BALITO INVESTMENTS

142 – 146 Pitt Road, North Curl Curl

Flood Impact and Risk Management Report

Date: 07/12/2023

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Document Control

Project: Commercial And Residential Development
Address: 142 - 146 Pitt Road, North Curl Curl, NSW 2099

Title of Report: Flood Impact and Risk Management Report

Name of Client: Balito Investments

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142 - 146 Pitt Road, North Curl Curl, NSW 2099

FLOOD IMPACT AND RISK MANAGEMENT REPORT

IGS is engaged to prepare a Flood Impact and Risk Management report for site 142 Pitt Road, Curl Curl. This 1,254m2 property will undergo a knockdown of existing buildings and the construction of mixed-use commercial and residential development.

The assessment's objective includes advice on Tuflow Modelling based on Northern Beaches Council's Greendale Creek Flood Study and Flood Planning Levels (FPL), which aligns with Northern Beaches Council's requirements. Additionally, the report evaluates the compliance of proposed floor levels for future development at the site. This study uses the "Northern Beaches Councils Waringha DCP 2011 " and the "Greendale Creek Flood Study" to establish design flood data.

1. DEVELOPMENT SITE

The proposed development (Figure 1), located at 142 – 146 Pitt Road, North Curl Curl, consists of 3 storeys comprising 11 residential apartments, retail floors and basement parking access from Playfair Road.

The site is approximately 1,299 m2 along Pitt Road, with the closest intersection of Playfair Road. The site has an existing commercial building. The new proposed development will require a knockdown of the existing commercial buildings.

The following flood impact and risk management report will examine the current flood behaviour relative to the site and propose solutions to mitigate any risks towards the site.

The assessment has been based on the following available information and studies:

- **Attachment 1- Site survey by Peak Surveying Services, Job No 23 -2072, Survey Date: 25 May 2023.**
- **Attachment 2 - Architectural Plans from Warren and Mahoney Living Australia Pty Ltd, Project No. , 10146 Dated 30 November 2023.**
- **Attachment 3 – Flood Results for Pre and Post Scenario.**
- **Attachment 4 – Driveway Ramp Design by IGS.**
- **Attachment 5 – Flood Compatible Materials and Building Components.**

Figure 1: Site Location (Source: Near map)

2. Existing Flood Behavior

2.1 Existing Model Data

To understand the potential flood liability of the existing site and the impact that the development may have on flood behaviours, it is necessary to define flood behaviours for existing or pre-development conditions. "Greendale Creek Flood Study, WMA Water 2023" undertook detailed modelling of the catchment under 'existing' conditions and included the development of a WBNM hydrological model to describe rainfall-runoff processes and a TUFLOW hydraulic model to define flood hydraulics (e.g., depths, levels, and velocities) across the catchment. A copy of the 'Base Model' was made available by the Northern Beaches Council to assist with the current study.

The Northern Beaches Council has adopted the Greendale Creek Flood Study, and this study utilises its base model. The base model was further updated for existing scenario modelling to study flood behaviour. The updates within the existing model were required to reflect the existing building footprints and terrain levels along the vicinity of the site.

2.2 Existing Site Conditions

The site is affected by overland flows flowing from Playfair Road and Reid Avenue. There are existing stormwater pipes along Playfair Road and the terrain depression between the lots to divert stormwater towards Pitt Road—a 675 DIA. RCP traverses the lots, which connects to a kerb Inlet Pit in front of 148A Pitt Road and continues downstream and a 900 DIA. RCP is within Playfair Road. Please see the attached figure below.

The overland flows are seen along Playfair Road, towards Pitt Road and the depression points between the lots. The overland flows traverse the lots ponds at the rear of 146 -148 Pitt Road. As per the model, there is no escape route for the overland flows from 146 -148 Pitt Road, which acts as a basin.

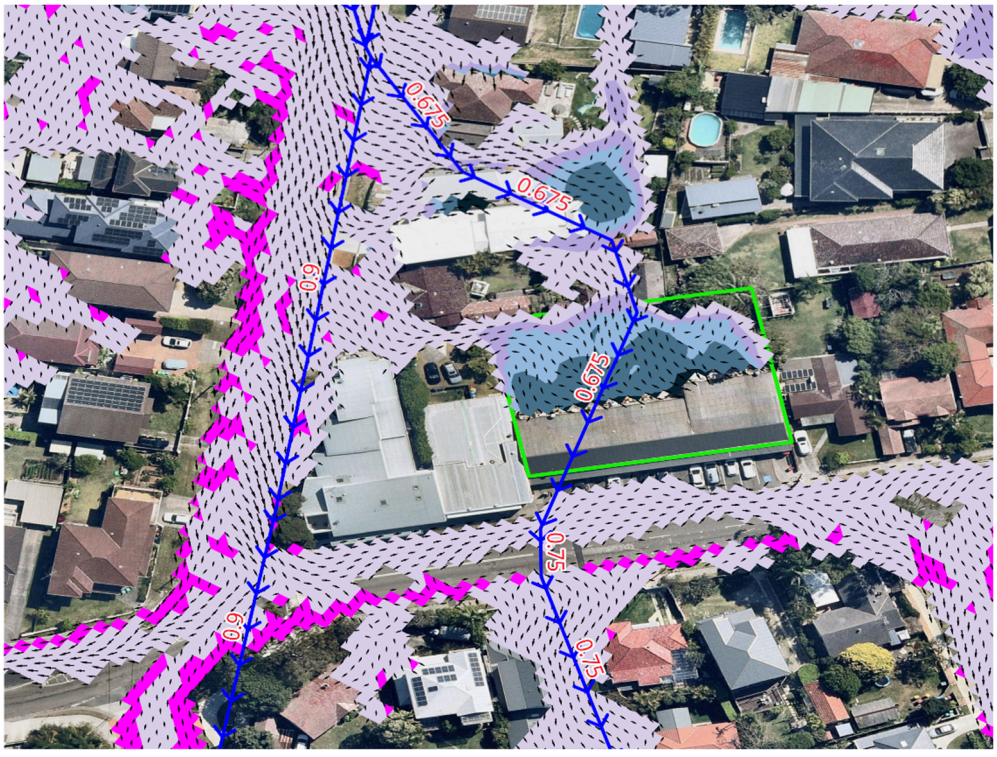


Figure 2. Figure shows the existing Overland Flows and Stormwater Network.

2.3 Existing Flood Assessment

The overland flowing from the northern direction of the catchment follows a natural depression within the catchment along Playfair Road and through residential lots and ponds at the rear of the site. The existing stormwater system within Playfair Road, the catchment, does not cater to the surface runoff, resulting in overland flows.

As per the existing scenario, the rear of the site acts like a basin. There is no escape route for overland flows in existing scenarios. Due to this, during critical storm events, a high hazard can be observed at the rear of the site.

A hazard map is prepared to investigate the hazard categorisation based on the NSW Floodplain Management Manual 2005. The Hazard level within the site varies from H1 to H5, with a high hazard of H4 observed at the rear during 1% AEP events, which may increase to H5 during more critical storm events.

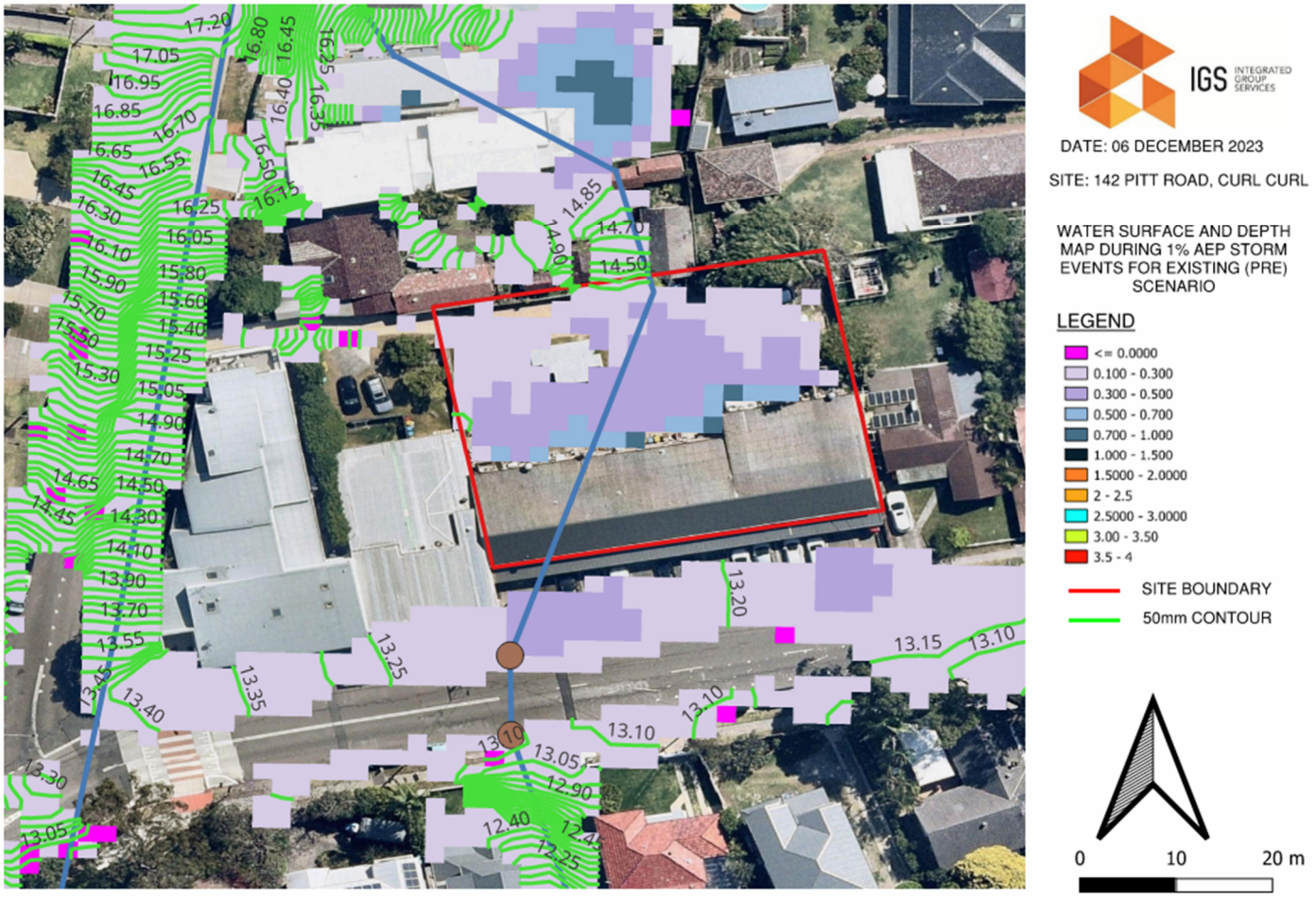


Figure 3: 1% AEP Water Surface Elevation and Flood Depth map for Existing Scenario

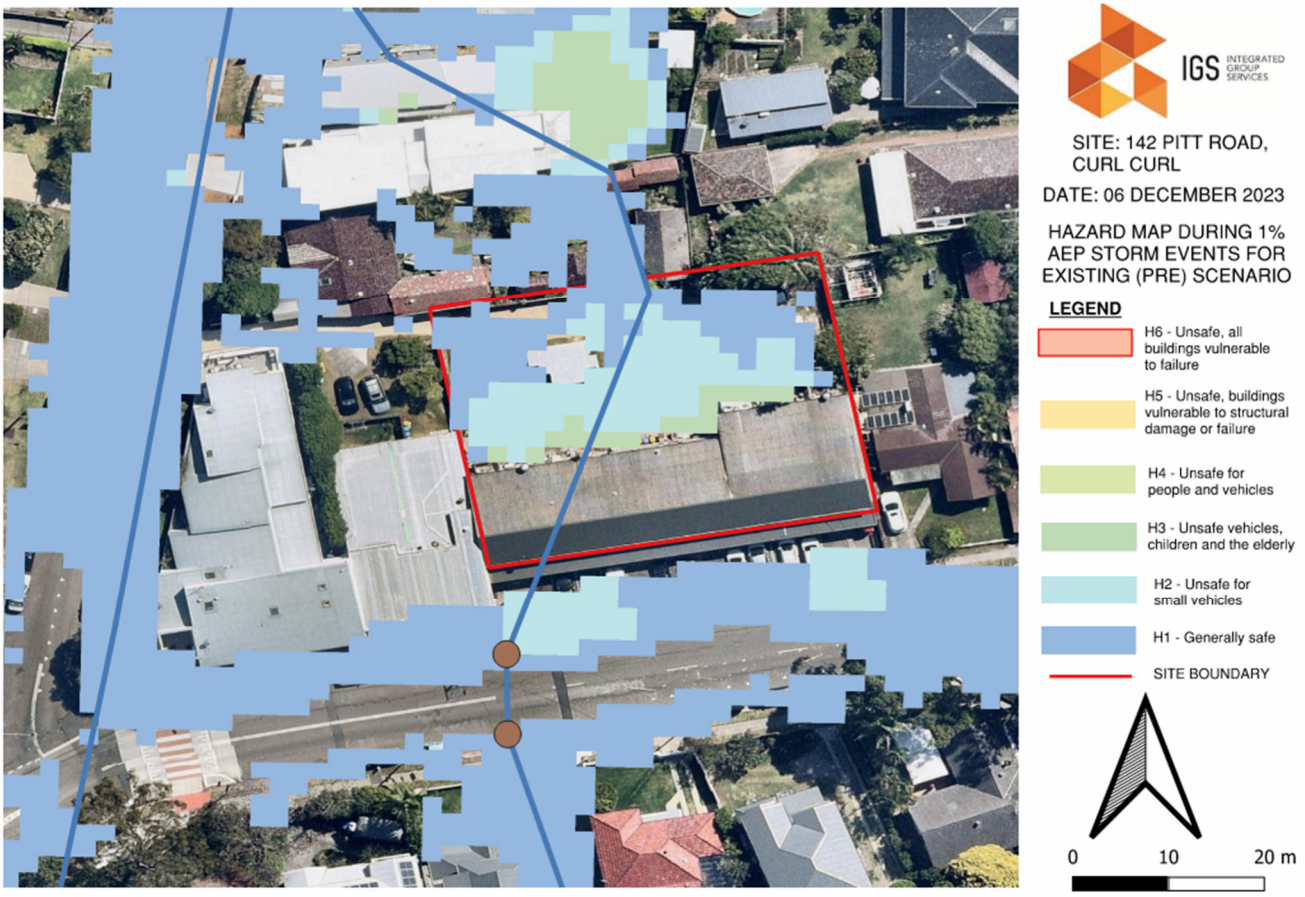


Figure 4: Hazard Map for Existing Scenario during 1% AEP Storm Events.

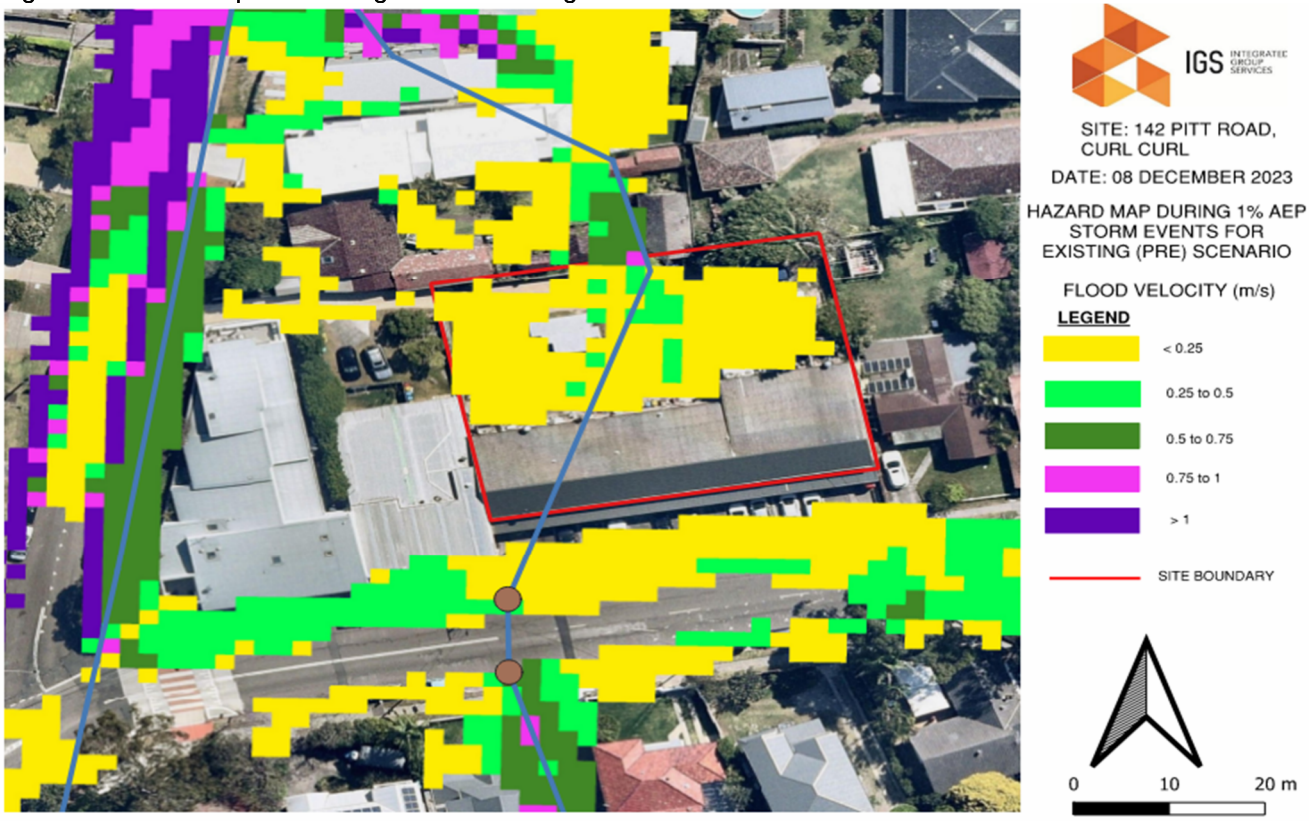


Figure 5: Velocity Map for Existing Scenario during 1% AEP Storm Events.

3. Post – Development Flood Behaviour

3.1 Description of the Proposed Development

The proposal is to build a 3-storey building with commercial and residential settings, including a basement carpark. The proposal includes 11 residential apartments and retail spaces on the ground floor.

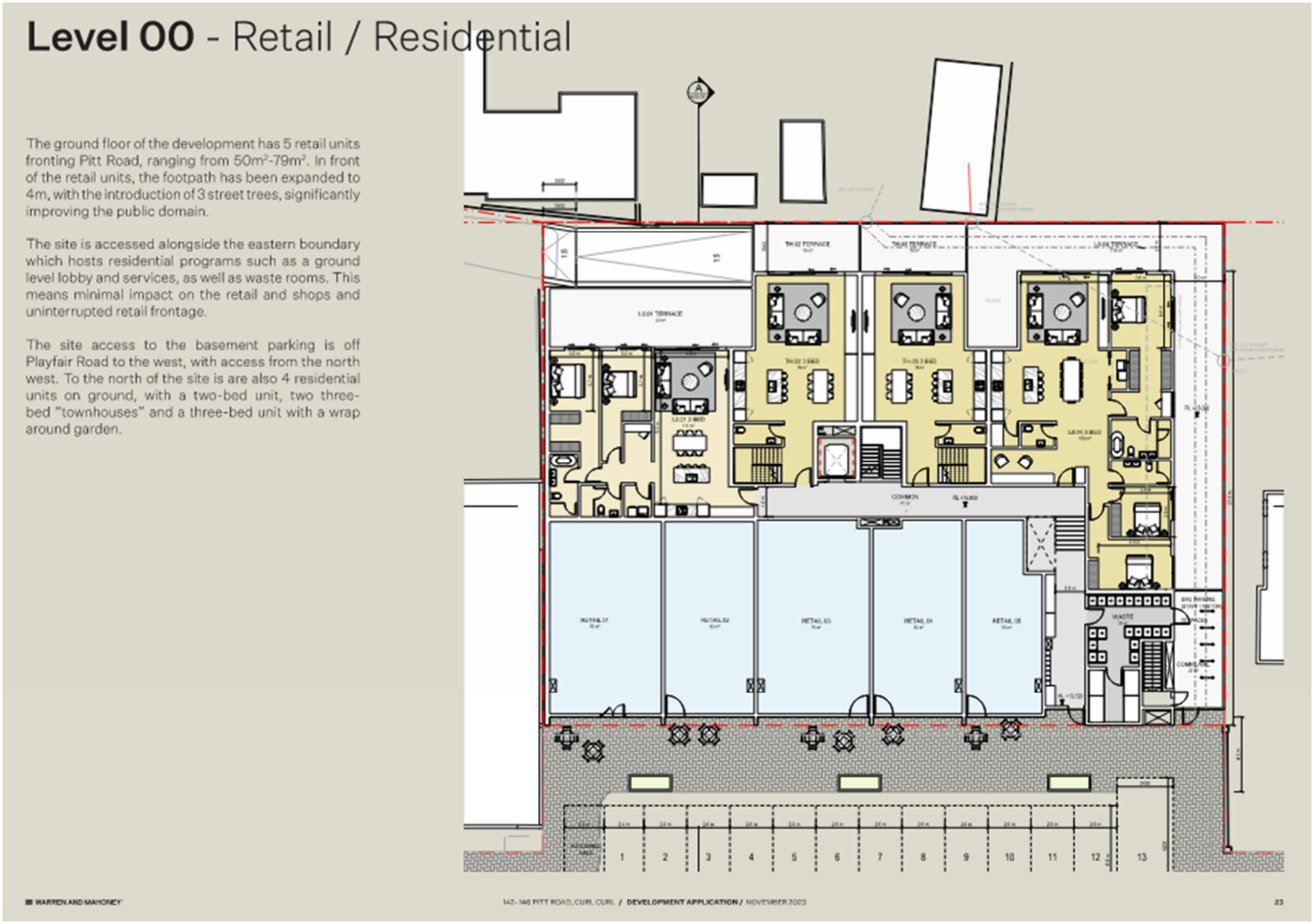


Figure 6: Level 00 – Retail / Residential.

The proposal also seeks to upgrade the existing 675 Dia. RCP traversing the site to 750 Dia. RCP and divert it along the eastern side boundary of the site. Thus, a 750 Dia. RCP pipe is diverted by creating a 3m wide drainage along the side boundary of the site. This will also provide an exit route to the overland flow flowing towards the rear of the site. Due to existing trees within the proposed boundary, the overland flow path is designed to convey flows under the suspended section of the building, which avoids the tree protection zone. The suspended section of the building is designed by using TUFLOW 2D Layered Flow Constriction with a 50% blockage factor. Refer to arborist report for more information on encroachment to tree protection zone.

This strategy will help upgrade the council's current infrastructure and improve the catchment's overland flow management. For more information, refer to the Stormwater Management Report and Easement Diversion Plans by IGS.

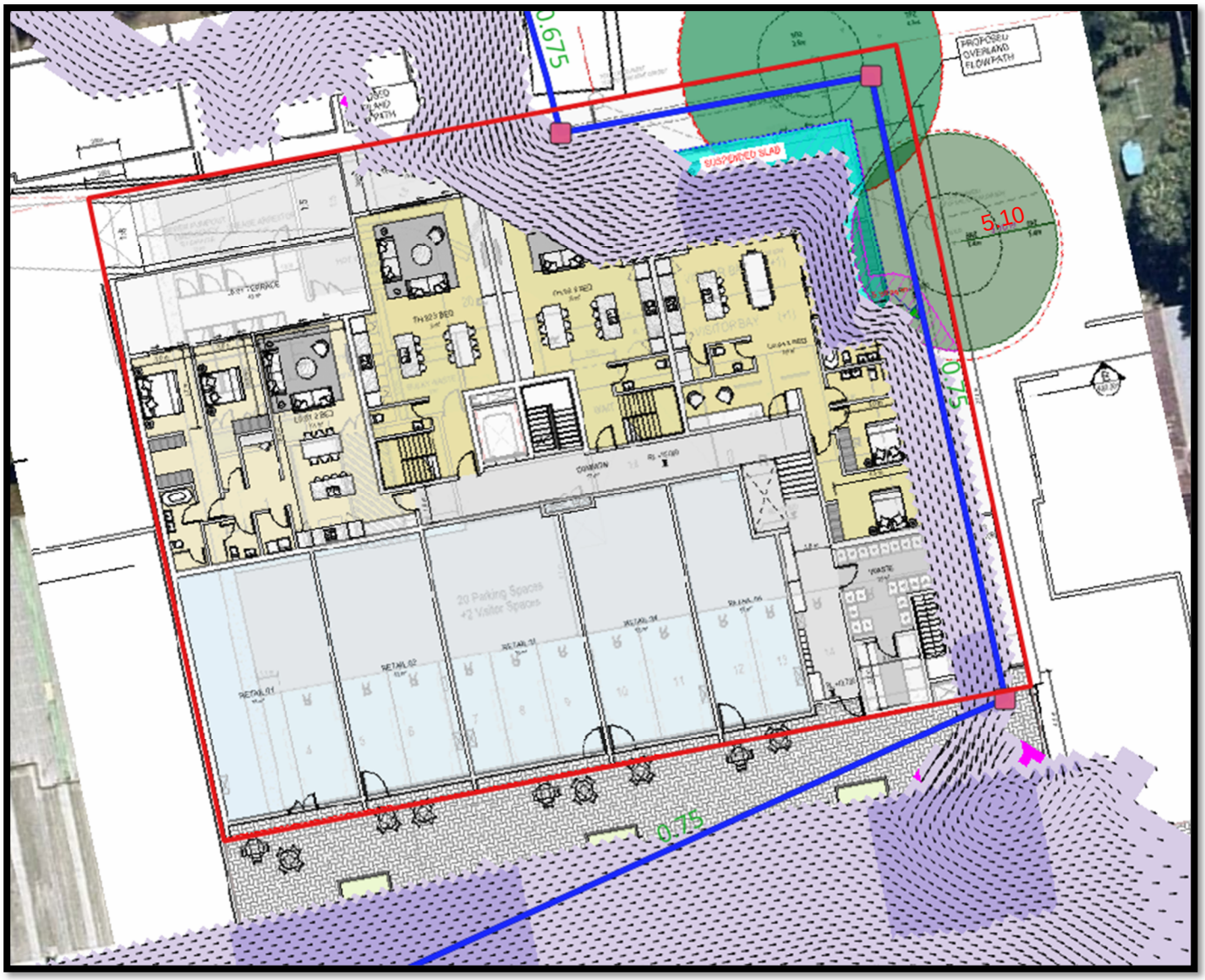


Figure 6: Easement and Overland Flow exit route.

3.2 Post – Development Flood Assessment

Flood Mitigation Measures and Modifications

As discussed, flood mitigation measures were required to ensure no adverse flood impacts across neighbouring properties. The critical mitigation measures include.

1. Provide an overland flow path to take the surface from the rear towards the front of the site.
2. The proposed Land-use (hydraulic roughness) coefficient was consistent with the existing model. The existing hydraulic Coefficient within the proposed easement is 0.052.
3. The terrain was modified according to the survey from Peak Surveying to reflect the surveyed ground levels within the site's vicinity.
4. The terrain was modified within the easement to ensure a minimum fall to take overland flows from the rear towards the front.
5. A driveway Crest at RL 16.00 is Proposed along the entrance through Playfair Road to ensure the basement is protected from 1%AEP plus 500 freeboard requirements.

Results

The updated model was used to re-simulate the 5% AEP, 1% AEP and PMF floods for 'Post-development' conditions. Peak floodwater depth and levels were extracted from the modelling results and are presented below. Flood hazard mapping was also prepared based on definitions in Book 6, Chapter 7 of the Australian Rainfall and Runoff (ARR) 2019 and included within the Attachments.

As per the Post Flood assessment results, providing an exit route to the existing overland flows at the rear and proposing a 3m wide drainage easement improved flood behaviour for the site. A comparison between pre and post (afflux maps) indicates a maximum difference of 20mm depth within the neighbouring properties, within the acceptable tolerance range as advised by the Northern Beaches Council.

The 1% AEP flood level varies within the site, and the maximum level of 14.50m AHD can be seen at the rear of the site. A maximum velocity of 0.5 – 0.75 m/s can be seen at the rear, with a maximum hazard category of H2 along the proposed easement.

A flood planning assessment has been performed on the proposed development to set the flood planning levels, which are presented in the sections below.

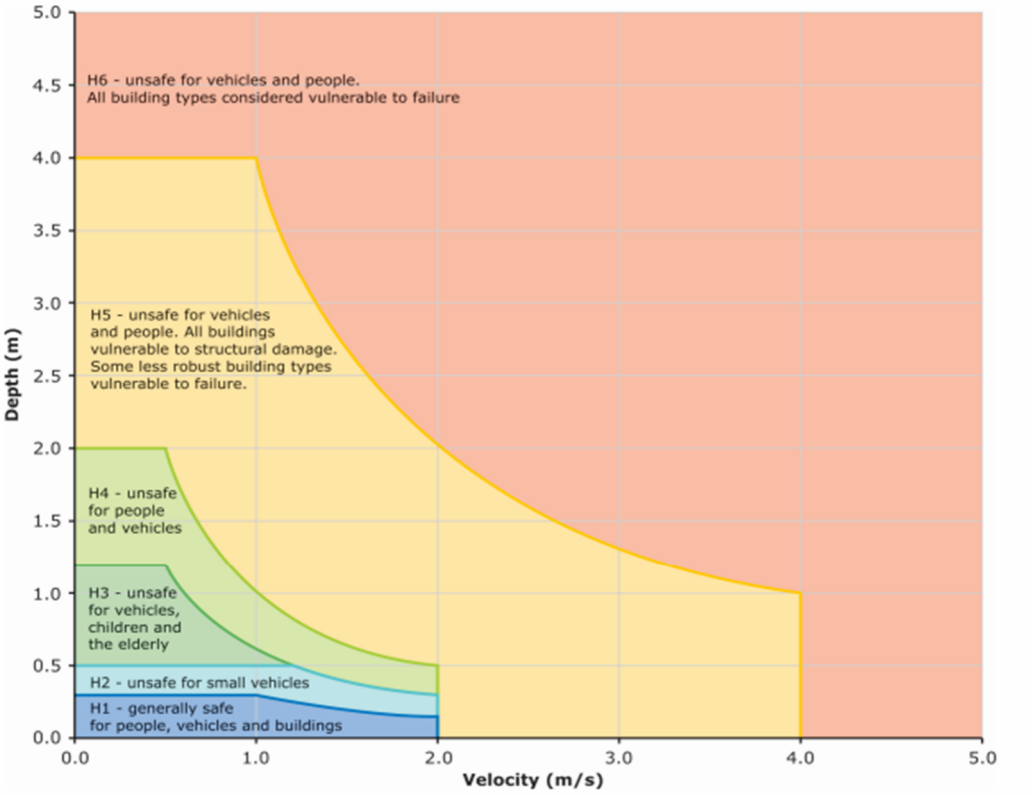


Figure 6.7.9. Combined Flood Hazard Curves (Smith et al., 2014)

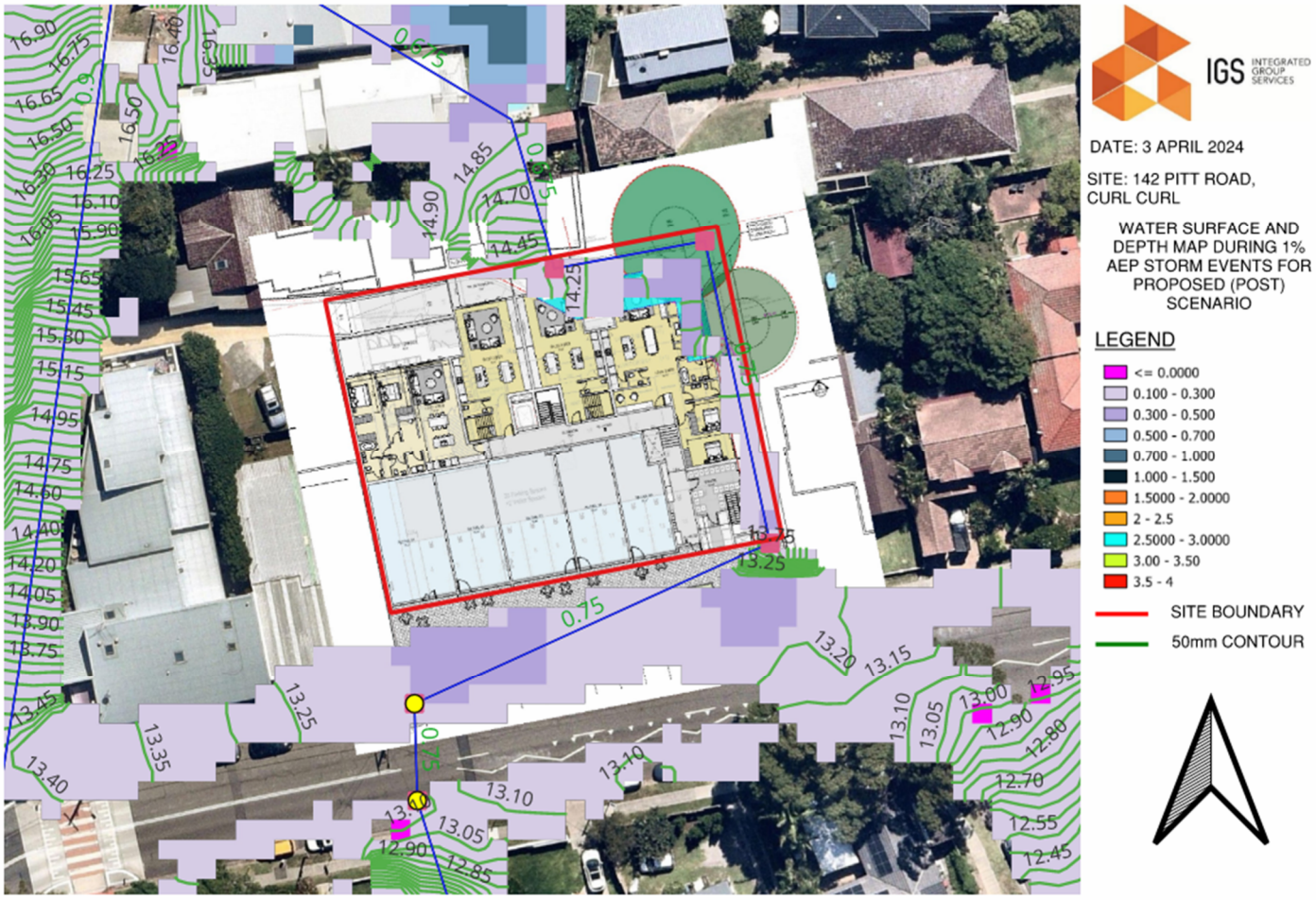


Figure 7: 1% AEP Flood Depth and Water Surface Elevation for Post–Scenario.

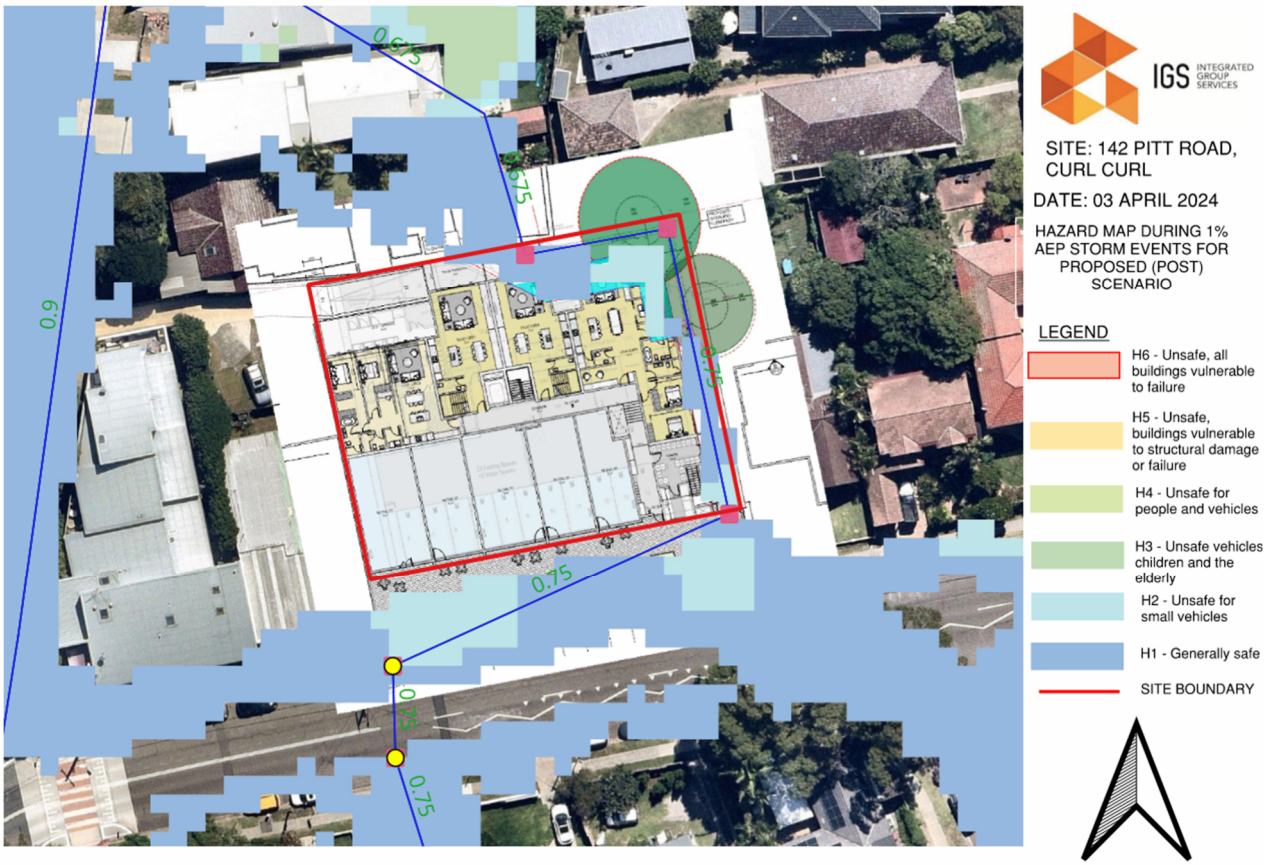


Figure 8. Hazard Map during 1% AEP storm events.

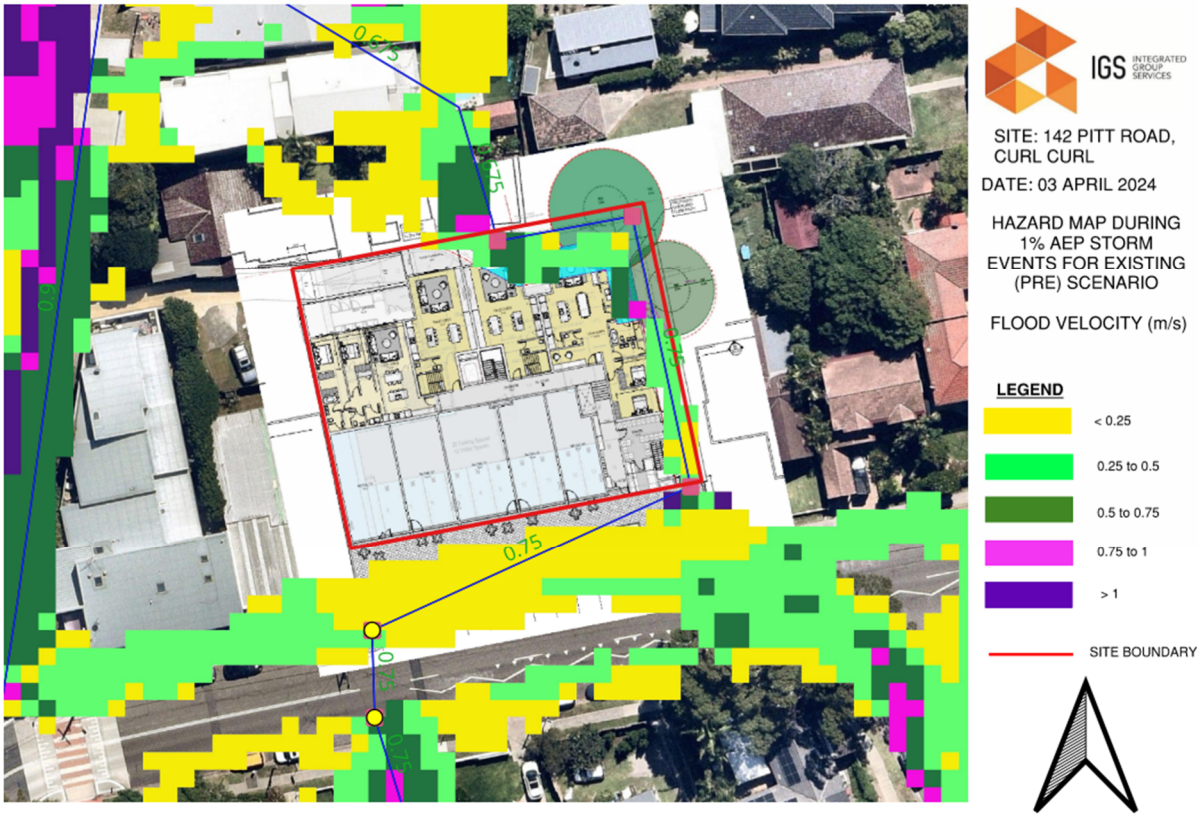


Figure 9. Velocity Map during 1% AEP storm events.

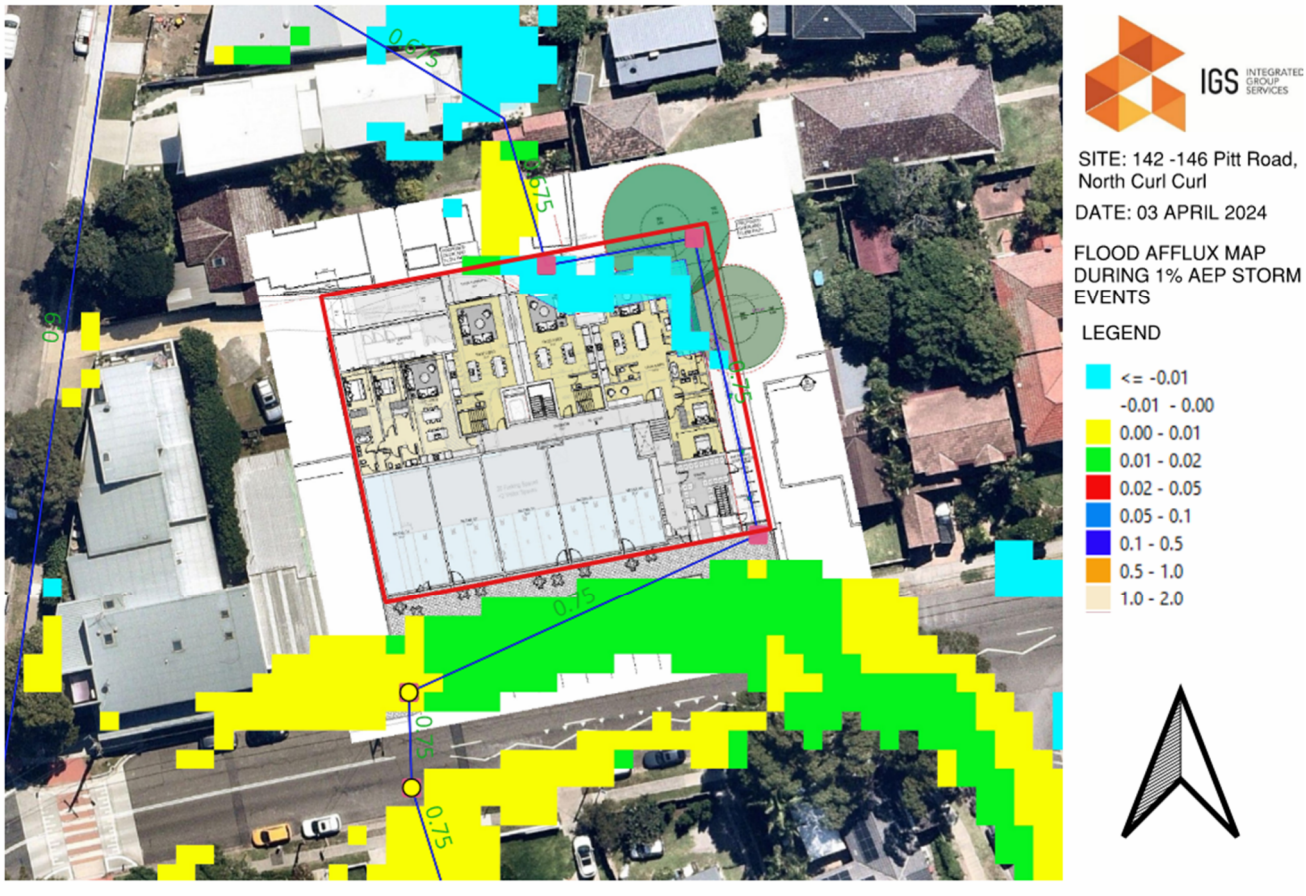


Figure 10. Afflux Map during 1% AEP storm events.

Figure 11. PMF Depth and Flood Map.

4. Flooding and Proposed Development

4.1 Flood Risk Precinct

As per the Northern Beaches Council Guidelines for Development on Flood Prone Land, the floodplains are classified based on different Hazard levels of potential flood risk. The council has adopted three three-tier Flood Risk Precincts.

a. **High Flood Risk Precinct** – The High Flood Risk Precinct lies within the Medium Flood Risk Precinct and covers flood-prone land, which is subject to a high hydraulic hazard.
b. **Medium Flood Risk Precinct** – The medium Flood Risk Precinct is equivalent to the Flood Planning Area and covers flood-prone land subject to a high hydraulic hazard.
c. **Low Flood Risk Precinct** – The Low-Risk Precinct covers flood-prone land affected by the Probable Maximum Flood (PMF) but is outside the Medium Flood Risk Precinct. The PMF is equivalent to the largest ever conceivable Flood.

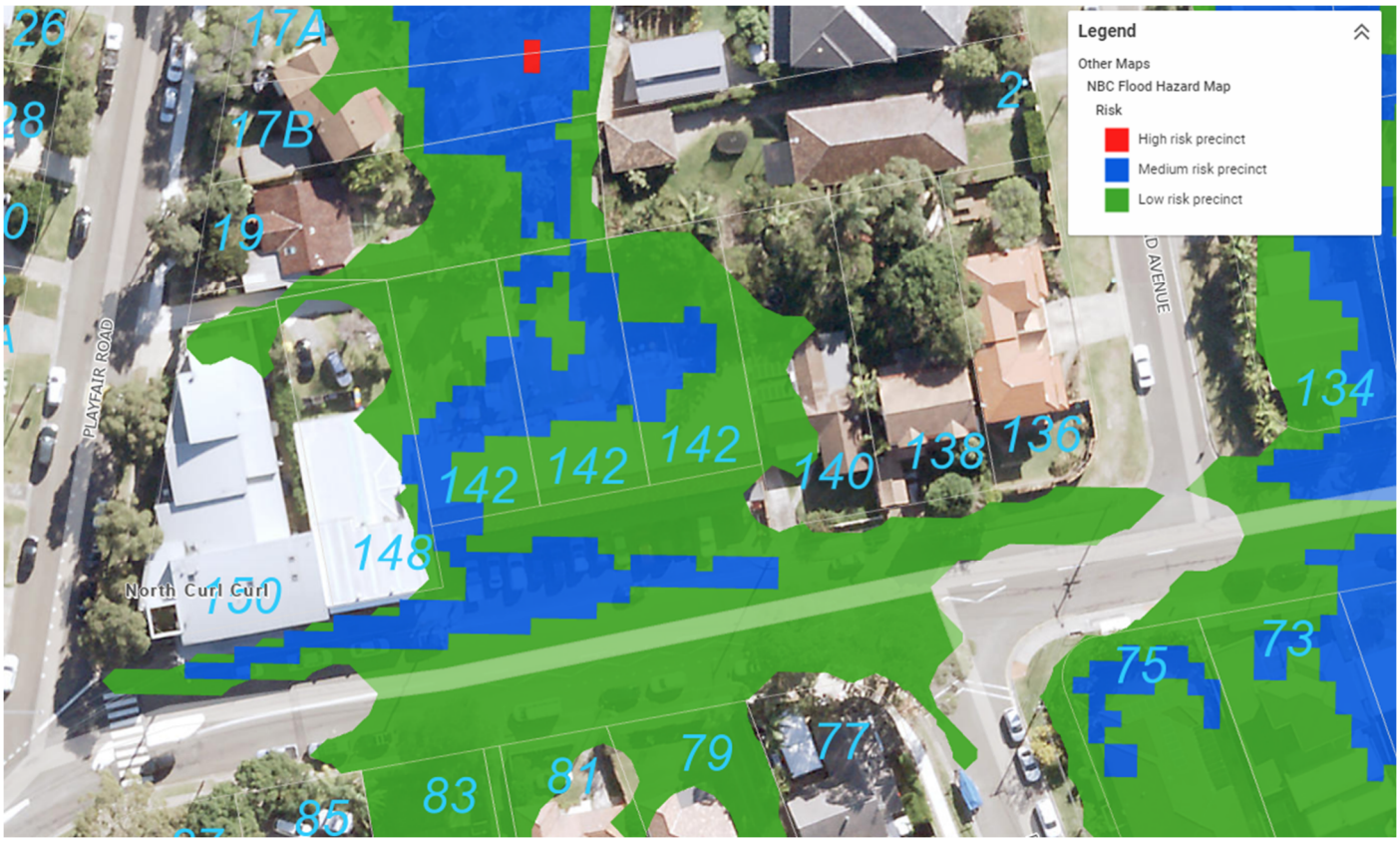


Figure 12. Flood Risk Precinct Categorization as per Northern Beaches Council.

The proposed site lies between Low to Medium Flood Risk Precinct. The development proposal reduces the flood Hazard within the site and improves the overall drainage pattern.

4.2 Flood Planning Requirements

IGS has identified the existing flood behaviour at the 142 -146 Pitt Road, North Curl Curl site. The provisions outlined in section 3.2 have been derived to ensure the site's intended functionality remains uncompromised and safe.

The requirements for Flood Planning Levels are given in **Table 3-1**, as per the Warringah Development Control Plan, E11 Flood Prone Land.

Table 3-1 Summary of Flood Planning Control – Warringah Development Control Plan

Control	Comment
A. Flood Caused by the Development	
A1. The 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: **a.** There are no adverse impacts on flood levels or velocities caused by alterations to the flood conveyance; and **b.** There are no adverse impacts on surrounding properties; and **c.** It is sited to minimise exposure to flood hazard.	The proposed development is not predicted to have a significant adverse flood impact on flood levels and velocities. The proposed development will not alter the existing flood behaviour. Provided the overland flows within site are thoughtfully captured and directed to the swale system incorporated as part of the proposed development and discharged to the front along the fall of the land and council stormwater infrastructure in front of the site. As per the Post Modelling Flood Results and Afflux Maps no adverse impact on flood level or velocities and surrounding properties has been observed. The proposal has reduced the existing flood hazard and improved the overland flow within the properties.
A2. 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.	The flood storage within the site has been increased by introducing an overland flow on top of the existing drainage easement. The proposal also has upgraded the existing 675 RCP to 750 RCP which allows for more capacity and handle peak flows.
Building Components & Structural Soundness	
B1 All buildings shall be designed and constructed with 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).	This will be designed during the detailed design phase. However, the development is expected to comprise construction for areas below the flood planning level, considered flood-compatible building materials. Refer to Attachment for a list of flood-compatible materials.
B2 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. Where shelter-in-place refuge is required, the	A structural engineer will satisfy this requirement as part of the detailed design based on the flood information in this report.

structural integrity for the refuge is to be up to the Probable Maximum Flood level. Structural certification shall be provided confirming the above.	
B3 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.	A service designing consultant will satisfy this requirement as part of the detailed design based on the flood information in this report.
Floor Levels	
C1 New floor levels within the development shall be at or above the Flood Planning Level.	The Flood Planning level for Basement and Residential Floors is set at 1% AEP plus 500mm Freeboard. All Residential floor levels and Basement Entrances are set above 1% AEP plus Freeboard.
C3 All new developments must be designed and constructed so as not to impede the floodway or flood conveyance on the site, as well as ensure no net loss of flood storage in all events up to the 1% AEP event.	The proposed development will not alter the existing flood behaviour. Provided the overland flows within the site are thoughtfully captured and directed to the swale system incorporated as part of the proposed development and discharged to the existing open drain at the rear and council stormwater infrastructure in front of the site.
C7. Consideration may be given to a floor level below the Flood Planning Level within the first 5 metres from the street front in an existing business zone provided it can be demonstrated that: (a) The minimum floor level is no lower than the adjacent footpath level, and (b) The maximum internal distance from the front of the building is 5 metres, which can only apply to one side of an individual premises, and (c) The maximum area for the floor area to be below the Flood Planning Level for an individual premises is 30 square metres, and (d) There is direct internal access between areas above and below the Flood Planning Level for each individual premises.	The proposed retail space on the ground floor along Pitt Street is set at RL 13.72m AHD. The proposed Retail Spaces are not within the flood extent and are 500mm above the adjacent Flood level. Refer to the Flood Planning assessment below.
D. Car Parking	

D7 All enclosed car parks must be protected from inundation up to the Probable Maximum Flood level or Flood Planning Level whichever is higher. For example, basement carpark driveways must be provided with a crest at or above the relevant Probable Maximum Flood level or Flood Planning Level whichever is higher. All access, ventilation and any other potential water entry points to any enclosed car parking shall be at or above the relevant Probable Maximum Flood level or Flood Planning Level whichever is higher.	A driveway crest at RL 16.00 is provided along the vehicular crossing from Playfair Street. 1% AEP Flood level at Playfair = 15.50m AHD (Maximum) PMF Level at Playfair = 15.65m AHD (Maximum) Entry Stairs to the basement are to be set at RL 14.70m AHD.
E. Emergency Response	
E1. **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.** **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.** **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).** **Where flood-free evacuation above the Probable Maximum Flood level is not possible, new development must provide a shelter-in-place refuge where:** **a) The floor level is at or above the Probable Maximum Flood level; and** **b)** **The floor space provides at least 2m2 per person where the flood duration is long (6 or more hours) in the Probable Maximum Flood event, or 1m2 per person for less than 6 hours;** **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** **d)** **It must contain as a minimum: sufficient clean water for**	The Flood Hazard around the Vicinity of the site is between H1 to H2 only. During severe events, the SES Evacuation Plan for North Curl Curl must be followed and await further instruction from SES. All Residential and Basement Floor levels are proposed above or equal to 1% AEP plus 500 or PMF storm events. During any flood events it is recommended to avoid Northern and Eastern side boundary of the site.

all occupants; portable radio with spare batteries; torch with spare batteries; and a first aid kit **Class 10 classified buildings and structures (as defined in the Building Codes of Australia) are excluded from this control.** **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.** **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**	
F. Fencing	
F1 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.	The fence at the rear and eastern sideways must be open type as per the council's fencing requirements.
G. Storage of Goods	
G1 Hazardous or potentially polluting materials shall not be stored below the Flood Planning Level unless adequately protected from floodwaters in accordance with industry standards.	All proposed floor levels are above or equal to the flood planning level.

4.3 Flood Planning Levels

Description	Flood level at 1% AEP storm events (m AHD)	Flood level at PMF storm events (m AHD)	Minimum FPL required.	Proposed Habitable & Non Habitable FFL level (m AHD)	Freeboard Provided (mm)	Complies with council requirements?
Driveway Entry from Playfair Road	15.50	15.65	16.00m AHD	Proposed Crest Level 16.00m AHD	500mm	Yes
Residential Floors at Ground Floor	14.50	16.15	15.00m AHD	15.00m AHD	500mm	**Yes**
Retail Space on Ground Floor	**13.25**	**13.45**	**13.25m AHD**	**13.72m AHD**	**470mm**	**Yes**

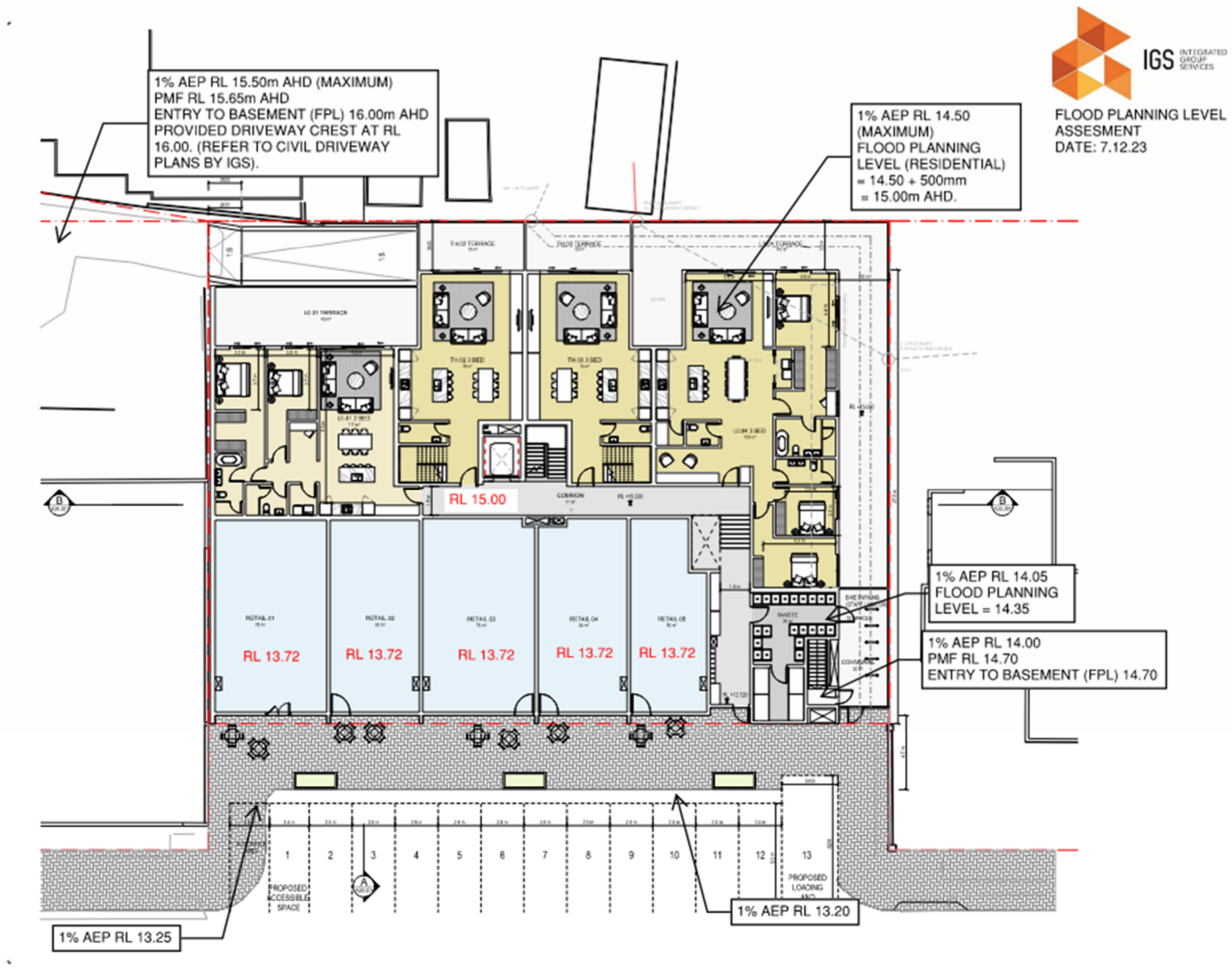


Figure 13. Flood Planning Assessment.

5. Flood Risk Management

5.1 On-Site Refuge and Evacuation

During extreme events, it is recommended that you stay on the 2nd floor of the building and follow directions from SES and other authorities. During flood events, the site's Rear and Eastern boundaries must be avoided, and you must evacuate to the higher grounds.

Flood Evacuation and Warning

This site must be evacuated when NSW SES issues an Evacuation Order. During extreme events, the Bureau of Meteorology will provide warnings through local radio stations, television, and websites, and NSW SES will also provide information on evacuation warnings and evacuation orders.

5.2 Flood Preparedness

Evacuation Warnings and Evacuation Orders are issued to residents and businesses from SES via media, door knocking and /or telephone.

The following measures should be undertaken for flood preparedness:

- A flood emergency kit must be prepared to be used in the event of flooding.
  The list of items to be included in the emergency kits can be found on the SES website,

  (https://www.ses.nsw.gov.au/floodsafe/prepare-your-home/emergency-kit/)

  - Portable radio with spare batteries
  - Torch with spare batteries
  - First aid kit (with supplies necessary for your household)
  - Candles and waterproof matches
  - Essential papers, including emergency contact numbers
  - Copy of any Home Emergency Plans
  - Waterproof bag for valuables

  When leaving or evacuating your property, place in your emergency kit:

  - A good supply of required medications
  - Any special requirements and supplies for babies, the disabled, the infirm and/or the elderly
  - Appropriate clothing and footwear
  - Fresh food and drinking water
  - Any list of visitor's logbooks or sign-in books on site.

  Keep your emergency kit in a waterproof storage container.

  Regularly check your emergency kit (remember to check use-by dates on batteries and gloves) and restock items if needed. Also, keep a list of emergency numbers near your phone or fridge.

  (Refer to the Attached Emergency Kit brochure from SES).

Local Flood Safe contacts

Emergency Phone numbers	
NSW SES	132 500
Life–threatening emergencies	000 (triple zero)
Phone Numbers	
NSW SES Information Line	1800 201 000
Police Assistance line	131 444
Roads and Maritime Services (Live Traffic)	132 701
Northern Beaches Council	1300 434 434
Disaster Welfare Assistance Line	1800 018 444
Department of Primary Industries	1800 814 647
Essential Energy	132 391
Telstra	132 203
Local Land Services	1300 795 299

Local Broadcast radio Stations

Radio Northern Beaches	90.30 FM	88.70 FM

Websites

NSW SES	www.ses.nsw.gov.au
Northern Beaches Council	https://www.northernbeaches.nsw.gov.au/
Bureau of Meteorology	www.bom.gov.au
Major Roads – Live Traffic	www.livetraffic.com
Local Roads	www.myroadinfo.com.au

Free Smartphone apps

NSW SES apps are available at app store. Search for Flood safe and StormSafe.

5.3 Flood Risk Management

Following Flood protection measures are recommended for the development.

- All structures must have flood-compatible building components/materials (e.g., concrete, timber, steel, and brickwork) below 100-year ARI flood level and the freeboard.
- Provide adequate storage areas for hazardous materials and valuable goods above the flood level.
- Electric wiring below the flood planning level shall be placed in conduits, and the conduits shall be able to drain "dry" once flood water recedes. Power points and switches below this level must be sealed, waterproofed, and securely installed.
- It is advised that floor and wall coverings are flood-compatible materials.
- Bolts, nails, hinges, and fittings shall be galvanised or stainless steel. Hinges with removable pins are recommended.

6. Summary

IGS has completed a Site-Specific Flood Risk Management Report for the proposed development at 142 – 146 Pitt Road, North Curl Curl. Based on the available information and performed Tuflow Modelling, the following summary of recommendations is given below:

- It is recommended to take refuge within the communal space at RL 15.00m of the residence and await further instruction from SES/relevant authorities.

- The flood planning levels mentioned in section 3 of this report and as indicated in the architectural plans by Warren and Mahoney, meet the flood planning requirements as per Warringah Development Control Plan 2011 DCP. These levels must be maintained to protect the property from flood waters.

This flood impact and risk management plan has identified the flood risks associated with the site and outlined flood mitigation and management strategies that address potential risks and hazards to the occupants and structure of the building.

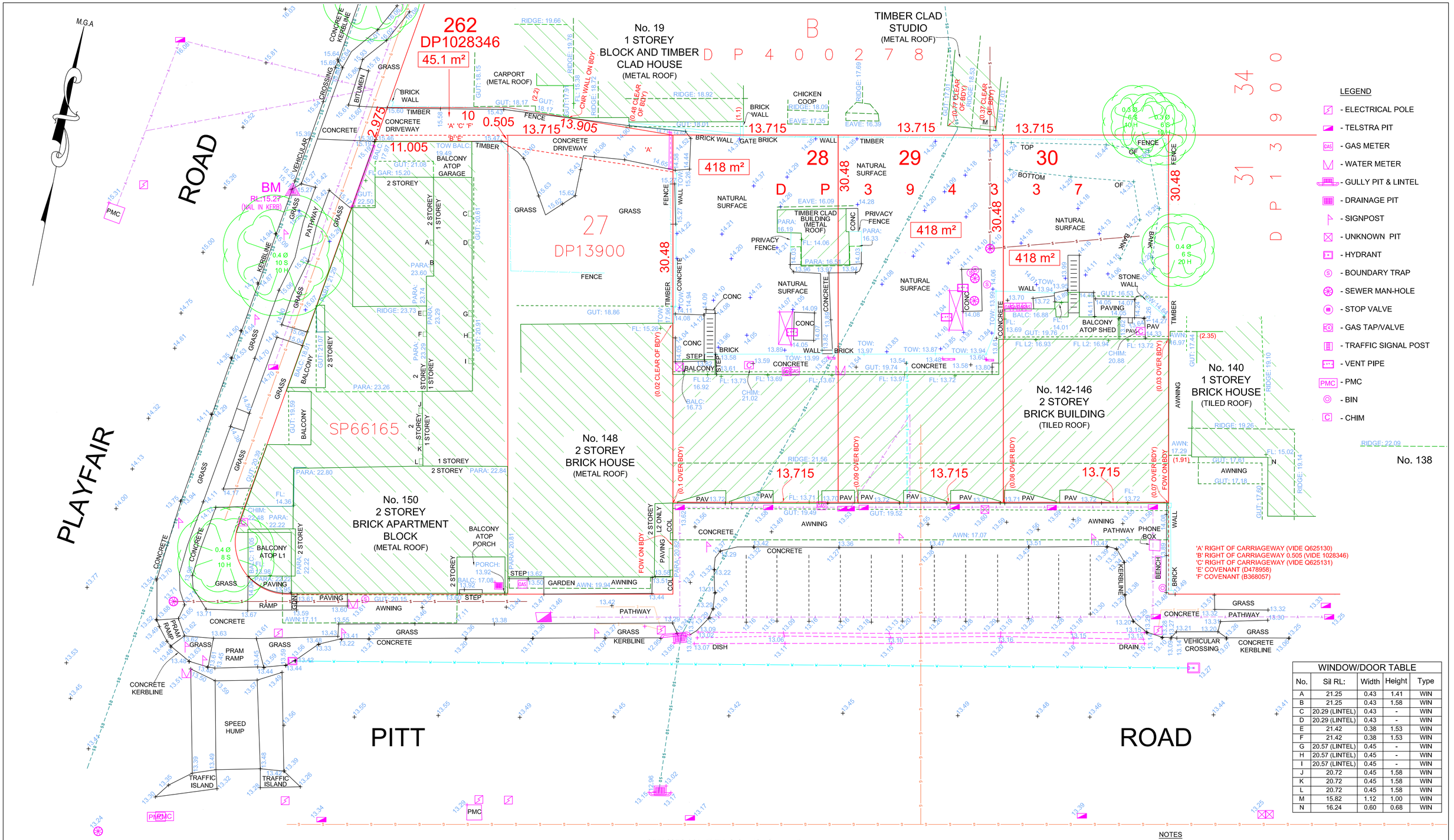
Based on the incorporated flood planning levels and flood impact and risk management plan, we believe this development application meets all flooding and risk management requirements stipulated within the Warringah Development Control Plan 2011 and Northern Beaches council Building in Flood Prone Land Guidelines.

7. Attachments:

- Attachment 1- Site survey by Peak Surveying Services, Job No 23 -2072, Survey Date: 25 May 2023.
- Attachment 2 - Architectural Plans from Warren and Mahoney Living Australia Pty Ltd, Project No., 10146 Dated 06 December 2024.
- Attachment 3 – Flood Planning Assessment Levels.
- Attachment 4 – Flood Results for Pre and Post Scenario.
- Attachment 5 – Driveway Ramp Design by IGS.

8. References

- Greendale Creek Flood Study, WMA Water 2022
- Warringah Development Control Plan 2011
- NSW Floodplain Manual 2005
- SES website



WINDOW/DOOR TABLE				
No.	Sil RL:	Width	Height	Type
A	21.25	0.43	1.41	WIN
B	21.25	0.43	1.58	WIN
C	20.29 (LINTEL)	0.43	-	WIN
D	20.29 (LINTEL)	0.43	-	WIN
E	21.42	0.38	1.53	WIN
F	21.42	0.38	1.53	WIN
G	20.57 (LINTEL)	0.45	-	WIN
H	20.57 (LINTEL)	0.45	-	WIN
I	20.57 (LINTEL)	0.45	-	WIN
J	20.72	0.45	1.58	WIN
K	20.72	0.45	1.58	WIN
L	20.72	0.45	1.58	WIN
M	15.82	1.12	1.00	WIN
N	16.24	0.60	0.68	WIN

SERVICES (vide BYDA Only -- Not Surveyed)

- AUSGRID
- JEMENA GAS
- STORMWATER (NBC)
- NBN & TELSTRA
- SEWER
- TELSTRA
- SYDNEY WATER

NOTES

- TOW DENOTES TOP OF WALL
- LINTEL HEIGHTS SHOWN WHERE SIL INACCESSIBLE FOR MEASUREMENT
- CONC DENOTES CONCRETE
- COL DENOTES COLUMN
- NBC DENOTES NORTHERN BEACHES COUNCIL

NOTES

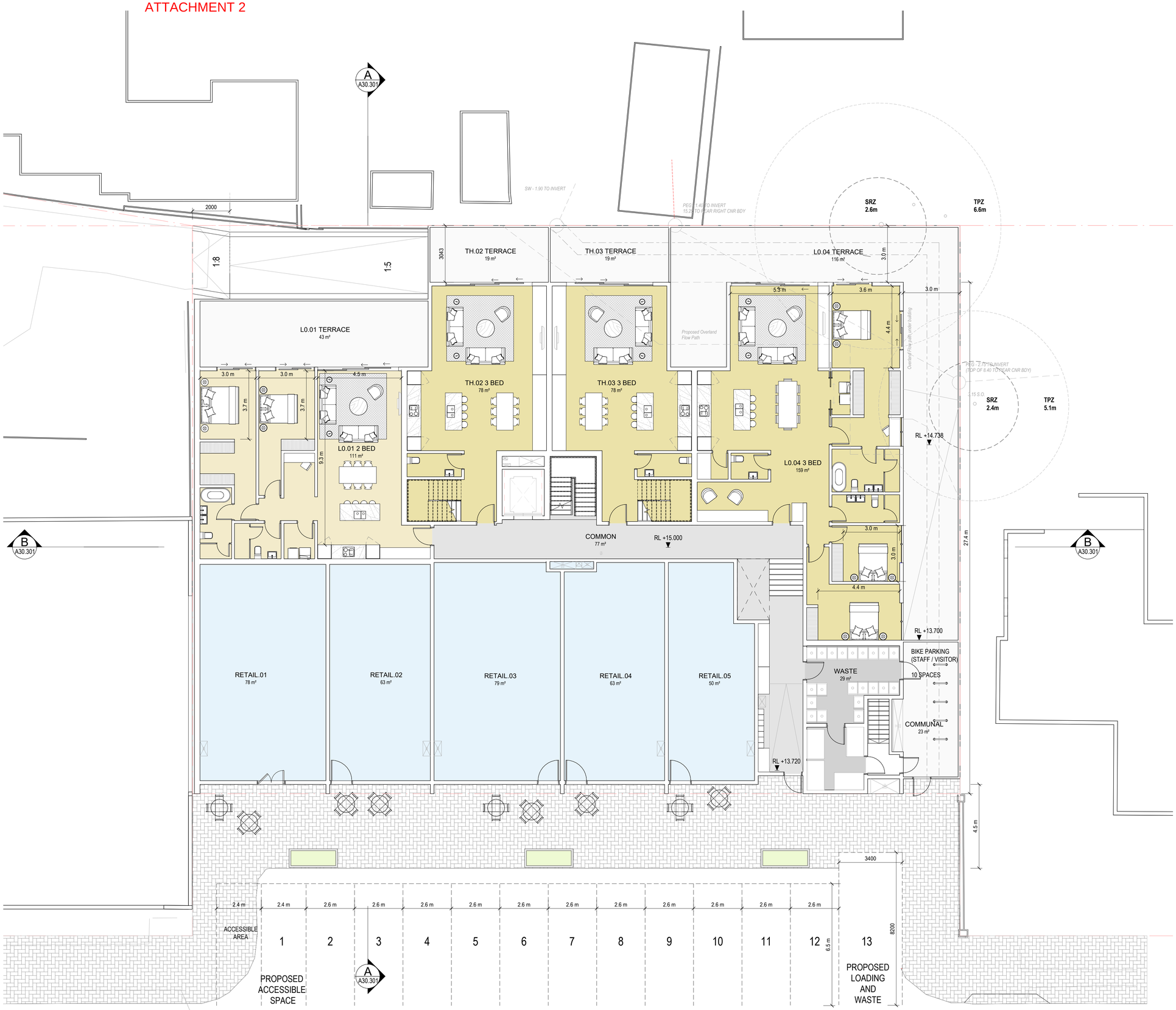
- TREE DIMENSIONS SHOWN APPROXIMATELY ONLY
- ONLY SERVICES AND WINDOWS VISIBLE FROM WITHIN THE SUBJECT PROPERTY AT THE TIME OF SURVEY SHOWN. BYDA UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND ANY CRITICAL LOCATIONS/DEPTHS MUST BE CONFIRMED BY A QUALIFIED UNDERGROUND SERVICE LOCATING PROFESSIONAL.
- NO SERVICE PITS ACCESSED/OPENED SHOWN AS LABELLED
- BOUNDARIES BY SURVEY. IDENTIFICATION SURVEY STANDARD
- ALL PITS SHOULD BE ACCESSED, CONFIRMED AND HAVE SUBSURFACE EXTENTS MEASURED BY THE RELEVANT AUTHORITIES, PRIOR TO ADOPTION. ALL PIPES, CABLES & DUCTS IN THE EXCAVATION AREA SHOULD BE ACCURATELY LOCATED BY A "PIPE LOCATOR" OR BY THE RELEVANT AUTHORITY, PRIOR TO ANY EXCAVATION IS UNDERTAKEN.
- THE SUBJECT TITLE'S ARE AFFECTED BY A COVENANT AFFECTING LOT 28 ONLY (VIDE C225341), A RIGHT OF CARRIAGEWAY (VIDE Q625130, Q625131 & DP1028346) & COVENANT'S (VIDE D478958 & B368057)

SHEET 1/1

PEAK SURVEYING SERVICES
PO BOX 23 CAMMERAY, NSW 2062
PO BOX 1 WENTWORTH FALLS, NSW 2782
Ph: (02) 9882 6769
Web: peaksurveying.com.au
Email: admin@peaksurveying.com.au

DETAIL SURVEY @ No. 142-146 PITT ROAD NORTH CURL CURL, NSW, 2099	JOB No: 23-2072	SCALE: 1:150 (@A1)/ 1:300 (@A3)
	SURVEYED ON: 24/05/23 & 25/05/23 BY: J PIERCE & M GONZALEZ	NORTH: MGA (by DP1028346)
		DATUM: PM2211 RL: 29.046 (AHD)
CLIENT: GRANT PRICE	DRAWN ON: 31/05/2023 BY: J PIERCE & M GONZALEZ	CONTOUR INT: N/A

ATTACHMENT 2



Revisions

A	06/12/2023	DA Submission

Notes

N
PROJECT NORTH

N
TRUE NORTH

Warren and Mahoney Living Australia Pty Ltd

Registered Architects and Designers
www.warrenandmahoney.com

Project Title

142-146 PITT ROAD

North Curl Curl, NSW, 2099

Drawing Title

Ground Level

Drawing Status

Development Application

Drawing Details

Scale	1 : 100@ A1
Date	2/04/2024 3:39:18 pm
Job No	10146
Drawn	PM
Checked	MM

Drawing No A10.100 **Revision** A

WARREN AND MAHONEY®

ATTACHMENT 3

IGS INTEGRATED GROUP SERVICES

FLOOD PLANNING LEVEL ASSESMENT
DATE: 4.04.24

1% AEP RL 14.50 (MAXIMUM)
FLOOD PLANNING LEVEL
(RESIDENTIAL) = 14.50 + 500mm
= 15.00m AHD.

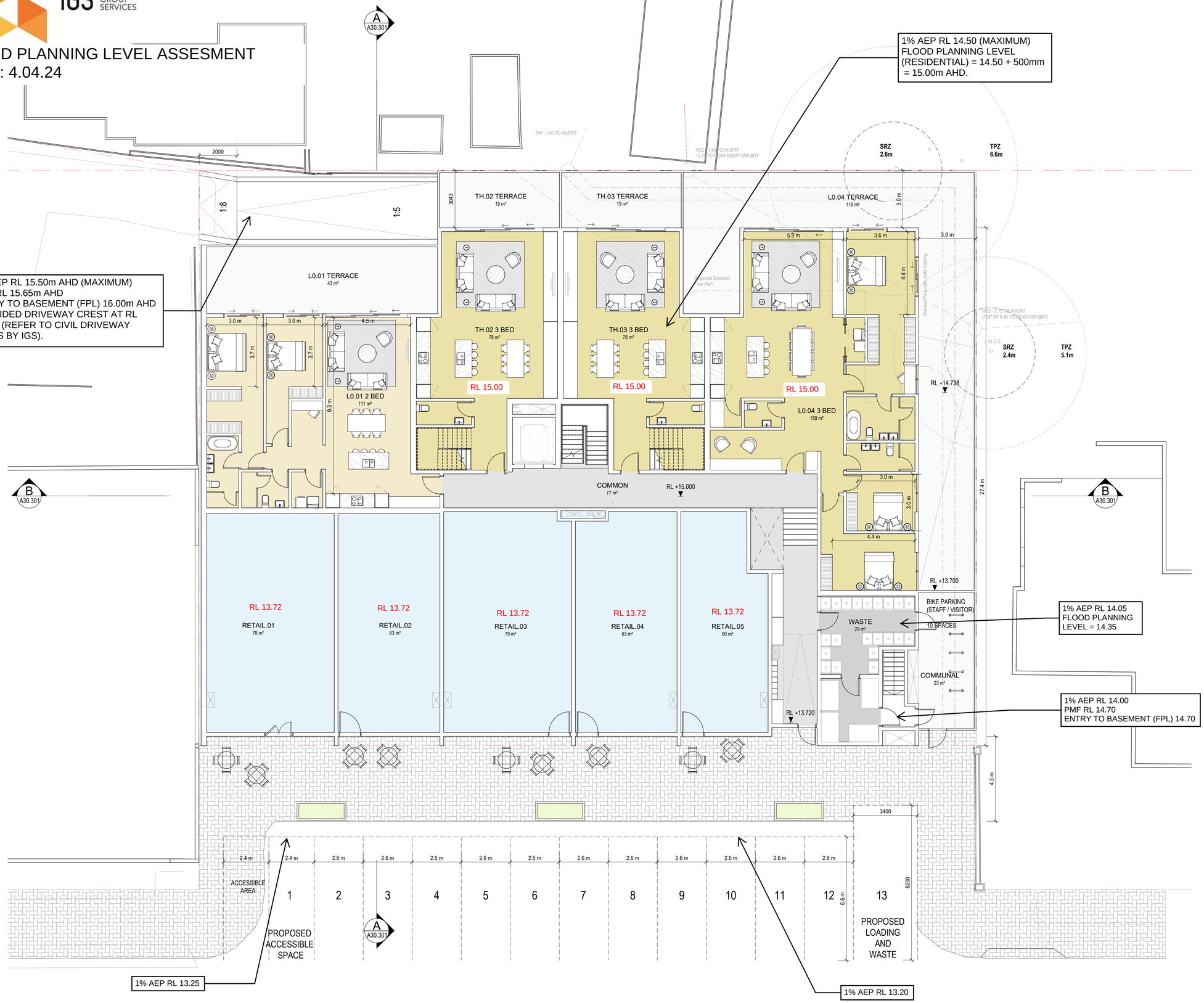
1% AEP RL 15.50m AHD (MAXIMUM)
PMF RL 15.65m AHD
ENTRY TO BASEMENT (FPL) 16.00m AHD
PROVIDED DRIVEWAY CREST AT RL
16.00. (REFER TO CIVIL DRIVEWAY
PLANS BY IGS).

1% AEP RL 14.05
FLOOD PLANNING
LEVEL = 14.35

1% AEP RL 14.00
PMF RL 14.70
ENTRY TO BASEMENT (FPL) 14.70

1% AEP RL 13.25

1% AEP RL 13.20



All dimension to be verified on site before producing shop drawings or commencing any work.
Do not scale. The copyright of this drawing remains with Warren and Mahoney Australia Living Pty Ltd.

Revisions

A	06/12/2023	DA Submission

Notes

N PROJECT NORTH

N TRUE NORTH

Warren and Mahoney Living Australia Pty Ltd

Registered Architects and Designers
www.warrenandmahoney.com

Project Title

142-146 PITT ROAD

North Curl Curl, NSW, 2099

Drawing Title

Ground Level

Drawing Status

Development Application

Drawing Details

Scale	1 : 100@ A1
Date	2/04/2024 3:39:18 pm
Job No	10146
Drawn	PM
Checked	MM

Drawing No A10.100 **Revision** A

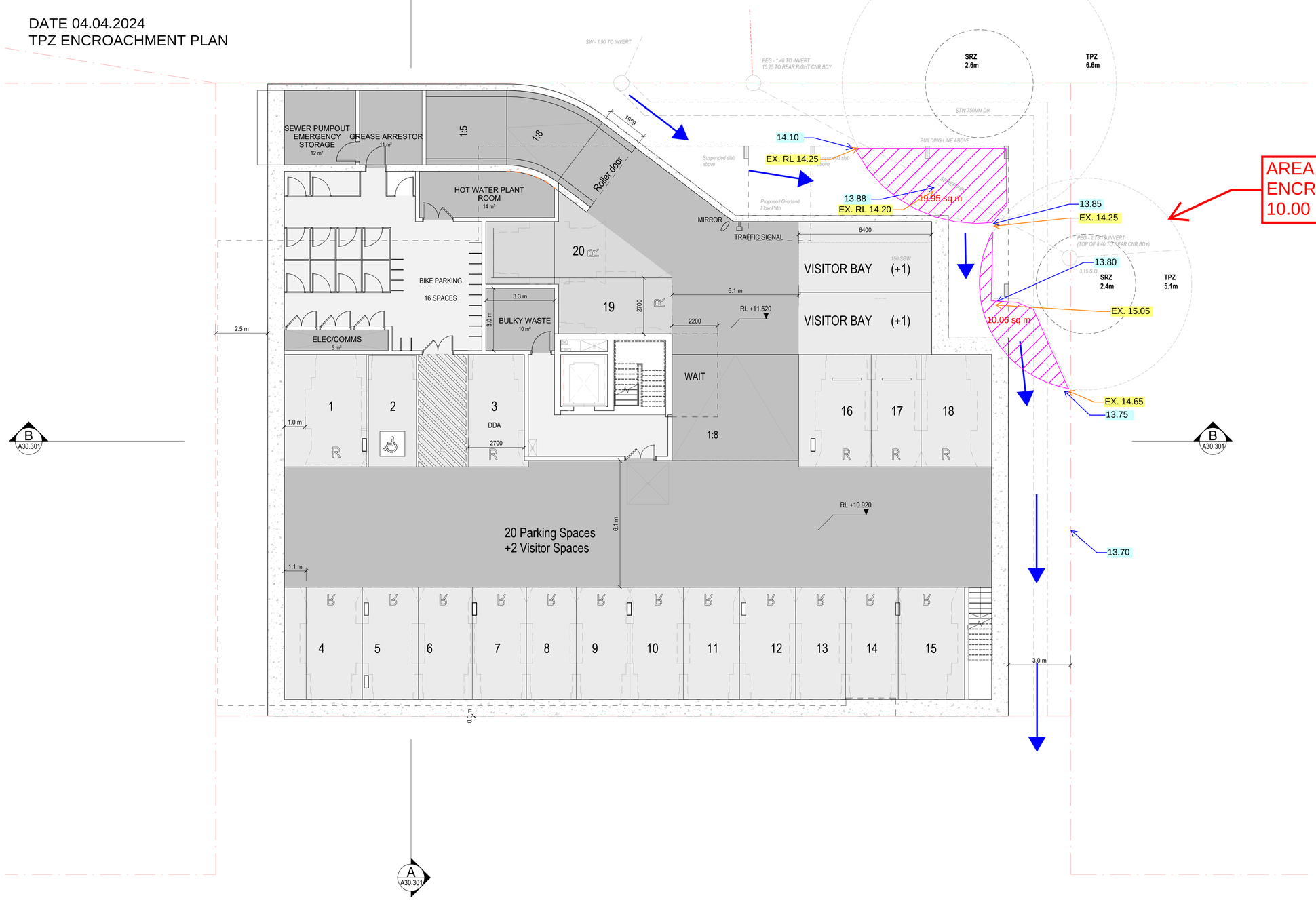
WARREN AND MAHONEY®

IGS INTEGRATED GROUP SERVICES

DATE 04.04.2024
TPZ ENCROACHMENT PLAN

AREA = 136.84 m2
ENCROACHMENT ON TPZ = 20.17 m2 (APPROX. 15%)

AREA = 81.70 m2
ENCROACHMENT ON TPZ = 10.00 m2 (APPROX. 12.30%)



All dimension to be verified on site before producing shop drawings or commencing any work.
Do not scale. The copyright of this drawing remains with Warren and Mahoney Australia Living Pty Ltd.

Revisions

A	06/12/2023	DA Submission

Notes

N PROJECT NORTH

N TRUE NORTH

Warren and Mahoney Living Australia Pty Ltd

Registered Architects and Designers
www.warrenandmahoney.com

Project Title

142-146 PITT ROAD

North Curl Curl, NSW, 2099

Drawing Title

B01

Drawing Status

Development Application

Drawing Details

Scale	1 : 100@ A1
Date	2/04/2024 3:17:48 pm
Job No	10146
Drawn	PM
Checked	MM

Drawing No A10.B01 **Revision** A

WARREN AND MAHONEY®

IGS INTEGRATED GROUP SERVICES

DATE: 3 APRIL 2024

SITE: 142 PITT ROAD, CURL CURL

WATER SURFACE AND DEPTH MAP DURING 5% AEP STORM EVENTS FOR PROPOSED (POST) SCENARIO

LEGEND

- <= 0.0000
- 0.100 - 0.300
- 0.300 - 0.500
- 0.500 - 0.700
- 0.700 - 1.000
- 1.000 - 1.500
- 1.5000 - 2.0000
- 2 - 2.5
- 2.5000 - 3.0000
- 3.00 - 3.50
- 3.5 - 4
- SITE BOUNDARY
- 50mm CONTOUR

IGS INTEGRATED GROUP SERVICES

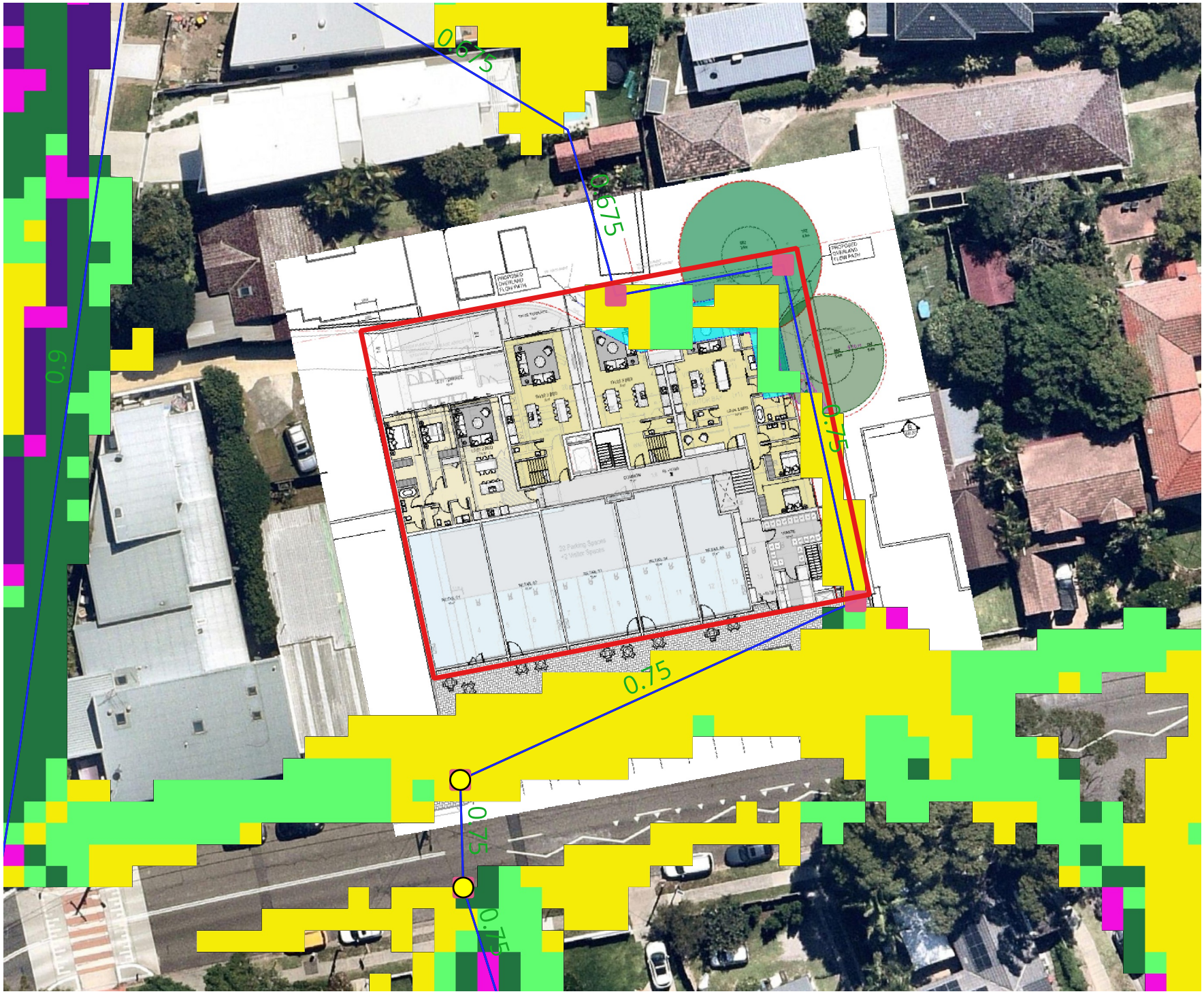
SITE: 142 PITT ROAD, CURL CURL

DATE: 03 APRIL 2024

HAZARD MAP DURING 5% AEP STORM EVENTS FOR PROPOSED (POST) SCENARIO

LEGEND

- H6 - Unsafe, all buildings vulnerable to failure
- H5 - Unsafe, buildings vulnerable to structural damage or failure
- H4 - Unsafe for people and vehicles
- H3 - Unsafe vehicles, children and the elderly
- H2 - Unsafe for small vehicles
- H1 - Generally safe
- SITE BOUNDARY



IGS INTEGRATED GROUP SERVICES

SITE: 142 PITT ROAD, CURL CURL

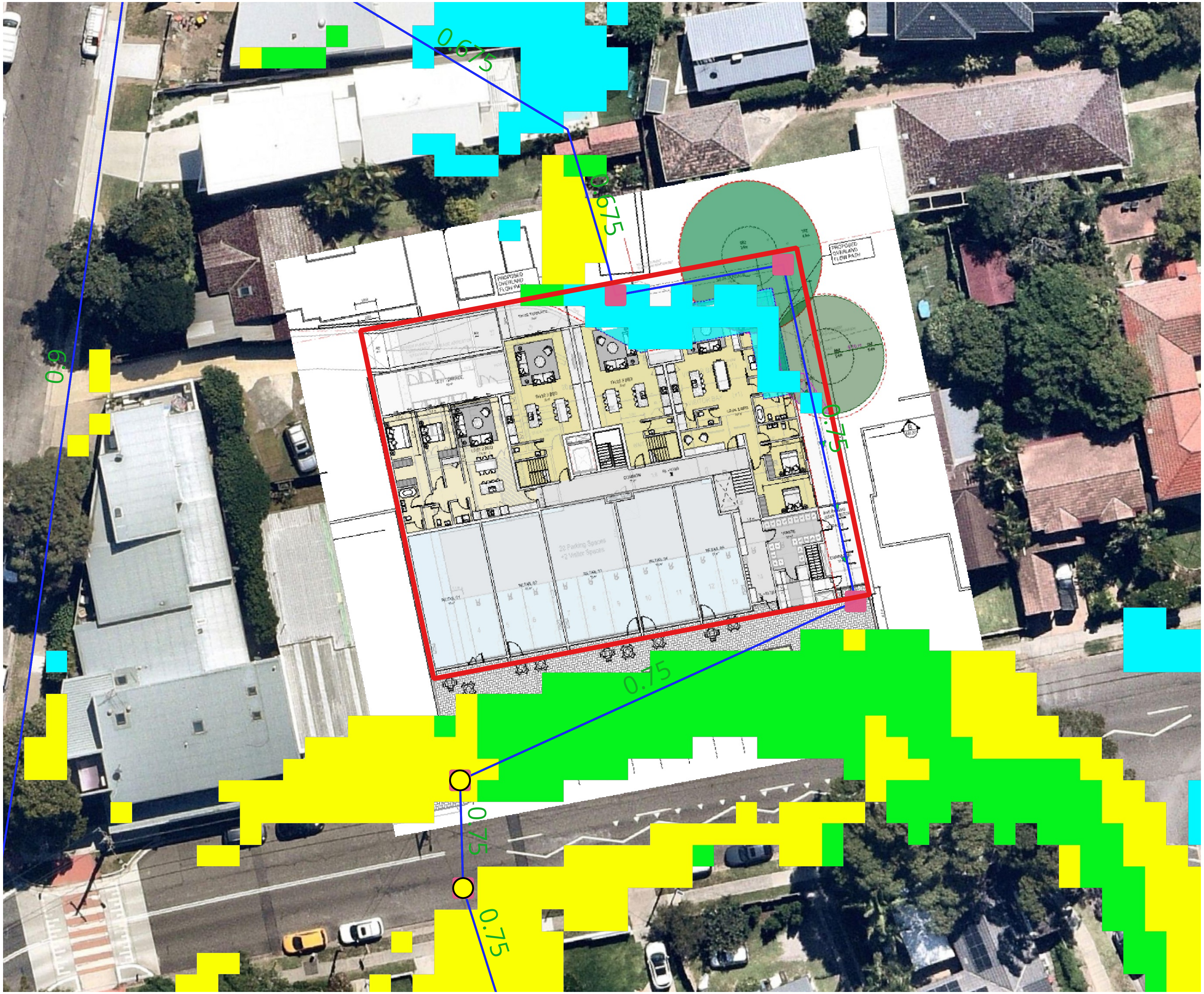
DATE: 03 APRIL 2024

VELOCITY MAP DURING 5% AEP STORM EVENTS FOR EXISTING (PRE) SCENARIO

FLOOD VELOCITY (m/s)

LEGEND

- < 0.25
- 0.25 to 0.5
- 0.5 to 0.75
- 0.75 to 1
- > 1
- SITE BOUNDARY



IGS INTEGRATED GROUP SERVICES

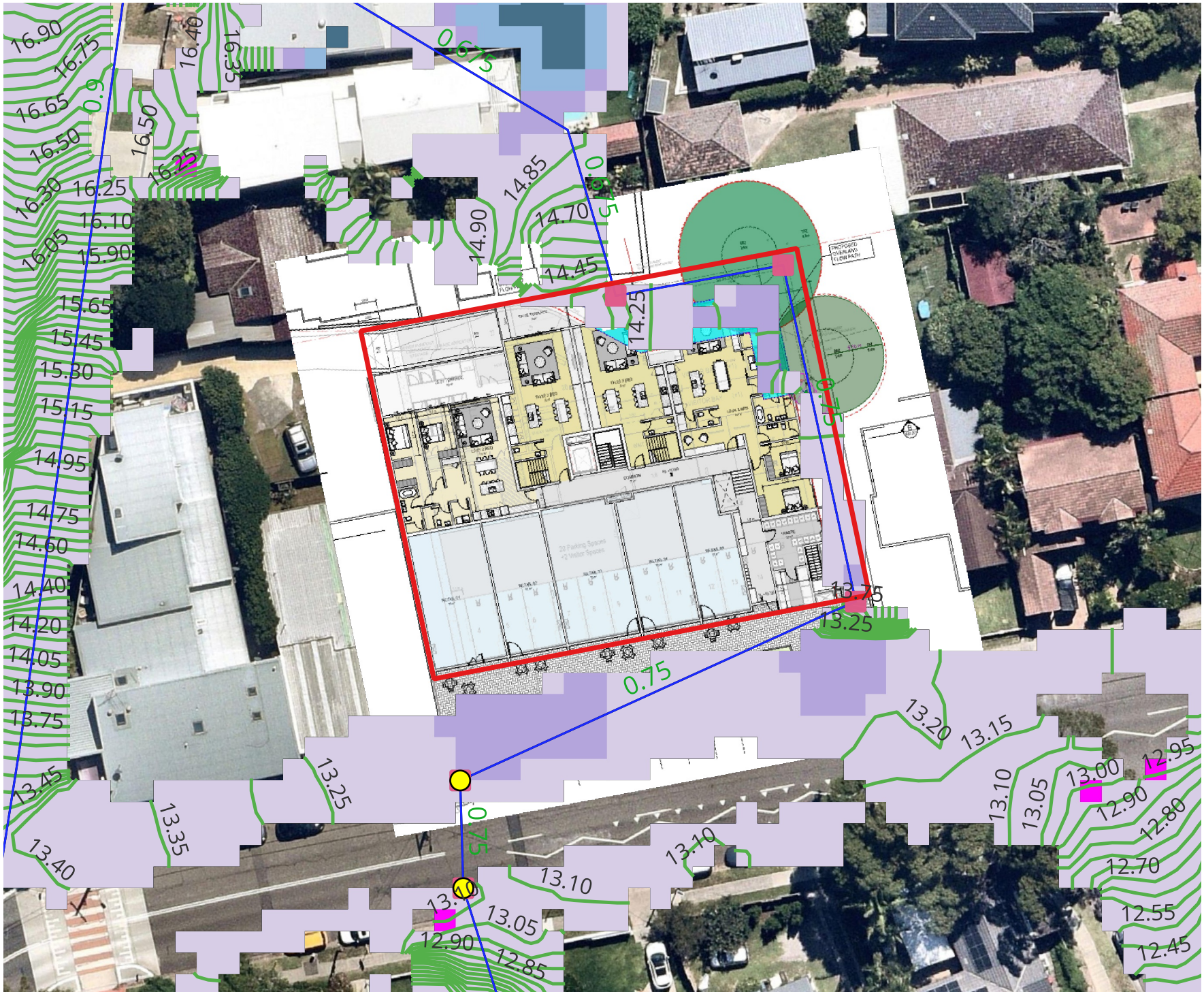
SITE: 142 -146 Pitt Road, North Curl Curl

DATE: 03 APRIL 2024

FLOOD AFFLUX MAP DURING 1% AEP STORM EVENTS

LEGEND

<= -0.01
-0.01 - 0.00
0.00 - 0.01
0.01 - 0.02
0.02 - 0.05
0.05 - 0.1
0.1 - 0.5
0.5 - 1.0
1.0 - 2.0



IGS INTEGRATED GROUP SERVICES

DATE: 3 APRIL 2024

SITE: 142 PITT ROAD, CURL CURL

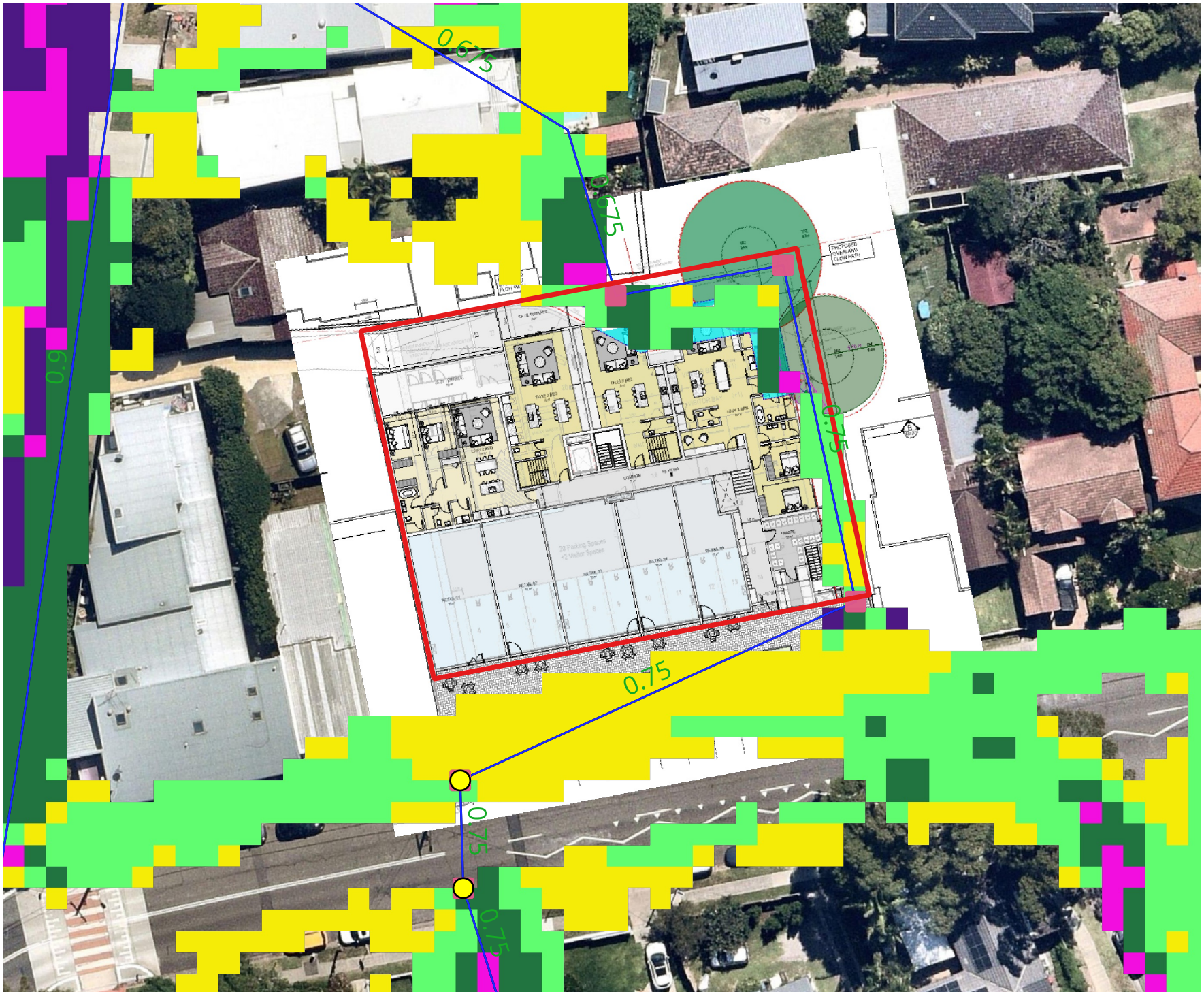
WATER SURFACE AND DEPTH MAP DURING 1% AEP STORM EVENTS FOR PROPOSED (POST) SCENARIO

LEGEND

- <= 0.0000
- 0.100 - 0.300
- 0.300 - 0.500
- 0.500 - 0.700
- 0.700 - 1.000
- 1.000 - 1.500
- 1.5000 - 2.0000
- 2 - 2.5
- 2.5000 - 3.0000
- 3.00 - 3.50
- 3.5 - 4

SITE BOUNDARY

50mm CONTOUR



IGS INTEGRATED GROUP SERVICES

SITE: 142 PITT ROAD, CURL CURL

DATE: 03 APRIL 2024

HAZARD MAP DURING 1% AEP STORM EVENTS FOR EXISTING (PRE) SCENARIO

FLOOD VELOCITY (m/s)

LEGEND

- < 0.25
- 0.25 to 0.5
- 0.5 to 0.75
- 0.75 to 1
- > 1
- SITE BOUNDARY

IGS INTEGRATED GROUP SERVICES

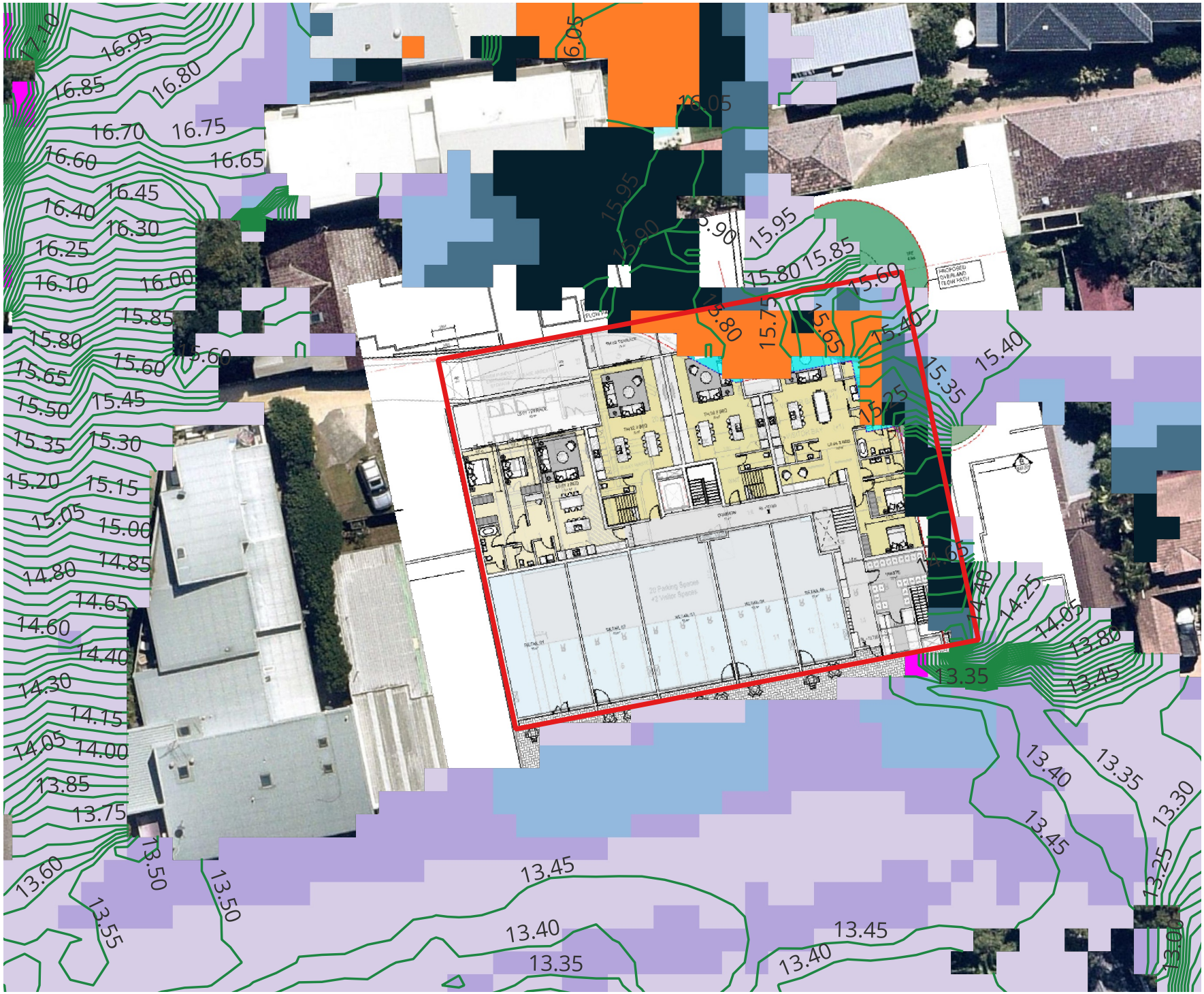
SITE: 142 PITT ROAD, CURL CURL

DATE: 03 APRIL 2024

HAZARD MAP DURING 1% AEP STORM EVENTS FOR PROPOSED (POST) SCENARIO

LEGEND

- H6 - Unsafe, all buildings vulnerable to failure
- H5 - Unsafe, buildings vulnerable to structural damage or failure
- H4 - Unsafe for people and vehicles
- H3 - Unsafe vehicles, children and the elderly
- H2 - Unsafe for small vehicles
- H1 - Generally safe
- SITE BOUNDARY



IGS INTEGRATED GROUP SERVICES

DATE: 3 APRIL 2024

SITE: 142 PITT ROAD, CURL CURL

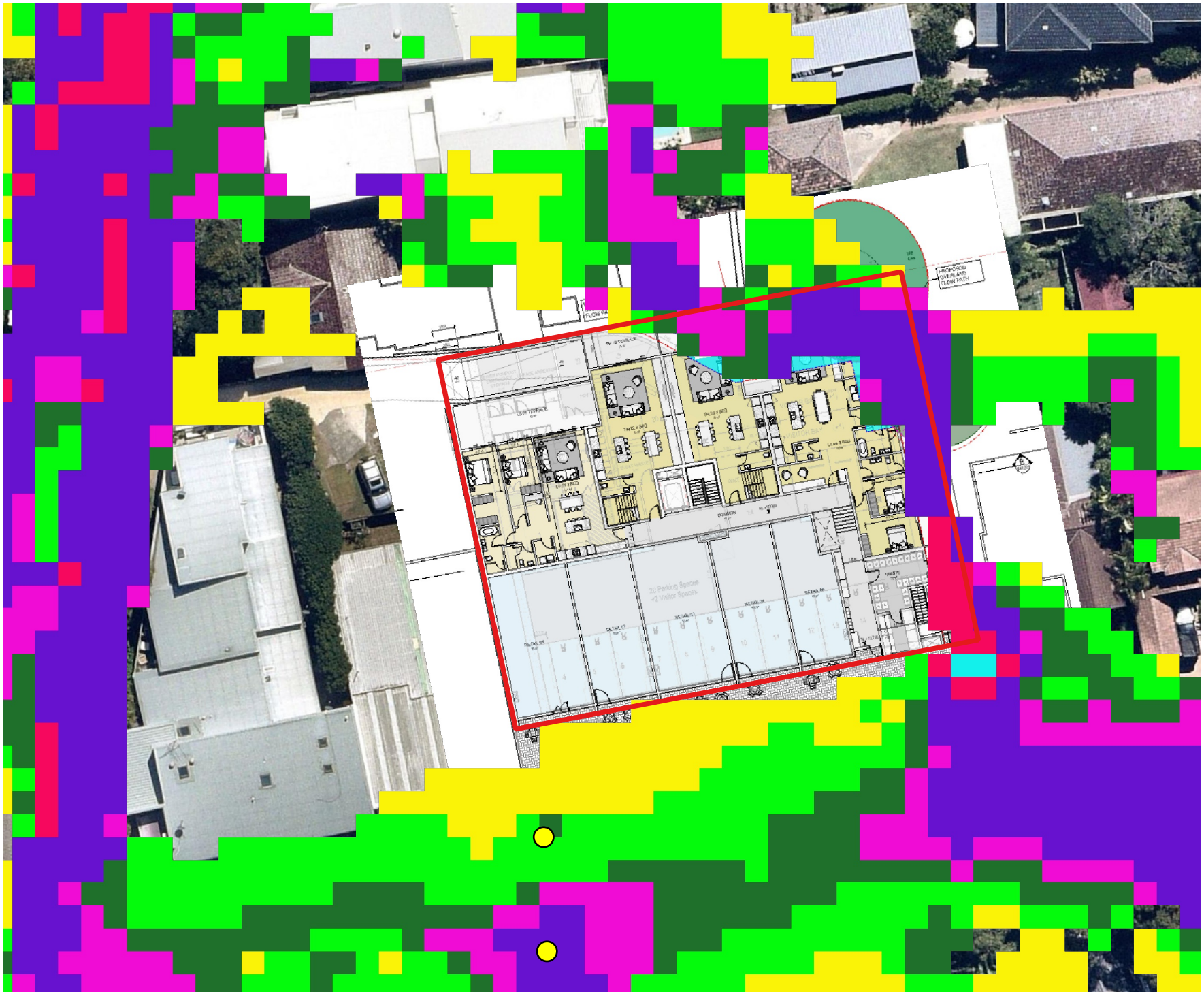
WATER SURFACE AND DEPTH MAP DURING PMF STORM EVENTS FOR PROPOSED (POST) SCENARIO

LEGEND

- <= 0.0000
- 0.100 - 0.300
- 0.300 - 0.500
- 0.500 - 0.700
- 0.700 - 1.000
- 1.000 - 1.500
- 1.5000 - 2.0000
- 2 - 2.5
- 2.5000 - 3.0000
- 3.00 - 3.50
- 3.5 - 4

SITE BOUNDARY

50mm CONTOUR



IGS INTEGRATED GROUP SERVICES

SITE: 142 PITT ROAD, CURL CURL

DATE: 03 APRIL 2024

HAZARD MAP DURING PMF STORM EVENTS FOR EXISTING (PRE) SCENARIO

FLOOD VELOCITY (m/s)

LEGEND

- < 0.25
- 0.25 to 0.5
- 0.5 to 0.75
- 0.75 to 1
- > 1
- SITE BOUNDARY

IGS INTEGRATED GROUP SERVICES

SITE: 142 PITT ROAD, CURL CURL

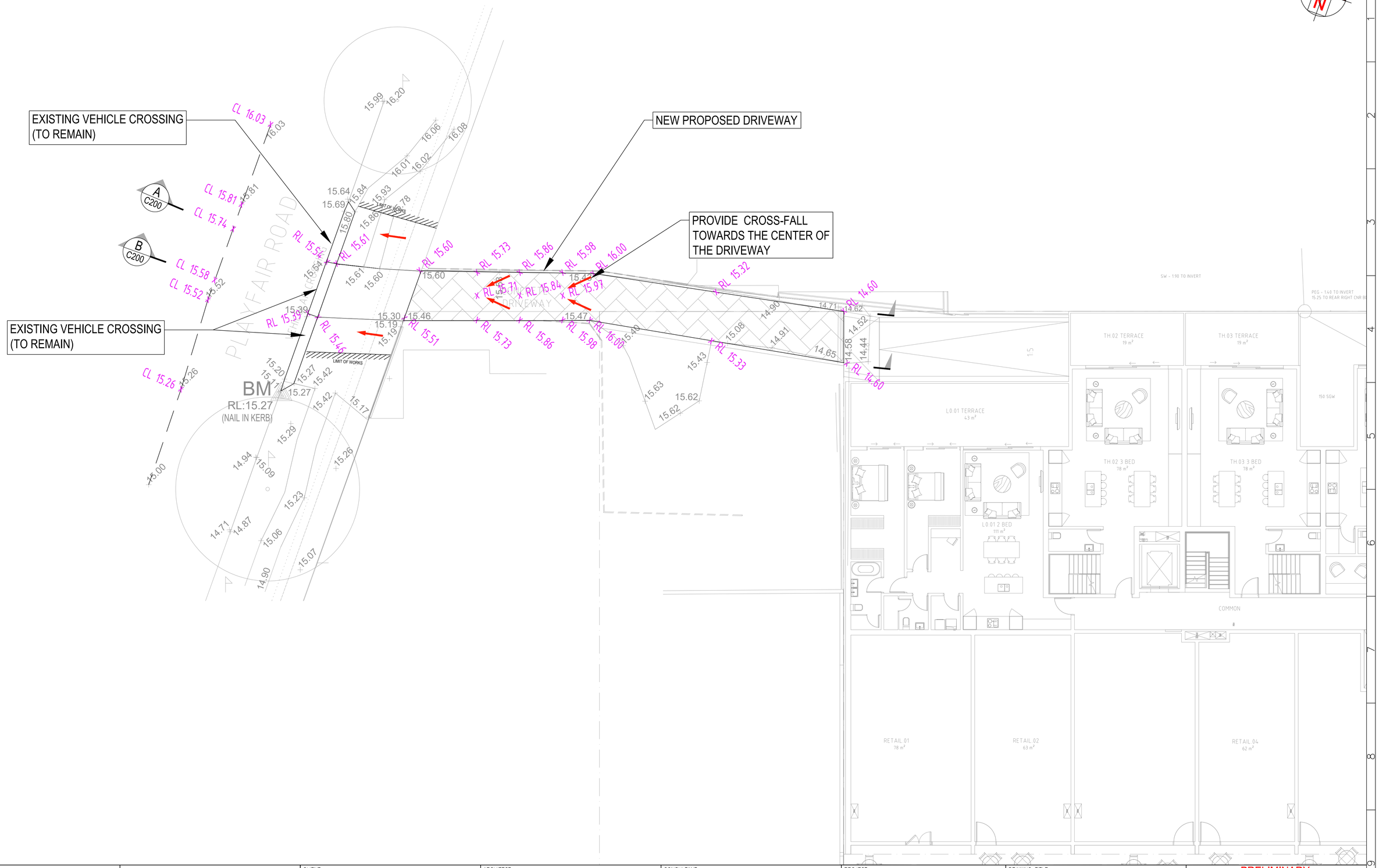
DATE: 03 APRIL 2024

HAZARD MAP DURING PMF STORM EVENTS FOR PROPOSED (POST) SCENARIO

LEGEND

- H6 - Unsafe, all buildings vulnerable to failure
- H5 - Unsafe, buildings vulnerable to structural damage or failure
- H4 - Unsafe for people and vehicles
- H3 - Unsafe vehicles, children and the elderly
- H2 - Unsafe for small vehicles
- H1 - Generally safe
- SITE BOUNDARY

ATTACHMENT 5



AMENDMENTS/REVISIONS				AMENDMENTS/REVISIONS			
Rev	Description	Initials	Date	Rev	Description	Initials	Date
01	PRELIMINARY	MS	30.11.23				
02	PRELIMINARY	MS	05.12.23				

CLIENT
BALITO INVESTMENTS

ARCHITECT
WARREN AND MAHONEY

CONSULTANT
IGS INTEGRATED GROUP SERVICES
Phone +61 2 8488 4600 Fax +61 2 9475 4588
Address Suite 1.11, 75 Mary St, St Peters, NSW 2044 Australia
Web www.igs.com.au

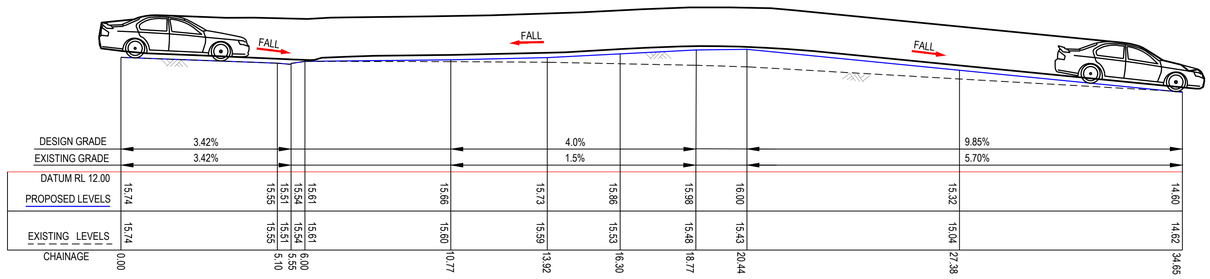
PROJECT
142 PITT ROAD,
CURL CURL

DRAWING TITLE
CIVIL
GROUND FLOOR PLAN
PLAYFAIR ROAD

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

DRAWN	DESIGNED	CHECKED	SCALE (AT FULL SIZE)	DATE
MS	PS	BM	1:100 @ A1	Dec-23

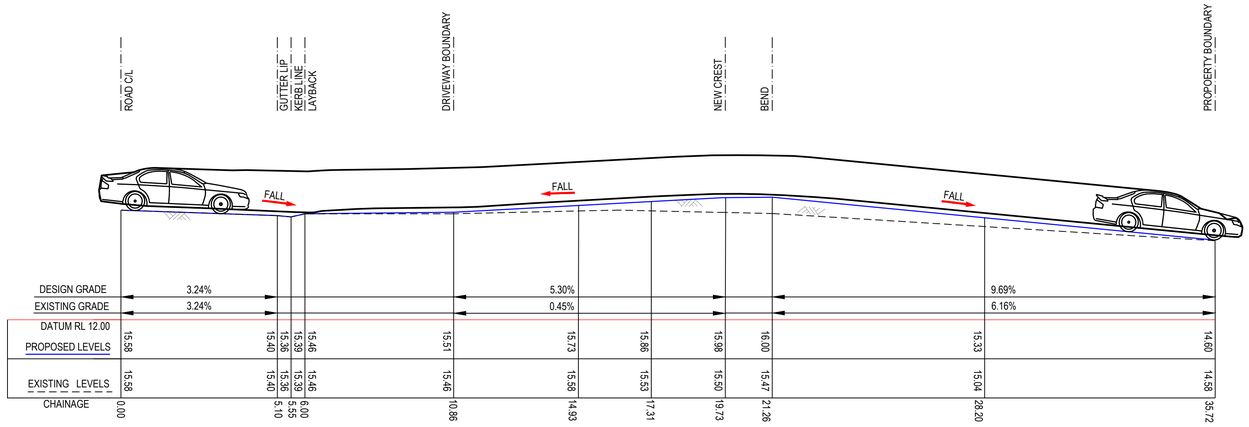
PROJECT No.	DRAWING No.	REVISION
EN-N23_149	C100	02



DRIVEWAY LONG-SECTION

SCALE HOR. 1:00 VER. 1:100

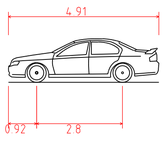
A C200



DRIVEWAY LONG-SECTION

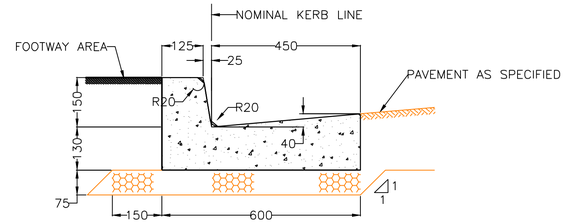
SCALE HOR. 1:00 VER. 1:100

B C200



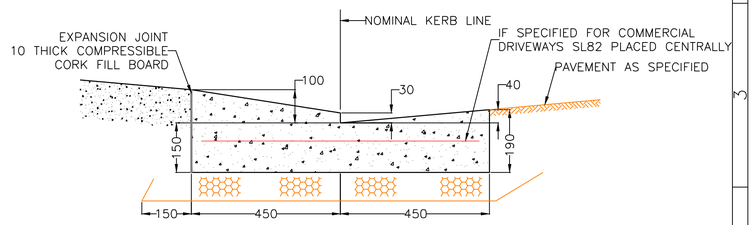
B85 Vehicle (Realistic min radius) (2004)

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5.750m



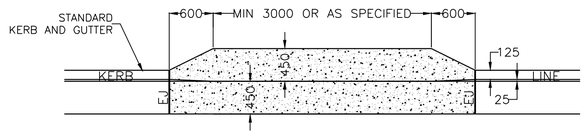
CONCRETE KERB & GUTTER DETAIL

NOT TO SCALE



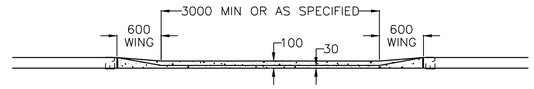
STANDARD CONCRETE LAYBACK DETAIL

NOT TO SCALE



CONCRETE LAYBACK – PLAN

NOT TO SCALE



CONCRETE LAYBACK – FRONT ELEVATION

NOT TO SCALE

STANDARD KERB AND GUTTER NOTES

1. KERB AND GUTTER, CONCRETE EDGING, DISH DRAINS AND THE LIKE SHALL BE POURED IN PLAIN CONCRETE AND FINISHED WITH A STEEL TROWEL.
2. THE MINIMUM COMPRESSIVE STRENGTH SHALL BE 25MPa AT 28 DAYS.
3. FOR ELEMENTS CONTRUCTED USING SLIPFORM, REINFORCEMENT WILL NOT BE REQUIRED PROVIDED THAT THE CONCRETE COMPRESSIVE STRENGTH IS NOT LESS THAN 32MPa AT 28 DAYS.
4. WHERE COUNCIL OR ITS REPRESENTATIVE DIRECTS THAT THE GUTTER IS TO BE RETAINED, THE CONTRACTOR SHALL PLACE A 75mm DEEP SAW CUT IN THE GUTTER INVERT AND REMOVE THE KERB AND OR LAYBACK.
5. WHERE EXISTING KERB AND ASSOCIATED ELEMENT IS TO BE REPLACED SAW CUT IN THE ASPHALT MINIMUM 500mm FROM LIP OF GUTTER, COMPACT SUBGRADE AND INSTALL ASPHALT STRIP TO MAKE SMOOTH TRANSITION.
6. THE CONSTRUCTION OF ALL VEHICLE CROSSINGS AND ASSOCIATED WORKS WITHIN THE ROAD RESERVE MUST BE UNDERTAKEN BY A COUNCIL APPROVED CONTRACTOR.

AMENDMENTS/REVISIONS

Rev	Description	Initials	Date
01	PRELIMINARY	MS	27.11.23
02	PRELIMINARY	MS	30.11.23
03	PRELIMINARY	MS	05.12.23

AMENDMENTS/REVISIONS

Rev	Description	Initials	Date

CLIENT: BALITO INVESTMENTS

ARCHITECT: WARREN AND MAHONEY

CONSULTANT: IGS INTEGRATED GROUP SERVICES
Phone +61 2 8488 4600 Fax +61 2 9475 4588
Address Suite 1.11, 75 Mary St, St Peters, NSW 2044 Australia
Web www.igs.com.au

PROJECT: 142 PITT ROAD, CURL CURL

DRAWING TITLE: DRIVEWAY AND FOOTPATH PROFILES

FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

DRAWN	DESIGNED	CHECKED	SCALE (AT FULL SIZE)	DATE
MS	PS	BM	1:100 @A1	Dec-23

PROJECT No.	DRAWING No.	REVISION
EN-N23_149	C200	03