Determination 2024/001

Regarding the issue of a dangerous and affected building notice for a residential dwelling

307 Lakes Boulevard, Pyes Pa, Tauranga

Summary

This determination considers an authority's decision in issuing a dangerous and affected building notice for a dwelling. The determination considers the status of the building at the time the notice was issued and takes into account all the information that is now available.

The legislation which is discussed in this determination is contained in Appendix A. 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.

Contents

1. The matter to be determined

1.1. This is a determination made under due authorisation by me, Peta Hird, Principal Advisor, Ministry of Business, Innovation and Employment ("the Ministry"), for and on behalf of the Chief Executive of the Ministry.[1]

The parties

1.2. The parties to the determination are:

1.2.1. Tauranga City Council, carrying out its duties as a territorial authority ("the authority") and who applied for the determination

1.2.2. B Cameron ("engineer 1"), who was a Chartered Professional Engineer[2] at the time the notice was issued and who undertook work at 307 Lakes Boulevard on behalf of the developer[3]

1.2.3. D Joseph, the Licensed Building Practitioner (LBP) who carried out the building work associated with the construction of the wing wall that is included in the notice issued by the authority ("the builder").[4]

1.3. I consider the following are persons with an interest in this determination:

1.3.1. D Cancian, sole director of Bella Vista Homes Ltd[5], which established the Bella Vista subdivision where the dwelling was located ("the developer")

1.3.2. BCD Group, an engineering consultancy firm that provided specialist advice to the authority ("engineer 2")

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

[2] Chartered Professional Engineers, under the Chartered Professional Engineers of New Zealand Act 2002, are treated as if they were licensed in the building work licensing class Design 3 and Site 3 under the Building (Designation of Building Work Licensing Classes) Order 2010, section 5(1), available at https://www.legislation.govt.nz.

[3] See *Tauranga City Council v Cancian* [2020] NZDC 25470, [160], [167], [172], [402], [416]. The reference to this judgment is only the purposes of confirming the work B Cameron undertook at the property. This determination does not discuss the outcome of the judgment or any subsequent appeals.

[4] Ibid. [173], [174], [175], [179], [401] (b) and (c), [403], [405], [425]. The reference to this judgment is only for the purposes of confirming D Joseph's role in the construction of the wing wall. This determination does not discuss the outcome of the judgment.

[5] According to the New Zealand Companies Office at https://app.companiesoffice.govt.nz Bella Vista Homes Limited (5379301) was placed into voluntary liquidation on 30 November 2017 and removed from the companies register on 19 August 2022.

1.3.3. C Mills, the owner at the time the notice was issued and recipient of the dangerous and affected notice for the dwelling at 307 Lakes Boulevard ("the previous owner")

1.3.4. A Mann, the owner at the time the dangerous and affected notice was issued of a dwelling at 307A Lakes Boulevard identified in the notice as a dangerous building affecting 307 Lakes Boulevard.

The dangerous and affected building notice issued to A Mann on 16 April 2018 for 307A Lakes Boulevard is outside the matter to be determined. However, it is referenced in this determination for the purpose of considering the deep scour and unretained soil face between 307 and 307A Lakes Boulevard, as well as concerns raised by the authority related to the construction of the roof on 307A Lakes Boulevard.

1.3.5. D Van Basten Batenburg of Coalesce Architecture Ltd, the designers of 307A Lakes Boulevard, specifically in relation to the design of the roof (in part)[6]. D Van Basten Batenburg[7] provided the certificate of design work[8] for the project, dated 31 January 2017, including carrying out the design for the timber wall framing and roof (excluding the roof trusses).

1.3.6. D Skipper, the Licensed Building Practitioner[9] who supervised the installation of the roof cladding on 307A Lakes Boulevard.

1.4. The determination arises from the authority's decision to issue a dangerous and affected[10] building notice on 16 April 2018 under section 124 ("the notice") regarding a dwelling at 307 Lakes Boulevard, Pyes Pa, Tauranga.[11]

1.5. In late 2018 to early 2019, Tauranga City Council acquired the dwelling at 307 Lakes Boulevard as well as other properties in the Bella Vista subdivision from the individual homeowners as part of a commercial settlement arrangement (this includes 307A Lakes Boulevard). The Council's status as the owner is distinct from

[6] The design of the roof trusses, and specification of the fixings to connect the roof trusses to the load-bearing timber framing below, was undertaken by a specialist truss design company, who provided a roof plan, Producer Statement – Design (PS1), and design statement which formed part of the building consent application for 307A Lakes Boulevard.

[7] Licenced Building Practitioner, current licence class Design 1 and 2 (as at 3 March 2023, start date 4 December 2014)

[8] Section 45(2) and (3), and Form 2A of the Building (Forms) Regulations 2004.

[9] Licence class: Roofing, date granted 9 August 2012. Provided a Record of Building Work (under section 88) dated 9 August 2017.

[10] Section 121 – Meaning of dangerous building, and Section 121A – Meaning of affected building.

[11] On the same day the authority issued the notice, it also issued dangerous and/or affected building notices for 20 other dwellings in the Bella Vista subdivision. None of these other notices relate to the matter to be determined.

its status as a territorial authority. For the purposes of this determination all references to "the authority" relate only to its duties and responsibilities as a territorial authority, and not as the owner of the building.

1.6. In the ordinary course of events, the building owner and recipient of the notice (in this case the previous owner) would be a party to the determination under section 176(c). However, in this case, Tauranga City Council purchased the property and the application for determination was lodged with the Ministry when the Council owned the property. For this reason, I have taken the view that the previous owner is not a party because they no longer have an interest in the property and are not affected by the determination.

1.7. The notice stated that 307 Lakes Boulevard was an "affected building" as the authority considered "that there are dangerous buildings adjacent to or nearby" to the 307. The authority did not indicate in the notice which dangerous buildings it considered were "adjacent to or nearby" except for 307A Lakes Boulevard. I have taken the view in this case, except for 307A Lakes Boulevard, the owners of other adjacent or nearby buildings or any other persons that may have been involved in the design and construction of those buildings are not parties or persons with an interest in this determination. If the notice had clearly identified other dangerous buildings "adjacent to or nearby" then I may have reached a different view on their status.

The matter to be determined

1.8. The matter to be determined under section 177(1)(b) and 177(3)(f) is the authority's decision to issue the notice for the dwelling at 307 Lakes Boulevard on 16 April 2018. In deciding this matter, I have considered whether the dwelling was a dangerous and affected building as defined in sections 121 and 121A for the reasons given in the notice.

Issues outside the determination

1.9. The matter for determination does not include the authority's decisions to grant and issue the building consents for the construction of 307 Lakes Boulevard and 307A Lakes Boulevard[12], Reference is made in this determination to the design and construction of the wing wall at 307 Lakes Boulevard and the roof at 307A Lakes

[12] Authority reference numbers 56947 and 58170 respectively.

Boulevard[13] but I have not considered whether these building elements complied with the Building Code.

1.10. The determination does not consider the part of the notice that lists the actions and remedies the authority suggested the previous owner carry out to reduce or remove the danger pursuant to section 124(2)(c)(i).

1.11. Engineer 1 raised the fact that the upper level of the dwelling that has been removed and relocated. Engineer 1 is of the view, "the fact the building continues to exist goes to the need to reverse the decision to issue the notice".
The authority's decision to issue the notice did not turn on the status of the upper level, and in my opinion the current status, condition, and location of the upper level has no bearing on the matter to be determined.

1.12. The determination does not consider the dangerous and affected building notice issued for 307A Lakes Boulevard on 16 April 2018. However, the authority had decided 307 Lakes Boulevard was an affected building and in doing so only identified 307A Lakes Boulevard as an adjacent or nearby dangerous building in the notice. Therefore, the determination does consider if 307 was affected by the construction at 307A.

The role of the determination

1.13. The authority and engineer 2 question whether information about the dwelling that was not available when the authority made its decision is a relevant consideration. Engineer 2 has expressed concern that this approach may discourage engineers from providing advice on buildings when asked to do so by building consent authorities or territorial authorities. For this reason, I have set out below what I consider to be the role of the determination.

1.14. This is a determination under section 177 in respect of the authority's decision to issue the notice. The determination considers whether the notice was issued in accordance with the requirements of section 124. The purpose of the determination is not to consider whether the authority acted reasonably in issuing the notice.

1.15. A determination is not a judicial review of an authority's decision, nor is it a tort proceeding in respect of a claim of losses as a result of an allegation of a breach of a duty of care. There are no powers for the determination or the parties to require evidence to test the authority's decision.

[13] Insofar as the roof of 307A Lakes Boulevard relates to the part of the notice that states 307 Lakes Boulevard is affected for the purpose of s121A.

1.16. In other words, a determination is not an assessment of the authority's judgement in issuing a notice based on the information available at the time or the process the authority followed in making its decision. I note these issues have already been considered by others (refer to paragraphs 2.5 and 2.7).

1.17. The timing of the determination also means I have the advantage of being able to access additional information relating to the particulars of the notice that was not available to the authority when it made the decision to issue the notice. For example, the determination has considered additional reports prepared for the authority in 2018 and 2019 (ie after the issue of the notice) and advice of experts commissioned by the Ministry.

1.18. The determination provides a forum for considering evidence about aspects of the dwelling and the site that are relevant to the decision to issue the notice, including from the parties' technical advisers, then considering and applying this evidence to the relevant provisions of the Act. Information that was not available at the time the authority made its decision is relevant to the exercise of power under section 188 to confirm, reverse or modify the authority's decision.

Precautionary principle

1.19. Engineer 1, engineer 2, and the second expert all referred to the "precautionary approach" taken by the authority in reaching the view, based on the information available to it at that time, that it was satisfied the building was dangerous and affected (refer to paragraphs 4.9, 4.19.2, and 6.15).[14]

1.20. The New Zealand courts have referred to a precautionary approach or precautionary principle informing decision-makers in certain contexts.

1.21. For example, in a case relating to coastal hazards and the Resource Management Act 1991, the Environment Court referred to the requirements in that Act that have precaution inherent in them. The court stated:[15]

> [31] The kind and degree of precaution to be taken depends on the level of knowledge of the risk, its likelihood of occurrence, and its consequences.

[14] The authority also provided a copy of advice (dated 20 April 2020) it had obtained from a building consultant on 'precautionary principle'. Although this advice was in response to a separate application for determination (regarding another building at the Bella Vista development) it is referred to here as it is relevant to both.

[15] *Fore World Developments Ltd v The Napier City Council* NZEnvC W029/2006, 13 April 2006. The court went on to state: "The Court in *Rotorua Bore Users Association Inc v Bay of Plenty RC (A138/98)* said this: 'The underlying rationale for the approach [ie the precautionary principle] stems from the need for decision-makers actually to make decisions. It is not dependent, as some may think, on a proposition that one should be inherently conservative in assessing actual and potential effects.'"

1.22. In addition, the High Court has noted that when public health considerations are an issue, a precautionary approach is required. In a case involving a judicial review of a decision by the Canterbury Earthquake Recovery Authority (CERA) to demolish a building it considered was dangerous and a threat to people and/or property, the High Court emphasised:[16]

> [47] …the need to take a precautionary approach when public health considerations are in issue.

1.23. In the Building Act context, this approach was alluded to in a recent case involving a warrant issued by an authority under section 129 for life safety reasons where a building was considered dangerous.[17] In *Napier City Council v Herbert & Lunn,* the District Court stated:[18]

> [36] The Court will be scrutinising a warrant based on what the Chief Executive of NCC considered "necessary in her judgement" to remove what she assessed to be likely immediate danger. This is likely to be an exercise in assessing the information, and the quality of the information, available to the Chief Executive at the time she made her decision, rather than whether the information was subsequently found to be incorrect.
>
> [37] **Requiring a Chief Executive to proceed with a higher degree of certainty (that may or may not be subsequently established) could risk tragedy in relation to a dangerous building**.
>
> [my emphasis]

1.24. The court's role in that case, in terms of section 130, is somewhat different to my role in making a determination. The court acknowledged this distinction, stating "[t]he Court and the Chief Executive of MBIE have different functions" and that the court's assessment under section 130 "may require something less than an assessment of objective facts established with 20/20 hindsight."[19]

1.25. The timing of this determination application means that I have the advantage of access to additional information that was not available to the authority at the time the notice was issued.

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[16] *Hampton v Canterbury Earthquake Recovery Authority* HC Christchurch CIV-2011-409-1368, 20 July 2011.

[17] Section 129 gives a territorial authority the power to issue a warrant if it considers "because of the state of a building … immediate danger to the safety of people is likely in terms of section 121 or 123". Section 130(1) provides that on completion of the action stated in the warrant the territorial authority must apply to the District Court for confirmation of the warrant.

[18] *Napier City Council v Herbert & Lunn* [2022] NZDC 17502.

[19] *Napier City Council v Herbert & Lunn* at [34] and [35].

1.26. The authority was in a unique and challenging position when it was considering concerns across the whole subdivision in relation to multiple buildings and issued the notice. This is evident from the number of dangerous and affected building notices the authority issued on 16 April 2018 (a total of 21 notices).

1.27. Whether or not a precautionary approach or principle applies in making the decision to issue those notices is not for me to consider or decide. However, I agree with the rationale set out in the court decisions referenced above for such a principle particularly in those situations (as they may arise) when authorities need to consider issues associated with public safety in a timely manner (while noting that the requirements of the relevant sections of the Act must also be satisfied).

2. The building work

The Bella Vista subdivision

2.1. The dwelling, which has now been part demolished and the upper storey relocated, was located at 307 Lakes Boulevard ("the property") in the Bella Vista subdivision ("the subdivision"), Pyes Pa, Tauranga. The subdivision included 16 dwellings on Lakes Boulevard (eight with road frontages and eight on rear sections) and five dwellings on higher ground at Aneta Way (refer to figure 1).

Figure 1: Location of the property within the subdivision (before the dwellings were removed or demolished)

2.2. The subdivision was established in 2015/2016 by Bella Vista Homes Ltd, which carried out earthworks to create the sections and building platforms. During 2016/2017 the company also built, or arranged to have built, dwellings for individual homeowners once associated building consent applications had been issued by the authority.[20]

2.3. In November 2017 Bella Vista Homes Ltd was placed into voluntary liquidation. At that time, the dwellings were at varying stages of completion and there were un-retained cut slopes between some of the Lakes Boulevard and Aneta Way properties.

2.4. On 16 April 2018, the authority declared 21 dwellings in the subdivision to be dangerous and/or affected buildings and issued notices to this effect, including the notice for 307 Lakes Boulevard.

2.5. On 24 April 2018, the authority commissioned Hon P Heath QC to review its involvement with the subdivision. Hon P Heath's report[21] ("the Heath Report") was published in June 2018. The Heath Report included a discussion on the background to and issue of the dangerous and affected building notices, including for 307 Lakes Boulevard. Associated extracts from the Heath Report are summarised together in Appendix B, table 1.

2.6. In November 2018, the authority agreed a settlement to purchase 21 properties in the subdivision from the then homeowners. The authority also resolved, where possible, to salvage and remove the upper floors of the Lakes Boulevard dwellings before the basements or lower ground floors and foundations were demolished. This work was largely completed in 2019 including the dwelling at 307 Lakes Boulevard.

2.7. The Ministry reviewed the authority's performance[22] with a focus on its statutory and regulatory building control functions under the Act and published a report in March 2019.[23] The report referred to the issue of dangerous and affected building notices[24], noting:

[20] Building consents for dwellings in the subdivision were issued progressively between June 2016 and August 2017.
[21] Titled "Investigation and review: The Tauranga City Council's involvement with 21 properties in the Bella Vista subdivision", Report of Hon P Heath QC, 1 June 2018, available at www.tauranga.govt.nz.
[22] Under sections 204 and 276.
[23] "Review of Tauranga City Council: Performance of statutory functions under the Building Act 2004 with respect to the Bella Vista development", Ministry of Business, Innovation and Employment, March 2019, available at www.building.govt.nz.
[24] At pages 36 and 37 of the Ministry's report.

It is however possible to conclude that the [authority] was entitled to rely on advice from appropriately qualified and experienced practitioners, and took steps beyond those required by its policies and procedures to ensure the decision was as sound as possible.

307 Lakes Boulevard

2.8. The dwelling was located towards the southeast of the subdivision on the street frontage to Lakes Boulevard. There was another dwelling on the rear section (to the north of 307 Lakes Boulevard) at 307A Lakes Boulevard, and there were other dwellings nearby at 305, 305A, 309 and 309A Lakes Boulevard[25] (refer to figures 1 and 2).

2.9. The design and construction of the two-storey dwelling was similar to the other buildings in the subdivision. The design was predominantly in accordance with *New Zealand Standard NZS 3604:2011 Timber-framed buildings* but incorporated some elements of specific engineering design. This included steel beams, posts, and portals, as well as several reinforced concrete masonry walls at the lower ground level, all supported on ground bearing reinforced concrete foundations and raft floor slab.[26]

[25] All five dwellings, namely 307A, 305, 305A, 309 and 309A Lakes Boulevard, were issued dangerous and affected building notices under section 124 on 16 April 2018.

[26] Raft floor slabs and foundations generally involve specific engineering design. They consist of a thick reinforced concrete slab that is integrated with steel reinforced beams or ribs which are dug into the ground. Systems can incorporate proprietary polystyrene blocks or pods placed between the beams or ribs.

Figure 2: 307 and 307A Lakes Boulevard

2.10. The first floor, wall and roof framing were constructed from timber and the interior lined with plasterboard. Exterior cladding was mainly timber weatherboards with small sections of aerated concrete panel and stone schist. The roof was primarily constructed from prefabricated roof trusses and was clad with long-run profiled metal roofing.

2.11. The approved building consent plans included a 900mm high timber pole retaining wall in the northeast corner of 307 Lake Boulevard. However, this was not constructed and instead the ground was retained by prefabricated interlocking concrete blocks (see Figure 2).

The "wing wall"

2.12. Type A and Type B[27] reinforced concrete masonry retaining walls on the lower (ground) level to the north and west of the dwelling were built approximately 2800mm in height. The layout of these walls is shown in figures 3 and 4.[28]

2.13. The design of the Type A and Type B cantilevered retaining walls was based on reinforced concrete masonry blockwork tied to and supported by 1400mm to 1500mm wide x 300mm to 800mm deep reinforced concrete foundations.[29]

2.14. Building consent plan 104 revision A specified a 2400mm long reinforced concrete masonry wall at the western end of the north wall ("**the wing wall**"), located directly below a 7.44m² timber-framed deck (see figure 6). The wing wall connects at the junction where the Type A and Type B walls intersect (see figure 3).

2.15. The wing wall was originally designed to be 1000mm high, constructed as a "20 series[30] masonry foundation wall as per NZS 3604 300x300 strip footing with 2/d12 along".

2.16. The original design of the wing wall relied on deformed 12mm diameter steel reinforcement placed horizontally at 600mm centre-to-centre spacings. The

[27] There are different types of retaining wall associated with the approved building consent. The determination uses the same taxonomy as annotated in the building consent plans.

[28] Figures 3 and 4 have been reproduced from building consent plan 104 revision A, dated 8 September 2016.

[29] As detailed on building consent plan 403 revision A, dated 8 September 2016, detail 20 (Type A retaining wall) and detail 21 (Type B retaining wall).

[30] 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. NZS 4229:2013 is cited in *Ministry of Business, Innovation and Employment Acceptable Solution and Verification Method for New Zealand Building Code clause B1 Structure*, first edition, amendment 13, effective from 1 June 2016 which was the current version when the building consent was granted.

corresponding vertical steel reinforcement was to be plain round bar 10mm in diameter at 600mm centre-to-centre spacings.[31]

2.17. The building consent plans indicate that the wing wall was intended to retain approximately 800 mm depth of soil.[32] I note this depth of soil is greater than 600mm provided for in NZS 3604:2011.[33]

2.18. The plans also indicate the area (or "alcove") between the wing wall and the north face of the Type A retaining wall was to be backfilled with material to approximately half the height of the Type A wall.[34] However, as built the Type A wall did not retain any fill material or natural soils in the alcove (see figure 6).

2.19. As built, the wing wall was approximately 2800mm high and supported soil and backfill material along the north face of the wall approximately 1000mm to 1800mm deep. The north face of the wing wall was protected by a self-adhesive sheet applied waterproofing membrane[35], a layer of high-density polyethylene "dimpled" sheet material, and an additional layer of expanded polystyrene.

2.20. The plumbing and drainage plan[36] indicated a 100mm diameter "perforated drainage pipe" was to be laid adjacent to the north side of the wing wall and Type B retaining wall. The pipe was to terminate at a sump located to the west of the dwelling.

2.21. The west end of the wing wall supported a timber post, which was secured in place using a proprietary steel bracket fixed into the top of the wall. The post in turn supported, in part, the timber bearers and joists which formed the timber deck.[37] The timber post was finished with a stone schist veneer. The top of the post supported one end of a timber beam which in turn supported a part of the roof structure above the deck.[38] See figures 6 and 7.

[31] As specified on building consent plan 401 revision A, dated 8 September 2016, detail 07 "Foundation detail".
[32] The depth of soil is approximated from plan 301 Rev. D, "North" elevation, and "Section 1 – 1" on plan 104 Rev. A, and as dimensioned on plan sheet 204 Rev. D.
[33] NZS 3604:2011, section 6 'foundation and subfloor framing, sub-section 6.11 foundation walls (concrete and concrete masonry), paragraph 6.11.1.1.
[34] Plan sheet 204 revision D and sheet 301 revision D.
[35] Proprietary waterproof membrane approved as a minor variation by the authority on 4 May 2017, and the applicator provided a Producer Statement – Construction (PS3) dated 3 July 2017 that stated compliance with Clause E2 External Moisture.
[36] 107 Rev. B.
[37] As detailed on building consent plan 111 Revision A.
[38] As detailed on building consent plan 115 Revision A.

2.22. Scan results of the wing wall undertaken in March 2018 indicate the vertical steel reinforcement was placed at approximately 200mm centre-to-centre spacings.[39] The scan results did not determine the size of the vertical reinforcement, or the presence, diameter, and spacing of any horizontal reinforcing.

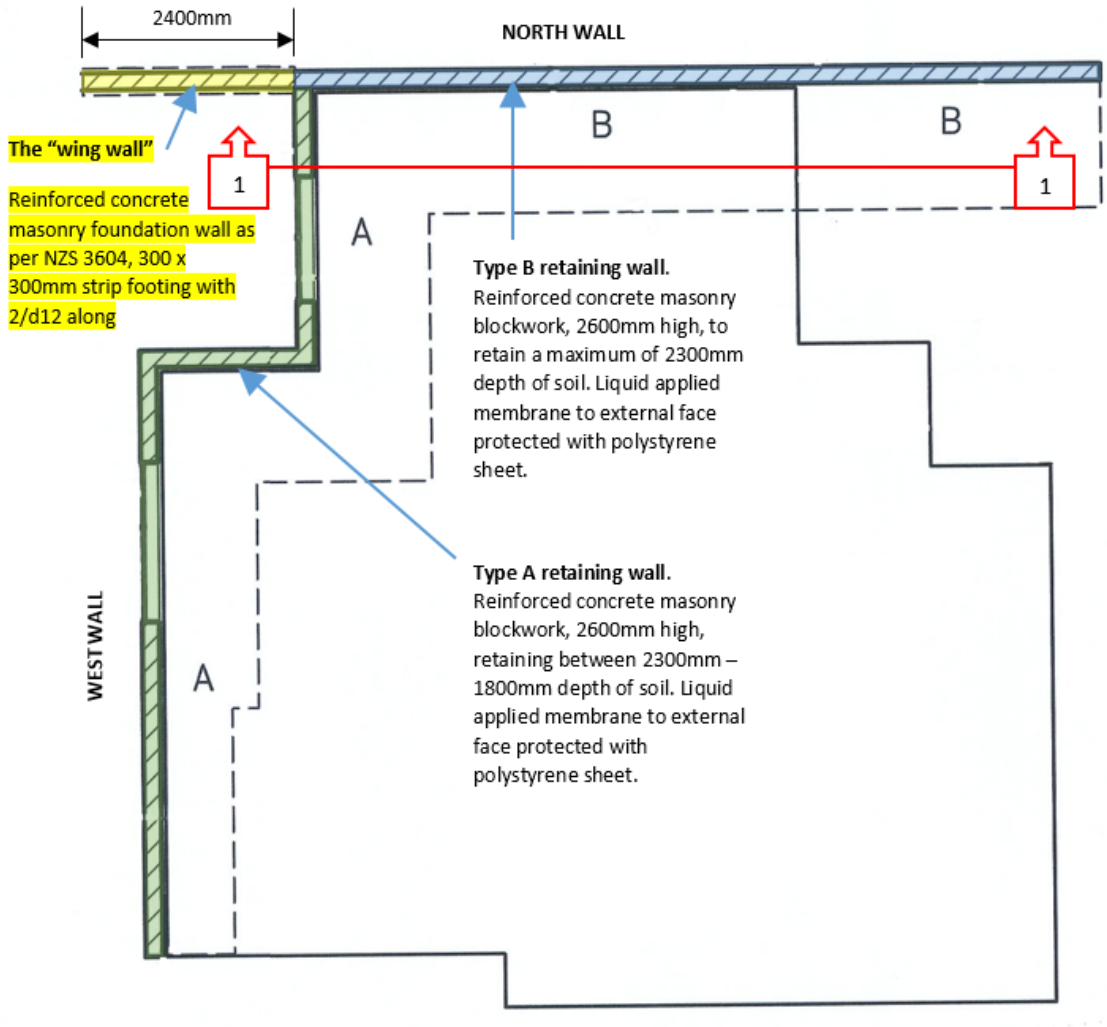

Figure 3: Retaining wall setting out (note to scale)[40]

[39] The scan was undertaken by a specialist consultant on behalf of engineer 2.

[40] Plan sheet 104 Revision A states the Type A and Type B retaining walls were to be 2600mm high. However, plan sheet 403 Revision A states both walls were to be 2800mm high (measured from the top of the foundation to the top of the wall).

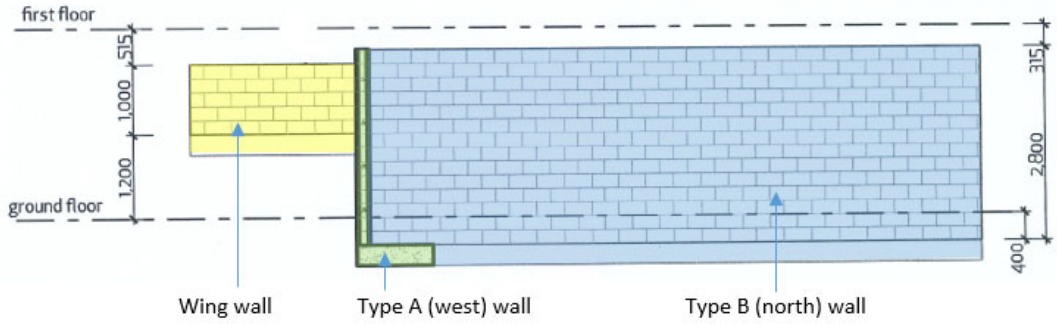

Figure 4: Wing wall design intent – Section 1-1 (not to scale)

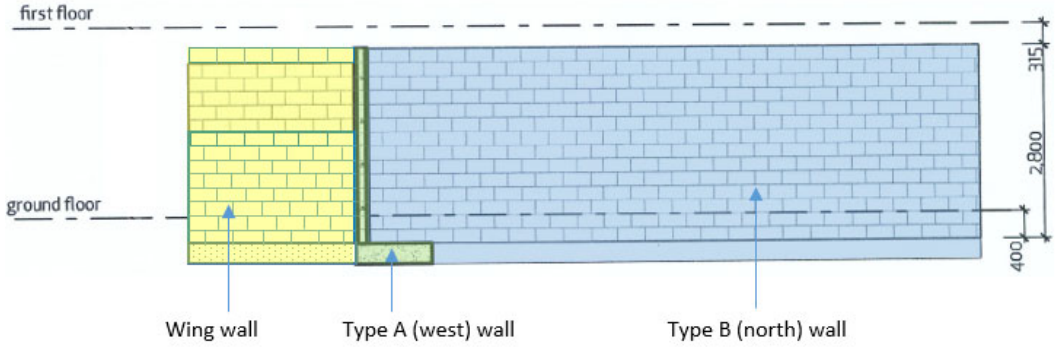

Figure 5: As-built wing wall – Section 1-1 (not to scale)

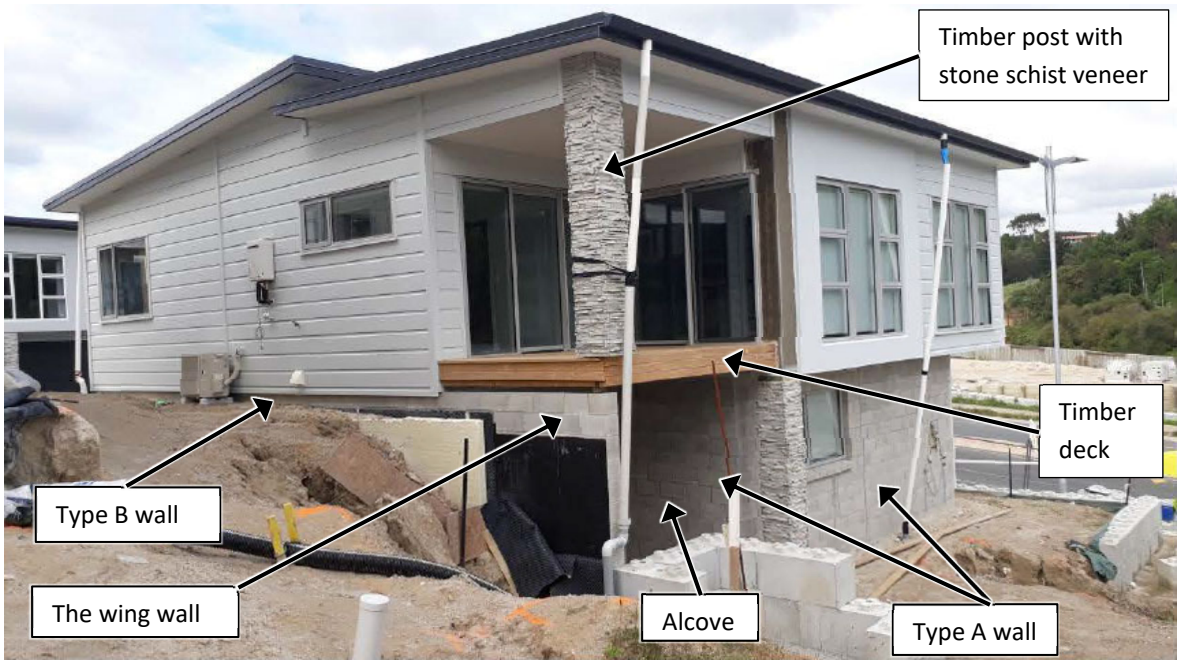

Figure 6: 307 Lakes Boulevard (northwest corner)

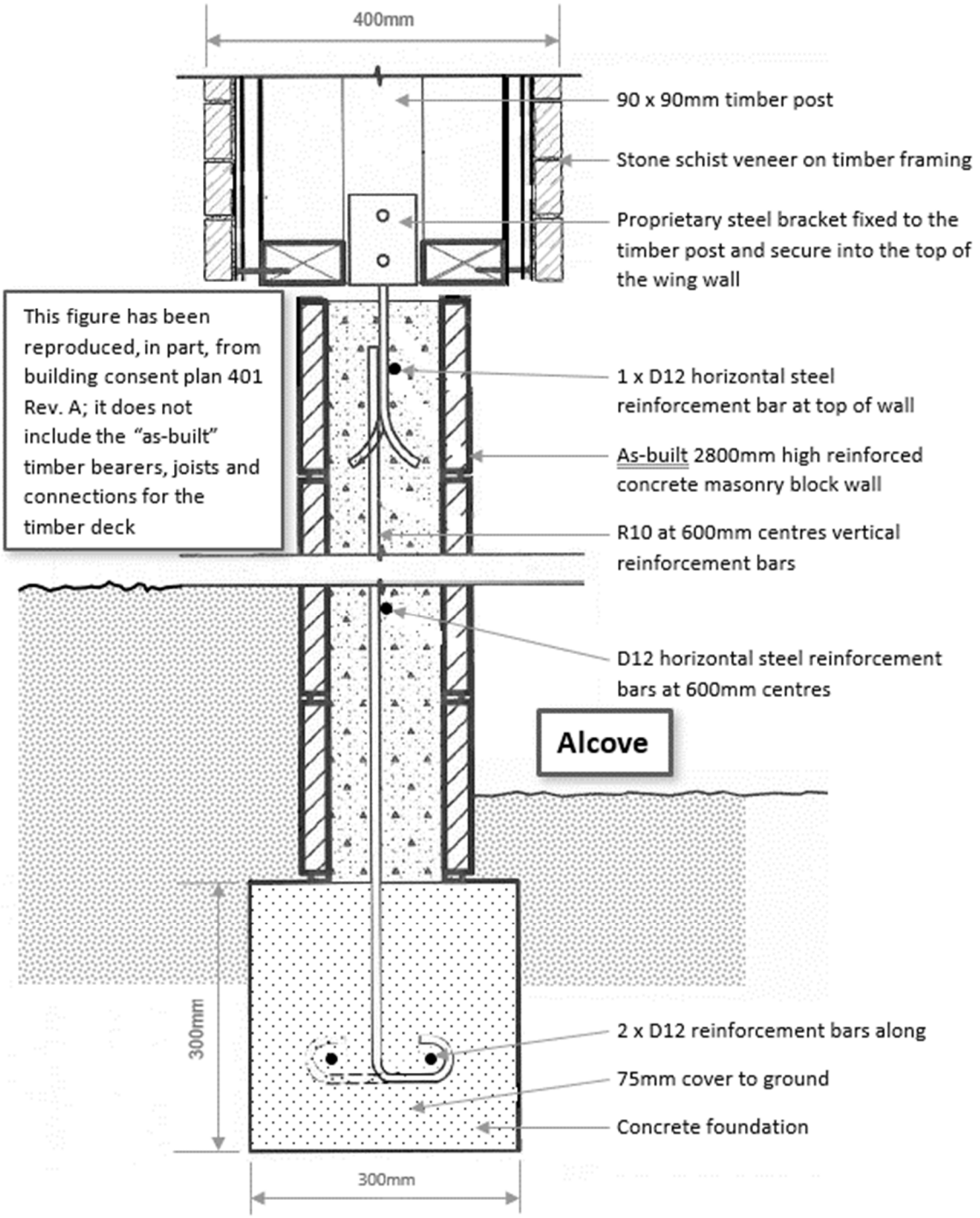

Figure 7: Wing wall excluding timber deck (not to scale)[41]

[41] The design specification for the vertical and horizontal steel reinforcement stated in figure 7 has been reproduced from plan sheets 104 revision A and 401 revision A for a wall that was to be 1m high. However, the wing wall as-built was 2.8m high, the vertical reinforcement was spaced at 200mm centres, and the type, size, and spacing of any horizontal reinforcement placed in the as-built foundation and wing wall is not known.

307A Lakes Boulevard – the foundations and roof

2.23. The foundations for 307A Lakes Boulevard are discussed in this determination because the notice referred to deep scour between the dwellings that could destabilise the foundations of 307A Lakes Boulevard.

2.24. The foundations of 307A included: specific engineering design reinforced concrete raft floor slab system to the ground floor garage, entry and staircase; specific engineering design reinforced concrete block walls and foundations to the west and north sides of the dwelling; and the extended first floor construction to the east was supported by three specific engineering design square hollow section posts supported on reinforced concrete pad foundations.

2.25. The overall height of the 307A Lakes Boulevard, from ground level to the uppermost part of the roof, was approximately 6.5m.[42] The horizontal distances from the south elevation of 307A Lakes Boulevard is approximately 4m to north elevation of 307 Lakes Boulevard, and approximately 1.85m to the property boundary with 307 Lakes Boulevard.[43] The 'proposed ground line' between the two dwellings was intended to be sloping, with only short flat sections at the top and bottom of the slope. The finished lower ground floor level for 307A Lakes Boulevard was 40.500; the corresponding lower ground floor level for 307 Lakes Boulevard was 39.700 (or 39.715).[44]

2.26. The roof construction of 307A Lakes Boulevard is discussed in this determination as the notice issued for 307 Lakes Boulevard identified that it was affected due to the dwelling being at "risk of…being hit by debris from 307A Lakes Boulevard". In issuing the notice, the authority did not describe what it meant by "debris", but it did include, "in particular, [307 Lakes Boulevard] is affected for structural reasons because there is a risk that the roofs of adjacent or nearby buildings will lift in gale force winds and could cause harm to people occupying" 307 Lakes Boulevard.[45]

2.27. The layout and type of the construction of 307A Lakes Boulevard was similar to 307 Lakes Boulevard.

[42] The height has been approximated from approved building consent (58170) plan sheet 302 revision B.
[43] Both these horizontal distances were approximated from plan sheet 302 revision B included in the building consent documentation for 307A Lakes Boulevard. The corresponding plan sheet 301 revision D included in the building consent for 307 Lakes Boulevard shows a similar profile for the finished ground, but the horizontal distance between the two dwellings is approximately 4.8m.
[44] There is conflicting information shown on the plan sheets for both dwellings regarding the finished floor level for 307 Lakes Boulevard. Further, it is not clear if the numerical values stated on the plans are the finished floor levels in metres above a local (temporary) benchmark, or another survey datum.
[45] The notice did not identify any other adjacent or nearby building other than 307A Lakes Boulevard.

2.28. The design of the roof for 307A Lakes Boulevard relied on 29 specialised designed prefabricated timber roof trusses spaced approximately 775mm to 900mm apart and incorporated a 450mm eave overhang.

2.29. The plan and fabricator design statement provided by the specialist designer of the roof trusses indicates the roof was designed for a "very high" wind zone, for a wind speed of 50 metres per second.[46]

2.30. The design included two load-bearing internal walls below the roof trusses. External walls on the west and east sides supported the ends of the roof trusses.

2.31. The roof design specified the fixings to be used to secure the roof trusses to the walls below, namely specialist proprietary joist hangers and ceiling ties as well as pairs of wire dogs for the truss to top plate connection and two skew nails.

2.32. The roof plan[47] states the roof pitch was 3 degrees to the west side of the roof and 5 degrees to the east side.

2.33. Bracing of the roof relied on pairs of proprietary metal poof plane braces which were to be tensioned and crossed over the roof structure and fixed in accordance with the manufacturer's instructions.

2.34. The roof cladding was profiled metal fixed over a self-supporting roofing underlay. The cladding was fixed to 70 x 45mm timber purlins spaced at 900mm centres which were secured to the roof trusses by specialist proprietary 2.4kN screw fixings.

2.35. "As built – final layout" roof truss plans, Producer Statement – Design (PS1), and fabricator design statement, all dated 27 June 2017, were provided by the manufacturer of the prefabricated roof trusses. The documents indicate a design wind speed of "very high" and showed a total of 92 components that form the roof structure, along with details of the fixings, and roof trusses spaced at 900mm apart. Included in the same pack of information was a timber wall panel plan showing opening dimensions and lintels.

2.36. On 21 July 2017, the authority inspected the wall framing, including bracing, lintels and fixings. The same inspection included the roof trusses, fixings, bracing, and

[46] *NZS 3604:2011 Timber-framed buildings*, Section 5 – "Bracing Design", Table 5.4 – "Determination of wind zone", VH = Very high wind speed of 50m/s.
[47] Plan sheet 116 revision A.

purlins. The inspection outcome was "pass" and in accordance with the building consent.[48]

2.37. On 31 July 2017, the authority inspected the roof construction, fixings, roof cladding and flashings. The inspection outcome was "pass" and the installed building elements were "compliant".

3. The sequence of events and the notice

3.1. On 8 September 2016, a building consent application for construction of the dwelling at 307 Lakes Boulevard was submitted to the authority.[49]

3.2. On 10 February 2017, a geotechnical engineer[50] sent an email to the authority and stated, in respect for Lots accessed from Lakes Boulevard:

> It is understood that building platforms for these are all in cut. Provided cuts are no steeper that 1:2 (vertical to horizontal) then the risk of large scale slumping is minor, though it must still be accepted that ongoing piping and scour can still occur on account of the presence of pumiceous sands and gravels.

3.3. On 16 February 2017, the developer sent a letter to the authority that acknowledged some sites at the subdivision (including 307 and 307A Lakes Boulevard) "are heavily cut sites and realise that there is a risk of erosion after heavy rain and cracking after long periods". The letter included steps the developer would take "if scouring has caused any safety issues, or affecting any other properties, [the developer] will immediately ensure remedial measures [will] be undertaken to protect any persons and/or properties".

3.4. On 3 March 2017, the authority granted and issued a building consent for the dwelling (authority reference number 56947).

[48] It is not clear who constructed the wall framing and roof structures. Although a record of building work dated 15 September 2017 (issued under section 88) is contained in the authority's building consent file, it is incomplete. It does not record the details of the property or project to which it relates, and it does not state which elements of the restricted building work the Licenced Building Practitioner either carried out or supervised.

[49] The application was submitted by a Licenced Building Practitioner (LBP) designer acting on behalf of the then owner.

[50] It is not clear whether the geotechnical engineer was representing the developer or another entity. However, I note the person concerned is a Chartered Professional Engineer, practice field: geotechnical engineering, and their registration with Engineering New Zealand was current at the time (available at https://members.engineeringnz.org/s/find-an-engineer).

3.5. Building work progressed, and the authority conducted several inspections between 21 March 2017 and 7 December 2017.[51]

3.6. On 20 March 2017, engineer 1 issued a Producer Statement – Construction Review (PS4) in respect of "building foundation ground preparation construction investigation and certification" for 307 Lakes Boulevard. The PS4 confirmed engineer 1 had conducted construction monitoring services in respect of Clause B1 Structure and for building work described in building consent 56947. Attached to the PS4 was a site inspection record dated 18 March 2017; it confirmed engineer 1 had undertaken a "Good ground check [to] NZS 3604 3.1.3"[52] and concluded "Good ground found". The inspection outcome was "ok to proceed with construction".[53]

3.7. On 21 March 2017, the authority conducted a pre-pour inspection of the foundation footings, including the associated steel reinforcement. The inspection report stated, "the footing trench is clean and correct size and the foundation wall size is compliant". The outcome of the inspection was "pass", and it noted the building work was in accordance with the building consent.

3.8. Engineer 1 issued two Producer Statement – Construction Reviews (PS4s), on 23 March and 11 April.[54]

3.8.1. The PS4 dated 23 March was in respect of "block foundation wall footing pre-pour construction investigation and certification" for 307 Lakes Boulevard.

3.8.2. The PS4 dated 11 April was in respect of "block foundation wall infill pre-pour construction investigation and certification" for 307 Lakes Boulevard.

[51] The authority's inspection audit checklist states the first inspection in respect of construction and demolition hazards was conducted on 8 March 2017. However, the associated inspection report indicates this was automated by the authority's computer system as opposed to a physical inspection by a person on site.

[52] *NZS 3604:2011 Timber-framed buildings*, section 3.1.3 "Determination of good ground"

[53] "Good ground" is defined in *Ministry of Business, Innovation and Employment Acceptable Solutions and Verification Methods for New Zealand Building Code Clause B1 Structure*, first edition, amendment 13, effective from 1 June 2016. This determination does not discuss the supporting ground in terms of compliance of the dwelling with performance requirements of the Building Code. However, due to the particulars stated in the notice and associated specialist engineering reports provided to the authority regarding the wing wall, "good ground" is referred to here to give context to the nature of the soils and bearing capacity.

[54] The PS4s were both dated 2016. This date doesn't align with the attached "site inspection record" dated 22 March 2017 and, noting the date of the building consent application and when it was issued authority, it appears appropriate to assume the date on the PS4 was a typographical error and it should read 2017.

3.8.3. Both PS4s confirmed engineer 1 had conducted construction monitoring services in respect of clauses B1 Structure and B2 Durability, for the building work described in building consent 56947.

3.8.4. Plans attached to the site inspection records associated with both PS4s include the blockwork wing wall.

3.8.5. The pre-pour site inspection record dated 22 March 2017 confirms engineer 1 inspected the size, cover and steel reinforcement, the damp proof course, and foundations. The inspection outcome was "ok to pour" concrete.

3.8.6. The pre-pour site inspection record dated 9 April 2017 confirms engineer 1 inspected the cover and steel reinforcement. The inspection outcome was "ok ready to pour [concrete] as per design".

3.8.7. Neither of the inspection records confirm the type, size, and spacing of the reinforcement installed in the wing wall or foundation.

3.9. On 6 June 2017, the builder issued a record of building work under section 88 for 307 Lakes Boulevard. It described the restricted building work that the builder carried out and supervised as:

> Block wall with HD12[55] rods 400mm verts and horizontal bars. Tied with control bar and joint.[56]

Events leading to the issue of the notice

3.10. Following the voluntary liquidation of Bella Vista Homes Ltd in November 2017, the authority undertook an assessment in February 2018 of the dwelling at 307 Lakes Boulevard along with 20 other properties at the subdivision.

3.11. The authority engaged the services of an independent building consultant ("the building consultant") to review and provide a report on the status and condition of some of the dwellings in the development, including 307 Lakes Boulevard. The building consultant "visited the subdivision on multiple occasions [from] 2 February 2018". The building consultant's report was provided to the authority on 12 April 2018 (see paragraph 3.18).

[55] HD12 – hot rolled deformed bars 12mm in diameter.

[56] The completed form indicates the builder carried out or supervised the "wall cladding or wall cladding system". However, the building work described in the record relates to the foundation wall construction not the cladding or cladding system. Therefore, for the purpose of this determination, I have assumed the builder completed the wrong part of the form.

3.12. On 9 March 2018, the authority received a geotechnical report that raised concerns about ground stability and aspects of construction at the subdivision.[57] The report noted that existing surface water controls were ineffective, and there were multiple scour channels, piping and gully erosion, and that the evident subsurface erosion presented a risk to people and vehicles on the ground surface. The report recommended temporary evacuation until the impending tropical storm passed and the site was reinspected.

3.13. The Chief Executive of the authority issued a warrant on 9 March 2018 [58] requiring homeowners to vacate certain occupied buildings ahead of an impending severe weather event.[59] The issue of the warrant by the Chief Executive of the authority is outside the scope of the determination and is only included here as context in terms of the sequence of events that led to issue of the notice.

3.14. The warrant required the completion of structural fixings to roofs at some dwellings in the subdivision (this did not include 307 or 307A Lakes Boulevard) and stated that a "full engineering inspection" would be carried out to confirm ground stability once the forecast cyclone had passed.

3.15. The authority engaged the services of engineer 2 and a geotechnical engineering company ("the geotechnical engineer"), to provide specialist advice on structural and geotechnical matters at the subdivision, including 307 Lakes Boulevard.

3.16. The authority received two geotechnical reports, one dated 14 March and another dated 18 March 2018. The report of 14 March summarised findings from surface inspections carried out to assess potential risks to occupants.[60] The report noted serious problems with scour and erosion around the structures due to earthworks exposing material highly prone to erosion, poor storm water control of overland flows, and very poor detailing and construction of stormwater systems. The report identified bad scour and an unretained face between 307 and 307A Lakes Boulevard, and "some small undermining of the raft foundation" of 307A. The report also made general comments about the subdivision, noting that there was local settlement in backfilled service trenches and there was a likelihood of pipes and small tomos forming, and recommended restricting access to the dwellings to foot traffic only. This report also raised concerns about drainage behind the

[57] Titled "Bella Vista: The Lakes / Aneta Way – Geotechnical basis for evacuation".
[58] Under section 129: Measures to avoid immediate danger or to fix insanitary conditions.
[59] Tropical Cyclone Hola, 3-13 March 2018 (considered extra-tropical after 11 March). Refer to MetService New Zealand, https://m.facebook.com/MetService/photos/cyclone-hola-to-bring-severe-weather-but-the-worst-remains-offshorecyclone-hola-/1770198659708851/?_se_imp=0TPwWpxxMSiI5WfeH
[60] Titled "Lakes Boulevard / Aneta Way Sites: Comments and Recommendations from Geotechnical Site Inspection – 14 March 2018"

concrete block walls and the effect of hydrostatic pressure on the full height walls (which includes the wing wall). The report recommended confirmation of the reinforcing steel in these walls and structural analysis be undertaken.

3.17. The report of 18 March 2018 was an update of the geotechnical report of 9 March 2018 and provided advice on whether the buildings that had been evacuated could be reoccupied.[61] The report included an assessment of 307A Lakes Boulevard. The author maintained the dwelling was dangerous because of the scour running parallel to the west wall, the scour and un-retained soil face between 307A and 307 Lakes Boulevard, and gas bottles positioned above a scour hole.[62] The report noted the authority's structural engineers had been requested to check the effects of hydrostatic pressure on the masonry retaining walls. It recommended the presence or absence of voids be confirmed before 307A was reoccupied, on the basis that voids caused by piping near services or in fills that are likely to be temporarily stable could increase in risk during intense or prolonged rainfall.

3.18. On 12 April 2018, the building consultant provided a report to the authority on the compliance of dwelling, listing defects that would need to be rectified for the authority to be able to issue a code compliance certificate.[63] The report made general comments about buildings in the subdivision and specific comments about 307 Lakes Boulevard, including but not limited to:

3.18.1. there are a lack of landscaping walls, leading to silt and erosion problems

3.18.2. there is a lack of engineering inspection reports for ground conditions, footings and block walls

3.18.3. there is inadequate drainage behind block walls

3.18.4. there is an overland flow path between 305 and 307 Lakes Boulevard, and this has been exacerbated by a lack of rainwater downpipes

3.18.5. undermining of foundations has occurred, and the extent of the earthworks undertaken was far greater than the approved building consent plans

3.18.6. uncontrolled surface water runoff has occurred

[61] This report was superseded by the report dated 12 April 2018 which is referred to in the notice.

[62] The report also noted the potential for impact from buildings above at 5 and 6 Aneta Way. This would have resulted in 307A being an affected building rather than a dangerous building.

[63] This report is not referenced in the notice issued by the authority on 16 April 2018. Regardless, the report is summarised here as some of the information it contains appears to relate (in part) to the wing wall and deep scour detailed in the notice.

3.18.7. there are concerns about the amount of uncertified fill placed behind the block walls, and the soil used comprises pumice and sand which washes away if exposed to heavy rainfall.

3.19. On 12 April 2018, the building consultant provided a similar report to the authority on 307A Lakes Boulevard. Access was limited at the time of the building consultant's inspection, and no indication was given in the report that the building consultant was able to inspect the roof construction or the associated wall connections below. However, the report included the following comments about the site and foundations to 307A, the west wall, and erosion and scour that I consider relevant to the matter of whether 307 Lakes Boulevard was affected:

3.19.1. The unretained slope to the north between 307A Lakes Boulevard and the Aneta Way properties above has resulted in significant storm water run off.

3.19.2. The entire length of the block wall on the western side does not align with the edge of the footing, and there are multiple lengths of reinforcing stell protruding from the footing.

3.19.3. There are large cracks in the soil on the west side of the building, with one measured at least 1m in depth and 850mm in width, and subsurface erosion evident at the southwest corner.

3.19.4. The building platform and safe slope between 307A and 307 Lakes Boulevard had not been created in accordance with the recommendations for the ribraft slab.

3.19.5. Foundations under the southeast column have been undermined.

Engineering advice provided to the authority

3.20. Table 1 contains a more detailed summary of the findings of the following reports, including the reasons given for considering the dwelling at 307 Lakes Boulevard to be dangerous and affected.

3.21. On 12 April 2018, the authority received a report from a geotechnical engineer.[64] In summary, the conditions for the buildings to be dangerous could be large underground voids, which the author considered "unlikely", or enlargement of small voids due to uncontrolled stormwater in periods of heavy or prolonged

[64] Titled "Bella Vista – Lakes Boulevard & Aneta Way: Geotechnical assessment of dangerous buildings", dated 12 April 2018. The conclusions reached in this report were based on observations of existing site conditions, a limited amount of subsurface information available at that time, and engineering judgement, but without any site-specific investigations or quantitative analysis.

rainfall.[65] On the basis of the latter scenario, the geotechnical report concluded the dwelling (307 Lakes Boulevard) should not be occupied until work was carried out to stabilise 307A Lakes Boulevard.

3.22. On 12 April 2018, the authority also received a structural engineering report from engineer 2.[66] This report was based on an initial inspection of the dwelling[67] by engineer 2 on 6 March 2018, and further "destructive testing" conducted on 14 March 2018 at 307 Lakes Boulevard. In summary, the structural assessment report concluded the dwelling was dangerous from a structural perspective due to the as-built construction of the wing wall.

3.23. On 14 April 2018, the authority received an addendum report from engineer 2.[68] In summary, the addendum report provided structural advice with respect to possible roof uplift of dwellings in the subdivision in a "storm weather event". Due to broad concerns with the "lintel and wall bottom plate connections not [being] installed in accordance with the design…for residential buildings", engineer 2 considered buildings in the subdivision to be dangerous and affected.

3.24. The notice issued by the authority on 16 April 2018 referenced the geotechnical report and the structural engineering reports of 12 March and the addendum report of 14 April 2018.

Table 1. The reports' findings

The geotechnical report
Unretained slopes up to approximately 6.0m high behind the Lakes Boulevard buildings are likely to become unstable in heavy or prolonged rainfall. This "could result in destabilisation of 5 and 6 Aneta Way, and the potential collision of debris with the buildings below on Lakes Boulevard". As part of the assessment, the geotechnical engineers had considered the proximity of the buildings to the unretained slope and the likely effects of slope failure (including loss of foundation support and partial building collapse as well as impact from a soil slurry and debris from an upslope building). Factors increasing the likelihood of instability are over-steep cuttings, poorly compacted fills and poor stormwater controls. Ongoing erosion and the lack of support to parts of the foundations of 307A Lakes Boulevard is likely to cause partial collapse of the masonry walls.

[65] Prolonged rainfall was described as two or more weeks.
[66] Titled "307 Lakes Boulevard, Tauranga: Structural Inspection" (dated 12 April 2018).
[67] The initial inspection assessed 21 dwellings at the subdivision; this determination only considers the relevant information in respect of 307 and 307A Lakes Boulevard.
[68] Titled "Bella Vista Subdivision – Storm Weather Event" (dated 14 April 2018).

Drainage measures behind masonry retaining walls have been poorly installed.

There did not appear to be any subsurface voids that could damage building foundations "at this stage" but that might change with heavy or prolonged rainfall. Regarding 307 Lakes Boulevard[69], the Ground Penetrating Radar (GPR) survey "indicates relatively normal ground conditions, with little or no indication of cavities" and "scala data and auger logs also indicate generally more stable formations".

Regarding a number of properties at the subdivision, including 307A Lakes Boulevard[70], the "GPR has identified issues such as potential small cavities, very weak/porous and unconsolidated sand/pumice. This correlates with scala data indicating weak soils at depth. The auger holes in this area did not directly intersect any cavities, though this is possibly because the auger holes were not positioned accurately over the GPR anomalies, and/or the small cavities are difficult to identify when augering into sands. No large, open cavities are interpreted on the processed GPR data".

There is a deep scour between 307 and 307A Lakes Boulevard that could destabilise the foundations and structure of 307A.

There is a risk of the building [307] being hit by debris from 307A Lakes Boulevard.

There is an unretained soil face between [307A] and 307 Lakes Boulevard

Work is required to remove or reduce the danger including stabilisation of 307A Lakes Boulevard, and repair of deep scour damage.[71]

307 Lakes Boulevard should not be occupied until stabilisation of 307A Lakes Boulevard has been undertaken.

The structural assessment report

The report discussed the general condition and completeness of the dwelling at the time of the inspections and identified structural issues (eg incomplete lintel uplift fixings, roof bracing fixings, bottom plate fixings etc) and options for remediation.

With regard to the wing wall, the report noted the footing was 300mm wide x 300m deep, and the wall was 2.8m high and retaining 1.8m of soil. This type of wall is limited to a maximum of 1.4m high under NZS 3604:2011, therefore the wall "does not comply with the consented plans and would not be able to support the retained soil loads".

[69] The report also referred to four other properties and a right of way at the subdivision which are not included here as they do not relate to this application for determination.

[70] This part of the report provided general information about ground conditions found at a total of 16 properties (including 307A Lakes Boulevard).

[71] The report included 307 Lakes Boulevard in the conclusion that there were eight dangerous buildings, whereas the content of the report suggests that 307 Lakes Boulevard was affected and 307A Lakes Boulevard was the dangerous building that is adjacent or nearby 307.

The report referred to section 121, and what was meant by "the ordinary course of events" and "likely to cause injury or death", and concluded the dwelling was dangerous:

> "… due to the basement [wing wall] which has been constructed to a height greater than the permissible levels outlined in NZS 3604 and the wall is retaining soil loads it is not designed to withstand. Therefore, the wall is at risk of failure under everyday static soil pressure loads of which the consequence is likely to cause damage to the property and injury to persons within the vicinity of the wall."

The addendum report

Lintel and wall bottom plate connections (which connect the roof to the floor) had not been installed in accordance with NZS 3604:2011, which was a common structural defect identified in "many of the Bella Vista dwellings".[72] These dwellings were "at risk of damage during high winds if the roofs separated from the supporting walls due to the lack of fixings".

The report provided background information on design criteria for Importance Level 2 structures[73] with a design life of 50 years for a 1 in 500-year wind event[74], and stated it "should be a 10% probability the structure will be subjected to the design wind load in the life of the structure (this is [the] link between 50 year design life and a 1 in 500 year event…)".

The gust wind speed was calculated to be 30.9 metres per second.

The report included calculations regarding wind gusts and roof weight and said that under gale force winds[75], which could be expected to occur every year, there was a "significant risk" that the roofs on these dwellings could lift off.

The report concluded:

> "Under s121 of the Building Act the Bella Vista dwellings with lintel and wall bottom plate connects not installed in accordance with the design code for residential buildings can be classified as 'dangerous' …
> Buildings immediately adjacent to the buildings determined to be 'dangerous' … can be classified as an *affected building* …

3.25. With respect to the test of whether a building is dangerous under the Act, both the geotechnical and structural assessment reports noted that the phrase "in the ordinary course of events" in section 121 had been considered in the New Zealand

[72] The addendum report did not identify an individual dwelling, or number of dwellings, to which its findings related. A general reference to "Bella Vista dwellings" was used.

[73] *AS/NZS 1170.0.2002 – Structural design actions, Part 0: General principles,* Amendment Number 5, September 2011, Table 3.2 – "Importance levels for building types – New Zealand structures".

[74] Ibid, Table 3.3 – "Annual probability of exceedance".

[75] Defined in the report as average wind speeds of between 62 to 74 km/h with peak gusts exceeding the average by 150%.

District Court to mean "the usual gamut of climatic occurrences likely to be encountered in this country" [76], and that the phrase "likely to cause injury or death" had also been considered in the courts[77] to mean a mere possibility is not enough and a reasonable consequence or something which could happen is required.[78]

3.26. The authors of the geotechnical report also stated their understanding was "that there must be a reasonable probability that the building would cause injury or death unless it got timeous attention", and that section 121 was for protection of the public and "is to be interpreted in a fair, large and liberal way". They considered if the sitework "(slopes and erosion features) could interact with a building in the ordinary course of events in a manner likely to result in injury, death or damage to other property, then the building itself was dangerous for the purpose of section 121".

The notice – 307 Lakes Boulevard

3.27. On 16 April 2018, the authority issued the notice to the previous owner.[79] At that point no code compliance certificate had been issued.[80] However, the construction of the dwelling was largely complete with exterior cladding installed and the internal linings in place.

3.28. The notice stated that pursuant to section 124(1), and "informed by expert advice", the authority is satisfied the dwelling is dangerous and affected for the purposes of sections 121(1)(a)[81] and 121A respectively.

3.29. Under the heading "Dangerous building" the notice set out the following particulars:

> 2. As outlined in the structural engineering report prepared by [Engineer 2] dated April 2018, the addendum report from [Engineer 2] dated 14 April 2018 and the geotechnical engineering report … dated 12 April 2018.

[76] District Court of Rotorua, *Rotorua District Council v Rua Developments Ltd*, Judge McGuire, 3 March 1998, NP number 966/97.

[77] *Auckland City Council v Weldon Properties Limited*, [1996] DCR 635 (upheld on appeal in *Weldon Properties Ltd v Auckland City Council* HC Auckland HC26/97, 21 August 1997).

[78] The text provided by engineer 2 was his own summary and not a direct copy of the text used in the judgment issued by the District Court which states "Nor is a mere possibility enough. What is alleged must be "*a reasonable consequence*" or "*could well happen*"".

[79] The issue of the dangerous and affected building notices on 16 April 2018 had the effect of taking the place of the warrant but still required the authority to comply with section 130 (Territorial authority must apply to District Court for confirmation of warrant).

[80] Section 95 Issue of code compliance certificate.

[81] The notice referred to section 121(a), which appears to be a typographical error.

> 3. In particular:
>
> a. The basement blockwall [the wing wall] has been constructed to a height greater than the permissible levels outlined in NZS3604 and the wall is retaining soil loads it is not designed to withstand. Therefore, the wall is at risk of failure under everyday static soil pressure loads of which the consequence is likely to cause damage to the property and injury to persons within the vicinity of the wall.
>
> b. There is a deep scour between 307 and 307A Lakes Boulevard that could destabilise the foundations and structure of 307A.

3.30. The notice included the requirement that work be carried out to reduce or remove the danger and included 'suggested' work, with the following related to the wing wall:[82]

> Install a temporary barrier to retain the soil loads. Prop and demolish the existing concrete block wall. Install a new concrete block retaining wall designed to resist the retained soil loads.

3.31. Under the heading "Affected building" the notice stated there were dangerous buildings adjacent to or nearby the dwelling, which meant 307 Lakes Boulevard was "affected". The notice only referred directly to one adjacent or nearby building (307A). It gave the following particulars:

> 8. … There is a risk of this building being hit by debris from 307A Lakes Boulevard. Work will need to be carried out, including stabilisation of 307A Lakes Boulevard. In particular, this building is affected for structural reasons because there is a risk that the roofs of adjacent or nearby buildings will lift in gale force winds and could cause harm to people occupying this building.

3.32. The notice implied there were a number of "adjacent or nearby dangerous buildings", but it did not identify which buildings the authority considered were relevant other than 307A Lakes Boulevard.

The dangerous and affected notice for 307A Lakes Boulevard

3.33. On 16 April 2018, a dangerous and affected building notice was also issued to the then owner of 307A Lakes Boulevard.

[82] Included in the notice as item 6, sub-item "h".

3.34. The notice stated that pursuant to section 124(1), and "informed by expert advice", the authority is satisfied the dwelling is dangerous and affected for the purposes of sections 121(1)(a)[83] and 121A respectively.

3.35. This notice did not state that there was a risk that the roof of 307A Lakes Boulevard was likely to lift off in gale force winds and cause harm to people occupying adjacent or nearby buildings.

3.36. Under the heading "Dangerous building" the notice referred directly to the geotechnical report (refer to paragraph 3.20). The notice included (but was not limited to) the following particulars:

3.36.1. There is deep scour between this building and 307 Lakes Boulevard.

3.36.2. There is an unretained soil face between this building and 307 Lakes Boulevard.

3.36.3. There is [a] risk that the scour parallel to building foundations results in foundation and wall collapse.[84]

3.37. The notice also detailed invasive testing by the authority's expert structural engineers on other buildings in the subdivision. This had "identified seven key structural defects (lack of roof bracing, lack of lintel fixing, lack of bottom plate fixing, lack of steel beam fixing, lack of floor joist fixing, lack of flooring sheet fixing and inadequate blockwall reinforcing)". The notice stated:

> Given the systemic structural defects that have been identified across the development and in light of the fact that all buildings were built by the same builder, at the same time and using similar designs and materials, the [authority] is satisfied that it is able to make an informed and reasonable assumption (until it can confirm otherwise) that the same defects exist in this building.

3.38. The notice included suggestions for reducing or removing the danger, including in relation to the ground conditions: "Scour to be repaired under the direction of a…geotechnical engineer."

[83] The notice referred to section 121(a), which appears to be a typographical error.

[84] The notice did not identify which foundations were at issue, or which foundation and wall was at risk of collapse. Regardless, for the purposes of this determination and based on the information contained in the geotechnical report, I have assumed the notice was referring to the concrete blockwork wall and its supporting foundations at the lower ground level along the west elevation of 307A Lakes Boulevard.

Additional information

3.39. The authority received additional information regarding 307 Lakes Boulevard after the notice was issued on 16 April 2018.

3.40. On 20 April 2018, engineer 2 sent an email to the authority titled "Bella Vista Buildings – Wind Direction Multiplier Explanation…". Engineer 2 referred to its addendum report dated 14 April 2018 regarding the risk of the buildings in the subdivision being damaged during a gale wind event uplifting the roofs from buildings with inadequate connections between the roof and the first floor. Engineer 2 confirmed "this assessment was based on a gale wind event (which can be expected to occur at least yearly) and the resulting peak gust wind speed was calculated to be 30.9 [metres per second] … from any of the cardinal directions". The wind gust pressure assessment was based on New Zealand Standard AS/NZS 1170 *Structural Design Actions*, Table 3.2.

3.41. The Heath Report, commissioned by the authority, was published in June 2018. It included a discussion on the background to, and issue of, the dangerous and affected building notices, including 307 Lakes Boulevard. Refer to Appendix B, table 2 for extracts from this report.

3.42. A geotechnical report dated 30 April 2018 was provided to the authority. The noted widespread issues across the subdivision and the history of erosion and slumping. The report commented on surface observations during site visits, noting the pipe erosion observed below the corners of the floor slabs at 307A Lakes Boulevard and surface collapse of subsurface erosion channels. It noted the extent that subsurface piping may have developed during construction was unknown, and:

> We note that 307A Lakes Boulevard is one of the properties for which we have some documentation for the repair of [the historic] deep scour. The documentation is dated seven weeks prior to the floor being poured. This is a significant period of time over the winter period and it is unknown if additional scour occurred that was not repaired under engineer supervision.

3.43. The report included a photograph dated May 2017, which identified fill placed below the southwest corner of 307A Lakes Boulevard. Regarding the results of ground penetrating radar (GPR) to identify any underground features, the report noted the findings for 307A correlated with Scala penetrometer data indicating weak soils at depth, but no large open cavities. The GPR findings for 307 indicated "relatively normal ground conditions" and generally more stable ground conditions than those in 307A.

3.44. The author commented that:

> At this stage there do not appear to be any subsurface voids that could immediately damage building foundations. However, this may change with heavy or prolonged rainfall events, and over the 50 years life of the building significant changes may occur. … Based on the information that we have reviewed as part of this assessment we are not able to confirm that the buildings and land do not have an elevated risk of damage due to erosion or subsidence over the life of the buildings, unless there is extensive remediation of the ground surface, drainage and piped surfaces.

3.45. In November 2018, the authority agreed a settlement to purchase the property.

3.46. On 11 April 2019 and 3 May 2019, engineer 2 conducted a site inspection of the dwelling while demolition works were underway[85], at which stage the internal linings on the lower level had been removed.

3.47. On 10 June 2019, engineer 2 provided a report to the authority.[86] The report is based on five site inspections conducted by engineer 2 between 14 March 2018 to 3 May 2019. The report summarised the background to the issue of the notice by the authority and the methodology adopted for demolishing dwellings in the Bella Vista development. The demolition work allowed engineer 2 to inspect 307 Lakes Boulevard on 11 April 2019 and 3 May 2019 "while the demolition works were underway".[87] The report stated:

> Based on the number and severity of the structural defects identified to the [dwelling] at 307…Lakes Boulevard during our April / May 2019 inspections, the [dwelling has] been correctly classified as Dangerous…in accordance with the provisions of the Building Act 2004.

3.48. Specifically in respect of the 2.4m long wing wall, engineer 2 summarised the defect as:

> The retaining wall was detailed on the consent drawings to be 1.0m high but was actually constructed as 2.8m high and retaining soil to a height of 1.8m. The wall is not able to resist the soil loads as the footing size (300mm wide x 300mm deep) is inadequate to support the wall soil loads.

[85] It is not clear when the demolition works commenced, albeit engineer 1 refers to a date of 14 January 2019 in his "Bella Vista Evictions Time Line" document (dated 14 October 2020).

[86] Titled "Bella Vista Development – 307 [and] 311 Lakes Boulevard – Structural Defects". The structural defects identified in respect of 311 Lakes Boulevard are outside the matter for determination in this application and are not discussed further.

[87] The report identified a number of structural defects. However, only one was related to the matter for determination.

3.49. On 11 June 2019, engineer 2 provided a report to the authority titled "Building Code Compliance – 307 [and] 311 Lakes Boulevard – Geotechnical and Civil Defects". In respect of 307 Lakes Boulevard the report included but was not limited to the following:

3.49.1. For the foundations, "good ground" was assumed with a bearing capacity of 300kPa.

3.49.2. Referred to the site inspection and records provided by engineer 1 in assessing "good ground" (refer to paragraph 3.6).

3.49.3. Observations that the tests and the data recorded by engineer 1 were not in accordance with NZS 3604:2011[88] or "the B1 compliance document, or one of the alternative methods from NZS 4402:…".[89]

3.49.4. Post construction soil testing was conducted in March and April 2018, and the results were recorded in a report dated 19 April 2018. Subsequently, engineer 2 recommended additional intrusive investigations be undertaken at 307 Lakes Boulevard; the results were presented in another report dated 19 September 2018. The tests were conducted by a specialist geotechnical company. Engineer 2 interpreted the soil testing results and stated, "there is a pronounced difference in soil strengths recorded by [engineer 1]" and the subsequent geotechnical tests, and the "testing indicates that the soil does not have the strength for foundations on building consent BC56947". Engineer 2 concluded that "as an assumed bearing capacity was adopted and independent testing indicates that the ground does not have the strength assumed in the design, foundation soil failure is likely" and "the natural ground does not comply with clauses B1 and B2 of the Building Code".

3.49.5. The masonry wall on the north side of 307 Lakes Boulevard is backfilled with a mixture of sand and silt.

3.50. In June 2019, the building consultant provided another report to the authority titled "307 Lakes Boulevard, Tauranga". The building consultant confirmed they had inspected the property on multiple occasions since February 2018; this included inspecting the dwelling in 2019 after the removal of claddings and linings at basement level as it was being prepared for demolition. The building consultant did

[88] Section 3 – *Site Requirements*.

[89] New Zealand Standard NZS 4402 *Method of testing soils for civil engineering purposes*. I note the version is 1986, with a supplement 1 issued in 1988. It appears that the reference to NZ4402:1998 in the report is a typographical error.

not offer an opinion on whether the wing wall was dangerous, but the report did state the following:

3.50.1. Scan results have confirmed that reinforcing steel to the footings and block retaining wall is not as per the building consent plan.

3.50.2. The wing wall under the deck exceeds the design height of 1.0m.

3.50.3. The as-built construction shows the wing wall is 2.6m in height[90], and it is unclear whether it has been constructed to the same design as the balance of the retaining wall.

3.50.4. Backfill used behind the block retaining walls is not in accordance with the approved plans and has been "contaminated with construction waste including timber, plastic, [and] broken bits of block and concrete".

3.50.5. Significant scouring and erosion of the land has occurred as a result of failing to take proper account of Clauses E1 Surface Water and F5 Construction and Demolition Hazards.

3.50.6. Erosion has affected the backfill behind the block wall and washed-out drainage on this building.

3.51. On 17 June 2019, the authority advised the Ministry that the dwelling's upper storey had already been removed from the site but the "basement walls remain in situ".

3.52. On 18 October 2019, the authority emailed the parties to confirm the "masonry block walls" at 307 Lakes Boulevard would be removed the week commencing 21 October 2019.

3.53. On 23 October 2019, the developer requested to be in attendance to witness the demolition of the walls and measure the steel reinforcement.[91]

3.54. The block walls were demolished in late 2019.[92]

[90] I note this dimension differs from the information provided by the engineer 2 and second expert which states the as-built height is 2.8m.

[91] The developer referred to being in attendance during part of the demolition of a wall at 311 Lakes Boulevard on or about 21 October 2019, but it is not clear if the developer attended site during the demolition of 307 Lakes Boulevard.

[92] On 25 November 2019, in an email to the Ministry, engineer 1 indicated he was "permitted on site during the destruction of the buildings". However, Engineer 1 did not confirm whether this is included 307 Lakes Boulevard, or on which date(s) demolition of the block walls occurred.

4. Initial submissions

The authority

4.1. The authority provided information that it relied on in making its decision to issue the notice, namely the geotechnical report and the structural engineering reports of 12 March and 14 April 2018 (see from paragraph 3.20, including Table 1).

4.2. The authority provided additional information that was obtained after the issue of the notice (see from paragraph 3.39).

4.3. Other documents provided by the authority included:

4.3.1. Copies of the plans, specifications, and inspection reports relating to building consent 56947.

4.3.2. Photographs of 307 Lakes Boulevard taken prior to demolition.

4.3.3. As-built topographical survey of 307 Lakes Boulevard dated 18 April 2018.

4.3.4. A "geotechnical completion report" dated 24 April 2015 related to completion of the earthworks for two stages of the Bella Vista sub-division.

4.3.5. An undated copy of the authority's "dangerous and insanitary buildings" policy.[93]

4.3.6. A copy of the District Court judgment *Tauranga City Council v Cancian* dated 10 December 2020.[94] The authority referred to several paragraphs in the judgment, including but not limited to:

> [405] The rear wall was built beyond design height, it was a retaining wall and required engineering specification as did the footings.
>
> [406] [Engineer 2] determined that the as built height of the rear [wing] wall was 2.8 m and was sited on inadequate footings which were designed for a 1 m NZS3604 wall and that the 2.8 m wall is at significant risk of failure.
>
> [423] In relation to the rear [wing] wall I do not accept that there was no need to inspect it or that it was to be buttressed on both sides. Nor do I accept that the footings were adequate.

[93] Section 131.
[94] *Tauranga City Council v Cancian* [2020] NZDC 25470.

4.4. In a letter to the Ministry dated 23 December 2020, the authority stated:

> The High Court has concluded, in the context of a leaky building case, that because a defect exists in one unit of a multi-unit complex, it is reasonable to assume that the same defect exists elsewhere.[95]

4.5. The authority also referred to *Tauranga City Council v Cancian*:

> … given the extent of random testing across a variety of walls in a number of [dwellings] there is a sound basis to infer that the reinforcing steel discrepancies are endemic throughout the subdivision and that the samples resulting from the random invasive testing reflect the overall construction of the particular wall in question.[96] I accept that the evidence establishes that.

Engineer 1

4.6. In support of their view the building was not dangerous, Engineer 1 stated the wing wall had "remained in place in a stable and secure form for 12 months leading up to [the cyclonic] event. And continued to remain in place, stable and secure until demolished by [the authority in] mid-2019", and this was despite the wing wall being "subject to two prior equally significant and disruptive storms in the 5 weeks leading up this event.[97] Plus other storm events during the 2½ years it existed". The engineer also stated, "no persons had been injured or property damaged at any time during the ordinary course of events from any of the six similar wing walls that had been built on the 21 dwellings".

4.7. Engineer 1 provided a timeline of events[98] that led up to issue of the notice, the subsequent demolition of the dwellings at subdivision (including 307 Lakes Boulevard), and several reports issued thereafter (including the Heath Report).[99]

4.8. Engineer 1 queried the process the authority had followed when it issued the notice and the appropriateness of the technical advice the authority received prior to the

[95] *Three Meade Street Limited v Rotorua District Council and Ors* [2005 High Court Auckland] 1 NZLR 504. The authority did not state the relevant part(s) of the judgment upon which it relied.

[96] The particular wall in question refers to a construction at 297 Lakes Boulevard. That dwelling is outside the scope of this determination. Regardless the text from the judgment has been provided here as the authority emphasised there is sound basis to consider that discrepancies are endemic throughout the subdivision and the judgment accepted the evidence before the court establishes that.

[97] Cyclone Fehi and Cyclone Gita in February 2018. Refer to National Institute of Water and Atmospheric Research (NIWA) New Zealand Climate Summary: February 2018, issued on 5 March 2018, available at https://niwa.co.nz/sites/niwa.co.nz/files/Climate_Summary_February_2018_Final.pdf.

[98] The document is dated 14 October 2020.

[99] Engineer 1 also referred to several other engineering reports from two companies that the authority may have obtained prior to issue of the notice. However, these reports were not referenced in the notice issued by the authority.

issue of the notice, and the "precautionary approach" taken by the authority in exercising that decision and the forecast cyclone.

4.9. Regarding the first experts report, Engineer 1 made some observations about the accuracy and completeness and did not agree with the inclusion of comments that Engineer 1 considered were unrelated to the substantive matter. In responding to the report, Engineer 1 submitted:

4.9.1. No underground erosion had been found, and there would be numerous circumstances that **if** found to occur, could cause the building to be classed as dangerous

4.9.2. The first expert had assessed the "wrong wall section detail".

4.9.3. Drainage behind the retaining walls was installed "as per the [authority's] building inspector, approved variation".

4.10. In response to the second expert's report, Engineer 1 submitted:

4.10.1. Any and all building projects in the ordinary course of events, with a form of uncompleted building work, could be deemed to be a dangerous or affected building.

4.10.2. The engineers advising the authority were unsure of the as-built footing type associated with the wing wall, and a reasonable assumption would have been an L-shaped retaining footing similar to the adjacent wall.

4.10.3. No evidence or concern was raised by the authority or its engineering advisors over the detailing of horizontal wall steel tie-in to the adjacent block wall.

4.11. Engineer 1 referred to and provided copies of reports prepared by geotechnical engineers and issued to the authority dated 14 March 2018 and 18 March 2018 (refer paragraphs 3.16 and 3.17).[100]

4.12. Engineer 1 referred to the matter of the steel reinforcement used in the wing wall raised by expert 2 and how it ties to the other walls, and that this was not considered by the authority or its technical advisors prior to the issue of the notice.

[100] Neither of the reports are referred to directly in the notice issued by the authority.

The Developer

4.13. The developer provided a copy of the scan results of the vertical steel reinforcement in the wing wall, and stated the wall was only 13 blocks high (not 14 blocks or 2.8m).

4.14. The developer also stated that the scouring "behind the wall…was done when [the authority] failed to maintain the sites and as for the fill behind the wall, it has never changed".

4.15. The developer provided several emails and some photographs[101] of the two properties. The developer was of the view that when it managed the site "the grounds were acceptable for a building site, with no visible scars or ruts on the landscape" and referred to photographs dated 13 October 2017. The developer also stated there was a "noticeable decline in maintenance" by the authority after the developer went into voluntary liquidation in November 2017, "leading to the emergence of unsightly ruts and scores in the terrain".[102]

Engineer 2

4.16. On 24 March 2020, engineer 2 made a submission, which raised but was not limited to the following:

4.16.1. Engineer 2 considered that the process it followed when undertaking the dangerous building assessments was "robust, responsible and correct for the limited information that was available at the time".

4.16.2. The meaning of "ordinary course of events" can and should also be taken to mean the load scenarios that the building and its elements must be designed to resist without failure in accordance with AS/NZS 1170.

4.16.3. The wing wall was designed to be 2.4m long x 1.0m high and not detailed to support any backfill but only to support the gravity loads from the timber deck above.

4.16.4. The wing wall is retaining soil to a maximum height of 1.8m and a minimum of 1.0m.

[101] Three of the photographs were dated prior to issue of the notice, and the remaining appeared to be taken after the issue of the notice. The developer also provided a video recording of the site (dated 29 April 2019) that showed a number of the properties along the Lakes Boulevard frontage.

[102] It is not for this determination to consider which entity was responsible for maintaining the site or assign responsibility to whoever was accountable or liable for the ground conditions.

4.16.5. Engineer 2 “conservatively analysed [the wing wall] as a propped cantilever retaining wall 2.8m high with the top of the wall supported laterally by the timber deck and no surcharge loads”.

4.16.6. The calculations (provided by engineer 2) show that the…footing is unable to resist the shear loads at the base of the [wing] wall and the wall will fail in foundation sliding. The calculations assumed both dry and wet conditions.

4.16.7. The failure of the wing wall would result in people falling from the deck or being hit by building debris if they were in the alcove below.

4.16.8. The sliding failure of the wing wall is therefore one element that confirms the dwelling at 307 Lakes Boulevard was correctly classified as dangerous, and the dwelling was not safe to be occupied.

4.16.9. The site has a history of severe scour issues due to the highly erodible pumice soils (refer to figure 8).

4.16.10. 307 Lakes Boulevard “was not considered geotechnically dangerous” because there was no clear evidence of severe erosion at the time of the inspections completed by the authors of the geotechnical report in April 2018.

4.16.11. 307 Lakes Boulevard was assessed by several chartered geotechnical engineers and assessed as an affected building due to potential impact from building debris originating from 307A Lakes Boulevard.

4.16.12. If slope failure occurred, soil and/or building debris from 6 Aneta Way had the potential to impact 307 Lakes Boulevard.

4.16.13. There was significant erosion, both of the surface and below the ground surface, which extended under the foundations under the load bearing masonry wall in the western side of 307A Lakes Boulevard.

4.16.14. The site’s “pumice soils had a history [of] severe and rapid erosion occurring in heavy rain events”.

4.16.15. The extent of subsurface erosion around 307A Lakes Boulevard was unknown at the time of the assessment by engineer 2 in April 2018. However, engineer 2 made a judgement call that 307 Lakes Boulevard was an affected building due to its proximity to 307A Lakes Boulevard and the potential of building materials impacting the dwelling in the event of a sudden scour induced collapse of 307A Lakes Boulevard.

4.16.16. The authority undertook repairs to the scour, laid new drainage, and constructed more silt fences. This inspection and repair process was monitored and repeated several times throughout 2018 (after the issue of the notice).

Figure 8: Scour and erosion between 307 and 307A Lakes Boulevard
(Note: The date of the photograph is unknown; photograph reproduced from the report by engineer 2 report dated 24 March 2020)

4.17. Engineer 2 also made submissions in response to those of the developer. Engineer 2 stated:

4.17.1. The photograph provided by the developer is correctly identified as the wing wall at 307 Lakes Boulevard (refer to figure 9(a)).

4.17.2. The wing wall was constructed 14 blocks high, which equates to 2.8m.

4.17.3. The fill level behind the wing wall is sloping and the ground surface has been subjected to significant scouring / erosion which makes it difficult to establish what the original sloping fills heights would have been when the wall was backfilled (refer to figure 9(b)).

4.17.4. The maximum current retained fill height is 1.6m.

4.17.5. To allow for the sloping fill behind the wing wall, engineer 2 conservatively checked the wall foundation sliding capacity assuming a fill height of 1.2m. This would equate to the actual fill height near the mid length of the approximately 2.4m long retaining wall.

4.17.6. Calculations showed that the wing wall is overloaded due to height of the wall, the amount of fill material behind it, and the "unfactored sliding factor of safety…is less than the minimum…required".

(a) Wing wall

(b) Sloping ground to rear of wing wall

Figure 9: Wing wall and sloping ground[103]

(Note: the chalk lines shown on figure 9(a) indicate the approximate location of the vertical steel reinforcement in the wing wall. The photograph does not indicate any horizontal steel reinforcement).

4.18. In response to the developer's opinion that the wing wall is only 2.6m high, engineer 2 provided marked-up photographs that indicate the wing wall is 14 blocks or 2.8m in height.

[103] The photographs provided by engineer 2 are undated.

4.19. Engineer 2 also commented on submissions from engineer 1 and the second expert's report.

4.19.1. In respect of the geotechnical report dated 14 March 2018[104], the author (a chartered professional engineer – geotechnical engineering) concluded "that more detailed checks are required on all buildings before re-occupation can be permitted, and [raised] concerns with all the block walls in the development".

4.19.2. In respect of the "wing wall tie-in to [the] adjacent wall", the wing wall at 307 Lakes Boulevard had been inspected by four chartered professional engineers "and all concluded that there were sufficient concerns with the design and/or construction of the [wall] and there was insufficient information regarding the actual construction to be able to undertake a numerical assessment. Therefore, the precautionary approach for the stability of the wingwall was adopted, which is endorsed" in the second expert's report.

5. The first expert

5.1. The Ministry engaged the services of a firm of chartered professional engineers with structural and geotechnical expertise ("the first expert") to carry out a review of the available information and provide their opinion on whether 307 Lakes Boulevard was dangerous and affected.

5.2. The report from the first expert, 24 October 2019, was provided to the parties and persons with an interest on 18 February 2020.

5.3. The findings of the first expert's report were informed by a desktop study of the plans, specifications, reports, and other documentation available at that time. The first expert carried out a site visit at the subdivision on 11 April 2019, but this did not include 307 Lakes Boulevard.

The first expert's findings

5.4. No weight has been given to the first expert's findings on whether the building was dangerous due to discrepancies in the identification and construction of the wall assess by them.

[104] Report titled: "Lakes Boulevard / Aneta Way Sites: Comments and recommendations from geotechnical site inspection – 14 March 2018".

5.5. However, the first expert also assessed the building's affected status in relation to the "deep scour between 307 and 307A Lakes Boulevard" identified in the notice. The first expert's findings included, but were not limited to, the following:

5.5.1. For failure to occur significant amounts of prolonged rain would be required such that the water table behind the retaining wall essentially reached ground level i.e. the soils were completely saturated.

5.5.2. Whilst [engineer 2] have not proven that collapse is likely, there is a real possibility of issues under sustained, prolonged periods of rain.

5.5.3. Scour in itself cannot be considered dangerous but the overall effects of long-term deep scour rills can initiate a high perched table, water filled tension / shrinkage cracks and ultimately slope stability.

5.5.4. The unretained slope between the buildings is an issue primarily due to the high risk of the rear retaining wall of 307 failing and collapsing. Under this circumstance failure could regress to 307A especially in adverse weather accentuated by the water filled scour…The result could be the undermining of 307A.

5.5.5. With the distance between the two buildings, the most likely scenario is that the raft foundation of 307A will be undermined to some degree. This is likely to cause distress to 307A but probably not cause collapse.

5.6. The expert considered the requirements of AS/NZS 1170[105], and the very high wind zone the truss manufacturer designed to. The expert did not consider the roofs of the adjacent properties would lift in 'gale force' winds, noting that they had not been provided any evidence of the absence of connections for the roofs[106].

5.7. In addition, the first expert stated the authority had interpreted the engineering advice given to them correctly on the notice.

6. The second expert

6.1. The Ministry engaged the services of another firm of chartered professional engineers with structural and geotechnical expertise ("the second expert") to carry out a review of the available information and provide their opinion on whether the dwelling was dangerous for the reasons stated in the notice.

[105] Australian / New Zealand Standard AS/NZS 1170.0:2002 *Structural design actions Part 0: General principles*.

[106] I have taken the view that the first expert was referring to the structural connections of the roof to the loadbearing supporting structure below.

6.2. The report from the second expert, dated 17 May 2021, was provided to the parties and persons with an interest on 20 May 2021.

6.3. The findings of the second expert's report were informed by a desktop study of the plans, specifications, reports, and other documentation available at the time. The second expert did not undertake an on-site investigation.

The second expert's findings

6.4. The second expert analysed and reviewed two criteria:

6.4.1. The geotechnical engineering, addressing the aspects of local and global stability, erosion, as well as soil and groundwater loads likely to be imposed on the wing wall in the ordinary course of events.

6.4.2. The structural engineering, analysing the capacity of the wing wall to carry the loads identified by the geotechnical engineering assessment and the load deformation behaviour of the wing wall.

Geotechnical engineering

6.5. The second expert summarised their findings in respect of the geotechnical engineering:

6.5.1. Their assessment confirms slope movement was likely to affect some parts of the properties above 307 Lakes Boulevard if close to full saturation of the steeper slopes occurred.

6.5.2. Saturation of much of the backfill could occur in the ordinary course of events but full saturation of the slope immediately below 307A Lakes Boulevard "is considered extremely unlikely".

6.5.3. In their opinion large scale slope failure was unlikely and similarly, slope debris was unlikely to significantly affect the wing wall if movement of the slope above the site occurred.

6.5.4. Significant scour channels can develop rapidly in the sorts of materials on and around the site, but "it was unlikely that this would cause damage to, or collapse of, 307 Lakes Boulevard".

6.5.5. Direct loading could potentially arise from slope failure above 307A Lakes Boulevard that was sufficient to cause collapse of 307A onto 307 Lakes Boulevard or undermining of 6 Aneta Way to occur such that it collapses or slides onto 307A and ultimately affects 307 Lakes Boulevard.

6.5.9. Movement or the removal of material from between 307A and 307 Lakes Boulevard is likely to be largely associated with erosion. Slope movement into an eroded channel could ultimately occur but will be limited by the depth of the scoured channel. In the opinion of the second expert, while such movement is possible it is unlikely to extend beneath 307A Lakes Boulevard and is highly unlikely to cause collapse of that structure.

6.5.10. In conclusion, the second expert stated:

> Scour is likely to be the dominant effect of prolonged heavy rain on the site. While some slope movement may occur this would be localised and insufficient to cause partial or complete collapse of 307 Lakes Boulevard or the upslope buildings.

6.6. The second expert also referred to the geotechnical data provided by engineer 2 in the report dated 11 June 2019 (refer to paragraph 3.49). Based on that data the second expert stated:

> The soil should not have been considered to be good ground as it did not meet the requirement specified in NZS 3604:2011. To be considered good ground, soil or rock should be capable of permanently withstanding an ultimate bearing pressure of 300 kPa (an allowable bearing pressure of 100 kPa using a factor of safety of 3.0) which has not been achieved.

Structural engineering

6.7. The second expert's findings in relation to the design and as-built construction of the wing wall included, but were not limited to:

6.7.1. The wing wall was built 14 blocks in height which equates to 2.8m. This is much higher than shown on the consented plans.

6.7.2. The scan results of the steel reinforcement indicated that the vertical bars were "at 200mm centre", but there was no investigation to determine the size of the vertical reinforcing, or the diameter and spacing of the horizontal reinforcing. The expert noted the design of the reinforcement shown on the building consent plans was to be D12 at 600mm centres horizontally and R10 [at] 600mm centres vertically.

6.7.3. The height of the retained soils behind the wing wall varied between 0.8 – 1.6m along the length of the 2.4 wing wall.

6.8. The second expert undertook a structural assessment of the wing wall using a specialist analysis programme.[107] The expert considered (amongst other factors) soil pressure, surcharge of the retained ground, potential hydrostatic pressure behind the wing wall, sliding resistance, the steel reinforcement used (based on available information), and the horizontal support from the timber deck. The second expert stated:

> The load condition *"in the ordinary course of events"* is interpreted as including all normal weather situations. This means the load conditions include both … dry and wet ground conditions.

6.9. The second expert found the results of the analysis were informed from different loads under wet and dry conditions and the size, type and spacing of the horizontal steel reinforcement. The expert used the specification of the horizontal steel reinforcement shown on the building consent plans (D12mm @600mm centres), as well as builder's record of work (HD12 @400mm centres), and calculated the wall capacity based on that information.

6.10. In *dry* conditions, the second expert concluded that:

> The wall has sufficient capacity to resist sliding shear at the wall footing level.
>
> The moment demands on the wall are within its capacity for horizontal reinforcing comprising D12 [at] 600 [mm centres] or as HD12 [at] 600 [mm centres].

6.11. In *wet* conditions, the expert's concluded that, with 800mm of water head built up behind the wall:

> The wall does not have sufficient capacity to resist wall footing sliding.
>
> If the horizontal reinforcing comprises **D12** [at] **600** [mm centres] then after the water pressure is reduced to zero, the wall horizontal bars still have insufficient capacity to resist the remaining soil pressure imposed on the wall, and the wingwall will become unstable, i.e. **collapse is likely**……The wingwall, the deck, the roof and building will very likely suffer from a partial or total collapse under such conditions. Potentially walls around the deck at first floor level and internal floor will be damaged / distorted.
>
> If the horizontal reinforcing comprises **HD12** [at] **600** [mm centres], then after 5 – 10mm movement the water pressure will be reduced to zero, the horizontal reinforcing will have sufficient capacity to resist the remaining soil pressure imposed on the wall, and the wingwall will be likely to regain its stability, i.e.

[107] "SAFE" – Slab Analysis by the Finite Element method

> **collapse is not likely**……The wingwall, the deck, the roof and the building would not suffer from a partial or total collapse. The deck to wall connection is likely to be damaged.
>
> [If the horizontal reinforcing comprises] **HD12's** at **400** [mm centres]…the wingwall will start to yield in wet conditions, but the wall moment is very likely to reduce and the wing wall will very likely regain its stability after the wall slides for 5 to 10mm. The wingwall, the deck, the roof and the building would be unlikely to suffer from a partial or total collapse.

6.12. In the worst-case scenario, i.e. with D12 horizontal bars at 600mm centres extending into the Type B block wall, and heavy or prolonged wet weather with 2.5kPa surcharge and an 800mm water head build up behind the wall, the wing wall will start to slide and rotate about the connection with wall Types A and B. If the wingwall slides 5mm to 10mm laterally, most of the hydrostatic pressure will dissipate but the soil pressure will still be too high. This means the wing wall will not regain equilibrium and "structural collapse is therefore very likely". In this scenario, the second expert stated this would have the effect of damaging the connection of the timber post to the fixed to the top of the wing wall, causing damage and partial collapse of the timber deck and part of the roof above, and part of the first-floor internal floor and external façade.

6.13. The second expert considered that from their analysis, two critical issues were apparent:

6.13.1. The as-built wall horizontal steel reinforcement is the key structural factor affecting classification of the building as a dangerous building, and

6.13.2. Wall footing sliding resistance is the critical stabilizing force determining whether the wall be classed as dangerous.

6.14. The expert summarised their assessment by stating:

> … in the ordinary course of events (excluding the occurrence of earthquake) the likely behaviour of the wingwall was dangerous and made 307 Lakes Boulevard a dangerous building…[and] the assessment the building was dangerous is based on a conservative assessment as to the horizontal reinforcing in the wingwall and its continuity with Wall B … In [the second expert's] opinion the wingwall was unlikely to affect any neighbouring or nearby buildings under such conditions and therefore would not have been a dangerous building had proof of such reinforcing been readily available.

6.15. In conclusion, the second expert stated that:

> In [their] opinion, at the time of issuing [the] "dangerous and affected building" notice, there was insufficient information to assess the wall stability and load capacity to determine whether the wing wall was dangerous. In [their] opinion applying a precautionary approach in the absence of such information, the threshold for a dangerous building under [section] 121 was met.

7. Further submissions and the second expert's addendum report

7.1. On 24 April 2023, a draft determination was issued to the parties and persons with an interest.

7.2. Engineer 1, who was also responding as the agent for the developer, confirmed they accepted the draft determination subject to several non-contentious comments:

7.2.1. The building has not been "demolished". The upper storey was relocated to another site, and it was the lower storey that was "cleared".

7.2.2. Referred to evacuation notices being issued by the authority on 9 April 2018 preventing access to the sites.

7.3. The authority did not accept the draft determination, and made the following submissions (in summary):

7.3.1. The authority objected to the approach taken regarding the matter to the determined, the issues outside and the role of the determination, and reiterated the importance of 'precautionary principle' in the authority's decision making.

7.3.2. The authority emphasised the phrase "power of decision" under section 177(1) and "[t]he focus is clearly on the power contained in [section] 124, not the substantive assessment itself".

7.3.3. Under section 124, the authority "acquires the right to exercise the power if it is satisfied that a building is dangerous".

7.3.4. The authority referred to advice it had received from a building consultant[108] dated 20 April 2020 on "the importance of the precautionary principle".[109] The advice stated, the precautionary principle "means that where making

[108] This is a different building consultant to the one referred to in paragraphs 3.18, 3.19 and 3.50.
[109] The advice referred to a separate application for determination, but the issues raised are equally applicable to this determination.

decisions particularly ones that involve life safety or have a major economic implication and information is imperfect or not complete the decision made errs on the side of caution".[110] The advice concluded the authority:

> … had reasonable grounds to be satisfied that the building met the tests of being dangerous and affected and therefore in [the consultant's] opinion exercised its powers correctly. That evidence had been provided by competent people and had been subject to a degree of scrutiny and review. Applying the precautionary principle, it was a prudent and appropriate decision for [the authority] to make as the matter involved was one of life safety".

7.3.5. The authority was unable to confirm "what, if any, horizontal reinforcing bar was used and at what centres (or cover)" and "[r]elying on the consented plans or the builder's record of work are both unreliable measures".

7.3.6. The authority is of the view the "deep scour between 307 and 307A was an essential aspect of the [authority's] decision to consider 307 Lakes Boulevard an affected building".

7.3.7. In relation to the roofs of adjacent or nearby buildings, the authority is of the view that relying on the "authority's inspection records to determine the quality of the roof construction at 307A Lakes Boulevard…is an unsafe position to take" bearing in mind the subdivision "didn't comply with the building consents" and noting the advice provided by engineer 2 on this issue.

7.4. Engineer 2 provided a submission in response to the draft determination (in summary):

7.4.1. It agreed with the second expert that significant scour channels can develop rapidly in the sorts of materials on and around the site. The risk of significant scouring was pivotal in engineer 2 recommending the building was dangerous and affected.

7.4.2. The second expert was incorrect in stating "the scour and erosion is unlikely to extend beneath 307A". Engineer 2 referred to a photograph of the southwest corner supporting the block wall at 307A Lakes Boulevard and an officer of the authority "who was able to put [their] entire arm into the scour and was not able to reach the back of it".

[110] The advice referred to section 133BN Principles for exercise of powers. This section was inserted into the Act on 17 December 2019 under Subpart 6B—Special provisions for buildings affected by emergency.

7.4.3. Based on observations by several engineers who visited site there was "a deep scour adjacent to and directly under part of the building".[111] Photographs provided by engineer 2 as part of the submission show evidence of scouring to west side and southwest corner of 307A Lakes Boulevard between it and 305 Lakes Boulevard (refer to figure 1), and one area south of 307A Lakes Boulevard and the northwest corner of 307 Lakes Boulevard.

7.4.4. There was concern that a wall that had external evidence of non-compliant construction could collapse resulting in blocks of masonry and other building materials…impacting the downslope properties including 307 Lakes Boulevard.[112] This meets the definition of a dangerous building and therefore 307A is affected".[113]

7.4.5. The report prepared by the second expert was mistaken with respect to the location of known scour in relation to the building foundations and not informed by a site visit.

7.4.6. There was a risk that failure of the wall at 307A may occur and there were potential debris paths.

7.4.7. At the time the dangerous and affected building notices were issued there were significant and serious concerns about the structural integrity of the masonry walls in the development.

7.4.8. Intrusive investigations were not conducted on 307A Lakes Boulevard, so any steel reinforcement used in the construction of the blockwork walls was not confirmed.[114]

[111] It is not clear whether engineer 2 was referring to just the southwest corner of 307A Lakes Boulevard or any other part of the building.

[112] It is not clear which wall engineer 2 was referring to, but I consider it likely to be the blockwork wall in the southwest corner of 307A Lakes Boulevard (i.e. Wall 3). Engineer 2 did not clarify what they considered to be the issues of non-compliance.

[113] It is not clear whether the reference to 307A was a typographical error, and it was meant to refer to 307 Lakes Boulevard, regardless, this determination does not include the dangerous and affected building notice issued for 307A Lakes Boulevard (including whether it was affected by another building).

[114] Engineer 2 referred to the previous owner of the property not giving permission for any invasive investigations but engineer 2 did note some "starter bars were visible outside of the wall".

7.4.9. The second expert made an incorrect assumption regarding protection provided to inhibit infiltration and scour, and slopes had minimal protection applied.[115]

7.4.10. It was correct to adopt a precautionary approach and assess 307A as dangerous and therefore 307 an affected building, on the basis of:

1) extensive scour and erosion in this area including directly below 307A foundations, and

2) uncertainty with the structural integrity on the masonry wall supported by those foundations; and

3) the Engineering New Zealand Code of Ethical Conduct, which requires engineers to take reasonable steps to safeguard health and safety of people.

7.5. The builder, the previous owners of 307 and 307A Lakes Boulevard, the LBP designer, and LBP roofer, did not provide a response to the draft determination.

Addendum report

7.6. In response to submissions to the draft determination, I sought further advice from the second expert. Specifically with regard to 307 Lakes Boulevard being affected (item b of the notice), if the deep scour between the properties could destabilise the foundations and structure of 307A.

7.7. On 10 November 2023, the second expert provided an addendum report to the Ministry, and a copy was sent to the parties and persons with an interest on 27 November 2023.

7.8. The second expert was of the view:

7.8.1. The footings under the west elevation wall ("**Wall 3**", refer to figure 10)[116] of 307A Lakes Boulevard would have needed to have lost approximately 1.5m of support for there to be a risk of failure of the wall.

[115] Engineer 2 referred to "a light grey filter fabric laid on the batter below the Aneta Way properties" in contrast to the second expert's understanding that shotcrete had been applied to this slope. Engineer 2 noted the fabric was installed "in the latter part of 2018". However, I note, a photograph of the filter fabric, was included in a report for 307A Lakes Boulevard prepared by the building consultant dated 12 April 2018, ie before the notice was issued. The same fabric material was also evident in a similar photograph (dated 7 December 2017) provided by the developer (on 27 July 2023).

[116] Plan 104 revision A titled 'Block retaining wall layout' indicates three walls at ground level, labelled Wall 1, Wall 2 and Wall 3. Wall 1 is across the north elevation of the dwelling, Wall 2 is under the first-floor deck, and Wall 3 is west of a subfloor space behind the garage.

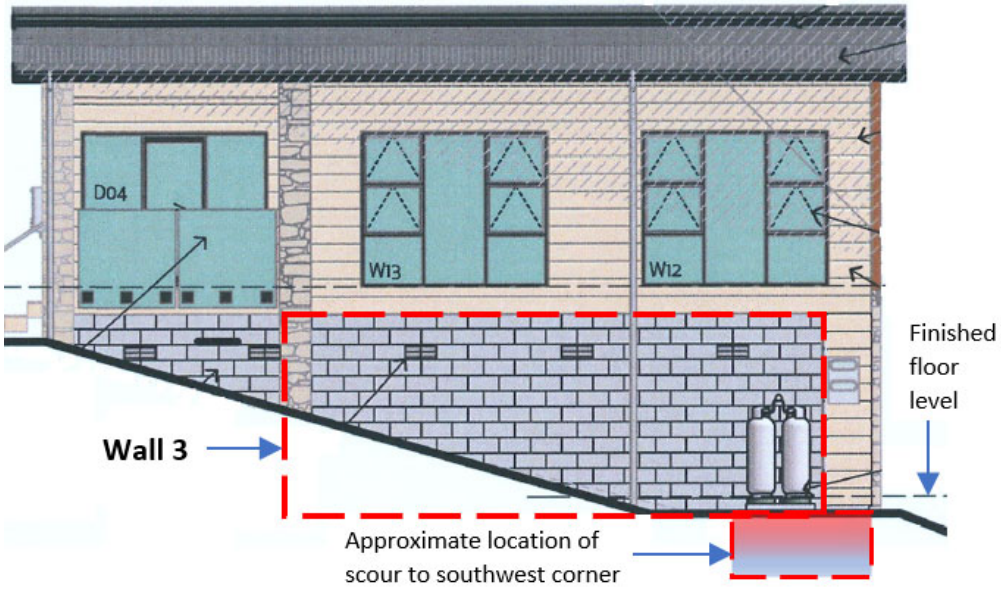

Figure 10: West elevation of 307A Lakes Boulevard (not to scale)[117]

7.8.2. Wall 3 was 6.2m long and constructed of reinforced concrete blockwork supported on a 600mm wide x 300mm thick reinforced concrete foundation. It has been assumed backfill[118] was placed to a depth of least 200mm in the subfloor space between the raft foundation to the garage and the back of Wall 3 (over the foundation). Refer to figure 11.

7.8.3. Taking into account the design information regarding the depth of the foundations[119], it was concluded the footing for Wall 3 would have been constructed 700mm below finished floor level and this would have been at or close to the invert of the perforated drain coil (refer to figure 11).

7.8.4. For the foundation to behave as per the design, it relies on the steel reinforcement starter bars from the foundation to Wall 3 to maintain its equilibrium. Analysis indicates Wall 3 maintains its equilibrium if 1m of end support was lost to the footing.

[117] Figure 10 has been reproduced in part from plan 302 revision B. The area highlighted only shows the approximate location of the scour and is not intended to represent the size or extent of the scour.

[118] Plan 508 revision A indicates the floor to the subfloor space was to be constructed using either a raft foundation or backfill material. It is not clear which construction method was adopted, but it is assumed backfill material was used on the basis plan 105 revision A did not show the raft foundation extending into the subfloor space.

[119] As indicated on plans 507 revision A and 508 revision A and based on a common thickness of 300mm for the foundation.

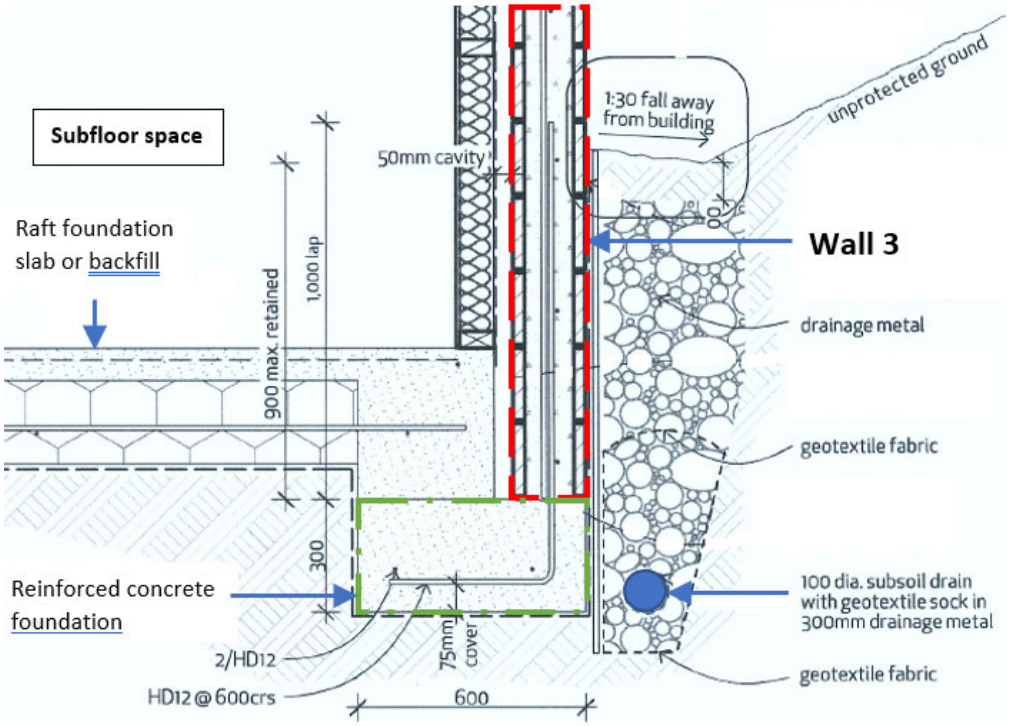

Figure 11: Wall 3 and foundation (not to scale)[120]

7.8.5. From all the documentation made available for review (for the purposes of preparing the addendum report), no evidence of damage or distress to Wall 3 was reported by the engineers or other observers reporting on the condition of 307A Lakes Boulevard.

7.8.6. Failure of Wall 3 would have resulted in loss of support of the first floor which would have had a tendency to buckle and move south towards 307 Lakes Boulevard, while also causing gradual collapse of the roof construction.[121]

7.8.7. The two dwellings were sufficiently close that in the event of undermining of Wall 3 sufficient to cause failure, the collapse could have impacted on 307 Lakes Boulevard, and under such circumstances 307 Lakes Boulevard would be an affected building.

7.8.8. Just outside, to the west of Wall 3, was a perforated subsoil drain coil.[122] The outlet of the drain coil is evident in photographs of the southwest corner of

[120] Figure 11 has been reproduced in part from plan 508 revision A.
[121] The addendum report also noted 305 Lakes Boulevard could have been an affected building in the event of failure of Wall 3 at 307A Lakes Boulevard.
[122] The drain coil is indicated on plans 107 revision B and 508 revision A. It is specified as '100mm diameter subsoil drain with geotextile sock in 300mm drainage metal'. The end of the drain coil was to be connected to a sump located in the southwest corner of the property.

307A Lakes Boulevard. Several photographs show a scour channel downslope of the outlet on a steep portion of ground between 307 and 307A Lakes Boulevard.

7.8.9. Concentrated rainfall runoff (or the natural development of concentrated flows) can lead to progressive formation of channels on the ground surface in response to rainfall.

7.8.10. The recorded behaviour on the site indicated that both runoff from a large, exposed area of the ground surface and discharges from downpipes carrying roof water generated scour channels.[123] The channels were typically narrow but could extend to greater than 1m below the ground surface. For scour to form there must be a source of water that saturates the soil, and the velocity of water flow is a critical factor (eg as a result of a steep gradient). Saturation reduces the soil's shear strength, making it susceptible to erosion. Refer to figure 12.

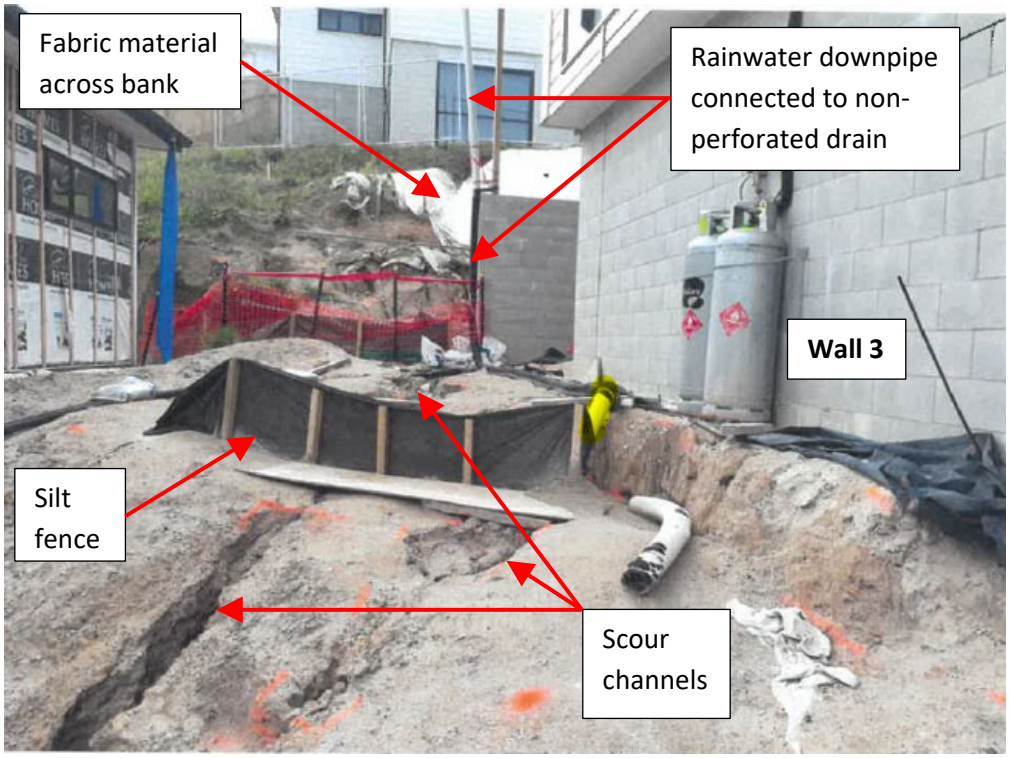

Figure 12: Area between 307A Lakes Boulevard (on the right) and 305 Lakes Boulevard (on the left)[124]

[123] The building consultant referred to the same issues.
[124] The photograph was included in the geotechnical engineer's report dated 12 April 2018.

7.8.11. The catchment area upslope could have contributed to water flow through the drain coil and soil saturation could have occurred beneath the drain coil and caused erosion within the likely poor quality bedding material. However, photographs show the drain coil was connected to a non-perforated drain discharging down towards Lakes Boulevard by 29 March 2018 (this was prior to the notice being issued by the authority on 16 April 2018). Refer to figure 13. Therefore, mitigation measures were taken to manage the risk of water within the perforated drain coil and associated scour.[125]

7.8.12. The direction of scour (as indicated in figure 12) is oriented away from 307A Lakes Boulevard and is some distance horizontally away from Wall 3, mitigating concerns regarding the structural performance of the dwelling.

7.8.13. There was a narrow scour-like feature trending downslope from 307A Lakes Boulevard to 307 Lakes Boulevard, but this was relatively minor and at a distance from Wall 3.

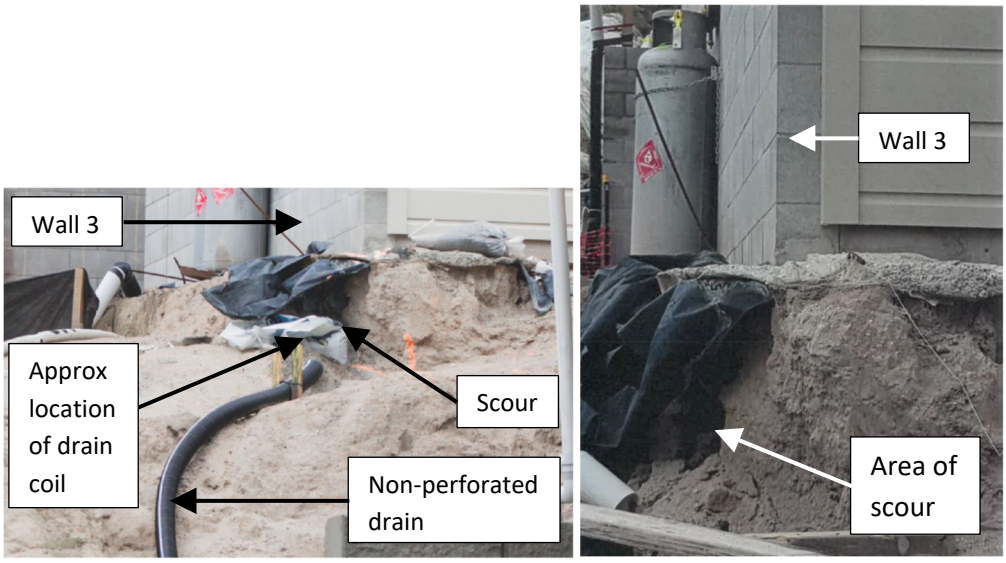

Figure 13: Southwest corner of 307A Lakes Boulevard[126]

7.8.14. For scour to be sufficient to undermine Wall 3 by approximately 1.5m thereby causing failure of the wall, the drain coil would have needed to be

[125] A photograph taken on 7 December 2017 that was provided by the developer did not show non-perforated pipes connected to the roof downpipe or subsoil drain coil but did show a fabric material laid across part of the battered slope between the 307A Lakes Boulevard and 6 Aneta Way. The same photograph showed some signs of soil erosion, though not to the extent apparent in photographs provided by the parties dated February 2018 onwards. It appears that the additional mitigation measures were introduced sometime between 7 December 2017 and 29 March 2018.

[126] The left-hand photograph (dated 30 April 2018) was provided by the developer. The right-hand photograph (dated February 2018) has been reproduced from the report prepared by engineer 2. Labels have been added by me to both photographs.

full and pressurised over an extended period for enough water to flow through the perforations in the drain coil and filter sock. This would have required an extreme weather event involving intense rainfall over several days or at least a week, and possibly not even then. Such an occurrence is outside the ordinary course of events.

7.8.15. With the connection of the Wall 3 drain coil to the non-perforated drain, regular monitoring was an option to manage the relatively low risk of slow and progressive scour.

7.8.16. The scour feature (shown in figure 13) likely formed in this location due to the need for an exit point for the drain coil system prior to the connection of the additional non-perforated drain and adjacent to, not beneath, Wall 3.

7.8.17. There would have been insufficient water discharge from the perforated drain coil to create a void extending more than 1m underneath the footings of 307A Lakes Boulevard.

7.8.18. The vertical face of ground below the gas bottles appears unaffected by erosion (refer to figures 12 and 13).

7.8.19. There was no reported evidence of damage to the raft foundation slab for the garage as a result of hydraulic uplift or loss of support. The development of a cavity between Wall 3 and the raft foundation slab, or beneath it, was highly unlikely in the normal course of events.

7.8.20. In the short time frame available to the engineers advising the authority on the risk posed by 307A Lakes Boulevard to 307 Lakes Boulevard (to consider the aspects of the design and as built structures), it was not unreasonable to conclude 307A Lakes Boulevard posed a significant risk such that it and 307 Lakes Boulevard were considered dangerous and affected buildings respectively.

7.8.21. However, the circumstances necessary for scour to extend at least 1.5m back beneath Wall 3, and for there to be a credible collapse mechanism as a result, it would not occur in the ordinary course of events, including during a tropical cyclone such as that forecast at the time the notice was issued. Accordingly, it is considered 307A Lakes Boulevard was not dangerous, and therefore, 307 Lakes Boulevard was not an affected building.

8. Discussion

8.1. The determination arises from the authority's decision to issue a dangerous and affected building notice on 16 April 2018 for the dwelling at 307 Lakes Boulevard. The decision by the authority was informed by technical advice it had received from several chartered professional engineers specialising in structural and geotechnical engineering.

8.2. The matter to be determined is the authority's decision in issuing the notice. In deciding this matter, I must consider whether the dwelling was a dangerous and affected building as defined in sections 121 and 121A.

The legislation

8.3. One of the purposes of the Act is to provide for the regulation of building work to ensure that people who use buildings can do so safely.[127]

8.4. One of the principles to be applied in exercising a power of decision under the Act is the need to provide for the protection of other property from physical damage resulting from the construction, use, and demolition of a building.[128]

8.5. The Act defines a dangerous building as:

> **121 Meaning of dangerous building**
>
> (1) A building is dangerous for the purposes of this Act if,—
>
> (a) in the ordinary course of events (excluding the occurrence of an earthquake), the building is likely to cause—
>
> (i) injury or death (whether by collapse or otherwise) to any persons in it or to persons on other property[129]; or
>
> (ii) damage to other property
>
> …

8.6. There are various modes of structural failure that can result in a building being dangerous under this definition, including if the building lacks structural integrity whether because of deficiencies in its construction, subsequent damage, excessive

[127] Section 3(a)(i).
[128] Section 4(2)(j).
[129] Section 7 defines "other property" to mean 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.

imposed loadings, or if the structure of the building remains intact but loses support from the ground.

8.7. The courts have considered the definition of a dangerous building in section 64 of the Building Act 1991. I am of the view the following apply equally to the definition in section 121 of the current Act.

8.8. The term "likely" as it relates to a dangerous building as considered by the District Court in *Wheldon (1996):*[130]

> … context is highly relevant to the particular test applied. It must, in my view, depend on the statutory scheme under consideration and what appears to be the desired consequence. In my view, s 64 [the equivalent of section 121 under the Building Act 1991] does not import a test in "likely" akin to probability. That I think puts the test too high. Nor is a mere possibility enough. What is alleged must be "*a reasonable consequence*" or "*could well happen*". The test is no higher than that.

8.9. The phrase "in the ordinary course of events", was interpreted by the District Court ("*Rua (1998)*")[131] as meaning:

> . . . the usual gamut of climatic occurrences likely to be encountered in this country. The provision specifically excludes earthquakes, but it would include the range of temperature variations and different climatic conditions that are likely to be encountered in the course of a year. Such would include, for example, dry and wet spells, heavy downpours, winter storms, equinoctial gales, but it would exclude incidents not normally occurring such as, for example, 50-year floods and cyclones.

8.10. The phrase "likely to cause injury or death", was considered in *Rua (1998)* to mean:

> …that the reasonable probabilities are that the building will cause injury or death unless it gets timeous attention.

8.11. In *Rua (1999)*, "likely" was subsequently held to mean:

> … that there is a reasonable probability[132]; or that having regard to the circumstances of the case it could well happen.

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[130] *Auckland City Council v Weldon Properties Ltd,* 1996 DCR 635 (DC) (upheld on appeal in *Weldon Properties Ltd V Auckland City Council* HC Auckland HC26/97, 21 August 1997)

[131] *Rotorua District Council v Rua Developments Ltd*, 3 March 1998, McGuire J, DC Rotorua NP966/97 ["*Rua (1998)*"]. I note a subsequent judgment added "local conditions", such as Rotorua's more than usually corrosive atmosphere, to that non-exclusive list of criteria (refer to *Rotorua District Council v Rua Developments Ltd*, 17 December 1999, McGuire J, DC Rotorua NP1327/97 ["*Rua (1999)*"]).

[132] With reference to *Dowling v South Canterbury Electric Power Board* [1996] NZLR 676 (NZSC) 678

8.12. The provisions of the Act relating to dangerous buildings that refer to a 'building' can also apply to a *part* of a building.[133]

8.13. The Act defines an affected building as:

> **121A Meaning of affected building**
>
> A building is an affected building for the purposes of this Act if it is adjacent to, adjoining, or nearby—
>
> (a) a dangerous building as defined in section 121
>
> …

8.14. It is evident that for a building to be affected there must be at least one adjacent, adjoining, or nearby building that is dangerous. Further, it only requires proximity to a dangerous building for a building to be affected.

8.15. If a territorial authority is satisfied that a building in its district is dangerous or affected, it has various powers available to it under section 124. These powers include issuing a notice restricting entry to that building for particular purposes, and in the case of a dangerous building to require work to be carried out to reduce or remove the danger.

8.16. For clarity, I note that an authority's assessment of whether a building is dangerous or affected is not the same as a rapid building assessment. Rapid building assessments are carried out when a state of emergency or designation is in place (such as following a major earthquake or flood) and are a brief assessment to ensure the safety of building occupants and the public.

Whether the building was dangerous

8.17. In the following paragraphs I consider whether the building at 307 Lakes Boulevard was dangerous for reasons relating to the wing wall and the deep scour between 307 and 307A Lakes Boulevard.

The wing wall

8.18. It is evident the wing wall had not been constructed in accordance with the approved building consent plans. However, just because the wing wall did not comply with the building consent, it does not follow that the building or part of the

[133] This was the view expressed in Determination 2012/043: "Whether the special provisions for dangerous, earthquake-prone, and insanitary buildings in Subpart 6 of the Building Act that refer to a building can also be applied to a part of a building" (dated 7 June 2012).

building was dangerous. The test in section 121 is not simply whether the building (or part of the building) complies with the Building Code.

8.19. I accept that in the event the wing wall was to become unstable and collapse it would result in damage and partial collapse of the timber deck and that this would be likely to cause injury or death to any person on the deck or in close proximity to the deck.

8.20. I also agree with the conclusion of the second expert, that the moment demands on the as-built wing wall are within its capacity in dry conditions with horizontal reinforcing of either D12 or HD12 at 600mm centres, but its capacity in wet conditions is dependent on the type and spacing of the horizontal reinforcing. And in wet conditions experienced in the ordinary course of events the wing wall is likely to become unstable to the extent that it would lead to partial collapse of the timber deck.

8.21. This makes the type and spacing of the horizontal reinforcing a critical factor in determining whether the building was dangerous in relation to the wing wall.

8.22. The following information and evidence has been presented about the reinforcing used in the construction of the wing wall:

8.22.1. The builder's record of work stated the block wall had been constructed with "HD12 rods [at] 400mm [vertical] and horizontal bars". It is not clear whether this applied to the wing wall and the Type A and B reinforced concrete block walls or just the latter. In my opinion the record of work cannot be relied on because of the contradictory evidence on the spacing of vertical reinforcing apparent in the scan (refer paragraph 2.22).

8.22.2. The scan that showed vertical reinforcement at approximately 200mm centres (refer to figure 9 (a)), but that did not include any indication of horizontal reinforcing. It is not clear whether this is because there was no horizontal steel reinforcement present or if it was outside the scope of engagement of the contractor performing the scan.

8.22.3. The PS4's issued by engineer 1 on 23 March 2017 and 11 April 2017 and associated inspection records, though these did not confirm the type, size, or spacing of the steel reinforcement used in either the wing wall footing or block wall construction.

8.23. There has been no information provided from the demolition of the wall that would confirm the presence of horizontal steel reinforcement in the wing wall.

8.24. I am of the opinion I cannot rely on the builder's record of work, and in the absence of other evidence, it is not possible to establish what type, size, and spacing of horizontal reinforcing was used in the construction of the wing wall, if any. Therefore, I am unable to conclude whether the was dangerous in terms of section 121(1)(a) in relation to the wing wall.

The deep scour between 307 and 307A Lakes Boulevard

8.25. Under the heading "Dangerous building", the notice stated:

> b. There is a deep scour between 307 and 307A Lakes Boulevard that could destabilise the foundations and structure of 307A.

8.26. For considering whether 307 Lakes Boulevard is dangerous due to the deep scour, it is the potential effect of that scour on the foundations and structure of 307 Lakes Boulevard that is relevant. The destabilisation of the foundations and structure of 307A Lakes Boulevard is a relevant consideration for whether 307 Lakes Boulevard was an affected building, which I address later.

8.27. The deep scour and erosion in the pumice soils and backfill material of sand and silt between 307 and 307A Lakes Boulevard is evident in photographs included in the various reports and the video footage that has been submitted. Likewise, there is evidence of souring and erosion during the siteworks to develop these and adjacent properties that indicates the erodibility of the soil conditions generally.

8.28. However, I am of the view building at 307 Lakes Boulevard was not dangerous in relation to that deep scour. In reaching this view I note the following relevant considerations:

8.28.1. The findings in the geotechnical assessment of 12 April 2018 regarding the ground conditions of 307 Lakes Boulevard.

8.28.2. Engineer 2's confirmation that 307 Lakes Boulevard was not considered "geotechnically dangerous" because there was no clear evidence of severe erosion at the time of their inspections completed in April 2018.

8.28.3. The second expert's opinion that while some slope movement may occur it would be localised and insufficient to cause partial or complete collapse of 307 Lakes Boulevard.

Whether the building was affected

8.29. Under the heading "Affected building" the notice stated:

> Additionally, the [authority] considers there are dangerous buildings adjacent to or nearby this building that makes this building "affected" for the purposes of s 121A of the Act. … There is a risk of this building being hit by debris from 307A Lakes Boulevard. Work will need to be carried out, including stabilisation of 307A Lakes Boulevard. In particular, this building is affected for structural reasons because there is a risk that the roofs of adjacent or nearby buildings will lift in gale force winds and could cause harm to people occupying this building.

8.30. In the following paragraphs I consider in turn both the risk of 307 Lakes Boulevard being hit by debris from the structural failure of 307A Lakes Boulevard and the risk that the roof of 307A would lift in gale force winds.

Debris from 307A Lakes Boulevard and destabilisation of its foundations

8.31. It seems the principal item of concern prior to the notice being issued, was the possible effects of deep scour features that may have destabilised the foundations of 307A, specifically wall 3. The authority concluded 307A Lakes Boulevard was dangerous, and in the event it was to collapse (either in part or in full) due to the failure of wall 3, then it was likely to affect 307 Lakes Boulevard because of the proximity of the two dwellings.

8.32. I agree that if the foundations 307A Lakes Boulevard were to be destabilised by the deep scour to such an extent that it was to cause the collapse of the structure (either in part or in full) in a southerly direction, then it is likely to have caused injury or death to any persons in the building or to persons on other property, and likely to damage to other property. Meaning it would meet the definition of a dangerous building under section 121 and given the relative location of the buildings it follows that 307 Lakes Boulevard would be an affected building.

8.33. I note the geotechnical report of 12 April 2018 stated there did not appear to be any subsurface voids that could damage building foundations "at this stage" but that might change with heavy or prolonged rainfall. This finding was repeated in the geotechnical report date 30 April 2018.

8.34. Heavy or prolonged rainfall is to be expected in the ordinary course of events and is a relevant consideration in terms of the likelihood of structural failure of 307A Lakes Boulevard. I also recognise the circumstances faced by the engineers advising the authority, and the timeliness of that advice in light of an impending storm event. The timing was such that it did not allow for an in-depth analysis, and this has been acknowledged in the Heath Report, the Ministry's report, and views of engineers

and experts involved. The benefit of the determination is that it provides for consideration of all the available information and in-depth analysis of the causes of the scour and possible effects on the structural performance of the foundations and Wall 3.

8.35. Scour channels had formed in the ground to the west of 307A Lakes Boulevard, at the southwest corner and between 307A and 307 Lakes Boulevard, and in a localised area to the northwest of 307 Lakes Boulevard.

8.36. Based on the photographic evidence provided by the parties, and the analysis provided by the second expert, I am of the view it is likely these deep scour channels were formed due to a combination of factors. These factors include, but may not be limited to:

- the catchment area to the north (upslope) of 307A Lakes Boulevard that contributed to water flow through the drain coil and to surface water flow on the west side of 307A Lakes Boulevard
- a rainwater downpipe in the northwest corner serving the west portion of the roof of 307A that had been discharging water onto the ground
- a subsoil drainage coil laid close to the footing for Wall 3 that was not connected to a drainage system
- the erodibility of the soils when saturated.

8.37. I have considered to what extent the scour affected, or in the ordinary course of events would affect, the structural stability of the dwelling on 307A Lakes Boulevard and whether this was to such an extent that it required timeous attention to reduce or remove the likelihood of causing injury or death through structural failure.

8.38. It is not clear whether the scour extended under the footing of Wall 3, or if it did to what extent. In regard to wall 3, I am of the view that in addition to the evidence of the extent of scour and erosion noted above, the following are relevant considerations:

8.38.1. If any subsurface voids were present under or extending toward the wall 3 footing, these could increase in size in heavy or prolonged rainfall.

8.38.2. The likelihood of the backfill material, if not constructed as specified, to reduce the effectiveness of the subsoil drainage coil, and the evidence of water flow from the coil prior to the notice being issued.

8.38.3. The likely effects of saturated soils causing flow of the soils, and the effects of hydrostatic pressure on wall 3 foundations.

8.38.4. The specific engineering design of the reinforced concrete foundations at 307A Lakes Boulevard, and, based on the analysis undertaken by the second expert, the extent to which scour would need to extend for there to be a risk of structural failure and collapse.

8.38.5. The mitigation measures to reduce the effect and extent of the deep scour features that were in place prior to the issue of the notice. This includes the rainwater downpipe and subsoil drain coil being connected to non-perforated drains discharging to a system leading down towards Lakes Boulevard, and silt fences on west side of 307A Lakes Boulevard at the base of the northern slope and at the southwest corner.

8.38.6. There is no evidence of distress, damage, structural failure, or displacement of wall 3 caused by the deep scour either before or after the notice was issued, or that the raft foundation for the ground floor garage at 307A Lakes Boulevard was affected in any way by the deep scour.

8.38.7. Except for the scour close to the southwest corner of 307A Lakes Boulevard, the deeper scours were orientated away, and some distance, from Wall 3.

8.39. In light of those factors, I am of the view that in the ordinary course of events it is unlikely the deep scour would have destabilised the foundations of wall 3 at 307A Lakes Boulevard to the extent it could cause the foundations or the structure to fail and collapse. Therefore, I conclude the building at 307 Lakes Boulevard was not an affected building in respect of the risk of being hit by debris from 307A Lakes Boulevard as a result of structural collapse caused by the deep scour.

Roofs of adjacent or nearby buildings

8.40. Regarding the risk that the roofs of adjacent or nearby buildings will lift in “gale force winds” and could cause harm to people occupying 307 Lakes Boulevard, I have only considered the roof construction at 307A Lakes Boulevard as it was the only building referred to in the notice.

8.41. In deciding that 307 Lakes Boulevard was an affected building, the authority has relied on the addendum report from engineer 2 dated 14 April 2018 (refer to paragraph 3.23 and table 1). That report does not refer to any particular dwelling in the subdivision.

8.42. In the absence of a specific report from any of the parties for 307A Lakes Boulevard that may otherwise bring into doubt the construction and structural integrity of the

as-built roof, I have considered the information provided in the authority's inspection records and by the specialist manufacturer of the roof trusses.

8.43. Regarding the authority's inspection records of the roof construction and supporting building elements, I have taken into account the Ministry's report (refer paragraph 2.7). While I have placed some weight on the authority's inspection records from July 2017, they are not determinative on their own.[134]

8.44. Regarding the design and construction of the roof at 307A Lakes Boulevard, I note:

8.44.1. The roof trusses and connections were the subject of a specific engineering design by a specialist manufacturer.

8.44.2. The design of the roof was based on a "very high" wind zone, for a wind speed of 50 metres per second, which is greater than the gust wind speed in the addendum report from engineer of 30.9 metres per second.

8.44.3. "As built – final layout" roof truss plans, Producer Statement – Design (PS1), and fabricator design statement, all dated 27 June 2017, were provided by the supplier and manufacturer of the prefabricated roof trusses.

8.44.4. On 21 July 2017, the authority inspected the wall framing, including bracing, lintels and fixings. The same inspection included the roof trusses, fixings, bracing, and purlins. The inspection outcome was "pass" and in accordance with the building consent.

8.44.5. On 31 July 2017, the authority inspected the roof construction, fixings, roof cladding and flashings. The inspection outcome was "pass" and the installed building elements were "compliant".

8.44.6. The record of work[135] dated 9 August 2017 from the Licenced Building Practitioner who supervised the installation of the roof cladding on 307A Lakes Boulevard.[136]

8.45. There is nothing in the information available to me that indicates the roof of 307A was likely to lift in winds that would be experienced in the ordinary course of events. Therefore, I conclude that 307 Lakes Boulevard was not an affected building for the purposes of section 121A due to the construction of the as-built roof at 307A Lakes Boulevard.

[134] In particular, the section of the Ministry's report titled 'On-site inspections'.
[135] Section 88 and Form 6A of the Building (Forms) Regulations 2004.
[136] I note I have not received a completed copy of a similar record of work from the LBP(s) who either carried out or supervised the construction of the structural wall framing and roof trusses.

8.46. Just because I have concluded the roof at 307A Lakes Boulevard was not at risk of lifting in the ordinary course of events, thereby possibly affecting 307 Lakes Boulevard, it does not necessarily follow I would reach the same view regarding other roof(s) on other adjacent or nearby dwelling(s). However, the notice did not provide any details of any other adjacent or nearby buildings that would cause 307 Lakes Boulevard to be an affected building.

8.47. If a roof(s) was likely to lift in the ordinary course of events from an adjacent or nearby dwelling, it follows it would meet the definition of a dangerous building. There are a number of factors that are relevant to considering this likelihood and whether 307 Lakes Boulevard would be affected, including (but not limited to) the likelihood of failure of any structural connections associated with the roof or supporting structure, the direction and intensity of the wind that could cause the roof(s) to be lifted, and the proximity of the other dwelling(s).

8.48. There is no prescribed form in the Building (Forms) Regulations 2004 for a notice issued under section 124. The Act sets out the requirements of such a notice in section 125, but this does not include identification of the nearby or adjacent dangerous building in an affected building notice. However, I am of the view the absence of that information means the notice does not fully inform an owner of an affected building in sufficient detail what has given rise to their building being affected. The affected building owner is then unable to query or challenge the grounds on which the authority reached that view.

8.49. In the absence of any adjacent or nearby buildings being identified by the authority when it issued the notice (with the exception of 307A Lakes Boulevard) I cannot reach a finding that 307 Lakes Boulevard was affected due to roofs of other adjacent or nearby buildings possibly being lifted off in “gale force winds”.

8.50. If the notice had identified other buildings the authority considered were dangerous due to the likelihood of their roof lifting, my view on whether 307 Lakes Boulevard was an affected building would be based on whatever information was available about the construction of the roofs on those other buildings. I note that engineer 2 identified issues with construction of roofs of some buildings in the subdivision and considered the findings would apply to others. However, not all buildings were constructed by the same people, and for that reason I don't consider the general advice can be applied to all buildings across the subdivision for the purpose of this determination.

Conclusion and remedy

8.51. I have reached the view, based on all the available information, that:

8.51.1. the wing wall was retaining soil loads it was not designed to withstand, but there is insufficient information about the reinforcing used in the construction of the wall for me to determine if the wing wall was dangerous in the ordinary course of events (item 3, a. of the notice)

8.51.2. 307 Lakes Boulevard was not dangerous as a result of the deep scour between 307 and 307A Lakes Boulevard (item 3, b. of the notice)

8.51.3. 307 Lakes Boulevard was not an affected building at risk of being hit by debris from 307A Lakes Boulevard due to structural collapse caused by the deep scour

8.51.4. 307 Lakes Boulevard was not an affected building due to the construction of the as-built roof at 307A Lakes Boulevard, and no other adjacent or nearby dangerous buildings were identified in the notice.

8.52. A determination under section 177(1)(b) is in respect of an authority's exercise of its powers of decision. Section 188(1) provides that a determination must confirm, reverse, or modify that decision, or determine the matter to which it relates.

8.53. The District Court, in *Estate Properties Ltd v Hastings District Council* stated "The Chief Executive's choice of remedy under s 188(1) is an exercise of discretion"[137] and that it was open to the Chief Executive to not apply one of the positive steps required by section 188(1)(a).[(138)(139)] Further, the court took the view that declining to reverse a decision did not have the effect of confirming the decision.[140]

8.54. I have elected not to exercise any powers in section 188(1)(a) in this determination for the following reasons:

8.54.1. The conclusions reached on the dwelling's status as a dangerous or affected building would not lead me to confirm the notice in the form it was issued.

8.54.2. The notice is no longer in effect and so cannot be modified in respect of the matters on which I concluded the dwelling was not dangerous or affected.

[137] [2021] NZDC 17000 at [21].

[138] The court dismissed an appeal against a decision of the Chief Executive that a code compliance certificate had been wrongly issued but declining to reverse the certificate (refer to Determination 2020/034 "Regarding the compliance of fire safety precautions in a motel at 2 Arataki Road, Havelock North", dated 16 December 2020).

[139] [2021] NZDC 17000 at [30].

[140] [2021] NZDC 17000 at [29].

8.54.3. There is insufficient information available for me to draw a conclusion on the dangerous building status in relation to the wing wall and in my opinion, this is inadequate grounds on which to reverse the decision to issue the notice.

8.54.4. The lower part of the building has already been demolished and the upper storey relocated elsewhere, so there would be no benefit in reversing the issue of the notice for the authority to make a new decision with respect to any other dangerous buildings nearby or adjacent that were not identified in the notice.

9. Decision

9.1. In accordance with section 188(1)(b) of the Building Act 2004, I determine the dwelling was not dangerous regarding the deep scour between 307 and 307A Lakes Boulevard, nor was it an affected building due to the risk of it being hit by debris from 307A Lakes Boulevard or due to the construction of the as-built roof at 307A Lakes Boulevard. I am unable to reach a conclusion on the status of the 307 Lakes Boulevard regarding the wing wall identified in the dangerous and affected building notice dated 16 April 2018.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 12 January 2024.

Peta Hird
Principal Advisor

APPENDIX A: RELEVANT EXTRACTS FROM LEGISLATION

Building Act 2004

124 Dangerous, affected, or insanitary buildings: powers of territorial authority

(1) This section applies if a territorial authority is satisfied that a building in its district is a dangerous, affected, or insanitary building.

(2) In a case to which this section applies, the territorial authority may do any or all of the following:

(a) put up a hoarding or fence to prevent people from approaching the building nearer than is safe:

(b) attach in a prominent place on, or adjacent to, the building a notice that warns people not to approach the building:

(c) except in the case of an affected building, issue a notice that complies with section 125(1) requiring work to be carried out on the building to—

(i) reduce or remove the danger; or

(ii) prevent the building from remaining insanitary:

(d) issue a notice that complies with section 125(1A) restricting entry to the building for particular purposes or restricting entry to particular persons or groups of persons.

APPENDIX B: TABLE 2 - EXTRACTS FROM THE HEATH REPORT, 1 JUNE 2018

Paragraph reference number	Text from the Heath report
[2]	For the reasons set out in this report, I [Hon P Heath QC] reached the following conclusions: …… (f) It was appropriate for the [authority], on 16 April 2018, to declare all buildings in the Bella Vista subdivision either "dangerous" or "affected" on the basis of the professional advice it received on or about 15 April 2018.
[77]	[The building consultant], (a consultant with almost 30 years' experience in the building control and regulatory environment…) commented on the nature of the problems in her report of 12 April 2018. I start by summarising, in my own words, the defects identified by [the building consultant]: (a) An absence of retaining walls that has led to erosions of the slopes that sit between the Lakes Boulevard and Aneta Way properties… (b) An absence of engineering inspection reports dealing with ground conditions, footings and block walls. These defects apply to all of the Lakes Boulevard properties. … (d)…inadequate drainage behind block walls. …
[174]	……I have identified (in the building consent file for 307 Lakes Boulevard) an email from the [authority's] inspector to a representative of Bella Vista Homes, dated 16 February 2017. [The inspector] said: "It is my intention to issue the consents for the properties (which includes 307 Lakes Boulevard) and as long as you agree any changes to the retaining walls will be designed by a (CPEng registered engineer) and [the authority] will inspect these walls or you may seek [the authority's] approval to have your engineer inspect on a case by case basis. If this is agreeable [the authority] will process these retaining wall changes on site under our minor variation process, noting this is required to be done before the work is undertaken." ……
[195]	……In making their determinations, [the authority's] inspectors are entitled to rely upon producer statements from accredited persons to confirm that completed work, not visible to the inspector at the time of

	his or her visit, has been undertaken in accordance with the Building Code.
[204]	(c) The absence of an appropriate retaining wall is obvious…The fact that it was ultimately necessary to declare the dwellings "dangerous buildings" underscores the seriousness of the problems.
[222]	Following receipt of the 12 April 2018 reports from [the building consultant], [engineer 2] and [geotechnical engineer], the [authority] reconsidered whether to issue dangerous and affected building notices under section 121 of the Building Act 2004. After receiving legal advice as to the appropriate test to apply, the [authority] made a decision to do so on 16 April 2018.
[223]	I am required to assume the correctness of the conclusions reached in the three 12 April 2018 reports. I do not take into account those reports that were provided on 30 April or 1 May 2018, because they were issued after the decision was made to declare the buildings dangerous. The [authority's] decision must stand or fall on the basis of the 12 April 2018 reports, and the legal advice it received….
[225]	Of those buildings that were characterised as dangerous: (a) ….307….Lakes Boulevard [was] declared dangerous on the basis of both structural and geotechnical defects.
[227]	On the basis that the opinions expressed in the three 12 April 2018 reports are correct, I consider that the [authority] was correct to declare the buildings "dangerous". The [authority] was confronted with a situation in which it had received advice that those entering the buildings could be at risk of injury or death. In those circumstances, I am not prepared to find the [authority] acted other than in good faith and for proper purposes in making its decision.