



Determination 2010/143

The issue of a notice to fix for two decks with tiles installed over membrane systems to a house at 2 Umere Crescent, Ellerslie, Auckland



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, 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 applicants are the owners, O and N Midgley (“the applicants”)
- the other party is the Auckland Council (“the authority”), carrying out its duties as a territorial authority or building consent authority².

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 After the application was made, and before the determination was completed, North Shore City Council was transitioned into the Auckland Council. The term authority is used for both.

- 1.3 This determination arises from the decision of the authority to refuse to issue a code compliance certificate and to issue a notice to fix for alterations to a house because it was not satisfied that elements of the building work complied with certain clauses³ of the Building Code (First Schedule, Building Regulations 1992). The authority's concerns relate to the lack of access to the membrane underlying the tiled areas to the decks of the house (see paragraph 1.6).
- 1.4 The matter to be determined⁴ is therefore whether the authority was correct in its decision to refuse to issue a code compliance certificate and to issue a notice to fix for the building work; in regard to the compliance of the tiled deck floors only.
- 1.5 In deciding this matter, I must consider whether the tiled deck areas as installed to two decks on the house comply with Clause E2 External Moisture and Clause B2 Durability of the Building Code. The tiled deck areas include the components of the systems (such as the membrane, the plywood substrate and the deck tiles) as well as the way the components have been installed and work together.

1.6 Matters outside this determination

- 1.6.1 Although the notice to fix dated 2 July 2010 identified a number of defects and other items, with the exception of the deck floors these have been, or are in the process of being, resolved between the parties.
- 1.6.2 The applicants have restricted their application to the item in the notice to fix relating to the tiled deck areas and I have received no evidence relating to a dispute about any other matters related to this building. This determination is therefore limited to the weathertightness of the tiled deck areas to the two decks.
- 1.7 In making my decision, I have considered the applicants' submission and the other evidence in this matter. I have evaluated this information in paragraph 5.

2. The building work

- 2.1 The subject building work consists of alterations to two existing verandah floors, which was part of more extensive alterations to a circa 1915 detached house. The house includes a basement level and is situated on a north sloping site which the expert describes as 'suburban sheltered'. Construction of the house is generally conventional light timber frame, with pile foundations, suspended floors, weatherboard claddings, timber windows and profiled metal roofing.

2.2 The verandahs

- 2.2.1 The house has verandahs to the front ("the front deck") and the rear ("the rear deck"), which have timber floors, timber balustrades and timber verandah posts. The balustrades and posts are a mix of original and new balustrades to match the original where the rear deck has been extended.

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 section 177(2)(f) of the Act

- 2.2.2 The original verandah floors were traditional tongue in groove timber boarding, some of which has been replaced as part of the alteration work. Parts of the deck floors now incorporate tiles laid over membrane on plywood substrates.

2.3 The front deck

- 2.3.1 The small front deck is 4.8m long x 1.9m wide and is the original verandah leading to the formal entrance of the house, with the roof extending past the floor edge. The enclosed bedroom below extends under about half of the deck floor. The original timber board floor is retained and a plywood substrate is laid over the boards. The overlaid membrane and tiles extend the full length and width of the verandah, falling across the width to the outer edge.

2.4 The rear deck

- 2.4.1 The larger rear deck extends across the north of the house, with stairs leading to the ground. An upper wall section projects to the north and forms a northeast internal corner, with two rear doors adjacent to the corner. The deck continues beyond the projecting wall, where it is open underneath and supported on timber posts that continue up to support an extension to the original verandah roof.
- 2.4.2 One corner of the basement rumpus room extends beneath the deck at the internal corner adjacent to the rear doors. The tiled area of about 3.5m² covers only that corner of the rumpus room. To keep the tiles flush with the adjacent board floor, the plywood substrate is rebated into the framing.

2.5 The deck membrane system

- 2.5.1 The deck membrane is a multi-coat 1.2mm to 1.5mm thick liquid applied, glass-fibre mat reinforced membrane applied to a plywood substrate described by the applicants as 'marine ply'. The manufacturer's instructions note that the membrane is able to be used as a waterproof membrane under tiles.
- 2.5.2 The membrane supplier has provided a producer statement dated 13 September 2008, which confirms the membrane applied and states:

We confirm viewing the application of the [membrane system] to the lower level shower/toilet areas, front and rear veranda's as being applied to or exceeding the manufacturer's requirements.

3. Background

- 3.1 The authority issued the building consent for the alterations on 29 November 2002 (No. B/2002/3608556) under the Building Act 1991. The consent was for 'internal alterations, basement, laundry, rumpus room and workshop'. I have not seen a copy of the building consent or the consent drawings and specification.
- 3.2 According to the applicants the alterations were undertaken gradually over the following seven years. In regard to the tiled deck areas, the applicants state that the 'waterproofing has been applied... ..as instructed by and inspected by the council', although I have not seen records of the inspections undertaken during construction. The membrane was also confirmed as satisfactory by the membrane supplier.

- 3.2.1 Based on the membrane supplier's producer statement, it appears that the membrane and tiling was completed about September 2008 by a 'professional tiler', according to the applicants. Sometime during 2008, a 'Practice Note 142' was issued by the authority, stating that it would not accept deck tiles directly adhered to membrane.
- 3.2.2 On 10 May 2010, the authority carried out the final inspection of the alterations. With regard to the tiled deck areas, the inspection record recorded a 'fail' for the 'waterproof membrane' and noted 'tiles fixed to membrane'. However, I note that a similar tile over membrane system was applied to basement shower and toilet areas, which were recorded as a 'pass' in the inspection record.

3.3 The notice to fix

- 3.3.1 The authority wrote to the applicants on 6 July 2010, stating that it was not satisfied that the building work complied with the Building Code in 'a number of respects'.
- 3.3.2 The authority attached a 'photo file' of defects and a notice to fix dated 2 July 2010, which cited non-compliance with various Building Code clauses (including B2 and E2). Included in the details of contraventions was the following item relating to the tiled deck areas:
- 2.0 a) 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.
- 3.4 Remaining items in the notice to fix were subsequently agreed between the parties, and the remedial work is now apparently completed. However, the situation regarding the decks remained unresolved, and the Department received an application for a determination on 19 August 2010. The Department sought further information from the applicants, which was received on 30 August 2010.
- 3.5 The Department also sought clarification from the authority on its position, receiving a response in an email dated 6 September 2010. The authority noted that it had reviewed the file and 'remain concerned for the deck[s] over the habitable area[s]'.

4. The submissions

- 4.1 The applicants' submission stated that their application applied only to item 2(a) of the notice to fix. The applicants set out the background of the project; describing the tiled deck areas and noting that any unlikely moisture ingress would 'become instantly noticeable' as the ceilings below lowered. They also pointed out that a similar system used in the shower had been passed by the authority. The applicants considered that the requirement in the notice to fix was 'too rigid an interpretation of the Code' and did not take account of the specific circumstances, concluding:

All the renovation work has been done with the best of intention through a changing landscape of legislation (as a result of the follies of others), in keeping with the heritage style of the house and none of the works pose a hazard or a durability issue.

4.1.1 The applicants forwarded copies of:

- the authority's final inspection record
- the membrane supplier's producer statement
- the notice to fix dated 2 July 2010
- various photographs and other information.

4.2 A copy of the applicants' submission was provided to the authority, which made no submission in response.

4.3 A determination was issued to the parties for comment on 10 December 2010. Both parties accepted the draft determination without comment.

5. Establishing code compliance

5.1 In order for me to form a view as to code compliance of the tiled deck areas to this house, I need to establish what evidence is available and assess that evidence in the context of the tiled deck areas to this particular house.

5.2 The authority's register

5.2.1 The authority has published a document dated 1 December 2010 titled 'External membranes register (external use only)' that lists various types of membranes along with their suitable use and limitations set by the authority ("the register").

5.2.2 The register includes the particular membrane installed to the tiled deck areas to this house, noting that it is suitable for deck areas with a plywood substrate, no steps and:

- a maximum area of 40m²
- a minimum fall of 2°.

5.2.3 However, the register also states:

No direct fixing of tiles or the like permitted onto membrane.

5.3 The evidence

5.3.1 In the case of these tiled deck areas, the evidence consists of:

- the authority's acceptance of the membrane as appropriate for waterproofing certain types of timber decks (see paragraph 5.2.2)
- the authority's apparently satisfactory inspections of the membrane application (see paragraph 3.2)
- the membrane supplier's satisfactory inspections of the membrane application (see paragraph 5.2.2)
- the membrane manufacturer's technical literature, which states that tiles may be adhered to the membrane (see paragraph 2.5.1)
- the applicant's statements about the quality of the tiling (see paragraph 3.2.1).

- the expert's report on the tiled deck areas (see paragraph 5.4).
- 5.3.2 The membrane supplier's producer statement confirms the particular membrane used and its satisfactory application to the deck substrates. The manufacturer's technical literature confirms that tiles may be adhered to the membrane, while the applicants' statements confirm that the tiles were professionally applied.
- 5.3.3 Taking into account this evidence, and in the absence of any evidence to the contrary, I am satisfied that the membrane used beneath the tiled decks is adequate for the purposes used in this building. Code compliance is therefore dependent on the installation of the products onto these particular decks.

5.4 The expert's photographs

- 5.4.1 Seeking evidence on whether the installed tiled deck floors meet the performance requirements of the building code, I engaged an independent expert to view and photograph the deck, in order to assess the weathertightness risks and to identify any apparent problems. The expert inspected the decks; providing annotated photographs of the tiles, the joints, the junctions and the associated interior areas.
- 5.4.2 The expert took non-invasive moisture readings in associated internal walls and ceilings, and found no elevated readings. He also removed light fittings from the basement ceilings below east deck to take invasive readings; recording 8% in the front deck substrate and 11% in the rear deck substrate.
- 5.4.3 On examination of the expert's annotated photographs, I note the following:

General for both decks

- The tiles are large at about 500mm square, and therefore incorporate fewer joints than would be the case with smaller tiles.
- The tiles and the wall to deck junctions are sheltered by deep verandah roofs that extend beyond the tiled areas.
- Both of the deck tiled areas are sheltered by walls on two sides, which will assist in limiting the amount of rainfall the tiles will be subject to.
- The general location is described as 'suburban sheltered'.

The front deck

- The 8% invasive moisture reading in the substrate indicates that the deck floor is currently weathertight.
- The bedroom ceiling under the deck is lowered, with an open storage area beneath the remaining deck area.
- The verandah roof is extended beyond the tiled area, limiting rain exposure.
- The deck slopes towards an outer drip edge, with a fall of 1.60 that is beyond the minimum 10 fall specified in E2/AS1.
- The close-up photograph of the deck to wall junction shows the membrane forming an upstand that underlaps the bottom weatherboard, with a silicon joint at the junction with the tiles.

The rear deck

- The 11% invasive moisture reading in the substrate indicates that the tiled deck area is currently weathertight.
- The corner of the rumpus room ceiling under the tiled area is lowered.
- The verandah roof is extended well beyond the tiled area, with minimum exposure to the weather.
- The tiled area is 2m x 1.7m situated in the internal corner and recessed flush with adjacent timber board deck surfaces.
- The deck has a cross fall of 0.7o, which is less than the minimum 1o fall specified in E2/AS1 (see paragraph 6.2).
- The membrane upstand is visible under the door threshold, with a silicon joint at the junction with the tiles. The silicon joint extends around the perimeter of the tiled area to form the junction with the timber board floor.

5.4.4 The expert noted that there was no indication of movement in the tiled deck areas, with the ‘tiles well laid with small uncracked grout joints’.

6. Discussion

6.1 Taking account of the expert’s annotated photographs and the other evidence, I am satisfied that the tiled areas to the decks have been installed to the manufacturer’s instructions in accordance with good trade practice.

6.2 Notwithstanding that the inlay of tiles to the rear deck has a limited fall, thus inhibiting drainage of rainwater from that surface, I note certain factors that assist the performance of the deck in this case:

- The tiled area is generally installed according to good trade practice and in accordance with the manufacturer’s instructions.
- The tiled surface is small and drains freely to the outside.
- The tiles are readily accessible for regular monitoring and maintenance.
- The tiled surface is sheltered by walls and very deep verandah roofs.
- After two years, there is no evidence of moisture penetration through the tiles
- Any future moisture penetration would be readily visible in the lowered ceiling below the tiled area.

These factors can assist the tiled deck area in the rear deck to comply with the weathertightness and durability provisions of the Building Code.

6.3 While the authority’s concerns relate to the lack of access to the membrane underlying the tiled areas to the decks of the house (see paragraph 1.6), and therefore it is outside of the matters put to me to determine, I note that the base of the verandah posts should have been fixed through the ply, the liquid membrane taken up the post and then capped or flashed i.e. the posts fixings should not penetrate the membrane. This matter should be part of the discussions between the parties (refer to paragraph 1.6.1).

7. Conclusion

- 7.1 I consider the expert's photographs and the other evidence have established that the current performance of the decks is adequate because they are preventing moisture penetration at present. Consequently, I am satisfied that the tiled deck areas comply with Clause E2 and Clause B2 of the Building Code.
- 7.2 It is emphasised that each determination is conducted on a case-by-case basis. Accordingly, the fact that a particular tiled membrane system has been established as being code compliant in relation to a particular building does not necessarily mean that the same system will be code compliant in another situation.
- 7.3 Effective maintenance of the tiled finish to these decks will be particularly important to ensure ongoing compliance with Clauses B2 and E2 of the Building Code and this is the responsibility of the building owners. Taking account of the limited fall to one of the decks, maintenance will require regular inspection of the tile joints and sealant, with prompt repair or replacement when any signs of deterioration are noted.

8. The decision

- 8.1 In accordance with section 188 of the Building Act 2004, I hereby determine that:
- the tiled deck areas to this house comply with Clause B2 and Clause E2 of the Building Code
 - the authority is to modify the notice to fix, dated 2 July 2010, 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 23 December 2010.

John Gardiner
Manager Determinations