2/AS1
- the method proposed to provide a 1:60 slope to the finished tiled deck.

5.1.2 The drawing submitted for Amendment 1 shows a 1:60 fall to the decks. It appears the fall is to be achieved by providing fall in the timber framing supporting the deck as the tiles are shown fixed directly to the membrane. The drawings also show the sill upstand to the window and door joinery as 100mm, and the downturn to the aluminium flashing to the edge of Deck A as 70mm.

5.1.3 With the proposed screed installed to provide 1:60 falls, and the tiles along the edge of the deck consequently raised to achieve this, the height of the sill upstand reduces to approximately 80mm, being less than the 100mm minimum provided for in Figure 62 of E2/AS1.

5.2 The requirements of the Building Code and the application of E2/AS1

5.2.1 When evaluating a design proposal for compliance with the Building Code, it is useful to make comparisons with the relevant Acceptable Solution, in this case E2/AS1. However, in making this comparison, the following general observations are valid:

- Acceptable Solutions are by their nature conservative and cover the worst case, so that they may be modified in less extreme cases and the resulting alternative solution will still comply with the Building Code.
- The requirements of an Acceptable Solution are not mandatory. Building work can comply with requirements of the Building Code, but may not comply with the relevant Acceptable Solution.
- Usually, when there is non-compliance with the provision of an Acceptable Solution, it will be necessary to consider what compensating features apply to the work in question, and whether reasonable grounds exist to form a view that any deficiencies in achieving the requirements of the Acceptable Solution will be compensated for.

5.3 The sill upstand

5.3.1 In this instance the two decks are relatively sheltered and partly covered by roof overhangs. The decks are small in area (approx. 1.5 m² and 6.8m²) so are significantly smaller than the 40m² upper limit for decks to which the scope of E2/AS1 applies. Deck A has free draining edges and is not located over a habitable space, and Deck B is only 1.5m² in area and has an outlet and overflow.

5.3.2 In addition I note that the work is to an existing building which may well affect the ease with which the solutions offered in E2/AS1 are able to be applied.

5.3.3 It is my opinion that under the circumstances the performance requirements of Clause E2 will still be met if the 100mm sill upstand is reduced to 80mm.

5.4 The down-turn to the edge flashing

- 5.4.1 The drawings for Amendment 1 detail a 70mm down-turn of the aluminium flashing over the cladding to the free draining edge to Deck A. A 50mm down-turn has been provided to the flashing as-built.
- 5.4.2 Table 7 of E2/AS1 describes flashing dimensions and the situation in which that may be applied. A 70mm down-turn is required to barge and capping flashing in very high wind zone and 50mm elsewhere. The house is located in a very high wind zone.
- 5.4.3 The section of cladding concerned is very limited in area and is only in the order of 300mm deep. The cladding incorporates a cavity and is located over open space. I also note that horizontal flashing dimensions of 35mm minimum cover are detailed elsewhere in E2/AS2: the cover being used irrespective of the wind zone.
- 5.4.4 While it was unhelpful detailing a flashing dimension on the drawings that was then not followed, I accept that the reduced dimension is acceptable under the circumstances.

5.5 The membrane and tiling

- 5.5.1 The installation of the membrane over the screed as advised in paragraph 2.9 fully satisfies the manufacturer's installation requirements. The manufacturer appears to be an established company that has been in existence for over 35 years, and the membrane itself complies with the relevant Australasian standards.
- 5.5.2 Subject to the architect satisfying the authority that the appropriate screed has been installed over the compressed fibre-cement, I have no reason to believe the finished deck will not comply with Clauses B2 and E2.

5.6 The documentation submitted in support of Amendment 1

- 5.6.1 I do not consider the documentation submitted in support of the amendment to the consent is sufficiently clear to adequately describe the proposed work. In my view a detailed plan and should have been provided for each of the two decks with corresponding perimeter details.
- 5.6.2 An outline section only has been provided for Deck B. Some information shown is incorrect; for example Note 7. 'existing drain' is referenced to both the parapet wall and the existing drain. Details considered necessary do not appear to have been provided including; allowance for the thickness and fall of the screed, the glass balustrade to Deck A, and size and construction of the overflows to both decks.

5.7 Conclusion

- 5.7.1 I conclude that the proposed work, if the remaining work is installed as described above, will meet the requirements of the Building Code.

6. What is to be done now?

- 6.1 The architect should resubmit amended documentation, in respect of Amendment 1, to the authority detailing the work as-built and as proposed, and to take account of the matters discussed above.
- 6.2 If the authority is satisfied that the amendment meets the requirements of the Building Code as discussed herein it should then approve the amendment.

7. The Decision

- 7.1 In accordance with section 188 of the Building Act 2004, I determine that the proposed amendments in respect of the two upper decks comply with Clauses B2 and E2 of the Building Code, subject to clarification of the screed to be used to provide falls for the tiling.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 21 March 2011.

John Gardiner
Manager Determinations