

Attachment A25

Flood Assessment – Mixed Use Scheme
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Stockland

Stockland Piccadilly Complex

Desktop Flood Assessment - Mixed Use Scheme

Reference: 295375

E | 6 August 2025

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Job number 295375

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Glossary

Term	Meaning
Annual Exceedance Probability (AEP)	The chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage. 1% AEP flood is approximately equal to 1 in 100 year Average Recurrence Interval (ARI) flood event (or simply 100 year flood). It has 1% chance to occur in a given year.
Australian Height Datum (AHD)	A common national plan of level corresponding approximately to mean sea level.
Average Recurrence Interval (ARI)	The long-term average number of years between the occurrence of a flood as big as or larger than, the selected event. For example, floods with a discharge as great as, or greater than, the 100 year ARI flood event may occur on average once every 100 years
Basement Car Parking or Below-Ground Car Parking	The car parking area generally below ground level where inundation of the surrounding areas may raise water levels above the entry level to the basement, resulting in inundation. Basement car parks are areas where the means of drainage of accumulated water in the car park has an outflow discharge capacity significantly less than the potential inflow capacity.
Flood Planning Level (FPL)	The combinations of flood levels and freeboards selected for floodplain risk management purposes, as determined in flood studies and floodplain risk management studies and plans.
Probable Maximum Flood (PMF)	The largest flood that could conceivably occur at a particular location, usually estimated from probable maximum precipitation.
Probable Maximum Precipitation (PMP)	The greatest depth of precipitation for a given duration meteorologically possible over a given size storm area at a particular location at a particular time of the year, with no allowance made for long-term climatic trends (World Meteorological Organisation, 1986). It is the primary input to the estimation of the probable maximum flood.

Acronyms

Acronym	Definition
AEP	Annual Exceedance Probability
ARI	Average Recurrence Interval
ARR	Australian Rainfall and Runoff
BoM	Bureau of Meteorology
CBD	Central Business District
CoS	City of Sydney
DA	Development Application
DCP	Development Control Plan
DEM	Digital Elevation Model
EOT	End Of Trip
FFL	Finished Floor Level
FPL	Flood Planning Level

Acronym	Definition
LEP	Local Environment Plan
LGA	Local Government Area
LiDAR	Light Detection and Ranging
mAHD	Metres above Australian Height Datum
NSW	New South Wales
PMF	Probable Maximum Flood
SWC	Sydney Water Corporation

1. Introduction

This Desktop Flood Assessment report accompanies a planning proposal seeking to amend the Sydney Local Environmental Plan 2012 (the LEP) relevant to the land known as ‘Stockland Piccadilly Complex’ located at 133-145 Castlereagh Street, Sydney (the site) and legally described as Lot 10 in DP828419. The planning proposal seeks to prescribe site specific LEP provisions, including amending the floor space ratio development standard, as well as concurrently preparing a site specific Development Control Plan (DCP) to guide the future development. The DCP will establish building envelopes for the site, as well as other key assessment criteria including the establishment of a through-site link and parking and vehicular access.

The intended outcome of the proposed amendments to the LEP and DCP is to facilitate the redevelopment of the site for either an all commercial development or a mixed-use development, together with an activated ground plane, basement car parking and associated facilities. The proposal will retain the structure of the majority of the existing commercial tower as well as the basement structure. The proposal facilitates additional commercial floor space capacity in Central Sydney while also delivering improved public domain outcomes. Such outcomes will include a rectified Solar Access Plane breach to Hyde Park, a northerly aligned direct through-site link between Pitt and Castlereagh Street and enhanced pedestrian amenity and activation at the ground plane.

The site locality is shown in Figure 1.

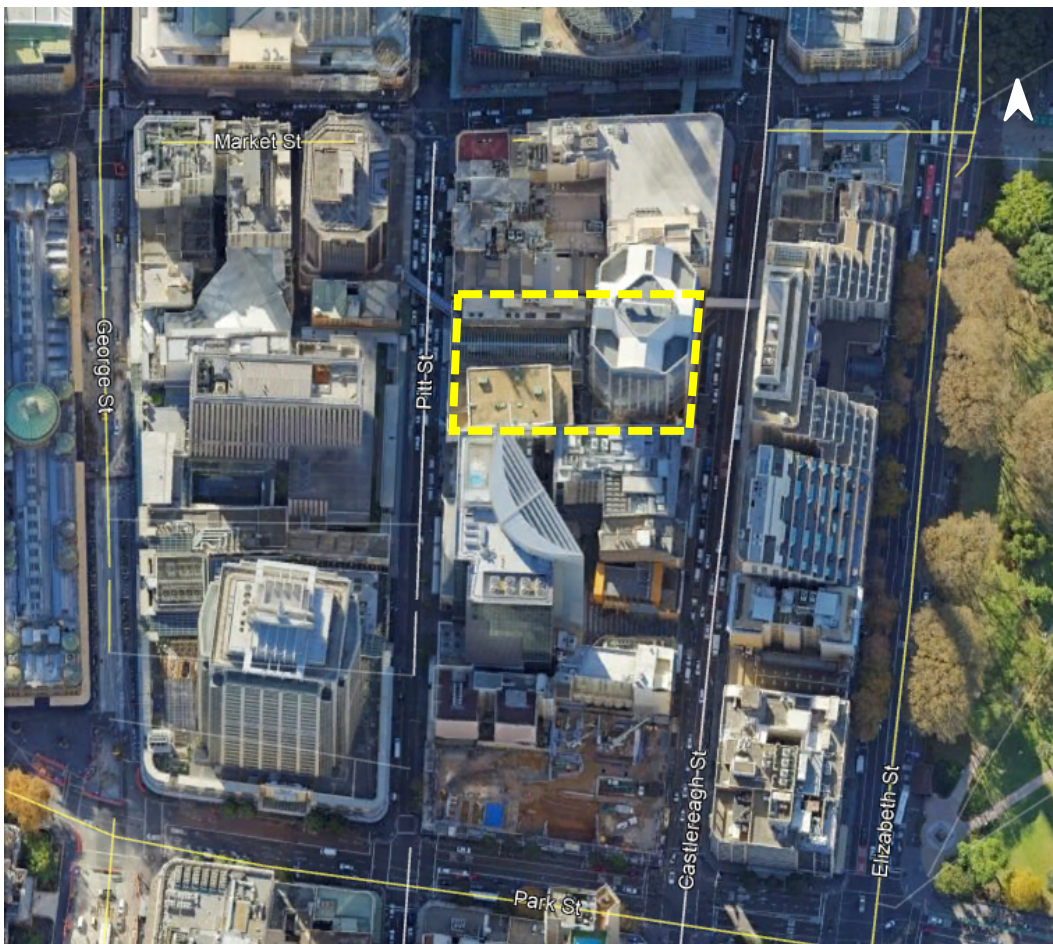


Figure 1: 133-145 Castlereagh Street, Sydney – Stockland Piccadilly Complex

1.1 Subject Site

The site currently comprises three buildings known as the ‘Piccadilly Complex’ completed in 1991 which has been the subject of progressive improvements to upgrade selected elements within the building. The buildings currently occupying the site are detailed in Table 1.

Table 1: Description of existing buildings and improvements

Building	Description
Piccadilly Court	Comprises a 14-storey office building completed in 1975 and first refurbished in 1991 with frontage to Pitt Street.
Piccadilly Shopping Centre	Comprises a 3-storey retail building and the Wesley Mission facilities including the Wesley Church, Lyceum, Wesley Theatre and supporting office space predominately located at basement level. The Wesley Centre facilities comprise the following patron capacity: • Theatre – 950 • Lyceum – 277 • Chapel – 534 A footbridge over Pitt Street connects the building to 55 Market Street to the west.
Piccadilly Tower	Comprises a 31-storey commercial building comprising office floor space and end of trip facilities and four basement levels of car parking accessed from Castlereagh Street. The building includes two lobby spaces, the main Castlereagh Street entrance and a smaller northern entrance to the through site link. A footbridge over Castlereagh Street connects the building to the Sheraton On the Park located to the east of the site.

1.2 Concept Reference Design

To demonstrate that the proposed building envelope is capable of accommodating a viable scheme, a Concept Reference Design accompanies the planning proposal within the Urban Design Study. The Concept Reference Design is indicative only and the final detailed design will be the subject of a competitive design process and detailed development application (DA) which will ultimately result in further refinement. The ground floor plan is shown in Figure 2.



1.3 Purpose of Report

The purpose of this Preliminary Flood Advice Report is to provide a review of relevant aspects of the proposed planning amendments and the Concept Reference Design (and supporting documents), to evaluate their likely suitability, and requirements for future assessment and detailed design. As the planning submission does not seek consent for the specific development, a detailed quantitative assessment of the Concept Reference Design is not considered to be warranted at this stage.

A high-level review of flooding risk has been undertaken to identify the flooding constraints and likely flood planning implications for the proposed development. Flooding advice is based on a desktop review of:

- City Area Catchment Flood Study, Final Report, October 2014, BMT WBM
- City Area Catchment Floodplain Risk Management Study, Final Report, September 2016, WMAwater
- Interim Floodplain Management Policy, May 2014, City of Sydney Council
- Sydney Development Control Plan 2012.

To undertake an initial flood assessment for the proposed development, the reference locations shown in Figure 3 have been identified as potential ingress points within the proposed development. The reference locations have been identified based on from the provided in *GA Plan - Level Ground, SK-11-100, Issue 4* (14/07/2025), and the *Coordination Section 15 Ramp Sketch* (3XN_SK_0015, received 04/10/24). Note that the Retail Entrance (Location 9) has been assumed conservatively where flood levels would be highest.

Reference Locations are summarised in Table 2, with finished floor levels interpreted from the drawings. Ramp threshold levels for the loading dock entrance (Reference Locations 12 and 13) are shown in further detail in Figure 4 and Figure 5. Note the driveway entrance threshold level of 22.711 m AHD shown in Figure 5 is understood to be applicable for the revised ground floor plan provided.

Compliance with the Flood Planning Level Criteria is discussed in Section 4.1. Note there may be additional building ingress locations not identified above proposed to the development. As the design evolves during design development, all points of egress to the development site will require an individual flood assessment.

Table 2: Reference Locations - Proposed Development (based on 3XN, SK-11-100, Issue 4, 14/07/2025)

Location Reference	Description	Proposed FFL/Threshold Level (m AHD)
1	Fire Egress	22.20
2	Fire Egress	22.20
3	Egress from Substation	22.20
4	Egress from Substation	22.20
5	Retail Entrance	22.30
6	Through Site Link - Castlereagh St	22.40
7	Egress from HVCP	22.40
8	Castlereagh Lobby Entry	22.60
9	Retail Entrance	22.50
10	Fire Booster	22.50
11	Fire Egress	22.60
12	Garbage Collection Access	22.71
13	Parking/Loading Dock	22.71

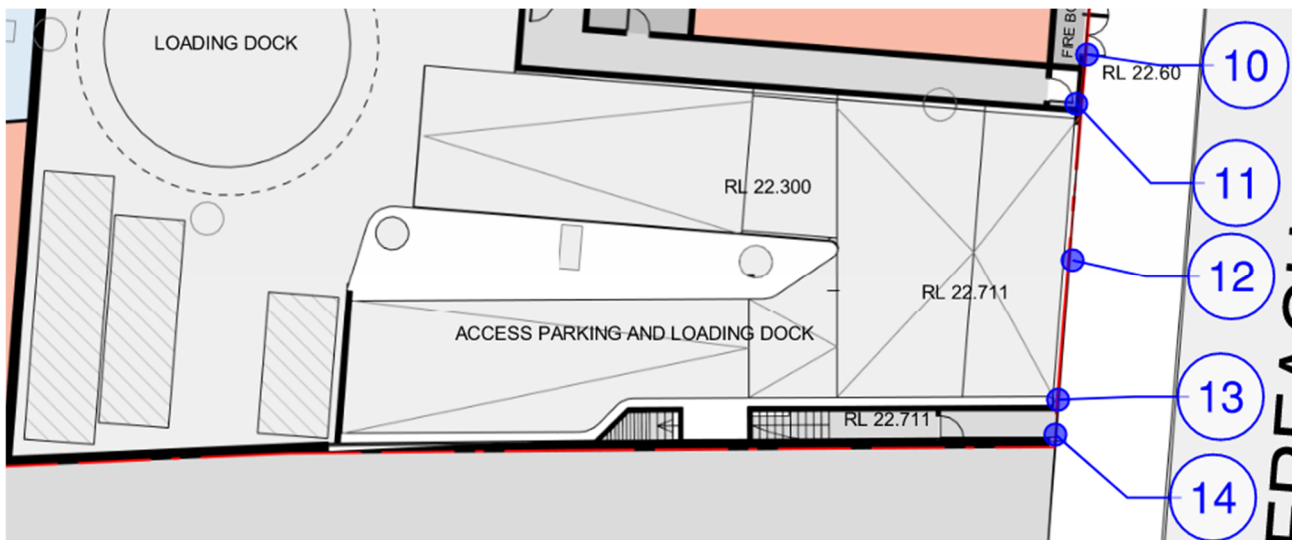


Figure 4: Proposed Loading Dock/Parking Entrance Ramp from Castlereagh Street - Plan (based on 3XN, SK-11-100, Issue 4, 14/07/2025)

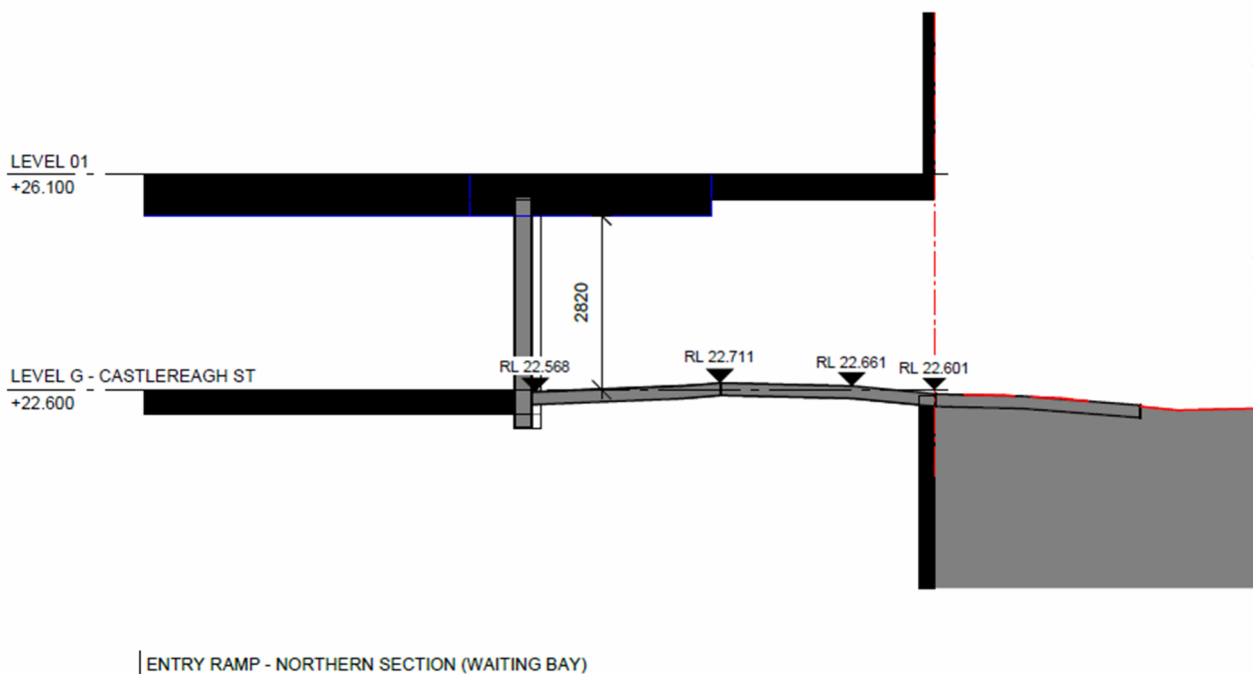


Figure 5: Proposed Loading Dock/Parking Entrance - Raised Threshold (3XN_SK_0015, received 04/10/24)

1.4 Objectives

The key objectives of this preliminary flood assessment are to:

- Review the relevant flood studies and the model results around the proposed development;
- Review the relevant Council flood risk management policies that may apply to the site;
- Provide flood advice for the proposed redevelopment, including identifying flood design requirements for specific areas of the development; and
- Identification of potential alternative Flood Planning Level requirements.

2. Review of Existing Flood Study

2.1 Previous Studies

The City Area Catchment Flood Study was completed by BMT WBM in October 2014 on behalf of the City of Sydney. A dynamic 1d/2d TUFLOW model was utilised using the “direct rainfall” approach (also referred to as “rainfall-on-grid”) in the study. The study defined the flood behaviour within the City Area catchment, and provides mapping for flood depths, flood levels, velocities and provisional hazard for a range of design flood events.

The City Area Catchment Floodplain Risk Management Plan was undertaken by WMAwater for the City of Sydney (WMAwater, September 2016). The model adopted in this study was based on the BMT WBM model, but incorporated minor refinements. The WMAwater study is referred to in this report for flood information. The purpose of the WMAwater study was to investigate the performance of a range of flood mitigation measures.

2.2 Review of the Flood Model Results

This preliminary flood assessment was based on the existing model results in the City Area Catchment Floodplain Risk Management Study (WMAwater, September 2016). Permission to utilise the WMAwater model for the current study has been granted by the City of Sydney.

The flood maps for the 1% AEP (100 year ARI) and the Probable Maximum Flood (PMF) events from the flood study are listed in Table 3.

The reference locations are approximate only and have relied upon a manual overlay of the ground floor layout with the flood mapping.

Table 3: Flood information extracted from WMAwater Model

Figure Reference	Flood Map Title
Figure 7	Critical Durations – 1% AEP (100 year ARI)
Figure 8	Critical Durations – PMF
Figure 9	Peak Flood Depths – 1% AEP Event (100 year ARI)
Figure 10	Peak Flood Depths – PMF
Figure 11	Provisional Hydraulic Hazard – 1% AEP (100 year ARI)
Figure 12	Provisional Hydraulic Hazard – PMF

A review of the flood maps included within the WMAwater study indicates that:

- The site is located near the top of the City Area stormwater catchment, with the catchment boundary located approximately 300 m south of the site at Bathurst Street.
- The critical duration in the vicinity of the site is the 25 minute storm for the 1% AEP (100 Year ARI) event (Figure 7) and 15 minute storm for the PMF (Figure 8).
- For the 1% AEP event, peak flood depths are up to 0.17 m within Castlereagh Street, and 0.15 m on Pitt Street (Figure 9).
- For the PMF peak flood depths are up to 0.30 m in Castlereagh Street and 0.40 m in Pitt Street (Figure 10).
- Provisional hydraulic hazard is categorised as per Figure L2 in *Floodplain Development Manual* (NSW Government, 2005), which is re-produced in Figure 6. The model results indicate that flooding adjacent

to the proposed site is categorised as low hydraulic hazard in the 1% AEP event (Figure 11). In the PMF, Castlereagh Street remains categorised as low hazard, however flooding within the Pitt Street corridor is categorised as high hydraulic hazard (Figure 12). It should be noted that this hazard categorisation has since been superseded by the General Flood Hazard curves available in the latest version of Australian Rainfall and Runoff, however results from the WMAwater flood model pre-date the updated hydraulic hazard guidance.

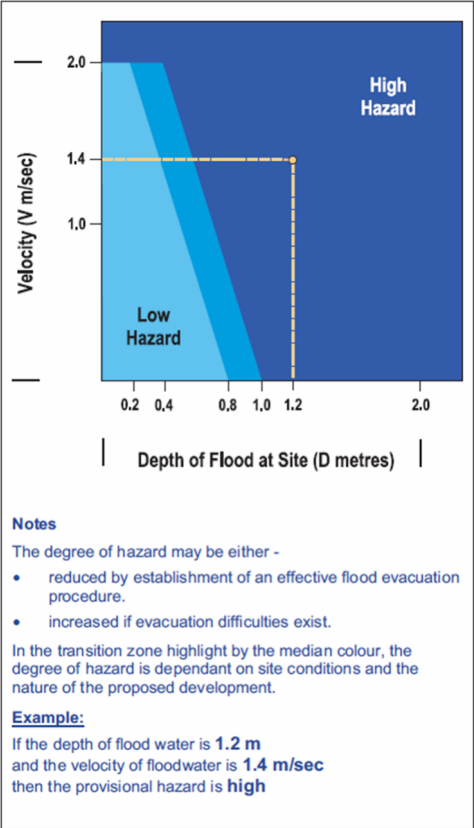


FIGURE L2 - Provisional Hydraulic Hazard Categories

Figure 6: Provisional Hydraulic Hazard Categories (re-produced from Appendix L, NSW Floodplain Development Manual 2005)

The following limitations should be noted regarding the setup of the WMAwater flood model:

- The Digital Elevation Model (DEM) incorporated in the TUFLOW model is based on LiDAR information, which is limited in its accuracy and does not pick up finer surface features within road corridors such as kerbs and gutters. Due to the age of the flood model, the LiDAR is also likely to be out of date.
- The TUFLOW model incorporates a 2 m grid size, which is reasonably coarse when it comes to extracting flood depths and levels at specific locations (for example, the grid size may not define local depressions from gutter invert).

Flood depths/levels presented in this report should therefore be treated as approximations and used with caution. Further modelling can be undertaken at later design stages to provide more accurate peak flood depths/level estimates.

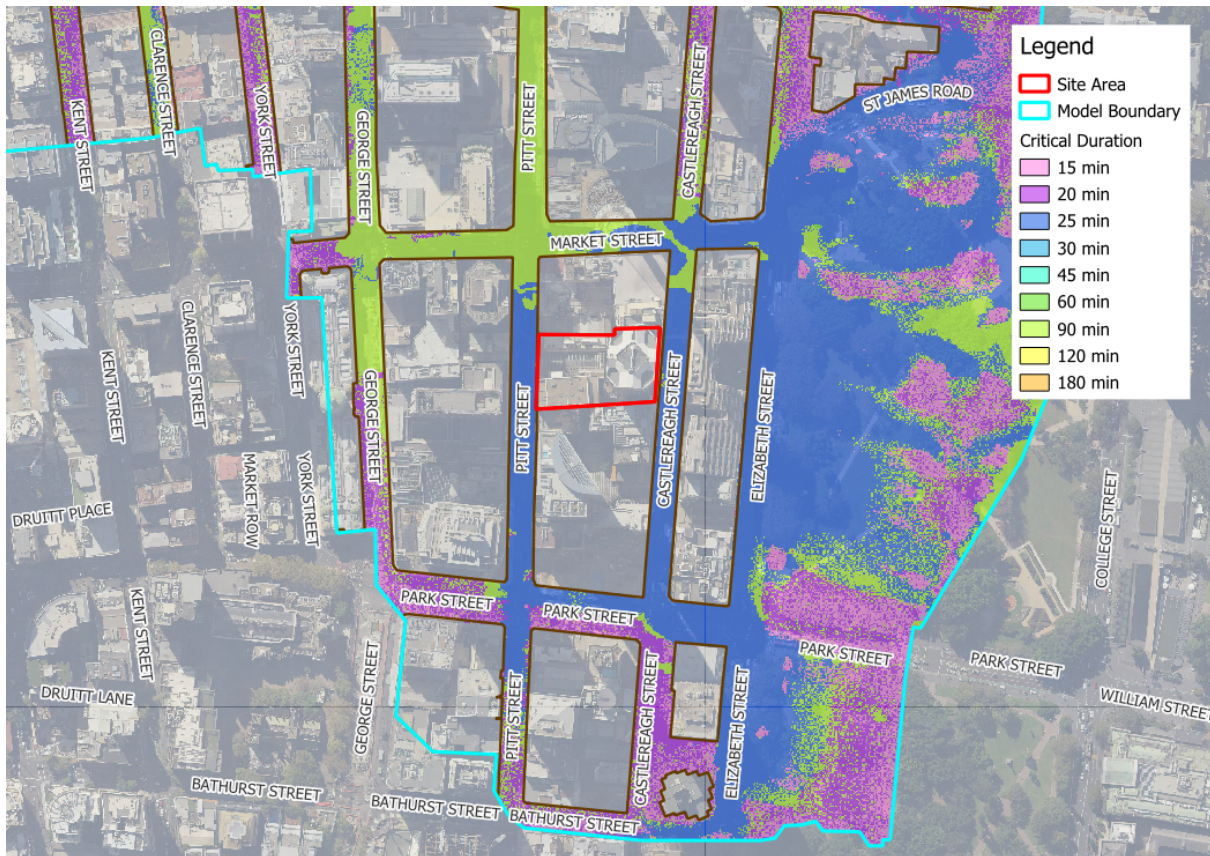


Figure 7: Critical Durations – 1% AEP (100 Year ARI) Results extracted from supplied TUFLOW model

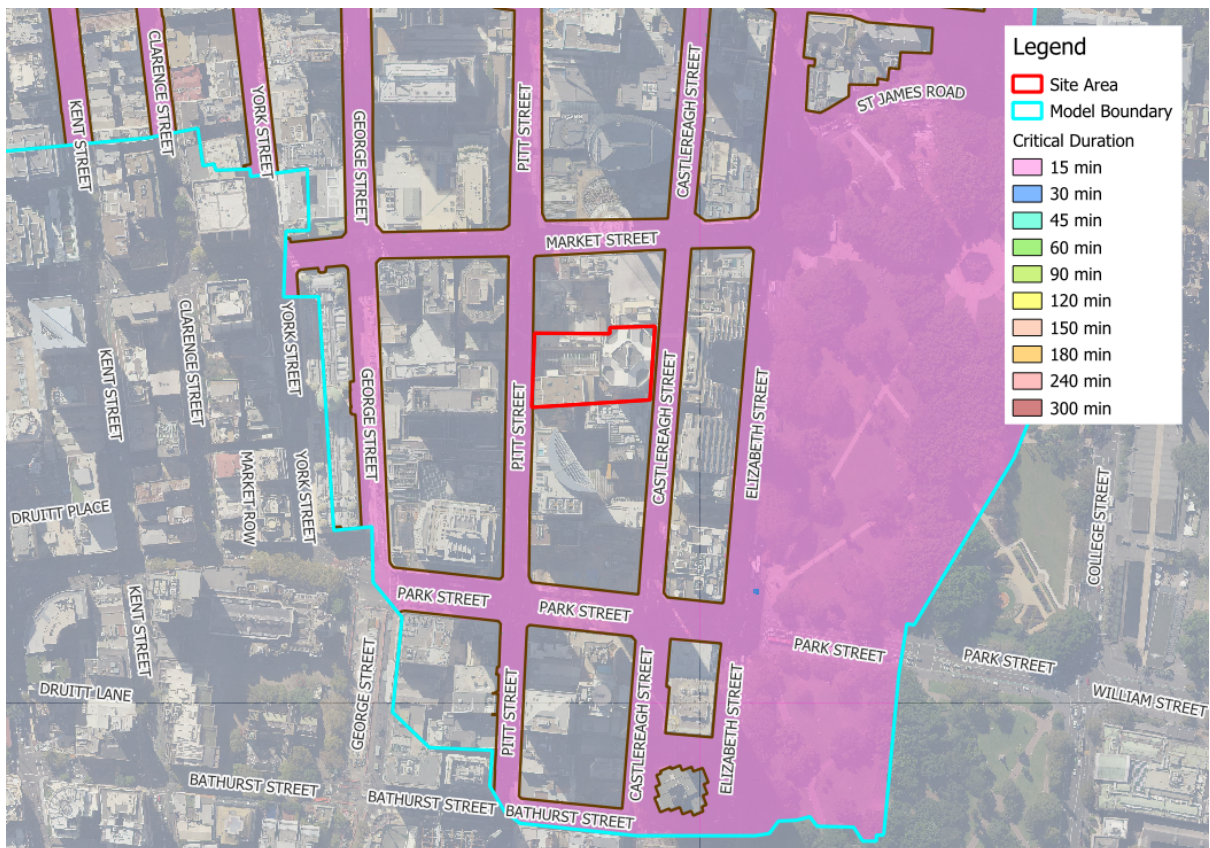


Figure 8: Critical Durations – PMF. Results extracted from supplied TUFLOW model



Figure 9: Peak Flood Depths – 1% AEP Event (100 Year ARI) Results extracted from supplied TUFLOW model (note flood depths clipped where < 0.05 m)

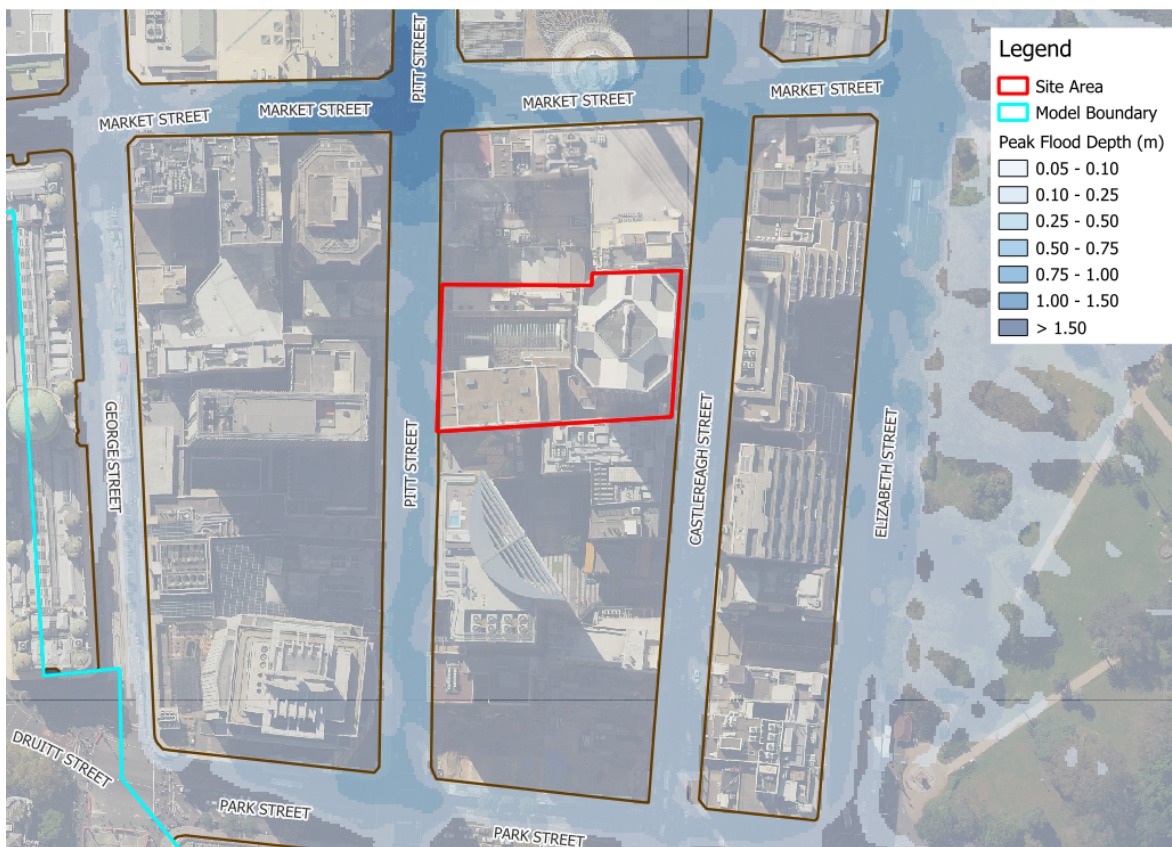
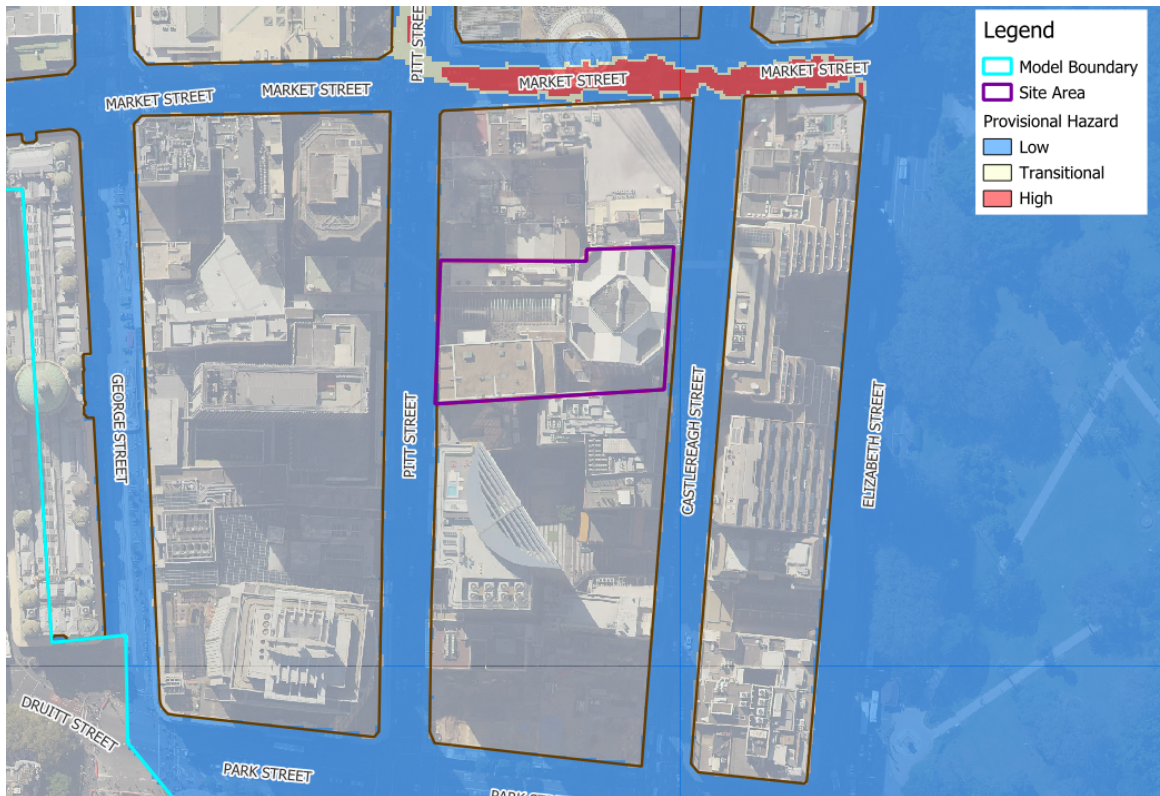


Figure 10: Peak Flood Depths – PMF Results extracted from supplied TUFLOW model (note flood depths clipped where < 0.05 m)



**Figure 11: Provisional Hydraulic Hazard – 1% AEP Event (100 Year ARI).
Results extracted from supplied TUFLOW model**

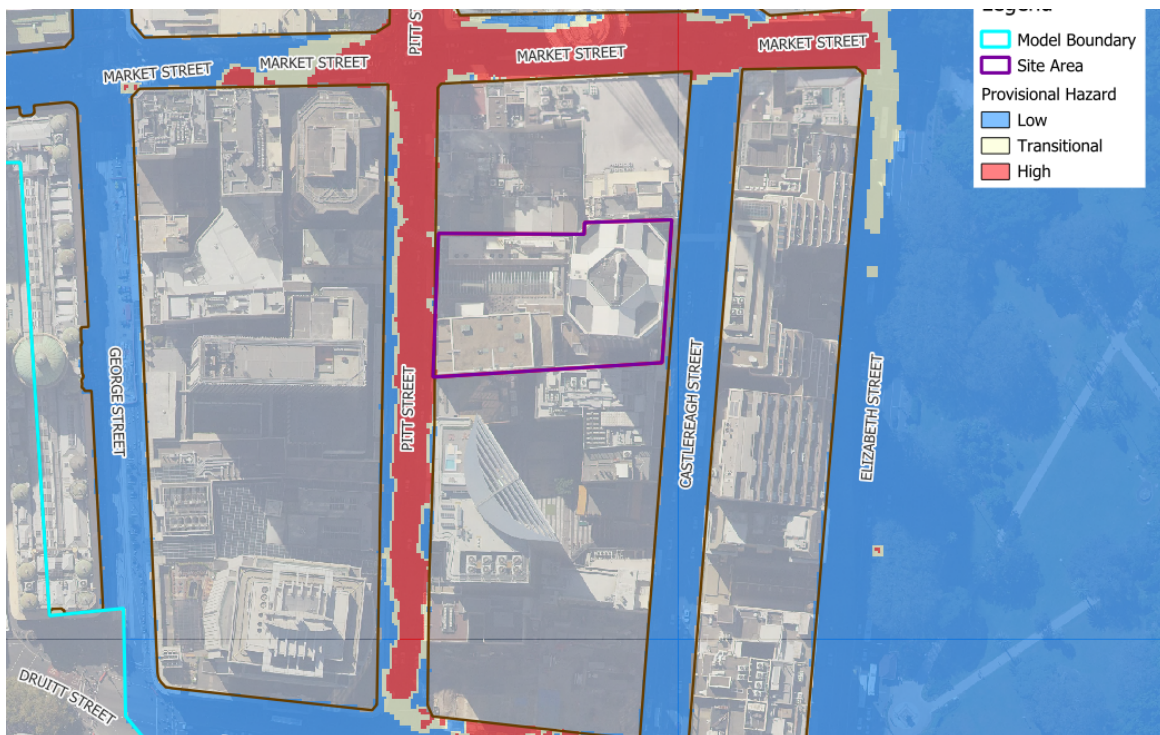


Figure 12: Provisional Hydraulic Hazard – PMF. Results extracted from supplied TUFLOW model

3. Flooding Design Criteria

According to the City of Sydney *Interim Floodplain Management Policy*, Flood Planning Level (FPL) is defined as

“The combinations of flood levels and freeboards selected for floodplain risk management purposes, as determined in flood studies and floodplain risk management studies and plans.”

The FPL refers to the permissible minimum building floor level or threshold level. For below-ground parking, the FPL refers to the minimum level at each access point, including ventilation ducts, windows, light wells, lift shaft openings, risers, services pits and stairwells. Details of these levels as extracted from the *Interim Floodplain Management Policy* are included in Table 4.

Table 4: Flood Planning Level Requirements (Extracted from the City of Sydney *Interim Floodplain Management Policy*)

Development	Flood Planning Level (FPL)
Residential – habitable rooms subject to local drainage flooding	1% AEP flood level + 0.5 m or Two times the depth of flow with a minimum of 0.3 m above the surrounding surface if the depth of flow in the 1% AEP flood is less than 0.25 m.
Residential – habitable rooms outside floodplain	0.3 m above the surrounding surface
Industrial or commercial – business subject to mainstream or local drainage flooding	Merits approach with a minimum of the 1% AEP flood level
Industrial or commercial – retail floor levels subject to mainstream or local drainage flooding	Merits approach with a minimum of the 1% AEP flood level. The development must demonstrate a reasonable balance between flood protection and urban design outcomes for street level activation.
Industrial or commercial – schools and childcare facilities subject to mainstream or local drainage flooding	Merits approach with a minimum of the 1% AEP flood level + 0.5 m.
Below-ground car park outside floodplain*	0.3 m above the surrounding surface
Below-ground car park subject to mainstream or local drainage flooding*	1% AEP flood level + 0.5 m or the PMF (whichever is the higher)

* The criteria for below ground car parks includes any intended use for spaces located below the surrounding surface levels e.g. car parking, retail, commercial uses, plant etc.

Sydney Development Control Plan 2012 requires that the development should manage and mitigate flood risk and does not exacerbate the potential for flood damage or hazard to existing development and to the public domain.

The City of Sydney’s *Interim Floodplain Management Policy* performance criteria include a requirement that a development “will not significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other developments or properties”.

4. Development Requirements

4.1 Flood Planning Level Requirements

The City of Sydney's *Interim Floodplain Management Policy* (May 2014) defines a floodplain as “the area of land which is subject to inundation by floods up to and including the probable maximum flood (PMF) event”.

The *CoS Interim Floodplain Management Policy* provides Flood Planning Level criteria based on the “type of flooding” present at the Site. These are listed below:

- Outside floodplain
- Mainstream flooding
- Local drainage flooding

The Policy considers a property “outside of the floodplain” where it is above the mainstream and local drainage flood planning levels, including freeboard. As some floor levels within the existing building are below the PMF level, the site is considered within the floodplain for the purpose of assessing the Flood Planning Level requirements.

The Policy defines “Local drainage flooding” to occur where:

- The maximum cross-sectional depth of flooding in the local overland flow path through and upstream of the site is less than 0.25 m for the 1% AEP flood; and
- The development is at least 0.5 m above the 1% AEP flood level at the nearest downstream trapped low point; and
- The development does not adjoin the nearest upstream trapped low point; and
- Blockage of an upstream trapped low point is unlikely to increase the depth of flow past the site to greater than 0.25 m in the 1% AEP flood.

Where the local drainage flooding criteria cannot be satisfied, flooding is considered to be mainstream flooding.

The WMAwater TUFLOW model results indicate the peak flood depths for the 1% AEP event to be a maximum of 0.17 m along both the Pitt Street and Castlereagh Street corridors. The site is over 1.0 m above the 1% AEP flood level at the nearest downstream trapped sag point (taken to be at the intersection of Pitt Street and Market Street) and does not adjoin any other trapped low points within the upstream catchment. It is also unlikely to be subject to flood depths of 0.25 m in the event of blockage of an upstream trapped low point.

Therefore, the proposed site should be considered as being subject to local drainage flooding (as opposed to mainstream flooding), and the “local drainage flooding” requirements would apply in accordance with the Flood Planning Level criteria listed in Table 4.

Where a flood planning level criteria of “a minimum 1% AEP flood level + 0.5 m or the PMF (whichever is the higher)” is required, the governing flood planning level will be the 1% AEP flood level + 0.5 m in all cases, noting the WMAwater flood model results indicate that the peak flood depths in the PMF do not exceed 0.40 m along either the Pitt Street or Castlereagh Street corridors.

The following sections identify key considerations for the current Proposal (*GA Plan Level Ground, SK-11-100, Issue 4*, dated 14/07/2025). Similar principles would apply during future design development.

4.1.1 Loading Dock/Parking Entry and Exit

Based on a strict interpretation of the Flood Planning Requirements, the 1% AEP flood level + 0.5 m will likely be governing the crest level of the driveway to the basement loading dock/parking areas.

Flood model results indicate the 1% AEP flood depths range from 0.07 – 0.10 m across the width of the loading dock/parking entry frontage. In the PMF, flood depths range from 0.18 – 0.22 m.

If the 1% AEP flood level + 0.5 m is applied, the loading dock/parking entry will require grading within the public domain and internally to the site to achieve the FPL requirements, which is in the order of 0.57 - 0.60 m above adjacent top of kerb level. Based on similar commercial developments in the Sydney CBD, it can be a challenge to achieve this threshold level with a driveway crest while balancing urban design outcomes for street level activation and vehicle clearance requirements.

An alternative Flood Planning Level (FPL) criterion for the Loading Dock/Parking Entrance has been proposed in Section 4.1.5 based on a risk-based approach to flooding within the Castlereagh Street corridor. This FPL criteria and any subsequent design mitigation measures can be addressed through further consultation with Council during detailed DA stage.

4.1.2 Ground Plane Development

Ground plane development areas have been identified in the current Proposal (*GA Plan Level Ground, SK-11-100, Issue 4* dated 14/07/2025). For the purposes of setting FPL's, this is limited to the retail areas (excluding penetrations to basement levels, which are addressed in Section 4.1.3).

The ground plane development areas have FPL based upon a merits approach with a minimum of the 1% AEP flood level. The WMAwater flood model indicates that 1% AEP flood depths are approximately 0.12 m across the Pitt Street frontages at the location of the retail entrance off the Through Site Link access (Location 19). The ground plane development areas will require grading within the public domain to achieve the FPL requirements, which is typically achieved through kerb height and footpath cross-falls for flow depths of this magnitude. It is assumed based on FFL's specified on the Ground Level drawings at the through-site link entrance (19.9 m AHD), that the FFL's in the Retail Areas are compliant with the applicable FPL criteria.

4.1.3 Basement Access and Penetrations

Basement access and penetrations (below ground facilities) have been identified in the current Proposal (*GA Plan Level Ground, SK-11-100, Issue 4*, dated 14/07/2025). Note: where lift shafts and stairwells to lower floor levels are proposed internally, these are treated as "below-ground facilities" for the purpose of this Flood Planning Level assessment. It is noted this applies across the majority of the Ground Level within the proposed development.

Areas of the development which are subject to the below-ground facilities Flood Planning Controls include:

- Through Site Link between Pitt Street and Castlereagh Street (due to lift connections to parking levels)
- Substation and HVCP entries from Castlereagh Street (due to connections to substation/HVCP rooms on level P1)
- Residential Lobby (due to lift shafts to parking levels)
- Commercial Lobbies (due to lift shafts to market hall on Level S and parking levels)
- End of Trip Facilities (due to lift shafts to EOT change area on Level P02)
- Fire Egress Doors at both Pitt Street and Castlereagh Street (due to fire stair connections to lower levels)
- Services connections to lower levels, including ventilation ducts, light wells, services risers, voids over lower levels etc.

The majority of the ground level (with the exception of the retail spaces) is required to be assessed as below-ground facilities due to the connections to the basement floor levels.

Where the below-ground entrance criterion applies to the development, the applicable FPL criteria will be the greater of the 1% AEP + 0.5 m or the PMF flood level. Based upon the WMAwater flood model results, the governing FPL is the 1% AEP + 0.5 m at all entrance locations identified from the plans. The flood depths in the 1% AEP event range between 0.07 – 0.17 m. As such, the basement access and penetrations

will require grading within the public domain and internally to the site to achieve the FPL requirements which is in the order of 0.57 – 0.67 m above adjacent gutter invert levels. This may be achieved through grading/ ramping in both the public and private domain and steps at thresholds. However, it is recognised that achieving the FPL requirements whilst maintaining urban design outcomes for street level activation, accessible entry requirements and retaining the existing structure is likely to be a challenge.

Noting the above constraints, alternative FPL requirements for the proposed development have been reviewed in Section 4.1.5.

4.1.4 Residential Developments

All residential development is proposed above the ground floor level. Therefore, compliance with the FPL requirements for habitable residential levels is achieved due to the elevation of upper floor levels.

4.1.5 Alternate Flood Planning Level Assessment

The flood planning level (FPL) requirements as defined by the City of Sydney's "Interim Floodplain Management Policy", May 2014 were defined for each of the proposed development uses and risks. These uses and risks included ground floor retail, below ground car park/penetrations etc.

CoS has previously commented that:

"Flood gates or barriers are not supported. Prior to giving consideration to the use of flood gates or barriers all other alternatives to meet the requirements of the City's Policy need to be adequately investigated."

A review of design implications for compliance with the FPL requirements has been undertaken by the architect, 3XN. This review has identified that FPL compliance in areas with penetrations/ access to basement levels, would compromise the conflicting interests of:

- Street level activation;
- Disability Discrimination Act (DDA) compliance; and
- Vehicle clearance requirements to basement level carpark ramp.

Compliance according to the CoS's "Interim Floodplain Management Policy" for penetrations/ access to basement levels requires a minimum FPL of the greater of 1% AEP + 0.5m or PMF. The development proposes an alternate FPL criterion which is considerate of the flood risk to the site whilst balancing the requirements of the above-mentioned design aspects.

The alternate options presented include FFLs/ threshold levels set at a minimum of:

- PMF level
- 300 mm above gutter invert (complies with the CoS's "Interim Floodplain Management Policy" for below-ground car parks outside the floodplain).

Based on a review of peak flood depths and levels adjacent to the site from the WMAwater flood model, the adoption of the PMF level as the applicable FPL (as opposed to the 1% AEP + 0.5 m) is relatively low risk at the site. This is due to the following factors:

- The site is located near the top of catchment;
- The site is located away from any significant trapped sag locations, so the potential for flooding within the development resulting from any significant blockage of the drainage network is low; and
- The sensitivity of peak flood levels at the site to changes in the hydrological assumptions is low, as evidenced by the relatively small differences in the PMF and 1% AEP peak flood levels (less than 0.25 m at all reference locations).

Achieving these alternate levels would provide flood immunity to the maximum possible flooding without the use of flood gates or flood barriers. The results of this review are contained in Table 5.

Table 5: FPL Compliance Table

Ref.	Description	FPL Criteria	Proposed FFL/ Threshold Level (m AHD)	1% AEP Peak Flood Level (m AHD)	1% AEP Peak Flood Level + 0.5m (m AHD)	PMF Level (m AHD)	300 mm above Gutter Invert Level (m AHD)	Compliance with CoS FPL Criteria?	Compliance with Alternative CoS FPL Criteria?	FPL Compliance Comments
1	Fire Egress	Basement Penetration - greater of 1% AEP + 0.5 or PMF	22.20	21.945	22.445	22.065	21.975	No	Yes	Achieves PMF immunity and minimum 300 mm above gutter invert level
2	Fire Egress	Basement Penetration - greater of 1% AEP + 0.5 or PMF	22.20	21.958	22.458	22.079	21.982	No	Yes	Achieves PMF immunity and minimum 300 mm above gutter invert level
3	Egress from Substation	Basement Penetration - greater of 1% AEP + 0.5 or PMF	22.20	21.985	22.485	22.104	22.014	No	Yes	Achieves PMF immunity and minimum 300 mm above gutter invert level
4	Egress from Substation	Basement Penetration - greater of 1% AEP + 0.5 or PMF	22.20	21.999	22.499	22.117	22.039	No	Yes	Achieves PMF immunity and minimum 300 mm above gutter invert level
5	Retail Entrance	Ground Level - 1% AEP	22.30	22.026	22.526	22.141	22.064	Yes	Yes	
6	Through Site Link - Castlereagh St	Basement Penetration - greater of 1% AEP + 0.5 or PMF	22.40	22.102	22.602	22.235	22.214	No	Yes	Achieves PMF immunity and minimum 300 mm above gutter invert level
7	Egress from HVCP	Basement Penetration - greater of 1% AEP + 0.5 or PMF	22.40	22.147	22.647	22.247	22.244	No	Yes	Achieves PMF immunity and minimum 300 mm above gutter invert level

Ref.	Description	FPL Criteria	Proposed FFL/ Threshold Level (m AHD)	1% AEP Peak Flood Level (m AHD)	1% AEP Peak Flood Level + 0.5m (m AHD)	PMF Level (m AHD)	300 mm above Gutter Invert Level (m AHD)	Compliance with CoS FPL Criteria?	Compliance with Alternative CoS FPL Criteria?	FPL Compliance Comments
8	Castlereagh Lobby Entry	Basement Penetration - greater of 1% AEP + 0.5 or PMF	22.60	22.264	22.764	22.376	22.347	No	Yes	Achieves PMF immunity and minimum 300 mm above gutter invert level
9	Retail Entrance	Ground Level - 1% AEP	22.50	22.358	22.858	22.448	22.447	Yes	Yes	
10	Fire Booster	Ground Level - 1% AEP	22.50	22.432	22.932	22.532	22.496	Yes	Yes	
11	Fire Egress	Basement Penetration - greater of 1% AEP + 0.5 or PMF	22.60	22.481	22.981	22.594	22.523	No	Yes	Achieves PMF immunity and minimum 300 mm above gutter invert level
12	Garbage Collection Access	Basement Penetration - greater of 1% AEP + 0.5 or PMF	22.71	22.542	23.042	22.661	22.583	No	Yes	Achieves PMF immunity and minimum 300 mm above gutter invert level.
13	Parking/Loading Dock	Basement Penetration - greater of 1% AEP + 0.5 or PMF	22.71	22.590	23.090	22.702	22.617	No	Yes	Achieves PMF immunity and minimum 300 mm above gutter invert level.
14	Basement Access	Basement Penetration - greater of 1% AEP + 0.5 or PMF	22.71	22.603	23.103	22.716	22.628	No	No	Slightly below PMF immunity. Could provide ramp internally to achieve PMF immunity. FFL is above minimum 300 mm above gutter invert level
15	Fire Egress	Basement Penetration - greater of 1% AEP + 0.5 or PMF	19.60	19.462	19.962	19.703	19.520	No	No	Slightly below PMF immunity. Could provide ramp internally to achieve PMF immunity. FFL is

Ref.	Description	FPL Criteria	Proposed FFL/ Threshold Level (m AHD)	1% AEP Peak Flood Level (m AHD)	1% AEP Peak Flood Level + 0.5m (m AHD)	PMF Level (m AHD)	300 mm above Gutter Invert Level (m AHD)	Compliance with CoS FPL Criteria?	Compliance with Alternative CoS FPL Criteria?	FPL Compliance Comments
										above minimum 300 mm above gutter invert level
16	Fire Egress	Basement Penetration - greater of 1% AEP + 0.5 or PMF	19.60	19.482	19.982	19.682	19.562	No	No	Slightly below PMF immunity. Could provide ramp internally to achieve PMF immunity. FFL is above minimum 300 mm above gutter invert level
17	Fire Egress	Basement Penetration - greater of 1% AEP + 0.5 or PMF	19.60	19.498	19.998	19.689	19.580	No	No	Slightly below PMF immunity. Could provide ramp internally to achieve PMF immunity. FFL is above minimum 300 mm above gutter invert level
18	Fire Egress	Basement Penetration - greater of 1% AEP + 0.5 or PMF	19.60	19.535	20.035	19.698	19.607	No	No	Slightly below PMF immunity and minimum 300mm threshold above gutter level. Could provide ramp internally to achieve PMF immunity and minimum 300 mm threshold above gutter invert level
19	Through Site Link - Pitt St	Ground Level - 1% AEP	19.90	19.677	20.177	19.877	19.804	Yes	Yes	
20	Retail Entrance	Ground Level - 1% AEP	20.00	19.871	20.371	20.009	19.948	Yes	Yes	
21	Pitt Street Commercial Lobby Entrance	Basement Penetration - greater of 1% AEP + 0.5 or PMF	20.20	20.003	20.503	20.186	20.072	No	Yes	Achieves PMF immunity and minimum 300 mm above gutter invert level.

Ref.	Description	FPL Criteria	Proposed FFL/ Threshold Level (m AHD)	1% AEP Peak Flood Level (m AHD)	1% AEP Peak Flood Level + 0.5m (m AHD)	PMF Level (m AHD)	300 mm above Gutter Invert Level (m AHD)	Compliance with CoS FPL Criteria?	Compliance with Alternative CoS FPL Criteria?	FPL Compliance Comments
22	Residential Lobby Entrance	Basement Penetration - greater of 1% AEP + 0.5 or PMF	20.45	20.261	20.761	20.427	20.344	No	Yes	Achieves PMF immunity and minimum 300 mm above gutter invert level.
23	Fire Egress	Basement Penetration - greater of 1% AEP + 0.5 or PMF	20.50	20.319	20.819	20.476	20.401	No	Yes	Achieves PMF immunity and minimum 300 mm above gutter invert level.

Compliance with FPLs (both CoS standard requirements or alternate agreed criteria) would be achieved by one or a combination of the following:

- CoS kerb and gutter profile;
- CoS footpath crossfall;
- Threshold ramps;
- Landscape elements (within property boundary);
- Ramping (internal to site boundary);
- Steps (internal to site boundary where acceptable e.g. egress stairs and substation).

Once the appropriate FPL criteria are agreed with the CoS, the design would be developed in subsequent design stages to achieve the required compliance. Acknowledging that the existing flood model is based upon LiDAR survey and a 2 m grid, future design stages also present the opportunity to further refine the flood model and the resulting flood levels, providing greater certainty on the predicted flood levels adjacent to the site.

4.2 Flood Affection

It is anticipated that public domain works will be undertaken to the Castlereagh and Pitt Street site frontages. This may include adjustment to footpath alignment levels and grading. Any adjustment to existing levels would need to consider the performance requirement for the development which is:

the development should manage and mitigate flood risk and does not exacerbate the potential for flood damage or hazard to existing development and to the public domain; and

a development “will not significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affection of other developments or properties”.

Noting the Piccadilly development (i.e. excluding any public domain works) is contained to within the existing building envelope and will not result in increased runoff compared to existing conditions, it is not anticipated the proposed development will result in any changes to flood affection within the wider catchment area.

However, during design development it will be necessary to coordinate the public domain design with the existing flooding to confirm that this requirement is met. This will also include incorporating detailed survey into the existing flood model to better define the existing site topography and a design surface for footpath alignment levels.

5. Conclusion

This preliminary flood assessment was based on the flood model results in the City Area Catchment Floodplain Risk Management Study (WMAwater, 2016). The results are subject to assumptions and limitations associated with this model.

Preliminary Flood Planning Levels for the site have been identified based upon the existing WMAwater flood model. An assessment of the existing flood levels indicates that achieving the FPL requirements for the below ground or car park/ penetration entrances (the governing criteria being the 1% AEP flood level + 0.5 m) will be particularly challenging within the constraints of maintaining urban design outcomes for street level activation and accessible site entry.

Therefore, alternative Flood Planning Level requirements have been presented, based primarily on achieving flood immunity to the PMF at basement entrance locations, as a means of balancing Flood Planning Level requirements with other design constraints applicable to the site (e.g. urban design outcomes for street level activation and accessible site entry). The PMF level has been recommended as an alternative FPL criteria noting that:

- The site is located near the top of catchment;
- The site is located away from any significant trapped sag locations, so the potential for flooding within the development resulting from any significant blockage of the drainage network is low; and
- The sensitivity of peak flood levels at the site to changes in the hydrological assumptions is low, as evidenced by the relatively small differences in the PMF and 1% AEP peak flood levels (less than 0.25 m at all reference locations).

Analysis of the entrance locations with the alternative FPL criteria indicates that a number of entrance locations are above the predicted PMF flood level. Where FFL's are below the PMF level, the potential exists for the alternate FPL compliance levels to be achieved through other means, (e.g. providing raised entrance thresholds, internal ramping etc). This will require further consideration in design development to achieve compliance.

Further hydraulic modelling will be required to refine the existing flood levels, in particular incorporating detailed existing ground survey information for the site and surrounds and improved representation of surface features in the flood model. Once the proposed design for the site has been developed, modelling will be undertaken to review flood performance, flood impacts and more accurately define the flood planning level requirements for the site.

Subject	Response to City of Sydney Planning Proposal RFIs - Flooding
Job No/Ref	Piccadilly Redevelopment
Date	12 January 2026

1. Introduction

Arup provide this memorandum to support the responses to the flooding queries that have been received from the City of Sydney, in their email dated 12 December 2025, following the submission of the Planning Proposal for the Piccadilly redevelopment.

2. Response to Flooding Related Queries

Arup have reviewed the City of Sydney commentary and note the following:

- We acknowledge the requirement for the Flood Impact and Risk Assessment (FIRA) and this will be completed prior to the Development Application (DA) submission for the proposed development, as requested.

We confirm that the FIRA will outline flood behaviour and assess risks and impacts in the existing as well as post development situation based on duration of flooding, depth and velocity, flood warning & evacuation time, period of isolation, frequency of inundation and flood hazards for full range of events up to and including PMF.

- In preparing the FIRA we confirm that we will discuss the compliance of the proposal with Direction 4.1 (flooding) of the Local Planning Directions, as requested. With respect to the planning proposal, we note that as the proposal does not significantly alter the existing building footprint and flooding is limited to the surrounding road corridors (and is of relatively shallow depths) that compliance with the directions in Direction 4.1 should be achieved.
- We confirm that following the issue of the initial flood assessment report, we have reviewed the revised flood planning criteria in the proposed DCP amendments and confirm that we do not expect the required flood planning levels (FPL) to materially change for the Piccadilly Development based on the proposed amendments.
- We acknowledge that new guidance on consideration of impacts of climate change is available and confirm that it will be considered in assessing the impacts when the FIRA is completed, along with the proposed amendments to the Sydney DCP.

Based on our initial review of the climate change guidance, we expect any increase in FPL's for this development resulting from applying climate change factors to be < 0.1 m.

- We acknowledge the requirement for a Flood Emergency Response Plan (FERP) and this will be prepared prior to the submission of the DA, with reference to the documents noted in the email, to manage flood risk to the development.

We therefore conclude that for concept reference schemes, submitted with the Planning Proposal, we believe that the recommendations in the Arup flood assessments reports, dated 14 July 2025, will not change and remain valid, and that the proposed envelopes and controls can meet the requirements for both the Flood Impact Risk Assessment and Flood Emergency Response Plan, which will both be completed prior to lodgement of the DA submission.