

4 April 2019

Paul and Mari Notaris
 25 Lakeside Crescent
 North Manly NSW 2100

mari.notaras@optusnet.com.au

Flood risk report in support of the proposed alterations and additions at 25 Lakeside Crescent

Dear Paul and Mari

1.0 Introduction

Stellen Consulting was engaged to assess the proposed alterations and additions at 25 Lakeside Crescent, North Manly in reference to potential risks and impacts connected with flooding. Architectural plans, survey and council provided flood information (attached) were used to determine flooding extents, impacts and to assess associated risks.

2.0 Description of the Site

Lot 61 DP12578, known as 25 Lakeside Crescent is a rectangular shaped allotment with an area of approximately 627m². The site is located in part of the low-lying foreshore area surrounding Manly Lagoon and slopes away from Lakeside Crescent toward the lagoon to the east. Current development of the site consists of a two-storey residential dwelling, access driveway and an external in-ground swimming pool.

3.0 Description of the Development

The development proposes demolition of an existing in-ground pool, alterations and additions at the ground and first floor levels of the existing dwelling, and construction of a new in-ground pool and associated landscaping to the rear of the property. The proposed architectural plans are attached in Appendix A.

4.0 Flooding

Council's Manly Lagoon Flood Study (2013) identifies the property as being affected by flooding. Council supplied flood information (refer Appendix B) was used to determine flooding extents, impacts and to assess associated risks to the development.

4.1 Analysis & Assessment of Impacts

Council's flood data predicts that during the 1% Annual Exceedance Probability (AEP) rain event the property will be inundated with floodwaters arising from Manly Lagoon up to 3.2 mAHD. The site has areas of both Medium and High Risk (refer Figure 1) and is subject to a flood planning level (FPL) of 3.7 mAHD which includes a 500mm freeboard to the predicted 1% AEP flood level. The flood characteristics are summarised in Table 1.

Table 1 - Flood characteristics for 25 Lakeside Crescent

Summary	Deck Area	Pool Area
Proposed FFL ⁽¹⁾ (mAHD)	2.45	2.45
Natural Surface Level ⁽¹⁾ (mAHD)	2.61	1.87 – 2.10
Flood Risk Precinct ⁽²⁾	Medium - High	Medium - High
Predicted 1% AEP Flood Level ⁽³⁾ (mAHD)	3.2	3.2
Flood Planning Level ⁽³⁾ (mAHD)	3.7	3.7
Probable Maximum Flood Level ⁽³⁾ (mAHD)	5.7	5.7

1. Refer attached survey and architectural plans (Appendix A)
2. Northern Beaches Council, Flood Hazard Map (Figure 1)
3. Council supplied flood information (Appendix B)

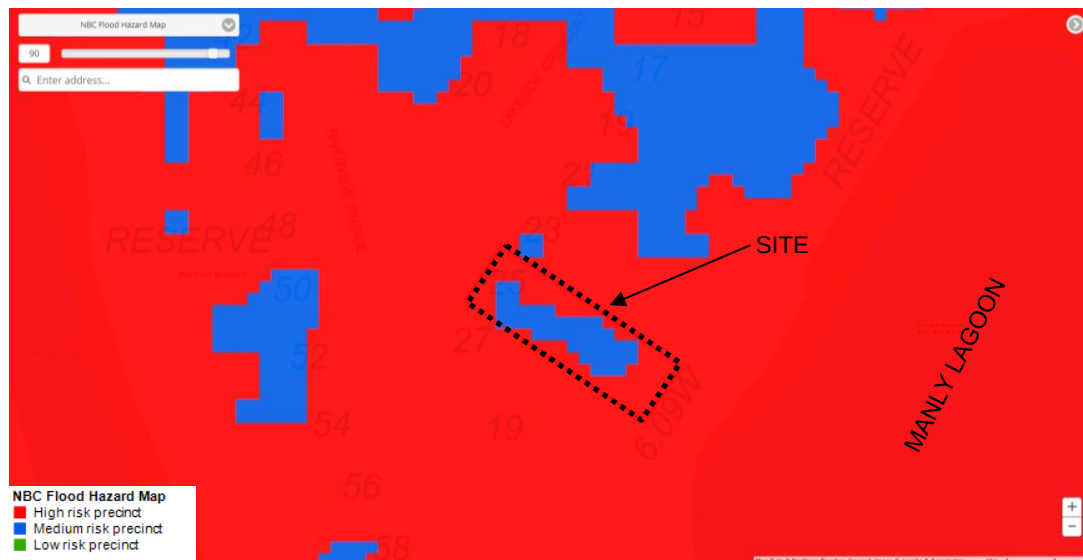


Figure 1 - Flood Hazard Map for 25 Lakeside Crescent (Northern Beaches Council, 2018)

4.2 Assessment of impacts

In accordance with Warringah Council Development Control Plan (DCP) sE11 Flood Prone Land, flood controls are applicable to the development. All aspects of the proposed development are categorised as concessional and located within the medium-high risk precinct (Figure 1). For the purpose of assessing the development only the high-risk controls have been used as they are more onerous.

Table 2 provides a summary of the applicable controls for the proposed alterations and additions.

Table 2. DCP flood controls, High risk precinct, concessional development

#	Prescriptive controls	Compliance with controls			Relevant Controls
		NA	Yes	No	
A	Flood effects caused by development		✓		A2, A3
B	Drainage infrastructure and creek works	✓			-
C	Building components and structural		✓		C1, C2, C3
D	Storage of goods		✓		D1, D2
E	Flood emergency response		✓		E1
F	Floor levels			✓	F2, F3, F6
G	Car parking	✓			G1, G2, G3, G4, G5, G6, G7
H	Fencing		✓		H1
I	Pools		✓		I1

NA – Not Applicable

4.3 Addressing the Controls

Control A - Flood effects caused by development

- A2. Refer to Form A/A1 (Appendix C)
- A3. No net additional filling is proposed below the 1% AEP flood level. The construction of the new pool (12m³ fill) is offset by the demolition of the existing pool and lowering of the surrounding area (54m³ cut). The proposed development results in approximately 42m³ of additional flood storage on the site. Refer to Appendix D for a calculation of the cut/fill.

Control B - Not applicable

Control C - Building components and structural soundness

- C1. The proposed dwellings footings, slab and structure, shall be designed / checked by a structural engineer and constructed of flood compatible materials 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 FPL (3.7 mAHD), taking into account the forces of floodwater, wave action, flowing water with debris, buoyancy and immersion. The structural certification shall be provided confirming the above.
- 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 FPL (3.7 mAHD).

Control D - Storage of goods

- D1. Hazardous or potentially polluting materials shall not be stored in the garage or under the house 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 FPL (3.7 mAHD).

Control E - Flood emergency response

- E1. The recommended emergency response is to **shelter in place**. The dwelling first floor level (6.03 mAHD) is above both the FPL (3.7 mAHD) and PMF (5.7 mAHD). All residents shall be informed of the flood evacuation procedures and a copy of this report shall be kept on the premises at all times. This Flood Emergency Response Plan shall be executed, on individual assessment, during high intensity rainfalls within the first 5–10 minutes of a storm and monitored accordingly.

In the event that floodwaters overtop the boundary at any point on the property, the recommended actions are:

- The occupants of the property shall be directed to the proposed first floor of the dwelling, above the PMF.
- Emergency services shall be contacted stating the property's location; the situation faced, number of people on the property and any evacuation measures to be carried out.

For emergency help in floods and storms call the State Emergency Service (SES) on 132 500.

If your emergency is life threatening call 000 (triple zero) for Police/Fire/Ambulance.

Control F - Floor levels

- F2. An additional external deck area is proposed at the rear of the dwelling at RL 2.45 mAHD with an open sub-floor structure. Despite the deck being constructed below the 1% AEP flood level (3.2 mAHD), no loss in flood storage will occur as the deck area will be constructed on existing fill (RL 2.61 mAHD) which is proposed to be lowered to RL 2.06 mAHD.

Any loss in flood storage as a result of the deck structure and or pool (refer Control I1) is offset by the demolition of the existing pool and lowering of the surrounding area to RL 2.06 mAHD. Refer to Appendix D for a calculation of the cut/fill.

- F3. Not applicable – No floor levels have been elevated to avoid floodwaters
- F6. Not applicable – A first floor addition is not proposed, alterations to the existing first floor only are proposed.

Control G - Not applicable

No changes to the existing carparking arrangement are proposed.

- G1. Not applicable
- G2. Not applicable
- G3. Not applicable
- G4. Not applicable
- G5. Not applicable
- G6. Not applicable
- G7. Not applicable

Control H - Not applicable

- H1. Fencing, including pool fencing surrounding the pool, must be designed so as is not to impede the flow of flood waters and not to increase flood affectation on surrounding land. The selection of fencing must comply the the Flood Prone Land Design standard in addition to any other regulatory requirements.

Control I - Not applicable

- I1. A partially in-ground pool with coping at RL 2.45 mAHD is proposed and sits approximately 580mm above the existing ground level at its highest point. The proposed pool is affected by the 1% AEP flood level, however, any loss as a result of the construction of the new pool is offset by the demolition of the existing pool and lowering of the surrounding area, no loss in flood storage in anticipated. Additionally the proposed pool will not impede the flow of floodwaters as is it is located within the flood shadow of an existing brickwall along the southern boundary.

All electrical equipment associated with the pool (including pool pumps) shall be waterproofed and/or located at or above the FPL (3.7 mAHD). All chemicals associated with the pool are to be stored at or above the FPL (3.7 mAHD).

5.0 Recommendations for Design

This Flood Risk Assessment Report has been undertaken by Stellen Consulting based on information provided by Northern Beaches Council (Warringah) and available architectural plans. The site has been identified by Council as being within the 1% AEP flood and PMF extents. The proposed alterations and additions have been assessed in accordance with the flood-related development controls in Section B3.11 of Northern Beaches Council's (Warringah) DCP, and NSW Floodplain Development.

To meet the controls outlined in Part E11 of the Warringah Council DCP it is recommended that:

- An FPL of 3.7 mAHD be adopted for the site.
- All new structures below the FPL, must be constructed of flood compatible materials and designed/verified as capable of withstanding the forces generated due to wave action and tidal inundation during the 1% AEP rain event.
- Non-waterproofed electrical services and stored materials (e.g. fuel, pool chemicals) must be located above or the FPL.

Provided that the recommendations within this report are followed, no additional adverse flooding impacts are expected to occur to neighbouring upstream and/or downstream properties as a result of the proposed development.

Please contact me with any questions regarding this report.

Kind regards,



Logan English-Smith
Engineer

Stellen Consulting
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E. logan.englishsmith@stellenconsulting.com.au

Appendix A – Architectural Plans

Proposed architectural plans by Emma Macindoe all dated 2 November 2018

DRAWING SCHEDULE

N1	NOTES		
A1	ROOF PLAN	S1	SITE ANALYSIS PLAN
A2	FIRST FLOOR PLAN	S2	SITE PLAN AND CALCULATIONS
A3	GROUND FLOOR PLAN	S3	SITE MANAGEMENT PLAN
A4	ELEVATIONS SHEET 1	S4	9AM SHADOWS
A5	ELEVATIONS SHEET 2	S5	12NOON SHADOWS
A6	SECTIONS SHEET 1	S6	3PM SHADOWS
E1	EXISTING FIRST FLOOR PLAN		
E2	EXISTING GROUND FLOOR PLAN		

Appendix B – Council Supplied Flood Information

From: Flood plain <floodplain@northernbeaches.nsw.gov.au>
Date: 9 March 2018 at 3:14:15 pm AEDT
To: mari notaras <mari.notaras@optusnet.com.au>
Subject: RE: Flood planning levels for 25 Lakeside Cres, North Manly

Hi Mari,

The property identified as 25 Lakeside Cres, North Manly is affected by the Medium and High Flood Risk Precincts.

1% AEP (100 year) flood level is 3.2 m AHD.

Freeboard: 0.5 m

Flood Planning Level (FPL) is 3.7 m AHD.

Flood Risk Precinct: Affected by the Medium and High Flood Risk Precincts. See the attached map.

Probable Maximum Flood (PMF) level: 5.7 m AHD.

The flood extents shown in the Flood Risk Precinct Map are indicative only. Flood levels should be compared to a survey plan of the property to identify flood extents.

The above information is based on the Manly Lagoon Flood Study (2013). This is currently the best available information on flooding in the area, but could be subject to change in the future.

Any development application to Council for this property would need to be accompanied by a flood management report, which addresses Council's relevant LEP and DCP. Helpful documents can be downloaded from this link:

<https://www.northernbeaches.nsw.gov.au/planning-and-development/building-and-renovations/environmental-and-community-protections>

Kind regards,

Fiona Coe
Engineering Project Manager

Stormwater Floodplain Engineering
t 02 9942 2964 m 0422 145 569
fiona.coe@northernbeaches.nsw.gov.au
northernbeaches.nsw.gov.au



From: mari notaras [<mailto:mari.notaras@optusnet.com.au>]
Sent: Tuesday, 6 March 2018 3:36 PM
To: Flood plain
Subject: Flood planning levels for 25 Lakeside Cres, North Manly

To whom it may concern

Justine from customer service has given me your email. I am wanting to find out the details for some potential renovations that we are considering at our property.

I have been advised to get a copy of the flood planning level report.

Could you please advise how I go about this process?

Thank you

Mari Notaras
25 Lakeside Cres
North Manly
NSW 2100
0410 562 985

Northern Beaches Council

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Appendix C – Form 1 Statement

Attachment A

NORTHERN BEACHES COUNCIL STANDARD HYDRAULIC CERTIFICATION FORM FORM A/A1 – To be submitted with Development Application

Development Application for

Address of site: 25 Lakeside Crescent, North Manly

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

I, Logan English-Smith on behalf of Stellen Consulting
(Insert Name) (Trading or Business/ Company Name)

on this the 04.04.2019 certify that I am engineer or a
(Date)

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 risk management report for proposed alterations and additions at 25 Lakeside Crescent

Report Date: 04.04.2019

Author: Logan English-Smith

Author's Company/Organisation: Stellen Consulting

I: Logan English-Smith
(Insert Name)

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

☒ have obtained and included flood information from Council (must be less than 12 months old)
(This is mandatory) Note: Original revision of this report was dated 25 Feb 2019 and the provided flood information was less than 12 months old, this revision includes updating Appendix A with the final architectural plans only. No changes were made to the contents of this report, the original flood information has been used.

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

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

Signature 

Name

Appendix D

