Dunning Thornton consultants

Fale Development:
Structural Engineering Statement

17.04.2024 Rev: A

Please read in conjunction with Jasmax Resource Consent drawings, prepared in conjunction with Dunning Thornton.

This statement summarises the structural engineering approach to the proposed new Fale project on Cable St, Wellington

1. Summary of Structural System

This new building consists of a light weight one storey structure consisting of timber and steel elements supported on a reinforcing concrete basement construction.

The building is to be founded on piles with reinforced concrete pile caps, tied at ground floor with foundations beams or a raft slab incorporated into the basement structure.

2. Seismic Performance

The building's superstructure is light weight and largely governed by wind loadings. The superstructure is designed to remain largely elastic in a design level seismic event (IL3 - 1/1000 years).

The basement structure is of reinforced concrete construction and is to be designed to remain elastic in a design level seismic event.

The foundations are designed to accommodate the seismic actions of the building and the soil movements calculated by Tonkin & Taylor while maintaining vertical load carrying capacity.

3. Additional Site Hazard Commentary (Structural - Qualitative Assessment)

DTC have been requested to comment on two aspects of the potential site hazards as part of the resource consent process. Our qualitative comments on these risks are provided here in the context of our role as structural engineer (ie not a flooding or Tsunami Specialist) and based on our experience of similar projects in Wellington.

3a. Impacts of Coastal Inundation / Flooding on the building primary structure

DTC comments: An assessment of flooding risk has been carried out by Aurecon and the buildings ground floor level has been raised above their proposed design level to mitigate these risks.

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Regardless of the likelihood, the consequence of any flooding to the durability of the primary structure is very low. The ground floor structure is of concrete and steel construction. These are durable materials which will already have been outside in a wet environment during construction. In the event of flooding on the ground floor non-structural finishes / linings may need to be removed and replaced. Structural steelwork which is not covered in concrete to above the flood level may need to be washed down as part of the cleanup. Any damaged coatings would need to be touched up as part of this cleanup.

3b. Impact of Tsunami on the building primary structure

DTC comments: The site is indicated as being within the Tsunami Risk zone according to the Wellington City Proposed District Plan. The site is approximately 30m from the harbour. The building's ground floor level is raised above the surrounding Frank Kitts Park to provide some mitigation of small/medium Tsunami Events.

There are no current specific New Zealand Building Code requirements for Tsunami actions within the NZSAS/1170.0 loadings code framework however general robustness is a design requirement under clause 6.2 and the material standards for seismic design.

Alternative frameworks such as the US design code ASCE 17-22 Chapter 6 – Tsunami Loads and Effects may be referenced during the design phase for assessment of debris impacts however it is not expected that the upper-level primary structure of this light-weight building would be un-damaged in a significant tsunami event. The basement structure and foundations are of robust reinforced concrete construction and are unlikely to be significantly damaged. It is expected that the primary risk mitigation approach related to life-safety Tsunami risk will be evacuation of the building following the principles of the National Emergency Management Agency's "Get Ready" Website (https://getready.govt.nz/en/emergency/tsunami)

As with other low-lying properties around the Wellington region, ground floor spaces may be inundated during large tsunami events. It is not practical to mitigate the effects of tsunami waves on non-structural ground floor elements (glass façades, light-weight partitions etc) which can be damaged without affecting the structural performance of the building. Significant damage could be expected to these elements in the event that a wave reaches the site.

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