

**FLOOD INUNDATION &
RISK ASSESSMENT REPORT
PROPOSED SUB DIVISION
337 LOWER PLATEAU RD
BILGOLA PLATEAU**

**Job No 221203
Mar 2023
Prepared by
Lucas Molloy
BE CPEng NER**

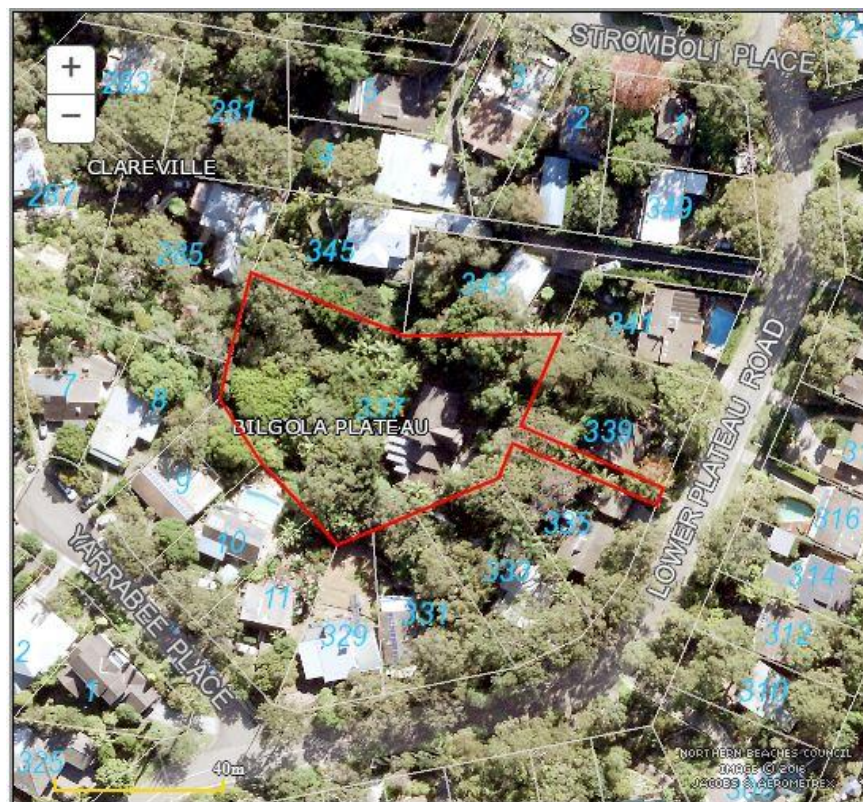
INTRODUCTION

This report has been prepared in support of the Development Application for a residential sub division (1 lot into 3) at No 337 Lower Plateau Rd Bilgola Plateau in respect to potential flood inundation / impacts and Northern Beaches Councils Water Management for Development Policy Section 10 Flood Risk Management and Pittwater 21 DCP Section B3.11 Flood Prone Land. The residential sub division is as detailed in the architectural plans by *Gartner Trovato Architects* refer Appendix A.

Barrenjoey Consulting Engineers p/l inspected the site on 16th Jan 2023.

The extent of flooding is as summarized in the "Flood Information Request" data as supplied by Northern Beaches Council, refer Appendix D. The flooding is associated with the natural watercourses that flow through the site from the Lower Plateau Rd piped / culvert infrastructure above. Noting the extent of flooding within the site is largely contained within distinct 6m wide corridors.

For the 1% AEP event the site is classified -
Flood Risk Precinct varies over site
Flood Hydraulic Category varies over site
Land Use Group Sub Division
FPL varies over site
Flood Life Hazard Category varies over site



Aerial Image of No 337 Lower Plateau Rd Bilgola Plateau
(Northern Beaches Council web site)

Pittwater 21 Development Control Plan
Section B General Controls
B3 Hazard Controls
B3.11 Flood Prone Land

A. FLOOD EFFECTS CAUSED BY DEVELOPMENT

A1	Development shall not be approved unless it can be demonstrated in a Flood Management Report that it has been designed and can be constructed so that in all events up to the 1% AEP event: (a) There are no adverse impacts on flood levels or velocities caused by alterations to the flood conveyance; and Development will be compliant as driveway works within vicinity of flood extents to be suspended above NGLs, with all column/pier supports to be located outside of the flood path extents. (b) There are no adverse impacts on surrounding properties; and Development will be compliant as per above (c) It is sited to minimise exposure to flood hazard. Development will be compliant as per above Major developments and developments likely to have a significant impact on the PMF flood regime will need to demonstrate that there are no adverse impacts in the Probable Maximum Flood. na to this development
A2	Development shall not be approved unless it can be demonstrated in a Flood Management Report that in all events up to the 1% AEP event there is no net loss of flood storage. Development will be compliant as driveway works within vicinity of flood extents to be suspended above NGLs, with all column/pier supports to be located outside of the flood path extents. Consideration may be given for exempting the volume of standard piers from flood storage calculations. If Compensatory Works are proposed to balance the loss of flood storage from the development, the Flood Management Report shall include detailed calculations to demonstrate how this is achieved.

B. BUILDING COMPONENTS AND STRUCTURAL SOUNDNESS

B1	na to this development
B2	na to this development
B3	na to this development

C. FLOOR LEVELS

C1	na to this development
C3	na to this development
C4	na to this development
C5	The applicant must demonstrate that future development following a subdivision proposal can be undertaken in accordance with this Development Control Plan. Review / analysis of proposed (and attached) architectural layout of residences indicates that future development can be undertaken in accordance with this Development Control Plan by achieving no adverse flood effects (residences to be suspended above NGLs), required FPLs, structural adequacy etc.
C6	na to this development
C7	na to this development

D. CAR PARKING

D1	Open carpark areas and carports shall not be located within a floodway. As proposed and compliant within the development
D2	na to this development
D3	na to this development
D4	na to this development
D5	na to this development
D6	na to this development

E. FLOOD EMERGENCY RESPONSE

E3	It must be demonstrated that evacuation or a shelter-in-place refuge in accordance with the requirements of this DCP will be available for any potential development arising from a Torrens title subdivision. Review / analysis of proposed (and attached) architectural layout of residences indicates that future development can be undertaken to ensure acceptable evacuation (to Lower Plateau Rd) or shelter in place (within residences with FFLs above PMF etc)
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F. FENCING

F1	Fencing, (including pool fencing, boundary fencing, balcony balustrades and accessway balustrades) shall be designed so as not to impede the flow of flood waters and not to increase flood affectation on surrounding land. At least 50% of the fence must be of an open design from the natural ground level up to the 1% AEP flood level. Less than 50% of the perimeter fence would be permitted to be solid. Openings should be a minimum of 75 mm x 75mm. na to this development
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G. STORAGE OF GOODS

G1	na to this development
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H. POOLS

H1	Pools located within the 1% AEP flood extent are to be in-ground, with coping flush with natural ground level. Where it is not possible to have pool coping flush with natural ground level, it must be demonstrated that the development will result in no net loss of flood storage and no impact on flood conveyance on or from the site. All electrical equipment associated with the pool (including pool pumps) is to be waterproofed and/or located at or above the Flood Planning Level. All chemicals associated with the pool are to be stored at or above the Flood Planning Level. na to this development
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FLOOD RISK ASSESSMENT

A flood risk assessment was carried out for the 1% AEP and PMF event adopting the following

- Likelihood of the hazard occurring
 - Almost Certain 1:10
 - Likely 1:100
 - Possible 1:1000
 - Unlikely 1:10000
 - Rare 1:100000
- Consequence of the hazard to persons and property
 - Insignificant no injury / \$ 0 - low
 - Minor first aid injury / \$ low - medium
 - Moderate medical treatment required / \$ medium – high
 - Major serious injuries / \$ major
 - Catastrophic death / \$ major ++

	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain					
Likely (1%)					
Possible					
Unlikely (PMF)					
Rare					

Legend

Low - acceptable
Moderate – tolerable
Sever – unacceptable

1 Risk to persons 'shelter in place' provisions as per the *Flood Risk Management Report* specified / ensured, therefore risk assessment -

1% event – minor injuries possible therefore moderate tolerable risk assessment

PMF event – minor injuries possible therefore low acceptable risk assessment

2 Risk to structures adequate structural capacity to resist the flood forces (water and debris) as per the *Flood Risk Management Report* specified / ensured, therefore risk assessment -

1% event – Insignificant damage to structures therefore low acceptable risk assessment

PMF event – minor damage to structures therefore low acceptable risk assessment

2 Risk to vehicles -

1% event – insignificant damage therefore low acceptable risk assessment

PMF event – minor damage therefore low acceptable risk assessment

3 Risk to services protection of services from flood exposure as per the *Flood Risk Management Report* specified / ensured, therefore risk assessment -

1% event – moderate damage therefore moderate tolerable risk assessment

PMF event – moderate damage therefore low acceptable risk assessment

SUMMARY

Assessment of Impacts Compliance Table

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

The proposed subdivision if carried out in accordance with recommendations within this *Flood Inundation & Risk Assessment Report* by Barrenjoey Consulting dated Mar 2023 will satisfy the intent of Northern Beaches Councils Water Management for Development Policy Section 10 Flood Risk Management and Pittwater 21 DCP Section B3.11 Flood Prone Land.

Noting the proposed subdivision access driveway will be suspended (and supported) well clear of the predicted flood extents.

It is our opinion the proposed residential buildings (as detailed in the attached architectural plans, subject to future DA submissions and review) will also accommodate the requirements of Northern Beaches Councils Water Management for Development Policy Section 10 Flood Risk Management and Pittwater 21 DCP Section B3.11 Flood Prone Land.

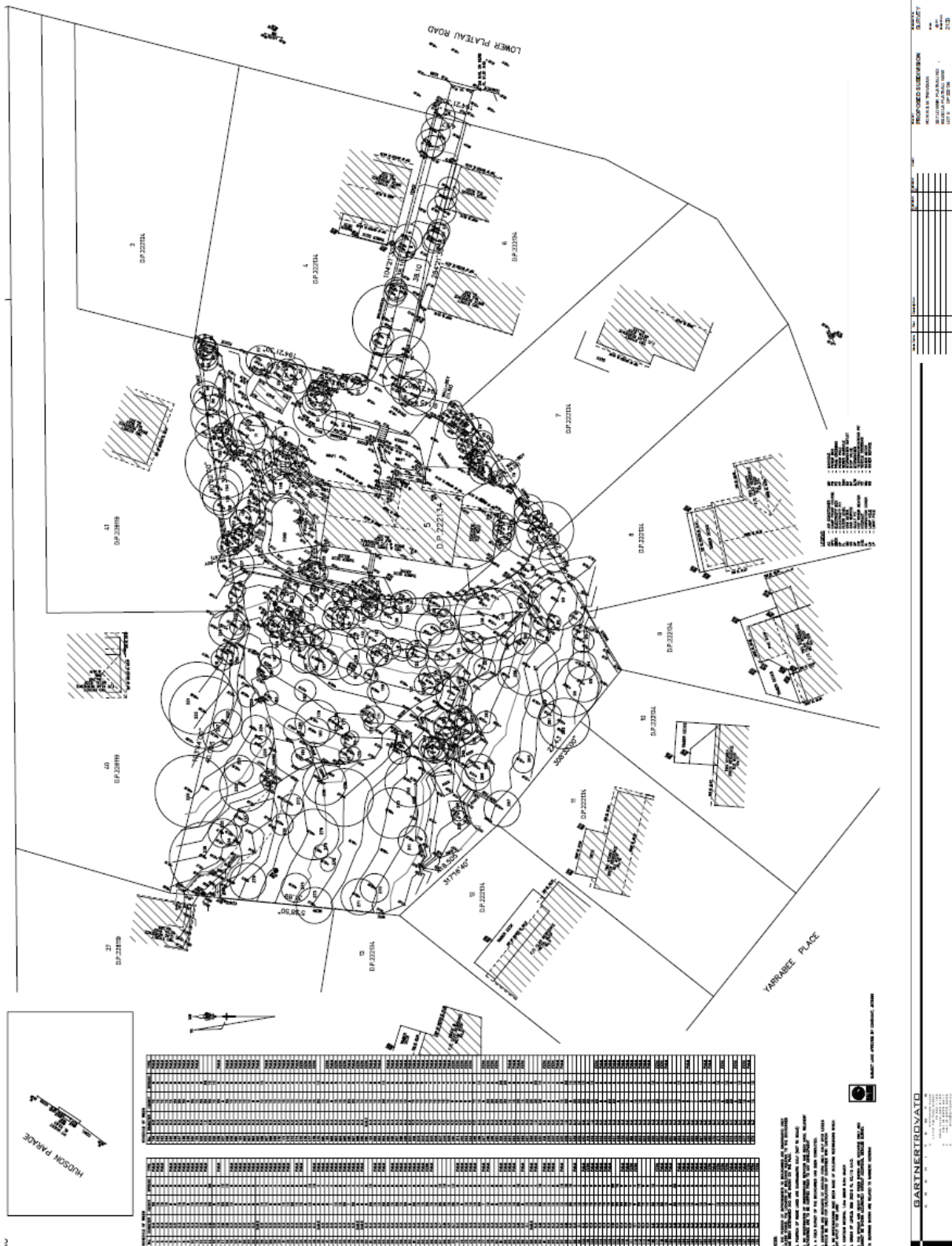
It is to be noted that, due to the many complex factors that can affect a site, the subjective nature of a risk analysis, and the imprecise nature of the science of flood analysis, the risk of persons being injured, to life and property cannot be completely removed. The recommendations within this Report do not remove the risk associated with the predicted flooding event, though lower those risks to an acceptable level reasonably anticipated by the community in everyday life.

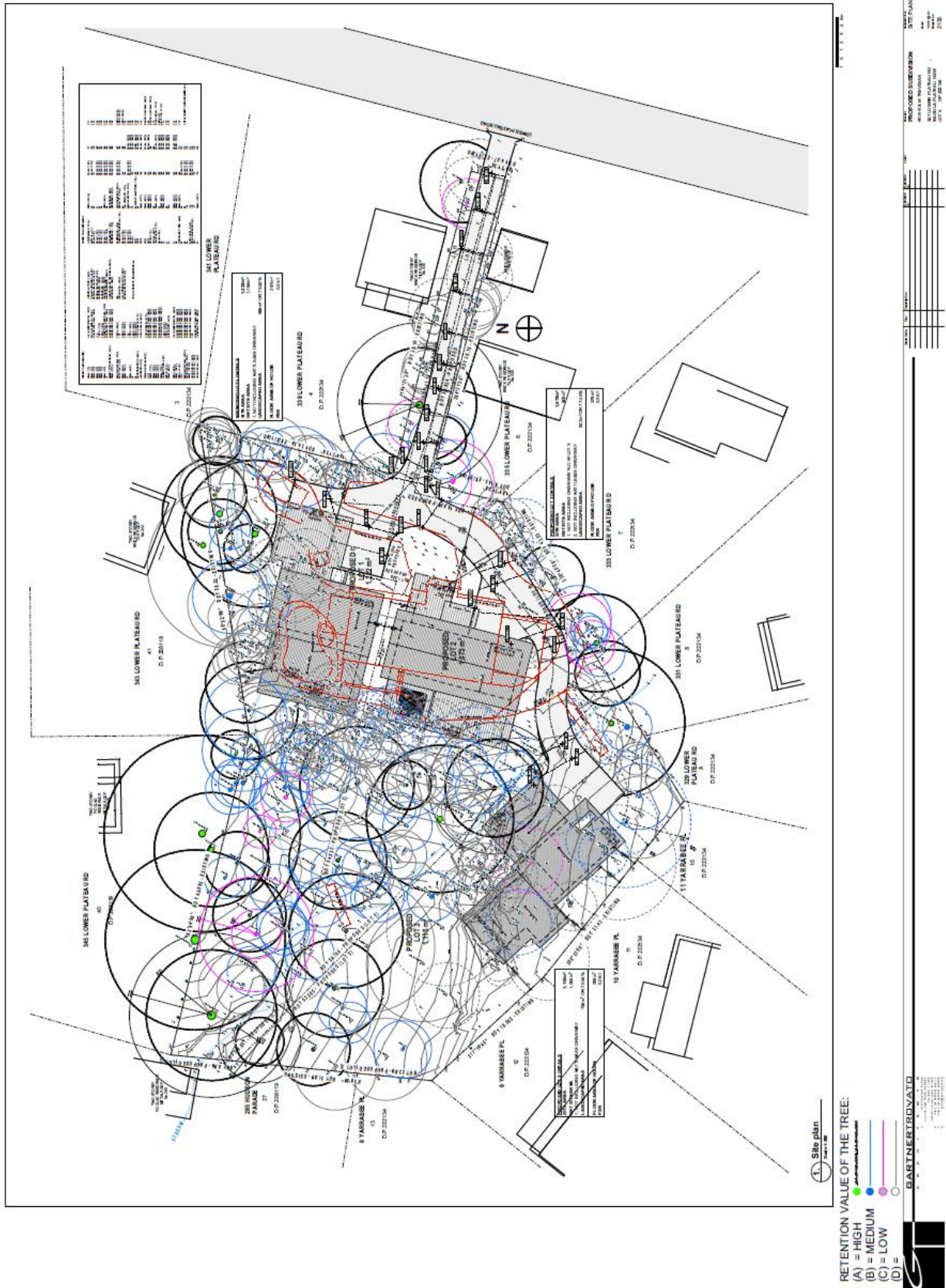
Regards
BARRENJOEY CONSULTING ENGINEERS Pty Ltd

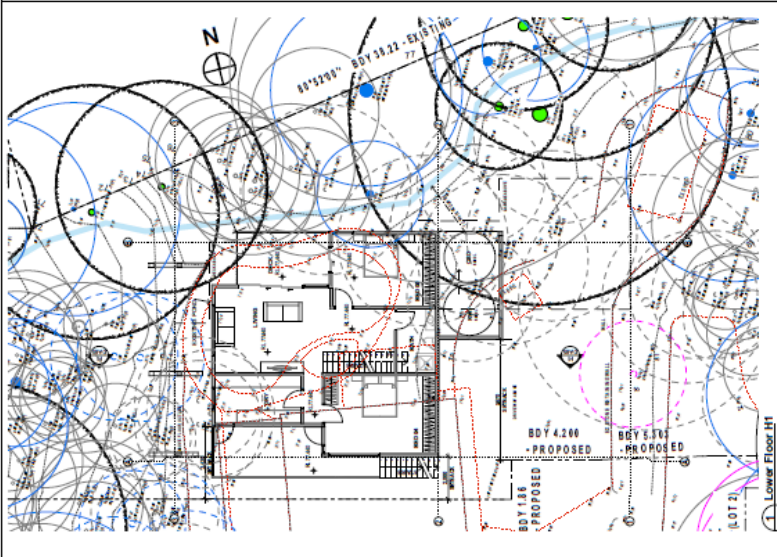


Per
Lucas Molloy (Director)
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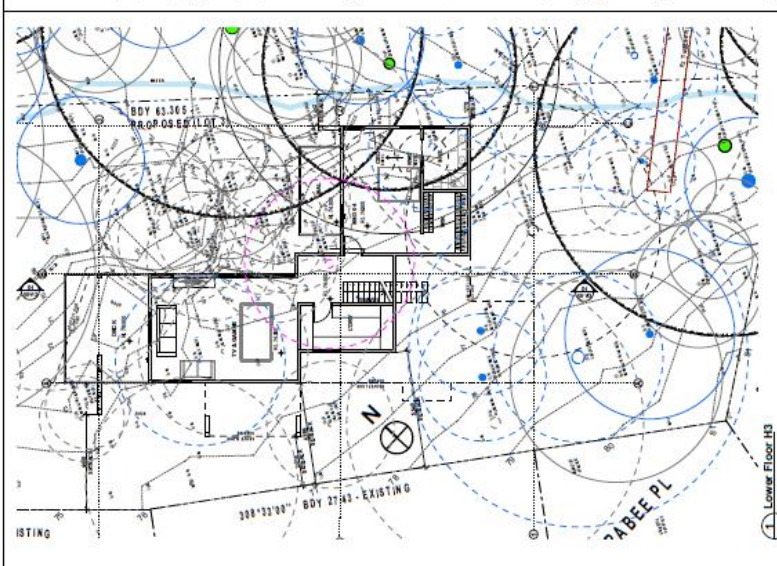
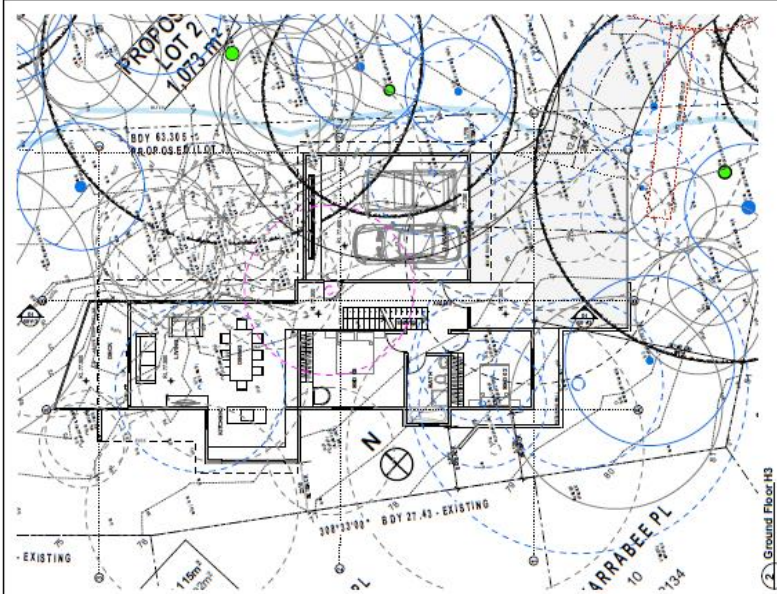
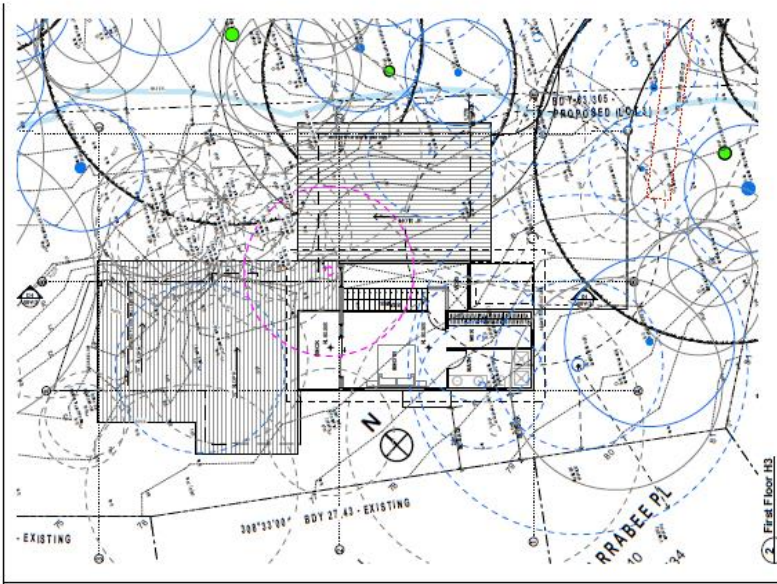
Appendix A
Architectural Plans by
Gartner Trovato Architects





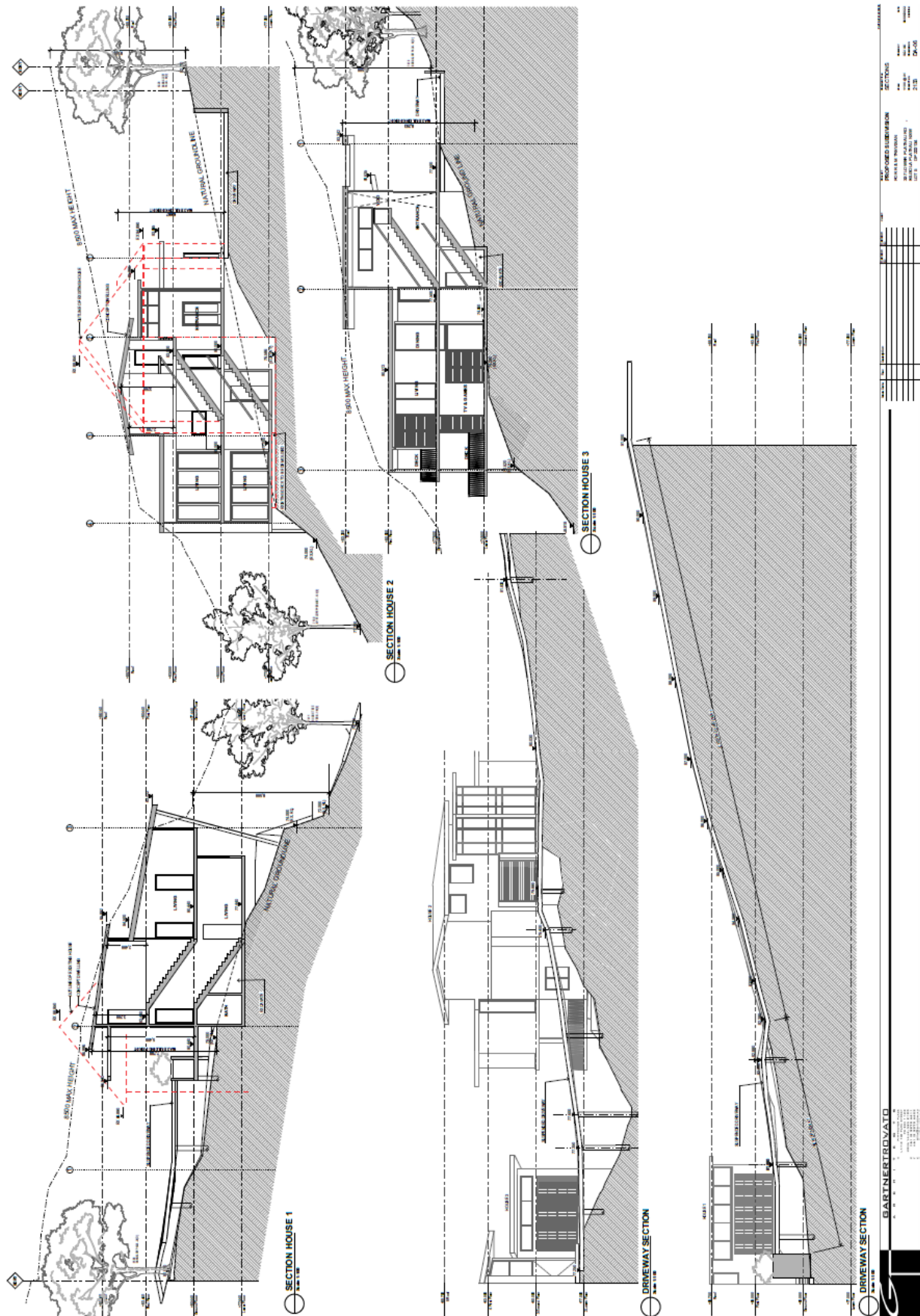
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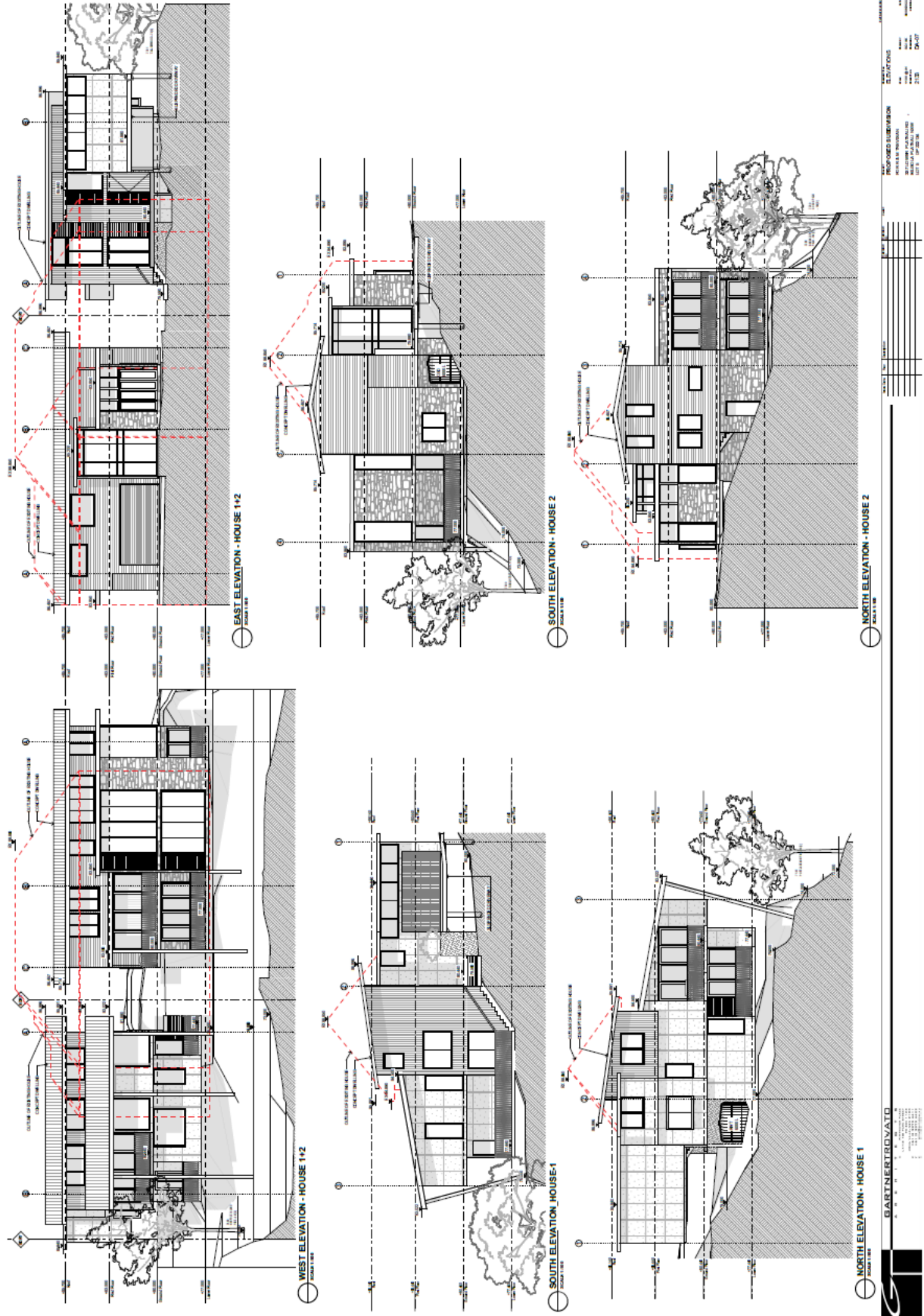
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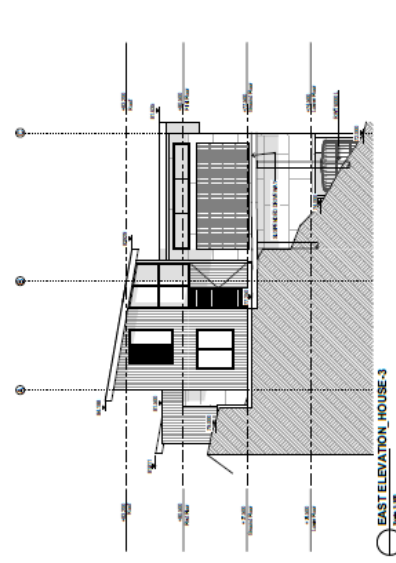
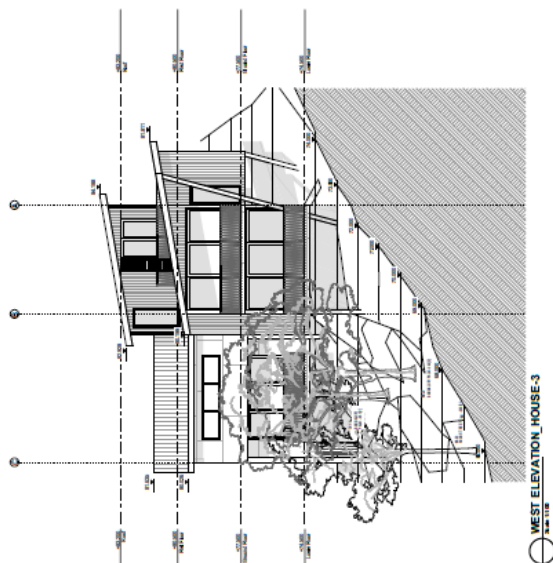
PROPOSED SUBMISSION	DATE	BY	FOR
PROPOSED LOT 2	2024-05-24	BARRENJOEY CONSULTING ENGINEERS PTY LTD	BARRENJOEY CONSULTING ENGINEERS PTY LTD
PROPOSED LOT 2	2024-05-24	BARRENJOEY CONSULTING ENGINEERS PTY LTD	BARRENJOEY CONSULTING ENGINEERS PTY LTD
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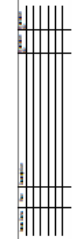




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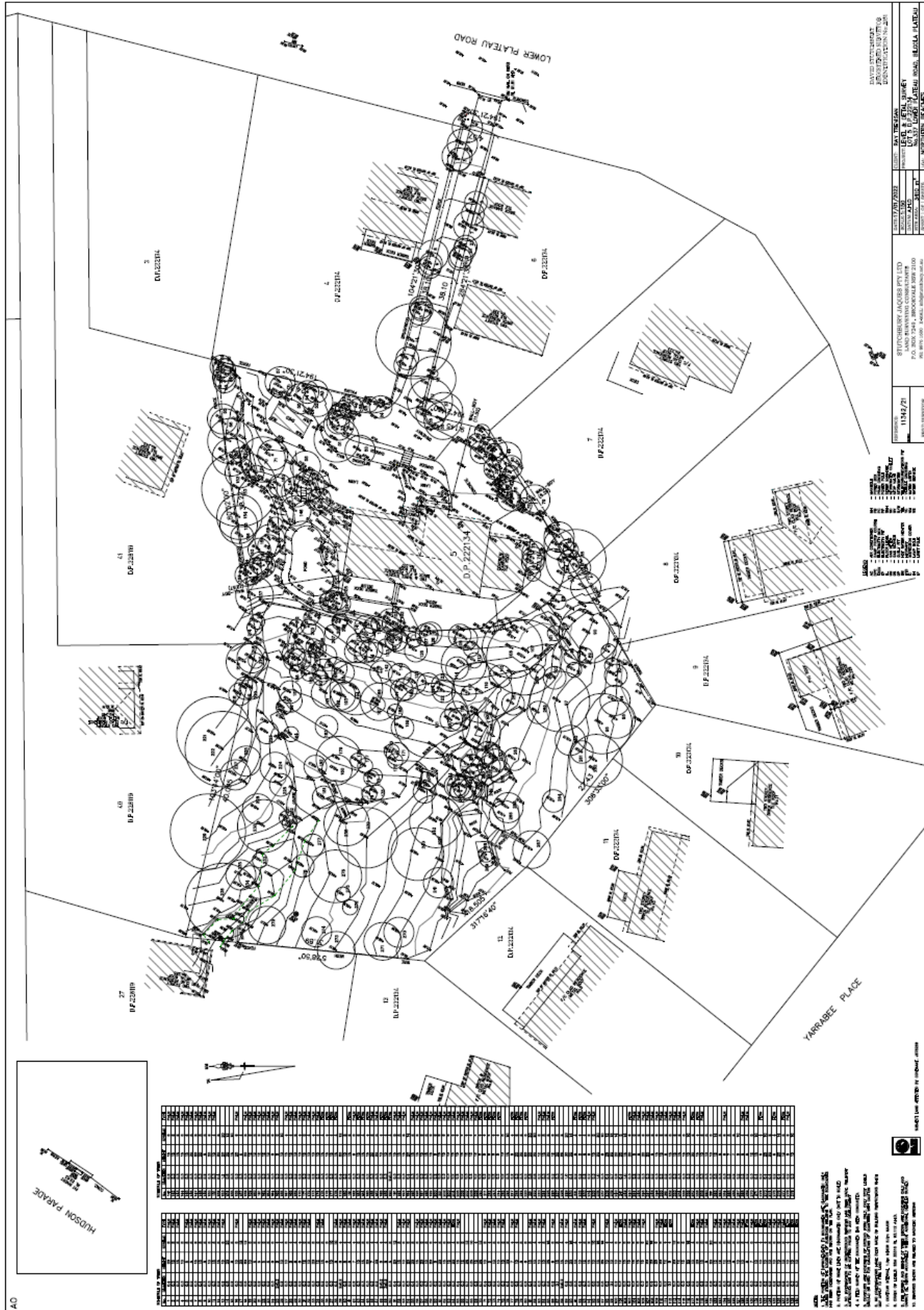



GARTNER
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Appendix B

Site Survey
David Stutchbury
Ref 11342 / 21



Appendix C
Flood Information Request – Comprehensive
Northern Beaches Council



FLOOD INFORMATION REPORT – COMPREHENSIVE

Property: 337 Lower Plateau Road BILGOLA PLATEAU NSW 2107

Lot DP: Lot 5 DP 222134

Issue Date: 18/12/2021

Flood Study Reference: Avalon to Palm Beach Floodplain Risk Management Study and Plan 2017, Manly Hydraulics Laboratory

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}: 80.93 m AHD

1% AEP Flood – See Flood Map B

1% AEP Maximum Water Level ^{2,3}: 80.43 m AHD

1% AEP Maximum Depth from natural ground level³: 0.65 m

1% AEP Maximum Velocity: 2.40 m/s

1% AEP Hydraulic Categorisation: Floodway See Flood Map D

Probable Maximum Flood (PMF) – See Flood Map C

PMF Maximum Water Level ⁴: 80.65 m AHD

PMF Maximum Depth from natural ground level: 0.95 m

PMF Maximum Velocity: 3.80 m/s

PMF Hydraulic Categorisation: Floodway See Flood Map E

Flooding with Climate Change (See Flood Map F)

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

1% AEP Maximum Water Level with Climate change³: 80.49 m AHD

1% AEP Maximum Depth with Climate Change³: 0.72 m

Flood Life Hazard Category – See Map G

Indicative Ground Surface Spot Heights – See Map H

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

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

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

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

General Notes:

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

FLOOD MAP A: FLOOD RISK PRECINCT MAP



Notes:

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

FLOOD LEVEL POINTS



Note: Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Avalon to Palm Beach Floodplain Risk Management Study and Plan 2017, Manly Hydraulics Laboratory) 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	79.95	0.36	79.98	0.40	1.23	80.48	80.16	0.57	2.05
2	78.30	0.19	78.33	0.22	1.33	78.83	78.45	0.35	2.40
3	76.83	0.19	76.85	0.20	0.80	77.35	76.95	0.30	1.44
4	73.60	0.17	73.63	0.20	1.80	74.13	73.79	0.36	3.14
5	67.95	0.31	67.98	0.34	1.73	68.48	68.21	0.57	2.89
6	78.00	0.29	78.03	0.32	0.99	78.53	78.18	0.48	1.68
7	N/A	N/A	77.53	0.16	0.86	78.03	77.59	0.27	1.48
8	N/A	N/A	75.97	0.13	0.78	76.47	76.00	0.23	1.35
9	73.77	0.17	73.79	0.18	0.86	74.29	73.77	0.27	1.51
10	67.84	0.20	67.86	0.22	0.98	68.36	67.98	0.34	1.68
11	65.51	0.44	65.57	0.50	1.49	66.07	65.87	0.81	2.33
12	61.17	0.54	61.22	0.59	2.29	61.72	61.54	0.92	3.61

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

ID	CC 1% AEP Max WL (m AHD)	CC 1% AEP Max Depth (m)
1	80.03	0.45
2	78.36	0.26
3	76.87	0.22
4	73.67	0.24
5	68.02	0.38
6	78.07	0.37
7	77.50	0.18
8	75.92	0.15
9	73.70	0.19
10	67.89	0.25
11	65.65	0.58
12	61.29	0.66

WL – Water Level

PMF – Probable Maximum Flood

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

A variable Flood Planning Level might apply. Freeboard is generally 0.5m above the maximum 1% AEP water level. However for overland flow with a depth less than 0.3m and a VelocityxDepth product less than 0.3m²/s, a freeboard of 0.3m may be able to be justified.

FLOOD MAP B: FLOODING - 1% AEP EXTENT



- 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: Avalon to Palm Beach Floodplain Risk Management Study and Plan 2017, Manly Hydraulics Laboratory) 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
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Avalon to Palm Beach Floodplain Risk Management Study and Plan 2017, Manly Hydraulics Laboratory) and aerial photography (Source: NearMap 2014) are indicative only

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



Notes:

- Extent represents the 1% annual Exceedance Probability (AEP) flood event
- Extent does not include climate change
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Avalon to Palm Beach Floodplain Risk Management Study and Plan 2017, Manly Hydraulics Laboratory) and aerial photography (Source: NearMap 2014) are indicative only

Issue Date: 18/12/2021

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FLOOD MAP E: 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: Avalon to Palm Beach Floodplain Risk Management Study and Plan 2017, Manly Hydraulics Laboratory) and aerial photography (Source: NearMap 2014) are indicative only

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



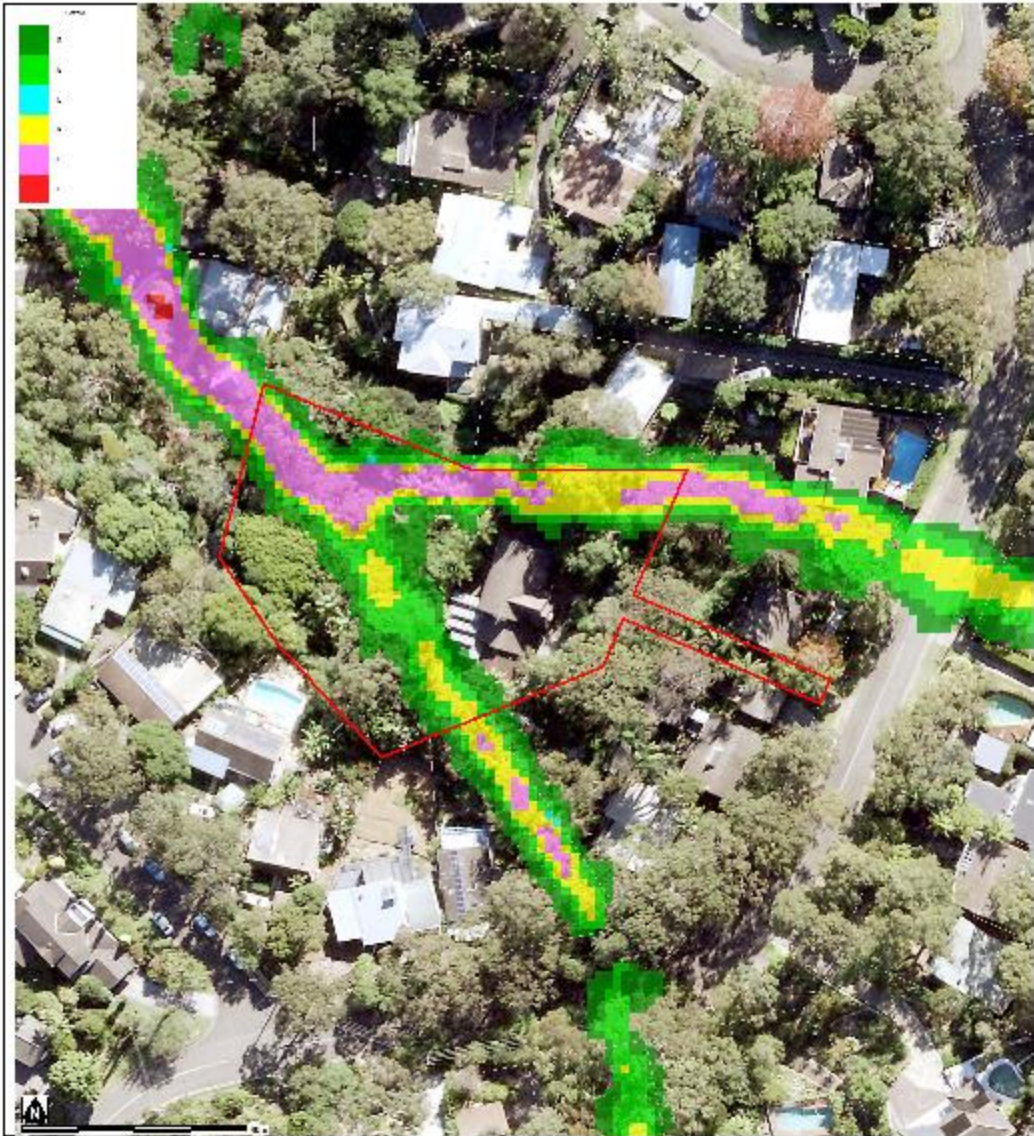
Note:

- Extent represents the 1% annual Exceedance Probability (AEP) flood event including 30% rainfall intensity and 0.9m Sea Level Rise climate change scenario
- Flood events exceeding the 1% AEP can occur on this site.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Avalon to Palm Beach Floodplain Risk Management Study and Plan 2017, Manly Hydraulics Laboratory) and aerial photography (Source: NearMap 2014) are indicative only

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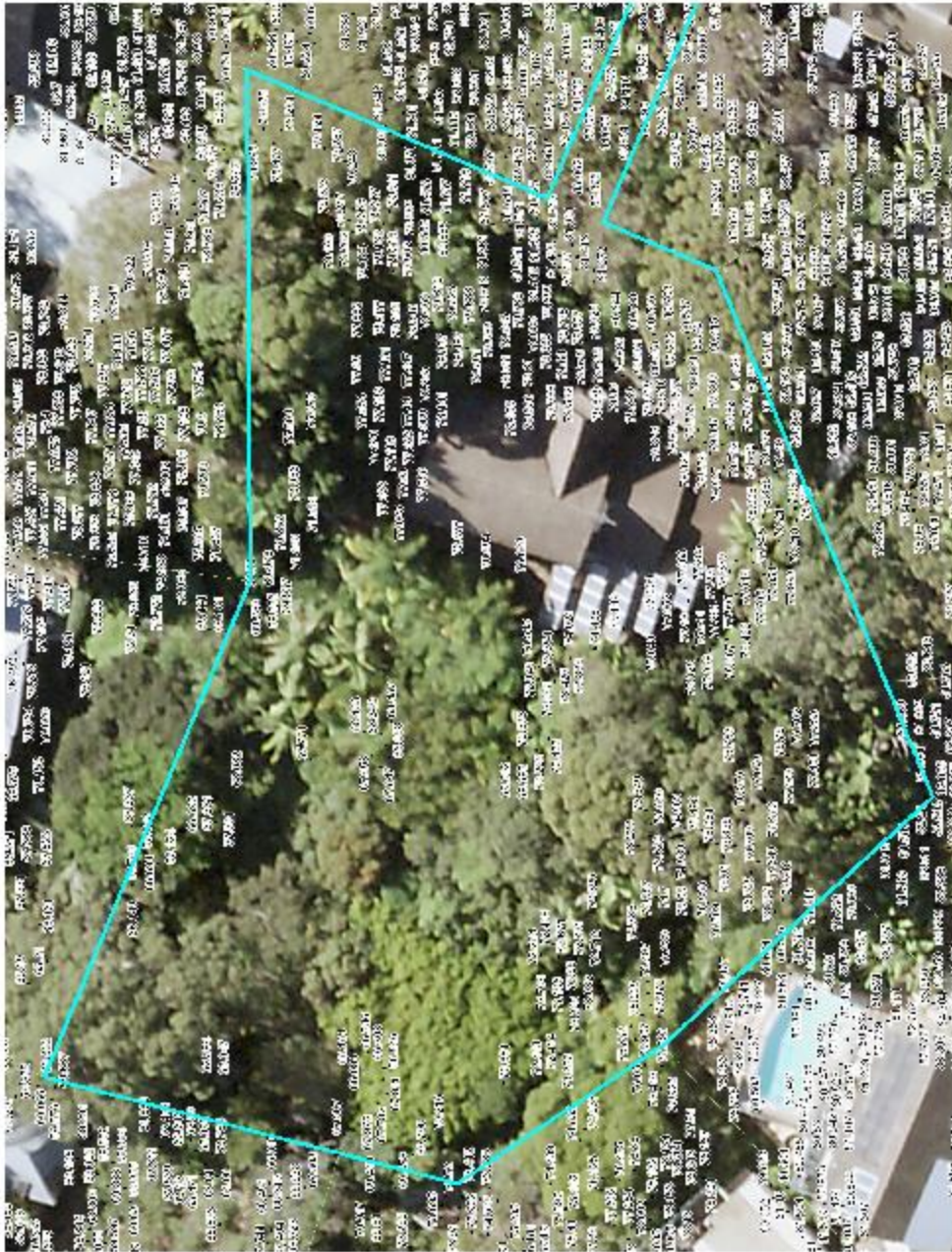
FLOOD MAP G: FLOOD LIFE HAZARD CATEGORY



Notes:

- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Avalon to Palm Beach Floodplain Risk Management Study and Plan 2017, Manly Hydraulics Laboratory) and aerial photography (Source: Near Map 2014) are indicative only.

MAP H: INDICATIVE GROUND SURFACE SPOT HEIGHTS



Notes:

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

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Preparation of a Flood Management Report

Introduction

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

Planning Requirements for Flood Prone Land

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

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

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

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

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

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

When is a Flood Management Report required?

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

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

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

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

What is the purpose of a Flood Management Report?

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

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

Preparation of a Flood Management Report

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

1. Description of development

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

2. Flood analysis

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

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

3. Assessment of impacts

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

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

- Demonstration of how the development complies with any relevant flood planning requirements from the DCP, LEP, Water Management for Development Policy, and if it is in the Warriewood Valley Urban Land Release Area, with the Warriewood Valley Water Management Specification (2001)

- For any non-compliance, a justification for why the development should still be considered.
- Calculations of available flood storage if compensatory flood storage is proposed
- Plan of the proposed development site showing the predicted 1% AEP and PMF flood extents, as well as any high hazard or floodway affectation
- Development recommendations and construction methodologies
- Qualifications of author - Council requires that the Flood Management Report be prepared by a suitably qualified Engineer with experience in flood design / management who has, or is eligible for, membership to the Institution of Engineers Australia
- Any flood advice provided by Council
- Any other details which may be relevant

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

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

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

Appendix D
Northern Beaches Council
Standard Hydraulic Certification Form

**NORTHERN BEACHES COUNCIL
STANDARD HYDRAULIC CERTIFICATION FORM**

FORM A/A1 – To be submitted with Development Application

Development Application for

Address of site: **337 Lower Plateau Rd Bilgola Plateau**

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

I, **Lucas Molloy** on behalf of **Barrenjoey Consulting Engineers p/l** on this the **16th Mar 2023** certify that I am engineer or a 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:

**FLOOD INUNDATION & RISK ASSESSMENT REPORT
PROPOSED SHOP TOP
SUB DIVISION**

Report Date:

**337 Lower Plateau Rd Bilgola Plateau
Mar 2023**

Author:

Lucas Molloy

Author's Company/Organisation:

Barrenjoey Consulting Engineers p/l

I: **Lucas Molloy**

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

X have obtained and included flood information from Council (must be less than 12 months old, noting information 16months old but acceptable)

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

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

Signature



Name

**Lucas Molloy
BE CPEng NER 788184
Director
Barrenjoey Consulting Engineers p/l**

End