

FLOOD RISK MANAGEMENT PLAN

DEVELOPMENT:
Single Residential Dwelling
& Granny flat

ADDRESS:
54 Abbott Rd, North Curl Curl

CLIENT:
Daniel & Rebekah Stone

LGA:
Northern Beaches Council

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GLOSSARY

Annual Exceedance Probability (AEP)

The chance of a flood of a given or a larger size occurring in any one year, usually expressed as a percentage.

Australian Height Datum (AHD)

A common national surface level datum approximately corresponding to mean sea level.

Average Recurrence Interval (ARI)

The long-term average number of years between the occurrence of a flood as big as or larger than the selected event.

Flood

Relatively high stream flow which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with major drainage before entering a watercourse.

Flood Liable Land or Flood Prone Land

Land susceptible to flooding by the PMF.

Flood Planning Levels (FPLs)

Are the combinations of flood levels and freeboards selected for floodplain risk management purposes.

Freeboard

Is a factor of safety typically used in relation to the setting of floor levels.

Habitable Room

In industrial or commercial situation: an area used for offices or to store valuable possessions susceptible to damage in the event of a flood.

Peak Discharge

The maximum discharge occurring during a flood event.

Probable Maximum Flood

PMF is the largest flood that could conceivably occur at a location, usually estimated from probable maximum precipitation.

Probable Maximum Precipitation

PMP is the greatest depth of precipitation for a given duration meteorologically possible over a given size storm area at a particular location at a particular time of the year.

Runoff

The amount of rainfall which actually ends up as stream flow.



1. INTRODUCTION

Brief

GEBA Consulting has been engaged to carry out a Flood Risk Management Plan as part of the development application at 54 Abbott Rd, North Curl Curl.

This report has been prepared to meet the Council's requirements for the Development Application. The Flood Risk Management Plan is required to assess the impact of the proposed development on the existing flood conditions of the subject site and the neighbouring properties.

Scope

The scope of this study covers:

- Reviewing Council's Flood Study and Site Specific Flood Information;
- Pre-development flood behaviour, including the flood inundation line marked on the survey plan;
- Loss of flood storage within the subject lot due to the proposed development;
- Post-development flood behaviour, including the flow path construction details and the flood inundation line, marked on the site plan;
- The flood impact on adjoining properties (upstream and downstream) in the locality;
- Design measures including maintaining an unobstructed flow path, raising the building with appropriate freeboard and flood proofing the walls that form part of the flow path;

Limitations

This report is intended solely for Timothy Dodd and Paula Silva as the Client of GEBA Consulting and no liability will be accepted for use of the information contained in this report by other parties than this client.

This report is limited to visual observations and to the information including the referenced documents made available at the time when this report was written.

Reference Documents

For the purpose of the study, the following information has been supplied by the Architect, Council, and the surveyor:

- (i) Survey Plan dated 13/03/2018; *C.M.S Surveyors Pty Ltd*
- (ii) Architectural Plan dated 31/05/2021 issued by *Canvas Architecture & Design Pty Ltd*
- (iii) Flood Information provided by Northern Beaches Council via email dated 05/03/2021
- (iv) 100YR & PMF Flood Extents from *Dee Why & Curl Curl Floodplain Risk Management Study and Plan, 2005*;
- (v) NSW Government Floodplain Development Manual - The management of Flood Liable Land (2005)
- (vi) Australian Rainfall & Runoff (AR&R 1999) and (AR&R 2016 and Revision Projects)



2. SITE ANALYSIS

The site is located within the municipality of Northern Beaches Council and is identified as Lot 1 on DP 18022. The site is located on the northern side of Abbott Rd and has a total site area of approximately 1226 m² in total. The site is bounded by residential allotments to the North, East and West (See Figure 1 – Site location).

The proposed development consists of the demolition of the existing dwelling and the construction of a new two storey residential dwelling and detached granny flat. The proposal includes to maintain and refurbish the existing swimming pool on site in the current location. The dwelling will have a total footprint area of approximately 286.5m² and the detached granny flat approximately 94m² (See Figures 3 & 4 Pre-developed & Post-developed site plans).

3. FLOOD ASSESSMENT AND RECOMMENDATIONS

The flood information provided by council dated 05/03/2021 states that the subject site is affected by *Dee Why & Curl Curl Floodplain Risk Management Study and Plan, 2005*.

As per the information provided, the site is impacted by Low Hazard Flooding and Low-Medium Risk Flooding at the front of the site. The site is determined not inundated during the 100-year Flood Event, and only impacted by the Probably Maximum Flood (PMF) event.

The flooding from the Abbott Rd frontage is wholly contained within the roadway. The proposed development is located in an area that is not impacted by the 100-Year the flood extent. With this, Council have determined a maximum Flood Planning level (FPL) for the site is to be set at the 100YR ARI Flood Level Plus 500mm Freeboard and therefore the FPL is set at **4.18mAHD**.

3.1 Finished Floor Levels

As per Northern Beaches Council's guidelines - '*Northern Beaches – Water Management Policy 2021 Part 10 – Flood Risk Management*', for flood affected sites, habitable floor levels are to be set at the 100YR ARI Flood Level Plus 500mm Freeboard.

For the subject site, the maximum 100 Year Flood level has been determined to be 3.68mAHD. Therefore, council have determined the proposed Floor level to be set at min.FFL4.18mAHD. This allows a 500mm freeboard.

The proposed garage is able to be a slab on ground designed that meet the BCA requirements and no freeboard is required.

3.2 Building Components and Structural Soundness

The lowest natural ground level in the vicinity of the proposed extension is approximately RL4.23. With a minimum Flood Planning Level of FPL4.18mAHD, the proposed single residential dwelling and detached granny flat are able to be constructed of unrestricted materials for all areas above the natural ground level.

Due to this, the proposal must be constructed as a reinforced concrete slab on ground with a raft slab/strip footing as necessary to the structural engineer's details.



All materials proposed in the construction of the extension below the Flood Planning level of FPL4.18mAHD are to be flood compatible material including concrete footings & foundations with full brick construction.

This form of construction will ensure structural soundness and the ability to withstand all forces of flowing waters, including debris and buoyancy. All power points are to be at least 500mm above the 1:100 flood levels.

3.3 Boundary fencing

Although not required for this site, it is preferred that any new boundary fences are to be flood fences so as to allow water to pass and not cause a blockage. Boundary fences should have a minimum gap of 100mm from Natural Ground Level in order to allow flood waters to pass (See Figure 6 – Flood Fence Detail).

3.4 Volume/Velocity

The existing flood storage volume of the site during a 1% ARI is not applicable as the site is unaffected by flooding during this storm event. The proposed development consists of the construction of a two storey single residential dwelling and detached grannyflat. As the proposal is not located within the 100YR flood extent it is expected that the Post-Developed Flood storage volume is expected to equal that of the pre-developed flood storage volume. We have also assessed the impacts on the flood velocity. The site boundary setbacks have been reduced, but due to the inundation extent during the 100YR storm, it is calculated that the post-developed flood velocity will equate the pre-developed scenario.

3.6 Impact on adjacent lands

As per the Flood Extent shown in Figure 6, it can be seen that the site is unaffected by the 1 in 100YR Flood event. With this, the inundation is maintained within the Abbott Rd frontage with no encroachment into the subject site. The proposal is expected to have no impact on the flooding or on the neighbouring properties.

4. EVACUATION

It is recommended that evacuation procedures shall be carried out pending instructions from authorities i.e. State Emergency Services.

Prior to storms reaching the 1% AEP, all occupants are to evacuate the property before floodwater reaches 0.2m depth at the front boundary. The dwelling also consists of existing/proposed upper floors. These areas are above the PMF and occupants are able to seek refuge should evacuation be dangerous. Evacuation during flooding may be quite dangerous and is NOT recommended.

As the site is impacted by the PMF, should evacuation not be possible, occupants are able to seek refuge on the first floor of the dwelling with a proposed Finished Floor level above the flood level.



5. CONCLUSION

The proposed single residential dwelling and detached granny flat as presented in this Flood Risk Management Plan will meet the requirements of Department of Planning's 'Floodplain Development Manual', Northern Beaches Council's Flood requirements as specified in '*Northern Beaches – Water Management Policy 2021 Part 10 – Flood Risk Management*', provided that all procedures and recommendations presented in this report are implemented.

Should you require any further information or clarification, feel free to contact our office.

Yours Sincerely,

GEBA CONSULTING



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Civil Engineer





Figure 1 - Site Plan (Source: SIX Maps May 2021)



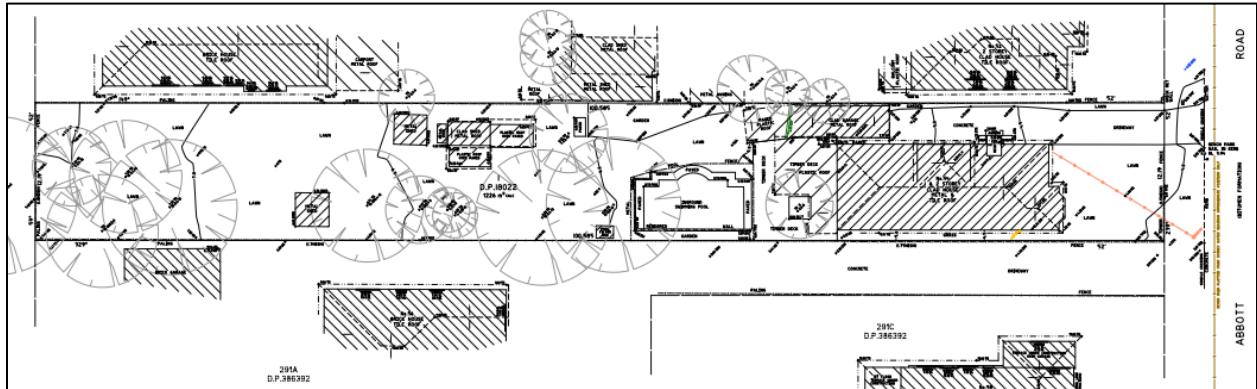


Figure 2 – Pre-Developed Site Plan (Source: C.M.S Surveyors Pty Ltd)

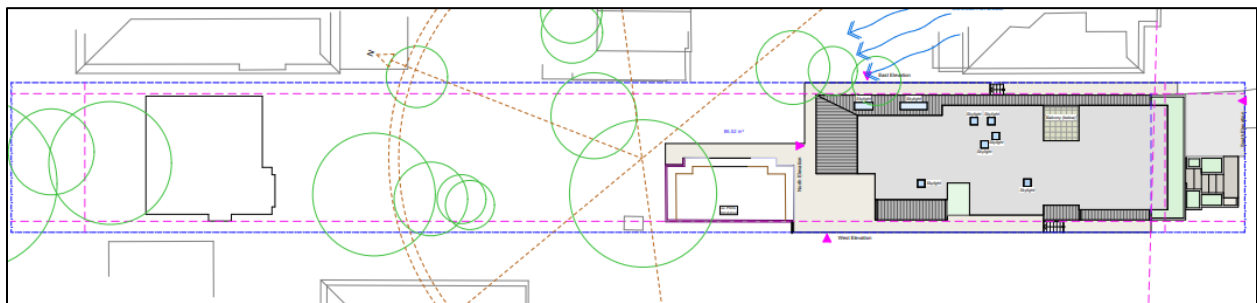


Figure 3 - Post-Developed Site Plan (Source: Canvas Architecture & Design Pty Ltd)





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FLOOD INFORMATION REQUEST - BASIC

Property: 54 Abbott Road NORTH CURL CURL NSW 2099

Lot DP: Lot 1 DP 18022

Issue Date: 05/03/2021

Flood Study Reference: Dee Why & Curl Curl Floodplain Risk Management Study and Plan, 2005

Flood Information for lot 1:

Flood Risk Precinct – See Map A

Flood Planning Area – See Map A

Maximum Flood Planning Level (FPL) ^{2,3,4}: 4.18 m AHD

1% AEP Flood – See Flood Map B

1% AEP Maximum Water Level ^{2,3}: N/A m AHD

1% AEP Maximum Depth from natural ground level³: N/A m

1% AEP Maximum Velocity: N/A m/s

1% AEP Hydraulic Categorisation: N/A See Flood Map D

Probable Maximum Flood (PMF) – See Flood Map C

PMF Maximum Water Level ⁴: 5.72 m AHD

PMF Maximum Depth from natural ground level: 1.71 m

PMF Maximum Velocity: N/A m/s

Flood Life Hazard Category – See Map E

Issue Date: 05/03/2021

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Figure 4 - Flood Information Summary Sheet (Source: Northern Beaches Council)



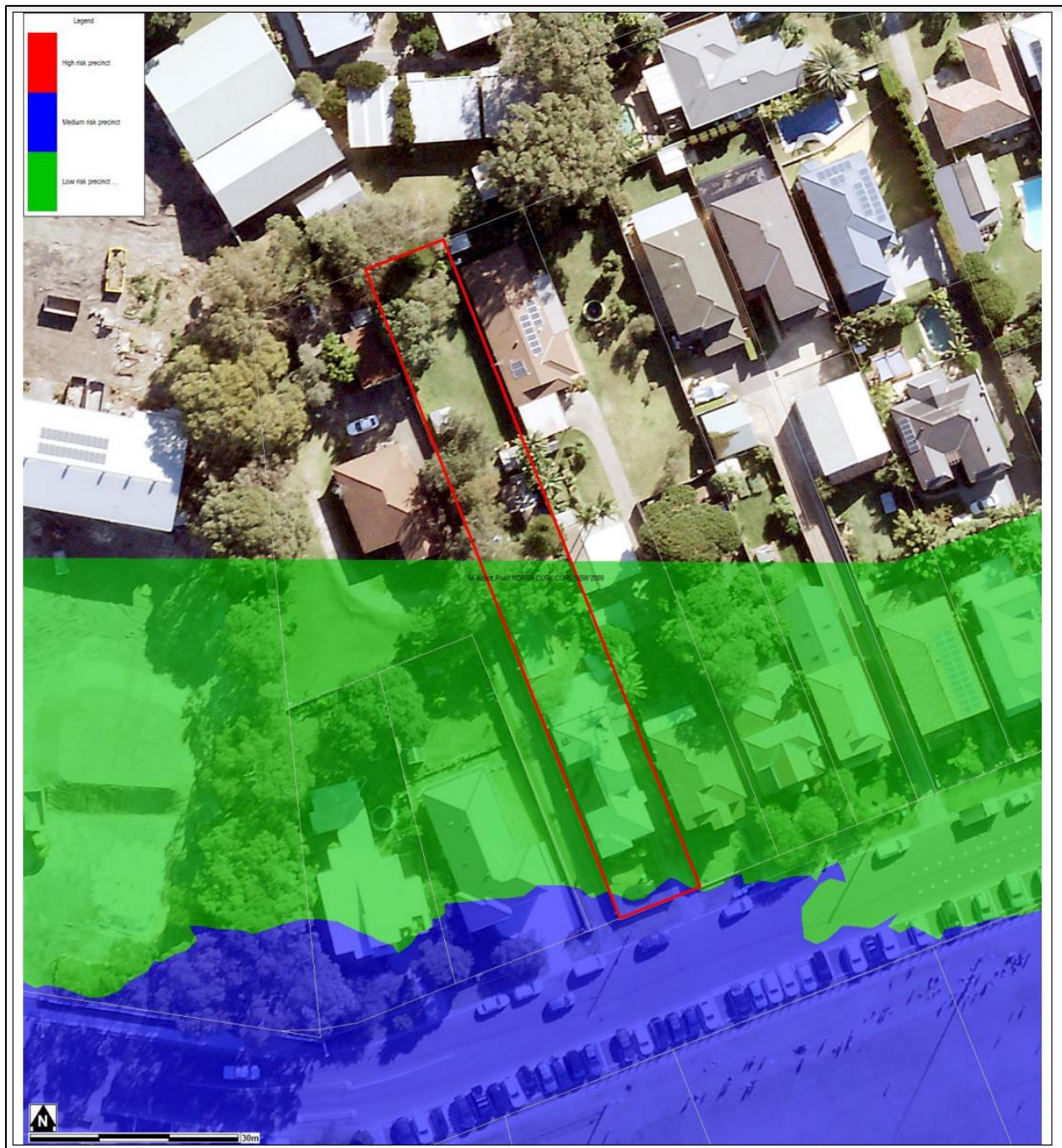


Figure 5 - Flood Hazard Map (Source: Northern Beaches Council)



Figure 6 – 1% Flood Extent (Source: Northern Beaches Council)



Figure 7 – PMF Flood Extent (Source: Northern Beaches Council)



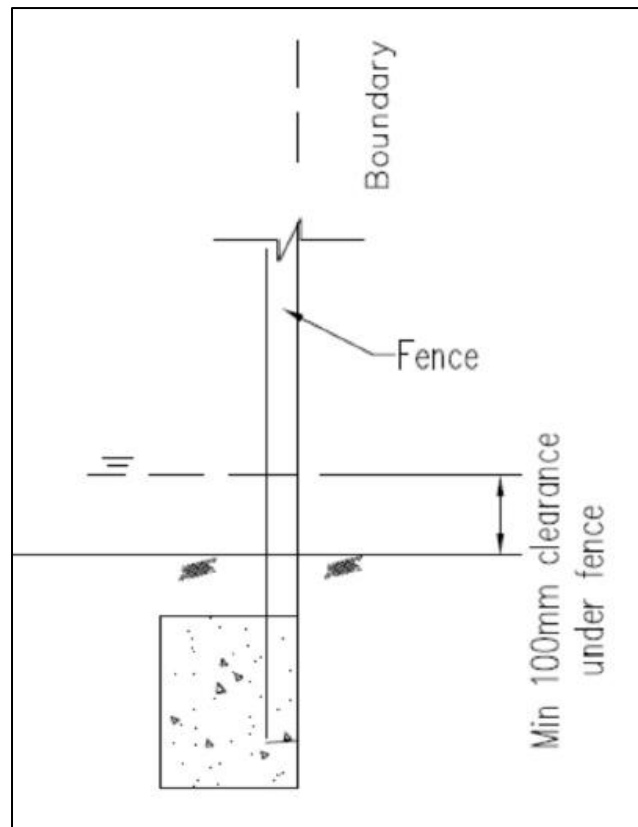


Figure 8 - Boundary Fencing Detail