

Determination 2026/015

Compliance of a tiled bathroom floor with Building Code clause E3

9 Stockport Grove, Churton Park, Wellington

Summary

This determination considers the compliance of a tiled floor of an upper-level bathroom with Building Code clause E3 *Internal moisture*. The determination discusses the tiled floor system, the shower enclosure and the compliance of the tiled floor with Building Code clause B2 *Durability*, in so far as it relates to clause E3.



Figure 1: Upper-level bathroom including shower enclosure¹

¹ Photo taken at the time of final inspection 16 November 2023

In this determination, unless otherwise stated, references to “sections” are to sections of the Building Act 2004 (“the Act”) and references to “clauses” are to clauses in Schedule 1 (“the Building Code”) of the Building Regulations 1992.

The Act and the Building Code are available at www.legislation.govt.nz. Information about the legislation, as well as past determinations, compliance documents (eg, Acceptable Solutions) and guidance issued by the Ministry, is available at www.building.govt.nz.

1. The matter to be determined

- 1.1. This is a determination made under due authorisation by me, Rebecca Mackie, for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment (“the Ministry”).²
- 1.2. The parties to the determination are:
 - 1.2.1. C Chen (“the owner”), the owner of the property who applied for the determination,
 - 1.2.2. Wellington City Council (“the authority”), carrying out its duties as a territorial authority or building consent authority.
- 1.3. This determination arises from the owner’s view that the tiled floor does not comply with Building Code clause E3 because there is no ‘continuous impervious waterproofing membrane’ installed. The owner considers the work has failed, particularly in relation to two recorded instances of water flowing through the midfloor structure to areas below on ground floor of the dwelling.
- 1.4. Accordingly, the matter to be determined, under section 177(1)(a), is whether the as-built tiled floor of the upper-level main bathroom of the dwelling complies with Building Code clause E3 *Internal Moisture*.
- 1.5. In deciding this matter, I consider it necessary to consider whether the tiled floor complies with clause B2 *Durability* in so far as it relates to the tiled floor performing its performance criteria in respect of clause E3. I have also considered clauses E3.3.3, E3.3.5 and E3.3.6 in regard to as-built tiled bathroom floor, and whether the proprietary shower enclosure complies with E3.3.4.

Issues outside this determination

- 1.6. This determination is limited to the matter set out in paragraphs 1.4 and 1.5 in relation to the dwelling main bathroom. Accordingly, I have not considered the:

² The Building Act 2004, section 185(1)(a) provides the Chief Executive of the Ministry with the power to make determinations.

- 1.6.1. authority's decision to issue the building consent³ or code compliance certificate.
- 1.6.2. dwelling's ensuite bathroom⁴.
- 1.6.3. compliance of any other building work.

2. Background and building work

- 2.1. In March 2022 a building company ("the building company"), who owned the land, applied for building consent to construct a new two storey dwelling with attached garage. On 28 April 2022 the authority issued Building consent SR510930 for the construction of the dwelling.
- 2.2. The building consent design for the upper-level bathroom and ensuite comprised tiled flooring laid with "waterproof adhesive" over the 19mm H3.2 treated timber plywood substrate/midfloor with supporting joists at 600mm centres.
- 2.3. The authority undertook a final inspection on 16 November 2023 and issued the Code Compliance Certificate (CCC) for the dwelling on 23 November 2023.
- 2.4. The owner purchased the property in December 2023.
- 2.5. In June 2024 the owner recorded that "water from the bathtub was leaking through the floor and dripping from the light fittings" in the room below. In July 2024 the building company applied silicone sealant to the 'bath edge', that being the junction of the free-standing bath and floor.
- 2.6. On 5 December 2025 the owner emailed the building company requesting action and an investigation into the state of the waterproof membrane in the bathroom and an inspection of floor framing. Three days later the building company's plumber attended site and advised that a waterproof membrane had not been installed and was not required. The owner raised this with the building company and set out their view that the tile floor was not built in compliance with clause E3, the building company advised that the dwelling was built as per the consented documents and a code compliance certificate issued by the authority.
- 2.7. On 12 December 2025 the owner emailed the authority to lodge a formal complaint. The owner requested the authority investigate and issue a notice to fix to rectify non-compliant building work.
- 2.8. On 12 January 2026 the authority responded that, once a code compliance certificate had been issued, it had no legal authority to withdraw, revoke or reverse that decision.

³ I note the owner was advised that the bathroom floor was built in accordance with the building consent.

⁴ While the determination itself is limited to the main bathroom, it is noted that the approved building consent construction details relate to both the upper-level bathroom and ensuite.

- 2.9. The owner subsequently made an application for determination.
- 2.10. On 23 January 2026 the owner advised an incident had occurred and the shower door was “accidentally left the shower box door ajar” during use in the early hours of 21 January 2026. The owner, who was in the room below at the time, noted that they “heard water running inside the wall/ceiling cavity immediately”. Later on the same day, following the incident, the owner engaged a company who undertook infrared imaging and moisture meters to assess the bathroom and provided a report (“the moisture report”).
- 2.11. The moisture report describes an infrared camera and moisture meter was used. Testing was only undertaken to the upper-level main bathroom, hallway adjacent to the bathroom and ground floor hallway below.

3. Submissions

The owner

- 3.1 The owner believes that the bathroom floor construction does not comply with clause E3 and clause B2 and that watersplash is penetrating under the floor tiles into the ceiling below due to the lack of an impervious membrane.
- 3.2 The owner supplied photos of water dripping from ground floor ceiling downlight and moisture tracking down a hallway wall. A video supplied of the shower enclosure also showed a significant volume water escaping between the shower glass and shower tray and ponding on bathroom floor.
- 3.3 In the owner’s view, the thermal imagery taken for the moisture report recorded significant dampness around bathroom shower, under the adjacent hallway carpet at the bathroom door, extending along and under the hallway skirting on the other side of the wall to the shower.
- 3.4 The owner therefore believes that the authority issued the CCC in error due to the approved bathroom floor tile detail in the building consent deviating from E3/AS1, and the alternative solution failing to satisfy the performance criteria of the Building Code.

The authority

- 3.5 The authority acknowledged in its submission that the wet area tile floor detail, approved at the time of the building consent, ‘did not align with the current wording of E3/AS1 3.1.1(b)’.⁵

⁵ Acceptable Solution E3/AS1 2nd edition, amendment 7. Effective on 5 November 2020. Section 3.0 Watersplash, 3.1 Lining materials, 3.1.1 Floors.

- 3.6 The authority states that instead it accepted the proposed detail of the bathroom tiled floor as an alternative solution, as it believed it aligned with the previous version of E3/AS1 Amendment 6, which was effective from 1 January 2017 until 3 November 2021, and therefore can be considered to meet the clause E3.3.5 (as an alternative solution).
- 3.7 The authority stated that the levels of moisture detected at the time of the owner's expert moisture report was due to a particular incident a few hours prior, rather than water splash during normal usage. On this basis the authority does not consider that the evidence demonstrates a failure of E3.3.5.
- 3.8 The authority advised that during its final inspection on 16 November 2023 the inspectors had carried out a test of the shower and 'would not have passed the final inspection if the junction between the shower screen and the shower tray was failing'.
- 3.9 The authority believes it had reasonable grounds that the requirements of E3.3.5 were met at the time the building consent was granted and code compliance certificate issued.

4. Discussion

- 4.1. The matter to be determined is whether the as-built tiled floor of the upper-level main bathroom complies with Building Code clause E3. The owner also disputes compliance with clause B2 Durability and has provided information about the performance of the proprietary shower enclosure.

Building Code compliance

- 4.2. Section 17 of the Act requires that all building work must comply with the Building Code to the extent required by the Act. This includes ensuring that all aspects of the building work comply with the relevant performance criteria of the Building Code⁶. While each Building Code clause contains objective and functional requirements, these do not impose additional obligations, as it is the performance criteria that are the mandatory requirements⁷. Rather, the objective and functional requirements guide the interpretation (or nature and scope) of the performance criteria.
- 4.3. The relevant objective of clause E3 *Internal moisture* is to safeguard people from the consequences of an accumulation of internal moisture.

⁶ See sections 16 and 18 of the Act and Determination 2025/049 *The compliance of a replacement cladding system on a dwelling with clauses B2 and E2 of the Building Code* (issued 25 September 2025) at paragraphs 4.11 and 4.17.

⁷ Refer to sections 16 and 18 and Determination 2012/061 *Regarding the compliance of door handles installed in school classrooms at Wairoa College, Lucknow Road, Wairoa* (24 September 2012)

- 4.4. The functional requirement clause E3.2(c) requires that buildings must be constructed to avoid the likelihood of damage to building elements caused by the presence of moisture.
- 4.5. The relevant performance criteria for the bathroom floor and shower enclosure, in achieving the above functional requirement, are clauses E3.3.3, E3.3.4, E3.3.5. and E3.3.6, which state:
- E3.3.3 Floor surfaces of any space containing sanitary fixtures or sanitary appliances must be impervious and easily cleaned.
- E3.3.4 Wall surfaces adjacent to sanitary fixtures or sanitary appliances must be impervious and easily cleaned.
- E3.3.5 Surfaces of building elements likely to be splashed or become contaminated in the course of the intended use of the building, must be impervious and easily cleaned.
- E3.3.6 Surfaces of building elements likely to be splashed must be constructed in a way that prevents water splash from penetrating behind linings or into concealed spaces.
- 4.6. The tiled floor must also comply the durability requirements of clause B2 *Durability* in respect of performing its clause E3 criteria. The objective of clause B2 is to ensure that a building will, throughout its life, continue to satisfy the other objectives of the Building Code.
- 4.7. The functional requirement of clause B2 requires sufficient durability of materials, components and construction methods to satisfy the other functional requirements of the Building Code throughout the life of the building, without reconstruction or major renovation.
- 4.8. The relevant performance criteria for the bathroom floor is clause B2.3.1, which requires Building elements must, with only normal maintenance, continue to satisfy the performance criteria of the Building Code for:
- (c) 5 years if:
- (i) the building elements (including services, linings, renewable protective coatings, and fixtures) are easy to access and replace, and
- (ii) failure of those building elements to comply with the building code would be easily detected during normal use of the building.
- 4.9. In summary, for the as-built tiled floor to satisfy the performance criteria of clauses E3 and B2, the tiled floor must be impervious, easily cleaned and be constructed in a way that prevents water splash from penetrating behind linings or into concealed spaces, and must remain sufficiently durable to carry out its clause E3 performance criteria for a period of at least 5 years.

Compliance with Acceptable Solution E3/AS1

- 4.10. The owner disputes the as-built floor complies with the relevant acceptable solution. Section 19 of the Act provides a Building Consent Authority must accept compliance with an acceptable solution, among other options, as establishing compliance with the Building Code. Acceptable solution E3/AS1 is an acceptable solution for Building Code clause E3.
- 4.11. The building consent application, made in March 2022 and issued in April 2022, nominated Acceptable Solution E3/AS1 means of compliance. At the time, the applicable version of Acceptable Solution E3/AS1 was Amendment 7, effective from 5 November 2020.⁸
- 4.12. Acceptable Solution E3/AS1 Amendment 7, at paragraph 3.1.1, sets out floor lining materials which satisfy the performance for impervious and easily cleaned, regardless of whether containment⁹ is required. In respect of tiled floors 3.1.1 b) requires:
- b) Ceramic or stone tiles having 6% maximum water absorption, waterproof grouted joints, and bedded with an adhesive specified by the tile manufacturer as being suitable for the tiles, substrate material and the environment of use. Edges of the tiled area where watersplash may occur must be **sealed or coved**, and tiles must be laid on a **continuous impervious substrate or a membrane** specified by the manufacturer as being suitable for the tiles, substrate material and the environment of use. [my emphasis]*
- 4.13. The approved building consent detail shows the floor tiles 'laid with waterproof adhesive' over a timber sheet flooring substrate, with a silicone bead positioned behind the pine skirting, above the junction of tile and plaster board wall lining. This detail shows the edge of the tile, behind the skirting at the junction with the wall lining, sealed with silicone, which risks moisture penetration under the timber skirting. However, photo evidence provided in submissions¹⁰ confirm a line of silicone sealant between the front face of the skirting and floor tiles. In this respect, I am satisfied the as-built tiled floors meets the requirement of 3.1.1 b) in relation to the edges of tiled area is sealed.
- 4.14. Despite this, E3/AS1 paragraph 3.1.1 b) requires tiles must be laid over either a continuous impervious substrate or a waterproof membrane. In this case, however, only a 'waterproof adhesive' has been referenced in the details. I have not been provided with any information to suggest the adhesive would satisfy the

⁸ Acceptable Solution E3/AS1, Amendment 6, must be accepted by a Building Consent Authority as establishing compliance with the code, via a transition time, up until 3 November 2021, but not required to be accepted after this time.

⁹ 'Containment' is required where accidental overflow could damage an adjoining household unit or other property and is not an applicable requirement for this detached dwelling.

¹⁰ Photographs provided in the moisture report dated 21 January 2026.

requirement for 'a continuous impervious substrate or a membrane'. The timber floor substrate also does not satisfy the 'continuous impervious substrate or a membrane' requirement.

- 4.15. Therefore, the as-built bathroom tiled floor does not comply with the requirements of Acceptable Solution E3/AS1 that was in force at the time, being amendment 7.

Compliance with clauses E3 and B2

- 4.16. Notwithstanding the above finding, the Acceptable Solution is only one means¹¹ of establishing compliance with the Building Code. As stated above, the Act requires building work to comply with the Building Code *performance criteria*.
- 4.17. In paragraphs 4.5, 4.8 and summarised in paragraph 4.9 I set out, in order to satisfy the performance criteria of clauses E3 and B2, the as-built tiled floor must be impervious, easily cleaned and be constructed in a way that prevents water splash from penetrating behind linings or into concealed spaces, and must remain sufficiently durable to carry out its clause E3 performance criteria (that is be impervious, easily cleaned and constructed to prevent water splash penetrating being linings or into concealed spaces) for a period of at least 5 years.
- 4.18. The owner considers the tiled floor does not comply with the Building Code and has provided information in relation to two events as evidence of non-compliance. The owner describes one in June 2024 in relation to the use of the bath, and in January 2026 in relation to the shower, where water flowed either through the light fittings and ceiling in the ground floor room or hallway below the main bathroom.
- 4.19. In relation to the first event, water leaked from the bath "through the floor and dripping from the light fittings downstairs". After this, the building company sealed the bottom of the bath to the floor. I have not been provided information about any further events in relation to the bath.
- 4.20. In relation to the second event in January 2026, the owner states "water did not stay on the tiled surface; it penetrated the sub-structure instantly and migrated into the hallway and downstairs". The owner also summarised the moisture report carried out after this event, which they said proves "water is actively migrating through the building envelope" and that "The report explicitly identifies 'moisture under the tiles,' proving the current design fails to protect the timber substrate". The owner also states that the report demonstrates a failure of the shower enclosure as "water runs directly through the unsealed shower enclosure where the frame meets the tray".

¹¹ Refer to section 19 - How compliance with Building Code is established.

Proprietary shower enclosure

- 4.21. It is clear from the video evidence provided that there has been a failure of the proprietary acrylic shower enclosure, as it is unsealed where the glass wall frame meets the tray. This allows the passage of water out of the enclosure, resulting in significant amount of water (more than water splash) being discharged onto the bathroom tiled floor.
- 4.22. The video provided shows the shower rose directed at this junction and water free flowing through the junction. I consider under the circumstances of the ordinary use of the shower (that is, when the rose is not directed at the junction) it is unlikely water will flow to the same extent and volume as shown in the video, however this junction will allow some water pass through the enclosure onto the tile floor.
- 4.23. It is clear the glass-to-shower-base junction is not adequately sealed and will allow water to pass through this junction during ordinary use and is a failure of the shower enclosure itself (even if door is closed). This therefore demonstrates that the shower enclosure does not comply with E3.3.4.

The as-built tiled floor

- 4.24. While I consider the shower enclosure does not comply, the Building Code performance criteria apply to each element according to its function. The tiled floor outside the shower enclosure is generally required to manage water splash and incidental wetting, not uncontrolled discharge of water.
- 4.25. The owner submits that the second event occurred when the shower enclosure was used with the door ajar. Use in this manner is not consistent with how these elements are designed. The floor is not designed and not required to manage uncontrolled water. In this respect I am of the opinion that the January 2026 event occurred as a result of the shower enclosure being used incorrectly.
- 4.26. The owner considers the moisture report is evidence that the floor does not comply with the clause E3. With respect, I disagree the report provide such definitive evidence. It is important to note the infrared camera used detects surface temperature differences, meaning it can only visualize heat signatures of objects behind a lining if those objects create a temperature variation on the surface.¹² Colder temperatures on the surface can suggest water behind the lining however thermal imaging does not, of itself, confirm the presence of water behind linings or within concealed spaces (as confirmed in the report¹³). Further, moisture meter reading, which uses electromagnetic waves to detect moisture, is highly sensitive to surface moisture, given the testing was carried out the same day as the second

¹² Infrared cameras can be used to detect gaps in thermal insulation by detecting thermal bridging through structural elements behind and connected to the lining or locate hot water pipes as the pipes can heat the surface of the lining.

¹³ The report states "the inspection is intended to assist with the indication of leaks and moisture, but it cannot be concluded from any given reading that excessive moisture is or is not present."

event, these measurements may not be accurate. I do not consider this evidence demonstrates that has water penetrated behind the tile floor lining. The report is instead evidence that uncontrolled water made its way out of the bathroom into the hallway and water leaked through the construction from there.

- 4.27. I have not been provided with any evidence that water has penetrated past and through the tile floor linings on an ongoing basis in a way that demonstrates the tile floor is not impervious or has allowed water to penetrate behind the lining or into concealed spaces. Rather the information provided and description from the owner suggests, by way of significant amounts of flowing water rather than slowing seeping through the construction, that in the second event uncontrolled water flowed across the tile floor into the hallway (both from the unsealed junction of the shower enclosure and through improper use of the shower enclosure with the door open) and then, from the hallway, migrated through the construction to the room below. I haven't been provided with any evidence of ongoing water penetration arising from the bath.

The tile adhesive

- 4.28. The tiled bathroom floor has been constructed with "waterproof adhesive" over the timber plywood substrate. The product specification refers to the adhesive as 'improved glue' and a 'flexible rubber modified tile adhesive'. However, the manufacturer's product specification also clearly states that the system is 'not suitable for use over timber floors.' The manufacturer's requirements for the adhesive are limited to substrates where "minimal movement is anticipated", such as concrete, plasterboard or compresses fibre-cement sheet.
- 4.29. Timber substrates are known to experience movement via expansion and contraction due to moisture changes in the environment, rather than 'minimal movement' required by the adhesive manufacturer. As such, the adhesive is not suitable for use over a timber substrate, and this incompatibility is likely to adversely affect the adhesion of the tiles to the substrate and affect the performance of the tiles and grout as a lining.
- 4.30. Given the expected movement of the timber substrate, the tile and grout system cannot be relied upon to remain intact or perform as a lining. Clause B2.3.1(c) requires building elements must remain sufficiently durable for a period of at least 5 years in performing an impervious lining constructed in a way to prevent water from penetrating behind the lining or into concealed spaces. Due to the foreseeable risk of adhesive failure when used over a moving timber substrate, this durability requirement is not met. On this basis, I am not satisfied that the tiled floor system will remain sufficiently durable and meet the performance requirements of clause B2.3.1(c) in so far as it relates to satisfying the performance criteria of clause E3.

5. Conclusion

- 5.1. It is clear, and the parties appear to agree, that the as-built tiled floor does not comply with Acceptable Solution E3/AS1, amendment 7, that was in effect at the time when the building consent was granted and issued. This is because Acceptable Solution E3/AS1 requires 'tiles must be laid on a continuous impervious substrate or a membrane' and the as-built tiled floor does not include such a substrate or membrane.
- 5.2. I am satisfied the glass-to-shower-base junction is not adequately sealed and will allow water to pass through this junction during ordinary use, and as such the proprietary shower does not comply with E3.3.4.
- 5.3. On the information before me I have no evidence that demonstrates that the bathroom tile floor lining is not impervious, or that it has failed to prevent water penetration behind the lining under conditions of intended use. The evidence does not establish a failure of the tile floor to meet the performance requirements of E3.3.3, E3.3.5 or E3.3.6.
- 5.4. However, the tile adhesive used requires minimal movement from its substrate and is not suitable for the timber substrate material used. The result will likely impact the tile and grout performance, and on this basis, I am not satisfied that the tiled floor system will remain sufficiently durable and meet the performance requirements of clause B2.3.1(c) in so far as it relates to satisfying the performance criteria of clause E3.

6. Decision

- 6.1. In accordance with section 188 of the Building Act 2004, I determine that the as-built tiled bathroom floor does not comply with Building Code clause B2.3.1(c) in satisfying the performance criteria of clause E3. Furthermore, the shower enclosure does not comply with clause E3.3.4.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 22 April 2026.

Rebecca Mackie

Principal Advisor Determinations