REPORT

Tonkin+Taylor

188 Beaumont Street, Westhaven

Coastal climate change hazard assessment

Prepared for

Westhaven Residential Limited Partnership

Prepared by

Tonkin & Taylor Ltd

Date

August 2025

Job Number

1098609 v3

Together we create and sustain a better world

www.tonkintaylor.co.nz

Document control

Title: 188 Beaumont Street, Westhaven – Coastal climate change hazard assessment					
Date	**Version**	**Description**	**Prepared by:**	**Reviewed by:**	**Authorised by:**
5 August 2025	1.0	Draft for planner review	E Beetham	P Quilter R Reinen-Hamill	R Reinen-Hamill
8 August 2025	2.0	Final incorporating planner comments	E Beetham	R Reinen-Hamill	R Reinen-Hamill
22 August 2025	3.0	Updated figures	E Beetham	R Reinen-Hamill	R Reinen-Hamill

Distribution:

Westhaven Residential Limited Partnership 1 electronic copy

Tonkin & Taylor Ltd (FILE) 1 electronic copy

Table of contents

1 Introduction

1.1 Scope

Westhaven Residential Limited Partnership are preparing an application for a referral project under the Fast Track Approvals Act (2024). The project is a residential led mixed use development at 188 Beaumont St, Wynyard Quarter.

Westhaven Residential Limited Partnership commissioned Tonkin & Taylor Ltd (T+T) to undertake a high-level screening assessment of climate change hazards and infrastructure capacity for the proposed development. The purpose of the climate change hazard assessment (this report) is to understand how the project can support climate change adaptation. T+T has also prepared a desktop infrastructure assessment for the site as a separate report.

This report presents the findings of our climate change hazard assessment with a specific focus on coastal inundation with sea level rise for the proposed multi-storey development including:

- Review of coastal inundation from storm surge and high tides at present day and with sea level rise for a range of climate change projections, considering MfE (2024) guidance of coastal hazard risks from climate change.
- Review of existing tsunami evacuation zone mapping.
- Review of existing information on pluvial flooding at the site.
- Commentary on site exposure to coastal inundation including projected timeframes for inundation.
- Commentary on implications of sea level rise for the existing ground level and the proposed finished floor level of the ground floor and the primary access roads.
- High level commentary on climate change adaptation options to reduce risk of natural hazards for the development.

Specifically, this assessment analyses how the project can support climate change adaptation, reduce risks arising from natural hazards, or support recovery from events caused by natural hazards. To demonstrate risk reduction, this report adopts a risk assessment approach to understand the level of exposure by assessing a number of factors, including the building and infrastructure elements at risk, access, and the nature of the land affected; and then identifies strategies to respond to that risk thereby supporting climate change mitigation and adaptation.

1.2 Site location

The site is in Wynyard Quarter, at the corner of Beaumont Street and Jellicoe Street, with street access on the north and east sides (Figure 1-1). The west side of the site is waterfront and currently used as Silo Superyacht Marina. The south side adjoins property currently used for ship building. The primary current use of the site appears to be carparking. The average level of the existing roads and streets adjacent to the property is 2.6 – 2.7 mRL. Average ground level with the existing property parcel is 3.0 mRL based on 2024 LiDAR survey data, with some variation across the site.

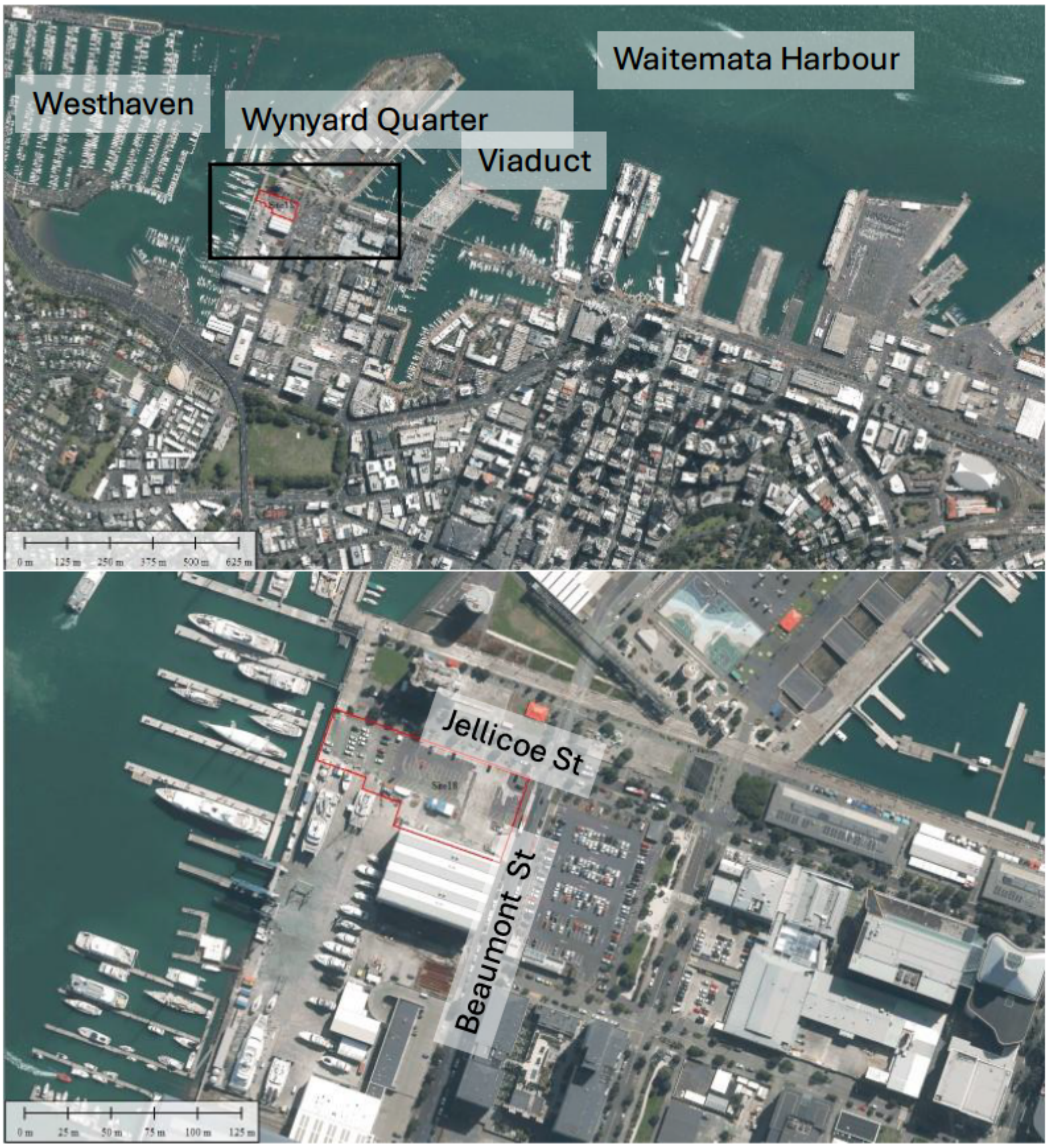

Figure 1-1: Site location.

1.3 Datums

Levels used in this assessment are relative to New Zealand Vertical datum 2016 (NZVD16), referred to as reduced level (RL). The conversion from Auckland Vertical Datum 1946 in this location is -0.313 based on bi-linear interpolation of the LINZ conversion raster. The primary terrain information source is the 2024 Auckland Regional LiDAR survey, sourced from LINZ[1].

2 Proposed development

Precinct Properties has proposed to develop the site with a new multi-storey building. We have assessed the development based on an architectural plan provided by Westhaven Residential Limited Partnership on 22 July 2025. An overview of the proposed development is shown in Figure 2-1 and Figure 2-2. The ground floor of the development includes a mix of commercial (dining/retail), service infrastructure (power, waste) and parking, with ramps to parking areas on levels 1, 2 and 3. No basements are proposed.

[1] https://data.linz.govt.nz/layer/121990-auckland-part-1-lidar-1m-dem-2024/

Figure 2-1: Development concept (Warren and Mahoney, Fast Track Referral Application Rev C, August 2025, Page 14).

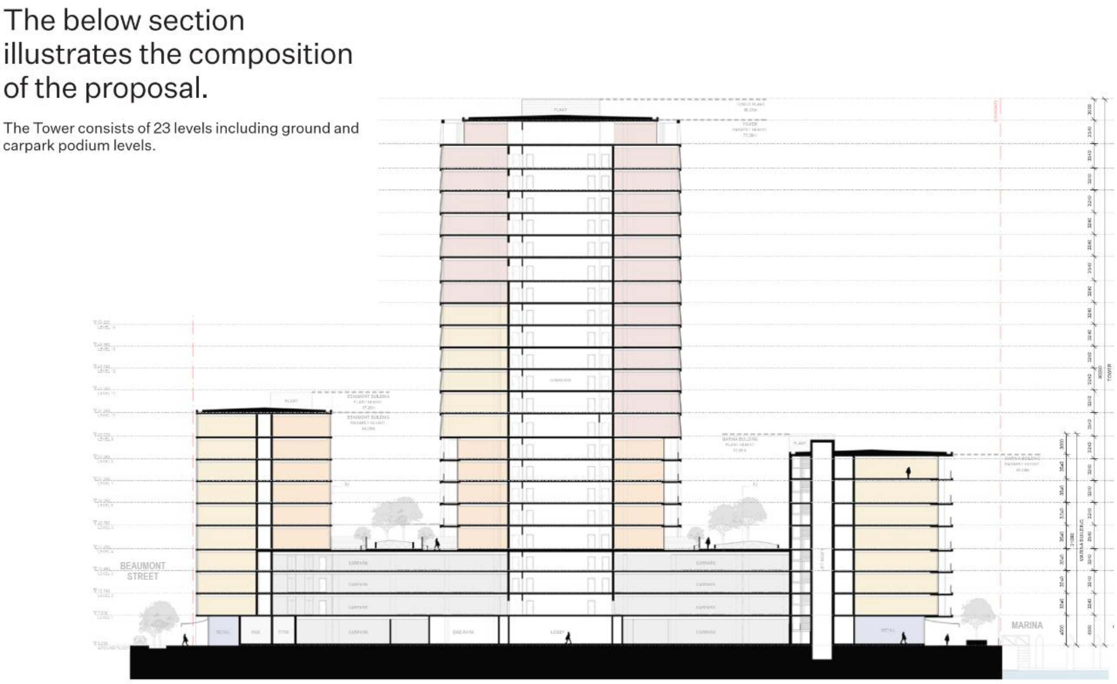

Figure 2-2: Typical long section profile (Warren and Mahoney, Fast Track Referral Application Rev C, August 2025, Page 13).

3 Climate change and natural hazards

The Wynyard Precinct is an area of significant recent development, as part of the wider Auckland city centre area along the waterfront. It is low-lying flat land, and therefore vulnerable to natural hazards including coastal inundation and flooding.

3.1 Coastal erosion

No ASCIE (Area Susceptible to Coastal Instability and Erosion) lines were generated for reclaimed shorelines such as those around the Auckland CBD as it was assumed that structures supporting these shorelines will be maintained, supporting the planning definition of reclaimed land as permanent.

3.2 Coastal inundation

The main climate change hazard at this location is coastal inundation from sea level rise. Existing coastal inundation information by Auckland Council (Figure 3-1) indicate that the site is exposed to coastal inundation during a 1% AEP annual exceedance probability (AEP) event with 1 m of sea level rise (SLR), with increasing inundation extents and depths for greater SLR magnitudes. Storm tide is the super-elevation of storm surge above the tide during storm conditions, caused by low atmospheric pressure and onshore wind. The site is in a sheltered harbour environment, so it is exposed to low energy wind wave and wake energy but is not exposed to surf-zone conditions that generate wave setup and runup.

The following sections provide more information on tide levels, storm surge, and sea level rise exposure at the site for a range of plausible relative sea level rise projections based on different Shared Socioeconomic Pathways (SSPs) with and without vertical land movement (VLM).

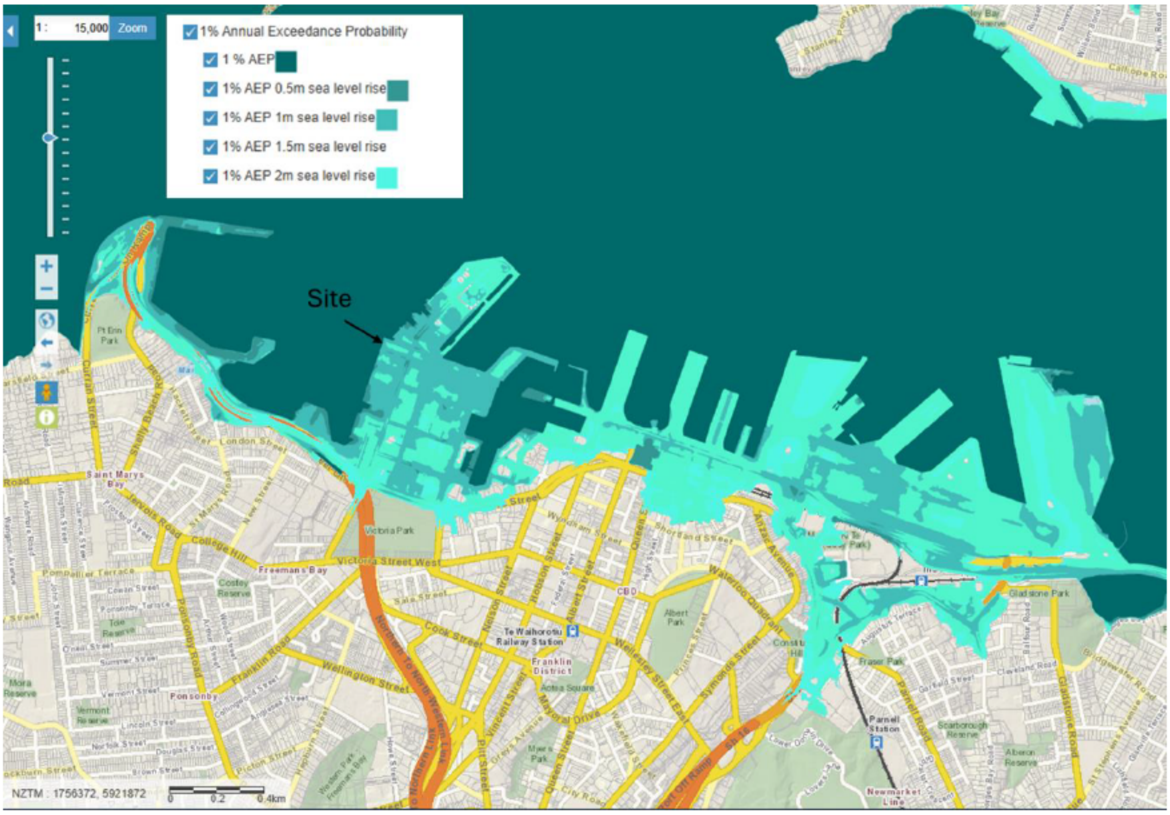

Figure 3-1: Existing coastal inundation hazards across the site and broader city centre waterfront- information from Auckland Council Geomaps.

3.2.1 Present day sea levels

Relevant tide and storm tide levels are presented in Table 3-1 for present day (adjusted to mean sea level in 2020). Nautical tide levels (n) were sourced form LINZ (2025)[2] and storm tide levels were from point ID#4 in Table 3.3 of Auckland Council Technical Report 2020/024[3], adjusted by +0.04 m to be relative to a mean sea level baseline in 2020, based on MSL values in LINZ (2025). The site is not currently exposed to coastal inundation during the typical tide or during rare storm tide events.

Table 3-1: Present day water levels for Downtown Auckland relative to 2020 baseline

Name	Level (m, Chart Datum)	Level (m, AVD-46)	Level (mRL, NZVD-16)
Lowest Astronomical Tide (LAT)	0.08	-1.66	-1.98
Mean low water spring (MLWSn)	0.52	-1.22	-1.54
Mean sea level (MSL)	1.93	0.19	-0.13
Mean high water spring (MHWSn)	3.36	1.62	1.30
Highest astronomical tide (HAT)	3.74	2.00	1.68
39% AEP (2yr ARI)	3.82	2.08	1.76
10% AEP (10yr ARI)	3.96	2.22	1.90
2% AEP (50yr ARI)	4.09	2.35	2.03

[2] https://www.linz.govt.nz/sites/default/files/doc/hydro_202425-almanac_full-nautical-almanac_pdf.pdf
[3] https://www.aucklandcouncil.govt.nz/environment/what-we-do-to-help-environment/Documents/coastal-inundation-in-auckland.pdf

Name	Level (m, Chart Datum)	Level (m, AVD-46)	Level (mRL, NZVD-16)
1% AEP (100yr ARI)	4.14	2.40	2.08
0.2% AEP (200yr ARI)	4.19	2.45	2.13

3.2.2 Relative sea level rise

An increase in mean sea level from global climate change will elevate the present-day tide and storm tide levels. The timing and magnitude of SLR is uncertain and in areas of land subsidence can be compounded by vertical land movement (VLM) causing relative sea level rise (RSLR).

Auckland Council is currently working through a Natural Hazard Plan Change, and we understand that Council has not yet updated the natural hazard provisions from E36. Therefore, we are basing this assessment on MfE (2024) guidance related to coastal hazards and climate change (particularly sea level rise), which promotes a risk-based approach for managing identified risks. If a risk assessment is not carried out, the guidance recommendation for Planning Category B '*Changes in land use and redevelopment (intensification and upzoning)*' is:

- A timeframe of at least 100 years, with 2130 proposed by MfE.
- Use of the SSP5-8.5 H+ (83rd percentile) pathway for sea level rise.
- Add allowance for vertical land movement (VLM).

The SSP5-8.5 projection is one of a suite of shared socioeconomic pathways (SSPs) that look at five different ways in which the world might evolve. Details of these pathways are available from NZSeaRise[4] along with data on relative sea level rise magnitudes around New Zealand. SSP5-8.5 is a high emission scenario and the 83rd percentile includes allowance for uncertainty. Sea level rise anticipated for the period to 2130, based on the recommended intensification pathway of SSP5-8.5-*p83*-2130 is 1.6 m for Wynyard Point based on NZ Sea Rise point 1230 and a mean sea level baseline of 2020.

Relative sea level rise (RSLR) may also occur in locations of geological subsidence, where vertical land movement (VLM) monitoring indicates land is gradually lowering relative to the sea. There is uncertainty in VLM monitoring data due to short timeframes. Land that now forms Wynyard Quarter was reclaimed over 100 years ago, which provides some opportunity to reference VLM at the site by comparing current levels to historic designs plans. Based on an examination of possible reclamation levels, it is likely that the land elevation was set at around 4 to 5 foot above the typical high-water spring of the day based on design plans developed around 1904 by W.H. Hamer who was the chief engineer to the Auckland Harbour Board. This would be a between 2.5 to 2.8 mRL, which is similar to the current road levels around the precinct.

RSLR values for the site were sourced from the closest NZ Sea Rise[5] point, at the end of Wynyard Point (ID 1230) associated with a change of -0.9 ± 1.4 mm/yr (i.e. subsidence). This adds to 0.12 m of subsidence for the 2130 timeframe, adopting the median (p50) projection, or 0.19 m subsidence adopting the H+ (p83) projection which includes RSLR uncertainty. NZ Sea Rise projections for neighbouring wharf sites are similar, but landward near Victoria Park and Westhaven Drive have greater VLM rates of -3.0 ± 1.9 mm/yr. However, based on limited evidence of subsidence since the land was reclaimed, this higher rate of subsidence is not adopted.

Projected SLR and RSLR for a range of SSPs are presented in Table 3-2, relative to a mean sea level baseline in 2020 based on NZ Sea Rise point 1230. This range is provided as consideration of a range of SSPs including SSP2-4.5p50 and SSP5-8.8p50 as these scenarios are recommended to be used for

[4] https://searise.nz/resources/education-about-global-sea-level-rise/shared-socioeconomic-pathways/
[5] https://searise.takiwa.co/map/6245144372b819001837b900/embed

detailed coastal hazard or risk assessment. For the development stress test scenario SSP5-8.5-*p83*-2130 which is appropriate for the initial screening of coastal hazard risk, the relevant SLR value is 1.59 + 0.19 VLM = **1.78 m RSLR** above 2020 sea level. In comparison the 50 percentile values for SSP5-8.5 result in 1.19 m SLR and 1.3 m of RSLR.

Table 3-2: Sea level rise from NZ Sea Rise point 1230 (Wynyard Point)

Year	SSP2-4.5 p50 (mRL)		SSP3-7.0 p50 (mRL)		SSP5-8.5 p50 (mRL)		SSP5-8.5 p83 (mRL)	
	No VLM	VLM	No VLM	VLM	No VLM	VLM	No VLM	VLM
2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	0.05	0.06	0.04	0.06	0.05	0.07	0.06	0.08
2040	0.10	0.12	0.10	0.12	0.12	0.14	0.13	0.18
2050	0.15	0.19	0.17	0.20	0.19	0.22	0.22	0.28
2060	0.22	0.26	0.24	0.29	0.28	0.32	0.34	0.41
2070	0.28	0.34	0.32	0.38	0.38	0.43	0.46	0.57
2080	0.35	0.41	0.42	0.49	0.49	0.56	0.61	0.73
2090	0.42	0.50	0.53	0.61	0.62	0.70	0.79	0.92
2100	0.50	0.58	0.65	0.74	0.76	0.84	0.97	1.11
2110	0.58	0.68	0.75	0.85	0.89	0.98	1.17	1.33
2120	0.67	0.77	0.88	0.99	1.03	1.14	1.38	1.55
2130	**0.75**	**0.87**	**1.01**	**1.13**	**1.19**	**1.30**	**1.59**	**1.78**
2140	0.84	0.97	1.16	1.28	1.34	1.47	1.82	2.02
2150	0.94	1.07	1.30	1.43	1.50	1.64	2.05	2.26

3.2.3 Future HAT inundation

A proxy for regular nuisance inundation is when the increase in highest astronomical tide (HAT) exceeds land level and causes shallow inundation that could flood ground floor buildings, back up drainage, and limit transport networks due to flooded roads and footpaths. Table 3-3 presents the HAT level for different RSLR pathways for each decade between 2020 and 2150, allowing assessment of when regular nuisance inundation could occur.

Table 3-4 shows the year when HAT is projected to exceed the existing road level of 2.7 mRL and the existing site ground level of 3.0 mRL for the different projections. The onset of road inundation at HAT would be 2100 for the stress test scenario (SSP5-8.5*p83*+VLM-2130), or later for the other RSLR pathways. The onset of ground level flooding at the existing site would be 2110 for the SSP5-8.5*p83* pathway. The projected HAT level for the stress test scenario of SSP5-8.5*p83*+VLM-2130 is ~3.5 mRL, which would result in inundation depth of 0.8 m on the road and 0.5 m on the existing ground.

Table 3-3: HAT with different RSLR pathways (m, NZVD-16)

Year	SSP2-4.5 p50 (mRL)		SSP3-7.0 p50 (mRL)		SSP5-8.5 p50 (mRL)		SSP5-8.5 p83 (mRL)	
	No VLM	VLM	No VLM	VLM	No VLM	VLM	No VLM	VLM
2020	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68
2030	1.73	1.74	1.72	1.74	1.73	1.75	1.74	1.76
2040	1.78	1.80	1.78	1.80	1.80	1.82	1.81	1.86
2050	1.83	1.87	1.85	1.88	1.87	1.90	1.90	1.96
2060	1.90	1.94	1.92	1.97	1.96	2.00	2.02	2.09
2070	1.96	2.02	2.00	2.06	2.06	2.11	2.14	2.25
2080	2.03	2.09	2.10	2.17	2.17	2.24	2.29	2.41
2090	2.10	2.18	2.21	2.29	2.30	2.38	2.47	2.60
2100	2.18	2.26	2.33	2.42	2.44	2.52	2.65	2.79
2110	2.26	2.36	2.43	2.53	2.57	2.66	2.85	3.01
2120	2.35	2.45	2.56	2.67	2.71	2.82	3.06	3.23
2130	**2.43**	**2.55**	**2.69**	**2.81**	**2.87**	**2.98**	**3.27**	**3.46**
2140	2.52	2.65	2.84	2.96	3.02	3.15	3.50	3.70
2150	2.62	2.75	2.98	3.11	3.18	3.32	3.73	3.94

Table 3-4: Onset year for HAT inundation of the present-day road and site level

Event	SSP2-4.5 p50		SSP3-7.0 p50		SSP5-8.5 p50		SSP5-8.5 p83	
	No VLM	VLM	No VLM	VLM	No VLM	VLM	No VLM	VLM
HAT > road (2.7 mRL)	>2150	2150	2140	2130	2120	2120	2110	2100
HAT > site (3.0 mRL)	>2150	>2150	2150	2140	2140	2140	2120	2110

3.2.4 Future 1% AEP inundation

Coastal inundation hazards are typically assessed using the 1% AEP storm tide level, which represents a rare (1%) probability of occurring any year and could cause disruption and damage if water enters buildings, basements, or floods roads. Table 3-5 presents the 1% AEP level for different RSLR pathways for each decade between 2020 and 2150.

Table 3-6 presents the year when the existing road level of 2.7 mRL and the existing site ground level of 3.0 mRL is exceeded by the 1% AEP event for the different projections. The onset of road inundation for a 1% AEP event would be 2080 for the SSP5-8.5*p83*+VLM scenario, or later for the other RSLR pathways. The onset of ground level flooding at the site would be 2100 SSP5-8.5*p83*+VLM scenario. The projected 1% AEP water level for the stress test scenario of SSP5-8.5*p83*+VLM-2130 is ~3.9 mRL, which would result in inundation depth of 1.2 m on the road and a depth around 0.9 m on the existing site ground.

Freeboard is typically added above the 1% AEP inundation level to inform finished floor levels, typically 0.3 m for less vulnerable activities such as non-habitable areas and 0.5 m for more vulnerable activities including residential/habitable areas, although this should be applied to the relevant P50 value, as the p83 already includes an allowance for uncertainty.

Table 3-5: 1% AEP water level for different RSLR pathways (m, NZVD-16)

Year	SSP2-4.5 p50 (mRL)		SSP3-7.0 p50 (mRL)		SSP5-8.5 p50 (mRL)		SSP5-8.5 p83 (mRL)	
	No VLM	VLM	No VLM	VLM	No VLM	VLM	No VLM	VLM
2020	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08
2030	2.13	2.14	2.12	2.14	2.13	2.15	2.14	2.16
2040	2.18	2.20	2.18	2.20	2.20	2.22	2.21	2.26
2050	2.23	2.27	2.25	2.28	2.27	2.30	2.30	2.36
2060	2.30	2.34	2.32	2.37	2.36	2.40	2.42	2.49
2070	2.36	2.42	2.40	2.46	2.46	2.51	2.54	2.65
2080	2.43	2.49	2.50	2.57	2.57	2.64	2.69	2.81
2090	2.50	2.58	2.61	2.69	2.70	2.78	2.87	3.00
2100	2.58	2.66	2.73	2.82	2.84	2.92	3.05	3.19
2110	2.66	2.76	2.83	2.93	2.97	3.06	3.25	3.41
2120	2.75	2.85	2.96	3.07	3.11	3.22	3.46	3.63
2130	**2.83**	**2.95**	**3.09**	**3.21**	**3.27**	**3.38**	**3.67**	**3.86**
2140	2.92	3.05	3.24	3.36	3.42	3.55	3.90	4.10
2150	3.02	3.15	3.38	3.51	3.58	3.72	4.13	4.34

Table 3-6: Onset year for 1% AEP inundation of the present-day road and site level

Event	SSP2-4.5 p50		SSP3-7.0 p50		SSP5-8.5 p50		SSP5-8.5 p83	
	No VLM	VLM	No VLM	VLM	No VLM	VLM	No VLM	VLM
1%AEP > road (2.7 mRL)	2120	2110	2100	2100	2090	2090	2090	2080
1%AEP > site (3.0 mRL)	2150	2140	2130	2120	2120	2110	2100	2100

3.2.5 Coastal inundation exposure

Road exposure

Based on the water level and exposure timing tables presented above, the road access to the existing site is likely to be exposed to a 1% AEP coastal inundation event between 2080 and 2120, which is 50 – 90 years' time. HAT flooding of the road is not projected until 2100 or later (e.g. after at least 70 years) and this could potentially be delayed until after 100 years if lower emission pathways are realised. Therefore, coastal inundation is unlikely to cut off access to/from the site in the next 50 years, but access issues are likely due to coastal inundation events in 50 – 100 years' time due to climate change.

The risks associated with coastal inundation flooding roads are that the site may be temporarily cut off from the surrounding road network for a period of a few hours around high tide. The closest ground above 4 m RL[6] is near Victoria Park, approximately 700 m away.

Access to and from the site could become limited during emergency situations, and therefore adaptation is likely required to facilitate emergency ingress and egress. This could include:

- Raised pedestrian evacuation pathways, connected to neighbouring buildings and suitable high ground.
- Raising the existing footpaths and roads in the next 50 years.
- Alternative emergency transport options (e.g. boat, helicopter).
- Onsite vertical evacuation infrastructure and systems for people to shelter in place during a temporary event.

Building exposure

New developments such as the proposal for 188 Beaumont Street have the opportunity to build natural hazard resilience into the design by raising the finished floor level above the design inundation event level. Auckland Council guidance on finished floor levels in the Unitary Plan (E36.6) currently adopts the 1% AEP inundation level with 1 m sea level rise and additional freeboard as a minimum habitable floor level, although there is also the requirement to consider the best information available, that includes the new sea level rise projections and VLM.

Based on the assessment presented in this report, a finished ground-floor level of 4.0 mRL (NZVD-16) would protect from the 1% AEP inundation level for all RSLR scenarios in the next 100 years, with the amount of freeboard in 2130 determined by the RSLR pathway. For the SSP5-8.5p50+VLM-2130 the freeboard is 0.62 m. The freeboard reduces with the stress test scenario of SSP5-8.5*p83*+VLM-2130 which is appropriate as this scenario already includes uncertainty.

The use of a finished ground-floor level of 4.0 m RL is consistent with recent developments in the area that have utilised a raised building platform of >4 mRL (Figure 3-2). Adaptation would still be needed at the site after this timeframe.

Upper floors would not be directly exposed to inundation and should be unaffected if services such as power and elevator electronics that are situated on the ground floor are not compromised during an inundation event.

[6] Unlikely to be inundated in the next 100 years.

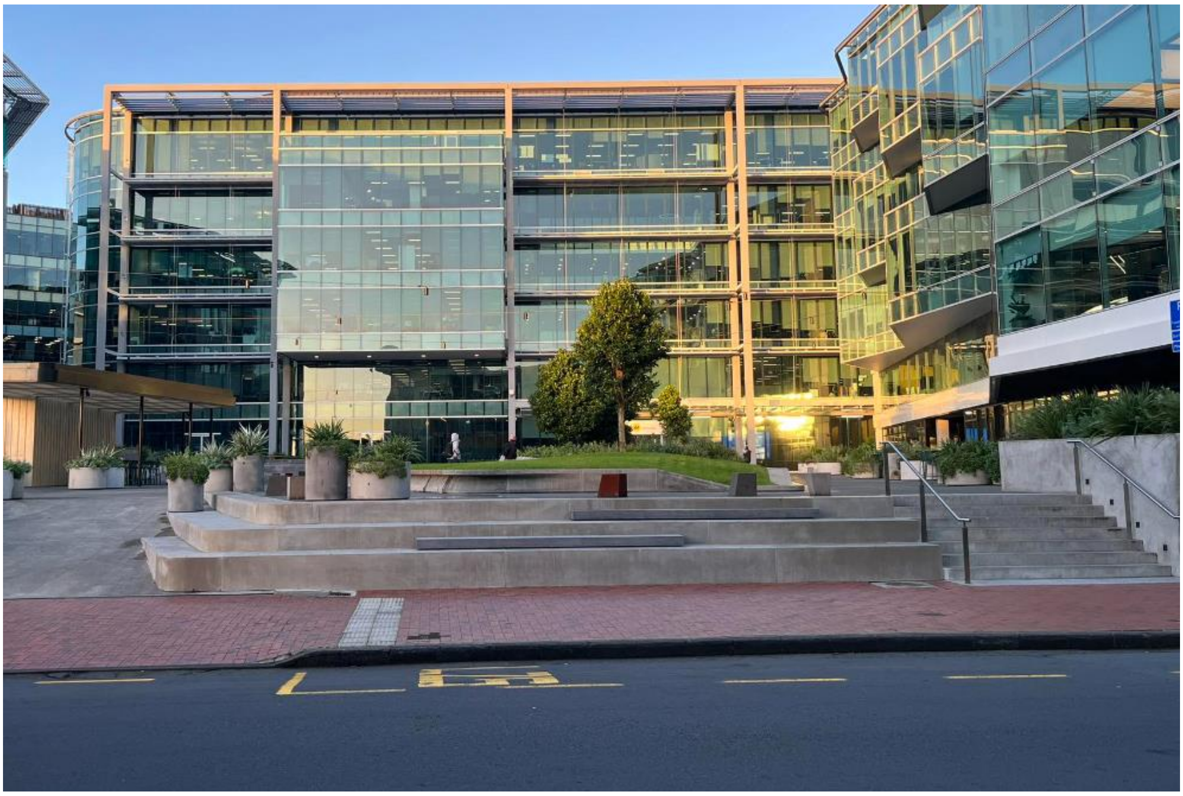

Figure 3-2: Example of raised building platform off Viaduct Harbour Ave (approx. 4.1 mRL).

Basements

Many building occupants in the Viaduct Harbour experienced significant basement flooding during extreme rainfall on 26 January 2023 (Auckland Anniversary floods) which can be damaging to electrical plant, vehicles, elevators, equipment, among other stored items and utilities.

Underground basements are high risk areas for sea level rise inundation if access is road level, as any inundation of the road would flood into the basement, potentially filling up water to the basement roof level.

No basements are proposed as part of this development.

3.3 Tsunami

The site is not identified as being inside the 'red' or 'yellow' tsunami zone mapped on the Auckland Council Hazard viewer to inform evacuation mapping. However, this may change with future sea level rise. Any adaptation measures used to manage risk from coastal inundation (e.g. raised building platform) will also mitigate risk from tsunami. The proposed development also has the potential for effective vertical evacuation with ramps to higher level car parking area.

Figure 3-3: Tsunami evacuation areas from Auckland Council Natural Hazard Maps: https://aucklandcouncil.maps.arcgis.com/apps/MapSeries/index.html?appid=81aa3de13b114be9b529018ee3c649c8

3.4 Rainfall flooding

The most current understanding of the floodplain around the Wynyard and Viaduct precincts comes from the Freemans Bay flood hazard mapping (FHM) report (AECOM, 2016). Flood information collected for Auckland Council during the Auckland Anniversary January 2023 flood event has not yet been analysed to determine the flood extents and depths. The 1% AEP floodplain map from the 2016 FHM[7] and predicted overland flow paths (WSP, 2019) are shown Figure 3-4.

This information does show the small areas of the site adjacent to the roads are covered by an overland flow path flood plain.

[7] The floodplains represent impervious land coverage scenarios representative of the maximum probable development permitted under unitary plan zoning. They include both "existing" and climate change scenarios with up to 2.1 degrees of warming allowed. Results presented in this report from the 2016 FHM represent the 2.1 degrees of warming.

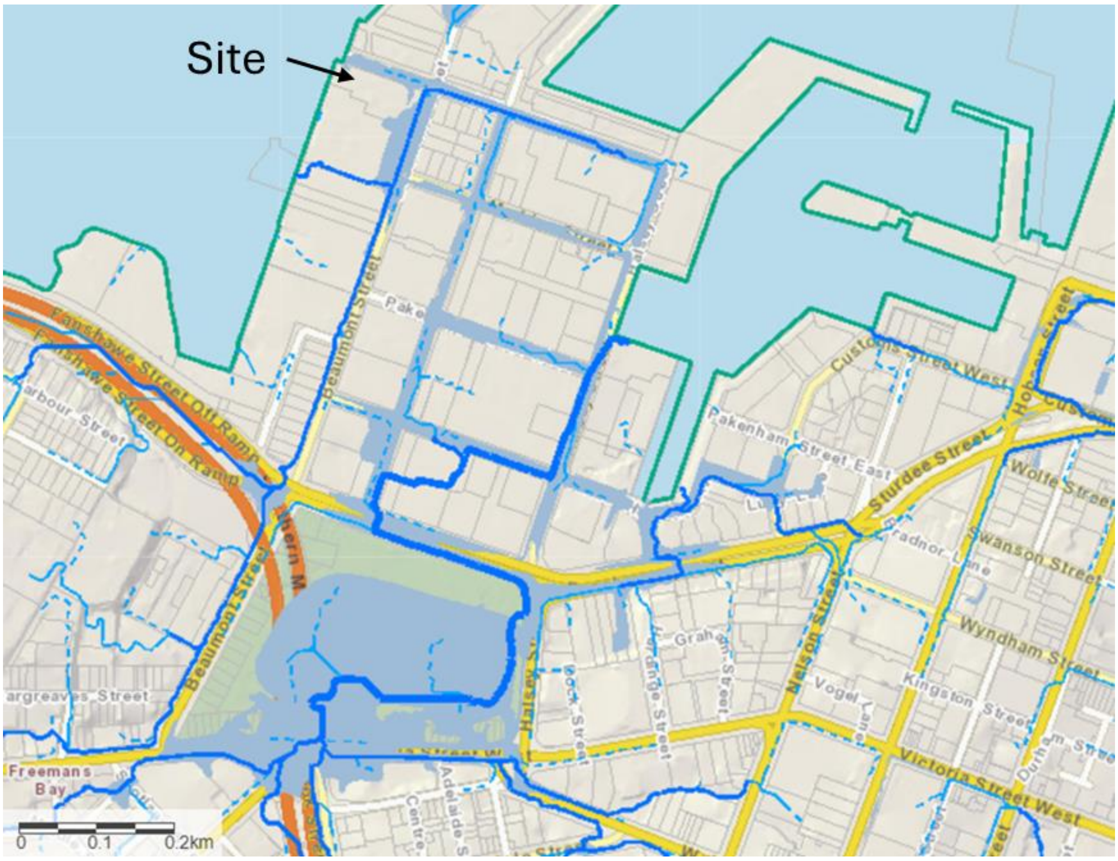

Figure 3-4: 100 year ARI flood plain and overland flow paths (Source: Auckland Council GeoMaps).

The 2016 FHM floodplain may underestimate the future 1% AEP floodplain because the design rainfall (relative to 2016) has increased for two reasons:

- The January 2023 event has had a statistically significant impact on the likelihood of extreme rainfall events in Auckland. The impact of this is that the rainfall depth has increased for the same likelihood event. For example, a 1% AEP event may previously have been 200 mm rainfall in 24 hours, now it may be 220 mm in 24 hours or even more.
- Regional guidance regarding allowance for climate change increases in rainfall has increased to 3.8 degrees[8] (from 2.1 degrees when the FHM was carried out). For every degree of warming there is an 8.6% increase in extreme rainfall for 100-year ARI, 24-hour duration rainfall storms[9].

In contrast to the above comments, there are a series of stormwater upgrades which have been completed which are not represented in the 2016 FHM model. Since 2015, stormwater pipe network upgrades have been undertaken in Halsey Street and Madden Street and upgrades along Beaumont Street are awaiting construction. The impact of these upgrades on the floodplain is currently unknown but are likely to result in improvements to stormwater management in the Wynyard Quarter area.

[8] The Climate Change Response (Zero Carbon) Amendment Act provides a framework for New Zealand to develop and implement clear and stable climate change policies. Te Tāruke-ā-Tāwhiri: Auckland's Climate Plan, underscores the imminent challenge of a projected 3.5°C (or more) temperature increase by 2110 under a high emissions scenario (RCP8.5). To align with this directive, Auckland Council document GD-15 'Climate Change Scenarios' (March 2024) states that to align with this directive, all project within Auckland Council must adhere to a statistical downscaled temperature projection of 3.8 degrees.

[9] Auckland Council, 2024. Climate Change Scenarios. Auckland Council guideline document GD15.

Rainfall flooding is a potential hazard in the precinct and in the short term (next 50 years) is likely the dominant flood hazard compared to coastal inundation. There is likely to be a transition period, where higher sea levels compound rainfall drainage issues from the precinct, then in the long-term coastal inundation becomes the dominant long-term hazard that will determine adaptation responses.

4 Conclusion

4.1 Site exposure to climate change and natural hazards

The main climate change hazard that will likely affect the site over at least the next 100 years is coastal inundation from sea level rise.

Auckland Council guidance requires the consideration of the best available guidance which for climate change induced coastal hazards is from MfE (2024). The criteria to consider includes:

- A timeframe of at least 100 years, with 2130 proposed by MfE.
- Use of the SSP5-8.5 H+ (83rd percentile) pathway for sea level rise.
- Add allowance for vertical land movement (VLM).

The projected 1% AEP water level for the stress test scenario of SSP5-8.5H+ + VLM (2130) is ~3.9 mRL. This results in inundation depth of 1.2 m on the existing road and a depth around 0.9 m on the existing site ground.

No erosion ASCIE lines were generated for reclaimed shorelines such as those around the Auckland CBD as it was assumed that structures supporting these shorelines will be maintained, supporting the planning definition of reclaimed land as permanent. However, it will be necessary to continue to maintain the coastal protection work along the coastal property boundary.

The site is not identified as being inside the 'red' or 'yellow' tsunami zone mapped on the Auckland Council Hazard viewer to inform evacuation mapping.

Information on the Council GIS viewer shows a small area of the site adjacent to the roads is covered by an overland flow path flood plain during a 100-year ARI event and flooding from more significant events, such as the Auckland Anniversary Floods of 2023 can occur.

4.2 Climate change risk and adaptation

Section 22(2)(a) of the Fast Track Approvals Act states that ministers may consider whether a project … (viii) '*will support climate change adaptation, reduce risks arising from natural hazards, or support recovery from natural hazards*'.

Development that builds in natural hazard adaptation measures at the site can reduce the overall risk to climate change hazards on the site and therefore adds to an overall risk reduction for the wider precinct. The primarily methods for reducing risk at the site is to protect the development from coastal inundation by raising the building platform above the inundation level.

Adaptation responses to ensure essential services situated on the ground floor are above the predicted flood levels from the SSP5-8.5p83+VLM-2130 and the building materials exposed to flooding are resilient to flooding, a scenario with a lower freeboard of 0.3 m above the SSP5-8.5p50 (2130) for the ground floor level could be considered as there is no habitable areas proposed on the ground floor.

However, setting a finished ground floor level of at least 4.0 mRL (NZVD-16) is recommended to avoid the 1% AEP inundation level for all RSLR scenarios in the next 100 years. This scenario provides an 0.62 m freeboard for the medium projection of SSP5-8.5p50 and leaves 0.14 m between the finished floor and the stress test inundation level of SSP5-8.5p83+VLM-2130. This effectively avoids hazard exposure of coastal inundation over the 100-year period therefore reduces the onsite risks, while intensifying development on the site.

In addition to establishing a ground floor level of at least 4.0 m RL, ensuring an effective emergency management protocol, including dills and training is in place for the occupants during coastal inundation, catchment flooding or tsunami events including the provision for stay in place and vertical evacuation for ground floor occupants will also increase the resilience of the development.

With these steps the proposal supports climate change adaptation and risk reduction at the project site. By adopting a minimum finished floor level that protects assets from coastal inundation over the next 100 years the development will not increase the overall risk for the precinct, as the development would not be exposed to inundation hazards directly.

5 Applicability

This report has been prepared for the exclusive use of our client Westhaven Residential Limited Partnership , with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

We understand and agree that our client will submit this report as part of a project application for Fast Track Approvals Act (2024) and that the relevant review panel will use this report for the purpose of assessing that application.

Tonkin & Taylor Ltd
Environmental and Engineering Consultants

Report prepared by:	Authorised for Tonkin & Taylor Ltd by:
....	....
Dr Eddie Beetham Senior Coastal Scientist	Richard Reinen-Hamill Project Director

Technical review: Peter Quilter
Principal Coastal Engineer

EDBE
\\ttgroup.local\corporate\auckland\projects\1098609\issueddocuments\coastal\2025_08_08_final\2025_08_22_t+t_oramsclimatehazards_v3.docx