Department of Building and Housing
Te Tari Kaupapa Whare

Determination 2011/085

Regarding the issue of a notice to fix in respect to a channel drain to a house at 2/35A Wheturangi Road, Greenlane, Auckland

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. The applicant is the owner, C Connor ("the applicant") and the other party is the Auckland Council ("the authority"), carrying out its duties 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 for a 1-year-old house because it was not satisfied that the building work complied with certain clauses[2] of the Building Code (First Schedule, Building Regulations 1992). The authority's concern relates to the effect of a drainage channel on the weathertightness and durability of the exterior building envelope. The matter to be determined[3] is therefore whether the authority was correct in its decision to issue the notice to fix for the house.

[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 sections are to sections of the Act and references to clauses are to clauses of the Building Code.
[3] Under sections 177(1)(b) and 177(2)(f) of the Act

1.3 In deciding this matter, I must therefore consider whether the installed channel drain and the adjacent building junctions ("the channel junction") comply with Clauses B2 Durability and E2 External Moisture of the Building Code. The channel junction includes the adjacent components of the exterior building envelope (such as the channel, the concrete haunching, the paving, the weatherboards and the glazed doors, as well as the way the components have been installed and work together.

1.4 In its submission dated 18 July 2011 (refer paragraph 4.2) the authority has also raised concerns about the compliance with Clauses B1 Structure, E1 Surface water, and G13 Foul water. I have discussed these matters in paragraphs 6.4 to 6.6.

1.5 In making my decision, I have considered the submissions of the parties, the 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 subject drainage channel is to part of the rear elevation 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].

2.2 The construction of the house is generally conventional light timber frame, with a concrete slab and foundations, timber weatherboards over a cavity, aluminium joinery with timber facings and sills, and profiled metal hipped roofing with eaves of more than 500mm overall.

2.3 Lean-to roofs extend over ground floor walls, including above the drainage channel, which extends along part of the east (rear) elevation as shown in the plan view sketch in Figure 1.

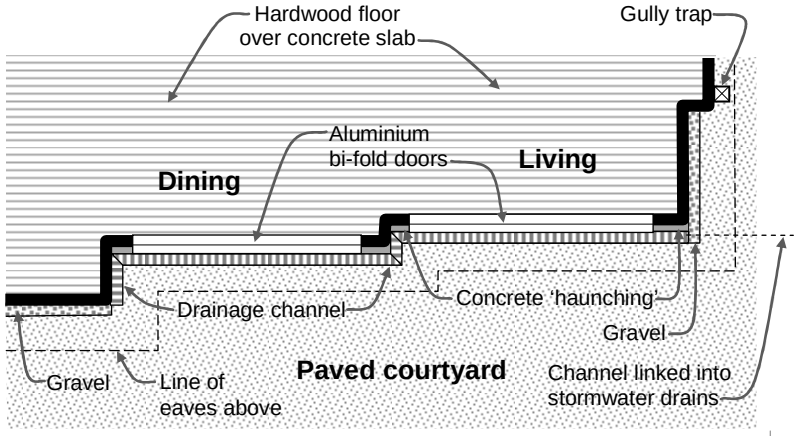

Figure 1: Plan view of channel (not to scale)

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

2.4 Based on the limited information available, an indicative sketch of the wall to paving junction at the channel drain is provided in Figure 2:

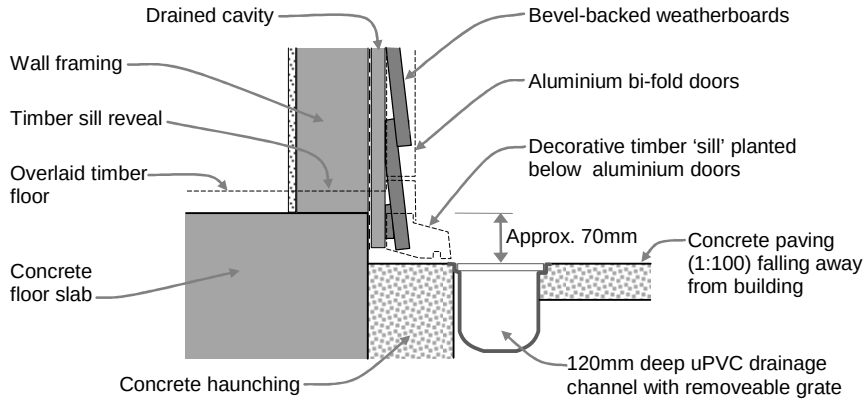

Figure 2: Sketch of drainage channel (not to scale)

2.5 The timber supplier has provided a statement dated 14 July 2011, which certifies that the wall framing timber supplied for the house was H3.1 treated. Given this evidence and the recent construction, I consider the wall framing is treated.

3. Background

3.1 The authority issued a building consent (No. B/2009/1052) for the house in 2009. I have seen no records of the building consent or the inspections carried out during construction, but the applicant apparently discussed the channel installation with the authority prior to installation in 2010 although no application for an amendment to the building consent was submitted for approval.

3.2 During a final inspection on 17 June 2010, the authority noted that 'the building had not been constructed in accordance with the building consent B/2009/1052 in that a channel drain had been constructed around the immediate perimeter of a significant portion of the house'.

3.3 In an email dated 18 May 2011, the applicant asked the authority to consider 'an alternate solution for approval of the channel drain'. The applicant attached information on the original consented detail, the positioning of the channel and the as-built drainage plan. The applicant also noted that other items identified in the final inspection had been attended to.

3.4 The notice to fix

3.4.1 In a letter to the applicant dated 3 June 2011 the authority stated that it 'was unable to satisfy itself that the present construction complies with E2/AS1 of the New Zealand Building Code' and attached a notice to fix, also dated 3 June 2011.

3.4.2 The 'Particulars of contravention or non-compliance' in the notice to fix described the drainage channel and noted that:

> … the building had not been constructed in accordance with the building consent BJ200911052 in that a channel drain had been constructed around the immediate perimeter of a significant portion of the house. This drain is to collect the surface water from a concrete path/paving that surrounds this portion of the house.
>
> The surface grate of the drain is approximately 62mm below the finished floor level and is required to be a minimum of 150mm below finished floor level. This is in breach of clause E2 (External moisture)/AS1 of the building code.

3.4.3 The notice also stated that the wall to paving junction in question must be built in accordance with the consent drawings and required the applicant to submit for approval an 'intended way forward prior to starting any remedial work'.

3.5 In a letter to the authority dated 7 June 2011, applicant explained the background to the situation. The letter described how, prior to installation, the applicant had discussed the use of a drain to provide 'a relatively even access' to the house and noted that a drainage inspector had inspected the drain and 'signed it off as approved' prior to concrete paving being poured'. The applicant also noted that 'at no stage was I advised to submit an amendment or variation' and concluded:

> I did not blatantly proceed without advice from [the authority's] office. I visited and consulted [the authority] and then the drainage inspector visited the site and approved the drain under E1...

3.6 The Department received an application for a determination on 16 June 2011.

4. The submissions

4.1 The applicant forwarded copies of:

- the original consented wall to paving detail
- a plan showing the location of the channel drain
- the as-built drainage plan
- the notice to fix dated 3 June 2011
- some correspondence with the authority
- some photographs and a statement from the timber supplier.

4.2 In response to a request for further information, the authority emailed the Department on 18 July 2011, noting that its concerns with respect to Clauses B1, B2, E1 as follows:

> E1 - Surface water must not be allowed to enter the house. Code clause E1.3.2 Using E1/AS1 for guidance the floor level is less than 150mm min above the road.
>
> B1 - If undue dampness is present and causes damage to the framing then this clause will not be complied with.
>
> B2 - … durability of timber framing (bottom plate being close t o the ground) also the weatherboards being in close proximity to the ground. How does this affect the connections such as holding down bolts and nail fixings?
>
> G13 - Can't allow foul water to enter buildings. Therefore using E2/AS2 for guidance. Gully trap to finish 150mm below lowest sanitary fixture, usually shower, and gully to finish 25mm above paved surfaces.

4.3 The draft determination was issued to the parties for comment on 17 August 2011. Both parties accepted the draft without comment.

5. The expert's report

5.1 As mentioned in paragraph 1.5, I engaged an independent expert, who is a Registered Architect[5], to assist me. The expert inspected the channel drain on 13 July 2011, providing a report dated 18 July 2011. The expert noted there had been heavy rain prior to his inspection and observed that the channel drain was 'clear and empty'; indicating satisfactory draining of that water.

5.2 General

5.2.1 The expert noted that the 130mm wide and 120mm deep drain is 7.4m long and drains to the northeast corner of the house, where it connects to the stormwater system. The paved area adjacent to the channel drain is about 20m^2, with a maximum slope of 1:100 away from the drain. The expert described the channel junction; and I have incorporated his comments within the sketches in Figure 1 and Figure 2 (see paragraphs 2.3 and 2.4).

5.2.2 The expert noted that water run-off from the large doors flows over the planted timber sill onto the edge of the channel drain, the bottom of which is about 190mm below the bottom plate level. However, the top of the concrete haunching to the foundations is exposed at small sections of weatherboards adjacent to the doors.

5.2.3 The expert inspected interior linings and flooring adjacent to the channel junction and observed no sign of moisture ingress. Non-invasive readings in these areas were low and did not vary from readings taken in adjacent locations where clearances accorded with the requirements of E2/AS1.

5.3 Comparing the channel junction with the detail for level thresholds provided in E2/AS1 (Figure 17B), the expert noted that:

- concrete haunching adjacent to weatherboards provides an exposed ledge about 70mm below the bottom plate level, which prevents aggregated clearances from being measured to the bottom of the channel
- there is only about 20mm clearance below the bottom painted edge of the weatherboards to the concrete ledge, which makes repainting 'next to impossible' and the edge subject to deterioration unless treated to H3.2
- there is only about 2 to 3mm clearance below the bottom edge of the timber sill below the slicing doors to the concrete haunching, which makes the timber effectively in contact with paving and subject to deterioration unless treated to H4.

5.4 Despite the likelihood of cladding deterioration noted above, the expert concluded:

> ...provided that the other features of construction comply with E2/AS1 details, including the use of preservative treated framing for the bottom plate, it is probable that the narrow strips of haunching will not change conditions significantly or sufficiently to cause failure of the construction behind the cladding.

(I note that the timber wall framing is H3.1 treated as outlined in paragraph 2.5.)

[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.

6. Discussion

6.1 Generally

6.1.1 As he had discussed the alternative solution to achieve a level threshold prior to installation and the authority's drainage inspector then inspected and passed the drain during construction, the applicant considers the channel junction should be approved as compliant with the Building Code. I also note that there is no evidence that the authority raised any concerns about the channel junction before the final inspection.

6.1.2 The authority subsequently issued a notice to fix noting the variation from the building consent and stating that the channel as installed was in breach of E2/AS1.

6.2 The nature of the building work

6.2.1 Taking account of the expert's report and the other evidence, I consider the following features to be relevant to the subject channel junction:

The weather exposure

- The house is on a rear section sheltered by mature trees and neighbouring houses and the resulting low wind zone will moderate the amount of rainwater likely to reach the wall and flow over the floor to paving junction.
- The walls above the subject junction are only one-storey high, with 500mm deep eaves projections; further moderating the quantity of rainwater on the wall.
- Although adjacent paving has limited fall, the area is small and falls away from the channel drain; limiting the quantity of water likely to reach the channel.

Construction features

- The wall framing is treated to H3.1 level, higher than required to comply with B2/AS1 at the time of construction.
- The walls include a drained cavity behind the timber weatherboards.
- The walls adjacent to the channel junctions have similar low levels of moisture to walls where floor clearances comply with E2/AS1.

6.3 Compliance with B2 Durability and E2 External moisture

6.3.1 Taking account of the expert's report, I consider the following features to be relevant to the adjacent junctions, in addition to the features outlined in paragraph 6.2.1:

- 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.

6.3.2 Taking account of the expert's report together with the factors outlined above, although I am satisfied that the junction is currently weathertight, I am not satisfied that the timber sill and weatherboards will remain durably weathertight to meet the requirements of Clause B2 (insofar as it applies to E2).

6.3.3 A method of providing adequate clearance to the bottom of the weatherboards and door way sills to the bottom of the subject walls is a matter for the applicant and his designer to propose. The presence of the concrete haunching prevents adequate clearances for draining and drying to the bottom of the cladding and joinery. I suggest that this may require removal of the haunching and modifying channel drain to extend it back to the main slab. An experienced designer will be able to investigate the existing construction and consider how this could be affected.

6.4 Compliance with Clause B1 Structure

6.4.1 I do not consider the performance requirements of Clause B1 are relevant to the compliance of the channel drain. The matters raised by the authority in respect of Clause B1 are relevant to B2 Durability and E2 External moisture.

6.5 Compliance with Clause E1 Surface water

6.5.1 I accept the applicant's submission that the authority inspected the surface water drainage serving the channel and passed it as complying with the Building Code. As the paved area falls away from the channel, it cannot be said to be receiving surface water.

6.5.2 The authority has advised that the channel does not meet Clause E1.3.2 and that 'surface water must not be allowed to enter the house'.

6.5.3 Clause E1.3.2 allows surface water to enter a habitable building in the 1 in 50 year storm event (i.e. having a 2 percent probability of occurring annually), and Clause E1.3.2 must apply to the building as a whole, and is a matter that must be considered separately to the compliance of the channel drain.

6.6 Compliance with Clause G13

6.6.1 The authority has said in respect of compliance with G13 that the 'gully trap [is] to finish 150mm below lowest sanitary fixture'.

6.6.2 While this requirement is correct in respect of providing overflow relief for the drainage system (refer paragraph 3.3.2 of G13/AS2), the gully adjacent the channel drain is at the highest point of the foul water drain and is not considered the overflow relief gully: the overflow relief gully is located at the northwest of the house. There is no requirement for the gully adjacent the channel drain to be 150mm lower than either the lowest sanitary fixture, or the ground floor level.

6.6.3 The top of the gully trap is approximately 50mm above the paved are thus preventing the ingress of surface water into the foul water disposal system.

6.7 The notice to fix

6.7.1 The notice to fix says that level of the drain below the finished floor level is 'in breach of Clause E2 (External moisture)/AS1 of the Building Code'. A departure from an Acceptable Solution does not represent a breach of the Act or regulations as provided for in Section 164(1)(a).

6.7.2 In my view the breach referred to in the notice to fix should have been in respect of the departure of the as-built work from what was consented, or in respect of work not meeting the requirements of Clause E2. There was no evidence that the authority considered the compliance of the as-built work in relation to the requirements of the Building Code, or required the applicant to verify this to the authority's satisfaction.

6.8 I consider the notice to fix should be modified to refer to the breaches of the Act or Regulations as discussed herein (paragraph 7.1 refers).

6.9 Conclusion

6.9.1 I am satisfied that the channel drain complies with Clauses E1 and E2 of the Building Code. The gully trap adjacent the channel drain complies with Clause G13. The requirements of Clause B1 are not relevant to the performance of the channel drain.

6.9.2 The channel drain, and the junction it forms with the house, is also required to comply with the durability requirements of Clause B2, which requires that a building must continue to satisfy all the objectives of the Building Code throughout its effective life with only normal maintenance. Because the defects outlined in paragraph 6.3.1 will adversely affect the continued performance of the building elements adjacent the channel drain, I conclude that the building work does not comply with Clause B2.

7. What is to be done now?

7.1 The notice to fix should be modified to take account the findings of this determination, identifying the items listed in paragraph 6.3.1, but not specifying how those defects are to be fixed. It is not for the notice to fix to stipulate directly how the defects are to be remedied and the house brought to compliance with the Building Code. That is a matter for the owner to propose and for the authority to accept or reject. It is important to note that the Building Code allows for more than one means of achieving code compliance.

7.2 I suggest that the parties adopt the following process to meet the requirements of paragraph 7.1. Initially, the authority should revise and re-issue the notice to fix. The applicant should then produce a response to this in the form of a detailed proposal for the subject junction, produced in conjunction with a competent and suitably qualified designer, as to the rectification or otherwise of the specified matters. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

8. The decision

8.1 In accordance with section 188 of the Act, I hereby determine 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; and accordingly I confirm the authority's decision to issue a notice to fix.

8.2 I also determine that the authority is to modify the notice to fix, dated 3 June 2011, to take account of the findings of this determination.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 13 September 2011.

John Gardiner
Manager Determinations