

Determination 2025/007

Regarding compliance of a masonry block retaining wall with Building Code Clause B1 Structure and the protection of other property

25 Victory Street, Welcome Bay, Tauranga

Summary

This determination considers whether a new retaining wall close to some existing retaining walls and the boundary between two properties complies with the provisions of Building Code Clause B1 *Structure* and the protection of other property.

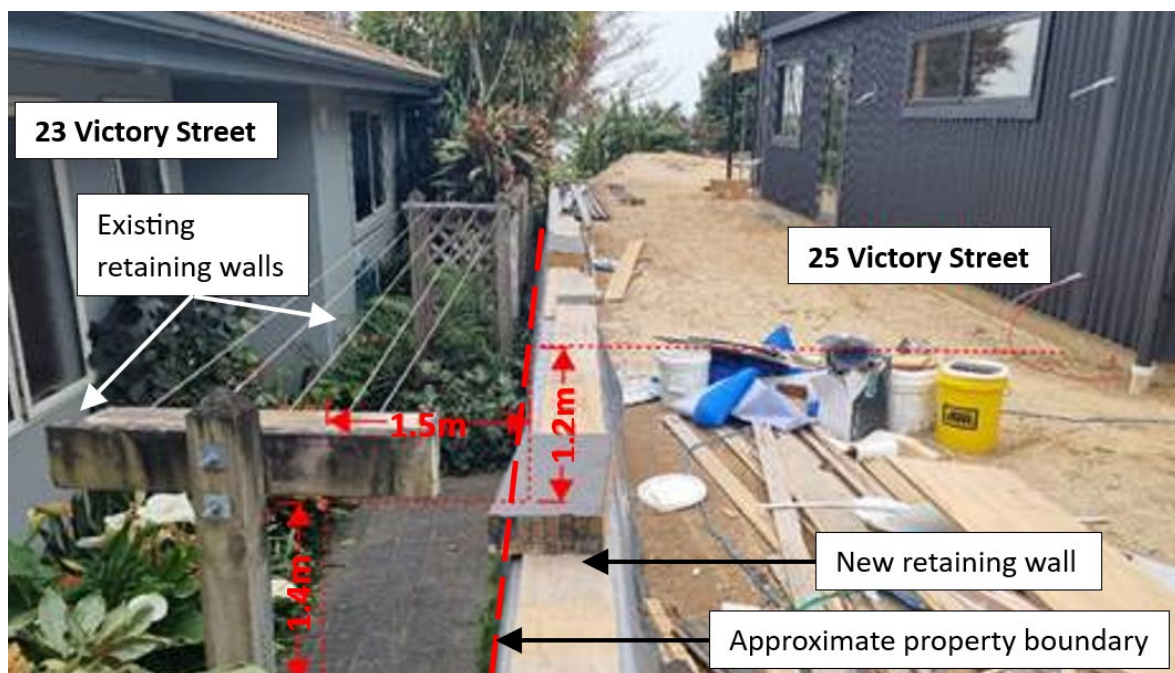


Figure 1: View of both properties looking north-east.

In this determination, unless otherwise stated, references to “sections” are to sections of the Building Act 2004 (“the Act”) and references to “clauses” are to clauses in Schedule 1 (“the Building Code”) of the Building Regulations 1992.

The Act and the Building Code are available at www.legislation.govt.nz. Information about the legislation, as well as past determinations, compliance documents (eg, Acceptable Solutions) and guidance issued by the Ministry, is available at www.building.govt.nz.

1. The matter to be determined

- 1.1. This is a determination made under due authorisation by me, Andrew Eames, Principal Advisor Determinations, for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment (“the Ministry”).¹
- 1.2. The parties to the determination are:
 - 1.2.1. R Braithwaite, the owner of 25 Victory Street (“the owner”), who applied for this determination
 - 1.2.2. G and D Wright, the owners of the neighbouring property at 23 Victory Street (“the neighbours”)
 - 1.2.3. Tauranga City Council, carrying out its duties as a territorial authority or building consent authority (“the authority”).
- 1.3. Kirk Roberts Consulting Engineers Limited (“the engineer”) is a person with an interest in this determination as the firm responsible for designing the new masonry blockwork retaining wall (“**the new retaining wall**”) at the owner’s property.
- 1.4. This determination arises from concerns raised by the authority about the construction of the new retaining wall, whether it complies with Clause B1 *Structure*, and how this may affect the existing masonry blockwork retaining walls on the neighbours’ property (“**the existing retaining walls**”). Refer to figures 1 and 2.
- 1.5. The design for the new retaining wall forms part of the building work detailed in building consent (number BC331205) for the construction of a new two-storey detached dwelling at the owner’s property.² This determination only considers compliance of part of the new retaining wall.³ Refer to figure 2.

¹ The Building Act 2004, section 185(1)(a) provides the Chief Executive of the Ministry with the power to make determinations.

² The matter to be determined does not include the decision by the authority to grant and issue the building consent (dated 6 November 2023), or the authority’s decision to require the owner to apply for an amendment to the consent regarding the new retaining wall.

³ The building consent includes the construction of several different retaining walls associated with the development of the property and the dwelling. This determination only considers the retaining wall annotated as MBRW01 on building consent plan L01 revision 1 dated 17 July 2023.

- 1.6. The matter to be determined, under section 177(1)(a), is the compliance of part of the new retaining wall with Building Code Clause B1 *Structure* (specifically clause B1.3.1), including as it relates to the protection of other property.
- 1.7. In this case, I note the owner has applied for an amendment to the building consent regarding the new retaining wall and several other walls⁴. The amendment to the building consent⁵ was granted by the authority on 18 January 2024. The authority has subsequently confirmed⁶ “The retaining walls...as constructed in accordance with BC331205 Amendment 1, comply with the performance requirements of B1.3.1, do not rely on the neighbouring retaining wall to meet compliance and do not impose a surcharge on the existing retaining walls, associated with 23 Victory [Street]”. Therefore, this determination only considers the construction of the new retaining wall as detailed in the original building consent granted by the authority on 6 November 2023.

Issues outside the determination

- 1.8. The determination does not consider the compliance of all the new retaining wall (MBRW01). The owner refers to a “passive surcharge load upon the neighbour’s existing wall”⁷, and associated email correspondence between the authority and the engineer refers to the existing wall forming the “Neighbouring property basement”.⁸ Therefore, I have only considered the part of the new retaining wall that is directly opposite, and runs parallel to, the neighbours’ existing retaining walls that forms the “basement” to the neighbour’s dwelling. Refer to figure 2.

⁴ The amended building consent refers to the new retaining wall as MBRW01-b. The other walls, annotated as MBRW01-a, MBRW01-c, and MBRW01-d are not related to the application for determination.

⁵ Reference number BC331205.A1.

⁶ In a letter to the Ministry dated 14 October 2024, and follows a similar correspondence on 10 May 2024.

⁷ In a letter to the Ministry dated 20 March 2024.

⁸ The emails dated 16 and 17 November 2023.

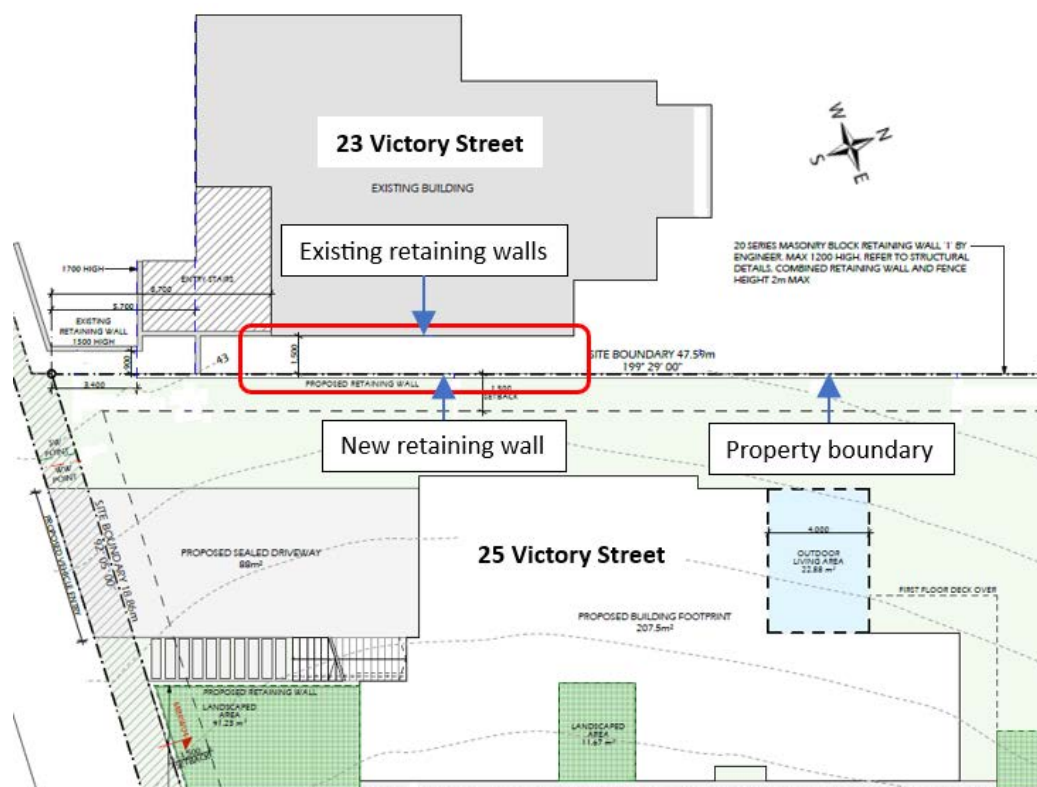


Figure 2: Site plan (not to scale)⁹

2. The building work and background

- 2.1. The owner's new dwelling is east of, and at a higher level than, the neighbours' existing dwelling (refer to figures 1 and 2). Development of the owner's property required cut-and-fill earthworks to form the building platform.

The new retaining wall

- 2.2. The new retaining wall is located close to the west boundary of the owner's property. It retains the fill material from the earthworks to create the building platform for the new dwelling.
- 2.3. The new 1.2m high retaining wall incorporates reinforced 20 series concrete blockwork¹⁰ supported on reinforced concrete foundations. The design was accompanied by a Producer Statement – Design (PS1), plans, a design features report, and structural calculations. The PS1 refers to compliance with clause B1

⁹ Figure 2 has been reproduced from amended building consent plan L01, revision 3, dated 20 December 2023. The area shown in a red coloured outline is the extent of the building work being considered in this determination. I have assumed the outline of the existing building (23 Victory Street) is of the roof; the existing retaining walls below the roof vary in length and vary in horizontal distance relative to the property boundary.

¹⁰ As defined in *New Zealand Standard NZS 4229:2013 "Concrete masonry buildings not requiring specific engineering design"*, section 1.3, "wall"; 20 series equate to a wall 190mm actual thickness.

using Verification Methods B1/VM1 and B1/VM4.¹¹ The design features report states:

It is understood that the proposed [retaining] walls are not surcharged by any adjacent structures, additional fill or another retaining walls nor are they undercut by another retaining wall.

The existing neighbouring retaining walls

- 2.4. The existing retaining walls on the neighbours' property are approximately 13m long (aligned in a south-west to north-east direction) and they vary in height.¹² They are constructed from 190mm-thick reinforced concrete masonry blockwork on reinforced concrete foundations and provide structural support to the upper floor level, external wall, and roof construction above.¹³
- 2.5. The existing retaining walls are staggered ie they vary in horizontal distance from the face of the walls to the property boundary. Two sections of the existing retaining walls are approximately 1.5m horizontally away from the west boundary of 25 Victory Street. The remaining sections of the walls are approximately 1.9m to 2.8m away from the boundary.
- 2.6. The plans provided by the neighbours' indicate the existing retaining walls retain a maximum depth of 1.4m of backfill material and soil.

¹¹ Acceptable Solution B1/AS1 (first edition, amendment 20, effective on 29 November 2021 until 1 November 2023, incorporating B1/VM1 and B1/VM4).

¹² Based on four plans provided by the neighbours, it appears the existing retaining walls to the east side of the dwelling vary between 1m to 1.6m in height.

¹³ Four plans provided by the neighbours indicate there are several different retaining walls associated with the construction of their dwelling. This determination only considers the existing retaining walls along the east side of the dwelling (nearest to the property boundary). The neighbours advise the walls were designed as cantilever walls; however, I have received no structural calculations, specifications, or other supporting documentation that details the design of the wall (other than the four plans provided by the neighbours).

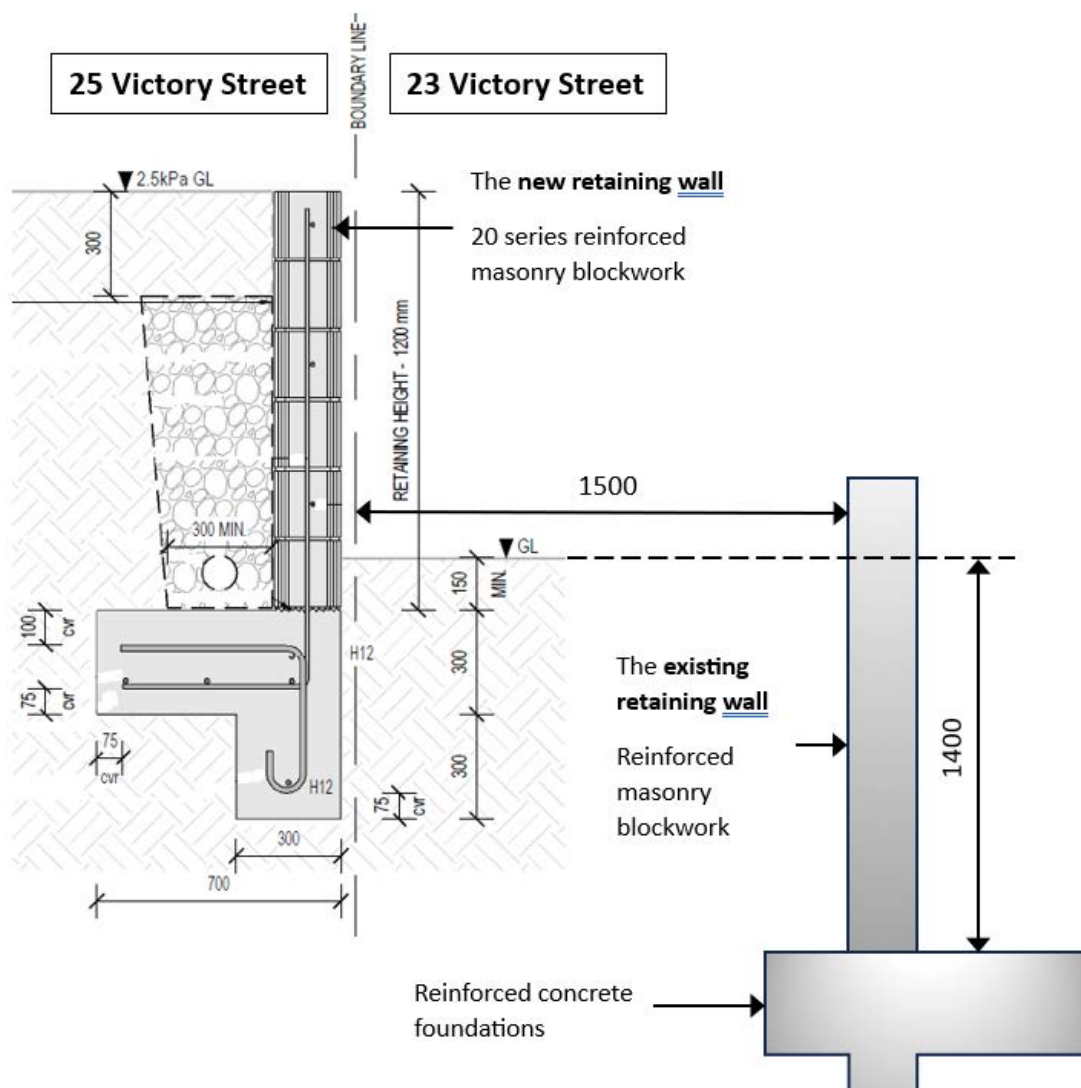


Figure 3: Generic cross-section (not to scale; dimensions are in millimetres)

Building Code compliance concerns

- 2.7. On 15 November 2023, the authority inspected the building work and issued a 'fail[ed]' inspection outcome report. It advised the owner:

A site inspection was undertaken due to concerns [the new retaining wall] was surcharging the neighbour's retaining walls which may not have been considered in the design.¹⁴

¹⁴ The inspection report included a photograph of some existing timber retaining walls but the report itself didn't refer to these walls directly; it is not clear where these timber retaining walls are in relation to the new retaining wall, and these are not referred to in the correspondence between the authority and the engineer on 16 and 17 November 2023. Therefore, the existing timber retaining walls have not been considered in this determination.

Based on a review of the structural design and drawings, no allowance appears to be made to avoid the passive resistance on the new masonry wall applying a surcharge load to the existing neighbour's walls.

...The structural engineer is to demonstrate that the new [retaining] wall will not surcharge the neighbour's retaining wall...

If the [new retaining] wall is found to surcharge the existing neighbour's walls...[an] amendment [to the building consent] will need to be submitted.¹⁵

- 2.8. On 16 and 17 November 2023, the authority and the engineer exchanged emails regarding the apparent surcharge from the new retaining wall onto the existing retaining walls (albeit focused on the "basement" walls located approximately 1.5m west of the property boundary).

3. Submissions

The owner

- 3.1. The owner submits (in summary):

- 3.1.1. The new "retaining wall, as consented, complied with the Building Code requirements, and did not apply a passive surcharge load upon the neighbour's existing wall" and it would not be "damaged".
- 3.1.2. "The depth of the passive pressure in front of the footing key to achieve compliance with the...combination of loads, is confirmed in the analysis at only 55mm depth. At this depth the passive pressure in front of the footing key is sufficient to not surcharge the neighbour's wall..."

The neighbours

- 3.2. The neighbours provided four plans detailing the construction of the existing retaining walls, and confirmed they were designed as cantilevers.

The authority

- 3.3. The authority submits (in summary):

¹⁵ The authority's report also raised an issue with the "toe slope...which may reduce the sliding resistance available". However, it appears the issue is not related to the part of the new retaining wall that is the subject of this determination, so it has not been considered further. The application for determination and associated letter to the Ministry dated 20 March 2024 did not include a reference to issues with the "toe slope".

- 3.3.1. “The gravity component of the [new retaining] wall as detailed does not appear to be the issue, the issue is the horizontal forces” ie the original design for the new retaining wall imposes a surcharge on the neighbours’ existing retaining walls.
- 3.3.2. The original design plans and structural calculations for the new retaining wall do not consider its impact on the existing retaining walls.
- 3.3.3. A building consent amendment was required due to the proposed “change in the design” as a result of “reducing the key depth”. The consequent “changes to the calculations and drawings” need to “demonstrate compliance with the building code”.

The engineer

- 3.4. The engineer submits (in summary):
 - 3.4.1. “[T]he neighbours retaining wall ... wasn’t shown on the [building] consent drawings [but consider it] has been addressed through [the request for further information] process”.¹⁶
 - 3.4.2. The shear “key [height] was shown as a nominal 300mm within the design, known to be conservative, the 55mm was derived by back calculating to determine what the minimum key requirement would be”.¹⁷

4. Discussion

- 4.1. The matter to be determined is the compliance of the new retaining wall at 25 Victory Street with Clause B1 *Structure* (specifically clause B1.3.1), including the protection of other property at 23 Victory Street. As noted above (refer to paragraph 1.7), the new retaining wall has already been constructed based on a revised design in an application to amend the building consent granted in January 2024. The authority has subsequently reached a decision on compliance with clause B1.3.1 and the protection of other property. I am only considering the compliance of the new retaining wall as detailed in the original building consent granted and issued by the authority in November 2023.

¹⁶ I have assumed the engineer was referring to the exchange of emails it had with the authority on 16 and 17 November 2023 (refer to paragraph 2.8).

¹⁷ The reduced shear key height of 55mm was noted by the engineer in its emails to the authority dated 16 and 17 November 2023.

- 4.2. In deciding this matter, I have considered whether the new retaining wall would have relied on the existing retaining walls on other property to achieve compliance with Clause B1, and whether the new retaining wall would have imposed a surcharge on the existing retaining walls in way that requires consideration as to whether there would be a likelihood of physical damage to other property leading to non-compliance with Clause B1.

Legislation

- 4.3. Section 4 of the Act sets the principles to be applied in performing functions or exercising powers, under this Act, including (but not limited to), sub-section 4(2)(j):

The need to provide protection to other property from physical damage resulting from the construction, use, and demolition of a building.

- 4.4. Other property is defined in section 7 of the Act as:

(a) means any land or buildings, or part of any land or buildings, that are –

(i) not held under the same allotment; or

(ii) not held under the same ownership ...

- 4.5. The parties do not dispute the new retaining wall is a building and it must comply with the requirements of section 17.

Clause B1 Structure

- 4.6. The objective of clause B1 *Structure* of the Building Code includes to “protect other property from physical damage caused by structural failure”¹⁸ and buildings shall withstand the combination of loads they are likely to experience during construction or alteration and throughout their lives.¹⁹ Performance criteria for clause B1 include (but are not limited to):

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.

...

¹⁸ Clause B1.1 (c).

¹⁹ Section B1.2.

- 4.7. With respect to the term “low probability” as expressed in clause B1.3.1, I refer to the reasoning in *Auckland City Council v Selwyn Mews Ltd*²⁰ (“*Selwyn Mews*”), where Judge McElrea stated:

[47]...In cl B1.3.3 “a low probability of becoming unstable or collapsing” means that the risk of such events is no more than an appreciable risk (as distinct from a slight risk) or is at most a low risk (as distinct from a very low risk)...^[21]

- 4.8. As discussed in previous determinations,²² I consider “other property” is not limited to the protection of buildings and 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 *Selwyn Mews*, where the Judge stated:

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

Compliance based on the existing retaining wall

- 4.9. First, I must consider whether the original design of the new retaining wall relied on the existing retaining walls on other property to achieve Building Code compliance.
- 4.10. In this case, the engineer has stated “[T]he neighbours retaining wall ... wasn’t shown on the [building] consent drawings”, and neither is the new retaining wall “undercut by another retaining wall”.²³ This implies the specific engineering design for the new retaining wall did not consider or allow for the neighbours’ existing retaining walls.
- 4.11. Further, I have received no plans and specifications to suggest the original design for the new retaining wall relied on Building Code compliance being demonstrated using any element of the neighbour’s existing retaining walls.
- 4.12. Regardless, the neighbours’ existing retaining walls are evident based on the information provided by the parties²⁴ and a building consent ‘topographical survey’ plan²⁵ does show the neighbours’ dwelling and its proximity to the property boundary with 25 Victory Street.

²⁰ District Court Auckland CRN2004067301-19, Judge McElrea, 18 June 2003, [2003] DCR 671.

²¹ I note the judgement refers to clause B1.3.3, but the quoted and abbreviated text is in clause B1.3.1.

²² Determination 2015/003 *Compliance of a retaining wall between two properties*. Dated 10 February 2015.

²³ Refer to paragraphs 3.4.1 and 2.3.

²⁴ For example, the authority’s inspection record dated 15 November 2023.

²⁵ Plan number 225344-100-SUR, revision A, dated July 2022.

- 4.13. It appears the design of the new retaining wall was based on the assumption there were no changes in topography in the vicinity of the new wall²⁶; however, this was not the case as the existing retaining walls meant there was an abrupt change in topography.
- 4.14. The original design for the new retaining wall did impose a passive (horizontal) load onto the lower-level ground on the neighbours' side of the property boundary; however, it is the degree or extent that loading would have had on the existing retaining walls that had not been quantified or addressed in the original application for building consent.
- 4.15. Although the owner and the engineer have relied on a back-calculation that demonstrates a theoretical key depth of 55mm would not impose a passive (horizontal) load, the actual design was for a key depth of 300mm.²⁷ It is the effects of this that was not quantified, whilst also taking into account the varying horizontal distances between the new retaining wall and the existing retaining walls (refer to paragraph 2.5). Just because a surcharge may have been applied to the existing retaining walls, it does not automatically follow this would have led to structural failure of the new retaining wall.
- 4.16. Regardless, it is not clear if the stability of the new retaining wall had been satisfactorily demonstrated in the original design (without considering the presence of the neighbours' existing retaining wall and the abrupt change in topography).
- 4.17. Based on the lack of design information provided in the original building consent regarding the stability of the new retaining wall, taking into consideration the issues described above, I have insufficient information for me to reach a decision whether the new retaining wall complied with clause B1.

Protection of other property from physical damage caused by structural failure

- 4.18. The original design for the new retaining wall was required to comply with the requirements of section 17, including clause B1, taking into the consideration the case specific circumstances for the protection of other property.

²⁶ Refer to paragraph 2.3. The 'design features report' did state the engineer's assumptions, including no sudden changes in slope, steps, embankments, or other effects which may affect the design of the walls, and that if these assumptions were not met then they should be brought to the attention of the engineer for further consideration.

²⁷ As shown on detail MBRW01, on the engineer's plan S1.1, revision 3, dated 27 September 2023 and the engineer's associated design calculations.

- 4.19. Therefore, the design for the new retaining wall needed to consider its structural stability and ensure it remained stable during construction and throughout its life²⁸, including the effects of any surcharge likely to be imposed on the existing retaining walls as a result of the proposed building work²⁹.
- 4.20. To put it another way, the new retaining wall was required to withstand a combination of loads such that there was a low probability of it rupturing, becoming unstable, losing equilibrium or collapsing causing physical damage to other property (in this case, the neighbours' land and/or building, including the existing retaining walls).
- 4.21. I have already reached the view the original design of the new retaining wall did impose a surcharge on the lower-level neighbours' land and the existing retaining walls, albeit the extent of that surcharge leading to any structural failure has not been quantified by the parties. However, just because a surcharge would have been imposed by the new retaining wall, it does not necessarily mean it would have caused physical damage to the neighbours' property.
- 4.22. I have been presented no structural calculations or other similar data by the parties, or the engineer, that discusses the probability or likelihood of physical damage to other property as a result of the proposed building work to construct the new retaining wall. Therefore, I can only conclude I have received insufficient information that demonstrates compliance for the protection of other property based on the original design of the proposed retaining wall.

6. Decision

- 6.1. In accordance with section 188 of the Building Act 2004, I determine there is insufficient information regarding the design of the new retaining wall at 25 Victory Street in the original building consent to establish compliance with the Building Code Clause B1 *Structure*, including for the protection of the other property at 23 Victory Street.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 5 February 2025.

Andrew Eames

Principal Advisor Determinations

²⁸ Refer to clauses B1.2 and B1.3.1.

²⁹ Refer to clauses B1.3.1, B1.3.3, B1.3.4 and B1.3.6.