Department of Building and Housing
Te Tari Kaupapa Whare

Determination 2011/102

Compliance of a proposed pebble strip to a house at 2/35A Wheturangi Road, Greenlane, Auckland

(to be read in conjunction with Determination 2011/085)

Applicant: C Connor ("the owner")

The authority: Auckland Council ("the authority")

1. The matter to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004[1] ("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.

1.2 I have previously described certain building matters regarding this house in Determination 2011/085 ("the first determination"). This second determination arises because the authority is not satisfied that the existing and proposed pebble beds comply with certain clauses[2] of the Building Code.

1.3 The matter to be determined[3] is therefore whether the existing pebble beds and the proposed alterations to the existing channel drain ("the proposal") comply with the relevant clauses of the Building Code; namely Clause D1 Access Routes, Clause E2 External Moisture and Clause B2 Durability.

1.4 Matters outside this determination

1.4.1 The authority's submission for this determination includes concerns about Building Code Clauses B1 Structure and G13 Foul Water (refer paragraph 4.2.1). I have already addressed those concerns in the first determination, where I found that the building work complied with Clauses B1 and G13 of the Building Code (refer paragraph 3.2.2). My conclusions on those matters have not changed.

[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] In this determination, unless otherwise stated, references to clauses are to clauses of the Building Code.
[3] Under section 177(1)(a) of the Act

1.4.2 This determination is therefore limited to addressing the relevant matters and clauses not included within the first determination. These are outlined in paragraph 1.3.

1.5 In making my decision, I have considered the applicant's submission, the addendum report of the expert commissioned by the Department to advise on this dispute ("the expert"), and the other evidence in this matter.

2. The building work

2.1 The existing drainage channel is to the rear of a two-storey house situated on a level building platform in a low to medium wind zone for the purposes of NZS 3604[4]. The house is generally conventional light timber frame construction, with a concrete slab and foundations, timber weatherboards installed over a cavity, aluminium joinery and profiled metal hipped roofing with eaves of more than 500mm overall.

2.2 The existing drainage channel extends between pebble beds as shown in Figure 1.

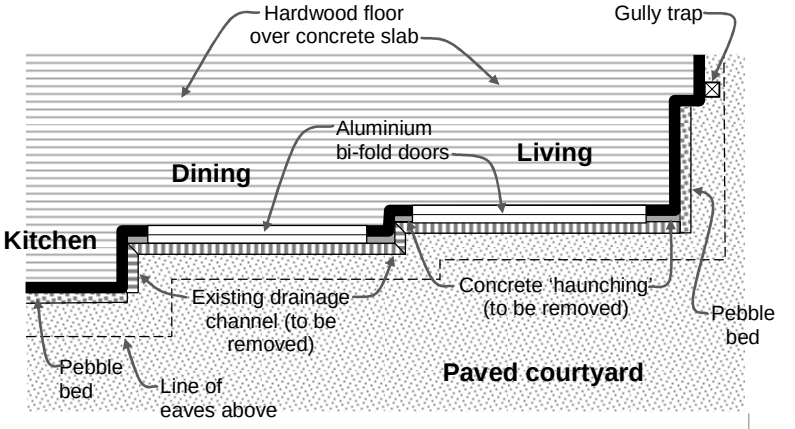

Figure 1: Plan view of existing channel (not to scale)

2.3 The proposal

2.3.1 The proposal is to replace the existing channel and concrete haunching with an extension of the pebble beds at both ends of the channel. Based on the expert's description of the existing pebble beds and the applicant's explanation of the proposed alterations, the proposal appears to be as shown in Figure 2:

[4] New Zealand Standard NZS 3604:1999 Timber Framed Buildings.

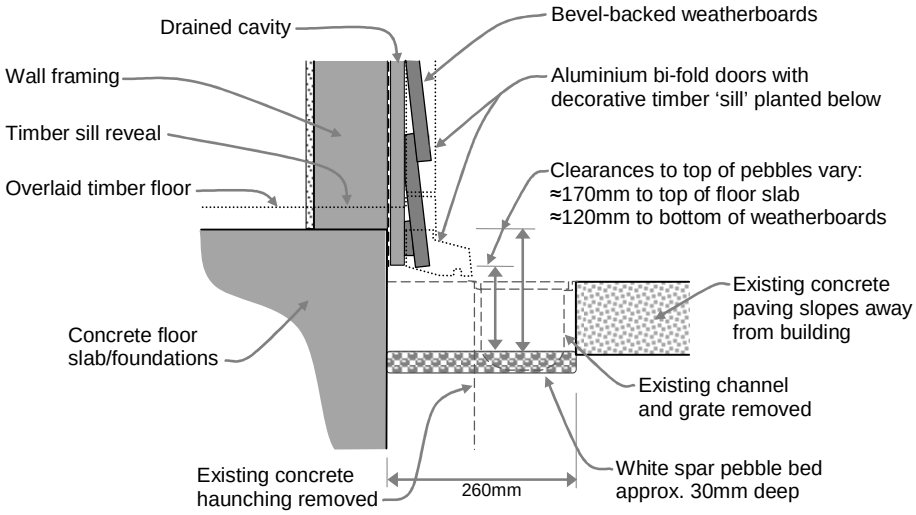

Figure 2: Sketch of the proposal (not to scale)

3. Background

3.1 The authority issued a building consent (No. B/2009/1052) for the house in 2009. During a final inspection on 17 June 2010, the authority questioned the installation of a channel drain without an approved amendment to the building consent. On 3 June 2011, the authority issued a notice to fix and the applicant applied for the first determination.

3.2 The first determination

3.2.1 Paragraph 6.3.1 of the first determination identified the following features likely to impinge on the durability of the junctions associated with the channel drain:

- A concrete ledge or haunching, separates the channel drain from the wall; impeding free drainage of water from the cladding and cavity into the drain.
- Lack of clearance to concrete haunching can allow moisture movement into the cladding and cavity via accumulation of debris on the ledge, which also prevents maintenance of lower edges of weatherboards and the door sill.
- The timber sill is effectively in contact with the ground.
- The details as built are likely to require much more than normal maintenance to prevent moisture and debris build up in the bottom of the wall cavity.

3.2.2 In paragraph 8.1 of the first determination I determined that the building work:

> ... complies with Building Code Clauses E1 Surface water, E2 External moisture, and G13 Foul water; but that it does not comply with Clause B2 Durability...

3.3 The applicant's proposal

3.3.1 In a letter to the authority dated 9 September 2011, the applicant noted that his understanding from the first determination was that durability was the 'outstanding issue', due to insufficient clearance under the sill and cladding coupled with the concrete haunching 'creating a space where debris may accumulate and possibly permit moisture to affect the cladding'.

3.3.2 The applicant therefore proposed the following remedial work, which he considered would allow future maintenance of the timber sill and lower weatherboards:

1. Cut the concrete along where the channel drain exists at 260mm from the foundation slab ie a similar distance as exists in the [pebble bed at kitchen wall].
2. Remove the channel drain completely along with the haunching.
3. Remove any debris from the channel and place a bed of pebbles as shown in [the pebble bed at the kitchen wall] across the area the former channel was placed.

3.4 In an email to the applicant dated 29 September 2011, the authority stated:

> ...the proposed alternative solution you submitted for consideration has been rejected with concerns over how the bottom plate and its fixings will be protected from potential moisture damage.

3.5 The Department received an application for a determination on 14 October 2011.

4. The submissions

4.1 The applicant's submission

4.1.1 In a letter to the Department dated 13 October 2011, the applicant outlined the following factors considered in his proposal (in summary):

- the expert confirmed that the paving fall provided sufficient drainage away from the house wall and moisture testing raised no concerns
- concerns in the first determination were limited to debris build-up causing possible retained moisture to affect the sill and weatherboards
- the proposal allows access for continued maintenance of the sill and weatherboards, consistent with the other pebbled areas
- the small paved area is serviced by two soakpits and the volcanic substrate has a high soakage rate.

4.1.2 The applicant stated that:

> The council's rejection of the proposal on the grounds "how the bottom plate and its fixings will be protected from potential moisture damage" appears unreasonable and inconsistent with the other areas that are pebbled that were acceptable through the final inspection.

4.1.3 The applicant provided copies of:

- the as-built drainage plan
- a photograph of the pebble bed and adjacent drainage channel
- the correspondence with the authority.

4.2 The authority's submission

4.2.1 In a letter to the Department dated 31 October 2011, the authority referred to concerns raised about the channel drain in its submission for the first determination and stated that it has 'the same concerns with the pebble area as we do with the unpebbled channel drain'. The authority listed those concerns as follows:

E2 – Claddings close to the ground must not absorb or transmit moisture that causes undue dampness.

B1 - If undue dampness is present and causes damage to the framing then this clause will not be complied with.

B2 – Durability is applicable to everything, therefore, concerns with durability of timber framing (bottom plate being close to the ground) weatherboards being in close proximity to the ground, bottom plate connections, nails etc too close to the ground.

G13 - Cannot allow foul water to enter buildings. Gully trap to finish 150mm below lowest sanitary fixture, usually shower, and gully to finish 25mm above paved surfaces.

4.3 A draft determination was issued to the parties for comment on 15 November 2011. The applicant responded on 18 November and accepted the draft without comment. The authority also accepted the draft without comment in a response dated 8 December 2011.

5. The expert's addendum report

5.1 As discussed in paragraph 1.5, I engaged an independent expert, who is a Registered Architect[5] and who had undertaken the earlier assessment of the channel drain which provided evidence for the preparation of the first determination. The expert revisited the house on 3 November 2011, providing a report on 4 November 2011.

5.2 The existing pebble bed

5.2.1 The expert inspected the pebble beds adjacent to the existing channel drain and measured the existing pebble bed at the south end of the channel drain. I have used those measurements in the sketch of the proposal in Figure 2.

5.2.2 The expert took an invasive moisture reading in the bottom plate above the pebble bed at the northeast corner of the house. The low reading of 14%, taken after periods of rain, indicated that the pebble bed areas as constructed were weathertight.

5.3 The proposal

5.3.1 In regard to the proposed extension of the pebble bed to replace the existing channel drain, the expert noted the following:

- The subsoil in the area is generally free-draining volcanic soil.
- The proposed and existing pebble bed strips are sheltered by the eaves and unlikely to be subject to significant rainfall.
- The adjacent paved area is small, with a slight slope away from walls
- Paving at the ends of the proposed pebble bed strip falls away, meaning that even if the bed filled with water it would overflow and drain away from walls.

[5] Registered Architects are under the Registered Architects Act 2005 are treated as if they were licensed in the building work licensing class Design 3 under the Building (Designation of Building Work Licensing Classes) Order 2010.

5.4 The expert concluded that the existing pebble beds are performing satisfactorily and therefore provide reasonable evidence that replacing the existing channel drain with a similar arrangement is likely to provide a weathertight and durable solution.

5.5 A copy of the expert's report was provided to the parties on 9 November 2011.

6. Discussion

6.1 The authority has referred to concerns raised in its submission for the first determination, stating that it has 'the same concerns with the pebble area as we do with the unpebbled channel drain' (refer paragraph 4.2.1).

6.2 Concerns about Clauses B1 and G13 have been addressed in the first determination, and I therefore consider that the authority's outstanding concerns are limited to Clauses E2 and B2.

6.3 In regard to compliance with Clauses E2 and B2, I make the following observations:

- The proposal addresses the channel drain defects identified in the first determination (refer paragraph 3.2.1) by
  - removing the concrete haunching to allow free drainage from the cladding and cavity into the proposed pebble bed
  - providing adequate clearance below the weatherboards and sill to prevent moisture movement into the timber
  - allowing sufficient space for clearing debris and maintaining the underside of the weatherboards and sill.
- The nature of the subsoil and the limited weather exposure assists drainage and moderates the quantity of rainwater the pebble strip will be subject to. In the unlikely event of overflow, water will drain away from wall junctions.
- The existing pebble strips are operating satisfactorily, with no evidence of moisture penetrating into the timber framing, and the cavity behind the weatherboard should ensure ventilation and drying of the building paper at the vicinity of the bottom plate.
- The expert considers that existing pebble beds are satisfactorily installed and therefore the extension of the pebble bed strip to replace the existing channel drain is also likely to be weathertight and durable.

6.4 Taking the above into account, I have reasonable grounds to be satisfied that the existing pebble beds and the proposed extension of these to replace the existing channel drain comply with Clauses B2 and E2 of the Building Code.

6.5 I note that any backfilling of the trench, such as the conversion of the pebble bed to a garden, may reduce or remove the separation that has been achieved in the proposed pebble bed. Though the current owner will be aware of the impact of such a change a future owner may not. I therefore suggest that the authority record this determination on the property file and also on any LIM issued concerning this property.

6.6 Compliance with Clause D1 Access routes

6.6.1 The proposal is also required to comply with the requirements of Clause D1 Access Routes, which includes the requirement to provide 'safe and easy movement' through doorways. Because the proposed pebble bed will cross doorways and create a tripping hazard, the proposal does not comply with Clause D1.

6.6.2 However, satisfactory resolution of this hazard, for example in the form of a removable grating, will result in the proposal being brought into compliance with Clause D1 of the Building Code.

7. The decision

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

- the existing pebble beds and the proposed remedial work complies with Building Code Clauses B2 Durability and E2 External Moisture
- the proposed pebble bed does not comply with Clause D1 of the Building Code.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 12 December 2011.

John Gardiner
Manager Determinations