NORTHROP

Level 11, 345 George Street, Sydney NSW 2000
T (02) 9241 4188 F (02) 9241 4324
E sydney@northrop.com.au ABN 81 094 433 100

Job No. 200211

14.10.2022

Royal Far West

DA-STA-0003

Re: Proposed Mixed Use Development, Royal Far West, 14-22 Wentworth Street and 19-21 South Steyne, Manly

Flood Statement

Royal Far West has submitted a Development Application for the proposed mixed-use development at Royal Far West, 14-22 Wentworth Street and 19-21 South Steyne, Manly. The proposal comprises of an eight and five story mixed-use development, constructed over a continuous basement beneath.

Northrop has prepared this Flood Statement, in response to Council's RFI letter (dated 16 September 2022) to:

- Describe the characteristics of existing floodwaters (if any);
- Explain the impact on the proposed development; and
- Recommend measures for the development to manage the effects of potential flooding.
- Respond to Council's *Natural Environment Referral Response – Flood* to comply with the RL 4.92 Flood Planning Level.

Background

Northrop has reviewed flood data from the Flood Study Report "Manly to Seaforth Flood Study Revision 3" (Cardno, 22 February 2019, refer to Appendix A) and Flood Information provided by Northern Beaches Council dated 3 – 9 September 2020 (refer to Appendix B). This provides the results of flood modelling for the Manly to Seaforth Catchment and Flood Planning Levels for the site.

The Flood Study indicates that the site will have a minimal inundation of flood water and is categorized as a H1 (generally safe for vehicles, people, and buildings) and H2 (unsafe for small vehicles), Medium flood hazard. Refer to Figure 1, Figure 2, Figure 3 and Figure 4 to below.

Extracts from Flood Mapping

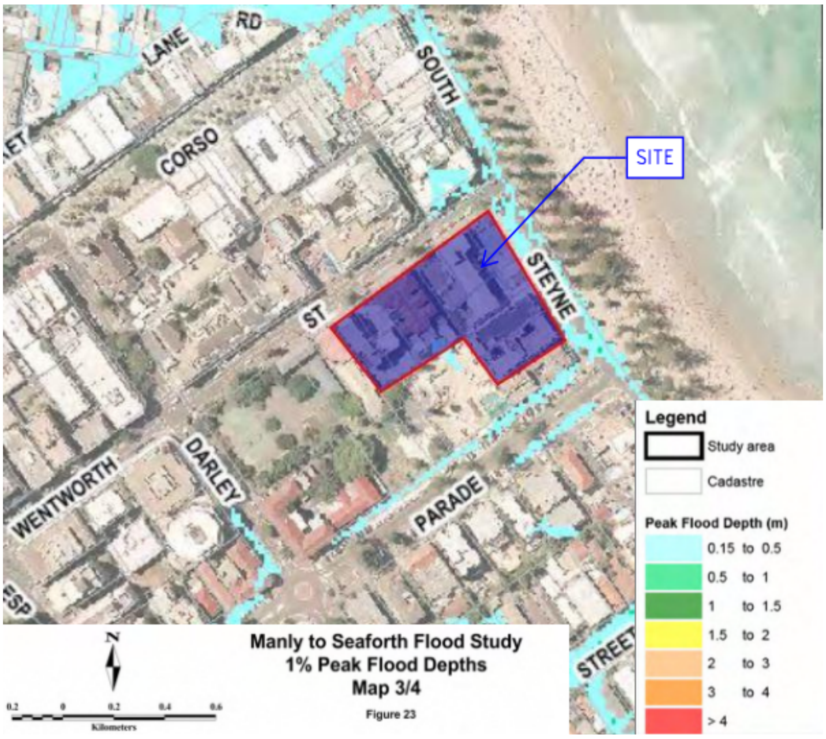


Figure 1 - Extract from 100 Year ARI (1% AEP) Peak Flood Depths

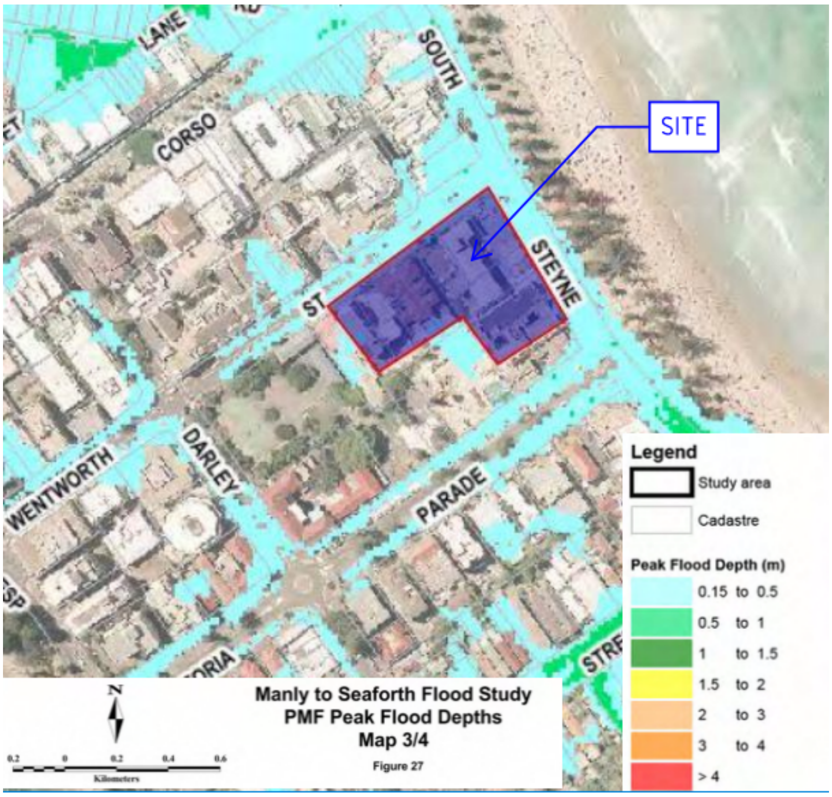


Figure 2 - Extract from PMF Peak Flood Depths

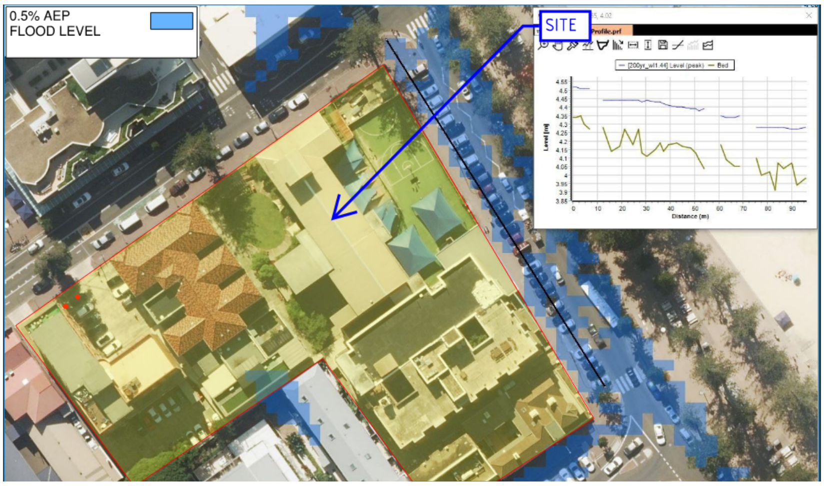


Figure 3 - Extract from 200 Year ARI (0.5% AEP) Flood Level

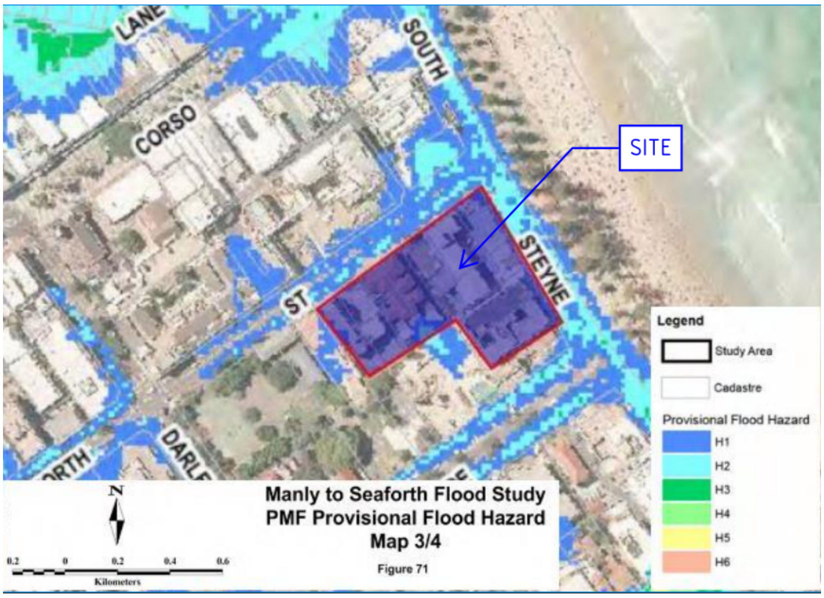


Figure 4 - Extract from Flood Study – Flood Hazard – PMF

Flood Planning Levels

The Flood Planning Level refers to the permissible minimum building floor levels for the proposed building. For below-ground parking or other forms of below-ground developments, the Flood Planning Level refers to the minimum level at each access point adjacent to a public area. Where more than one Flood Planning Level is applicable the higher of the applicable Flood Planning Levels shall prevail.

Figure 5 summarises the Flood Planning Levels provided in the Flood Information.

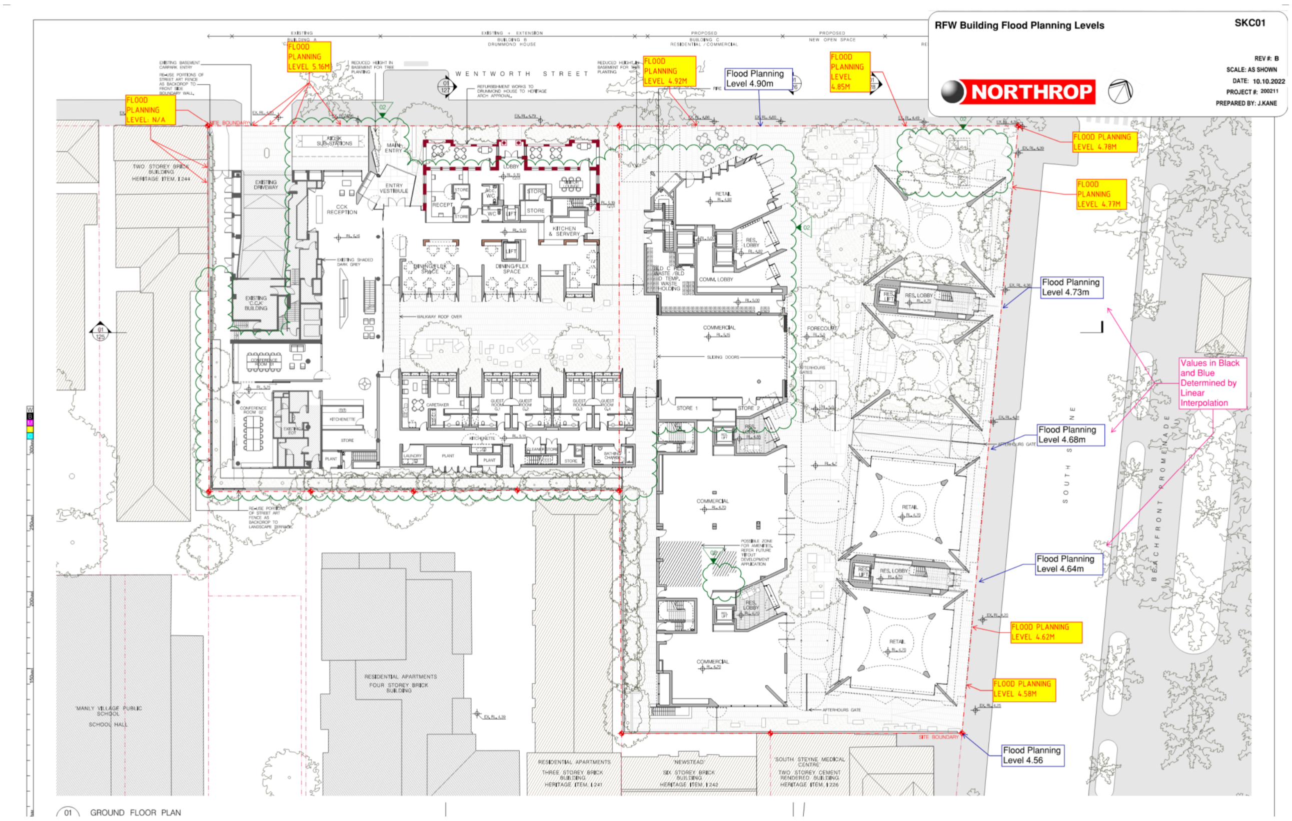


Figure 5 – Flood Planning Levels around the Development (Refer Appendix C)

Buildings

Northrop recommends the following Flood Planning Levels to inform the finished floor levels for the development in accordance with the Flood Study Report and Flood Information.

Table 1 summaries the Flood Planning Levels proposed for the main building blocks, obtained from site survey and levels along Wentworth Street and South Steyne.

Figure 5 shows the building layout and the location of the building entrances. Refer also to Appendix C

Table 1: Flood Planning Levels Proposed for the Main Building Blocks

Building Entrances	Area Description	Flood Planning Level (mAHD)	Proposed Building Floor Level (mAHD)
1.	Building A (Constructed) Carpark Entry (Wentworth Street)	RL 5.16	RL 5.15
2.	Building A (Constructed) Main Entrance to Lobby (Wentworth Street)	N/A	RL 5.15
3.	Building B North (Wentworth Street)	N/A	RL 5.15
4.	Building B South	N/A	RL 5.15
5.	Building C Northern Entrance to Lobby (Wentworth Street)	RL 4.90	RL 4.92
6.	Building C Central & Southern Entrance to Lobby	RL 4.68	RL 4.85 & 4.75 respectively
7.	Building C Retail (Wentworth Street)	RL 4.92	RL 4.92
8.	Building D Northern Lobby Entrance (South Steyne)	RL 4.73	RL 4.75
9.	Building D Southern Lobby Entrance (South Steyne) + Retail Premises	RL 4.68	RL 4.70

Basement Carpark Entry

The proposed basement carpark for the main buildings is accessed from the existing Building A basement entrance point in the western corner of the site. This existing entrance provides vehicular access to Wentworth Street and has a driveway ramp crest level of 5.15 mAHD, which matches closely with the recommended Flood Planning Level of 5.16 mAHD.

Council Comments.

Council's comment regarding update to the retail of Building C along Wentworth Street have been addressed in this report.

Conclusions

This Flood Statement has been prepared by Northrop to support a Development Application for the proposed development. The outcomes of this assessment demonstrate:

- That the property is mostly outside of the 1% AEP floodplain.
- Flood Planning Levels have been advised in accordance with the Flood Information provided by the Northern Beaches Council, and Flood Study Report “Manly to Seaforth Flood Study Revision 3” (Cardno, 22 February 2019).
- Floor levels and the basement entrance to the proposed development achieve Flood Planning Level requirements.
- Site levels have been amended in accordance with Councils response letter dated 17/08/2022 “Natural Environment Referral Response – Flood”.

We trust this Statement is sufficient to support the Development Application for the subject site.

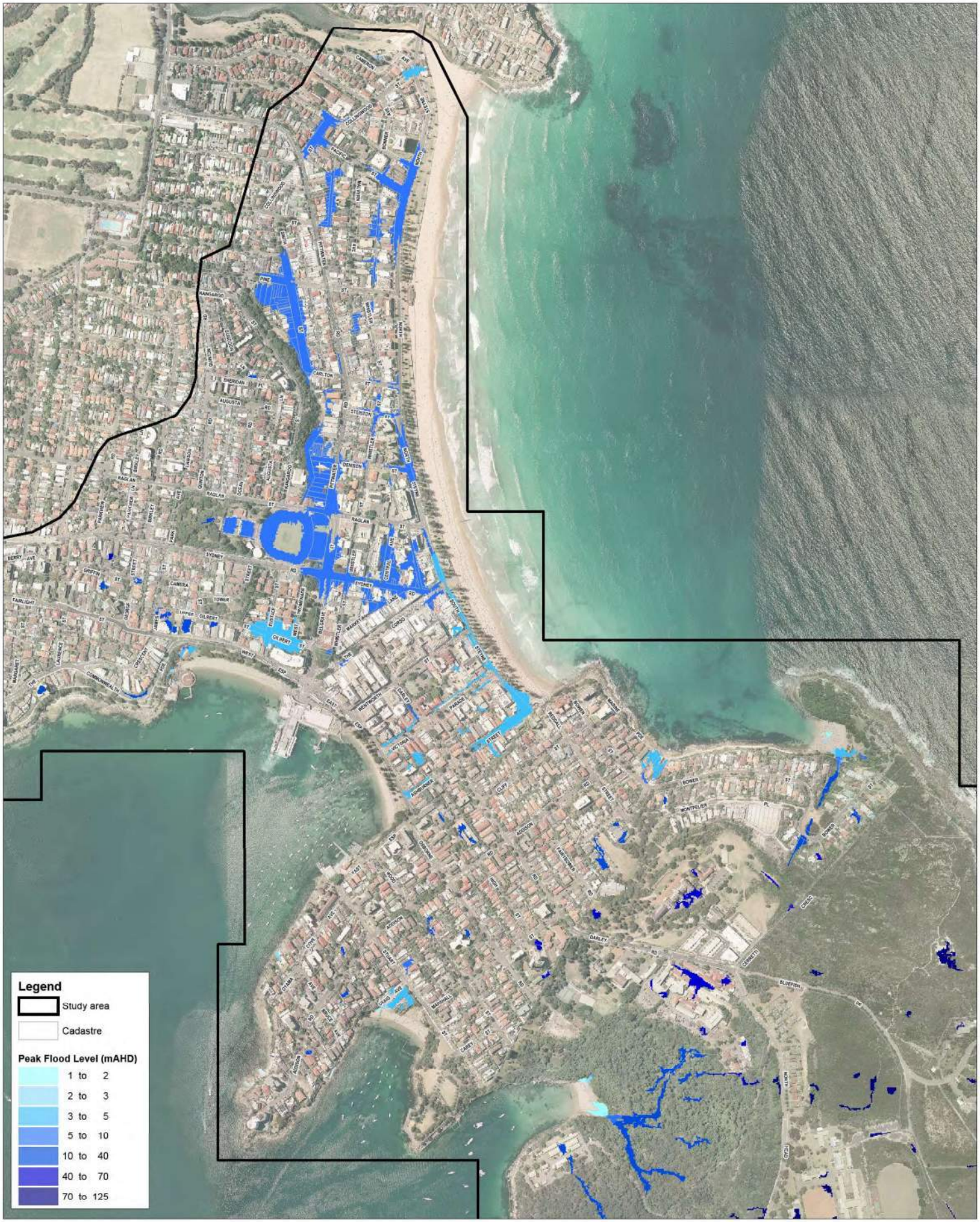
Yours faithfully,

Danny Liganaris

Civil Engineer

Northrop Consulting Engineers

APPENDIX A – Manly To Seaforth Flood Study Revision 3 (Cardno, 22 February 2019)



N

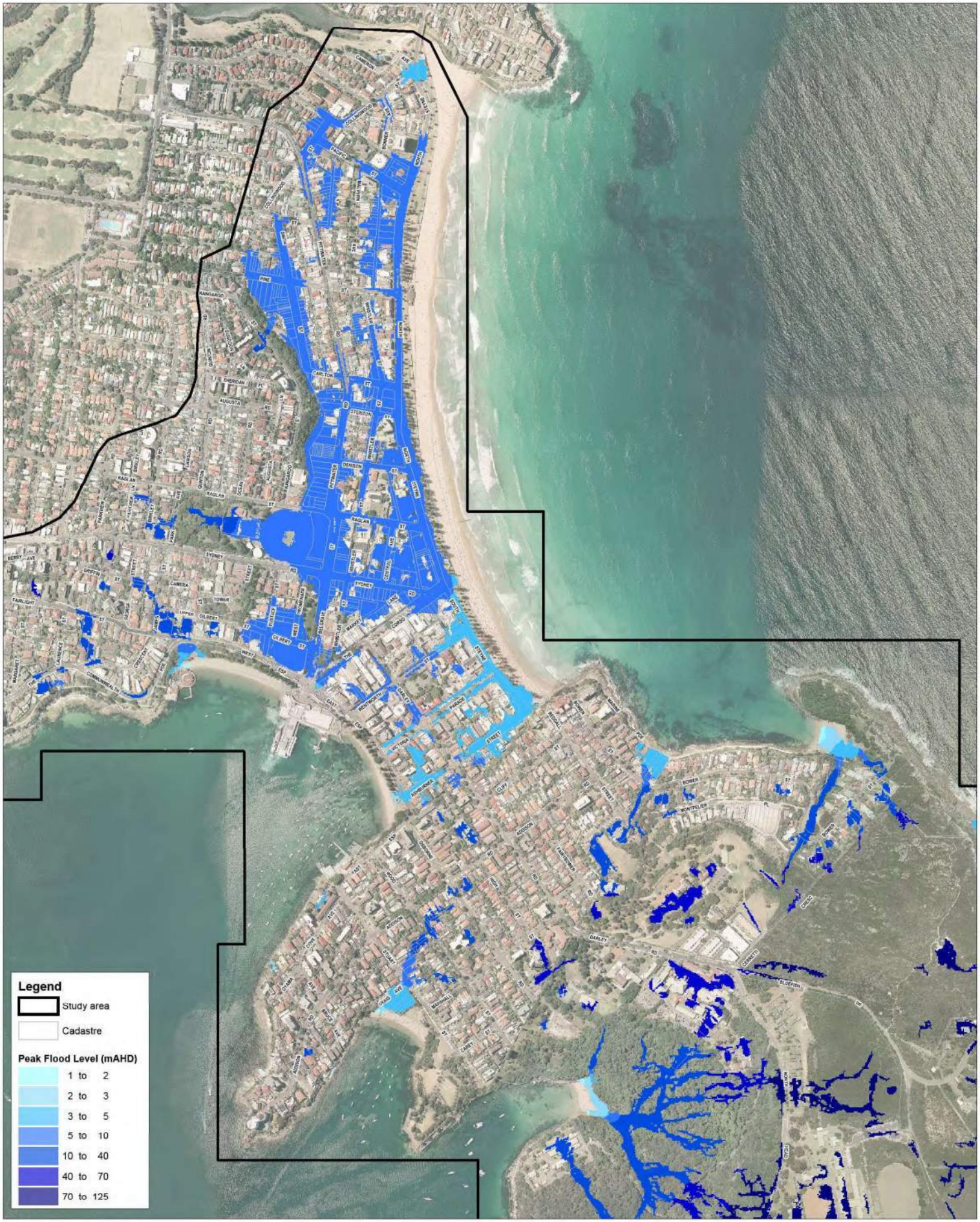
0.2 0 0.2 0.4 0.6

Kilometers

Manly to Seaforth Flood Study
1% Peak Flood Water Level
Map 3/4

Figure 11

Cardno



N

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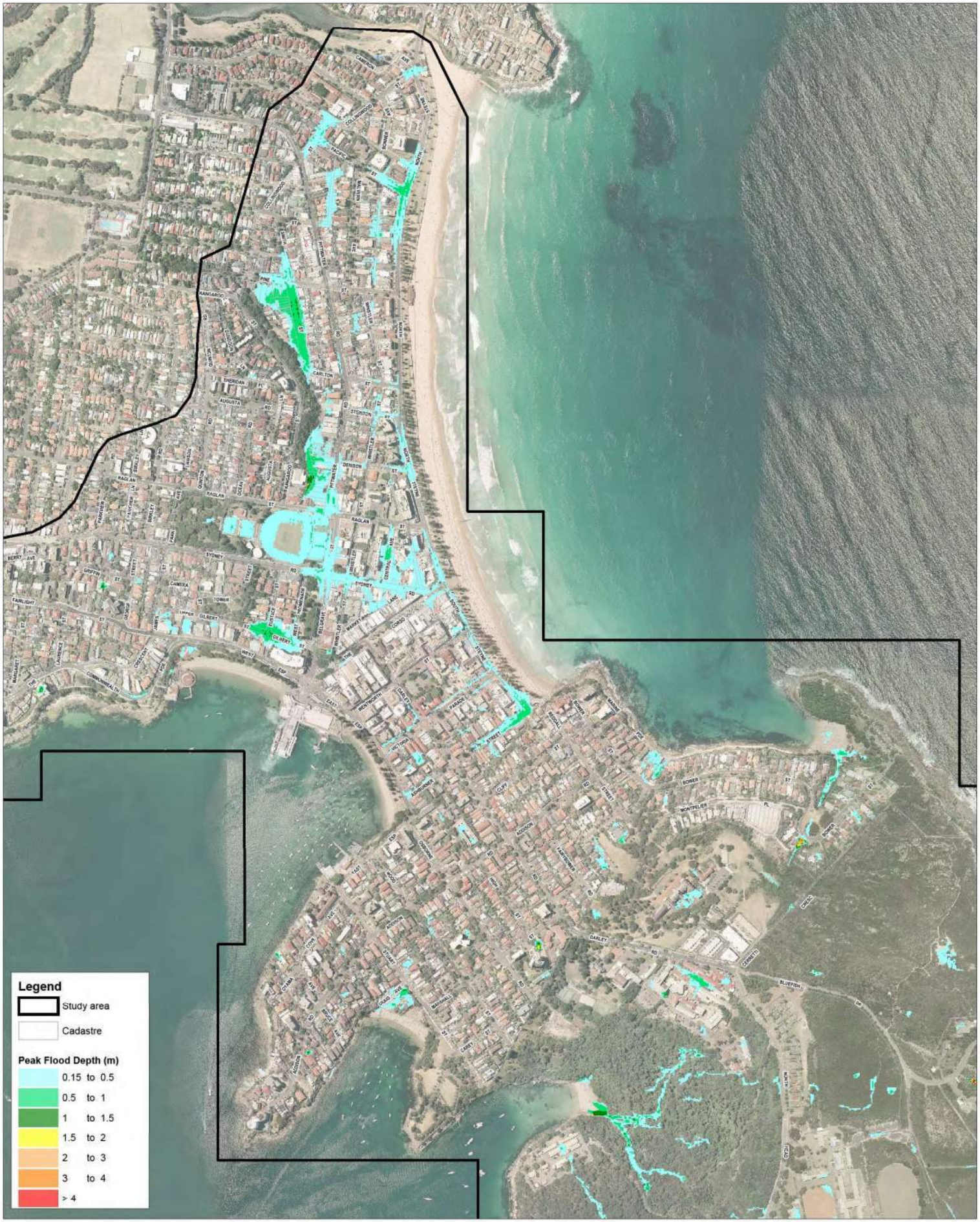
Kilometers

Manly to Seaforth Flood Study
PMF Peak Flood Water Level
Map 3/4

Figure 15

Cardno



N

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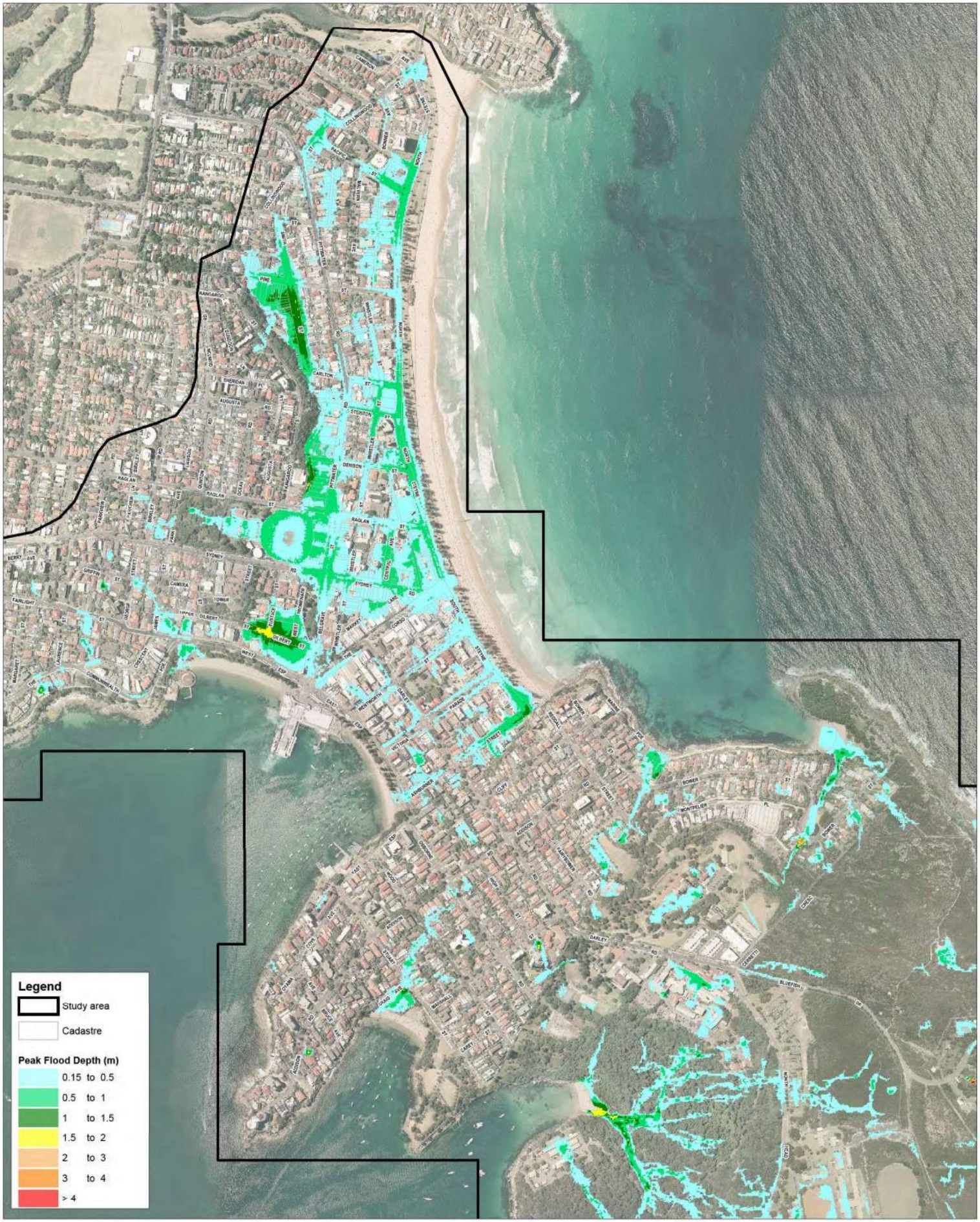
Kilometers

Manly to Seaforth Flood Study
1% Peak Flood Depths
Map 3/4

Figure 23

Cardno



N

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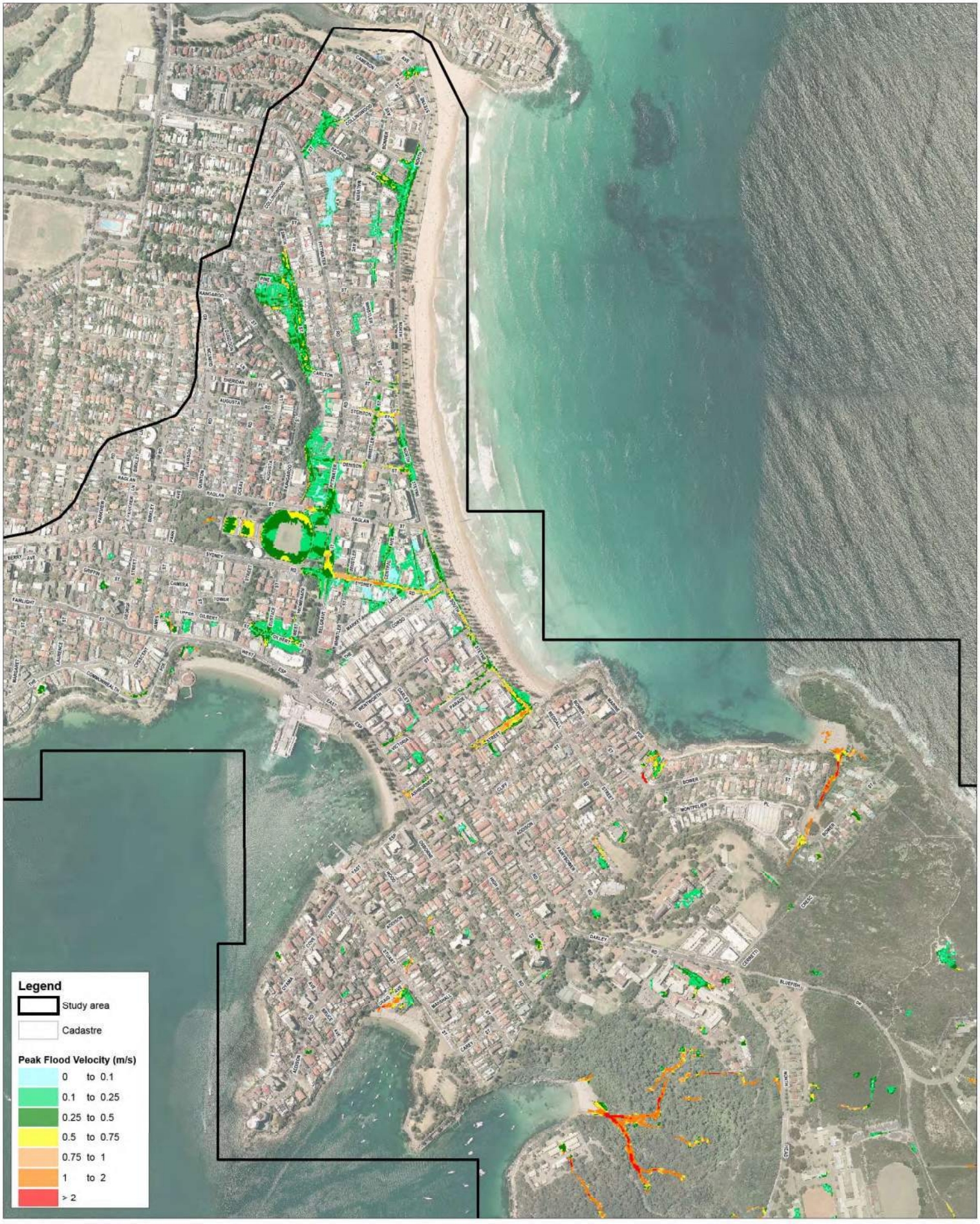
Kilometers

Manly to Seaforth Flood Study
PMF Peak Flood Depths
Map 3/4

Figure 27

Cardno



N

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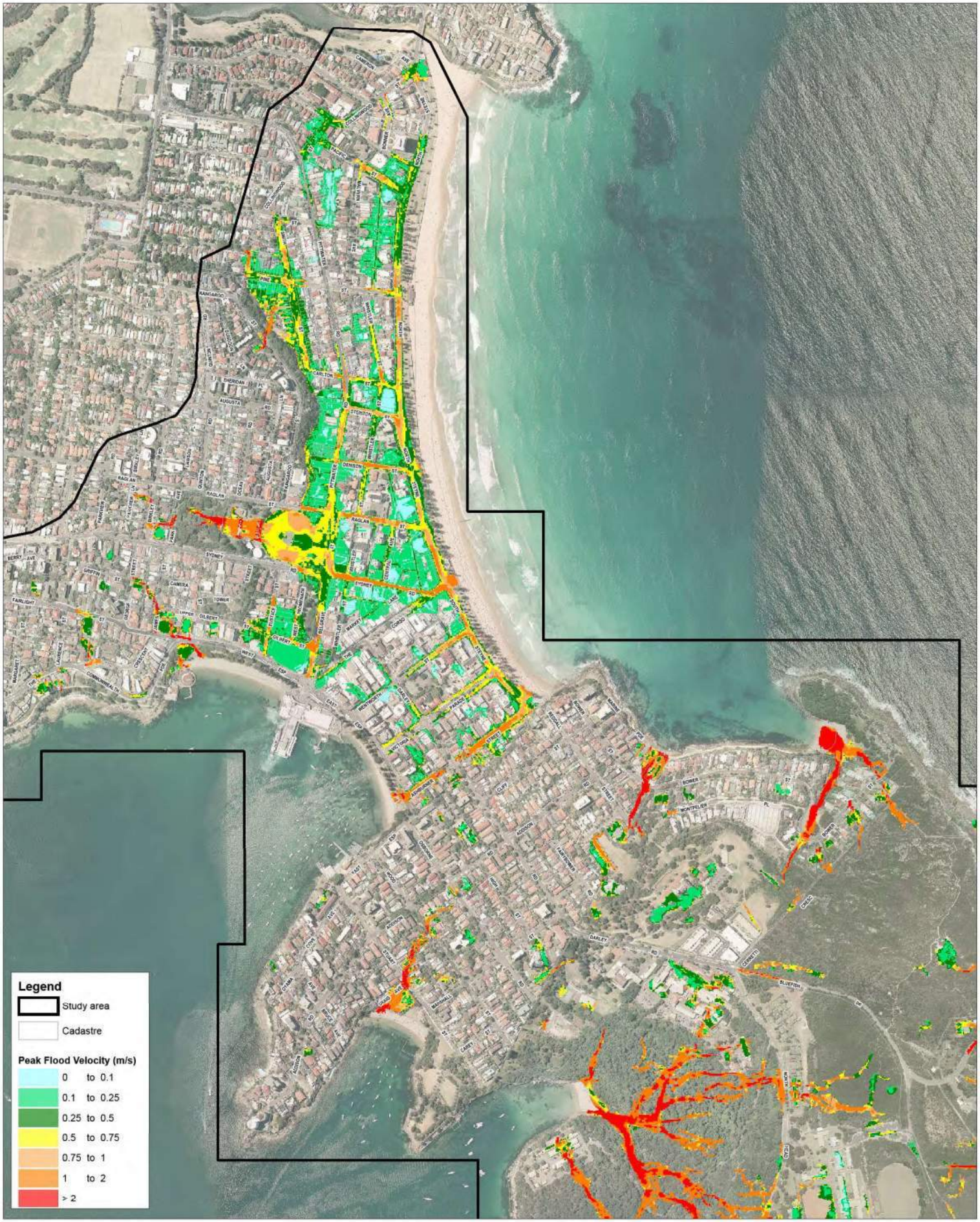
Kilometers

Manly to Seaforth Flood Study
1% Peak Flood Velocity
Map 3/4

Figure 35

Cardno



N

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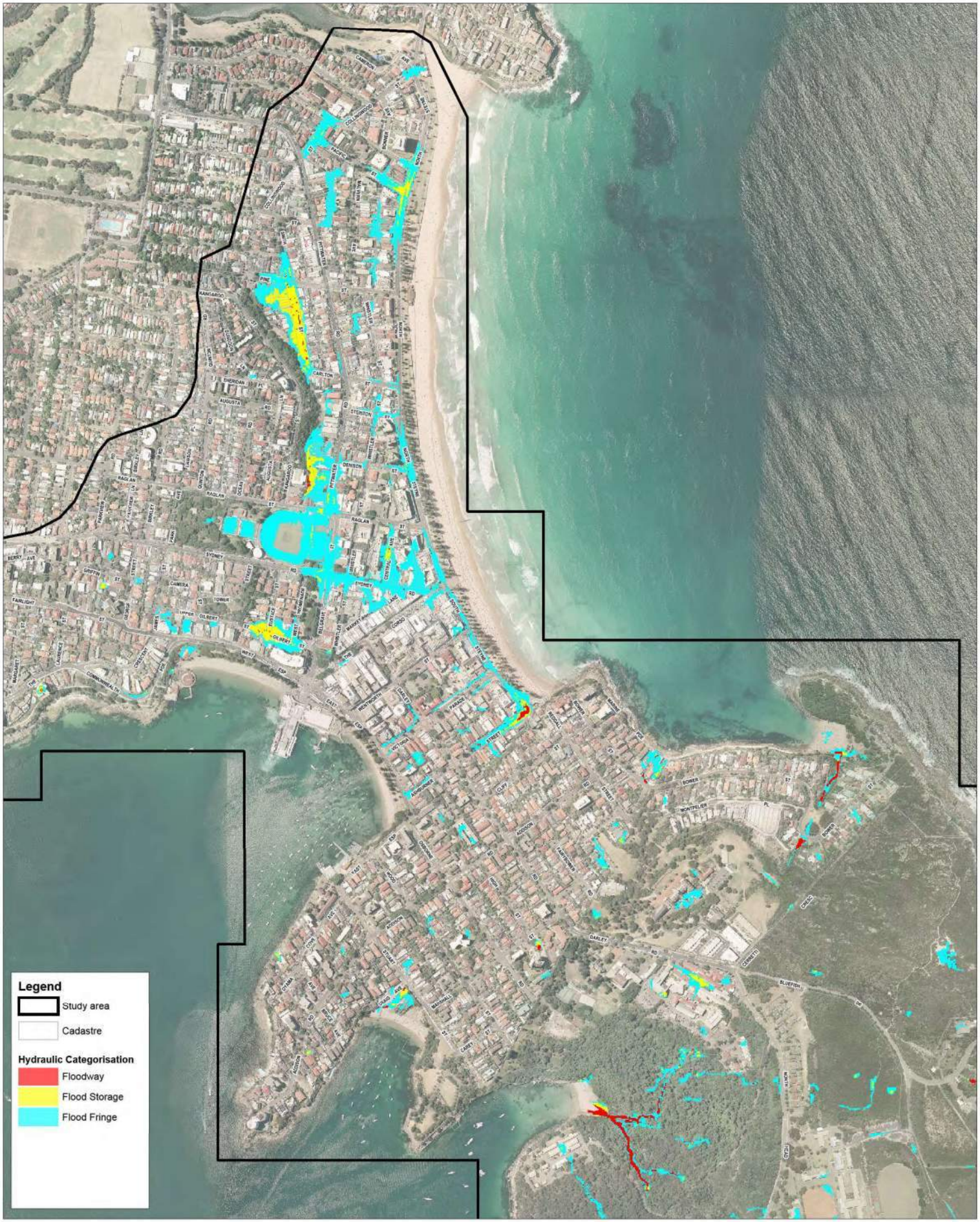
Kilometers

Manly to Seaforth Flood Study
PMF Peak Flood Velocity
Map 3/4

Figure 39

Cardno



N

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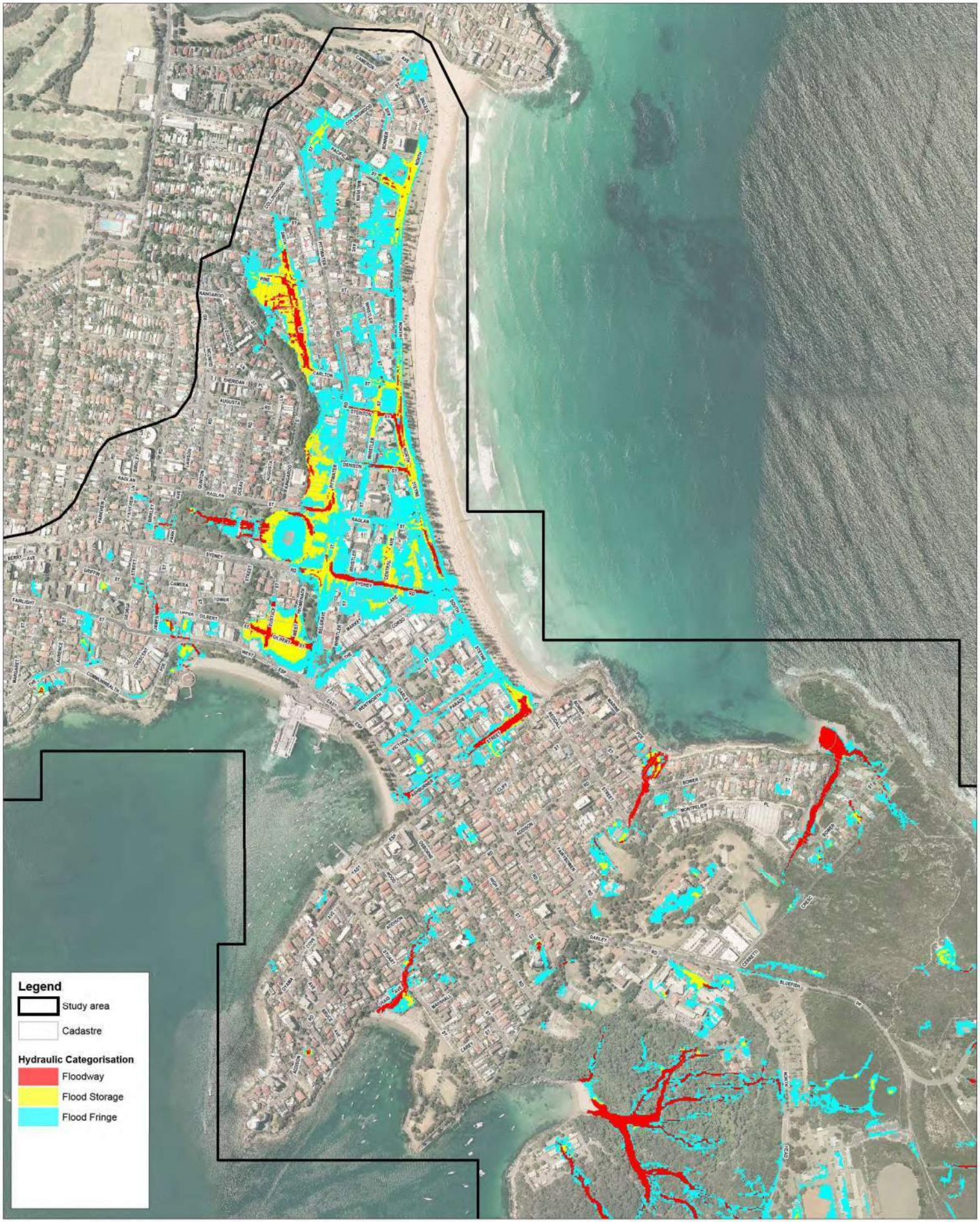
Kilometers

Manly to Seaforth Flood Study
1% Hydraulic Categories
Map 3/4

Figure 47

Cardno



N

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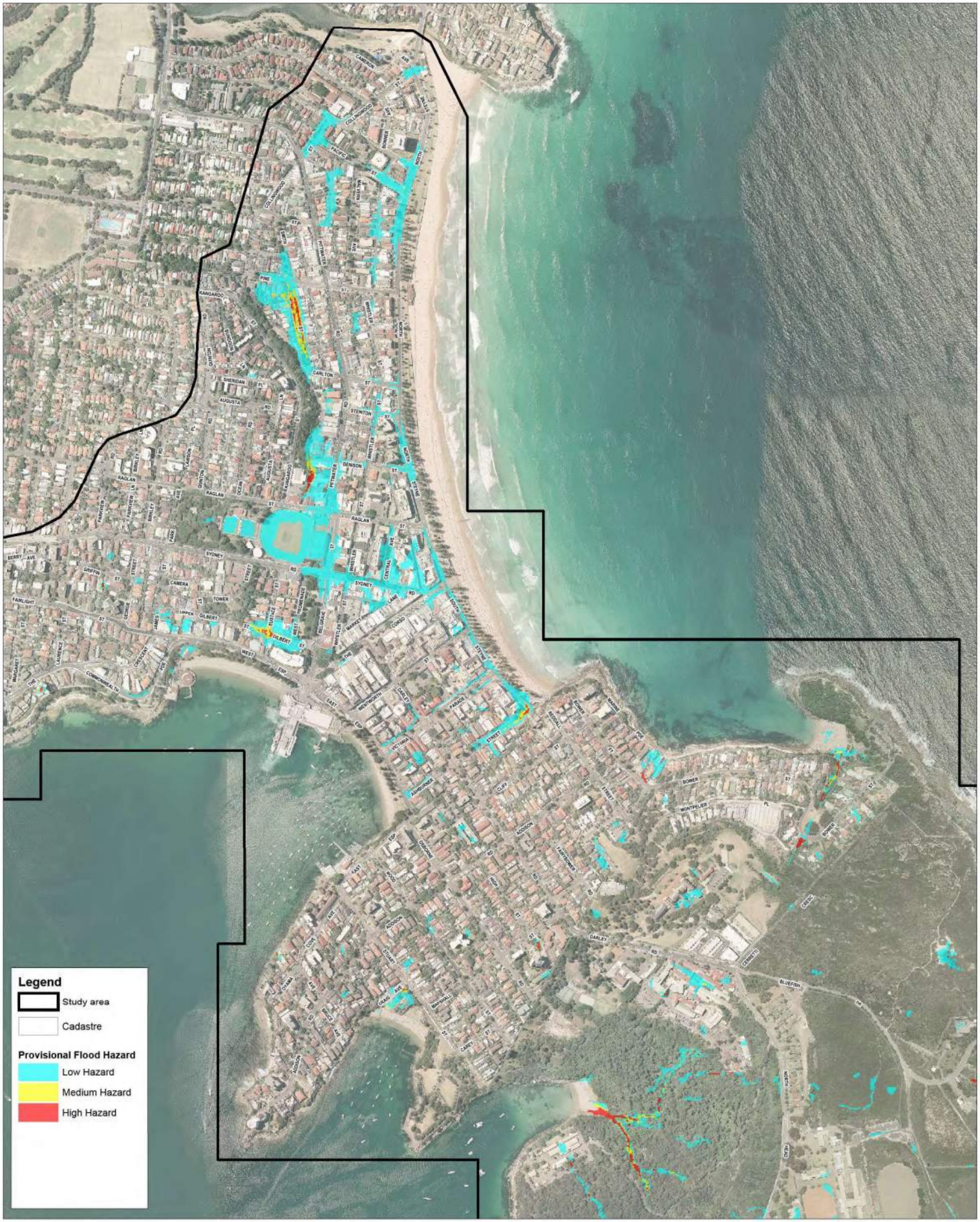
Kilometers

Manly to Seaforth Flood Study
PMF Hydraulic Categories
Map 3/4

Figure 51

Cardno



N

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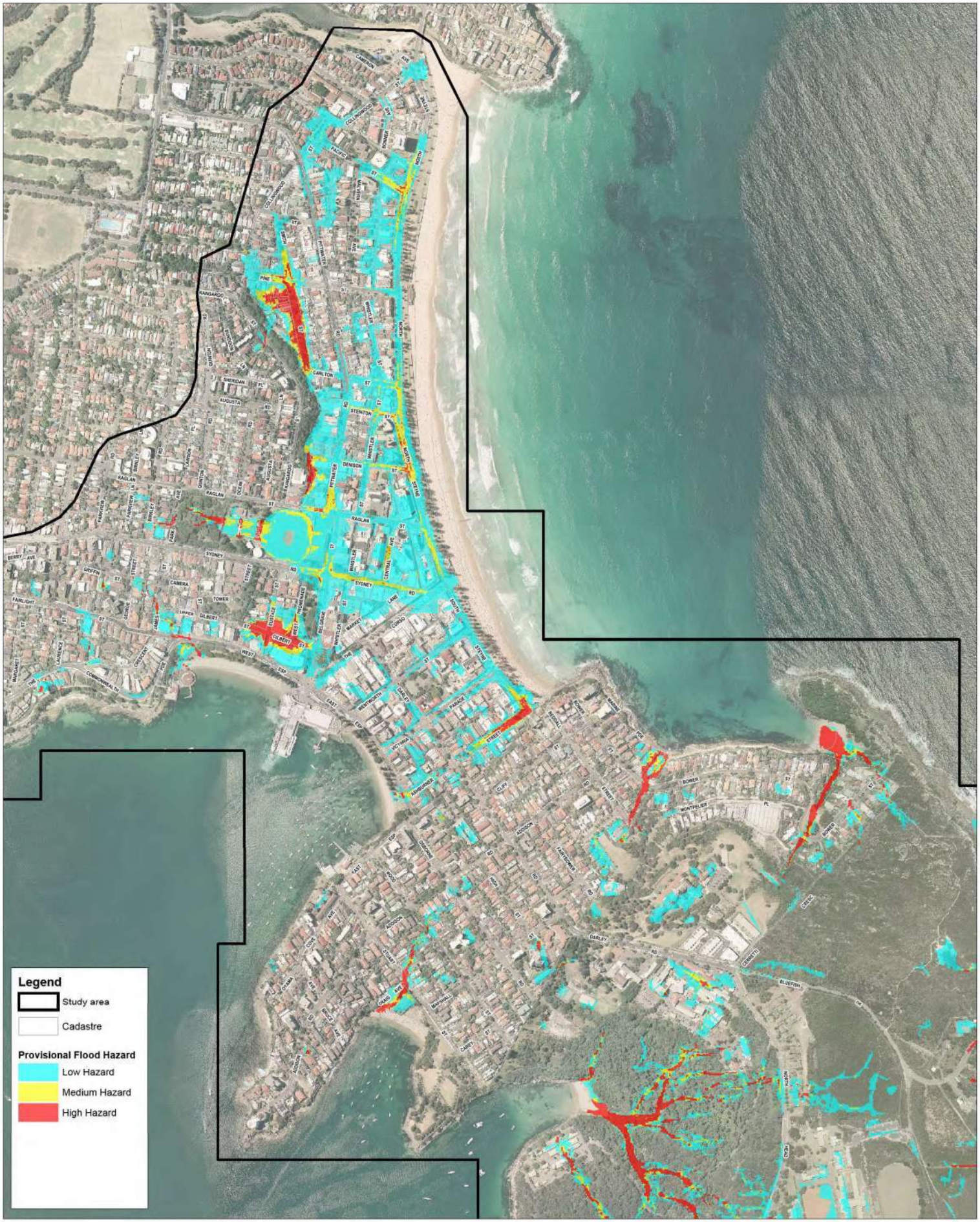
Kilometers

Manly to Seaforth Flood Study
1% Provisional Flood Hazard
Map 3/4

Figure 59

Cardno



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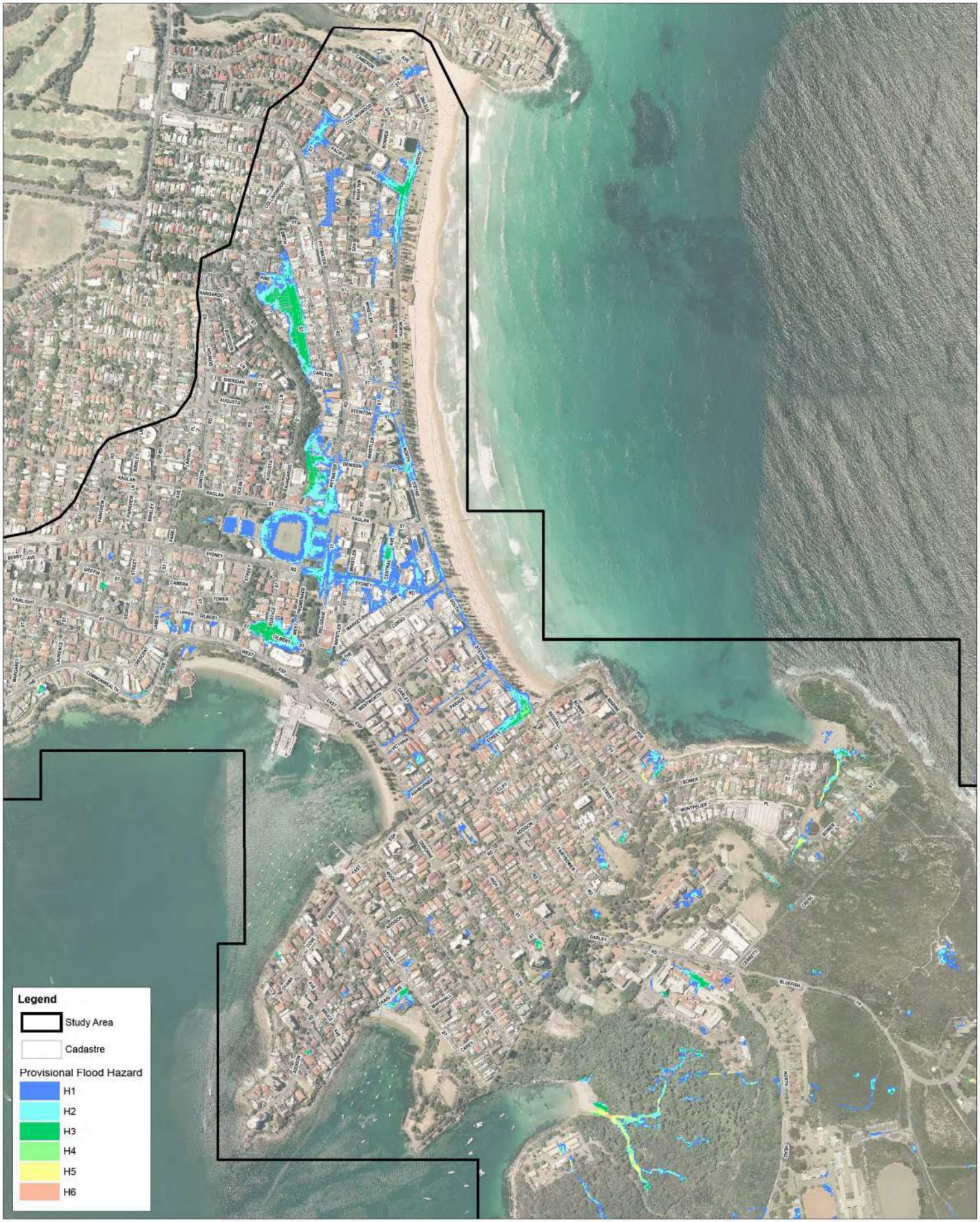
Kilometers

Manly to Seaforth Flood Study
PMF Provisional Flood Hazard
Map 3/4

Figure 63

Cardno



N

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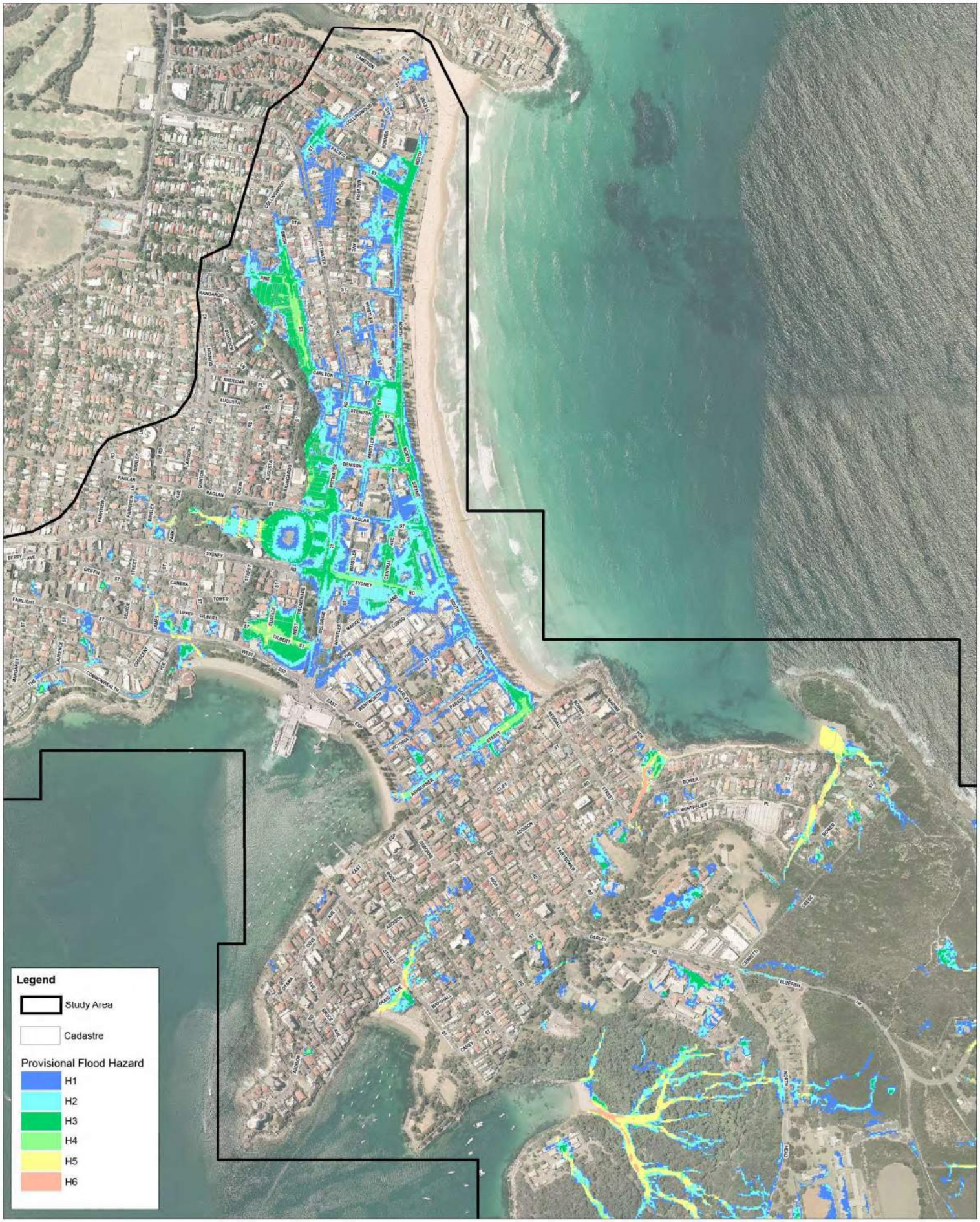
Kilometers

Manly to Seaforth Flood Study
1% Provisional Flood Hazard
Map 3/4

Figure 67

Cardno



N

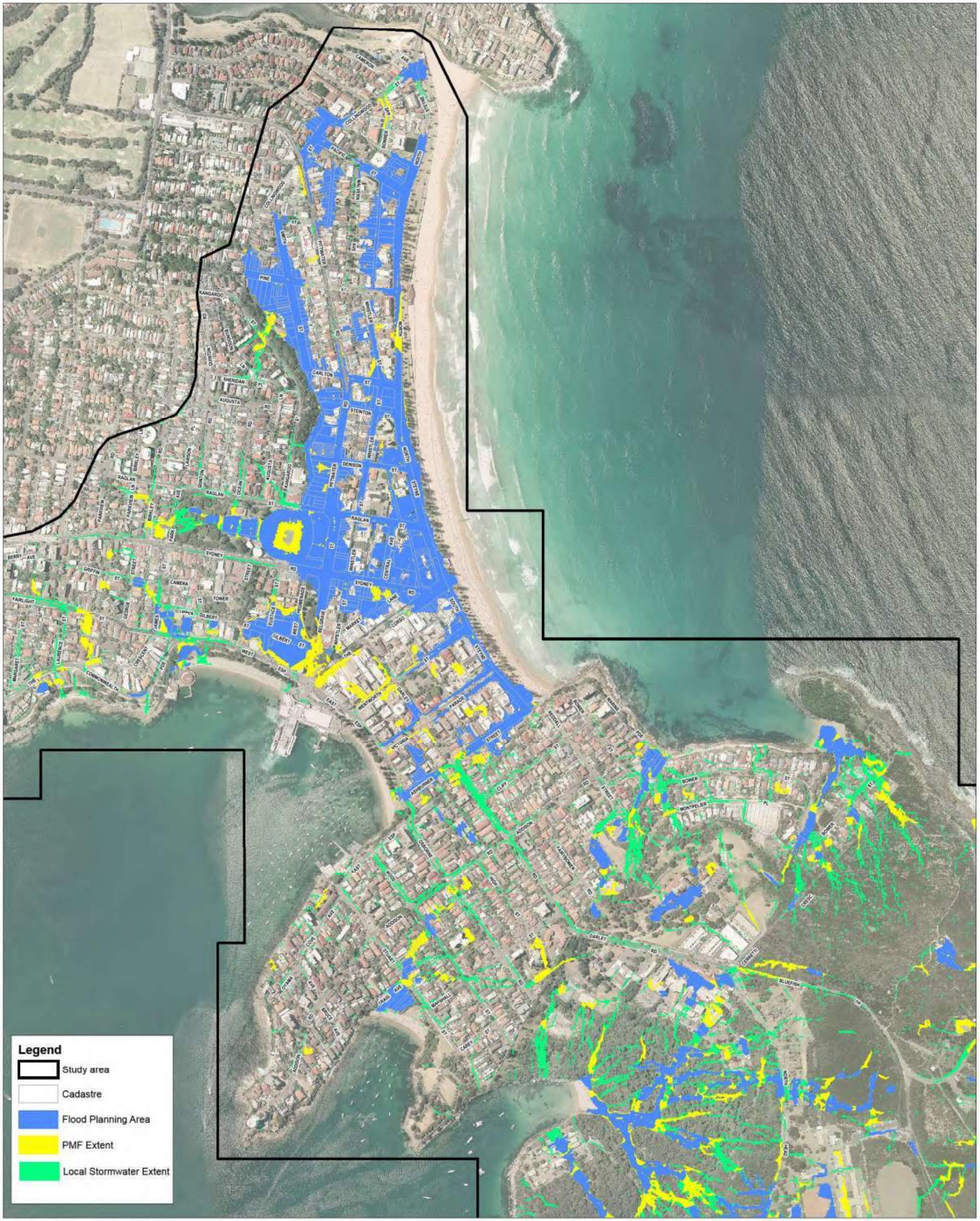
0.2 0 0.2 0.4 0.6

Kilometers

Manly to Seaforth Flood Study
PMF Provisional Flood Hazard
Map 3/4

Figure 71

Cardno



N

0.2 0 0.2 0.4 0.6

Kilometers

Manly to Seaforth Flood Study
Flood Planning Area
Map 3/4

Cardno

Figure 106

APPENDIX B – Flood Information (Northern Beaches Council, 3 – 9 September 2020)

FLOOD INFORMATION REQUEST – COMPREHENSIVE

Property: 22 Wentworth Street MANLY NSW 2095
Lot DP: Lot 1 DP 223468
Issue Date: 03/09/2020
Flood Study Reference: Manly to Seaforth Flood Study 2019

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]: 4.92 m AHD

1% AEP Flood – See Flood Map B

1% AEP Maximum Water Level [2, 3]: N/A mAHD

1% AEP Maximum Peak Depth from natural ground level[3]: N/A m

1% AEP Maximum Velocity: N/A m/s

1% AEP Provisional Flood Hazard: N/A **See Flood Map D**

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

Probable Maximum Flood (PMF) – See Flood Map C

PMF Maximum Water Level [4]: 4.87 m AHD

PMF Maximum Depth from natural ground level: 0.20 m

PMF Maximum Velocity: 0.49 m/s

PMF Flood Hazard: Low **See Flood Map F**

PMF Hydraulic Categorisation: N/A **See Flood Map G**

Flooding with Climate Change (See Flood Map H)

The following is for the 30% Rainfall intensity increase and 0.9m Sea Level Rise Scenario:

1% AEP Maximum Water Level with Climate change [3]: N/A m AHD

1% AEP Maximum Depth with Climate Change[3]: N/A m

1% AEP Maximum Velocity with Climate Change[3]: N/A m/s

Flood Life Hazard Category – See Map I

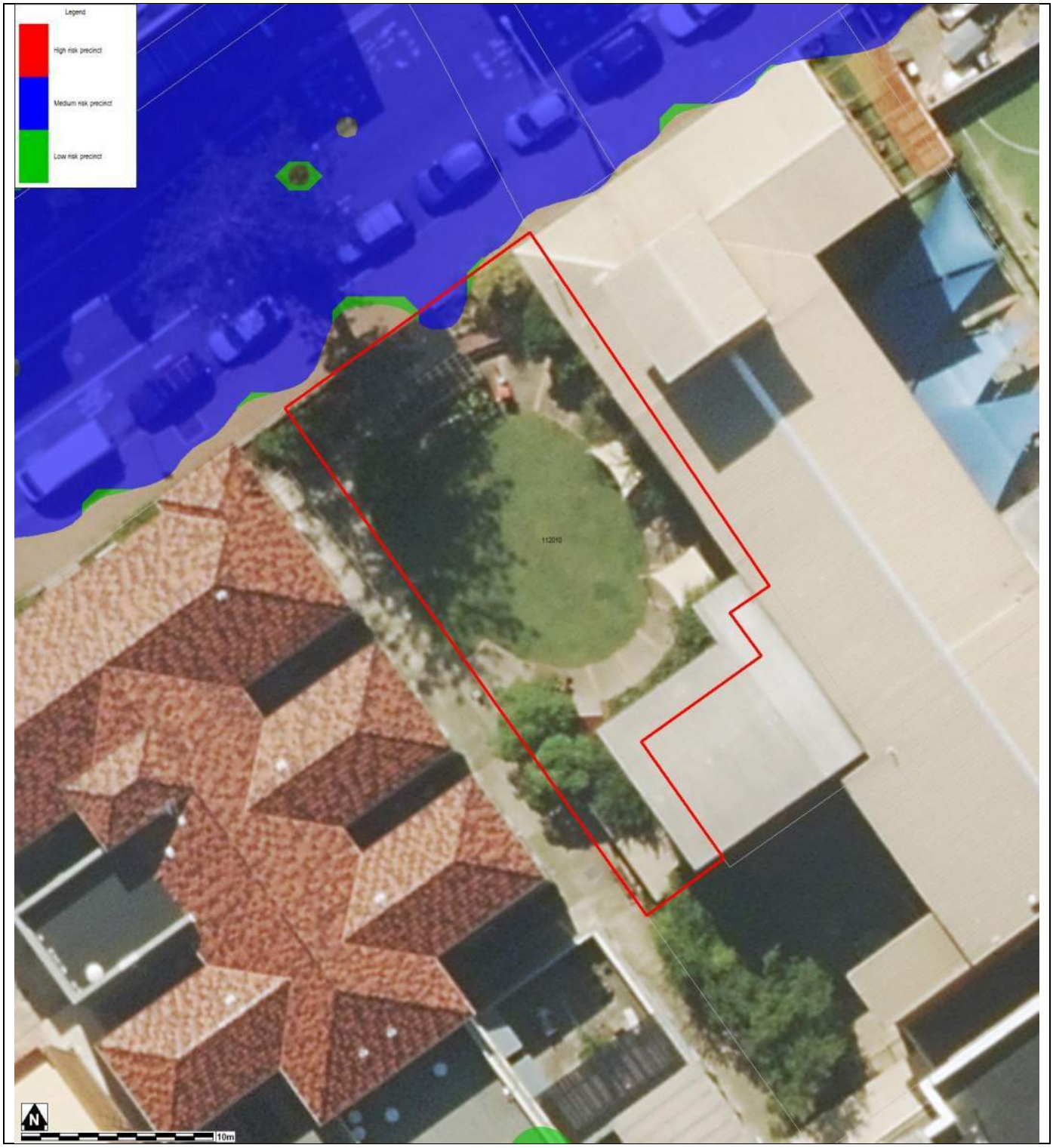
Indicative Ground Surface Spot Heights – See Map J

[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:) 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	4.92	4.83	0.16	0.41

WL – Water Level
PMF – Probable Maximum Flood
N/A = no peak water level/depth/velocity available in flood event

Climate Change Flood Levels (30% Rainfall intensity and 0.9m Sea Level Rise)

ID	CC 1% AEP Max WL (m AHD)	CC1 % AEP Max Depth (m)
1	N/A	N/A

A variable Flood Planning Level might apply - 0.5m above 1% AEP max water level (for Mainstream flooding) or 0.5m above the 1% AEP max water level flow path extent with depth greater than 0.3m and 0.3m above the 1% AEP max water level flow path with depth 0.3m and less (for overland flow).

If the CC 1% AEP level is less than the 1% AEP level, this is probably because the 1% AEP level used for planning includes a 5% AEP ocean surge. In this case, the 1% AEP value should be used.

WL – Water Level
PMF – Probable Maximum Flood
N/A = no peak water level/depth/velocity available in flood event.

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:) 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:) and aerial photography (Source: NearMap 2014) are indicative only

FLOOD MAP D: 1% AEP FLOOD HAZARD 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:) and aerial photography (Source: NearMap 2014) are indicative only

FLOOD MAP E: 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:) and aerial photography (Source: NearMap 2014) are indicative only

FLOOD MAP F: PMF FLOOD HAZARD EXTENT MAP

Notes:

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

FLOOD MAP G: PMF FLOOD HYDRAULIC CATEGORY EXTENT MAP

Notes:

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

FLOOD MAP H: 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:) and aerial photography (Source: NearMap 2014) are indicative only

FLOOD MAP I: FLOOD LIFE HAZARD CATEGORY

Notes:

- For additional information on Flood Life Hazard Categories, refer to 'Flood Emergency Response Planning for Development in Pittwater Policy' and Pittwater 21 DCP Control B3.13.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source:) and aerial photography (Source Near Map 2014) are indicative only.

MAP J: 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 ± 0.2m vertically and ± 0.15m 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.

GUIDELINES for Preparing a Flood Management Report

Introduction

These guidelines are intended to provide advice to applicants on preparing a Flood Management Report. The purpose of a Flood Management Report is to help applicants measure and manage the flood risk to life and property on their site.

When is a Flood Management Report required?

A Flood Management Report must be submitted with any Development Application on flood prone land, for Council to consider the potential flood impacts and 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.

Note that the flood extents shown on the mapping are indicative only. It is recommended that flood levels are compared to registered ground survey to more accurately determine the flood extent.

There are some circumstances where a 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 Flood Planning Level 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 in a Flood Management Report?

The aim of a Flood Management Report is to demonstrate how a proposed development will comply with the flood related 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.

Technical requirements of a Flood Management Report

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

1. ***Description of development***

   The description of development should identify:
   - 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, ie, critical, vulnerable, subdivision, residential, business, industrial, recreational, environmental or concessional

2. ***Flood analysis***

   The flood analysis should include:
   - Predicted 1 in 100 year flood level
   - Flood Planning Level (FPL)
   - Probable Maximum Flood (PMF) level
   - Flood Risk Precinct, ie High, Medium or Low
   - Flood Life Hazard Category (in former Pittwater Council area only)
   - Mapping of relevant extents
   - Flood characteristics for the site, eg depth, velocity, hazard and hydraulic category, and the impact these have on the proposed development

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

3. Assessment of impacts

The assessment of impacts should address the various elements of the relevant LEP and DCP. A simple compliance table should be provided, similar to the table one below.

	Compliance		
	Not Applicable	Yes	No
A Flood effects caused by Development			
B Drainage Infrastructure & Creek Works			
C Building Components & Structural			
D Storage of Goods			
E Flood Emergency Response			
F Floor Levels			
G Car Parking			
H Fencing			
I Pools			

Further details of what is required for each of these categories can be found in the *Development Control Plan for Flood Prone Land*.

For any of these categories which are applicable, the assessment should demonstrate how the development complies, or if it doesn't, provide an explanation of why the development should still be considered.

Reporting requirements for a Flood Management Report

The Flood Management Report should include:

a) Executive summary
b) Location plan, at an appropriate scale, that includes geographical features, street names and identifies all waterways and Council stormwater pipes, pits and easements
c) Plan of the proposed development site showing the extent of the predicted 100 year, any high hazard or floodway conditions and the PMF flood event
d) Development recommendations and construction methodologies
e) Calculation formulae (particularly for flood storage)
f) Clear referencing using an accepted academic referencing system (eg. Harvard)
g) Analysis of development against relevant State Environmental Planning Policies
h) Analysis of development against relevant Local Environment Plan and Policies
i) Conclusion detailing key points
j) Standard Hydraulic Certification (Form A/A1)
k) Qualifications of author
l) Any flood advice provided by Council
m) Any other details which may be relevant

NOTE: 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 Australian Institute of Engineers.

For further information please contact Stormwater and Floodplain Team on 1300 434 434 or via email at floodplain@northernbeaches.nsw.gov.au

Attachment A

NORTHERN BEACHES COUNCIL STANDARD HYDRAULIC CERTIFICATION FORM

FORM A/A1 – To be submitted with Development Application

Development Application for

Address of site: _____

Declaration made by hydraulic engineer or professional consultant specialising in flooding/flood risk management as part of undertaking the Flood Management Report:

I, _____ on behalf of _____
(Insert Name) (Trading or Business/ Company Name)

on this the _____ certify that I am engineer or a
(Date)

professional consultant specialising in flooding and I am authorised by the above organisation/ company to issue this document and to certify that the organisation/ company has a current professional indemnity policy of at least $2 million.

Flood Management Report **Details:**

Report Title: …….

Report Date: …….

Author: …….

Author's Company/Organisation: …….

I: _____
(Insert Name)

Please tick all that are applicable (more than one box can be ticked)

☐ have obtained and included flood information from Council (must be less than 12 months old) **(This is mandatory)**

☐ have followed Council's Guidelines for Preparing a Flood Management Report

☐ have requested a variation to one or more of the flood related development controls. Details are provided in the *Flood Management Report*.

Signature …….

Name ……..

FLOOD INFORMATION REQUEST – COMPREHENSIVE

Property: 22 Wentworth Street MANLY NSW 2095
Lot DP: Lot 12 DP 1096038
Issue Date: 03/09/2020
Flood Study Reference: Manly to Seaforth Flood Study 2019

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]: 4.62 m AHD

1% AEP Flood – See Flood Map B

1% AEP Maximum Water Level [2, 3]: N/A mAHD

1% AEP Maximum Peak Depth from natural ground level[3]: N/A m

1% AEP Maximum Velocity: N/A m/s

1% AEP Provisional Flood Hazard: N/A **See Flood Map D**

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

Probable Maximum Flood (PMF) – See Flood Map C

PMF Maximum Water Level [4]: 5.01 m AHD

PMF Maximum Depth from natural ground level: 0.27 m

PMF Maximum Velocity: 0.22 m/s

PMF Flood Hazard: Low **See Flood Map F**

PMF Hydraulic Categorisation: N/A **See Flood Map G**

Flooding with Climate Change (See Flood Map H)

The following is for the 30% Rainfall intensity increase and 0.9m Sea Level Rise Scenario:

1% AEP Maximum Water Level with Climate change [3]: 4.36 m AHD

1% AEP Maximum Depth with Climate Change[3]: 0.15 m

1% AEP Maximum Velocity with Climate Change[3]: m/s

Flood Life Hazard Category – See Map I

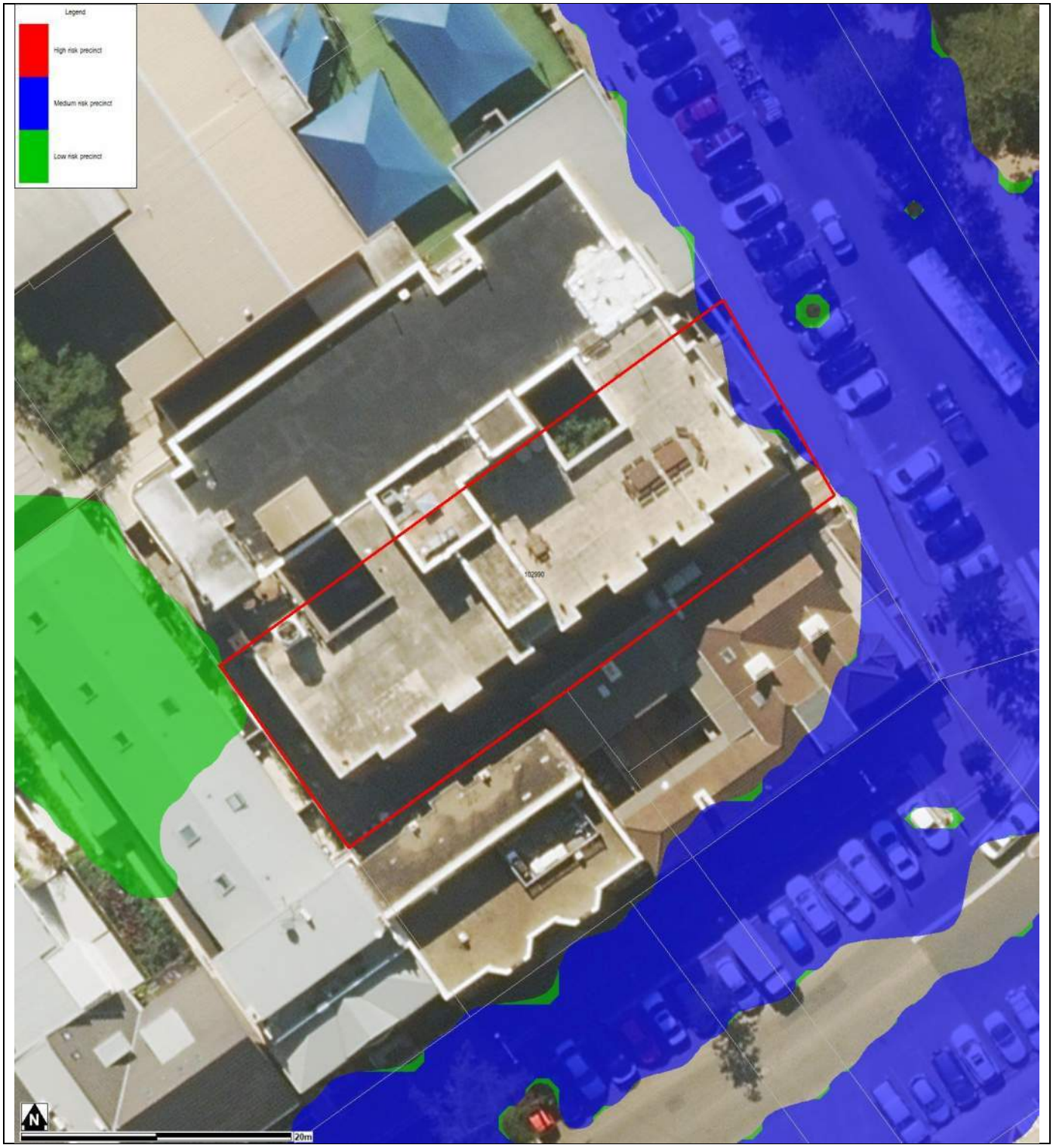
Indicative Ground Surface Spot Heights – See Map J

[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.

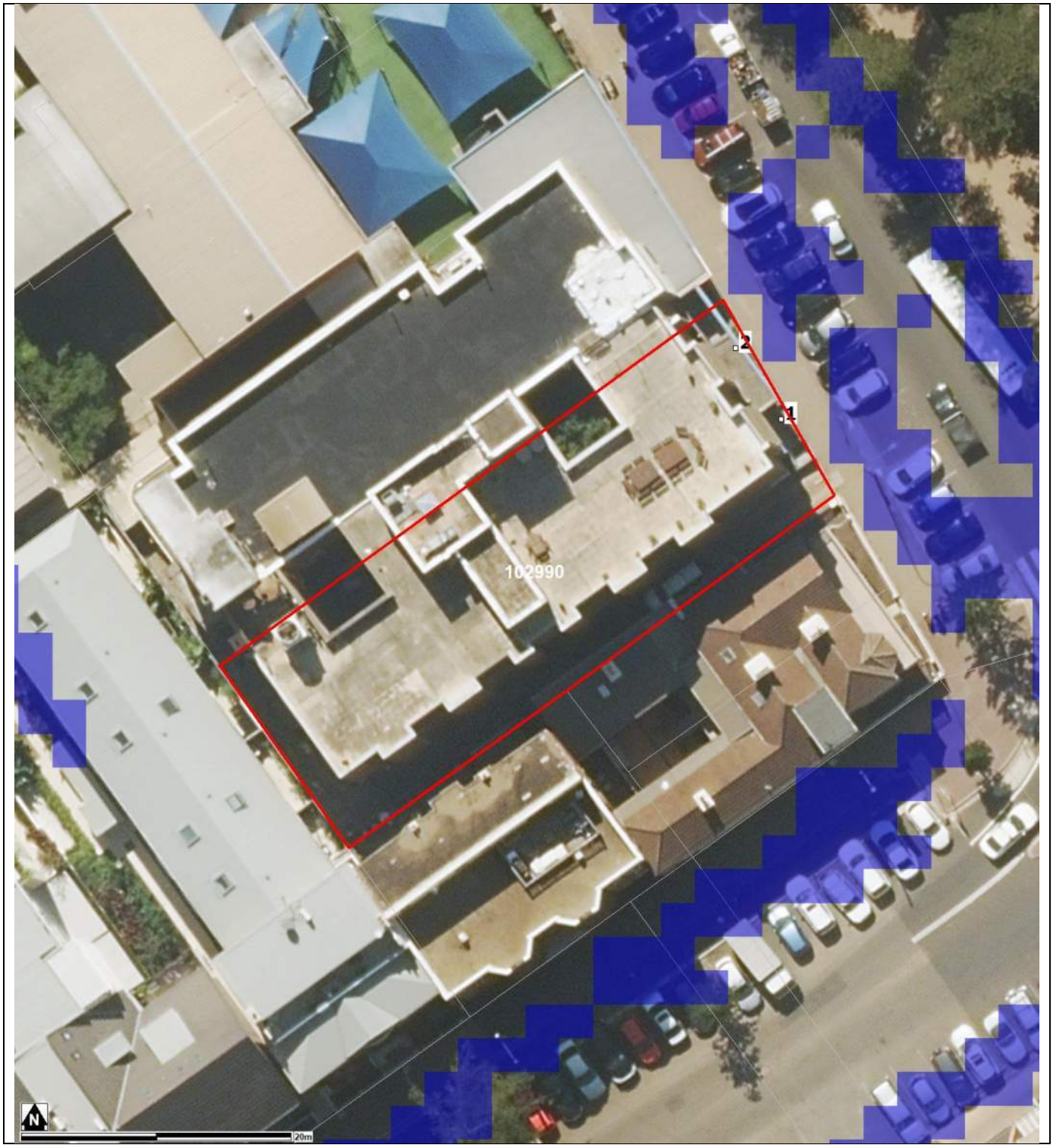
FLOOD MAP A: FLOOD RISK PRECINCT MAP



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:) 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	4.58	4.42	0.16	0.18
2	N/A	N/A	N/A	N/A	N/A	4.62	4.45	0.24	0.20

WL – Water Level
PMF – Probable Maximum Flood
N/A = no peak water level/depth/velocity available in flood event

Climate Change Flood Levels (30% Rainfall intensity and 0.9m Sea Level Rise)

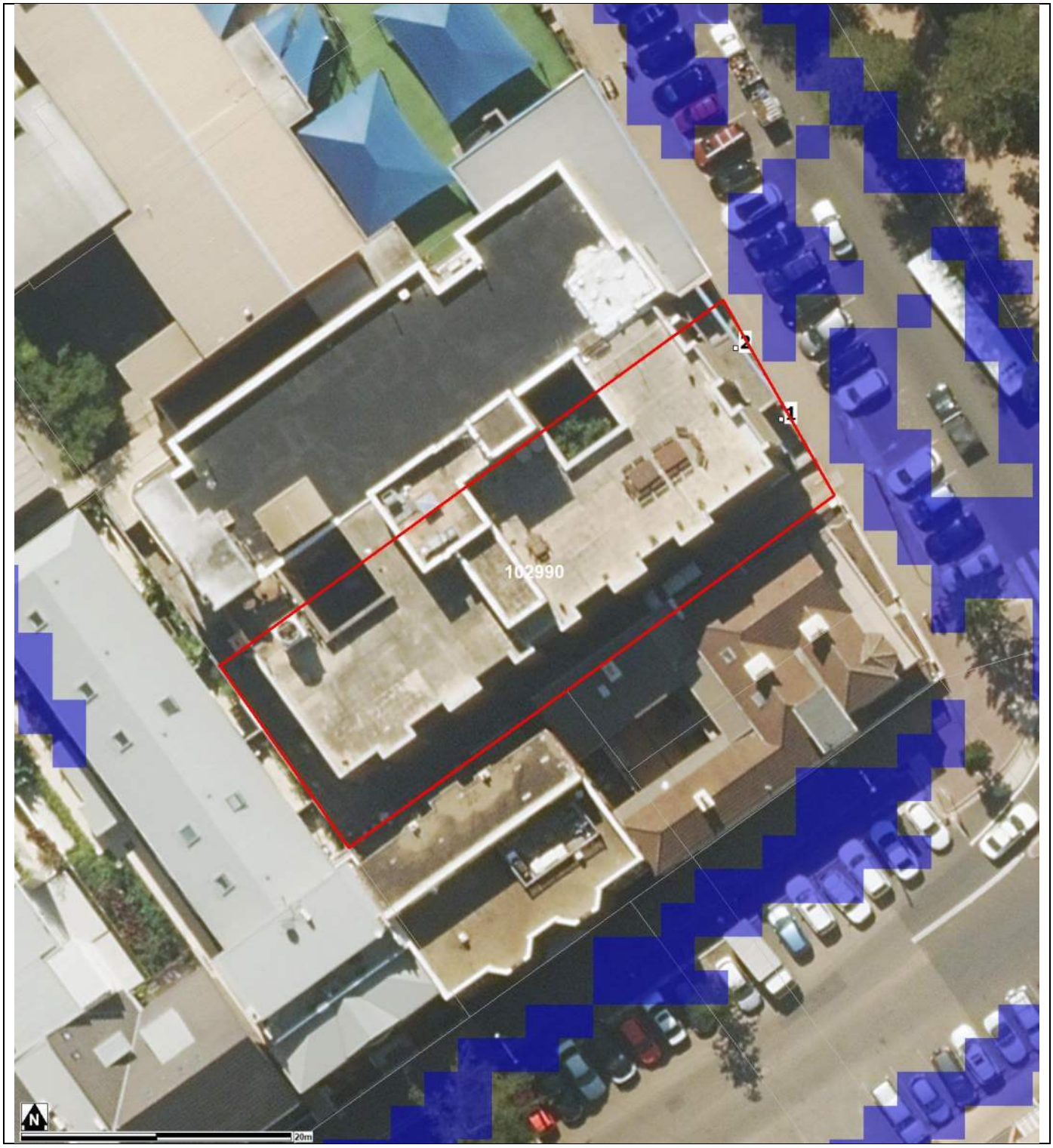
ID	CC 1% AEP Max WL (m AHD)	CC1 % AEP Max Depth (m)
1	N/A	N/A
2	N/A	N/A

A variable Flood Planning Level might apply - 0.5m above 1% AEP max water level (for Mainstream flooding) or 0.5m above the 1% AEP max water level flow path extent with depth greater than 0.3m and 0.3m above the 1% AEP max water level flow path with depth 0.3m and less (for overland flow).

If the CC 1% AEP level is less than the 1% AEP level, this is probably because the 1% AEP level used for planning includes a 5% AEP ocean surge. In this case, the 1% AEP value should be used.

WL – Water Level
PMF – Probable Maximum Flood
N/A = no peak water level/depth/velocity available in flood event.

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:) 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:) and aerial photography (Source: NearMap 2014) are indicative only

FLOOD MAP D: 1% AEP FLOOD HAZARD EXTENT MAP

Notes:

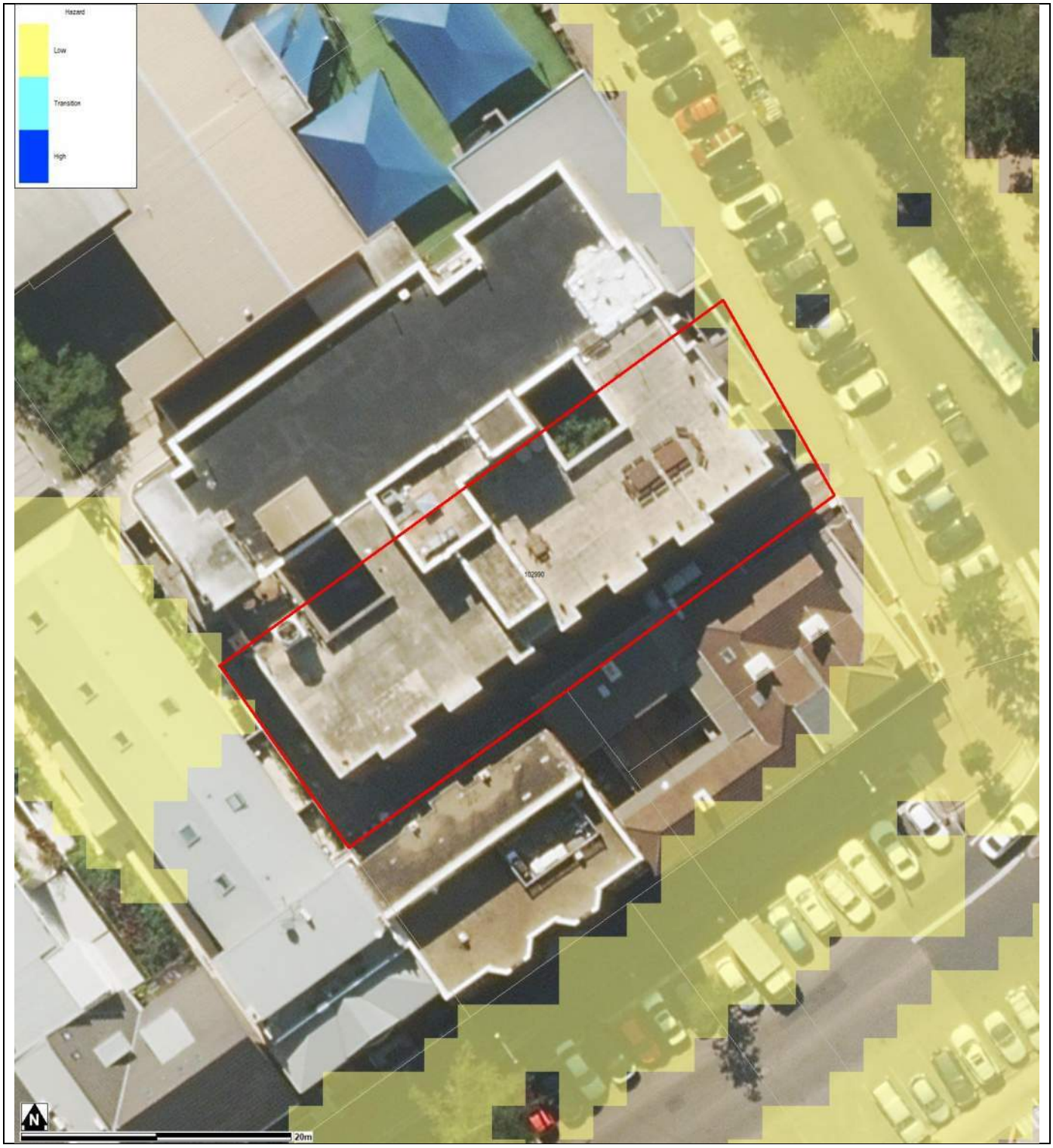
- Extent represents the 1% annual Exceedance Probability (AEP) flood event
- Extent does not include climate change
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source:) and aerial photography (Source: NearMap 2014) are indicative only

FLOOD MAP E: 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:) and aerial photography (Source: NearMap 2014) are indicative only

FLOOD MAP F: PMF FLOOD HAZARD EXTENT MAP



Notes:

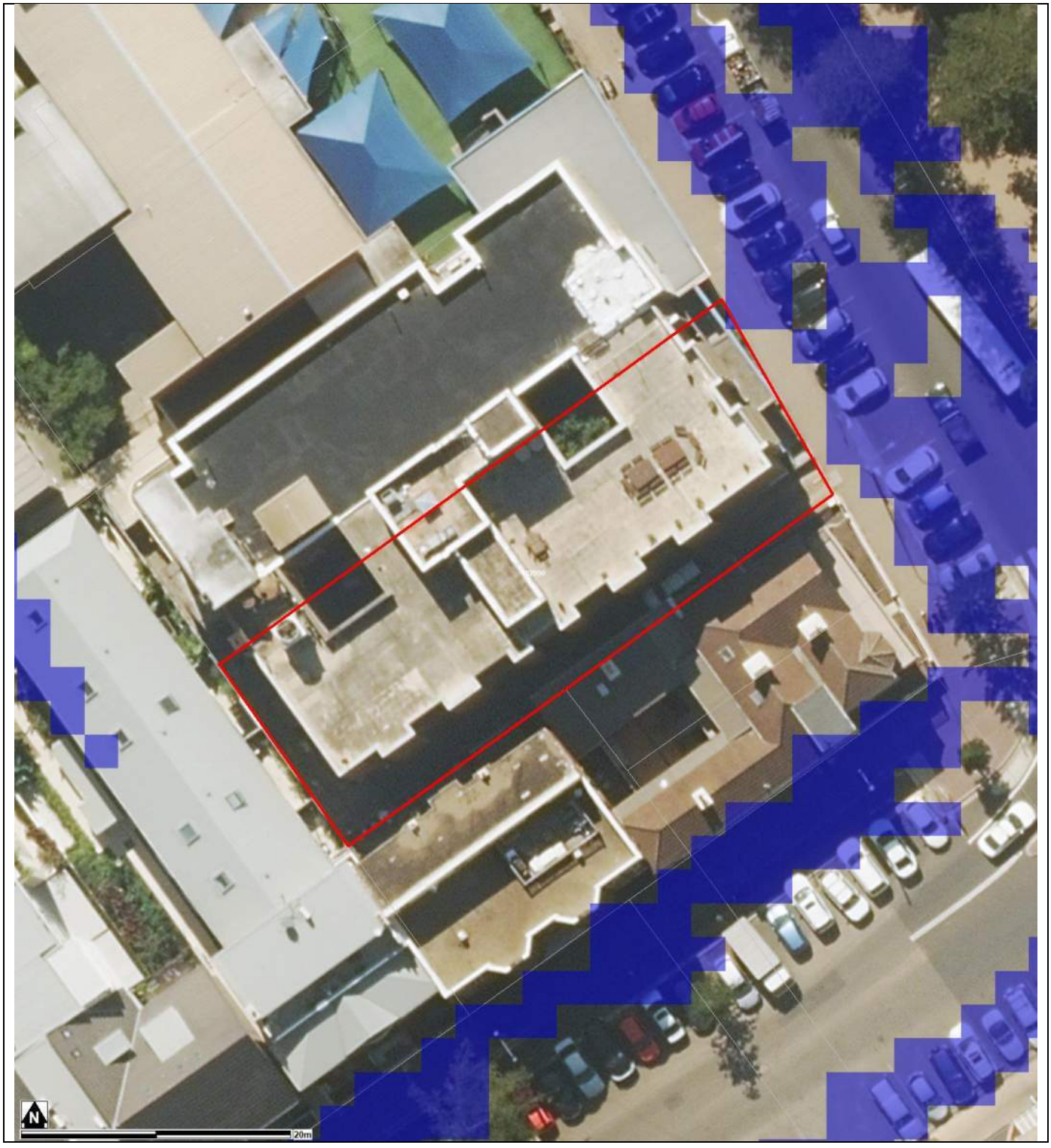
- Extent represents the Probable Maximum Flood (PMF) event
- Extent does not include climate change
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source:) and aerial photography (Source: NearMap 2014) are indicative only

FLOOD MAP G: PMF FLOOD HYDRAULIC CATEGORY EXTENT MAP

Notes:

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

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



Note:

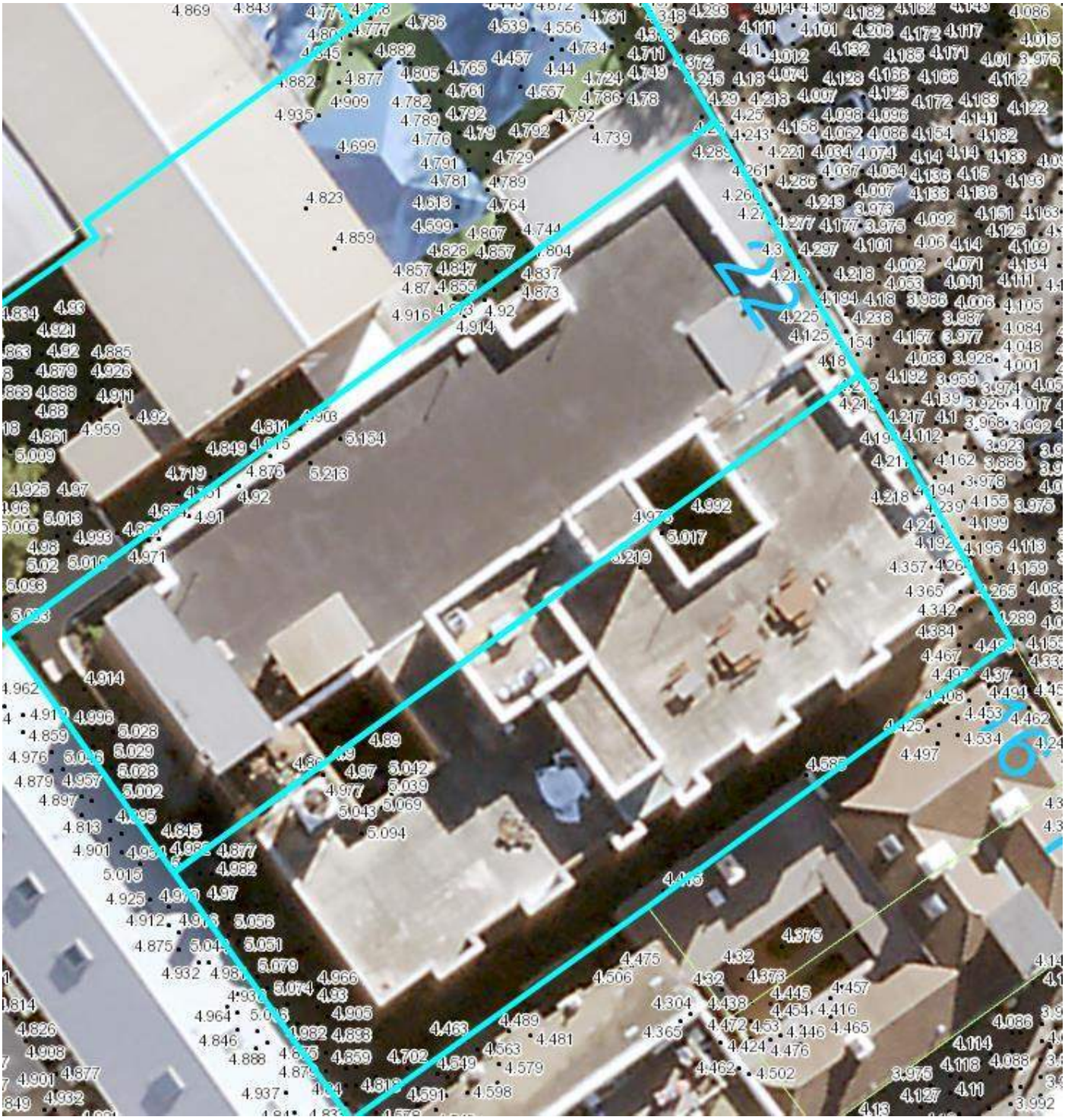
- Extent represents the 1% annual Exceedance Probability (AEP) flood event including 30% rainfall intensity and 0.9m Sea Level Rise climate change scenario
- Flood events exceeding the 1% AEP can occur on this site.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents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

FLOOD MAP I: FLOOD LIFE HAZARD CATEGORY

Notes:

- For additional information on Flood Life Hazard Categories, refer to 'Flood Emergency Response Planning for Development in Pittwater Policy' and Pittwater 21 DCP Control B3.13.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source:) and aerial photography (Source Near Map 2014) are indicative only.

MAP J: 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 ± 0.2m vertically and ± 0.15m 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.

GUIDELINES for Preparing a Flood Management Report

Introduction

These guidelines are intended to provide advice to applicants on preparing a Flood Management Report. The purpose of a Flood Management Report is to help applicants measure and manage the flood risk to life and property on their site.

When is a Flood Management Report required?

A Flood Management Report must be submitted with any Development Application on flood prone land, for Council to consider the potential flood impacts and 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.

Note that the flood extents shown on the mapping are indicative only. It is recommended that flood levels are compared to registered ground survey to more accurately determine the flood extent.

There are some circumstances where a 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 Flood Planning Level 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 in a Flood Management Report?

The aim of a Flood Management Report is to demonstrate how a proposed development will comply with the flood related 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.

Technical requirements of a Flood Management Report

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

1. ***Description of development***

   The description of development should identify:
   - 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, ie, critical, vulnerable, subdivision, residential, business, industrial, recreational, environmental or concessional

2. ***Flood analysis***

   The flood analysis should include:
   - Predicted 1 in 100 year flood level
   - Flood Planning Level (FPL)
   - Probable Maximum Flood (PMF) level
   - Flood Risk Precinct, ie High, Medium or Low
   - Flood Life Hazard Category (in former Pittwater Council area only)
   - Mapping of relevant extents
   - Flood characteristics for the site, eg depth, velocity, hazard and hydraulic category, and the impact these have on the proposed development

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

3. Assessment of impacts

The assessment of impacts should address the various elements of the relevant LEP and DCP. A simple compliance table should be provided, similar to the table one below.

	Compliance		
	Not Applicable	Yes	No
A Flood effects caused by Development			
B Drainage Infrastructure & Creek Works			
C Building Components & Structural			
D Storage of Goods			
E Flood Emergency Response			
F Floor Levels			
G Car Parking			
H Fencing			
I Pools			

Further details of what is required for each of these categories can be found in the *Development Control Plan for Flood Prone Land*.

For any of these categories which are applicable, the assessment should demonstrate how the development complies, or if it doesn't, provide an explanation of why the development should still be considered.

Reporting requirements for a Flood Management Report

The Flood Management Report should include:

a) Executive summary
b) Location plan, at an appropriate scale, that includes geographical features, street names and identifies all waterways and Council stormwater pipes, pits and easements
c) Plan of the proposed development site showing the extent of the predicted 100 year, any high hazard or floodway conditions and the PMF flood event
d) Development recommendations and construction methodologies
e) Calculation formulae (particularly for flood storage)
f) Clear referencing using an accepted academic referencing system (eg. Harvard)
g) Analysis of development against relevant State Environmental Planning Policies
h) Analysis of development against relevant Local Environment Plan and Policies
i) Conclusion detailing key points
j) Standard Hydraulic Certification (Form A/A1)
k) Qualifications of author
l) Any flood advice provided by Council
m) Any other details which may be relevant

NOTE: 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 Australian Institute of Engineers.

For further information please contact Stormwater and Floodplain Team on 1300 434 434 or via email at floodplain@northernbeaches.nsw.gov.au

Attachment A

NORTHERN BEACHES COUNCIL STANDARD HYDRAULIC CERTIFICATION FORM

FORM A/A1 – To be submitted with Development Application

Development Application for

Address of site: _____

Declaration made by hydraulic engineer or professional consultant specialising in flooding/flood risk management as part of undertaking the Flood Management Report:

I, _____ on behalf of _____
(Insert Name) (Trading or Business/ Company Name)

on this the _____ certify that I am engineer or a
(Date)

professional consultant specialising in flooding and I am authorised by the above organisation/ company to issue this document and to certify that the organisation/ company has a current professional indemnity policy of at least $2 million.

Flood Management Report **Details:**

Report Title: …….

Report Date: …….

Author: …….

Author's Company/Organisation: …….

I: _____
(Insert Name)

Please tick all that are applicable (more than one box can be ticked)

☐ have obtained and included flood information from Council (must be less than 12 months old) **(This is mandatory)**

☐ have followed Council's Guidelines for Preparing a Flood Management Report

☐ have requested a variation to one or more of the flood related development controls. Details are provided in the *Flood Management Report*.

Signature ……..

Name ……..

FLOOD INFORMATION REQUEST – COMPREHENSIVE

Property: 22 Wentworth Street MANLY NSW 2095
Lot DP: Lot 101 DP 247422
Issue Date: 03/09/2020
Flood Study Reference: Manly to Seaforth Flood Study 2019, Cardno

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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]: 5.16 m AHD

1% AEP Flood – See Flood Map B

1% AEP Maximum Water Level [2, 3]: 4.86 mAHD

1% AEP Maximum Peak Depth from natural ground level[3]: 0.35 m

1% AEP Maximum Velocity: 0.24 m/s

1% AEP Provisional Flood Hazard: Low **See Flood Map D**

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

Probable Maximum Flood (PMF) – See Flood Map C

PMF Maximum Water Level [4]: 5.16 m AHD

PMF Maximum Depth from natural ground level: 0.49 m

PMF Maximum Velocity: 0.35 m/s

PMF Flood Hazard: Low **See Flood Map F**

PMF Hydraulic Categorisation: N/A **See Flood Map G**

Flooding with Climate Change (See Flood Map H)

The following is for the 30% Rainfall intensity increase and 0.9m Sea Level Rise Scenario:

1% AEP Maximum Water Level with Climate change [3]: 4.89 m AHD

1% AEP Maximum Depth with Climate Change[3]: 0.38 m

1% AEP Maximum Velocity with Climate Change[3]: m/s

Flood Life Hazard Category – See Map I

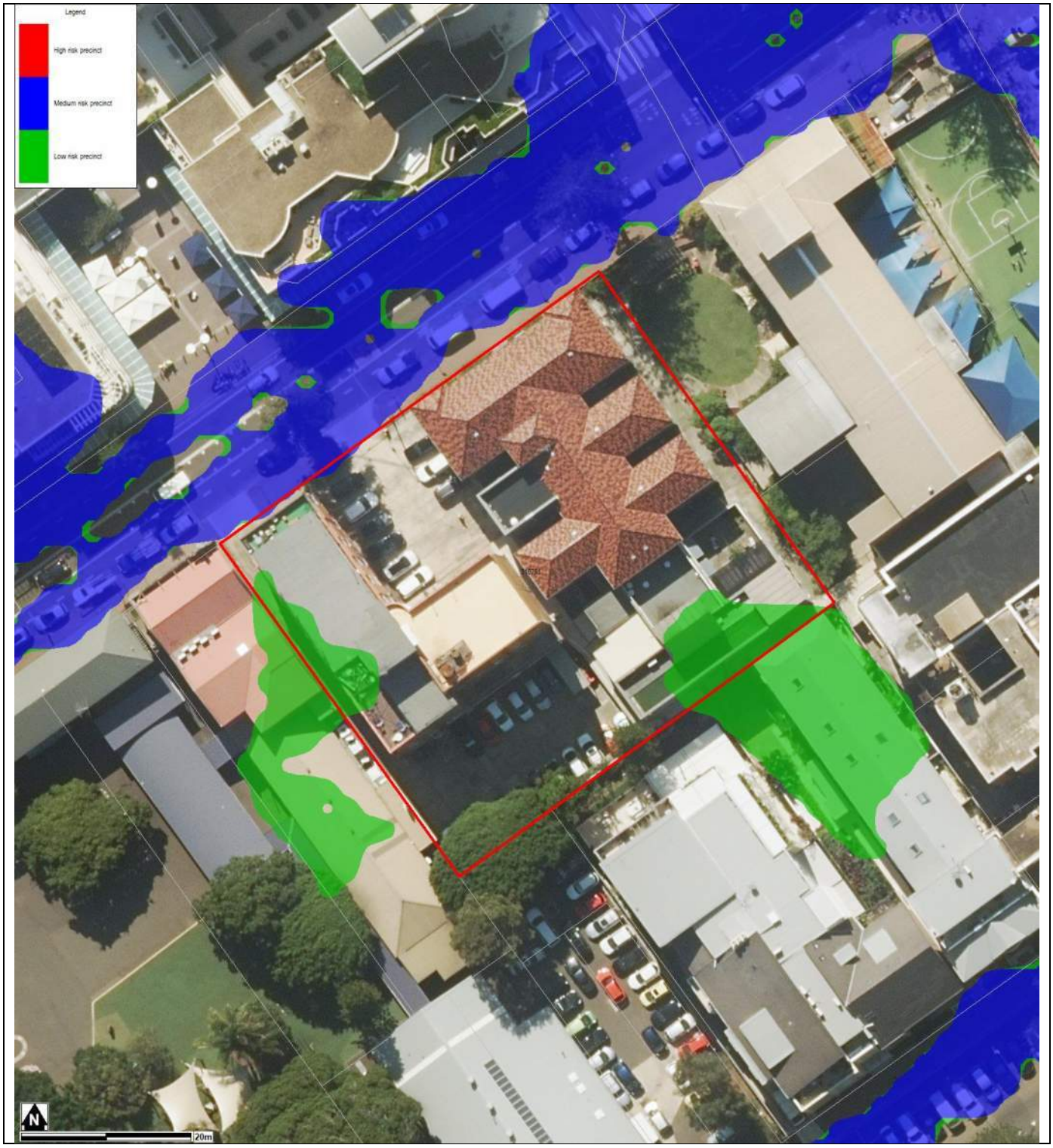
Indicative Ground Surface Spot Heights – See Map J

[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.

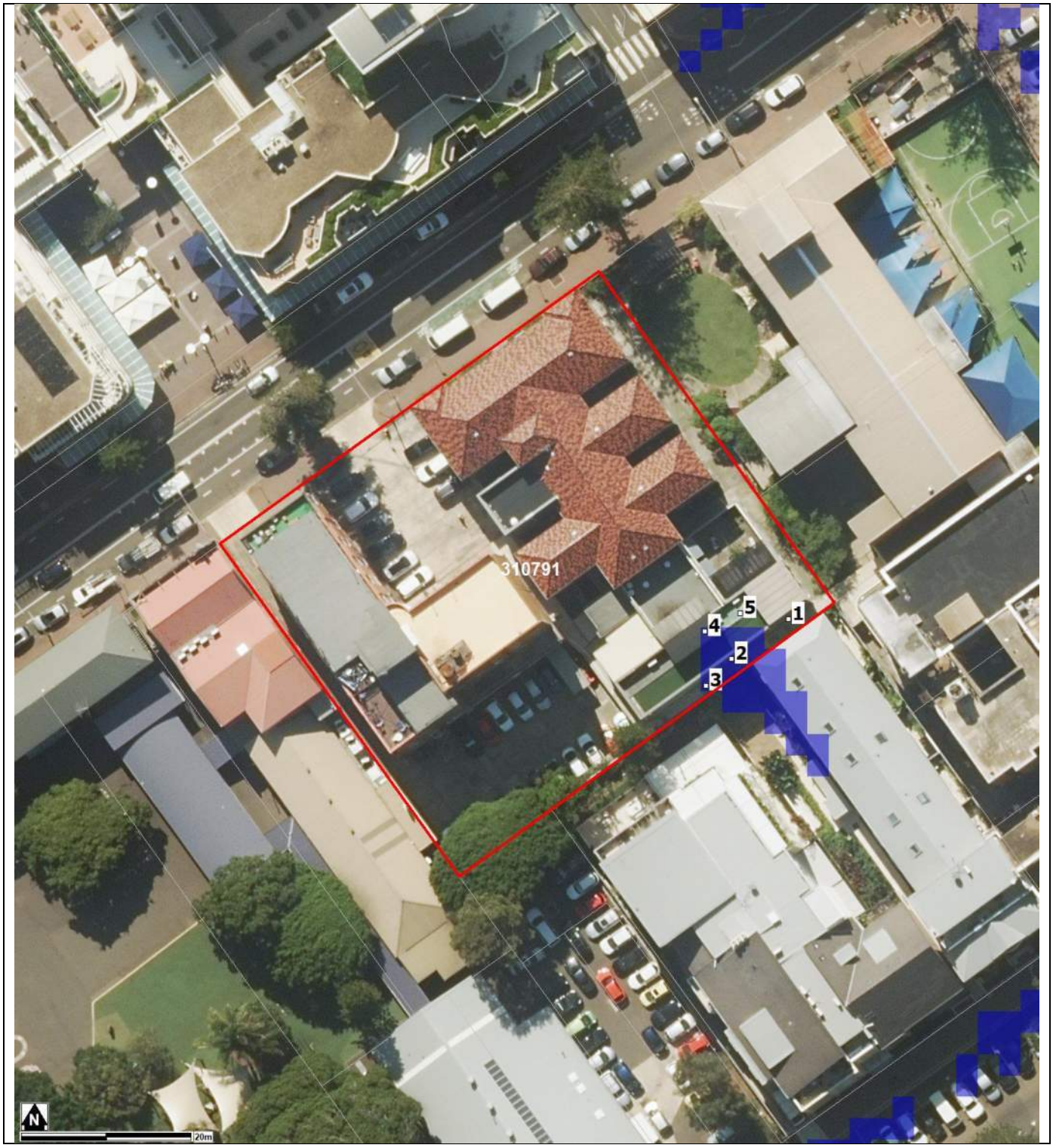
FLOOD MAP A: FLOOD RISK PRECINCT MAP



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	N/A	5.01	0.26	0.14
2	N/A	N/A	4.86	0.35	0.07	N/A	5.01	0.49	0.08
3	N/A	N/A	4.86	0.19	0.24	N/A	5.01	0.34	0.23
4	N/A	N/A	4.86	0.20	0.20	N/A	5.01	0.35	0.19
5	N/A	N/A	N/A	N/A	N/A	N/A	5.01	0.24	0.23

WL – Water Level
PMF – Probable Maximum Flood
N/A = no peak water level/depth/velocity available in flood event

Climate Change Flood Levels (30% Rainfall intensity and 0.9m Sea Level Rise)

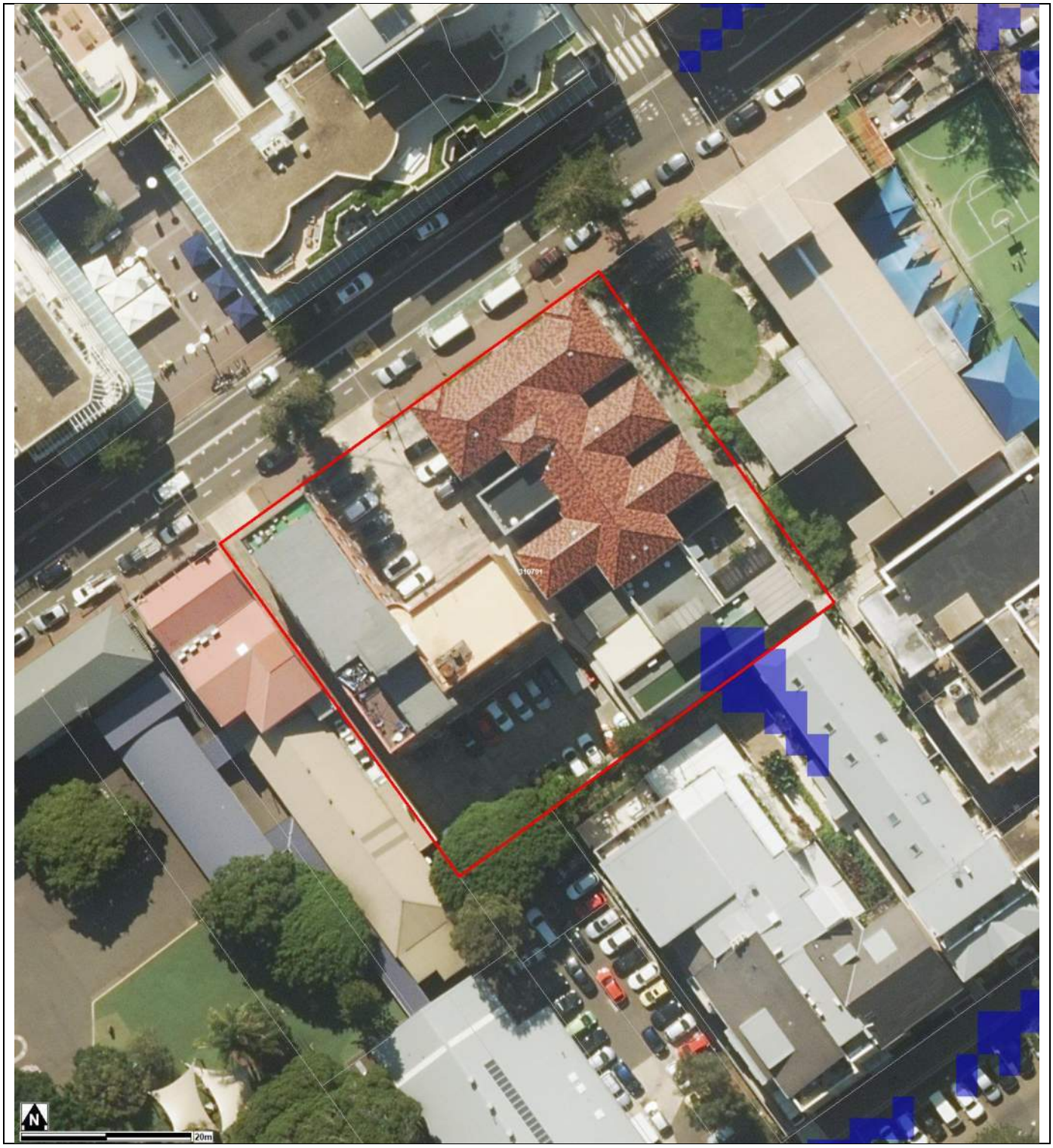
ID	CC 1% AEP Max WL (m AHD)	CC1 % AEP Max Depth (m)
1	N/A	N/A
2	4.89	0.30
3	N/A	N/A
4	4.89	0.29
5	4.89	0.29

A variable Flood Planning Level might apply - 0.5m above 1% AEP max water level (for Mainstream flooding) or 0.5m above the 1% AEP max water level flow path extent with depth greater than 0.3m and 0.3m above the 1% AEP max water level flow path with depth 0.3m and less (for overland flow).

If the CC 1% AEP level is less than the 1% AEP level, this is probably because the 1% AEP level used for planning includes a 5% AEP ocean surge. In this case, the 1% AEP value should be used.

WL – Water Level
PMF – Probable Maximum Flood
N/A = no peak water level/depth/velocity available in flood event.

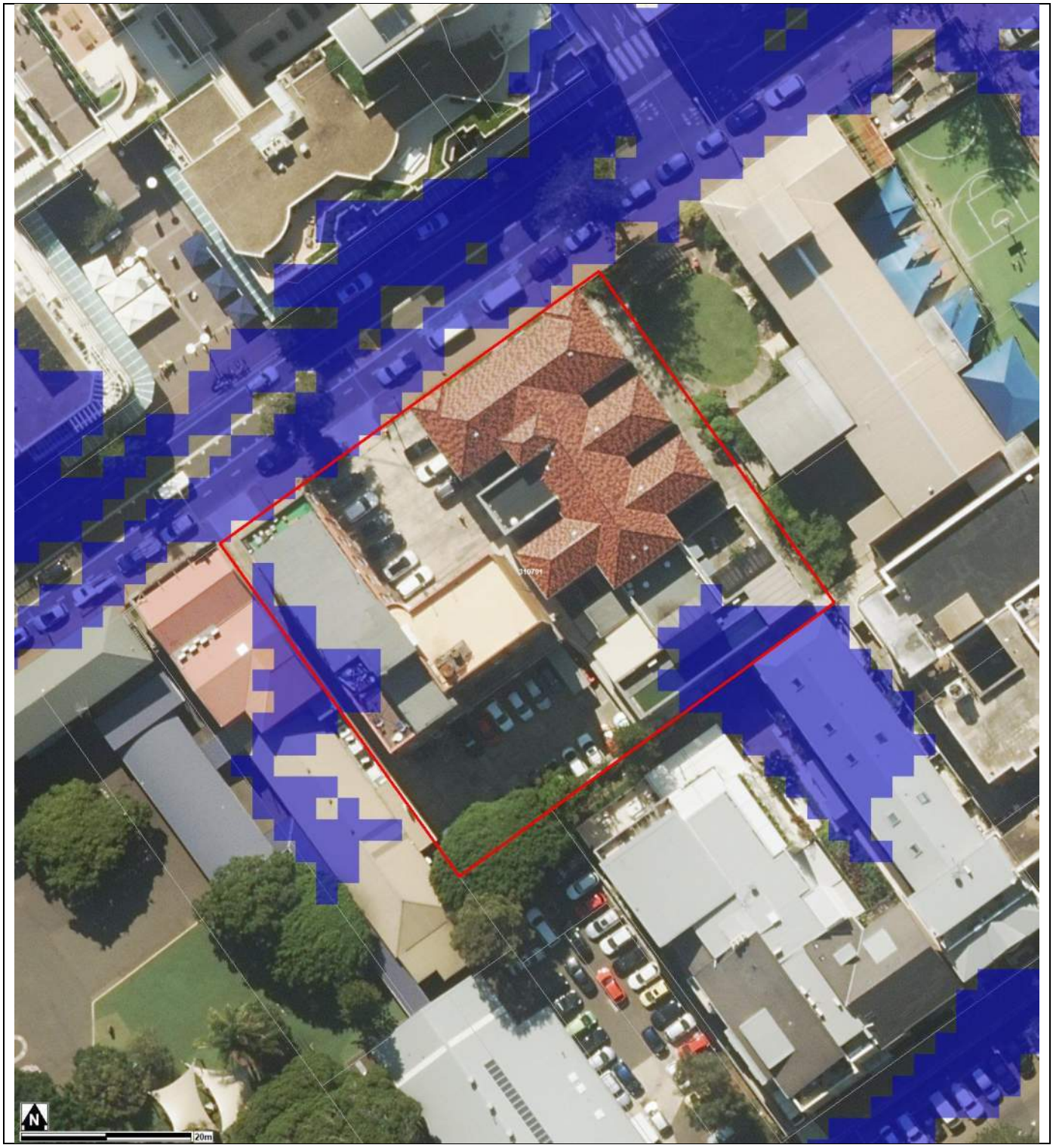
FLOOD MAP B: FLOODING - 1% AEP EXTENT



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.

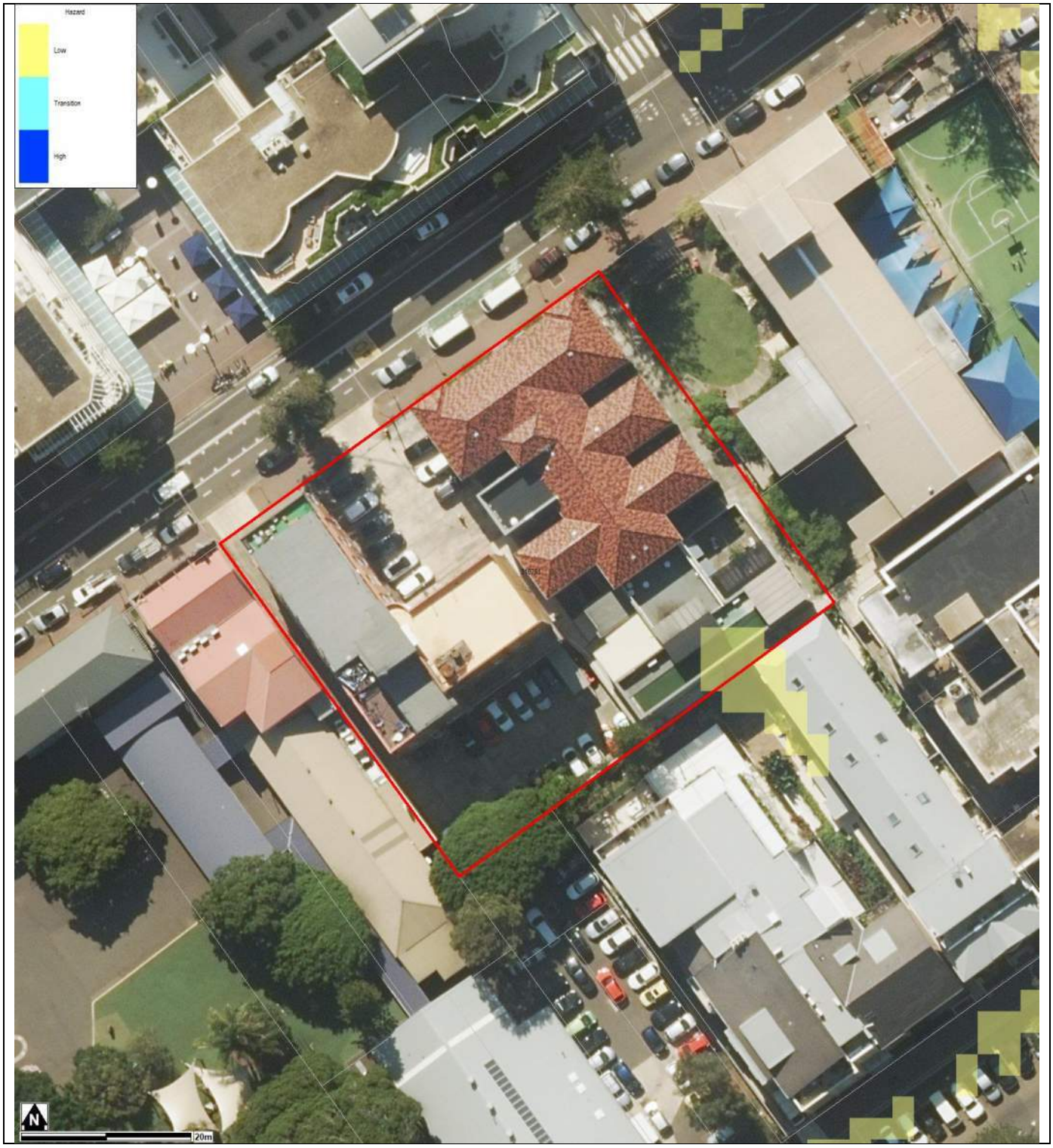
FLOOD MAP C: PMF EXTENT MAP



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

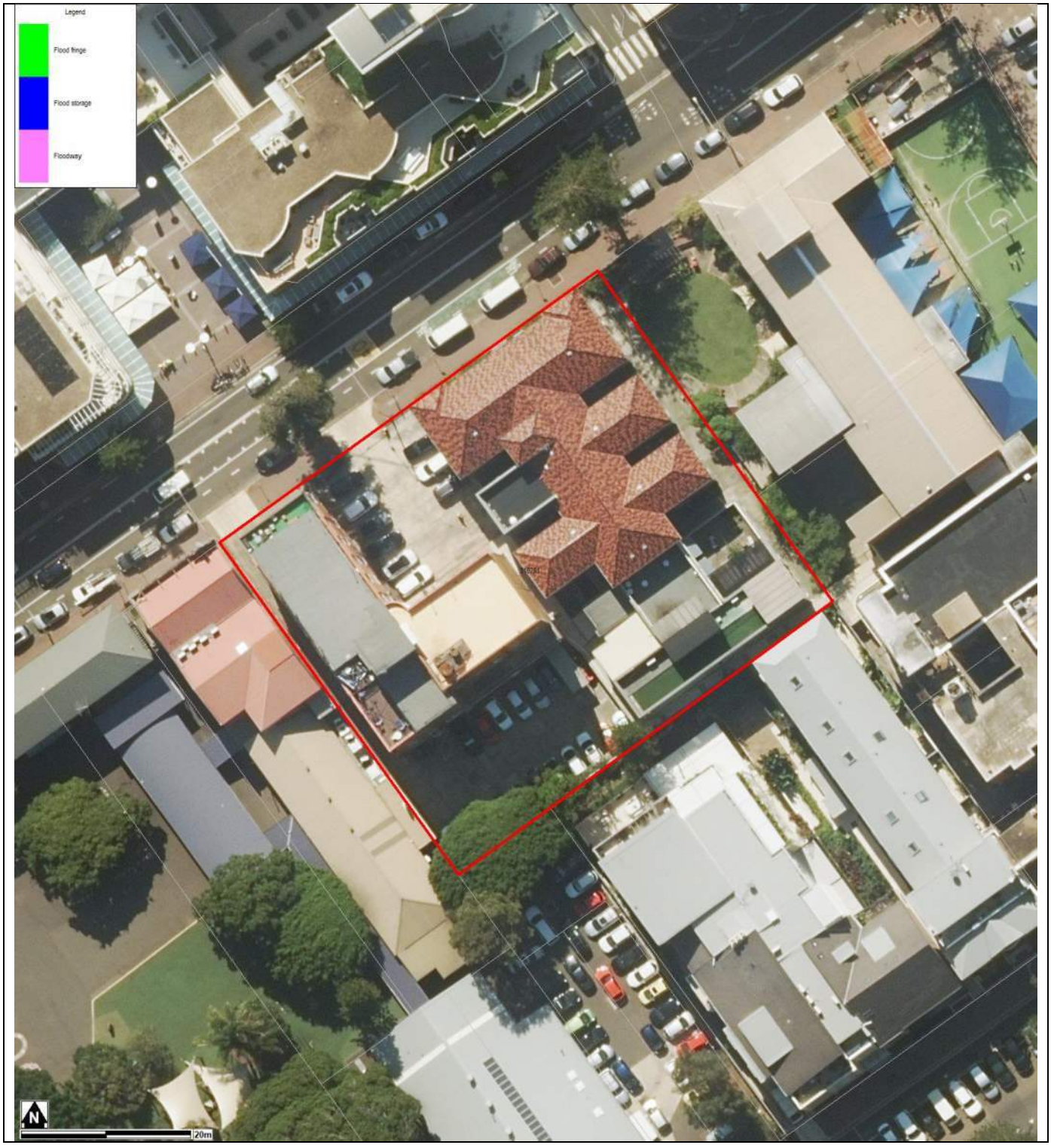
FLOOD MAP D: 1% AEP FLOOD HAZARD EXTENT MAP



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

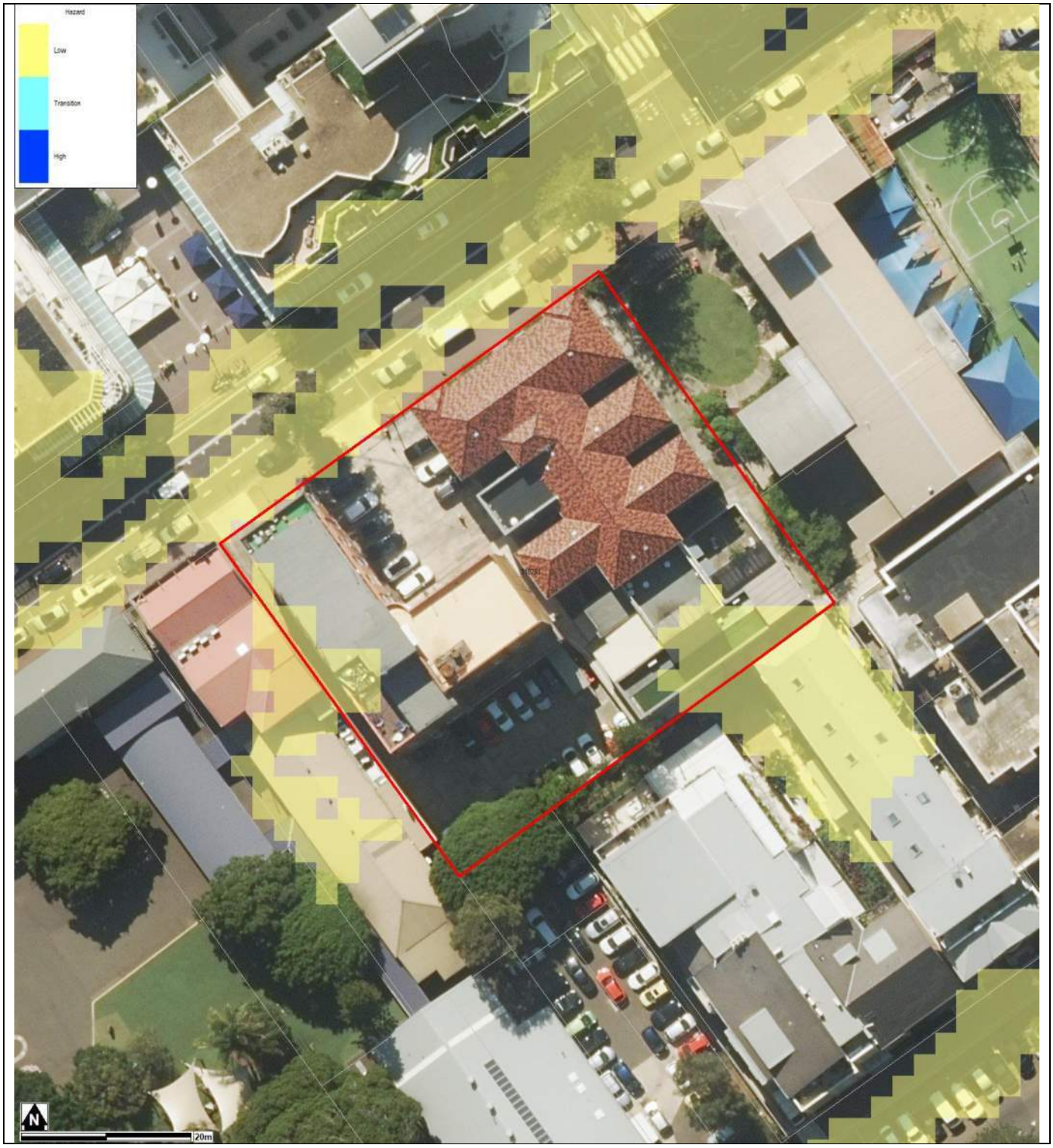
FLOOD MAP E: 1% AEP FLOOD HYDRAULIC CATEGORY EXTENT MAP



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

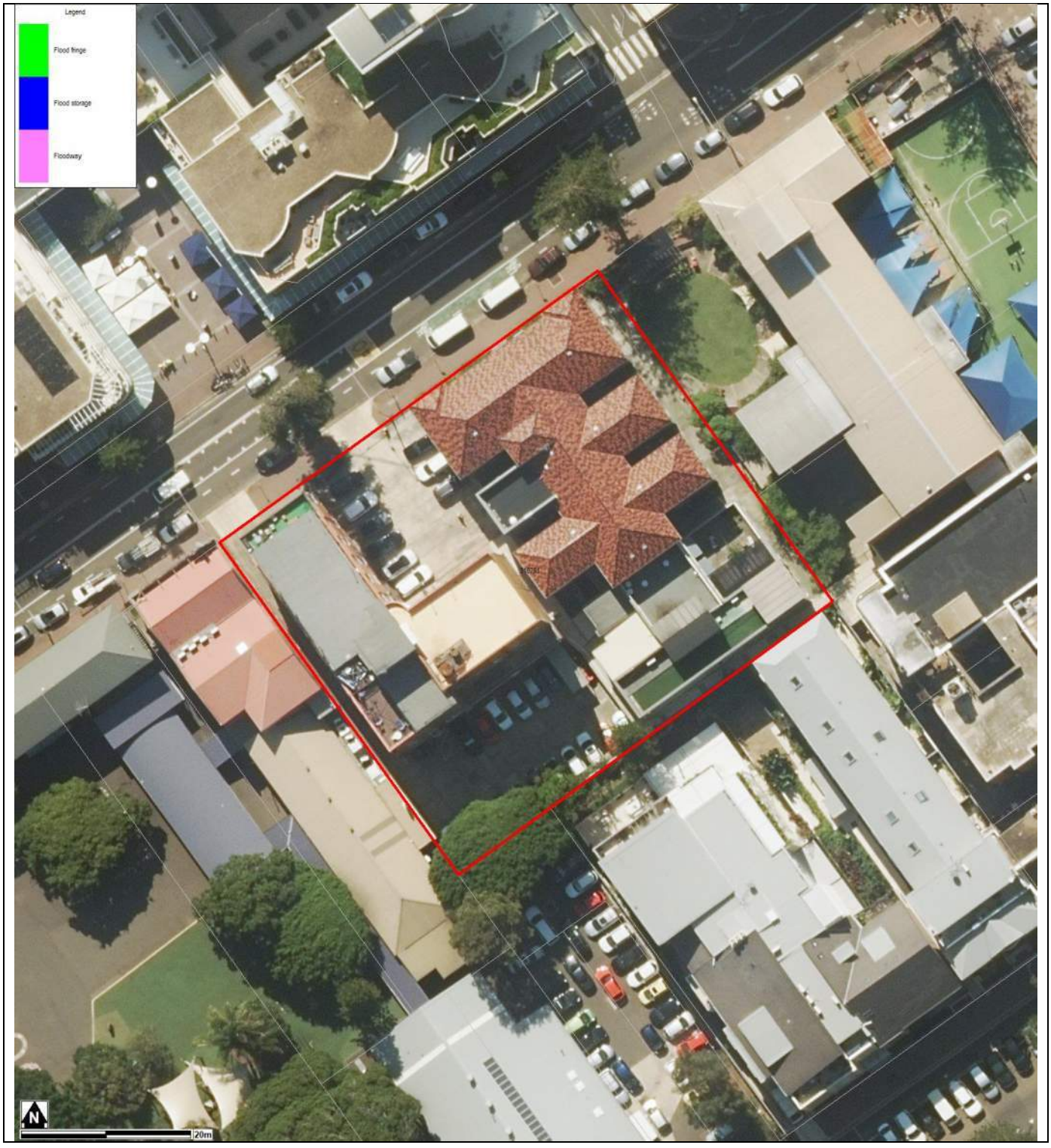
FLOOD MAP F: PMF FLOOD HAZARD EXTENT MAP



Notes:

- Extent represents the Probable Maximum Flood (PMF) 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 G: PMF FLOOD HYDRAULIC CATEGORY EXTENT MAP



Notes:

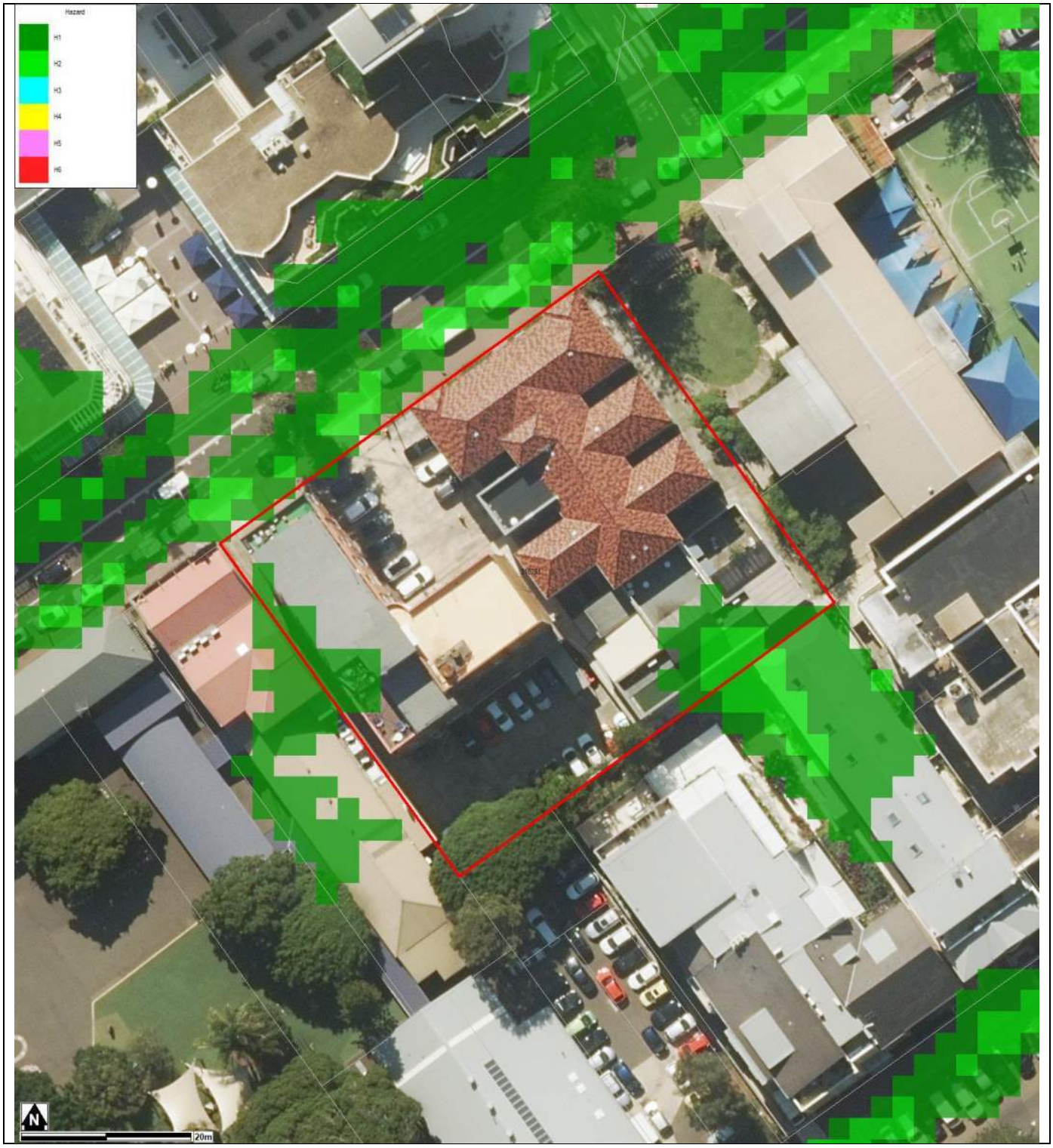
- Extent represents the Probable Maximum Flood (PMF) event
- Extent does not include climate change
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Manly to Seaforth Flood Study 2019, Cardno) and aerial photography (Source: NearMap 2014) are indicative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

FLOOD MAP H: 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

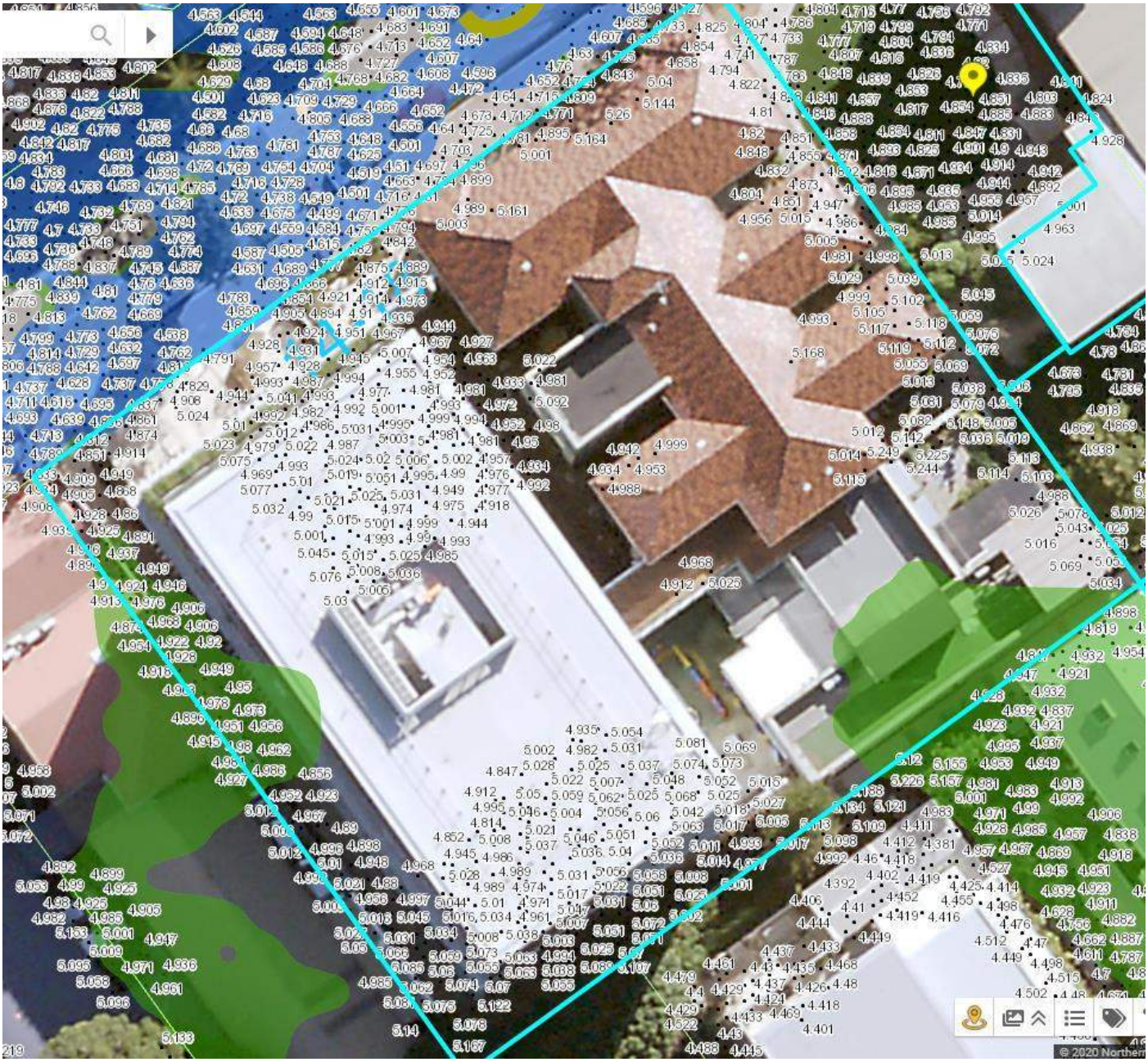
FLOOD MAP I: FLOOD LIFE HAZARD CATEGORY



Notes:

- For additional information on Flood Life Hazard Categories, refer to 'Flood Emergency Response Planning for Development in Pittwater Policy' and Pittwater 21 DCP Control B3.13.
- 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 J: 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 ± 0.2m vertically and ± 0.15m 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.

GUIDELINES for Preparing a Flood Management Report

Introduction

These guidelines are intended to provide advice to applicants on preparing a Flood Management Report. The purpose of a Flood Management Report is to help applicants measure and manage the flood risk to life and property on their site.

When is a Flood Management Report required?

A Flood Management Report must be submitted with any Development Application on flood prone land, for Council to consider the potential flood impacts and 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.

Note that the flood extents shown on the mapping are indicative only. It is recommended that flood levels are compared to registered ground survey to more accurately determine the flood extent.

There are some circumstances where a 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 Flood Planning Level 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 in a Flood Management Report?

The aim of a Flood Management Report is to demonstrate how a proposed development will comply with the flood related 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.

Technical requirements of a Flood Management Report

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

1. ***Description of development***

   The description of development should identify:
   - 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, ie, critical, vulnerable, subdivision, residential, business, industrial, recreational, environmental or concessional

2. ***Flood analysis***

   The flood analysis should include:
   - Predicted 1 in 100 year flood level
   - Flood Planning Level (FPL)
   - Probable Maximum Flood (PMF) level
   - Flood Risk Precinct, ie High, Medium or Low
   - Flood Life Hazard Category (in former Pittwater Council area only)
   - Mapping of relevant extents
   - Flood characteristics for the site, eg depth, velocity, hazard and hydraulic category, and the impact these have on the proposed development

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

3. Assessment of impacts

The assessment of impacts should address the various elements of the relevant LEP and DCP. A simple compliance table should be provided, similar to the table one below.

	Compliance		
	Not Applicable	Yes	No
A Flood effects caused by Development			
B Drainage Infrastructure & Creek Works			
C Building Components & Structural			
D Storage of Goods			
E Flood Emergency Response			
F Floor Levels			
G Car Parking			
H Fencing			
I Pools			

Further details of what is required for each of these categories can be found in the *Development Control Plan for Flood Prone Land*.

For any of these categories which are applicable, the assessment should demonstrate how the development complies, or if it doesn't, provide an explanation of why the development should still be considered.

Reporting requirements for a Flood Management Report

The Flood Management Report should include:

a) Executive summary
b) Location plan, at an appropriate scale, that includes geographical features, street names and identifies all waterways and Council stormwater pipes, pits and easements
c) Plan of the proposed development site showing the extent of the predicted 100 year, any high hazard or floodway conditions and the PMF flood event
d) Development recommendations and construction methodologies
e) Calculation formulae (particularly for flood storage)
f) Clear referencing using an accepted academic referencing system (eg. Harvard)
g) Analysis of development against relevant State Environmental Planning Policies
h) Analysis of development against relevant Local Environment Plan and Policies
i) Conclusion detailing key points
j) Standard Hydraulic Certification (Form A/A1)
k) Qualifications of author
l) Any flood advice provided by Council
m) Any other details which may be relevant

NOTE: 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 Australian Institute of Engineers.

For further information please contact Stormwater and Floodplain Team on 1300 434 434 or via email at floodplain@northernbeaches.nsw.gov.au

Attachment A

NORTHERN BEACHES COUNCIL STANDARD HYDRAULIC CERTIFICATION FORM

FORM A/A1 – To be submitted with Development Application

Development Application for

Address of site: _____

Declaration made by hydraulic engineer or professional consultant specialising in flooding/flood risk management as part of undertaking the Flood Management Report:

I, _____ on behalf of _____
(Insert Name) (Trading or Business/ Company Name)

on this the _____ certify that I am engineer or a
(Date)

professional consultant specialising in flooding and I am authorised by the above organisation/ company to issue this document and to certify that the organisation/ company has a current professional indemnity policy of at least $2 million.

Flood Management Report **Details:**

Report Title: …….…….....

Report Date: …….....

Author: …….....

Author's Company/Organisation: …….…….

I: _____
(Insert Name)

Please tick all that are applicable (more than one box can be ticked)

☐ have obtained and included flood information from Council (must be less than 12 months old) **(This is mandatory)**

☐ have followed Council's Guidelines for Preparing a Flood Management Report

☐ have requested a variation to one or more of the flood related development controls. Details are provided in the *Flood Management Report*.

Signature …….……..

Name ……..……..

FLOOD INFORMATION REQUEST – COMPREHENSIVE

Property: 22 Wentworth Street MANLY NSW 2095
Lot DP: Lot 101 DP 1247422
Issue Date: 09/09/2020
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]: 5.16 m AHD

1% AEP Flood – See Flood Map B

1% AEP Maximum Water Level [2, 3]: 4.86 mAHD

1% AEP Maximum Peak Depth from natural ground level[3]: 0.35 m

1% AEP Maximum Velocity: 0.24 m/s

1% AEP Provisional Flood Hazard: Low **See Flood Map D**

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

Probable Maximum Flood (PMF) – See Flood Map C

PMF Maximum Water Level [4]: 5.16 m AHD

PMF Maximum Depth from natural ground level: 0.49 m

PMF Maximum Velocity: 0.35 m/s

PMF Flood Hazard: Low **See Flood Map F**

PMF Hydraulic Categorisation: N/A **See Flood Map G**

Flooding with Climate Change (See Flood Map H)

The following is for the 30% Rainfall intensity increase and 0.9m Sea Level Rise Scenario:

1% AEP Maximum Water Level with Climate change [3]: 4.89 m AHD

1% AEP Maximum Depth with Climate Change[3]: 0.38 m

1% AEP Maximum Velocity with Climate Change[3]: m/s

Flood Life Hazard Category – See Map I

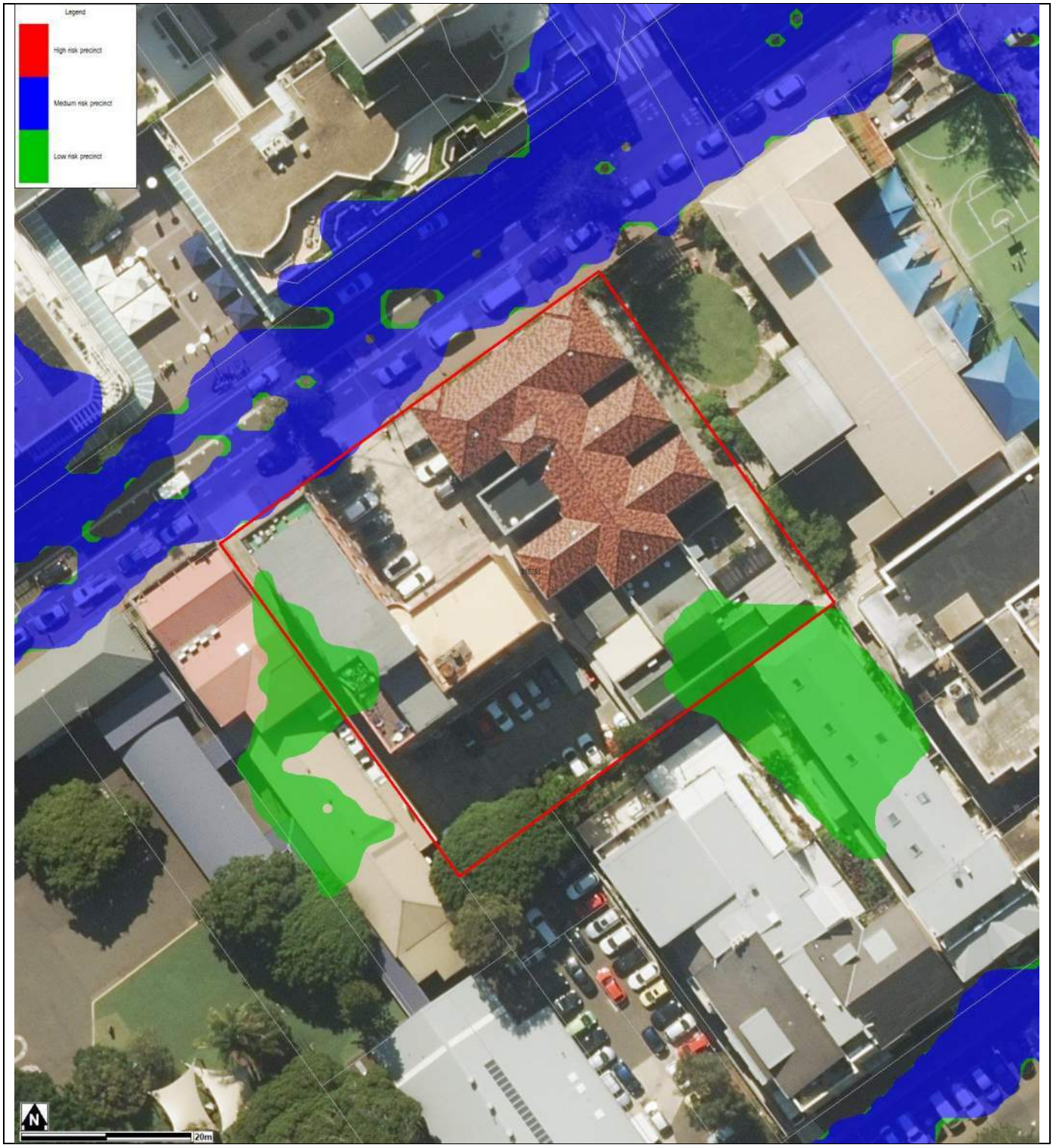
Indicative Ground Surface Spot Heights – See Map J

[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.

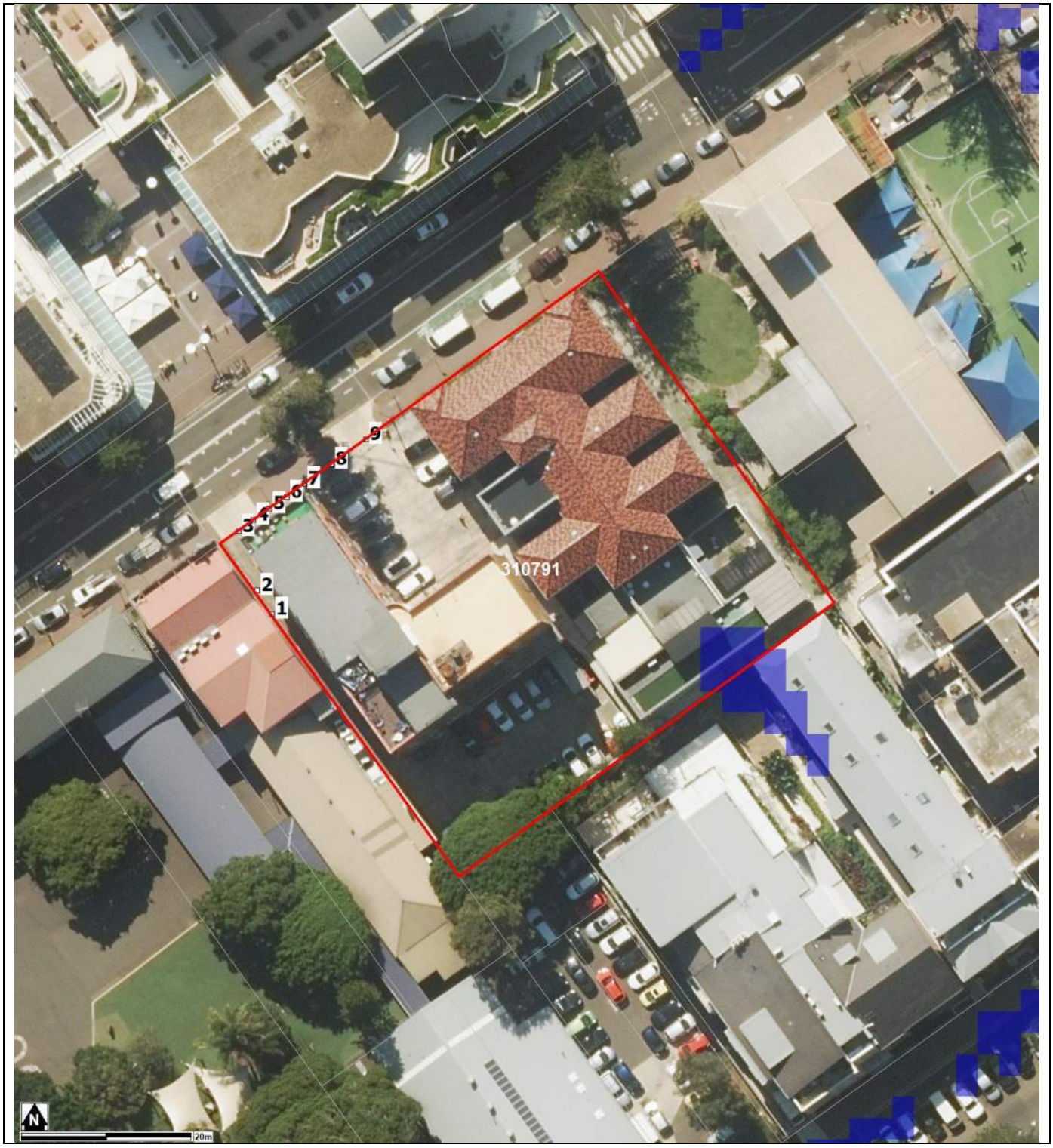
FLOOD MAP A: FLOOD RISK PRECINCT MAP



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	N/A	5.14	0.19	0.09
2	N/A	N/A	N/A	N/A	N/A	N/A	5.12	0.16	0.13
3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A	5.16	5.05	0.17	0.24
5	N/A	N/A	N/A	N/A	N/A	5.16	5.05	0.17	0.24
6	N/A	N/A	N/A	N/A	N/A	5.16	5.05	0.18	0.25
7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	N/A	N/A	5.16	5.03	0.16	0.18
9	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

Climate Change Flood Levels (30% Rainfall intensity and 0.9m Sea Level Rise)

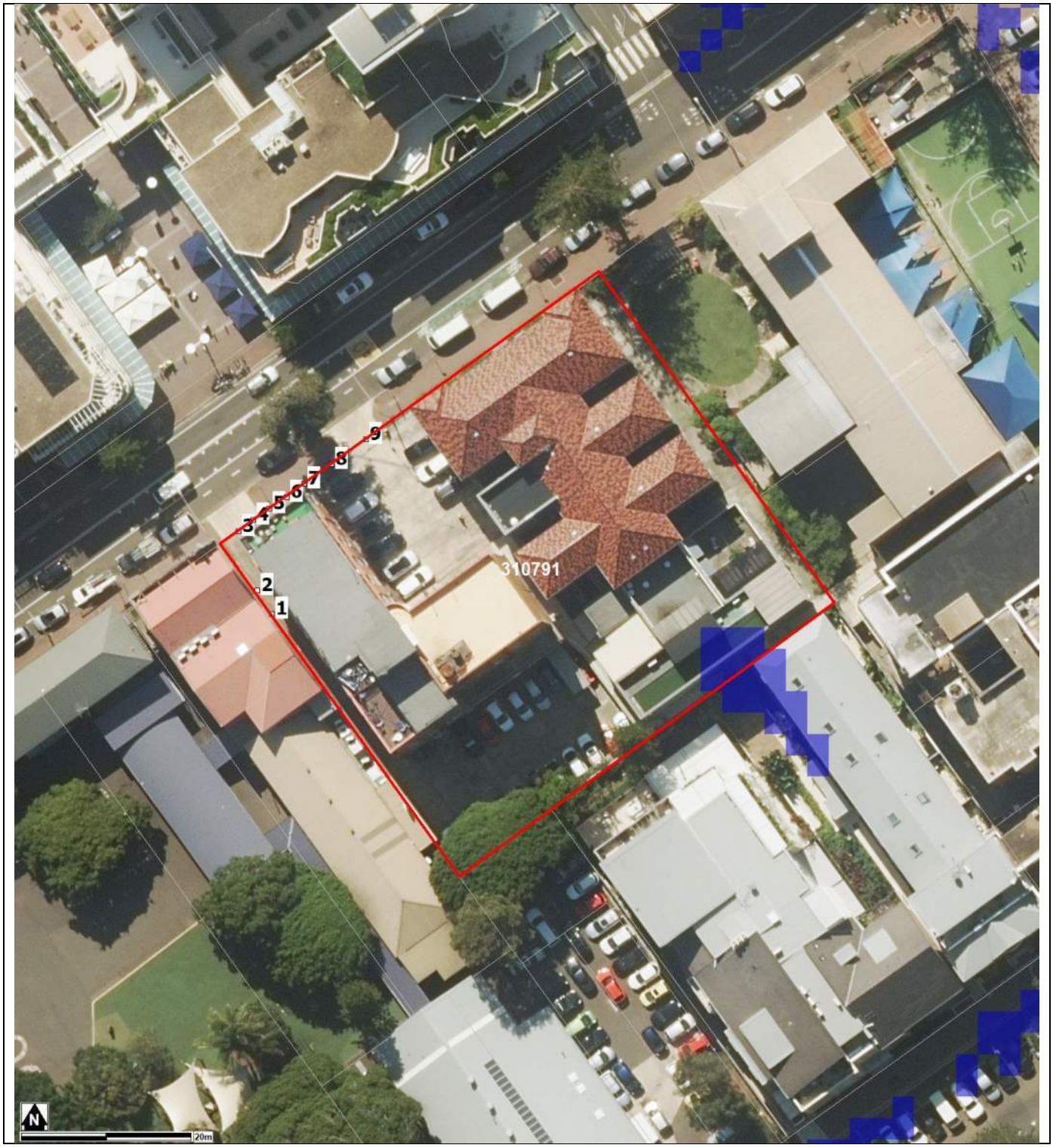
ID	CC 1% AEP Max WL (m AHD)	CC1 % AEP Max Depth (m)
1	N/A	N/A
2	N/A	N/A
3	N/A	N/A
4	N/A	N/A
5	N/A	N/A
6	N/A	N/A
7	N/A	N/A
8	N/A	N/A
9	N/A	N/A

A variable Flood Planning Level might apply - 0.5m above 1% AEP max water level (for Mainstream flooding) or 0.5m above the 1% AEP max water level flow path extent with depth greater than 0.3m and 0.3m above the 1% AEP max water level flow path with depth 0.3m and less (for overland flow).

If the CC 1% AEP level is less than the 1% AEP level, this is probably because the 1% AEP level used for planning includes a 5% AEP ocean surge. In this case, the 1% AEP value should be used.

WL – Water Level
PMF – Probable Maximum Flood
N/A = no peak water level/depth/velocity available in flood event.

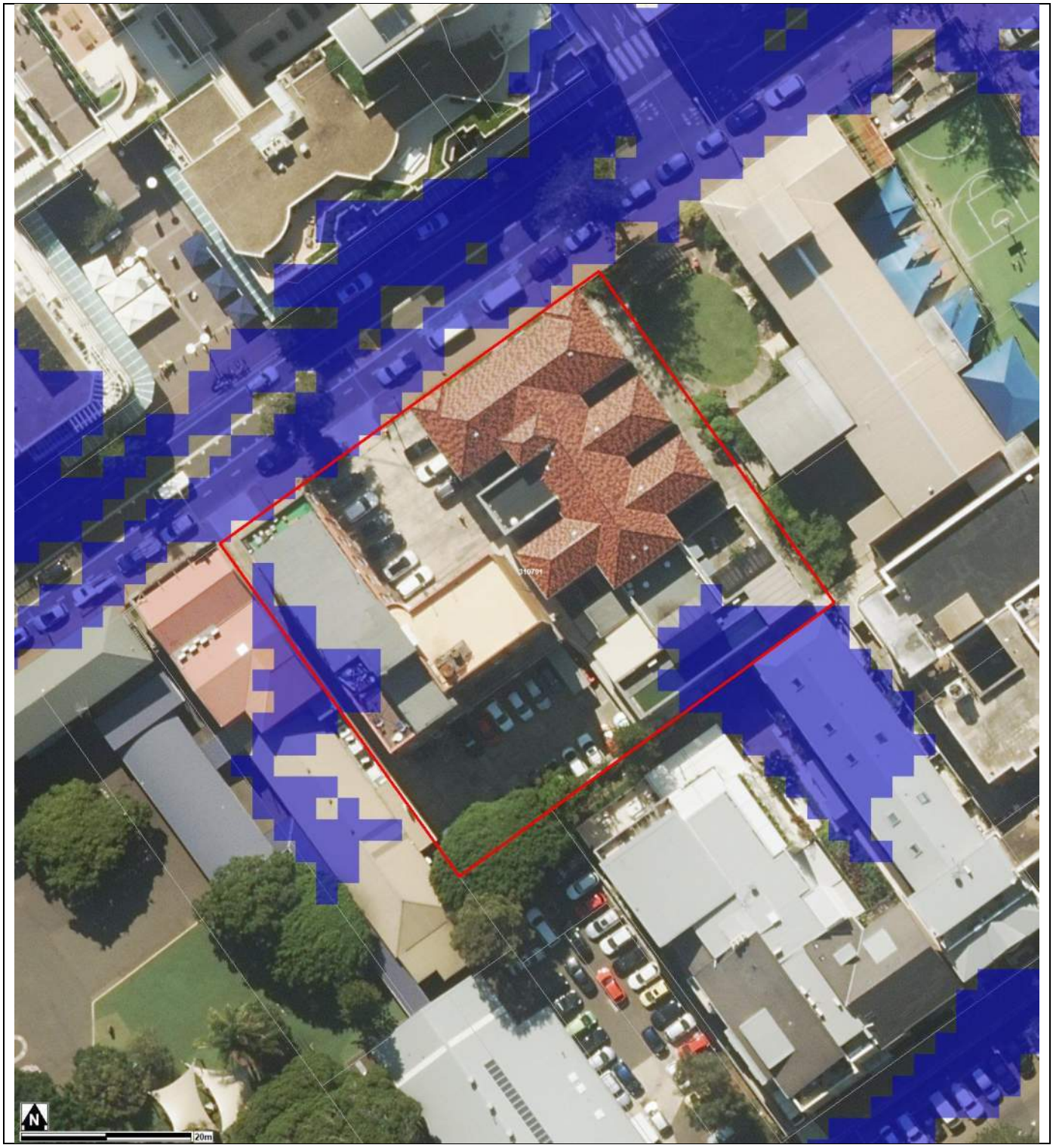
FLOOD MAP B: FLOODING - 1% AEP EXTENT



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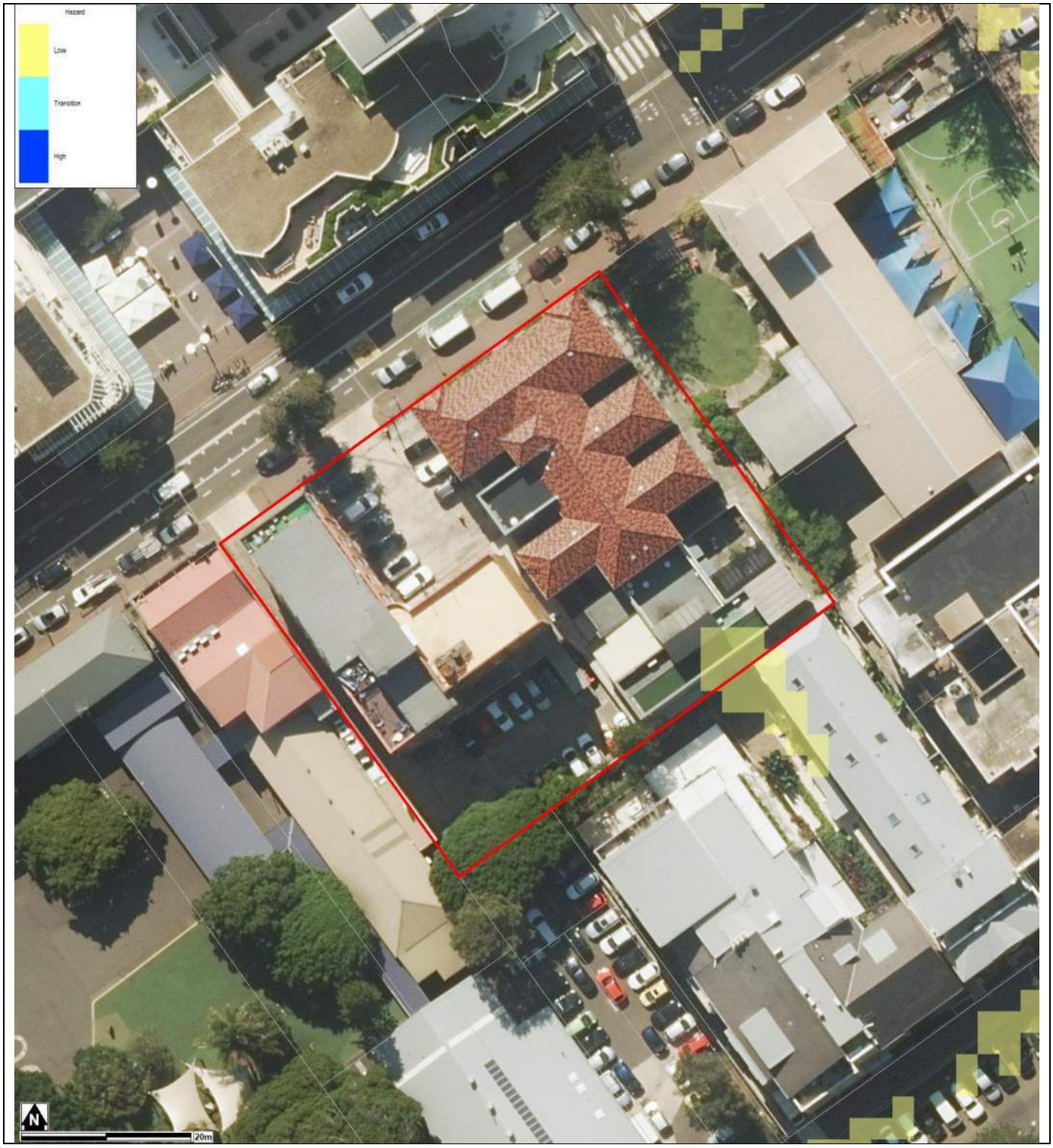
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Manly to Seaforth Flood Study 2019, Cardno) and aerial photography (Source: NearMap 2014) are indicative only

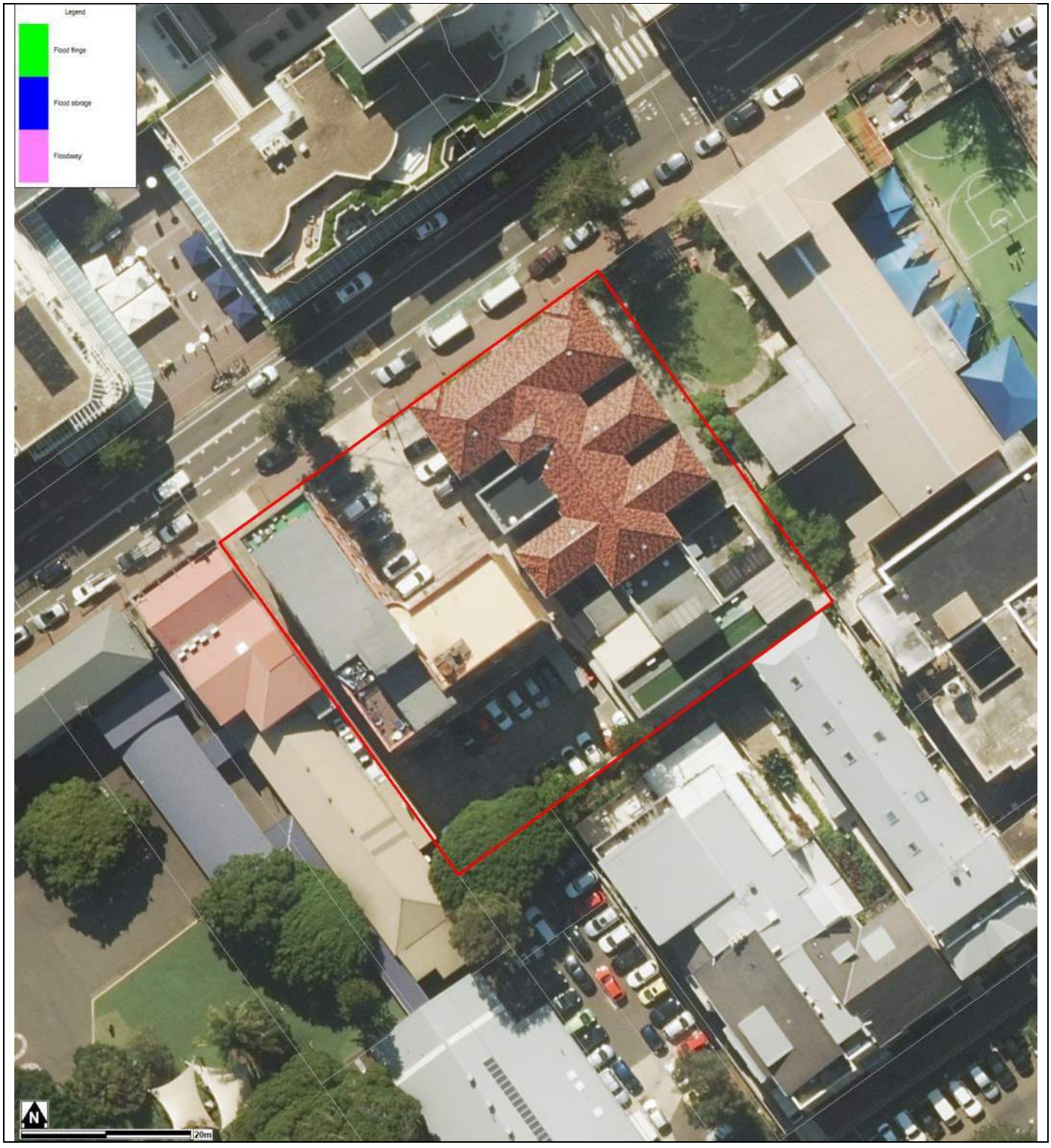
FLOOD MAP D: 1% AEP FLOOD HAZARD EXTENT MAP



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: 1% AEP FLOOD HYDRAULIC CATEGORY EXTENT MAP



Notes:

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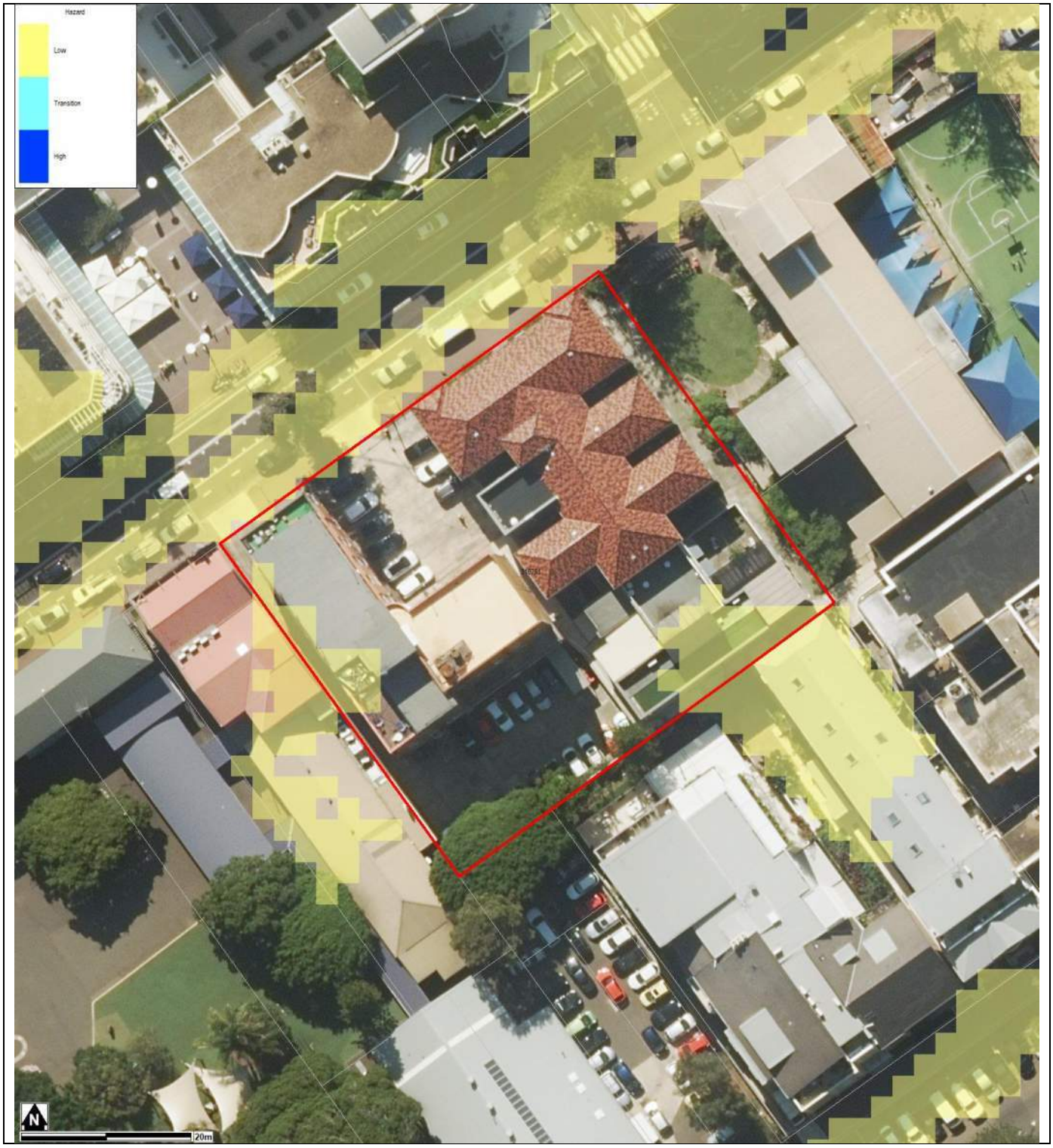
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Manly to Seaforth Flood Study 2019, Cardno) and aerial photography (Source: NearMap 2014) are indicative only

FLOOD MAP F: PMF FLOOD HAZARD EXTENT MAP



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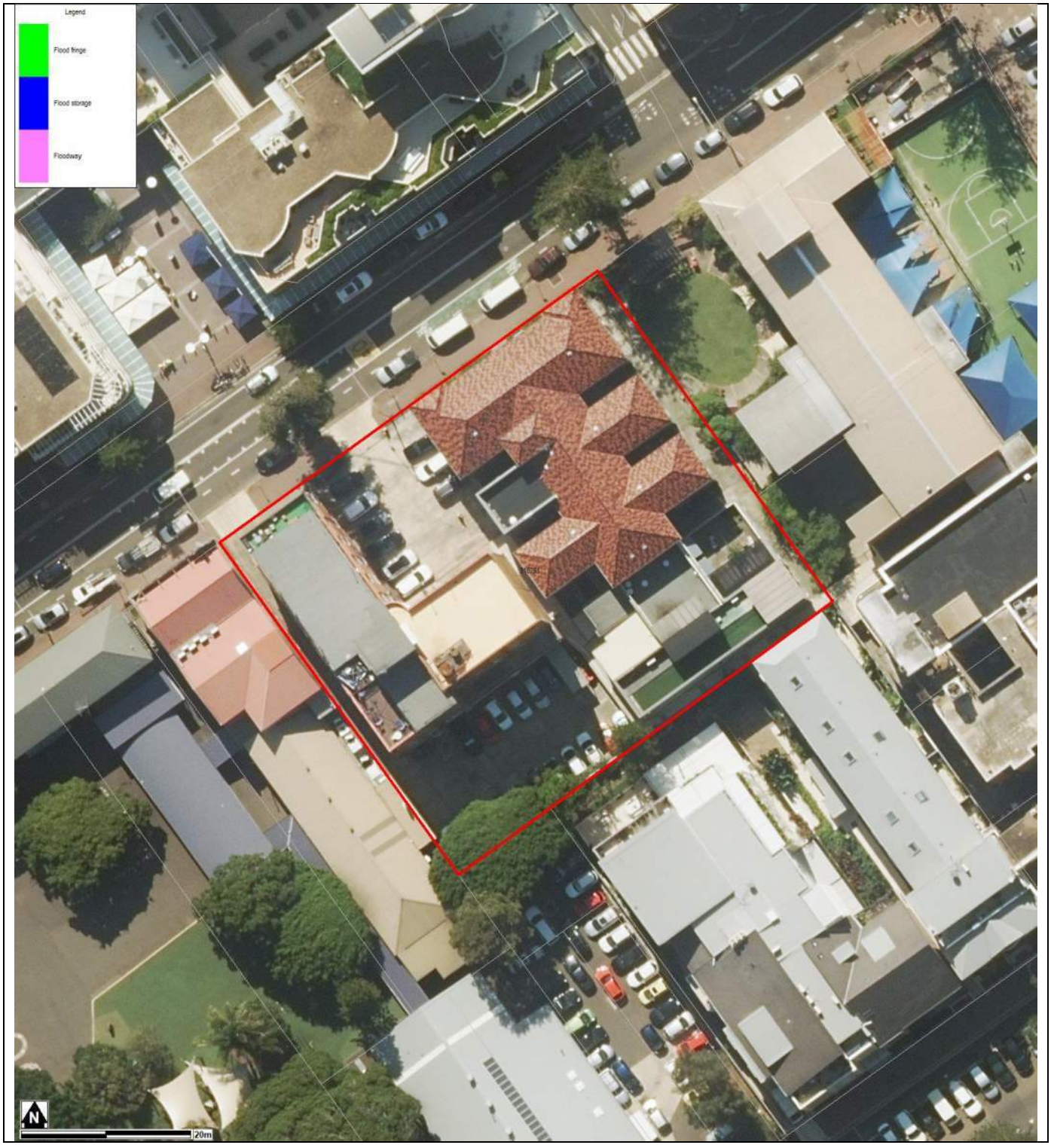
FLOOD MAP G: PMF FLOOD HYDRAULIC CATEGORY EXTENT MAP



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

Note:

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- Flood events exceeding the 1% AEP can occur on this site.
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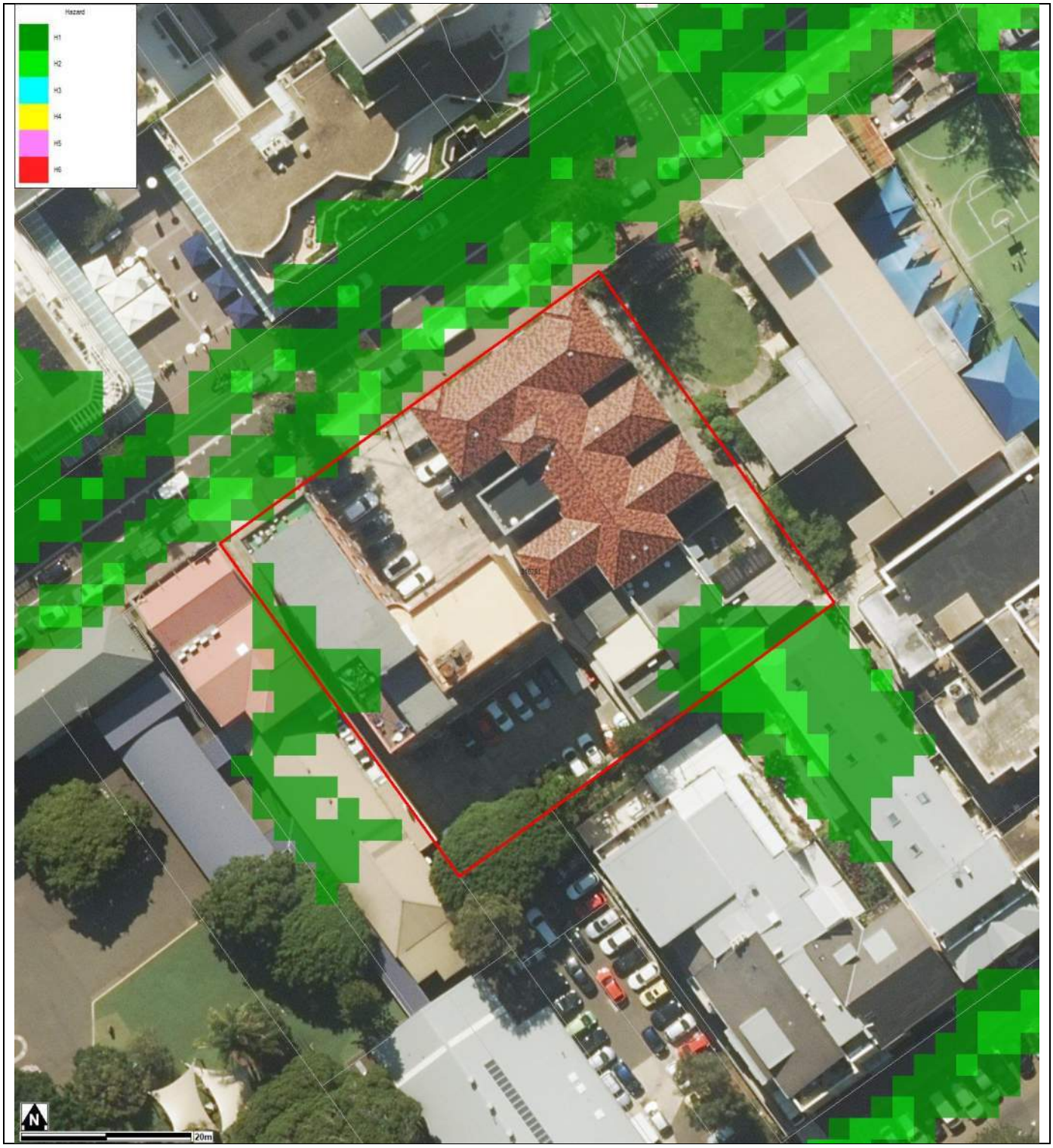

Notes:

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MAP J: INDICATIVE GROUND SURFACE SPOT HEIGHTS

DELETE ME: INSERT SCREENSHOT OF PROPERTY WITH ALS GROUND DATA

Notes:

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- Accuracy is generally within ± 0.2m vertically and ± 0.15m horizontally, and Northern Beaches Council does not warrant that the data does not contain errors.
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There are some circumstances where a 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
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The aim of a Flood Management Report is to demonstrate how a proposed development will comply with the flood related 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.

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Technical requirements of a Flood Management Report

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

1. ***Description of development***

   The description of development should identify:
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   - Type of use, ie, critical, vulnerable, subdivision, residential, business, industrial, recreational, environmental or concessional

2. ***Flood analysis***

   The flood analysis should include:
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   - Flood Planning Level (FPL)
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   - Flood Risk Precinct, ie High, Medium or Low
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   - Mapping of relevant extents
   - Flood characteristics for the site, eg depth, velocity, hazard and hydraulic category, and the impact these have on the proposed development

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The assessment of impacts should address the various elements of the relevant LEP and DCP. A simple compliance table should be provided, similar to the table one below.

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	Not Applicable	Yes	No
A Flood effects caused by Development			
B Drainage Infrastructure & Creek Works			
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D Storage of Goods			
E Flood Emergency Response			
F Floor Levels			
G Car Parking			
H Fencing			
I Pools			

Further details of what is required for each of these categories can be found in the *Development Control Plan for Flood Prone Land*.

For any of these categories which are applicable, the assessment should demonstrate how the development complies, or if it doesn't, provide an explanation of why the development should still be considered.

Reporting requirements for a Flood Management Report

The Flood Management Report should include:

a) Executive summary
b) Location plan, at an appropriate scale, that includes geographical features, street names and identifies all waterways and Council stormwater pipes, pits and easements
c) Plan of the proposed development site showing the extent of the predicted 100 year, any high hazard or floodway conditions and the PMF flood event
d) Development recommendations and construction methodologies
e) Calculation formulae (particularly for flood storage)
f) Clear referencing using an accepted academic referencing system (eg. Harvard)
g) Analysis of development against relevant State Environmental Planning Policies
h) Analysis of development against relevant Local Environment Plan and Policies
i) Conclusion detailing key points
j) Standard Hydraulic Certification (Form A/A1)
k) Qualifications of author
l) Any flood advice provided by Council
m) Any other details which may be relevant

NOTE: 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 Australian Institute of Engineers.

For further information please contact Stormwater and Floodplain Team on 1300 434 434 or via email at floodplain@northernbeaches.nsw.gov.au

Attachment A

NORTHERN BEACHES COUNCIL STANDARD HYDRAULIC CERTIFICATION FORM

FORM A/A1 – To be submitted with Development Application

Development Application for

Address of site: _____

Declaration made by hydraulic engineer or professional consultant specialising in flooding/flood risk management as part of undertaking the Flood Management Report:

I, _____ on behalf of _____
(Insert Name) (Trading or Business/ Company Name)

on this the _____ certify that I am engineer or a
(Date)

professional consultant specialising in flooding and I am authorised by the above organisation/ company to issue this document and to certify that the organisation/ company has a current professional indemnity policy of at least $2 million.

Flood Management Report **Details:**

Report Title: ……

Report Date: ……

Author: ……

Author's Company/Organisation: ……

I: _____
(Insert Name)

Please tick all that are applicable (more than one box can be ticked)

☐ have obtained and included flood information from Council (must be less than 12 months old) **(This is mandatory)**

☐ have followed Council's Guidelines for Preparing a Flood Management Report

☐ have requested a variation to one or more of the flood related development controls. Details are provided in the *Flood Management Report*.

Signature ……

Name ……

FLOOD INFORMATION REQUEST – COMPREHENSIVE

Property: 22 Wentworth Street MANLY NSW 2095
Lot DP: Part Lot 2587 DP 752038
Issue Date: 03/09/2020
Flood Study Reference: Manly to Seaforth Flood Study 2019

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]: 4.85 m AHD

1% AEP Flood – See Flood Map B

1% AEP Maximum Water Level [2, 3]: N/A mAHD

1% AEP Maximum Peak Depth from natural ground level[3]: N/A m

1% AEP Maximum Velocity: N/A m/s

1% AEP Provisional Flood Hazard: N/A **See Flood Map D**

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

Probable Maximum Flood (PMF) – See Flood Map C

PMF Maximum Water Level [4]: 4.72 m AHD

PMF Maximum Depth from natural ground level: 0.24 m

PMF Maximum Velocity: 0.72 m/s

PMF Flood Hazard: Low **See Flood Map F**

PMF Hydraulic Categorisation: N/A **See Flood Map G**

Flooding with Climate Change (See Flood Map H)

The following is for the 30% Rainfall intensity increase and 0.9m Sea Level Rise Scenario:

1% AEP Maximum Water Level with Climate change [3]: N/A m AHD

1% AEP Maximum Depth with Climate Change[3]: N/A m

1% AEP Maximum Velocity with Climate Change[3]: N/A m/s

Flood Life Hazard Category – See Map I

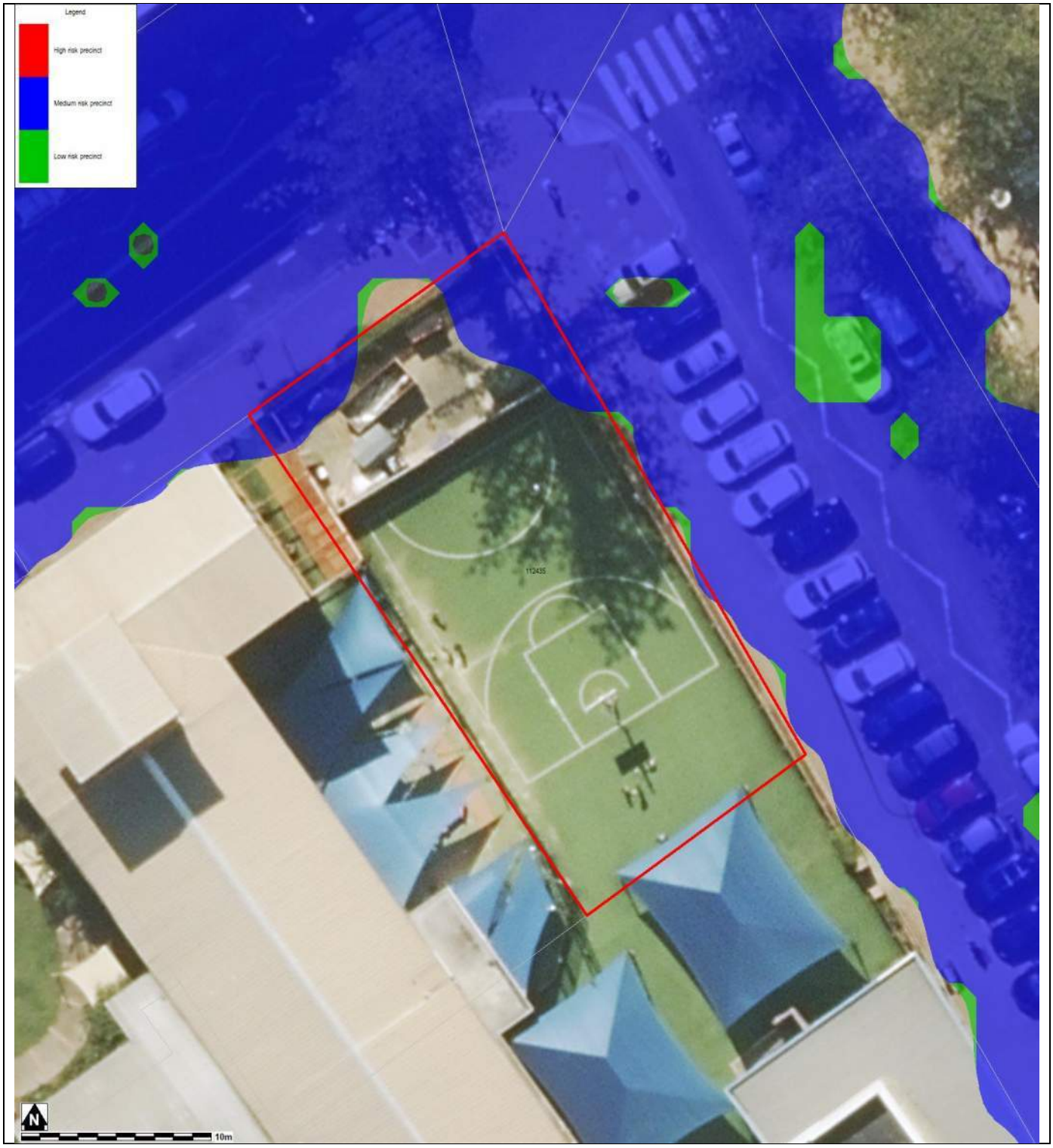
Indicative Ground Surface Spot Heights – See Map J

[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:) 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	4.77	4.60	0.21	0.50
2	N/A	N/A	N/A	N/A	N/A	4.78	4.63	0.19	0.62
3	N/A	N/A	N/A	N/A	N/A	4.85	4.71	0.20	0.47

WL – Water Level
PMF – Probable Maximum Flood
N/A = no peak water level/depth/velocity available in flood event

Climate Change Flood Levels (30% Rainfall intensity and 0.9m Sea Level Rise)

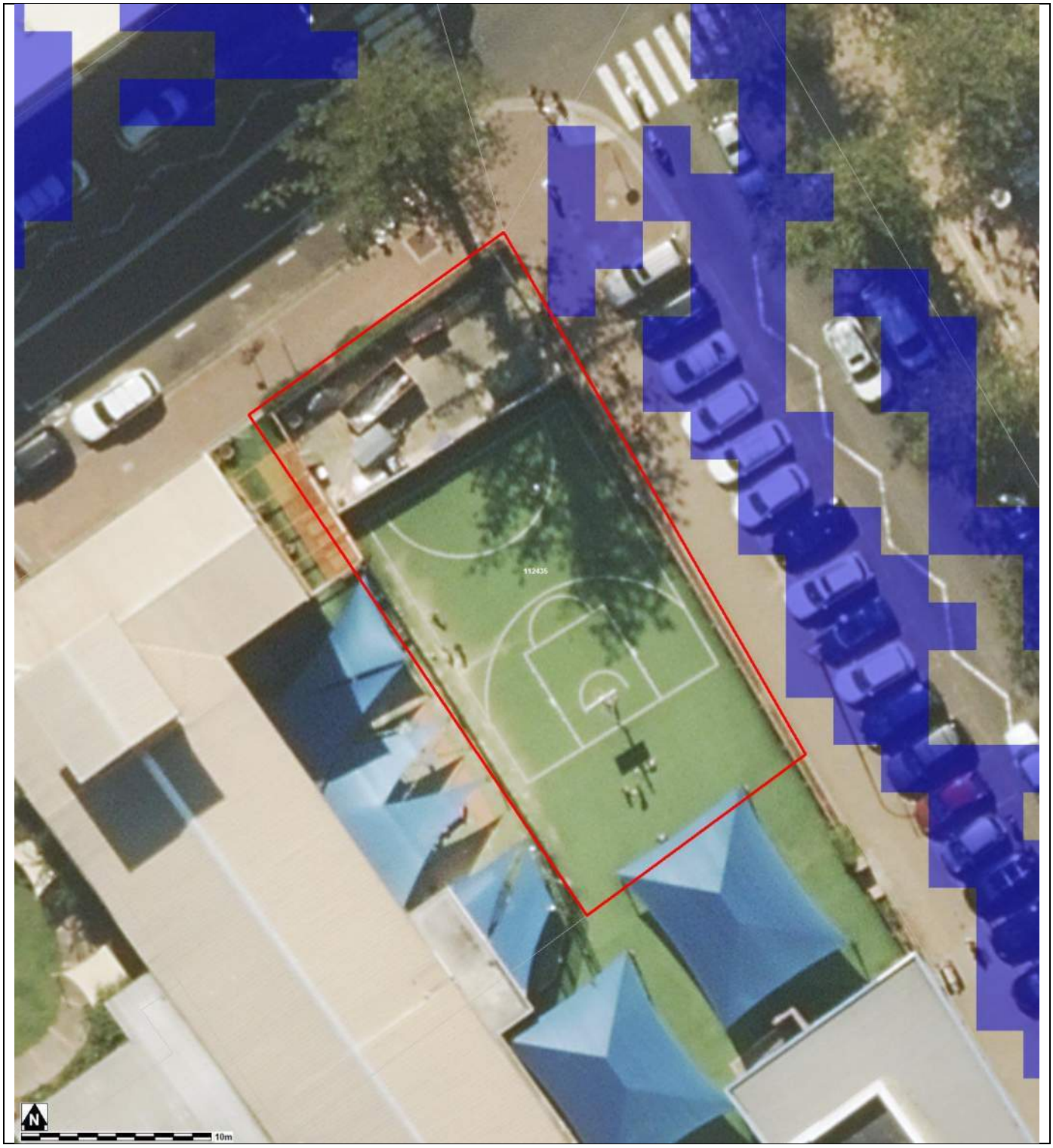
ID	CC 1% AEP Max WL (m AHD)	CC1 % AEP Max Depth (m)
1	N/A	N/A
2	N/A	N/A
3	N/A	N/A

A variable Flood Planning Level might apply - 0.5m above 1% AEP max water level (for Mainstream flooding) or 0.5m above the 1% AEP max water level flow path extent with depth greater than 0.3m and 0.3m above the 1% AEP max water level flow path with depth 0.3m and less (for overland flow).

If the CC 1% AEP level is less than the 1% AEP level, this is probably because the 1% AEP level used for planning includes a 5% AEP ocean surge. In this case, the 1% AEP value should be used.

WL – Water Level
PMF – Probable Maximum Flood
N/A = no peak water level/depth/velocity available in flood event.

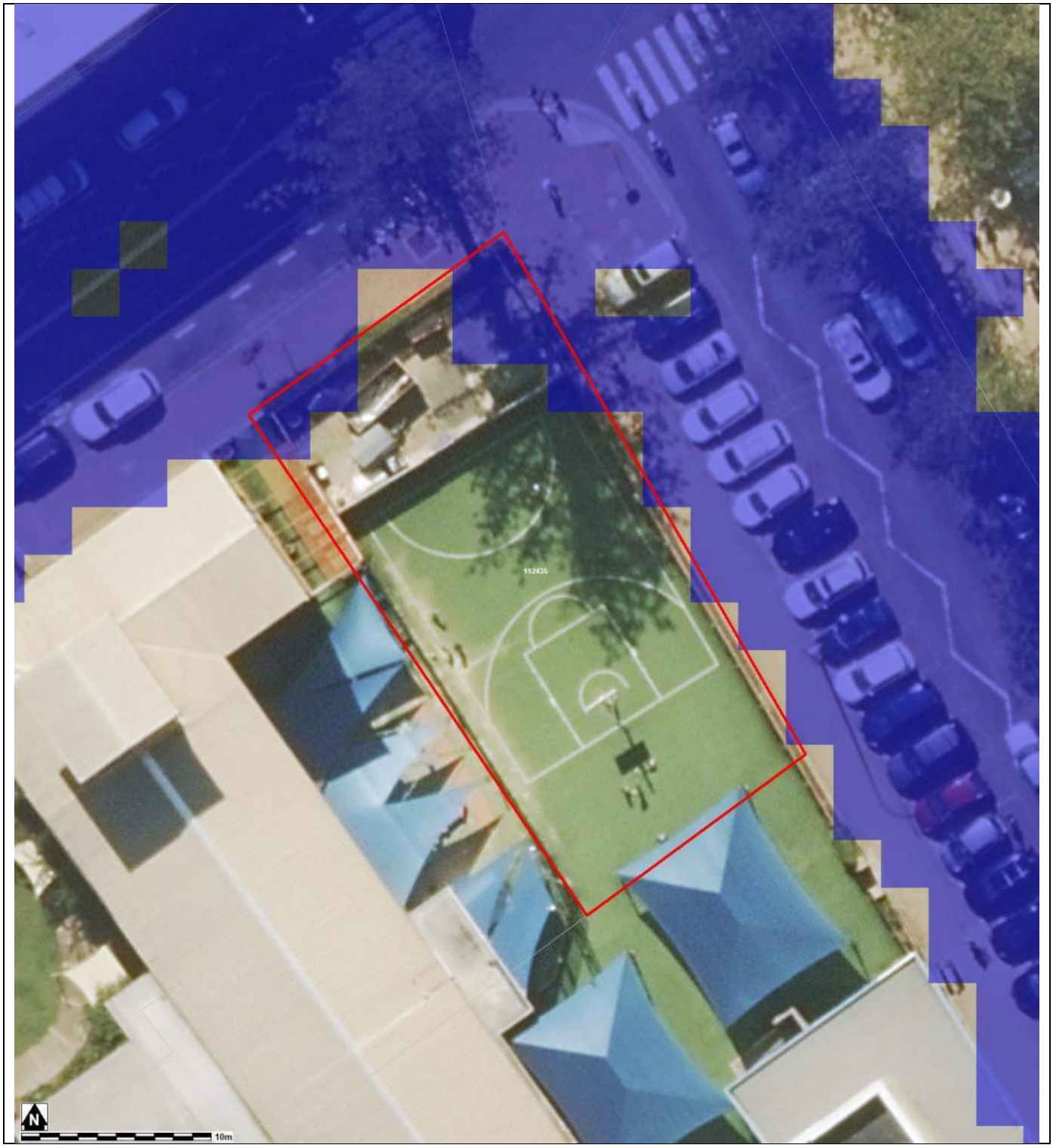
FLOOD MAP B: FLOODING - 1% AEP EXTENT



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:) and aerial photography (Source Near Map 2014) are indicative only.

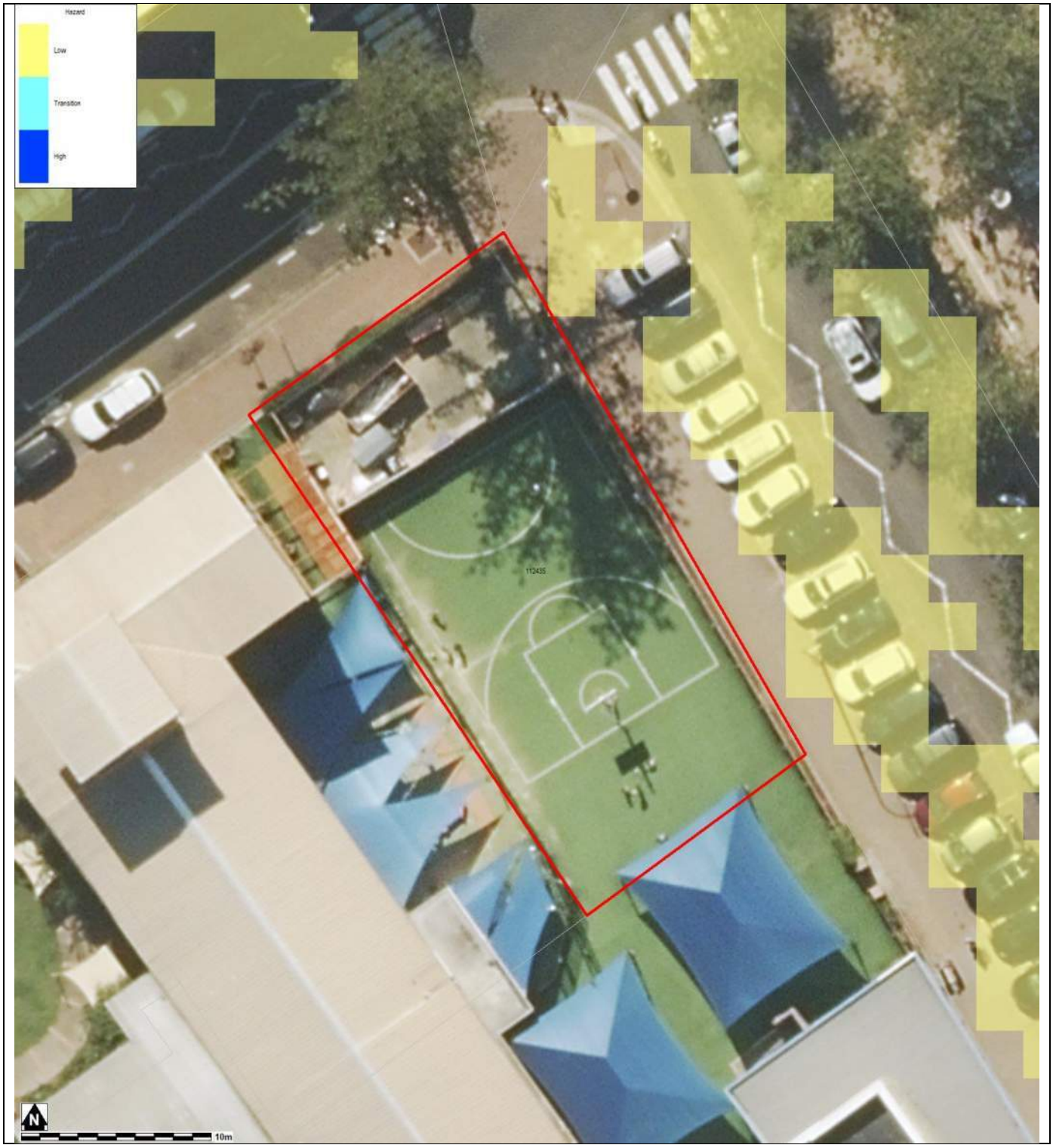
FLOOD MAP C: PMF EXTENT MAP



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:) and aerial photography (Source: NearMap 2014) are indicative only

FLOOD MAP D: 1% AEP FLOOD HAZARD 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:) and aerial photography (Source: NearMap 2014) are indicative only

FLOOD MAP E: 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:) and aerial photography (Source: NearMap 2014) are indicative only

FLOOD MAP F: PMF FLOOD HAZARD EXTENT MAP

Notes:

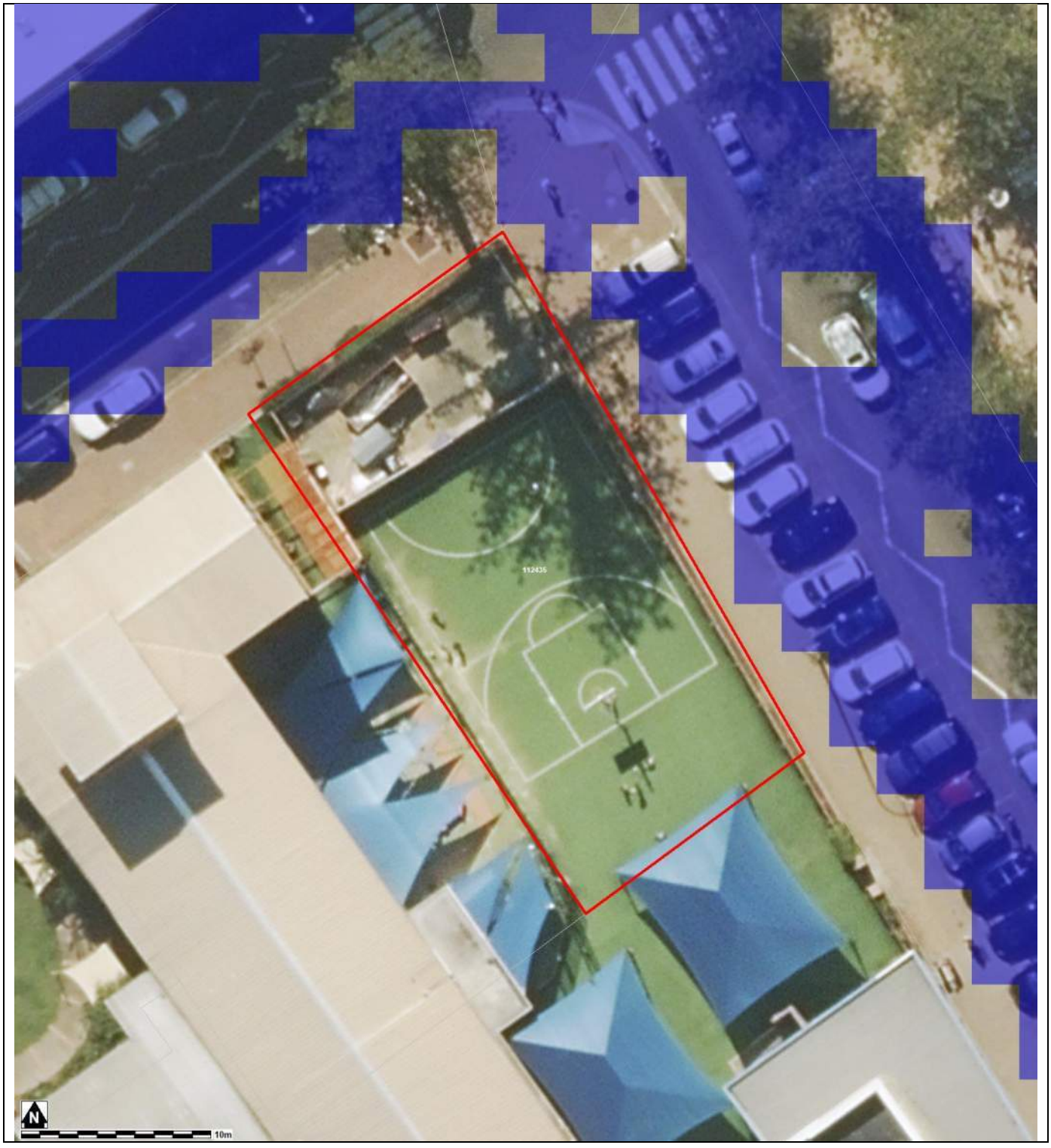
- Extent represents the Probable Maximum Flood (PMF) event
- Extent does not include climate change
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source:) and aerial photography (Source: NearMap 2014) are indicative only

FLOOD MAP G: PMF FLOOD HYDRAULIC CATEGORY EXTENT MAP

Notes:

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

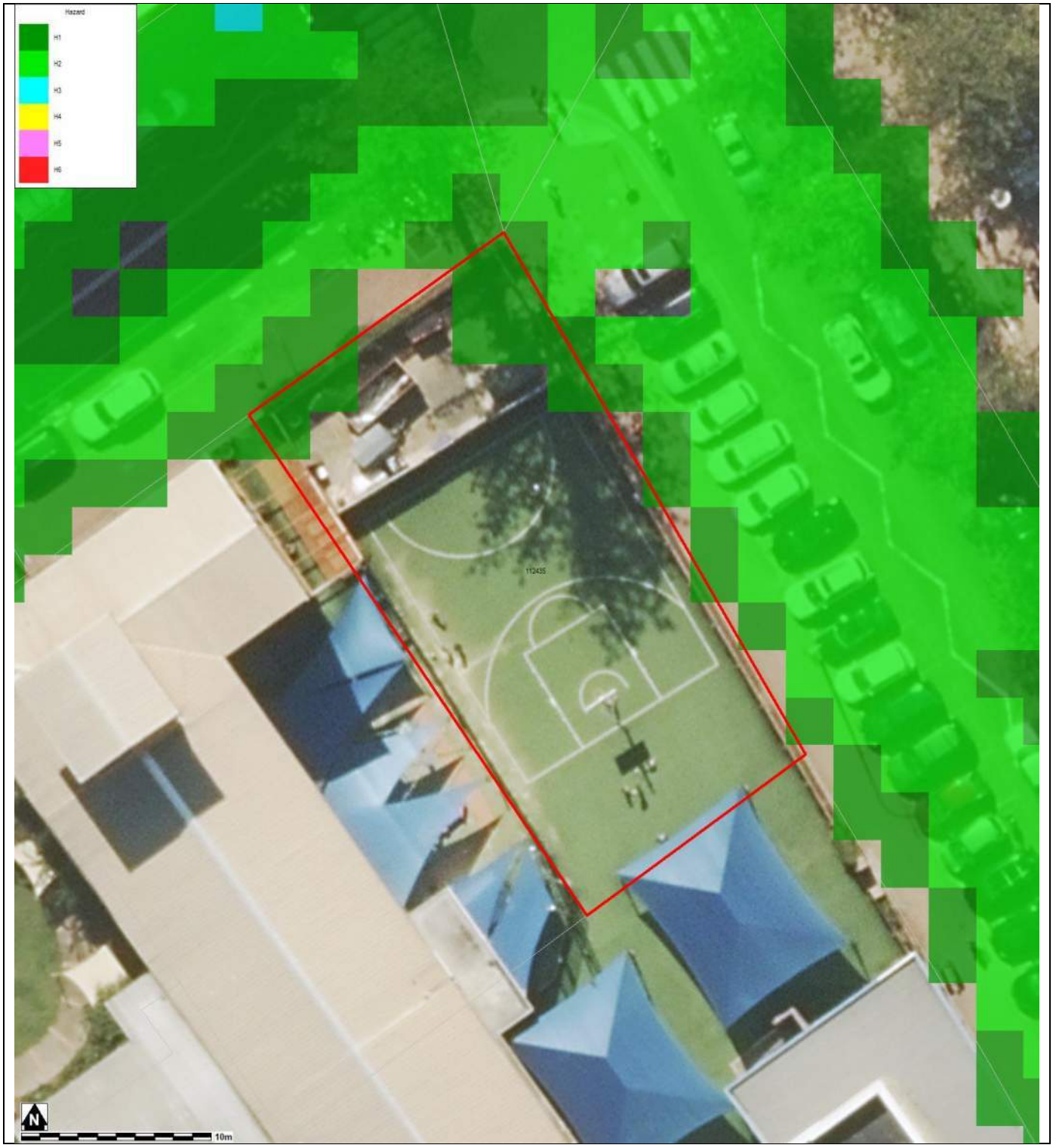
FLOOD MAP H: FLOODING – 1% AEP EXTENT PLUS CLIMATE CHANGE



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:) and aerial photography (Source: NearMap 2014) are indicative only

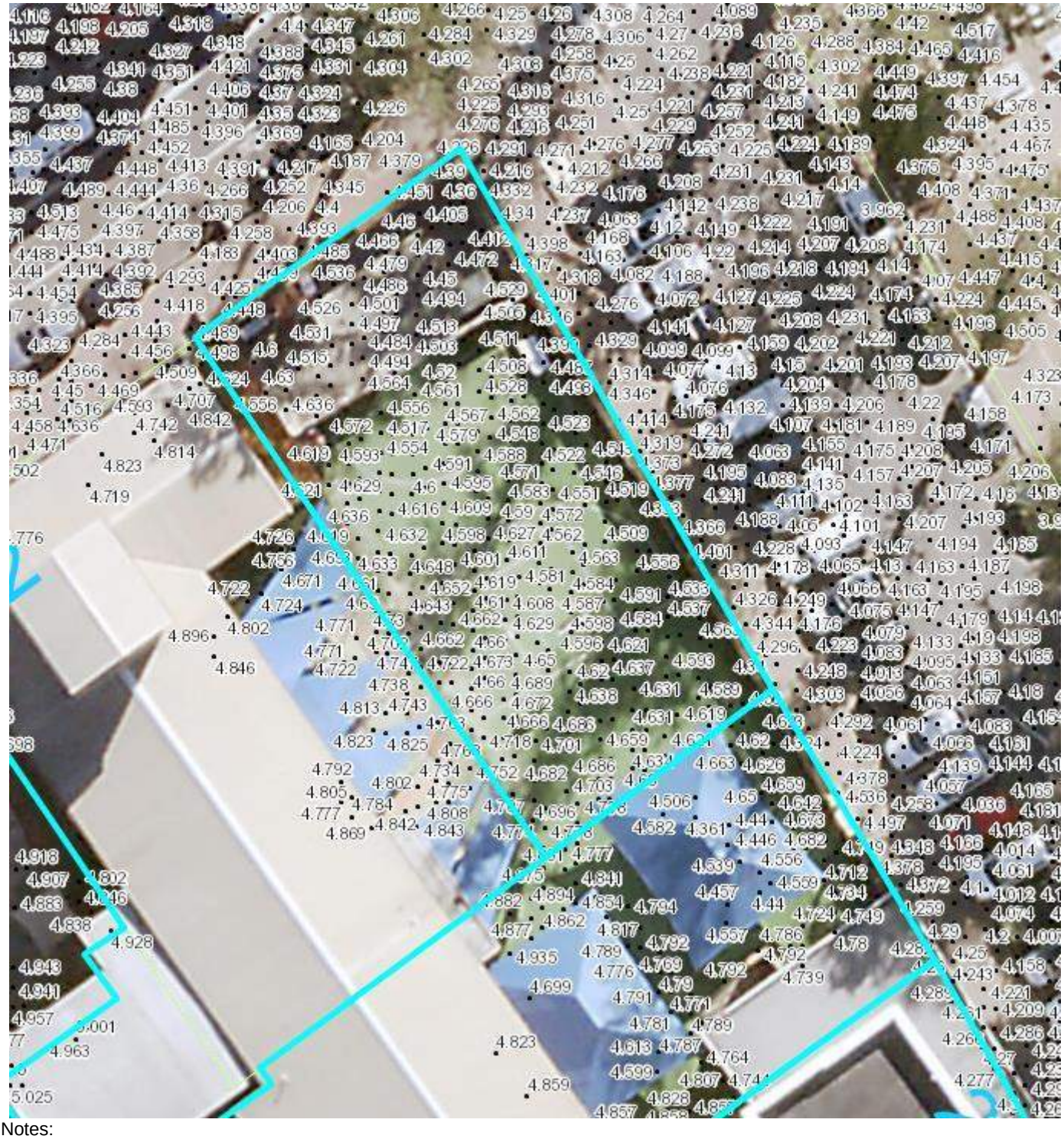
FLOOD MAP I: FLOOD LIFE HAZARD CATEGORY



Notes:

- For additional information on Flood Life Hazard Categories, refer to 'Flood Emergency Response Planning for Development in Pittwater Policy' and Pittwater 21 DCP Control B3.13.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source:) and aerial photography (Source Near Map 2014) are indicative only.

MAP J: 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 ± 0.2m vertically and ± 0.15m 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.

GUIDELINES for Preparing a Flood Management Report

Introduction

These guidelines are intended to provide advice to applicants on preparing a Flood Management Report. The purpose of a Flood Management Report is to help applicants measure and manage the flood risk to life and property on their site.

When is a Flood Management Report required?

A Flood Management Report must be submitted with any Development Application on flood prone land, for Council to consider the potential flood impacts and 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.

Note that the flood extents shown on the mapping are indicative only. It is recommended that flood levels are compared to registered ground survey to more accurately determine the flood extent.

There are some circumstances where a 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 Flood Planning Level 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 in a Flood Management Report?

The aim of a Flood Management Report is to demonstrate how a proposed development will comply with the flood related 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.

Technical requirements of a Flood Management Report

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

1. ***Description of development***

   The description of development should identify:
   - 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, ie, critical, vulnerable, subdivision, residential, business, industrial, recreational, environmental or concessional

2. ***Flood analysis***

   The flood analysis should include:
   - Predicted 1 in 100 year flood level
   - Flood Planning Level (FPL)
   - Probable Maximum Flood (PMF) level
   - Flood Risk Precinct, ie High, Medium or Low
   - Flood Life Hazard Category (in former Pittwater Council area only)
   - Mapping of relevant extents
   - Flood characteristics for the site, eg depth, velocity, hazard and hydraulic category, and the impact these have on the proposed development

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

3. Assessment of impacts

The assessment of impacts should address the various elements of the relevant LEP and DCP. A simple compliance table should be provided, similar to the table one below.

	Compliance		
	Not Applicable	Yes	No
A Flood effects caused by Development			
B Drainage Infrastructure & Creek Works			
C Building Components & Structural			
D Storage of Goods			
E Flood Emergency Response			
F Floor Levels			
G Car Parking			
H Fencing			
I Pools			

Further details of what is required for each of these categories can be found in the *Development Control Plan for Flood Prone Land*.

For any of these categories which are applicable, the assessment should demonstrate how the development complies, or if it doesn't, provide an explanation of why the development should still be considered.

Reporting requirements for a Flood Management Report

The Flood Management Report should include:

a) Executive summary
b) Location plan, at an appropriate scale, that includes geographical features, street names and identifies all waterways and Council stormwater pipes, pits and easements
c) Plan of the proposed development site showing the extent of the predicted 100 year, any high hazard or floodway conditions and the PMF flood event
d) Development recommendations and construction methodologies
e) Calculation formulae (particularly for flood storage)
f) Clear referencing using an accepted academic referencing system (eg. Harvard)
g) Analysis of development against relevant State Environmental Planning Policies
h) Analysis of development against relevant Local Environment Plan and Policies
i) Conclusion detailing key points
j) Standard Hydraulic Certification (Form A/A1)
k) Qualifications of author
l) Any flood advice provided by Council
m) Any other details which may be relevant

NOTE: 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 Australian Institute of Engineers.

For further information please contact Stormwater and Floodplain Team on 1300 434 434 or via email at floodplain@northernbeaches.nsw.gov.au

Attachment A

NORTHERN BEACHES COUNCIL STANDARD HYDRAULIC CERTIFICATION FORM

FORM A/A1 – To be submitted with Development Application

Development Application for

Address of site: _____

Declaration made by hydraulic engineer or professional consultant specialising in flooding/flood risk management as part of undertaking the Flood Management Report:

I, _____ on behalf of _____
(Insert Name) (Trading or Business/ Company Name)

on this the _____ certify that I am engineer or a
(Date)

professional consultant specialising in flooding and I am authorised by the above organisation/ company to issue this document and to certify that the organisation/ company has a current professional indemnity policy of at least $2 million.

Flood Management Report **Details:**

Report Title: …….

Report Date: …….

Author: …….

Author's Company/Organisation: …….

I: _____
(Insert Name)

Please tick all that are applicable (more than one box can be ticked)

☐ have obtained and included flood information from Council (must be less than 12 months old) **(This is mandatory)**

☐ have followed Council's Guidelines for Preparing a Flood Management Report

☐ have requested a variation to one or more of the flood related development controls. Details are provided in the *Flood Management Report*.

Signature …….

Name ……..

APPENDIX C – Flood Planning Levels in Relation to The Development

RFW Building Flood Planning Levels

SKC01

REV #: **C**
SCALE: AS SHOWN
DATE: **14.10.2022**
PROJECT #: **200211**
PREPARED BY: J.KANE

NORTHROP

EXISTING BUILDING A C.C.K. BUILDING
EXISTING + EXTENSION BUILDING B DRUMMOND HOUSE
PROPOSED BUILDING C RESIDENTIAL / COMMERCIAL
PROPOSED NEW OPEN SPACE

W E N T W O R T H S T R E E T

FLOOD PLANNING LEVEL 5.16M
FLOOD PLANNING LEVEL 4.92M
Flood Planning Level 4.90m
FLOOD PLANNING LEVEL 4.85M
FLOOD PLANNING LEVEL 4.78M
FLOOD PLANNING LEVEL 4.77M
Flood Planning Level 4.73m
Values in Black and Blue Determined by Linear Interpolation
Flood Planning Level 4.68m
Flood Planning Level 4.64m
FLOOD PLANNING LEVEL 4.62M
FLOOD PLANNING LEVEL 4.58M
Flood Planning Level 4.56
FLOOD PLANNING LEVEL: N/A

EXISTING BASEMENT CARPARK ENTRY
RE-USE PORTIONS OF STREET ART FENCE AS BACKDROP TO FRONT SIDE BOUNDARY WALL.
REDUCED HEIGHT IN BASEMENT FOR TREE PLANTING
REFURBISHMENT WORKS TO DRUMMOND HOUSE TO HERITAGE ARCH APPROVAL.
FIRE
SITE BOUNDARY
RE-USE PORTIONS OF STREET ART FENCE AS BACKDROP TO LANDSCAPE TERRACE.

TWO STOREY BRICK BUILDING
HERITAGE ITEM, I 244

KIOSK SUB-STATIONS
MAIN ENTRY
ENTRY VESTIBULE
EXISTING DRIVEWAY
CCK RECEPTION
EXISTING SHADED DARK GREY
EXISTING C.C.K. BUILDING
CONFERENCE ROOM 01
CONFERENCE ROOM 02
EXISTING EOT
KITCHENETTE
STORE
PLANT

BUILDING A

LOBBY
RECEPT.
STORE
Acc. WC
WC
LIFT
VISITOR LOUNGE
KITCHEN & SERVERY
DINING/FLEX SPACE
WALKWAY ROOF OVER
CARETAKER
GUEST ROOM G1
GUEST ROOM G2
GUEST ROOM G3
GUEST ROOM G4
LAUNDRY
CLEANER STORE
BATHING CHANGE

BUILDING B

RETAIL RL. 4.92
COMM. LIFT
RES. LIFT
RES. LOBBY RL. 4.92
WASTE LIFT
BLD C RES. WASTE /BLD D WASTE HOLDING
COMM. LOBBY
COMMERCIAL RL. 5.15
SLIDING DOORS
STORE
RES. LOBBY RL. 4.85
POSSIBLE ZONE FOR AMENITIES. REFER FUTURE 'FITOUT DEVELOPMENT APPLICATION

BUILDING C

FORECOURT RL. 5.0
AFTERHOURS GATES
RES. LIFT
RES. LOBBY RL. 4.75
RETAIL RL. 4.70
AFTERHOURS GATE

BUILDING D

RES. LOBBY RL. 4.70
RES. LIFT
RES. LOBBY RL. 4.70
RETAIL RL. 4.70
AFTERHOURS GATE

RESIDENTIAL APARTMENTS
FOUR STOREY BRICK BUILDING

'MANLY VILLAGE PUBLIC SCHOOL'
SCHOOL HALL

RESIDENTIAL APARTMENTS
THREE STOREY BRICK BUILDING
HERITAGE ITEM, I 241

'NEWSTEAD'
SIX STOREY BRICK BUILDING
HERITAGE ITEM, I 242

'SOUTH STEYNE MEDICAL CENTRE'
TWO STOREY CEMENT RENDERED BUILDING
HERITAGE ITEM, I 226

S O U T H S T E Y N E
B E A C H F R O N T P R O M E N A D E

EX. RL. 4.93 · EX. RL. 4.96 · EX. RL. 4.79 · EX. RL. 4.66 · EX. RL. 4.60 · EX. RL. 4.49 · EX. RL. 4.35 · EX. RL. 4.39 · EX. RL. 4.36 · EX. RL. 4.31 · EX. RL. 4.20 · EX. RL. 4.25 · EX. RL. 4.39

01 — GROUND FLOOR PLAN
1:200

Town Planning: Boston Blyth Fleming — Suite 1, 9 Narabang Way, Belrose NSW 2085, greg@bbfplanners.com.au, T: 02 9986 2535
Project Manager: Lighthouse Project Group — Level 2, 56 Berry St, North Sydney NSW 2000, info@lighthouseprm.com.au
Heritage Consultant: URBIS — Angel Place, L8, 123 Pitt St, Sydney NSW 2000, T: 02 8233 9900
BCA Consultant: City Plan — Level 6, 120 Sussex St, Sydney NSW 2000, reception@cityplan.com.au, T: 02 8270 3500
Geotech & Contamination: Douglas & Partners — 96 Hermitage Rd, West Ryde NSW 2114, sydney@douglaspartners.com.au, T: 02 9809 0666
Acoustic Engineer: Acoustic Logic — 9 Sarah Street, Mascot NSW 2020, enquiries@acousticlogic.com.au, T: 02 8339 8000
Landscape Architect: Jane Irwin Landscape Architecture — Suite 203, L2, 61 Marlborough St, Surry Hills NSW 2010, info@jila.net.au, T: 02 9212 6957
Fire Engineers: OMNII — Level 13, 5 Martin Place, Sydney NSW 2000, T: 02 8871 8200
Civil & Stormwater Engineers: Northrop — Level 11, 345 George St, Sydney NSW 2000, sydney@northrop.com.au, T: 02 9241 4188
Hydr & Mech & Fire Services Eng: DSC Consulting — 57-59 Hill St, Roseville NSW 2069, mail@dsc.com.au, T: 02 9416 1177
Structural Engineer: SCP Engineers & Development Consultants — L2 507 Kent St, Sydney NSW 2000, mail@scpconsult.com.au, T: 02 9267 9312

02 — 13.10.2022 — DA RESUB — DA RESUB
01 — 10.06.2022 — Issue — Description

NORTH

Project: Royal Far West Neighbourhood
Site: 14-22 Wentworth Street & 19-21 South Steyne, Manly
Applicant: Royal Far West

Scale:	Drawn By:	Checked 1:	Checked 2:	Approved:
As shown @ A1	BD, EP	BD	EP	EP

Architect: Murcutt Candalepas — 309 Sussex Street, Sydney NSW 2000, info@candalepas.com.au, T: 02 9283 7755, F: 02 9283 7477, Registration No. NSW 5773

Drawing: GROUND FLOOR PLAN
Drawing Number: DA - 112
FOR A DEVELOPMENT APPLICATION ONLY
Job Number: 5899
Issue: 02.

DRAWING ORIGINAL SIZE: A1

Note.
This drawing is to be read in conjunction with all relevant project documentation and written architectural specifications) & all specialist consultant documentation incl structural, mechanical, electrical & hydraulic engineering documentation etc. Refer architectural drawing notes page for further notation.
Do not scale from this drawing. Only figured dimensions shall be used.
Report any discrepancy between this drawing & other project documentation immediately to the architect for clarification prior to commencement of works on site. All structural element (load bearing columns, beams, walls etc) sizes shown on these architectural documents are indicative only. Refer Structural Engineer's documents for all sizes. Shop drawings to be completed for all metalwork, joinery etc and checked by architect & SE prior to fabrication.
This document shall only be used for the purpose for which it was commissioned.

APPENDIX D – Natural Environment Referral Response (Northern Beaches Council, 17 August 2022)

Natural Environment Referral Response - Flood

Application Number:	DA2022/1000

Date:	17/08/2022
To:	Lashta Haidari
Land to be developed (Address):	Lot 100 DP 1276056 , 19 - 21 South Steyne MANLY NSW 2095

Reasons for referral

This application seeks consent for the following:

- All Development Applications on land below the 1 in100 year flood level;
- All Development Applications located on land below the Probable Maximum Flood levels.

And as such, Council's Natural Environment Unit officers are required to consider the likely impacts on drainage regimes.

Officer comments

The development proposes to demolish existing commercial buildings to construct mixed use buildings with basement carpark.
The site is generally not affected by 1% AEP, however, it is affected by the PMF. The site is subjected to various Flood Planning Level (FPL) control levels.
The proposed retail area at building C fronting Wentworth Street with Finish Floor Level (FFL) of 4.75m AHD is not complying with FPL of 4.92m AHD. The reason provided by applicant is the need to activate the street front and provision of wheelchairs access.
The existing footpath level is at RL4.66m AHD, the access gradient of 4% is easily achievable for wheelchair access and street activation.
The proposal is considered non-compliant with Section B3.11 of Council's DCP.

The proposal is therefore unsupported.

Note: Should you have any concerns with the referral comments above, please discuss these with the Responsible Officer.

Recommended Natural Environment Conditions:

Nil.