

Determination 2022/008

Regarding the compliance of a timber retaining wall with Building Code clauses B1 Structure and E1 Surface Water with respect to the protection of other property

7 Abbots Way, Remuera, Auckland

Summary

This determination considers whether building work to construct a new retaining wall close to the boundary between two properties complies with the provisions of Building Code clauses B1 *Structure* and E1 *Surface water* that have the purpose of protecting other property.



The legislation 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 (e.g., Acceptable Solutions) and guidance issued by the Ministry, is available at www.building.govt.nz.

1. The matter to be determined

- 1.1. This is a determination made under due authorisation by me, Peta Hird, Principal Advisor Determinations, Ministry of Business, Innovation and Employment (“the Ministry”), for and on behalf of the Chief Executive of the Ministry.¹
- 1.2. The parties to the determination are:
 - 1.2.1. Latitude 36.8 Limited, the previous owner of the property at 7 Abbotts Way, Remuera, Auckland (“the previous owner”). The previous owner carried out the building work to the property, and in that capacity I refer to them as “the builder”.
 - 1.2.2. J Zhu, the current owner of the property at 7 Abbotts Way (“the current owner”)
 - 1.2.3. G Prasad, the owner of the neighbouring property at 9A Abbotts Way who applied for the determination (“the applicant”)
 - 1.2.4. Auckland Council (“the authority”), carrying out its duties as a territorial authority or building consent authority.
- 1.3. I also consider the following are persons with an interest in the matter:
 - 1.3.1. the structural engineer, Markplan Consulting Ltd (“the structural engineer”)
 - 1.3.2. the geotechnical engineer, KGA Geotechnical Group Ltd (“the geotechnical engineer”).
- 1.4. This determination arises from the construction of a timber pole retaining wall (“the Type 3 retaining wall”)² and associated sitework that is part of a project to subdivide 7 Abbotts Way, Remuera, Auckland, into two lots.

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

² There are several different “types” of retaining wall associated with the building consent. The determination uses the same taxonomy to identify the different types as was annotated in the relevant building consent plans and specifications.

- 1.5. The applicant considers the Type 3 retaining wall causes surface water to be collected and concentrated such that it causes a nuisance and damage at their property, which the applicant contends did not occur prior to the retaining wall being constructed. The applicant also considers the Type 3 retaining wall has not been constructed in accordance with the relevant building consent. On this basis, the applicant believes the Type 3 retaining wall does not comply with the Building Code, specifically clauses B1 *Structure*, B2 *Durability*, and E1 *Surface water*.
- 1.6. As the applicant does not own the property where the building work was carried out, they may only seek a determination in respect of those Building Code clauses that have the purpose of protecting other property.³
- 1.7. The matter to be determined⁴ is therefore whether the building work carried out to construct the partially completed⁵ Type 3 retaining wall, under building consent BCO10257508, complies with Building Code clauses B1 *Structure* and E1 *Surface water*, with respect to those provisions that have the purpose of protecting other property.
- 1.8. The requirements of clause B2 *Durability* are also relevant insofar as it applies to clause B1. Clause B2 ensures that buildings will continue to satisfy the performance requirements of the code throughout their lifetime

Matters outside this determination

- 1.9. I have not considered any other aspects of the building work covered by the building consent. This includes the other retaining walls annotated in the building consent documentation as Types 1, 2, and 4, as well as the safety barrier yet to be installed along the top of the retaining walls.⁶
- 1.10. The matter for determination does not include the exercise of decision by the authority when it granted and issued the building consent BCO10257508.
- 1.11. The applicant has referenced matters that relate to the Resource Management Act 1991 and the authority's district plan. These are outside the scope of a determination under the Building Act. I have no jurisdiction under other enactments, and this determination only considers matters related to the Building Act and its regulations.
- 1.12. The work to form the subdivision ("the subdivision works") at 7 Abbots Way into two lots (lot numbers 1 and 2) are the subject of a resource consent application.⁷

³ Section 7 "Interpretation" of the Act. *Other property* means any land or buildings, or part of any land or buildings, that are (i) not held under the same allotment; or (ii) not held under the same ownership....

⁴ Section 177(1)(a) of the Act.

⁵ For example, the safety barrier has yet to be installed along the top of the retaining wall.

⁶ Clause F4 *Safety from falling* does not have the purpose of protecting other property.

⁷ The reference number LUC60124464 was provided by the applicant. However, I note the geotechnical engineer has referenced SUB60235674.

The resource consent documentation included reference to the construction of the Type 3 retaining wall and surface water control measures to address the existing overland flow path across the property⁸, and several of the design reports, plans and specifications are included in the associated building consent BCO10257508.⁹

- 1.13. The granting of the resource consent and the work carried out under the resource consent, including redirection of the overland flow path, is outside the matter to be determined. In relation to surface water, this determination considers only the surface water collected and concentrated by the retaining wall and the sitework associated with the retaining wall (refer Figure 5). Information about the management of surface water over lot 2 is included in this determination as context only.
- 1.14. On 13 July 2021, the authority issued a code compliance certificate¹⁰ related to building consent BCO10257508. The authority did not have the power to issue the code compliance certificate after the applicant had applied for the determination. Section 183(1) of the Act states, “until the Chief Executive makes a determination on a matter, any decision or exercise of a power by any person referred to in section 177 that relates to that matter is suspended”. It will therefore be for the current owner and the authority to re-consider an application for, and issue of, a code compliance certificate upon completion of the building work¹¹ and the issue of this determination.

2. The building work

The properties

- 2.1. The 7 Abbots Way property comprises two lots below the level of the road and has a south-easterly aspect. The total contour over the property falls approximately 11 to 12 metres from the road, which is to the north of the property, down to a low point at the southern boundary.
- 2.2. Lot 1 of the 7 Abbots Way property (“lot 1”) is closest to the road and adjacent to 9 Abbots Way. It contains an existing detached residential dwelling and has a right of way (driveway) constructed on its eastern side to access lot 2.

⁸ Work carried out under the resource consent altered the overland flow path, re-directing it via open channels along the west and south sides of lot 2 towards the south-east corner of the property and then across the south end of the Type 3 retaining wall and onto 9A Abbots Way (see Figure 4).

⁹ The resource consent plans indicate a proposed new 2-storey residential dwelling on lot 2, approximately 201m² in floor area, and associated stormwater disposal using detention tanks and new below ground stormwater drainage. Future building work is not a relevant factor in considering the compliance of the retaining wall as built.

¹⁰ Section 95 of the Act.

¹¹ The evidence in this case indicates that the building work is incomplete, and this includes, but may not be limited to, the installation a safety barrier along the top of the retaining walls, the preservative treatment of the ends of the cut timber poles, and sitework to the base of the Type 3 retaining wall.

- 2.3. Lot 2 of the 7 Abbots Way property ("lot 2") is at the rear of the property. The Type 3 retaining wall is constructed on lot 2 and is parallel and adjacent to the eastern boundary. This corresponds with the western boundary of 9A Abbots Way. See figure 1.

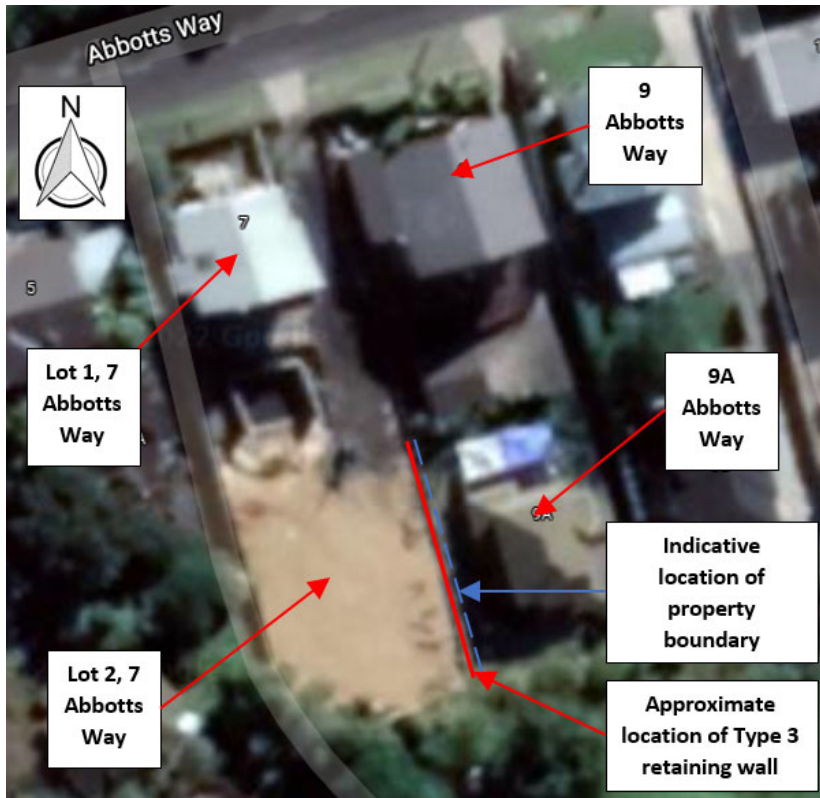


Figure 1: Aerial view¹² (not to scale).

- 2.4. For the purposes of this determination, it is assumed that the location of the Type 3 retaining wall is approximately 750mm¹³ to the west of the property boundary.
- 2.5. The property at 9A Abbots Way includes the applicant's detached residential dwelling. At the rear of 9A Abbots Way, to the west of the dwelling, there is a grassed area, flower border, and an existing low level raised planter formed by a

¹² Created from Google Maps New Zealand (accessed on 14 February 2022). The boundary lines that delineate the extent of the different properties are not shown on this figure.

¹³ I have received conflicting information on the horizontal distance between the base of the Type 3 retaining wall relative to the property boundary. The previous owner advised the distance was approximately 1.5 to 2m; the applicant believes the distance is between 300mm to 450mm; the expert assessed it as being between approximately 1020 to 775 mm from the exposed face of the timber railings; the designer's plan (sheet 02 issued on 25 October 2017) indicates the distance is between approximately 780mm to 980mm (albeit hand-written notes of the same plan state it could be as little as 300mm); a site survey of the as-built retaining wall provided to the structural engineer by a consultant land surveyor indicates a measurement of 780mm. The actual horizontal distance has not been surveyed or formally established for the purposes of this determination. Taking into account the information received, I have assumed a measurement of 750mm.

low height timber retaining wall and proprietary interlocking concrete block garden wall, close to the base of the Type 3 retaining wall. See figure 2.

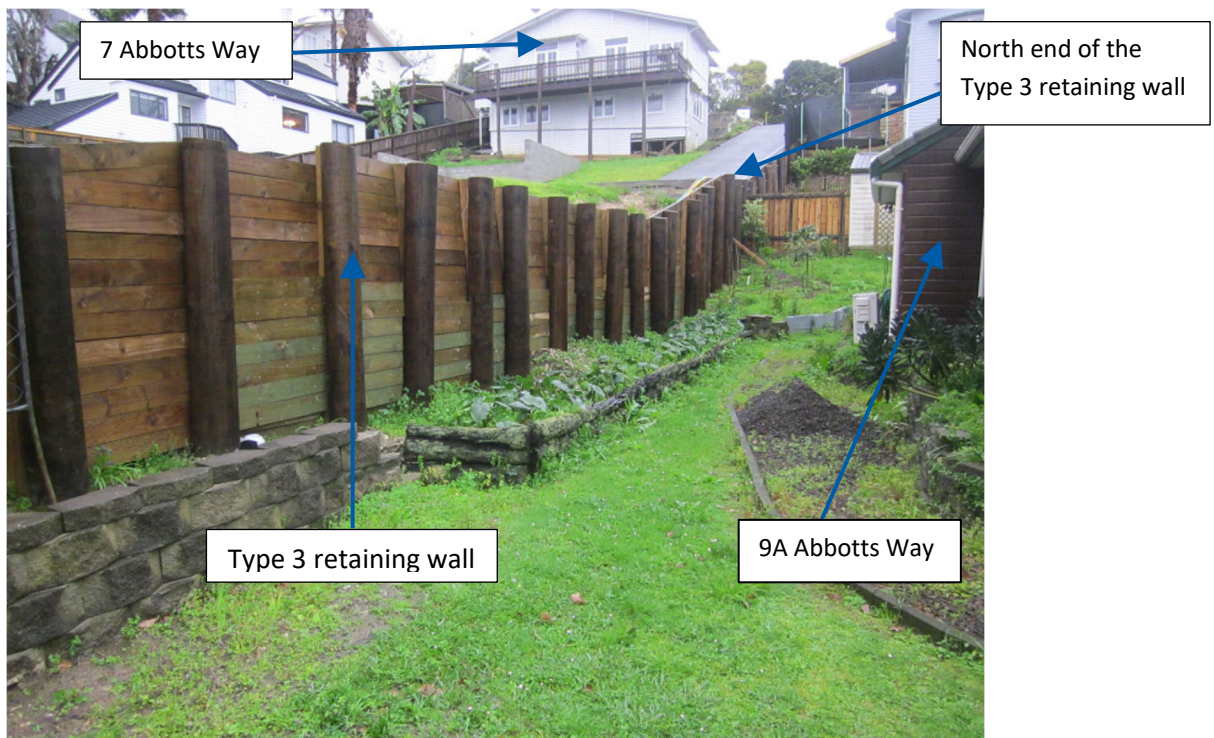


Figure 2: 7 and 9A Abbotts Way, and the Type 3 retaining wall.¹⁴

Surface water

- 2.6. There was an existing pre-development overland flow path from 7 Abbotts Way that traversed down and across to 9A Abbotts Way at the midpoint of what is now the Type 3 retaining wall and on towards the south-east (see figure 3). The overland flow path remains (in part) as a result of the subdivision works.
- 2.7. The lot 1 surface water is currently directed towards the eastern boundary across the right of way (driveway) and is intercepted by a grated channel drain across the driveway and grated yard sump at the shared boundary.¹⁵ The surface water is then reticulated to the public stormwater system.
- 2.8. A public stormwater drain traverses the north of lot 1 and 9 Abbotts Way, and another public stormwater drain crosses the south western corner of lot 2.

¹⁴ Photograph taken on 11 August 2020 and reproduced from the expert's report.

¹⁵ The surface water collected at the channel drain and disposed of via the sump is not considered in this determination.

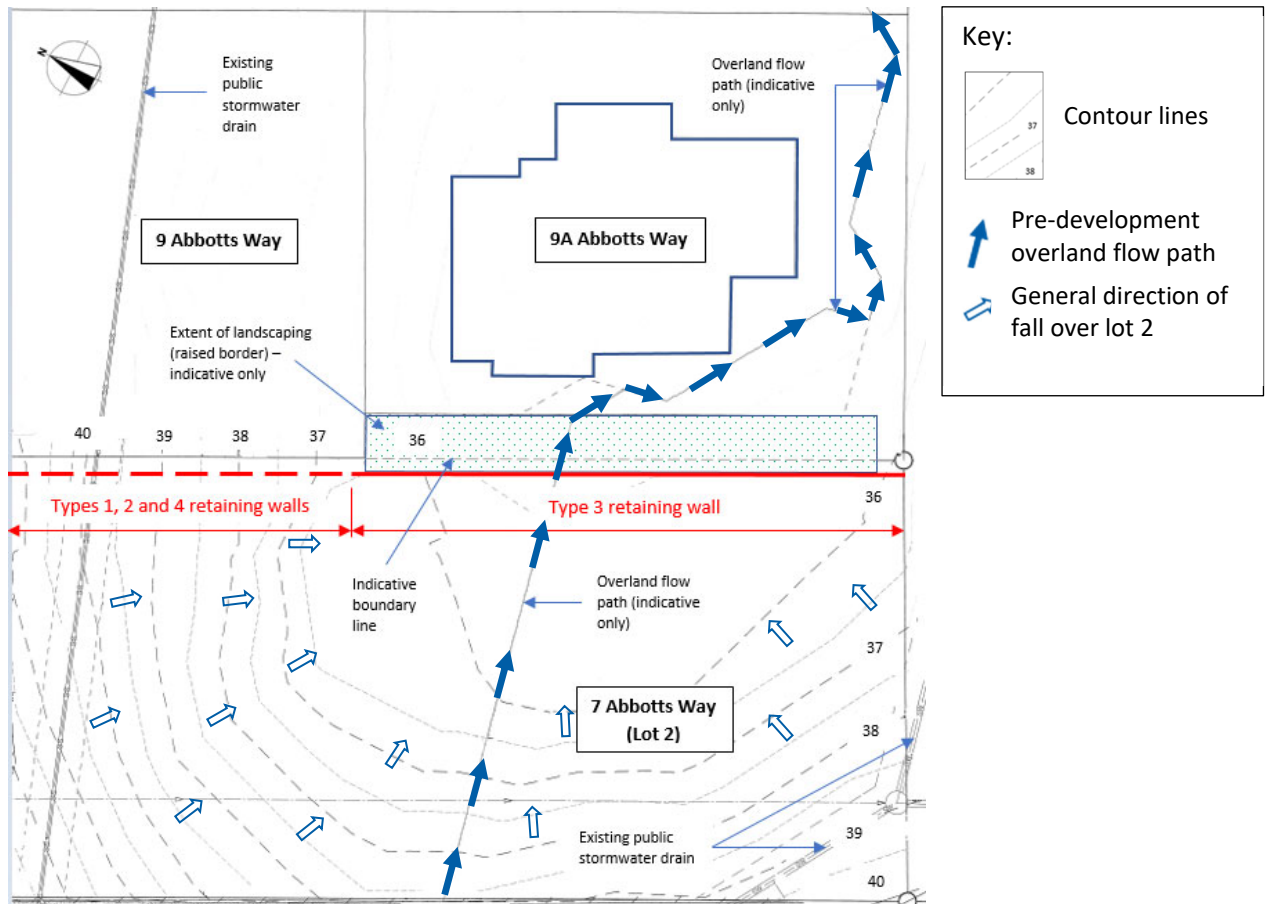


Figure 3: Site plan – pre-development overland flow path¹⁶ (not to scale).

- 2.9. On lot 2, new surface water drainage has been laid and the contours of the ground altered, including the creation of a new overland flow path channel to the west and south of lot 2 that directs surface water towards 9A Abbotts Way across the south of the property (see figure 4).¹⁷
- 2.10. The lot 2 surface water is directed (in part) towards the eastern boundary of the property and is intercepted by the Type 3 retaining wall. The building consent plan indicates a 100mm diameter sub-surface drainage coil¹⁸ at the base of the Type 3 retaining wall that extends into a surface water silt trap.¹⁹ However, it is unclear from the plan where the sub-surface water discharges to once it enters the silt trap.

¹⁶ Created from plan sheet 01 dated 27 January 2016 titled “Existing site plan”

¹⁷ On 16 December 2020 the structural engineer issued a Producer Statement – Construction Review (PS4) related to the altered “overland flow path” across Lot 2, 7 Abbotts Way. The PS4 stated compliance with clause E1 *Surface water*. The PS4 was issued in conjunction with an “as-built – final contours overland flow path” plan, reference 3485p72, dated December 2020, from a registered land surveyor.

¹⁸ A sub-surface drainage coil located at the base of a retaining wall is usually installed to relieve hydrostatic pressure that could otherwise build-up behind the wall, rather than for the disposal of surface water.

¹⁹ Plan number 4.2, dated 19 April 2017, titled “Pole Retaining Wall – Type 3”.

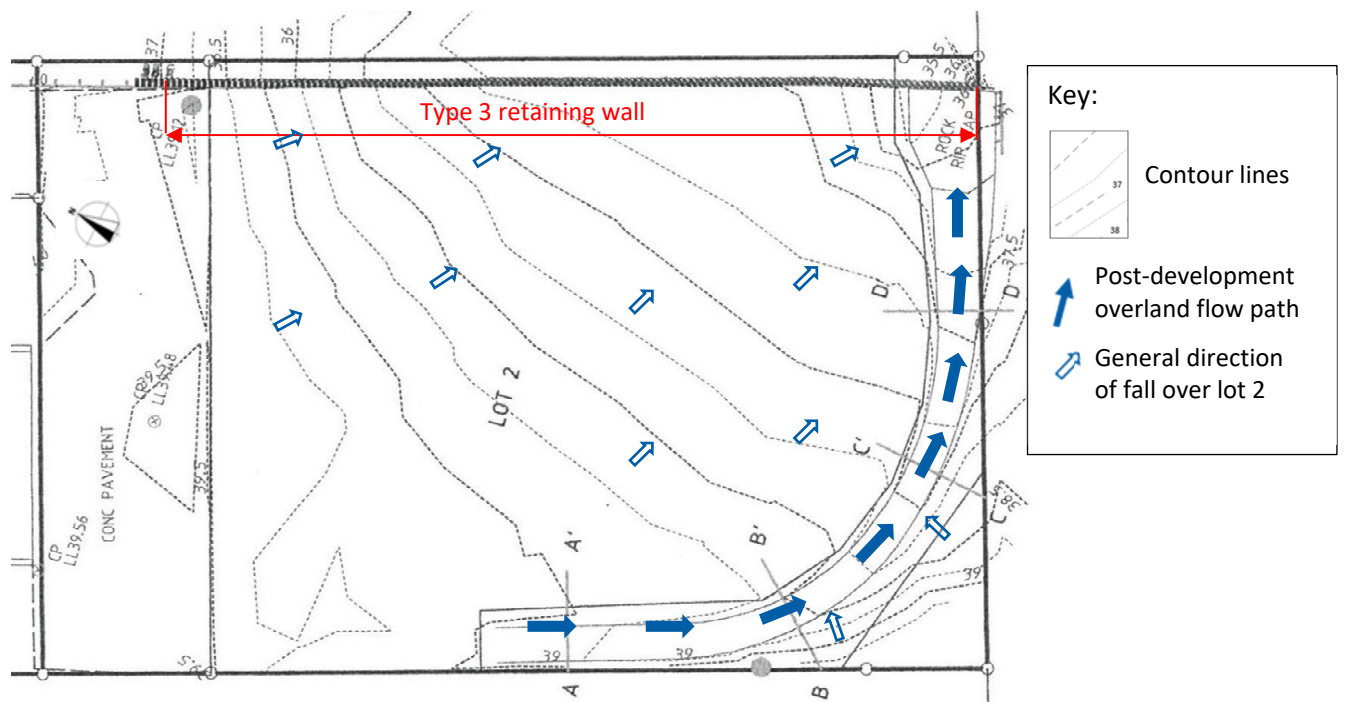


Figure 4: Site plan – post-development overland flow path²⁰ (not to scale).

The Type 3 retaining wall design

2.11. The specific engineering design (SED) of the Type 3 retaining wall proposed in the building consent can be summarised as (see figure 5):

2.11.1. A maximum height above ground level of 2.4m.

2.11.2. Poles set at a 1 in 20 reverse batter, allowing for a maximum retained slope of 1 in 3 behind it.

2.11.3. 275mm diameter H5²¹ treated timber poles, spaced apart at a maximum of 1.3m centres.

2.11.4. Poles require a minimum depth of embedment into good ground²² of 3.3m, and allows for a maximum depth of 2.1m through any poor-quality fill material.

2.11.5. The poles below ground level encased in concrete in a 500mm diameter hole.

²⁰ Created from plan sheet dated December 2020 titled “As-built plan – final contours overland flow path”

²¹ Timber treated to hazard classifications H4, H5 and H6 are described in New Zealand Standard NZS 3640:2003 “Chemical preservation of round and sawn timber”.

²² “Good ground” is a defined term in Ministry of Business Innovation and Employment Acceptable Solution and Verification Method for New Zealand Building Code clause B1 *Structure*, first edition, amendment 15, effective from 1 January 2017.

- 2.11.6. The face of the retaining wall formed using 150mm deep x 50mm thick H4 treated rails nailed to the posts.
- 2.11.7. A 100mm diameter sub-surface drainage coil wrapped in a filter cloth at the base of the retaining wall with free draining scoria placed above it, connected to a silt trap.
- 2.11.8. Engineered fill material, lightweight low density proprietary expanded polystyrene blocks, and a damp-proof course behind the retaining wall placed between the free draining scoria and the face of the polystyrene blocks²³, all covered in topsoil.

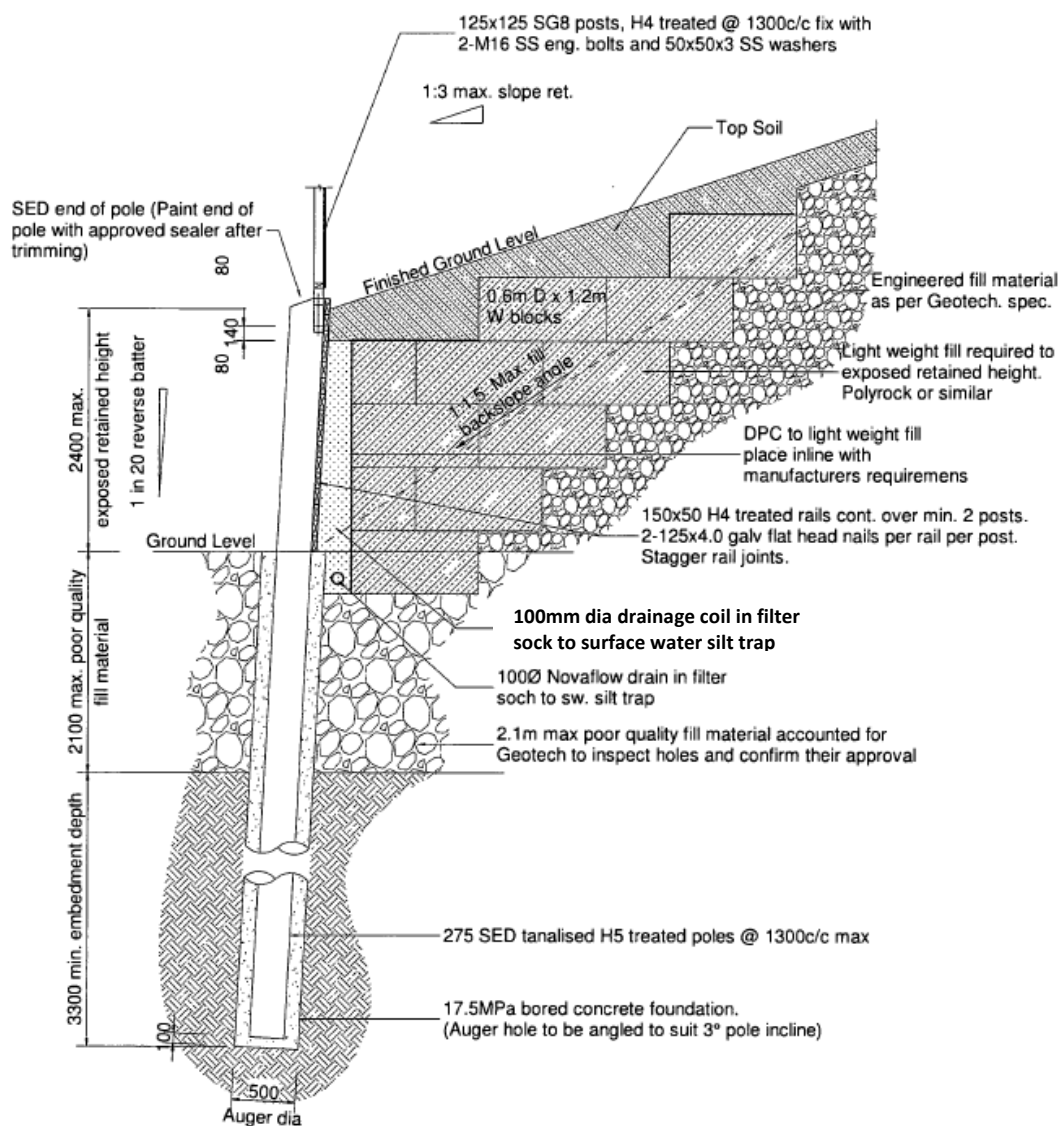


Figure 5: The Type 3 retaining wall (not to scale).²⁴

²³ The design plan states a damp-proof course is to be placed in line “with manufacturer’s instructions” (dated 1 August 2008); these state protection of the polystyrene blocks is necessary in certain circumstances, for example, if they are in contact with harmful substances such as organic solvents.

²⁴ Reproduced from building consent plan SO5 Revision 2, titled “Details”, dated 24 April 2017.

2.11.9. A timber safety barrier to the top of the Type 3 retaining wall.

3. Background

- 3.1. The authority issued a resource consent (LUC60124464) in respect of the proposed subdivision of 7 Abbots Way on 11 September 2017.²⁵ The plans associated with the resource consent note an existing overland flow path running from lot 2 of 7 Abbots Way to 9A Abbots Way.
- 3.2. The resource consent documentation, and the plans and specifications for the associated building consent application, included:
 - 3.2.1. an onsite stormwater mitigation report dated February 2017 from the structural engineer
 - 3.2.2. structural details and calculations dated 24 April 2017 from the structural engineer
 - 3.2.3. a revised assessment report with 100-year flood event calculations dated August 2017, in respect of the overland flow path of surface water and the design of open channels to address the issue, from the structural engineer
 - 3.2.4. a geotechnical report dated 10 April 2017 prepared by the geotechnical engineer.
- 3.3. The geotechnical report recorded ground water levels of between 400mm to 800mm below the ground surface at the two test holes located nearest to the proposed Type 3 retaining wall.²⁶ The report also stated:

Groundwater levels do vary seasonally and it must be expected that higher groundwater levels may be encountered following periods of heavy or prolonged rainfall.

- 3.4. On 2 November 2017, the authority received a building consent application which included (but was not limited to) the Type 3 timber retaining wall and associated sitework. Included with the building consent application was a Producer Statement – Design (PS1) dated 24 April 2017 from a chartered professional engineer. The PS1 included the design for the Type 3 retaining wall and stated the design was compliant with clauses B1 *Structure*²⁷ and B2 *Durability* (“insofar as is covered by the relevant structural materials codes listed on [the] PS1”).

²⁵ The resource consent is outside the matter to be determined (see paragraph 1.13). However, it is referenced here because the subdivision works included mitigating measures to address the existing overland flow path.

²⁶ The ground water levels were recorded on 27 July 2016, prior to the sub-division of the property.

²⁷ The PS1 referred to clause “B1/VM1” as the means of compliance.

- 3.5. According to the applicant, site clearing, and excavation (which is part of the subdivision works) started on site during 2017.
- 3.6. Building consent (reference number BCO10257508) was issued by the authority on 13 February 2018.²⁸ A “schedule of inspections and documentation required for compliance” was issued by the authority in conjunction with the building consent. The schedule included, but was not limited to, a requirement of the previous owner to notify the authority when it could conduct inspections related to the drainage and timber retaining walls.²⁹ It also required third-party verification and Producer Statements – Design Review (PS4s) from the structural and geotechnical engineers related (in part) to the construction of the timber retaining walls, including the Type 3 wall.
- 3.7. On 28 March 2018, the structural engineer carried out an inspection of the siteworks for the Type 3 retaining wall. The inspection record notes most of the pole holes had been prepared, but some would need to be redrilled prior to placing the poles and grouting due to the high water table. The structural engineer also observed the H6 treated 275mm diameter timber poles onsite.³⁰
- 3.8. On 16 November 2018, a Producer Statement – Construction (PS3) was issued for “drainage works” by the drainlayer. The PS3 indicated compliance of the building work with clause E1 *Surface water*.³¹
- 3.9. Also on 16 November 2018, the authority conducted an inspection in relation to building consent BCO10257508. The inspection report included a photograph of the partially constructed Type 3 retaining wall (see figure 6) and noted:
- Retaining wall up to 3.0 m high no notes on consent to the construction to date need evidence that construction and land compaction is under engineering supervision.
- 3.10. Surface water runoff from lot 2 occurred during the construction phase, including during construction of the Type 3 retaining wall. The first report of flooding by the applicant was in May 2018. The authority investigated and confirmed “there was no clear evidence of significant storm water or sediment run off from [number] 7 onto [number] 9 Abbots Way”.³²

²⁸ The building consent was in respect of “Sub-divisional retaining walls. Right of way construction and drainage. Lot 1 [and] 2 [surface and foul water] private drainage”.

²⁹ To check soil conditions and the size and depth of footings; poles must be in place but prior to the placement of concrete.

³⁰ An invoice dated 16 March 2018, from the suppliers of the specific engineering design timber poles to the previous owner, confirm the timber treatment was H6 as opposed to the H5 specified in the building consent. The same invoice confirms that H6 treated 150mm x 50mm “rough sawn timber” was also supplied which is assumed to be for the “timber rails” placed between the poles (see figure 8).

³¹ The as-built drain plan did not indicate the sub-surface drainage coil behind the Type 3 retaining wall.

³² Confirmed in an email to the Ministry dated 23 December 2019.

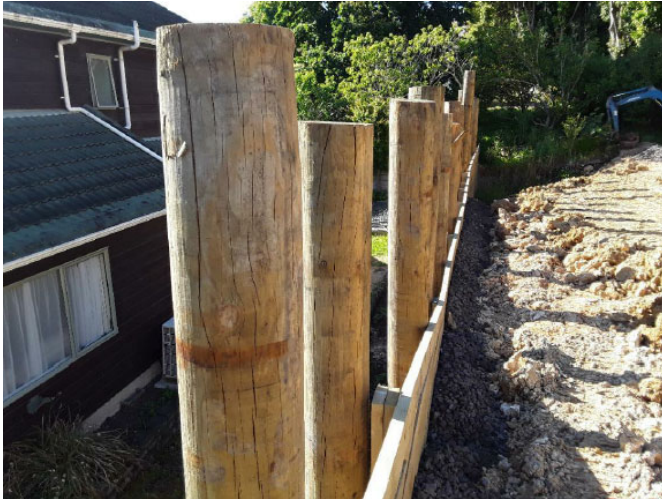


Figure 6: The Type 3 retaining wall as at 16 November 2018.³³

- 3.11. The Ministry received an application for a determination on 29 July 2019, which was accepted on 5 August 2019.
- 3.12. On 4 November 2019, the applicant provided a number of photographs and video recordings. The photographs are dated between June 2018 and October 2019.
- 3.12.1. A varying quantity of water can be observed at the toe, or base, of the Type 3 retaining wall and on the grassed area adjacent to the raised planter bed. The water appears to be localised to an area nearest to the Type 3 retaining wall, and it does not cover all of the lower grassed area or the raised planter (see figure 2).
- 3.12.2. A video recording dated 13 October 2019 shows water flowing over the top of the lowest part of the Type 3 retaining wall at its southern end, and onto the applicant's property. The point where the water overtops the Type 3 retaining wall coincides with the new overland flow path channel formed by the subdivision works. The water is shown ponding on the grassed and raised area next to the base of the Type 3 retaining wall, as well as an existing earthenware open drainage channel and sump located along the south side of the applicant's property.
- 3.12.3. A video recording dated 21 April 2019 shows water seeping through the bottom rails of the Type 3 retaining wall, approximately midway along its length, and ponding in an area of the raised vegetable planter on the owner's property.
- 3.13. The dates of the videos and photographs coincide with the construction phase of the Type 3 retaining wall and the subdivision works. With regard to an event size in E1.3.1 being a 10 percent probability of occurring annually, the applicant was

³³ Photograph reproduced from the authority's inspection report dated 16 November 2018

unable to provide information about the size and intensity of the rainfall events that coincided with the dates when the photographs and videos were taken.

- 3.14. On 5 December 2019, the structural engineer carried out an inspection of the construction of the Type 3 retaining wall. However, the building work was not completed.
- 3.15. On 13 February 2020, being two years after the date the building consent was issued, the authority issued a letter under section 95A of the Act refusing to issue a code compliance certificate for the building work associated with the building consent BCO10257508.³⁴
- 3.16. In September 2020, the proprietary lightweight expanded polystyrene block fill was installed behind the Type 3 retaining wall.
- 3.17. On 11 September 2020, the structural engineer reviewed site photographs provided by the builder.³⁵ The records associated with this review noted:
- 3.17.1. Remedial works summarised in an email from the structural engineer to the builder dated 29 May 2019 have been completed.
 - 3.17.2. The wall was constructed generally as per the revised detail (see figure 8).
 - 3.17.3. Two widths of 0.6m deep x 1.2m wide lightweight polystyrene fill were installed behind free drainage material, with blocks stacked two deep where necessary.
 - 3.17.4. Additional 150mm deep x 50mm thick timber rails have been screw fixed between the poles.
 - 3.17.5. 14-gauge x 150mm long class 4 screws were used and were confirmed as a suitable alternative for use in treated timber.
 - 3.17.6. Confirmation that “the work appeared to be completed in general accordance with [the structural engineer’s] design and documentation” and there was “no outstanding remedial items”.
- 3.18. On 19 October 2020, the builder provided a Producer Statement – Construction (PS3) for the retaining walls stating compliance with clauses B1 *Structure* and B2 *Durability*. The PS3 also confirmed the building work had been undertaken in accordance with the building consent.³⁶

³⁴ Section 93(2)(b)(i) of the Act.

³⁵ The builder (B Mahoney) retains a 50 percent shareholding in Latitude 36.8 Ltd (the previous owner). Inspection records from the structural engineer, and Producer Statement – Construction (PS3) dated 19 October 2020, confirm the builder undertook and/or supervised the relevant building work.

³⁶ The building consent reference number quoted on the PS3 is different to consent number BCO10257508 issued for the subject building work, but all other details, including the property address, legal description, and name of the owner are correct.

- 3.19. On 11 November 2020³⁷, the structural engineer wrote to the authority to advise it about the changes to the retaining walls during construction. The structural engineer noted:
- 3.19.1. Geotechnical soil design parameters were refined onsite during construction, necessitating a redesign. Less poor-quality fill was confirmed than initially expected.
 - 3.19.2. Changes to the lightweight fill were made to better suit site conditions.
 - 3.19.3. Changes to the heights were made to suit the finished earthworks levels.
 - 3.19.4. Difficulties arose because of challenging soils and an elevated ground water table, affecting final pole inclination and position.
 - 3.19.5. A number of structural and geotechnical observations were not called for prior to concrete pours, resulting in an incomplete record of works.
- 3.20. Attached to the structural engineer's letter to the authority were copies of the following:
- 3.20.1. A construction methodology dated 16 May 2019, and as-built data for the Type 3 retaining wall provided by the builder working for the previous owner.
 - 3.20.2. The geotechnical engineer's report, site inspection schedule, and Producer Statement – Construction Review (PS4), all dated 25 November 2020. The PS4 stated the building work complies with clause B1 *Structure*.
 - 3.20.3. As-built photographs provided by the previous owner showing the 100mm drainage coil wrapped in a filter cloth material laid parallel to the base of the Type 3 retaining wall, with scoria backfill in the process of being placed around and above the coil. See figure 7, (a) and (b).
 - 3.20.4. As-built retaining wall survey from a registered land surveyor.
 - 3.20.5. The Producer Statement – Construction (PS3) from the builder dated 19 October 2020.
 - 3.20.6. As-built structural engineer's calculations and details (including the Type 3 retaining wall). See figure 8.³⁸

³⁷ The date of the letter pre-dates several of the documents included in its appendices. Therefore, for the purposes of this determination, it is assumed the date of the letter is incorrect and it must have been issued on or sometime after 1 December 2020 (i.e. the date of the new PS1).

³⁸ The as-built plan also shows a safety barrier fixed to the top of the retaining wall, but this has yet to be installed.

3.20.7. Details of the remedial work required to the Type 3 retaining wall that the structural engineer emailed to the builder on 29 May 2019.

3.20.8. Producer Statement – Design (PS1) from the structural engineer dated 1 December 2020 in respect of the “updated pole retaining walls” (including the Type 3 wall). The PS1 stated compliance with clauses B1 *Structure* and B2 *Durability*.



(a) View looking northwards

(b) View looking southwards

Figure 7: Drainage coil at the base of the Type 3 retaining wall³⁹.

3.21. On 18 November 2020, the structural engineer issued a Producer Statement – Construction Review (PS4) for work that included the construction and remedial work to the Type 3 retaining wall. The PS4 stated the building work complied with clauses B1 *Structure*⁴⁰ and B2 *Durability* (“insofar as is covered by the relevant structural materials codes listed on [the] PS1”).

³⁹ Photographs taken during construction by the previous owner and provided to the structural engineer

⁴⁰ The PS4 referred to clause “B1/VM1” as the means of compliance.

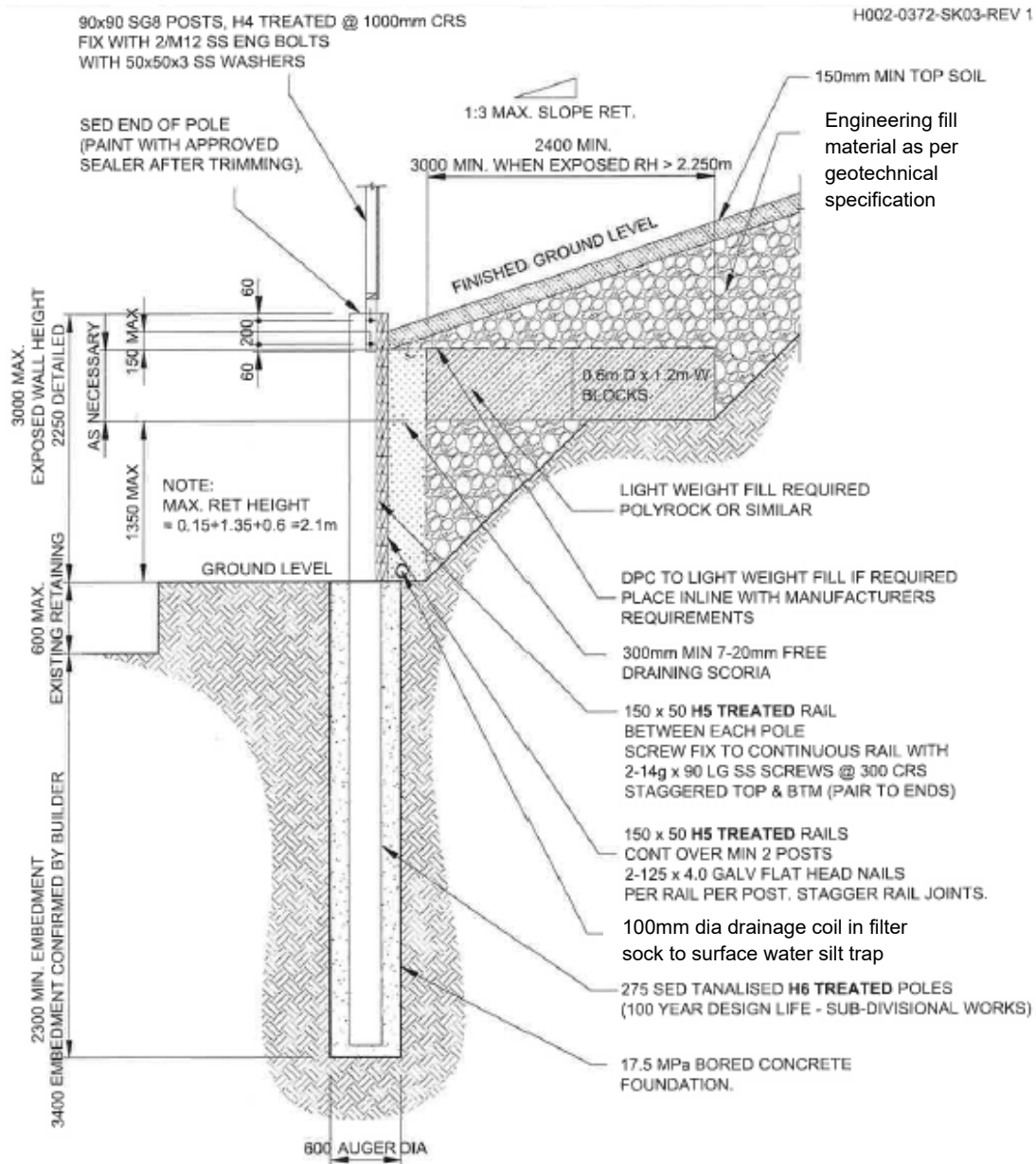


Figure 8: As-built detail for the Type 3 retaining wall.⁴¹

3.22. On 25 November 2020, the geotechnical engineer issued a Producer Statement – Construction Review (PS4) in respect of “observations on ground conditions only”. The PS4 stated the building work complied with clause B1 *Structure*. In additional documentation that accompanied the PS4, the geotechnical engineer confirmed:

3.22.1. site observations related to the geotechnical aspects of the work were conducted between March 2018 and October 2020

⁴¹ Reproduced from the structural engineer’s detail titled “SK03 – Pole Ret Wall Detail – Type 3”, reference H002-0372-SK03-REV 1, dated 28 May 2019. Note: The as-built drawing states the 150mm x 50mm rails were “H5 treated” timber. However, the invoice received from the suppliers of the timber stated it was H6 treated.

- 3.22.2. the works were in accordance with “the approved Building Consent” (BCO10257508)
- 3.22.3. observations of the ground conditions included those for the Type 3 retaining wall, and noted for the majority of the pile holes, “ground conditions were found to be of higher strength than those assumed in the design”
- 3.22.4. pole centres vary between 800mm to 1.5m, as noted in inspection report dated 10 December 2018
- 3.22.5. the poles are offset by up to 150mm from the wall facing, as noted in the inspection report dated 10 December 2018
- 3.22.6. the height of the Type 3 retaining wall varied from 2.1m to 3.2m, as noted in the inspection report dated 10 December 2018.
- 3.23. On 30 April 2021, the authority carried out a final inspection in respect of the retaining walls and drainage. The authority’s notes state a PS4 for the foundation has been submitted, that elements including the retaining walls appear to be in place as per the consented plan, and there were no issues identified during the inspection. The authority’s inspection report included a photograph of the as-built Type 3 retaining wall (see figure 9). The authority then issued a code compliance certificate on 13 July 2021 (see paragraph 1.14).

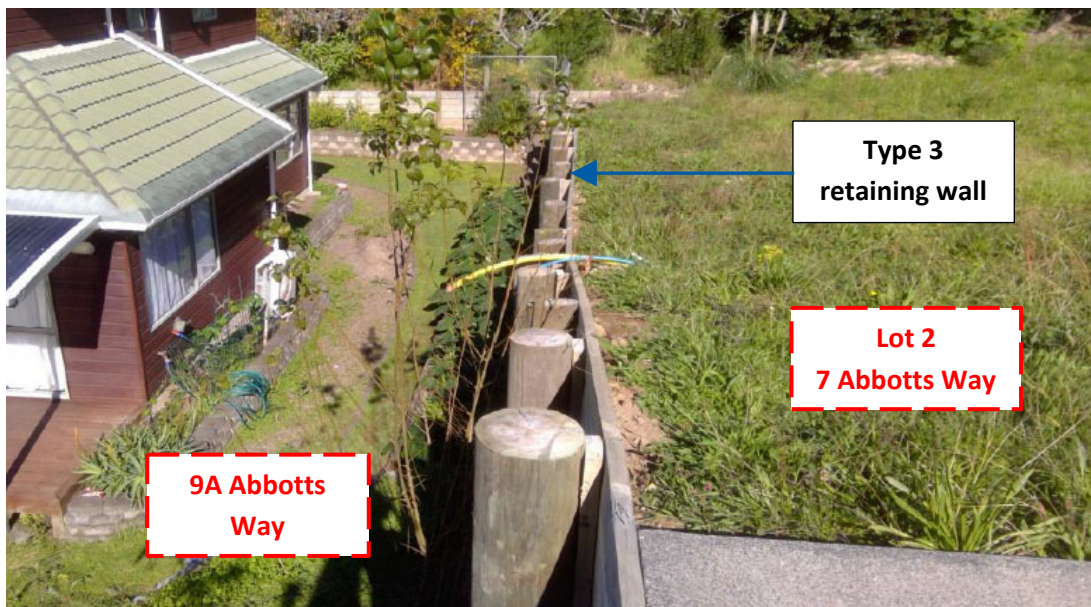


Figure 9: As-built Type 3 retaining wall as at 30 April 2021.⁴²

⁴² Photograph reproduced from the authority’s inspection report dated 30 April 2021.

3.24. On 23 September 2021, the applicant reported flooding in the backyard of 9A Abbotts Way to the authority. The applicant provided photographs taken on 23 September 2021 (see figure 10). No information has been provided to establish if the rainfall event on or about the 23 September 2021 met the criteria in clause E1.3.1 of an event having a 10 percent probability of occurring annually.⁴³



Figure 10: Extent of reported flooding on 23 September 2021.⁴⁴

3.25. On 24 September 2021, the authority attended the site. In an email to the Ministry dated 18 October 2021, the authority stated it had “checked [the public] stormwater lines were clear and running at [the] time of the site visit which they were”. The authority also confirmed it did not prepare a report following its visit on 24 September 2021, and it did not give any indication that it had observed the presence of any flooding.

3.26. On 11 November 2021, in an email to the Ministry, the structural engineer noted with respect to the remedial work:

3.26.1. The overall exposed wall height⁴⁵ is clearly shown on the plans to be 3m at its highest point (refer to figure 8). The 2.1m maximum design retained height⁴⁶ allows for 2.1m of lateral soil load with the remainder comprising a suitable depth of lightweight polystyrene fill necessary to ensure the 2.1m of soil retaining is not exceeded. This fill material does not apply lateral soil load to the wall.

⁴³ National Institute of Water and Atmospheric Research (NIWA) “New Zealand Historic Weather Events Catalogue” at <https://hwe.niwa.co.nz> accessed on 4 May 2022. No results were returned for any flooding or heavy rain event in Auckland for 22 and 23 September 2021.

⁴⁴ Photographs provided by the applicant on 5 November 2021.

⁴⁵ “Exposed wall height” is the vertical distance between ground level at the base (or toe) of the retaining wall, to the exposed top of the timber poles and rails. See figure 8.

⁴⁶ “Design retained height” is the vertical distance between ground level at the base (or toe) of the retaining wall, to the underside of the proprietary expanded polystyrene blocks (lightweight fill). See figure 8.

- 3.26.2. The rails were found to have not been completed to the design. A face fixed remedial option was chosen as the wall had already been backfilled, and this work was subsequently completed.
- 3.26.3. There was no evidence of twisting or bowing within the retaining wall rails as a result of overloading. Many of the poles were installed out of alignment, necessitating timber packers. As a result, the rails are not as regular as is usual, and the face fixed rails have also been installed with little regard to aesthetics, although the as-built Type 3 retaining wall is structurally sound.
- 3.26.4. The uneven pole centres were noted in the retrospective review process, and this has been accounted for within the as-built retaining wall capacity calculations.
- 3.26.5. Confirmed that elements of the building work have yet to be completed. This includes the completion of the final landscaping to the toe of the retaining wall, provision of details of or completion of the subsoil drain discharge, and the cut ends of the poles.

4. Submissions

The applicant

- 4.1. The applicant is of the view:
- 4.1.1. The Type 3 retaining wall has not been constructed in accordance with the building consent plans and specifications, and it is between 1.5m to 2.36m high above the gardens at 9A Abbotts Way.
- 4.1.2. The building work causes surface water to be concentrated, which results in the “flooding” of the property at 9A Abbotts Way causing a nuisance and damage⁴⁷. The applicant referred vegetable gardens being damaged and stated that “at times there is more than 200mm deep water” on the applicant’s property.⁴⁸ The applicant contends that the incidence of water on the property did not occur before the work took place.
- 4.1.3. Water and silt have come through and over the Type 3 retaining wall to 9A Abbotts Way.

⁴⁷ The damage referred to by the applicant does not relate to any building or part thereof, but it does relate to “vegetable gardens”.

⁴⁸ The applicant did not provide any supporting evidence to substantiate the depth of water.

4.1.4. The sub-surface drainage coil, the silt trap, and the lightweight polystyrene fill were not installed⁴⁹, and the free draining scoria backfill “never extended to [the] bottom of [the] retaining wall”.

4.1.5. There was no sediment control onsite.⁵⁰

The authority

4.2. The authority stated they had not been invited by the previous owner to inspect the construction of the Type 3 retaining wall (including the foundation pile holes and placement of the drainage).

4.3. The first inspection by the authority was on 16 November 2018 (see paragraph 3.9). The authority noted that the retaining wall had already been partly constructed at that time and the authority required the builder to provide “evidence that construction (of the retaining wall) and land compaction is under engineering supervision”.

4.4. The authority was of the view the sub-surface drainage coil “as part of the retaining wall construction is not intended to manage surface water and its purpose is for hydrostatic pressure relief”.

4.5. The authority acknowledged it could not confirm if sealant had been applied to the exposed ends of the timber posts.

4.6. The authority acknowledged the changes made from the original approved building consent plans and specifications are currently “undocumented” for record keeping purposes.

The previous owner

4.7. The previous owner stated:

4.7.1. The Type 3 retaining wall “is built in accordance with the [building] consent”.

4.7.2. The Type 3 retaining wall “has the appropriate amount of drainage scoria behind it”, and the drainage coil has been installed as per the consent.

4.7.3. “The overland flow path on the plan [indicates] that it goes to the bottom of [the applicant’s] site and flows [through] on its natural path downstream”.

⁴⁹ The applicant provided additional photographs to the Ministry on 15 November 2021 which did indicate that the lightweight expanded polystyrene fill blocks had been installed behind the Type 3 retaining wall.

⁵⁰ I note that sediment control measures (including use of a “silt fence”) were included in the plans submitted for the resource consent, with the proposed “silt fence” shown on the owner’s property along the line of the Type 3 retaining wall. These measures are installed and maintained during the construction phase only.

- 4.7.4. There was an existing high-water table.
- 4.7.5. The lightweight expanded polystyrene block fill has been installed behind the Type 3 retaining wall.
- 4.7.6. Topsoil is still required to be placed at the toe of the Type 3 retaining wall.

5. Expert's report

- 5.1. The Ministry engaged the services of a firm of structural and civil consulting engineers ("the expert") to assist it with a review of the as-built Type 3 retaining wall for compliance with clause B1 *Structure* and the reported incidence of surface water causing a nuisance to the applicant's property for compliance with clause E1 *Surface water*. The review was conducted by a Licenced Building Practitioner⁵¹ on behalf of the firm.
- 5.2. The review included an assessment of the plans and specifications related to building consent BCO10257508 and site visits on 11 August 2020 ("the first site visit") and 1 June 2021 ("the second site visit"). The expert provided a report to the Ministry dated 7 September 2021. This report was then provided to the parties on 9 September 2021.
- 5.3. The expert did not undertake any invasive investigations in relation to the construction of the Type 3 retaining wall (e.g. assessment of the ground conditions and depth of embedment of the poles). The expert also did not have available to them, when preparing the report, any of the Producer Statement – Construction Reviews (PS4s) issued by the structural and geotechnical engineers.
- 5.4. At the time of the first site visit, the Type 3 retaining wall was only partially backfilled (see figure 11(a)), and the expert observed some scoria drainage material behind the wall. At the time of the second site visit, the area behind the wall had been backfilled and "the ground cover had become more substantial and denser, and therefore having an increased capacity for infiltration and reducing surface water flow". See figure 11(b).

Site boundary

- 5.5. For the purpose of considering the compliance of the building work in relation to protection of other property, the expert was asked to establish, if it was reasonably practicable to do so, the setting out of the Type 3 retaining wall in relation to the boundary between numbers 7 and 9A Abbots Way.
- 5.6. In observing the boundary pegs and survey nail, the expert was of the view that the entire retaining wall, including the Type 3 wall, was located on 7 Abbots Way.

⁵¹ Area of practice design 2 licence class.



(a) Site as at 11 August 2020

(b) Site as at 1 June 2021

Figure 11: Site conditions.⁵²

Retaining wall structure

5.7. With respect to the construction of the Type 3 retaining wall, the expert noted:

- 5.7.1. Some elements of the wall appear “to be constructed in accordance with the [structural engineer’s] consented design”, whilst also noting the lack of authority inspections, not sighting any PS4s, and not undertaking any invasive observations, to verify compliance with the building consent.
- 5.7.2. Some differences apparent between the original design of the Type 3 retaining wall and its as-built construction.
- 5.7.3. The section of wall adjacent to the dwelling at 9A Abbotts Way is typically between 2.1m to 2.25m high, with the variance due to the undulation of the ground level at the base. The ground level at 7 Abbotts Way for this section of wall is approximately 150mm below the top rail. The poles are 275mm in diameter and are of a specific engineering design (SED).
- 5.7.4. The section of wall just forward (north) of the dwelling at 9A Abbotts Way reaches a maximum height of 3m. The ground level at 7 Abbotts Way for this section of wall is approximately 200mm below the top rail. The three SED poles closest to the boundary between 9 and 9A Abbotts Way are 300mm in diameter.
- 5.7.5. The centre-to-centre spacing of the poles is reduced to approximately 1.1m through the section of wall that is taller than the design height of 2.4m. The expert noted it is not clear whether the embedment depths were increased.

⁵² Photographs reproduced from the expert’s report

- 5.8. The expert observed issues with the quality of the construction of the as-built Type 3 retaining wall, being:
- 5.8.1. A heavily splintered post.
 - 5.8.2. The tops of the poles cut horizontally rather than at an angle to shed moisture.
 - 5.8.3. The possible lack of treatment to the tops of the posts.
 - 5.8.4. The inconsistency of pole spacings, which do not match the consented details.
 - 5.8.5. The line of railings and the poles at the top of the wall are not straight (i.e. the end-to-end alignment of the wall along its length is not straight).
 - 5.8.6. The assortment of packing timbers between the poles and rails, which indicates the poles may not have been correctly supported, braced and/or string-lined during construction when the concrete footings were poured.
 - 5.8.7. The gaps at the bottom of the wall between the bottom railings and the finished ground level.
 - 5.8.8. The second thickness of railings for the lower portion of the Type 3 retaining wall have been installed and screw fixed to the exposed/front face, rather than the back face which provides more strength, and some of the rails are bowing and splitting in some areas.
 - 5.8.9. The expert was unable to determine from the site observations if the lightweight expanded polystyrene blocks had been installed as per the building consent plans and specifications.

Surface water

- 5.9. At the first site visit, the expert noted the wall had not been fully backfilled, effectively leaving a swale behind the Type 3 retaining wall (see figure 11(a)). The expert noted there was some grass cover regenerating to the remainder of the site, but when previous surface water runoff had occurred during construction, the ground cover would have been minimal as the site had been stripped bare for the siteworks.
- 5.10. The expert had viewed the photographs and videos provided by the applicant (see paragraph 3.12). The expert noted:

It is also important to note that at the time of the applicant's photos and video's being taken, the ground cover on Lot 2 of 7 Abbots Way would have been very minimal as the site had been stripped bare. Minimal ground cover has very little effect on either absorbing (infiltration) or slowing down the flow of surface water.

- 5.11. The expert noted there was no silt fence evident in pictures of the construction along the base of the retaining wall or haybales at the lowest point of lot 2 to intercept the stormwater before it crossed the eastern boundary.
- 5.12. The expert noted the drainage coil was installed behind the base of the wall. However, the expert could not confirm what the drainage coil was connected to, whilst noting the building consent referred to a connection to be made to a stormwater drain via a silt trap. The expert observed a drainage marker peg at the bottom south-east corner of the site that may indicate a stormwater connection.
- 5.13. The expert noted that there is evidence of ground water seepage and scoria backfill leakage from the base of the Type 3 retaining wall towards the rear of 9A Abbotts Way. This was due (in part) to the bottom rail of the wall being clear of the adjacent ground level, and this is assumed to be very near to the original pre-development overland flow path.
- 5.14. The expert included photographs taken during his site visit on 11 August 2020. The photographs show the base of the Type 3 retaining wall, and ground adjacent to it, which is located on the owner's property at 7 Abbotts Way. No information has been provided to establish if the rainfall event on or about the 11 August 2020 met the criteria in clause E1.3.1 of an event having a 10 percent probability of occurring annually.⁵³
- 5.15. The expert noted that the overland flow path will always be in existence due to the topography of the land.
- 5.16. The expert observed an existing raised planter at the rear of 9A Abbotts Way. There is also a half-round earthenware drain laid at ground level that runs to a yard sump located near the south-eastern corner of 9A Abbotts Way, which is likely intended to reticulate any overland flow surface water.
- 5.17. The expert noted a channel is to be formed around the southern and eastern sides of the proposed Lot 2 buildings.⁵⁴ The stormwater catchment associated with this, including the retention and detention mitigation, will significantly lessen the downstream impact on 9A Abbotts Way. The proposed mitigations will ensure compliance with clause E1 and the 10 percent AEP threshold, and the overland surface water flow will be at predevelopment levels or better.
- 5.18. The expert concluded that while Lot 2 remains undeveloped, there will continue to be surface water seepage from the base of the retaining wall. However, the surface water flow is following the original overland flow path.

⁵³National Institute of Water and Atmospheric Research (NIWA) "New Zealand Historic Weather Events Catalogue" at <https://hwe.niwa.co.nz> accessed on 4 May 2022. No results were returned for any flooding or heavy rain event in Auckland for 11 August 2020.

⁵⁴ The as-built overland flow path plan from a registered land surveyor shows the channel was formed to the western and southern sides of lot 2, and not the eastern side as reported by the expert.

- 5.19. The expert was of the view that as the vegetative cover was nearly back to pre-development levels, any stormwater runoff as a result of a significant rainfall event may soon be back to an acceptable level, if not already.

6. Draft determination

- 6.1. On 24 March 2022, a draft determination was sent to the parties and persons with an interest.
- 6.2. On 7 April 2022, the authority accepted the draft determination without comments.
- 6.3. On 13 April 2022, the current owner accepted the draft determination without comments.
- 6.4. On 27 April 2022, in a telephone call to the Ministry, the structural engineer confirmed his acceptance of the draft determination without comments.
- 6.5. On 27 April 2022, in a telephone call to the Ministry, the geotechnical engineer confirmed his acceptance of the draft determination without comments.
- 6.6. On 29 April 2022, the applicant confirmed he did not accept the draft determination “on the basis [that] water [is] coming on [the] backyard from 7 Abbots [Way during] heavy rain”.
- 6.7. On 2 May 2022, the previous owner indicated his acceptance of the draft determination and stated, “we have no opposition to the file being closed”.

7. Discussion

- 7.1. This determination concerns building work associated with the construction of a timber pole (Type 3) retaining wall at 7 Abbots Way.
- 7.2. The applicant contends that the building work associated with the Type 3 retaining wall has not been constructed in accordance with the relevant building consent with regard to its structure, and it causes surface water to be collected or concentrated and disposed of such that it causes a nuisance and damage at the applicant’s property.
- 7.3. As the applicant does not own the property where the building work was carried out, the matter to be determined is therefore whether the building work carried out to construct the Type 3 retaining wall complies with Building Code clauses B1 *Structure* and E1 *Surface water*, with respect to the provisions that have the purpose of protecting other property.

Legislation

7.4. Section 3 of the Act has the following purposes:

....

(b) to promote the accountability of owners, designers, builders, and building consent authorities who have responsibilities for ensuring that building work complies with the Building Code.

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

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

7.6. Other property is defined in Section 7 of the Act as:

(a) means any land or buildings, or part any land or buildings, that are –
 (i) not held under the same allotment; or
 (ii) not held under the same ownership ...

7.7. “Sitework” is also defined in section 7, as “work on a building site, including earthworks, preparatory to or associated with the construction, alteration, demolition, or removal of a building”.

7.8. The definition of “building”, in section 8, includes “a temporary or permanent movable or immovable structure”. There are some exclusions to this definition in section 9.

7.9. The Type 3 retaining wall is a building as defined in section 8 of the Act⁵⁵, and I do not consider that any of the exclusions under section 9 of the Act apply. Therefore, it follows that construction of the retaining wall and the sitework associated with its construction (i.e. adjacent the boundary) was building work. For clarity, I note that the subdivision works, which included contouring of the site on lot 2 (see figure 4), is not earthwork associated with the construction of the retaining wall and is therefore excluded from my considerations of clause E1.

Clause B1 Structure

7.10. The objective of clause B1 *Structure* of the Building Code includes “to protect other property from physical damage caused by structural failure.”⁵⁶ The performance criteria for clause B1 includes (but is not limited to):

⁵⁵ See also clause A1 - *Classified Uses*, 8.0 *Ancillary*, item 8.0.1.

⁵⁶ Clause B1.1 (c).

B1.3.1 Buildings, building elements and sitework shall have a low probability of rupturing, becoming unstable, losing equilibrium, or collapsing during construction, or alteration and throughout their lives.

B1.3.3 Account shall be taken of all physical conditions likely to affect the stability of buildings, building elements and sitework, including:

- (a) Self-weight,
- (b) Imposed gravity loads arising from use,
- ...
- (d) Earth pressure,
- (e) Water...,
- (f) Earthquake,
- ...
- (r) Removal of support.

B1.3.6 Sitework, where necessary, shall be carried out to:

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

7.11. With respect to the term “low probability” as expressed in clause B1.3.1, I refer to the reasoning in *Auckland City Council v Selwyn Mews Ltd*⁵⁷ (“*Selwyn Mews*”), where Judge McElrea stated:

[47]...In cl B1.3.3 “a low probability of becoming unstable or collapsing” means that the risk of such events is no more than an appreciable risk (as distinct from a slight risk) or is at most a low risk (as distinct from a very low risk)^[58]

7.12. As discussed in previous determinations,⁵⁹ I consider that “other property” is not limited to the protection of buildings and the land itself must also be protected from the likelihood of damage. With respect to the “likelihood of damage” I refer to the reasoning in *Selwyn Mews*, where the Judge stated:

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

Clause B2 Durability

7.13. Clause B2 requires:

B2.2 Building materials, components and construction methods shall be sufficiently durable to ensure that the building, without reconstruction or major renovation, satisfies the other functional requirements of this code throughout the life of the building.

⁵⁷ District Court Auckland CRN2004067301-19, Judge McElrea, 18 June 2003, [2003] DCR 671.

⁵⁸ I note the judgement refers to clause B1.3.3, but the quoted and abbreviated text is in clause B1.3.1.

⁵⁹ For example, Determination 2015/003: “Compliance of a retaining wall between two properties at 34A and 36B Ballin Street, Ellerslie, Auckland”. Issued 10 February 2015.

- 7.14. Accordingly, the materials and construction method used in the Type 3 retaining wall must be sufficiently durable to ensure that the wall will continue to comply with the relevant clauses of the Building Code throughout its life.
- 7.15. Buildings may have specified intended lives of less than 50 years. Where this is the case, the specified intended life is stated in the building consent. No such specified intended life was included in the building consent for the Type 3 retaining wall. In the absence of a specified intended life, the life of the building as a whole (in this case the retaining wall) is not less than 50 years.⁶⁰
- 7.16. Clause B2.3.1 goes on to provide specific durability periods that building elements must continue to comply for, with only normal maintenance. These periods vary depending on whether the building has a specified intended life, and whether the element has a structural function, how easy it is to access and replace, and whether failure would go undetected.

Clause E1 Surface water

- 7.17. "Surface water" is defined in clause A2 of the Building Code as:

all naturally occurring water, other than sub-surface water, which results from rainfall on the site or water flowing onto the site, including that flowing from a drain, stream, river, lake or sea.

- 7.18. The objectives of clause E1 of the Building Code include to "safeguard people from injury or illness, and other property from damage, caused by surface water".⁶¹ The functional requirement is "Buildings and sitework shall be constructed in a way that protects people and other property from the adverse effects of surface water".⁶²

- 7.19. The performance criteria for clause E1 includes:

E1.3.1 Except as otherwise required under the Resource Management Act 1991 for the protection of other property, surface water, resulting from an event having a 10% probability of occurring annually and which is collected or concentrated by buildings or sitework, shall be disposed of in a way that avoids the likelihood of damage or nuisance to other property.

- 7.20. With regard to "...the likelihood of damage or nuisance to other property", I consider the meaning of "likelihood" as it relates to Clause E1.3.1 needs to be interpreted in a way that accords with the purpose of that particular provision, for example, as referred to above in *Selwyn Mews*. (See paragraph 7.12).

- 7.21. The term "nuisance" is not defined in the Act or Building Code.

⁶⁰ Section 113(1) of the Act.

⁶¹ Clause E1.1 (a).

⁶² Clause E1.2.

7.22. A previous determination⁶³ considered the term “nuisance” as follows:

[6.2.4] ...However broad a meaning is given to the word “nuisance”, there must be some significant nuisance effect before there can be a breach of [clause] E1.3.1.

7.23. Another determination⁶⁴ expanded on this as follows:

[6.1.5] The term “nuisance” is not defined in the Act or the Building Code, and it appears only in Clauses E1.3.1 and G4.3.4⁶⁵. The term “nuisance” has a particular common law meaning which is ‘the unreasonable interference with an individual person’s use or enjoyment of land or of some right connected with that land’. The question of whether a nuisance is unreasonable is a question of fact and must be considered in relation to factors such as the nature of the harm and the locality in which it occurs, and the frequency, duration and intensity of the interference.

[6.1.6] ...I am of the view that any nuisance has to be an *unreasonable interference*; calling a nuisance a significant nuisance is simply reflecting the fact that it is not a trivial or minor interference with a person’s use and enjoyment, but must be an unreasonable or significant interference with that use or enjoyment.

7.24. In respect of the disposal of surface water, I hold the same view as discussed in previous determinations⁶⁶:

...not all surface water needs to be so disposed of; only surface water resulting from an event with ‘a 10% probability of occurring annually’ or put another way, a storm or rainfall event of such severity that it only occurs once every 10 years. A 2% AEP storm event is expected to occur only once every 50 years, and falls outside the level of performance required by Clause E1.3.1.

7.25. Further, I am of the view that clause E1.3.1 does not require prevention of all surface water from moving across the property boundary; rather it requires prevention only to the extent that the surface water is likely to cause damage or nuisance to other property. This means that if some surface water moves across a property boundary it does not necessarily follow that clause E1.3.1 has been breached.

⁶³ Determination 2010/059, “Disposal of surface water collected behind a retaining wall at 226A Beach Road, Mairangi Bay, North Shore City”. See paragraph 6.2.4. Issued 12 July 2010.

⁶⁴ Determination 2015/052, “Regarding the compliance of proposed building work at 70B Grand Vue Road, Kawaha Point, Rotorua, in respect of adjacent other property”. Issued 12 August 2015.

⁶⁵ Clause G4.3.4 – Contaminated air shall be disposed of in a way which avoids creating a nuisance or hazard to people and other property. Clause G4.3.4 is outside the matter for determination in this case.

⁶⁶ For example, Determination 2017/042, “Regarding compliance of building work with Clause E1 of the Building Code at 1-5 Saint Bathans Lane, Papanui, Christchurch”. Issued 20 June 2017.

Compliance with clause B1 Structure

- 7.26. The applicant is of the view that the Type 3 retaining wall has not been constructed in accordance with the building consent BCO10257508. Consequently, the applicant has queried the compliance of the building work in respect of clause B1 *Structure*.
- 7.27. It is clear from the structural engineering and geotechnical engineering records, and other evidence in this case, the construction of the Type 3 retaining wall has not been carried out in accordance with the original building consent plans and specifications. In this respect, the applicant is correct. Changes were made during the construction of the wall (e.g. the extended height of the wall, and the vertical placement of the timber poles). The increase in height of the wall to 3m was observed by the authority during its inspection on 16 November 2018, and the authority sought evidence that the construction and land compaction was under “engineering supervision” (see paragraph 3.9).
- 7.28. The changes made were observed, assessed and agreed to by the structural engineer and geotechnical engineer. Producer Statement – Construction Reviews (PS4s) have been provided by both engineers in respect of the construction monitoring they have conducted during the course of the building work.
- 7.29. Further, the applicant has not provided any contrary evidence, such as a structural and stability analysis of the as-built construction of the Type 3 retaining wall, to provide an alternative view on the compliance of the wall with the Building Code clause B1 as it relates to the protection of other property.
- 7.30. The expert did observe issues with the quality of the construction and workmanship of the Type 3 retaining wall. However, taking into consideration the specific engineering design and construction monitoring by both the structural and geotechnical engineers, I am of the view that the Type 3 retaining wall complies with clause B1 of the Building Code as it relates to the protection of other property.

Durability

- 7.31. No clear evidence has been provided to suggest that the specific engineering design, the materials, or construction method used in building the Type 3 retaining wall will not be sufficiently durable to ensure the wall will continue to comply with clause B1 throughout its life. For example, in terms of the building materials and components used, H6 treated timber poles and boarding are considered durable for use in construction of this nature.⁶⁷

⁶⁷ Refer to New Zealand Standard *NZS 3602:2003 – Timber and Wood-based Products for Use in Building*, Table 1 “Requirements for wood-based building components to achieve a 50-year durability performance”, A “Members in contact with the ground”, including 1A.6 retaining wall – uprights (minimum level of treatment H5), and 1A.7 retaining walls – horizontal members (minimum level of treatment H4). Timber treated to a higher level satisfies the minimum requirements. NZS 3602:2003 is cited in *Ministry of Business, Innovation and Employment, Acceptable Solutions and Verification Methods, for Building Code clause B2 Durability*, second edition, amendment 9, effective from 1 January 2017.

- 7.32. Further, the Producer Statement – Design (PS1) and Producer Statement – Design Review (PS4) issued by the structural engineer included reference to compliance with clause B2 *Durability* (see paragraphs 3.4 and 3.21), and it is reasonable to place weight on that information when considering compliance with the Building Code.
- 7.33. However, the expert did identify several issues that the current owner and the authority should consider, including (but not limited to) the possible lack of treatment to the top of the posts (see paragraph 5.8.3). Taking the expert's comments into account and that the building work is not complete, I am unable to reach a conclusion on compliance with clause B2 *Durability*. I will therefore leave it for the parties to review and take any steps necessary to address these issues.

Compliance with clause E1 Surface water

- 7.34. The applicant is of the view that the construction of the Type 3 retaining wall has caused surface water to be concentrated such that "flooding" has occurred, resulting in a nuisance and damage at their property. The applicant also contends that the "flooding" did not occur prior to the works to subdivide the property at 7 Abbots Way.
- 7.35. Taking account of the expert's report and the information provided by the applicant, most of the events when the surface water runoff occurred were during the siteworks and construction phase. This includes the construction of the Type 3 retaining wall as well as the subdivision works.
- 7.36. The applicant has provided photographic and video evidence of varying quantities of surface water that did pass from lot 2 (7 Abbots Way), to the east side of the Type 3 retaining wall and onto 9A Abbots Way, at specific points in time. The flooding was such that in some instances (during the construction of the wall and subdivision works) it caused water to pond on the applicant's lawn adjacent to the raised planter to the west of their property, and along the area of the existing open earthenware channel and surface water sump to the south of the applicant's property. The applicant has stated this continues to be the case (see paragraphs 3.24 and 6.6). However, I have received insufficient information that clearly demonstrates the frequency and extent of any flooding after the construction was completed.
- 7.37. With regard to events with a 10 percent probability of occurring annually (i.e. the relevant threshold in clause E1.3.1), no information has been provided to confirm the size and intensity of the rainfall events on the dates the applicant took the photographs and videos either during the construction of the Type 3 retaining wall and associated siteworks or thereafter.
- 7.38. I am only required to consider surface water that may be collected and concentrated by the Type 3 retaining wall and its associated siteworks. Some surface water will be captured within lot 2, i.e. it will permeate the soil and be taken up by vegetation or reach the water table. Some of it (closer to the wall) will

permeate to the drainage coil at the bottom of the retaining wall; and it is this surface water collected or concentrated by the Type 3 retaining wall and its associated earthworks that must be disposed of in a manner that is not likely to cause damage or nuisance to the applicant's property. I note that this will include surface water in rainfall events having a 10% probability of occurring annually that is directed to the southeast corner by the channel.

- 7.39. The photographic evidence indicates that small amounts of silt and scoria passed under and through the Type 3 retaining wall and settled directly next to the base of the wall, in an area which is within the boundary of 7 Abbots Way (see paragraph 2.4). Consequently, it is not clear if any of the silt and scoria passed onto the applicant's property causing a nuisance or damage.

Factors considered in this case

- 7.40. Taken together, there a number of factors that have a bearing on compliance with clause E1 *Surface water* and the protection of other property at 9A Abbots Way. These include:
- 7.40.1. Most of the incidences of surface water reaching the applicant's property are recorded during the period when the subdivision works and construction of the Type 3 retaining wall at 7 Abbots Way were being undertaken.
- 7.40.2. The lack of any information or data related to the frequency, intensity and duration of any storm or rainfall event in the area concerned that coincides with the dates reported by the applicant. As such, with regard to the threshold in E1.3.1 (an event with 10 percent probability of occurring annually), no evidence has been provided of the likelihood of nuisance or damage occurring in such an event.
- 7.40.3. The applicant has not reported any damage to the dwelling, or part thereof, at 9A Abbots Way as a result of any surface water being collected and concentrated by the Type 3 retaining wall.
- 7.40.4. In terms of any reported damage to the land, the applicant has only referred to "vegetable gardens", but it is unclear whether the area that the applicant contends has been affected is indeed part of the property at 9A Abbots Way. This takes into consideration the approximate setting out of the retaining wall in relation to the boundary between the properties.
- 7.40.5. Since the location of the property boundary is approximated (see paragraph 2.4), it is unclear as to the extent (e.g. area, duration, and depth) of the incidences of any surface water crossing the boundary onto 9A Abbots Way. The nature of the flooding or ponding and the locality in which it occurs appears to be limited, in the main, close to the base of the Type 3 retaining wall and to the flat grassed area and vegetable border close to the property boundary.

- 7.40.6. 7 Abbots Way is higher in elevation than 9A Abbots Way.
- 7.40.7. The existing overland flow path which included the applicant's property and the mitigating measures now in place as a result of the subdivision works at 7 Abbots Way, and the observations of the expert. This is confirmed by the construction monitoring and issue of Producer Statement – Construction Reviews (PS4s) by the structural and geotechnical engineers for this work.
- 7.40.8. The elevated ground water table recorded in the area of the Type 3 retaining wall.
- 7.40.9. The natural filtration of the soil and grassed area at lot 2 behind the Type 3 retaining wall.
- 7.40.10. The landscaping to be completed to the area at the base (east side) of the Type 3 retaining wall.
- 7.40.11. The drainage coil⁶⁸, wrapped in a filter cloth, that has been placed at the base of the Type 3 retaining wall, with scoria drainage material above. However, as noted by the expert and structural engineer, it is unclear where the drainage coil discharges to, albeit the building consent plans and specifications refer to a silt trap.
- 7.41. Taking these factors together, the evidence in this case suggests that as a result of the construction of the Type 3 retaining wall:
- 7.41.1. the likelihood of damage to other property does not meet the threshold of a real and substantial risk of such damage occurring, and
- 7.41.2. avoids the likelihood of nuisance to other property that may substantially and unreasonably interfere with the applicant's right to use and enjoy their land.
- 7.42. For these reasons, I am of the view that the partially completed Type 3 retaining wall complies with clause E1 *Surface water* with respect to the protection of other property.
- 7.43. I note the building consent and resource consent documentation refers to the construction of a proposed new 2-storey residential dwelling on lot 2, along with associated surface water detention tanks and below ground drainage. Although this is not material to the factors listed above, if the dwelling was constructed at some point in the future, this is likely to reduce the amount of any surface water that may

⁶⁸ As noted previously, a sub-surface drainage coil located at the base of a retaining wall is usually installed to relieve hydrostatic pressure that could otherwise build-up behind the wall, rather than for the disposal of surface water. The reference to the drainage coil has only been added here in light of the submissions from the parties, the structural and geotechnical engineers, and the observations of the expert.

otherwise be collected or concentrated by the Type 3 retaining wall if the site remained undeveloped (in its current state).

Overland flow

- 7.44. High intensity and short duration events can trigger the overland flow of surface water in some instances.⁶⁹ The disposal of water from the overland flow path in rainfall events that are greater than that specified in clause E1.3.1 is not a relevant consideration in determining whether the retaining wall complies with clause E1.3.1. However, I offer the following comments for context.
- 7.45. In this case, 9A Abbots Way is lower in elevation compared to 7 Abbots Way and it is evident that an overland flow path existed prior to the subdivision works (see paragraph 2.6). The ground contours on lot 2 after the subdivision works are relatively level.
- 7.46. Although the ground contours have been altered and a new open channel formed to the west and south sides of lot 2 as part of the subdivision works, an overland flow path still exists. As such, it is evident that the applicant's property will continue to receive a measure of surface water from the overland flow path.
- 7.47. The building consent and resource consent plans do not show a means of disposing of any overland surface water to an appropriate outfall on lot 2. Rather the plans indicate a continuation of the overland flow across the south side of the applicant's property to meet up with the pre-development overland flow path on 9A Abbots Way. For this to occur, the overland flow is required to pass over or through the south end of the Type 3 retaining wall. The retaining wall is likely to have the effect of reducing the velocity of the surface water, but it does not necessarily prevent that water from entering onto the applicant's property.
- 7.48. The expert noted the retention and detention mitigations associated with the subdivision works to address the overland flow path should lessen the downstream impact on 9A Abbots Way. As such, it is reasonable to consider that the overland flow of surface water is expected to be equivalent or better than pre-development levels.
- 7.49. It is also evident that there is an existing open surface water drain on the south side of the 9A Abbots Way at the base of an existing low level concrete block retaining wall (see paragraph 5.16). This drain discharges to a surface water sump. It is therefore reasonable to consider that these measures were introduced, at some

⁶⁹ Australian/New Zealand Standard, AS/NZS3500.0, "Plumbing and drainage", Part 0, Glossary of terms, item 30.20 "Overland flow – water running across the land after rainfall that cannot enter the stormwater drainage system due to blockage or rainfall exceeding the design intensity of the drainage system". Overland flow paths are the paths taken by stormwater as it concentrates and flows downhill over the land.

point in the past, to help mitigate the effects of any pre-development overland flow.

8. What happens next?

- 8.1. The building work associated with building consent BCO10257508 is incomplete. This includes, but is not limited to, the installation of a safety barrier that is required along the top of the Type 3 retaining wall (see figure 8).
- 8.2. The current owner will need to consider making arrangements to complete the building work and liaise with the authority so it can conduct whatever inspections are necessary prior to the issue of a code compliance certificate.
- 8.3. However, as noted above, it is evident that the as-built works do not comply with the approved building consent. This remains for the current owner and the authority to discuss and agree to the most appropriate measures necessary to address this issue before a code compliance certificate is issued.

9. Decision

- 9.1. In accordance with section 188 of the Building Act 2004, I determine the partially completed building work associated with the construction of the Type 3 retaining wall and associated sitework under building consent BCO10257508 complies with the provisions of Clause B1 *Structure* and Clause E1 *Surface water* of the Building Code that relate to the protection of other property.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 23 June 2022.

Peta Hird

Principal Advisor Determinations

APPENDIX A

A.1 The relevant provisions of the Building Code are:

B1 STRUCTURE

FUNCTIONAL REQUIREMENT

B1.2 Buildings, building elements and sitework shall withstand the combination of loads that they are likely to experience during construction or alteration and throughout their lives.

PERFORMANCE

B1.3.4 Due allowance shall be made for:

(a) The consequences of failure

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