

Report

Civil Design Report

61 North Steyne. Manly NSW

SCP Ref: S220130-CV-RP-01

Client Lindsay Bennelong

Project 61 North Steyne, Manly NSW

Date 31 October 2022

Revision table

Rev #	Date	Issue description	Prepared by	Reviewed by	Issued by
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1 Introduction

SCP Consulting has been engaged by Lindsay Bennelong to prepare the civil and stormwater design for development application for the proposed development at 61 North Steyne, Manly NSW.

1.1 Background

The development site is in the Northern Beaches Council Local Government Area (LGA). The site is bound by North Steyne to the east, Denison Street to the north and multi-storey housing to the west and south. The site currently accommodates a residential housing complex. Refer to Figure 1 for an aerial view of the development site boundary.



Figure 1 - Aerial View of Site Boundary (Source: - Nearmaps)

2 The Site

A desktop review was carried out in order to determine the existing drainage infrastructure servicing the development site. The review revealed the following:-

- Northern Beaches Council's Mapping shows the existing stormwater network discharging in an easterly direction to Manly Beach;
- Council stormwater drainage system discharges 200m from the site directly to Manly Beach;
- Google Street view and the site survey further confirms the presence of existing stormwater pits fronting the development site on Denison Street, and;
- The stormwater from the existing site is discharging directly to the kerb and gutter on Denison Street.

Refer to Figure 2 and Figure 3 for the existing stormwater infrastructure.

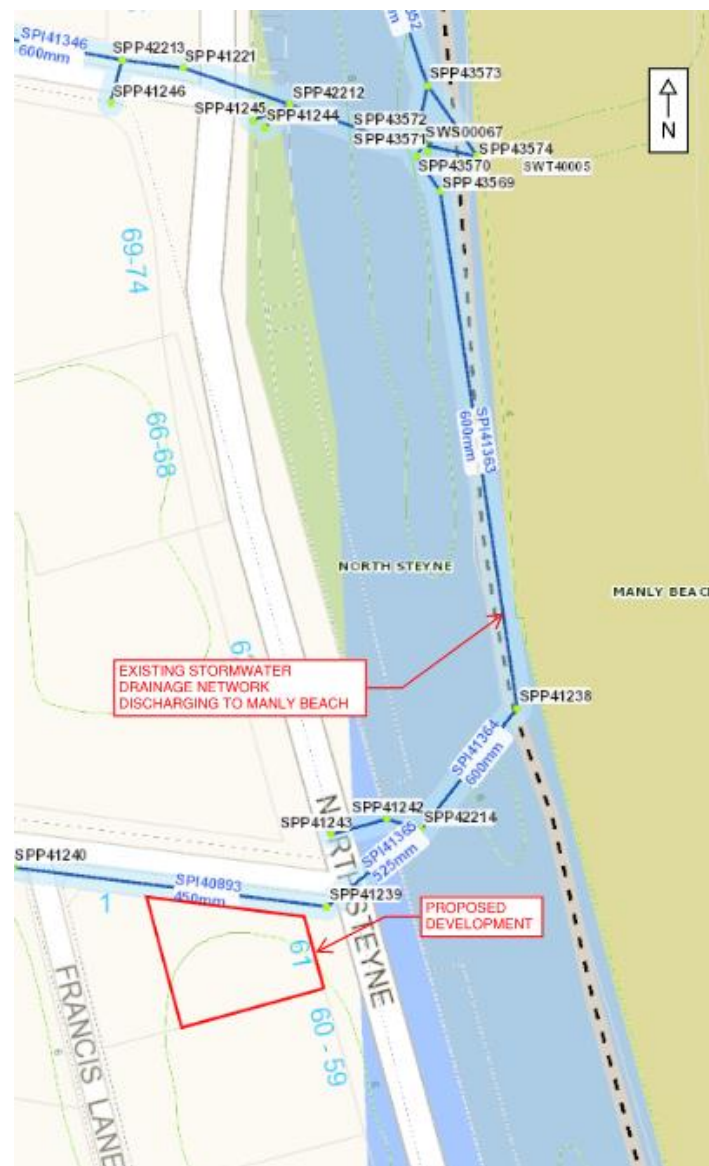


Figure 2 – Existing Stormwater Infrastructure (Source: Northern Beaches Council's Mapping)

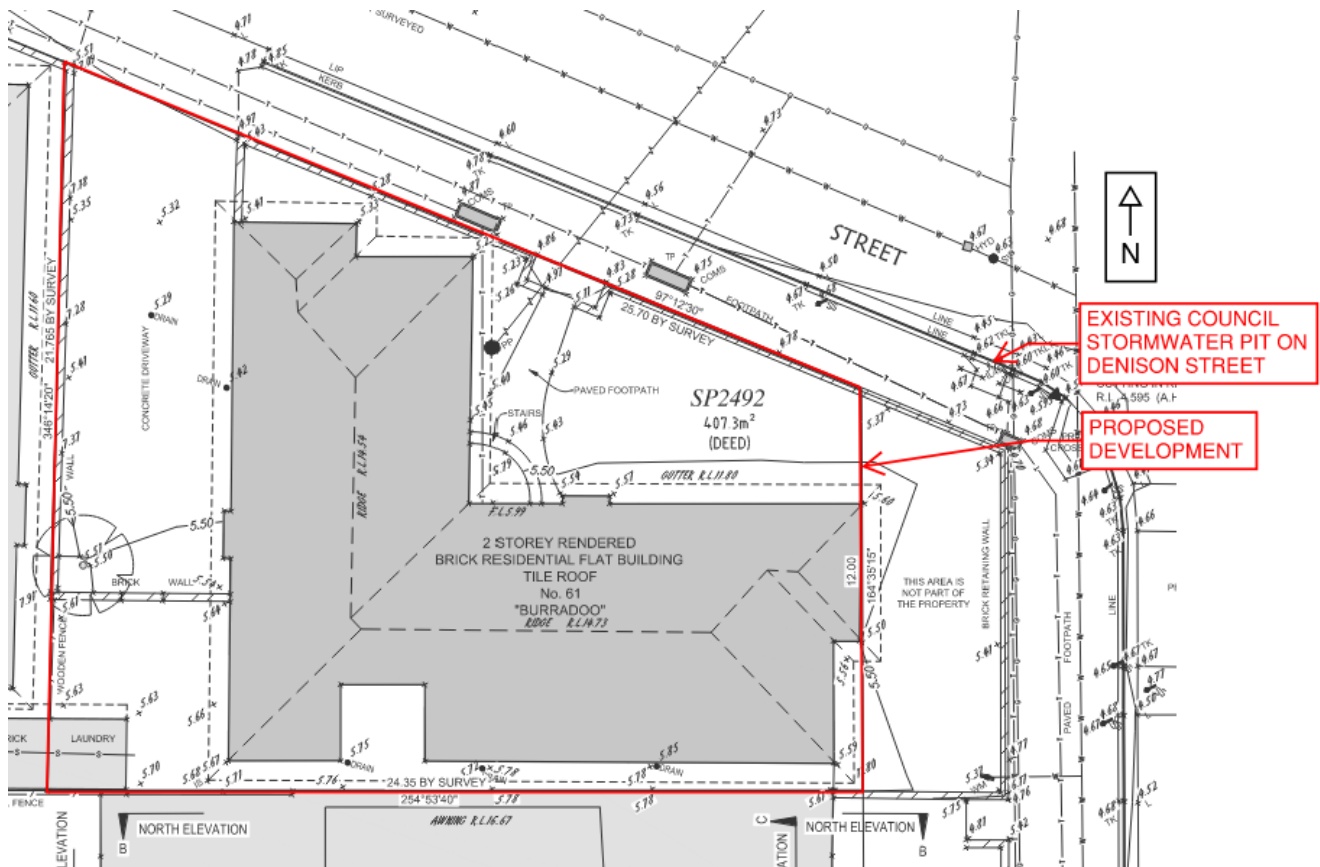


Figure 3 – Survey (Source: Craig & Rhodes)

3 Proposed Development

The proposed development is a residential seven-storey building, including two basement levels for car parking. Primary access to the building will be from Denison Street and vehicular access to the basement will be provided via the proposed car lift accessed off Denison Street.

Refer to Figure 4 for the proposed development ground floor layout.

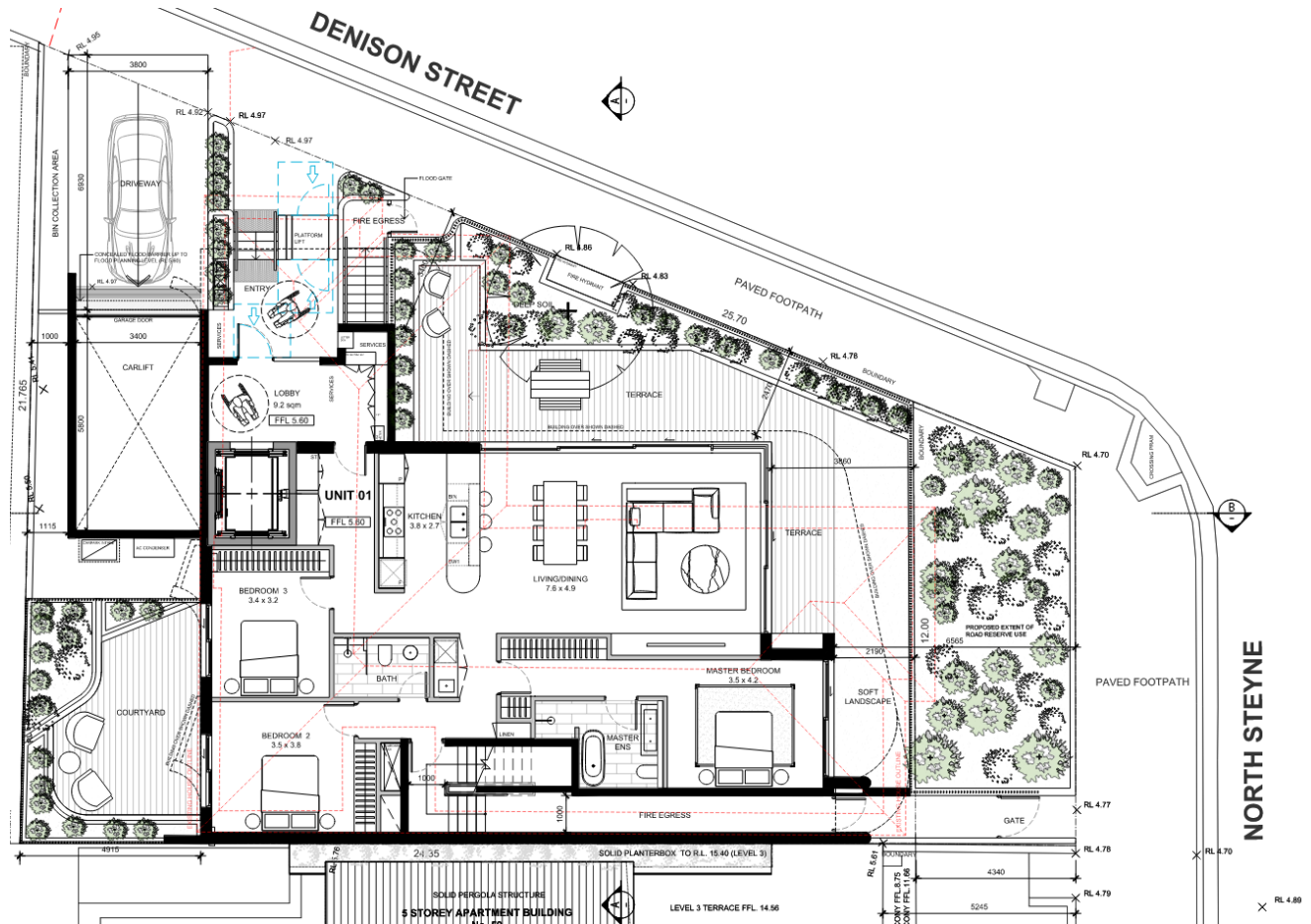


Figure 4 - Proposed Ground Floor Plan (Source: Platform Architects – A1.03)

4 Civil Services

4.1 Purpose of this Document

The purpose of this document is to describe the civil stormwater services in relation to the residential development at 61 North Steyne, Manly.

4.2 Reference Documents

This report is based on the following reference documents:-

- Survey Plan by Craig & Rhodes, undertaken 21/04/2022;
- Geotechnical Report by Douglas Partners, project no. 216903.01, dated September 2022;
- Platform Architects DA Drawing Set, dated 06/10/2022 and;
- Dial Before You Dig.

4.3 Civil Scope of Work

The Civil Services scope of work consists of the following:-

- Flooding and associated protection works;
- Proposed connection to Council stormwater drainage system;
- Proposed site stormwater drainage design;
- WSUD requirements and;
- Erosion and Sediment control.

The Civil scope for proposed stormwater drainage shall comprise of the in-ground pit and pipe network external to the building and external overland flow paths. For stormwater drainage associated with suspended slabs, refer to the Hydraulic Engineer's design documentation.

4.4 Limitations

This report is based primarily on the information provided by the architect, design team, survey drawings, Dial Before You Dig data, and information communicated during the design development process. Any assumptions made through the design process have been communicated in this report.

4.5 Design Criteria

Table 1: Civil Design Criteria

ITEM	DESIGN CRITERIA
Flooding	NSW Floodplain Development Manual Northern Beaches Council Water Management for Development Policy Flood Information Report for 61 North Steyne, Manly
Stormwater Quality	Northern Beaches Council Water Management for Development Policy
Sediment and Erosion Control	Landcom 'Blue Book' – Managing Urban Stormwater Soils and Construction Guideline Edition 4
On-Site Absorption (OSA)	Northern Beaches Council Water Management for Development Policy
Stormwater Drainage	Australian Rainfall and Runoff (ARR) 2019 AS/NZS 3500.3-2015 – Stormwater Drainage Northern Beaches Council Water Management for Development Policy

5 Flooding

The Flood Advice Letter issued by Council has identified the development site to be flood affected in the 1% AEP and PMF storm event by localised overland flow from adjacent upstream catchments. The flood level for the 1% AEP and PMF storm event is 5.10m AHD and 5.59m AHD, respectively. Figures 5 and 6 below present the 1% and PMF flooding respectively.



Figure 5 - 1% AEP Flood Extent Map (Source: Northern Beaches Council Flood Advice Letter)



Figure 6 - PMF Flood Extent Map (Source: Northern Beaches Council Flood Advice Letter)

In accordance with the flood advice letter received from Northern Beaches Council, the flood planning level (FPL) is 5.60m AHD (1% AEP flood level plus 0.5m freeboard). Basements and below ground garages are to be physically protected to the FPL via installation of a flood gate/door. All electrical connections, air conditioning units and external power points are to be set above the FPL.

The new development has been designed to adhere to the following development controls:

- Any new portion of the building that is lower than the applicable Flood Planning Level (FPL) must be built from flood compatible materials specified by the structural engineer
- All new services associated with the development shall be flood proofed to the habitable floor level.
- Structures up to the habitable floor must be able to withstand the forces of floodwater, debris, and buoyancy in a 1% AEP flood event, as determined by suitably qualified engineer.

The flooding shown in Figure 5 confirms that the extend of flood impact is confined to the adjacent road reserve which removes any need to assess the impact of the new development on the overland flow.

Flood Risk Management will be addressed through a Shelter-In-Place. Typically, urban overland flow catchments operate as a flash-flood scenario with very limited ability to excavate and a short duration of peak flow. Since the property has been designed to withstand flood effect up to the FPL, this is a suitable refuge for residents to Shelter-In-Place.

Refer to Appendix A for the Flood Information Letter.

6 Proposed Stormwater Drainage

6.1 Stormwater Drainage Design Requirements

6.1.1 Stormwater Drainage Requirements

With reference to Northern Beaches council's Water Management for Development Policy; the stormwater requirements are as follows: -

- The minor (piped) drainage system must be designed to convey stormwater runoff for storm events up to, and including, the 5% Annual Exceedance Probability (AEP) storm event, and;
- The major (overland) drainage system must be designed to convey stormwater runoff for storm events up to, and including, the 1% AEP storm event.

6.1.2 On-Site Detention (OSD) Requirements

With reference to the Northern Beaches Council's Water Management for Development Policy, OSD is to be provided in the form of infiltration, where feasible, or detention to limit site discharge. OSD is not required for proposed developments where,

- The proposed development is situated adjacent to a natural waterway. Therefore, runoff generated from the development will not have any adverse impacts to downstream properties.
- The site of the development is located within a Council established 1% AEP flood plain.

6.3 On-Site Detention

Council's Water Management Development Policy requires properties in the Region 3, Zone 2 catchment to provide On-Site Absorption (OSA) for new developments. OSA has not been provided for the proposed development in line with exception criteria listed in Council's policies.

- The development site is located 50m from Manly Beach (natural waterway). The location of the site stormwater connection is 200m south of the site from the Council downstream outlet to Manly Beach. Given the site fronts North Steyne there will not be any impact on properties downstream of the site as overland flow discharges to Manly Beach.
- Inclusion of On-Site Detention will result in extending peak stormwater flows from the site during larger storm events resulting in a potential increase in peak flows in the adjacent road reserve as upstream catchment flows may coincide with the restricted site flows.
- Inclusion of an OSA system cannot be accommodated due to the extent of the building basement structure without adverse impact to the projects basement structure or adjoining developments.

7 Water Quality Management Plan

As per Council's Water Management for Development Policy, stormwater quality treatment is not required for developments with site area less than 0.100Ha. The proposed development site area is 0.040Ha and will therefore, not require stormwater quality treatment.

A boundary pit with silt arrestor has been included to limit gross pollutants and larger suspended solids entering the Council Stormwater system.

8 Erosion and Sediment Control

Erosion and Sediment Control (ECS) has been prepared in accordance with Landcom's Soil and Construction manual (commonly known as the Blue Book). The Contractor for the works is required to provide the specified measures in accordance with the general requirements outlined in the ESC plans including: -

- Temporary stabilised site access
- Sediment control including, fences, sandbags and geofabric silt traps
- Dust control
- Stockpiling

All erosion and sediment controls will be maintained to ensure they remain operational for the duration of the construction activities.

Appendix A Flood Information Letter

FLOOD INFORMATION REPORT – COMPREHENSIVE

Property: 61 North Steyne MANLY NSW 2095

Lot DP: Lot CP SP 2492

Issue Date: 25/07/2022

Flood Study Reference: Manly to Seaforth Flood Study 2019, Cardno

Flood Information for lot 1:

Flood Risk Precinct – See Map A

Flood Planning Area – See Map A

Maximum Flood Planning Level (FPL) ^{2, 3, 4}: 5.60 m AHD

1% AEP Flood – See Flood Map B

1% AEP Maximum Water Level ^{2, 3}: 5.10 m AHD

1% AEP Maximum Depth from natural ground level³: 0.24 m

1% AEP Maximum Velocity: 0.37 m/s

1% AEP Hydraulic Categorisation: N/A See Flood Map D

Probable Maximum Flood (PMF) – See Flood Map C

PMF Maximum Water Level ⁴: 5.59 m AHD

PMF Maximum Depth from natural ground level: 0.72 m

PMF Maximum Velocity: 0.43 m/s

PMF Hydraulic Categorisation: N/A See Flood Map E

Flooding with Climate Change (See Flood Map F)

Not available.

Flood Life Hazard Category – See Map G

Indicative Ground Surface Spot Heights – See Map H

¹ The flood information does not take into account any local overland flow issues nor private stormwater drainage systems.

² Overland flow/mainstream water levels may vary across a sloping site, resulting in variable minimum floor/flood planning levels across the site. The maximum Flood Planning Level may be in a different location to the maximum 1% AEP flood level.

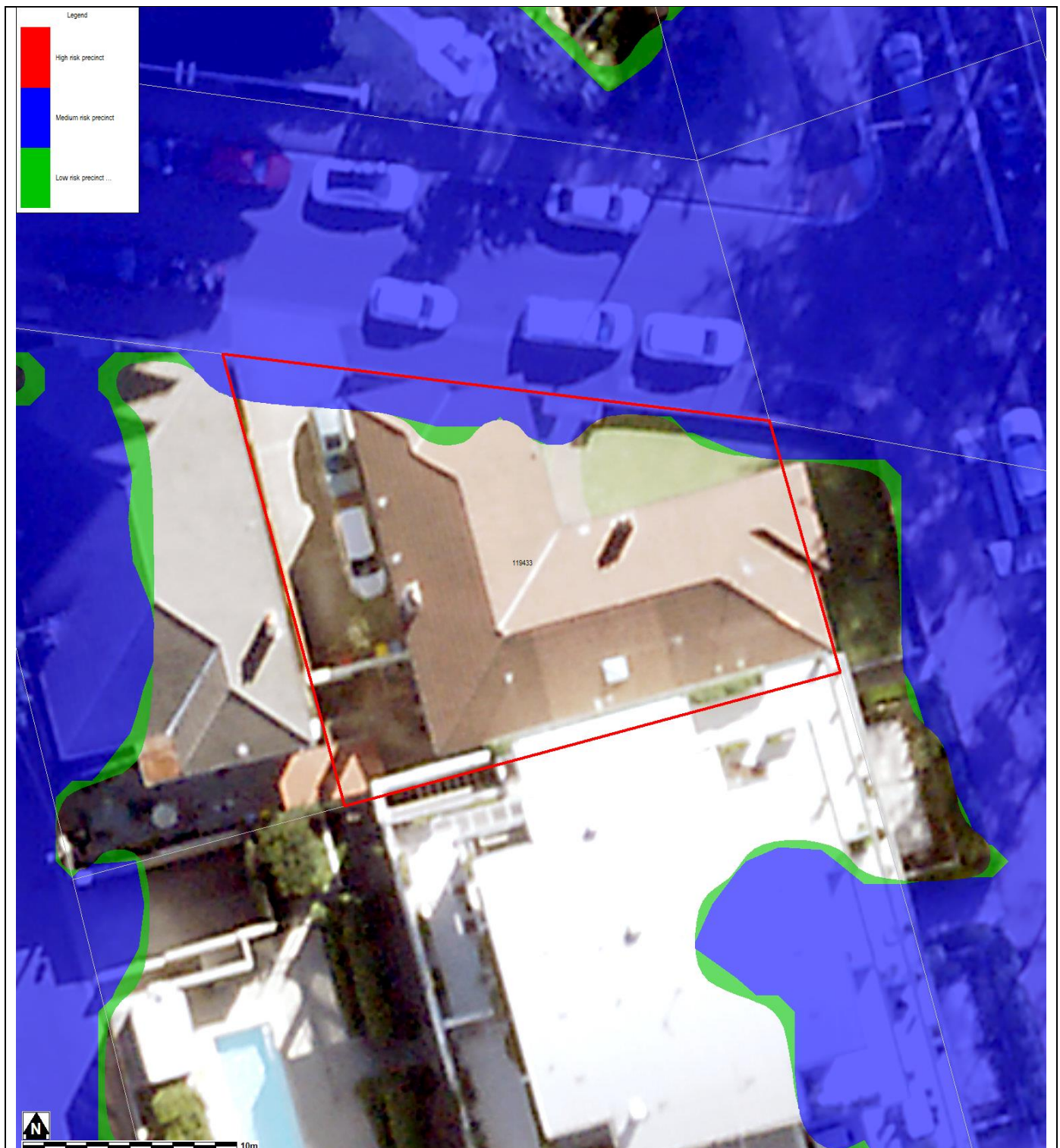
³ Intensification of development in the former Pittwater LGA requires the consideration of climate change impacts which may result in higher minimum floor levels.

⁴ Vulnerable/critical developments require higher minimum floor levels using the higher of the PMF or FPL.

General Notes:

- All levels are based on Australian Height Datum (AHD) unless otherwise noted.
- This is currently the best available information on flooding; it may be subject to change in the future.
- Council recommends that you obtain a detailed survey of the above property and surrounds to AHD by a registered surveyor to determine any features that may influence the predicted extent or frequency of flooding. It is recommended you compare the flood level to the ground and floor levels to determine the level of risk the property may experience should flooding occur.
- Development approval is dependent on a range of issues, including compliance with all relevant provisions of Northern Beaches Council's Local Environmental Plans and Development Control Plans.
- Please note that the information contained within this letter is general advice only as a detail survey of the property as well as other information is not available. Council recommends that you engage a suitably experienced consultant to provide site specific flooding advice prior to making any decisions relating to the purchase or development of this property.
- The Flood Studies on which Council's flood information is based are available on Council's website.

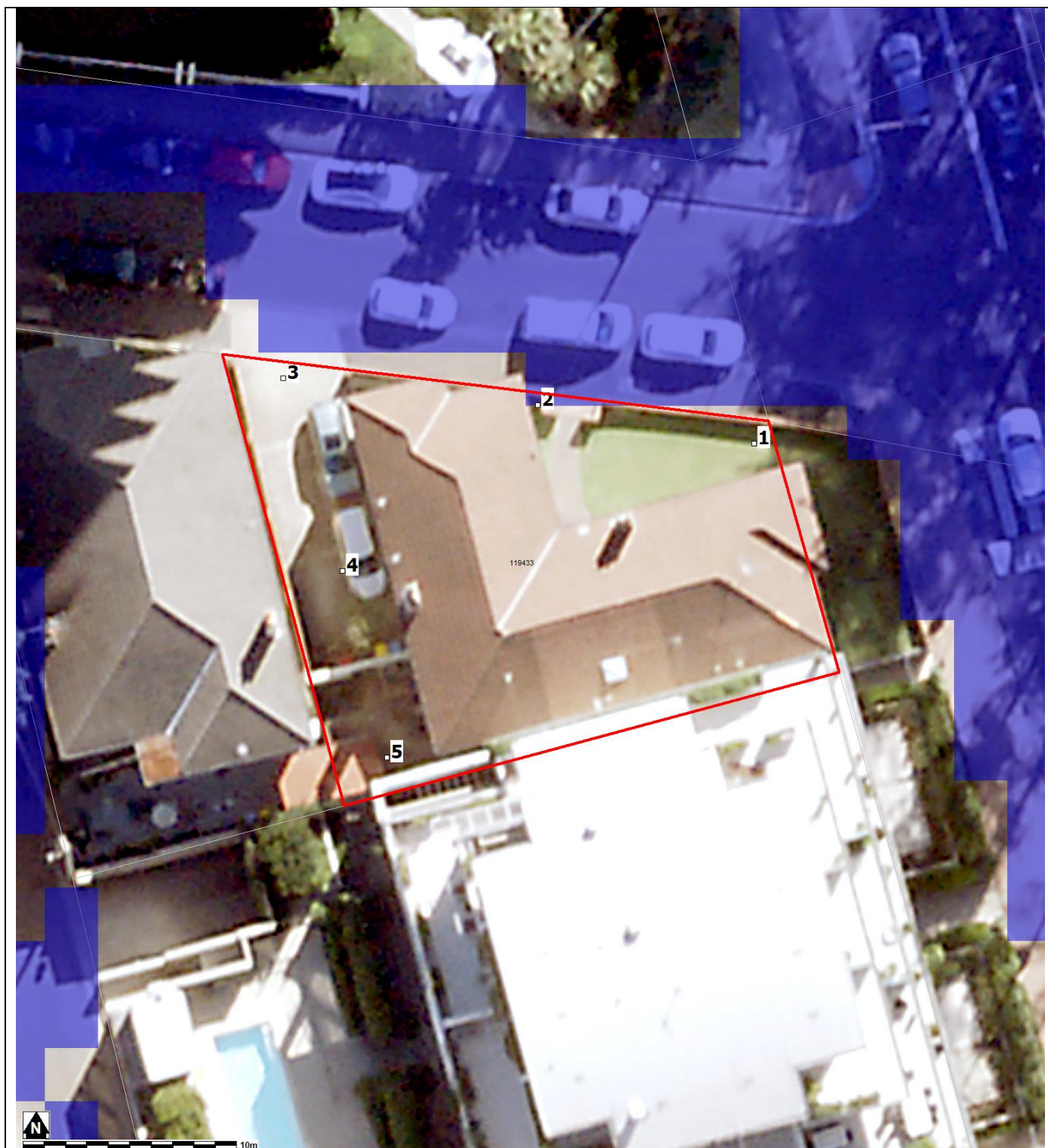
FLOOD MAP A: FLOOD RISK PRECINCT MAP



Notes:

- **Low Flood Risk precinct** means all flood prone land not identified within the High or Medium flood risk precincts.
- **Medium Flood Risk precinct** means all flood prone land that is (a) within the 1% AEP Flood Planning Area; and (b) is not within the high flood risk precinct.
- **High Flood Risk precinct** means all flood prone land (a) within the 1% AEP Flood Planning Area; and (b) is either subject to a high hydraulic hazard, within the floodway or subject to significant evacuation difficulties (H5 or H6 Life Hazard Classification).
- The **Flood Planning Area** extent is equivalent to the Medium Flood Risk Precinct extent, and includes the High Flood Risk Precinct within it. The mapped extent represents the 1% annual Exceedance Probability (AEP) flood event + freeboard.
- None of these mapped extents include climate change.

FLOOD LEVEL POINTS



Note: Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Manly to Seaforth Flood Study 2019, Cardno) and aerial photography (Source: NearMap 2014) are indicative only.

Flood Levels

ID	5% AEP Max WL (m AHD)	5% AEP Max Depth (m)	1% AEP Max WL (m AHD)	1% AEP Max Depth (m)	1% AEP Max Velocity (m/s)	Flood Planning Level (m)	PMF Max WL (m AHD)	PMF Max Depth (m)	PMF Max Velocity (m/s)
1	N/A	N/A	N/A	N/A	N/A	5.60	5.58	0.33	0.43
2	N/A	N/A	5.10	0.17	0.35	5.60	5.59	0.65	0.36
3	N/A	N/A	N/A	N/A	N/A	5.60	5.59	0.44	0.38
4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

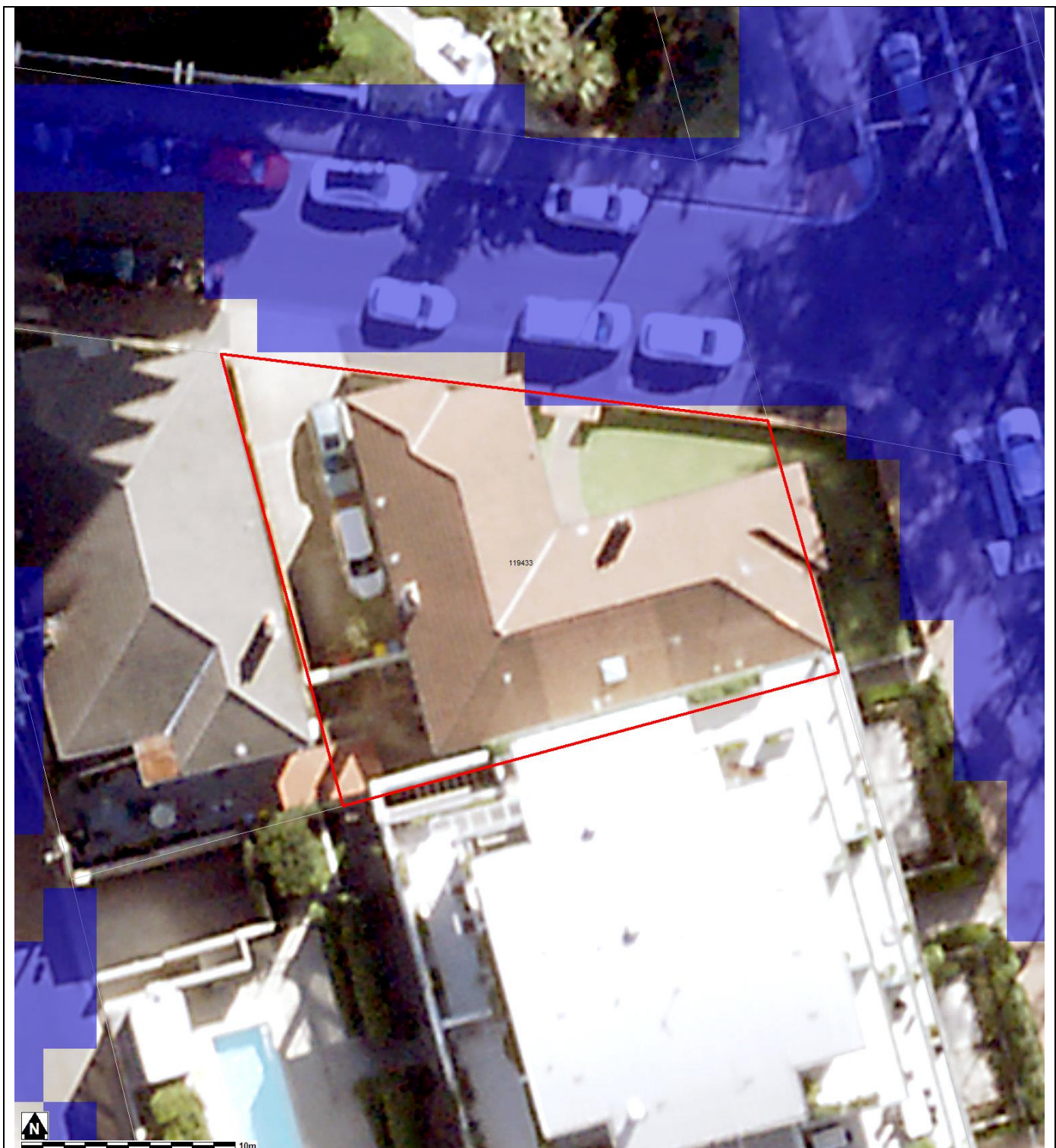
WL – Water Level

PMF – Probable Maximum Flood

N/A = no peak water level/depth/velocity available in flood event

A variable Flood Planning Level might apply. Freeboard is generally 0.5m above the maximum 1% AEP water level. However for overland flow with a depth less than 0.3m and a $\text{Velocity} \times \text{Depth}$ product less than $0.3\text{m}^2/\text{s}$, a freeboard of 0.3m may be able to be justified.

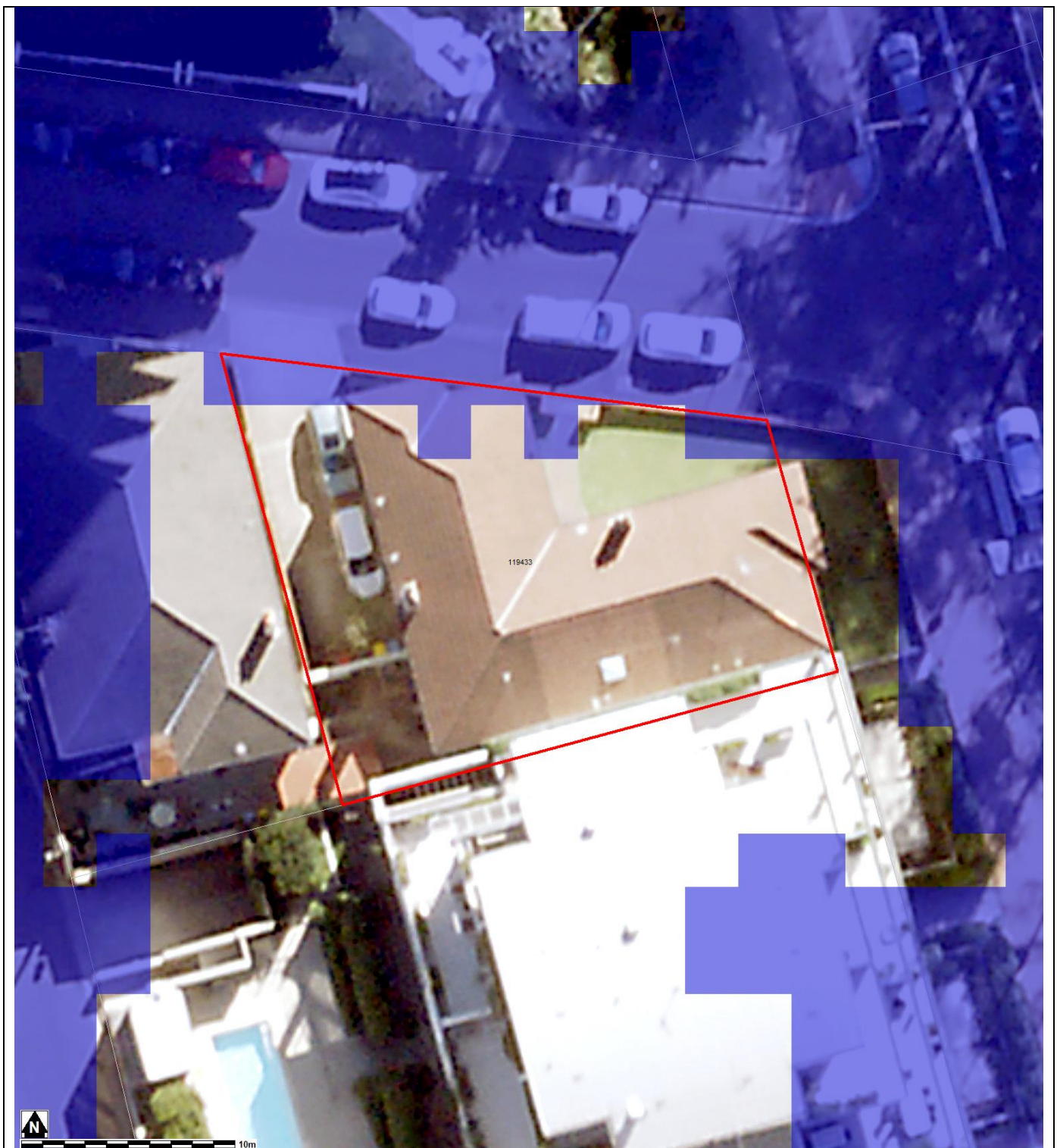
FLOOD MAP B: FLOODING - 1% AEP EXTENT



Notes:

- Extent represents the 1% annual Exceedance Probability (AEP) flood event.
- Flood events exceeding the 1% AEP can occur on this site.
- Extent does not include climate change.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Manly to Seaforth Flood Study 2019, Cardno) and aerial photography (Source Near Map 2014) are indicative only.

FLOOD MAP C: PMF EXTENT MAP



Notes:

- Extent represents the Probable Maximum Flood (PMF) flood event
- Extent does not include climate change
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Manly to Seaforth Flood Study 2019, Cardno) and aerial photography (Source: NearMap 2014) are indicative only

FLOOD MAP D: 1% AEP FLOOD HYDRAULIC CATEGORY EXTENT MAP



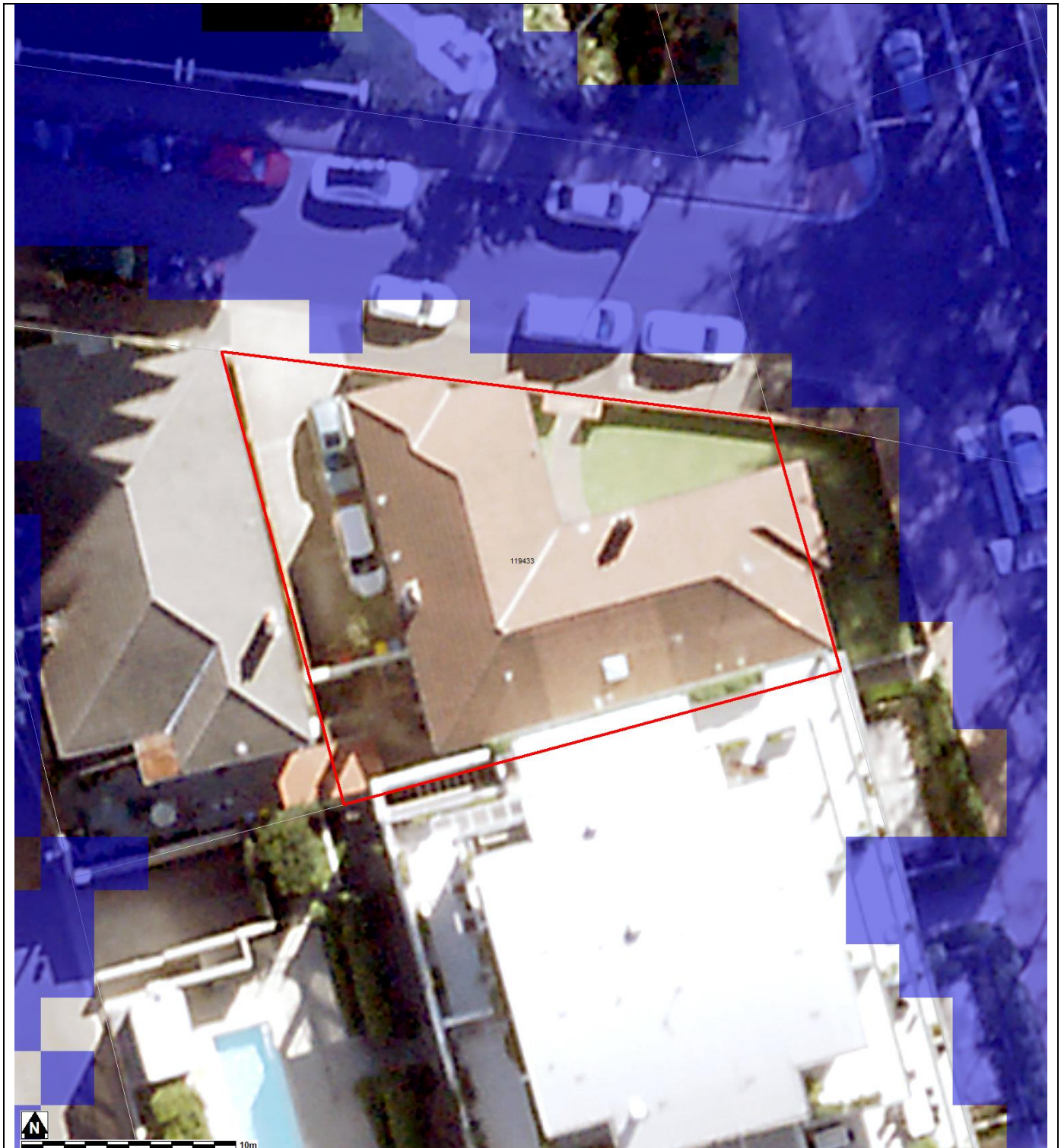
Notes:

- Extent represents the 1% annual Exceedance Probability (AEP) flood event
- Extent does not include climate change
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Manly to Seaforth Flood Study 2019, Cardno) and aerial photography (Source: NearMap 2014) are indicative only

FLOOD MAP E: PMF FLOOD HYDRAULIC CATEGORY EXTENT MAP

Not Available

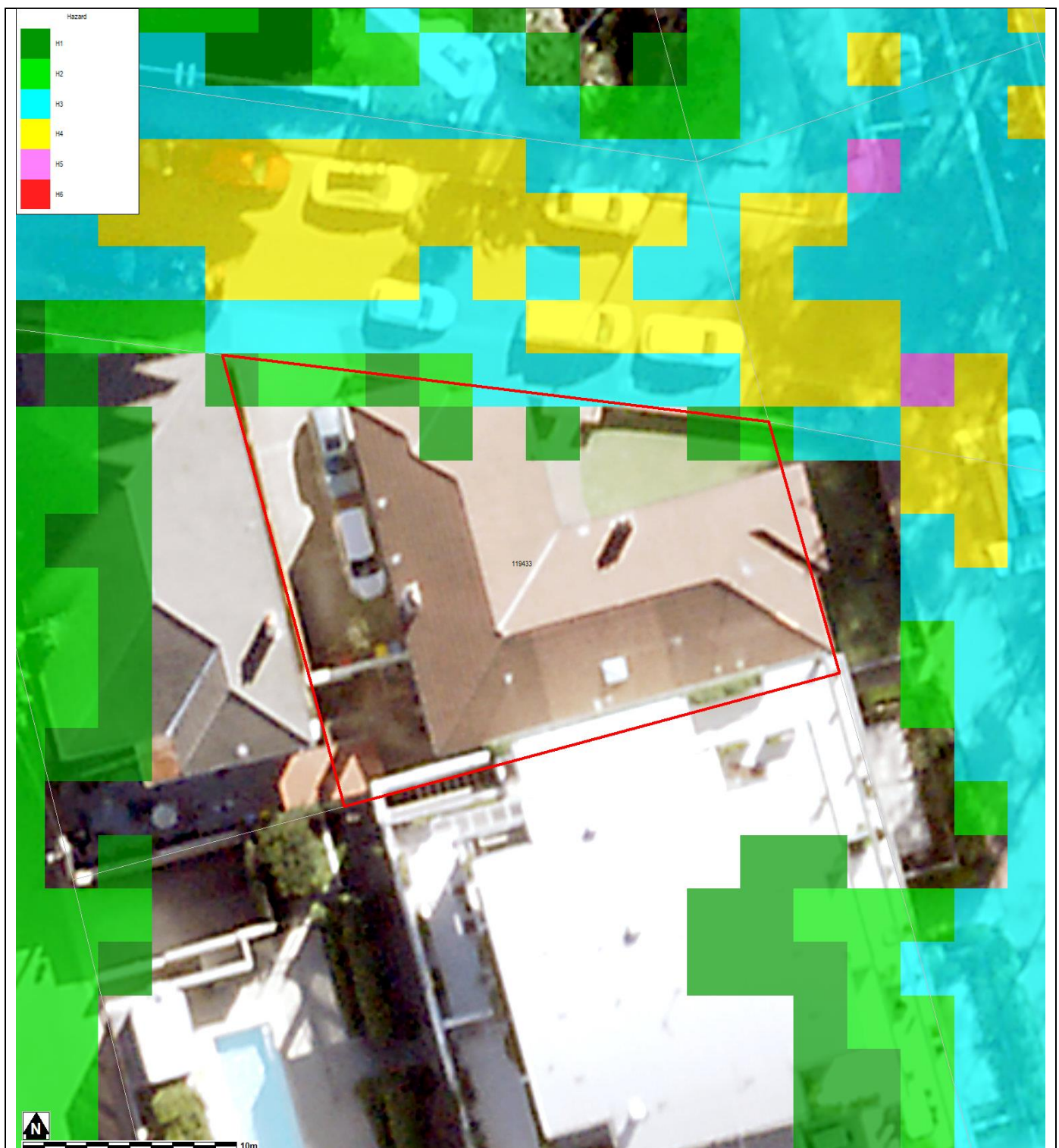
FLOOD MAP F: FLOODING – 1% AEP EXTENT PLUS CLIMATE CHANGE



Note:

- Extent represents the 1% annual Exceedance Probability (AEP) flood event including 30% rainfall intensity and 0.9m Sea Level Rise climate change scenario
- Flood events exceeding the 1% AEP can occur on this site.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Manly to Seaforth Flood Study 2019, Cardno) and aerial photography (Source: NearMap 2014) are indicative only

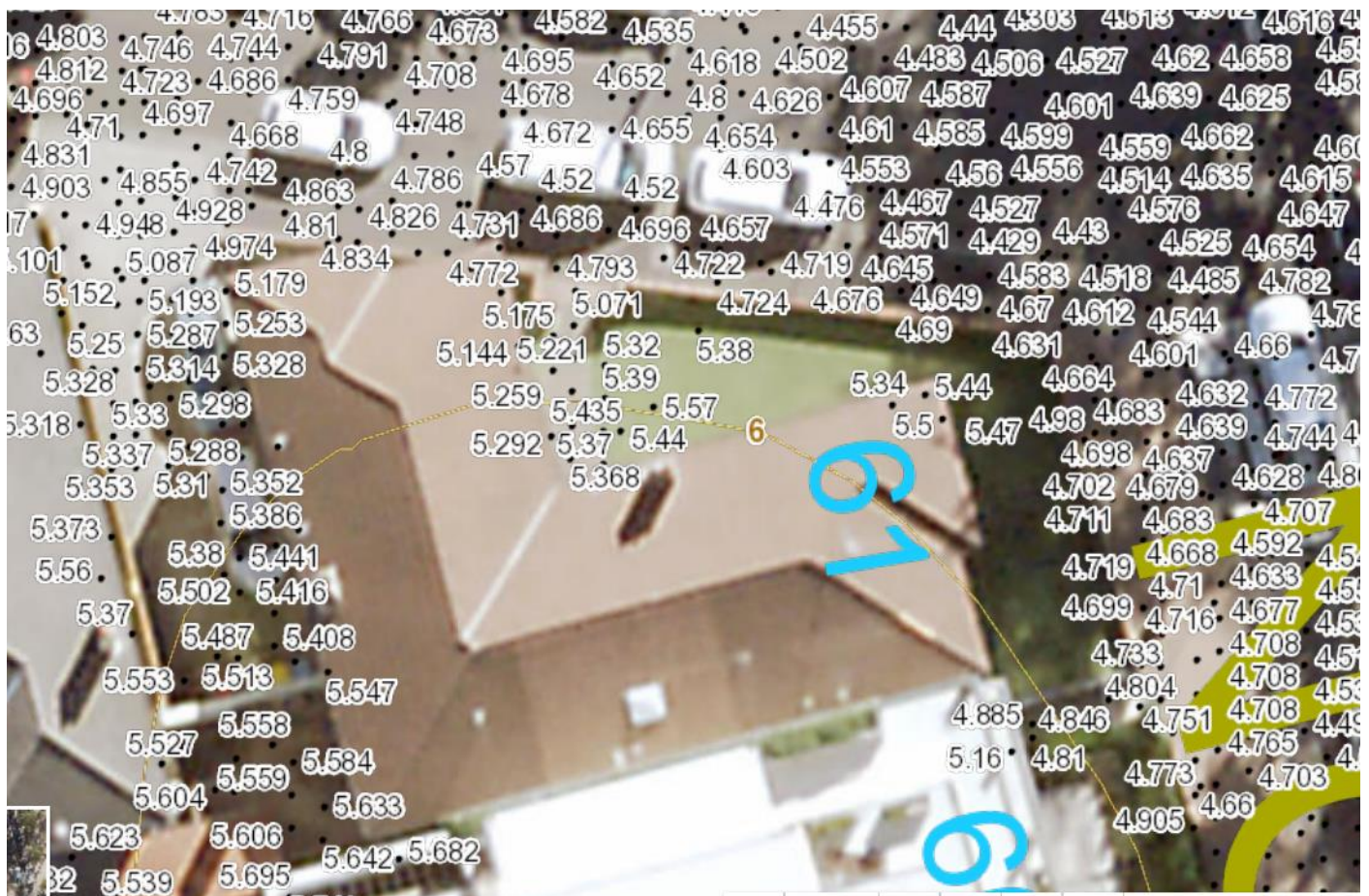
FLOOD MAP G: FLOOD LIFE HAZARD CATEGORY



Notes:

- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Manly to Seaforth Flood Study 2019, Cardno) and aerial photography (Source Near Map 2014) are indicative only.

MAP H: INDICATIVE GROUND SURFACE SPOT HEIGHTS



Notes:

- The surface spot heights shown on this map were derived from Airborne Laser Survey and are indicative only.
- Accuracy is generally within $\pm 0.2\text{m}$ vertically and $\pm 0.15\text{m}$ horizontally, and Northern Beaches Council does not warrant that the data does not contain errors.
- If accuracy is required, then survey should be undertaken by a registered surveyor.

Preparation of a Flood Management Report

Introduction

These guidelines are intended to provide advice to applicants on how to determine what rules apply on flood prone land, and how to prepare a Flood Management Report. The purpose of a Flood Management Report is to demonstrate how a proposed development will comply with flood related planning requirements.

Planning Requirements for Flood Prone Land

Development must comply with the requirements for developing flood prone land set out in the relevant Local Environment Plan (LEP) and Development Control Plan (DCP). There are separate LEPs and DCPs for each of the former Local Government Areas (LGAs), although preparation of a LGA-wide LEP and DCP is currently under way.

The clauses specific to flooding in the LEPs and DCPs are as follows:

LEP Clauses	DCP Clauses
Manly LEP (2013) – 6.3 Flood Planning	Manly DCP (2013) – 5.4.3 Flood Prone Land
Warringah LEP (2011) – 6.3 Flood Planning Warringah LEP (2000) – 47 Flood Affected Land *	Warringah DCP (2011) – E11 Flood Prone Land
Pittwater LEP (2014) – 7.3 Flood Planning Pittwater LEP (2014) – 7.4 Flood Risk Management	Pittwater 21 DCP (2014) – B3.11 Flood Prone Land Pittwater 21 DCP (2014) – B3.12 Climate Change

* The Warringah LEP (2000) is relevant only for the “deferred lands” which affects only a very small number of properties, mostly in the Oxford Falls area.

Development on flood prone land must also comply with Council's Water Management for Development Policy, and if it is in the Warriewood Release Area, with the Warriewood Valley Water Management Specification. Guidelines for Flood Emergency Response Planning are available for addressing emergency response requirements in the DCP. These documents can be found on Council's website on the [Flooding page](#).

Note that if the property is affected by estuarine flooding or other coastal issues, these need to be addressed separately under the relevant DCP clauses.

When is a Flood Management Report required?

A Flood Management Report must be submitted with any Development Application on flood prone land (with exceptions noted below), for Council to consider the potential flood impacts and applicable controls. For Residential or Commercial development, it is required for development on land identified within the Medium or High Flood Risk Precinct. For Vulnerable or Critical development, it is required if it is within any Flood Risk Precinct.

There are some circumstances where a formal Flood Management Report undertaken by a professional engineer may not be required. However the relevant parts of the DCP and LEP would still need to be addressed, so as to demonstrate compliance. Examples where this may apply include:

- If all proposed works are located outside the relevant Flood Risk Precinct extent
- First floor addition only, where the floor level is above the Probable Maximum Flood level
- Internal works only, where habitable floor areas below the FPL are not being increased

Note that development on flood prone land will still be assessed for compliance with the relevant DCP and LEP, and may still be subject to flood related development controls.

What is the purpose of a Flood Management Report?

The purpose of a Flood Management Report is to demonstrate how a proposed development will comply with flood planning requirements, particularly the development controls outlined in the relevant LEP and DCP clauses. The report must detail the design, measures and controls needed to achieve compliance, following the steps outlined below.

A Flood Management Report should reflect the size, type and location of the development, proportionate to the scope of the works proposed, and considering its relationship to surrounding development. The report should also assess the flood risk to life and property.

Preparation of a Flood Management Report

The technical requirements for a Flood Management Report include (where relevant):

1. Description of development

- Outline of the proposed development, with plans if necessary for clarity
- Use of the building, hours of operation, proposed traffic usage or movement
- Type of use, eg vulnerable, critical, residential, business, industrial, subdivision, etc

2. Flood analysis

- 1% AEP flood level
- Flood Planning Level (FPL)
- Probable Maximum Flood (PMF) level
- Flood Risk Precinct, ie High, Medium or Low
- Flood Life Hazard Category
- Mapping of relevant extents
- Flood characteristics for the site, eg depth, velocity, hazard and hydraulic category, and the relevance to the proposed development

If the property is affected by an Estuarine Planning Level (EPL) which is higher than the FPL, then the EPL should be used as the FPL. If the FPL is higher than the PMF level, then the FPL should still be used as the FPL, as it includes freeboard which the PMF does not.

3. Assessment of impacts

- Summary of compliance for each category of the DCP, as per the table below.

	Compliance		
	N/A	Yes	No
A) Flood effects caused by Development			
B) Building Components & Structural Soundness			
C) Floor Levels			
D) Car parking			
E) Emergency Response			
F) Fencing			
G) Storage of Goods			
H) Pools			

- Demonstration of how the development complies with any relevant flood planning requirements from the DCP, LEP, Water Management for Development Policy, and if it is in the Warriewood Valley Urban Land Release Area, with the Warriewood Valley Water Management Specification (2001)
- For any non-compliance, a justification for why the development should still be considered.
- Calculations of available flood storage if compensatory flood storage is proposed
- Plan of the proposed development site showing the predicted 1% AEP and PMF flood extents, as well as any high hazard or floodway affectation
- Development recommendations and construction methodologies
- Qualifications of author - Council requires that the Flood Management Report be prepared by a suitably qualified Engineer with experience in flood design / management who has, or is eligible for, membership to the Institution of Engineers Australia
- Any flood advice provided by Council
- Any other details which may be relevant

Further information and guidelines for development are available on Council's website at:

<https://www.northernbeaches.nsw.gov.au/planning-and-development/building-and-renovations/development-applications/guidelines-development-flood-prone-land>

Council's Flood Team may be contacted on 1300 434 434 or at floodplain@northernbeaches.nsw.gov.au .