

FLOOD EMERGENCY RESPONSE PLANNING FOR DEVELOPMENT IN PITTWATER POLICY
FORM NO. 1 – To be submitted with Development Application

Development Application for

 (Name of Applicant)

Address of site: 60 BINBURRA AVENUE AVALON

Declaration made by hydraulic engineer or engineer specialising in flooding/flood emergency response as part of a Flood Risk Emergency Assessment:

I, GARTH HODGSON on behalf of JACK HODGSON CONSULTANTS P/L
 (Insert Name) (Trading or Business/ Company Name)

on this the 15TH APRIL 2019 (Date) certify that I am a hydraulic engineer or engineer

specialising in flooding/flood emergency response 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 \$2million.

Flood Risk Emergency Assessment Details:

Report Title:

60 BINBURRA AVENUE, AVALON FLOOD RISK ASSESSMENT REPORT

Report Date: 15TH APRIL 2019

Author: GARTH HODGSON

Author's Company/Organisation: JACK HODGSON CONSULTANTS P/L

I: GARTH HODGSON
 (Insert Name)

Please tick appropriate box (more than one box can be marked)

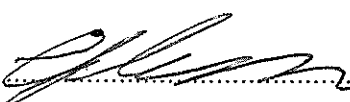
- ☐ have prepared the Flood Risk Emergency Assessment referenced on Form 1 in accordance with Council's guidelines and the Flood Emergency Response Planning for Development in Pittwater Policy.
- ☐ am willing to technically verify that the detailed Flood Risk Emergency Assessment referenced on Form 1 has been prepared in accordance with Council's guidelines and the Flood Emergency Response Planning for Development in Pittwater Policy.
- ☐ have examined the site and the proposed development in detail and have carried out a risk assessment (which has been attached to this form), and can confirm that:
- ☐ The addition/dwelling/building is located outside of the extents for Flood Life Hazard Categories H3-H4, H5 and H6 and a Flood Risk Emergency Assessment is not required.
- ☒ confirm that the results of the risk assessment for the proposed development are in compliance with the Flood Risk Management Policy for Development in Pittwater and a detailed risk assessment is not required for the subject site.

- ☒ have examined the site and the proposed development/alteration/addition in detail and I am of the opinion (after carrying out a risk assessment) that the Development Application does not require a Flood Risk Emergency Assessment and I have attached the risk assessment to this form.
- ☐ have reviewed (provide details of Report) the Flood Risk Emergency Assessment previously prepared for this property and can confirm it is up to date and is still current.

Documentation which relate to or are relied upon in report preparation:

☒ I am aware that the Flood Risk Emergency Assessment referenced on Form 1, prepared for the abovementioned site is to be submitted in support of a Development Application for this site and will be relied on by Pittwater Council as the basis for ensuring that the Flood Risk Management aspects of the proposed development have been adequately addressed to achieve an "Acceptable or Tolerable Risk" level for the life of the structure, taken as at least 100 years unless otherwise stated and justified in the Report and that reasonable and practical measures have been identified to remove foreseeable risk.

Hydraulic engineer or engineer specialising in flooding/flood emergency response details:

Signature 
Name GARTH HODGSON
Chartered Professional Status B.Eng Civil, MIE AUST
Membership No. 2211514
Company JACK HODGSON CONSULTANTS P/L
Number of years specialising in flooding/emergency response.....



Jack Hodgson Consultants Pty Limited

CONSULTING CIVIL, GEOTECHNICAL AND STRUCTURAL ENGINEERS

ABN: 94 053 405 011

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60 BINBURRA AVENUE, AVALON. **FLOOD RISK ASSESSMENT REPORT**

Executive Summary

The flood risk assessment is of the subject property for the proposed alterations and additions as shown on the plans prepared by Fineline Building Design Professionals Project No: 15.015, Drawing No: DA 01 to DA 13, Issue C and dated 10th January, 2019. We have used the survey prepared by Total Surveying Solutions, Job No 160291, Drawing No. 1 and dated 17th March, 2016 and applied Council's DCP Section B3.11 Flood Prone Land to this development. The subject property is affected by flood waters for both the 1 in 100 year event and the PMF event. Appendix A is the map from Council showing the extents of the 1 in 100 year and PMF event. Appendix C shows Council's assessment matrix for a medium risk property and Appendix B showing some Flood compatible building materials. In our opinion the proposed alterations and additions will not adversely affect the existing flood regime as long as the recommendations of this report are carried out.



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The General Manager
Northern Beaches Council - Warringah Area
PO Box 882
MONA VALE NSW 2103

60 BINBURRA AVENUE, AVALON. **FLOOD RISK ASSESSMENT REPORT**

We have been asked to prepare a report in regards to the proposed alterations and additions as shown on the plans prepared by Fineline Building Design Professionals Project No: 15.015, Drawing No: DA 01 to DA 13, Issue C and dated 10th January, 2019. We have also reviewed the survey prepared by Total Surveying Solutions, Job No 160291, Drawing No. 1 and dated 17th March, 2016 for the subject address.

1. Description of the development

It is proposed to carry out alterations and additions to the existing property. These include the construction of a new carport, secondary dwelling under the carport, new lower ground floor office and new swimming pool with associated decks. Normal residential traffic and occupation is expected.

Table 1: Proposed and Existing Floor Levels

Area	Floor Level (RL m AHD)
Existing Ground Floor	29.52
Proposed Ground Floor	29.52
Existing Lower Ground Floor	26.93
Proposed Lower Ground Floor	26.93
Proposed Lower Ground Floor Office	26.58
Proposed swimming pool	25.97
Proposed carport	30.39 to 30.49
Proposed secondary dwelling	27.53

2. Flood Analysis

Flood information as provided by Council, See Appendix A
Flood Emergency Response Strategy: H1-H2 50% Unclassified 50%
Flood Risk Precinct: Affected by the Low 60% Medium 40% of Flood Risk Precinct.
1% AEP (100 year) Maximum Water Level: 30.54m AHD
1% AEP (100 year) Maximum Peak Depth: 0.28m
1% AEP (100 year) Hydraulic Categorisation: Flood Fringe
Freeboard: 0.3m
Flood Planning Level (FPL): 30.84m AHD
Probable Maximum Flood (PMF) Water Level: 31.01m AHD
Probable Maximum Flood (PMF) Peak Depth: 0.40m AHD

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2. Flood Analysis (Continued)

According to the map provided by Council approximately 25% of the property is affected by the 1 in 100 year flood. Council's map also shows that approximately 10% of the property is affected by the medium risk category and 20% the low risk category. Approximately 40% of the property is affected by the PMF event, see Appendix A.

The property is burdened by Council's stormwater asset with pipeline entering the property near the south east front corner of the existing residence, then runs adjacent to the north eastern side boundary then turning to more westerly direction near the middle of the property where it exits the property on the downhill side boundary.

According to Council's mapping the flood waters could enter the subject property from the north east west from behind the neighbouring residence, flowing to the west if overland but just as likely from the west rising up over the land as the pipeline is surcharged.

The existing ground level near the entry point of the flood waters on the north eastern uphill side boundary is approximately 26.22m AHD and on the opposite side boundary is 24.65m AHD. Given the maximum depth of flow from the information provided by Council for 1% AEP event is 0.28m the calculated uphill level and downhill water levels are 26.50m AHD and 24.93m AHD.

The flood waters are to have a minor diversion around the deck and swimming pool area by the wall on the north eastern side of the proposed swimming pool area. The flood waters will then continue downhill along the existing modelled overland path.

3. Assessment of Impacts

We have used the Medium Flood Risk Planning Precinct matrix in Council's DCP Section B3.11 Flood Prone Land for this part of the assessment. See Appendix C.

3.1 Residential:-

			Compliance		
			Not Applicable	Yes	No
A	Flood effects caused by Development	A1	X		
		A3		X	
B	Drainage Infrastructure & Creek Works	B1	X		
		B2	X		
C	Building Components & Structural	C1		X	
		C2		X	
		C3		X	
D	Storage of Goods	D1		X	
		D2		X	

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3. Assessment of Impacts (Continued)

E	Flood Emergency Response	E1	X		
		E2	X		
F	Floor Levels	F1		X	
		F2		X	
		F3	X		
		F4	X		
		F6	X		
		F8	X		
		F9	X		
G	Car Parking	G1		X	
		G2	X		
		G3	X		
		G5	X		
		G6	X		
		G7	X		
		G8	X		
H	Fencing	H1		X	
I	Pools	I1		X	

- A3.** The affected area of the proposed development is to be placed on posts where elevation above the existing natural ground level permits. The flood waters are not to be impeded by the installation of the glass pool fence. The timber deck supports are not to impede the flood waters of the 1% AEP event.
- B1** No flood mitigation measures or modifications required.
- C1** New decks and swimming pool materials and foundations will need to comply as a flood compatible building.
- C2** New decks and swimming pool will need to be built to ensure structural integrity up to the Flood Planning Level of 0.3m above natural ground levels in the affected area. The FPL ranges from 26.50m to 24.93m AHD in this area.
- C3** New decks and swimming pool will need to be built with all new electrical equipment, power points, wiring, fuel lines, sewerage systems or any other service pipes and connections must be waterproofed and/or located above the Flood Planning Level ranging from 26.50m to 24.93m AHD. All existing electrical equipment and power points located below the Flood Planning Level must have residual current devices installed that turn off all electricity supply to the property when flood waters are detected.
- D1** Hazardous or potentially polluting materials are to be stored above the Flood Planning Level ranging from 26.50m to 24.93m AHD.
- D2** Goods, materials or other products which may be highly susceptible to water damage to be located/stored above the Flood Planning Level ranging from 26.50m to 24.93m AHD.



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3. Assessment of Impacts (Continued)

- E1** H1-H2 Not required.
- E2** H1-H2 Not required.
- F1** The closest and lowest proposed habitable roof to the affected area is the proposed office with a floor RL of 26.58m AHD which is above the Flood Planning Level ranging from 26.50m to 24.93m AHD.
- F2** New decks and swimming pool surrounds including the glass swimming pool fence are to be placed as to not impede the flood waters. In our opinion the proposed wall at the north eastern side of the swimming pool will cause the flood waters to have minor diversion before flowing downhill along the existing flood water flow path. This will not cause any significant changes to the neighbouring properties flood regimes.
- H1** Any new fences in the overland flow path to be built in accordance with Council's requirements and be designed so as not to impede the flow of flood waters and not to increase flood affectation on surrounding land. Appropriate fencing must comply with the Flood Prone Land Design Standard in addition to other regulatory requirements of pool fencing.
- I1** The proposed swimming pool is on the edge of the affected area and has been raised to allow the flood waters to flow down the north eastern side to the north to the existing over land flow path. In our opinion the proposed wall at the north eastern side of the swimming pool will cause the flood waters to have minor diversion before flowing downhill along the existing flood water flow path. This will not cause any significant changes to the neighbouring properties flood regimes. All electrical equipment associated with the pool (including pool pumps) is to be waterproofed and/or located at or above the Flood Planning Level ranging from 26.50m to 24.93m AHD.

All chemicals associated with the pool are to be stored at or above the flood planning level.

4. Conclusion

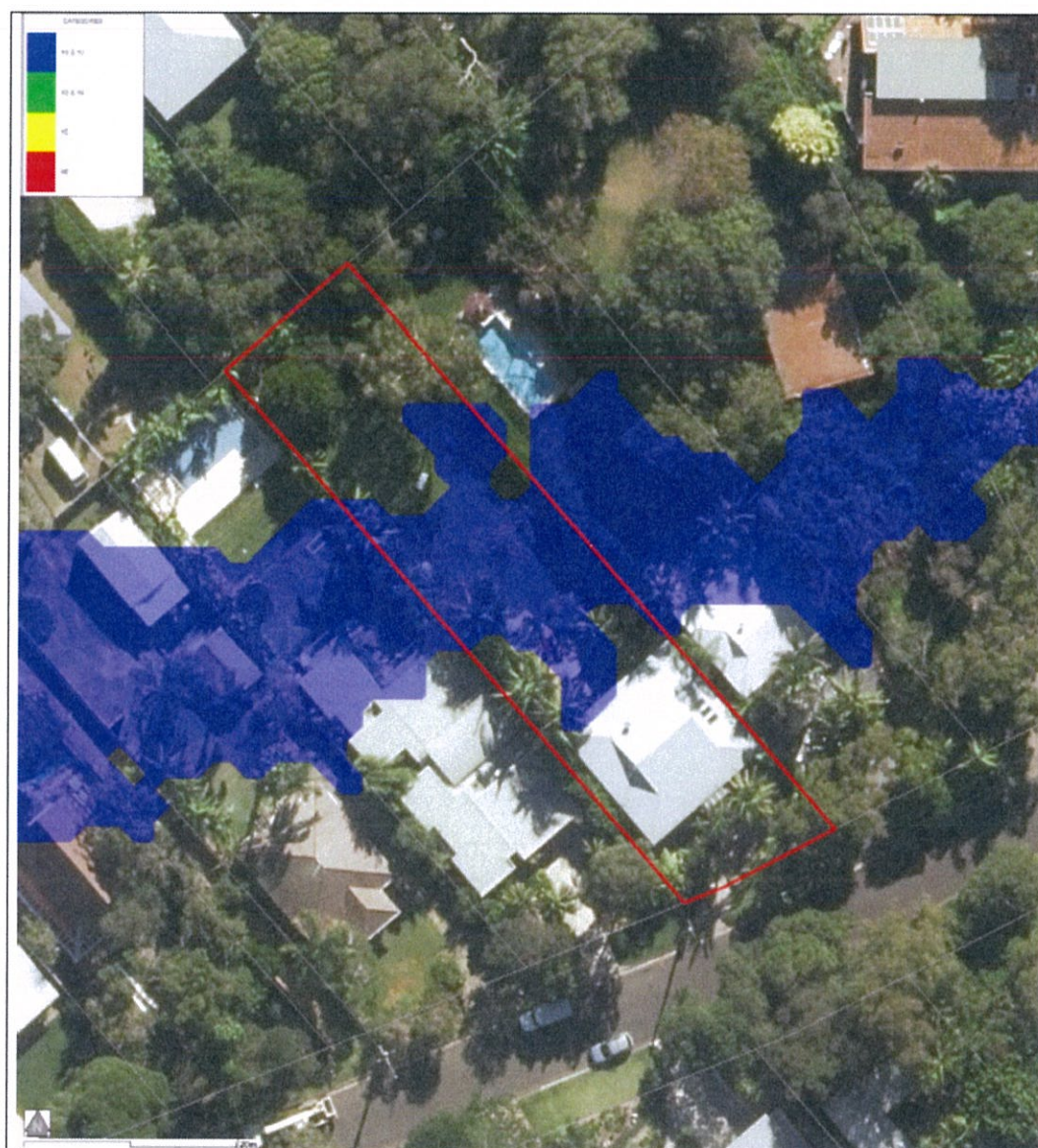
In our opinion the proposed alterations and additions will not adversely affect the existing flood regime as long as the recommendations of this report are carried out.

JACK HODGSON CONSULTANTS PTY. LIMITED.

Garth Hodgson
B.Eng Civil, MIE Aust 2211514

Appendix A

FLOOD MAP A: FLOOD LIFE HAZARD CATEGORY



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: Avalon to Palm Beach Floodplain Risk Management Study and Plan) and aerial photography (Source Near Map 2014) are indicative only.



FLOOD INFORMATION REQUEST - COMMON

Property: 60 Binburra Avenue, Avalon Beach

Lot DP: 20//22275

Issue Date: 05/04/2019

Flood Study Reference: Avalon to Palm Beach Floodplain Risk Management Study and Plan 2017, NSW Public Works - MHL

Flood Information for lot:

Flood Life Hazard Category – See Map A

1% AEP – See Flood Map B

1% AEP Maximum Water Level³: 30.54 mAHD

1% AEP Maximum Peak Depth from natural ground level³: 0.28 m

1% AEP Maximum Velocity: 0.79 m/s

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

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

Flood Planning Area – See Flood Map C

Flood Planning Level (FPL)^{1,2,3 & 4}: 30.84 m AHD

Probable Maximum Flood (PMF) – See Flood Map D

PMF Maximum Water Level²: 31.01 m AHD

PMF Maximum Depth from natural ground level: 0.40 m

PMF Maximum Velocity: 1.23 m/s

Flood Risk Precinct – See Map G

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

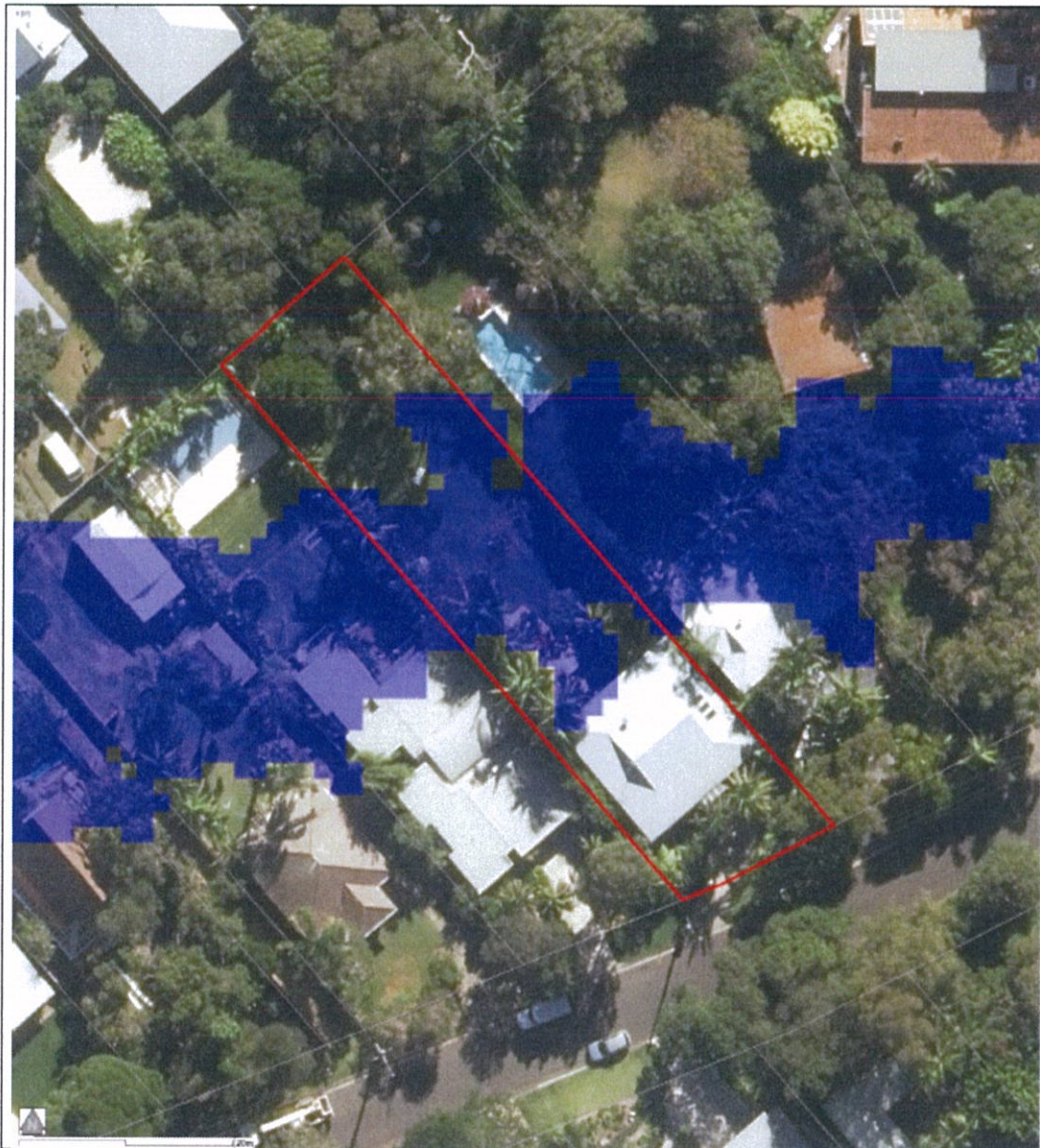
FLOOD MAP B: FLOODING - 1% AEP EXTENT



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: Avalon to Palm Beach Floodplain Risk Management Study and Plan) and aerial photography (Source Near Map 2014) are indicative only.

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: Avalon to Palm Beach Floodplain Risk Management Study and Plan) and aerial photography (Source Near Map 2014) are indicative only.

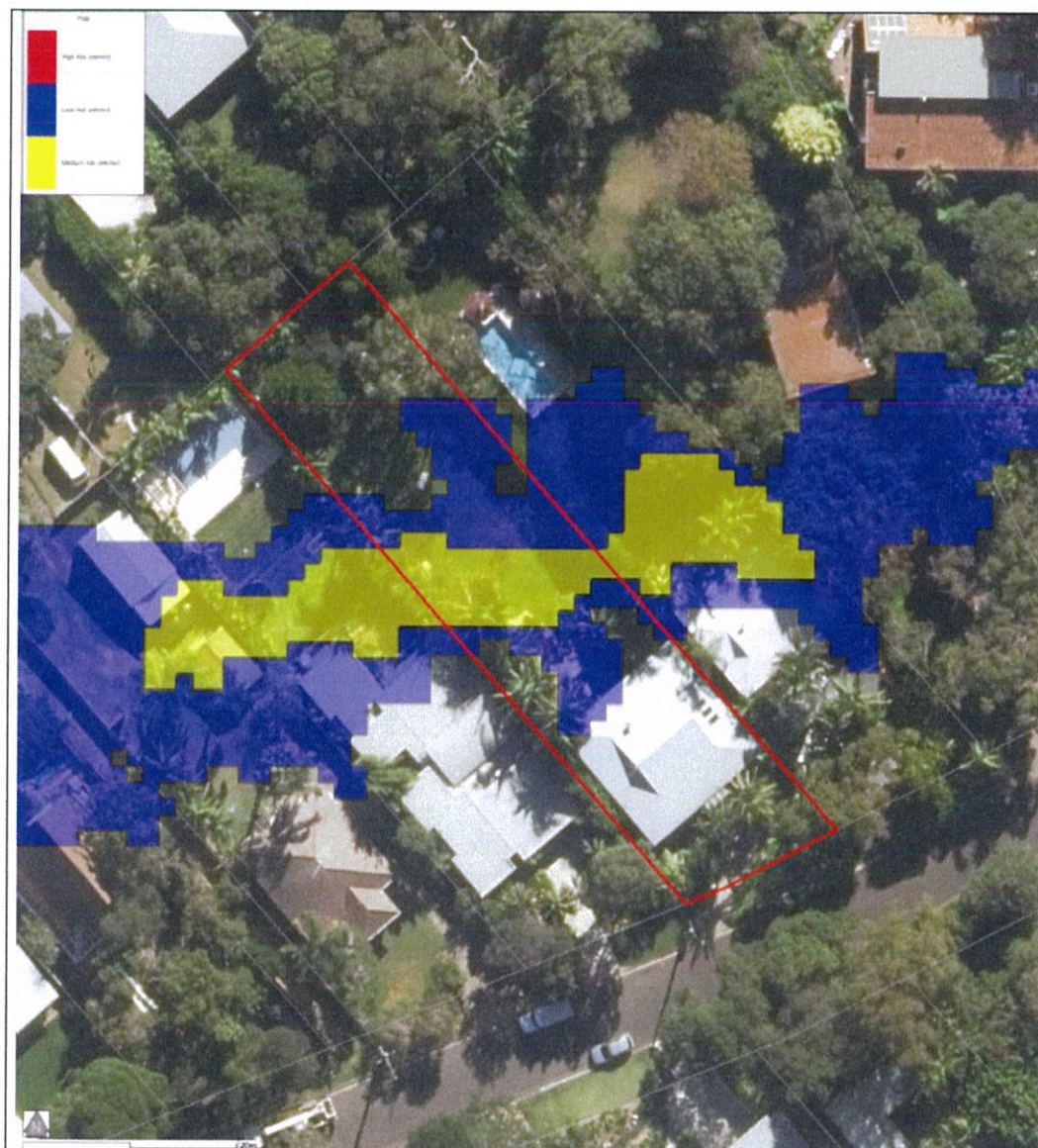
FLOOD MAP F – 1% AEP FLOOD HYDRAULIC CATEGORY EXTENT MAP



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: Avalon to Palm Beach Floodplain Risk Management Study and Plan) and aerial photography (Source: NearMap 2014) are indicative only.

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 (H5 and or H6 Life Hazard Classification).

Appendix B

Building Component Flood Compatible Material

Flooring and Sub Floor Structure

Pier and beam construction or
Suspended reinforced concrete slab

Floor Covering

Clay tiles
Concrete, precast or in situ
Concrete tiles
Epoxy formed-in-place
Mastic flooring, formed-in-place
Rubber sheets or tiles with chemical-set adhesive
Silicone floors formed-in-place
Vinyl sheets or tiles with chemical set adhesive
Ceramic tiles, fixed with mortar or chemical set adhesive
Asphalt tiles, fixed with water resistant adhesive

Wall Structure

Solid brickwork, blockwork, reinforced, concrete or mass concrete

Windows

Aluminium Frame with stainless steel rollers or similar
Corrosion and water resistant material.

Doors

Solid panel with waterproof adhesives
Flush door with marine ply filled with closed cell foam
Painted material construction
Aluminium or galvanised steel frame

Wall and Ceiling Linings

Brick, face or glazed
Clay tile glazed in waterproof mortar
Concrete
Concrete block
Steel with waterproof applications
Stone natural solid or veneer, waterproof grout
Glass blocks
Glass
Plastic sheeting or wall with waterproof adhesive

Insulation

Foam or closed cell types

Nails, Bolts, Hinges and Fittings

Galvanised
Removable pin hinges

Fences

Wooden horizontal slatted fences with capacity to allow flood flowthrough.

Note: The above is not an exhaustive list of Flood compatible materials

Appendix C

Medium 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 F4 F6 F8 F9	F1 F2 F3 F4 F6 F8 F9 F10 F11	F2	F1 F2 F3 F4 F6 F11
G	Car Parking	G1 G4 G6 G7 G9 G10	G1 G4 G6 G7 G9 G10	G1	G1 G2 G3 G5 G6 G7 G8	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

Matrix Table Requirements

A. FLOOD EFFECTS CAUSED BY DEVELOPMENT	
A1	Jetty
Intensive plant agriculture	Development (including earthworks and subdivision) shall not be approved unless it can be demonstrated in a Flood Management Report that it complies with the Flood Prone Land Design Standard found on Council's webpage.
A2	Certification shall be provided in accordance with Northern Beaches Council's Standard Hydraulic Certification Form (Forms A and A1 of Northern Beaches Council's Guidelines for preparing a Flood Management Report) to the effect that the works have been designed and can be constructed to adequately address flood risk management issues.
A3	The applicant shall include in their submission, calculations to illustrate that any fill or other structures that reduce the total flood storage are replaced by Compensatory Works.
A4	Development (including earthworks and subdivision) shall not be approved unless it can be demonstrated in a Flood Management Report that it been designed and can be constructed so that in a Probable Maximum Flood event: (a) There are no adverse impacts on flood levels and velocities caused by alterations to the flood conveyance; (b) There are no adverse impacts on surrounding properties; and (c) It is sited to minimise exposure to flood hazard. Where relevant certification shall also be provided in Northern Beaches Council's Standard Certification Form (Forms A and A1 of Northern Beaches
B. DRAINAGE INFRASTRUCTURE AND CREEK WORKS	
B1	Flood mitigation works or stormwater devices that modify a major drainage system, stormwater system, natural water course, floodway or flood behaviour within or outside the development site may be permitted subject to demonstration through a Flood Management Report that they comply with the Flood Prone Land Design Standard found on Council's webpage.
B2	A Section 88B notation under the Conveyancing Act 1919 may be required to be placed on the title describing the location and type of flood mitigation works with a requirement for their retention and maintenance.
C. BUILDING COMPONENTS AND STRUCTURAL SOUNDNESS	
C1	All buildings shall be designed and constructed as flood compatible buildings in accordance with Reducing Vulnerability of Buildings to Flood Damage: Guidance on Building in Flood Prone Areas, Hawkesbury-Nepean Floodplain Management Steering Committee (2006).
C2	All structures must be designed and constructed to ensure structural integrity up to the Flood Planning Level, taking into account the forces of floodwater, wave action, flowing water with debris, buoyancy and immersion. Structural certification shall be provided confirming the above. Where shelter-in-place refuge is to be provided the structural integrity is to be to the Probable Maximum Flood level.
C3	All new electrical equipment, power points, wiring, fuel lines, sewerage systems or any other service pipes and connections must be waterproofed and/or located above the Flood Planning Level. All existing electrical equipment and power points located below the Flood Planning Level must have residual current devices installed that turn off all electricity supply to the property when flood waters are detected.
D. STORAGE OF GOODS	
D1	Hazardous or potentially polluting materials shall not be stored below the Flood Planning Level unless adequately protected from floodwaters in accordance with industry standards.
D2	Goods, materials or other products which may be highly susceptible to water damage are to be located/stored above the Flood Planning Level.
E. FLOOD EMERGENCY RESPONSE	
E1	Development shall comply with Council's Flood Emergency Response Planning for Development in Pittwater Policy and the outcomes of any Flood Risk Emergency Assessment Report where it applies to the land.
E2	New development must provide an appropriately sized area to safely shelter in place above the Probable Maximum Flood level and appropriate access to this area should be available from all areas within the development.
E3	Adequate Warning Systems, Signage and Exits shall be installed to allow safe and orderly evacuation without reliance upon the SES or other authorised emergency services personnel.
E4	The application shall demonstrate that evacuation/shelter in place in accordance with the requirements of this DCP will be available for any potential development arising from a torrens title subdivision.
F. FLOOR LEVELS	
F1	New floor levels within the development shall be at or above, the Flood Planning Level. A reduced Flood Planning Level may be considered only where it is permitted in this Development Control Plan. The structure must be flood proofed (wet or dry) to the Flood Planning Level. This control cannot be applied to critical or vulnerable uses.
F2	All development structures must be designed and constructed so as not to impede the floodway or flood conveyance on the site, as well as ensuring no loss of flood storage in a 1% AEP Event. Where the dwelling is located over a flow path it must be elevated on suspended pier/pile footings such that the level of the underside of all floors including balconies and decks within the flood affected area are at or above, or raised to the Flood Planning Level to allow clear passage of the floodwaters under the building. The development must comply with the Flood Prone Land Design Standard.
F3	Where the lowest floor has been elevated to allow the passage of flood waters, a restriction shall be imposed on the title of the land, pursuant to S88B of the Conveyancing Act confirming that the undercroft area is not to be enclosed.
F4	A one- off addition or alteration below the Flood Planning Level of less than 30 square metres or an increase of less than 10% of the ground floor area (whichever is the lesser) for residential development may be considered only where: (a) it is an extension to an existing room (b) the Flood Planning Level is incompatible with the floor levels of the existing room This control will not be permitted if this provision has previously been utilised since the making of this Plan. The structure must be flood proofed to the Flood Planning Level.
F5	The applicant must demonstrate that future development following a subdivision proposal can be undertaken in accordance with this Control.

F6	Any existing floor level may be retained below the Flood Planning Level when undertaking a first floor addition provided that: (a) it is not located within a floodway; (b) there is no increase to the building footprint below the Flood Planning Level; (c) it is flood proofed to the Flood Planning Level;
F7	All floor levels within the development shall be at or above the Probable Maximum Flood level or Flood Planning Level whichever is higher.
F8	The minimum floor level of any first floor additions shall be at or above the Probable Maximum Flood Level.
F9	Foyers – consideration may be given to a minimum floor level of a foyer being set at the 5% AEP flood level, provided it can be demonstrated that it complies with the Flood Prone Land Design Standard.

F10	Consideration may be given to a minimum floor level for the first 5 metres from the street front of new development in business zonings below the Flood Planning Level provided it can be demonstrated that it complies with the Flood Prone Land Design Standard.
F11	A one-off addition or alteration below the Flood Planning Level of less than 100 square metres or an increase of less than 10% of the ground floor area (whichever is the lesser) for non-residential development may be considered only where the required floor level cannot be achieved for the following reason: (a) it would be incompatible with floor levels of the existing building This control will not be considered if the existing floor level of the additions/alterations are located within a high hydraulic hazard area. This control will not be permitted if this provision has previously been utilised since the making of this Plan. Any features of the additions or alterations on the floor level must be flood proofed to the Flood Planning Level
G. CAR PARKING	
G1	Open carpark areas and carports shall not be located within a floodway.
G2	The lowest floor level of open carparks and carports (unroofed or with open sides) shall be constructed no lower than the natural ground levels.
G3	All enclosed car parks must be protected from inundation up to the relevant flood planning level. For example, basement carparks must be provided with a crest at the entrance, the crest of which is at the relevant Flood Planning Level. All access, ventilation and any other potential water entry points to any enclosed car parking shall be above the relevant Flood Planning Level. Council will not accept any options that rely on electrical, mechanical or manual exclusion of the floodwaters from entering the enclosed carpark
G4	Vehicle barriers or restraints are to be provided to prevent floating vehicles leaving the site where there is more than 300mm depth of flooding in a 1% AEP flood event. The minimum height of the vehicle barriers or restraints must be at or above the Flood planning Level. Vehicle barriers or restraints must comply with the Flood Prone Land Design Standard.
G5	Enclosed Garages must be located at or above the 1% AEP level
G6	Carports must comply with the Flood Prone Land Design Standard
G7	Where a driveway is required to be raised it must be demonstrated that there is no loss to flood stage in the 1% AEP flood event and no impact on flood conveyance through the site
G8	Multi Dwelling Housing and Shop Top Housing residential carparking – consideration may be given to a minimum floor level for open or covered carparking being set at the 5% AEP flood level, provided it can be demonstrated that it complies with the Flood Prone Land Design Standard.
G9	All enclosed car parks must be protected from inundation up to the Probable Maximum Flood level or Flood Planning Level whichever is higher. For example, basement carparks must be provided with a crest at the entrance, the crest of which is at the relevant Probable Maximum Flood level or Flood Planning Level whichever is higher. All access, ventilation and any other potential water entry points to any enclosed car parking shall be above the relevant Probable Maximum Flood level or Flood Planning Level whichever is higher.
G10	Enclosed Garages must be located at or above the Probable Maximum Flood Level or Flood Planning Level whichever is higher.
H. FENCING	
H1	Fencing, including pool fencing, shall be designed so as not to impede the flow of flood waters and not to increase flood affectation on surrounding land. Appropriate fencing must comply with the Flood Prone Land Design Standard in addition to other regulatory requirements of pool fencing.
I. POOLS	
I1	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.

Advisory Notes

Applications must demonstrate compliance with the following references:

- 0 Flood Prone Land Design Standard
- 1 Flood Risk Management Policy