



Determination 2009/59

Dispute about amendments to a building consent for a membrane to a garage roof at 2A Herbert Street, Riverton

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, D McLellan (“the applicant”), acting through the membrane installer, and the other party is the Southland District Council (“the authority”), carrying out its duties and functions as a territorial authority or building consent authority.
- 1.2 This determination arises from the decision of the authority to issue a notice to fix because it was not satisfied that the particular membrane material applied to the roof deck of a 6-year-old garage complies with Clause E2 of the Building Code² (First Schedule, Building Regulations 1992).
- 1.3 In order to determine whether the decision to issue the notice to fix was correct, I consider that the matter for determination, in terms of sections 177(a), 177(b)(iii) and 188 of the Act³, is whether the membrane material complies with and Clause E2 “External Moisture” and Clause B2 “Durability” (insofar as it relates to Clause E2) of the Building Code.
- 1.4 The authority has also raised concerns regarding its inability to inspect the membrane prior to the surface being overlaid with tiles, and I address this in paragraph 6.4.

1.5 Matters outside this determination

- 1.5.1 I note that the notice to fix is limited to the use of a particular membrane material as outlined in paragraph 3.6, and makes no reference to any other work under the building consent. I also note that the applicant has restricted the matter to be

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

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

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.

determined to the membrane material applied to the roof deck in 2008. This determination does not therefore consider any other matters.

1.6 The evidence in this matter

1.6.1 In a previous determination (Determination 2007/37)⁴, I considered certain matters that included questions of compliance regarding the same membrane material as has been used in this instance. I consider certain information from that determination to be relevant to the membrane in question, including:

- a report provided in May 2005, which assessed the membrane material on behalf of the membrane supplier (“the consultant’s 2005 report”)
- certain sections of the report of the expert commissioned by the Department to advise on that dispute (“the 2007 expert’s comments”)

1.6.2 In making my decision, I have therefore considered the submissions of the parties, the consultant’s 2005 report on the membrane, the 2007 expert’s comments on the membrane and the other evidence in this matter. I have evaluated this information using a framework that I describe in paragraph 5.

2. The building work

2.1 The building work in question relates to a relocated house that is set into an excavated sloping site, with an adjoining garage which is not part of the structure of the house. Construction of the relocated house is conventional light timber frame, with a suspended timber framed floor and concrete pile foundations. The floor level of the house is above the level of the garage roof.

2.2 The garage

2.2.1 The garage was constructed as a new structure directly adjoining but not attached to the east wall of the house. The garage is about 6m x 9.6m, with a 4m x 4.4m extension beneath the northeast corner of the house and a staircase that provides access to the house above. A timber deck to the north of the house aligns with the garage roof to create a continuous deck area.

2.2.2 Construction of the garage is specifically engineered, with a concrete slab and foundations, reinforced concrete block walls and retaining walls, and a proprietary reinforced concrete roof.

2.3 The roof deck

2.3.1 The precast concrete slab to the garage roof is overlaid with a reinforced concrete topping that provides a 50mm fall to the outer edge. The concrete topping has been overlaid with the proprietary fibreglass-reinforced vinyl membrane that is the matter central to this determination.

⁴ Copies of all determinations issued by the Department can be obtained from the Department’s website.

- 2.3.2 The roof deck has a tiled floor and balustrades to match those on the house deck. I have received no information about the balustrade system, and it is not part of this determination.
- 2.3.3 Tiles are installed over the liquid-applied membrane, providing a trafficable surface and protection from UV radiation. The tiles have been laid using a tile adhesive that is compatible with the membrane and which was specified by the membrane supplier.

2.4 The membrane material

- 2.4.1 The membrane material in question is “Chevaline Dexe”, which according to the supplier has been applied to the concrete substrate in accordance with its ‘Standard Specification P3011’ that was applicable at the time of installation. The membrane installer was approved by the membrane supplier.
- 2.4.2 The membrane supplier provided a producer statement dated 25 November 2008 for the membrane system, which notes that the completed system was inspected prior to tiling and ‘found to be satisfactory’. The producer statement stated that the installed system would meet the provisions of Clauses B2 and E2 of the Building Code.
- 2.4.3 The producer statement also recommended that, in order to maintain the integrity of the membrane, the deck be inspected annually ‘to ensure that all drainage points are clear and working’, and any exposed membrane surfaces be cleaned and re-top coated between the 8th and 11th year of service.
- 2.4.4 In Determination 2007/37 (in which the Southland District Council was also the authority involved), the 2007 expert made the following specific comments regarding the Chevaline Dexe system:
- The system has been in use in New Zealand for over 20 years.
 - The expert had viewed the system at other locations over that period of time and attributed any failures to poor workmanship rather than to product failure.
 - The expert was of the opinion that, with the exception of the Southland District Council, all authorities accepted that this membrane system complied with the requirements of B2 and E2.

3. Background

- 3.1 The authority issued a building consent (No. 24274/1) on 14 January 2003 under the Building Act 1991. The building consent was for the ‘relocation of dwelling and proposed garage’. I note that the consent documents include no information regarding the finish (if any) to the roof deck of the garage.
- 3.2 The building work appears to have been inspected by the authority and completed during 2003, although I have seen no inspection records. No code compliance certificate has been issued for the building work under the consent.

- 3.3 It appears that leaking through the concrete roof resulted in the applicant arranging for the deck surface to be waterproofed in 2008. However, no amendment to the building consent was applied for before the work was undertaken.
- 3.4 The membrane supplier inspected the roof deck prior to membrane installation and advised the installer on 'methodology and detailing issues'. The supplier also inspected and approved the completed membrane installation; and specified the tile adhesives to be used in an email to the installer dated 5 November 2008.
- 3.5 It appears that the applicant contacted the authority after the work was completed, and was advised that the 'deck had to be signed off'. As far as I am aware, the authority has not inspected the completed work.
- 3.6 The authority issued a notice to fix on 22 January 2009, which stated that the building work did not comply with Clause E2 of the Building Code as:

The [membrane system] installed has not been approved by Southland District Council as an "Alternative Solution". An accepted product requires to be installed or a successful application for an "Alternative Solution" made for the [membrane system].
- 3.7 The membrane supplier emailed the authority on 23 January 2009 to confirm that it had 'inspected the deck prior to start and at completion of works', had advised the membrane installer of 'methodology and detailing issues', and had approved the finished membrane installation.
- 3.8 Further email correspondence followed without resolution, and the membrane installer emailed the authority on 26 March 2009 to explain the background, noting that he had been 'unsure of protocol and went ahead and finished the job'. The installer requested a meeting with the authority to discuss the situation, noting that the deck had been leaking before the work and had not leaked since completion.
- 3.9 The authority responded in an email to the membrane installer dated 27 March 2009, attaching the text of a letter to the membrane supplier dated 4 November 2005 (relating to the consultant's 2005 report considered in Determination 2007/37). The authority noted that the situation was 'further complicated' as the tiling is complete, with no opportunity to inspect the underlying membrane. The authority stated:

The problem with the [membrane system] applied in this instance is that Southland District Council has not approved the system as part of its alternative solutions register. Application for inclusion was declined way back in 2005 and we haven't heard anything from Equus since. Please find a copy of the last correspondence with Equus below. Until we receive more current and NZ relevant testing information, supported by an independent third party verification such as a BRANZ appraisal, we will not be in a position to carry out further assessment on the product.
- 3.10 The Department received an application for a determination on 9 June 2009.

4. The submissions

- 4.1 In a statement accompanying the application, the membrane installer explained his involvement in the waterproofing of the roof deck, noting that:

The problem we are having is that it was my first job involving Council and not following protocol fired ahead, finished job, now owner wants a sign off but the Council doesn't accept this coating.

4.2 The membrane installer forwarded copies of:

- some of the consent drawings
- the producer statement from the membrane supplier
- the correspondence with the membrane supplier and the authority.

4.3 A copy of the applicants' submission was provided to the authority, which made no submission in response but forwarded copies of:

- the consent application documentation
- the specification and some of the consent drawings
- the building consent
- the notice to fix dated 14 January 2009.

4.4 A draft determination was issued to the parties on 10 July 2009. Both parties accepted the draft without comment.

5. Evaluation framework

5.1 In evaluating a building element, it is useful to make some comparisons with the relevant Acceptable Solutions⁵, which will assist in determining whether the remedial work to this roof deck is 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.

5.2 As an alternative solution, the roof deck surface needs to be assessed according to the particular circumstances of the garage structure and its position within this building.

5.3 Weathertightness risk

5.3.1 The relevant part of this house has the following environmental and design features which influence its weathertightness risk profile:

- the roof deck is over a one-storey high garage area
- the garage is simple in plan and form, with a roof fall to the outside
- the garage construction, including the roof, is reinforced concrete.

⁵ 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. Discussion

6.1 I note the authority's concerns regarding the lack of independent product testing or verification of the membrane system installed on the roof deck and I have taken these concerns into account in making my final decision.

6.2 The criteria for assessing the membrane

6.2.1 In this case, the use of the membrane is considered to be an alternative solution for compliance with the building code. There are several criteria which can be used to assess a building product in a particular application for code compliance. In this case I have considered the following criteria:

- the history of use of the membrane material
- the in-service performance in this building
- the quality of the finished application

6.2.2 With regard to the above, I make the following observations:

- As outlined in paragraph 2.4.4, the membrane system has been used in New Zealand for over 20 years, is accepted by other authorities, and failures appear to relate to the installation rather than a product failure. I also note that the most common problem with liquid-applied membranes is the inadequate quality control at time of application.
- The work to the roof deck was only completed 7 months ago, which limits the assessment of its in-service performance. However, the remedial work was undertaken due to the roof deck leaking, which appears to have been remedied as a result of the work done to the roof deck surface.
- The membrane supplier inspected the roof deck prior to the membrane installation and on completion (prior to the tiling), provided advice to the installer, specified the tile adhesives, and provided a producer statement for the membrane system stating that its installation was satisfactory. This provides me with assurance that the membrane was applied to the roof deck in accordance with good trade practice, and to the manufacturer's requirements.

6.3 The consequences of future failure

6.3.1 Clause E2.3.2 of the Building Code requires that 'Roofs and exterior walls must prevent the penetration of water that could cause undue dampness, damage to building elements, or both'. I therefore take the view that, in addition to the factors outlined above, I need to assess the risks applying to the particular situation of this roof deck, which means considering the consequences of any possible future moisture penetration.

6.3.2 In regard to the risks and consequences of any possible future failure of the membrane system to this roof deck, I make the following observations:

- The roof deck has a simple plan shape, and is constructed with a fall to shed water to the outer edge, so minimising the risk of water ponding on the deck surface.

- The tiles installed to the roof deck provide protection against the risk of damage to the membrane from foot traffic and the effects of UV radiation.
- The area below the deck is a garage, not a habitable space and will from time to time have water carried in on wet vehicles; therefore dampness is unlikely to cause a significant loss of amenity to such an area and accordingly the garage need not comply with Clause E2.
- The roof deck and all of the walls of the garage are concrete; and these building elements are unlikely to be damaged by moisture penetration and effect compliance with Clauses B1 and B2.

6.4 The lack of inspections

- 6.4.1 I note that the applicant did not seek an amendment to the building consent, and the authority therefore had no opportunity to reject the proposed building work. Due to this oversight, the authority was also not provided with any opportunity to inspect the work while it was carried out. However I have not been provided with any documentation to show the membrane was part of the original consented work or what the inspection requirements may have been.
- 6.4.2 I accept the authority's concern that it was unable to inspect the membrane prior to tiling, although the authority is now able to inspect the finished surfaces. I consider that an inspection of the finished roof deck should allow the authority to seek assurance on the quality of workmanship with regard to the visible elements of the repair work.
- 6.4.3 I take the view that, having regard to the extent to which the garage is required to comply with Clause E2, the membrane supplier's inspections and producer statement provide the authority with reasonable grounds to conclude that the work to the roof deck complies with the Building Code.

7. Conclusion

- 7.1 I have considered the criteria outlined in paragraph 6.2.2 together with the consequences described in paragraph 6.3.2. I am of the opinion that this combination of factors provides sufficient grounds for me to conclude that the membrane system, in this particular application, is able to achieve compliance with Clauses E2 and B2.
- 7.2 I emphasise that each determination is conducted on a case-by-case basis. Accordingly, the fact that a particular membrane system has been established as being code compliant in relation to a particular deck to a particular building does not necessarily mean that the same system will be code compliant in another situation.
- 7.3 I acknowledge and support the authority's submissions with respect to the need to properly assess alternative solutions, and how these should be adequately documented when seeking consent for their use. I note that the consent documentation made no reference to how the concrete deck over the garage was to be waterproofed. I also note that the building consent was issued to the building owner, who is responsible for ensuring that any amendments to the consent are applied for, and approved by the authority.

- 7.4 Effective maintenance of the membrane is important to ensure ongoing compliance with clauses B2 and E2 of the Building Code and is the responsibility of the building owner. In the case of this membrane system, the membrane manufacturer has described these maintenance requirements (see paragraph 2.4.3).

8. The decision

- 8.1 In accordance with section 188 of the Building Act 2004, I determine that the membrane material applied to the roof deck of the garage complies with Clauses E2 and B2 of the Building Code, and accordingly instruct the authority to withdraw the notice to fix dated 14 January 2009.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 31 July 2009.

John Gardiner
Manager Determinations