

Determination 2008/88

Dispute over amendments to a building consent for a house with decks at 7 Aldersgate Road, Hillsborough, 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. The applicant is the owner, the Alsborough Trust and the other party is the Auckland City Council (“the authority”), carrying out its functions as a territorial authority or building consent authority.
- 1.2 The application is in respect of a decision by the authority to refuse to grant an amendment to a building consent for a house unless changes are made to two proposed decks and balustrades.
- 1.3 I note that the applicant and the authority have restricted the matters to be determined to the baluster fixing method and the deck membrane system. The authority has also stated that it has no concerns regarding the fall of the decks or the installation of tiles over a suitable membrane.
- 1.4 I therefore consider that the matter for determination is whether the decks and balustrades, when completed as proposed, will comply with Clauses B2 Durability

¹ The Building Act 2004 is available from the Department’s website at www.dbh.govt.nz.

and E2 External Moisture of the Building Code² (Schedule 1, Building Regulations 1992). In order to determine this matter, I must consider the following matters:

1.4.1 Matter 1: The decks completed to date

Do the partly completed decks to the first and second floors comply with the provisions of the Building Code?

1.4.2 Matter 2: The proposed deck membrane system

Will the completed membrane system, including the proposed tiled finish, comply with the provisions of the Building Code?

1.4.3 Matter 3: The proposed baluster fixings

Will the proposed method for fixing the balustrade system to the decks comply with the provisions of the Building Code?

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 the other evidence in this matter. I have evaluated the information on the decks using a framework that I describe more fully in paragraph 6.1.

2. The building

2.1 The building work consists of a detached house situated on a long steeply sloping site, which is in a high wind zone for the purposes of NZS 3604³. The house is essentially rectangular in plan to suit the site constraints, and is generally 3-storeys high, with the ground floor set into the slope and a 2-storey section to the rear. Construction is generally conventional light timber frame, with concrete slabs and foundations, concrete block walls to the ground floor, brick veneer cladding to the first and second floors with aluminium joinery throughout. The pressed metal tile hipped roof has eaves projections of more than 600mm overall.

2.2 The decks

2.2.1 On the south corner, brick veneer clad columns rise from ground level to support decks at the first and second floors. Each deck is wrapped around the south corner, extending part way along the southwest and southeast elevations. The areas under the decks are completely open to the exterior.

2.2.2 The decks fall towards gutters at the outer edges, with the ends of the decks finishing with a kerb upstand formed from a metal capping. The deck surfaces are intended to be tiled.

2.2.3 A third deck, which is not part of this determination, wraps around the east corner of the second floor, extending from the stairwell on the southeast elevation part way along the northeast elevation.

² The Building Code is available from the Department’s website at www.dbh.govt.nz.

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 New Zealand Standard NZS 3604:1999 Timber Framed Buildings

2.3 The deck membrane

- 2.3.1 The decks are not yet completed, and currently have only membrane applied over the plywood substrate. Neither the balustrades nor the tiling has been installed.
- 2.3.2 The deck membrane system is a single-layer 3mm “torch on” VEDAG membrane system called “Vedatorch”, which is a polyester reinforced modified waterproofing bituminous membrane system that is made to adhere to the substrate by the application of heat.
- 2.3.3 The deck surfaces are intended to be tiled, with the tiles providing a trafficable surface and to provide protection from UV radiation. The tile adhesive will be as recommended by the membrane supplier to ensure compatibility with the membrane.
- 2.3.4 The membrane supplier has supplied a 20 year guarantee dated 17 April 2006 for the membrane as completed on 16 April 2006. However, I note that this guarantee does not refer to the membrane being finished with tiles.

2.4 The baluster fixings

- 2.4.1 No deck balustrades have been installed, although the applicant has noted that they have been partially manufactured. The balustrades have powder-coated aluminium posts (balusters) and handrails, with 6mm polycarbonate infill panels. A plate at the base of the posts is to be fixed vertically through the membrane and plywood to the timber framing beneath. I note the original consent drawings described the balustrade as being made of stainless steel.
- 2.4.2 The proposed system of fixing includes 20mm thick H3 treated plywood mounting blocks with sloped edges, which are fixed over the membrane layer. An additional section of membrane is to be applied over the mounting blocks. The base plates are to be sealed onto a compressible foam pad or urethane sealant bed and fixed through the blocks into the deck framing with stainless steel screws and neoprene washers. The fixing holes to the base plate are also filled with sealant.
- 2.4.3 The mounting blocks are sized to allow the base plate to sit a minimum of 5mm above the finished tiled surface.

3. Background

- 3.1 The authority issued a building consent for the house (No. BLD 20040615001) on 27 July 2004, under the Building Act 1991. It appears that construction did not commence until January 2006.
- 3.2 The authority carried out various inspections during construction, including a deck membrane inspection on 15 May 2006. I also note that an inspection on 4 September 2006 recorded:

Waterproofing to bathrooms and deck membrane all on. Producer Statements required for both.

- 3.3 At that stage, the manufacture of the deck balustrades was underway based on the top fixing details in the consent drawings, which showed the posts fixed through the deck tiles into the framing.
- 3.4 In a letter to the authority dated 13 October 2006, the applicant noted that, despite becoming aware of potential concerns regarding top-fixed balusters through membranes, a change to side-fixing was not possible due to the presence of the edge gutters and the late stage of the construction work. The applicant supplied a revised detail of the fixing for the authority's approval, so that construction work could be completed.
- 3.5 The authority responded in a letter dated 3 November 2006, suggesting that a determination be sought as:
- ...we conclude your proposal is an alternative solution to NZBC E2/AS1 that will not meet the requirements of the New Zealand Building Code.
- 3.6 I am not aware of any further correspondence between the applicant and the authority before the Department received an application for a determination on 22 April 2008.

4. The submissions

- 4.1 In a letter to the Department dated 15 May 2008, the applicant described the background to the dispute, noting the significant redesign, reconstruction and costs that would be involved in altering the balustrade system to meet the authority's requirements. The applicant explained that top fixing had been approved in the original consent drawings, and asked that the altered and improved detail submitted by the balustrade suppliers be approved as an alternative solution, noting:
- The Council has a moral obligation not to change its requirements, especially after building construction had taken place based on the earlier approved plans.
- 4.2 The applicant forwarded copies of:
- the consent drawing of the balustrades
 - the proposed baluster fixing detail
 - correspondence with the authority
 - a photograph of the house
 - various other statements and information.
- 4.3 The authority made a submission in the form of a letter to the Department dated 20 June 2008, making comments on the matter, which are summarised as follows:
- Fixings into horizontal surfaces and through a membrane are susceptible to possible failure, with the potential for structural damage should moisture penetrate through the baluster fixings into other parts of the building.
 - Long-term compliance is of concern, as fixings may start off watertight but work loose with time and use of the balustrades.

- It is acknowledged that the consent drawings of 2004 showed top fixings, but the applicant raised the issue of acceptability in 2006. Based on the new information available at that time, the proposed amendment was not approved.
- The membrane system also needs to be considered, as the consent drawings showed tiles direct fixed over a Situclad waterproofing membrane, and this has been replaced with a Vedag Vedatorch membrane.
- The Vedag membrane system is a roofing membrane only, suitable as a trafficable area only for maintenance purposes, and there appears to be no BRANZ appraisal of the membrane.
- The question is whether the membrane system is suitable for the decks on this house, and also whether it can be used under tiles.
- It is unclear as to whether the proposed membrane system is to be a single or double layer system, and this needs to be made clear.
- There is no concern with the fall of these decks, with direct fixed tiles over appropriate membranes or with the ability to issue a code compliance certificate for the building providing compliance is achieved.

4.4 The authority forwarded copies of:

- the consent documentation
- the inspection records
- excerpts from a “verification report” on the deck membrane.

4.5 Copies of the submissions and other evidence were provided to each of the parties. Neither party made any further submissions in response to the submission of the other party.

4.6 A draft determination was issued to the parties on 18 July 2008. The authority accepted the draft on 24 July 2008.

4.7 The applicant responded to the expert’s report and the draft determination in a letter to the Department dated 20 August 2008; and attached copies of:

- a revised detail for the baluster fixing, dated 20 August 2008
- letter from the balustrade manufacturers dated 16 July 2008
- information on membrane used elsewhere on the house.

4.8 The applicant did not accept the draft, and asked that the following summarised comments be taken into account:

- The revised fixing method for the balusters.
- The expert’s report and the draft determination incorrectly describe the membrane. The deck membrane is intended to be one layer only, with additional membrane used only over the fixing blocks for the balusters.
- The membrane supplier has explained that the 2-layer system is only used for roofs, where the top layer is intended for UV protection and not as a trafficable

surface. Where used on a deck, the membrane supplier has advised that only one layer is needed, as the UV protection is provided by the tile surface, which also provides protection from damage.

- Other similar membrane products are used in the same way on decks. Before choosing the membrane for these decks, another quotation was received for a different brand that also proposed to use a single layer on the decks. Two further suppliers of similar membranes have now seen the decks, and have commented positively on the quality of the membrane installation. Both stated that their particular products were used as single layers under tile surfaces.
- The single layer has now been in place for more than 2 years and is proving to be weathertight despite severe weather conditions. The membrane surface was protected during construction, and no access has been allowed to the decks since occupation, in order to ensure that the membrane remains undamaged, and the expert confirms that the membrane is in good condition.
- While a preference for removable surfaces is understandable, this membrane has proved to be weathertight, there are no enclosed spaces under the decks and removable decks would be impractical in such an exposed high wind zone.

I have considered the applicant's comments and additional information, and I have amended the determination as I consider appropriate.

5. The expert's report

- 5.1 As discussed 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 addition on 13 June 2008 and furnished a report that was completed on 24 June 2008.
- 5.2 The expert provided product information sheets on the membrane system, and a copy of a letter from the authority dated 15 April 2008 regarding the membrane. However, I note that the information sheet relate to a 2-layer membrane system and have limited relevance to the single-layer system used in these decks.
- 5.3 The expert noted that the decks were covered with a layer of membrane, and no balusters had been installed. The deck floors fell towards gutters at the outer edges, with the narrow ends finished with a kerb upstand formed from a metal capping.
- 5.4 The expert noted that the membrane generally appeared to be "well laid and adhered, with even joints", although the deck edge flashings were not well formed and relied on sealant for weathertightness.
- 5.5 The expert inspected the interior of the walls adjacent to the decks and no evidence of moisture was observed. The expert took non-invasive moisture readings around the door openings, and beneath the deck framing and no elevated readings were noted. The expert also took "low penetration" invasive moisture readings of the deck framing, with no elevated readings noted.
- 5.6 Commenting specifically on the decks, the expert noted that:

- there is some ponding at the outer edges of the second floor deck
 - at the south corner of the second floor there is a minor area of joint where the lap has lifted
 - the cappings over the end kerbs are poorly formed and rely on sealants for weathertightness, with no saddle flashings at the junctions with the bricks.
- 5.7 The expert also noted there is no clearance from the deck membrane to the bottom of the brick cladding of the columns and walls, and there is staining and light mortar cracking of the column cladding indicating moisture absorption into the bricks.
- 5.8 The expert considered the proposed detail for the baluster fixing, and suggested various improvements, including:
- the addition of a seal to the entire underside of the base plate
 - the addition of sealant into the predrilled holes for the fixing screws
 - increase the height of the mounting blocks to improve the clearance above the finished tile levels.
- 5.9 A copy of the expert's report was provided to each of the parties on 27 June 2008.
- 5.10 The authority responded to the expert's report in a letter to the Department dated 2 July 2008, noting that the report did not cover the membrane system. The authority attached excerpts from a "verification report" on the Vedag 2-layer membrane system, and noted that its submission had included the matter of the deck membrane system in regard to its use as a deck membrane. I have addressed the question of the membrane system within this determination, as outlined in paragraph 1.4.2.
- 5.11 The applicant responded to the expert's report as part of its comments on the draft determination (refer paragraph 4.7).

6. Evaluation for code compliance

6.1 Evaluation framework

- 6.1.1 In evaluating the design of a building and its construction, it is useful to make some comparisons with the relevant Acceptable Solutions⁴, which will assist in determining whether the features of these decks are code compliant. However, in making this comparison, the following general observations are valid:
- Some Acceptable Solutions 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.
 - Usually, when there is non-compliance with one provision of an Acceptable Solution, it will be necessary to add one or more other provisions to compensate for that in order to comply with the Building Code.

⁴ An Acceptable Solution is a prescriptive design solution approved by the Department that provides one way (but not the only way) of complying with the Building Code. The Acceptable Solutions are available from The Department's Website at www.dbh.govt.nz.

6.2 Evaluation of the decks for E2 and B2 Compliance

6.2.1 The approach in determining whether building elements are weathertight and durable and is likely to remain so, is to apply the principles of weathertightness. This involves the examination of the design of the elements within the building, the surrounding environment, the design features that are intended to prevent the penetration of water, the deck membrane system, its installation, and the moisture tolerance of the deck framing. The Department and its antecedent, the Building Industry Authority, have also described weathertightness risk factors in previous determinations⁵ (for example, Determination 2004/1) and these factors are also used in the evaluation process.

6.2.2 The consequences of a building element demonstrating a high weathertightness risk is that building solutions that comply with the Building Code will need to be more robust. Conversely, where there is a low weathertightness risk, the solutions may be less robust. In any event, there is a need for both the design of the cladding system and its installation to be carefully carried out.

6.3 Weathertightness risk

6.3.1 In relation to these characteristics I find that the decks to this house:

- are attached to a fairly simple concrete block and brick veneer 3-storey building
- are not situated above enclosed areas
- have deck to wall junctions that are sheltered beneath upper decks, or beneath eaves projections of more than 600mm overall
- have deck substrate and framing that is treated to provide resistance to the onset of decay if the framing absorbs and retains moisture
- are built in a high wind zone
- have a single layer membrane, and are proposed to have a tiled finish
- are proposed to have open balustrades with the balusters top-fixed into mounting blocks

6.3.2 The decks have been evaluated using the deck risk factor within the E2/AS1 risk matrix. This has allowed the summing of a range of design and location factors applying to a specific deck design. The resulting level of risk can range from 'low' to 'very high'. Higher levels of risk will require more rigorous weatherproof detailing.

6.3.3 When evaluated using the E2/AS1 risk matrix, the weathertightness features outlined in paragraph 6.3.1 show that the second floor decks to this house demonstrate a very high weathertightness risk rating, with the first floor decks a medium risk.

⁵ Copies of all determinations issued by the Department can be obtained from the Department's website.

6.4 Weathertightness performance: the decks to date

- 6.4.1 I consider that the expert's report has established that the partly completed decks generally appear to have been constructed in accordance with good trade practice. However, taking account of the expert's report, I conclude that remedial work is necessary in respect of the areas outlined in paragraph 5.6.
- 6.4.2 I note the expert's comment in paragraph 5.7 regarding the junction of the membrane with the brick veneer. However, I also note that the consent drawings clearly indicate that the membrane is extended through the cavity and up the framing to form a 180mm upstand. As the authority carried out an inspection of the membrane as outlined in paragraph 3.2, there are reasonable grounds to be satisfied that the membrane has been installed in accordance with the drawings, and will be effective in protecting the deck framing from moisture. With regard to the bricks absorbing moisture, I consider that, providing adequate weephole drainage and ventilation has been provided, any dampness should be adequately dissipated within the cavity. I therefore consider that the junctions are adequate in these circumstances.

6.5 Weathertightness performance: the proposed membrane system

- 6.5.1 Based on the information provided by the applicants, I consider that the proposed membrane and tile system, as outlined in paragraphs 2.3.2 and 2.3.3 is likely to provide a weathertight floor to the decks. However, I note that the authority has concerns about the suitability of this particular membrane for the proposed tiled finish to these decks, and I accept that the following is required:
- A statement from the membrane supplier confirming that the tiling system proposed to be installed over the membrane is appropriate for use on these decks.

6.6 Weathertightness performance: the proposed balustrades

- 6.6.1 I consider that the proposed method of fixing the balusters, as outlined in paragraph 2.4.2 and as now confirmed by the balustrade manufacturer, is likely to be weathertight.
- 6.6.2 The balustrade manufacturer has explained that increasing the thickness of the fixing block beyond 20mm will mean there is insufficient fixing of the baluster to the timber framing.
- 6.6.3 I also note that the applicant describes the tiles purchased for the decks as "ceramic", which I take to indicate a limited thickness. I am therefore prepared to accept that, providing the total thickness of the tiles, adhesive and any mortar levelling screed will allow the raised baseplate to sit proud of the finished surface, the proposed fixing of the balusters will be adequate in these circumstances.

7. Conclusion

7.1 Matter 1: The decks completed to date

7.1.1 I consider the expert's report establishes that the current performance of the first layer of deck membrane is adequate because it is currently preventing water penetration into the building. Consequently, I am satisfied that the partly completed decks comply with Clause E2 of the Building Code.

7.1.2 The decks are also required to comply with the durability requirements of Clause B2. Clause B2 requires that a building continues to satisfy all the objectives of the Building Code throughout its effective life, and that includes the requirement for the house to remain weathertight. Because the faults identified in the decks may allow the ingress of moisture in the future, the building work completed on the decks to date does not comply with the durability requirements of Clause B2. Because the faults identified occur in discrete areas, I am able to conclude that satisfactory rectification of the items outlined in paragraph 5.6 will result the building work completed on the decks to date being brought into compliance with Clause B2.

7.1.3 In addition I note that the membrane manufacturer requires the single layer membrane to be protected, in the long term, from the effects of UV radiation.

7.2 Matter 2: The proposed deck membrane system

7.2.1 I consider the technical information available to me has generally established that the current proposal for the completed deck membrane and tile system is likely to prevent the ingress of moisture now and in the long term. However, as outlined in paragraph 6.5.1, the membrane manufacturer is to provide written confirmation that the tiling system proposed to be installed over the membrane is appropriate for use on these desks.

7.3 Matter 3: The proposed baluster fixings

7.3.1 I consider the proposed method of fixing the balusters, as outlined in paragraph 2.4.2 is likely to prevent the ingress of moisture now and in the future. Consequently, I am satisfied that the baluster fixing will comply with Clauses E2 and B2 of the Building Code.

7.4 It is emphasised that each determination is conducted on a case-by-case basis. Accordingly, the fact that particular deck and balustrade 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.

8. What is to be done now?

8.1 A notice to fix should be issued that requires the owner to bring the decks into compliance with the Building Code, identifying the defects listed in paragraph 5.6, and referring to any further defects that might be discovered in the course of rectification, but not specifying how those defects are to be fixed. It is not for the notice to fix to specify how the defects are to be remedied and the proposed decks

brought to compliance with the Building Code. That is a matter for the owner to propose and for the authority to accept or reject. The notice to fix may also seek the confirmation outlined in paragraph 6.5.1.

8.2 I would suggest that the parties adopt the following process to meet the requirements of paragraph 8.1. Initially, the authority should issue the notice to fix. The owner should then produce a response to this in the form of a detailed proposal, produced in conjunction with a competent and suitably qualified person, as to the rectification or otherwise of the specified issues. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

8.3 The documentation to support the application for the amended building consent should be amended to reflect the proposed baluster fixing detail outlined in paragraph 2.4.2.

9. The decision

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

- (a) the partly completed deck membrane system complies with Clause E2, but does not comply with Clause B2 of the Building Code.
- (b) the baluster fixing detail, dated 20 August 2008, will comply with Clauses E2 and B2 of the Building Code for the purposes of issuing the amended building consent.

9.2 The authority is to issue the amended building consent once the matters set out in paragraphs 7.2.1 and 8.3 have been resolved to the authority's satisfaction.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 18 September 2008.

John Gardiner
Manager Determinations