CONSULTING ENGINEERS

Waitākere District Court – New Courthouse Project

Flood Assessment

Ministry of Justice

14 Edmonton Road

Henderson

250061

8 August 2025

Ministry of Justice

Waitākere District Court – New Courthouse Project

Flood Assessment

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Henderson

Document Status

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1. Introduction

This report has been prepared to support a Substantive Application made by Ministry of Justice (on behalf of the Requiring Authority - Minister of Justice) under the Fast Track Approval Acts 2024 in accordance with the requirements of Section 42. The proposal is a Referred Project and this report has been prepared to support a Notice of Requirement Application to designate the site at 14 Edmonton Road, Henderson for 'Judicial and Court purposes' known as the Waitakere District Courthouse - New Courthouse project.

Under s42(4)(d), this substantive application is giving notice of a requirement to designate the site that would otherwise be applied for under the Resource Management Act 1991. Section 43 of the Fast Track Approval Act sets out the information to be included in a substantive application, which includes an assessment of adverse effects of the project on the environment. This report has been prepared to assess the flood hazard risk on the site, and the effects of the Waitakere District Courthouse Project.

1.1 Site Description

The subject site (Lot 1 DP 564257), located to the north of the Alderman Drive and Edmonton Road intersection, has an area of 4,435 m². The site is currently used as a parking area and recreational space, and generally slopes towards the northwestern boundary at an average gradient of approximately 1.5%. The site has a gulley (low point) running through the centre of the site in a north westerly direction. The site is zoned as the following under the Auckland Unitary Plan (AUP) (Operative in Part):

- Open Space - Informal Recreation Zone
- Business - Metropolitan Centre Zone

A GIS Layout plan has been included in Appendix A.

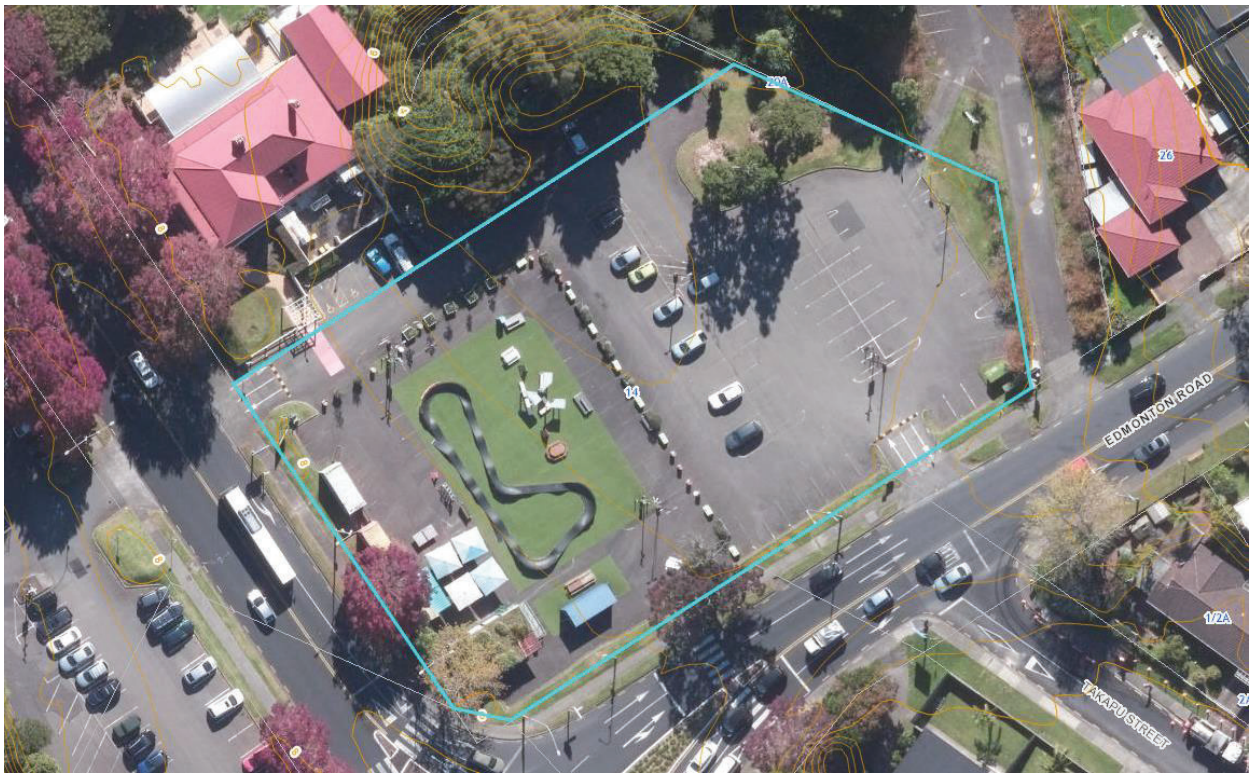


Figure 1 Existing Site Layout

2. Existing GIS Information

The outdated 100-year floodplain shown on Council's GIS, and as seen in Figure 2 below, is based on a flood report completed by Jacobs in 2014 (revised in 2016). The flood report calculated that the 100-year flood peak flow would be 295 m ³/s with water surface levels (WSL) along the Alderman Drive carpark ranging between 6.82 m RL and 7.72 m RL (NZVD2016). The 100-year flood event, as shown on GIS, would therefore not reach levels to overtop the Edmonton Road and Alderman Drive carriageways. A GIS flood layout plan, relevant pages from the Jacobs Report, and flood maps have been included in Appendix B.

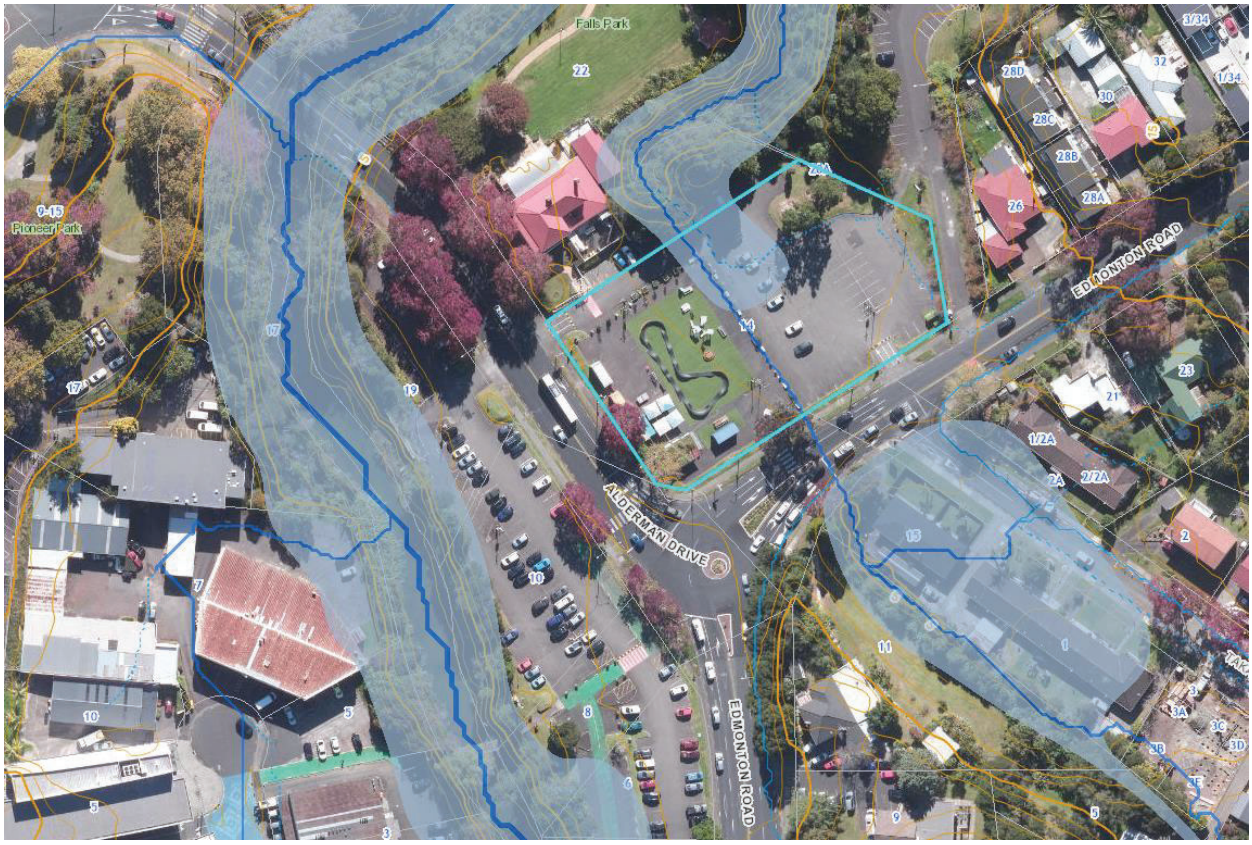


Figure 2 Outdated GIS Floodplain

3. Healthy Waters Updated Floodplain

3.1 Healthy Waters Requirements

Healthy Waters (HW) have provided the MoJ and ACH Consulting with the latest flood modelling information (attached in Appendix C) as a 2D HEC-RAS model needs to be prepared to determine the impact of the proposed development on the floodplain. The following information and requirements were provided by HW to ACH to create a base flood model of the subject area:

- The model, created by ACH Consulting, is to include the main Oratia Stream from the Great North Road bridge up to the downstream pedestrian bridge located to the east of 20 Alderman Drive.
- The model must include the overland flow path (OLFP) running through 14 Edmonton Road.
- The peak inflow into the Oratia Stream, at the Great North Road bridge, is 401.2 m³/s (including 3.8-degree climate change).
- The peak inflow for the Edmonton Road OLFP is as per Council's GIS at 10.86 m³/s (including 3.8-degree climate change).

- The water surface level, at the downstream 20 Alderman Drive pedestrian bridge, is 7.51 m RL (NZVD2016).
- The existing 1,500 mm culvert, running through 14 Edmonton Road, is 100% blocked.

Email correspondence and information provided by HW have been attached in Appendix C.

3.2 ACH Base Model of Existing Flood

ACH Consulting Ltd prepared a HEC-RAS 2D base model of the existing flood conditions based on the information in section 3.1 above, which includes 3.8-degree climate change peak flows. The model was calibrated to closely represent the water surface levels on HW's model, with water surface elevations on the ACH model being within 0.00 m to 0.13 m of what is shown on the HW model. It is noted that the information provided by HW was based on the Lands and Survey Datum of Auckland 1946, while the model prepared by ACH Consulting Ltd was completed in NZVD2016 (-280 mm Height Difference from AUK1946 to NZVD2016). Additionally, the terrain within the model was created using the LINZ 1 m DTM file of the subject area. A layout plan, which has the corrected HW levels (NZVD2016) and the ACH levels, has been attached in Appendix D.

4. Post Development Flood Model

4.1 Future Justice Facility

The Notice of Requirement application will designate the site for the construction and operation of a Justice Facility at 14 Edmonton Road, Henderson. Whilst the exact design of the Waitākere District Courthouse is not known at this stage, a future building would be built on suspended slabs, supported by piles which would be located within the 1% AEP floodplain extent. The indicative design for a future Justice Facility, provided in the bulk and location study plans prepared by Architectus, shows most of the building slab will be located above the water surface level of the existing floodplain. However, the indicative sloped vehicle access along the south-east corner of the building, which connects to level 2, and indicative vehicle crossing locations on Edmonton Road, are located within the 1% AEP floodplain.

A summary of the slabs finished floor levels (FFL), thicknesses, and bottom of slab levels, based on the indicative design, have been summarised in Table 1 below.

Table 1 Finished Floor Level Summary for Indicative Building Design

[redacted]

The following items have been modelled within the HEC-RAS 2D model as impediments to the floodplain:

- The sloped slab is partially located within the floodplain and would therefore block flows along the eastern end of the building. The cross-sectional area of the impediment has been modelled along with the overall volume reduction within the floodplain.

- All piles for the suspended slabs have been modelled as they are located within the flood plain and would therefore impede flows.
- The indicative vehicle crossing "bridge" slabs have been modelled from the existing ground level at the site boundaries up to the FFL (7.75 m RL) for the sloped building slab.

Layout plans of the indicative building slabs and piles for the future Justice Facility have been included in Appendix E.

4.2 Freeboard Requirements

The Auckland Council Stormwater Code of Practice (based on the NZ Building Code E1/VM2) defines the freeboard requirements for buildings in Auckland. The Code of Practice notes the following in Table 2 below.

Table 2 Freeboard Requirements for the 1% AEP event Flood Plain and 1% AEP Coastal Storm Inundation Including 1 m Sea-Level Rise

Scenario	Freeboard
More Vulnerable Activities* in Floodplains	500 mm
Less Vulnerable Activities* in Floodplains	300 mm
Overland Flow Paths, where Flow is Less than 2 m^3/s	• 500 mm where surface water has a depth of 100 mm or more and extends from the building directly to a road or car park, other than a car park for a single dwelling. • 150 mm for all other cases.
Overland Flow Paths, where Flow is Equal to or in Excess of 2 m^3/s	• 500 mm for More Vulnerable Activities.* • 300 mm for Less Vulnerable Activities.*
Coastal Storm Inundation Areas (1% AEP Including 1 m Sea-Level Rise)	• 500 mm for dwellings and habitable rooms which are subject to wave action from the sea. • 150 mm for all other cases.

*As defined in the AUP

In this case, the Auckland Unitary Plan requires a minimum freeboard of 300 mm for the building ground floor level, as the activity is classified as a less vulnerable community activity. Based on the information provided above, it is confirmed that a future Justice Facility can comply with the minimum freeboard requirements above the 1% AEP peak flood level.

Where the vehicle crossings on Edmonton Road and access ramp shown on the indicative bulk and location plans are unable to achieve this freeboard, effects must be managed through the implementation of a robust flood response management plan to ensure that any vehicles are removed from the building prior to any flooding, and the area is cordoned off so that vehicles do not attempt to enter the flood water in this location.

4.3 Proposed Flood Impact Mitigation

The following design items, provided by Holmes, have been included into the HEC-RAS model to mitigate the impact of the future building on the existing floodplain:

- The existing ground level, along the existing gulley running through the site, has been lowered by 150 mm and replaced with a 5 m wide trapezoidal channel.
- The ground level underneath the proposed vehicle crossings have been shaped at a uniform longitudinal slope to form a 5 m wide rectangular channel. This allows for more surface runoff to pass under the vehicle crossing bridges while also providing additional storage capacity.
- The building footprint has decreased along the eastern corner to provide additional flood storage.

Overall flood maps and sections have been included in Appendix F.

4.4 Post Development Effects on Neighbouring Properties

Overall, the modelling confirms that a future building on the site will have a negligible impact on adjacent sites and there will be no impact to the downstream environment resulting from future redevelopment of the site. Individual properties have been addressed below.

4.4.1 22-24 Edmonton Road

[redacted] Figure 3 below indicates that the extent increase between pre-development (blue) and post development (green).

[redacted]

[redacted] Further, it is noted that most of the existing driveway experiences flooding of depths up to 330 mm and therefore the future redevelopment of the 14 Edmonton Road site does not introduce new flood risk given the driveway is inundated during the 1% AEP flood event (as per the pre-development modelling). Overall, the increase in flood depth of the predicted flooding post-development is less than minor, and potential effects of a future building on the site will be appropriately managed (through carefully considered building design and mitigation measures described above) to ensure no adverse flood risk to people and property resulting from the redevelopment of the site.

4.4.2 26 Edmonton Road

The post development flooding confirms no increase or exacerbated flood risk to this site during a 1% AEP event. As such, the future redevelopment of the site will not result in any adverse flooding effects on persons and property at 26 Edmonton Road.

4.4.3 Edmonton Road Road Reserve

The post development modelling confirms that future redevelopment of the site will increase the water surface level by approximately 40 mm. This increase is negligible as the Edmonton Road carriageway currently experiences flood depths of approximately 450 mm (at the intersection of Edmonton Road and Takapu Street) during the 1% AEP flood event. Therefore, the future development of the site will not give rise to any adverse flooding effects.

4.4.4 1/2A and 2/2A Takapu Street

[redacted] During a pre-development 1% AEP event, these properties are impacted by flooding, and therefore, the future redevelopment of the site does not introduce new flood risk to this site. It is noted that the increased flooding extent relates to the landscaping and boundary of the site, and that the existing building footprint for the dwelling (and associated habitable spaces) is inundated during the pre-development flood modelling scenario. Therefore, based on the site-specific flood modelling exercise undertaken, it is considered that the future redevelopment of the site will not exacerbate flood hazard risk and will not result in any adverse flood effects to persons and property.

4.4.5 15A & 15B Edmonton Road

[redacted] The minor increase in flood depth will have a negligible impact on the flood risk to these properties and therefore, the future redevelopment of the site will not exacerbate or worsen flood risk to this property.

4.4.6 11 Edmonton Road

The existing property is partially flooded during a pre-development 1% AEP storm event, along the existing channel to the northeast, with the existing buildings located outside of the floodplain. Based on the modelling undertaken, it is evident that a future Justice Facility and redevelopment of the site will have no impact on the existing flooding conditions, and therefore, any potential adverse flood effects on persons and property will be avoided.

4.4.7 Alderman Drive Road Reserve

[redacted] This increase is negligible as the Alderman Drive carriageway already experiences flood depths between 50 mm to 500 mm during the 1% AEP flood event. Therefore, there will be no adverse flooding effects resulting from the redevelopment of the site.

4.4.8 8 and 10 Edmonton Road, and 19 Alderman Drive

The existing sites consist of surface parking and pedestrian footpaths only. The sites are practically 100% inundated with flood waters during a pre-development 1% AEP storm event, with depths ranging between 20 mm and 2 m closer to the Oratia Stream. The future Justice Facility will have no impact on the flooding in this area.

4.4.9 26 Alderman Drive (Alderman Café)

The existing site experiences some flooding during a pre-development 1% AEP storm event, with most of the existing building located outside of the floodplain. The future Justice Facility will have no impact on the flood levels throughout the site. Therefore, the redevelopment of the site will not exacerbate flood risk to persons and properties, and potential flooding effects will be appropriately mitigated.

Flood maps have been included in Appendix F.

5. Recommendations

The following items are recommended as part of this assessment:

- A minimum freeboard of 300 mm (8.32 m RL) must be provided to the water surface level.
- The flood mitigation design measures outlined in this report, including the centralised trapezoidal channel under the building and rectangular channel under the vehicle crossings must be implemented into the future building design of the Justice Facility on the site.
- A Flood Management Plan (FMP) must be prepared and implemented for the operation of the activity. The FMP will outline measures and protocols to manage safe access and egress to the site, including details of early waring systems to be implemented for the operation of the activity.

6. Conclusions

The following conclusions were made as part of this assessment:

- Council's GIS indicates that a 1% AEP floodplain is present on the subject site. The floodplain has been analysed with a HEC-RAS 2D model to determine the potential impact of the future Justice Facility on the existing floodplain.
- The finished floor level (FFL) is recommended to be at least 300 mm (8.32 m RL) above the 1% AEP flood level to achieve compliance with the Auckland Council Stormwater Code of Practice (V4). [redacted] Overall, a building that achieves a minimum 300 mm freeboard is appropriate to mitigate flooding effects.
- The future redevelopment of the site will have a negligible impact on neighbouring buildings, persons, property, and adjacent sites. Overall, any potential adverse effects will be appropriately mitigated as discussed in Section 4.4 above.
- The post development flood model confirms that a future building will not increase the flooding risk to the downstream environment.

7. Limitations

This report has been prepared for the Ministry of Justice in support of a Notice of Requirement application to designate the site at 14 Edmonton Road, to enable construction and operation of a Justice Facility on the site. The information provided in this report is for the Ministry of Justice, Waitakere Project Design Team, Ministry for Environment fast track review panel, environmental Protection Authority, and Associated Stakeholders. Although this application is not before the Environment Court, this report has been prepared in accordance with the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023. A Copy of the qualifications and experience of the authors is provided with this assessment.

All design information used to prepare the flood risk assessment, and to understand the impacts on the floodplain, have been based on Civil plans provided by Holmes and flooding information provided by Healthy Waters. The design information provided by Holmes will address all relevant clauses within the Auckland Unitary Plan relating to the subject development. This report is not to be used by other persons or for any other purpose without first contacting ACH Consulting Ltd.

Appendix A

Existing GIS Layout Plan

GIS Layout Plan

0 5 10 15
Meters

Scale @ A3
= 1:500

Date Printed:
3/06/2025

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Appendix B

Outdated Flood Information

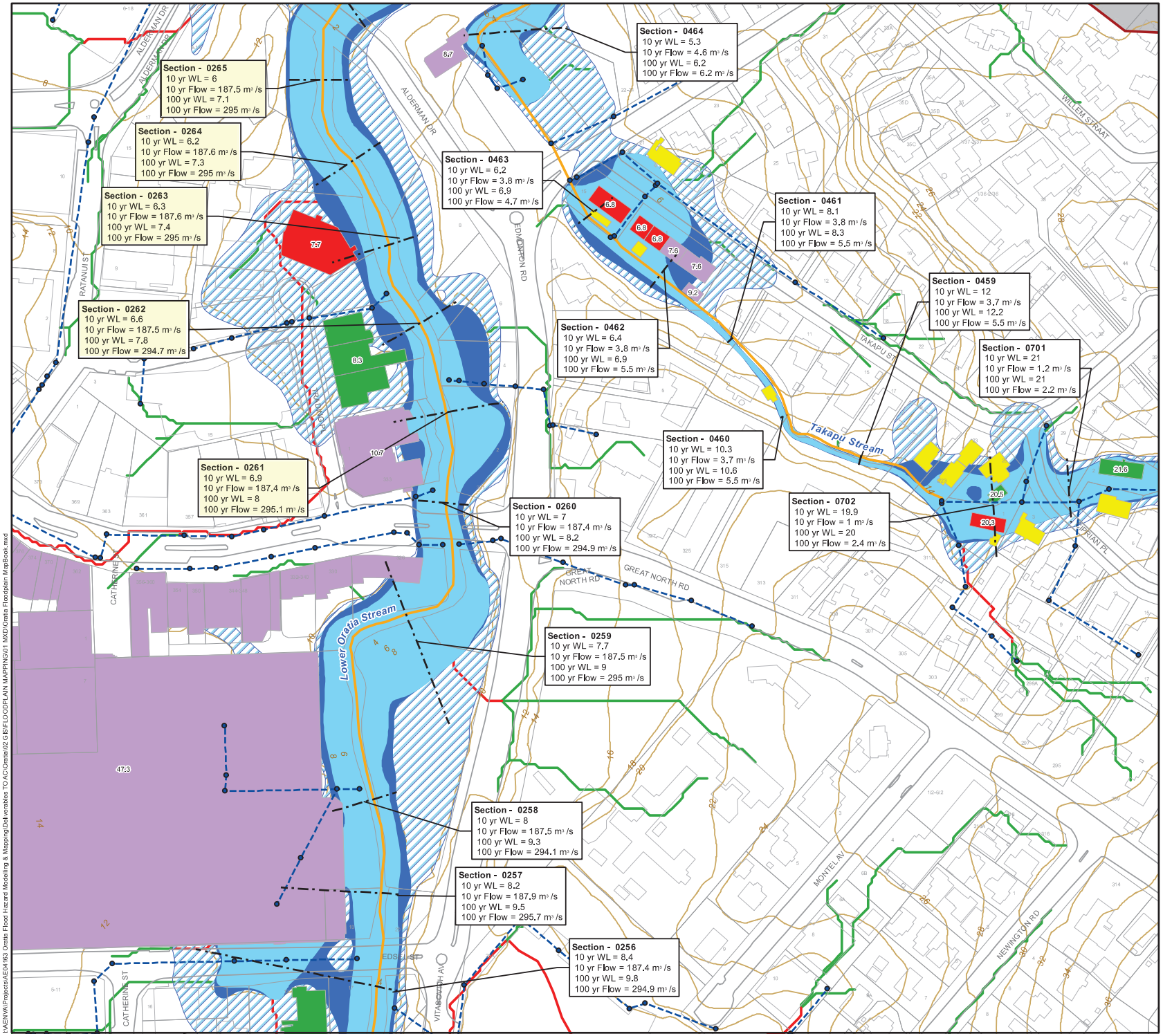
GIS Flood Layout Plan

0 25 50 75
Meters

Scale @ A3
= 1:2,500

Date Printed:
3/06/2025

Auckland Council
Te Kaunihera o Tāmaki Makaurau



I:\AEN\A\Projects\AE\64183 Oratia Flood Hazard Modelling & Mapping\Deliverables TO AC\Oratia\02 GIS\FLOODPLAIN MAPPING\01 MXD\Oratia Floodplain MapBook.mxd

Date 6/05/2016 Drawn: KH
Version 0 Checked: NC

0 10 20 40 60 80 100 Meters

SCALE (A3): 1:2,000

JACOBS SPATIAL

ORATIA
SYSTEM PERFORMANCE ASSESSMENT

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Figure H.1 Floodplain Map (MPD Scenario)

Section ID/Spot ID	River/Stream Name	Chainage	Peak Flood Flow (m^3/s) during Various ARI Storm Event - ED						Peak Flood Flow (m^3/s) during Various ARI Storm Event - MPD						Sheet No.	Comments
			2-Year	5-Year	10-Year	20-Year	50-Year	100-year	2-Year	5-Year	10-Year	20-Year	50-Year	100-year		
0254	Lower_Oratia_Stream	1250	84.9	125.3	154.6	177.7	216.4	237.6	97.9	150.2	186.8	216.8	262.6	293.9	100	
0255	Lower_Oratia_Stream	1300	84.9	125.3	154.7	177.7	216.4	237.5	97.9	150.2	186.7	216.9	262.5	293.8	103	
0256	Lower_Oratia_Stream	1350	85.0	125.6	155.2	178.3	217.0	238.4	98.0	150.7	187.4	217.6	263.5	294.9	103	
0257	Lower_Oratia_Stream	1400	85.3	125.9	155.4	178.7	217.6	239.1	98.2	151.1	187.9	218.3	264.3	295.7	103	
0258	Lower_Oratia_Stream	1450	85.2	125.7	155.1	178.3	217.1	238.1	98.2	150.7	187.5	217.5	263.0	294.1	103	
0259	Lower_Oratia_Stream	1600	85.3	125.7	155.2	178.4	217.4	238.4	98.2	150.8	187.5	217.7	263.5	295.0	103	
0260	Lower_Oratia_Stream	1650	85.4	125.8	155.0	178.2	217.6	238.5	98.2	150.7	187.4	217.9	263.5	294.9	103	
0261	Lower_Oratia_Stream	1700	85.3	125.8	155.2	178.4	218.0	238.3	98.2	150.8	187.4	217.6	263.9	295.1	103	
0262	Lower_Oratia_Stream	1750	85.3	125.8	155.2	178.4	218.2	238.5	98.2	150.8	187.5	218.8	264.1	294.7	103	
0263	Lower_Oratia_Stream	1800	85.4	125.8	155.2	178.4	218.1	238.5	98.3	150.8	187.6	219.1	263.7	295.0	103	
0264	Lower_Oratia_Stream	1850	85.4	125.8	155.2	178.4	217.8	238.5	98.2	150.8	187.6	219.1	263.7	295.0	103	
0265	Lower_Oratia_Stream	1900	85.4	125.8	155.1	178.3	217.7	238.5	98.2	150.7	187.5	217.8	263.6	295.0	106	
0266	Lower_Oratia_Stream	1950	85.4	125.8	155.1	178.3	217.7	238.5	98.2	150.7	187.5	217.8	263.6	295.0	106	
0267	Lower_Oratia_Stream	2000	85.4	125.7	154.9	178.2	217.6	238.9	98.2	150.6	187.4	218.1	263.9	296.0	106	
0268	Lower_Oratia_Stream	2100	86.0	126.4	155.5	178.9	218.3	239.9	98.6	151.5	187.4	218.6	264.1	295.8	106	
0269	Lower_Oratia_Stream	2150	86.0	126.4	155.5	178.9	218.3	239.9	98.6	151.5	187.4	218.6	264.1	295.8	106	
0270	Lower_Oratia_Stream	2200	86.0	126.3	155.2	178.7	218.6	239.5	98.5	151.3	187.8	218.3	263.8	296.2	106	
0271	Lower_Oratia_Stream	2250	85.9	126.2	155.1	178.5	218.4	239.4	98.4	151.2	187.7	218.2	263.6	296.0	106	
0272	Lower_Oratia_Stream	2300	85.8	126.0	154.8	178.1	218.2	239.2	98.3	151.0	187.4	218.0	263.4	295.9	106	
0273	Lower_Oratia_Stream	2400	85.7	125.4	153.9	176.9	216.6	236.0	98.0	150.1	187.4	217.0	263.4	295.9	65	
0274	Lower_Waikumete_Stream	0	26.9	32.8	38.4	43.1	48.9	61.3	28.3	38.6	46.0	55.8	70.9	79.9	65	
0275	Lower_Waikumete_Stream	50	26.8	32.7	38.4	43.2	49.0	61.4	28.1	38.5	46.1	55.8	70.8	79.6	65	
0276	Lower_Waikumete_Stream	100	27.6	32.3	37.9	42.6	50.7	59.9	28.1	38.5	46.1	55.8	70.8	79.6	65	
0277	Lower_Waikumete_Stream	150	28.1	32.7	38.3	43.1	52.2	61.3	28.2	38.4	46.1	55.7	70.3	79.6	65	
0278	Lower_Waikumete_Stream	200	28.0	33.7	39.4	45.0	51.5	62.7	29.0	39.5	47.7	57.0	71.8	80.7	65	
0279	Lower_Waikumete_Stream	300	27.6	34.5	40.5	49.4	53.7	63.6	29.7	40.5	49.3	57.9	72.7	81.4	75	
0280	Lower_Waikumete_Stream	350	28.1	33.9	39.2	51.0	53.6	64.3	29.7	40.5	52.3	57.9	72.7	81.6	75	
0281	Lower_Waikumete_Stream	400	29.5	36.1	42.4	52.1	53.8	67.0	31.3	42.4	52.3	61.0	76.8	81.8	75	
0282	Lower_Waikumete_Stream	450	29.1	36.6	42.8	51.2	52.6	65.9	31.6	42.8	52.3	60.1	75.6	81.8	75	
0283	Lower_Waikumete_Stream	500	26.7	35.5	41.6	48.9	49.4	64.3	30.6	41.5	52.3	58.8	75.6	81.8	75	
0284	Lower_Waikumete_Stream	600	29.2	36.8	43.1	51.1	52.5	69.2	31.3	44.5	52.3	63.2	75.6	81.8	75	
0285	Lower_Waikumete_Stream	700	30.5	36.0	42.1	47.0	51.8	64.2	31.0	42.1	52.3	58.6	73.4	81.8	75	
0286	Lower_Waikumete_Stream	750	30.9	35.7	41.8	47.3	54.5	64.2	30.9	41.8	52.3	58.9	73.1	84.5	75	
0287	Lower_Waikumete_Stream	800	29.6	35.8	41.8	47.2	55.1	64.0	30.9	41.8	52.3	58.5	73.0	84.5	75	
0288	Lower_Waikumete_Stream	850	29.2	35.7	41.5	46.7	54.5	63.8	30.7	41.6	52.3	58.3	72.8	84.5	75	
0289	Lower_Waikumete_Stream	950	31.9	37.3	43.5	48.8	58.1	63.5	31.9	43.6	52.3	59.1	70.7	86.7	75	
0290	Lower_Waikumete_Stream	1000	31.8	37.2	43.5	48.7	57.8	66.6	31.8	43.5	52.2	60.6	76.0	88.7	75	
0291	Lower_Waikumete_Stream	1100	32.1	38.1	44.8	50.3	60.6	68.0	32.4	44.8	54.2	62.3	77.1	88.7	83	
0292	Lower_Waikumete_Stream	1300	30.8	37.8	44.2	49.5	57.4	67.6	32.3	44.2	54.2	61.6	77.5	89.9	83	
0293	Lower_Waikumete_Stream	1350	32.5	38.2	44.6	49.8	58.3	68.3	32.5	44.7	54.2	62.2	78.3	89.9	82	
0294	Lower_Waikumete_Stream	1400	33.0	38.9	45.8	51.1	58.2	69.1	33.0	45.8	54.5	63.1	79.1	90.9	82	
0295	Lower_Waikumete_Stream	1450	32.9	38.8	45.5	50.7	57.4	68.9	33.0	45.5	54.5	63.0	78.8	90.9	82	
0296	Lower_Waikumete_Stream	1500	32.4	38.8	45.6	50.7	57.8	68.9	33.0	45.6	54.6	63.0	78.7	90.9	82	
0297	Lower_Waikumete_Stream	1550	31.9	38.7	45.5	50.7	58.2	68.7	32.9	45.5	54.6	63.0	78.4	90.9	82	
0298	Lower_Waikumete_Stream	1600	31.7	38.6	45.3	50.4	58.4	68.0	32.9	45.4	54.6	62.5	77.2	91.6	82	
0299	Lower_Waikumete_Stream	1650	31.5	38.5	45.3	50.6	57.4	68.5	32.7	45.3	54.6	62.8	78.0	91.6	82	
0300	Lower_Waikumete_Stream	1700	32.6	38.9	45.9	51.2	56.2	68.9	33.0	45.9	54.6	63.4	78.3	91.6	82	
0301	Lower_Waikumete_Stream	1750	32.8	38.6	45.5	50.7	61.4	68.8	32.8	45.5	54.6	62.9	78.3	91.6	82	
0302	Lower_Waikumete_Stream	1800	32.9	38.8	45.7	50.9	61.6	68.7	32.9	45.7	54.8	63.1	78.1	91.6	82	
0302a	Lower_Waikumete_Stream	1850	32.7	38.8	45.9	51.2	60.3	69.5	32.9	45.9	55.1	63.7	79.3	91.6	82	
0303	Lower_Waikumete_Stream	1950	34.3	41.3	48.5	54.1	62.6	73.1	34.3	48.5	58.2	67.1	83.2	91.8	82	
0304	Lower_Waikumete_Stream	2000	34.2	41.5	48.8	54.3	62.7	72.1	34.3	48.7	58.2	66.1	82.3	91.8	82	
0305	Lower_Waikumete_Stream	2050	34.3	42.0	48.7	54.4	63.7	72.4	34.3	48.6	58.2	66.7	81.6	91.8	82	
0306	Lower_Waikumete_Stream	2150	34.4	43.0	48.9	54.7	65.2	72.6	34.4	48.8	58.3	66.8	82.2	91.8	88	
0306a	Lower_Waikumete_Stream	2200	34.4	44.4	48.9	54.7	65.4	72.4	34.4	48.8	58.3	66.8	81.9	91.6	88	
0307	Lower_Waikumete_Stream	2250	34.4	44.9	48.9	54.7	65.5	72.3	34.4	48.9	58.3	66.8	81.7	91.8	87	
0308	Lower_Waikumete_Stream	2300	36.9	45.8	52.3	59.3	67.2	75.3	36.9	52.7	63.7	71.0	82.7	93.4	87	
0309	Lower_Waikumete_Stream	2350	37.0	45.5	52.4	59.6	67.5	80.2	37.0	52.7	64.5	74.1	90.4	101.8	87	
0310	Lower_Waikumete_Stream	2450	37.1	45.3	52.6	60.1	73.0	81.5	37.1	52.9	65.4	75.4	92.2	101.8	87	
0311	Lower_Waikumete_Stream	2500	37.1	45.3	52.6	60.1	73.4	81.6	37.1	52.9	65.5	75.4	92.1	103.4	87	
0312	Lower_Waikumete_Stream	2550	37.8	46.1	53.7	61.2	74.7	82.9	37.8	54.0	66.7	76.7	93.6	103.4	87	
0313	Lower_Waikumete_Stream	2650	37.8	46.0	53.7	61.3	74.7	82.9	37.8	54.0	66.7	76.7	93.5	104.4	87	
0314	Lower_Waikumete_Stream	2700	36.9	45.1	52.4	59.6	68.3	80.5	37.7	52.7	66.7	74.5	91.0	105.0	87	
0315	Lower_Waikumete_Stream	2750	31.8	45.9	54.6	62.7	67.0	83.0	38.0	55.0	66.7	79.0	96.3	105.0	87	

Appendix C

Updated HW Information

AUCKLAND COUNCIL HEALTHY WATERS

RESPONSE TO REQUEST FOR FLOODING INFORMATION

Ref:	8704080434

Requestor details	Name	Business Name	Email
	[redacted]		

Site Address	Catchment / Model
14 Edmonton Road, Henderson	Regionwide Rural Rapid Flood Model 2022 Unit D

INFORMATION TO APPLICANT

This Document provides current information held by Auckland Council relating to predicted flooding levels and extent within the catchment that includes the property noted above.

The information is extracted from a catchment wide modelling study. The study does not consider effects of built structures or potential blockage of piped infrastructure and should not be assumed to be a detailed representation of potential flooding impact that will occur within a particular site.

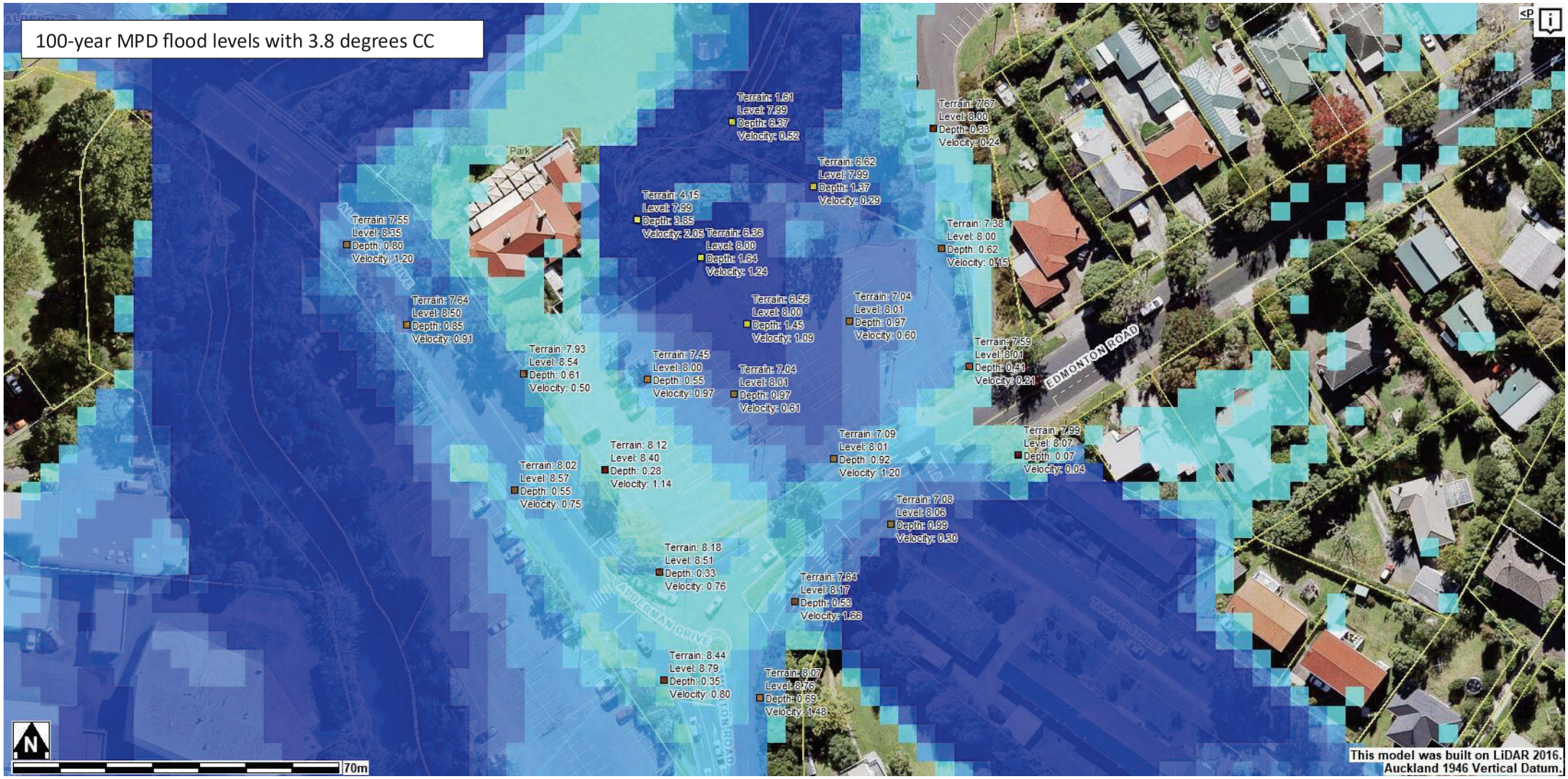
Disclaimer

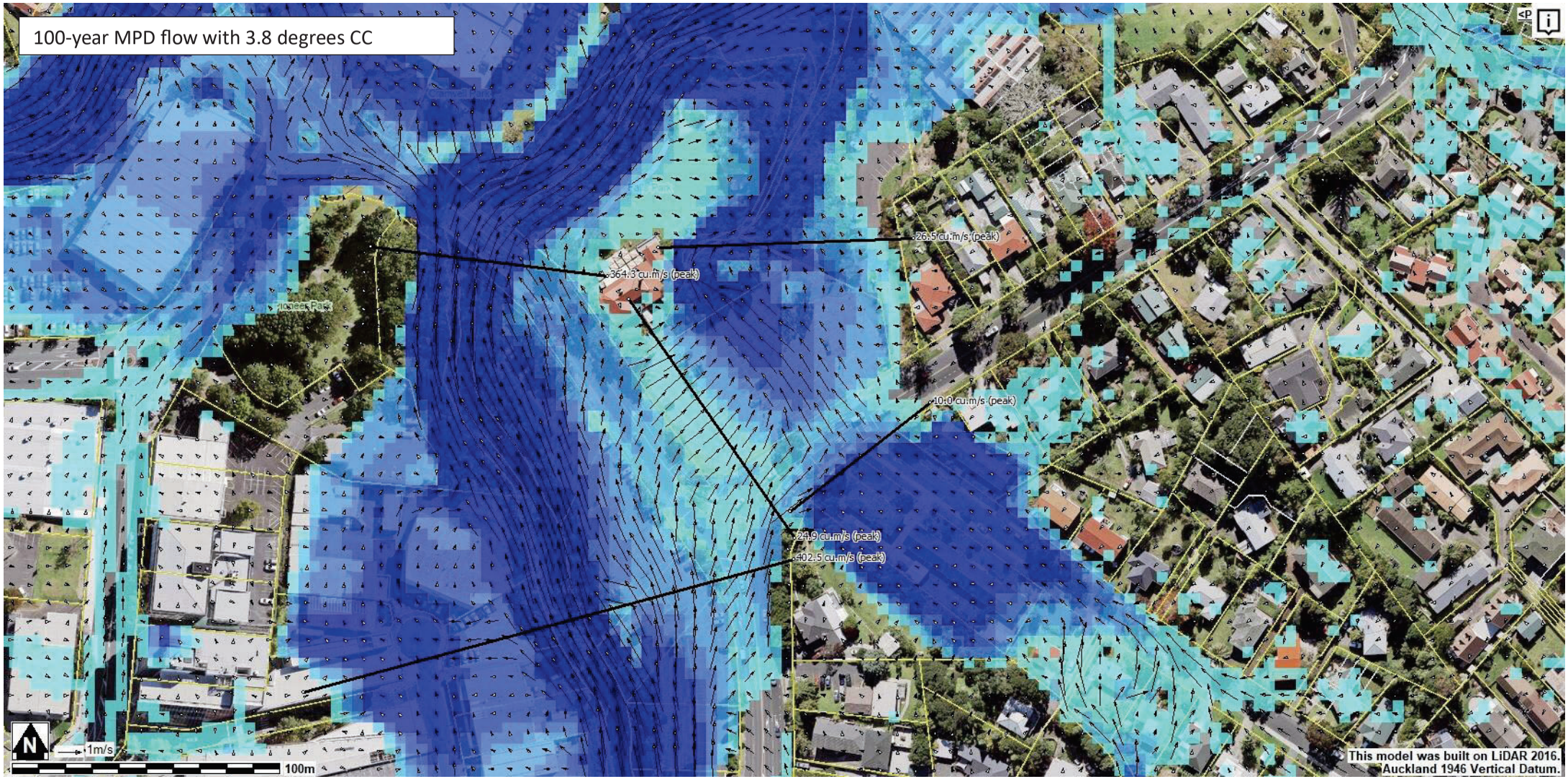
Auckland Council gives no warranty as to the accuracy and completeness of any information given and accepts no liability for any error, omission or use of the information. The information provided does not preclude the need for an appropriate site-specific assessment and cannot be construed as endorsement, or approval, by Auckland Council. of any development

Special information requirements Auckland Unitary Plan Chapter E36 Section E36.9.2
A hazard risk assessment must be undertaken when subdivision, use or development requiring resource consent is proposed to be undertaken on land which may be subject to the 1 per cent annual exceedance probability (AEP) floodplain or overland flow paths. A hazard risk assessment report must accompany a resource consent application for the subdivision, use or development referenced above. The flooding hazard risk should be assessed for all rainfall event frequencies where flooding of the site occurs.

FLOODING INFORMATION

1% AEP Flooding Information		
Overland Flow: Q_{max}	402.5 m^3/sec	Please refer to the attached figures for flow rates and velocities for the 1% AEP event.
Maximum Flooding Level	RL 8.54 (AUK1946)	Refer to the attached figure for a variety of flood levels and depths for the 1% AEP event across the wider site area. Note that the site is near a flood prone area.


100-year MPD flood levels with 3.8 degrees CC
Park
EDMONTON ROAD
ALDERMAN DRIVE
Terrain: 1.61
Level: 7.99
Depth: 6.37
Velocity: 0.52
Terrain: 7.67
Level: 8.00
Depth: 0.33
Velocity: 0.24
Terrain: 6.62
Level: 7.99
Depth: 1.37
Velocity: 0.29
Terrain: 4.15
Level: 7.99
Depth: 3.85
Velocity: 2.05
Terrain: 6.36
Level: 8.00
Depth: 1.64
Velocity: 1.24
Terrain: 7.38
Level: 8.00
Depth: 0.62
Velocity: 0.15
Terrain: 7.55
Level: 8.35
Depth: 0.80
Velocity: 1.20
Terrain: 7.64
Level: 8.50
Depth: 0.85
Velocity: 0.91
Terrain: 6.56
Level: 8.00
Depth: 1.45
Velocity: 1.09
Terrain: 7.04
Level: 8.01
Depth: 0.97
Velocity: 0.60
Terrain: 7.59
Level: 8.01
Depth: 0.41
Velocity: 0.21
Terrain: 7.93
Level: 8.54
Depth: 0.61
Velocity: 0.50
Terrain: 7.45
Level: 8.00
Depth: 0.55
Velocity: 0.97
Terrain: 7.04
Level: 8.01
Depth: 0.97
Velocity: 0.61
Terrain: 7.99
Level: 8.07
Depth: 0.07
Velocity: 0.04
Terrain: 8.12
Level: 8.40
Depth: 0.28
Velocity: 1.14
Terrain: 7.09
Level: 8.01
Depth: 0.92
Velocity: 1.20
Terrain: 8.02
Level: 8.57
Depth: 0.55
Velocity: 0.75
Terrain: 7.08
Level: 8.06
Depth: 0.99
Velocity: 0.30
Terrain: 8.18
Level: 8.51
Depth: 0.33
Velocity: 0.76
Terrain: 7.64
Level: 8.17
Depth: 0.53
Velocity: 1.66
Terrain: 8.44
Level: 8.79
Depth: 0.35
Velocity: 0.80
Terrain: 8.07
Level: 8.76
Depth: 0.69
Velocity: 1.48
N
70m
This model was built on LiDAR 2016.
Auckland 1946 Vertical Datum.
Depth [m]
0.05 to 0.3
0.3 to 0.5
0.5 to 0.8
0.8 to 1
1 to 1.2
> 1.2
(Ctrl Alt: N W U D R)


100-year MPD flow with 3.8 degrees CC
364.3 cu.m/s (peak)
26.5 cu.m/s (peak)
10.0 cu.m/s (peak)
24.9 cu.m/s (peak)
402.5 cu.m/s (peak)
N
1m/s
100m
This model was built on LiDAR 2016.
Auckland 1946 Vertical Datum.

Flood prone area information for 100-year MPD with 2.1 degrees CC

Info | Legend | Results

Flood Prone Area

Attribute	Value
Flood prone area ID	30502357
Can fill in a 100yr ARI rainfall event	Yes
Catchment Area (m2)	264572
Minimum elevation (m RL AUK1946)	3.88
Minimum elevation (m RL NZVD2016)	3.6
Spill elevation (m RL AUK1946)	7.58
Spill elevation (m RL NZVD2016)	7.3
Spill ponding depth (m)	3.7
Volume to spill elevation (m3)	6543
Rainfall required to fill flood prone area (mm)	49
Rainfall depth 100yr ARI future scenario (mm)	234
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

100Yr ARI MPD 3.8 degree Climate change adjusted scenario

Time(hrs)	Flow at Great North Road Bridge (m3/s)	Flow at Takapu Street (m3/s)	Water Level at downstream (mRL) - 1946 Vertical Datum	NZVD2016 Δ-280mm
0	0	0	2.7	2.42
0.17	0.182	0.0014	2.701317	2.421317
0.33	0.1576	0.0005	2.700843	2.420843
0.5	0.1475	0.002	2.699788	2.419788
0.67	0.1248	0.0005	2.700996	2.420996
0.83	0.1296	0.0023	2.700574	2.420574
1	0.1401	0.0007	2.699357	2.419357
1.17	0.116	0.0025	2.699074	2.419074
1.33	0.1235	-0.002	2.699626	2.419626
1.5	0.1119	-0.0002	2.699555	2.419555
1.67	0.1353	0.0005	2.700138	2.420138
1.83	0.0961	0.0005	2.701821	2.421821
2	0.1392	0.0048	2.700825	2.420825
2.17	0.1495	0.0037	2.699837	2.419837
2.33	0.1243	-0.0015	2.700055	2.420055
2.5	0.1833	0.0033	2.700997	2.420997
2.67	0.1842	0.0037	2.699659	2.419659
2.83	0.1917	0.006	2.698452	2.418452
3	0.2202	0.0071	2.699902	2.419902
3.17	0.2535	0.0084	2.700981	2.420981
3.33	0.2572	0.0099	2.701144	2.421144
3.5	0.3009	0.0127	2.70113	2.42113
3.67	0.3848	0.0164	2.701803	2.421803
3.83	0.4437	0.0204	2.701203	2.421203
4	0.547	0.0256	2.700722	2.420722
4.17	0.5913	0.032	2.701623	2.421623
4.33	0.7659	0.0391	2.70043	2.42043
4.5	0.9128	0.0468	2.700308	2.420308
4.67	1.016	0.0542	2.701187	2.421187
4.83	1.159	0.061	2.703178	2.423178
5	1.288	0.0678	2.702778	2.422778
5.17	1.414	0.074	2.702033	2.422033
5.33	1.577	0.0798	2.70256	2.42256
5.5	1.694	0.0851	2.702585	2.422585
5.67	1.818	0.0897	2.702526	2.422526
5.83	1.992	0.0944	2.701983	2.421983
6	2.188	0.0982	2.703145	2.423145
6.17	2.477	0.1073	2.704245	2.424245
6.33	2.793	0.1214	2.70621	2.42621
6.5	3.115	0.1402	2.709832	2.429832
6.67	3.413	0.1327	2.710154	2.430154

6.83	3.733	0.1892	2.709262	2.429262
7	4.166	0.2189	2.710635	2.430635
7.17	4.704	0.2493	2.712264	2.432264
7.33	5.355	0.2782	2.714109	2.434109
7.5	5.947	0.3027	2.716852	2.436852
7.67	6.542	0.3228	2.718956	2.438956
7.83	7.41	0.3389	2.724097	2.444097
8	8.493	0.3518	2.729054	2.449054
8.17	9.171	0.3628	2.731826	2.451826
8.33	10.06	0.3721	2.735454	2.455454
8.5	10.96	0.3799	2.739822	2.459822
8.67	11.97	0.3863	2.744433	2.464433
8.83	13.05	0.3922	2.750223	2.470223
9	14.22	0.3975	2.755753	2.475753
9.17	15.57	0.4131	2.764225	2.484225
9.33	17.3	0.4379	2.77763	2.49763
9.5	19.28	0.4672	2.793394	2.513394
9.67	21.39	0.5024	2.812294	2.532294
9.83	22.98	0.5304	2.830255	2.550255
10	25.05	0.5558	2.853517	2.573517
10.17	27	0.6045	2.88283	2.60283
10.33	29.13	0.6748	2.917062	2.637062
10.5	31.24	0.7517	2.954126	2.674126
10.67	34.17	0.8347	2.997907	2.717907
10.83	37.34	0.901	3.052982	2.772982
11	40.3	0.9482	3.107199	2.827199
11.17	43.59	1.054	3.165421	2.885421
11.33	47.82	1.212	3.23869	2.95869
11.5	51.81	1.399	3.319933	3.039933
11.67	60.88	1.819	3.430454	3.150454
11.83	69.48	2.456	3.589706	3.309706
12	85.21	4.145	3.84019	3.56019
12.17	111.49	8.595	4.27879	3.99879
12.33	146.85	9.315	4.828167	4.548167
12.5	176.71	6.52	5.238454	4.958454
12.67	195.78	4.491	5.514441	5.234441
12.83	211.68	3.334	5.713975	5.433975
13	236.05	2.794	5.934576	5.654576
13.17	274.48	2.377	6.22383	5.94383
13.33	329.56	1.977	6.570397	6.290397
13.5	374.99	0.377	6.930629	6.650629
13.67	399.5	0.7965	7.264499	6.984499
13.83	401.2	0.9669	7.513452	7.233452
14	387.34	1.054	7.676386	7.396386
14.17	362.27	1.309	7.769277	7.489277
14.33	333.65	1.535	7.794282	7.514282
14.5	302.76	1.785	7.76034	7.48034
14.67	274.47	1.864	7.680562	7.400562

14.83	248.89	1.459	7.564112	7.284112
15	225.9	1.098	7.421731	7.141731
15.17	203.91	0.9334	7.255143	6.975143
15.33	182.3	0.8343	7.060624	6.780624
15.5	162.84	0.7511	6.845224	6.565224
15.67	146.17	0.6879	6.607584	6.327584
15.83	133.88	0.6358	6.367216	6.087216
16	123.71	0.6002	6.127775	5.847775
16.17	113.52	0.5765	5.885397	5.605397
16.33	105.24	0.5627	5.653642	5.373642
16.5	97.63	0.5546	5.440874	5.160874
16.67	92.86	0.55	5.241053	4.961053
16.83	87.07	0.5472	5.058056	4.778056
17	81.99	0.5456	4.884566	4.604566
17.17	77.59	0.5453	4.720656	4.440656
17.33	73.86	0.5446	4.558476	4.278476
17.5	70.94	0.5445	4.41136	4.13136
17.67	67.69	0.5444	4.276498	3.996498
17.83	64.55	0.5444	4.15351	3.87351
18	62.84	0.5442	4.048599	3.768599
18.17	61.01	0.5224	3.95969	3.67969
18.33	59.32	0.4872	3.881695	3.601695
18.5	58.64	0.447	3.814379	3.534379
18.67	58.78	0.3945	3.753741	3.473741
18.83	57.36	0.3707	3.699703	3.419703
19	53.83	0.3438	3.650812	3.370812
19.17	52.46	0.3213	3.603826	3.323826
19.33	50.96	0.3048	3.559077	3.279077
19.5	49.82	0.2925	3.517949	3.237949
19.67	48.3	0.2836	3.479232	3.199232
19.83	47.08	0.2774	3.443263	3.163263
20	45.6	0.2729	3.408731	3.128731
20.17	43.4	0.2699	3.370629	3.090629
20.33	41.52	0.2679	3.330892	3.050892
20.5	39.98	0.2666	3.289514	3.009514
20.67	38.46	0.2659	3.248239	2.968239
20.83	36.48	0.2653	3.212331	2.932331
21	35.46	0.2649	3.181501	2.901501
21.17	34	0.2647	3.149623	2.869623
21.33	32.53	0.2647	3.117655	2.837655
21.5	31.47	0.2646	3.088348	2.808348
21.67	30.87	0.2647	3.062281	2.782281
21.83	30.39	0.2646	3.041361	2.761361
22	29.68	0.2647	3.021802	2.741802
22.17	29.36	0.2646	3.006354	2.726354
22.33	28.91	0.2646	2.993192	2.713192
22.5	28.64	0.2646	2.983568	2.703568
22.67	28.14	0.2645	2.974442	2.694442

22.83	28.01	0.2647	2.967726	2.687726
23	27.84	0.2646	2.963191	2.683191
23.17	27.57	0.2646	2.959693	2.679693
23.33	27.51	0.2646	2.956676	2.676676
23.5	27.47	0.2646	2.955348	2.675348
23.67	27.44	0.2646	2.954526	2.674526
23.83	27.42	0.2646	2.953435	2.673435
24	27.41	0.2645	2.952677	2.672677
24.17	24.48	0.2532	2.951832	2.671832
24.33	25.48	0.2321	2.956465	2.676465
24.5	26.47	0.2074	2.961341	2.681341
24.67	26.08	0.1833	2.963815	2.683815
24.83	25.46	0.16	2.957952	2.677952
25	24.58	0.1389	2.94689	2.66689
25.17	23.85	0.1187	2.935924	2.655924
25.33	23.31	0.1022	2.923623	2.643623
25.5	22.11	0.0889	2.907124	2.627124
25.67	21.53	0.0759	2.896496	2.616496
25.83	20.08	0.0668	2.879856	2.599856
26	19.54	0.06	2.865962	2.585962
26.17	17.84	0.0525	2.848412	2.568412
26.33	16.29	0.0475	2.829123	2.549123
26.5	15.37	0.0426	2.811558	2.531558
26.67	14.34	0.0378	2.797272	2.517272
26.83	13.37	0.0335	2.787778	2.507778
27	12	0.031	2.772903	2.492903
27.17	10.69	0.0281	2.757922	2.477922
27.33	9.47	0.0249	2.744528	2.464528
27.5	9.09	0.0233	2.739089	2.459089
27.67	7.914	0.0213	2.731849	2.451849
27.83	7.106	0.0202	2.724168	2.444168
28	6.405	0.0195	2.717748	2.437748
28.17	5.659	0.0167	2.713033	2.433033
28.33	5.084	0.0157	2.709675	2.429675
28.5	4.371	0.0155	2.707942	2.427942
28.67	3.581	0.0137	2.705591	2.425591
28.83	3.034	0.0122	2.702602	2.422602
29	2.586	0.0119	2.702055	2.422055
29.17	2.262	0.0109	2.703822	2.423822
29.33	1.976	0.0104	2.703341	2.423341
29.5	1.836	0.0099	2.700448	2.420448
29.67	1.565	0.0094	2.69812	2.41812
29.83	1.289	0.0092	2.69814	2.41814
30	1.304	0.0077	2.699911	2.419911
30.17	1.268	0.0082	2.700493	2.420493
30.33	1.125	0.0075	2.699057	2.419057
30.5	1.087	0.0067	2.697323	2.417323
30.67	0.993	0.0068	2.69734	2.41734

30.83	0.8963	0.0066	2.69922	2.41922
31	0.8388	0.0058	2.698651	2.418651
31.17	0.7961	0.0057	2.698085	2.418085
31.33	0.7454	0.0061	2.698722	2.418722
31.5	0.7263	0.0052	2.699355	2.419355
31.67	0.6652	0.0054	2.70041	2.42041
31.83	0.6579	0.0052	2.700772	2.420772
32	0.6077	0.0048	2.700831	2.420831

Please find the attached Inflow hydrographs for the Waikumete Stream and overland flow path and downstream water levels from modelled 1% AEP MPD event with a 3.8-degree climate change scenario.

The following tables show the changes in the rainfall depth and rainfall intensity due to climate change.

Table A1 – 1: Percentage Increase in 24-hour Design Rainfall Depth

Annual Exceedance Probability (AEP)	Percentage Increase in 24-hour Design Rainfall Depth due to Future Climate Change (2.1°C Increase in Temperature)	Percentage Increase in 24-h Design Rainfall Depth due to Future Climate Chan (3.8°C Increase in Temperat
50%AEP	15.1%	27.4%
20%AEP	16.4%	29.6%
10%AEP	17.0%	30.8%
5%AEP	17.2%	31.2%
2%AEP	17.6%	31.9%
1%AEP	18.1%	32.7%

Table A1 – 2: TP108 Normalised 24-hour Temporal Rainfall Intensity Profile

Time (hrs:mins)	Time Interval (min)	TP108 Normalised Rainfall Intensity (I/I24)		
		Historic Climate	Future Climate change (2.1°C Increase in Temperature)	Future Climate (3.8°C Increase Temperat
0:00 – 6:00	360	0.34	0.29	0.27
6:00 – 9:00	180	0.74	0.69	0.66
9:00 – 10:00	60	0.96	0.93	0.91
10:00 – 11:00	60	1.40	1.42	1.43
11:00 – 11:30	30	2.20	2.30	2.36
11:30 – 11:40	10	3.80	4.14	4.35
11:40 – 11:50	10	4.80	5.23	5.50
11:50 – 12:00	10	8.70	9.49	9.97
12:00 – 12:10	10	16.20	17.66	18.56
12:10 – 12:20	10	5.90	6.43	6.76
12:20 – 12:30	10	4.20	4.58	4.81
12:30 – 13:00	30	2.90	3.08	3.20
13:00 – 14:00	60	1.70	1.65	1.62
14:00 – 15:00	60	1.20	1.20	1.19
15:00 – 18:00	180	0.75	0.72	0.70
18:00 – 24:00	360	0.40	0.36	0.34

[redacted]

[redacted]

[redacted]

Hope all is well.

Just touching base regarding [redacted] email below. Are you able to advise a timeframe to provide this information?

Thanks in advance.

Ngā mihi | Kind regards,

[redacted]

[redacted]

Following on from our catch up on the 30th of January, please find below a summary of what we will require from Healthy Water to be able to generate our site-specific flooding calculations for the site.

- *Confirmation of the extent of the Waikumete and surrounding streams which will need to be included in the model, including upstream and downstream points.*
- *Inflow hydrographs for the Waikumete Stream and overland flow paths, for the events that need to be modelled (1% AEP with climate change of 3.8º)*
- *GIS information on the culvert under Edmonton Rd (Diameter, invert, location) and any other existing features which will need to be included in model.*
- *Confirmation on how the culvert under Edmonton Road is to be treated in the model. i.e. partially or fully blocked during a 100-year event.*
- *The engineer will be looking to download the GIS contour for the ground profile and will calculate the top water level as part of their assessment.*
- *Roughness information/land use information from the detailed model. If this is not available, the engineer will use their own roughness coefficients based on accepted engineering standards.*

[redacted]

Looking forward to hearing from you.

Kind regards,

[redacted]

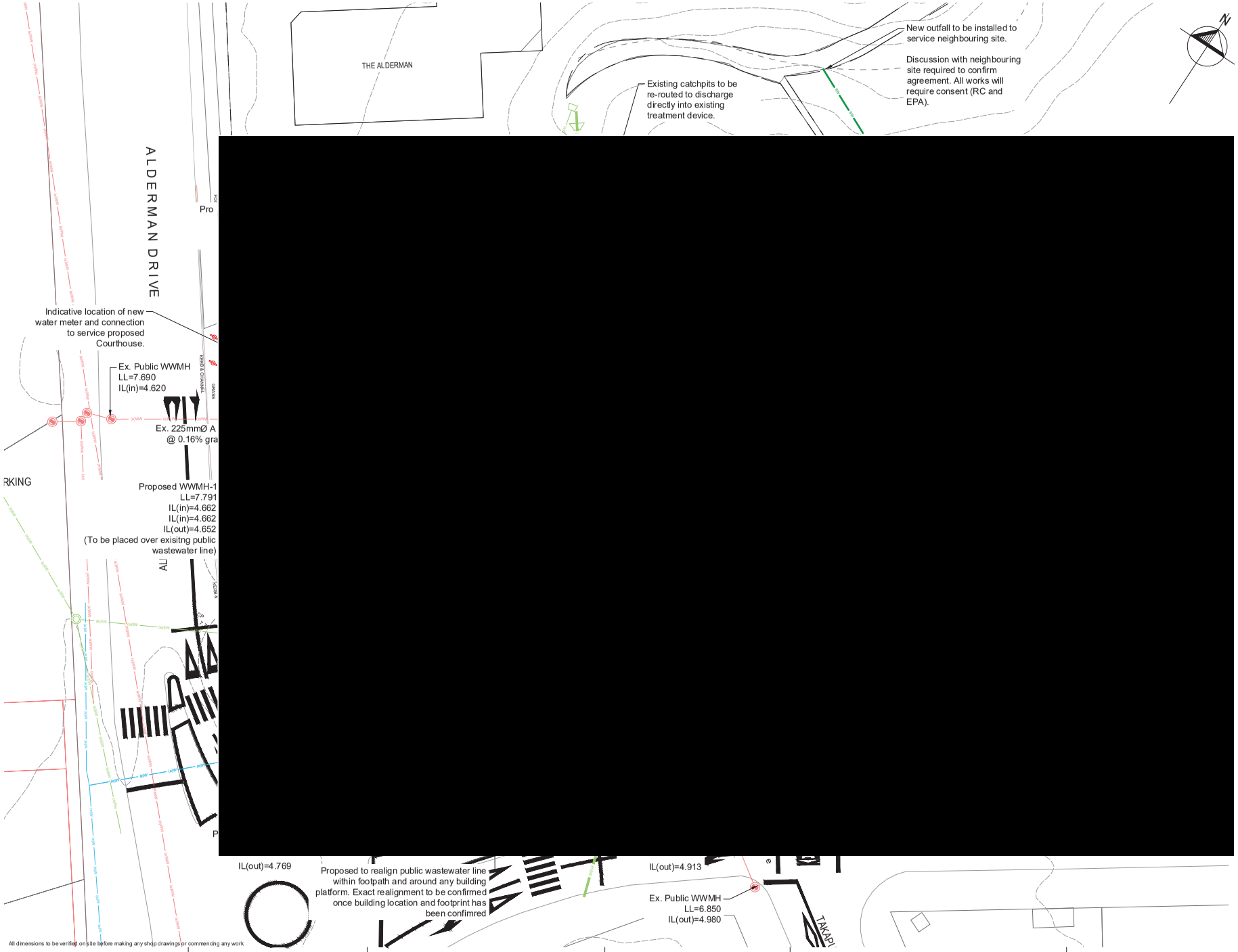
Level 13, Grant Thornton House, 215 Lambton Quay, Wellington 6011 | PO Box 830, Wellington, 6140

Appendix D

ACH and HW Flood Comparison

Appendix E

Proposed Building Drawings



notes:

1. Refer to drawing C00-01 for project notes.
2. This drawing set contains colour. All reproduction to be in colour.
3. Above ground detention tanks location indicatively shown.
4. Downpipe locations to be confirmed by Architect.
5. Wastewater and stormwater demolition plans as per CSK-001.
6. All re-routing of drainage is for concept design only.

legend:

- Site boundary (existing)
- Adjacent site boundary (existing)
- Wastewater MH (existing)
- Wastewater MH (proposed)
- Stormwater MH (existing)
- Stormwater sump (existing)
- Stormwater MH (proposed)
- SW Standard sump (proposed)
- Water valve (existing)
- Fire hydrant (existing)
- Water meter (existing)
- Water valve (proposed)
- Fire hydrant (proposed)
- Water meter (proposed)
- Fibre Box (existing)
- Telecommunications box (existing)
- Street light (existing)
- Electrical power box (existing)
- Stormwater pipe (existing)
- Wastewater pipe (existing)
- Water pipe (existing)
- Duct (existing)
- Fibre optic (existing)
- Gas (existing)
- Power (existing)
- Telecommunications (existing)
- Stormwater pipe (proposed)
- Wastewater pipe (proposed)
- Water pipe (proposed)
- Duct (proposed)
- Fibre optic (proposed)
- Gas (proposed by others)
- Power (proposed)
- Building footprint (proposed)
- Access door

All dimensions to be verified on site before making any shop drawings or commencing any work

Rev	Date	Appd	Reason
B	30/04/2025	CG	For Consent

Consultants

Holmes NZ LP
254 Montreal Street
Christchurch 8142
New Zealand
holmesnz.com
T: +64 3 366 3366

WAITAKERE COURTHOUSE
14 EDMONTON ROAD
HENDERSON, AUCKLAND

Sheet Title
proposed drainage and utility services layout plan

Drawn JP | Scale 1:200 (at A1)
Filename HC_149014.33 - M-P - Concept Design.dwg
Job No 149014.33 | Sheet No C40-02 | Rev B

File: \\akl.offices.holmesgroup.com\data\HC\CAD\149014.33\149014.33_Waitakere Courthouse\HC_149014.33 - M-P - Concept Design.dwg Date Plotted: 30/04/2025 5:20:02 pm By: Nathan Gilbertson

Structural Concept
Foundation Plan

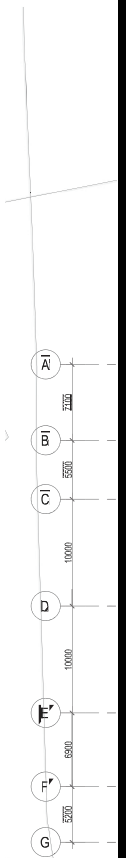
COMMERCIAL IN CONFIDENCE

Refer Structural Engineers Legend Below:

[redacted]

[redacted]

[redacted]



Scale @ A3:
1:500

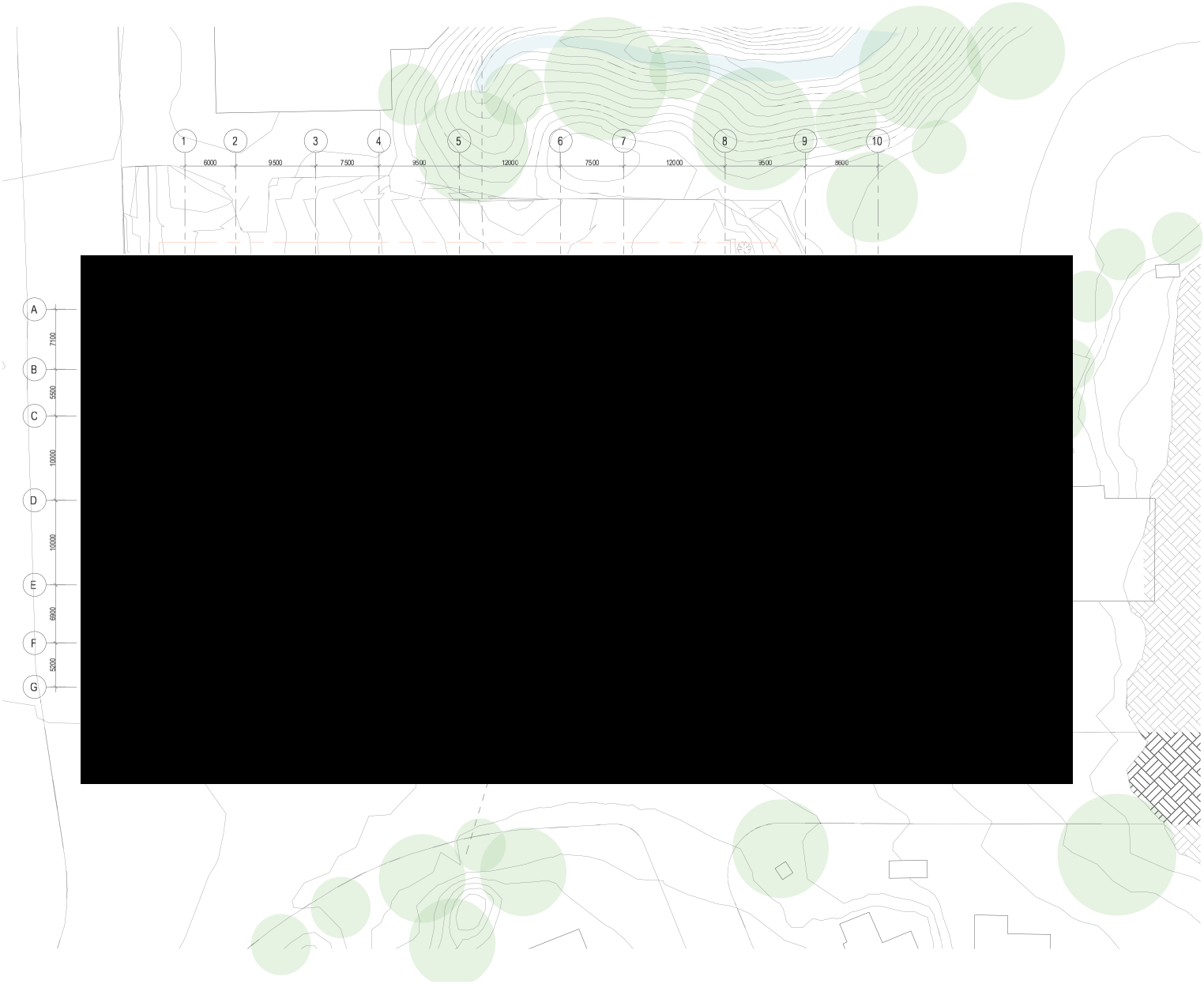
0 2 4 8 10 20 30
m

Structural Concept
Foundation Plan

COMMERCIAL IN CONFIDENCE

Refer Structural Engineers Legend Below:

[redacted]



[redacted]

Scale @ A3:
1:500

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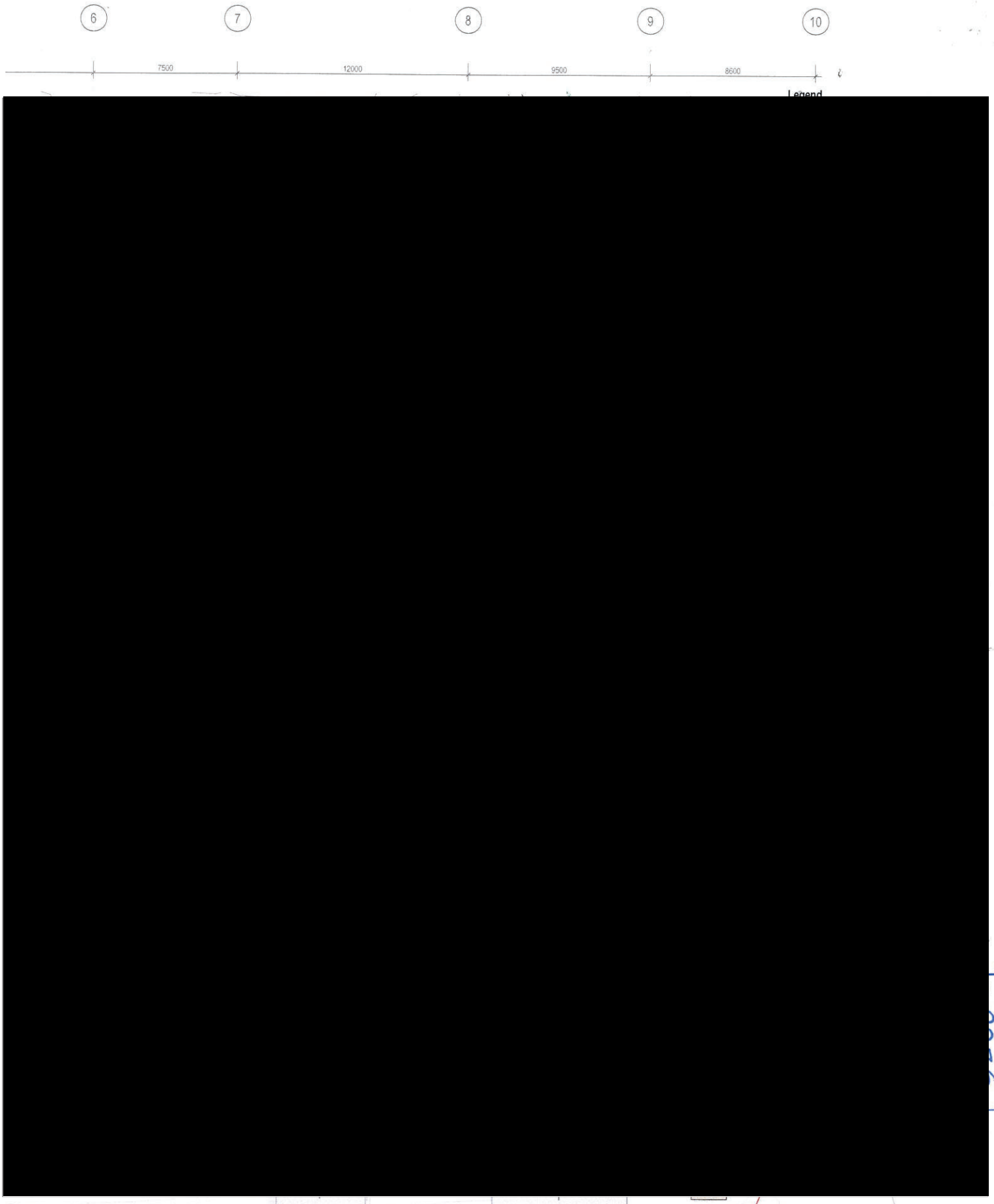
m



architectus™ Waitākere Court House

Drawing: **GA PLAN - GROUND - 1-250**
Drawing no: SK 1-30
Issue:
Date: 02/04/25
Job no: 2440.01

Appendix F

ACH Flood Results