

Determination 2022/027

Regarding the decision by the authority to issue a notice to fix for work carried out to a large dam without a building consent

25 Old Ford Road, Seddon

Summary

This determination arises from the authority's decision to issue a notice to fix for work carried out to a large dam without a building consent for the contravention of section 40. The owner and the authority disagree on the scope of works that required building consent.



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 (eg, acceptable solutions) and guidance issued by the Ministry, is available at www.building.govt.nz.

1. The matter to be determined

- 1.1. This is a determination made under due authorisation by me, Rebecca Mackie, 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. Trelawne Farm Limited, which is the owner of the property where the building work was carried out and is the applicant in this determination (“the owner”)
 - 1.2.2. Marlborough District Council, carrying out its duties as a territorial authority, building consent authority, or regional authority (“the authority”)
 - 1.2.3. K Suleiman, who was the engineer involved with the building work and was issued a notice to fix in respect of it (“the engineer”). The engineer is also acting as the owner’s agent in this matter.
- 1.3. This determination arises from the authority’s decision to issue a notice to fix for work carried out to the owner’s dam. The work was carried out without a building consent, and the authority considers a building consent was required under section 40 of the Act² for all of the work carried out. The owner and engineer agree that a building consent was required for some of the work. However, they disagree on other aspects of the work, notably the engineer considers the work associated with lining the reservoir and inlet, and the installation of a cut-off drain, did not require a building consent and therefore should not have been included in the notice to fix.
- 1.4. The matter to be determined, under section 177(1)(b) and (3)(e)³, is the authority’s exercise of a power of decision to issue a notice to fix for a contravention of section 40 for building work carried out on a large dam without building consent. In deciding this matter, I must consider the work carried out is ‘building work’ and whether that building work required a building consent.

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

² See Appendix A.

³ See Appendix A.

Matters outside this determination

- 1.5. This determination is limited to the matter set out in paragraph 1.4. I have not considered any aspects of the Act other than those necessary to form a conclusion on the matter to be determined. Specifically, I have not considered the Building Code compliance of the dam or the work carried out to the dam.
- 1.6. I have not considered matters relating to the Resource Management Act 1991, including the District Plan and any resource consents as I have no jurisdiction under other enactments.

2. The building work

- 2.1. The owner's property is a rural property near the township of Seddon, Marlborough. The property is primarily used as a vineyard and for other farming activities.
- 2.2. Around 2004/2005 the dam⁴ subject of this determination was constructed on the property to store water for vineyard and farm irrigation. The dam was constructed under a building consent (BC040282) and was stated to be "an Earthfill Embankment Dam with Low Potential Impact of Classification⁵".
- 2.3. The dam was constructed with earth embankment walls and holds the irrigation water in a reservoir. The embankment walls of the dam and reservoir were partially faced with rock protection and was lined with gravel. The dam covered an area of approximately two hectares and was capable of retaining 46,587m³ of water. The height of the dam's walls/banks varied between 3.77m and 4.45m⁶. The dam was fed by an unlined inlet channel at its eastern end, with water pumped from the Awatere River, some distance away. An unlined piped spillway⁷ was located on the dam's northern side.
- 2.4. The authority issued a code compliance certificate for the construction of the original dam on 24 May 2005.
- 2.5. Some years later, the owner subsequently decided to carry out work to the dam, refer to paragraph 2.8 for a detailed list. The owner engaged the engineer for this purpose, with the engineer providing drawings, specifications, construction monitoring and certification of the works.

⁴ 'Dam' is used in this determination in the context of its definition in Section 7 of the Act. This is explained and examined in greater detail in section 6 'Discussion' of this determination.

⁵ Section 134B of the Act outlines the classification of a dam

⁶ Accordingly, the subject dam is considered a 'large dam'. Refer to section 7 of the Act for the definition of a large dam.

⁷ A spillway is a structure that is designed to discharge or drain the water stored in the reservoir

- 2.6. The owner applied for a resource consent in relation to this work, and the authority granted the resource consent⁸ on 27 July 2015.
- 2.7. In response to conditions attached to the resource consent, the engineer provided a design certificate (dated 3 August 2015) for the reservoir earthworks, certifying that the design satisfied all “applicable codes and standards”. He also supplied a Producer Statement Design (“PS1”), dated 3 August 2015. This PS1 certified that the part of the proposed building work would comply with the relevant provisions of the Building Code as an alternative solution⁹. However, the PS1 did not detail, or was not explicit, as to the extent of the building work referred to nor the relevant Building Code clauses the building work complied with.
- 2.8. The works were carried out from August to October 2015. They involved:
- 2.8.1. lining the dam base and embankments with a high-density polyethylene (HDPE) geomembrane liner to address leakage, with the liner ‘keyed’ (or held in place) into the top of the dam wall using a ‘trench’ (designed to hold the liner in place).
 - 2.8.2. performing earthworks, to create a more uniform shape for the dam’s earth walls/embankment and make it easier to line, and to increase the dam’s potential storage volume to 49,434m³.
 - 2.8.3. removing the rock protection from the dam wall and placing a layer of soil fill (approximately 800mm deep) on the dam wall to reshape it and make it easier to install the lining and protect the longevity of the lining.
 - 2.8.4. replacing the dam spillway with “a more formal structure” made of concrete and larger diameter culverts.
 - 2.8.5. shaping and lining the dam inlet channel and lining it with an HDPE liner.
 - 2.8.6. installing a cut-off field drain, upstream of the dam, to capture any potential sub-surface water flow. The cut-off drain runs along its northern side to connect to an existing drain/spillway.
- 2.9. The engineer subsequently supplied a Producer Statement – Construction Review (“PS4”) to the authority which, confirmed part of the building works had been completed and was issued with respect to certain clauses of the Building Code, although the specific clauses were omitted.
- 2.10. The authority received the PS1 and PS4 along with other related documents on 25 November 2015 as part of the resource consent process.

⁸ Under the Resource Management Act 1991

⁹ An ‘alternative solution’ is all or part of a building design that demonstrates compliance with the Building Code performance requirements, as opposed to establishing compliance with the Building Code by way of, for example, an Acceptable Solution or Verification Method which are issued by the Chief Executive under Section 22 of the Act.

2.11. The owner did not obtain building consent for any of the work described in paragraph 2.8.

3. Background

- 3.1. In late 2020, while reviewing its property files and register¹⁰ of dams in its district, the authority identified that work had been carried out to the owner's dam, and that the work may have required building consent.
- 3.2. The authority wrote to the owner on 17 November 2020 raising the issue. On 23 November, it sent an email to the engineer, seeking to establish the extent of any building work carried out in association with the dam, and detailed further aspects of the building work that may have been carried out which required building consent. The engineer responded in an email dated 6 January 2021.
- 3.3. The authority carried out a "Compliance Investigation Site Visit" on 12 January 2021, to investigate the extent of the building work that had taken place and current condition of the dam.
- 3.4. Following this visit, the authority held a meeting with the engineer on 19 January 2021 to discuss the possibility of a certificate of acceptance¹¹ ("COA") being issued for the work.
- 3.5. During the meeting, the parties disagreed on the extent of the building work that would need to be covered by the COA. The authority considered the installation of the HDPE liner and the associated earthworks to the dam and inlet is building work that required a building consent, so those should form part of the COA application. In forming this opinion, the authority relied on the New Zealand Society of Large Dams (2015) *New Zealand Dam Safety Guidelines*¹² ("the NZSOLD guidelines"). The engineer disagrees with the authority's position.
- 3.6. The authority subsequently issued a notice to fix¹³ to the owner and engineer on 27 January 2021 ("the notice to fix"). The particulars of contravention or non-compliance given in the notice to fix were:

Details of failure or error:

Contrary to section 40 of the Building Act 2004, the following building works have been carried out without first obtaining a building consent:

- A High Density Polyethylene liner has been installed to a large earth fill embankment dam

¹⁰ Section 151 requires each regional authority to establish and maintain a register of dams in its district.

¹¹ Section 96 sets out when an authority may issue a certificate of acceptance for building work that has already been carried out.

¹² The NZSOLD guidelines are often used as evidence of Building Code compliance

¹³ Under sections 164 and 165

- The dam wall and spillway have been modified by the building works associated with installing a High Density Polyethylene liner.

3.7. The owner then applied for a determination.

4. Submissions

The owner and the engineer

- 4.1. The engineer is acting as the owner's agent in this matter but is also party, and their views are incorporated and summarised with the owner's submissions.
- 4.2. The owner's submission set out the background to the dispute and noted that at no point during the resource consent process, or while the building works were being undertaken, did the authority advise the owner that building consent was required.
- 4.3. The owner and engineer accept the removal of rock protection/gravel lining of the original dam earth walls and the replacement of the spillway are 'appurtenant structures'¹⁴, and a building consent was therefore required to replace these elements "as the works were an alteration to the dam". The owner intends to apply for a certificate of acceptance in respect of these aspects of the building work.
- 4.4. However, the engineer does not agree with the authority on the scope of the works that required a building consent (which will inform the work to be included in the certificate of acceptance application). Other than the removal of the rock protection and replacement spillway, the engineer considers the remaining work does not require a building consent. The reason given for this view was:

The [dam] was unlined originally, therefore there was no component or specified system, and the HDPE lining has improved the functionality of the reservoir. We are of the opinion that the HDPE liner is only [an] appurtenant structure where it replaces the rock lining (on and around the dam).

- 4.5. On 27 May 2021, in response to a request from the Ministry, the owner confirmed the building work they consider does not require a building consent:
 - 4.5.1. earthworks to the dam to create a more practical shape for lining and to increase the storage volume of the reservoir.
 - 4.5.2. the lining of the dam with a HDPE liner.
 - 4.5.3. the reshaping and lining of the inlet and the creation of the cut-off field drain.

¹⁴ Refer to definition in section 7 of the Act

The authority

4.6. The authority made a submission, dated 27 May 2021, in which it set out its view that a building consent was required for the work. They consider the work was not exempt under section 41¹⁵ of the Act, or exempt under clause 22 of Schedule 1¹⁶ of the Act as Schedule 1 specifically excludes large dams. As a building consent was required, there has been a breach of section 40 of the Act.

4.7. The authority also stated:

4.7.1. the installation of the HDPE liner was “integral to the safe functioning of the dam as a structure for retaining water” and therefore required consent.

4.7.2. the siteworks associated with the liner “involve alteration to dam or its appurtenant structure of siteworks” and also require building consent.

4.7.3. they were correct to issue the notice to fix to the owner and engineer under section 164(1)(a) of the Act, as they had reasonable grounds to consider a specified person was contravening or failing to comply with the Act or its regulations.

4.7.4. they will consider whether the building work complies with the Building Code as part of the certificate of acceptance process.

4.7.5. section 6.7 of the NZSOLD guidelines in particular highlights the importance of a framework for designing and constructing HDPE-lined embankment dams; geo-membrane lined embankment dams have more “potential failure modes” than similar embankment dams that are not lined, as they create additional locations for pressure build-up.

4.8. The authority concluded:

A high standard of care was needed to be provided for alteration works of this large dam during the design and construction to meet appropriate and acceptable performance criteria that reflect the consequence of dam failure and this all the more reinforces the legislative need to obtain building consent to establish compliance with building code. NZSOLD Guidelines comment that ‘even small design changes must not be considered in isolation as significant reductions in dam safety can result from a sequence of relatively minor seemingly unrelated modifications’.

4.9. The authority summarised the building work that it considers requires a building consent as follows.

4.9.1. HDPE liner installation to the whole dam and associated earthworks with installing an HDPE liner. This includes additional earth fill over the dam wall

¹⁵ Section 41 provides exceptions to the requirement under section 40.

¹⁶ Schedule 1 sets out a list of building work for which building consent is not required.

to re-contour slope, placement of additional earth fill on dam wall under the liner to support it, liner 'key trench' (or fixing) into the top of the dam, and removal of rockfill protection from the upstream face of the dam.

- 4.9.2. Spillway modification including drainage works (cut off drain and spillway drainage).

5. The draft determination

- 5.1. A draft determination was issued to the parties 16 February 2022.
- 5.2. The authority accepted the draft without additional comment.
- 5.3. The owner did not accept all aspects of the draft and provided the following comments (in summary):
- 5.3.1. They stated, "The determination is generally accepted, with the exception of the liner being an appurtenant structure and we would like acknowledgement that the design works were carried out in the transition between the 2000 and 2015 NZSOLD Guidelines." The guideline had only recently been issued at the time of the project.
- 5.3.2. They highlighted the NZSOLD guidance does not specifically mention "lining or membranes" in the sections discussing appurtenant structures.
- 5.3.3. They confirmed the dam was constructed in 2004 and "there were no issues identified with the dam structure".
- 5.3.4. They also confirmed there was a leak in the reservoir, stating:
- ...a leak in the floor of the reservoir, some distance behind the dam within a gravel seam, this is not clear... [in]... the draft determination and this is important to the safety of the dam. The leak did not pass through under the dam, but to the northeast of the reservoir as shown on the attached aerial photograph.
- 5.3.5. They proposed that the dam was unlined and designed as such.
- If the liner was not installed, there would be no difference to the safety of the dam. The liner is not required for the safe functioning of the dam and therefore cannot be categorised as an appurtenant structure.
- 5.3.6. They agreed that failures in the lining could threaten the stability of the dam if the dam was designed with a liner. They stated:

There is no explanation as to how a tear of failure of a joint could threaten the stability of this dam given it was designed to retain water without a liner and as such has features such as a chimney drain.

5.3.7. They made a number of submissions on the inlet and outlet, including:

The [dam] is filled by pumped water from a river some distance from the [dam]. The [dam] has an inlet from an old watercourse channel that has a modified catchment. The watercourse only flows when there is heavy rainfall.... The old watercourse is not used to fill the drain. The inlet apron and cut-off drain were installed to assist in the capture of surface and subsurface water, but again are not integral to the safe functioning of the dam as a structure.

6. Discussion

- 6.1. The matter to be determined is the authority's decision to issue the notice to fix to the owner and engineer for a contravention of section 40. The notice was issued on the basis that building work had been carried out to the dam, the authority considers a building consent was required for that building work, and a building consent was not obtained for the work.
- 6.2. The matter in dispute is the extent of building work that requires a building consent. The owner and engineer accept that a building consent was required for the 'removal of rock protection/gravel lining of the original dam earth walls and the replacement of the spillway'. However, the parties dispute whether the remaining works carried out to the dam require a building consent. I consider the remaining works to be; the installation of the HDPE lining to the whole dam (including the associated earthworks, the lining itself and the 'keyed in trench'), the reshaping and lining of the inlet, a new cut off drain to the north.

The legislation

- 6.3. A notice to fix is an enforcement notice that requires a person to remedy a contravention of the Act or its regulations. The legislation regulating notices to fix can be found in sections 163 to 168 of the Act.
- 6.4. Section 164¹⁷ states if an authority considers on reasonable grounds that a specified person is contravening or failing to comply with the Act or its regulations, then the authority must issue the 'specified person' a notice to fix, requiring them to remedy the contravention or comply with the Act or regulations.
- 6.5. The parties dispute is limited to the extent of building work that requires a building consent as it relates to the contravention of section 40 stated in the issued notice to

¹⁷ See Appendix A.

fix. No other aspects of the notice are disputed, including that it is not disputed that both the owner and the engineer are specified persons for the purposes of section 163 and 164, so I will not address any other aspects further.

- 6.6. A notice to fix must clearly identify what part of the Act or regulation is being contravened.
- 6.7. The contravention identified by the authority in the notice to fix was that building work had been carried out without first obtaining a building consent when one was required under section 40.
- 6.8. Section 40 states:

40 Buildings not to be constructed, altered, demolished, or removed without consent

(1) A person must not carry out any building work except in accordance with a building consent...

- 6.9. Section 40 is subject to section 41 and section 42A. Section 41 sets out exceptions to section 40 and states building consent is not required for certain building work in certain circumstances. Section 42A sets out building consent is not required for building work described in Schedule 1 of the Act.
- 6.10. Section 8 and 9 define what a 'building' does and does not include and section 7 defines 'Building work' for the purposes of the Act. If the work subject of this determination is not a building, or not building work, or satisfies sections 41 or section 42A of the Act, then building consent is not required for the work.
- 6.11. The work in question relates to a dam. This requires me to consider what is meant by the term "dam" under the Act: what it does and does not include.
- 6.12. Section 7 defines what is meant by dam for the purposes of the Act:

dam—

(a) means an artificial barrier, and its appurtenant structures, that—

(i) is constructed to hold back water or other fluid under constant pressure so as to form a reservoir; and

(ii) is used for the storage, control, or diversion of water or other fluid; and

(iii) [Repealed]

(b) includes—

(i) a flood control dam; and

(ii) a natural feature that has been significantly modified to function as a dam; and

(iii) a canal; but

(c) does not include a stopbank designed to control floodwaters

6.13. It is also important to consider the inclusion of appurtenant structures within the definition of a dam. Section 7 defines an appurtenant structure:

appurtenant structure, in relation to a dam, means a structure that is integral to the safe functioning of the dam as a structure for retaining water or other fluid

6.14. As the term appurtenant structure is noted in the definition of ‘dam’, if something is identified as an appurtenant structure, it is also part of the definition of a dam.

6.15. It is important¹⁸ to note there is no dispute between the parties that the dam is a “large dam”, as that term is defined in section 7:

large dam means a dam that has a height of 4 or more metres and holds 20,000 or more cubic metres volume of water or other fluid

With a maximum storage volume of over 49,000m³, and maximum embankment heights up to 4.45m in places, the criteria in this definition are clearly fulfilled.

6.16. The final definition in Section 7 I must consider is that of building work itself.

building work—

(a) means work—

(i) for, or in connection with, the construction, alteration, demolition, or removal of a building; and

(ii) on an allotment that is likely to affect the extent to which an existing building on that allotment complies with the building code; and

(b) includes sitework; and ...

6.17. There is no question or dispute here that a “dam” is not a building under the Act. However, for completeness I consider that a dam is a “temporary or permanent movable or immovable structure” as described in section 8 of the Act, and therefore a building for the purposes of the Act¹⁹.

The notice to fix for a contravention of section 40

¹⁸ This is salient in assessing whether work associated with a dam requires a building consent or is exempt from the requirement under section 42A and Schedule 1 of the Act.

¹⁹ The Act also contains specific provisions relating to the roles of authorities in relation to buildings that are dams (see section 14 and subpart 7). Clause A1 of the Building Code clarifies that dams are classified as “Ancillary” buildings for the purpose of those regulations.

6.18. The notice to fix states the following work was carried out in contravention of section 40 as the work was carried out without first obtaining a building consent:

- the HDPE liner installed on the dam
- the associated modifications to the dam wall and spillway.

6.19. In further correspondence between the parties and the Ministry, it is now clear the work the authority considers required a building consent is slightly broader than this (refer to paragraph 4.9 for a more explicit description of what the authority considers requires a building consent).

6.20. In response to a request from the Ministry, the engineer has clarified (refer to paragraph 4.5) the work they consider is excluded from the requirement for building consent is:

6.20.1. the earthworks within the reservoir to create a more practical shape for lining and to increase the storage volume of the reservoir.

6.20.2. the reshaping and lining of the inlet.

6.20.3. the creation of the cut-off field drain.

6.20.4. the HDPE lining of the reservoir.

6.21. The engineer has stated they do not consider the HDPE lining to be an ‘appurtenant structure’, except in those areas where it replaces the rock lining on and around the dam embankment wall. The engineer also does not consider “the rest of the works” – namely the earthworks within the reservoir and installation of the HDPE lining, the earthworks and lining of inlet, and the creation of the cut-off drain – to be subject to the Building Act. This argument can be summarised as the owner stating these works do not fall within the definition of ‘dam’ in Section 7. As I also understand it the engineer’s argument is that the work to the owner’s dam is not in fact building work. I assume this is because, as the dam was originally designed without a liner, the engineer considers the work carried out in respect of the lining is not required for and/or does not alter dam and its ability to function/hold back water.

6.22. In order to consider the authority’s decision to issue the notice to fix for a contravention of section 40, it appears clarification is required in respect of; how the works that have been carried out relate to the definition of ‘dam’, whether the work is ‘building work’ for the purpose of the Act, and then whether a building consent was required.

Definition of Dam

6.23. The Act defines a dam, relevant to the facts in this case, as meaning an artificial barrier that forms a reservoir which holds back or stores water and which has ‘appurtenant structures’ that are integral to the safe functioning of the dam.

6.24. I consider the two relevant aspects are the part of a dam is the 'artificial barrier', and the dam's 'appurtenant structures'. I will consider what constitutes the artificial barrier and then identify any relevant appurtenant structures in relation to the work carried out to the owner's dam.

The artificial barrier which holds back or stores water

6.25. I want to return to the definition of dam and highlight (b)(ii):

(b) includes—

(i)

(ii) a natural feature that has been significantly modified to function as a dam; and

6.25. The natural feature here is the ground, which has been significantly modified via excavation, formation of a reservoir and dam walls at the time of its construction. It has now been modified further.

6.26. The reservoir and its embankments are part of the dam as they are the artificial barrier which holds back or stores water. The applicant and the authority are incorrectly trying to assess whether or not these parts of the dam meet the definition of appurtenant structure when I consider they fall in the definition of dam as part of the 'artificial barrier that forms a reservoir which holds back or stores water' and in (b)(ii) instead.

6.27. I consider the earthworks to increase the size and change the shape of the reservoir, and the installation of the HDPE lining to the reservoir and dam and the construction of the keyed in trench are work to the artificial barrier of a dam.

Appurtenant structures

6.32. An appurtenant structure is defined in section 7 as "a structure that is integral to the safe functioning of the dam as a structure for retaining water or other fluid".

6.33. It is worth noting that this definition was amended in 2013 to replace the word "proper" with the word "safe" (i.e. the previous definition of an appurtenant structure was one that was "integral to the proper functioning of the dam").

6.34. In my opinion, this change placed the emphasis on identifying those structures where a failure to perform their function would contribute to a wider potential failure of the dam itself to perform its primary function of retaining water or other fluids.

- 6.35. The authority refers to the NZSOLD guidelines in its submission. The authority notes the guidelines are “often used as evidence of compliance as an alternative solution for Clauses B1, B2 and E1²⁰” for these structures.
- 6.36. The owner referred to these guidelines in its resource consent application where it noted, in the absence of specific standards for dams in New Zealand, complying with the NZSOLD guidelines will “ensure factors that may cause dam failure are correctly addressed and should also ensure any adverse effects caused by the proposed dam alterations are no more than minor”.
- 6.37. Likewise, in his PS1, the engineer relies on the NZSOLD guidelines as a means of establishing the compliance of the proposed works with the Building Code.
- 6.38. It is clear from these references that the parties consider the NZSOLD guidelines to be a useful guide to dam safety and regulation in New Zealand. Accordingly, I consider it useful to refer to the guidelines in relation to dams, as well as their appurtenant structures, and what might contribute to the safe functioning of a dam.
- 6.39. There are two relevant versions of these guidelines, one published in 2000 (“2000 guidelines”²¹) and one published in 2015 (“2015 guidelines”²²).
- 6.40. The focus of the NZSOLD guidelines is on providing recommended practices for the investigation, design, construction, commissioning, assessment, rehabilitation and operation of large dams. The guideline’s fundamental objective is to protect people, property and the environment from “the harmful effects of a dam failure or an uncontrolled release of the reservoir contents”.
- 6.41. I note the engineer has raised some concern that the 2015 guidelines were only recently released at the time of the works being carried out and considered more emphasis should be placed on what was set out in the 2000 guidelines.
- 6.42. I hold the opinion that the 2015 guidelines were intended to capture practices already prevalent in the industry and to update the guidelines to reflect the changes in legislation, which had occurred in 2013.
- 6.43. I consider it therefore appropriate to refer to both the 2000 and 2015 guidelines.
- 6.44. The 2000 guidelines define appurtenant structures as:

Structures and equipment on a project site, other than the dam itself. They include but are not limited to, such facilities as intake towers, powerhouse structures, tunnels, canals, penstocks, low-level outlets, surge tanks and towers, gate hoist mechanisms and their supporting structures, and all critical water control and release facilities. Also included are mechanical and electrical control

²⁰ B1 Structure, B2 Durability, and E1 Surface Water

²¹ New Zealand Society on Large Dams. *New Zealand Dam Safety Guidelines*. Published November 2000.

²² New Zealand Society on Large Dams. *New Zealand Dam Safety Guidelines*. Published May 2015.

and standby power supply equipment located in the powerhouse or in remote control centers (sic).

6.45. With respect to dams, the 2015 guidelines note:

The Dam – The dam creates the barrier which holds back the reservoir or stored fluid. It cannot be treated in isolation from its foundations or abutments with which it acts in an integrated manner. Similarly, the design of the dam and appurtenant structures must be integrated to ensure that events such as floods are managed within design expectations without compromising dam safety.

... Dam safety deficiencies can arise from...the interaction of the dam with its associated appurtenant structures, and the interaction of the dam (and its foundation, abutments and appurtenant structures) with the reservoir...

6.46. The reservoir is also considered integral to dam safety, with the guidelines noting:

For most dams the reservoir represents the principal hazard, the control of which necessitates dam safety measures...

6.47. Of particular interest is the definition of an appurtenant structure:

Appurtenant Structures – An appurtenant structure is a structure at the dam site, other than the dam itself, which is designed and is required for the safe containment and control of the reservoir contents and reservoir discharges under all loading conditions. As such, appurtenant structures are required to fulfil functions necessary for the safety of dams and may include, but are not limited to, spillway, intake, outlet and sluice facilities together with their associated gates/valves and control equipment. Spillway facilities enable the management of flood flows and intake, outlet and sluice facilities enable reservoir lowering or dewatering in response to a dam safety emergency. Depending on the specific requirements of a site, other conduits or structures (e.g. tunnels, pipelines, surge chambers, penstocks, power stations) may fit the appurtenant structure definition if they fulfil dam safety functions (p. 9).

6.48. Appurtenant structure is elsewhere defined in the 2015 guidelines:

Appurtenant Structure – A structure at the dam site, other than the dam itself, which is designed and is required for the safe containment and control of the reservoir contents and reservoir discharges under all loading conditions. Pipelines and penstocks downstream of intake structures should be considered appurtenant structures if there are no gates or valves designed to isolate them from the reservoir contents (p. 22).

6.49. I have quoted from the NZSOLD 2000 and 2015 guidelines at length, as they reinforce the principle that when it comes to dam safety, the total system surrounding the dam should be taken into account. Considerations of compliance cannot be limited to just the dam wall structure alone. Dams and appurtenant structures control the release of water downstream of a dam and reduce the

likelihood of events that might lead to a loss of control over the stored volume and discharges that could cause damage.

- 6.50. This also aligns with the considerations required by New Zealand Building Code Clause B1 Structure²³. They include safeguarding people and property, as well as making due allowance for the “consequences of failure” when designing structures.
- 6.51. It is this focus on any structure’s role in the overall safety of the dam, and whether in that context the structure “is integral to the safe functioning of the dam”. In my view, this must be kept in mind when assessing whether each structure is an appurtenant structure.
- 6.52. I will turn now to the remaining items in dispute and consider whether they fall under the definition of appurtenant structure.

The inlet and its lining

- 6.53. For the owner’s dam, the water is pumped into the inlet, and from there flows into the reservoir. The primary means of water flow will be the pump, but without the inlet that flow cannot be controlled.
- 6.54. The inlet is integral to the safe functioning of the dam, as it is how water enters the reservoir. If it fails to function as intended, then the flow of water cannot be controlled. The lining is part of this inlet. I note that in the NZSOLD guidelines, the dam “intake” is specifically listed as an appurtenant structure. In my opinion, the inlet contributes to the safe functioning of the dam and is an appurtenant structure.

The cut-off field drain

- 6.55. The function of the cut-off drain, is to manage any subsurface water flows approaching the reservoir, and thus prevent the reservoir from being undermined and eroded. This is an identified risk to the reservoir and dam; otherwise, the drain would not have been installed.
- 6.56. The drain also provides redundancy in by allowing the lowering of the reservoir level in order to reduce the likelihood of a dam failure in response to unusual conditions or an emergency by controlling the intake of water to by-pass the reservoir by way of the cut-off drain if needed. These functions contribute to the safe functioning of this dam.
- 6.57. In my opinion, the cut-off drain contributes to the safe functioning of the dam and is therefore an appurtenant structure.

Conclusion on definition of dam, artificial barrier and appurtenant structures

²³ See Appendix B.

- 6.58. I consider the installation of the HDPE lining to the whole dam (including the associated earthworks, the lining itself and the 'keyed in trench') is work to the artificial barrier which holds back or stores water, it follows they are all parts of the dam for the purposes of the Act.
- 6.59. Having decided that the inlet channel and cut-off drain are appurtenant structures, it follows they are all parts of the dam for the purposes of the Act.
- 6.60. In response to some of the submissions from parties I consider it important to note the lining of any areas or structures that are not themselves appurtenant structures would not be included in the definition of appurtenant structures. The lining itself is not an appurtenant structure, it is underlying structures that should be considered when interpreting the definition of appurtenant structure as the underlying structures themselves are critical to the safe functioning of the dam. In this case, the lining of the inlet is not the appurtenant structure, rather the inlet is the appurtenant structure critical to the safe functioning of the dam.
- 6.61. For the avoidance of doubt, I agree with the parties that the removal of rock protection/gravel lining of the original dam earth walls (to accommodate the HDPE liner) is work to the artificial barrier which holds back or stores water and therefore part of the dam. I also agree with the parties that the spillway is an appurtenant structure and therefore part of the definition of dam.

Is the work 'building work'?

- 6.62. I have identified that the work carried out was to a 'dam' as defined by the Act, either to the artificial barrier that forms a reservoir which holds back water or to the dam's appurtenant structures. The question now becomes, as the engineer disputes this, whether the work carried out to the dam was building work for the purposes of the Act.
- 6.63. Building work is defined as work "for, or in connection with, the construction, alteration, demolition, or removal of a building" and includes sitework. The owner's dam is a building for the purposes of the Act.
- 6.64. I consider the work to install the HDPE liner to the reservoir (including the associated earthworks, the lining itself and the 'keyed in trench') and the reshaping and lining of the inlet channel was building work as the work alters the artificial barrier of the dam. This includes the associated earthworks to increase the capacity of the reservoir and create a ground profile more suitable for lining. I also consider the installation of a cut-off drain and the alteration of the inlet falls under the description of construction and alteration.
- 6.65. The work to install and alter these elements of the dam all fall under a normal and ordinary understanding of the terms construction and alteration. The work carried out to the owner's dam is work for or in connection with the construction and

alteration of a dam, that is a building, and is therefore building work for the purposes of the Act.

Is a building consent required for the building work?

- 6.66. I have found the work carried out to the owner's dam is building work. Section 40 requires that building work must not be carried out without a building consent, however, section 40 is subject to the exceptions and exemptions set out in sections 41, 42A and Schedule 1 of the Act.
- 6.67. Schedule 1 clause 22 of the Act provides an exemption from the requirement for a building consent for "building work in connection with a dam that is not a large dam". It is accepted by the parties that in the current case the owner's dam is a large dam (refer to paragraph 6.15). Therefore, this clause does not provide for the work carried out to the owner's dam to be exempt from the requirement of section 40.
- 6.68. Schedule 1 clause 1 of the Act provides an exemption from the requirement for a building consent for the "repair, maintenance, and replacement" of any "component or assembly incorporated in or associated with a building" provided that they are "comparable" and in the same position. There is some suggestion in the engineer's submissions that they may be relying on this exemption to the requirement of section 40. I do not consider Clause 1 applies as the building work in question did not involve the repair, maintenance or replacement of a component or assembly incorporated or associated with a building. The work involved the creation of new, altered and extended structures and incorporated new building works and materials such as the HDPE lining (which are also not comparable to those in place prior).
- 6.69. Sections 41 and 42A offer no other relevant exceptions to section 40 and there are no other relevant clauses in Schedule 1 that provide an exemption to section 40, accordingly, a building consent was required for the building work described in paragraphs 2.8.

Conclusion

- 6.70. I have found the work carried to the owner's dam is building work that required a building consent. It follows that the authority was correct in its decision to issue the notice to fix in respect of that work, for a contravention of section 40 as building consent was required and not obtained.
- 6.71. However, I do note the building work described in the notice to fix has a narrower scope and is not a clear reflection of works carried out in contravention of section 40.

6.72. Accordingly, the authority should now reissue the notice to fix to accurately detail the scope of the works to the owner's dam that was carried out in contravention of section 40. I consider the modifications should:

6.72.1. Clarifying the existing reference to the installation of the HDPE lining to include the associated earthworks, the lining itself and the 'keyed in trench'.

6.72.2. Include the alteration of the inlet.

6.72.3. Include the new cut off drain to the north.

6.73. I leave it to the parties to proceed with the certificate of acceptance process as planned.

7. Decision

- 7.1. In accordance with section 188 of the Building Act 2004, I determine that the authority was correct in its decision to issue the notice to fix in respect of a contravention of section 40 of the Act for the work carried out to the owner's dam. However, I modify the authority's decision to issue the notice to fix as set out in paragraph 6.72 of this determination.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 30 November 2022.

Rebecca Mackie

Principal Advisor Determinations

APPENDIX A: LEGISLATION

Building Act 2004

7 Interpretation

(1) In this Act, unless the context otherwise requires,—

alter, in relation to a building, includes to rebuild, re-erect, repair, enlarge, and extend the building

construct, in relation to a building, includes to design, build, erect, prefabricate, and relocate the building

40 Building work not to be carried out without consent

(1) A person must not carry out any building work except in accordance with a building consent.

(2) A person commits an offence if the person fails to comply with this section.

(3) A person who commits an offence under this section is liable on conviction to a fine not exceeding \$200,000 and, in the case of a continuing offence, to a further fine not exceeding \$10,000 for every day or part of a day during which the offence has continued.

41 Building consent not required in certain cases

(1) Despite [section 40](#), a building consent is not required in relation to—

(a) a Crown building or Crown building work to which, under [section 6](#), this Act does not apply; or

42A Building work for which building consent is not required under Schedule 1

(1) Despite section 40, subject to the conditions set out in subsection (2) and whether or not a building consent would otherwise have been required, a building consent is not required for building work in the following categories:

(a) building work described in Part 1 of Schedule 1; or

(b) building work described in Part 2 of Schedule 1 that is carried out by an authorised person (see subsection (3)); or

(c) building work described in Part 3 of Schedule 1 if the design of the building work has been carried out or reviewed by a chartered professional

engineer and the building work has been carried out in accordance with that design.

164 Issue of notice to fix

(1) This section applies if a responsible authority considers on reasonable grounds that—

- (a) a specified person is contravening or failing to comply with this Act or the regulations (for example, the requirement to obtain a building consent); or
- (b) a building warrant of fitness or dam warrant of fitness is not correct; or
- (c) the inspection, maintenance, or reporting procedures stated in a compliance schedule are not being, or have not been, properly complied with.

(2) A responsible authority must issue to the specified person concerned a notice (a **notice to fix**) requiring the person—

- (a) to remedy the contravention of, or to comply with, this Act or the regulations; or
- (b) to correct the warrant of fitness; or
- (c) to properly comply with the inspection, maintenance, or reporting procedures stated in the compliance schedule.

(3) However, if a responsible authority considers that it is more appropriate for another responsible authority to issue the notice to fix, it must—

- (a) notify the other authority that it holds that view; and
- (b) give the other authority the reasons for that view.

(4) The other responsible authority referred to in subsection (3) must issue the notice to fix if it considers that this section applies.

177 Application for determination

(1) A party may apply to the chief executive for a determination in relation to either or both of the following:

...

(b) the exercise, failure or refusal to exercise, or proposed or purported exercise by an authority in subsection (2), (3), (4), or (4A) of a power of decision to which this paragraph applies by virtue of that subsection.

...

(3) Subsection (1)(b) applies to any power of decision of a territorial authority in respect of, or under, all or any of the following:

...

(e) a notice to fix:

Schedule 1, clause 1 – General repair, maintenance, and replacement

(1) The repair and maintenance of any component or assembly incorporated in or associated with a building, provided that comparable materials are used.

(2) Replacement of any component or assembly incorporated in or associated with a building, provided that—

(a) a comparable component or assembly is used; and

(b) the replacement is in the same position.

(3) However, subclauses (1) and (2) do not include the following building work:

(a) complete or substantial replacement of a specified system; or

(b) complete or substantial replacement of any component or assembly contributing to the building's structural behaviour or fire-safety properties;
or

(c) repair or replacement (other than maintenance) of any component or assembly that has failed to satisfy the provisions of the building code for durability, for example, through a failure to comply with the external moisture requirements of the building code; or

(d) sanitary plumbing or drainlaying under the Plumbers, Gasfitters, and Drainlayers Act 2006.

Schedule 1, clause 22 – Dams (excluding large dams)

Building work in connection with a dam that is not a large dam.

APPENDIX B: BUILDING CODE

B1 Structure

Objective

B1.1 The objective of this provision is to:

- (a) safeguard people from injury caused by structural failure,
- (b) safeguard people from loss of amenity caused by structural behaviour, and
- (c) protect other property from physical damage caused by structural failure.

.....

B1.3.4 Due allowance shall be made for:

- (a) the consequences of failure,
- (b) the intended use of the building,
- (c) effects of uncertainties resulting from construction activities, or the sequence in which construction activities occur,
- (d) variation in the properties of materials and the characteristics of the site, and
- (e) accuracy limitations inherent in the methods used to predict the stability of buildings.