

**FLOOD INUNDATION &  
RISK ASSESSMENT REPORT  
PROPOSED  
ALTERATIONS & ADDITIONS  
7 LEWIS CLS  
WARRIEWOOD**

**Job No 250602  
July 2025  
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## **INTRODUCTION**

This report has been prepared in support of the proposed Development Application for alterations and additions at No 7 Lewis Cls Warriewood in respect to potential flood inundation / impacts and Northern Beaches Councils Water Management for Development Policy Section 10.0 Flood Risk Management and Pittwater 21 DCP Section B3.11 Flood Prone Land.

The predicted flooding is associated with the surcharging of the local infrastructure in relation to the extent of the nearby Narrabeen Creek and its flooding.

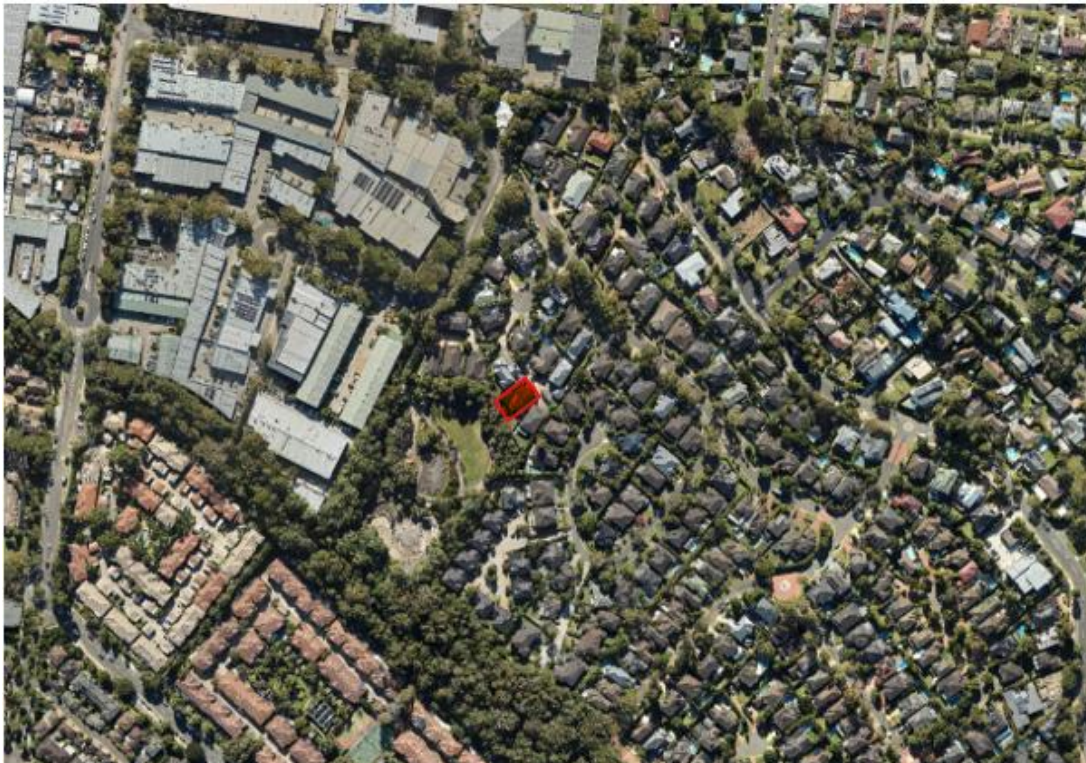
It is proposed to construct a rear and entry awnings as detailed in the architectural plans by *Action Plans*, refer Appendix A. The works within the DA are planned and to be constructed outside of the predicted flood extents and therefore Councils flood protection measures are not applicable and thus ensuring there will be no adverse impacts on local flood conveyance.

Barrenjoey Consulting Engineers p/l inspected the site on 17<sup>th</sup> June 2025.

The extent of flooding is as summarized in the “Flood Information Request” data as supplied by Northern Beaches Council, refer Appendix D.

For the 1% AEP event the site is classified -

Flood Planning Level	15.14m AHD
Flood Hazard	H1 / H2 / H3
Flood Hydraulic Category	Flood Fringe / Flood Storage
Flood Risk Precinct	Medium / Low
Land Use Group	Residential – Dwelling House



Aerial Image of No 7 Lewis Cls Warriewood  
(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	<p>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:</p> <ul style="list-style-type: none"><li>a) There are no adverse impacts on flood levels or velocities caused by alterations to the flood conveyance; and</li><li>b) There are no adverse impacts on surrounding properties; and</li><li>c) It is sited to minimise exposure to flood hazard.</li></ul> <p>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</p> <p><b>The works are planned and to be constructed outside of the predicted flood extents, thus ensuring there will be no adverse impacts on local flood conveyance.</b></p>
A2	<p>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.</p> <p>Consideration may be given for exempting the volume of standard piers from flood storage calculations.</p> <p>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.</p> <p><b>The works are planned and to be constructed outside of the predicted flood extents, thus ensuring there will be no net loss of flood storage.</b></p>

## B. BUILDING COMPONENTS AND STRUCTURAL SOUNDNESS

B1	<p>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).</p> <p><b>As the works are planned and to be constructed outside of the predicted flood extents this requirement is not applicable to the DA, although it is recommended the works adhere to this requirement and may be achieved using conventional building practices.</b></p>
B2	<p>All new development 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. Structural certification shall be provided confirming the above.</p> <p><b>As the works are planned and to be constructed outside of the predicted flood extents this requirement is not applicable to the DA, although it is recommended the works adhere to this requirement and may be achieved using conventional building practices.</b></p>
B3	<p>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 within the subject structure must have residual current devices installed that turn off all electricity supply to the property when flood waters are detected.</p> <p><b>As the works are planned and to be constructed outside of the predicted flood extents this requirement is not applicable to the DA, although it is recommended the works adhere to this requirement and may be achieved using conventional building practices.</b></p>

## C. FLOOR LEVELS

C1	<p>New floor levels within the development shall be at or above, the Flood Planning Level.</p> <p><b>The works are external to the existing dwelling and therefore there is no 'new floor levels'</b></p>
C2	<p><b>na to this development.</b></p>
C3	<p>All new development 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.</p> <p>For suspended pier/pile footings:</p> <ol style="list-style-type: none"> <li>The underfloor area of the dwelling below the 1% AEP flood level is to be designed and constructed to allow clear passage of floodwaters, taking into account the potential for small openings to block; and</li> <li>At least 50% of the perimeter of the underfloor area is of an open design from the natural ground level up to the 1% AEP flood level; and</li> <li>No solid areas of the perimeter of the underfloor area would be permitted in a floodway</li> </ol> <p><b>The works are planned and to be constructed outside of the predicted flood extents, thus ensuring there will be no adverse impacts on local flood conveyance.</b></p>

C4	<p>A one-off addition or alteration below the Flood Planning Level of less than 30 square metres (in total, including walls) may be considered only where:</p> <ul style="list-style-type: none"> <li>a) it is an extension to an existing room; and</li> <li>b) the Flood Planning Level is incompatible with the floor levels of the existing room; and</li> <li>c) out of the 30 square metres, not more than 10 square metres is below the 1% AEP flood level.</li> </ul> <p>This control will not be permitted if this provision has previously been utilised since the making of this Plan.</p> <p>The structure must be floodproofed to the Flood Planning Level, and the Flood Management Report must demonstrate that there is no net loss of flood storage in all events up to the 1% AEP event.</p> <p><b>As the works are planned and to be constructed outside of the predicted flood extents this requirement is not applicable to the DA.</b></p>
C5	<b>na to this development</b>
C6	<b>na to this development</b>
C7	<b>na to this development</b>
C8	<b>na to this development</b>

#### D. CAR PARKING

D1	<b>na to this development</b>
D2	<b>na to this development</b>
D3	<b>na to this development</b>
D4	<b>na to this development</b>
D5	<b>na to this development</b>
D6	<b>na to this development</b>
D7	<b>na to this development</b>

#### E. FLOOD EMERGENCY RESPONSE

E1	<p>If the property is affected by a Flood Life Hazard Category of H3 or higher, then Control E1 applies and a Flood Emergency Assessment must be included in the Flood Management Report.</p> <p>If the property is affected by a Flood Life Hazard Category of H6, then development is not permitted unless it can be demonstrated to the satisfaction of the consent authority that the risk level on the property is or can be reduced to a level below H6 or its equivalent.</p> <p>If the property is flood affected but the Flood Life Hazard Category has not been mapped by Council, then calculations for its determination must be shown in the Flood Management Report, in accordance with the "Technical Flood Risk Management Guideline: Flood Hazard", Australian Institute for Disaster Resilience (2012).</p> <p>Where flood-free evacuation above the Probable Maximum Flood level is not possible, new development must provide a shelter-in-place refuge where:</p> <ul style="list-style-type: none"> <li>a) The floor level is at or above the Probable Maximum Flood level; and</li> <li>b) The floor space provides at least 2m<sup>2</sup> per person where the flood duration is long (6 or more hours) in the Probable Maximum Flood event, or 1m<sup>2</sup> per person for less than 6 hours;</li> <li>c) It is intrinsically accessible to all people on the site, plainly evident, and self-directing, with sufficient capacity of access routes for all occupants without reliance on an elevator; and</li> </ul>
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	<p>d) It must contain as a minimum: sufficient clean water for all occupants; portable radio with spare batteries; torch with spare batteries; and a first aid kit.</p> <p>Class 10 classified buildings and structures (as defined in the Building Codes of Australia) are excluded from this control.</p> <p>In the case of change of use or internal alterations to an existing building, a variation to this control may be considered if justified appropriately by a suitably qualified professional.</p> <p>Note that in the event of a flood, occupants would be required to evacuate if ordered by Emergency Services personnel regardless of the availability of a shelter-in-place refuge.</p> <p><b>As the works are planned and to be constructed outside of the predicted flood extents this requirement is not applicable to the DA. Noting "low hazard" (Australian Rainfall and Runoff Revision Project 10: Appropriate Safety Criteria for People) evacuation via Lewis CIs to higher ground is available.</b></p>
E2	<b>na to this development</b>
E3	<b>na to this development</b>

#### F. FENCING

F1	<p>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.</p> <p><b>na to this development</b></p>
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#### G. STORAGE OF GOODS

G1	<p>Hazardous or potentially polluting materials shall not be stored below the Flood Planning Level unless adequately protected from floodwaters in accordance with industry standards.</p> <p><b>As the works are planned and to be constructed outside of the predicted flood extents this requirement is not applicable to the DA, although it is recommended the works adhere to this requirement and may be achieved using conventional building practices.</b></p>
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#### H. POOLS

H1	<b>na to this development</b>
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## **FLOOD EMERGENCY 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

**This assessment incorporates that the works within the DA are planned and to be constructed outside of the predicted flood extents and therefore Councils flood protection measures are not applicable, although it is recommended the works adhere to these measures, noting these measures may be achieved using conventional building practices.**

### **1 Risk to persons -**

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

### **2 Risk to structures -**

1% event – insignificant therefore low / acceptable risk assessment  
PMF event – minor damage to structures therefore low / risk assessment

### **2 Risk to vehicles -**

1% event – minor therefore moderate / acceptable risk assessment  
PMF event – major damage therefore moderate / tolerable risk assessment

### **3 Risk to services -**

1% event – insignificant therefore low / acceptable risk assessment  
PMF event – major damage therefore moderate / tolerable risk assessment



## SUMMARY

### Assessment of Impacts Compliance Table

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

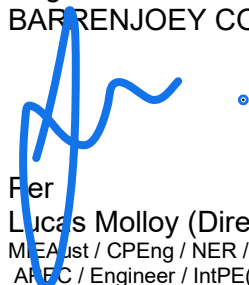
The proposed works if carried out in accordance with recommendations within this *Flood Inundation & Risk Assessment Report* by Barrenjoey Consulting dated May 2025 will satisfy the intent of Northern Beaches Councils Water Management for Development Policy Section 10.0 Flood Risk Management and the Pittwater 21 DCP Section B3.11 Flood Prone Land. Noting the following measures are to be implemented into the works –

- **The works within the DA are planned and to be constructed outside of the predicted flood extents and therefore Councils flood protection measures are not applicable, although it is recommended the works adhere to these measures, noting these measures may be achieved using conventional building practices.**
- **All occupants are to be informed of the sites flooding potential / impact and available warning services (ie : Councils *Floodwatch*, SES services etc), safe evacuation route/s and requirements for goods / valuables storage etc.**
- **All of the developments relevant design and construction group are to ensure adherence to - *Reducing Vulnerability of Buildings to Flood Damage: Guidance on Building in Flood Prone Areas, Hawkesbury-Nepean Floodplain Management Steering Committee (2006)*.**

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

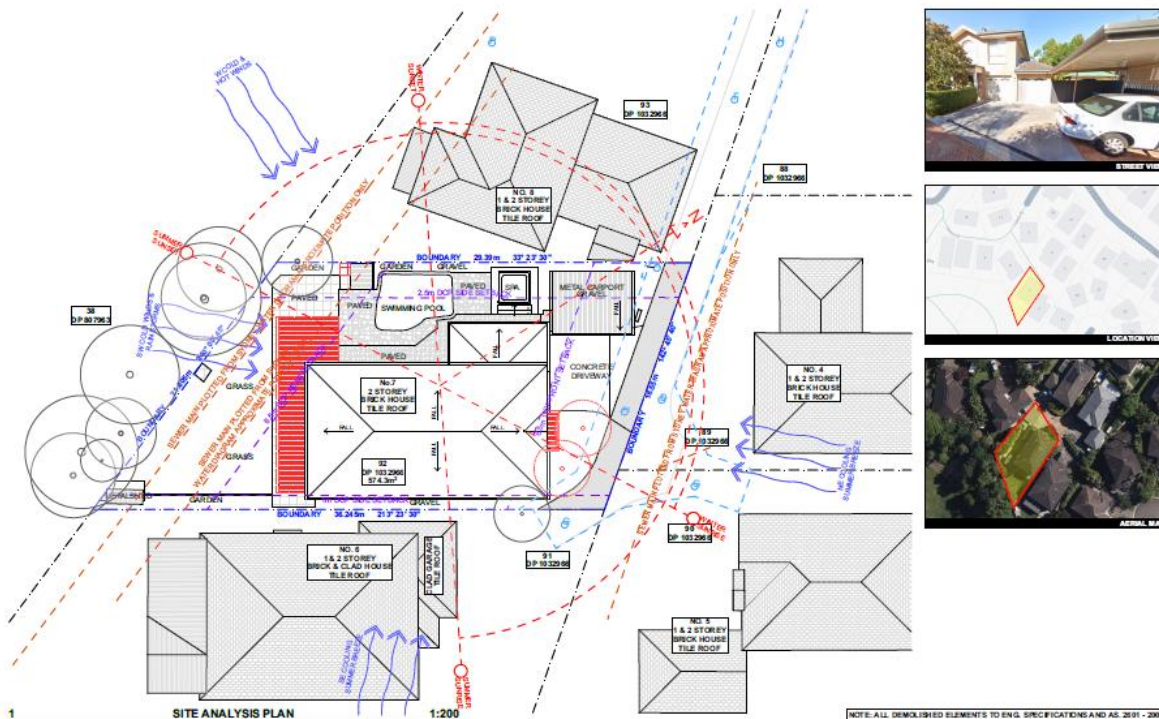
BARRENJOEY CONSULTING ENGINEERS Pty Ltd



Per  
Lucas Molloy (Director)  
M EAust / CPEng / NER /  
APFC / Engineer / IntPE(Aus)

**Appendix A**  
**Architectural Plans**  
***Action Plans***



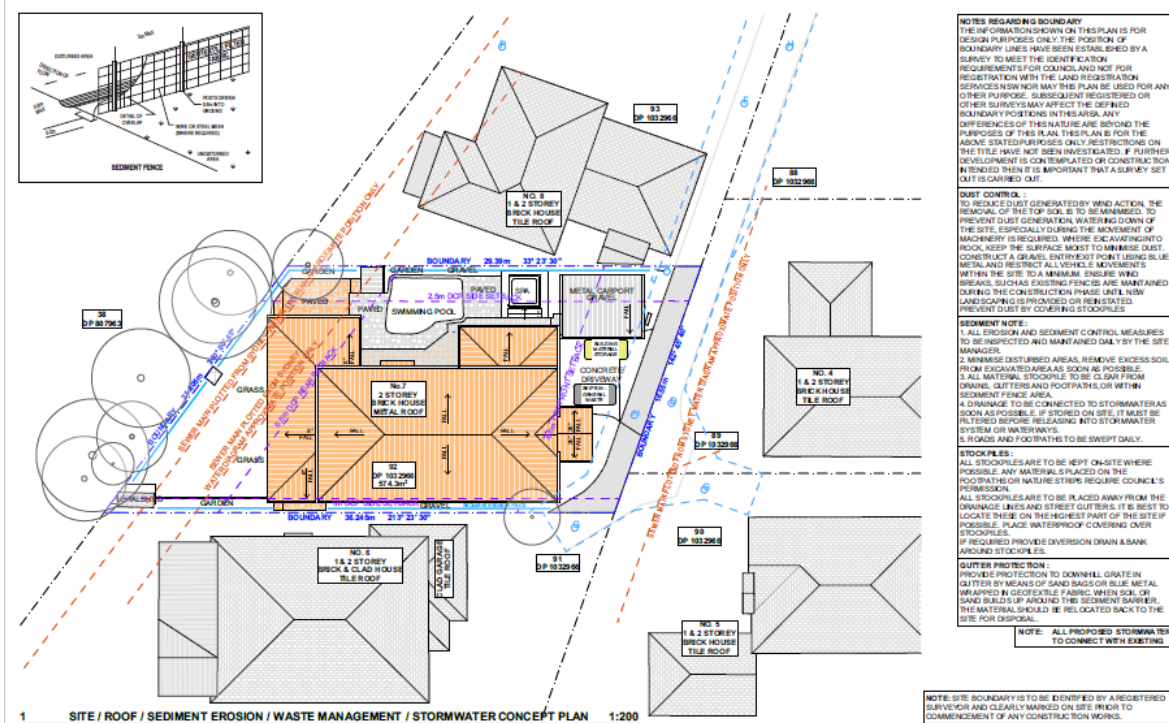


REV.	DATE	COMMENTS	DRAWN
1	04/05/2018	Initial design	DA03
2	04/05/2018	Revised design	DA03
3	04/05/2018	Final design	DA03

CLIENT	Barrenjoey & Co Pty Ltd
PROJECT ADDRESS	1/100-1/110, 1/111-1/112, 1/113-1/114, 1/115-1/116, 1/117-1/118, 1/119-1/120, 1/121-1/122, 1/123-1/124, 1/125-1/126, 1/127-1/128, 1/129-1/130, 1/131-1/132, 1/133-1/134, 1/135-1/136, 1/137-1/138, 1/139-1/140, 1/141-1/142, 1/143-1/144, 1/145-1/146, 1/147-1/148, 1/149-1/150, 1/151-1/152, 1/153-1/154, 1/155-1/156, 1/157-1/158, 1/159-1/160, 1/161-1/162, 1/163-1/164, 1/165-1/166, 1/167-1/168, 1/169-1/170, 1/171-1/172, 1/173-1/174, 1/175-1/176, 1/177-1/178, 1/179-1/180, 1/181-1/182, 1/183-1/184, 1/185-1/186, 1/187-1/188, 1/189-1/190, 1/191-1/192, 1/193-1/194, 1/195-1/196, 1/197-1/198, 1/199-1/200, 1/201-1/202, 1/203-1/204, 1/205-1/206, 1/207-1/208, 1/209-1/210, 1/211-1/212, 1/213-1/214, 1/215-1/216, 1/217-1/218, 1/219-1/220, 1/221-1/222, 1/223-1/224, 1/225-1/226, 1/227-1/228, 1/229-1/230, 1/231-1/232, 1/233-1/234, 1/235-1/236, 1/237-1/238, 1/239-1/240, 1/241-1/242, 1/243-1/244, 1/245-1/246, 1/247-1/248, 1/249-1/250, 1/251-1/252, 1/253-1/254, 1/255-1/256, 1/257-1/258, 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#### ACTION PLANS

REV. DATE COMMENTS DRAWN BY  
1. 04/05/2025 1. 04/05/2025 1. 04/05/2025 1. 04/05/2025

REV.	DATE	COMMENTS	DRAWN BY
1.	04/05/2025	1. 04/05/2025	1. 04/05/2025
2.			
3.			
4.			
5.			

**LEGEND**  
EXISTING  
DEMOLISHED  
PROPOSED

**CLIENT**  
Catherine & Ed Bates

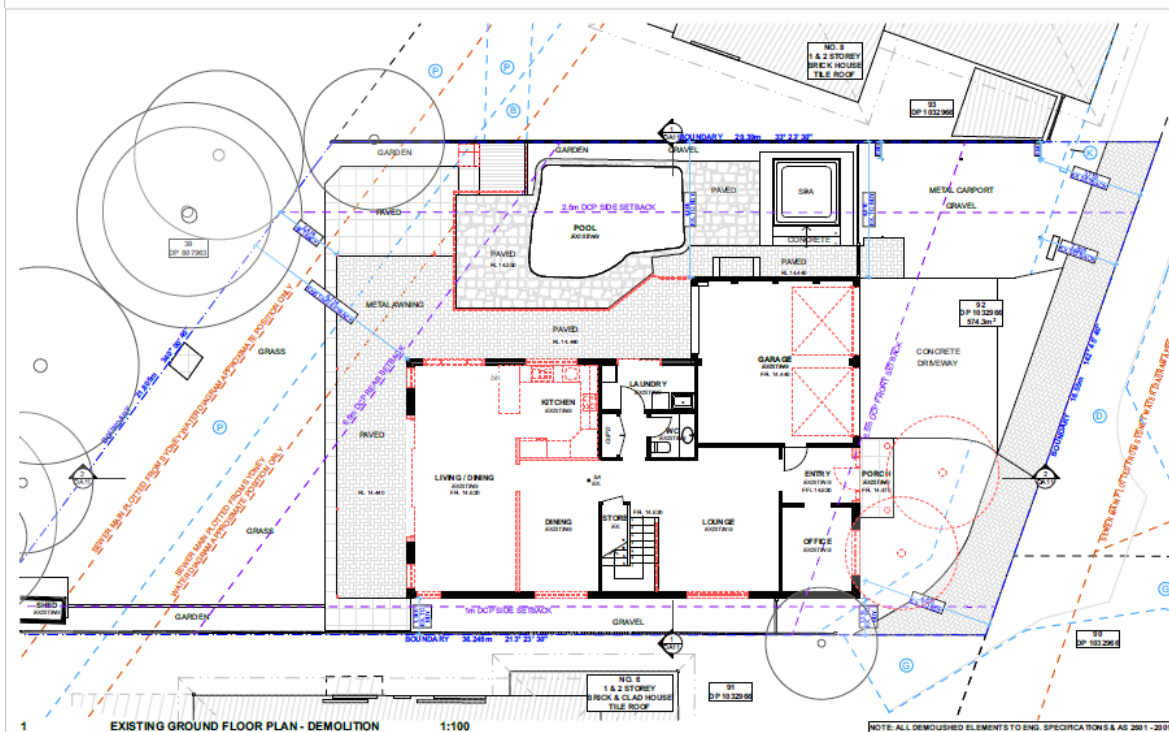
**PROJECT ADDRESS**  
7 Levee Close  
Warrambool, NSW, 2102

**DRAWING NO.**  
DA04

**DATE**  
Tuesday, 29 April 2025

**DRAWING NAME**  
SITE / ROOF / SEDIMENT  
EROSION / WASTE  
MANAGEMENT / STORMWATER  
CONCEPT PLAN

**SCALE**  
1:200 @A3



#### ACTION PLANS

REV. DATE COMMENTS DRAWN BY  
1. 04/05/2025 1. 04/05/2025 1. 04/05/2025 1. 04/05/2025

REV.	DATE	COMMENTS	DRAWN BY
1.	04/05/2025	1. 04/05/2025	1. 04/05/2025
2.			
3.			
4.			
5.			

**LEGEND**  
EXISTING  
DEMOLISHED  
PROPOSED

**CLIENT**  
Catherine & Ed Bates

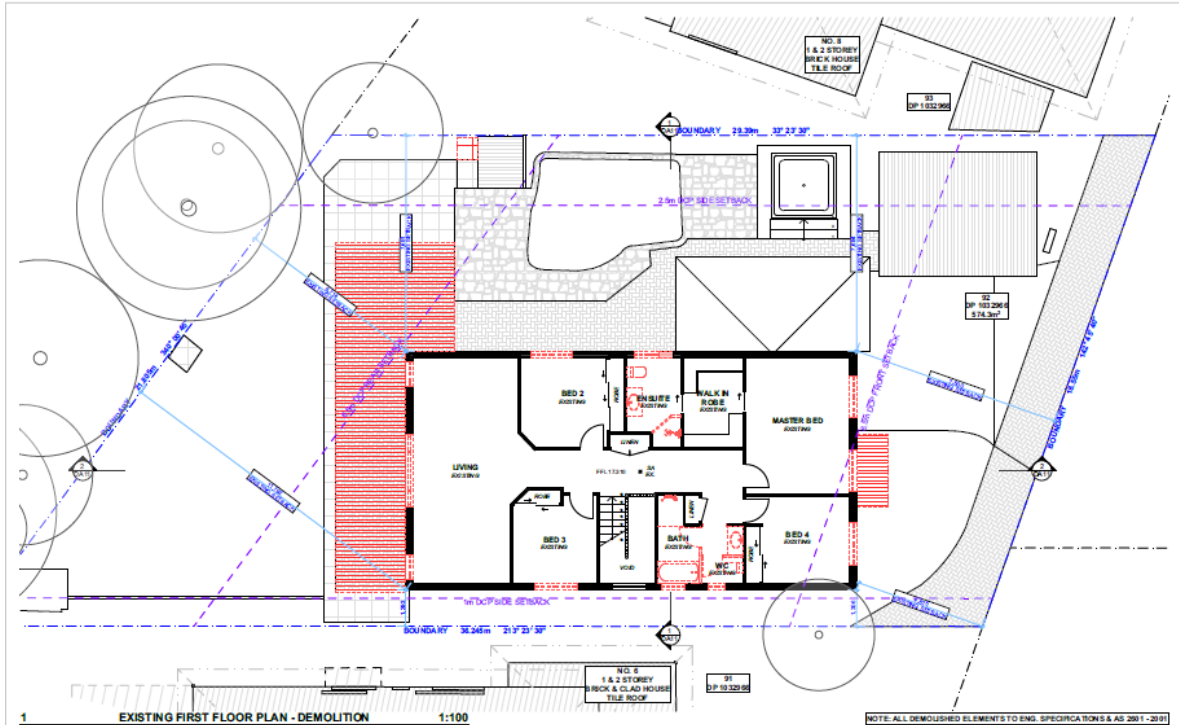
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7 Levee Close  
Warrambool, NSW, 2102

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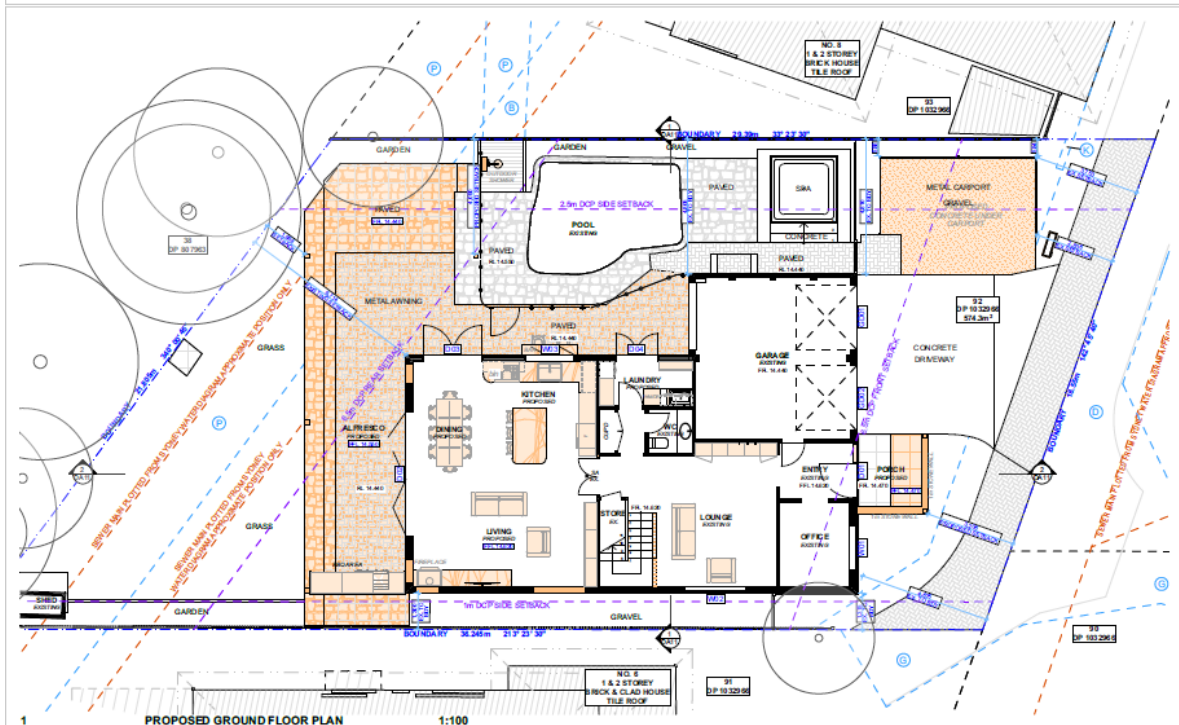
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Tuesday, 29 April 2025

**DRAWING NAME**  
EXISTING GROUND FLOOR  
PLAN

**SCALE**  
1:100 @A3

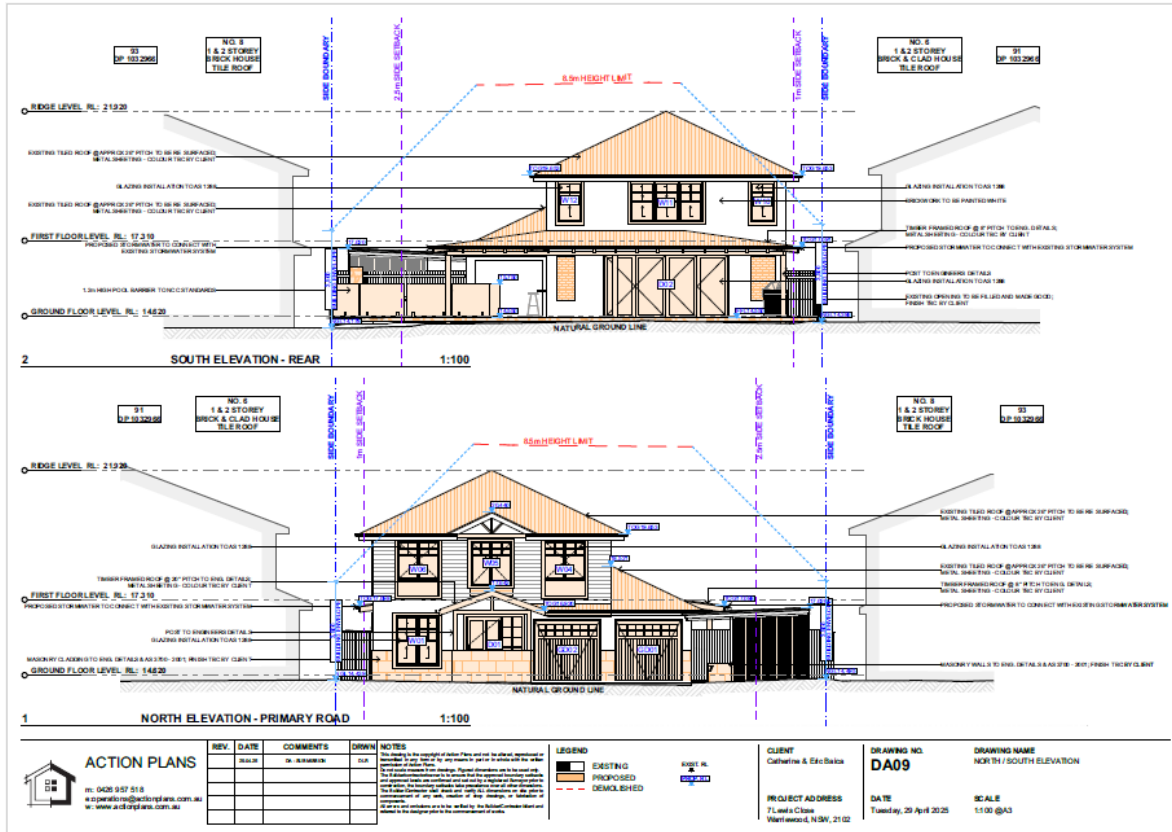
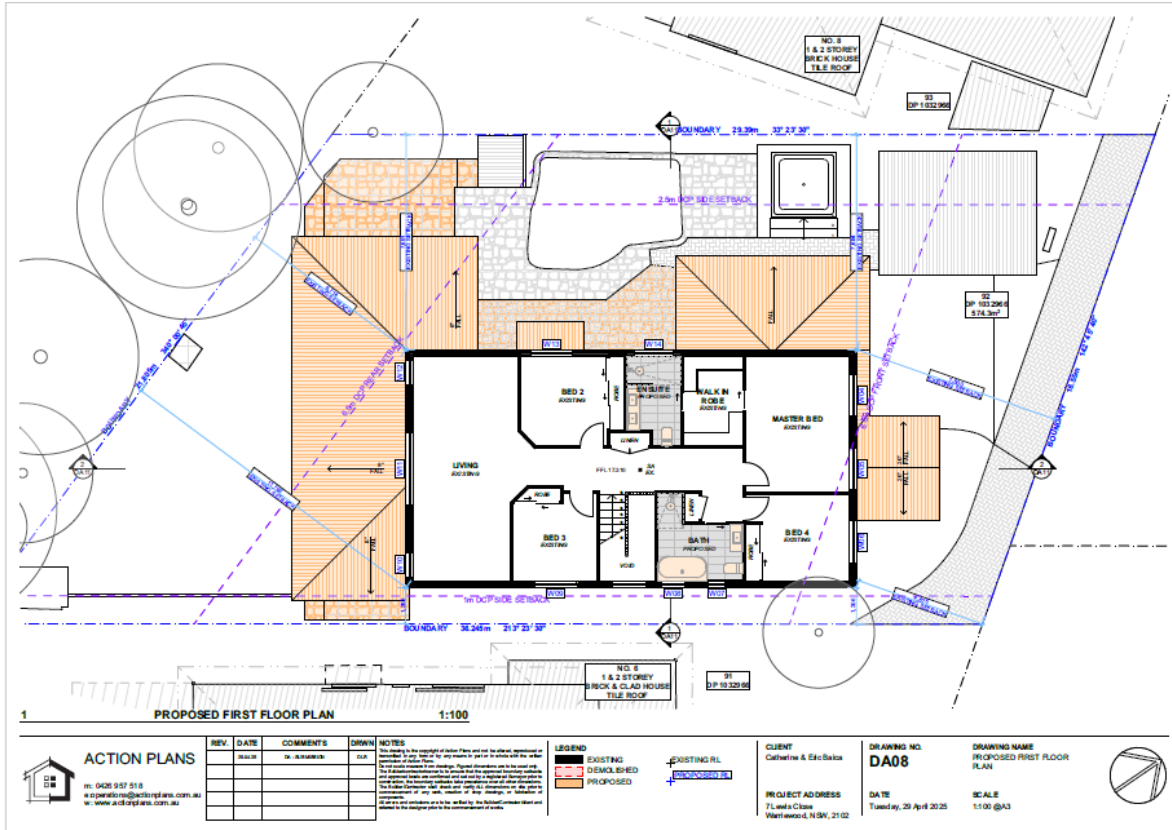


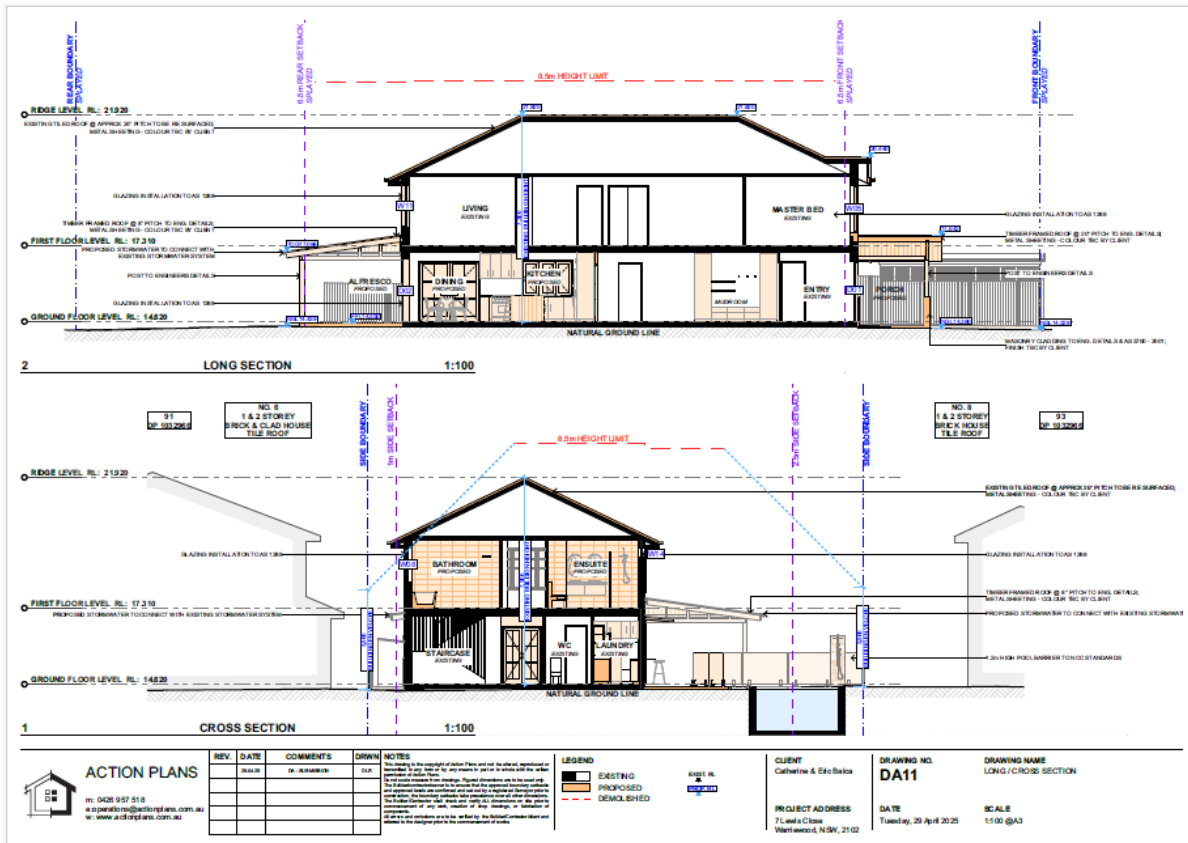
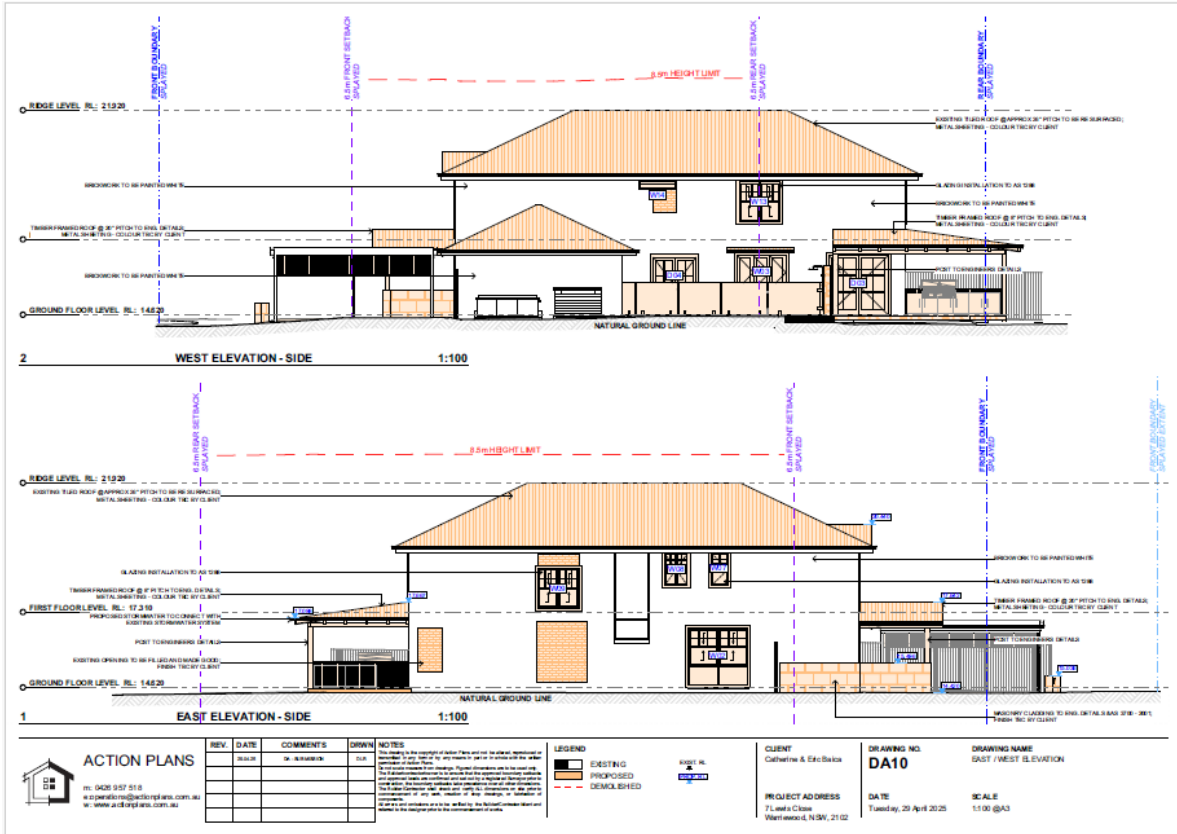
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REV.	DATE	COMMENTS	BY	CHKD	EXISTING	DEMOLISHED	Catharine & Etc Baka	PROJECT ADDRESS	DA06	DATE	SCALE	
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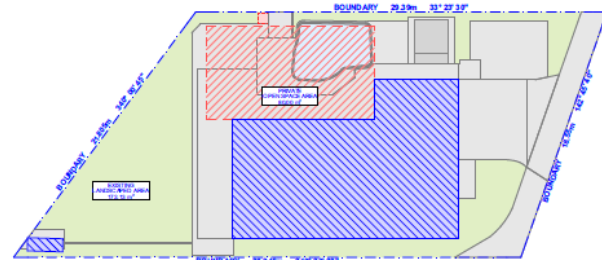
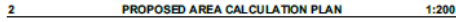


ACTION PLANS					LEGEND		CLIENT		DRAWING NO.		DRAWING NAME	
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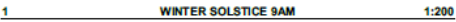


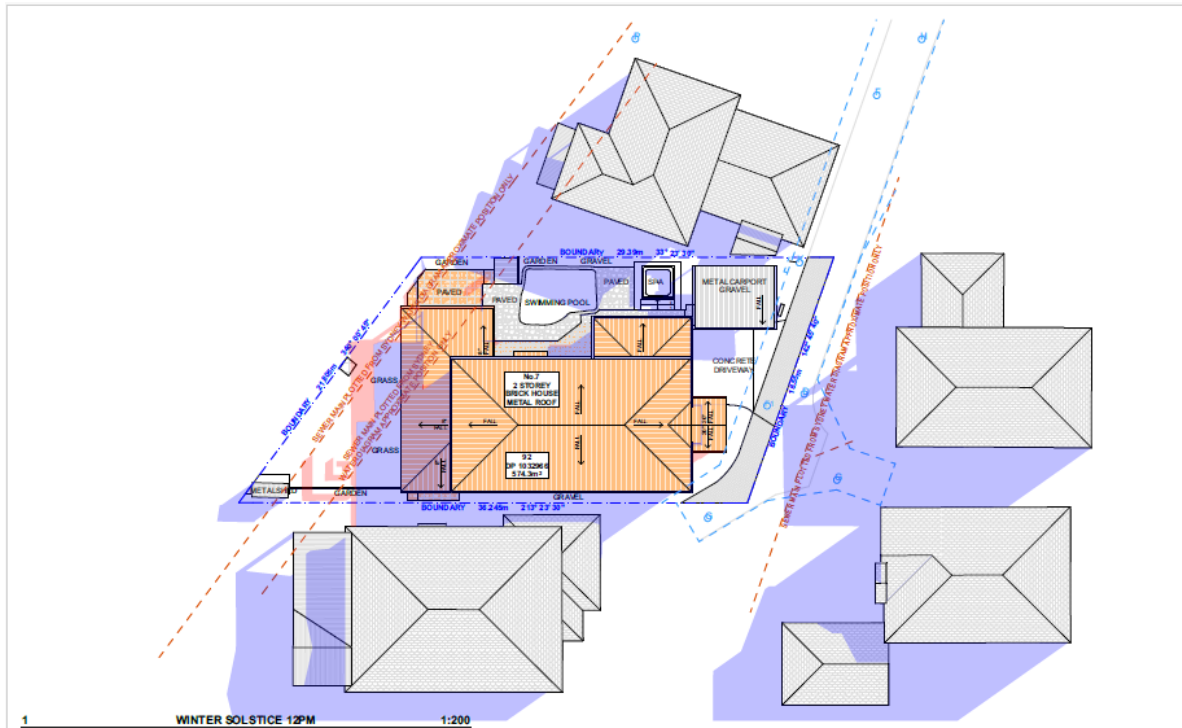




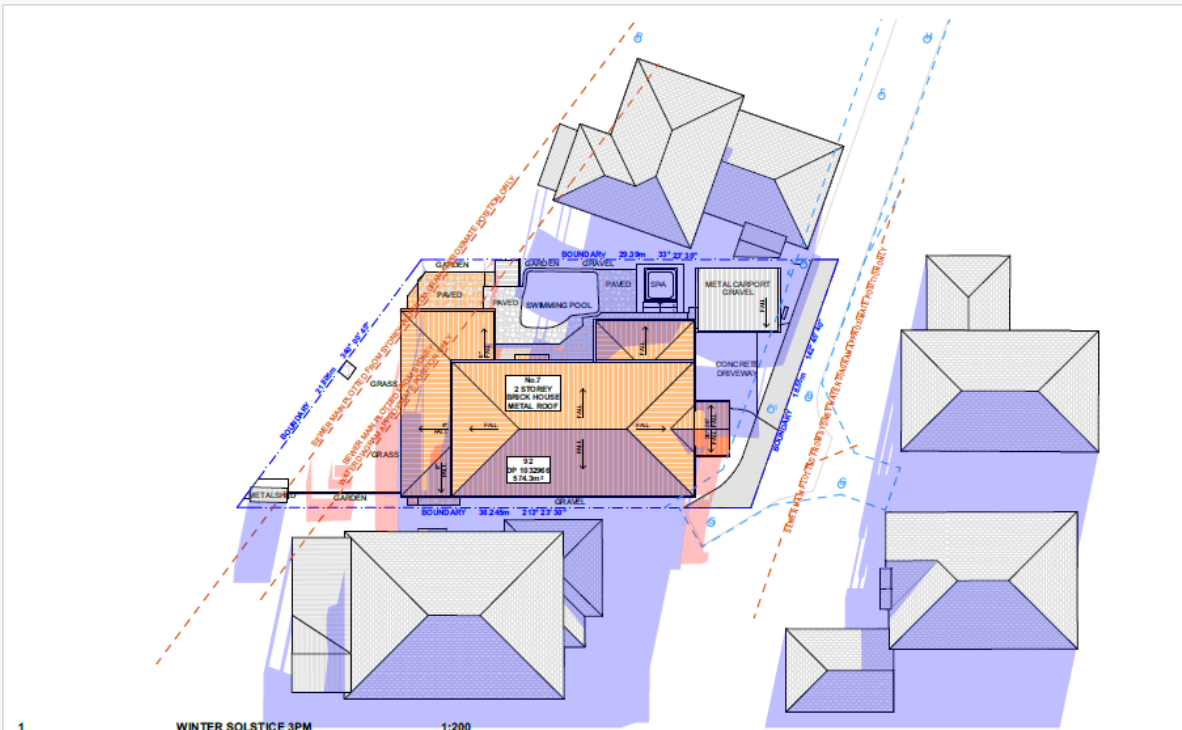
1      EXISTING AREA CALCULATION PLAN      1:200

 <b>ACTION PLANS</b> inc. (INC) GST 519 a corporation of British Columbia, inc. www.actionplans.com.au	<b>REV.</b> 0001 24-06-2024	<b>DATE</b> 24-06-2024	<b>COMMENTS</b> 1.	<b>DRWN</b> CLM	<b>NOTES</b> 1. This is a conceptual design. It is not a final design and should not be used for construction. It is a conceptual design and should not be used for construction. It is a conceptual design and should not be used for construction.	<b>LEGEND</b>	<b>CLIENT</b> Catharine & Eric Davis	<b>DRAWING NO.</b> <b>DA12</b>	<b>DRAWING NAME</b> AREA CALCULATIONS	
	<b>PROJECT ADDRESS</b> 71 Leach's Close Warriewood, NSW, 2112	<b>DATE</b> Tuesday, 29 April 2025	<b>SCALE</b> 1:200 @A3							

[illegible]



	<b>ACTION PLANS</b>  no. 0426 957 518 a@barrenjoey.com.au www.actionplans.com.au	REV.	DATE	COMMENTS	DRAWN	NOTES	<b>LEGEND</b> <div><div></div>EXISTING SHADOWS</div> <div><div></div>PROPOSED SHADOWS</div>	<b>CLIENT</b> Catherine & Eric Baker	<b>DRAWING NO.</b> <b>DA14</b>	<b>PROJECT ADDRESS</b> 71 Levea Close Warriewood NSW 2102	<b>DRAWING NAME</b> WINTER SOLSTICE 12 PM	



	<b>ACTION PLANS</b>  no. 0426 957 518 a@barrenjoey.com.au www.a@barrenjoey.com.au	<table><tr><th>REV.</th><th>DATE</th><th>COMMENTS</th><th>DRAWN</th></tr><tr><td>001.00</td><td>20. APRIL 2025</td><td>FOR APPROVAL</td><td>DLR</td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr></table>	REV.	DATE	COMMENTS	DRAWN	001.00	20. APRIL 2025	FOR APPROVAL	DLR													<b>NOTES</b> This drawing is for the purpose of shadow studies and is not to be used for any other purpose. It is based on the information provided by the client and is subject to change without notice. The drawing is not to be used for any other purpose without the written consent of Barrenjoey Consulting Engineers Pty Ltd.	<b>LEGEND</b> <div><div></div> EXISTING SHADOWS</div> <div><div></div> PROPOSED SHADOWS</div>	<b>CLIENT</b> Catherine & Eric Baker  <b>PROJECT ADDRESS</b> 71 Levea Close	<b>DRAWING NO.</b> <b>DA15</b>  <b>DATE</b> Tuesday, 20 April 2025	<b>DRAWING NAME</b> WINTER SOLSTICE 3 PM  <b>SCALE</b> 1:200 @A3	
		REV.	DATE	COMMENTS	DRAWN																							
001.00	20. APRIL 2025	FOR APPROVAL	DLR																									





1. WINDOWS TO HAVE HATCH PATTERN  
DETAILING - COLOUR TO BE CONFIRMED BY  
CLIENT



2. COLOURBOND METAL ROOF SHEETING -  
COLOUR TO BE CONFIRMED BY CLIENT



3. EXTERNAL STONEMASONRY CLADDING -  
STONE TO BE CONFIRMED BY CLIENT



4. EXTERNAL WEATHERBOARD CLADDING -  
COLOUR TO BE CONFIRMED BY CLIENT

REV.	DATE	COMMENTS	DRAWN	NOTES	LEGEND	CLIENT	DRAWING NO.	DRAWING NAME
01	20/04/2025	As Issued	DR. BARRENGOY	NOTES		Catherine & Eric Davis	DA16	SAMPLE BOARD
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## BASIX™ Certificate

Building Sustainability Index  
www.planningportal.nsw.gov.au/development-and-assessment/basix

### Alterations and Additions

Certificate number: A170647

This certificate confirms that the proposed development will meet the NSW government's requirements for sustainability. It is a full certificate in accordance with the provisions set out below. Terms used in this certificate are in the following definitions, have the meaning given by the document entitled "BASIX Certificate" dated 10/05/2023 published by the Department of Planning and Infrastructure. This document is available at: www.planningportal.nsw.gov.au/basix

Secondary Date of Issue: Tuesday, 08 April 2025  
To be valid, this certificate must be signed within 3 months of the date of issue.



Features and systems	Score on DA Plans	Score on CCDC/DA Plans & space	Certifier Check
<b>Lighting</b> The applicant must ensure a minimum of 40% of new or altered light fixtures are fitted with fluorescent, compact fluorescent, or light emitting diode (LED) lamps.	✓	✓	✓
<b>Features</b> The applicant must ensure new or altered external walls have a low rate to greater than 0.05 per m² or a low water rating.	✓	✓	✓
The applicant must ensure new or altered roofs have a low rate to greater than 0.05 per m² or a low water rating.	✓	✓	✓
The applicant must ensure new or altered walls have a low rate to greater than 0.05 per m² or a low water rating.	✓	✓	✓

Construction requirements	Score on DA Plans	Score on CCDC/DA Plans & space	Certifier Check
<b>Insulation requirements</b> The applicant must ensure the new or altered construction (walls, roofs, and ceilings) is in accordance with the specifications listed in the table below. Insulation is not required where the area of new construction is less than 10m².	✓	✓	✓
<b>Construction</b> Additional insulation required (R-value) Other specifications	✓	✓	✓
External wall thermal performance (R-value)	✓	✓	✓
External wall thermal performance (R-value)	✓	✓	✓

Cladding requirements	Score on DA Plans	Score on CCDC/DA Plans & space	Certifier Check
<b>Windows and glazed doors</b> The applicant must ensure the windows, glazed doors and sliding doors, in accordance with the specifications listed in the table below. Windows and glazed doors must be installed in accordance with the specifications listed in the table below. The following requirements must also be satisfied in relation to each window and glazed door: Each window or glazed door with double glazing or triple glazing and single pane or double pane may either match the specification or have a minimum U-value (U-value) of 0.15 or greater than the value in the table below. Triple glazing windows and double glazing doors must be installed in accordance with the specifications listed in the table below. The specification is provided for information only. Alternative options with varying U-values and R-values may be installed. For glazing installed in relation to the leading edge of each window, single pane, double pane or triple pane must not be more than 30mm above the level of the window or glazed door. For glazing installed in relation to the leading edge of each window, single pane, double pane or triple pane must not be more than 30mm above the level of the window or glazed door. For glazing installed in relation to the leading edge of each window, single pane, double pane or triple pane must not be more than 30mm above the level of the window or glazed door. The spacing between glazing must not be more than 30mm.	✓	✓	✓

Cladding requirements	Score on DA Plans	Score on CCDC/DA Plans & space	Certifier Check
<b>Windows and glazed doors glazing requirements</b>			
<b>Insulation</b> The applicant must ensure a minimum of 40% of new or altered light fixtures are fitted with fluorescent, compact fluorescent, or light emitting diode (LED) lamps.	✓	✓	✓
<b>Features</b> The applicant must ensure new or altered external walls have a low rate to greater than 0.05 per m² or a low water rating.	✓	✓	✓
The applicant must ensure new or altered roofs have a low rate to greater than 0.05 per m² or a low water rating.	✓	✓	✓
The applicant must ensure new or altered walls have a low rate to greater than 0.05 per m² or a low water rating.	✓	✓	✓
<b>Construction</b> Additional insulation required (R-value) Other specifications	✓	✓	✓
External wall thermal performance (R-value)	✓	✓	✓
External wall thermal performance (R-value)	✓	✓	✓

Cladding requirements	Score on DA Plans	Score on CCDC/DA Plans & space	Certifier Check
<b>Windows and glazed doors</b> The applicant must ensure the windows, glazed doors and sliding doors, in accordance with the specifications listed in the table below. Windows and glazed doors must be installed in accordance with the specifications listed in the table below. The following requirements must also be satisfied in relation to each window and glazed door: Each window or glazed door with double glazing or triple glazing and single pane or double pane may either match the specification or have a minimum U-value (U-value) of 0.15 or greater than the value in the table below. Triple glazing windows and double glazing doors must be installed in accordance with the specifications listed in the table below. The specification is provided for information only. Alternative options with varying U-values and R-values may be installed. For glazing installed in relation to the leading edge of each window, single pane, double pane or triple pane must not be more than 30mm above the level of the window or glazed door. For glazing installed in relation to the leading edge of each window, single pane, double pane or triple pane must not be more than 30mm above the level of the window or glazed door. For glazing installed in relation to the leading edge of each window, single pane, double pane or triple pane must not be more than 30mm above the level of the window or glazed door. The spacing between glazing must not be more than 30mm.	✓	✓	✓

REV.	DATE	COMMENTS	DRAWN	NOTES	CLIENT	DRAWING NO.	DRAWING NAME
01	20/04/2025	As Issued	DR. BARRENGOY	NOTES	Catherine & Eric Davis	DA17	BASIX COMMENTS
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Building Sustainability Index  
www.planningportal.nsw.gov.au/index

### Alterations and Additions

Certificate number: A1790647

This certificate confirms that the  
government's requirements for

**Secretary**  
Date of issue: Tuesday, 08 April 2025  
To be valid, this certificate must be lodged within 3 months of the date of issue.


To be valid, this certificate must be lodged within 3 months of the date of issue.



<b>Project address</b>	
Project name	DA_7 - Lifford CL, 14400010000-2702
Street address	7 Lifford - 14400010000-2702
Local Government Area	Northam Seachoice Council
Plan type and number	Discretionary Plan DP1020066
Lot number	42
Section number	-
<b>Project type</b>	
Dwelling type	Dwelling House (detached)
Type of extension and address	The undisturbed development site for 100 year residential with a 200,000 or more, and does not include a pool (SPA)
NRA	NRA
<b>Certificate Prepared by</b> (please complete before submitting to Council or PCG)	
Name / Company Name	ACTION REALITY PTY LTD
ARN (if applicable)	50000046711

Shooting requirements					Score on SA Pass	Score on OS/MSD Phase 8 open	Cumulative Count
W01T	SW	3.50	0	0	score worst/only penalty/misses =0/0/0	dis-0/0/0 maximum single miss, 0/1 =0/0/0 SA/CAC: 0/1/0	
W02T	SW	1.50	0	0	score worst/only penalty/misses =0/0/0	dis-0/0/0 maximum single miss, 0/1 =0/0/0 SA/CAC: 0/1/0	
W03T	NN	2.20	0	0	score worst/only penalty/misses =0/0/0	dis-0/0/0 maximum single penalty knee 0/1 =0/0/0 SA/CAC: 0/0/0	
W04T	NN	0.40	0	0	score worst/only penalty/misses =0/0/0	dis-0/0/0 maximum single miss, 0/1 =0/0/0 SA/CAC: 0/1/0	
D01T	NN	4.21	0	0	score worst/only penalty/misses =0/0/0	dis-0/0/0 maximum single miss, 0/1 =0/0/0 SA/CAC: 0/1/0	
D02T	SW	10.50	0	0	score worst/only penalty/misses =0/0/0	dis-0/0/0 maximum single miss, 0/1 =0/0/0 SA/CAC: 0/1/0	
D03T	NN	4.60	0	0	score worst/only penalty/misses =0/0/0	dis-0/0/0 maximum single miss, 0/1 =0/0/0 SA/CAC: 0/1/0	
D04T	NN	3.27	0	0	score worst/only penalty/misses =0/0/0	dis-0/0/0 maximum single penalty knee 0/1 =0/0/0 SA/CAC: 0/0/0	

Is There a Gap?

Commitments identified with a  in the "Show on CO2DC plans & spend" column contribute towards the carbon and/or climate goals. For a more detailed explanation, see the glossary.

Comments and feedback are welcome. If you have a comment, please contact the author at [author@openstax.org](mailto:author@openstax.org). All comments are subject to review and may be edited for clarity and brevity.

REV.	DATE	COMMENTS	DRWN	NOTES
				THE DRAWING IS THE PROPERTY OF ADDISON-PHILLIPS AND IS NOT TO BE REPRODUCED OR COPIED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF ADDISON-PHILLIPS.

[illegible]

— 0428 087 81 8

REV.	DATE	COMMENTS	DRAWN
	20.04.20	OK - INSTRUCTIONS	CLW

[illegible]

1

• *Wormholes*, by David, 21 C.

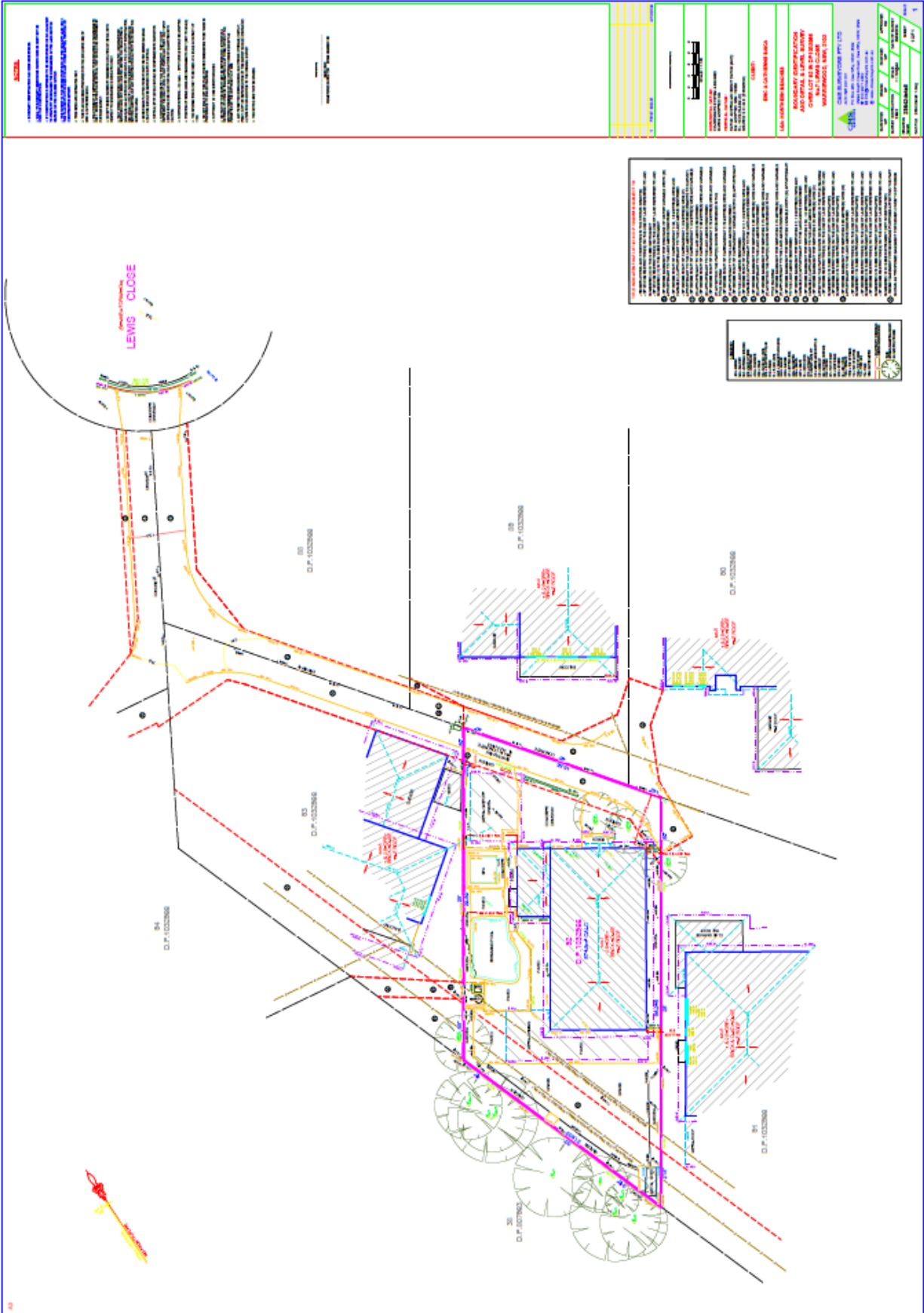
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## **Appendix B**

**Site Survey**  
**CMS Surveyors**



## **Appendix C**

### **Flood Information Request – Comprehensive Northern Beaches Council**



## COMPREHENSIVE FLOOD INFORMATION REPORT

**Property:** 7 Lewis Close WARRIEWOOD NSW 2102

**Lot DP:** Lot 92 DP 1032966

**Issue Date:** 04/07/2025

**Flood Study Reference:** Ingleside, Elanora and Warriewood Overland Flow Flood Study 2019, WMAwater

### Flood Information<sup>1</sup>:

#### **Map A - Flood Risk Precincts**

Maximum Flood Planning Level (FPL)<sup>2,3,4</sup>: 15.14 m AHD

#### **Map B - 1% AEP Flood & Key Points**

1% AEP Maximum Water Level<sup>2,3</sup>: 14.64 m AHD

1% AEP Maximum Depth from natural ground level<sup>3</sup>: 0.40 m

1% AEP Maximum Velocity: 0.12 m/s

#### **Map C - 1% AEP Hydraulic Categorisation**

1% AEP Hydraulic Categorisation: Flood storage / Flood fringe

#### **Map D - Probable Maximum Flood**

PMF Maximum Water Level (PMF)<sup>4</sup>: 15.02 m AHD

PMF Maximum Depth from natural ground level: 0.78 m

PMF Maximum Velocity: 1.72 m/s

#### **Map E - Flooding with Climate Change**

1% AEP Maximum Water Level with Climate change<sup>3</sup>: 14.71 m AHD

1% AEP Maximum Depth with Climate Change<sup>3</sup>: 0.47 m

#### **Map F - Flood Life Hazard Category in PMF**

H3 – H1

#### **Map G - Indicative Ground Surface Spot Heights**

- (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.

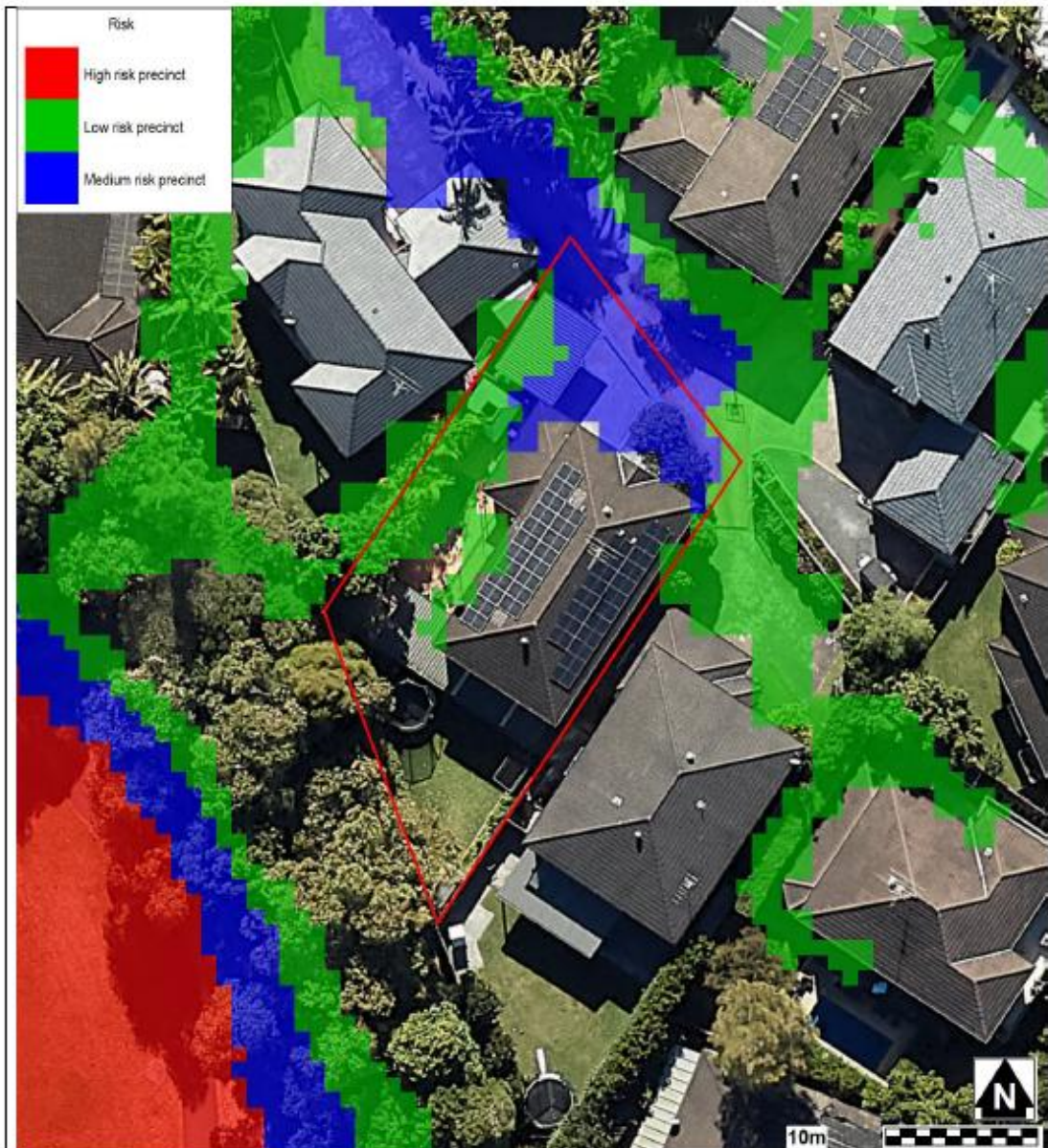
### **Property**

- Please note that if a development on the property is proposed completely outside of the Flood Planning Area (Medium Flood Risk Precinct), a formal Flood Management Report would not need to be submitted to council with a Development Application for Residential Development.





## MAP A: FLOOD RISK PRECINCTS

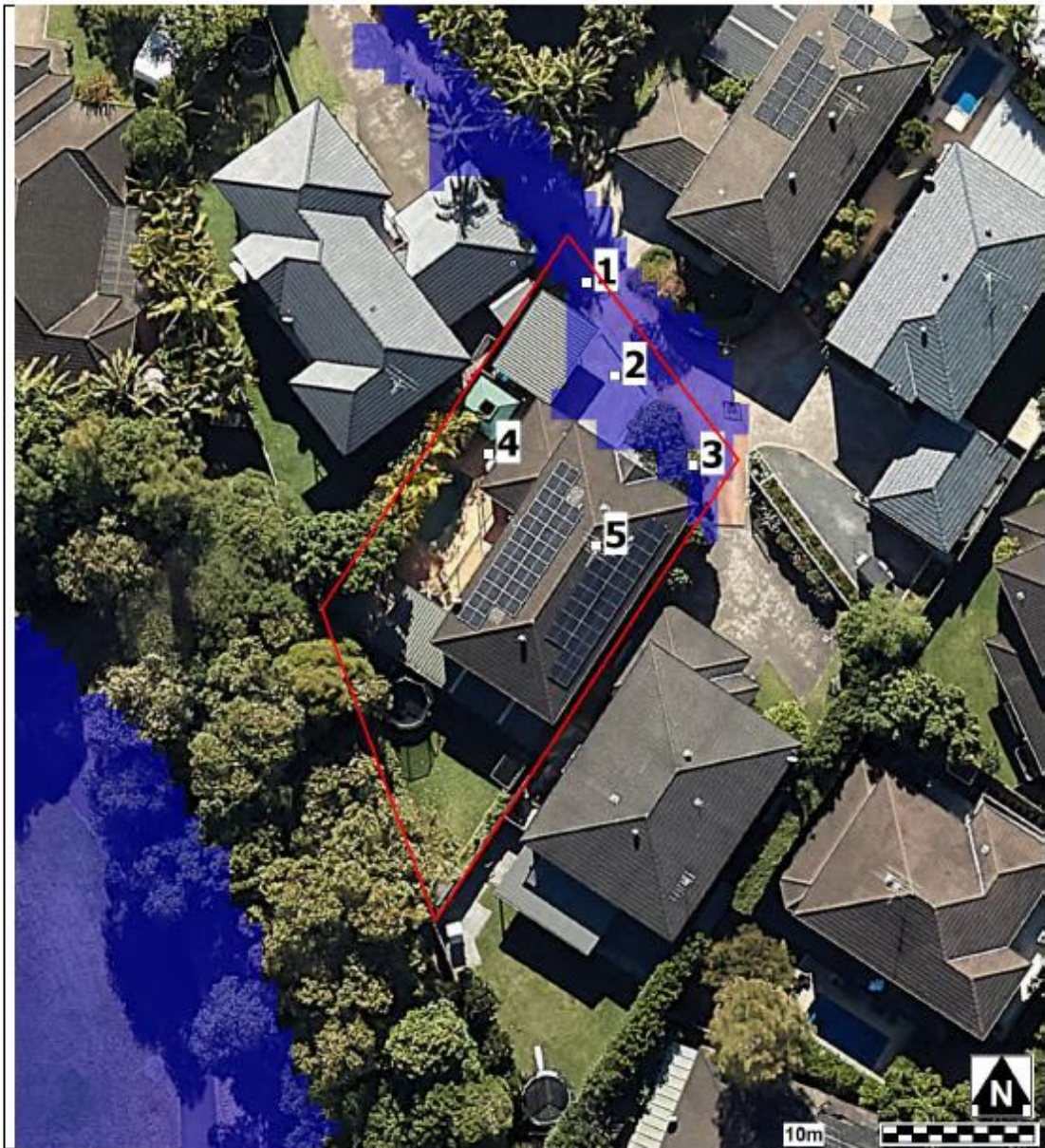


**Notes:**

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



## MAP B: FLOODING - 1% AEP EXTENT & KEY POINTS



### 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, WMAwater) and aerial photography (Source Near Map 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	14.59	0.28	14.64	0.34	0.11	15.14	15.02	0.71	0.60
2	14.59	0.24	14.64	0.30	0.04	15.14	15.02	0.67	0.35
3	N/A	N/A	14.64	0.16	0.02	15.14	15.02	0.53	0.29
4	N/A	N/A	N/A	N/A	N/A	N/A	14.88	0.30	1.46
5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

#### 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	14.71	0.41
2	14.71	0.37
3	14.71	0.23
4	N/A	N/A
5	N/A	N/A

WL – Water Level

PMF – Probable Maximum Flood

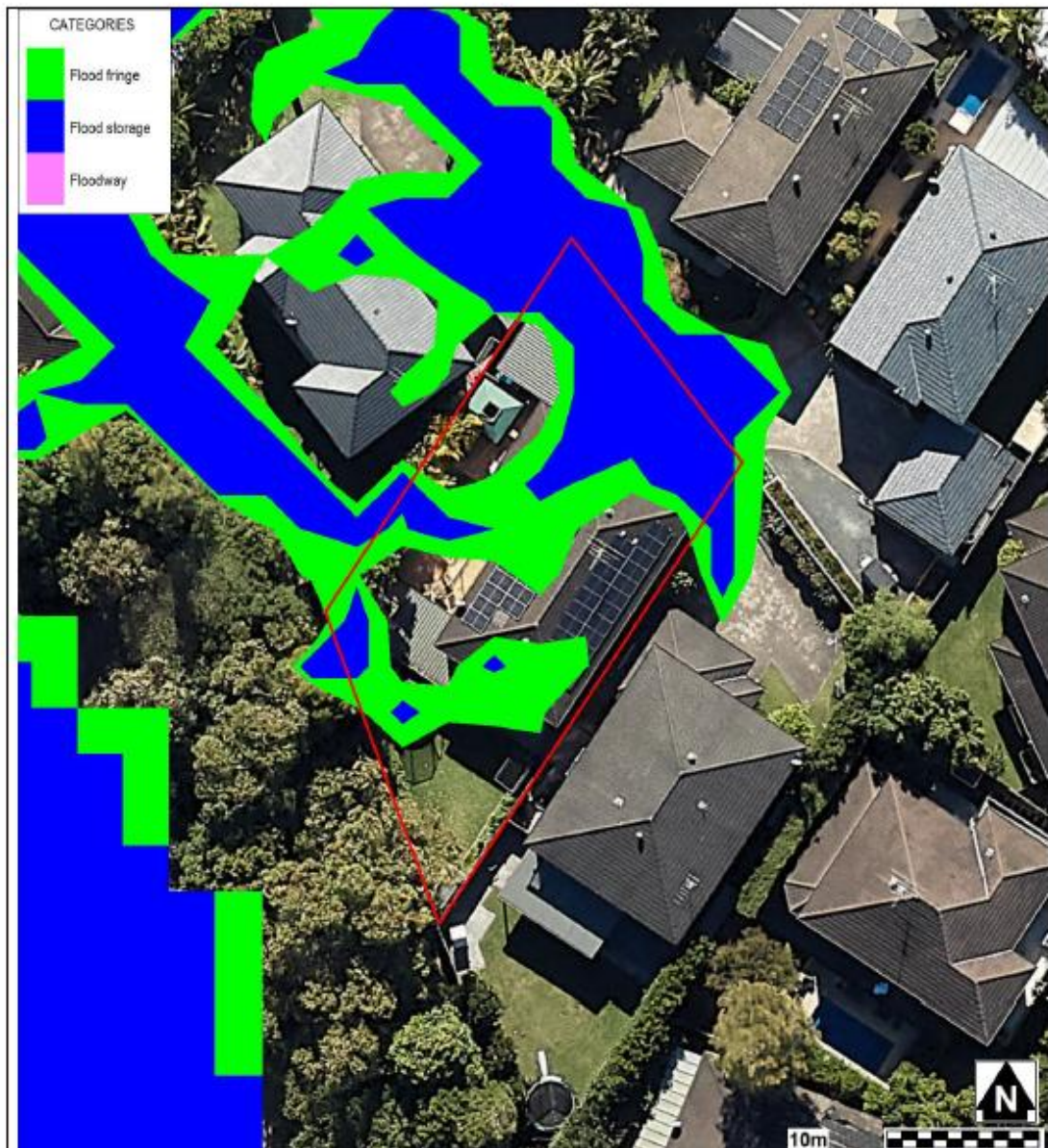
N/A - No Peak Water Level/Depth/Velocity Available.

#### Notes:

- The flood planning levels above are calculated by adding a 0.5m freeboard to the 1% AEP water level. However, if the depth of flow is less than 0.3m and a Velocity X Depth product is less than 0.3m<sup>2</sup>/s, a freeboard of 0.3m may be able to be justified for development.



## MAP C: 1% AEP FLOOD HYDRAULIC CATEGORY EXTENT MAP

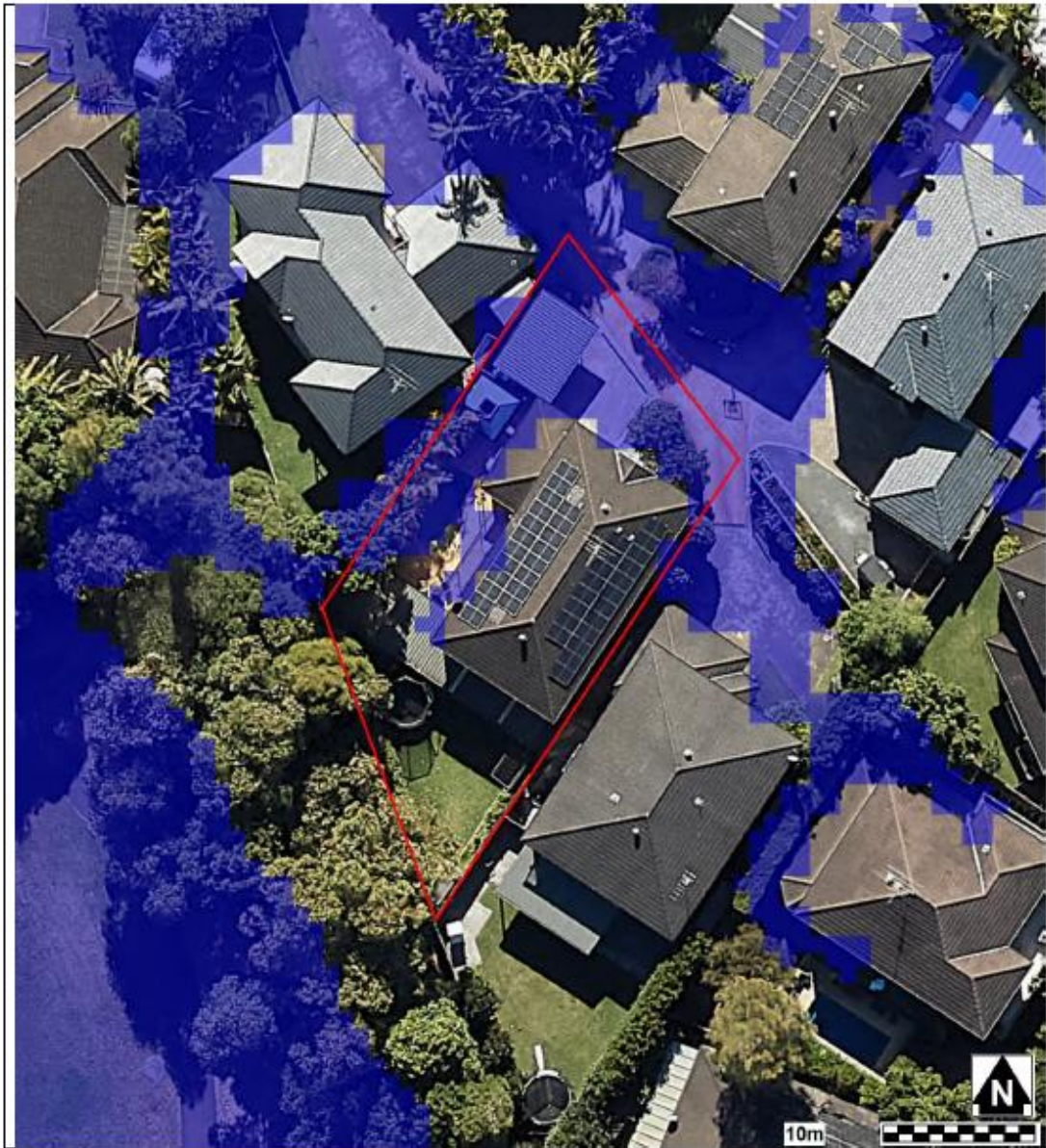


**Notes:**

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



## MAP D: PMF EXTENT MAP



**Notes:**

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



## MAP E: FLOODING – 1% AEP EXTENT PLUS CLIMATE CHANGE



### Notes:

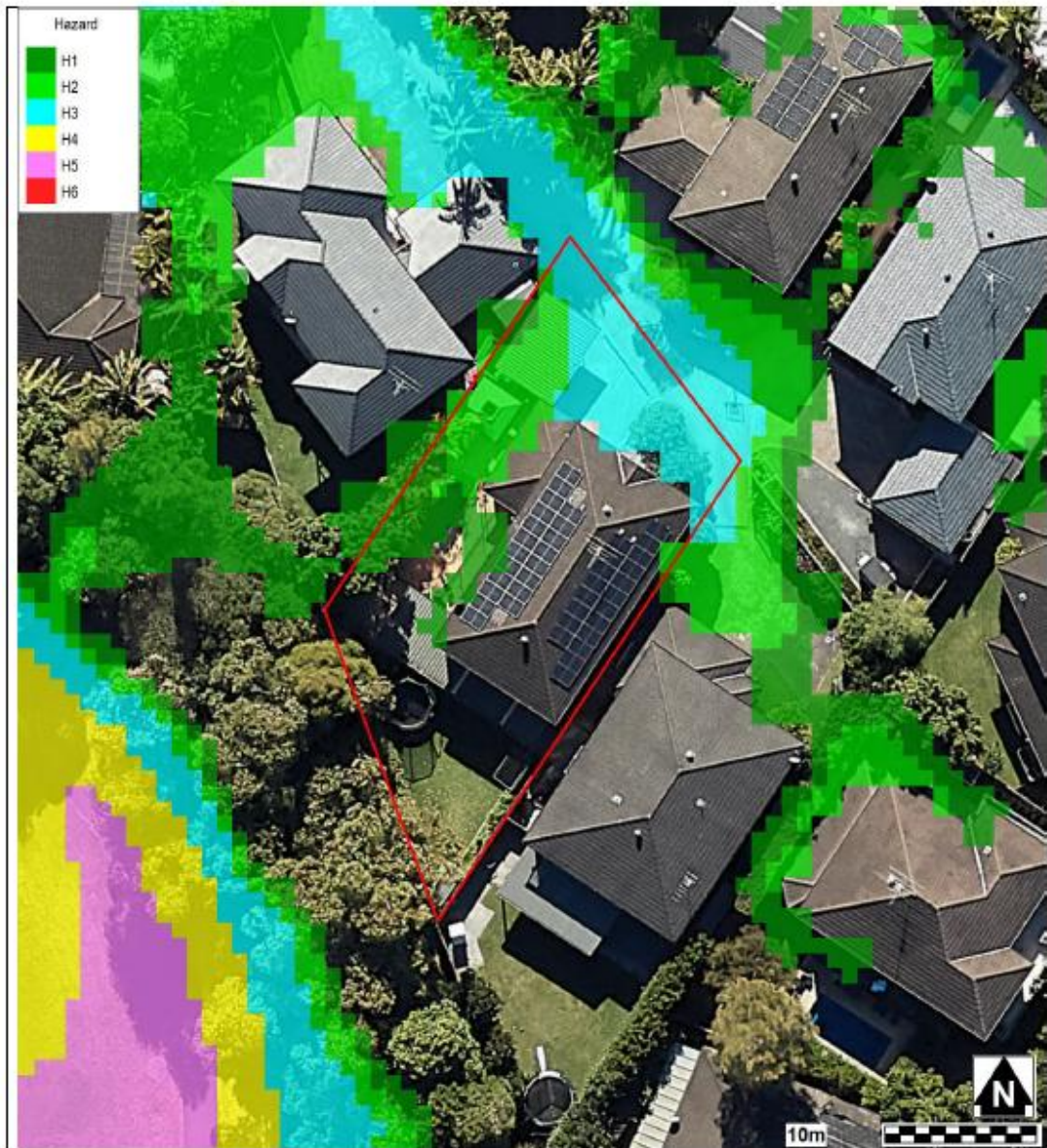
- Extent represents the 1% annual Exceedance Probability (AEP) flood event including 30% rainfall intensity and 0.9m Sea Level Rise climate change scenario
- Flood events exceeding the 1% AEP can occur on this site.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Ingleside, Elanora and Warriewood Overland Flow Flood Study 2019, WMAwater) and aerial photography (Source: NearMap 2014) are indicative only

Issue Date: 04/07/2025

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## MAP F: FLOOD LIFE HAZARD CATEGORY IN PMF

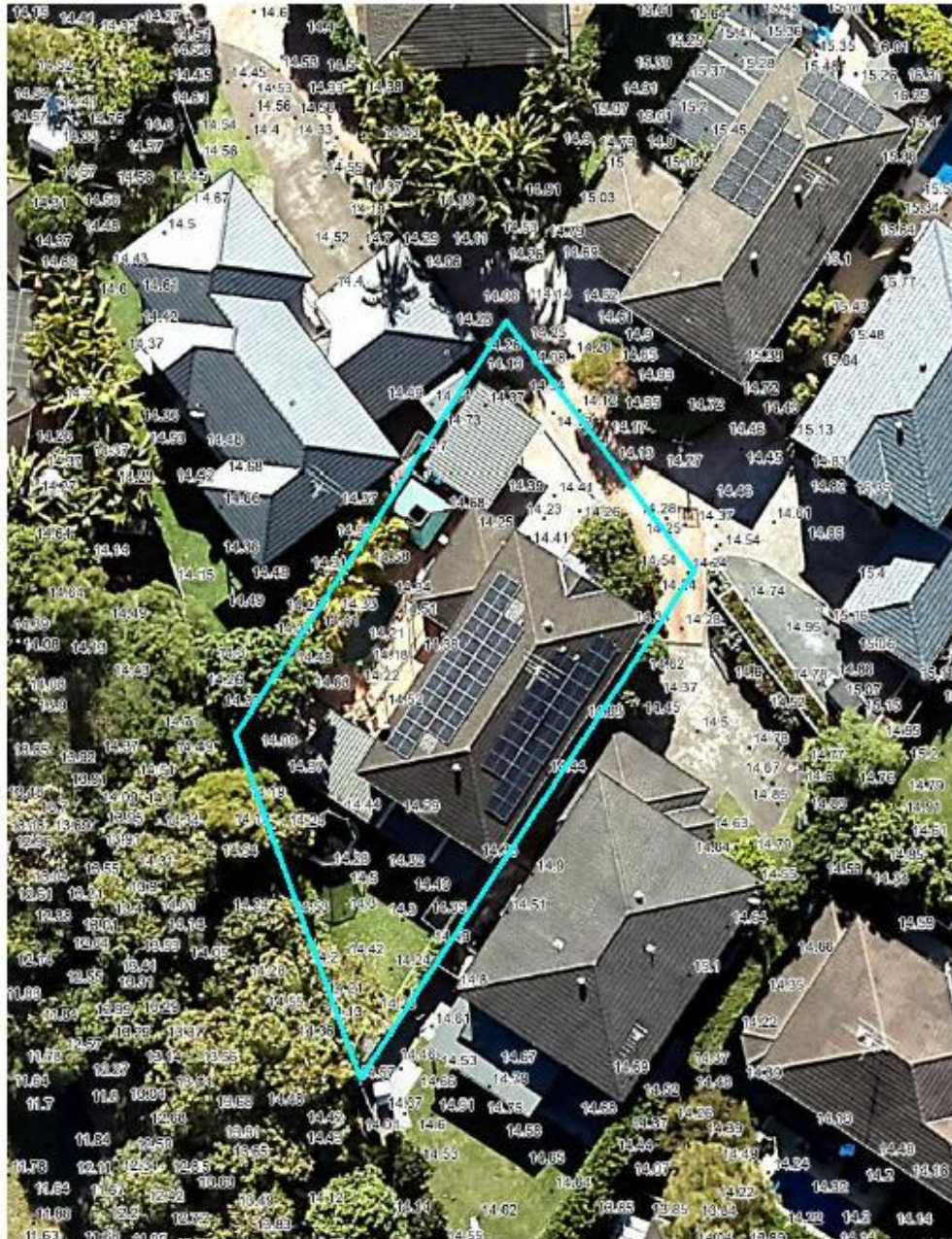


### Notes:

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



## MAP G: 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.

Issue Date: 04/07/2025

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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) – 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 affection
- 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](mailto:floodplain@northernbeaches.nsw.gov.au).

## **Appendix D**

Excerpt from

**Reducing Vulnerability of Buildings to Flood Damage:  
Guidance on Building in Flood Prone Areas,  
Hawkesbury-Nepean Floodplain  
Management Steering Committee (2006).**

REDUCING VULNERABILITY OF BUILDINGS TO FLOOD DAMAGE

**Table 4.3.1.3 Materials for 96-Hour Immersion**

COMPONENT	SUITABLE*	MILD EFFECTS*	MARKED EFFECTS*	SEVERE EFFECTS*
FLOOR, SUB-FLOOR STRUCTURE	<ul style="list-style-type: none"> <li>slab-on-ground</li> <li>suspended concrete</li> </ul>	<ul style="list-style-type: none"> <li>timber T&amp;G (with ends only epoxy sealed and provision of side clearance for board swelling) or plywood</li> </ul>	<ul style="list-style-type: none"> <li>standard grade plywood</li> </ul>	<ul style="list-style-type: none"> <li>timber floor close to the ground and particleboard flooring close to the ground</li> </ul>
WALLS SUPPORT STRUCTURE	<ul style="list-style-type: none"> <li>reinforced or mass concrete</li> </ul>	<ul style="list-style-type: none"> <li>full brick/block masonry cavity brick</li> </ul>	<ul style="list-style-type: none"> <li>brick/block veneer with venting (stud frame)</li> </ul>	<ul style="list-style-type: none"> <li>inaccessible openings</li> <li>large windows low to the ground</li> </ul>
WALL AND CEILING LININGS	<ul style="list-style-type: none"> <li>fibre cement sheet</li> <li>face brick or blockwork</li> <li>cement render</li> <li>ceramic wall tiles</li> <li>galvanised steel sheet</li> <li>glass and glass blocks</li> <li>stone, solid or veneer</li> <li>plastic sheeting or tiles with waterproof adhesive</li> </ul>	<ul style="list-style-type: none"> <li>common bricks</li> <li>solid wood, fully sealed</li> <li>exterior grade plywood</li> <li>fully sealed</li> <li>non ferrous metals</li> </ul>	<ul style="list-style-type: none"> <li>exterior grade particleboard</li> <li>hardboard</li> <li>solid wood with allowance for swelling</li> <li>exterior grade plywood</li> <li>plasterboard</li> </ul>	<ul style="list-style-type: none"> <li>particleboard</li> <li>fibreboard or strawboard</li> <li>wallpaper</li> <li>cloth wall coverings</li> <li>standard plywood</li> <li>gypsum plaster</li> </ul>
ROOF STRUCTURE	<ul style="list-style-type: none"> <li>reinforced concrete</li> <li>galvanised metal construction</li> </ul>	<ul style="list-style-type: none"> <li>timber trusses with galvanised connections</li> </ul>	<ul style="list-style-type: none"> <li>traditional timber roof construction</li> </ul>	<ul style="list-style-type: none"> <li>inaccessible flat floor</li> <li>ungalvanised structural steelwork</li> <li>unsecured roof tiles</li> </ul>
DOORS	<ul style="list-style-type: none"> <li>solid panel with waterproof adhesive</li> <li>flush marine ply with closed cell foam</li> <li>aluminium or galvanised steel frame</li> </ul>	<ul style="list-style-type: none"> <li>flush or single panel marine ply with waterproof adhesive</li> <li>painted metal construction</li> <li>timber frame, full epoxy sealed before assembly</li> </ul>	<ul style="list-style-type: none"> <li>standard timber frame</li> </ul>	<ul style="list-style-type: none"> <li>standard flush hollow core with PVA adhesives and honeycomb paper core</li> </ul> <p>Note: lowest cost and generally inexpensive to replace</p>

COMPONENT	SUITABLE*	MILD EFFECTS*	MARKED EFFECTS*	SEVERE EFFECTS*
WINDOWS	<ul style="list-style-type: none"> <li>aluminium frame with stainless steel or brass rollers</li> </ul>	<ul style="list-style-type: none"> <li>timber frame, full epoxy sealed before assembly with stainless steel or brass fittings</li> </ul>		<ul style="list-style-type: none"> <li>timber with PVA glues</li> <li>mild steel fittings</li> </ul>
INSULATION	<ul style="list-style-type: none"> <li>plastic/polystyrene boards</li> <li>closed cell solid insulation</li> </ul>	<ul style="list-style-type: none"> <li>reflective foil perforated with holes to drain water if used under timber floors</li> </ul>		<ul style="list-style-type: none"> <li>materials which store water and delay drying</li> <li>open celled insulation (batts etc)</li> </ul>
BOLTS, HINGES, NAILS & FITTINGS	<ul style="list-style-type: none"> <li>brass, nylon/stainless steel, removable pin hinges</li> </ul>	<ul style="list-style-type: none"> <li>galvanised steel, aluminium</li> </ul>		<ul style="list-style-type: none"> <li>mild steel</li> <li>** see Note below</li> </ul>
FLOOR COVERING	<ul style="list-style-type: none"> <li>clay/concrete tiles</li> <li>epoxy or cementitious floor toppings on concrete</li> <li>rubber sheets (chemically set adhesives)</li> <li>vinyl sheet (chemically set adhesive)</li> </ul>	<ul style="list-style-type: none"> <li>terrazzo</li> <li>rubber tiles (chemically set adhesives)</li> <li>vinyl tiles (chemically set adhesive)</li> <li>polished floor &amp; loose rugs</li> <li>ceramic tiles</li> </ul>	<ul style="list-style-type: none"> <li>loose fit nylon or acrylic carpet (closed cell rubber underlay)</li> </ul>	<ul style="list-style-type: none"> <li>wall to wall carpet</li> <li>wall to wall seagrass matting</li> <li>cork</li> <li>linoleum</li> </ul>

\* KEY

**SUITABLE**

these materials or products are relatively unaffected by submersion and flood exposure and are the best available for the particular application.

**MILD EFFECTS**

these materials or products suffer only mild effects from flooding and are the next best choice if the most suitable materials or products are too expensive or unavailable.

**MARKED EFFECTS**

these materials or products are more liable to damage under flood than the above category.

**SEVERE EFFECTS**

these materials or products are seriously affected by floodwaters and have to be replaced if inundated.

\*\* Note: For nominal fixings in timber framing, AS 1684.2 requires nails used in joints that are continuously damp or exposed to the weather to be hot dip galvanised, stainless steel or monel metal.



**Appendix E**  
**Curriculum Vitae 2025**  
**Lucas Molloy**

## Curriculum Vitae 2025

Lucas Molloy

MIEAust / CPEng / NER / APEC / Engineer / IntPE(Aus)

### Education -

- 1988 Higher School Certificate  
Pittwater High School NSW Australia
- 1995 Bachelor of Engineering (Civil)  
University of Wollongong NSW Australia

### Employment -

- May 2007 to date  
Barrenjoey Consulting Engineers Pty Ltd  
Director / Engineer / Draftsman
- April 2003 to April 2007  
Northern Beaches Consulting Engineers Pty Ltd  
Director / Engineer
- Feb 1997 to April 2003  
Northern Beaches Consulting Engineers Pty Ltd  
Engineer
- Dec 1988 to Dec 1993  
Jack Hodgson Consulting Engineers  
Undergraduate trainee / Engineer

For last sixteen years Director / Engineer / Draftsman of the structural and civil engineering practice Barrenjoey Consulting Engineers Pty Ltd (est 2007). I am responsible for the structural and civil (including stormwater management) design, documentation, investigation and construction supervision of predominately residential developments.

The spectrum of projects I have consulted on, vary from a 6 square meter timber framed deck extension of a residential house (budget ~ \$1,500) to 8 storey commercial development (budget of ~ \$10,000,000).

During my career I have been active in the preparation and issuing of –

- 250+ stormwater management plans inc on site detention
- 50+ overflow / flood analysis using DRAINS / HECRAS / AR+R
- 25+ flood inundation & risk assessment reports

**Appendix F**  
**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: **C & E Baica**

Address of site: **7 Lewis Cls Warriewood**

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 **4<sup>th</sup> July 2025** 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 \$10 million.

*Flood Management Report Details:*

Report Title:

**FLOOD INUNDATION &  
RISK ASSESSMENT REPORT  
PROPOSED ALTERATIONS & ADDITIONS  
7 LEWIS CLS WARRIEWOOD**

Report Date:

**July 2025**

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)

**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  
MIEAust / CPEng / NER /  
APEC / Engineer / IntPE(Aus)  
788184  
Director  
Barrenjoey Consulting Engineers p/l**

**End**