



## Determination 2013/022

### Dispute about a subdivision being considered land subject to a natural hazard due to slippage at 6 to 40 Morere Street, Porirua

#### 1. The matter to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004<sup>1</sup> (“the current Act”) made under due authorisation by me, John Gardiner, Manager Determinations and Assurance, Ministry of Business, Innovation and Employment (“the Ministry”)<sup>2</sup>, for and on behalf of the Chief Executive of the Ministry.

1.2 The parties to the determination are:

- Titahi Estates Ltd, the owner of the subdivision (“the applicant”), acting through an agent
- Porirua City Council (“the authority”), carrying out its duties as a territorial authority or building consent authority.

1.3 I take the view that the matter to be determined<sup>3</sup> is whether the authority correctly exercised its power when it imposed section 36(2) notifications under the Building Act 1991 (“the former Act”) requiring an entry on the certificate of title on 7 lots. I note that the application for determination was made in respect of 19 properties on 14 lots within the subdivision; however the authority has sought to record notifications on only seven lots in the subdivision (refer paragraph 2.3).

1.4 In making this decision I must also consider:

- whether in terms of section 71(1)(a), ‘the land on which the building work’ was carried out is subject or is likely to be subject to 1 or more natural hazards, in this case subsidence or slippage
- whether in terms of section 72(a) the building work has not or ‘will not accelerate, worsen, or result in a natural hazard on the land on which the building work is to be carried out or any other property
- whether the building work complies with the requirements of the Building Code in terms of subsidence or slippage.

1.5 The lots in question have been subject to the requirements of section 36 of the former Act. However, as set out in section 434 of the transitional provisions in the current Act, an entry on a certificate of title under section 36(2) of the former Act must be treated as if it had been made under the current Act. Accordingly, all such title entries described in this determination are considered in terms of the current sections 71 to 74.

---

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

<sup>2</sup> After the application was made, and before the determination was completed, the Department of Building and Housing was transitioned into the Ministry of Business, Innovation and Employment. The term “the Ministry” is used for both.

<sup>3</sup> Under sections 177(1)(b) and 177(2)(a) of the Act

- 1.6 In making my decision, I have considered the submissions of the parties, including the reports of the various consultants engaged by the parties (refer to paragraph 1.8), the report of the independent expert (“the expert”) commissioned by the Ministry to advise on this dispute, and the other evidence in this matter.
- 1.7 While I have carefully considered the parties’ submissions and the various consultants’ reports, I have only summarised the main points of these in the context of this determination.
- 1.8 The following table identifies the various specialist consultants engaged by the parties, and the description I have used for those consultants throughout this determination.

Consultants	Engaged by	Peer review by
Consultants A	The applicant	Consultants B
Consultants B	The applicant	
Consultant C	The authority	
The expert	The Ministry	

- 1.9 I have not considered any other aspects of the Act or the Building Code (Schedule 1, Building Regulations 1992). Appendix A contains the relevant sections of the Act referred to in this determination.

## 2. The subdivision

- 2.1 The seven lots in question are part of a subdivision situated at Morere Street, Titahi Bay (“the subdivision”). The subdivision is set out on a steep-sided gully with the sites sloping down from Morere Street before levelling off at the base of the gully. On two previous occasions, many of the sites were bulk filled, but not all the entire fill was placed under controlled conditions.
- 2.2 The application for determination was made in respect of the following lots:
- Lots containing one house: Nos 2, 4, 6, 7, 9 16, 17, 18, and 19
  - Lots containing two houses: Nos 11 to 15 inclusive.
- 2.3 However, it has subsequently been established that section 36(2) notifications have only been applied to some lots; I have therefore considered the notifications in respect of the following lots only:

Building Consent	Date Issued	Street #	Lot #	S36(2) notification issued
ABA 20001084	28/08/2001	6	2	18/7/2000
ABA 30042	02/08/2002	10	4	20/9/2002
ABA 30179	11/02/2005	14	6	20/9/2002
ABA 20187	20/12/2001	16	7	25/1/2002 and 18/10/2002
ABA 30180	07/08/2003	20	9	20/9/2002
ABA 40101 BCA0938/06	04/12/2003 6/6/2006	30 30A <sup>4</sup>	14	27/7/2000
ABA 40105	14/06/2004	38	18	27/7/2000

<sup>4</sup> In this determination 30A refers to the house built at the rear of Lot 14; the legal address is 30 Morere Street.

- 2.4 The houses in question are generally two-storey and of timber framed construction with timber sub-floors. The foundations are predominantly timber piled, and the cladding and roofing are constructed with lightweight materials (note: some foundations use steel piles and in-situ concrete).

### 3. Background

- 3.1 I summarise below in chronological order the various events and reports that have occurred regarding the matters to be determined:

Date	Event or Report	Commentary
12 November 1999	Consultants A issued a geotechnical investigative report for Lots 2 and 3.	Addressed house foundation settlement concerns but did not consider any global land stability issues.
15 March 2000	Consultants A responded to an authority query outlining further investigative requirements for Lots 4 to 9.	requirements included an assessment of fill stability and designing the house foundations to take into account "lateral forces developed as a result of instability with the fill area"
13 April 2000	The authority issued resource consent (No 2165) for the construction of 8 dwellings and garages on Lots 2 to 9 inclusive. It noted that "Section 36 of the [former Act] is applicable to the proposed development".	Included conditions requiring a pre-construction geotechnical investigation and recommendations regarding site instability. Required a covenant to be lodged on the titles detailing the conditions. Concerns regarding the site filling could be dealt with via the resource and building consents and Section 36.
14 July 2000	Consultants A issued a geotechnical investigative report for Lots 4 to 9.	With the exception of Lot 6, where safety factors under seismic conditions were marginal, all lots were considered to have adequate safety factors against sliding failures. No recommendations were made concerning Lot 6 or the design of the house piles to accommodate lateral loads. It was concluded that the development complied with Sections 36 (1a) and (1b).
12 July 2000	In a letter to the applicant the authority advised that lot 6 was subject to, or was likely to be, subject to a section 36(2) <sup>5</sup> notice.	Notice would be in terms of subsidence or slippage but no reasons or background information was provided.
18 July 2000	Section 36 notification for Lot 2	
27 July 2000	Section 36 notification for Lots 14 and 18 <sup>6</sup>	
13 September 2000	Consultants A issued a supplementary report on the settlement and stability of the filling on Lots 2 and 3.	Based on a comparative analysis of Lot 5, it was concluded that the predicted fill on these lots had an adequate factor of safety against sliding.
18 July 2000	Section 36 notification for Lot 2	
27 July 2000	Section 36 notification for Lots 14 and 18 <sup>7</sup>	
13 September 2000	Consultants A issued a supplementary report on the settlement and stability of the filling on Lots 2 and 3.	Based on a comparative analysis of Lot 5, it was concluded that the predicted fill on these lots had an adequate factor of safety against sliding.

<sup>5</sup> Section 36(2) of the former Act has the same effect as section 73(1) of the current Act

<sup>6</sup> Note this is before the consent was issued for this lot

<sup>7</sup> Note this is before the consent was issued for this lot

Date	Event or Report	Commentary
9 March 2001	Consultants A issued a supplementary report on lot 6.	This analysis calculated the factor of safety with respect to ground stability under earthquake conditions for different ground profiles. The fill profile ultimately selected attained "a higher level of resistance to earthquake shaking than is usually called for". Lots 4 and 5 were less critical than Lot 6 as they contained competent natural soil and had flatter slopes.
28 August 2001	Consent ABA 20001084 issued for Lot 2	
30 October 2001	Consultants A inspected the drainage trench at Lot 6.	The consultants were of the opinion that, on reasonable grounds, the work complied with the Act, the Building Code, and the design intent.
20 December 2001	Consent ABA 20187 issued for Lot 7	
10 January 2002	The authority granted a resource consent No 2849 for Lots 4 to 9 the superseded consent No 2165	The geotechnical conditions set out in the original consent were deleted but the applicant was advised that section 36 notices would be placed on the titles.
25 January 2002	Section 36 notification for Lot 7	
July 2002	Consultants A issued a geotechnical report for Lots 11 to 19, 21, and 22.	General foundation recommendations were given for Lots 14 to 19 only, with further investigation for the remaining lots required. No specific parameters for foundation/pile design or how to address soil creep were included. Notes that foundations must take into account soil creep and foundation movement. Slope stability risk was considered to be low.
2 August 2002	Consent ABA 30042 issued for Lot 4	
18 September 2002	The authority confirmed the section 36(2) notices on Lots 2, 3, 5, and 7, and advised this will also be applied on Lots 4, 6, and 8.	The authority noted that the land was subject to subsidence and slippage, and claimed that it had not received justifiable information or reports. Would reconsider if suitably qualified persons provided information that would satisfy the authority as to the stability and suitability of the site.
20 September 2002	Section 36 notifications for Lots 4, 6 and 9 <sup>8</sup>	
30 September 2002	In a letter to the authority, Consultants A disputed the authority's position.	Concluded that apart from some problems with land settlement on Lots 2 and 3, due to the specific foundation designs, all lots and their development satisfied section 36(1)(a) (b) and (c).
18 October 2002	Section 36 notification for Lot 7 (the second notification for this lot)	
26 November 2002	Consultants A informed the applicant that the authority's concerns were related to its experiences with Lot 1	
4 February 2003	Consultants A confirmed that the authority required the geotechnical reports to be peer reviewed, and then further reviewed, by an expert appointed by the authority.	

<sup>8</sup> Note this is before the consent was issued for this lot

Date	Event or Report	Commentary
25 February 2003	In a letter to the applicant, the authority confirmed its requirements for a peer review and its reasons why the section 36(2) notices were issued.	The authority claimed that Consultants A's reports did not address "protecting the land" and other property issues, were based on a relatively small number of samples, and were not prepared by a Registered Geotechnical Engineer.
May 2003	As requested by the applicant, Consultants B carried out a peer review of Lots 2 to 9.	<p>The review concluded that the potential for:</p> <ul style="list-style-type: none"> <li>• subsidence of the piled houses was negligible</li> <li>• subsidence of the surrounding land was low, with no effect on amenity</li> <li>• slippage in Lots 2 to 5 was acceptably low, did not constitute a hazard, and a section 36(2) notice was not applicable.</li> <li>• slippage in Lot 6 was uncertain and this required further investigation</li> <li>• slippage in Lots 7 to 9 required further investigation.</li> </ul>
8 May 2003	The authority granted resource consent (No 3339) for the development of Lots 11 to 19 and 21 and 22. The applicant was advised that the authority intended to apply section 36(2) notices to these lots.	<p>The conditions were similar to those for resource consent No 2165, but also included conditions that:</p> <ul style="list-style-type: none"> <li>• mitigated damage to land and any buildings on Lots 14 to 19</li> <li>• related to piled foundations to Lots 14 to 19 to allow for soil creep and lateral movement</li> <li>• required further specific investigations for Lots 11 to 13.</li> </ul>
28 July 2003	Consultants B issued a geotechnical investigation report on Lots 11 to 13.	The report concluded that the houses were to be founded on piles and that there was no particular hazard from slope instability. No parameters were given for the design of piles in relation to end bearing capacity or soil creep/ lateral movement.
7 August 2003	Consent ABA 30180 issued for Lot 9	
12 August 2003	Consultants B issued a supplementary geotechnical investigation report on Lots 7 and 9, which included the results of test pits logs.	The report concluded that there was very limited potential for subsidence and that the slope stability factors of safety were acceptable. It was recommended that ground beams be installed at the house on Lot 7, to tie the front and second row of piles together.

Date	Event or Report	Commentary
21 and 22 August 2003	Consultants B issued a site specific geotechnical investigative report for Lots 14 to 19. No recommendations regarding pile design were given.	<p>The review concluded that for all lots:</p> <ul style="list-style-type: none"> <li>• there was adequate bearing for bored pile foundations</li> <li>• the proposed work would not accelerate or worsen the settlement potential of the site</li> <li>• there were no particular slope instability hazard or subsidence issues with filling that would affect amenity</li> <li>• imposing a section 36(2) notice was not justified</li> <li>• the cut faces at the toe of the slope should be retained.</li> </ul> <p>For lots 18 and 19, a retaining wall was required at the foot of the slope along the site access way.</p>
17 September 2003	Consultants B issued a supplementary geotechnical investigative report for Lots 11 to 13, which included the results of test pits logs.	The comments and conclusions were the same as those for Lots 14 to 19.
3 October 2003	Consultants B issued PS4-Construction Reviews for the piled foundations at Lots 14 to 19.	
30 October 2003	Consent ABA 40103 issued for Lot 16 (House No. 34) File note on the authority's records indicates section 36(2) notification would be applied, but no notification was made.	
4 November 2003	Consent ABA 40104 issued for Lot 17 (House No. 36) File note on the authority's records indicates section 36(2) notification would be applied, but no notification was made.	
4 December 2003	Consent ABA 40101 issued for Lot 14 (House No. 30)	
11 February 2005	Consent ABA 30179 issued for Lot 6	
17 and 18 December 2003	Exchange of correspondence between the applicant's and the authority's legal advisors regarding a judicial review.	
14 June 2004	Consent ABA 40105 issued for Lot 18	
29 November 2005	Consultants B reviewed previous advice regarding Lots 2 to 9 and 11 to 19.	The review concluded that due to small settlements and overland flow, section 71(1) might not strictly apply. However, the lots did comply with the intent of sections 72(a)(1), 72(a) ( <i>sic</i> ), and 72(c). There was no geotechnical reason why building consent could not be issued for all the lots.
29 November 2005	Consultants B issued a geotechnical investigative report for the second set of dwellings on Lots 11-19 and two houses on Lots 21 and 22.	Conclusions similar to previous reports were reached. It was recommended that bored timber piles founded between 5 to 6 metres deep be installed in areas of uncontrolled fill. In other areas, driven timber or shallow footings were acceptable.
6 June 2006	Consent BCA 0938/06 issued for Lot 14 (House 30A)	

Date	Event or Report	Commentary
19 July 2006	The authority issued resource consents Nos 4277 to 4282 for the second dwellings on Lots 11 to 15, and 17.	The 29 November 2003 report from Consultants B was acknowledged, and no condition relating to section 73 notices were imposed.
11 November 2009	The authority issued resource consents Nos 5346 and 5347 for the second dwellings on Lots 18 to 19.	No condition relating to section 73 notices were imposed.
In 2010	The authority issued building consents for the second dwellings on lots 18 and 19.	
January and February 2012	An exchange of correspondence between the applicant, the authority, and the Ministry.	This correspondence was in relation to documentation and reviews.
24 February 2012	The authority wrote to the applicant.	Based on the geotechnical reports and the presence of uncompacted fill and potential slippage, the authority was of the opinion that the application of the 36(2) notices was appropriate. This was on the grounds that there was still a small chance of some land slippage. The authority also noted that the resource consents had covered this issue and that these consents were upheld by the Environment Court.
1 March 2012	The applicant responded by letter.	As regards the notices: <ul style="list-style-type: none"> <li>• The geotechnical reports concluded that they were not justified.</li> <li>• The Environment Court decision was related to development contributions and not to the question of the notices.</li> <li>• The notices were Building issues.</li> </ul>
27 April 2012	An independent consultant (Consultant C) provided a report to the authority.	The report provided some opinions regarding the relevant parts of the Act but did not specifically address any of the engineering issues.

3.2 The Ministry received an application for a determination on 16 May 2012.

#### 4. The initial submissions

4.1 In a covering letter forwarded with the application, the applicant was of the opinion that the land in question was 'no more likely to evoke the need for these [section 36(2) and 73(1)] notices than any other land.

4.2 In an email to the Ministry dated 18 August 2012, the applicant noted that the drainage drawings showed that the drainage trench and the buttress for Lot 6 were part of the building consent and it was not possible to construct the drainage without the buttress being in place. The applicant understood, with respect to Lots 18 and 19, that as the surcharge was tapered to a revised moderate angle it was agreed by all concerned that the consented retaining walls were not necessary.

4.3 The applicant provided copies of some of the various reports and correspondence referred to in paragraph 3.1 and additional information as requested by the Ministry.

- 4.4 The authority did not make a formal submission. However, in an email to the Ministry dated 30 January 2012, the authority noted that the consultants' reports 'do not confirm that a slip will not happen, they only state that it is highly unlikely'. Accordingly, the authority's decision to issue section 36 and 73 notifications was appropriate.
- 4.5 In a further email to the Ministry dated 8 August 2012, the authority was of the opinion that the Act clearly stated that if there was a hazard on the land that was subject to a building consent, then a notice that advised of the hazard should be placed on the title. In the current situation, the house foundations had been designed so that the buildings were not affected by the hazard but the hazard still existed and had not been mitigated. The authority also noted that the expert had not carried out any meaningful on-site investigations or tests.
- 4.6 The authority provided copies of:
- some of the various reports and correspondence referred to in paragraph 3.1
  - the relevant resource consents
  - some additional consent documentation as requested by the Ministry.
- 4.7 Submissions were made by the parties in response to the expert's reports and the draft determination. I have included those comments in paragraph 6.

## **5. The expert's reports**

### **5.1 The initial report**

- 5.1.1 As described in paragraph 1.6, I engaged an independent expert, who is a Chartered Professional Engineer, to assist me. The expert has noted in his report that he also consulted with an independent geotechnical engineer. The expert visited the subdivision on 2 July 2012 and produced a report dated 17 July 2012. Copies of this report were forwarded to the parties on 23 July 2012.
- 5.1.2 The report described the background to the dispute and summarised the results of a visual inspection of the subdivision and the houses constructed on it as:
- There was no visual evidence of any house subsidence or house/foundation slippage.
  - There was visual evidence of localised land subsidence affecting pathways and driveways. However, as the outcomes are very similar, it was difficult to distinguish this subsidence from drying shrinkage movements.
  - There was little or no evidence of global land instability or slippage.
- 5.1.3 The following localised issues were also observed:
- Lots 18 and 19 had cuts beneath the houses that had not been retained and there was evidence that these cuts have slumped.
  - There was a gap between the downslope piles and the ground on Lot 7 possibly caused by the drying contraction of the soils or by soil-creep. However, these piles were tied back to the next row of piles.
  - Lot 8 was similar to Lot 7, but the piles were not tied back.
  - Some sections of the various concrete driveways had differential movements at the joints, which indicated typical drying and shrinkage.

## **5.2 Comment on the work of the consultants**

5.2.1 The expert reviewed the various reports prepared by Consultants A, B and Consultant C (as listed in paragraph 3.1) and I summarise the expert's comments as:

### **Consultants A's report of 12 November 1999**

- This only dealt with the protection of the buildings on Lots 2 and 3 and did not address land subsidence or slippage in any detail. No specific geotechnical recommendations were given to assess pile-load capacities.
- The authority was aware of previous filling on the land and had encountered subsidence issues on an adjoining site that concerned a dwelling constructed in the early 1990s. This subsidence was attributed to the surcharge load of filling placed in the late 1980s on filling previously placed in the 1940s, together with inadequate pile depths.
- The expert was of the opinion that based on the information available to it at the time, the authority acted reasonably in considering that there was a risk of land subsidence or slippage.

### **Consultants A's reports of 14 July 2000 and 9 March 2001**

- The only concern raised in the July report related to the potential for land slippage on Lot 6 under earthquake conditions. This concern was addressed in Consultants A's March 2001 report, which made recommendations for remedial work to protect the land. The expert was unable to confirm whether these latter recommendations had been implemented.
- The expert did not agree with the reasons given by the authority in its letter of 25 February 2003 for not accepting Consultants A's reports. However, the letter did outline a pathway for reviewing the section 36(2) notices.

### **The peer reviews undertaken by Consultants B**

- The expert noted that the reviews undertaken by Consultants B:
  - generally agreed with the reports prepared by Consultants A
  - sought verification that the protection work for Lot 6 had been undertaken
  - recommended that further stability analyses be undertaken regarding to land slippage for Lots 7 to 9.
- In addition, the subsequent reviews by Consultants B addressed the additional work recommended for Lots 7 to 9. These were in terms of the protection of the buildings from subsidence, land subsidence and stability issues, and section 36 and section 71 issues.

### **Consultant C's report of 27 April 2012**

- The expert did not agree with many of the opinions made by Consultant C. This was on the grounds that the reports from Consultants A and B clearly:
  - mitigated the presence of fill on the sites by piling the structures

- demonstrate that the predicted land subsidence was negligible
- either assessed that the factors of slippage safety meet the requirements of the Building Code, or recommended measures to be implemented to ensure the safety factors are acceptable.

### 5.3 General

5.3.1 The expert stated that he had no reason to disagree either with the conclusions reached or the recommendations made in the consultants' documentation, or with the processes that were followed. Apart from the report from Consultant C, there were no other documents that he had observed that refuted or disputed the findings of Consultants B.

5.3.2 However, the expert was of the opinion that the reports were not 'stand alone documents'. This was on the grounds that:

- there were no design parameters given for assessing pile load capacities
- there were no recommendations or design parameters given for designing the piles for soil creep/lateral movement.

5.3.3 As far as the expert was aware, either Consultants A or B designed and supervised the house foundations on all the lots under consideration. Not having sighted all the design documentation, the expert had to assume 'that all the foundations were designed and constructed to meet their requirements including any provision for soil creep/lateral movement'.

5.3.4 The expert was of the opinion that the presence of fill did not necessarily justify the issuing of a section 36 or a section 73 notice. There were less onerous means to ensure future owners were aware of the presence of filled ground.

5.3.5 The expert had taken into account the steepness of the gradient experienced on the lots, and considered the fact that possible soil-creep was observed in two of them was 'not unexpected on slopes of this gradient' and this had 'no relevance to the presence of the fill'. Similar gradients in insitu soils could also be subject to soil-creep.

5.3.6 The expert was of the opinion that:

- The land on which the buildings were constructed was not likely to be subject to future subsidence, and where subsidence had occurred it was minimal and could not be considered to be a hazard.
- Adequate provision had been made to protect the buildings from subsidence.
- Either the land on which the buildings were constructed was not likely to be subject to slippage, or where slippage risk if slippage has been identified provision had been made to protect the land (the latter was subject to confirmation).
- Adequate provision has been made to protect the buildings from slippage (the latter was also subject to confirmation).

5.3.7 The expert made the following recommendations:

- Confirm that provision had been made for soil creep/lateral movement in the design of the foundations.

- Confirm that Consultants B's recommendations for slope re-grading and compacted toe fill buttresses been implemented, particularly for Lot 6.
- Verify what remedial work, if any, is required for the cuts beneath the houses on Lots 18 to 19.

## **5.4 The applicant's response**

5.4.1 In a letter to the Ministry dated 7 July 2012, the applicant responded to the expert's report. In summary, the applicant stated:

- Both Consultants A and B 'engineered and supervised the construction of the foundations to the houses to ensure that the recommendations contained in the respective reports in respect to the foundations were abided with'.
- In all cases, the pile logs, which were submitted with each building consent, indicated that the piles were drilled through the filling and "socketed" into the underlying rock.
- It was unlikely that the consultants would fail to follow their own recommendations as to the house designs, when they supervised the work and issued a PS4 certificate.
- Copies of all the geotechnical reports had been forwarded to the authority; it was a condition of the resource consent that building consents could not be issued until this had occurred.
- The authority had not provided any evidence that they had undertaken a technical peer review of the consultants' reports. The only review provided by the authority was the report from Consultant C.

5.4.2 The applicant also commented on three specific Lots as follows:

- At Lot 6, the drainage buttress and drainage trench were built in October 2001 in accordance with the details attached to the applicant's letter. The applicant was of the opinion that the inspection carried out by Consultants A on 30 October 2001 included both the buttress and the trench as they needed to be built together.
- At Lots 18 and 19, as the ground was 'very stiff', it was not retained as originally detailed, and advice was received that there was no need to retain it. In addition, the houses, which were built seven years ago, had not moved in that time.

5.4.3 The applicant also attached copies of the following documents to his letter:

- The letter dated 30 October 2001 from Consultants A to the applicant (described in paragraph 3.1).
- The report from Consultants A dated 9 March 2001 (described in paragraph 3.1).

## **5.5 Subsequent comment from the expert and the responses**

5.5.1 In an email to the Ministry dated 27 August 2012, the expert confirmed that he had reviewed the additional information provided by the applicant and was satisfied that the foundation construction was supervised and signed off by the respective consultants. However, this information did not contain any documentation that demonstrated that the piles to the Lots in question had been designed for soil creep/lateral movement. The expert also wished to view any geotechnical comment that had been provided regarding the cuts to Lots 18 and 19.

- 5.5.2 In a further email to the Ministry dated 21 September 2012, the expert noted that he had received additional information from the authority and reiterated his comments regarding the pile design. The expert also commented that while the applicant had affirmed both the design issues and the cuts to Lots 18 and 19, the applicant was not a geotechnical engineer and comment from the respective geotechnical consultants was required. However, the expert did not consider that the cuts to Lots 18 and 19 were critical to the determination.
- 5.5.3 In an email to the Ministry dated 5 September 2012, the applicant responded to the expert's first email. The applicant stated that while he did not have the structural details, he had no doubt that the foundations were designed correctly and that all the engineering information regarding the design was provided in the building consent applications. The applicant stated that information yet to be provided by the authority would show that the structural design calculations were included with each building consent application.
- 5.5.4 The applicant also noted that he had no knowledge that the cuts posed any risks and any retaining was part of the original design. The taper to the cuts had been reduced, alleviating the original requirement that the cuts be retained. The foundations for the innermost piles extend 2.2 and 3.2 metres into the ground, which was well over a metre below the retained cuts. Should the expert consider that a retaining wall was required, the applicant would comply with this opinion.

## **5.6 Soil creep and lateral movement and the responses**

- 5.6.1 The applicant's request (refer paragraph 6.2) that the determination consider whether the foundation design allowed for soil creep and lateral movement was accepted. The expert was asked to consider these aspects, and the expert sought further information from Consultants B.
- 5.6.2 Consultants B provided additional documentation by letter dated 13 December 2012; the documentation provided a foundation assessment, noting that:
- there is no history of slips on the site
  - it is not clear whether the cracks identified by the expert around some of the poles is due to drying and shrinking of the soil under the building or is evidence of creep; no cracks or gaps were observed around the poles in an inspection carried out on 12 December 2012, and this would indicate the previous cracking was due to 'extremely dry weathered associated soil shrinkage'
  - there is not a significant back slope above the properties to drive a slope or creep failure
  - the poles are founded in ground well below any foreseeable depth of long term or seismic induced movements
  - the timber poles have significant bending capacity over that required to support the house and were encased in concrete to achieve the required bearing capacity which also increases their effective bending strength.

5.6.3 The letter stated in conclusion that:

- Based on a site inspection on 12 December 2012 there is no compelling evidence that significant soil creep is occurring along the slopes below Moreere Street sufficient to affect the pole foundations supporting the houses.
- Calculations using conservative parameters indicate that the 300mm timber poles can carry in bending the creep load ...
- A qualitative assessment and indicative calculations indicate that the site soils at depth have sufficient capacity to carry the possible creep loads ...

5.6.4 The expert reviewed the documentation provided by Consultants B and concluded in an email to the Ministry dated 13 December 2013, that he was satisfied the foundation design has allowed for soil creep and lateral movement. The expert also noted that his understanding that retaining walls were required to stabilize the cuts beneath Lots 18 and 19.

5.6.5 The additional information and the expert's opinion were forwarded to the parties on 29 January 2013. On 21 March 2013 Consultants B provided the results of a further review undertaken of calculations and assessment of the likely soil properties and the performance of the pole foundations. The review concluded that 'the foundations as constructed have adequate capacity to cope with any lateral loads caused by soil creep (if it is actually occurring).' This information was forwarded to the parties on 2 April 2013.

5.6.6 The authority responded to the Ministry by email on 3 April 2013 noting that it does not have geotechnical expertise so it would not comment on the findings or conclusions reached. It noted that it stood by its original decision in respect of section 36 of the former Act.

5.6.7 The applicant emailed the Ministry on 4 April 2013 disputing the authority's view, and reiterating the expert opinions previously provided to the authority.

## **6. The draft determination and responses**

6.1 On 8 November 2012 a draft determination was issued to the parties for comment. The draft concluded that the land is not subject to, nor is likely to be subject to, future subsidence and/or slippage in terms of section 71(1)(a), and therefore the authority was incorrect to issue the building consents subject to section 36(2) or 73(1) notices for the lots contained in the subdivision. The determination also noted that the onus was on the applicant to satisfy the authority that the foundations have been designed to allow for soil-creep and lateral movement, and that the cuts beneath the houses on Lots 18 and 19 met the requirements of the Building Code.

6.2 The applicant provided a submission to the draft by email on 16 November 2012, requesting that the determination be expanded to consider the matter of design for allowing for soil-creep and lateral movement as the applicant considered that based on the history of the dispute between the parties this would remain unresolved.

6.3 The authority responded to the draft in a letter dated 22 November 2012 submitting that it maintained the view that in 2000 it correctly issued the consents subject to section 36(2) and disagreeing with the findings of the draft determination. The authority made the following comments (in summary):

- Based on the information available at the time of the authority's decision the authority was correct in considering that there was a risk of land subsidence or slippage and the determination should acknowledge that the original decision was correctly made on that basis.

- That decision was also recently reviewed by the authority and a consultant; the conclusion reached was that the decision was correct.
  - The authority disagreed with the statement that it did not apply the appropriate test ‘in that it required complete certainty’. At the time (between 2000 and 2002) there was a lack of evidence to show that slippage or subsidence would not occur, and the peer review completed in 2003 did not provide sufficient evidence to remove the section 36 notices.
- 6.4 The authority also considered that whether subsidence is major or minor the ‘Act provides little flexibility in this regard’ and that “minor” subsidence would still be considered a hazard under section 71(3) of the Act, and the authority obligated to follow section 71 and ‘issue notices if required’.
- 6.5 The authority also sought confirmation of the Ministry’s view as to the cuts beneath Lots 18 and 19, the possibility of slippage and the impact on the house foundations.
- 6.6 On 12 December 2012 the applicant provided a further submission on the draft and in response to the authority’s submission of 22 November 2012, commenting that (in summary):
- The decision to issue the building consents subject to section 36(2) notices was not justified at the time of the decision and that given the history of fill on the site the authority needed only to request geotechnical tests and engineered designs.
  - The opinion ‘of all the experts was that there was no risk to the land or the houses and that section 36 notices were not appropriate’.
  - The test under the former Act is “likely”; the authority’s correspondence in January 2012 (refer paragraph 4.4) applies a different test when it refers to the consultants’ reports confirming the slip is “highly unlikely” but uses this as justification not to remove the section 36 notices.
  - The basis of the authority’s decision to impose the section 36 notices was unclear, as it appeared that the authority ‘ignored the legislation and expert advice’.

## **7. Discussion**

### **7.1 General**

- 7.1.1 In considering the authority’s decisions to issue building consents for the houses subject to section 36(2) notifications, I must follow the process described in the Act before I can reach any final decision. This is illustrated in the decision tree set out in Figure 1 of Appendix B.
- 7.1.2 I note that the wording of both section 36(2) of the former Act and section 71(1) of the current Act, with minor exceptions, convey the same meaning. In addition, section 434 of the current Act requires such notices to be applied as if they had been made under that Act. Accordingly, I have therefore addressed this matter in terms of the provisions of the current Act.

### **7.2 Are the houses code compliant?**

- 7.2.1 Before sections 71, 72, and 73 can be considered, I must first establish whether the houses are code compliant assuming that they are not constructed on land not subject to a natural hazard; in this case subsidence or slippage.

- 7.2.2 In his initial report, the expert recommended that confirmation is sought in respect of:
- provision for any soil-creep and lateral movement in the design of the house piles
  - the slope re-grading and formation of compacted toe fill buttresses has been implemented as recommended by the consultants, with particular emphasis on Lot 6
  - whether any remedial work is required in relation to the cuts beneath the houses on Lots 18 and 19.
- 7.2.3 In later advice, the expert assumed that the consultants engaged on behalf of the applicant would have ensured that the house foundations would meet their design and construction requirements. The expert was also of the opinion that the cuts at Lots 18 and 19 were not critical to this determination. However, he had not received sufficient information or documentation that showed the piles for the lots in question had been designed for soil creep or lateral movement.
- 7.2.4 Further information was sought from the consultants and the expert concurred with the conclusion that the foundation design where required has allowed for soil creep and lateral movement. I accept the expert's view in this matter, noting that the compliance is by way of an alternative solution rather than B1/VM4, and I consider that the house foundations as presently constructed comply with the requirements of the Building Code.

### **7.3 Is the subdivision subject to a natural hazard?**

- 7.3.1 In order to consider whether the authority correctly exercised its powers when it imposed section 36(2) notifications on the subject building consents, I have considered whether, in terms of section 71(1)(a), the land on which the buildings have been constructed is subject (or is likely to be subject) to subsidence or slippage and whether, in terms of section 71(1)(b), the building work is likely to accelerate, worsen, or result in a natural hazard on that land or any other property .
- 7.3.2 I note that the word "likely" occurs in both sections 71(1)(a) and (b). I discussed the term "likely" in the context of section 121 in Determination 2008/82. I accepted that previous decisions of the Courts were good law in respect of the word "likely" in section 71, which was interpreted to mean that there had to be a reasonable probability or consequence that something could happen. I also accept that this interpretation can be applied to the current situation.
- 7.3.3 Section 71(1)(a) relates to the land on which the subdivision is situated. As set out in paragraph 5.3.6, the expert is of the opinion that the land is not likely to be subject to future subsidence, and that the buildings have been protected from subsidence. Where subsidence has occurred it is minor and cannot be considered a hazard (refer also paragraph 7.3.5). The expert is also of the opinion that the land in question is not likely to be subject to slippage although this was subject to the expert's confirmation of the parameters used for the foundation design. Although possible soil creep was observed on site, this was not unexpected and had no relevance to the presence of the fill.
- 7.3.4 I also note that in its correspondence with the applicant and the Ministry, the authority has stated that the consultants' reports did not confirm that a slip would not take place, only that it was "highly unlikely". Accordingly, the authority is of the opinion that it was justified in applying the section 36 notices. In view of the

opinions that I have expressed above, I consider that the authority did not apply the appropriate test as to the occurrence of future land slippage, in that it required a level of evidence that would be akin to “certainty” that I consider was above and beyond that required by the application of the “likely” test (refer section 71(1)(a)) which I consider is the appropriate test in this case.

- 7.3.5 In respect of the authority’s view that “minor” subsidence would still be considered a hazard under section 71(3) of the Act (refer paragraph 6.4) and require the authority issue a notice under section 73, I respond as follows.
- 7.3.6 Section 7 provides that the term ‘natural hazard’ has the meaning given to it by section 71. Section 71(3)(a) to (c) defines a natural hazard by the event occurring but does not give an indication of the extent of that event. However, section 71(2) presumes that for section 71 to apply the natural hazard will have a more than minimal effect. For example, section 71(2)(a) presents the natural hazard as one that will affect the land, building work or other property in such a way that measures will be required to protect the land, building work or other property from the natural hazard.
- 7.3.7 Similarly, section 71(2)(b) presumes that the damage to the land or other property as a result of the way the building work affects the natural hazard will require the damage to the land or other property to be restored. I hold the view therefore that in the case of minor subsidence that has no potential for affecting the land, building work or other property in such a way as to require protection, nor the potential for causing damage that will need to be restored, the minor subsidence cannot be said to be a natural hazard for the purposes of section 71.
- 7.3.8 In conclusion I consider that the subdivision as a whole is not subject to a section 71(3) hazard.

#### **7.4 Has the building work resulted in a hazard?**

- 7.4.1 I now have to decide whether the requirements of section 71(1)(b) apply in this instance. This provision considers whether the building work is likely to accelerate, worsen, or result in a natural hazard on that land, or any other property.
- 7.4.2 In approaching this requirement, I must first consider the requirements of section 18 of the Act. This states that building work is not required to achieve performance criteria additional to, or more restrictive than, the Building Code.
- 7.4.3 In Determination 2007/110, which considered a house constructed on land subject to coastal hazards, I confirmed this interpretation when I took the view that:
- ...compliance with the Building Code must be accepted as being “adequate provision” to protect the building work (and also protect other property where that is the objective of the clause concerned).
- 7.4.4 I consider that this interpretation is also valid in the present case. As I have concluded that the houses meet the requirements of the Building Code, then the provisions of section 71(1)(b) are also satisfied.

#### **7.5 Conclusions**

- 7.5.1 Taking into account the above observations, I am of the opinion that the land in question is not subject to, nor is likely to be subject to, future subsidence and/or slippage in terms of section 71(1)(a). Accordingly, I find that the authority was incorrect to issue the building consents subject to section 36(2) or 73(1) notices for the lots contained in the subdivision.

7.5.2 I am satisfied that the foundations to the houses have been designed to allow for soil-creep and lateral movement, and that compliance has been achieved in this respect.

7.5.3 I accept the expert's view that work is required to the cuts to Lots 18 and 19. However, it is noted that the compliance of the cuts to lots 18 and 19 has no bearing on the decision made herein with respect to sections 71 and 73.

## **8. The Decision**

8.1 In accordance with section 188 of the Building Act 2004, I determine that in terms of sections 71(1)(a) and 71(3), the land on which the properties are situated is not subject nor is not likely to be subject to subsidence or slippage, and accordingly the decision of the authority to issue the building consents subject to section 36(2) or 73(1) notification requiring an entry on the certificate of title on 19 properties is reversed.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 3 May 2013.

John Gardiner  
**Manager Determinations and Assurance**

## APPENDIX A – The legislation

A.1 The relevant sections of the Act are:

### 71 Building on land subject to natural hazards

- (1) A building consent authority must refuse to grant a building consent for construction of a building, or major alterations to a building, if –
  - (a) the land on which the building work is to be carried out is subject or is likely to be subject to 1 or more natural hazards: or
  - (b) the building work is likely to accelerate, worsen or result in a natural hazard on that land or any other property.
- (2) Subsection (1) does not apply if the building consent authority is satisfied that adequate provision has been or will be made to –
  - (a) protect the land, building work, or other property referred to in that subsection from the natural hazard or hazards; or
  - (b) restore any damage to that land or other property as a result of the building work.
- (3) In this section and sections 72 to 74, natural hazard means any of the following:
  - (c) subsidence:
  - (e) slippage.

### 72 Building consent for building on land subject to natural hazards must be granted in certain cases

Despite section 71, a building consent authority must grant a building consent if the building consent authority considers that-

- (a) the building work to which an application for a building consent relates will not accelerate, worsen, or result in a natural hazard on the land on which the building work is to be carried out or any other property; and
- (b) the land is subject or is likely to be subject to 1 or more natural hazards: and
- (c) it is reasonable to grant a waiver or modification of the building code in respect to the natural hazard concerned.

### 73 Conditions on building consents granted under section 72

- (1) A building consent authority that grants a building consent under section 72 must include, as a condition of the consent, that the building consent authority will, on issuing the consent, notify the consent to,—
  - (c) . . . the Registrar-General of Land.

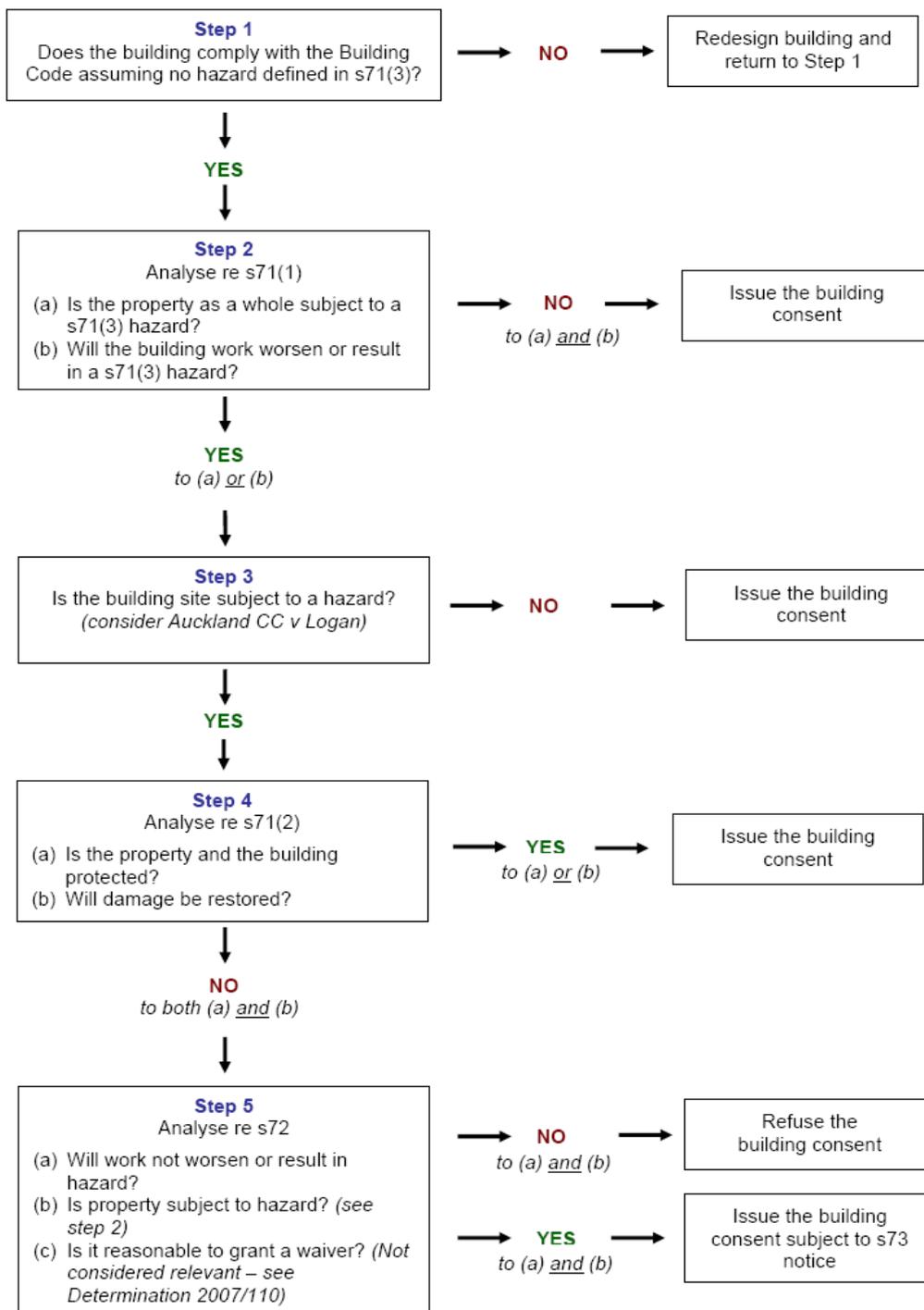
[I note that section 73(1) of the Act has in effect as Section 36(2) of the former Act]

### 434 Transitional provision for certain entries on certificates of title made under former Act

- (1) This section applies to any of the following entries that is made before the commencement of this section:
  - (a) an entry on a certificate of title under section 36(2) of the former Act; and
  - (b) an entry in the records of the Surveyor-General or the Maori Land Court under section 36(7) of the former Act; and
  - (c) an entry under section 641A of the Local Government Act 1974.
- (2) On and from the commencement of this section, an entry to which this section applies must be treated as if it had been made under this Act and the provisions of this Act apply accordingly with all necessary modifications.

## APPENDIX B – Building sites subject to hazards

### Building Sites Subject to Hazards – Decision Tree



**Figure 1: Building sites subject to hazards – the decision process described in the Building Act 2004**