

# memorandum

archifact

architecture & conservation



ltd

[www.archifact.co.nz](http://www.archifact.co.nz)

suite 9, level 2  
d-72 building  
72 dominion road  
mount eden  
auckland 1024

po box 8334  
newmarket  
auckland 1149  
09 966 6940  
[info@archifact.co.nz](mailto:info@archifact.co.nz)



**Figure 1:** Water Tower, Ruakiwi Road, Hamilton.  
Image credits: Thornton, Geoffrey *Cast in Concrete*, 1996, p218, Reed Books, Auckland

**for:** bbo

**attn:** chris dawson

**from:** archifact – architecture & conservation ltd (Archifact)

**date:** 18 august 2025

**re:** ruakiwi reservoir  
assessment of effects on historic heritage values

## 1. introduction

This Memorandum provides additional assessment of effects assessment to that provided in the Archifact – architecture & conservation ltd *Assessment of effects – heritage* dated 30 June 2025 and should be read in conjunction with that assessment.

This assessment considers the proposed structural strengthening assessment and recommended works proposed in the WSP *Detailed Seismic Assessment (DSA)* dated 7 August 2025 and landscaping works in immediate proximity of the heritage water tower.



## **2. wsp detailed seismic assessment**

### **2.1 findings of the dsa**

The recently completed WSP DSA assessed the structure of the heritage water tower as having an overall %NBS Rating of less than 34%, and as such the reservoir has been identified as an earthquake prone structure as per the NZSEE Guidelines and Building Act. There is a legislative requirement to strengthen or demolish the structure within the next 25 years as per Clause 133AM of Subpart 6A of the Building Act.

The WSP DSA recognised the governing critical structural weakness as being the connection between the reservoir walls and the base slab. This detail consists of the wall sitting on a steel expansion guide with no positive connection between the concrete. Therefore, the only sliding resistance across this plane is friction between the steel plates of the expansion guide. Failure of this connection due to out-of-plane moment exceeding the friction capacity of the steel plates will result in the lateral movement of the walls relative to the base slab and could lead to structural failure.

The lack of any meaningful connection between the reservoir wall and the base slab to resist lateral loading means that the connection between the wall and base slab has been assumed to allow full lateral displacement in both directions. The reservoir wall has no mechanical connection to the base slab. A conservative assumption was made in the DSA that the only resistance for the reservoir structure overturning on the base slab is its own weight and the hollow core columns connected to the base slab. A conservative assumption was also made for the lateral resistance against the reservoir structure sliding off the base slab because of the absence of a mechanical connection between the wall and the base slab, and the lack of quantifiable resistance from the hollow-core columns and the soil profile. The assumption was made that the resistance against sliding would be entirely provided by friction between the wall and base slab, and the nominal resistance provided by the columns and soil would be ignored. The friction between the wall and base slab and the passive soil resistance provide the entirety of the lateral restraint against seismic demand. The capacity provided is not sufficient to overcome the seismic demand, and the reservoir structure above the base slab would be expected to significantly displace relative to the base slab in an IL2 ULS seismic event.

### **2.2 proposed strengthening works**

The only element within Ruakiwi Reservoir that requires strengthening is the base to wall connection. The strengthening required would be to implement a reinforced concrete perimeter ring beam that would travel around the inside circumference of the base of the lower reservoir wall. The ring beam would be fixed to both the reservoir wall and base slab through drilled dowels to ensure an adequate structural connection between the two sections.

A typical example of the recommended strengthening is shown in Figure 2 below.

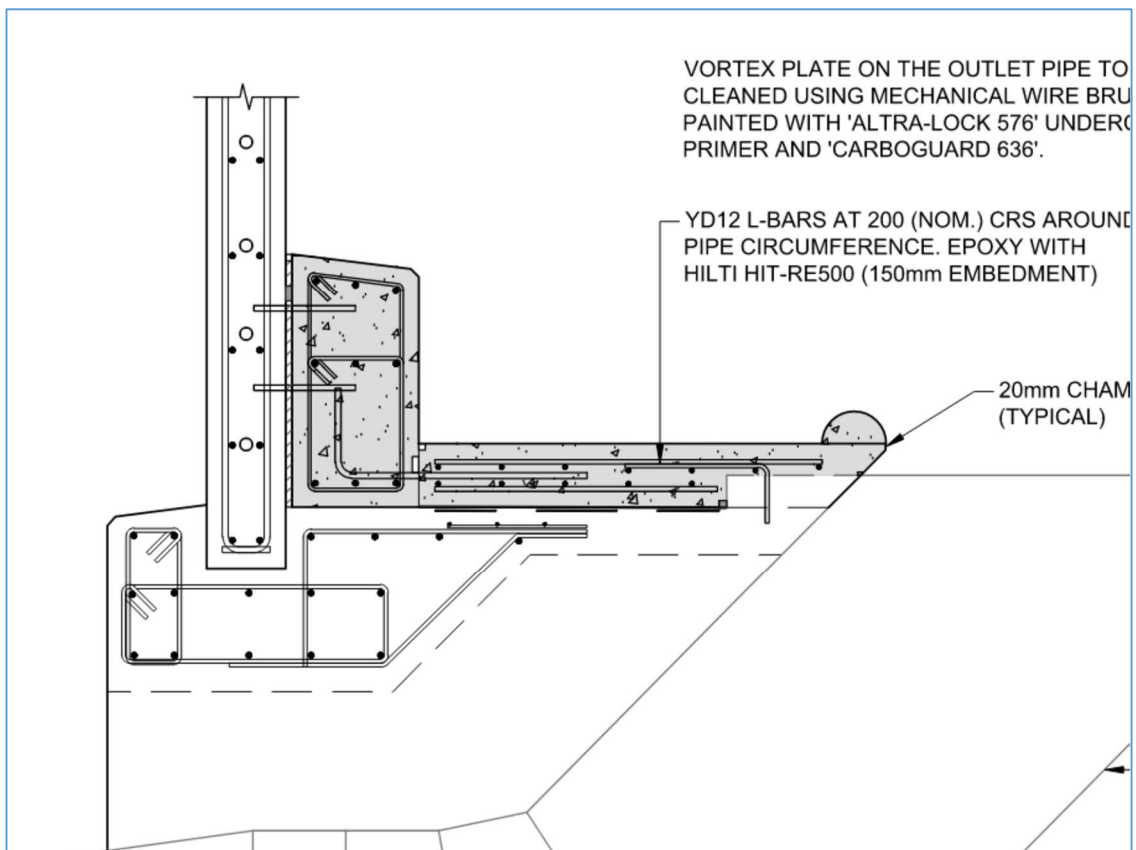


Figure 2: WSP example of typical RC ring beam detail.

### 3. hcc operative district plan provisions

#### 3.1

Having regard to the historic heritage values recognised in this place, this heritage impact assessment memorandum considers the effects of the proposed structural strengthening to the existing Ruakiwi Road heritage-listed tower against provisions at Volume 1 Chapter 19 of the Operative District Plan.

The purpose of Chapter 19 of the ODP includes, at 19.1(e), that:

*Unsympathetic alterations or additions can damage heritage values associated with heritage buildings or structures. While modifications are often needed to make built heritage usable (e.g. telecommunication upgrading, energy-efficiency and conforming with fire, earthquake and access standards) these need to be undertaken in a manner that protects the heritage value.*

An interpretation of the activity status of the proposed strengthening suggests that the works would be permitted under the ODP as under Rule 19.3.1 a) *Maintenance and Repair* is Permitted and under Rule 19.3.1 b) *Internal Alterations* of buildings is also Permitted.

The strengthening works proposed would be maintenance and repairs and internal alterations to bring the tower up to the required earthquake standard and so would fall under Rule 19.3.1 a) as a Permitted Activity.

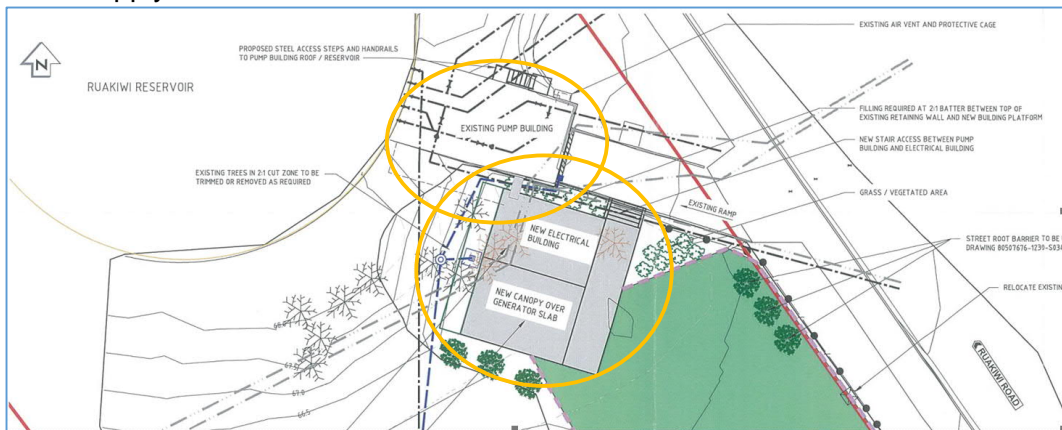
## 4. assessment of effects

### 4.1 proposed seismic strengthening

As the proposed strengthening works are internal to the heritage water tower not only is the activity status Permitted, but any physical effects arising will be imperceptible. As such the adverse effects arising from the proposed works are less than minor and arguably positive in that they ensure a greater than 34%NBS rating as an IL2 structure with a 50-year design life affording potential future commercial use by HCC of the Tower.

### 4.2 proposed removal of non-original building elements

There are a number of non-original (and non-heritage) structures currently associated with the heritage tower that could be removed as part of the proposed works and whose removal would positively add to the mitigation of adverse effects and enhancement of the historic heritage values of the heritage Tower reservoir. Figure 3 (below) provides a plan of existing buildings and elements that would become redundant (circled) in disengaging the heritage tower reservoir from the public potable water supply.



**Figure 3:** Plan view of non-original and non-heritage ancillary elements that could be removed to enhance the heritage reservoir in hand with the proposed landscaping.  
Image: Edwards White Architects

Figure 4 (below) offers a “before” and “after” render of the potential visual enhancement afforded by this action. It is noted that the modern stair access to the roof-mounted communications equipment is required to be maintained at this time.



**Figure 4:** Non-original and non-heritage ancillary elements that could be removed (circled) to enhance the values of the heritage reservoir in hand with the proposed landscaping.  
Image: Edwards White Architects

### 4.3 landscaping

A number of existing trees in the development area and close to the heritage Tower will be removed in order to provide sufficient unobstructed land to construct the proposed new reservoirs. A small number of trees immediately adjacent to the heritage Tower will also be removed, while the proposed landscape concept design indicates that four new trees will be planted in that immediate context. Replacement tree species will be selected to replicate the forms and habitats currently found on the site and will be selected from native and exotic species in order to provide screening, shade, and habitat. Careful recontouring of the ground to the southern half of the Tower is intended return the “cone” shape around the base of the Tower and will include seating integrated into that contour. The landscaping concept will appropriately enhance views to, and the setting of, the Tower from the public realm.

## **conclusion**

The proposed strengthening of the Tower is limited to the interior of this listed historic heritage place and is a relatively small, discrete, and positive intervention and presents no significant adverse effect on the overall values of the place and is appropriate, positive, and can be undertaken in a manner that protects its heritage values in accordance with Rule 19.3.1 e) of the ODP.

The proposed landscaping provides positive mitigation to the required removal of existing trees and the adjustment of ground contours to the southern flanks of the tower enhance views and public amenity.

Removal of non-original (and non-heritage) built elements currently attached to, or in close proximity of, the Tower are positive and enhancing to the historic heritage values of the Tower and its setting, appropriate, and should be supported.

Adam Wild fnzia

**Archifact – architecture & conservation ltd**

auxiliary buildings to be removed



comms services and stairs retained



ground re-contoured  
landscape seating

remove low level trees,  
maintain established oak trees

new under planting