IGS INTEGRATED GROUP SERVICES

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160 -172 Lord Sheffield Circuit, Penrith

Flood Impact and Risk Management Report

5 May 2023

200 Euston Road, Alexandria NSW
ABN: 68 163 019 029
(02) 8488 4600
admin@igs.com.au

Approvals

SJB	Sign: ..... Date: ..... Name: .....
Urban Property	Sign: ..... Date: ..... Name: .....
IGS	Sign: ..... Date: ..... Name: .....

Document Control

Version	Date	Issue	Author		Reviewer	
01	22.07.2022	For Approval	Prabeg Sharma	PS	Bill Masri	BM
02	04.11.2022	For Approval	Prabeg Sharma	PS	Bill Masri	BM
03	05.05.2023	For Approval	Prabeg Sharma	PS	Bill Masri	BM

Contents

160 – 172 Lord Sheffield Circuit, FLOOD IMPACT AND RISK MANAGEMENT REPORT

IGS has been engaged to prepare a flood impact and risk management report for the proposed development at 160 Lord Sheffield Circuit, Penrith.

The proposed development is for a mixed-use Residential/Retail/Commercial development consisting of:

- Two basement levels containing all car parking and servicing for the development; and
- Approx. 11 retail tenancies on the ground floor; and
- Approx. 18 commercial tenancies on level 01; and
- Up to approx. 288 luxury residential apartments.
- Amenities include green spaces, pools, public spaces, and other communal spaces.

This assessment aims to help the stakeholders understand the nature of mainstream flooding from the Nepean River and localised flooding near the site and perform an impact assessment report based on the Penrith City Council flood plain management requirements.

REVISION 3 – Incorporation of Assessment and Recommendation provided by Relevant Authorities.

Penrith City Council.

Penrith City Council has conducted a new overland flood study within the site's catchment area. As per the Obtained Flood information dated 24 March 2023, the 1% AEP flood level upstream of this site is at RL27.5 m AHD.

Penrith City Council's Request as per DA22/1086 Dated 10 February 2023:

Penrith City Council has requested to provide access to basement parking to be above 300mm above the Kerb Level and the threshold to be increased to a minimum of 300mm above 1% AEP flood level. The basement crest level has been proposed as 300mm above Kerb and 1% AEP flood level.

- The flood planning level for the basement is proposed to be 300 min kerb and 1% AEP flood level.
- Required Minimum Flood Planning level (Basement) = 27.5m + 300mm = 27.80m AHD
- Proposed Minimum Flood Planning Level (Basement) = 27.90 m AHD

Infrastructure NSW:

Draft Hawkesbury – Nepean River Flood Study results have been provided by Infrastructure NSW, which supersedes the Nepean River Flood study 2018. As per the new Nepean River Flood Study, this site is not within 1% AEP flood Extent but is within the PMF flood extent. The flood level during the PMF event is approximately 32.50 m AHD with varying Flood Depths of 5 – 5.5 meters.

Infrastructure NSW recommended triggering the evacuation of residential apartments for regional flood events needs to be triggered by SES.

- The New Draft Hawkesbury Nepean River Flood Study results indicate the PMF flood level to be approximately 5 – 5.5m above existing ground level, which equates to approximately 32.5m AHD.
-
- Evacuation of residential apartments to be triggered as per SES announcements during a flooding event.

State Emergency Services (SES).

SES requested the height of the access to the basement be increased to reduce the risk of basement flooding. – The basement height is altered above the kerb level and above 1% AEP plus 300mm freeboard.

As per SES and HN 2D Regional Flood Study, Penrith's 1% AEP flood level is at 26.80 m AHD. This site will be isolated and lose its evacuation route in a flood event equivalent to the current 1 in a 500-year rivering flood event, which will likely be more frequent.

- The flood level during 1 in 500-year flood event is approximately 2.6m existing ground level, equating to 29.60m AHD.
- Evacuation of residential apartments will only be triggered as per SES announcements.

The Revision 3 of this report reflects recommendations and further assessment as required by the relevant authorities.

1 Development Site

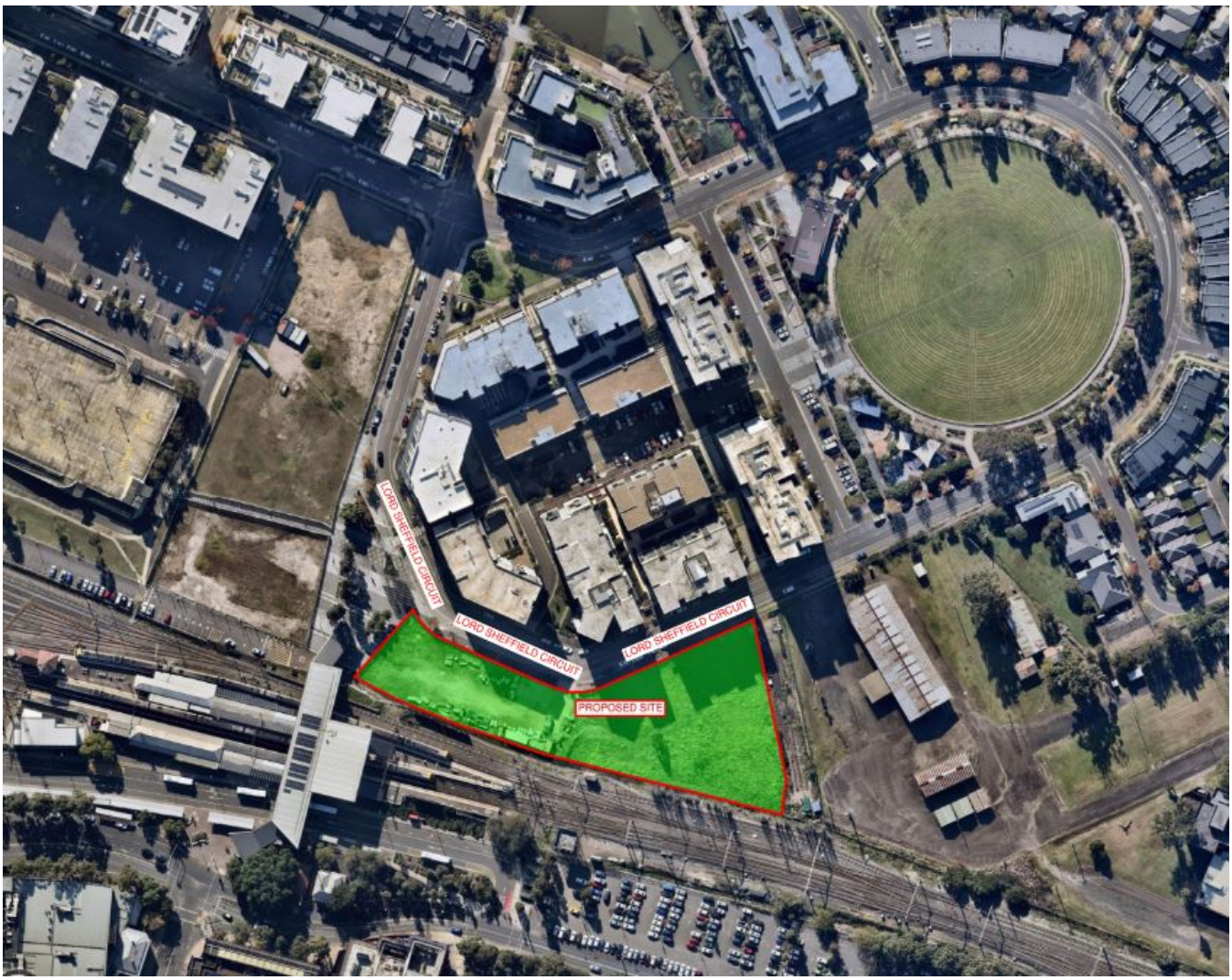
The proposed development at 160 – 172 Lord Sheffield Circuit, Penrith, is a multi-story mixed-use development featuring underground basement parking and commercial and residential spaces.

The 8280.00 m^2 site is approximately located 1.35 km away from the Nepean River. This site is currently vacant and is bounded by Penrith Train Station to the south and Lord Sheffield Circuit to the north.

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

- Hawkesbury – Nepean Valley Regional Flood Study, July 2019.
- Nepean River Flood Study, 2018.
- The Resilient Valley, Resilient Communities strategy by Infrastructure NSW for Hawkesbury – Nepean Valley, January 2017.
- Survey Plan by SDG Ref no. 8653, ISSUE A, Dated 10 January 2022. **(Attachment 1)**
- Proposed Design Plans.
- Site Specific 2D Overland Flow Modelling.
- SES fact sheets and information's.

Figure 1-1 Site Location.



2 Existing Flood Behaviour

Mainstream Flooding

This site lies approximately 1.35 km from the Nepean River and is only susceptible to mainstream flooding during extreme storm events. According to the Nepean River flood study 2018, this site is not affected by 1% AEP storm events but only by the Probable Maximum Flood (PMF) event. The flood level during the PMF event is approximately 30.45m AHD with varying Flood depths of 3 – 4 meters.

As per the Nepean River Flood Study 2018, during the PMF event, the Hazard level within this site can be classified as "H5". ARR 2019 Hazard Hydraulic Classification describes category "H5" as unsafe for vehicles, people, all buildings vulnerable to structural damage, and some less robust building types susceptible to failure. This site must be evacuated during this regional Nepean Flood event to reduce the risk of loss of life.

No hazard is associated with 1% AEP Mainstream flooding on this site. However, some hazards will be related to the area due to the local catchment flooding events due to potential blockages of stormwater networks and road cut-offs.

This site falls downstream of Warragamba Dam. This Dam is categorised as a potential risk to downstream properties. This property lies within the flood risk in the extreme event of Dam failure or other unsafe scenarios. The considered extremity of this event is that evacuation orders and warnings can be issued at any time of the year.

As per SES and HN 2D Regional Flood Study, Penrith's 1% AEP flood level is at 26.80 m AHD. This site will be isolated and lose its evacuation route in a flood event equivalent to the current 1 in a 500-year rivering flood event, which will likely be more frequent. During a 1 in 500-year flood, the flood level is approximately 2.6m existing ground level, equating to 29.60m AHD.

In such scenarios, following the direction of emergency services and SES is essential. Additional information regarding Hawkesbury – Nepean Valley flooding can be found on the SES website.

Figure 2-1 shows Flood Contours (mAHD) for existing scenarios during 100-Year ARI Storm events. (Source: Nepean River Flood Study, 2018) **(Please Note this is flood map is superseded).**

Figure 2-2 shows Flood Contours (mAHD) for existing scenarios during PMF Storm events. (Source: Nepean River Flood Study, 2018) – **(Please Note this flood map is superseded).**

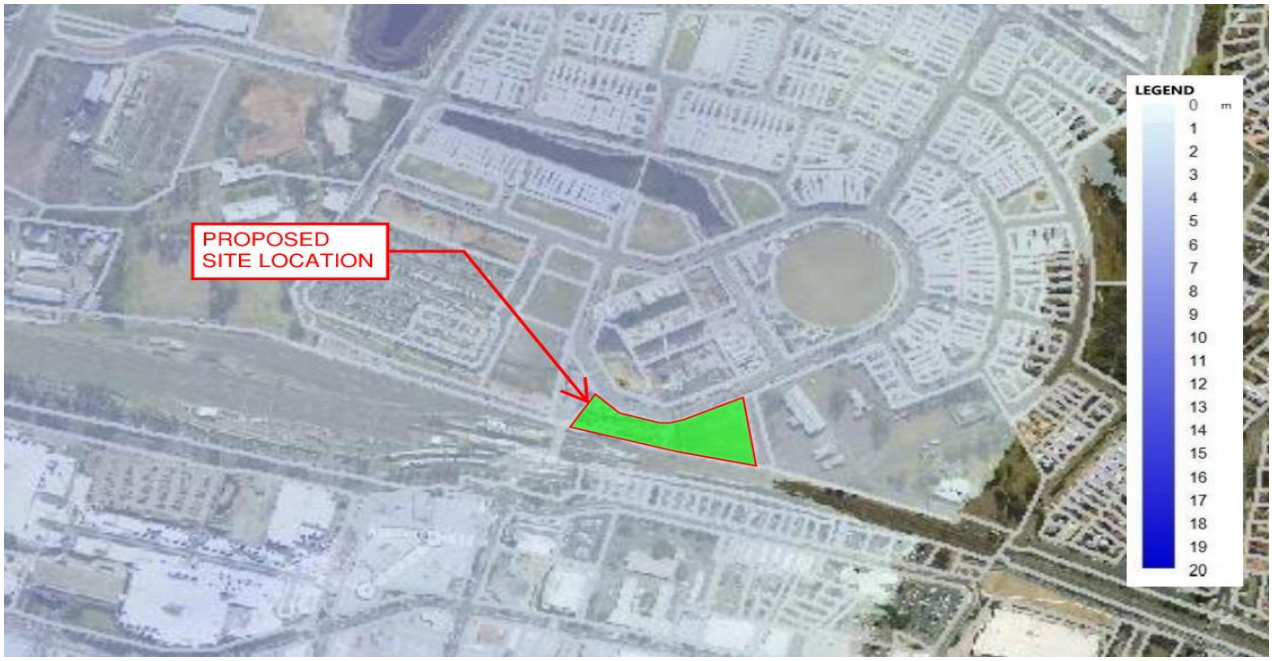


Figure 2-3 Shows Flood Depth (mAHD) for existing scenarios during PMF Storm events (Source: Nepean River Flood Study, 2018) - **(Please Note this flood map is superseded).**

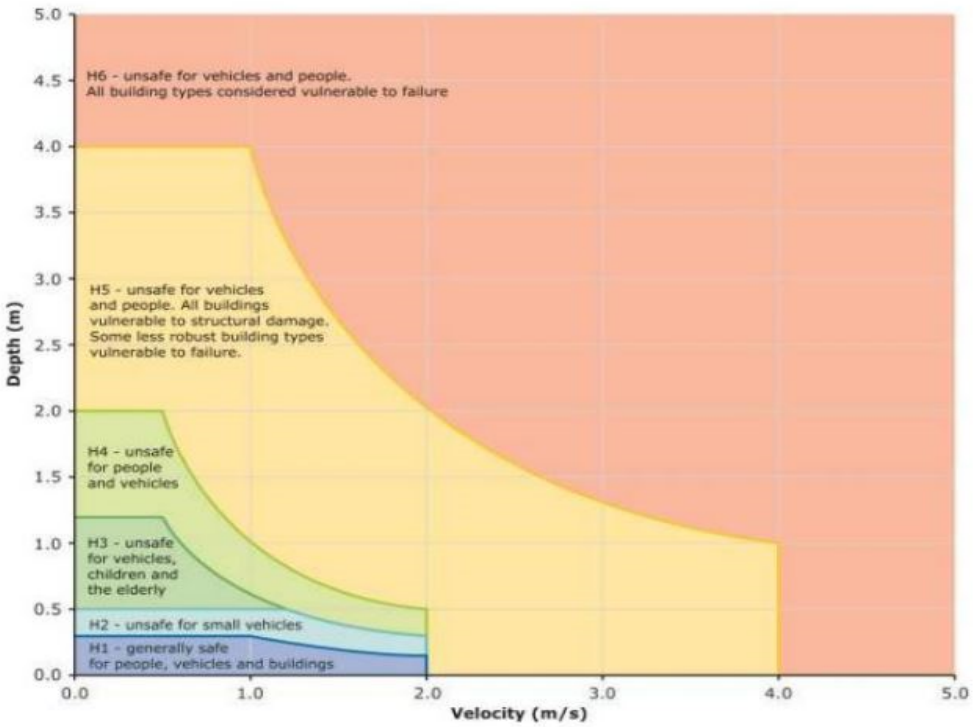


Figure 2 – 4 Hydraulic Hazard Classification (AR&R 2019).

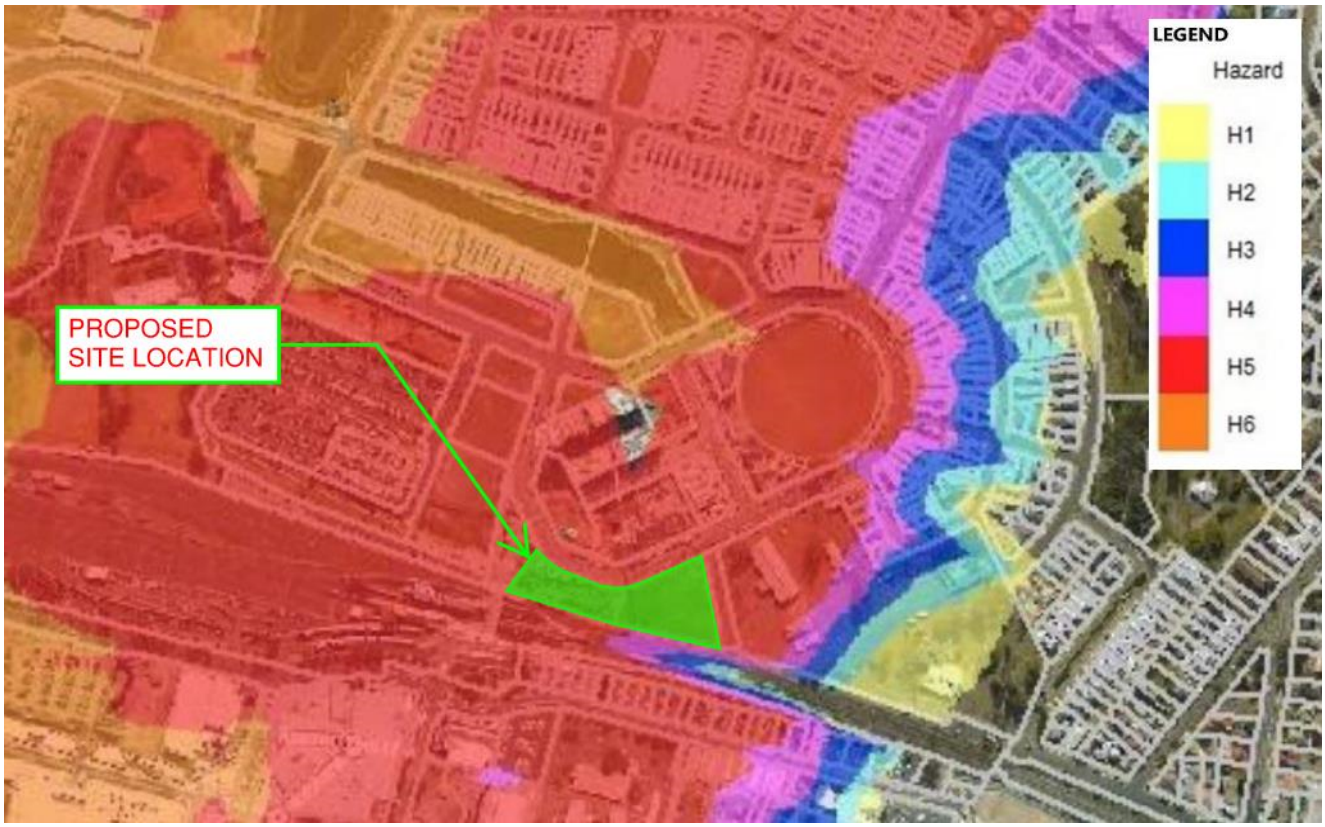


Figure 2 - 5 Shows Flood Hazard during PMF storm events (Source: Nepean River Flood Study, 2018) **(Please Note this flood map is superseded).**

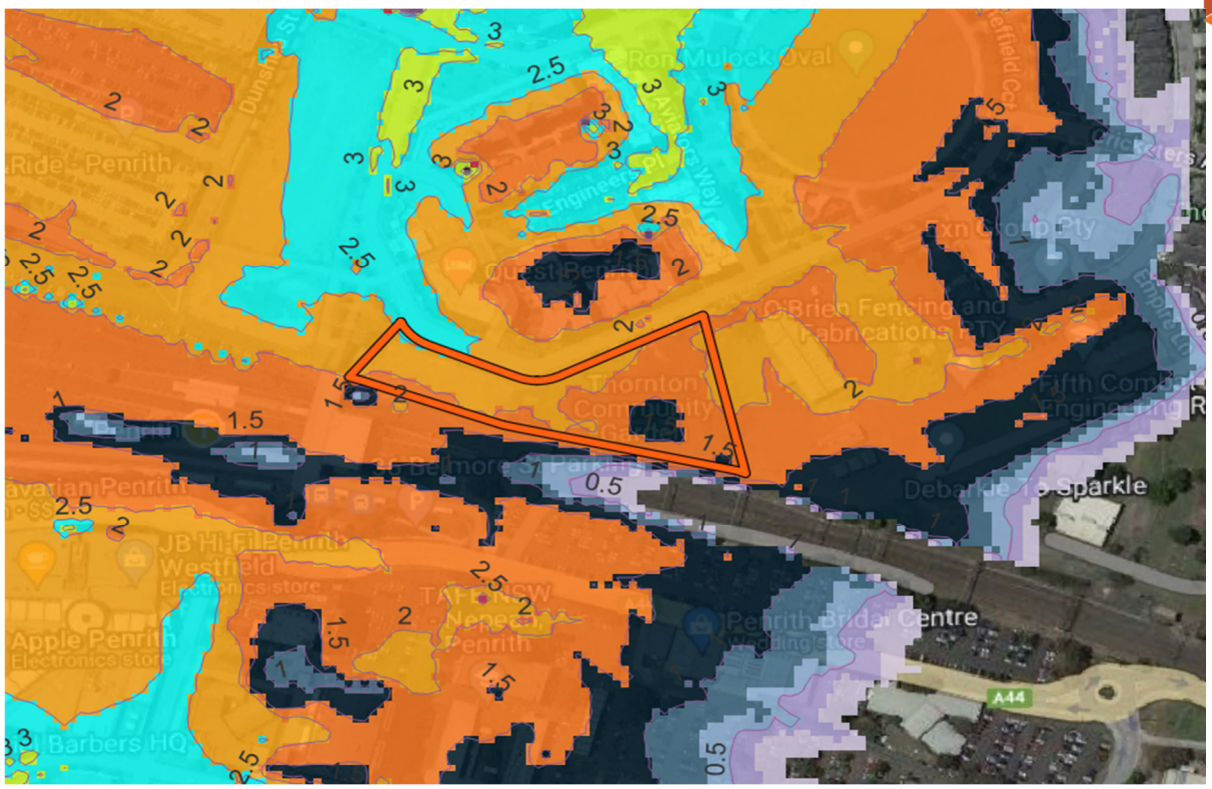


Figure 2 - 6 Shows Flood Depth During 1 in 500 Year storm events (As per Nepean River Flood Study).

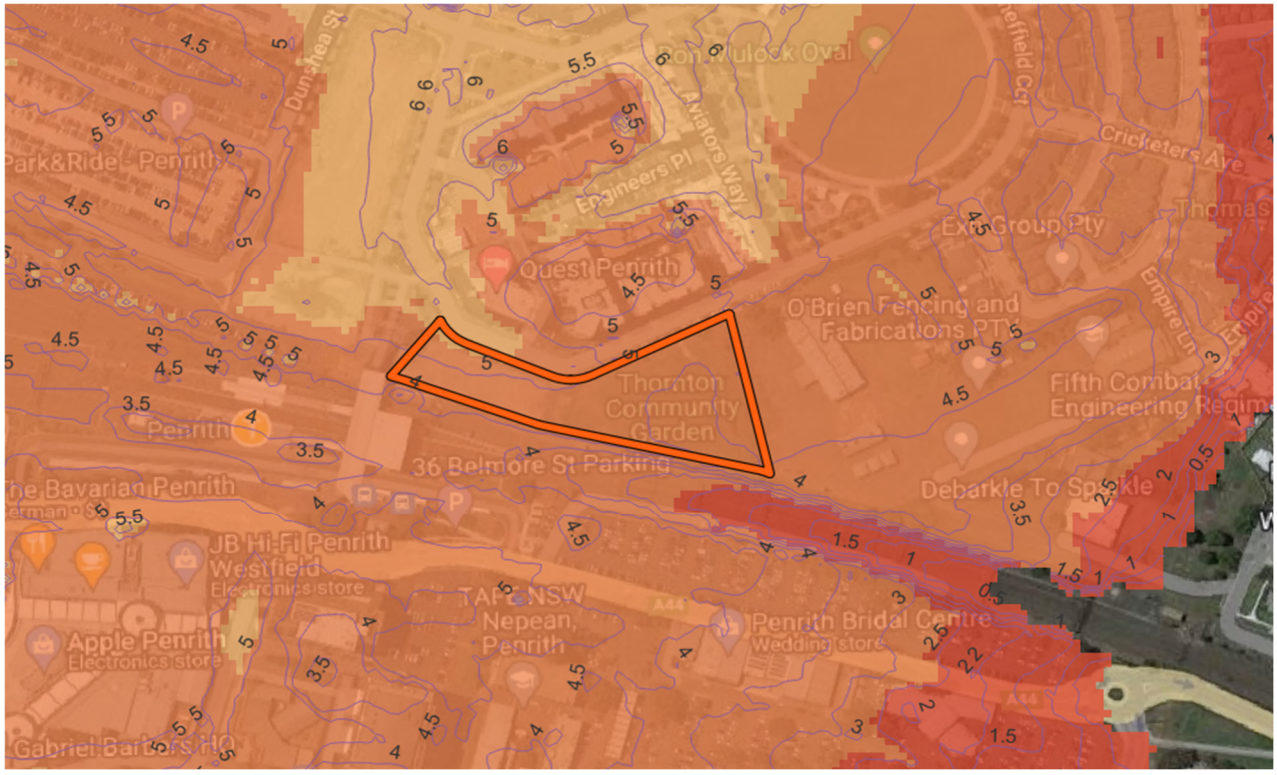


Figure 2 - 7 Shows Flood Depth During PMF Year storm events (As per Nepean River Flood Study).

Localised Overland Flooding

According to the Penrith CBD Floodplain Risk Management Study Plan by Molino Stewart, 2020, this site is affected by overland flows along the eastern boundary. The terrain and contours around the area are very flat, and in an extreme storm event, overland flows may affect the site's eastern boundary. There is a railway corridor along the southern side boundary of the side; during an extreme storm event, there is a probability of localised flooding from the railway corridor along the southern side boundary.

An independent site-specific overland flow study, including catchment analysis using a conservational approach, was performed to identify the probability and extent of overland flows affecting the site. This overland flood study assumed the existing stormwater network to be entirely blocked, and no allowance for On-Site Detention and other systems are made.

The big catchment area of 42 Hectares, as shown in **figures 2 - 5,** drains towards 10 The Crescent, Penrith, which lies along the eastern boundary of this site. In extreme storm events, the overland flows flowing towards 10 The Crescent Penrith may affect the eastern boundary of this site.

As per the study, this site is affected by 1% AEP overland flows along the eastern boundary and flows towards the northern direction following natural depression via Lord Crescent Circuit. The 1% AEP storm events do not enter the site. The maximum overland flow depth of 0.25m AHD can be seen along the eastern boundary. A shallow water depth of 50mm to 150mm can be seen on the Lord Crescent Circuit (Refer to attached flood maps for more details).

Penrith City Council has conducted a new overland flood study within the site's catchment area. As per the Obtained Flood information dated 24 March 2023, the 1% AEP flood level upstream of this site is at RL27.5 m AHD. Refer to the attached flood advise letter from Penrith City Council for more details.

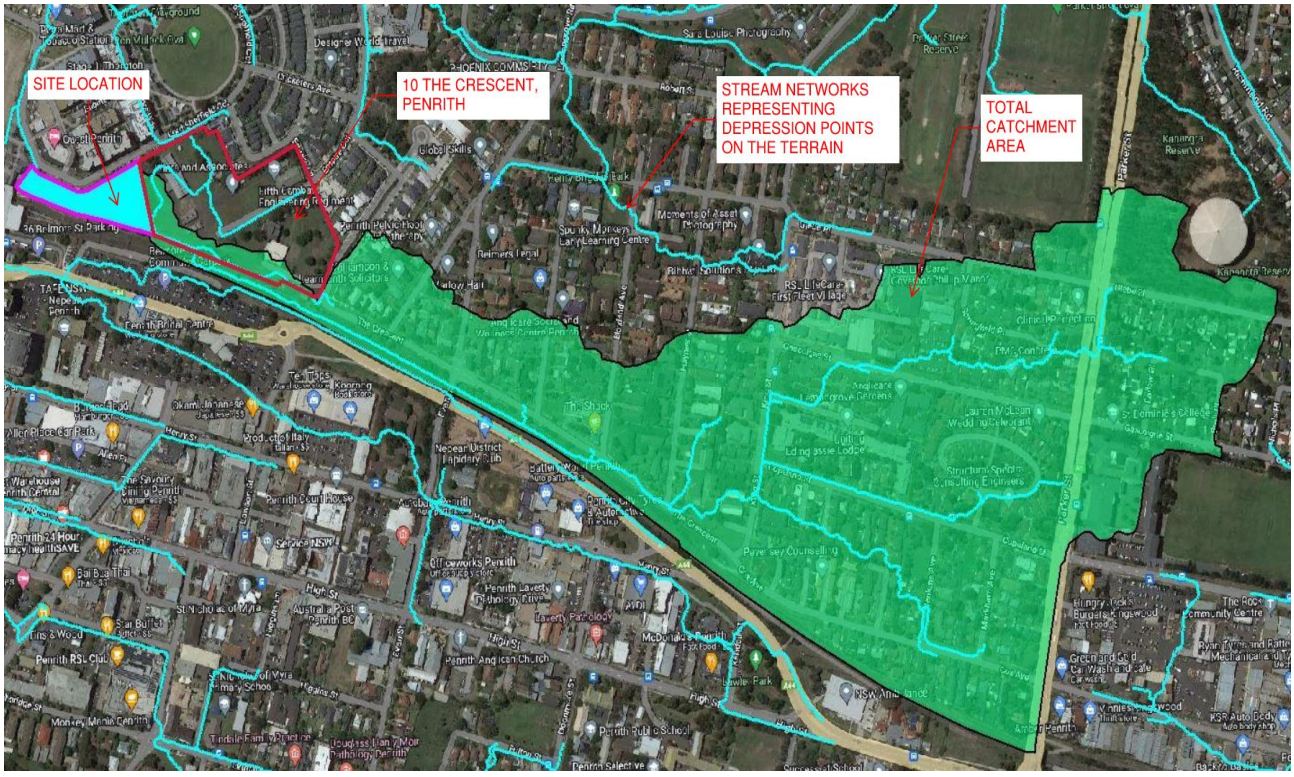


Figure 2 - 5 Total Catchment Area obtained from the catchment modeling using terrain analysis.

Figure 2 - 6 Probable flow pattern around the vicinity of site computed from 2D Modelling.

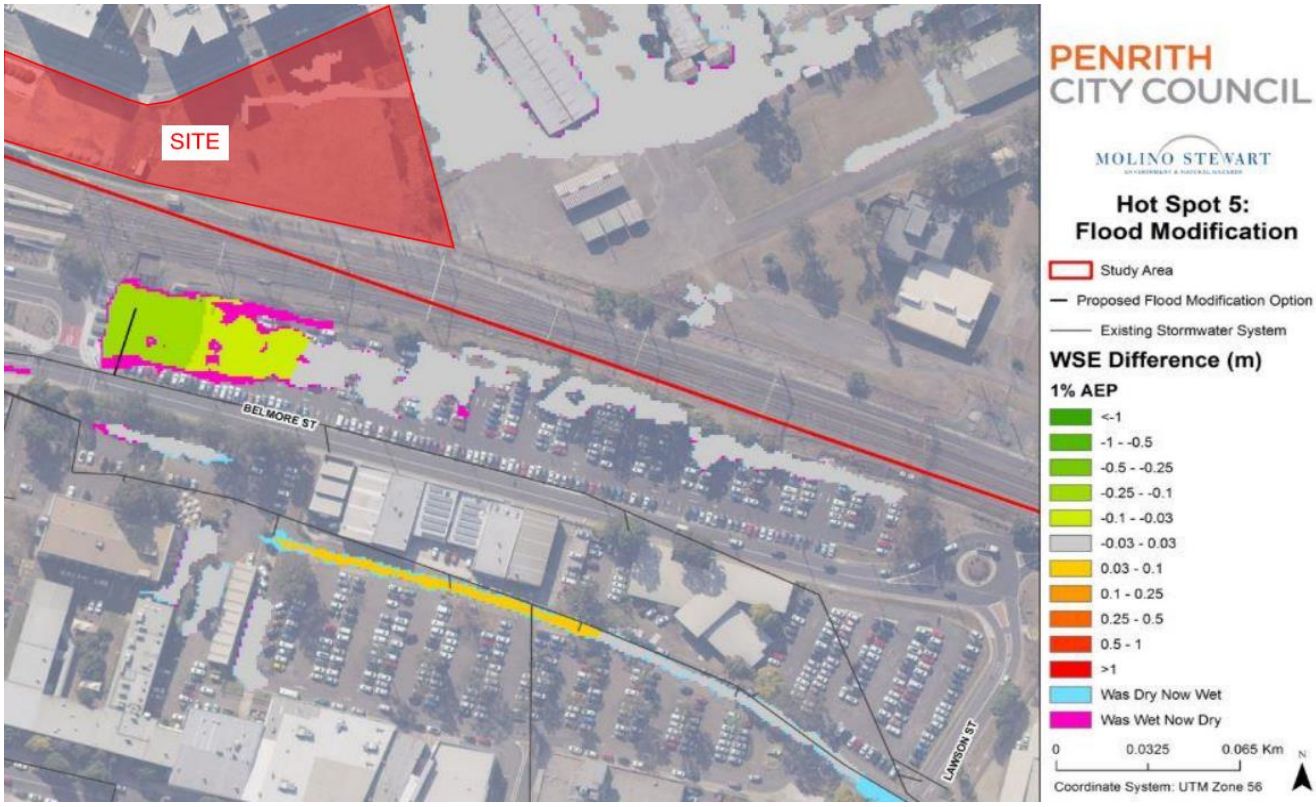


Figure 2 - 7 Extract from Penrith CBD Detailed Overland Flow Flood Study, 2015.

As per the Pre and Post comparison map, we can see that the development has no impact on surrounding properties. The extent, velocity, and depth of the overland flow are unchanged. As per the depth afflux map, the maximum change in depth in Post and Predevelopment is less than 10mm.

The development does not impede the passage of overland flow to cause a rise in the water levels and or increase velocities of flow on adjoining lands. Please refer to the attachments for Pre- and Post-Flood Extent, Hazard, and Afflux Maps.

The velocity depth product is less than 0.4 within the site boundary, and there is no change in Hazard Classification in the Post scenario as compared to Pre (refer to velocity x Depth map in the appendix). Below presented hazard maps are categorized as per the Hydraulic Hazard Classification AR&R 2019 color ramp (refer to figure 2 - 4).

Figure 2 - 8 Pre Development Hazard Map During 1% AEP Storm Events.

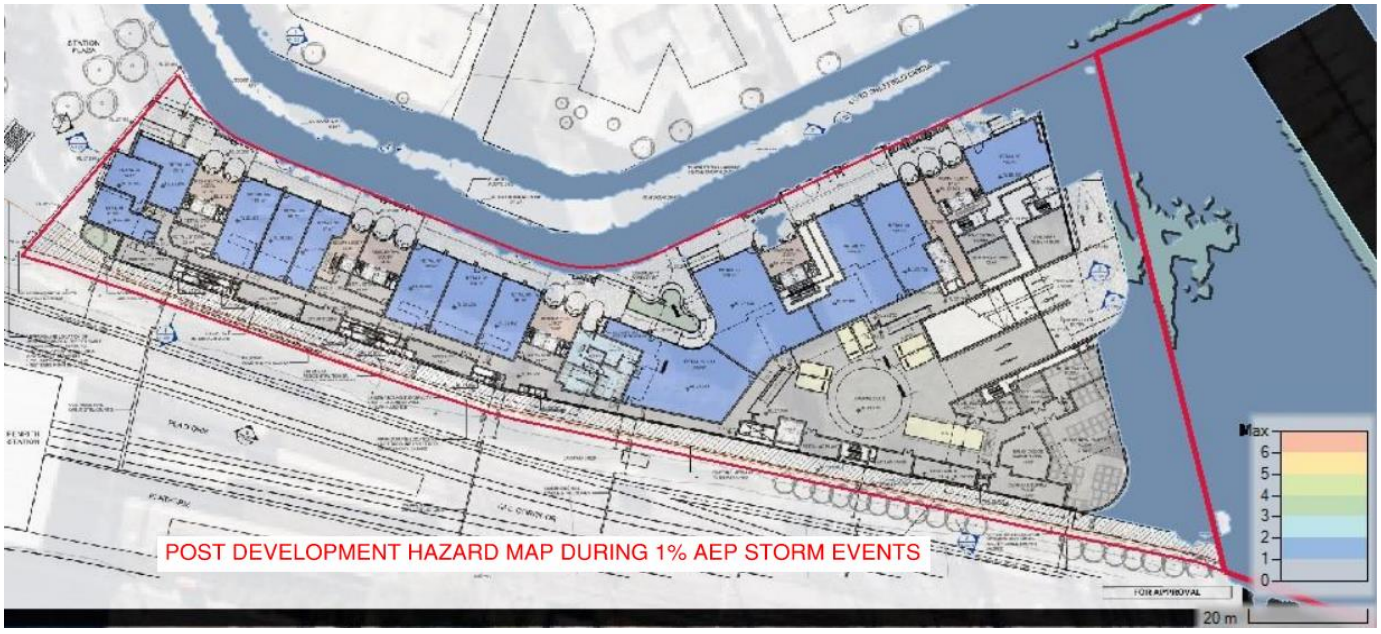


Figure 2 - 9 Post Development Hazard Map During 1% AEP Storm Events.

3 Flooding and the Proposed Development

3.1 Flood Planning Requirements

The flood planning level can be varied as per the terrain and flood levels during 1% AEP storm events.

An extract of flood planning controls from Penrith City Council's DCP 2014 is shown below:

1. *The floor level shall be at least 0.5m above the 1% AEP (100-year ARI) flood, or the buildings shall be floodproofed to a least 0.5m above 1%AEP (100-year ARI) flood.*
2. *The safe flood access and emergency egress shall be provided to all new developments.*
3. *The council may approve of the development with floor levels below the 1% AEP (100-year ARI) flood if the applicant can demonstrate that all practical measures will be taken to prevent or minimise the impact of flooding. In considering such applications and determining the required floor level, Council shall consider such matters as:*
    - *The nature of the business to be carried out.*
    - *The frequency and depth of flooding.*
    - *The potential for personal and property loss.*
    - *The utility of the building for its proposed use.*
    - *Whether the filling of the site or raising of the floor levels would render the development of the property unworkable or uneconomical.*
    - *Whether the raising of the floor levels would be out of character with adjacent buildings; and,*
    - *Any risk of pollution of water from storage or use of chemicals within the building.*

3.2 Flood Planning Levels

A flood planning level assessment of proposed development as per Architectural plans by SJB, Revision 14, Job no. 6626, Dated 1 November 2022 at key entrances is provided below:

Description	Maximum 1% AEP Flood Level	PMF	Proposed Finished Floor Level (m AHD)	Freeboard Provided (mm)	Compliance with Council Requirements?
Retail 01	26.92	27.48	27.500	580	**Yes**
Retail 02	26.92	27.28	27.330	410	**Yes**
Retail 03	26.90	27.20	27.270	370	**Yes**
Retail 04	26.94	27.24	27.270	**330**	**Yes**
Retail 05	26.96	27.28	27.350	390	**Yes**
Retail 06	27.00	27.30	27.350	350	**Yes**
Retail 07	27.10	27.38	27.500	400	**Yes**
Retail 08	27.15	27.40	27.500	350	**Yes**
Retail 09	27.18	27.46	27.500	320	**Yes**
Retail 10	27.23	27.50	27.550	320	**Yes**
Retail 11	27.23	27.52	27.550	320	**Yes**
Retail 12	27.31	27.58	27.62	310	**Yes**
Retail 13	27.35	27.66	27.70	350	**Yes**
Retail 14	27.40	27.70	27.70	300	**Yes**
Retail 15	27.54	27.78	27.90	360	**Yes**
Driveway Crest	**27.60**	**27.88**	**27.90**	**300**	**Yes**

4 Flood Risk Management

4.1 On-Site Refuge and Evacuation

The site's eastern side boundary must be avoided during localized flood events.

During regional flood events, an on-site refuge is not recommended. This site is categorised as an "H5" Hazard Category during extreme storm events, and this is deemed unsafe for vehicles and people. Further, all buildings are vulnerable to structural damage, and some less robust building types are susceptible to failure.

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 website, and NSW SES will also provide information on evacuation warnings and evacuation orders.

The chief flood warden must register for automatic text and email communication and notifications from early warning networks.

(Please refer to the attached Flood Risk Management Plan for more details on evacuation routes from the site.)

4.2 Flood Preparedness

During any specific flood event, the Chief Flood Warden will be responsible for preparing the facility during the flood event. This can be achieved via. Providing induction and training to the operator, the appointment of flood wardens, providing information regarding flood risks, hazards, and preparation of flood emergency kits. This report, including the attached flood risk management plan, must be placed with other emergency information on the site.

The following measures should be undertaken for flood preparedness:

- New and existing residents on the site must be informed about the flood behaviour and brief flood emergency information available on the site.
- All new residents and commercial staff must be provided induction training explaining flood behaviour and identifying evacuation routes and emergency information included in this plan. The induction training must be well documented to ensure no one is left behind.
- Evacuation drills are an excellent exercise to prepare for a flood event. This drill must cater for mobility-impaired personnel. Further information can be obtained from Australian Disability networks.
- A flood emergency kit must be prepared for every commercial and residential tenancy 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 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 you need to. Also, keep a list of emergency numbers near your phone or on your fridge.

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

4.3 Flood Response Actions

All trading and operation are to be ceased, and the building is to be closed upon the quantitative flood warning with a flood level at Victoria Bridge (Penrith) exceeding 8.2m (22.3m AHD).

- Flood warnings, evacuation orders, and emergency information are to be relayed by the chief flood warden to all personnel within the site.
- Chief Flood warden will contact SES and other emergency services to identify off-site refuge and evacuation routes.
- Chief Flood warden to inform all personnel using PA systems and sound the alarm.
- All commercial and residential tenants must carry flood-safe kits and valuables to the designated evacuation centre via the advised evacuation route.
- Chief Flood wardens to notify emergency personnel and SES regarding the evacuation and put signage on the site.
- Commercial tenants can return home by using recommended evacuation routes to remain at the designated refuse and wait it out.

After a Flood event

- Structural and services Assessments are to be performed by qualified personnel.
- Evaluate the current flood management plan and prepare for probable flood events.

4.4 Flood Risk Management

A Flood Risk Management Plan with a flood evacuation route has been prepared (Refer to the attachment). The prepared flood risk management plan must be installed in an area frequented by occupants, including a basement car park (level 0) and lobby area (level 1).

Following Flood protection measures are recommended for the development.

- All structures (basement and ground floor levels) 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 on basement and ground floor 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. Carpets and wallpapers are not recommended.
- Bolts, nails, hinges, and fittings shall be galvanised or stainless steel. Hinges with removable pins are recommended.
- Emergency self–powered lights, indicating safe exit to upper levels, are to be installed above the flood planning levels and in the basement car parking area

5 Recommendations

IGS has completed a Site-Specific Flood Risk Management Report for the proposed development at 160-172 Lord Sheffield Circuit, Penrith. Based on the available information and performed 2D flood study, the following summary of recommendations are given below:

- During regional flood events, when the flood and evacuation warnings are received from SES/relevant authorities, the site must be evacuated, and all relevant measures within the flood risk management plan (Section 4) must be implemented. Refer to section 4 of this document to review the stakeholders' roles and responsibilities during a flood evacuation event.

- The flood planning levels mentioned in section 3 of this report and as indicated in the architectural plans by SJB Architects, Rev 14, Job No. 6626, Dated 1 November 2022, meets the flood planning requirements as per Penrith City Council's DCP 2014. These levels must be maintained to protect the property from overland flows. Refer to Planning Levels Markups in the attachments.

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 risk management plan, we believe that this development application meets all flooding and risk management requirements stipulated within the Penrith City Council's floodplain management policy.

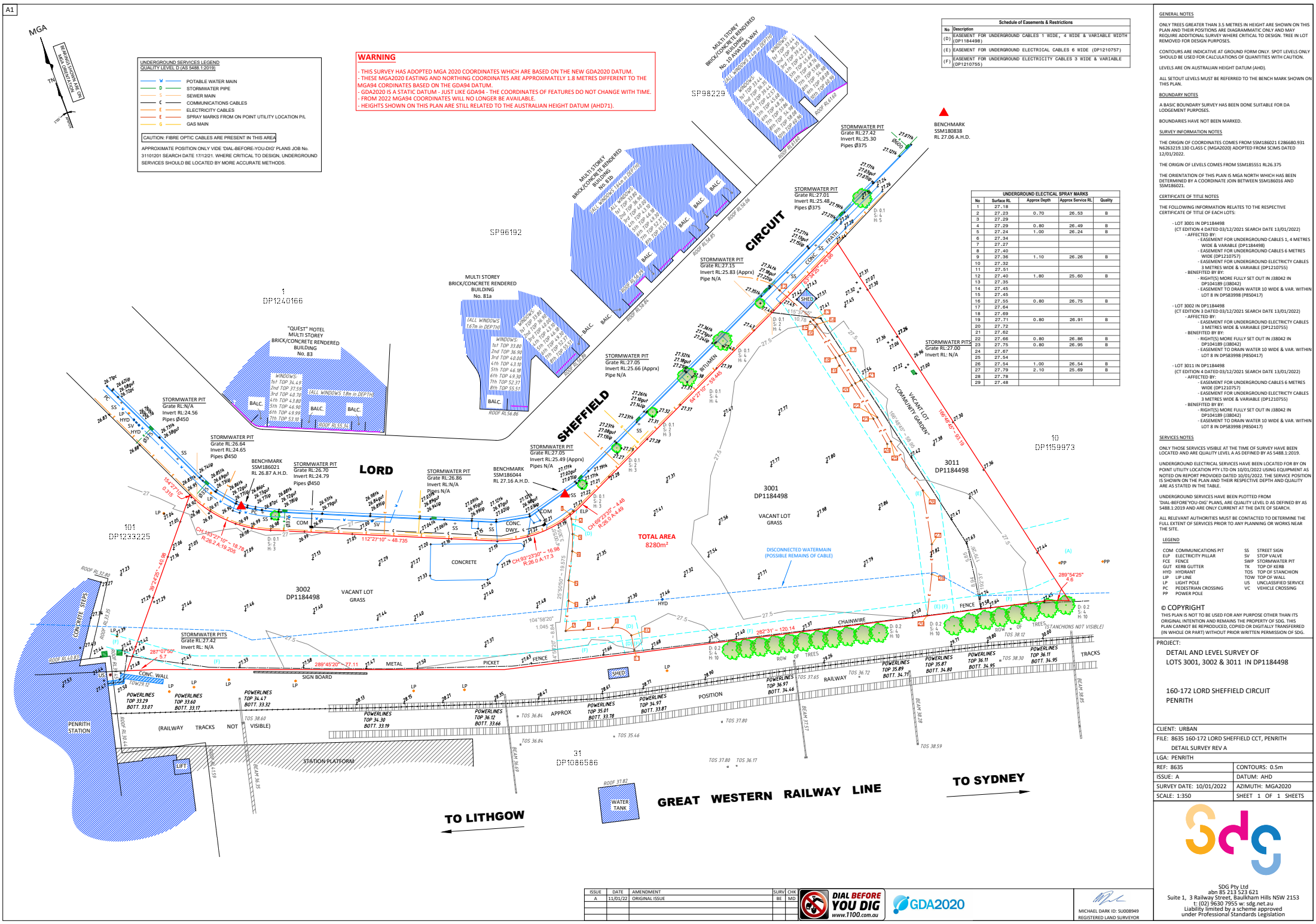
6 Attachments:

- Survey Plan by SDS Ref. 8635 002DT, Issue A, Dated 10 February 2022. **(Attachment 1)**
- Flood Risk Management Plan for 160-172 Lord Sheffield Circuit Penrith. **(Attachment 2)**
- Architectural Plans by SJB, Rev 14, Dated 1 November 2022. **(Attachment 3)**
- Flood Planning Level Markups. **(Attachment 4)**
- 1% AEP Map for Pre-Scenario. **(Attachment 5)**
- PMF Map for Pre-Scenario. **(Attachment 6)**
- 1% AEP Map for Post–Scenario**. (Attachment 7)**
- PMF Map for Post-Scenario. **(Attachment 8)**
- Velocity Depth Product Map for Pre-Scenario during 1% AEP Storm events. **(Attachment 9)**
- Velocity Depth Product Map for Post Scenario during 1% AEP Storm events. **(Attachment 10)**
- Depth Afflux Map during 1% AEP Storm events. **(Attachment 11)**
- SES Emergency Kit Brochure. **(Attachment 12)**
- SES Evacuation Route (Know how to get out). **(Attachment 13)**
- Flood Advice Letter from Penrith City Council dated 24 March 2023. **(Attachment 14)**
- Flood Risk Management Plan Review Letter from SES. **(Attachment 15)**
- Flood Risk Management Plan Review Letter from Infrastructure NSW. **(Attachment 16)**

7 References:

- Hawkesbury – Nepean Valley Regional Flood Study, July 2019.
- Nepean River Flood Study, 2018.
- The Resilient Valley, Resilient Communities strategy by Infrastructure NSW for Hawkesbury – Nepean Valley, January 2017.
- Penrith CBD Floodplain Risk Management Study and Plan, 2015
- Penrith Local Emergency Plan, 2020
- Local Flood Plan – A sub-plan of Penrith Local Disaster Plan.

A1



GENERAL NOTES

ONLY TREES GREATER THAN 3.5 METRES IN HEIGHT ARE SHOWN ON THIS PLAN AND THEIR POSITIONS ARE DIAGRAMMATIC ONLY AND MAY REQUIRE ADDITIONAL SURVEY WHERE CRITICAL TO DESIGN. TREE IN LOT REMOVED FOR DESIGN PURPOSES.

CONTOURS ARE INDICATIVE AT GROUND FORM ONLY. SPOT LEVELS ONLY SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION.

LEVELS ARE ON AUSTRALIAN HEIGHT DATUM (AHD).

ALL SETOUT LEVELS MUST BE REFERRED TO THE BENCH MARK SHOWN ON THIS PLAN.

BOUNDARY NOTES

A BASIC BOUNDARY SURVEY HAS BEEN DONE SUITABLE FOR DA LODGEMENT PURPOSES.

BOUNDARIES HAVE NOT BEEN MARKED.

SURVEY INFORMATION NOTES

THE ORIGIN OF COORDINATES COMES FROM SSM186021 E286680.931 N6263219.130 CLASS C (MGA2020) ADOPTED FROM SCIMS DATED 12/01/2022.

THE ORIGIN OF LEVELS COMES FROM SSM185551 RL26.375

THE ORIENTATION OF THIS PLAN IS MGA NORTH WHICH HAS BEEN DETERMINED BY A COORDINATE JOIN BETWEEN SSM186016 AND SSM186021.

CERTIFICATE OF TITLE NOTES

THE FOLLOWING INFORMATION RELATES TO THE RESPECTIVE CERTIFICATE OF TITLE OF EACH LOTS:

- LOT 3001 IN DP1184498
  (CT EDITION 4 DATED 03/12/2021 SEARCH DATE 13/01/2022)
  - AFFECTED BY:
    - EASEMENT FOR UNDERGROUND CABLES 1, 4 METRES WIDE & VARABLE (DP1184498)
    - EASEMENT FOR UNDERGROUND CABLES 6 METRES WIDE (DP1210757)
    - EASEMENT FOR UNDERGROUND ELECTRICITY CABLES 3 METRES WIDE & VARIABLE (DP1210755)
  - BENEFITED BY:
    - RIGHT(S) MORE FULLY SET OUT IN J38042 IN DP104189 (J38042)
    - EASEMENT TO DRAIN WATER 10 WIDE & VAR. WITHIN LOT 8 IN DP583998 (P850417)
- LOT 3002 IN DP1184498
  (CT EDITION 3 DATED 03/12/2021 SEARCH DATE 13/01/2022)
  - AFFECTED BY:
    - EASEMENT FOR UNDERGROUND ELECTRICITY CABLES 3 METRES WIDE & VARIABLE (DP1210755)
  - BENEFITED BY:
    - RIGHT(S) MORE FULLY SET OUT IN J38042 IN DP104189 (J38042)
    - EASEMENT TO DRAIN WATER 10 WIDE & VAR. WITHIN LOT 8 IN DP583998 (P850417)
- LOT 3011 IN DP1184498
  (CT EDITION 4 DATED 03/12/2021 SEARCH DATE 13/01/2022)
  - AFFECTED BY:
    - EASEMENT FOR UNDERGROUND CABLES 6 METRES WIDE (DP1210757)
    - EASEMENT FOR UNDERGROUND ELECTRICITY CABLES 3 METRES WIDE & VARIABLE (DP1210755)
  - BENEFITED BY:
    - RIGHT(S) MORE FULLY SET OUT IN J38042 IN DP104189 (J38042)
    - EASEMENT TO DRAIN WATER 10 WIDE & VAR. WITHIN LOT 8 IN DP583998 (P850417)

SERVICES NOTES

ONLY THOSE SERVICES VISIBLE AT THE TIME OF SURVEY HAVE BEEN LOCATED AND ARE QUALITY LEVEL A AS DEFINED BY AS 5488.1:2019.

UNDERGROUND ELECTRICAL SERVICES HAVE BEEN LOCATED FOR BY ON POINT UTILITY LOCATION PTY LTD ON 10/01/2022 USING EQUIPMENT AS NOTED ON REPORT PROVIDED DATED 10/01/2022. THE SERVICE POSITION IS SHOWN ON THE PLAN AND THEIR RESPECTIVE DEPTH AND QUALITY ARE AS STATED IN THE TABLE.

UNDERGROUND SERVICES HAVE BEEN PLOTTED FROM 'DIAL-BEFORE'YOU-DIG' PLANS, ARE QUALITY LEVEL D AS DEFINED BY AS 5488.1:2019 AND ARE ONLY CURRENT AT THE DATE OF SEARCH.

ALL RELEVANT AUTHORITIES MUST BE CONTACTED TO DETERMINE THE FULL EXTENT OF SERVICES PRIOR TO ANY PLANNING OR WORKS NEAR THE SITE.

LEGEND

COM	COMMUNICATIONS PIT	SS	STREET SIGN
ELP	ELECTRICITY PILLAR	SV	STOP VALVE
FCE	FENCE	SWP	STORMWATER PIT
GUT	KERB GUTTER	TK	TOP OF KERB
HYD	HYDRANT	TOS	TOP OF STANCHION
LIP	LIP LINE	TOW	TOP OF WALL
LP	LIGHT POLE	US	UNCLASSIFIED SERVICE
PC	PEDESTRIAN CROSSING	VC	VEHICLE CROSSING
PP	POWER POLE		

PROJECT:
DETAIL AND LEVEL SURVEY OF
LOTS 3001, 3002 & 3011 IN DP1184498

160-172 LORD SHEFFIELD CIRCUIT
PENRITH

ISSUE	DATE	AMENDMENT	SURV	CHK
A	11/01/22	ORIGINAL ISSUE	BE	MD

DIAL BEFORE YOU DIG www.1100.com.au

GDA2020

MICHAEL DARK ID: SU008949
REGISTERED LAND SURVEYOR

CLIENT: URBAN
FILE: 8635 160-172 LORD SHEFFIELD CCT, PENRITH
DETAIL SURVEY REV A
LGA: PENRITH

REF: 8635	CONTOURS: 0.5m
ISSUE: A	DATUM: AHD
SURVEY DATE: 10/01/2022	AZIMUTH: MGA2020
SCALE: 1:350	SHEET 1 OF 1 SHEETS

SDG Pty Ltd
abn 85 213 523 621
Suite 1, 3 Railway Street, Baulkham Hills NSW 2153
t: (02) 9630 7955 w: sdg.net.au
Liability limited by a scheme approved under Professional Standards Legislation

ATTACHMENT 2

FLOOD RISK MANAGEMENT PLAN
(60 Lord Sheffield Circuit, Penrith)

THIS AREA IS LOCATED WITHIN THE HAWKESBURY-NEPEAN FLOODPLAIN. REFER TO FLOOD & EVACUATION WARNING FROM SES/BOM WEBSITES, RADIO, AND TELEVISIONS.
SES WILL ISSUE AN EVACUATION ORDER – IF REQUIRED.

During flood events, please follow the below Instructions.

Before a flood event:

1. Ensure all goods are placed above ground level.
2. Prepare emergency equipment and clothing, including wet weather clothing, Battery radio, Basic food Stuff, Torch, Prescription medicines, spare batteries, etc.
3. Download Emergency Applications on your phones.
    a. Emergency +: Provides information on Emergency Contacts.
    b. Live Traffic NSW.
    c. Flood Near me NSW (Access at http://www.floodsnearme.com.au/)
4. Evacuate immediately as per the emergency personnel's or Chief Flood warden's notice.

During a flood event:

1. Seize all activities and allow sufficient time to evacuate and relocate to higher ground levels.
2. Do not leave the site during a flood event.
3. Communicate instructions to remain on-site and organize seating and lighting.
4. Turn off electricity and gas if time and situation permit.
5. Do not drive or walk over the floodwaters. If stranded on-site and water inundates floor level, call 000 immediately.
6. Keep listening to your local station for information, updates, and advice.
(*Radio Frequencies include (702 AM) ABC Sydney, (873 AM) 2GB, (96.9 FM) Nova, (104.1 FM) 2-Day FM, (96.1) The Edge).*

After a flood event:

1. Structural and services Assessments to be performed by qualified personnel.
2. Evaluate the current flood management plan and prepare for probable flood events.

For Emergency Help

CALL Triple Zero (000) immediately in life-threatening situations.
TTY: 106 – Hearing / Speech impaired.
For emergency help In Flood, Storms, and Tsunamis, contact NSW SES on 132 500.
Translating and Interpreting Service – 13 14 50

(If you do not speak English well, you can call the Translating and Interpreting Service on 13 14 50 and ask them to contact any of the numbers to interpret for you.)

For Road Blockages, fallen trees and other local asset issues, please call

Penrith City Council's Emergency Hotline on (02) 4732 7777

CONTACT DETAIL AND ROUTE

Location	Address
Cranebrook High School (SES listed Evacuation Centre for North Penrith Area)	Hosking Street, Cranebrook (02) 4729 0777
Penrith Selective High School	158-240 High Street, Penrith (02) 4721 0529
NSW SES – Penrith Unit	27 Fowler St, Claremont Meadows NSW 2747 (02) 4721 0529
Penrith Police Station	High St, Penrith NSW 2750 (02) 4721 9444
Penrith Fire Station (Fire and Rescue NSW)	290-294 High St, Penrith NSW 2750 (02) 4784 8386

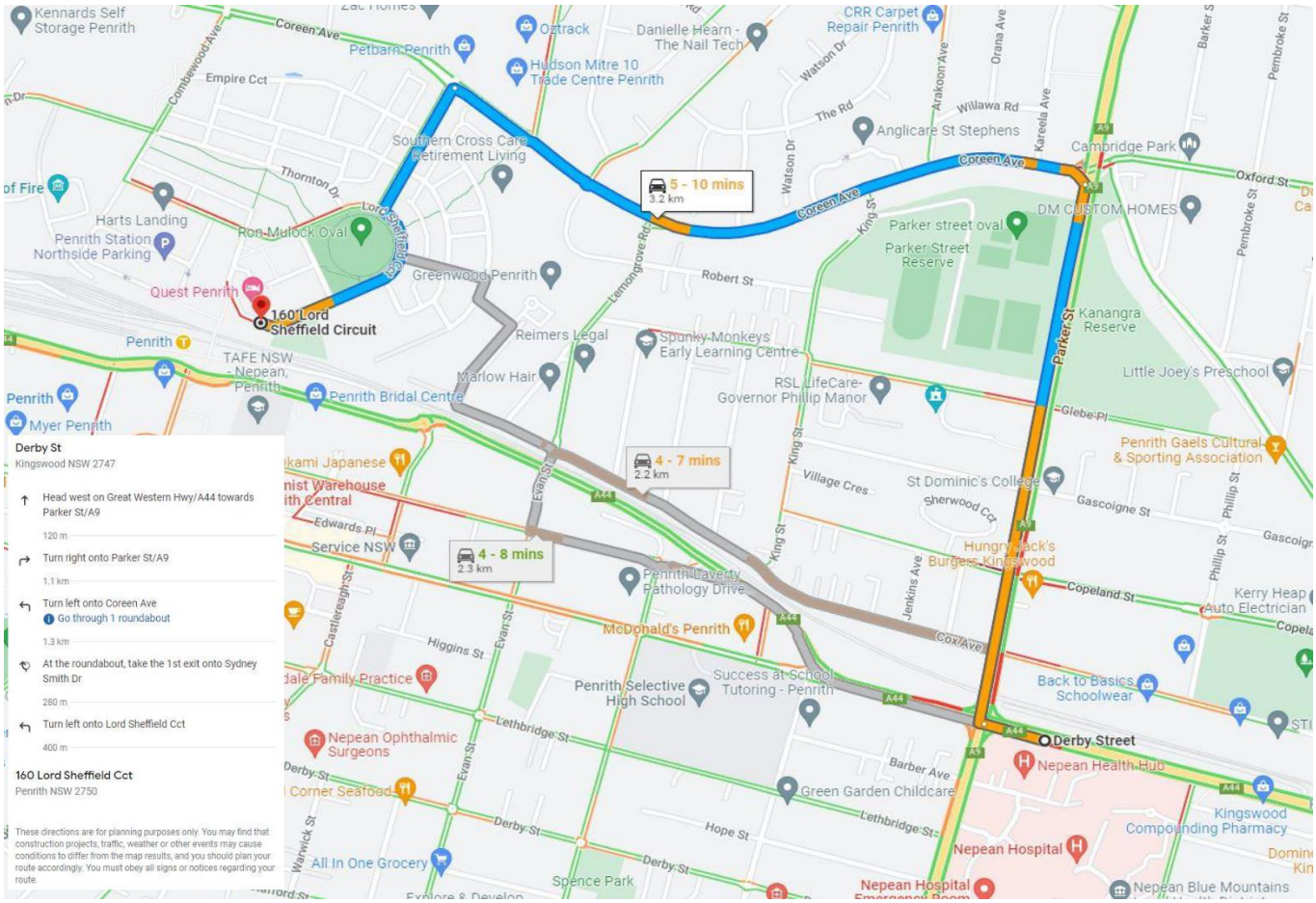
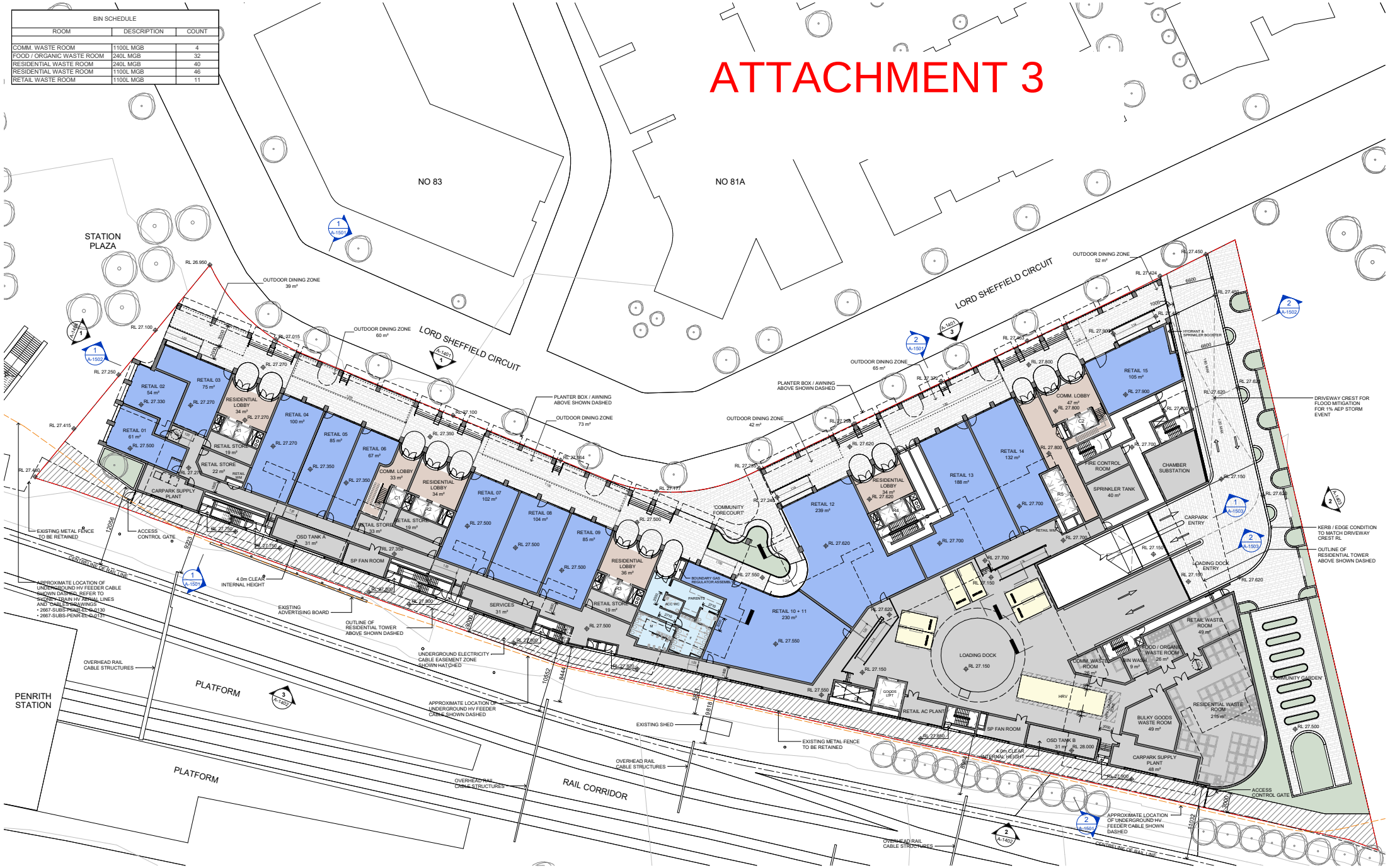


Figure: Local Evacuation Route to Northern Road Route (Google Maps).

(Please Note: SES may direct an alternative route during a flood event.)

ATTACHMENT 3

BIN SCHEDULE		
ROOM	DESCRIPTION	COUNT
COMM. WASTE ROOM	1100L MGB	4
FOOD / ORGANIC WASTE ROOM	240L MGB	32
RESIDENTIAL WASTE ROOM	240L MGB	40
RESIDENTIAL WASTE ROOM	1100L MGB	46
RETAIL WASTE ROOM	1100L MGB	11



FOR APPROVAL

0 2.5 5 12.5m
1:250 @A1

Rev	Date	Revision	By	Chk.
5	11.07.2022	PRE-DA	DC	WG
6	08.08.2022	FOR COORDINATION	DC	WG
7	25.08.2022	FOR COORDINATION	MF	WG
8	01.09.2022	FOR CLIENT REVIEW	SC	DC
9	02.09.2022	FOR COORDINATION	SC	WG
10	14.09.2022	FOR DIP	MF	DC
11	27.09.2022	FOR COORDINATION	MF	DC
12	14.10.2022	FOR COORDINATION	MF	DC
13	18.10.2022	FOR COORDINATION	DC	WG
14	01.11.2022	FOR DEVELOPMENT APPLICATION	DC	WG

Client
URBAN PROPERTY

Project
MAYFAIR ON PENRITH
160-172 LORD SHEFFIELD CIRCUIT
PENRITH NSW 2750
DARUG COUNTRY

Drawing Name
FLOOR PLAN - GROUND LEVEL

Date	Scale	Sheet Size
01.11.2022	1 : 250	@ A1
Drawn	Chk.	Job No.
DC	WG	6626
Drawing No.		Revision
A-1003		/ 14

SJB Architects
Level 2, 490 Crown St
Surry Hills NSW
2010 Australia
T 61 2 9380 9911
www.sjb.com.au

BIN SCHEDULE		
ROOM	DESCRIPTION	COUNT
COMM. WASTE ROOM	1100L MGB	4
FOOD / ORGANIC WASTE ROOM	240L MGB	32
RESIDENTIAL WASTE ROOM	240L MGB	40
RESIDENTIAL WASTE ROOM	1100L MGB	46
RETAIL WASTE ROOM	1100L MGB	11

IGS INTEGRATED GROUP SERVICES

IGS MARK UP IN RED
DATE 4 NOVEMBER 2022

ATTACHMENT 4

NO 83

NO 81A

NO 81B

BUILDING OPENING 3
(ENTRY VIA STAIRS TO RETAIL 03 GROUND FLOOR LEVEL)

(COMMERCIAL FLOOR LEVEL) = 27.270m AHD

PMF FLOOD LEVEL: 27.20m AHD (APPROX.)

1% AEP FLOOD LEVEL STORM EVEN = 26.90 + 0.37m FREEBOARD

PROPOSED FLOOR LEVEL= 27.270 mAHD ... OK

BUILDING OPENING 4
(ENTRY VIA STAIRS TO RESIDENTIAL LOBBY GROUND FLOOR LEVEL)

(COMMERCIAL FLOOR LEVEL) = 27.270m AHD

PMF FLOOD LEVEL: 27.22m AHD (APPROX.)

1% AEP FLOOD LEVEL STORM EVEN = 26.95 + 0.3m FREEBOARD

PROPOSED FLOOR LEVEL= 27.270 mAHD ... OK

BUILDING OPENING 6
(ENTRY VIA STAIRS TO RETAIL 05 GROUND FLOOR LEVEL)

(COMMERCIAL FLOOR LEVEL) = 27.350m AHD

PMF FLOOD LEVEL: 27.30m AHD (APPROX.)

1% AEP FLOOD LEVEL STORM EVEN = 26.96 + 0.39m FREEBOARD

PROPOSED FLOOR LEVEL= 27.350 mAHD ... OK

BUILDING OPENING 8
(ENTRY VIA STAIRS TO RESIDENTIAL & COMMERCIAL LOBBY GROUND FLOOR LEVEL)

(COMMERCIAL FLOOR LEVEL) = 27.350m AHD

PMF FLOOD LEVEL: 27.36m AHD (APPROX.)

1% AEP FLOOD LEVEL STORM EVEN = 27.05 + 0.3m FREEBOARD

PROPOSED FLOOR LEVEL= 27.350 mAHD ... OK

BUILDING OPENING 10
(ENTRY VIA STAIRS TO RETAIL 08 GROUND FLOOR LEVEL)

(COMMERCIAL FLOOR LEVEL) = 27.500m AHD

PMF FLOOD LEVEL: 27.40m AHD (APPROX.)

1% AEP FLOOD LEVEL STORM EVEN = 27.15 + 0.35m FREEBOARD

PROPOSED FLOOR LEVEL= 27.500 mAHD ... OK

BUILDING OPENING 12
(ENTRY VIA STAIRS TO RESIDENTIAL LOBBY GROUND FLOOR LEVEL)

(COMMERCIAL FLOOR LEVEL) = 27.500m AHD

PMF FLOOD LEVEL: 27.48m AHD (APPROX.)

1% AEP FLOOD LEVEL STORM EVEN = 27.20 + 0.3m FREEBOARD

PROPOSED FLOOR LEVEL= 27.500 mAHD ... OK

BUILDING OPENING 14
(ENTRY VIA STAIRS TO RETIAL 12 GROUND FLOOR LEVEL)

(COMMERCIAL FLOOR LEVEL) = 27.620m AHD

PMF FLOOD LEVEL: 27.58m AHD (APPROX.)

1% AEP FLOOD LEVEL STORM EVEN = 27.31 + 0.31m FREEBOARD

PROPOSED FLOOR LEVEL= 27.620 mAHD ... OK

BUILDING OPENING 15
(ENTRY VIA STAIRS TO RETAIL 13 FLOOR LEVEL)

(COMMERCIAL FLOOR LEVEL) = 27.70m AHD

PMF FLOOD LEVEL: 27.66m AHD (APPROX.)

1% AEP FLOOD LEVEL STORM EVEN = 27.35 + 0.35m FREEBOARD

PROPOSED FLOOR LEVEL= 27.700 mAHD ... OK

BUILDING OPENING 16
(ENTRY VIA STAIRS TO RETAIL 14 FLOOR LEVEL)

(COMMERCIAL FLOOR LEVEL) = 27.70m AHD

PMF FLOOD LEVEL: 27.68m AHD (APPROX.)

1% AEP FLOOD LEVEL STORM EVEN = 27.40 + 0.3m FREEBOARD

PROPOSED FLOOR LEVEL= 27.700 mAHD ... OK

BUILDING OPENING 17
(ENTRY VIA STAIRS TO RETAIL 15 FLOOR LEVEL)

(COMMERCIAL FLOOR LEVEL) = 27.900m AHD

PMF FLOOD LEVEL: 27.78m AHD (APPROX.)

1% AEP FLOOD LEVEL STORM EVEN = 27.54 + 0.36m FREEBOARD

PROPOSED FLOOR LEVEL= 27.900 mAHD ... OK

BUILDING OPENING 18
(DRIVEWAY ENTRY TO LOADING DOCK AND CAR PARK LEVEL)

PROPOSED DRIVE WAY CREST: 26.62m AHD

PMF FLOOD LEVEL: 27.88m AHD (APPROX.)

1% AEP FLOOD LEVEL = 27.60 mAHD (APPROX.) + 0.02m FREEBOARD

DRIVEWAY LEVEL = 26.62 mAHD ... OK

BUILDING OPENING 2
(ENTRY VIA STAIRS TO RETAIL 02 GROUND FLOOR LEVEL)

(COMMERCIAL FLOOR LEVEL) = 27.330m AHD

PMF FLOOD LEVEL: 27.28m AHD (APPROX.)

1% AEP FLOOD LEVEL STORM EVEN = 26.92 + 0.41m FREEBOARD

PROPOSED FLOOR LEVEL= 27.330 mAHD ... OK

BUILDING OPENING 1
(ENTRY VIA STAIRS TO RETAIL 01 GROUND FLOOR LEVEL)

(COMMERCIAL FLOOR LEVEL) = 27.500m AHD

PMF FLOOD LEVEL: 27.48m AHD (APPROX.)

1% AEP FLOOD LEVEL STORM EVEN = 26.92 + 0.58m FREEBOARD

PROPOSED FLOOR LEVEL= 27.500 mAHD ... OK

BUILDING OPENING 5
(ENTRY VIA STAIRS TO RETAIL 04 GROUND FLOOR LEVEL)

(COMMERCIAL FLOOR LEVEL) = 27.270m AHD

PMF FLOOD LEVEL(AT REAR): 27.24m AHD (APPROX.)

1% AEP FLOOD LEVEL STORM EVEN = 26.94 + 0.33m FREEBOARD

PROPOSED FLOOR LEVEL= 27.270 mAHD ... OK

BUILDING OPENING 7
(ENTRY VIA STAIRS TO RETAIL 06 GROUND FLOOR LEVEL)

(COMMERCIAL FLOOR LEVEL) = 27.350m AHD

PMF FLOOD LEVEL: 27.28m AHD (APPROX.)

1% AEP FLOOD LEVEL STORM EVEN = 27.00 + 0.35m FREEBOARD

PROPOSED FLOOR LEVEL= 27.350 mAHD ... OK

BUILDING OPENING 9
(ENTRY VIA STAIRS TO RETAIL 07 GROUND FLOOR LEVEL)

(COMMERCIAL FLOOR LEVEL) = 27.500m AHD

PMF FLOOD LEVEL: 27.38m AHD (APPROX.)

1% AEP FLOOD LEVEL STORM EVEN = 27.10 + 0.4m FREEBOARD

PROPOSED FLOOR LEVEL= 27.500 mAHD ... OK

BUILDING OPENING 11
(ENTRY VIA STAIRS TO RETAIL 09 GROUND FLOOR LEVEL)

(COMMERCIAL FLOOR LEVEL) = 27.500m AHD

PMF FLOOD LEVEL: 27.46m AHD (APPROX.)

1% AEP FLOOD LEVEL STORM EVEN = 27.18 + 0.32m FREEBOARD

PROPOSED FLOOR LEVEL= 27.500 mAHD ... OK

BUILDING OPENING 13
(ENTRY VIA RAMP TO RETAIL 10 &11 GROUND FLOOR LEVEL)

(COMMERCIAL FLOOR LEVEL) = 27.550m AHD

PMF FLOOD LEVEL: 27.52m AHD (APPROX.)

1% AEP FLOOD LEVEL STORM EVEN = 27.23 + 0.32m FREEBOARD

PROPOSED FLOOR LEVEL= 27.550 mAHD ... OK

LORD SHEFFIELD CIRCUIT

OUTDOOR DINING ZONE 60 m²

OUTDOOR DINING ZONE 73 m²

OUTDOOR DINING ZONE 42 m²

OUTDOOR DINING ZONE 65 m²

PLANTER BOX / AWNING ABOVE SHOWN DASHED

RETAIL 01 61 m² RL 27.500
RETAIL 02 54 m² RL 27.330
RETAIL 03 75 m²
RETAIL 04 100 m²
RETAIL 05 85 m²
RETAIL 06 67 m²
RETAIL 07 102 m² RL 27.500
RETAIL 08 104 m² RL 27.500
RETAIL 09 85 m² RL 27.500
RETAIL 10 + 11 230 m² RL 27.550
RETAIL 12 239 m² RL 27.620
RETAIL 13 188 m² RL 27.700
RETAIL 14 132 m² RL 27.800
RETAIL 15 105 m² RL 27.900

RESIDENTIAL LOBBY 34 m² RL 27.270
RESIDENTIAL LOBBY 34 m² RL 27.350
RESIDENTIAL LOBBY 36 m² RL 27.500
RESIDENTIAL LOBBY 34 m² RL 27.620

COMM. LOBBY 33 m² RL 27.350
COMM. LOBBY 47 m² RL 27.800

RETAIL STORE 19 m² RL 27.270
RETAIL STORE 22 m² RL 27.270
RETAIL STORE 33 m² RL 27.350
RETAIL STORE 19 m² RL 27.500
RETAIL STORE 19 m² RL 27.500

CARPARK SUPPLY PLANT RL 27.480
CARPARK SUPPLY PLANT 48 m² RL 27.900

OSD TANK A 31 m² RL 27.750
OSD TANK B 31 m² RL 28.000

SP FAN ROOM RL 27.350
SP FAN ROOM RL 27.850

SERVICES 31 m² RL 27.800

FIRE CONTROL ROOM RL 27.700
SPRINKLER TANK 40 m² RL 27.700
CHAMBER SUBSTATION RL 27.700

'COMMUNITY FORECOURT'

BOUNDARY GAS REGULATOR ASSEMBLY RL 27.550

PARENTS RL 27.620
ACC WC RL 27.620

LOADING DOCK RL 27.150
LOADING DOCK ENTRY RL 27.150
CARPARK ENTRY RL 27.150

RETAIL AC PLANT RL 27.850

GOODS LIFT RL 27.150

HRV

RETAIL WASTE ROOM 49 m²
FOOD / ORGANIC WASTE ROOM 26 m²
BIN WASH 9 m²
COMM. WASTE ROOM 26 m²
BULKY GOODS WASTE ROOM 49 m²
RESIDENTIAL WASTE ROOM 215 m²

'COMMUNITY GARDEN'

HYDRANT & SPRINKLER BOOSTER

DRIVEWAY CREST FOR FLOOD MITIGATION FOR 1% AEP STORM EVENT

KERB / EDGE CONDITION TO MATCH DRIVEWAY CREST RL

OUTLINE OF RESIDENTIAL TOWER ABOVE SHOWN DASHED

ACCESS CONTROL GATE

APPROXIMATE LOCATION OF UNDERGROUND HV FEEDER CABLE SHOWN DASHED. REFER TO SYDNEY TRAIN HV AERIAL LINES AND CABLES DRAWINGS
• 2667-SUBS-PENR-EL-D-0130
• 2667-SUBS-PENR-EL-D-0131

APPROXIMATE LOCATION OF UNDERGROUND HV FEEDER CABLE SHOWN DASHED

OVERHEAD RAIL CABLE STRUCTURES

EXISTING SHED

EXISTING METAL FENCE TO BE RETAINED

4.0m CLEAR INTERNAL HEIGHT

UNDERGROUND ELECTRICITY EASEMENT ZONE SHOWN HATCHED

RAIL LINE

CENTRELINE OF RAIL LINE

PENRITH STATION

PLATFORM

FOR APPROVAL

0 2.5 5 12.5m
1:250 @A1

Rev	Date	Revision	By	Chk.
5	11.07.2022	PRE-DA	DC	WG
6	08.08.2022	FOR COORDINATION	DC	WG
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13	18.10.2022	FOR COORDINATION	DC	WG
14	01.11.2022	FOR DEVELOPMENT APPLICATION	DC	WG

Client: URBAN PROPERTY

Project: MAYFAIR ON PENRITH
160-172 LORD SHEFFIELD CIRCUIT
PENRITH NSW 2750
DARUG COUNTRY

Drawing Name: FLOOR PLAN - GROUND LEVEL

Date	Scale	Sheet Size
01.11.2022	1 : 250	@ A1
Drawn	Chk.	Job No.
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Drawing No.		Revision
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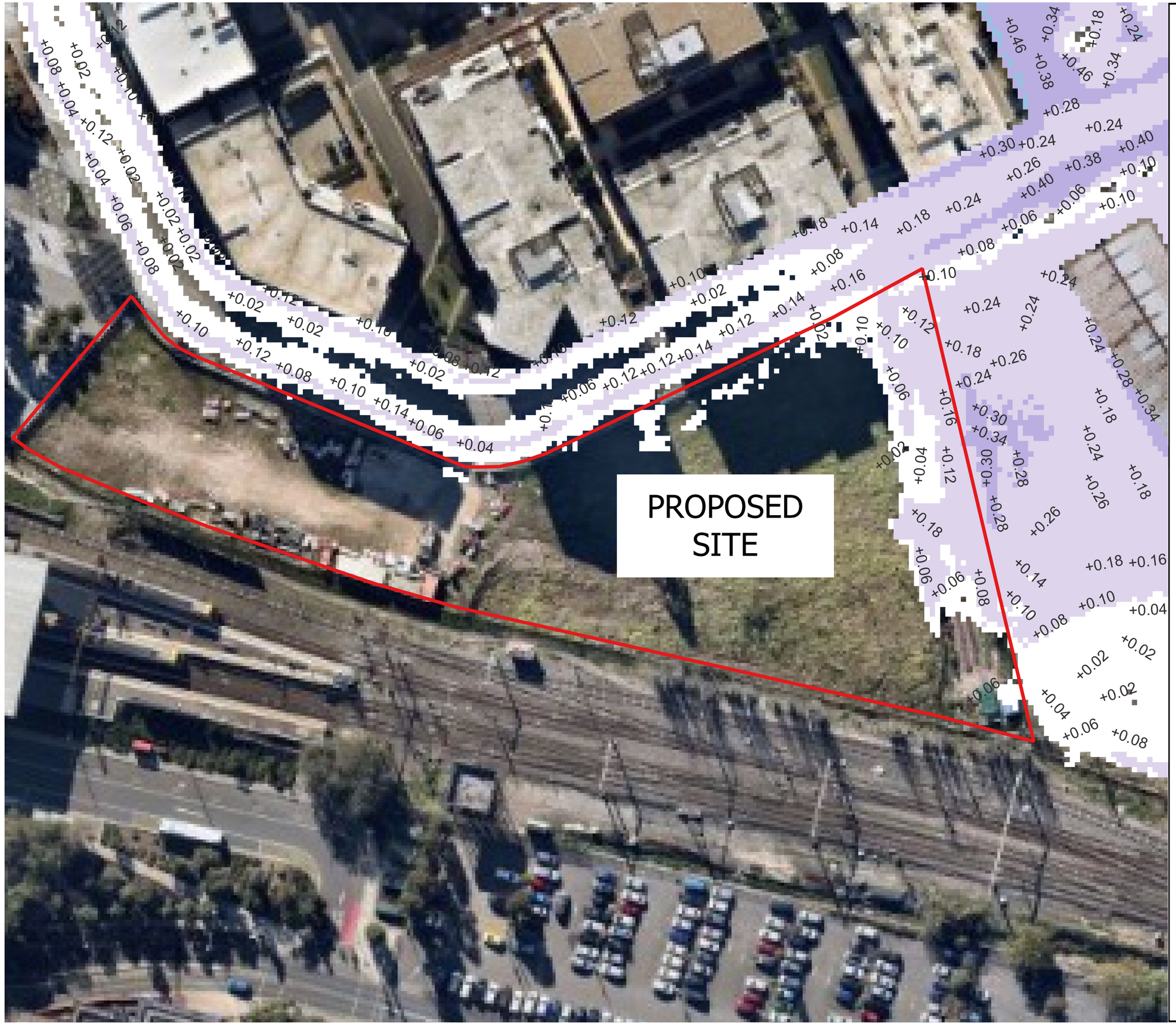


160 - 172 Lord Sheffield Circuit

Date: 20 July 2022

Depth Map during 1% AEP Storm Events

LEGEND

- <= 0.100
- 0.100 - 0.300
- 0.300 - 0.500
- 0.500 - 0.700
- 0.700 - 1.000
- 1.000 - 1.500

Property boundary

0 10 20 m

IGS INTEGRATED GROUP SERVICES

ATTACHMENT 6

PROPOSED SITE

160 - 172 Lord Sheffield Circuit

Date: 20 July 2022

Water Surface Elevation Contour Map during 1% AEP Storm Events

LEGEND

- <= 0.100
- 0.100 - 0.300
- 0.300 - 0.500
- 0.500 - 0.700
- 0.700 - 1.000
- 1.000 - 1.500
- Contours at 0.02m intervals
- Property boundary

0 10 20 m

IGS INTEGRATED GROUP SERVICES

ATTACHMENT 7

PROPOSED SITE

160 - 172 Lord Sheffield Circuit

Date: 4 November 2022

Water Surface Elevation Map during 1% AEP Storm Events For Post Development Scenario

LEGEND

- <= 0.100
- 0.100 - 0.300
- 0.300 - 0.500
- 0.500 - 0.700
- 0.700 - 1.000
- 1.000 - 1.500
- Contours at 0.02m intervals
- Property boundary

IGS INTEGRATED GROUP SERVICES

160 - 172 Lord Sheffield Circuit

Date: 4 August 2022

Water Surface Elevation Map during PMF Storm Events For Post Development Scenario

LEGEND

- <= 0.100
- 0.100 - 0.300
- 0.300 - 0.500
- 0.500 - 0.700
- 0.700 - 1.000
- 1.000 - 1.500
- Contours at 0.02m intervals
- Property boundary

0 25 50 m

IGS INTEGRATED GROUP SERVICES

ATTACHMENT 9

PROPOSED SITE

160 - 172 Lord Sheffield Circuit

Date: 4 November 2022

Velocity x Depth for Pre Scenario during 1% AEP Storm events

VALUES SHOWN ARE INDICITIVE OF THE PRODUCT OF VELOCITY AND DEPTH DURING 1%AEP EVENTS PRE SCENARIO.

IGS INTEGRATED GROUP SERVICES

ATTACHMENT 10

PROPOSED SITE

160 - 172 Lord Sheffield Circuit

Date: 4 November 2022

Velocity x Depth for Post Scenario during 1% AEP Storm Events

VALUES SHOWN ARE INDICITIVE OF THE PRODUCT OF VELOCITY AND DEPTH DURING 1%AEP EVENTS POST SCENARIO.

IGS INTEGRATED GROUP SERVICES

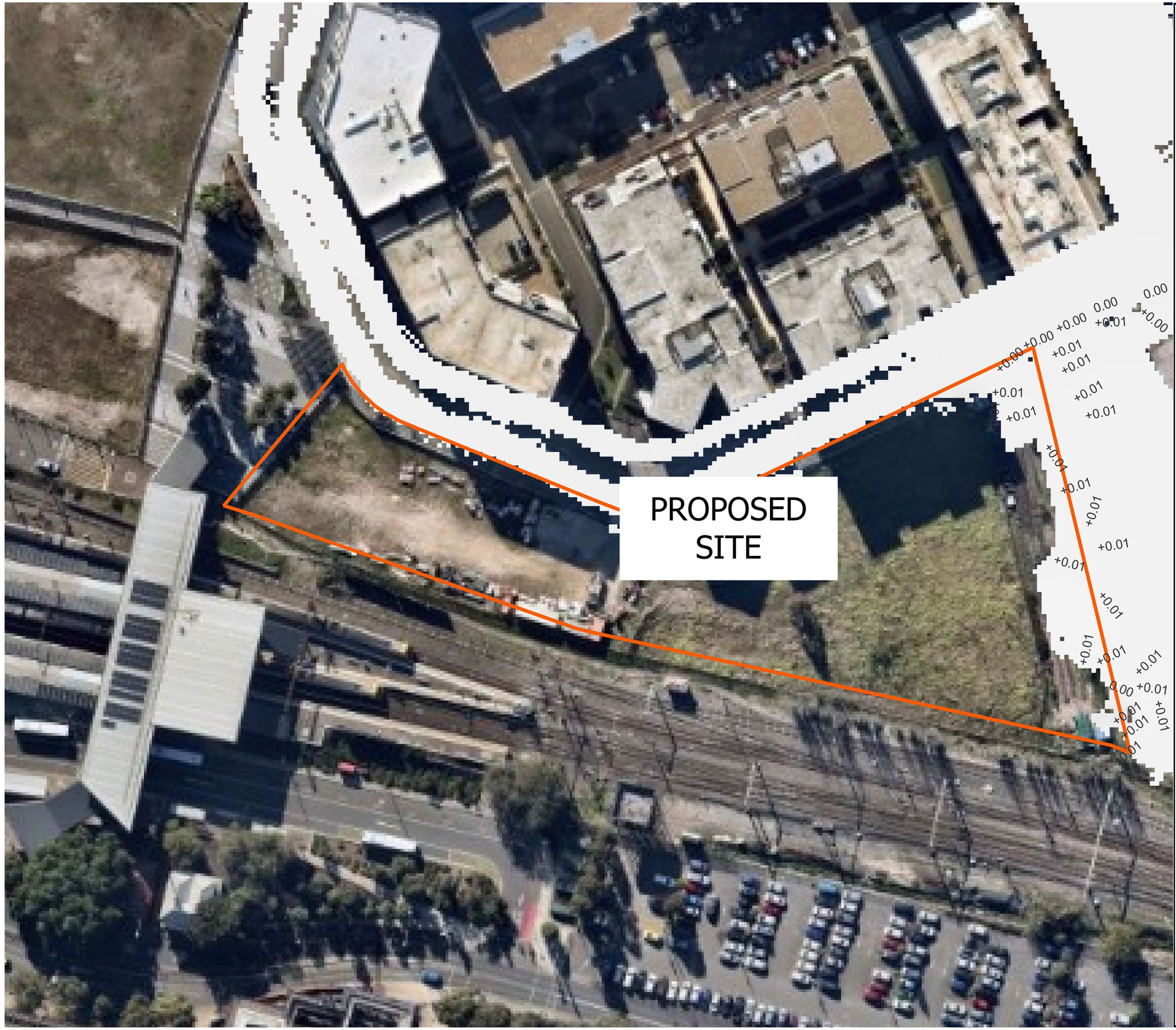
160 - 172 Lord Sheffield Circuit

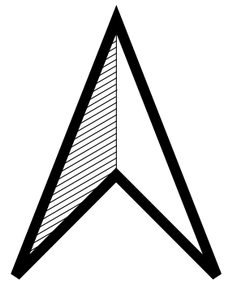
Date: 23 September 2022

Depth Afflux Map (Post Depth - Pre Depth) @ 1% AEP Storm Events.

DIFFRENCE IN FLOOD DEPTH BETWEEN POST AND PRE

PROPOSED SITE





IGS INTEGRATED GROUP SERVICES

ATTACHMENT 12

Prepare now for flood, storm and tsunami

SES
NSW STATE EMERGENCY SERVICE

Your Emergency Kit

Your emergency kit contents

- ✅ A portable radio with spare batteries
- ✅ A torch with spare batteries
- ✅ A first aid kit
- ✅ Candles and waterproof matches
- ✅ Important documents including emergency contact numbers
- ✅ Copies of any emergency plans
- ✅ A waterproof bag for valuables

If you have to evacuate, add to your emergency kit

- ✅ Medications
- ✅ Supplies for your baby or any other people in your care
- ✅ Appropriate clothing and footwear
- ✅ Food and drinking water

Keep your emergency kit in a waterproof storage box.
Check your emergency kit regularly and restock any out-of-date items such as batteries.

For more information: www.ses.nsw.gov.au

#NSWSES /NSWSES /NSWSES

SES
NSW STATE EMERGENCY SERVICE

FOR EMERGENCY HELP IN FLOOD, STORM AND TSUNAMI CALL
132 500

Principal Partner
NRMA INSURANCE

HAWKESBURY-NEPEAN FACT SHEET

ATTACHMENT 13

Know how to get out

FLOOD EVACUATION ROUTES IN THE HAWKESBURY-NEPEAN VALLEY

Floods in the Hawkesbury-Nepean Valley can happen with little warning. You may only have a few hours to get out following an evacuation order. You need to be prepared and get to know your evacuation routes.

Knowing when and how to leave

The Hawkesbury-Nepean Valley has a long history of damaging and dangerous floods. You need to follow evacuation orders to keep you, your family and pets safe. You will typically be asked to leave well before you see any sign of floodwater in your neighbourhood. It is not safe to stay and shelter in your home once you have been ordered to evacuate.

To find out about evacuation orders and which routes are open listen to your local and ABC radio, visit the NSW SES website, or follow NSW SES Facebook, or NSW Police Facebook and Twitter.

Get familiar with the routes

There are 12 designated evacuation routes that provide the quickest and safest way to exit the Wallacia, Penrith-Emu Plains, Richmond-Windsor, South and Eastern Creek floodplains. (See map on reverse of fact sheet).

You need to be aware of more than one route because each flood behaves differently and evacuation routes will get cut by floodwater at different points. Some routes can get cut quite early in relatively small floods. For example, Windsor Road is cut when floodwaters reach 13.5m at Windsor, around a 1 in 20 chance of happening in any given year.

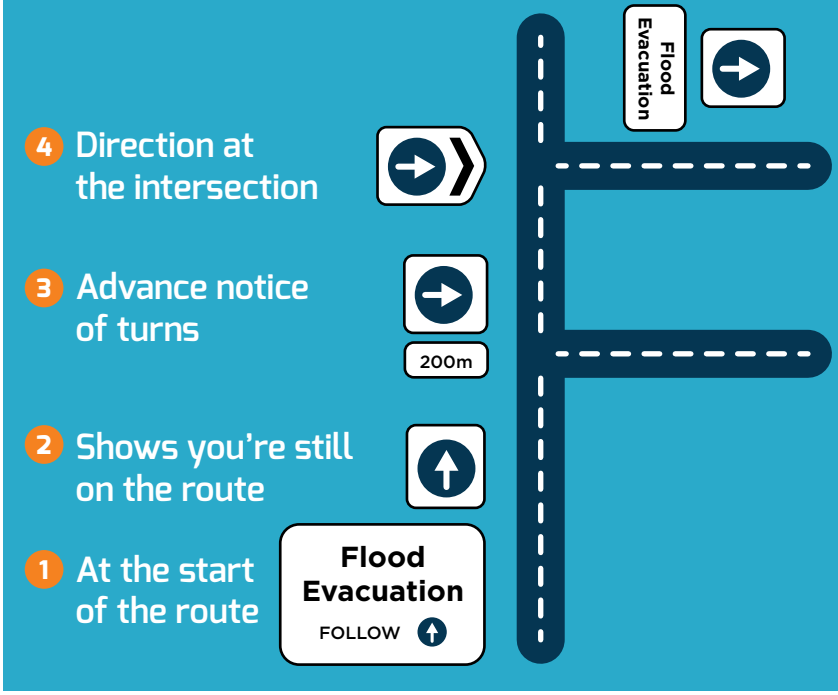
Even high set evacuation routes can be affected by large floods. The Jim Anderson Bridge would be cut when floodwaters approach its road level at 17.3 metres at Windsor, around a 1 in 100 chance of happening in any given year.

Once you know your best routes, have a conversation with friends or relatives to organise a place to go to. Remember, as each flood can be different, it's important to follow evacuation orders when they are given.

Follow the signs

More than 150 new flood evacuation signs have been installed across the Hawkesbury-Nepean Valley to guide drivers. There are several different types of signs, including a number of folded signs designed to be opened during a flood emergency to provide extra direction for drivers.

Signs to guide people along the regional flood evacuation routes towards safer areas.

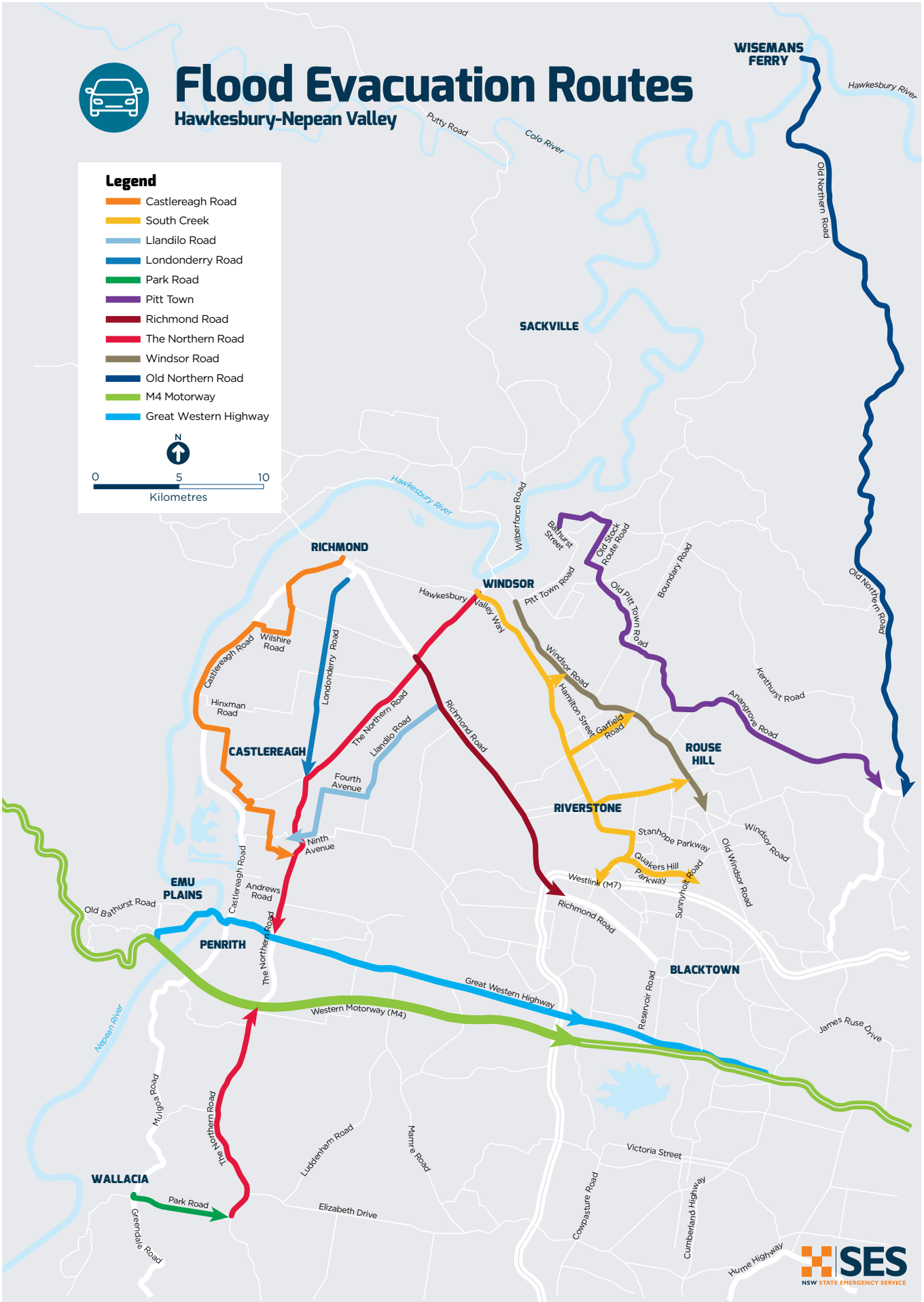


Find out more at **www.myfloodrisk.nsw.gov.au**

NSW SES NSW STATE EMERGENCY SERVICE

Flood Evacuation Routes

Hawkesbury-Nepean Valley



Our reference: P-465586-Y2L0
Contact: Dr Elias Ishak
Telephone: 4732 7579

24 March 2023

Richard Boulus
Level 10
11-15 Deane Street
BURWOOD NSW 2134

Dear Sir/Madam,

Flood Level Enquiry
Lots 3011 & 3001 DP 1184498 – No 160 & 162 Lord Sheffield Circuit Penrith

Please find enclosed Flood Level information for the above property.

Should you require any further information please do not hesitate to contact me on 4732 7579.

Yours sincerely

Dr Elias Ishak
Senior Engineer – Floodplain Management

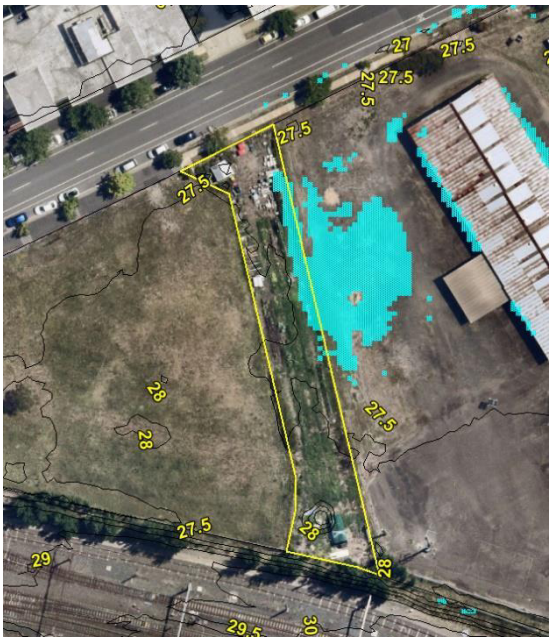
Penrith City Council
PO Box 60, Penrith
NSW 2751 Australia
T 4732 7777
F 4732 7958
penrith.city

Flood Information
Lot 3011 DP 1184498 - No 160 Lord Sheffield Circuit Penrith

Date of Issue: 24 March 2023

The 1%AEP local overland flow flood level affecting the above property is estimated to be RL27.5m AHD.

Property less than 0.5m above the 1% AEP flood level is subject to Penrith Development Control Plan 2014 Section C3.5 Flood Planning. The Penrith Development Control Plan 2014 is available from Council's website penrith.city.



Definitions

AEP – *Annual Exceedance Probability* – the chance of a flood of this size occurring in any one year.

AHD – *Australian Height Datum* – A standard level datum used throughout Australia, approximately equivalent to mean sea level.

Legend

	Extent of 1% AEP local catchment overland flow path. Generally depths less than 150mm is not shown.

Notes:

1. The contours shown above in yellow numbering are at 0.5m intervals and are based on Aerial Laser Scanning (ALS) Survey undertaken in 2002. The contour levels are approximate and for general information only. Accurate ground levels should be obtained by a Registered Surveyor.
2. The flood level is based on current information available to Council at the date of issue. The flood level may change in the future if new information becomes available. The 1% AEP flood is the flood adopted by Council for planning controls. Rarer and more extreme flood events will have a greater effect on the property.
3. Council's studies are reflected in flood mapping for the City which show properties potentially affected by overland flows in excess of 150mm.
4. This property is shown on Council's flood mapping as potentially so affected.
5. Council imposes flood related development controls where, in its opinion, such controls are justified. Such controls may or may not be imposed with respect to this property in the event of an application for development consent.
6. If a development proposal is submitted with respect to this property, Council will consider the possibility of flood or overland flow in the context of the application. Council may impose a requirement that the applicant for development consent carry out a detailed assessment of the possible overland water flows affecting the property (a flood study) and/or may impose other controls on any development designed to ameliorate flood risk.
7. You are strongly advised if you propose to carry out development upon the property, that you retain the assistance of an experienced flooding engineer and have carried out a detailed investigation.
8. Council accepts no liability for the accuracy of the flood levels (or any other data) contained in this certificate, having regard to the information disclosed in Notes "1" to "4". As such you should carry out and rely upon your own investigations.

Penrith City Council
PO Box 60, Penrith
NSW 2751 Australia
T 4732 7777
F 4732 7958
penrith.city

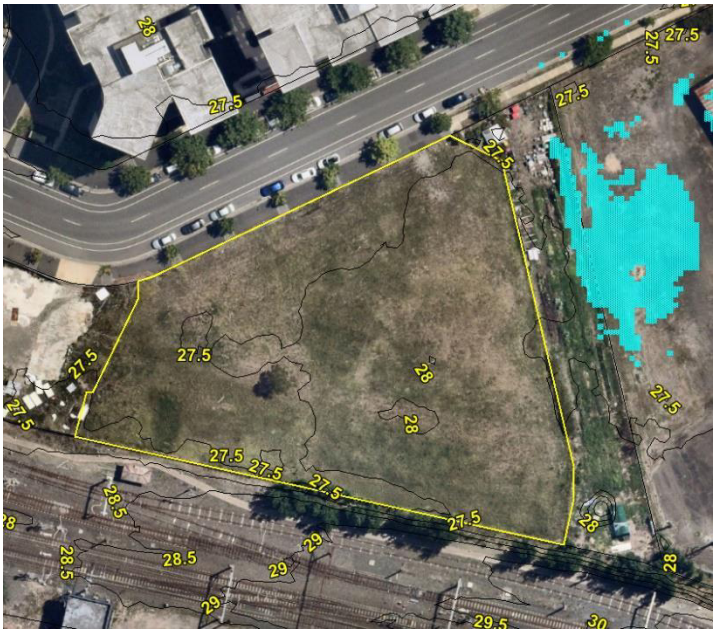
Dr Elias Ishak
Senior Engineer – Floodplain Management

Flood Information
Lot 3001 DP 1184498 - No 162 Lord Sheffield Circuit Penrith

Date of Issue: 24 March 2023

The 1%AEP local overland flow flood level in the vicinity of the above property is estimated to be RL27.5m AHD at the eastern boundary.

Property less than 0.5m above the 1% AEP flood level is subject to Penrith Development Control Plan 2014 Section C3.5 Flood Planning. The Penrith Development Control Plan 2014 is available from Council's website penrith.city.



Definitions

AEP – *Annual Exceedance Probability* – the chance of a flood of this size occurring in any one year.

AHD – *Australian Height Datum* – A standard level datum used throughout Australia, approximately equivalent to mean sea level.

Legend

	Extent of 1% AEP local catchment overland flow path. Generally depths less than 150mm is not shown.

Notes:

9. The contours shown above in yellow numbering are at 0.5m intervals and are based on Aerial Laser Scanning (ALS) Survey undertaken in 2002. The contour levels are approximate and for general information only. Accurate ground levels should be obtained by a Registered Surveyor.
10. The flood level is based on current information available to Council at the date of issue. The flood level may change in the future if new information becomes available. The 1% AEP flood is the flood adopted by Council for planning controls. Rarer and more extreme flood events will have a greater effect on the property.
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14. If a development proposal is submitted with respect to this property, Council will consider the possibility of flood or overland flow in the context of the application. Council may impose a requirement that the applicant for development consent carry out a detailed assessment of the possible overland water flows affecting the property (a flood study) and/or may impose other controls on any development designed to ameliorate flood risk.
15. You are strongly advised if you propose to carry out development upon the property, that you retain the assistance of an experienced flooding engineer and have carried out a detailed investigation.
16. Council accepts no liability for the accuracy of the flood levels (or any other data) contained in this certificate, having regard to the information disclosed in Notes "1" to "4". As such you should carry out and rely upon your own investigations.

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NSW 2751 Australia
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F 4732 7958
penrith.city

Dr Elias Ishak
Senior Engineer – Floodplain Management

Our Ref: ID 1817
Your Ref: DA22-1086 (CNR-48934)

23 December 2022

Ryan Klingberg
Department of Planning and Environment
Locked Bag 5022
Parramatta NSW 2124

email: ryan.klingberg@planning.nsw.gov.au

Dear Ryan,

Development Application for 106-172 Lord Sheffield Circuit Penrith

Thank you for the opportunity to provide advice on the Development Application (DA) for 106-172 Lord Sheffield Circuit Penrith. It is understood that the proposal seeks to:

- Construct two mixed use 8 storey residential towers (up to 288 residential apartments) above a 2 storey podium comprising 11 retail and 18 commercial spaces.
- Three basement levels containing all car parking and servicing for the development (421 spaces).

It is noted that in 2011, the Concept Plan MP10_0075 was approved, involving the staged construction of 900-1000 residential dwellings supported by retail, commercial and industrial development as well as recreational, community and open space facilities.

The NSW State Emergency Service (NSW SES) is the agency responsible for dealing with floods, storms and tsunami in NSW. This role includes, planning for, responding to and coordinating the initial recovery from floods. As such, the NSW SES has an interest in the public safety aspects of the development of flood prone land, particularly the potential for changes to land use to either exacerbate existing flood risk or create new flood risk for communities in NSW.

Penrith City Council, under the Adaptive Management Framework 2019 stage one, have a limit of 4050 additional dwellings within the Penrith City Centre up to 2026.

NSW SES advice has been sought regarding this DA in line with the letter from Brett Whitworth to Penrith City Council (MDPE21/1789) dated 17 July 2021:

> *The Department will establish an interim measure for Penrith, Hawkesbury and Blacktown councils, to commence on 14 July 2021 and conclude once the regional land-use planning framework has been finalised. Under this interim measure, when assessing against clause 5.21 (2) (c) to determine if an application exceeds the capacity of evacuation routes the following conditions can apply:*

STATE HEADQUARTERS
93 - 99 Burelli Street, Wollongong 2500
PO Box 6126, Wollongong NSW 2500
P (02) 4251 6111
F (02) 4251 6190
www.ses.nsw.gov.au
ABN: 88 712 649 015

1. If a development application increases the capacity of a development by more than 150 dwellings, or 200 employee vehicles for a commercial development, the Department will coordinate a response with Infrastructure NSW (INSW) and NSW SES.

The NSW SES recommends due consideration and application of the requirements of the NSW Government's Flood Prone Land Policy occurs, as set out in the Floodplain Development Manual and relevant planning directions under the *EP&A Act*.

Attention is drawn to the following principles outlined in the Manual which are of importance to the NSW SES role as described above:

- **Development should not result in an increase in risk to life, health or property of people living on the floodplain.**

  The high point on the site is RL27.98m AHD and lowest point is RL26.92m AHD.

  Overland flooding

  According to the Flood Impact and Risk Management Report this site is affected by overland flows towards the east site boundary. There would be little to no warning time available for the overland flooding. However, the depth and velocity of floodwater appear not to be greater than 0.5m in the vicinity of the proposed development. Therefore it is unlikely to result in structural damage and we note that stormwater infrastructure has been designed to further minimise the risk. The site appears to be outside the study area of the Penrith CBD Floodplain, Risk Management Study and Plan by Molino Stewart (2020). However, it is isolated by relatively frequent (5% AEP) flooding (Penrith Overland Flow Flood "Overview Study", 2006).

  Riverine flooding

  According to the Nepean River Flood Study 2018 and Hawkesbury-Nepean Valley Regional Flood Study 2019, the site is not affected by 1% AEP flooding.

  The flood level during the PMF event is approximately 30.45m AHD with varying flood depths of 3-4m. The hazard category is estimated to be around H5, which is unsafe for vehicles and people and all buildings are vulnerable to structural damage.

  We also note that the interim results from the new HN 2D Regional Flood Study indicate that the 1% AEP level at Penrith is around 1m higher than the current height based on the calibration against the March 2021 flood event and more detailed modelling. This equates to approximately 26.8m AHD. This 2D flood study is expected to be finalised in the first half of 2023. Council is aware of the interim results and is part of the Technical Working Group for the Study. At this stage the interim results are not likely to change significantly.

- **Risk assessment should consider the full range of flooding, including events up to the Probable Maximum Flood (PMF) and not focus only on the 1% AEP flood.**

  This has been included in the Flood Impact and Risk Management Report.

- **Risk assessment should have regard to flood warning and evacuation demand on existing and future access/egress routes. Consideration should also be given to the impacts of localised flooding on evacuation routes. Evacuation must not require people to drive or walk through flood water.**

  The site becomes isolated in overland flooding events, with little to no warning time. The hazard at the site is not anticipated to result in structural damage to the buildings in an overland flood. The site also becomes isolated, therefore loses its evacuation route, in a flood equivalent to the current 1 in 500 year riverine flood event. This is likely to be more frequent, based on the preliminary results from the HN 2D Regional Flood Study.

  The basement consists of 421 car spaces, 133 bicycle spaces and associated services. The basement entrance is proposed to be at 27.62m AHD, which is slightly above the 1% AEP for the local catchment flooding. It is recommended that the height of the access to the basement is increased to reduce the risk of basement flooding, particularly for the flash flooding.

  Evacuation of the site would be challenging even in a riverine flood event, particularly due to "one-way" traffic restrictions along the Crescent. Any evacuation would have the potential to have significant traffic delays, despite land above the PMF being nearby. However, as the hazard is high in larger flood events and the duration would be several days, it is critical that evacuation occurs. Failure to do so at this site would increase the number of people exposed to the effects of flooding and other secondary emergencies such as fires and medical emergencies.

- **In the context of future development, self-evacuation of the community should be achievable in a manner which is consistent with the NSW SES's principles for evacuation.**

- **Development must not conflict with the NSW SES's flood response and evacuation strategy for the existing community.**

  The Flood Impact and Risk Management Report recommends evacuation at 22.3m AHD at Victoria Bridge, equivalent to a 1 in 5 to 1 in 10 year event. This is very conservative and inappropriate for residential dwellings or apartments. Taking a precautionary approach and closing businesses and employment activities at this level is appropriate given the flood risk in the Penrith floodplain. However triggering evacuation of residential areas at this low flood level in the Nepean River at is not appropriate as evacuated people may require assistance and accommodation, and

NSW SES and welfare agencies would not usually establish evacuation centres and emergency accommodation when floods at this low level. Evacuation of residential premises for in response to regional Nepean River flooding should therefore be triggered by NSW SES, currently as a part of the North Penrith B4 subsector.

- **Development strategies relying on deliberate isolation or sheltering in buildings surrounded by flood water are not equivalent, in risk management terms, to evacuation.**

  'Shelter in place' strategy is not an endorsed flood management strategy by the NSW SES for future development. Such an approach is only considered suitable to allow existing dwellings that are currently at risk to reduce their risk, without increasing the number of people subject to such risk. The flood evacuation constraints in an area should not be used as a reason to justify new development by requiring the new development to have a suitable refuge above the PMF. Allowing such development will increase the number of people exposed to the effects of flooding. Other secondary emergencies such as fires and medical emergencies may occur in buildings isolated by floodwater. During flooding it is likely that there will be a reduced capacity for the relevant emergency service agency to respond in these times. Even relatively brief periods of isolation, in the order of a few hours, can lead to personal medical emergencies that have to be responded to.

- **Development strategies relying on an assumption that mass rescue may be possible where evacuation either fails or is not implemented are not acceptable to the NSW SES.**

  This may occur at this site if evacuation is not successful in a PMF event.

- **The NSW SES is opposed to the imposition of development consent conditions requiring private flood evacuation plans rather than the application of sound land use planning and flood risk management.**

  Although NSW SES encourages homes and businesses to be prepared and has developed a home FloodSafe toolkit and a Business FloodSafe toolkit, even well written plans are dependent on human application and often rely on technical support systems. Most plans will rely on the actions of one or more third parties and all plans require regular maintenance and review, and most importantly an ongoing commitment from all participants. These conditions are difficult enough to implement and monitor over the long term for a full-time emergency service and are unlikely to be achieved at all in a private ownership context where there is no external audit or monitoring.

  It should also be noted that the Manual specifically precludes the practice of consent conditions requiring a site plan if that plan is trying to overcome an underlying flood risk that would otherwise be considered too high to permit approval (see Manual

Annex L-3). In other words, if the existence of a flood plan is ignored, is the underlying flood risk unacceptable in the context of the proposed development?

- **NSW SES is opposed to development strategies that transfer residual risk, in terms of emergency response activities, to NSW SES and/or increase capability requirements of the NSW SES.**

- **Consent authorities should consider the cumulative impacts any development will have on risk to life and the existing and future community and emergency service resources in the future.**

You may also find the following Guidelines, originally developed for the Hawkesbury Nepean Valley and available on the NSW SES website useful:

- Reducing Vulnerability of Buildings to Flood Damage

Please feel free to contact Elspeth O'Shannessy via email at rra@ses.nsw.gov.au should you wish to discuss any of the matters raised in this correspondence. The NSW SES would also be interested in receiving future correspondence regarding the outcome of this referral via this email address.

Yours Sincerely

Melissa Daley
A/Senior Manager, Emergency Risk Management
NSW State Emergency Service

Infrastructure NSW

AON Tower, Level 27, 201 Kent Street
Sydney NSW 2000 Australia
ABN 85 031 302 516

Ryan Klingberg
Department of Planning and Environment
Locked Bag 5022
Parramatta NSW 2124

21/12/2022

Dear Mr Klingsberg

Re: Planning Proposal – 106-172 Lord Sheffield Circuit, Penrith (CNR-48934)

I refer to your email dated 12 December 2022 consulting with Infrastructure NSW on the proposal to develop 106-172 Lord Sheffield Circuit as a combined retail and apartment complex.

The Directorate has assessed the development and notes that the site is subject to both regional Nepean River and local Werrington Creek flooding. The Directorate advice is focussed on the management and mitigation of the regional flood risk. Penrith City Council and the NSW State Emergency Service (SES) should provide advice on the local catchment flood risk.

The Directorate's assessment of the regional flood risk is based on the Penrith City Council Nepean River flood study. The Directorate is finalising a draft Hawkesbury-Nepean River Flood Study for consultation and exhibition planned for the second quarter of 2023. This study, which includes assessment of recent flood events, indicates that flood levels have increased in the Penrith floodplain, and are projected to further increase with climate change. Penrith City Council is a member of the technical working group providing input in the development of the flood study. They are aware of the likely increases particularly to the current flood planning level in the Penrith floodplain. The draft results have been provided to your Department Planning and Environment.

In terms of regional flood evacuation risk, the development adds to the considerable evacuation traffic generated from the Thornton area of Penrith. However, the development would only need evacuation for events greater than 1 in 500 chance per year, and vehicles would have a relatively short rising road evacuation to above PMF. This means the evacuation risk to life is relatively low for events smaller than the 1 in 500 chance per year flood. Notwithstanding this increased traffic generation will affect local traffic, and likely exacerbate traffic congestion problems with traffic entering The Northern Road evacuation route.

Self-evacuation by private vehicle ahead of evacuation routes being cut is the preferred method of reducing risk to life for regional (Nepean River) flood events. Shelter in place is not supported for regional (Nepean River) flood events as essential services (such as water, power

and telecommunications) could be lost or impacted due to flooding for significant periods of time.

It is also noted that the although the proactive closure of the ground level retail tenancies at the development based on forecast Nepean River flood levels at Penrith is appropriate, the evacuation of residential apartments for regional flood events needs to be triggered by the SES as they need to ensure that the appropriate emergency traffic management and evacuation centres have been established.

It is recommended that developer consider the likely changes to flood risk associated with new information on the regional flood levels from the new Directorate flood study.

If you have any questions, please do not hesitate to contact the Directorate at paul.fuller@infrastructure.nsw.gov.au or phone – [redacted].

Yours sincerely

Maree Abood

Head, Hawkesbury-Nepean Valley Flood Risk Management Directorate

Infrastructure NSW