BUILDING PERFORMANCE

Determination 2024/014

Compliance of a stormwater tank near a property boundary with Building Code clauses concerning fire affecting other areas

Future lot 26, Border Road, Henderson, Auckland

Summary

This determination considers whether a stormwater tank near a property boundary is required to comply with performance clauses C3.6 and C3.7 of Building Code Clause C3 *Fire affecting areas beyond the fire source.*

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, 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]

Parties

1.2. The parties to this determination are:

1.2.1. Housing New Zealand Limited,[2] the owner of the property ("the owner")

1.2.2. Consentium, carrying out its duties as a building consent authority, which applied for this determination ("the authority")

1.3. Thin Tanks NZ Limited ("the tank supplier") is a person with an interest in this determination, as the supplier of the particular plastic tank originally proposed to be installed at the property.

1.4. I received submissions in respect of this determination from two suppliers of other plastic tanks, which I have taken into consideration in making my decision.[3]

1.5. I have consulted with Fire and Emergency New Zealand as required under section 170, as the determination concerns fire safety.

Matter

1.6. This determination arises from the authority's view that the stormwater tank that had been proposed to be installed near the boundary of the property, did not comply with Building Code requirements that are concerned with limiting spread of fire between properties. The building consent application was amended to a metal tank to enable the building consent to be granted. It is the stormwater tank as originally proposed that is the subject of this determination.

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

[2] As identified in record of title NA107B/73. Housing New Zealand Limited is held by Kāinga Ora–Homes and Communities, a Crown entity established by the Kāinga Ora–Homes and Communities Act 2019.

[3] As I am required to do by section 186(5).

1.7. In this determination, references to "the tank" and "stormwater tank" include its component parts as described in paragraph 2.3, except where it is clear that I am referring to the plastic component only or in the summary of submissions and correspondence.

1.8. The matter to be determined, under section 177(1)(a), is whether the stormwater tank near the boundary of the property as proposed complies with clauses C3.6 and C3.7 of Clause C3 *Fire affecting areas beyond the fire source.*

1.9. I have not considered any other aspects of the Act or of the Building Code, including whether a waiver or modification should be incorporated in the decision under section 188(3)(a).

2. The building work and background

2.1. The owner applied for a building consent to construct a new two-storey detached dwelling at the property, as part of a larger development. The proposed building work included an above-ground stormwater tank, situated between the northeast side of the dwelling and the boundary with the neighbouring property.

2.2. The plastic component of the tank is 2950mm long, 880mm wide, and 2170mm high (5000 litres). The distance from the stormwater tank to the boundary with the neighbouring property is 150mm (refer to Figure 1).

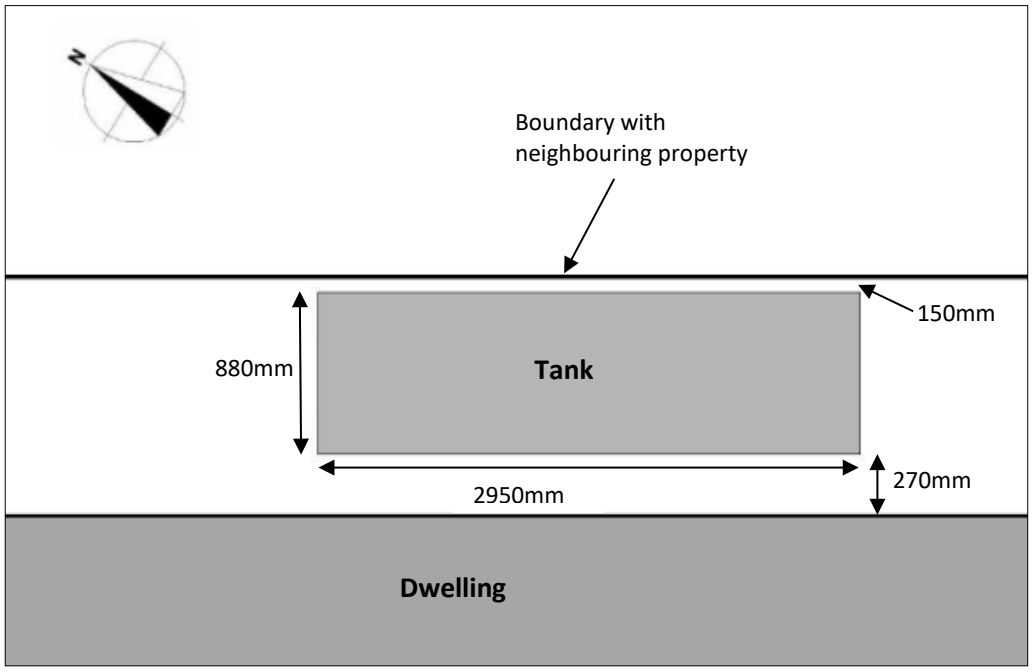

Figure 1: Site plan (not to scale)

2.3. The plastic component of the tank is fixed between two steel posts at each end, with the posts set into a 100mm thick concrete slab on the ground with 1m

concrete footings (refer to Figure 2). Water enters the plastic tank via a pipe at the top which comes from the dwelling's downpipes and exits via a pipe connected to the main stormwater network. There is also an outlet tap at the base of the plastic tank.

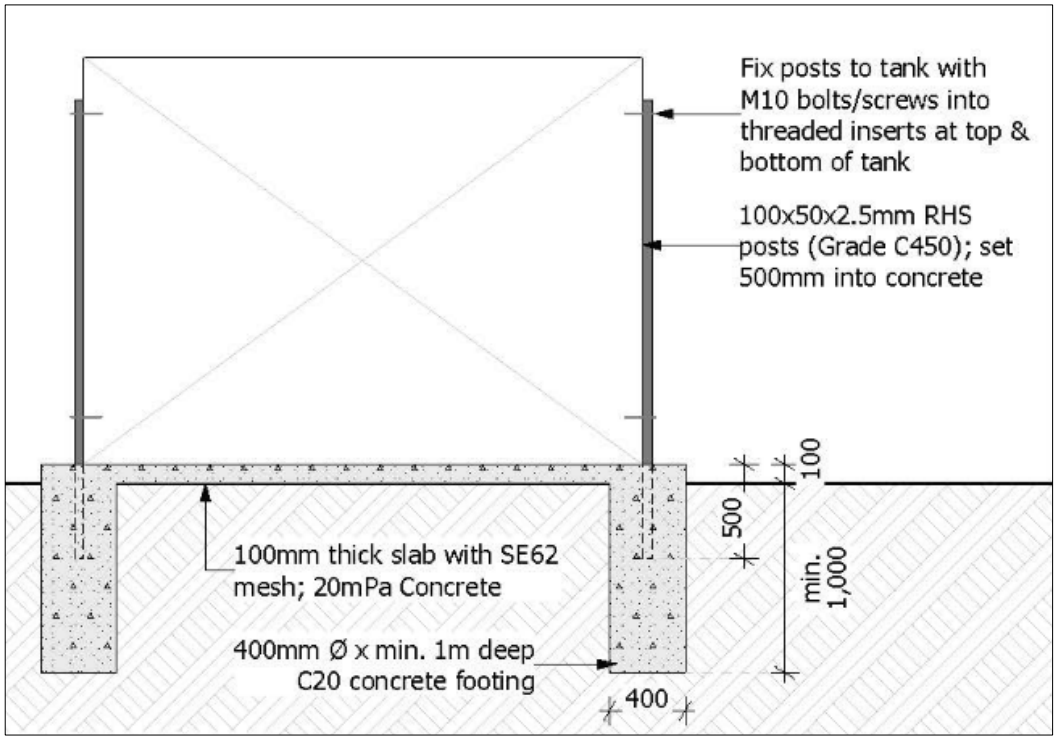

Figure 2: Section through tank (not to scale)

2.4. In considering the application for a building consent, the authority requested the owner provide information in relation to clauses C3.6 and C3.7. The request stated:

> Please justify compliance with NZ Building Code clauses C3.6 and 3.7. The storm water detention tank is shown against the boundary on sheet 101. Your nominated means of compliance requires these to be fire rated if they are within 1 m of the boundary. Please provide calculations or evidence showing the ignition and heat output requirements of the building code will be [met] in the current location.

2.5. The owner replied to the authority's request and disputed that the tank was required to be fire rated.

2.6. The authority responded with a further request for information, stating:

> … we have had an independent fire engineer review the installation of plastic tanks on the boundary. [They] concluded that the ignition data provided to [them] suggested the tanks [they] reviewed would not meet [clauses] C3.6 and C3.7. Could you please provide the tank testing information [showing] the tanks, if installed within 1m of the boundary would meet the requirements of building code clauses 3.6 and 3.7.

2.7. The review referred to by the authority consisted of a report provided by the fire engineer.[4] The report concluded, "The plastic tanks by [the tank supplier] without additional fire rated construction do not comply with clauses C3.6 and C3.7 due to the specific fire properties of the plastic used".

3. Submissions

The authority

3.1. The authority submits (in summary):

3.1.1. The "tank was defined as a building under the Building Act and as a building it was considered to have importance level 1".

3.1.2. The tank did not comply with clauses C3.6 and C3.7, "because the [owner] could not provide evidence that the tanks did produce a radiant flux values below what is listed in the [building] code ([clause] C3.6) and they could not provide evidence that it would not ignite, as it is a combustible material, when exposed to the radiant flux value of 30 kW/m2 ([clause] C3.7(c))".

3.1.3. The authority relies on a fire report provided to it in relation to another building consent application, "that assessed the tanks and said without being provided evidence to the contrary the tanks did not comply with the clauses NZBC C3.6 and C3.7". This fire report states:

> No fire testing has been carried out for the [tank supplier's] plastic tanks, however reference data for the material used (food grade polyethylene) indicates that tanks made of that material will not comply with clauses C3.6 and C3.7. …
>
> … it is assumed that no combustible materials would be present in the tanks structures in order to comply with [clause] C3.6. As the tanks are proposed for rainwater retention, build-up of leaves washed into the tanks from roofs is possible and would require inlet gratings and/or periodic inspection to prevent building-up of such combustibles in the tanks. …
>
> For the [tank supplier's] plastic tanks, laboratory ignition tests of the material, not specific to the application in [the tank supplier's] products indicate that the tanks would not comply with [clause] C3.7.

The owner

3.2. The owner has not made any submissions in this determination.

[4] I note that the report, which is dated 18 January 2021, is in respect of another property, but evidently relates to plastic tanks supplied by the same tank supplier as in this case.

The tank supplier

3.3. The tank supplier submits their plastic tanks "with the material that they are made of, are not a fire hazard if installed along a fence line".[5]

Other suppliers

3.4. Two other suppliers of other plastic stormwater tanks made submissions, which are summarised below.

3.5. The first other supplier submits (in summary):

3.5.1. Water tanks 5000 litres and smaller should "be excluded from the definition of a building" under section 9. "A tank this small cannot be lived in or accessed, therefore it should not be classified as a building".

3.5.2. "At the time the Building Regulations 1992 was written [which contain the Building Code], requirement for and allowance for Stormwater Tanks in high density housing lots was not considered".

3.5.3. "A tank made of plastic material is less flammable than a timber fence. Although the material is classified as flammable, if a fire is present, the tank will hinder the spread of fire, given the reduction in flammability nature". "Proven examples where a plastic water tank has been involved in a fire indicates the plastic does not burn, but melts instead".

3.5.4. "A tank is designed to hold water. If a fire on the boundary causes the tank to melt or burn, the resulting release of water will help extinguish the fire".

3.6. The second other supplier submits (in summary):

3.6.1. A tank is a building as defined under the Act.

3.6.2. "The functional requirement for [clauses] C3.6 (and C3.7) uses the term 'low probability' for both life safety and protection of property requirements."

3.6.3. Clause C3.6 "relates to a fire in the building. In the instance of a tank the scenario relates to a fire within the tank. … For a tank to have a fire in it it needs to contain within it a fire load to provide calorific energy to fuel and sustain a fire".

3.6.4. "As a tank, the 'fire load' is either 'air' or 'water' or more realistically both. Neither represent a fire load (water of course is a fire suppressant) therefore no consideration needs to be given to the performance (fire rating) of the physical barrier to deal with a fire in the tank. … as a water

[5] The tank supplier provided a photograph of a tank "that survived a house fire" as an example.

tank contains no fire load, [clause] C3.6 does not apply as there is a 'low probability' of a fire event in the building".

3.6.5. The purpose of clause C3.7 "is life safety of the building occupants, not protection of the owner's property. … the hazard relates to a fire on a neighbouring property igniting the building (in this case being the tank). … The tank is unoccupied, so there is no life safety risk. … [clause] C3.7 has no meaning for a tank … and therefore does not apply".

3.6.6. Alternatively, clause C3.7 does not apply because, "While water tanks have walls, they do not provide protection against the outdoor environment. Instead, the skin of the tank is designed to contain water and minimize contaminants".

3.6.7. With reference to the fire report relied on by the authority, "In their report they make mention of the build up of combustible materials such as 'old leaves'. While this is theoretically possible any realistic amount of build-up is negligible as is the fire load involved. If their analysis was correct, it would also apply to any water tanks located close a relevant boundary or any standard wooden or plastic fence".

4. Discussion

4.1. The matter to be determined is whether the stormwater tank near the boundary of the property complies with clauses C3.6 and C3.7.

4.2. As clauses C3.6 and C3.7 both apply to "buildings", I must first consider whether the tank is a building. If the tank is a building, then I will go on to consider whether and how the obligations in clauses C3.6 and 3.7 apply.

Whether the stormwater tank is a building

4.3. Section 8 defines what the term 'building' means and includes. Section 9 defines what 'building' does not include. Therefore, to be a building, the tank must come within section 8, and not be excluded by section 9.

4.4. Section 8(1)(a) sets out the general definition of 'building':

> (1) In this Act, unless the context otherwise requires, **building**–
>
> (a) means a temporary or permanent movable or immovable structure (including a structure intended for occupation by people, animals, machinery, or chattels); and

4.5. The word 'structure' is not defined in the Act or Building Code. In *Woodward v Astrograss Allweather Surfaces Limited,* the High Court held that the word

'structure' in the definition of 'building' in the predecessor to the Act, the Building Act 1991, "must be taken to have its usual or ordinary meaning".[6]

4.6. Previous determinations have also considered the meaning of 'structure' in section 8(1)(a), with reference to its ordinary meaning. Determination 2016/002 stated:[7]

> 4.2.4 "Structure" is not defined in the Act and must be taken to have its usual or ordinary meaning: 'A building or other object constructed from several parts'[5], 'Something constructed or having organization – a building, an edifice'[6], and further 'Any framework or fabric of assembled material parts; a (typically large) man-made construction'.[7]
>
> 4.2.5 **For something to be a "structure" for the purposes of the Act, it must have some elements or constituent parts and/or be of some complexity**. This is consistent with the content of sections 8 and 9 of the Act. The items included in the definition of "building" in section 8 or expressly excluded from the definition of "building" in section 9 are all objects composed of different parts and/or of some complexity. [my emphasis]

4.7. In this case, the tank includes the concrete pad and footings, posts, fixings, outlet tap, pipes and connections to the downpipes and stormwater network. In my view, the tank consists of a number of elements and is of sufficient complexity to be a 'structure' in terms of the definition of a 'building' in section 8(1)(a).

4.8. I consider other aspects of the Act and Building Code provide support for this conclusion, as set out below.

4.9. Clause A1 of the Building Code sets out the various classified uses a building may have. I note that a "tank" is given as an example of the 'Ancillary' category of classified use in paragraph 8.0.1:

> **8.0. Ancillary**
>
> 8.0.1 Applies to a *building* or use not for human habitation and which may be exempted from some amenity provisions, but which are required to comply with structural and safety-related aspects of the *building code*. Examples: … tank …

4.10. In addition, clause 23 of Schedule 1 of the Act exempts certain building work relating to a tank from the requirement to obtain a building consent.[8] It states:

> Building work in connection with a tank or pool and any structure in support of the tank or pool, including any tank or pool that is part of any other building for which a building consent is required, that –

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[6] *Woodward v Astrograss Allweather Surfaces Limited* HC Auckland HC112/96, 25 November 1996 at p7.

[7] Determination 2016/002 *Regarding the issue of a dangerous building notice in respect of a damaged shared driveway* (20 January 2016). Footnotes 5, 6 and 7 in paragraph 4.2.4 of the determination are "n: Oxford English Dictionary. Web. 25 Oct 2015".

[8] Under sections 41(1)(b) and 42(A(1)(a). However, the building work is still required to comply with the Building Code to the extent required by the Act, under section 42A(2).

…

(f) does not exceed 8 000 litres capacity and is supported not more than 0.5 metres above the supporting ground; or …

4.11. I conclude that the tank is a permanent, immovable structure, and therefore a 'building' as defined by section 8(1)(a).[9] The tank does not fall within any of the categories excluded from being a building in section 9.

Compliance with clauses C3.6 and C3.7

4.12. All building work is required to comply with the Building Code. Section 17 states:

> All building work must comply with the building code to the extent required by this Act, whether or not a building consent is required in respect of that building work.

4.13. Clause C3 is the relevant Building Code clause that the building work in this case must comply with. One of the functional requirements of clause C3 is:

> **C3.3** *Buildings* must be designed and constructed so that there is a low probability of *fire* spread to *other property* vertically or horizontally across a *relevant boundary*.

4.14. The relevant performance requirements in this case, in clauses C3.6 and C3.7, are set out below at paragraphs 4.17 and 4.21 respectively.

4.15. Clause C3.6 requires buildings to be designed and constructed in a way that ensures if a fire starts inside the building, the received radiation at the boundary and 1m beyond does not exceed certain levels. Clause C3.7 requires external walls of buildings located closer than 1m to the relevant boundary to be constructed of materials that are either not combustible or do not ignite for a period of time depending on the building's 'importance level' (see paragraph 4.22 below).

4.16. There is no 'limit on application' for clause C3.6 or C3.7, therefore they apply to all classified uses, including Ancillary, which the tank is.

Application of clause C3.6

4.17. Clause C3.6 states:

> *Buildings* must be designed and constructed so that in the event of *fire* in the *building* the received radiation at the *relevant boundary* of the property does not exceed 30 kW/m^2 and at a distance of 1 m beyond the *relevant boundary* of the property does not exceed 16 kW/m^2.

[9] The tank could also be considered to be part of the surface water drainage system. Section 8(1)(b)(i) and (2) includes a mechanical, electrical or other system (attached to the structure in (1)(a)) required by the building code or required to comply with the building code.

4.18. The term 'relevant boundary' is defined in Clause A2 *Interpretation*.[10] In this case the relevant boundary is the boundary of the property as marked on Figure 1, which is 150mm from the tank.

4.19. Clause C3.6 refers to "in the event of fire in the building". In this case, I am of the view it is very unlikely a fire could occur "in" the tank. It is difficult to see how a fire could start inside the tank, given that the plastic tank would contain water and air. This conclusion is consistent with the functional requirement in clause C3.3 that there be a low probability of fire spread to other property.

4.20. Therefore, clause C3.6 is not applicable to the tank, and it is not necessary to consider the received radiation at the relevant boundary and 1m beyond.

Application of clause C3.7

4.21. Clause C3.7 states:

> External walls of *buildings* that are located closer than 1 m to the *relevant boundary* of the property on which the *building* stands must either:
>
> (a) be constructed from materials which are not *combustible building materials*, or
>
> (b) for *buildings* in importance levels 3 and 4, be constructed from materials that, when subjected to a radiant flux of 30 kW/m^2, do not ignite for 30 minutes, or
>
> (c) for *buildings* in Importance Levels 1 and 2, be constructed from materials that, when subjected to a radiant flux of 30 kW/m^2, do not ignite for 15 minutes.

4.22. Clause A3 sets out 'building importance levels' for the purposes of clause C. The "description of building type" (and examples of "specific structure") for importance level 1 states:

> *Buildings* posing low risk to human life or the environment, or a low economic cost, should the *building* fail. These are typically small non-habitable *buildings*, such as sheds, barns, and the like, that are not normally occupied, though they may have occupants from time to time.
>
> [Eg] Ancillary *buildings* not for human habitation, Minor storage facilities, Backcountry Huts.

4.23. The tank, being an ancillary building that is not for human habitation, is an importance level 1 building.

4.24. It follows that if the tank in this case has an 'external wall' within 1m of the relevant boundary, that external wall must either be constructed from materials which are

[10] The definition states, "**relevant boundary** means the *boundary* of an *allotment* that is *other property* in relation to the *building* in question and from which is measured the separation between the *building* and that *other property*; and for the external wall of any *building*, the *relevant boundary* is the nearest of— (a) a *boundary* of a freehold *allotment*, …"

not combustible building materials[11], or be constructed from materials that, when subjected to a radiant flux of 30 kW/m^2, do not ignite for 15 minutes.

4.25. The tank is located 150mm from the relevant boundary, being the boundary of the property with the neighbouring property. This is closer than 1m.

4.26. The term 'external wall' is defined in clause A2:

> **external wall** any exterior face of a *building* within 30° of vertical, consisting of primary and/or secondary elements intended to provide protection against the outdoor environment, but which may also contain *unprotected areas*[12]

4.27. The tank, being a stormwater tank, is primarily intended to hold and store water (and air), which does not require protection against the outdoor environment. Therefore, the tank does not have 'external walls' as that term is defined.

4.28. Consequently, clause 3.7 is not applicable and it is not necessary to consider whether the tank meets the criteria in paragraphs (a) or (c).

4.29. As noted in paragraph 1.5, I have consulted with Fire and Emergency New Zealand, which advised it did not have any comments it wished to make on this matter.

5. Decision

5.1. In accordance with section 188 of the Building Act 2004, I determine the stormwater tank near the boundary of the property is not required to comply with clauses C3.6 and C3.7 of Clause C3 *Fire affecting areas beyond the fire source.*

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 28 March 2024.

Peta Hird
Principal Advisor, Determinations

[11] Clause A2 states, "**combustible building materials** means building materials that are deemed combustible according to AS 1530.1."

[12] I note the definition of 'unprotected area' in clause A2 was revoked on 10 April 2012, by regulation 4(1) of the Building (Building Code: Fire Safety and Signs) Amendment Regulations 2012.