



Determination 2010/132

Sufficiency of information to establish code compliance of a floor slab for a proposed dwelling at lot 26 Anchorage Drive, Karaka Lakes, Papakura

1. The matters to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004¹ (“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 The parties to the determination are:

- the applicant, Mr T Lanigan, the design engineer² concerned with the building work (“the applicant”)
- Spaceline Homes Ltd, the building owner
- the Papakura District Council (“the authority³”) carrying out its duties and functions as a territorial authority and a building consent authority

1.3 I take the view that the matter to be determined, in terms of sections⁴ 177(1)(b) and 177(2)(a) of the Act, is whether the authority correctly exercised its powers in respect of the building consent in requiring further information to show that the raft floor slab of a proposed house (“the raft slab”) complies with Clause B1 “Structure” of the Building Code (Schedule 1, Building Regulations 1992).

1.4 In making my decision, I have considered the submissions of the parties, and the other evidence in this matter. I also note that the relevant provisions of the Act and NZS 3604:1999 “Timber Framed Buildings” (“NZS 3604”) are set out in Appendix A.

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 Chartered professional engineers under the Chartered Professional Engineers of New Zealand Act 2002 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.

³ After the application was made, and before the determination was completed, Papakura District Council was transitioned into the new Auckland Council. The term “authority” is used for both.

⁴ 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.

2. The building work

- 2.1 The raft slab has overall dimensions of 11.960 x 14.870 metres and consists of a proprietary raft slab system with associated concrete edge and internal beams, constructed on a polyethylene damp-proof membrane laid over a 50mm thick sand-blinding layer.
- 2.2 The raft slab is constructed over what is described as “moderately expansive clay”.

3. Background

- 3.1 The applicant issued a “Producer Statement—PS1—Design” dated 22 June 2010 for the house in respect of ‘lintels, beams, raft floor (for moderately expansive clay), drain protection as per [the applicant’s] calcs #949’. The PS1 refers to the use of the B1 Compliance Document and specifically to B1/VM1 and B1/VM4, in verifying the design.
- 3.2 Following an application for a building consent, the authority requested further information on 27 August 2010. The authority had concerns regarding several aspects of the consent, including the raft slab that was proposed to be used.
- 3.3 In an email copied to the applicant dated 6 September 2010 the authority stated, among other matters, that:
- The floor [system] requires specific design, based on the M class soils on site. Therefore, please provide the calculations for the floor design.
- 3.4 The applicant responded in an email dated 6 September 2010, referring the authority to page 5 of his submitted calculations, where it was stated that the raft floor was ‘designed to class M soils’.
- 3.5 On 7 September 2010, the authority emailed the applicant stating:
- I have reviewed page 5 of your calculations, which references the slab design complying to AS 2870, the problem is that AS 2870 is not a referred standard of NZBC B1/VM4. ... full calculations complying with B1 are required.
- 3.6 In an email to the authority dated 7 September 2010, the applicant said:
- NZS 3604 is a referred std within NZBC. Clause 17.1.5 of NZS 3604 states that standard solutions of AS 2870 may be used.
- 3.7 The authority emailed the applicant again on 7 September 2010, stating:
- Yes we are aware of this clause. This section is informative only, clause 1.2.3 [of NZS 3604] provides the interpretation. It [clause 17.1.5] has been included for information only, and does not form part of this standard, nor has any standing within it.
- 3.8 The applicant responded to authority in an email of the same date noting that the authority was “legalistically” correct regarding the informative sections of NZS 3604. However, this was contrary to the ‘spirit of the document’ and clearly section 17 of that Standard was there to be used. If there was anything wrong with the section, then it would have been deleted from the new DZ 3604 (the proposed new NZS 3604, which has recently been released for public comment).
- 3.9 The applicant noted that many houses in Auckland had been built using the AS 2870 “Residential slabs and footings—Construction” standard solutions and a firm of consulting engineers had been commissioned by an independent testing authority to report and recommend on the applicability of AS 2870 to the Auckland region (“the study report”).

3.10 The applicant also stated that, while he was complying with the authority's request for further information, he was seeking a determination regarding the authority's interpretation of the matter at issue. The applicant also attached to the email a copy of the cover sheet of the study report.

3.11 The application for a determination was received by the Department on 13 September 2010.

4. The submissions

4.1 The applicant supplied copies of the following:

- A plan showing the raft slab and its various elements.
- Calculations relating to the raft slab design.
- The "Producer Statement—PS1—Design" dated 22 June 2010.
- Cover sheets of AS 2870:1996 'Residential slabs and footings – Construction'
- Cover sheets of BRANZ Study Report No 120 (2003) 'Soil Expansivity in the Auckland Region'⁵ ("the study report")
- Clauses 17.1 to 17.4 of NZS 3604.
- Correspondence with the authority.

4.2 The authority noted in its response to the application for the determination that 'the consent in question has not been refused', and noted that the applicant had agreed to provide details required in order for the authority to process the building consent.

4.3 The authority supplied a copy of two of the emails sent between the applicant and the authority on 7 September 2007.

5. The draft determination

5.1 The draft determination was forwarded to the parties for comment on 4 November 2010.

5.2 The authority accepted the determination without comment.

5.3 The applicant did not accept the determination, and set out his reasons in an email to the Department dated 8 November 2010. In summary the applicant stated:

- There was no alternative reference or accepted solution for dealing with expansive clays other than AS 2870, which has been accepted on many occasions by various building consent authorities. The applicant was of the opinion that such building consent applications would not be in the form of alternative solutions.
- The authority had requested what amounted to a specific design with reference to AS 2870, which contains specific and standard designs not requiring specific review.
- The specific design showed that the standard design had a safety factor of 175% which infers justification for the use of standard designs.

⁵ The report was finalised in an Addendum Study Report No. 120A issued in 2008.

- Specific design in such cases have time and cost implications and are similar to requesting specific design for joists, lintels, etc that can be sized from NZS 3604.

6. Discussion

- 6.1 It appears from submissions received that the applicant will comply with the authority's request for further information to enable the authority to decide whether or not the raft slab as designed is code-compliant. Accordingly, there is no necessity for me to determine whether the raft slab meets the requirements of the Building Code. However, the applicant wishes me to determine whether the authority correctly interpreted the application of AS 2870 to NZS 3604. As such a determination would give guidance to both building consent applicants and building consent authorities; I have decided to proceed with the determination in line with this request.
- 6.2 The initial issue was whether the raft slab designed to the provisions of AS 2870, being the Standard mentioned in section 17 of NZS 3604, comes within the scope of NZS 3604.
- 6.3 As set out in the objectives of NZS 3604, sections 1-16 of that Standard were intended to be called up in as an Acceptable Solution for meeting certain requirements of the Building Code. NZS 3604 is cited, without modification, in Acceptable Solution B1/AS1 of the B1 Compliance Document, and that citation therefore incorporates the limitation contained within those objectives.
- 6.4 Further, section 17 of NZS 3604 is described as being "Informative". Applying the definition set out in clause 1.2.3 of that Standard (refer paragraph A.2), section 17 is provided as guidance and does not form part of its mandatory requirements. Therefore section 17 does not form part of NZS 3604 insofar as it forms an Acceptable Solution to Clause B1 of the Building Code.
- 6.5 It appears from the correspondence that in the initial application for a building consent, compliance with B1/AS1 was to be achieved by virtue of meeting the requirements of section 17 of NZS 3604. As section 17 falls outside the scope of B1/AS1, it cannot be accepted that B1/AS1 has been followed.
- 6.6 From this, it follows that the proposed use of AS 2870, together with the study report, was in the form of an alternative solution proposal. As such, the proposal needed to be justified to the authority so that it could consider any arguments that are presented in order to make a decision.
- 6.7 I note here that AS 2870, as modified by the most recent version of the study report, represents an appropriate starting point for an alternative solution proposal. The Department's recently issued Simple House Acceptable Solution (SH/AS1⁶), which includes designs for foundations on expansive soils, is itself based on the design methodologies contained in these documents although it is important to note SH/AS1's limited scope (e.g. single storey) and that its standard foundation design differs from the standard details contained in AS 2870. I do not know if SH/AS1 is applicable in this instance as the Department received no information in respect of the particular building in question and SH/AS1 was not mentioned in any of the submissions received.

⁶ Simple House Acceptable Solution, published by the Department of Building and Housing, 31 March 2010.

- 6.8 I am of the opinion that, in terms of section 45(1)(c), the authority acted entirely appropriately when, in considering the building consent application, it requested further information to establish compliance with Clause B1. While the authority could have elected not to check the design and accept the LBP's producer statement, it apparently was not prepared to do so in this instance.
- 6.9 I also note that as set out in paragraph 6.1, I am no longer required to determine whether the raft slab is code compliant. However, as a matter of principle, I have decided that designs to AS 2870 do not come within B1/AS1's citation of NZS 3604.
- 6.10 The applicant, in commenting on the draft determination, has raised issues that are set out in paragraph 5.3, and I respond to those as follows:
- It is over to the various building consent authorities to decide as to how they approach applications for building consents; and in the cases where AS 2870 is cited then such applications are always alternative solution proposals.
 - Accordingly, a building consent authority is perfectly entitled to request further justification for any design that is based on AS 2870. Just because AS 2870 exists does not mean that it is applicable to all situations and that in itself it is automatically sufficient.
 - I do not consider that the comparison with joists, lintels, etc in the context of NZS3604 is relevant. In such cases NZS 3604 forms part of B1/AS1, and a building consent authority is bound to accept compliance with that acceptable solution. As I have found that AS 2870 does not come within B1/AS1's citation of NZS 3604, I cannot accept the applicant's contention.

Based on my comments above, I did not consider that it was necessary to amend the determination in line with the applicants's comments.

- 6.11 I also wish to comment on two aspects of the applicant's producer statement that appear to be incorrect. Firstly, the producer statement claims that the design had been carried out in accordance with B1/VM1 and B1/VM4 of the Compliance Document and, secondly, it requires site verification of 'soil bearing strength to NZS 3604'.
- 6.12 From the correspondence, it appears that the design basis claimed by the applicant is B1/AS1 (not B1/VM1 or B1/VM4) and, as AS 2870 is proposed, it is clearly not intended to verify the soil bearing strength to NZS 3604. I believe (but have not verified) that the applicant's intention in imposing this requirement was to ensure that a minimum bearing strength requirement would be provided, but in my view his statement is not clear in that regard.
- 6.13 Accordingly, I am of the opinion that the producer statement, in respect of the raft slab design, is incorrect in at least two respects.
- 6.14 In my view, the appropriate reference on the producer statement should have been to an alternative solution proposal based on AS 2870 and the study report. Calculations submitted with the plans and specifications for the building consent application needed to include the following:
- a) reference to the standard designs or other information within AS 2870 that is being relied on
 - b) justification for the use of that information or any variations to it considered necessary

- c) evidence, such as a geotechnical report, justifying the soil classification chosen, for example Class “M”.

7. The decision

- 7.1 In accordance with section 188 of the Building Act 2004, I hereby determine that insufficient evidence was initially provided to the authority to show that the raft slab complied with Clause B1 of the Building Code, and accordingly the authority was correct to request further information.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 20 December 2010.

John Gardiner
Manager Determinations

Appendix A: The relevant documentation

A.1 The relevant section of the Act is:

45 How to apply for a building consent

- (1) An application for a building consent must—
(c) contain or be accompanied by any other information that the building consent authority reasonably requires...

A.2 The relevant clauses of NZS 3604 1999 are:

Objective

Use of NZS 3604 as a means of compliance with the New Zealand Building Code

It is intended that sections 1-16 of NZS 3604 will be called in the [Compliance Documents] as an Acceptable Solution for meeting the following requirements of the New Zealand Building Code...

1.2.3

The term “informative” identifies information provided for guidance or background which may be of interest to the Standard’s users.

Informative provisions do not form part of the mandatory requirements of the Standard nor do they form part of the Standard as an Acceptable Solution to the *NZBC*

3.1.1

Foundations on expansive soils are outside of the scope of this Standard as an Acceptable Solution to the *NZBC*

C3.1.1

Section 17 contains some information which may be of assistance to those designing foundations on expansive soils

SECTION 17

EXPANSIVE SOILS

ADDITIONAL INFORMATION (INFORMATIVE)