



Determination 2009/99

Determination regarding the code compliance of a tiled shower cubicle at 117 Domain Road, Springfield

1. The matters to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004¹ (“the current 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 applicants are the owners, Mr B and Mrs D Yaxley (“the applicants”) acting through an agent (“the agent”). The other party is the Selwyn District Council (“the authority”), carrying out its duties as a territorial authority or a building consent authority. Winstone Wallboards Limited, the wet area plasterboard manufacturer (“the manufacturer”) has been included as a person with an interest in the determination, following a request from the authority.
- 1.3 This determination arises from the decision of the authority to refuse to issue a code compliance certificate because it was not satisfied that the waterproofing of the tiled shower substrate, as constructed, did not comply with the building consent and would not comply with the Building Code.
- 1.4 Consequently, I take the view that the matters for determination² are whether the waterproofing of the tiled shower cubicle complies with Clause E3 Internal Moisture and Clause B2 Durability of the Building Code (Schedule 1, Building Regulations 1992) and whether the authority was correct to refuse to issue a code compliance certificate.
- 1.5 I have not considered the authority’s refusal to issue the code compliance certificate as a refusal to amend the building consent to reflect the as-built work. Whether the consent is required to be amended or not is considered in paragraph 7.2.

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 Under sections 177(a) and 177(b)(i) of the Act. 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.

- 1.6 In making my decision, I have considered the submissions of the parties and the manufacturer, the report of the independent expert commissioned by the Department to advise on this dispute (“the expert”), and other evidence in this matter.

2. The building work

- 2.1 The building work is a tiled shower cubicle that was installed into a new house. The shower has been constructed on a concrete floor, is lined with a plasterboard lining material designed for use in wet areas (“the wet area plasterboard”), and treated with a continuous membrane to the shower floor and walls (“the membrane”). The shower is finished with ceramic tiles.

3. Background

- 3.1 The authority issued a building consent (No 061558) on 21 February 2007.
- 3.2 The building consent required 10mm plasterboard and three coats of the membrane to the shower cubicle.
- 3.3 I have not seen the all the inspection records, however the two inspection records provided by the authority state:

Date	Inspection	Comments
12 July 2007	Post line bracing	[Wet area plasterboard] to bathrooms. Ensure the shower completed to [manufacturers] requirements. Standard plasterboard to remainder.
17 July 2009	Drainage	Note on inspection, shower not completed to [manufacturer's] requirements. Ensure this is completed.

- 3.4 On 4 November 2008, the authority wrote to the applicants refusing to issue a code compliance certificate. The authority stated:

“Our records indicate that the wall lining system in the tiled shower has not been installed in accordance with the manufacturers installation instructions. Our records also indicate that the main contractor has refused to carry out remedial action. We are not, therefore, satisfied on reasonable ground that the construction meets the requirements of [Clauses E3 and B2].

- 3.5 The Department received an application for a determination on 21 May 2009.

4. The submissions

- 4.1 The application for determination included information from the manufacturer of the wet plasterboard, correspondence from the agent to the authority about the issue, and some of the consented plans. In a letter dated 21 February 2009 to the authority, the applicant stated:

When the issue of the metal angle was raised at the prestop inspection it was the first occasion our company had ever been requested to install this. Although we have built more than 100 similar tiled showers previously this had never been a requirement and never seen as important in the system we use.

No notice to fix was ever issued in fact no response was ever received and no mention of the topic has been made at any further inspection including the final. Reinspection of the outstanding items occurred on [12 February 2007] and in a follow up phone call we were informed that [a code compliance certificate] would be issued...

- 4.2 I understand from the submission of the authority that a copy of the application for a determination was not provided by the agent to the authority at the time of application. The Department informed the authority of the determination in a letter dated 26 May 2009 and a copy of the application was subsequently provided to the authority on 9 July 2009.
- 4.3 Copies of a draft determination were sent to the parties for comment on 22 July 2009.
- 4.4 The Department received a number of submissions about the expert's report and draft determination. I have summarised the main points raised by the parties as follows:

The authority (20 July 2009)

The approved specification for this project was 9.5mm [plasterboard], and the work was not done in accordance with the building consent.

On two occasions [12 & 17 September] the inspection notes refer to the requirement for the shower to be completed to the [manufacturer's] specifications.

The agent (28 July 2009)

... the [authority seems focused solely on the [wet area plasterboard] substrate rather than assessing the actual waterproofing.

... the waterproofing membrane manufacturer do not have any reservations for their [membrane] product being used on any substrate... They confirm [the membrane] has been used extensively... for 10 years and have no record of failure in corner junctions.

The [wet area plasterboard] system is only one alternative solution offered by [the manufacturer] and there are many other methods and systems that can be satisfactorily used to meet E3. [Representatives of the authority] agreed that what is currently in place may well be satisfactory but it 'deviated from the consent drawings' and 'did not comply with the system'. Hence I submitted to [the authority] amended documentation for the system used here as an alternative solution but this documentation was refused.

The authority (18 August 2009)

The discussion should also consider [Clause B2]. The authority has concerns about the existing and future durability, given that the shower is less than 2 years old and the reason for the steel angles is to prevent physical damage to the waterproof membrane and tiles due to structural movement caused by timber shrinkage and seismic activity.

... the principal reason for refusing to issue the code compliance certificate was that the work does not comply with the building consent.

The disputed work is contrary to the manufacturer's requirements...

The manufacturer (25 August 2009)

The [wet area plasterboard] systems specify components such as the lining material, fasteners, waterproof membrane and reinforcing angles. As with any other building element the complete specification must be followed in order for the system to work as intended and as independently appraised.

...we continue to be faced with quality of internal finish issues associated with timber movement, mainly due to in-service drying. These also appear to have been increasing with the current low density crop of radiata pine. Problems are particularly evident with 'winter builds' following summer drying and a subsequent winter heating cycle. Areas of greatest risk are where large or multiple timber members are used such as top plate level, near openings, and in corners. Symptoms are fasteners 'popping' and joints 'peaking' and cracking. Reports are commonly more frequent in southern climates where temperatures are more extreme.

The agent (21 September 2009)

[The product] used as the membrane behind the tiles on this job is a very flexible product with a Modulus of Elasticity of 630%. This is more than capable of accommodating any small movements due to shrinkage (which appears to be the sole reason for suggesting a metal angle) however given that the framing surrounding this job is all kiln dried and the [authority]

verified the moisture content as below 18% before lining occurred – I am not sure if there is potential for any real movement at all.

The agent (21 September 2009)

Enclosed: information from the manufacturer of the membrane

The angle is part of the old established method (before liquid membranes) of preventing water travelling into the framing etc behind sheet wall linings. It is no longer necessary where an internal system covers the join but habit is a hard thing to change and should anything go wrong, it is there [to] direct moisture down to the floor.

It is a very durable system and the shower will not leak even if the metal angle is omitted.

The agent (7 October 2009)

Enclosed: samples of the membrane.

One sample in sheet form to gauge elasticity (it stretches 670%)

One sample on a corner join (without any polyester mat) to gauge durability of the product even without the [polyester] mat that is normally embedded in the corner joins.

This product easily spans any movement that could occur in the corner of this shower in question.

The agent (20 October 2009)

The shower is now 2 yrs old and there is no evidence of lack of durability. I believe that any movement that could possibly occur would have done so by now and any durability failure due to movement would therefore also be evident by now. It is highly unlikely for any further movement to occur causing any future breakdown of the membrane

It is my belief that there is already sufficient fixing in place for this installation to meet the requirements of clause B2.

... could you please sketch on the drawing provided a quick detail of any additional fixing that is now suggested to meet B2 and a short explanation as why the existing mechanical fastening is insufficient and what the practical benefit of those additions would be.

5. The experts report

- 5.1 As discussed in paragraph 1.6, 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 house on 1 July 2009 and furnished a report that was completed on 2 July 2009.
- 5.2 The expert noted the installation of the shower cubicle was to a good standard and has been reasonably maintained, although maintenance is required to seal around the waste escutcheon at the base of the shower cubicle.
- 5.3 The expert took invasive moisture readings of the wall linings, to the exterior walls of the shower cubicle, and recorded no elevated readings of the bottom plates. The expert also took capacitance moisture readings of the tiles, above the wall to floor junction, and recorded readings considered to be in the normal range. The expert found no visible signs of moisture leakage or water damage.
- 5.4 A copy of the expert's report was provided to the parties on 3 July 2009.

6. Discussion

Requirements of the system and compliance with the building consent

- 6.1 The consented shower tanking detail specifies 10mm Gib board and three coats of the membrane. The manufacturer's specification and BRANZ appraisal for the plasterboard state that the wet area plasterboard is the only plasterboard mandated to

be used in shower cubicles and shower over bath applications. I note that standard plasterboard can be used as a substrate in bathrooms outside shower cubicles and in shower over bath installations.

6.2 The manufacturer's technical manual at the time the work was consented, as applicable to the wet area plasterboard states:

Prior to lining in tiled areas (shower cubicles and shower over bath only) the internal corners shall be reinforced with a minimum 32 x 32 x 0.55mm galvanised metal angle.

6.3 The BRANZ appraisal for the wet area plasterboard states:

Internal corners in shower areas must be reinforced with a minimum 32x32x0.55mm galvanised metal angle prior to lining the walls.

6.4 The BRANZ appraisal for the membrane states:

Plasterboard wall linings must be manufactured to comply with AS/NZS 2588, and be covered by a valid BRANZ Appraisal Certificate for use in internal wet areas.

6.5 I therefore take the view that, as the metal angle referred to in 6.3 above has been omitted, the construction of the shower was not completed in accordance with the consented details and specifications.

Compliance with Clause E3

6.6 I note the following features of this shower:

- the moisture readings show the construction is preventing moisture penetrating behind the linings
- bandage reinforcing to all corners and joins in substrate has been applied
- the overall construction of the shower cubicle is to a high standard.

6.7 I have taken into account the expert's comments that the installation of the floor and wall tiling has been carried out to a good standard and that the wall to floor junctions are well sealed with the membrane.

6.8 I am of the view that the shower complies with Clause E3 because it is both impervious and currently preventing moisture from penetrating behind the linings.

Compliance with Clause B2

6.9 I note that BRANZ appraisals are independent assessments of building products, materials, systems or methods of design or construction. I note the products are assessed for Building Code compliance and fitness of purpose.

6.10 I accept the argument of the manufacturer that there are currently significant and serious issues associated with timber movement, mainly due to in-service drying. I accept that the metal angle is a component of an appraised system and has been relied upon by both the appraiser and the authority. I accept that future durability may be compromised given that the component of the appraised system has not been installed, in addition to which, I note that the BRANZ appraisal for the membrane also requires that plasterboard wall linings must be covered by a BRANZ appraisal for use in wet areas.

- 6.11 Taking these factors into consideration, and based on the evidence before me in this particular case, I am unable to assess the effect of the omission of the metal angle on the long-term performance of the building with respect to Clause E3.
- 6.12 I therefore take the view that while the construction of the shower currently complies with Clause E3, I am not satisfied that the construction of the shower complies with the durability requirements of Clause B2.

7. What is to be done now?

- 7.1 The manufacturer's literature, and the BRANZ appraisal for the wet area lining, and by interference the BRANZ appraisal for the membrane itself, all require a metal angle to be installed at the internal corners of the shower cubicle to limit the relative movement between the corner framing members. While the metal angle cannot now be installed without removing the shower linings, I am of the opinion that the same degree of restraint could be achieved by other mechanical means to achieve the same performance requirements.
- 7.2 That will require the applicant to propose, to the satisfaction of the authority, an equivalent means of restraint to that detailed by the manufacturer. I do not believe the work is sufficiently significant to require a formal amendment of the building consent.
- 7.3 I acknowledge the applicant's agent has requested specific advice from me as to what means of restraint would be considered acceptable. However, this is outside my powers under the Act. The Building Code is a performance-based document and there is more than one means of achieving compliance. I note the building consent was issued on the understanding that one particular means of compliance was to be used.

8. The decision

- 8.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the waterproofing of the tiled shower cubicle, as constructed:
- does not comply with the building consent
 - complies with Clause E3
 - does not comply with Clause B2 of the Building Code
- and I therefore confirm the authority's decision to refuse to issue the code compliance certificate.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 10 November 2009.

John Gardiner
Manager Determination