

## Determination 2009/112

# Refusal to amend a building consent regarding damp proofing to a basement of a house at 75A Awatere Avenue, Hamilton

### 1. The matters to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004<sup>1</sup> (“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 Pulse Developments Ltd (“the applicant”), who was also the owner and builder of the house. The other party is the Hamilton City Council (“the authority”), carrying out its duties as a territorial authority or building consent authority.
- 1.2 This determination arises from a decision by the authority to refuse to grant an amendment to the building consent for the substitution of damp proof membranes to a new house, because it is not satisfied that the substituted systems comply with certain clauses of the Building Code (Schedule 1, Building Regulations 1992).
- 1.3 The matter to be determined, under section 177(b)(vi) of the Act<sup>2</sup> is therefore whether the authority was correct to refuse to amend the building consent. In making this decision, I must consider:

#### 1.3.1 Matter 1: Compliance with the Building Code

Whether the damp proofing systems as applied will result in the basement retaining walls achieving compliance with Clause E2 External Moisture and Clause B2 Durability (insofar as it relates to Clause E2) of the Building Code. (I consider this matter in paragraph 7).

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<sup>1</sup> The Building Act, Building Code, Compliance documents, past determinations and guidance documents issued by the Department are all available at [www.dbh.govt.nz](http://www.dbh.govt.nz) or by contacting the Department on 0800 242 243

<sup>2</sup> 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.

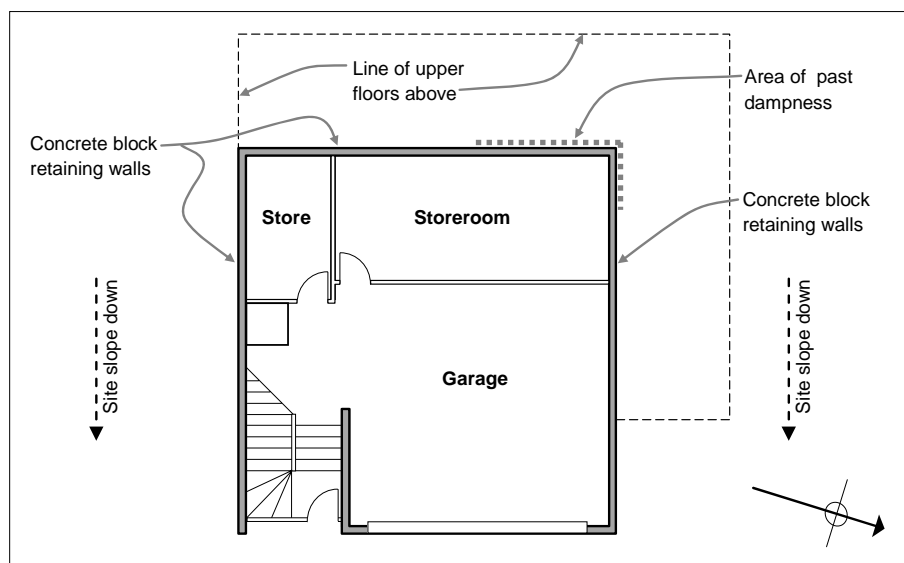
### 1.3.2 Matter 2: The authority's decision

Whether the authority was correct in its decision to refuse to amend the building consent, in respect of the damp proofing systems only. (I consider this matter in paragraph 8).

- 1.4 I note that the matter to be determined is restricted to the weathertightness of the basement retaining walls and slab.
- 1.5 In making my decision, I have considered the submissions of the parties and the other evidence in this matter.

## 2. The building work

- 2.1 The building work covered by the original building consent consists of a three-storey house on a site that slopes steeply towards the street.
- 2.2 The basement level of the house accommodates a double garage area and two storerooms; and is set into the slope of the site, with a concrete slab and foundations, and reinforced concrete block retaining walls to three sides as shown below:



- 2.3 The consent documents call for damp proofing to the exterior of the retaining walls to be provided by a brand-named composite membrane incorporating a bentonite compound, which is protected by a layer of brand-named geocomposite vertical drainage blanket.

### 2.4 The damp proofing as installed

- 2.4.1 The outside of the retaining walls have been damp proofed using a substituted membrane that is a bituminous water-based emulsion. According to the applicant, the membrane was applied in three coats and was protected from backfill compaction damage using twin-wall polypropylene sheets.

- 2.4.2 Following minor moisture problems, additional waterproofing was applied to the inside of the retaining walls (“the remedial waterproofing”). The remedial waterproofing inside the basement used two products:
- (a) A crystalline waterproofing material that was applied to cracks in the wall, which consists of cement, quartz sand, and a compound of active chemicals. The product is absorbed into the concrete where the material combines with certain elements in the concrete to form an insoluble crystalline structure that is intended to fill the pores and minor shrinkage cracks in the concrete to prevent moisture ingress.
  - (b) A proprietary two-part water-based epoxy coating which was applied in two coats to the entire retaining walls and continued 150mm onto the basement floor slab itself.

### 3. Background

- 3.1 The authority issued a building consent (No. 2007/17970) on 1 June 2007, under the Building Act 2004. I have not seen a record of the consent. It appears that construction was completed during 2008.
- 3.2 During construction, the applicant decided to replace the specified damp proofing (as described in paragraph 2.3) with a less expensive option. The applicant had intended to apply for an amendment to the building consent for the substituted product and was under the impression that the authority had generally accepted that type of product. The applicant reportedly carried out the work and then backfilled the wall without calling for any inspection by the authority.
- 3.3 Before the applicant applied for the amendment, water began to penetrate the northwest corner of the retaining wall. It appears that the damp proof membrane may not have been adequately protected and was damaged during backfilling. It is believed the failure occurred at the junction of the concrete block retaining wall with the protruding ledge of the concrete foundation pad. This resulted in moisture being absorbed into the bottom course of the concrete blocks and transmitted into the basement area.
- 3.4 During an inspection on 5 December 2007 the authority noted dampness on the inside of the wall. After investigating methods of waterproofing, the applicant chose to apply the remedial waterproofing systems outlined in paragraph 2.4.2. It is not clear when this was completed, but it appears that the remedial waterproofing work was inspected as part of the authority’s final inspection.

### 3.5 The notice to fix

- 3.5.1 Under cover of a letter to the applicant dated 10 June 2009, the authority issued a notice to fix regarding the basement. The notice stated:

**Details of Contravention or Non Compliance:**

Failure to build in accordance with approved building consent

**Required Action to Remedy:**

Establish compliance with sections B2 and E2 of NZBC

- 3.5.2 The 'Further particulars' attached to the notice stated that the authority was 'not in a position to issue a Code Compliance Certificate' as the tanking under the slab and behind the blockwork did not accord with the approved building consent and no amendment to the consent had been approved.

3.5.3 The notice also stated:

Moisture sighted on the internal face of the blockwork in the lowest level of the building on the fifth of December 2007 indicated that the tanking (method/system unknown) had failed. Compliance with section E2 NZBC has not been established...

[The authority] is not satisfied that the remedial works or the tanking/waterproofing applied to the building will meet the requirements of sections B2 or E2 of the NZBC.

3.6 On 12 July 2009, the applicant applied for an amendment to the building consent for the substituted damp proofing, which the authority apparently refused.

3.7 The Department received an application for a determination on 17 July 2009 and sought further information from the applicant, which was received on 10 August 2009.

## 4. The submissions

4.1 In a statement dated 12 July 2009, the applicant explained the background to the substituted damp proofing and described the later waterproofing applied to the inside of the walls, which he stated 'had worked well as there is no moisture coming through considering the amount of rain we have had in Hamilton'.

4.2 The applicant noted that remedial waterproofing was applied to the inside of all the basement retaining walls. Where the dampness had occurred at the northwest corner, the waterproofing was carried 150mm onto the perimeter of the floor slab.

4.3 The applicant forwarded copies of:

- several consent drawings and an excerpt from the specification
- some information on the substituted membrane and remedial waterproofing
- a series of annotated photos of the retaining walls.

4.4 In a submission dated 21 July 2009, the authority noted that the applicant has indicated that the other matters identified in the final inspection can be satisfied, so those matters are not related to the determination. With respect to the basement waterproofing, the authority made the following points:

- the installed damp proof membrane did not accord with the building consent and no amendment was approved prior to its use
- the durability required for the damp proofing is 50 years and, as the substituted damp proof membrane has failed, it has not complied
- the remedial product was not submitted for consideration prior to its use
- the remedial product was applied to only part of the basement
- even if the remedial product has been effective, a failure may recur.

4.5 The authority forwarded a copy of the notice to fix dated 10 June 2009.

4.6 A draft determination was issued to the parties for comment on 9 October 2009. Both parties accepted the draft without comment.

## 5. The expert's observations

- 5.1 In order to assist me with assessing this dispute, I requested an independent expert (“the expert”) to visit the house to observe the surface condition of the basement retaining walls. The expert is a member of the New Zealand Institute of Building Surveyors.
- 5.2 The expert visited the house on 13 September 2009 and emailed the Department on 14 September 2009. The expert noted that the applicant had told him that the moisture penetration had been minor and had been limited to the floor to wall junction of the basement store room behind the garage.
- 5.3 The expert confirmed that the:
- ...coating had been applied and at the time of my visit there was no visual evidence of moisture penetration.

## 6. The legislation

- 6.1 The relevant section of the Act is:
- 94 Matters for consideration by building consent authority in deciding issue of code compliance certificate**
- (1) A building consent authority must issue a code compliance certificate if it is satisfied, on reasonable grounds,—
- (a) that the building work complies with the building consent...
- 6.2 The relevant provision of Clause E2 of the Building Code that was in force at the time the building consent was issued is:
- E2 External moisture**
- Performance**
- E2.3.3** Walls, floors, and structural elements in contact with, or in close proximity to, the ground must not absorb or transmit moisture in quantities that could cause undue dampness, damage to building elements, or both.
- 6.3 The relevant definition in Clause A2 Interpretation of the Building Code is:
- Habitable space** a space used for activities normally associated with domestic living, but excludes any bathroom, laundry, water-closet, pantry, walk-in wardrobe, corridor, hallway, lobby, clothes-drying room, or other space of a specialised nature occupied neither frequently nor for extended periods

## Matter 1: Compliance with the Building Code

### 7. Discussion

- 7.1 The original exterior waterproofing system was a dedicated system providing waterproofing and protection with an expected life commensurate with the life of the building. The manufacturer recommends installation by trained applicators.

- 7.2 There is a greater reliance on the proper installation and protection of the substituted waterproofing to ensure it performs correctly. I note, however, that the substituted membrane is typically installed by non-specialist personnel.
- 7.3 I accept that the substituted external damp proof membrane has failed, which has resulted in dampness to the northwest corner of the basement store room at the floor to wall junction.
- 7.4 The applicant maintains that the waterproofing applied to the inside of the basement walls has remedied the moisture penetration, and the expert's observations confirm that there is no evidence of current moisture penetration. However, the authority maintains that, even if the remedial work has been effective, the failure may recur.
- 7.5 Taking account of the limited evidence and investigation of the products used, I consider that the failure of the substituted damp proof membrane is likely to be due to inadequate installation or damage sustained during construction activities. I take the view that the damage in this case is most likely to have resulted from the inadequate protection of the membrane provided by a product that was not fit for the purpose used (refer paragraph 2.4.1).
- 7.6 I accept that making the basement construction comply with the building consent at this stage is not practically possible. However, the fact that the building has been completed cannot, of itself, have a bearing on the matter of code compliance. I therefore need to consider whether the completed basement, including its remedial waterproofing, complies with the relevant clauses of the Building Code.

## 7.7 Code compliance of the basement

- 7.7.1 In regard to the code compliance of the basement to this house, I note the following:

<b>The legislation and Compliance Documents</b>	<b>The basement</b>
<p><b>Clause A2 Interpretation</b>  <b>habitable space</b> a space used for activities normally associated with domestic living, but excludes any bathroom, laundry, watercloset, pantry, walkin wardrobe, corridor, hallway, lobby, clothesdrying room, or other space of a specialised nature occupied neither frequently nor for extended periods</p>	<p><b>The current use of the basement</b>  The basement currently provides storage and garage facilities, which are classified as non-habitable spaces.</p> <p><b>Possible future uses of the basement</b>  The only exterior wall is the east wall, occupied by the garage door, the main entry and the staircase.  All other basement walls are retaining, which reduces their suitability for future conversion into habitable spaces.</p>

<p><b>Clause E2</b></p> <p>The basement elements in contact with the ground must not absorb or transmit moisture in quantities that could cause <u>undue dampness or damage</u>...</p>	<p><b>The current condition of the basement</b></p> <p>The basement walls and floor are currently dry, but future dampness is possible.</p> <p><b>The likelihood of future failure</b></p> <p>The upper floor overhangs the west and north basement walls, providing some protection from surface water accumulation. However, the west (rear) wall is on the uphill side of a sloping site, with underground water draining towards the wall.</p> <p><b>The consequences of failure</b></p> <p>Provided the concrete wall surfaces are not strapped and lined in the future (thus impeding ventilation), the storage and garage spaces are unlikely to be significantly affected by undue dampness from minor moisture penetration.</p> <p>The low level of moisture penetration expected would be unlikely to risk any significant damage to the structure.</p>
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7.7.2 Taking into account the above factors, I of the opinion that:

- the failure of the substituted exterior damp proof membrane is likely to be due to damage sustained during construction activities, due to inadequate protection of the membrane (refer paragraph 2.4.1)
- the failure of the substituted damp proof membrane became apparent early in the construction process, and there has been no evidence of failure related to any other areas since that original failure
- the original failure was minor and limited to one area and, should there be any future moisture penetration, it is likely to be similar in magnitude and location
- the remedial waterproofing applied to the inside of the basement appears to have been effective as the area is currently dry.

## 7.8 Maintenance of the remedial waterproofing

7.8.1 The remedial waterproofing is brittle in nature. Future movement of the structure is therefore likely to impact on the performance of the remedial waterproofing. The crystalline waterproofing material is reliant on the presence and the surface evaporation of moisture in order to work. Surfaces where this product has been used should therefore not be covered.

7.8.2 Providing the concrete walls remain exposed, any future moisture penetration will be able to be detected and allow the remedial waterproofing to be maintained. This proviso will impact on the use to which the basement areas are put.

## 7.9 Conclusion

7.9.1 Taking into account the available evidence and the particular circumstances applying to this part of the house, I am satisfied that there are reasonable grounds to consider the basement of this building complies with Clause E2. However, the applicant's



substitution of a lesser-quality product has resulted in a higher risk of E2 failure should building movement occur in the future. Therefore I consider that the basement of this building does not comply with Clause B2 Durability (insofar as it relates to Clause E2).

- 7.9.2 The ongoing compliance with Clause E2 is dependent on the maintenance of the remedial waterproofing which is also closely associated with the current use and the wall finishes employed in the basement areas.
- 7.9.3 In my view it is reasonable to expect that both products used for the remedial waterproofing will require maintenance over time to ensure their ongoing performance. It is therefore not unreasonable for the owner to confirm how the maintenance is to be achieved to the satisfaction of the authority as part of the application for the amendment of the building consent. The maintenance requirements should contain information on the frequency and nature of the maintenance work itself.
- 7.9.4 I note that the maintenance requirements may impact on the future use of the basement should this change from the current situation (garage and storage).

## **Matter 2: The authority's decision**

### **8. Discussion**

- 8.1 It is not disputed that the damp proof membrane specified in the consent drawings was not installed to the basement, with a different damp proofing system installed without the authority's approval. The building work as constructed in the basement therefore did not comply with the building consent. The applicant should have applied to the authority to amend the consent before the work was carried out. On that basis, the authority was entitled to refuse to issue a code compliance certificate under Section 94 of the Act and to subsequently issue the notice to fix.
- 8.2 The applicant subsequently submitted an application for an amendment to the building consent. The authority has refused to amend the consent, stating that it 'cannot accept an amendment for a product that has failed'.
- 8.3 I consider that the basement currently complies with Clause E2. However, I share the authority's concerns about any future failure of the remedial waterproofing. As discussed in paragraph 7.9.3, I consider any application for an amendment to the original consent should include advice about how the remedial waterproofing is to be maintained.
- 8.4 I strongly suggest that the authority records this determination, plus the maintenance requirements, on the property file and also on any LIM issued concerning this property.

## **9. The decision**

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

- the basement currently complies with Building Code Clause E2
- the basement does not comply with Building Code Clause B2 insofar as it relates to Clause E2

and accordingly I confirm the authority's decision to refuse to amend the building consent, in respect of the as-built basement damp proofing systems only.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 22 December 2009.

John Gardiner  
**Manager Determinations**