Ibrahim Stormwater Consultants

ABN: 37 116 185 516

PROPOSED DEVELOPMENT AT 43 INGLESIDE ROAD INGLESIDE

FLOOD IMPACT & RISK ASSESSMENT

September 2024

Prepared by Ibrahim Stormwater Consultants
Suite 25, 15 Terminus Street
Castle Hill NSW 2154
Ph: 02 9980 5515 Fax: 02 9980 6114

FLOOD IMPACT & RISK ASSESSMENT

TABLE OF CONTENTS ***PAGE***

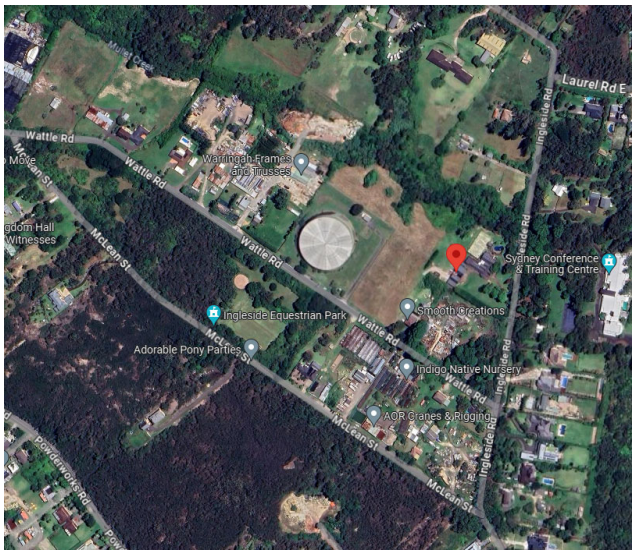
1 INTRODUCTION

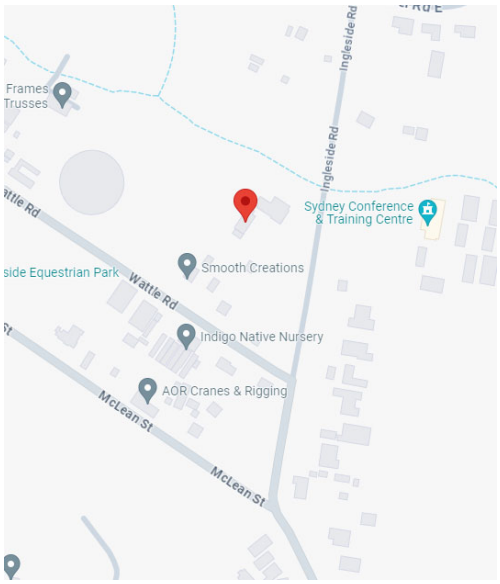
A Development Application proposing a, new single detached residential dwelling for the subject site at 43 Ingleside Road, Ingleside, has been lodged with Council. Subsequently, this report is to provide information with regard to council flood risk policy.

Ibrahim Stormwater Consultants were commissioned to undertake this assessment of the site and proposed development.

The assessment is based on council's flood information sheet, draft flood study prepared by WMA (2019) and council, councils Flood Risk Management Policy and the following list of documents:

1. Architectural drawings 29917089, dated 21-8-24.
2. Title Searches
3. 10.7 Certificate





The results of this report are for the purposes of assessing this proposed development only, in its current form and is not to be used for any other purposes or developments on this property or adjoining ones.

2 AIM OF ASSESSMENT

The objectives of this assessment is to address council's Flood Risk Management Policy of NBC DCP Part 11.0, Overland Flow Flooding, as follows:

a) Identify Minimum Floor levels required for habitable areas.

b) Identify the Flood Risk Precinct.

c) Identify Structural Soundness Requirements

d) Identify Building Component Requirements

e) Identify Flood Effects

f) Identify Evacuation Requirements.

3 SUMMARY OF ASSESSMENT

The property is identified as being partially in an overland flow path along the northern boundary and considered a Low Risk Precinct as a result of local overland flow. The proposed dwelling is located outside the FPL and PMF extents.

Accordingly, the following relevant parameters will need to be followed as per Water Management for Development Policy 2021 Part 11 and Pittwater DCP Part B 3.11:

Planning Consideration		
Floor Levels		*Minimum floor level at or above the Flood Planning Level (500mm above the 1% AEP Flood Level); and; There is no net decrease in volume of Flood Storage Area within the property for any flood event up to the 1% AEP flood event.* The over land flow path is predominantly contained within the road way and very minor at the rear of the site. Accordingly the Floor levels shall adopt a minimum FFL to accommodate typical flows in accordance with BCA/NCC requirements.
Building Components		*All structural elements below the Flood Planning Level shall be constructed from flood compatible materials; and All electrical equipment, wiring, fuel lines or any other service pipes and connections must be waterproofed up to at least the Flood Planning Level. The storage of toxic or potentially polluting goods, materials or other products, which may be hazardous or pollute floodwaters, will not be permitted below the Flood Planning Level.* As the proposed dwelling it outside the overland flow path standard construction practice is satisfactory.
Structural Soundness		*All structures must be designed and constructed to ensure structural integrity for immersion and impact on velocity and debris up to the level of 1% AEP flood. If the structure is to be relied upon for 'shelter-in-place' refuge then structural integrity must be ensured up to the level of the Probable Maximum Flood* As the proposed dwelling it outside the overland flow path standard construction practice is satisfactory.
Flood Effects		*All foundation structures within the area of the property affected by the Flood Planning Level, is to incorporate a suspended floor system on open pier/pile footings with openings in perimeter walls to allow for the flow of surface water and flood storage up to the level of the 1% AEP flood; The volume of flood storage displaced by the existing structure may be assumed to have been taken into consideration in the assessment of Flood Levels within the catchments. The filling of land, bunded carpark facilities, enclosure of structures and/or construction of swimming pools (identified within Overland Flow Path – Major) will only be permitted where the Flood Risk Management Report demonstrates there is no additional adverse flood impact on the surrounding properties or flooding processes for any flood event up the Probable Maximum Flood event.* As the proposed dwelling it outside the overland flow path standard construction practice is satisfactory. No external filling will be permissible without council consent.
Car Parking & Driveway Access		*Covered basement carparking – all access entry points shall be at the Flood Planning Level; and; Open carpark areas (including covered carpark areas) and Carports for all Development, expect Dwelling House, Secondary Dwelling, Dual Occupancy and Multi-Unit Housing are permissible at the existing ground level, but not within a floodway area; and; Open carpark areas (including covered carpark areas) and Carports for Dwelling House, Secondary Dwelling, Dual Occupancy and Multi-Unit Housing floor levels shall be at or above the Flood Planning Level.* Proposed Garages and driveway to adopt design levels to ensure

		adequate flows paths exist around the dwelling.
Evacuation		-*Reliable access for pedestrians or vehicles is required from the building, commencing at a minimum level equal to the lowest habitable floor level to an area of refuge above the PMF level, or a minimum of 20% of the gross floor area of the dwelling to be above the PMF level.* Council records note the PMF level as 106.56m AHD. The proposed dwelling has a ground floor level well above this level providing adequate safe refuge.

4 CONCLUSION

The proposed development based on the below design criteria and with relevant DA. conditioning, will ensure that the current use of the property will not be a hazard to the community in the event of 1 in 100 year storm event.

The proposal to construct a new residence shall adopt the following limitations:

1. A floor level higher than or equal to RL 107.51m relative to the front BM to AHD,
2. A garage level higher than or equal to 107.167m,
3. Proposal's footprint is outside the 100yr ARI mainstream flooding and flood storage areas, accordingly negligible effect to flood storage would occur. The maintaining of all nominated ground levels as noted on plans C11824-17089 to be adhered too, including the future paths shall be implemented.
4. Any new fencing to the perimeter of the property having a min. 100mm clearance to NGL to be provided. Particular attention to the rear of the site is required as a separate DA application for fencing may be required by council due noted flooding adjacent the neighbour.
5. All Buildings to be flood compatible building components below the 100yr flood level plus 500mm is not applicable as the proposed dwelling is sited above the FPL.
6. Structural engineer to certify that structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year flood plus 500mm is not applicable as the proposed dwelling is sited above the FPL..
7. Evacuation refuge on the ground floor at FFL of 107.51 will be higher then the PMF level of 106.56m.

The proposed development will complement all the design issues raised and provide an extension to any future council flood management proposal.

APPENDIX A

Council Flood Data and Site Plan

northern beaches council

BASIC
FLOOD INFORMATION REPORT

Property: 43 Ingleside Road INGLESIDE NSW 2101
Lot DP: Lot 4 DP 12129
Issue Date: 13/05/2024
Flood Study Reference: Ingleside, Elanora and Warriewood Overland Flow Flood Study 2019, WMA Water

Flood Information[1]:

Map A - Flood Risk Precincts

Map B - 1% AEP Flood

Map C - 1% AEP Hydraulic Categorisation

Map D - Probable Maximum Flood (PMF)
PMF Maximum Water Level [4]: 106.56 m AHD
PMF Maximum Depth from natural ground level: 0.19 m
PMF Maximum Velocity: 1.01 m/s

Map E - Flood Life Hazard Category in PMF

(1) The provided flood information does not account for 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.

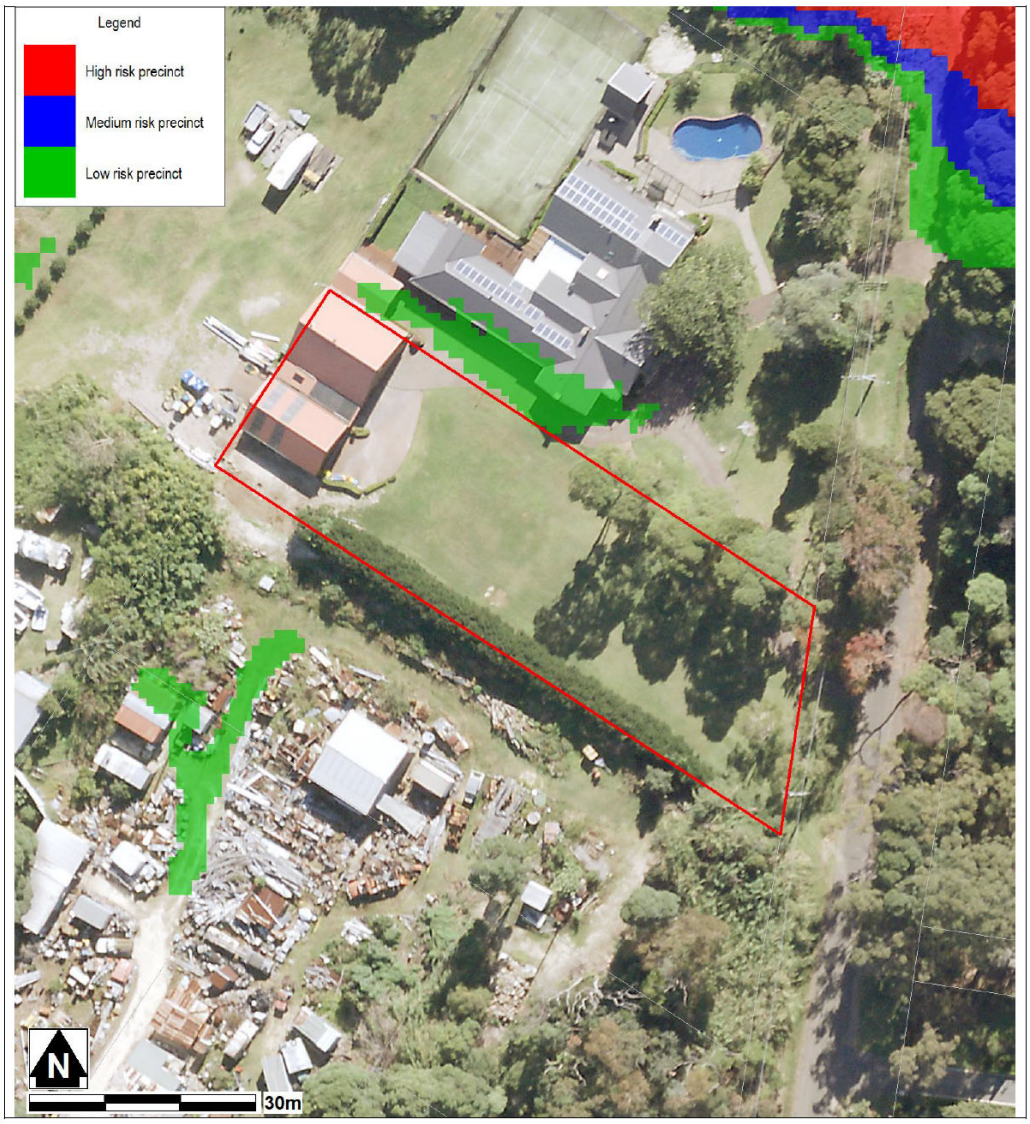
Notes

General

- 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 online Flood Study Reports webpage.
- If the FPL is higher than the PMF level, then the FPL should still be used as the FPL, as it includes freeboard which the PMF does not.
- If the property is affected by an Estuarine Planning Level (EPL) which is higher than the FPL, then the EPL should be used as the FPL.
- Areas affected by an EPL in the former Pittwater LGA are mapped on Council's online Estuarine Hazard Map. Note that areas in the former Manly LGA affected by an EPL have been identified and will be soon added to this map.
- Council's drainage infrastructure is mapped on Council's Stormwater Map. Note that locations are indicative only and may not be exactly as shown.

Issue Date: 13/05/2024 Page **2** of **10**

MAP A: FLOOD RISK PRECINCTS



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.

Issue Date: 13/05/2024

Page **3** of **10**

MAP B: FLOODING - 1% AEP EXTENT

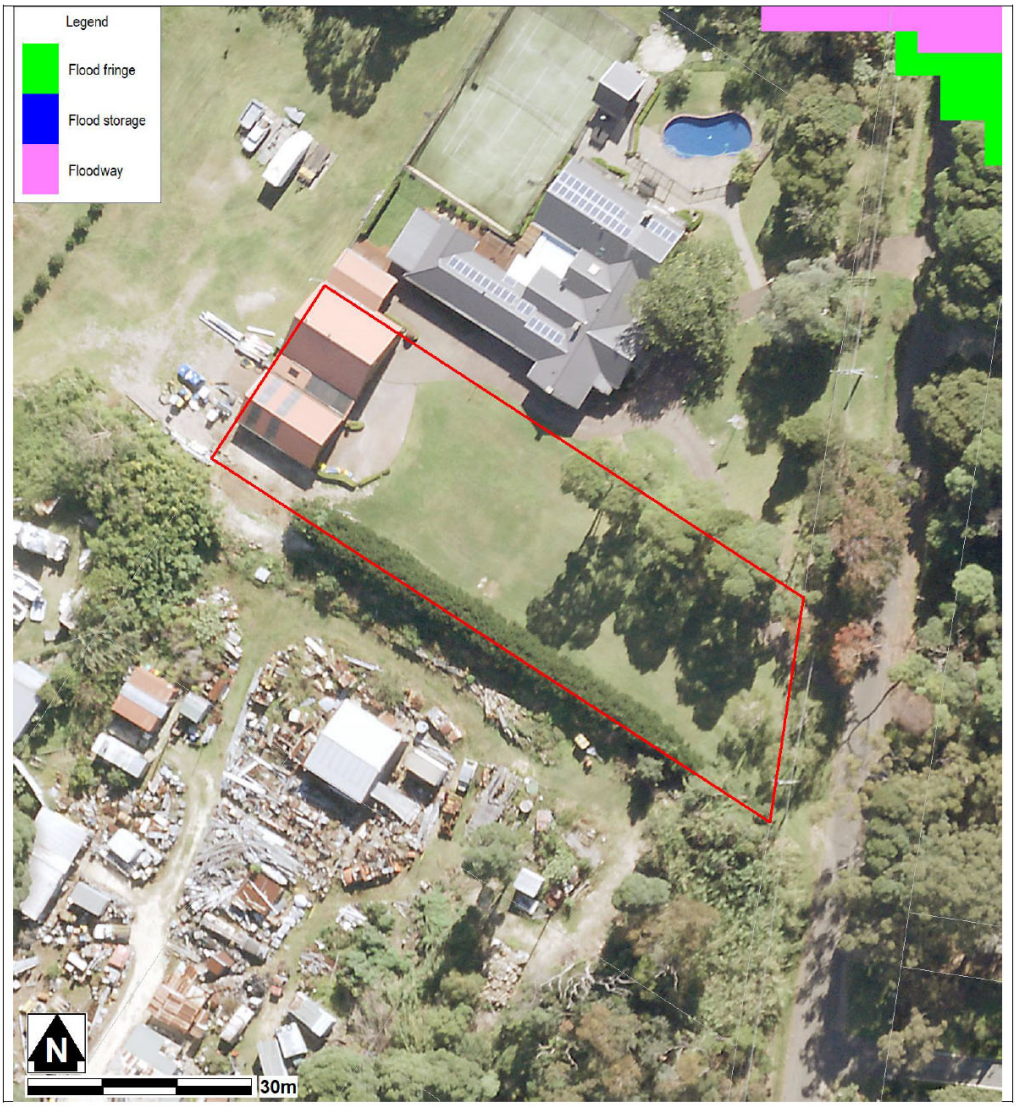
Notes:

- 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: Ingleside, Elanora and Warriewood Overland Flow Flood Study 2019, WMA Water) and aerial photography (Source: NearMap 2014) are indicative only.

Issue Date: 13/05/2024

Page **4** of **10**

MAP C: 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: Ingleside, Elanora and Warriewood Overland Flow Flood Study 2019, WMA Water) and aerial photography (Source: NearMap 2014) are indicative only.

Issue Date: 13/05/2024

Page **5** of **10**

MAP D: PROBABLE MAXIMUM FLOOD EXTENT

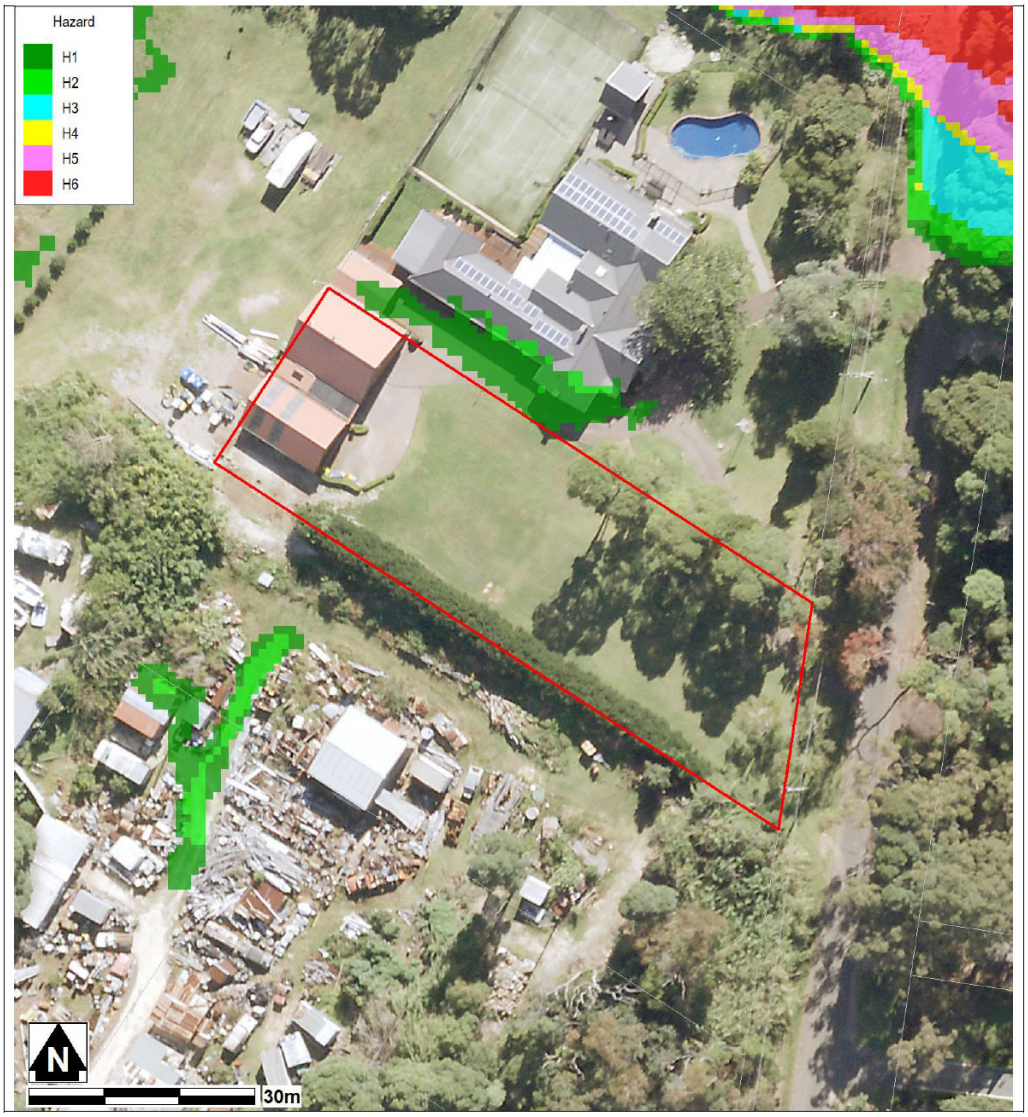
Notes:

- 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: Ingleside, Elanora and Warriewood Overland Flow Flood Study 2019, WMA Water) and aerial photography (Source: NearMap 2014) are indicative only.

Issue Date: 13/05/2024

Page **6** of **10**

MAP E: FLOOD LIFE HAZARD CATEGORY IN PMF



Notes:

- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Ingleside, Elanora and Warriewood Overland Flow Flood Study 2019, WMA Water) and aerial photography (Source: NearMap 2014) are indicative only.

Issue Date: 13/05/2024

Page **7** of **10**

Preparation of a Flood Management Report

Introduction

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

Planning Requirements for Flood Prone Land

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

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

LEP Clauses	DCP Clauses
Manly LEP (2013) – 5.21 Flood Planning Manly LEP (2013) – 5.22 Special Flood Considerations	Manly DCP (2013) – 5.4.3 Flood Prone Land
Warringah LEP (2011) – 5.21 Flood Planning Warringah LEP (2011) – 5.22 Special Flood Considerations Warringah LEP (2000) – 47 Flood Affected Land *	Warringah DCP (2011) – E11 Flood Prone Land
Pittwater LEP (2014) – 5.21 Flood Planning Pittwater LEP (2014) – 5.22 Special Flood Considerations	Pittwater 21 DCP (2014) – B3.11 Flood Prone Land Pittwater 21 DCP (2014) – B3.12 Climate Change

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

Development on flood prone land must also comply with Council's Water Management for Development Policy, and if it is in the Warriewood Release Area, with the Warriewood Valley Water Management Specification and Clause C6.1 of the Pittwater 21 DCP (2014). Guidelines for Flood Emergency Response Planning are available for addressing emergency response requirements in the DCP. These documents can be found on Council's website on the Flooding page.

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

When is a Flood Management Report required?

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

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

- If all proposed works are located outside the relevant Flood Risk Precinct extent
- First floor addition only, where the existing ground floor level is above the FPL

- Internal works only, where habitable floor areas below the FPL are not being increased

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

What is the purpose of a Flood Management Report?

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

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

Preparation of a Flood Management Report

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

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

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

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

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

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

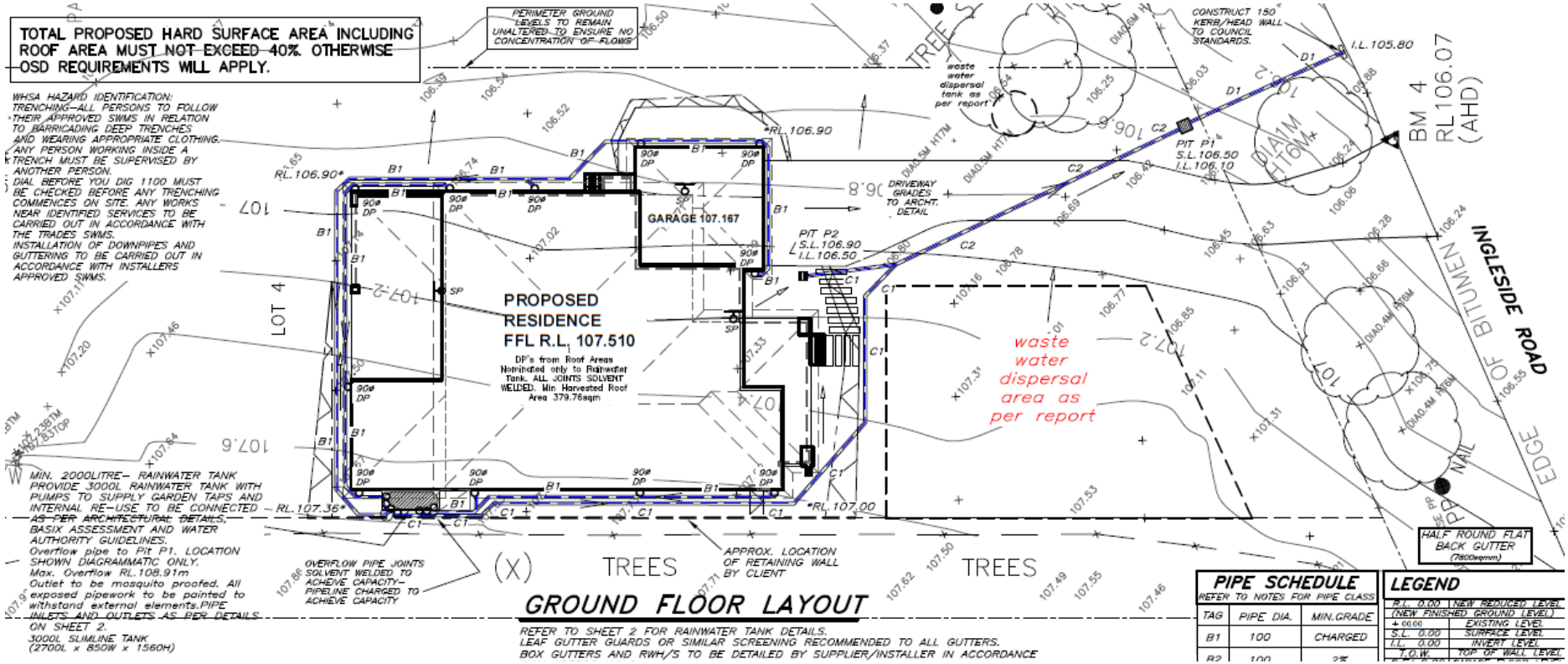
H) Pools			

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

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

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

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


TOTAL PROPOSED HARD SURFACE AREA INCLUDING ROOF AREA MUST NOT EXCEED 40%. OTHERWISE OSD REQUIREMENTS WILL APPLY.
PERIMETER GROUND LEVELS TO REMAIN UNALTERED TO ENSURE NO CONCENTRATION OF FLOWS
WHSA HAZARD IDENTIFICATION: TRENCHING—ALL PERSONS TO FOLLOW THEIR APPROVED SWMS IN RELATION TO BARRICADING DEEP TRENCHES AND WEARING APPROPRIATE CLOTHING. ANY PERSON WORKING INSIDE A TRENCH MUST BE SUPERVISED BY ANOTHER PERSON. DIAL BEFORE YOU DIG 1100 MUST BE CHECKED BEFORE ANY TRENCHING COMMENCES ON SITE. ANY WORKS NEAR IDENTIFIED SERVICES TO BE CARRIED OUT IN ACCORDANCE WITH THE TRADES SWMS. INSTALLATION OF DOWNPIPES AND GUTTERING TO BE CARRIED OUT IN ACCORDANCE WITH INSTALLERS APPROVED SWMS.
MIN. 2000LITRE— RAINWATER TANK PROVIDE 3000L RAINWATER TANK WITH PUMPS TO SUPPLY GARDEN TAPS AND INTERNAL RE—USE TO BE CONNECTED AS PER ARCHITECTURAL DETAILS, BASIX ASSESSMENT AND WATER AUTHORITY GUIDELINES. Overflow pipe to Pit P1. LOCATION SHOWN DIAGRAMMATIC ONLY. Max. Overflow RL.108.91m Outlet to be mosquito proofed. All exposed pipework to be painted to withstand external elements.PIPE INLETS AND OUTLETS AS PER DETAILS ON SHEET 2. 3000L SLIMLINE TANK (2700L x 850W x 1560H)
OVERFLOW PIPE JOINTS SOLVENT WELDED TO ACHEIVE CAPACITY— PIPELINE CHARGED TO ACHIEVE CAPACITY
PROPOSED RESIDENCE FFL R.L. 107.510
DP's from Roof Areas Notrinicted only to Rainwater Tank. ALL JOINTS SOLVENT WELDED. Min Harvested Roof Area 379.76sqm
GARAGE 107.167
PIT P2 S.L.106.90 I.L.106.50
PIT P1 S.L.106.50 I.L.106.10
*RL.106.90
*RL.107.00
RL.107.36*
waste water dispersal tank as per report
waste water dispersal area as per report
DRIVEWAY GRADES TO ARCHT. DETAIL
CONSTRUCT 150 KERB/HEAD WALL TO COUNCIL STANDARDS.
I.L.105.80
BM 4 RL106.07 (AHD)
INGLESIDE ROAD
EDGE OF BITUMEN
HALF ROUND FLAT BACK GUTTER (7800sqmm)
LOT 4
TREES
APPROX. LOCATION OF RETAINING WALL BY CLIENT
GROUND FLOOR LAYOUT
REFER TO SHEET 2 FOR RAINWATER TANK DETAILS.
LEAF GUTTER GUARDS OR SIMILAR SCREENING RECOMMENDED TO ALL GUTTERS.
BOX GUTTERS AND RWH/S TO BE DETAILED BY SUPPLIER/INSTALLER IN ACCORDANCE
PIPE SCHEDULE
REFER TO NOTES FOR PIPE CLASS
TAG | PIPE DIA. | MIN.GRADE
B1 | 100 | CHARGED
LEGEND
R.L. 0.00 (NEW REDUCED LEVEL)
(NEW FINISHED GROUND LEVEL)
+ 0000 EXISTING LEVEL
S.L. 0.00 SURFACE LEVEL
I.L. 0.00 INVERT LEVEL
T.O.W. TOP OF WALL LEVEL