



## Determination 2019/029

# Regarding the compliance of a retaining wall and associated sitework at 18 Reeves Road, Pakuranga with Building Code Clause B1 Structure and whether a notice to fix should have been issued



**Figure 1: view of the retaining wall looking west (image taken early 2018 by the applicant's surveyor)**

### Summary

This determination is concerned with the compliance of a timber retaining wall with Building Code Clause B1 Structure. The determination considers whether the wall once completed will comply with Building Code Clause B1 Structure, and whether the authority was correct not to issue a notice to fix in relation to the retaining wall.

## 1. The matters to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004<sup>1</sup> (“the Act”) made under due authorisation by me, Katie Gordon, Manager Determinations, Ministry of Business, Innovation and Employment (“the Ministry”), for and on behalf of the Chief Executive of the Ministry.
- 1.2 The parties to this determination are:
  - S Ormond, owner of the neighbouring property at Flat 2/17B Ayr Road and who applied for this determination (“the applicant”)
  - J Gu, owner of the property at 18 Reeves Road, Pakuranga (“the owner”)
  - Auckland Council carrying out its duties as a territorial authority or building consent authority (“the authority”).

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

- 1.3 The determination arises from the applicant's concerns about excavations carried out by the owner close to their shared boundary and the retaining wall being constructed there. The applicant is concerned that this wall is closer to the boundary than shown on the plans approved for building consent, was not designed to cope with the additional loading, and is not high enough to support her land. She also considers the authority should have issued a notice to fix<sup>2</sup> for this building work.
- 1.4 Accordingly, the matters to be determined<sup>3</sup> are:
- whether the retaining wall on the owner's property, when completed, and associated sitework comply with the requirements of Building Code Clause B1 Structure<sup>4</sup> with respect to the protection of other property, and
  - whether the authority was correct not to issue a notice to fix in regard to this.
- 1.5 In making my decision I have considered the parties' submissions, the report from the independent expert ("the expert"), I engaged and who is a chartered professional engineer with specialist expertise in civil and structural engineering, and the other evidence in this matter.
- 1.6 The applicant has also asked me to consider the retaining wall's compliance with Clause F4 Safety from falling. However, as this wall is located on the owner's property and not her own, I can only determine matters that relate to Building Code provisions with the purpose of protecting other property<sup>5</sup>. Clause F4 is not one of these.
- 1.7 The applicant has also raised other issues, including criteria for walls on property boundaries, which relate to local planning and/or resource management requirements. However, these are outside the matters I can determine under the Act.

## 2. The building work

- 2.1 The owner's section at 18 Reeves Road, Pakuranga, Auckland is downslope from the applicant's property at Flat 2/17B Ayr Road. Their common boundary ("the shared boundary") north of the owner's section is about 17m across.
- 2.2 In mid-2015 the owner carried out excavations on his property to create building platforms for a new house. The excavations included a 1.6-1.9m near-vertical soil cut broadly parallel to, and about 1.5m from, the shared boundary.
- 2.3 This soil cut is supported by a timber pole retaining wall comprising 250mm SED (small end diameter) poles in 400mm diameter concrete footings at an average of 1m centres, and with 150x50mm horizontal whalers between the poles. When the expert visited on 26 February 2019 the retained height was 1.95m at the wall's western end, dropping to 1.5m at the eastern end (refer Figure 2 below).
- 2.4 Beyond the retaining wall, and converging on the shared boundary is a row of hedging trees. The trees are 1-2m apart and have been trimmed back to about 1.5m high.

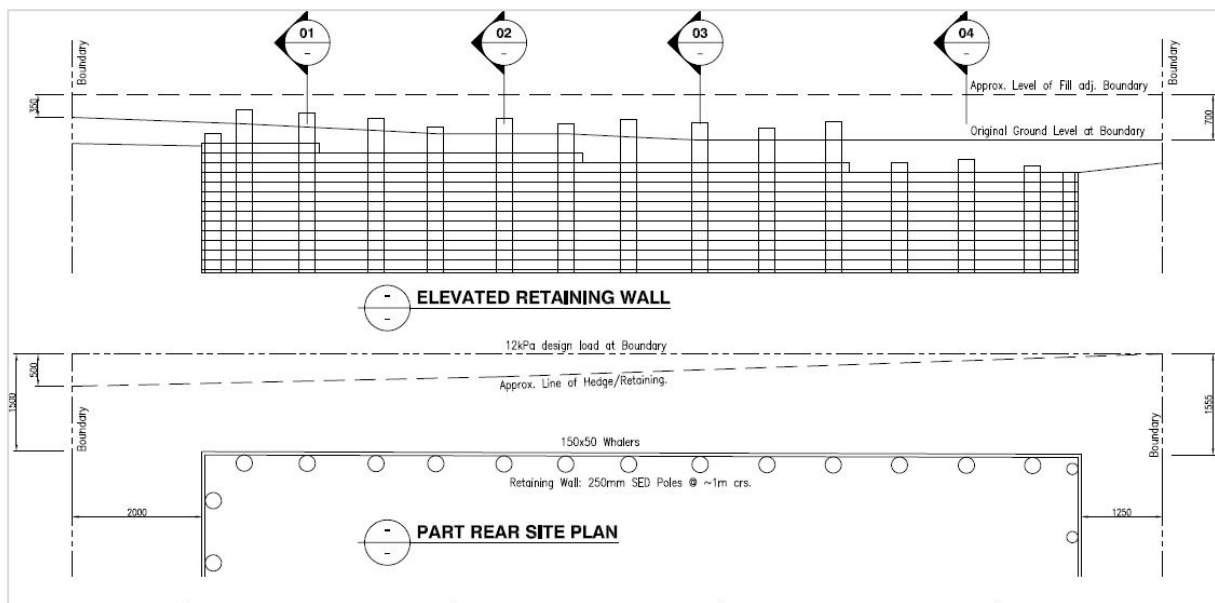
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<sup>2</sup> Under section 164 of the Act

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

<sup>4</sup> References to clauses in this determination are to clauses of the Building Code and to sections are to sections of the Act, unless otherwise specified

<sup>5</sup> Under section 176(e)(i) of the Act



**Figure 2: Retaining wall and partial site plan (from the expert's report)**

- 2.5 The applicant's flat at 17B Ayr Road is about 4m north of the shared boundary. It was built in 1985 and she bought it in 2003. Some years before this purchase a previous owner or developer put corrugated iron and plastic sheeting against the hedging trees (on the applicant's side) and added fill behind these sheets to level the back yard. The current depth of this fill at the shared boundary varies from about 350-700mm (west to east), according to the expert.
- 2.6 The photograph in Figure 1 (at the start of this determination), which was taken in early 2018, looks west along the shared boundary and shows the top of the retaining wall, the row of hedging trees, and the plastic and iron sheeting against these. When the expert visited in February 2019 the retaining wall appeared to be in a similar state with the timber poles untrimmed and safety barrier shown on the consented plans yet to be installed.

### 3. Background

- 3.1 The authority granted building consent (#20143279) to the owner on 10 February 2015 to remove the existing house on his property and build a new dwelling. The approved plans and specifications show that this included construction of a retaining wall of 2.3-2.4m in height on the shared boundary.
- 3.2 On 9 March 2015 the authority granted an amendment to the consent (#20143279A1) to change the position of the retaining wall. The plans approved for this amendment show a retaining wall 1.7-1.8m high and set back 2m from the shared boundary. The plans are also annotated "Barrier required".
- 3.3 In mid-2015 the owner began excavating his site and made the soil cut described in paragraph 2.2. However, while this cut was still un-retained, the soil collapsed along 4m of its length.
- 3.4 The authority learned of the soil collapse on 3 August 2015 and engaged geotechnical engineers ("the authority's engineers"), who carried out an "Emergency geotechnical inspection for unsupported excavation" later that day. They sent a report to the authority on 7 August 2015 which noted that the effect of the owner's

excavation on the applicant's property was not part of their brief and that there were no visible signs of movement within her property.

3.5 The authority's engineers described the excavation and soil collapse, which they said did not extend as far as the shared boundary. They reported that there were timber poles along most of the soil cut (180mm SED at about 1m centres with hand-dug piles) and extending 1.5-1.7m high, but that the owner could not supply relevant design calculations or drawings for these. The engineers also noted the surcharge to the wall from the uphill slope and said that, in their view, the wall being constructed did not appear to have enough capacity to provide a sufficient factor of safety to meet the requirements of the Building Code and the New Zealand loadings code NZS 1170<sup>6</sup>.

3.6 The authority's engineers recommended:

- the owner take interim measures to prevent further soil collapse (including putting lagging against the poles and a hardfill buttress)
- a suitably experienced Chartered Professional Engineer provide an appropriate retaining wall design.

3.7 On 20 November 2015 the authority granted Amendment 2 to the consent (#20143279A2) for: "Changes to timber pole wall at rear of site, increase height to 2m & move towards the dwelling". The approved plans and calculations for this retaining wall ("the amended design") show the retained height up to 1.8m (although references in the documentation mention a wall height of 2m) and allowance for a 12kPa<sup>7</sup> surcharge. The plans showed the wall 2m from the shared boundary and included a 1m high safety barrier to be installed at the top of the completed wall.

3.8 A summary of subsequent events follows (also refer the applicant's submissions in paragraph 4.1):

Date	Event
Feb 2016	Applicant says the new retaining wall is constructed.
17 Jun 2016	Authority and authority's engineers inspect the applicant's property.
4 Aug 2016	<p><b>Authority's engineers – follow-up report</b>            Authority's engineers follow up their August 2015 inspection. Their report says:</p> <ul style="list-style-type: none"> <li>• the collapsed zone has been temporarily stabilised with a hardfill buttress, and a retaining wall constructed which provides the current permanent retention</li> <li>• this new wall is high enough to retain the owner's property up to the existing ground level at the boundary</li> <li>• it is unlikely that the owner's excavation caused significant settlement or damage to the applicant's property or would cause future significant settlement.</li> </ul> <p>They also recommend that the authority review the owner's property file to check the retaining wall design considered the surcharging effect of the slope above it and surcharge from the existing fill on the boundary and within the applicant's property.</p>
7 Feb 2018	<p><b>Applicant's survey plan</b>            Applicant engages surveyor to confirm location of shared boundary: he supplies survey plan (refer Figure 2 for detail) and associated photos.</p>

<sup>6</sup> Australian Standard/ New Zealand Standard AS/NZS 1170 Structural design actions

<sup>7</sup> The kilopascal (kPa) is a unit of pressure measurement.

Date	Event
8 Mar 2018	Authority's principal building surveyor emails applicant's lawyer after visiting the site, concludes: <ul style="list-style-type: none"> <li>• the raised material near the shared boundary is fill put there some time ago, not natural ground</li> <li>• the authority contends the applicant is responsible for maintaining the integrity of the fill on her land, not the owner</li> <li>• there is no indication the excavation is causing any erosion of the natural ground level at her property</li> </ul>
16 Mar 2018	Applicant's lawyer emails authority to dispute this, refers to the authority's guidance regarding retaining walls on a boundary.
19 Mar 2018	Authority's surveyor replies that the ground level at the shared boundary has not been disturbed by the new retaining wall. Also says the natural ground level is only slightly higher than the new retaining wall "and that ground level is being supported well enough by the retaining wall".
25 Mar 2018	Applicant emails authority disagreeing with this view and her ability to support the fill as the trees are on the owner's land, says she has not agreed to any barrier over the boundary on her property
11 Jun 2018	<p><b>Applicant's geotechnical report</b></p> <p>Applicant engages geotechnical engineers who report:</p> <ul style="list-style-type: none"> <li>• subsidence in applicant's rear yard has not worsened in the last 22 months (based on photographs taken by the authority's engineers) and has probably arrested now because the hedge has been reduced</li> <li>• this subsidence probably historic (pre-2015) and unlikely to have solely resulted from excavation at the owner's property</li> <li>• at their site visit on 10 May 2018 the owner's retaining wall was only installed to about 1.6m high whereas the consented plans were to 1.8m – they recommended that it be completed to this height and backfilled to support the cut (with the designer first checking the fill batter did not compromise the stability or exceed surcharge loads (of 12kPa) onto the retaining wall).</li> </ul> <p>Applicant sends copy of this report to the authority.</p>

3.9 On 5 July 2018 the Ministry received an application for a determination.

## 4. Submissions

### 4.1 The applicant

4.1.1 The applicant sent copies of the following with her application and subsequently:

- the survey plan/report and geotechnical report prepared for her, photographs and a sketch of the boundary area, and the two reports by the authority's engineers
- extracts from the plans approved for building consent Amendments 1 and 2, the retaining wall design and associated calculations approved 20 November 2015 (Amendment 2), and other information from the authority's file for the owner's property including a "Field Card Building Consent #20143279A2" 18 August 2015 and memorandum 31 August 2015 between the owner and applicant (in which the owner agreed to fix/build a retaining wall and fence "on the boundary" and keep the hedging trees)

- an extract from authority guidance document AC 2231 re designing retaining walls on or near boundaries
  - correspondence with the authority and the owner 19-24 July 2015, 18 July 2017 and 27 February - 25 March 2018; and between the owner, his engineers and designers 28 September - 17 November 2015 regarding the amended design.
- 4.1.2 The applicant explained her concerns that the owner’s retaining wall did not support her section, which she said was half a metre higher than the top of the current retaining wall. She also questioned the authority’s refusal to issue a notice to fix for the wall’s construction.
- 4.1.3 The applicant said the owner had excavated earth in June 2015 “at the boundary” back to the trees and the authority’s compliance officer had advised him not to remove these trees, but he had taken more soil from around them. She considered the retaining wall should have been built high enough to support the top of the boundary from 2015 but this had not happened. While the authority had advised her lawyer this was not necessary as it was only fill, she said “surely whatever is on the boundary ought to be supported so is this relevant?”
- 4.1.4 The applicant said she had advised the authority of her concerns, met with them and made an official complaint but the retaining wall height had still not increased. She said the authority’s general manager wanted to review the situation and suggested a further geotechnical report but she was not willing to do this and had not received a response to her own geotechnical report, so decided to apply for a determination.
- I am being told to support it from my side of the boundary by [the authority] but firstly am questioning the rules about this according to the building code. I also cannot see how it can be done from my side of the boundary as there is no room to work from.
- 4.1.5 The applicant also sent a number of emails to the Ministry 12 July 2018 - 27 March 2019. Points made included:
- The applicant did not consider the current retaining wall was high enough to support the “top part of the boundary, which includes my land”. She now considered the boundary height was about 2.4m above the top of the wall, saying there was about a metre of earth held up by mostly dead tree stumps and the corrugated iron/plastic sheeting. She had been advised by a geotechnical engineer that anything there, including fill, ought to be supported, and she wanted the originally consented retaining wall, which was designed to 2.4m high, to be installed.
  - Her surveyor had established that the retaining wall had been built 1.5m from the shared boundary, which was not in accordance with the consented plans (which show the wall 2m away). She said because the ground sloped up to the boundary, it was higher where the retaining wall was now sited and the wall might not be able to cope with the increased load.
  - She had not agreed to share part of her section with the owner, had never agreed to the erection of a retaining wall or barrier on her land, and had been unaware of the amended design approved in November 2015. Regarding this design she said the authority’s file notes suggested a maximum height of 2m but this was incorrect. The builder had installed a wall at 1.5m high so didn’t meet these obligations.

- She thought the wall was unfinished and still had some horizontal timbers (whaling) to be installed – she was concerned that now the owner’s new house was being built this would restrict access. She also thought the new house was closer to the boundary than shown on the consented plans.

4.1.6 On 27 March 2019 the applicant responded to the expert’s report (paragraph 5) and said:

- The expert had advised that the owner did not have to support fill at the boundary, but she had been told earlier by a geotechnical engineer that anything there had to be supported. Her surveyor’s plan also showed the material between the trees was on the owner’s property and she would be trespassing to get there.
- The expert had said there was 800mm of unsupported earth above the retaining wall and that plants would hold it, but she disagreed. She did not believe the Building Code supported his conclusion that she would need to support this from her side of the boundary.
- She understood the original retaining wall was to be placed against the boundary to a height of 2.4m and this was later changed to leave the trees and earth in front of them for safety, so the wall was moved back to 2m from the boundary and reduced to 1.8m height. However, the owner had excavated to the boundary by removing earth in front of and around the trees and had also killed off a number of trees, which is why the wall was not high enough.

## 4.2 The authority

4.2.1 The authority acknowledged the application for determination on 17 August 2018 and later provided:

- photographs and the survey plan from the applicant’s surveyor
- an extract from the plans approved for building consent Amendment 1 on 9 March 2015
- a building file for the owner’s property containing information regarding the owner’s building consent and amendments (including plans and specifications).

4.2.2 The authority also commented on 1 October 2018:

... a key issue here is that the applicant or the applicant’s predecessors in title have introduced fill to level part of their property. [The authority’s] view is that if retaining is required it is the responsibility of the applicant to retain the fill, and not that of neighbouring property owners.

4.2.3 The authority responded to Ministry queries during the determination process regarding the current status of the retaining wall, relevant plans and consent amendments, as follows:

- 18 September 2018 re the retaining wall under construction in August 2015 (refer paragraphs 3.4 to 3.6) and whether this had been removed, strengthened or remained in place – “this was designed appropriately but the owner did not place enough whalers on which left the bank at risk of collapse. The owner was required to complete the whalers and backfill to the design height, which is as is now”.

- 18 September 2018 re the status of the wall design dated 16 November 2015, as a PS1 (design producer statement) of that date was annotated “not accepted”, and what design was consented for the current wall – “the wall has been built in accordance with the building consent”.
- 8 November 2018 re when the wall height was increased and whether a safety barrier had been erected – the authority sent the approved plans for consent Amendment 1 saying these were for the retaining wall that had been built. The authority said the wall was 2m from the shared boundary and, as far as it could ascertain, the excavation was only carried out for this retaining wall; not the wall in the original plans, which was right on the boundary. The authority said the owner was required to finish placing whalers to the current height and backfilling, and this had been done. It said the safety barrier shown on the consented plans would need to be constructed before final inspection and issue of a code compliance certificate.
- 6 December 2018 re the applicant’s information showing the wall had been built 1.5m not 2m from the shared boundary as shown on the consented plans, and her view that it was not in accordance with the building consent and would not comply with the Building Code as the ground was higher than it was designed for – the authority said the siting of the retaining wall in this case made no difference to its design and construction, and in its view the wall would be compliant once the safety barrier was installed.

If the location of the wall differs marginally (in relative terms) from the consented location then [the authority] is of the view that issue can be dealt with if need be by means of as-built plans showing the actual location.

4.2.4 The draft determination was issued to the parties for comment on 6 May 2019.

4.2.5 The applicant and the authority responded on 15 May 2019, and the owner on 17 May 2019, all three parties accepting the findings of the draft with no comments.

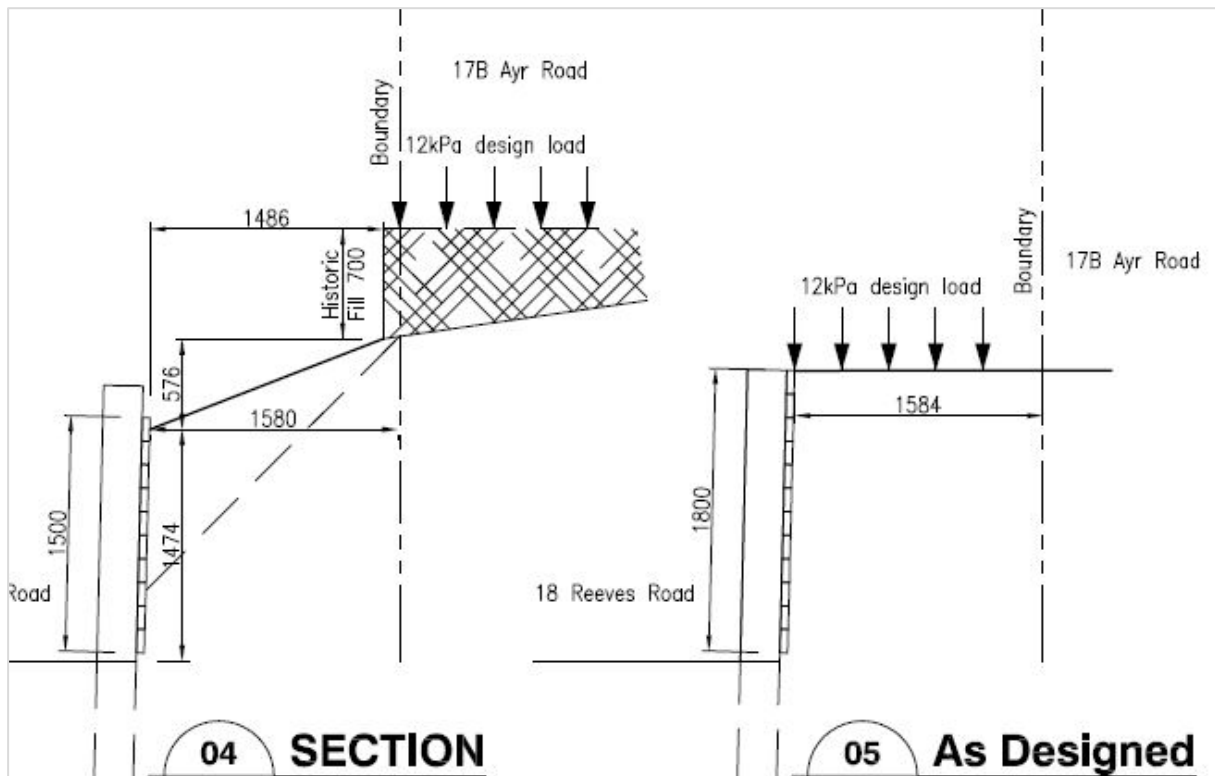
## **5. Expert’s report**

5.1 On 11 February 2019 I engaged the expert described in paragraph 1.5 to assess the retaining wall as designed and as built with respect to Clause B1, noting the applicant’s concern that its changed location might affect the loadings. I also gave him copies of information provided by the parties.

5.2 The expert visited the owner’s and applicant’s properties on 26 February 2019. He provided his final report on 19 March 2019 and I sent this to the parties for comment on 20 March 2019.

5.3 The expert’s report included a part site plan drawing. Figure 2 (refer page 3) shows a detail of this drawing and Figure 3 shows another, being one of the cross-sections (at the wall’s eastern end) and the expert’s sketch of the amended design to illustrate where the 12kPA load was applied.





**Figure 3: Sketches showing cross section of retaining wall at eastern end. On left, as built; on the right, as designed (from the expert's report)**

- 5.4 The expert said the retaining wall was in place but not completed when he visited, as its “agreed” full height had not been finalised. He said the safety barrier still had to be added and the timber poles were still untrimmed, so there was some provision to increase the retained height. He also said the upper part of the cut face that was still exposed above the retaining wall did not show any obvious signs of lateral ground movement.
- 5.5 The expert agreed with the conclusions of both reports by the authority’s engineers and the applicant’s geotechnical report, and found that settlement on the applicant’s property was historic and not caused by the owner’s excavation.
- 5.6 The expert said he had “no issues” with the amended design and added:
- The retaining wall’s proximity to the shared boundary (ie 1.5m instead of 2m away) was not an issue as the amended design took this into account.
  - This design was conservative as the designers had applied the 12kPa surcharge immediately behind the wall instead of at the shared boundary, and the loading imposed by non-engineered fill on the applicant’s property was no greater than this surcharge.
  - The amended design and drawings showed a maximum height of 1.8m but the associated documentation referred to 2m. The as-built wall exceeded 1.8m at its western end but this was not a concern, as corners were self-propping.
- 5.7 In the expert’s view the retaining wall should be completed by adding whalers behind the over-height poles, and then backfilled so the original boundary ground level (the ground surrounding the base of the tree trunks) was satisfactorily

supported, in accordance with the amended design. The expert also commented that the poles should be trimmed on a 15 degree angle and their ends treated, which I note is not specified in the consent documents but is in accordance with industry practice.

5.8 The expert concluded:

We are satisfied that the completed timber pole retaining wall as specified above will comply with Clauses B1 and F4 of the New Zealand Building Code.

5.9 The expert also recommended that the applicant look at other ways to retain the fill on her property – at the very least, planting additional ground cover – while noting that any new retaining would have to be inside her boundary.

## 6. Discussion

### 6.1 Compliance with Clause B1 Structure

6.1.1 The Act and the Building Code both require that any building, including sitework, must be constructed in such a manner as to protect “other property”. This is defined<sup>8</sup> as follows:

Other property means any land or buildings or part thereof which are –

- (a) not held under the same allotment; or
- (b) not held under the same ownership

6.1.2 The objectives of Clause B1 Structure include “to protect other property from physical damage caused by structural failure”. Its performance requirements include:

#### **B1.3.1**

Buildings, building elements and sitework shall have a low probability of rupturing, becoming unstable, losing equilibrium, or collapsing during construction or alteration and throughout their lives.

...

#### **B1.3.6**

Sitework, where necessary, shall be carried out to:

- (a) Provide stability for construction on the site, and
- (b) Avoid the likelihood of damage to other property.

6.1.3 As discussed in previous determinations<sup>9</sup> I consider that “other property” is not limited to the protection of buildings and that the land itself must also be protected from the likelihood of damage. With respect to the “likelihood of damage” I refer to the reasoning in *Auckland CC v Selwyn Mews Ltd*<sup>10</sup>, where the Judge stated:

...In cl B1.3.6 “the likelihood of damage to other property” refers to a real and substantial risk of such damage.

6.1.4 The applicant is concerned about the protection of her property (ie the “other property” in this case) following excavations on the owner’s section near their shared boundary. She questions whether the retaining wall constructed to support these excavations, which included a near-vertical soil cut of 1.6-1.9m, complies with the Building Code. This wall now appears to have been built about 500mm closer to the boundary than shown on the approved plans and she has queried whether it is adequate to cope with the increased loads. She also considers the wall is not high

<sup>8</sup> In Building Code Clause A2 Interpretation

<sup>9</sup> For example, Determination 2015/003: Compliance of a retaining wall between two properties (10 February 2015).

<sup>10</sup> Refer 18/6/03, Judge McElrea, DC Auckland CRN2004067301-19

enough to support her property, which has been raised by fill that is currently held back by iron and plastic sheeting.

- 6.1.5 The authority considers the retaining wall will be compliant once its safety barrier has been installed, and that the wall's siting has made no difference to the design or construction. It also considers it the applicant's responsibility to retain fill on her property.
- 6.1.6 The expert has assessed the retaining wall as designed and built. In his view it will comply with the requirements of Clause B1 when completed and backfilled so it supports the original boundary ground level, as described in paragraph 5.7. The expert also inspected the applicant's property and agreed with the findings of other investigations: that there was no evidence of any settlement that could be attributed to the owner's excavation.
- 6.1.7 As the amended design is conservative – it applies a 12kPa surcharge behind the retaining wall instead of at the boundary – the expert considers the wall's siting closer to the boundary is not a concern. He also considers the loading imposed by fill on the applicant's property is no greater than this 12kPa surcharge.
- 6.1.8 I accept the expert's views on this matter and accordingly I consider that the owner's building work, being the excavations (sitework) and retaining wall, do not present a "real and substantial risk" of damage to other property.
- 6.1.9 Therefore, I conclude that the sitework and retaining wall, when completed as specified, will meet the requirements of Clause B1 for structural stability (which for the retaining wall includes supporting the land behind it) and to avoid the likelihood of damage to other property (ie Clause B1.3.6(b)).
- 6.1.10 I note the applicant's concerns about the fill on her property and that the completed retaining wall will not extend to the top of this. While I appreciate these concerns I agree with the authority that it is the applicant's responsibility to retain this fill on her land, not that of neighbouring property owners.

## **6.2 Notice to fix**

- 6.2.1 As I consider the owner's sitework and the retaining wall, when completed, meet the requirements of Clause B1, I also conclude that the authority was correct not to issue a notice to fix in these circumstances.

## **7. The decision**

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

- the retaining wall on the owner's property, when completed as designed, and associated sitework will comply with the requirements of Building Code Clause B1.3.6(b)
- the authority was correct not to issue a notice to fix in regard to this.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 27 June 2019.

Katie Gordon  
**Manager Determinations**