

RF90201

Revised Flood Assessment Report For Proposed Swimming Pool

Development Site at:
2 Riverview Parade,
North Manly, NSW 2100
LOT 96 DP 12578

08 April 2019

Prepared by:



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at

2 Riverview Parade, North Manly, NSW 2100

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1. INTRODUCTION

1.1 Background

ACCON Engineers was commissioned by Nick Kilpin on 22 November 2018 to assess the impact of flooding associated with the proposed swimming pool at 2 Riverview Parade, North Manly, NSW 2100.

This report describes the existing characteristics of the area, proposed development and quantifies the impact of the proposed development. According to the flood information provided by Northern Beaches Council, the subject site is affected by mainstream flooding during major storm events with medium to high flood hazard category and lies in flood storage area. The work in this study draws upon the results of Manly Lagoon Flood Study 2013.

1.2 Objectives

The main objective of this study is to carry out a detail site-specific flood assessment report for proposed swimming pool development site at 2 Riverview Parade, North Manly, NSW 2100. In order to achieve this goal, the following specific objectives are proposed:

- Northern Beaches Council (Warringah Council LEP 2011)
- Review on Manly Lagoon Flood Study 2013
- Section E11 of the Warringah Development Control Plan 2011
- NSW Government Floodplain Management Manual 2005
- Analysis of the existing flood category
- Identification and recommendation of relevant floodplain controls

1.3 Methodology

This flood assessment report is prepared based on the hydrological analysis of the development site using the information on the several documents such as survey plan of the development site, proposed development plan provided by the client, Warringah Development Control Plan, Flood Information from Council. In addition to this, some

relevant information about the development site and the surrounding are collected using Land and Property Information (LPI) web services and by visiting the site by our drainage engineer.

2. SITE DESCRIPTION

2.1 Land Details

The site is located on the Western side of Northview Parade as shown in Figure 2.1. The land is identified as Lot 96 DP 12578. The site has an overall area of 603.9 Sq. M as per survey plan provided by client.



Figure 2.1 Location of Site (Source: Department of Lands- Six Maps)

The site has a single storey dwelling. There is existing concrete driveway from Northview Parade, which provides vehicular access to the existing garage.

2.2 Topography

The site is generally flat slightly sloping from front to rear of the property. The survey plan prepared by Landscape Surveys is presented in Figure 2.2. The full detail survey plan is provided in Appendix A.

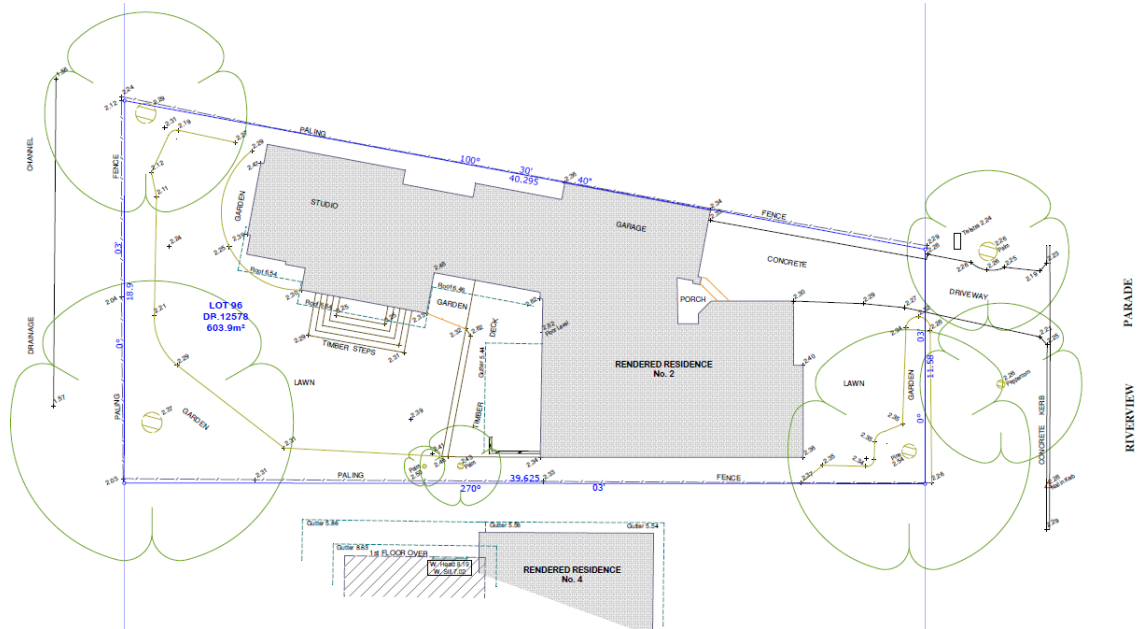


Figure 2.2 Survey Plan (Source: Landscape Surveys)

3. EXISTING FLOOD CHARACTERISTICS

3.1 Flood Behaviour

The site is located on Riverview Parade in North Manly and extend onto Nolan Reserve which is adjacent to Manly Lagoon. According to the flood information provided by Northern Beaches Council, the subject site is affected by mainstream flooding during major storm events with medium to high flood hazard category and lies in flood storage area. Hence, it is advised that the flood related development controls apply to the development purposes.

3.2 Flood Level and Hazard Category

Flood level information at the development site for the various flood event is provided in Table 3.1 as per council flood level information.

Table 3. 1 Flood Levels

Flood Event (ARI)	Flood Level (m AHD)
1% AEP	3.18
PMF	5.68

The subject property lies in flood storage area during 1% AEP. Whole of the property is affected with flooding during 1% AEP and PMF flood events. The flood planning level (FPL) of this property is 3.68 m. The flood level information obtained from Council is presented in Appendix D. The flood control matrix obtained from Warringah Development Control Plan 2011 is presented in Appendix C.

4. PROPOSED DEVELOPMENT

The proposed developments include construction of swimming pool and deck extending from main dwelling at the rear of existing dwelling. The proposed swimming pool lies in flood storage area. The proposal is assessed against Warringah Development Control Plan 2011. The site plan that includes the proposed development is shown in Figure 4.1. The full detail site plan of this block is provided in Appendix B.

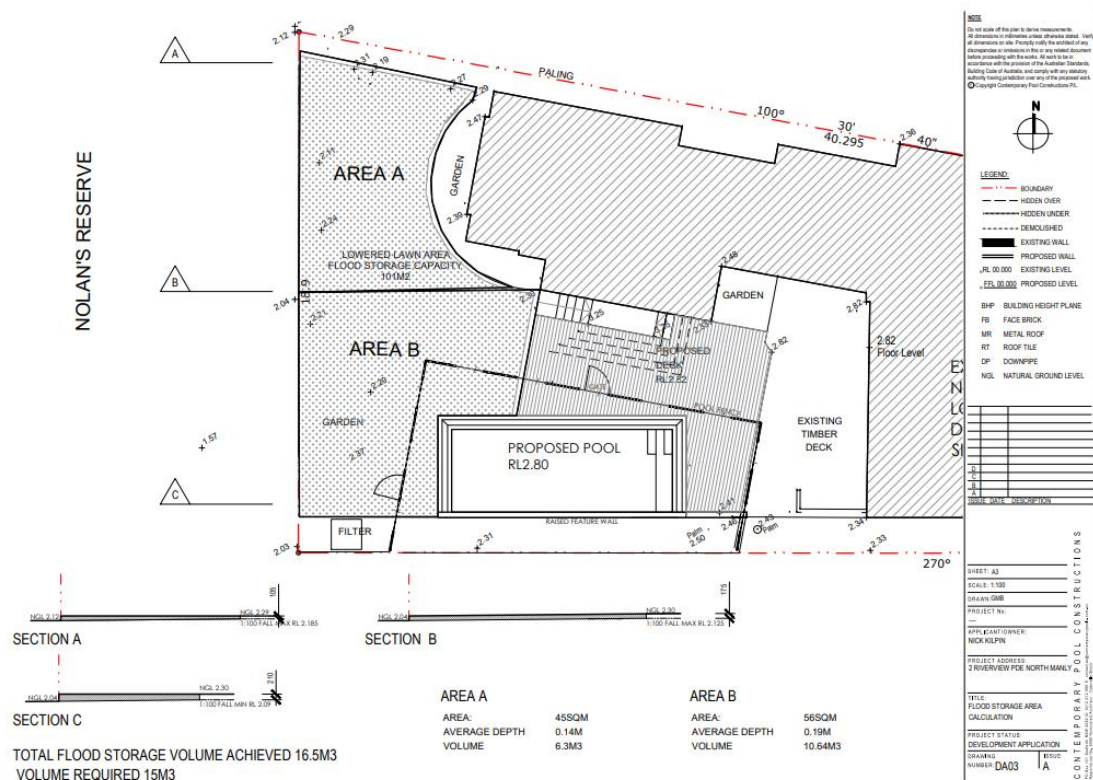


Figure 4.1 Site plan (Source: Contemporary Pool Construction)

4.1 Floor Level

The coping level of the proposed swimming pool is proposed 2.80 m, which is approximately 0.5 m above the natural ground level. The proposed coping level is below 1% AEP flood level. The proposed deck near the existing dwelling is proposed at 2.82 m which is same as existing dwelling floor level. The deck is proposed with suspended floor to allow free flow of floodwater.

4.2 Building Component and Method

All structural components below FPL (3.68 m) should be constructed of flood compatible materials.

4.3 Structural Soundness

Engineer's report is required certifying that the structure can withstand the forces of floodwater debris and buoyancy up to and including FPL (3.68 m).

4.4 Flood Affection

The proposed development is a small development and does not involve substantial change on existing topography of the development site. The subject property lies in flood storage area. There will be approximately $(8.5 \times 3.5 \times 0.5 \sim 15 \text{ m}^3)$ of flood storage loss due to proposed pool. This flood storage loss should be compensated by cutting available landscape area at rear of the property. It is proposed to cut the natural ground over 101 m^2 with depth on average 0.15 m in this proposal. By providing compensated area, there will not be loss in flood storage area and the proposed development will not affect surrounding area. The compensated area is proposed as shown in appendix B.

4.5 Car Parking and Driveway Access

No car park and driveway access is proposed in this development.

4.6 Fence

The new fence should be constructed in such a manner, which does not affect the flow of floods, so as detrimentally increase flood affection on surrounding land. Flow through open form of fencing is required for all new and replacement fences and gates upto 1% AEP flood level 3.16 m. The fence material below FPL 3.68 m should be constructed of flood compatible materials.

4.7 Evacuation

The subject property is affected by flooding during major storm events with medium to high flood hazard. The floor level of existing dwelling is below 1% AEP and PMF flood level. There may be risk involved in staying in the premises during these flood events. It is recommended to evacuate the premises as soon as flood water begin to inundate the

street kerb and gutter adjacent the premises. There might be evacuation difficulties for small cars during major flood events for this property. SES vehicles can be used for evacuation during higher flood event if needed. In the event that emergency authorities such as SES issue an evacuation order, evacuation from the site is recommended towards flood free area as directed by emergency authorities and this should be done before major flood events. As the mainstream flood event is one of the very common hazards in the low-lying area, it is very important to prepare flood evacuation plan.

In addition, it is strongly recommended that the owners should be aware of the flood situation at this property as in the flood certificate issued from the council. The certificate would contain vital information such as the expected flood levels in a range of design floods. It would also provide information on ground and floor levels, which would allow an assessment of the depths of flooding over the property and building. This awareness will give timely and safe evacuation from the expected high flood event.

Refer to Northern Beaches Council and SES flood warning website for update.

<http://new.mhl.nsw.gov.au/users/NBFloodInfo/>

<https://www.ses.nsw.gov.au/disaster-tabs-header/flood/>

4.8 Surface Drainage

The existing landscape area (of which proposed deck is to be constructed over) at the rear may be ponding during heavy rainfall. It is recommended to grade towards existing stormwater channel beyond the rear fence to Nolan Reserve. To mitigate ponding of stormwater in this area with the following requirements.

- Achieve 1% fall toward Nolan Reserve
- No additional fill is to be brought to the site to achieve the required grade.

4.9 Management and Design

No storage of materials would be expected to be stored below the FPL (3.68 m), which would cause pollution or would be likely to be potentially hazardous during a flood. It must be demonstrated that goods, materials and other products that may be potentially hazardous and/or pollute floodwaters, including pool chemicals, should be stored above the FPL.

All the new electrical services, fixtures and fittings must be located above the FPL. No electrical equipment or electrical motors (including pool pumps and equipment) are to be located below FPL.

5. CONCLUSION

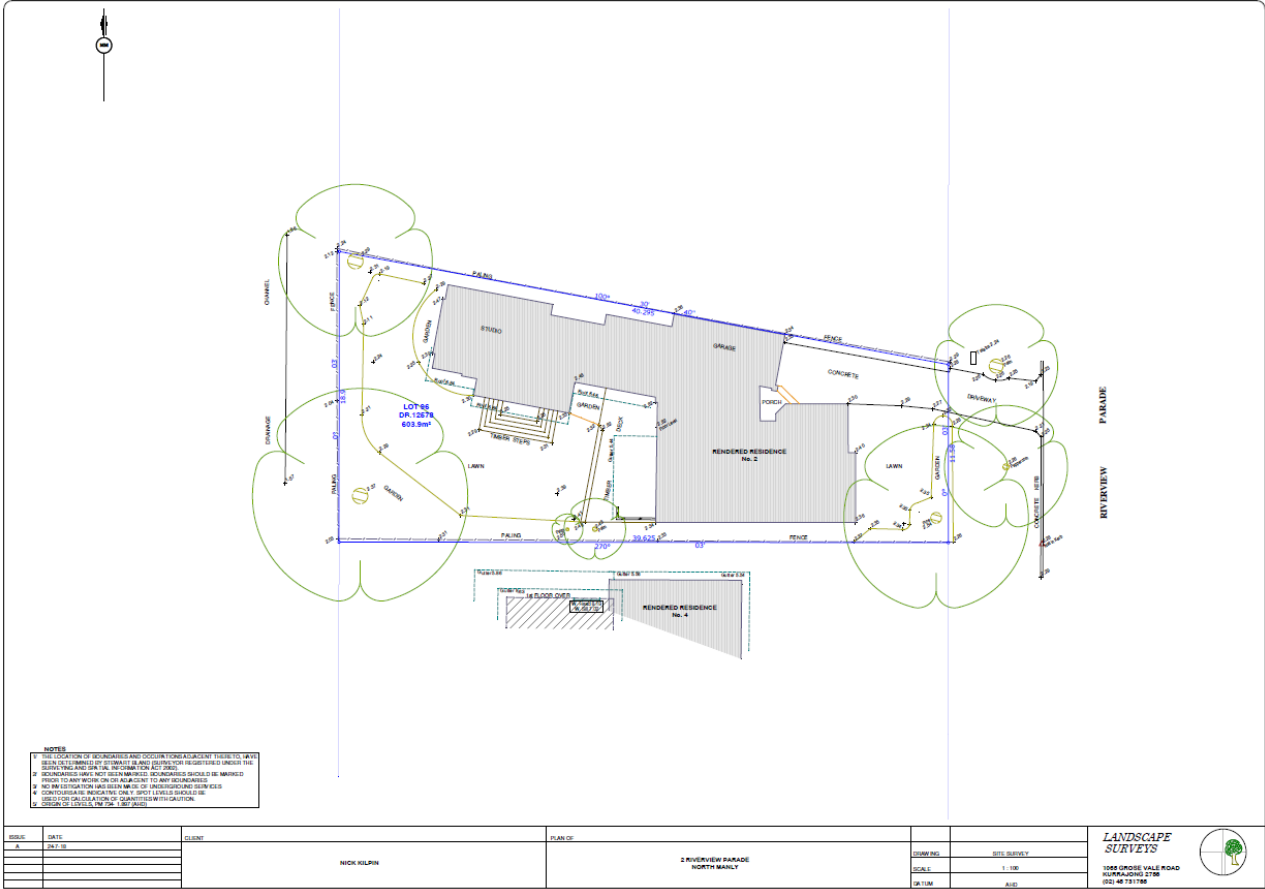
This study considered the impacts of proposed pool development at 2 Riverview Parade, North Manly, NSW 2100 to the flooding characteristics of the surrounding area.

The proposed developments includes construction of swimming pool at the rear of existing dwelling. According to flood information provided by Northern Beaches City Council, the subject property is affected by flooding during major storm events. The followings are the conclusion of this study:

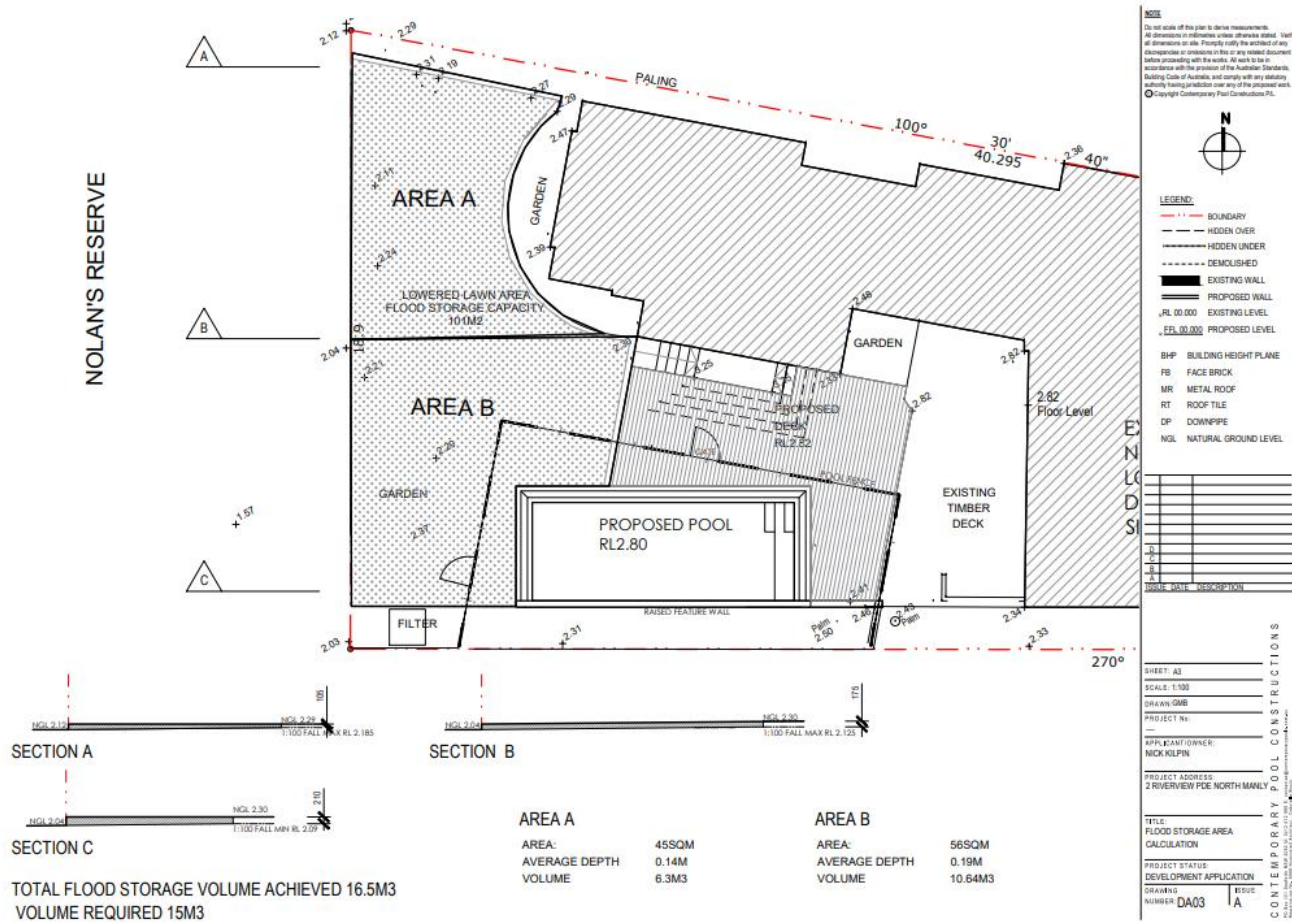
- The coping level of the proposed swimming pool is proposed at 2.80 m.
- The proposed deck near the existing building is proposed at 2.82 m same as floor level of existing dwelling, which is below FPL (3.68 m).
- The floor level of existing dwelling is below 1% AEP and PMF flood level. There may be risk involved in staying in the premises during these flood events. It is recommended to evacuate the premises as soon as floodwater begin to inundate the street kerb and gutter adjacent the premises.
- The subject property lies in flood storage. There will be approximately 15 m³ flood storage loss due to proposed pool. This flood storage loss should be compensated by cutting available landscape area at rear of the property. It is proposed to cut the natural ground over 101 sq meter with depth on average 0.15 m in this proposal. By providing compensated area, there will not be loss in flood storage area and the proposed development will not affect surrounding area.
- All structural components below FPL (3.68 m) should be constructed of flood compatible materials.
- Engineer's report is required certifying that the structure can withstand the forces of floodwater debris and buoyancy up to and including FPL 3.68 m.
- Flow through open form of fencing (louvers or pool fencing) is required for all new rear, front fences and all new internal fences and gates upto 1% AEP flood level (3.16 m). The fence material below FPL (3.68 m) should be constructed of flood compatible materials.

- No storage of materials would be expected to be stored below the FPL (3.68 m), which would cause pollution or would be likely to be potentially hazardous during a flood.
- All the new electrical services, fixtures and fittings must be located above the FPL. No electrical equipment or electrical motors (including pool pumps and equipment) are to be located below FPL.
- The proposed cutting of natural ground shows that it will achieve 1% fall to Nolan's, Reserve at the rear of the property.

APPENDIX – A: DETAIL SURVEY PLAN



APPENDIX – B: DETAIL SITE PLAN SHOWING FLOOD STORAGE LOSS COMPENSATE AREA



APPENDIX – C: FLOOD CONTROL MATRIX

		High Flood Risk						
		Critical Uses	Vulnerable Uses	Subdivision	Residential	Business & Industrial	Recreational & Environmental	Concessional
A	Flood effects caused by Development	A1 A3 A4	A1 A3 A4	A1 A3	A1 A3	A1 A3	A2 A3	A2 A3
B	Drainage Infrastructure & Creek Works	B1 B2	B1 B2	B1 B2	B1 B2	B1 B2	B1 B2	
C	Building Components & Structural	C1 C2 C3	C1 C2 C3		C1 C2 C3	C1 C2 C3	C1 C2 C3	C1 C2 C3
D	Storage of Goods	D1 D2	D1 D2		D1 D2	D1 D2	D1 D2	D1 D2
E	Flood Emergency Response	E1 E2 E3	E1 E2 E3	E1 E4	E1 E2	E1 E2 E3	E1	E1
F	Floor Levels	F2 F3 F7	F2 F3 F7	F5	F1 F2 F3 F6 F8	F2 F2 F3 F6 F8 F10	F2	F2 F3 F6
G	Car Parking	G1 G4 G6 G7 G9 G10	G1 G4 G6 G7 G9 G10	G1	G1 G2 G3 G4 G5 G6 G7	G1 G2 G3 G4 G5 G6 G7	G1 G2 G3 G4 G5 G6 G7	G1 G2 G3 G4 G5 G6 G7
H	Fencing	H1	H1	H1	H1	H1	H1	H1
I	Pools	I1	I1	I1	I1	I1	I1	I1

APPENDIX – D: FLOOD INFORMATION LEVEL

NORTHERN BEACHES COUNCIL

FLOOD INFORMATION REQUEST - COMMON

Property: 2 Riverview Parade NORTH MANLY

Lot DP:

Issue Date: 13/09/2018

Flood Study Reference: Manly Lagoon Flood Study 2013

Flood Information for lot:

Flood Life Hazard Category – See Map A

1% AEP – See Flood Map B

1% AEP Maximum Water Level³: 3.18 m AHD

1% AEP Maximum Peak Depth from natural ground level³: 1.33 m

1% AEP Maximum Velocity: 0.23 m/s

1% AEP Provisional Flood Hazard: High See Flood Map E

1% AEP Hydraulic Categorisation: Flood storage See Flood Map F

Flood Planning Area – See Flood Map C

Flood Planning Level (FPL)^{1,2,3&4}: 3.68 m AHD

Probable Maximum Flood (PMF) – See Flood Map D

PMF Maximum Water Level²: 5.68 m AHD

PMF Maximum Depth from natural ground level: 3.82 m

PMF Maximum Velocity: 0.56 m/s

Flood Risk Precinct – See Map K

¹The flood information may not take into account all local overland flow issues and private stormwater drainage systems.

²Overland flow/mainstream water levels may vary across a sloping site, resulting in variable minimum floor/flood planning levels across the site.

³Intensification of development in the former Pittwater LGA requires the consideration of climate change impacts which may result in higher minimum floor levels than those indicated on this flood advice.

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⁴Vulnerable/critical developments require higher minimum floor levels using the higher of the PMF or Flood Planning Level

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 LIFE HAZARD CATEGORY

Not used

Notes:

- Refer to 'Flood Emergency Response Planning for Development in Pittwater Policy' for additional information on the Flood Life Hazard Categories and Pittwater 21 DCP Control B3.25.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: N/A and aerial photography (Source Near Map 2014) are indicative only.

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 Lagoon Flood Study 2013) and aerial photography (Source Near Map 2014) are indicative only.

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FLOOD MAP C: FLOOD PLANNING AREA EXTENT



Notes:

- Extent represents the 1% annual Exceedance Probability (AEP) flood event + freeboard.
- Extent does not include climate change.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Manly Lagoon Flood Study 2013) and aerial photography (Source: Near Map 2014) are indicative only.

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FLOOD MAP D: PROBABLE MAXIMUM FLOOD EXTENT



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 Lagoon Flood Study 2013) and aerial photography (Source Near Map 2014) are indicative only.

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FLOOD MAP E – 1% AEP FLOOD HAZARD EXTENT MAP



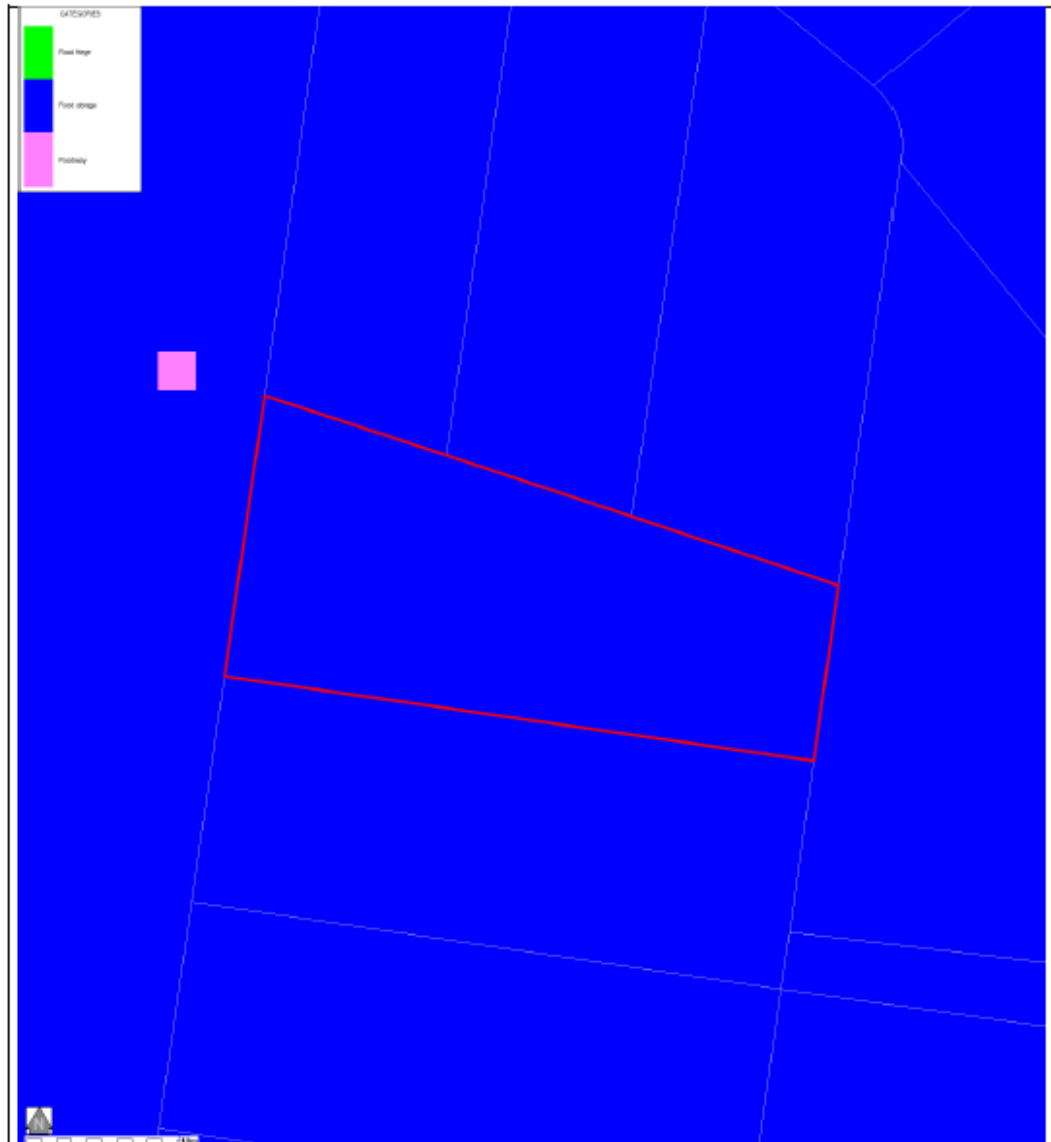
Notes:

- 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 Lagoon Flood Study 2013) and aerial photography (Source: NearMap 2014) are indicative only.

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FLOOD MAP F – 1% AEP FLOOD HYDRAULIC CATEGORY EXTENT MAP



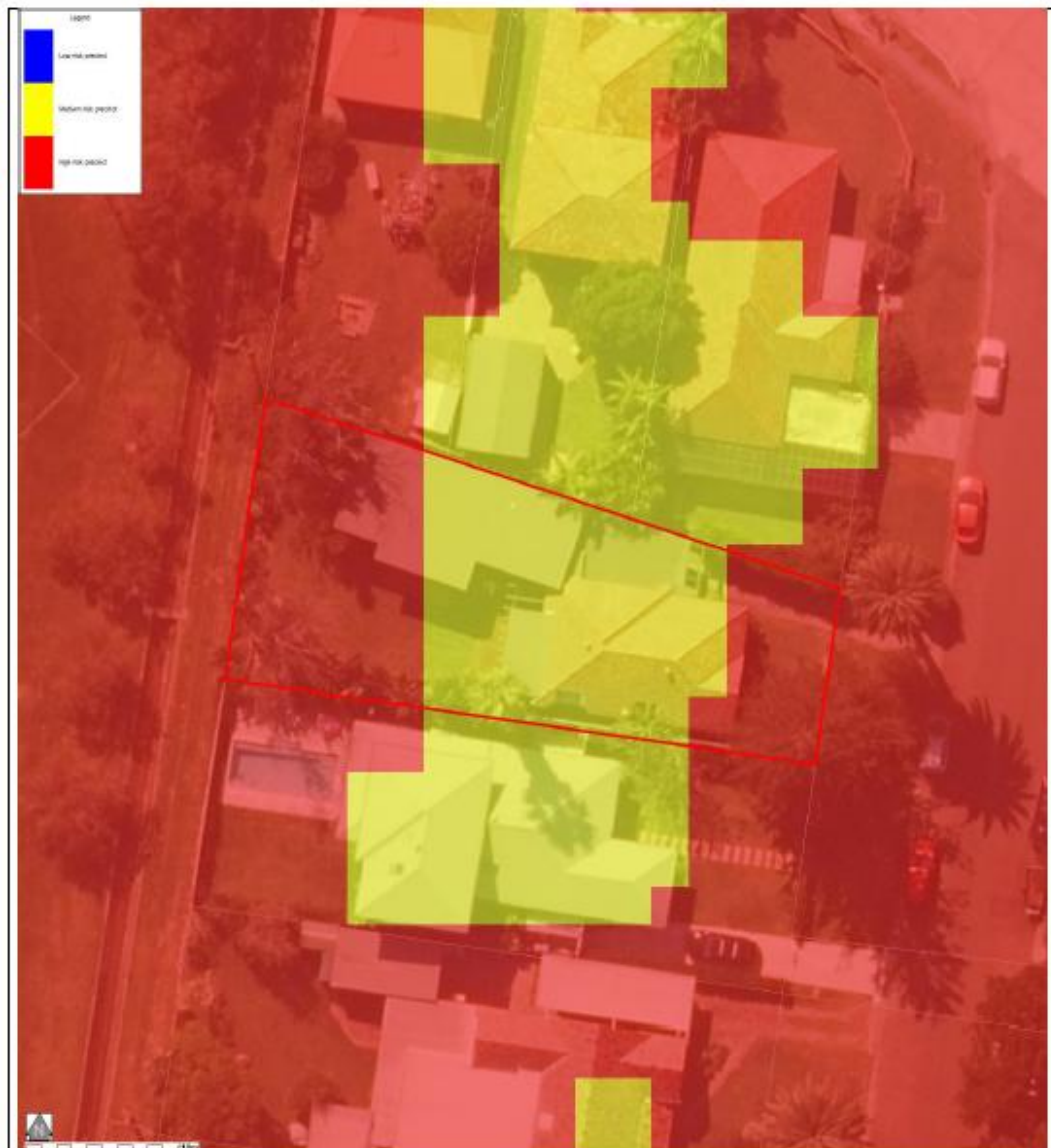
Notes:

- 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 Lagoon Flood Study 2013) and aerial photography (Source: NearMap 2014) are indicative only.

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FLOOD MAP G – 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.

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