19 May 2026
Job No: 1093341.0000

Devonport Property Management Ltd
Level 3, 6 Viaduct Harbour Avenue
Auckland 1010

Attention: Nick Turley

Dear Nick

Devonport Mixed Use Development
Flood assessment

1 Introduction

Devonport Property Management Ltd engaged Tonkin & Taylor Ltd to undertake a flood assessment for Devonport Mixed Use Development to inform the application for fast-track referral. Tonkin + Taylor has also been engaged to report on infrastructure, coastal inundation, stormwater, flooding and geotechnical ground conditions, covered in separate reports. This report presents the findings of the flooding risk assessment, including whether flood mitigation is required for the site.

This assessment draws on the following key information sources:

- T+T 2025, Devonport Mixed Use Development Infrastructure Assessment
- T+T 2026, Devonport Mixed Use Development Stormwater assessment
- Refer to Devonport Mixed Use Development Infrastructure Assessment (T+T, 2026) for site context, description of the development and wider infrastructure considerations.

The purpose of this report is to present rainfall-induced flood hazard information and a risk assessment to support the fast-track referral application with reference to the operative Auckland Unitary Plan (AUP) and proposed Plan Change 120 provisions.

1.1 Proposed development

The proposal is for a comprehensive mixed-use urban town centre development located in Devonport, Auckland, within the block bounded by Victoria Road, Clarence Street, and Wynyard Street. The site comprises 14 existing titles and approximately 6,126 m² of brownfield land and includes five Auckland Unitary Plan Category B listed heritage buildings and one Category A listed heritage building.

The development comprises five buildings arranged across three site areas, with building heights ranging from four to eight storeys, and includes up to two basement levels. Buildings 1–3 are located between Victoria Road and Wynyard Street and include a hotel and mixed-use buildings with a two-level basement accessed from Wynyard Street. Building 4 is a mixed-use building located at the corner of Victoria Road and Clarence Street and includes one basement level. Building 5 is a mixed-use building located to the south-west of the site on Wynyard Street with on-grade carparking access.

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The proposal includes a commercially activated ground plane comprising a network of laneways and a central courtyard, providing pedestrian connections between Victoria Road and Wynyard Street and supporting active ground-floor uses.

The development includes the adaptive reuse of the Victoria Road heritage buildings, which are integrated into the commercial ground plane.

The development delivers approximately 21,125 m² of total gross floor area and 1,770 m2 of commercial ground plane. This encompasses 12,516 m² of residential floor area, 2,382 m² of commercial space, and 3,004 m² of ground floor retail including commercial outdoor ground plane area. The proposal incorporates 2,319 m² of adaptively reused heritage and a new 2,095 m² hotel, with the balance comprising building circulation.

Associated works include carparking and loading facilities potentially ranging between 80 and 200 carparks and loading spaces; earthworks and excavation potentially ranging between 2,000 m^2 and 6,735 m² and 9,380 m³ and 25,000 m³; and all required associated infrastructure including water supply, stormwater (including any required flood mitigation measures), and wastewater services.

The site is located immediately north of the Devonport Ferry Terminal and associated public transport services.

The proposed development is shown in Figure 1.1.

Figure 1.1: Proposed development (sourced from PB&A architectural plans).

The five buildings are situated across three broad areas, and the site boundaries for the three areas are shown on the aerial image in Figure 1.2. Defining these areas helps translate flood hazard and flood risk later in the report.

Figure 1.2: Site Location. Site boundary shown in red. Sourced from Auckland Council Geomaps.

2 Flood risk assessment

The proposed plan change 120 to the AUP is operative in part, with Chapter E36 'Natural Hazards and Flooding' requiring the completion of natural hazard risk assessments when a subdivision, use or development requiring resource consent is proposed to be undertaken on land which may be subject to natural hazards considering the effects of climate change over at least a 100-year timeframe (rounded in this assessment to be year 2130).

The development site boundaries have been compared with the floodplain, flood hazard and flood prone areas hazard overlays on Auckland Council's GIS viewer; these are shown on Figure 2.1, Figure 2.2 and Figure 2.3 respectively. This information shows that one of the three site boundaries has exposure to a low hazard floodplain and flood prone area. Specifically, it is only Building 3 that is exposed.

This risk assessment therefore only relates to Building 3 since the other four buildings are located outside the floodplain.

Figure 2.1: Site boundary in comparison with floodplain and overland flowpaths (AC Geomaps).

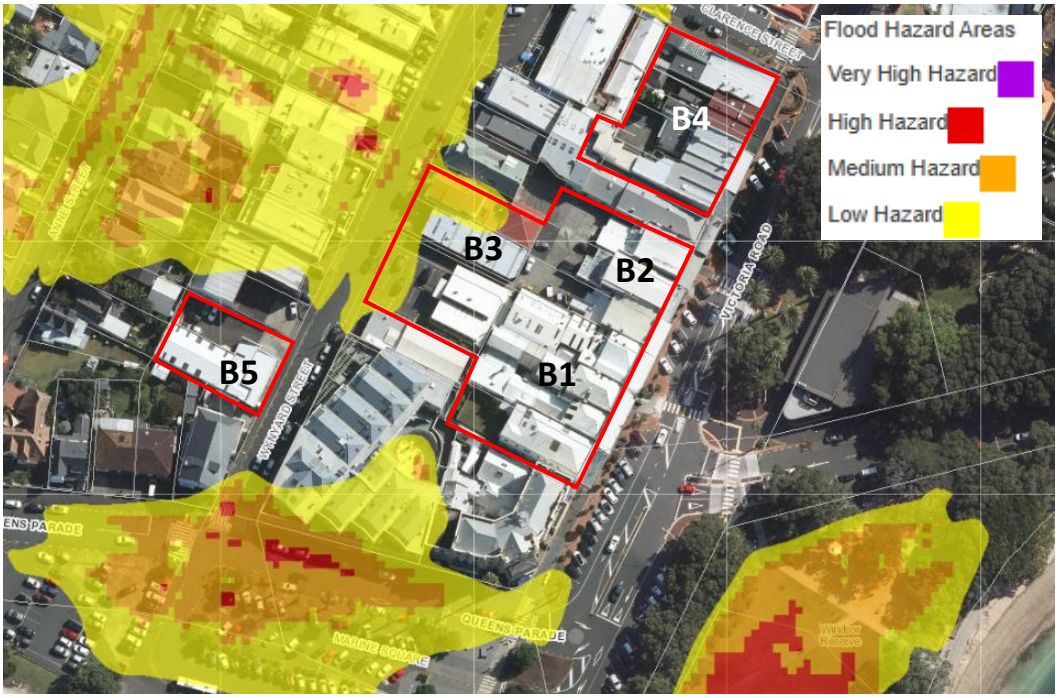

Figure 2.2: Site boundary in comparison with flood hazard (AC Geomaps).

Figure 2.3: Site boundary in comparison with the flood prone area and overland flowpaths (AC Geomaps).

2.1 Risk assessment framework

AUP PC120 E36 provides a proportionate risk-based approach to address the risks associated with natural hazards. A risk reduction approach applies to land that has been developed for urban use, such as the present site, with a risk assessment matrix included in Table E36.3.1B.1 that states activities sensitive and potentially sensitive to natural hazards are potentially tolerable and activities less sensitive to natural hazards are acceptable.

PC120 E36 (3) requires consideration all of the following, taking into account the potential effects of climate change and adopting a precautionary approach where information is uncertain or incomplete:

1 The type, frequency, range and scale of the natural hazard(s), including:
- Where there may be coinciding, compounding and/or cascading hazards
- Whether the hazard risks will be temporary or permanent
- Whether natural hazard events of lower intensity and higher frequency than the 1 per cent AEP event will impact the property and proposed activity

2 The consequences of the natural hazard in relation to the proposed activity, including consideration of the following matters:
- Accelerating or exacerbating the natural hazard and/or its potential impacts
- Creating natural hazard risks that previously were not present at the location
- The type of activity being undertaken and its sensitivity to natural hazard events
- Creating or increasing the natural hazard risk(s) to people and communities, including long-term impacts from more frequent hazard events

- Creating or increasing the natural hazard risk(s) to other properties, infrastructure and the environment
- Cultural impacts, including consequences for Māori land, Treaty Settlement, Land, marae, urupā, mana whenua cultural heritage and values

3 Existing and proposed mitigation measures

4 Residual risk

5 Any relevant management plan, strategy or hazard risk assessment relating to the area.

PC120 E36 (4B) requires the following matters to be considered as part of a risk assessment of existing and future mitigation measures and residual risk:

a Whether any building, structure or activity located on land subject to natural hazards can be relocated within the site or removed

b Whether the use, design and construction of buildings and structures can mitigate risks associated with natural hazards

c The extent to which methods for long term maintenance of areas affected by natural hazards, such as easements, are provided

d The ability for site layout and management to limit exposure of people and property to natural hazards, including safe egress during a natural hazard event

e The effect of structures to mitigate hazards on landscape values and public access

f The robustness of the mitigation measures, their enforceability and the ability to carry out repairs and maintenance

g The potential consequences of events that exceed the design parameters of mitigation measures

h The potential effects resulting from failure of structural and nature-based mitigation measures over a 100-year timeframe

i The impacts of the mitigation on other people, properties, infrastructure and the environment.

Relevant parts of PC120 E36 (4C) relates to adaptation in natural hazard areas and includes consideration of the following in flood hazard and coastal inundation hazard areas:

i Ensuring appropriate safe refuge and safe egress are provided where possible and maintained where currently available

ii Raising floor levels to reduce the extent of flooding or inundation within the building.

2.2 The type, frequency, range and scale of the flood hazard

The following information summarises the characteristics of flood hazard on the site at Building 3 (detailed information provided in Appendix A):

- Flooding is a temporary hazard which will drain through the stormwater pipes and through infiltration when there is capacity to do so.
- Without consideration of climate change effects, there is currently no flooding predicted at the site for storm events up to 1% AEP storm (Annual Exceedance Probability).
- Under climate scenarios (2.1^{o} C and 3.8 ^{o} C) there is isolated shallow flooding (<0.15 m) predicted to start occurring in the 10% AEP design storm at the south-western part of the site.
- Maximum flood levels under future climate change scenarios are predicted to be up to 3.1 m RL (NZVD 2016) in the 1% AEP design storm and extend across ~500 m^2 of the western end of the site. Refer Figure A5 in Appendix A.

- 3.1-3.15 m RL (NZVD 2016) is considered an upper limit for flooding on the site because of the "spillway level" (2.93 m RL) which is located adjacent to 1-3 Wynyard Street, and shown in Figure 2.4. When flood levels exceed the spillway level, flood flows southwards down Wynyard Street. Between the spillway location and the site, there is approximately 100 mm driving head which causes the flow. Flooding in and around the area is controlled by the spillway and driving head and therefore we are confident that any further increases in rainfall will not cause further increases in water level at the site (i.e. any increase in water level at the site would simply drive more flows over the spillway).
- The floodplain on the site is considered low hazard, based on the information shown earlier in Figure 2.2.

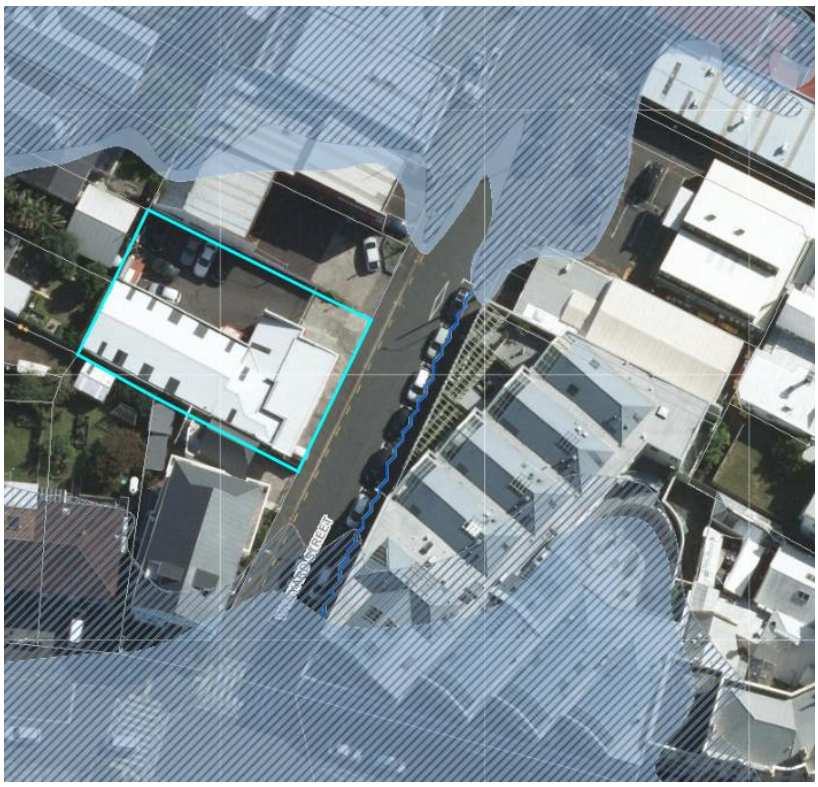

Figure 2.4: "Spillway" location along Wynyard Street.

The floodplain can be characterised as a low energy, low hazard, shallow floodplain which has the potential to extend across up to 500 m^2 of the site. The floodplain volumes shown in Table 2.1 help characterise the floodplain further by demonstrating the low floodplain volume.

Table 2.1: Floodplain storage volume on the site

Scenario	Volume of flooding (m^3) (> 0.05 m depth)
1% AEP – Present Day	0
2% AEP – Present Day	0
5% AEP – Present Day	0
10% AEP – Present Day	0
20% AEP – Present Day	0
50% AEP – Present Day	0
1% AEP - 2.1^o Climate Change Scenario	30
2% AEP - 2.1^o Climate Change Scenario	16
5% AEP - 2.1^o Climate Change Scenario	2.2
10% AEP - 2.1^o Climate Change Scenario	<1
20% AEP - 2.1^o Climate Change Scenario	0
50% AEP - 2.1^o Climate Change Scenario	0
1% AEP - 3.8^o Climate Change Scenario	57
2% AEP - 3.8^o Climate Change Scenario	43
5% AEP - 3.8^o Climate Change Scenario	14
10% AEP - 3.8^o Climate Change Scenario	2
20% AEP - 3.8^o Climate Change Scenario	0
50% AEP - 3.8^o Climate Change Scenario	0

2.3 The consequences of the flood hazard in relation to the proposed activity, including consideration of the following matters

2.3.1 The type of activity being undertaken and its sensitivity to natural hazard events

The proposed development at Building 3 incorporates parking in the basement and commercial activities on the ground floor[1]. These basement and ground floor activities are of most relevance to the flood hazard risk assessment due to the low hazard flood depths. Residential building use is proposed on 1st floor and safe access, egress and refuge is considered further in the Section 2.4.

The AUP identifies a range of activities that should be considered in the risk assessment. Table 2.2: identifies the AUP activities of potential relevance to Building 3, noting that and whether they are included in the assessment.

[1] PB&A Architect drawing 1089-A-SK9101

Table 2.2: AUP activities and Devonport Mixed Use Development risk elements

AUP Sensitivity	Risk element	Included in risk assessment
Sensitive	Residential dwellings	There are no residential dwellings on the ground floor, therefore risk assessment of residential dwelling unnecessary. Safe access, egress and refuge discussed in Section 2.4.
	Critical infrastructure/electrical	Included
Potentially sensitive	Ground floor commercial/non-habitable development/Offices/Retail	Included
Activities less sensitive to natural hazards	Parking and loading areas	Included

2.3.2 Creating natural hazard risks that previously were not present at the location

There are no new natural hazards at the location as a result of the proposed activities.

The commercial activity does not present a new risk (i.e. it's an existing activity) although the basement parking is a new activity that is not presently at the location. Mitigation of risks is discussed in Section 2.4

2.3.3 Potential to accelerate or exacerbate the natural hazard and/or its potential impacts

Earthworks associated with the development have the potential to displace floodwaters, however we do not consider that the floodwater displacement will accelerate or exacerbate the natural hazard or its potential impacts for the following reasons:

- Displacement of floodwaters (<60 m^3 under worst case scenario) will not increase flood levels associated with the floodplain or flood prone area because flood levels are controlled by the "spillway" level outlined in Section 2.2. The downstream floodplain is also similarly controlled by a topographic depression and "spillway" at the intersection of Victoria Road and Queens Parade and therefore any increased in flows will convey downstream. Refer Appendix A for flood prone area information.
- Under a full blockage scenarios (which is highly unlikely), there is potential to increase the frequency of overtopping due to small reduction in the flood prone area. However the change in the volume of the flood prone area is less than 60 m^3 which equates to less than 2% of the 3,250 m^3 total flood prone area volume[2]. Given that the flood prone area requires only 35 mm rainfall to fill the area, the change in flood prone area volume is akin to the change in frequency of rainfall event from 35 mm to 34 mm (i.e. negligible). We consider the likelihood of 35 mm and 34 mm rainfall to effectively be the same and therefore changes in flood spill frequency are negligible.
- There are no increases in the impervious site coverage as a result of the proposed development and therefore there will be no increased flood flows. However even if there were increased flood flows downstream there is a downstream topographic depression where

[2] It will be less than 60m^3 because the 60m^3 has been calculated at the 1% AEP level 3.8 climate change scenario level (3.1m RL), and not at the spillway level which is lower (2.93m RL).

floodwaters pond and the flood characteristics are controlled by the road elevation at the intersection of Victoria Road and Queens Parade (i.e. another "spillway"). Any increased flood flows would cause increased overflow over the road and into Windsor Reserve and to the coast.

Overall we do not consider that the development will accelerate or exacerbate the flood hazard or its potential impacts.

2.3.4 Creating or increasing the natural hazard risk(s) to people and communities, including long-term impacts from more frequent hazard events

Frequent flood hazard events do not impact the site or increase the flood risk to people and communities (refer Appendix A for further information).

We anticipate that there will be no increases to natural hazard risk to people and communities in extreme rainfall events because mitigation measures appear relatively simple to adopt in the mitigation measures (i.e. raise the basement entrance and floor level above the flood level).

2.3.5 Creating or increasing the natural hazard risk(s) to other properties, infrastructure and the environment

The flood hazard assessments (coastal and flooding) has not identified activities that will create or increase the natural hazard risk(s) to other properties, infrastructure and the environment (refer also Section 2.3.3).

2.3.6 Cultural impacts, including consequences for Māori land, Treaty Settlement, Land, marae, urupā, mana whenua cultural heritage and values

This has not been assessed as part of this risk assessment.

2.4 Existing and proposed mitigation measures

The primary methods for reducing risk at the site is to protect the activities from inundation by building the minimum ground floor level above the future 1% AEP inundation level, allowing for a suitable freeboard between these levels.

2.4.1 Freeboard guidance

Table 2.3 summarises freeboard guidelines in relation to the sensitivity of the activities. These have been interpreted from the Auckland Region Guidelines document GD13 (December 2024) in relation to vulnerable activities, and the reader is directed towards the document for further guidance and information[3].

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

Freeboard is a factor of safety that provides for the uncertainties in the estimation of flood/inundation water levels and an allowance for processes not included in the estimate (e.g. wake from cars driving through floodwater).

[3] https://www.aucklanddesignmanual.co.nz/content/dam/adm/adm-website/developing-infrastructure/infrastructure-technical-guides/gd13-freeboard/FINAL_Freeboard_GD13v1_December_2024.pdf

Table 2.3: Freeboard guidelines for 1%AEP scenario

Scenario	Freeboard	Relevance
Sensitive activities	500 mm	N/a – vulnerable activities (habitable floor levels/dwellings) are located above Level 0.
Potentially sensitive activities	300 mm	Commercial areas
Less sensitive activities	150 mm	Parking and loading areas (noting that flooding of basements has a higher risk profile and higher freeboards may therefore be appropriate).

2.4.2 Floor level

Minimum floor levels for the building design, based on flood inundation levels plus freeboard based on regional guidance (Auckland Council, 2024b) is shown in Table 2.4: .

These floor levels are based on the 1% AEP p50 coastal inundation levels forecast to year 2130. They do not take into account a risk-based approach, solely applying a freeboard level above a hazard elevation rather than considering both likelihood and consequence. A comparison with the stress test (p83 scenario) inundation levels is included in the "additional" column.

Table 2.4: Minimum Floor level

Variable	Level (m NZVD-16)	Additional
Sensitive activity	3.6	Freeboard of 0.5 m above 1% AEP flood level with allowance for 3.8 degrees climate change. This would apply to critical infrastructure and electrical. If critical infrastructure and critical electrical components are located in the basement, the accessway to the basement should also be located at or above this level. Currently residential dwellings are proposed on the 1st floor which will be considerably higher than this level
Potentially sensitive activity	3.4-3.6	A range is given here because the sensitivity of the commercial use has not been fully determined at this stage. 3.4 m RL applies 300 mm of freeboard above the 1% AEP flood level with allowance for 3.8 degrees climate change. 3.6 m RL applies 500 m freeboard
Activities less sensitive to natural hazards	3.25	This minimum level has applied 0.15 m above the 1% AEP flood level with allowance for 3.8 degrees climate change. Despite this being consistent with the policy and guidelines, we recommend increasing the freeboard allowance for entrances to basement car parks to 3.6 m RL to further reduce the likelihood of people putting themselves at harms way (note the previous comment about critical infrastructure and electrical equipment located in the basement being treated as a sensitive activity).

2.4.3 Safe egress or refuge

PC120 E36 (4C) requires ensuring appropriate safe refuge and safe egress are provided where possible and maintained where currently available, with E36,5L and 30E suggesting either safe egress and/or refuge is possible for new subdivision, use and development where potential flood hazard risk is tolerable.

The proposal allows for safe access, egress and refuge. Figure 2.5 shows the proposed pedestrian movement which highlights a clear pathway through to Victoria Road and away from the low hazard floodplain that exists along Wynyard Street. We also consider that safe access and egress can be maintained along Wynyard Street given the low flood hazard and low flood depths.

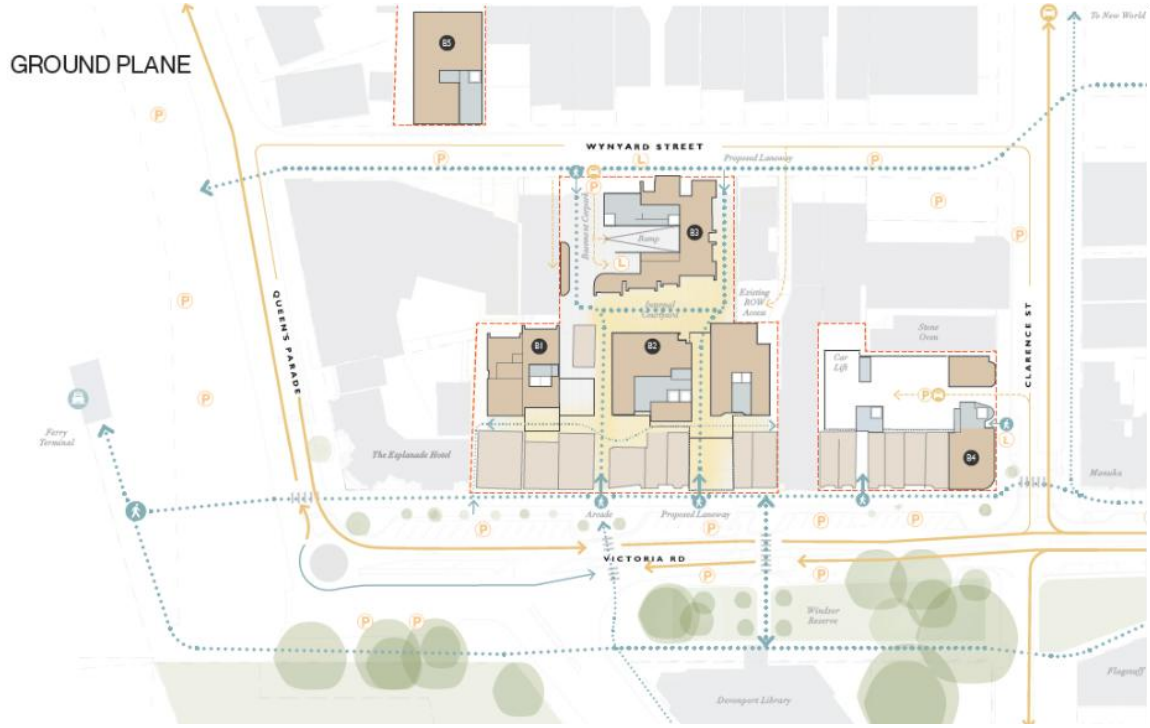

Figure 2.5: Proposed pedestrian movement patterns. Reproduced from Referral Planning Report. (Tattico, April 2026)

Safe refuge in the building is also provided because building floors are proposed above the flood hazard ensuring that floodwater will not enter the building with sufficient provision of freeboard. Specifically:

- All residential development is at least on level 1 or higher, well above all possible flood levels.
- The main ground floor levels to be above 3.4 m RL of 3.7 mRL
- Vehicular access to the basement car park above 3.25 m RL
- The ground floor is constructed from durable materials

2.4.4 Residual risk

This section considers the potential effects of lower frequency events (i.e. less than 1%AEP).

For the reasons outlined earlier in the report, we consider that the flood levels are relatively insensitive to further increases in rainfall depth, due to more flows passing over the “spillway”. Therefore, residual risk for over design events is adequately addressed with the selected freeboard allowance.

2.5 Any relevant management plan, strategy or hazard risk assessment relating to the area.

There are no relevant management plans, strategy or hazard risk assessment relevant to the flood area identified on the site.

3 Conclusion

This report presents the findings of the rainfall-induced flooding risk assessment, including whether flood mitigation is required for the site. The information is being used to support a fast-track referral application with reference to the operative Auckland Unitary Plan (AUP) and proposed Plan Change 120 provisions.

A review of floodplain, flood hazard and flood prone areas hazard overlays identified that the proposed Building 3 may be exposed to future flooding. The four other buildings are not exposed to flooding and were therefore not included in this assessment.

In summary:

- A low energy, low hazard, shallow floodplain (<0.35 m) has the potential to extends across up to 500 m^2 of the western end of the site in the future 1% AEP events with allowance for 3.8^o C climate change. The site is not predicted to flood in events up to 1% AEP in the existing climate.
- The consequences of the flood hazard in relation to the proposed activity are low because:
  - Minimum floor levels and basement entrances will be built above the inundation levels with allowance for suitable freeboard.
  - There have not been any adverse impacts identified as a result of the proposed activities on the development or to other properties, infrastructure and the environment
  - Occupiers of the building will have the opportunity for safe refuge in the building or safe egress to Victoria Road and away from the low hazard floodplain that exists along Wynyard Street. We also consider that safe access and egress can be maintained along Wynyard Street given the low flood hazard and low flood depths.

The minimum floor levels recommended in this report apply to rainfall-induced flood hazard with some allowance for future sea level rise. Coastal inundation floor level requirements are addressed separately in the Coastal Inundation Report (T+T, May 2026).

Based on the flood hazard and flood risk assessment there have been no significant flood issues identified and flooding consequences can be mitigated by the design by ensuring that the proposed buildings and basement car park access are raised above the 1% AEP flood level with allowance for climate change and further freeboard.

4 Applicability

This report has been prepared for the exclusive use of our client Devonport Property Management Ltd, 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.

Tonkin & Taylor Ltd

Report prepared by:

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Jon Rix
Principal Water Consultant

Authorised for Tonkin & Taylor Ltd by:

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Mark Thomas
Project Director

20-May-26
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Appendix A Flood hazard information

Auckland Council provided model results from their detailed ICM catchment model to support the flood assessment for Building 3 for Devonport Mixed Use Development. The detailed ICM catchment model was used instead of the Regionwide TUFLOW model results because it has been through the quality assurance process for use in this catchment and provides all the information needed to support the hazard assessment. The information needed to support the hazard assessment includes flood characteristics relating to the flood depth, flood level and flood frequency for existing and future climate scenarios. For comparative purposes the 1% AEP floodplains with 3.8 degrees of warming associated with climate change are provided in Figure Appendix A.1. The comparison shows close similarities between the floodplains predicted by the two models.

Flood levels and supporting information for the floodplain are derived from two sources of information, which are summarised in Table Appendix A.1.

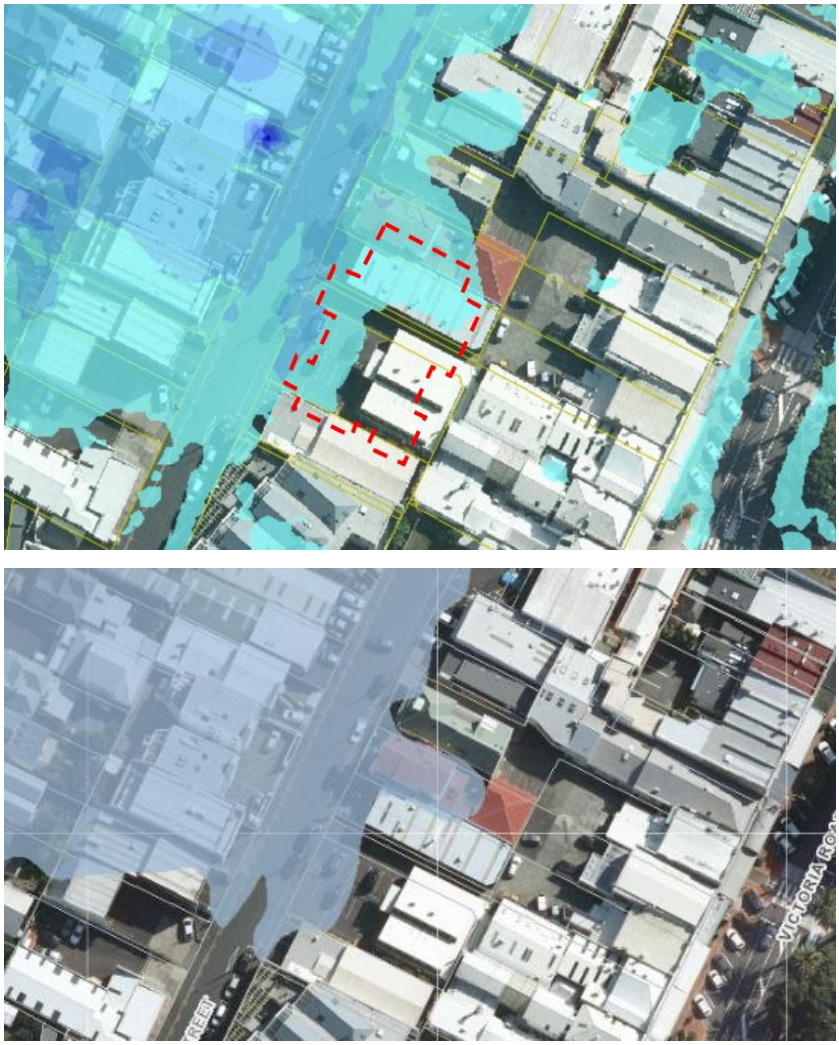


Figure Appendix A.1: Comparison of 1% AEP floodplains with 3.8 degrees of warming for the detailed ICM catchment model (top image) and the Regionwide TUFLOW model (lower image).

Note: the building boundary shown on the upper image was included in the information provided by Auckland Council and can not be adjusted.

Figure Appendix A.2 and Figure Appendix A.3 show the flood depths and flood levels respectively for 16 locations across the proposed Building 3 location. The flood depth and flood level information is provided for the following scenarios (bracketed name is the ID shown on the graph):

- 50% AEP Present Day rainfall (2-year PD)
- 50% AEP with allowance for rainfall increases associated with 2.1 degrees of warming associated with climate change (2-year – 2.1 CC)
- 50% AEP with allowance for rainfall increases associated with 3.8 degrees of warming associated with climate change (2-year – 3.8 CC)
- 20% AEP Present Day rainfall (5-year PD)
- 20% AEP with allowance for rainfall increases associated with 2.1 degrees of warming associated with climate change (5-year – 2.1 CC)
- 20% AEP with allowance for rainfall increases associated with 3.8 degrees of warming associated with climate change (5-year – 3.8 CC)
- 10% AEP Present Day rainfall (10-year PD)
- 10% AEP with allowance for rainfall increases associated with 2.1 degrees of warming associated with climate change (10_year – 2.1 CC)
- 10% AEP with allowance for rainfall increases associated with 3.8 degrees of warming associated with climate change (10-year – 3.8 CC)
- 5% AEP Present Day rainfall (20-year PD)
- 5% AEP with allowance for rainfall increases associated with 2.1 degrees of warming associated with climate change (20-year – 2.1 CC)
- 5% AEP with allowance for rainfall increases associated with 3.8 degrees of warming associated with climate change (20-year – 3.8 CC)
- 2% AEP Present Day rainfall (50-year PD)
- 2% AEP with allowance for rainfall increases associated with 2.1 degrees of warming associated with climate change (50-year – 2.1 CC)
- 2% AEP with allowance for rainfall increases associated with 3.8 degrees of warming associated with climate change (50-year – 3.8 CC)
- 1% AEP Present Day rainfall (100-year PD)
- 1% AEP with allowance for rainfall increases associated with 2.1 degrees of warming associated with climate change (100-year – 2.1 CC)
- 1% AEP with allowance for rainfall increases associated with 3.8 degrees of warming associated with climate change (100-year – 3.8 CC)

The results of the analysis show the following:

- There is currently no flooding predicted at the site for storm events up to 1% AEP (most extreme scenario modelled)
- Under 2.1^{o} C climate change scenarios, isolated shallow flooding (<0.1 m) is predicted to occur in a 10% AEP scenario. During the 20-year Ari scenario, the flood extents increase, although the maximum depth is 0.15 m. The maximum depth predicted under the 2.1^{o} C is 0.3 m in the 1% AEP design storm event. The maximum flood level predicted for the 1% AEP scenario with 2.1^{o} C climate change allowance is 3.05 m RL (NZVD-2016).
- Under the 3.8^{o} C climate change scenario, shallow flooding (<0.15 m) is predicted to occur in a 10% AEP scenario. The maximum depth predicted under the 3.8^{o} C climate change scenario is 0.3 m in the 1% AEP design storm event. The maximum flood level predicted for the 1% AEP scenario with 3.8^{o} C climate change allowance is 3.11 m RL (NZVD-2016).

The floodplain in the proximity of our area of interest aligns closely with the flood prone area (refer Figure Appendix A.4) which is identified as having a spillway level of 2.93 m (NZVD-2016). The 2.93 m RL level is shown on Figure Appendix A.3 for comparative purposes with the model-predicted water levels. These results suggest that the maximum flood level on the site is controlled by the spillway level along Wynyard Street and the driving head required to pass flood flows over the spillway. Based on the spillway of 2.93 m and the predicted flood levels of 3.05-3.11 m, the driving head appears to be approximately 100 mm. This indicates that further increases in rainfall will not substantially increase the water level on the site.

Downstream of the "spillway" are two additional flood prone areas with spillway heights of 2.51 m RL and 2.09 m RL respectively. Surface water flows associated with the floodplain pass from one flood prone area to the next before discharging to the coast. The characteristics of the downstream flood prone areas are provided in

To support an assessment of effects for filling in the floodplain, an assessment of floodplain volume on the site was carried out for flood depths greater than 0.05m. This is to help indicate the potential volume of floodwater displacement. The floodplain volume was calculated from the 2D model results provided by Auckland Council[5]. Table Appendix A.1 summarises the results of the assessment.

Table Appendix A.1: Floodplain storage volume on the site

Scenario	Volume of flooding > 0.05 m (m3)
100 year - 3.8 CC	56.6
50 year - 3.8 CC	43.41
20 year - 3.8 CC	13.79
10 year - 3.8 CC	2.29
5 year - 3.8 CC	0
2 year - 3.8 CC	0
100 year - 2.1 CC	30.56
50 year - 2.1 CC	16.34
20 year - 2.1 CC	2.2
10 year - 2.1 CC	<1 m
5 year - 2.1 CC	0
2 year - 2.1 CC	0
100 year - PD	0
50 year - PD	0
20 year - PD	0
10 year - PD	0
5 year - PD	0
2 year - PD	0

For comparative purposes, an assessment of the 1% AEP 3.8 CC floodplain volume was also carried out for the floodplain that encroaches on Devonport Mixed Use Development. The floodplain is shown in Figure Appendix A.5 and the estimated flood volume for the floodplain is ~13,200 m^3. The

[5] Auckland Council had converted model results to WaterRIDE and shared the WaterRIDE results.

flood prone area (ID 28298149) storage is approximately ~3,250 m^3 based on information provided on AC Geomaps (refer Figure Appendix A.4).

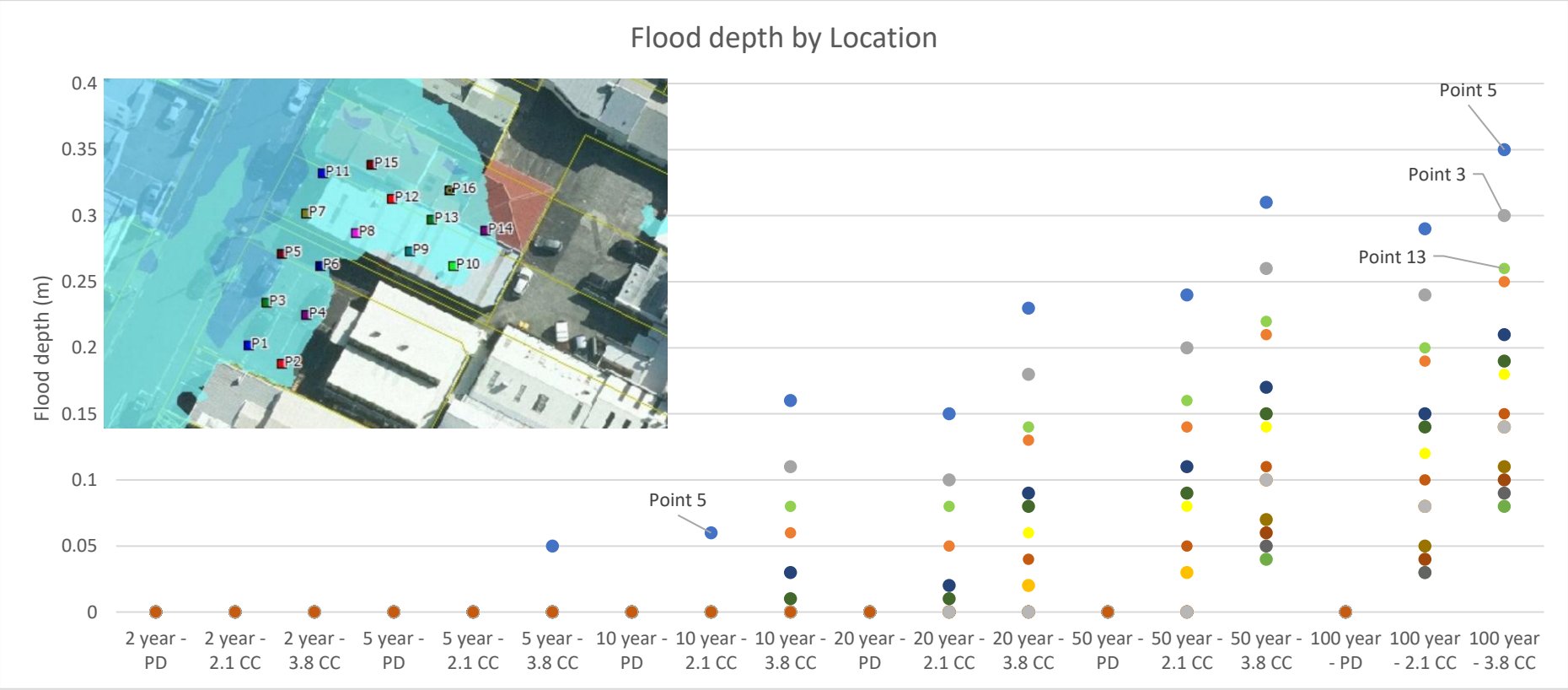


Figure Appendix A.2: Flood depths (AC Devonport Flood model)

Note that the colours do not align with the colours on the figure.

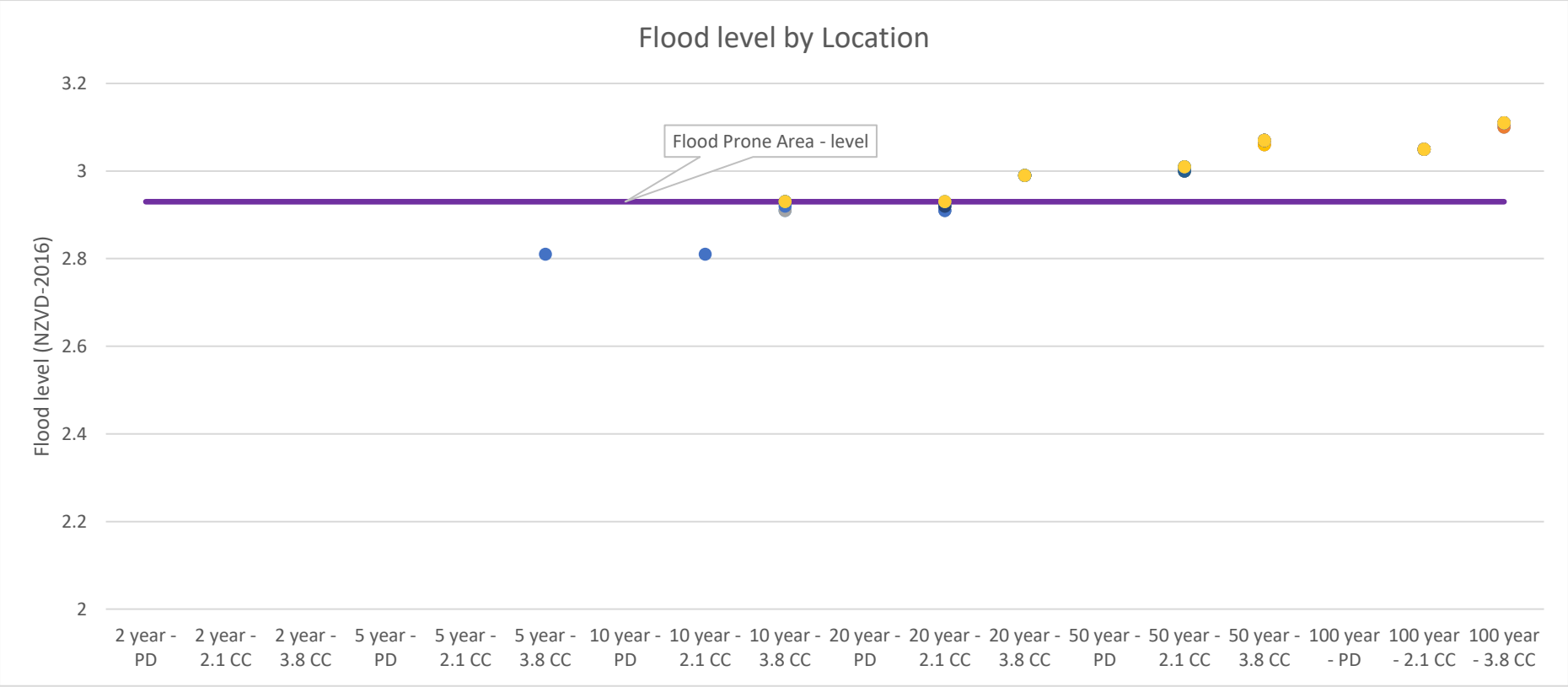


Figure Appendix A.3: Flood level (NZVD2016) (AC Devonport Flood model)

Note that there are many points stacked on top of each other highlighting that the flood levels do not vary across the site.

Flood Prone Areas

Attribute	Value
Flood prone area ID	28298149
Can fill in a 100yr ARI rainfall event	Yes
Catchment Area (m2)	173277
Minimum elevation (m RL)	2
Minimum elevation (m RL NZVD2016)	1.68
Spill elevation (m RL)	3.25
Spill elevation (m RL NZVD2016)	2.93
Spill ponding depth (m)	1.25
Volume to spill elevation (m3)	3252
Rainfall required to fill flood prone area (mm)	35
Rainfall depth 100yr ARI future scenario (mm)	229
Flood prone elevation in 100yr ARI event (m RL)	Spills – specific calculation is required
Flood prone elevation in 100yr ARI event (m RL NZVD_2016)	Spills – specific calculation is required
Flood prone depth in 100yr ARI event (m)	Spills – specific calculation is required
Flood prone volume stored in 100yr ARI event (m3)	Spills – specific calculation is required
NZVD2016 Confidence	NZVD2016 Calculated
Auckland 1946 Confidence	Null

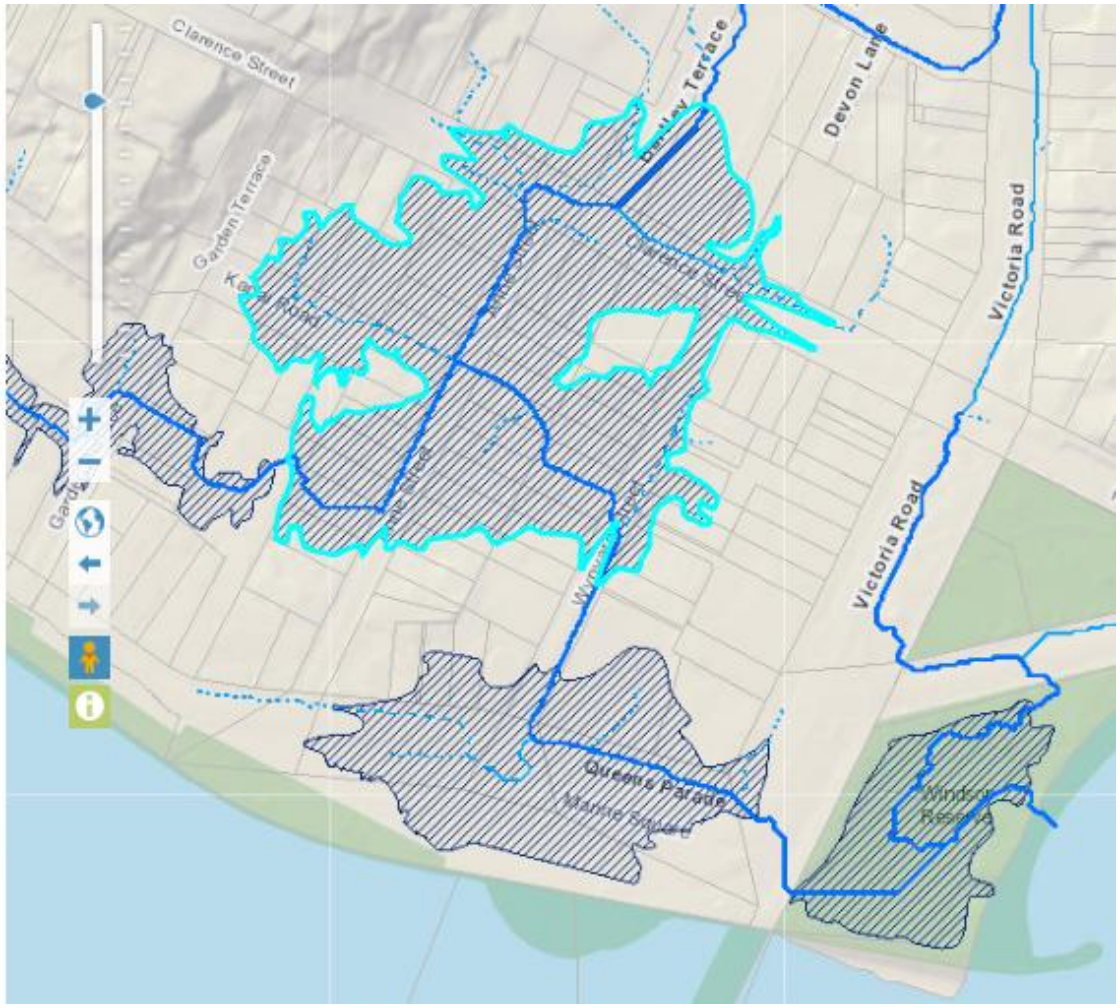


Figure Appendix A.4: Flood prone area information (adjacent to site).

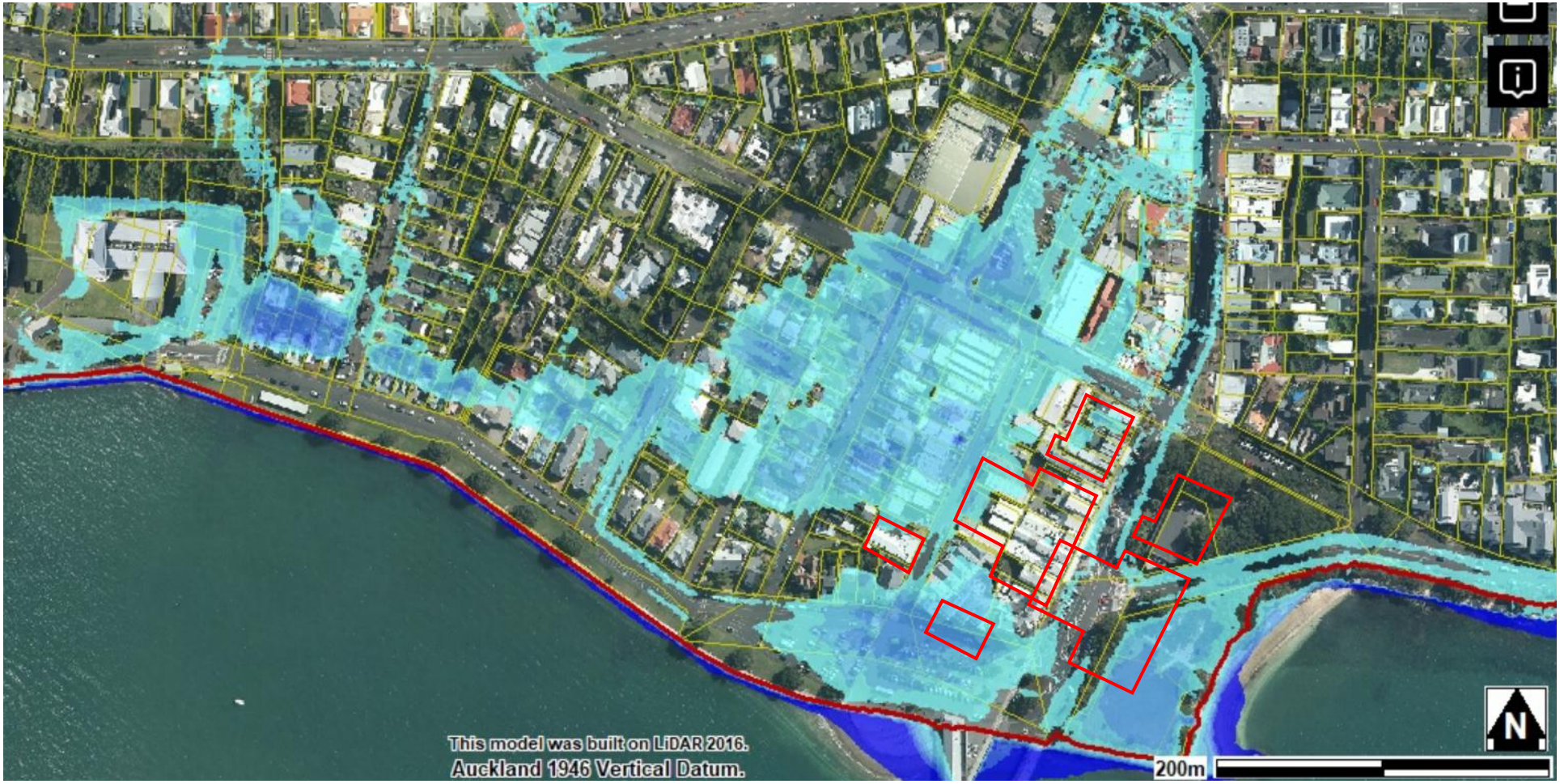
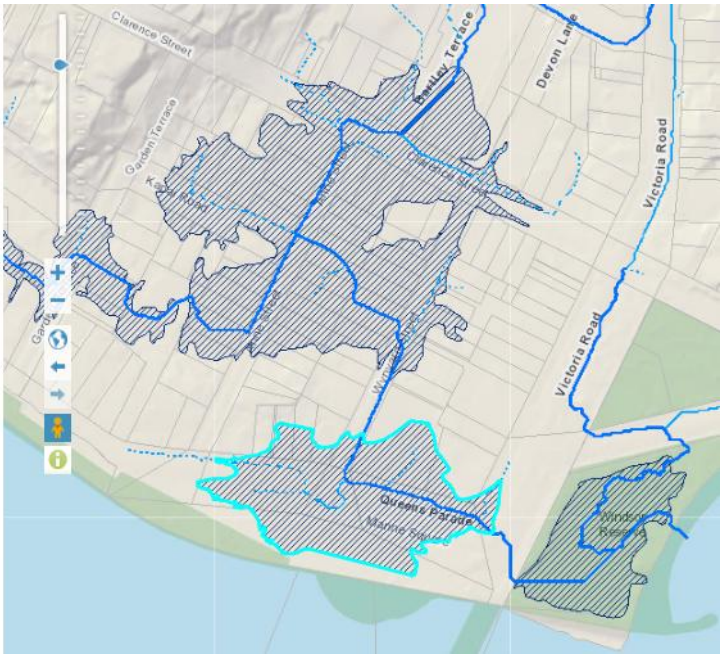


Figure Appendix A.5: 1% AEP floodplain (3.8 degrees climate change, ICM model WaterRide results).

Flood Prone Areas

Attribute	Value
Flood prone area ID	28331241
Can fill in a 100yr ARI rainfall event	Yes
Catchment Area (m2)	197913
Minimum elevation (m RL)	2.15
Minimum elevation (m RL NZVD2016)	1.83
Spill elevation (m RL)	2.83
Spill elevation (m RL NZVD2016)	2.51
Spill ponding depth (m)	0.68
Volume to spill elevation (m3)	2045
Rainfall required to fill flood prone area (mm)	23
Rainfall depth 100yr ARI future scenario (mm)	228
Flood prone elevation in 100yr ARI event (m RL)	Spills – specific calculation is required
Flood prone elevation in 100yr ARI event (m RL NZVD_2016)	Spills – specific calculation is required
Flood prone depth in 100yr ARI event (m)	Spills – specific calculation is required
Flood prone volume stored in 100yr ARI event (m3)	Spills – specific calculation is required
NZVD2016 Confidence	NZVD2016 Calculated
Auckland 1946 Confidence	Null



Flood Prone Areas

Attribute	Value
Flood prone area ID	28338124
Can fill in a 100yr ARI rainfall event	Yes
Catchment Area (m2)	265988
Minimum elevation (m RL)	1.52
Minimum elevation (m RL NZVD2016)	1.2
Spill elevation (m RL)	2.41
Spill elevation (m RL NZVD2016)	2.09
Spill ponding depth (m)	0.89
Volume to spill elevation (m3)	1204
Rainfall required to fill flood prone area (mm)	17
Rainfall depth 100yr ARI future scenario (mm)	228
Flood prone elevation in 100yr ARI event (m RL)	Spills – specific calculation is required
Flood prone elevation in 100yr ARI event (m RL NZVD_2016)	Spills – specific calculation is required
Flood prone depth in 100yr ARI event (m)	Spills – specific calculation is required
Flood prone volume stored in 100yr ARI event (m3)	Spills – specific calculation is required
NZVD2016 Confidence	NZVD2016 Calculated
Auckland 1946 Confidence	Null

Figure Appendix A.6: Flood prone area information (downstream of site)