

9 December 2022

Shelly Bay Taikuru Ltd
C/- Earl Hope-Pearson
Development Manager
Ground Floor 93 Customhouse Quay, Te Aro, Wellington 6011

Structural Commentary on the condition & risks of Shed 8 & Shipwrights

Dear Earl,

As requested, New Zealand Consulting Engineers Ltd (NZCEL) will provide commentary on the structural condition of both the Shipwrights building and Shed 8 at Shelly Bay.

Background

NZCEL have been engaged by Shelly Bay Taikuru Ltd to perform a detailed seismic assessment of both structures in May 2021. An initial site visit was performed on 26 May 2021 of the Shed 8 structure. The Shipwrights building was not accessible at this stage. A subsequent assessment of the Shed 8 structure was performed on the basis of the original structural drawings which resulted in the recommendation to move straight into a strengthening scheme as the existing structure was shown to be well below 34%NBS for some elements. The project then went dormant for another year.

On 31 August 2022 NZCEL issued a strengthening design concept that would bring both structures to 100%NBS. This design was based on the original structural drawings available for Shed 8 and the assumption that the Shipwrights building was in questionable condition.

In November 2022 we were provided additional records for the building that painted a better picture of the actual condition of the sea wall and foundations at the Shed 8 building. The information consisted of three inspection reports by Tonkin & Taylor dated 19/08/2016, 22/06/2020 & 8/07/2020 along with two earthquake prone notices for both structures as well as a document named "Health and Safety Critical Risks" that outlines the damaged piles in Shed 8 as well as mark-up of areas containing Asbestos throughout the structures.

Additional Risks from Updated Information

The structure in its current condition should be considered earthquake prone, based on the existing EQ prone notice and NZCEL's own preliminary findings.

Given the updated information we believe the damaged foundations, which includes some piles having completely corroded away, constitute a critical structural weakness, and pose a severe life safety risk. The piles support main columns which support the large trusses holding up the roof. 60% of the columns along the South-Western side of the building are supported by damaged or completely corrode piles (see Figure 1). This means that even under moderate earthquake shaking or vibrations to the structure there is a risk of the supports of the columns to fail and for a partial collapse of the structure.

Shed 8 – Foundation Plan

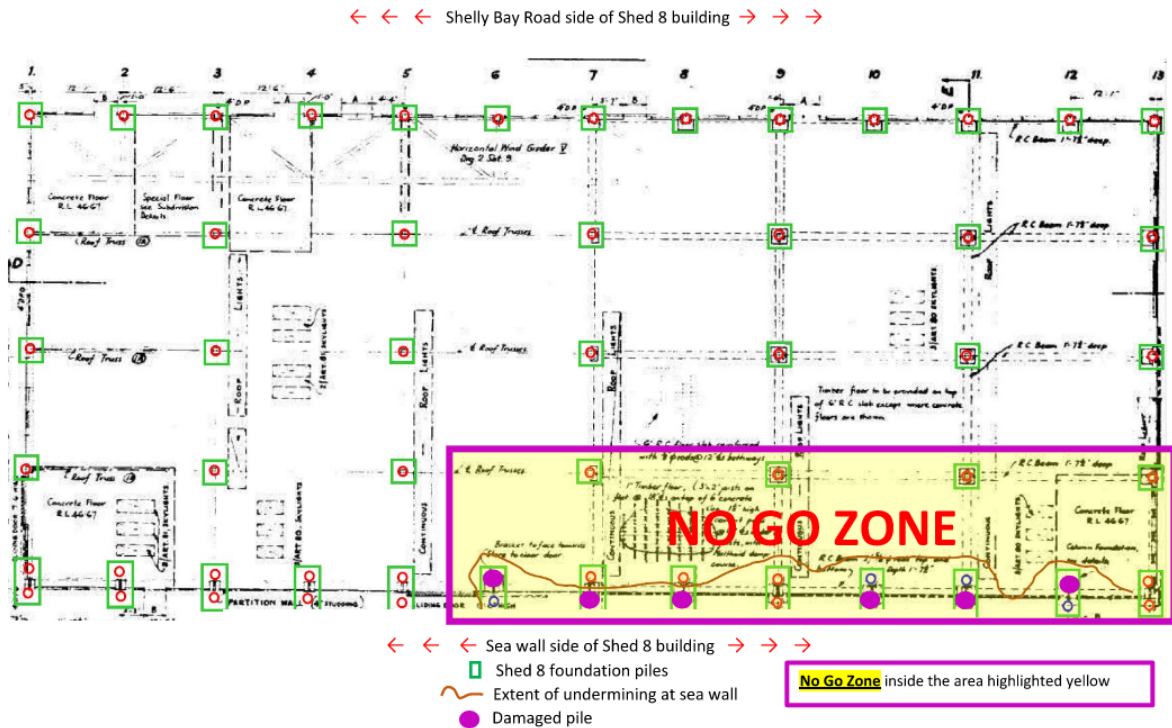


Figure 1: Plan of damaged piles from "health and Safety Critical Risks" document

The foundations are the first item that needs to be addressed in the structure before any further work on site can take place.

A letter from Holmes Consulting Group “Shelly Bay Redevelopment - Security of Shelly Bay Wharf and adjacent seawall and structures” issued 9 December 2022 lays out further commentary on the condition of the wharf, seawall and foundation. NZCEL agrees that any piling works in this area are high risk due to the amount of heavy equipment, vibration and access that would be required. It would be very difficult to provide temporary propping to the foundations while these works take place due to the large amount of risk accessing the areas involved.

The Shipwrights building’s superstructure is in much worse condition from visual inspections on site. Due to weather exposure, we believe that the existing gravity structure is questionable, and it is impossible to assess the structure in a desktop study. Any feasible strengthening of the structure would probably require complete replacement of the existing timber elements or the addition of a new primary structure within the existing. We believe that similar to Shed 8 the structure is at severe risk of collapse during even moderate seismic events.

The renewal of the sea wall is critical if both structures are meant retained as the undermining of Shed 8 and the potential undermining of the Shipwrights building pose critical risks to both structures.

Summary

As laid out above, both structures can be considered earthquake prone in their current condition. The renewal works for the sea wall are critical to retain structural stability for both structures, however:

- » Any works near the existing buildings poses a high risk to their structural stability in their current state
- » High risk for any personnel working in or near the structures
- » Difficult sequencing of the required works to mitigate risks, resulting in longer than normal construction times for both the sea wall renewal as well as the strengthening of the structures
- » Strengthening of the foundations will have to happen before any other works can be undertaken. Difficult to determine how this can be achieved without addressing the sea wall first

NZCEL believes that any works with the existing structures in place poses a high risk for any people on site and it should be investigated whether a removal of the structures would not be the safer and better option, especially considering the significant efforts required to bring the structures to a level that sits above earthquake prone. This would allow for the sea wall strengthening works to occur in a much safer and more straightforward manner.

Regards



Daniel Lehn
Commercial Manager
New Zealand Consulting Engineers Ltd