APPROVED
CONSULTING
ENGINEERS

ABN 90 645 409 801
ACN 645 409 801

FLOOD RISK REPORT

FOR PROPOSED ADDITIONS AT

4/0 BENNETT STREET CURL CURL

(HARBORD BOWLING CLUB)

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Contents

1 – Introduction

Approved Consulting Engineers has completed a review of the proposed development at 4/0 Bennett Street, Curl Curl (Harbord Bowling Club) and determined that the site is located within a High Flood Risk Precinct in accordance with Northern Beaches Council's 'Dee Why and Curl Curl Lagoons Floodplain Risk Management Study' (Lyall & Associates 2006). The proposed architectural plans prepared by Rapid Plans (Plot Date: 7/10/2020) detail the demolition of two existing structures, the creation of a new amenity building and re-levelling of the existing recreation area (including 43m^3 approx fill to the middle section of the court and a 30mm topping layer consisting of synthetic grass over the entire surface [2200m^2 approximate]).

This report has been prepared in accordance with section E11 of Northern Beaches Council's - Warringah Development Control Plan (DCP) for development and the RFI response from council's 'Natural Environment Referral Response – Flood' unit.

1.0 - Flood Information Summary

Background Information	
Council	Northern Beaches Council (Warringah)
RFI date	30th November 2020
Flood Study Reference	Dee Why & Curl Curl Lagoons Floodplain Risk Management Study (2006)
Flood Behaviour	Mainstream Flooding
1% AEP Flood Information	
Flood Level	4.8m AHD
Flow Rate	Not Provided
Peak Depth On-site	1.5 m (approximate)
PMF Flood Information	
Flood Level	5.8m AHD
Velocity	Not Provided
Peak Depth On-site	2.5 m (estimated)

2 - Flood Risk Report

Flood Planning Summary	
Hazard Level	High and Medium Hazard
Flood Emergency Response Strategy (Onsite Response)	Evacuation (to Bennett street) *(refer section 3 for recommendation)*
Flood Planning Level (FPL)	5.30m AHD
Existing Dwelling Floor Level	4.72 m AHD (Bowling Club)
Proposed Storeroom/Toilet Block Structure	3.95 m AHD *(refer section 2.4 for recommendation)*
Degree of Inundation	100%
Flood Storage	No Reduction (provided report recommendations are adopted) *(refer section 2.1)*
Flood Levels	No anticipated increase
Recommendations For Structural Design	*Refer section 2.2*
Recommended Construction Materials	*Refer section 2.3*
Ground Floor Requirements	NA
Stormwater Management	*Refer section 2.5*
Waterproofing	Above 5.30 m AHD *(refer section 2.6)*
Flood Warning	Signage Recommended (evacuation route)
Hazardous Materials Storage	Above 5.8 m AHD *(refer section 2.7)*

2.1 - Flood storage

- The drawings provided by Rapid Plans propose the following:
  - A 30mm topping to the existing court surface (2200m^2 Approx). This would result in 66m^3 flood storage reduction.
  - The filling of the existing lower paved section between the existing courts and demolition of the existing 'brick shelter' structure within this area. This would result in a 43m^3 flood storage reduction.
  - The demolition of the existing brick 'admin office' structure to the south of the existing courts (35m^2 footprint approx). This would result in 23m^3 flood storage increase (0.647m average 1% AEP flood depth).
  - The construction of a new office/toilet block structure to the south of the existing courts (116m^2 footprint). This would result in 107m^3 flood storage increase (0.92m average 1% AEP flood depth).
  - The net flood storage across the site would be reduced by 193m^3.
- To avoid any reduction in flood storage, we recommend the following:
  - That the 30mm topping layer over the court is cut 30mm into the existing surface.
  - The lower paved section is left open, and a suspended concrete slab is poured over the top to achieve the desired FSL. The void beneath is to provide adequate drainage to ensure floodwaters can flow through this area unimpeded.
  - The proposed new toilet and storage area is to provide open gated doors (minimum 50mm openings between bars) to allow floodwaters to flow into the building.
  - The above will ensure no net reduction in flood storage across the site.
  - The perimeter masonry walls around the playing courts are to match the existing wall heights.

2.2 – Structural Requirements

- Perimeter fencing must be designed to be open and to withstand flood forces up to the 1% AEP Flood event (including debris impact).
- The proposed office/toilet block building is to be certified by a structural engineer as adequate to withstand forces from flood waters and debris impact up to the FPL.

2.3 - Recommended Construction Materials

- The proposed office/toilet block building must be constructed as a flood compatible building, and wet flood proofed below the FPL.
- Below the FPL standard lining materials, such as timber and plasterboard may be used in accordance with section 3.10.3 of the NCC and the ABCB handbook 'Construction of Buildings in Flood Hazard Areas.' The owner is to acknowledge however, that after a flood event these linings may need to be removed to drain walls and replaced.
- Standard Building Materials (concrete, steel, timber and/or brickwork) are to be used above and below the FPL.

2.4 – Floor Level requirements

- The proposed floor level of the new building is at RL 3.95m AHD. It should be noted by the client and staff that the floor level is below the FPL and that inundation is to be expected in a flood event.

2.5 - Stormwater Management

- To be incorporated as per council requirements and AS3500.3.
- Onsite Detention (OSD) is not recommended for this development.

2.6 - Waterproofing methods

- All electrical equipment is to be fitted with circuit breakers.
- All conduits below the FPL are to be free draining, with 1% (minimum) fall.
- Switchboard and main circuit unit to be fitted above RL 5.30m AHD (FPL)
- Other valuable materials or possessions are to be stored above RL 5.30m AHD (FPL)
- Owner and occupant are to acknowledge that a reasonable extent of damage to fittings below the RL 5.30m AHD (FPL) is to be expected during the 1% AEP storm event.

2.7 - Hazardous Material Storage

- The owner and occupant are to acknowledge that all hazardous materials are to be stored at or above 5.30m AHD.

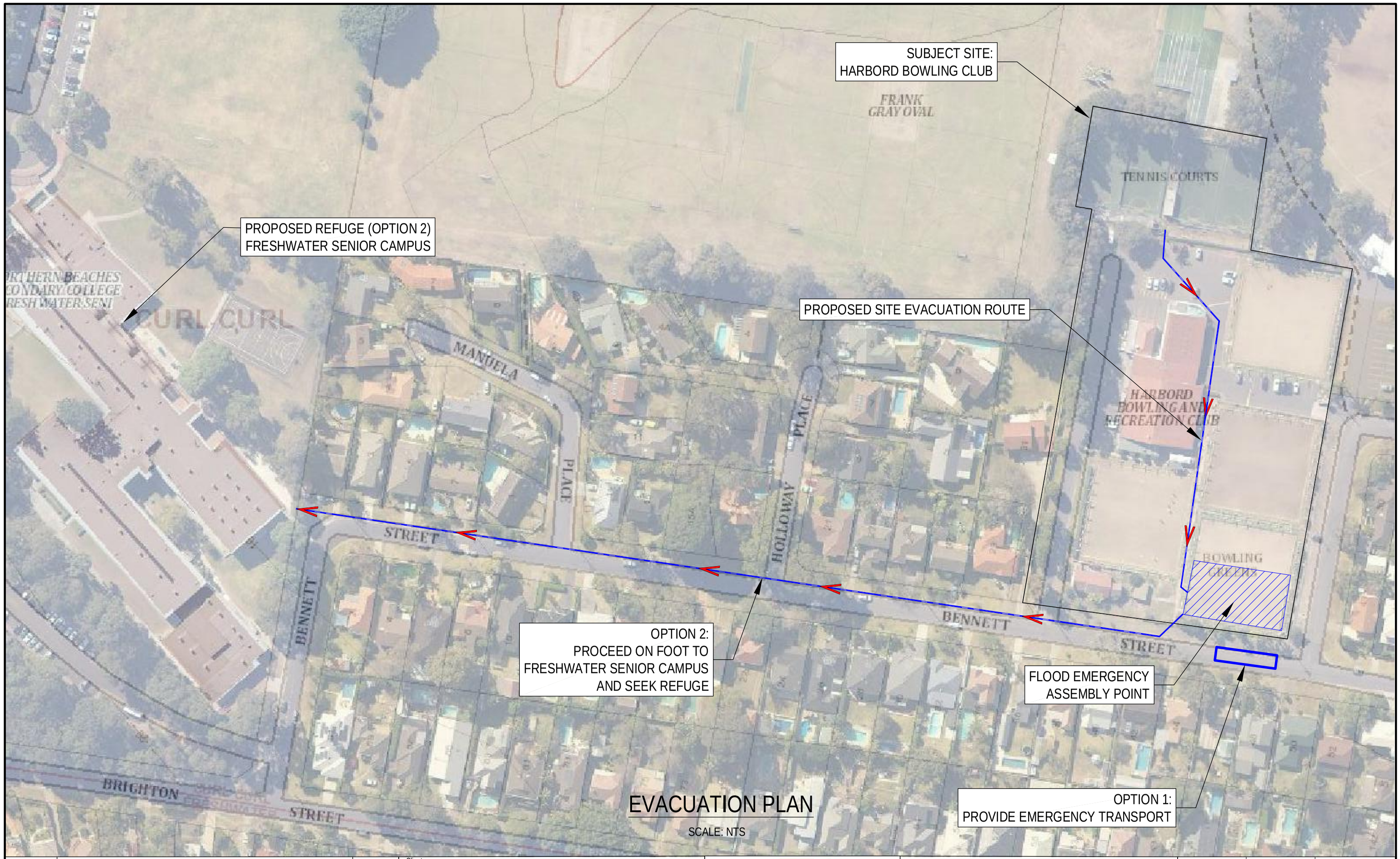
3 – Emergency Response Plan

- In a flood event, staff and patrons are to be directed by the FEC (see below) to the southern end of Bowling Green No.1 (adjacent to Bennet Street) located outside the PMF extent.
- Sufficient pre-arranged transport should be implemented by the 'Harbord Bowling Club' to ensure patrons can exit the premises in an orderly manner, along a route that is not flood affected.
- Alternatively, freshwater senior campus (located 350m west of 'Harbord Bowling Club') could be utilised as an emergency refuge (subject to approval). This option would require staff to direct all patrons west along Bennett street to the 'Freshwater Senior Campus'.

- Evacuation to Bowling Green No.1 should be completed within the first 5 minutes of the rainfall event (heavy rainfall or inundation of John Fisher Park indicate a potential flood event). Staff can also refer to local flood warnings provided by the Bureau of Meteorology and the MHL 'flood watch' website: https://www.mhl.nsw.gov.au/users/NorthernBeaches/ .
- We recommend staff are educated on the flooding affecting this site and the greater catchment. To be prepared for any future flood event, staff members are to be educated, with the roles and responsibilities to be delegated as generally outlined below:
    - Flood Evacuation Coordinator (FEC):
        - responsible for arranging regular staff meetings to provide ongoing training and education for flood emergency requirements
        - responsible ensuring that all staff are educated of flood evacuation requirements
        - responsible for all required flood warning signage
        - responsible for providing evacuation instructions
        - responsible for closing site frontage during flood evacuation
        - responsible for implementing flood evacuation (see below)
        - responsible for notifying all staff and customers present and ensuring all are accounted for
        - must be the last to evacuate to ensure everyone present has been accounted for and evacuated safely.
    - Flood Evacuation Assistant (FEA):
        - responsible for ensuring that sufficient copies of this Flood Risk Report and Emergency Response Plan are kept onsite and are to be made available on request
        - to assist with maintenance of flood warning signage

- required to report to the FEC during heavy rainfall
- to assess rising floodwaters and notify FEC for instructions
- to assist with notifying all staff and customers present
- to assist with the evacuation of staff and customers
- to wait for the FEC prior to them both evacuating the premises.

- Flood warning and signage is recommended to outline the evacuation procedure and route.
- A list of emergency contacts is to be provided that includes but not limited to; emergency services (000), the State Emergency Service (132 500), local Council, the local Police, ambulance and fire and rescues numbers and the Bureau of Meteorology.
- A copy of this Flood Risk Report and the *Flood Emergency Response Plan* is to be kept on the premises at all times. The owner/occupant is to be fully aware of these documents and requirements in the event of floodwaters rising.
- We anticipate that some patrons will be elderly and therefore present a heightened risk if these patrons are required to wade through floodwaters. We have considered the rate of rise and of floodwaters and are of the opinion that, provided this emergency response plan is followed, all patrons will be evacuated to a point that is outside the PMF extent prior to flooding along the evacuation route.
- It is the responsibility of staff, the FEC and FEA to ensure patrons are not intoxicated as per RSA regulations. This emergency plan assumes that no intoxicated patrons will require evacuation from the site, as there should be no intoxicated persons on the premises.
- It is the responsibility of the venue to ensure there is a sufficient number of staff and appointed coordinators to efficiently evacuate patrons to the designated assembly point. Considering the above information, there may need to be additional staff to assist with evacuating elderly or disabled patrons.



EVACUATION PLAN

SCALE: NTS

REVISION	AMENDMENT	DATE
-	RFI RESPONSE	23/02/21

Client: OLI KIKOFF

Architect: RAPID PLANS

PO BOX: 1510 DEE WHY 2099
ABN - 90 645 409 801

APPROVED CONSULTING ENGINEERS

Project: 4/0 BENNETT STREET
CURL CURL

Title: GENERAL NOTES

Designed	Checked	Approved	Scale
CH	CH	CH	1 : 100

23/02/2021

Drawing number	Job number	Revision
S01	2021032	-