

WATERLOO METRO QUARTER OVER STATION DEVELOPMENT

Environmental Impact Statement Appendix W – Flood Impact Assessment

SSD-79307746 Central Precinct

Detailed State Significant Development
Development Application

Prepared for **WL Developer Pty Ltd**

September 2025

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WLD Developer Pty Ltd

**Waterloo Metro Quarter
Over Station
Development**

Flood Impact Assessment

wsp

September 2025

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Waterloo Metro Quarter Over Station Development SSD-79307746 Central Precinct Flood Impact Assessment

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WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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Glossary

Reference	Description
1D	One-dimensional
2D	Two-dimensional
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
ARR	Australian Rainfall & Runoff
BCA	Building Code of Australia
BoM	Bureau of Meteorology
CoS	City of Sydney
DA	Development Application
DEM	Digital Elevation Model
DTM	Digital Terrain Model
DPHI	Department of Planning, Infrastructure and Housing
DPIE	Department of Planning, Industry and Environment
FEMP	Flood Emergency Management Plan
FFL	Finished Floor Level
FPL	Flood Planning Level
Hydraulic model	A theoretical model used to provide representation of flow distribution and flood mechanisms at the area of interest.
LiDAR	Light Detection and Ranging
LPI	Land and Property Information
OSD	Over station development
PMF	Probable Maximum Flood
SEARs	Secretary's Environmental Assessment Requirements
SSD	State Significant Development
WMQ	Waterloo Metro Quarter

Executive summary

WSP conducted a flood impact assessment on behalf of WL Developer Pty Ltd to support the State Significant Development Application for the Central precinct at Waterloo Metro Quarter. This report relates to the Central Precinct (SSD-79307746).

The report addresses Item 16 of the Planning Secretary's Environmental Assessment Requirements issued by the Department of Planning, Infrastructure and Housing on 13 February 2025.

As part of the assessment, WSP engaged with the City of Sydney in its role of the flood authority, to discuss planning requirements and agree on the proposed methodology for the flood impact assessment.

City of Sydney flood engineer confirmed that:

- City of Sydney Interim Floodplain Management Policy (CoS, 2014) should be adopted to inform Flood Planning Levels requirements.
- Climate change should be assessed as a sensitivity analysis by 10% rainfall intensity increase and sea level rise by 90 cm for 2100.
- Flood impact is to be assessed by comparing the pre and post development conditions. It is acknowledged, however, that the impact caused by the proposed development would replicate what was included in the previous applications for Central (application number: SSD-10439), Northern (application number: SSD-10440), and Southern Precinct (application number: SSD-10437), Basement Car Park (application number SSD-10438) and Amending Concept (application number: SSD-10441) for which planning consent was granted.

Flood conditions were assessed using the City of Sydney's flood model (provided by WSP by council flood engineer). WSP updated the council flood model with the latest survey data available for the site and the proposed development layout (and design surface). The model was used to simulate the 5% AEP, 1% AEP, and Probable Maximum Flood events.

The flood modelling results indicate that the site is subject to overland flooding during the 5% AEP, 1% AEP, and Probable Maximum Flood events.

Flood Planning Levels

Finished Floor Levels have been set above the Flood Planning Levels.

Access to the basement has been provided at 16.500 m AHD which is above the 1% AEP flood level plus 0.5 m and the Probable Maximum Flood level.

Areas at ground floor have Finished Floor Levels that meet the Flood Planning Levels.

Flood impact

The potential flood impacts of the proposed development were assessed through hydraulic modelling, considering changes in flood level and flood hazard.

The model results indicate that the proposed development does not exacerbate flood conditions.

Flood emergency response

Flood protection in case of a flood emergency can be achieved by evacuating occupants of the building areas to higher ground (levels above the Probable Maximum Flood level).

1 Project background

1.1 Acknowledgement of Country

We acknowledge Aboriginal and Torres Strait Islander peoples as the Traditional Owners and custodians of the land on which the project is located.

We pay respect to Elders past and present and recognise their continuing connection with and contribution to the land and waters.

This acknowledgement reminds us of our responsibilities to our relationships and to the ancestral lands on which we learn, share and live.

1.2 Introduction

This report has been prepared by WSP on behalf of WL Developer Pty Ltd (the applicant) to accompany a State Significant Development Application (SSDA) for the detailed Central Precinct SSD (SSD-79307746), located within the Waterloo Metro Quarter (WMQ) at 150 Cope Street, Waterloo. This SSD will replace the previous detailed approval applying to the Central Precinct.

Figure 1-1 indicates the land to which this SSD applies in relation to the overall WMQ site (shaded in Green).

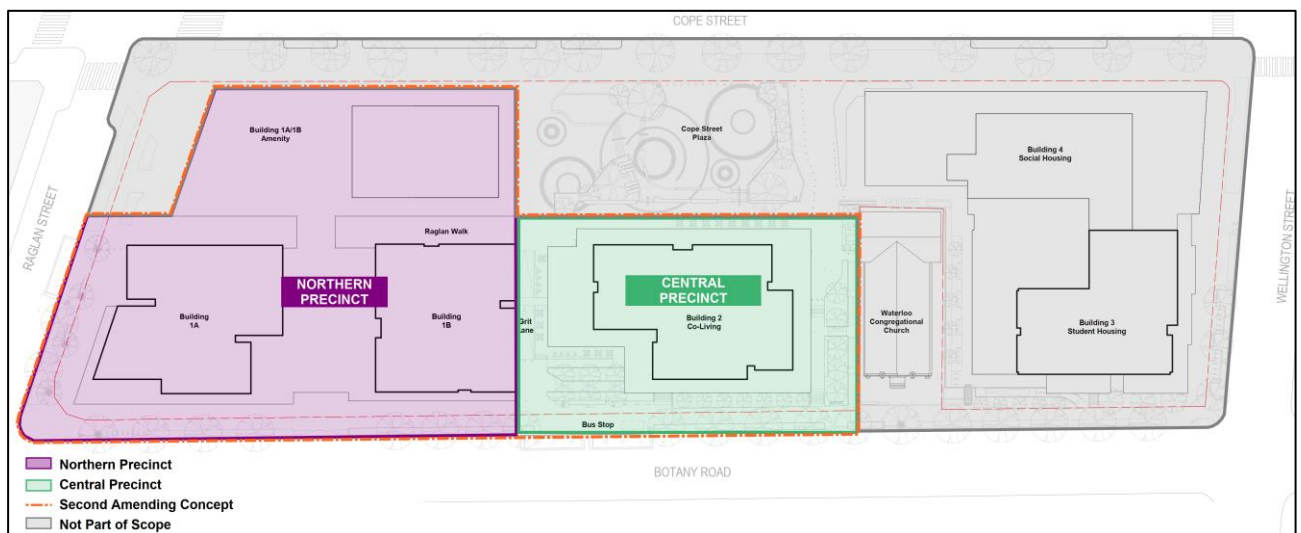


Figure 1-1: WMQ site area; the Central Precinct is indicated in the green polygon

This application seeks consent for the design, construction and operation of a 26 storey (including plant level) mixed use building within the Central Precinct (the site) of the WMQ estate.

The proposal comprises a Co-living housing tower above a three-storey podium containing retail and community facility in the form of a childcare centre. Specifically, the proposal comprises:

- Ground level retail tenancies, community facility and childcare, co-living and shared basement access lobbies
- Community centre in the form of a childcare centre at Level 1 and Level 2
- A Co-living housing tower from Levels 3 to 24 comprising:
- Self-contained co-living accommodation rooms across 20 levels, with capacity for around 500 rooms
- Indoor and outdoor communal amenity at Levels 3 and 24
- Communal space also provided on each accommodation level;

- Ground level vehicular access from Church Square shared zone to the shared basement, delivery of a pedestrian thoroughfare through the site, landscaping and public domain works.
- Indicative building signage zones

This application is submitted for concurrent assessment with an SSD application to amend the Waterloo Metro Over Station Development (OSD) Concept DA (SSD 9393) (the Concept DA) – referred to as the Second Amending Concept DA. The Second Amending Concept DA seeks consent to modify the existing concept approval as it relates to the Northern and Central Precincts, by amending the building envelopes to redistribute floor space to suit a new mix of land uses. This Central Precinct SSD application will be consistent with the Concept DA as amended.

Separately, a SSD for the detailed design, construction and operation of the Northern Precinct (SSD-79307758) and a Section 4.55 Modification Application to modify the approved detailed Basement SSD (10438), will be concurrently submitted with this application.

1.3 Study overview

The flood impact assessment aims to:

- Assess the flood conditions at the Central Precinct site and surrounding areas for the existing and post-development conditions for different flood events and storm durations.
- Establish mitigation measures required to ensure the sustainability and safety for the users of the Central Precinct.
- Assess flood impacts caused by the Central Precinct to the adjacent areas.
- Define Flood Planning Levels (FPLs) and Finished Floor Levels (FFLs).

1.3.1 Objectives

WSP completed the following objectives:

- Undertake a desktop review of flood information available for the site and surrounding area to inform the overall strategy of the proposed scheme.
- Undertake consultations with the City of Sydney flood engineer to present the proposed scheme, confirm flood model methodology to define flood conditions at the site and flood planning requirements.
- Obtain the City of Sydney Council’s latest TUFLOW flood model (Alexandra Canal Flood Model Update (WMAwater, 2023)).
- Update the Council’s hydraulic model with the latest topography survey to represent the flood mechanisms at the site and surrounding area (i.e., water level, water depth, water velocity and flood hazard).
- Update the Council’s hydraulic model to reflect the proposed development configuration to describe flood mechanisms at the site and surrounding area.
- Use the hydraulic model results to define the FPLs and inform FFLs for the proposed development.
- Undertake a flood impact assessment to estimate changes generated by the proposed scheme to the flood mechanisms (i.e., water levels, flood extent, water velocity and flood hazard) on adjacent areas.
- Undertake a climate change sensitivity analysis to address residual food risks associated to climate change.
- Prepare impact assessment maps for the concept design (including afflux, velocity and hazard change for all events).

1.4 Site location

The proposed development is within the WMQ area, located within the City of Sydney Local Government Area (LGA) and is situated approximately 3.3 km south of Sydney CBD in the suburb of Waterloo. The WMQ contains Waterloo Metro Station and the Waterloo Congregational Church, which is located mid-block along Botany Road.

The WMQ is a rectangular shaped allotment and has an overall site area of approximately 1.29 hectares (ha).

The WMQ comprises land to the west of Cope Street, east of Botany Road, south of Raglan Street and north of Wellington Street.

Figure 1-2 shows the site locality.

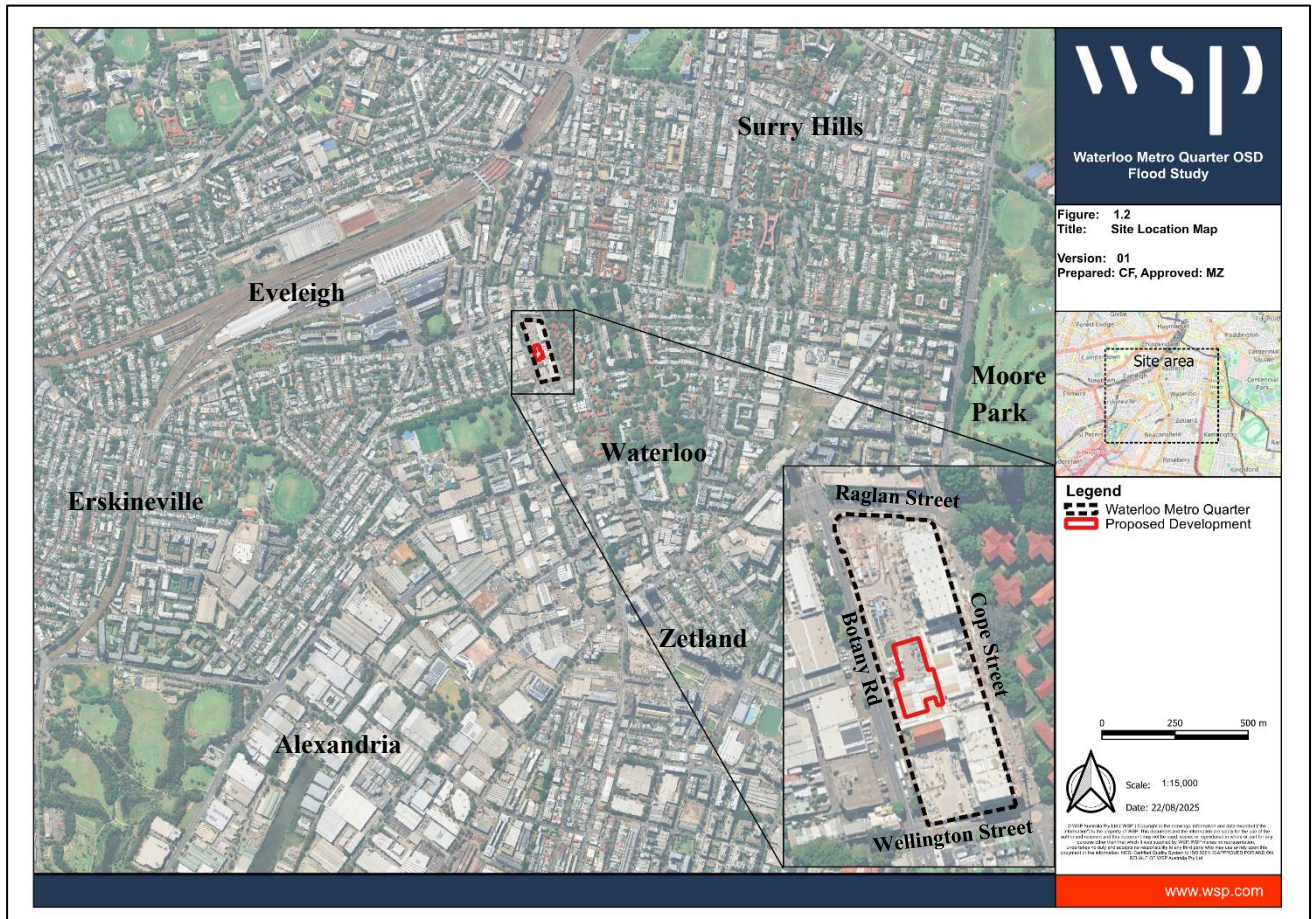


Figure 1-2: WMQ site locality in relation to proposed development

1.5 Catchment description

The site is located at the top of the Alexandra Canal Catchment. The 14 km² catchment is south of the CBD and convey surface water runoff into the Cooks River and Botany Bay. Figure 1-3 shows the extent of the Alexandra Canal Catchment in relation to the site.

The Alexandra Canal Catchment comprises the suburbs of Alexandria, Rosebery, Erskineville, Beaconsfield, Zetland, West Kensington, Waterloo, Redfern, Newtown, Eveleigh, Surry Hills and Moore Park.

The catchment is urbanised, featuring a concentration of medium to high-density residential areas alongside commercial and industrial zones. Scattered throughout are several substantial open spaces, such as Moore Park, various playing fields, Moore Park Golf Course, The Australian Golf Course, and public parks including Sydney Park, Redfern Park, Waterloo Park, and Alexandria Park.

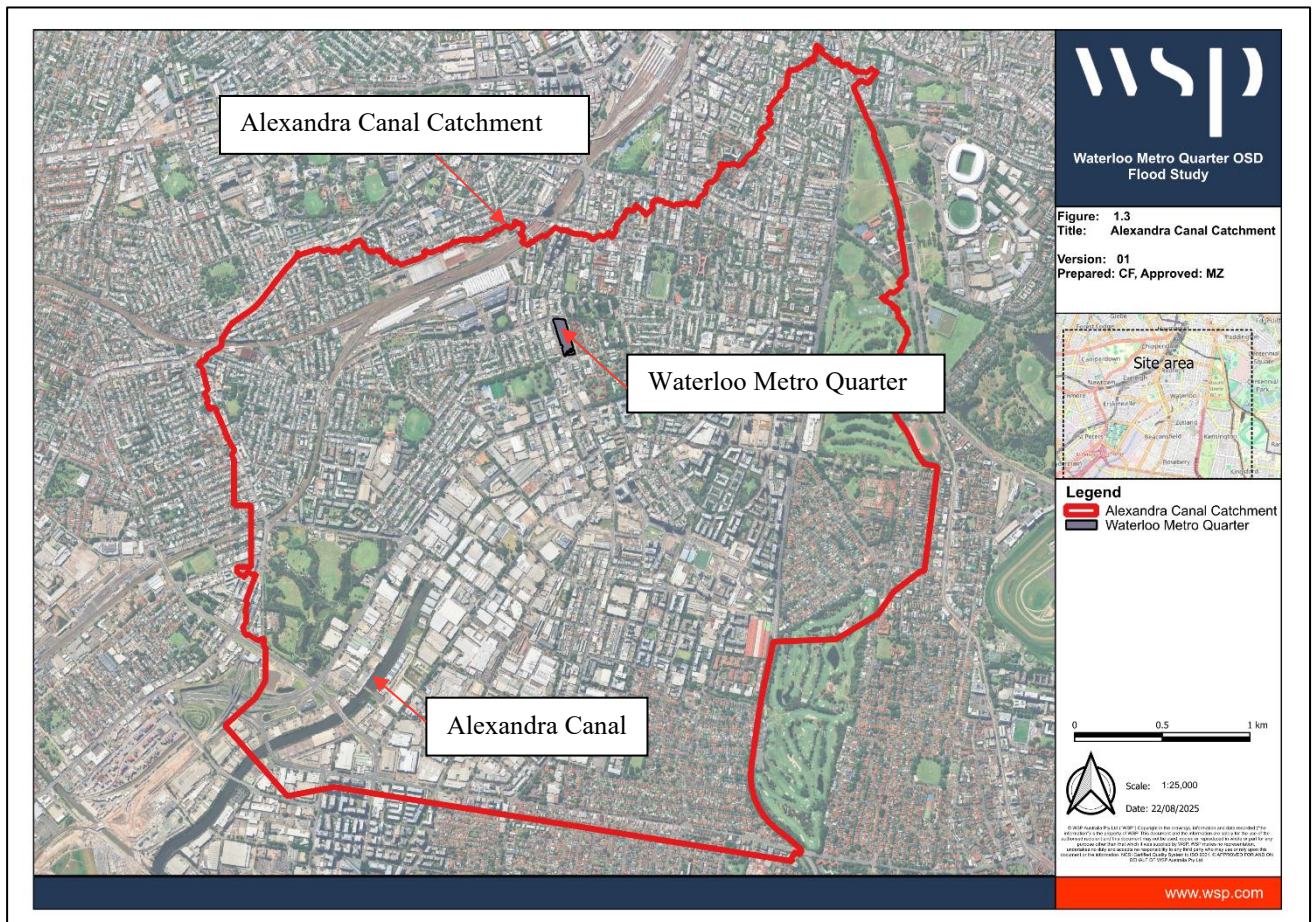


Figure 1-3: Alexandra Canal Catchment extent

1.6 Topography

The topography at the site and its surroundings areas has been informed by LiDAR data and survey data at the site. Topography elevation ranges from around 55–60 m AHD in the north-east, its highest point, down to approximately 5–10 m AHD in the south-west, the lowest point.

Water runoff is directed toward the Alexandra Canal, with the eastern section draining south-west and the western section flowing in a south to south-east direction. Overall, the terrain slopes from the north, north-east, and east toward the south-west, where the Alexandra Canal is located (see Figure 1-4).

Within the catchment, several low-lying topographical depressions rely solely on the pit and pipe drainage system for surface runoff conveyance. Due to the combined influence of natural terrain and surrounding urban development, these areas are susceptible to water ponding and may experience flooding of roads and private properties during heavy rainfall events.

The WMQ site specifically features a gentle slope, with elevation ranging from approximately 17–17.5 m AHD at its highest point to around 14–15 m AHD at its lowest. In the northern section, near the intersection of Raglan Street and Botany Road, levels range from about 16.5–17 m AHD, gradually dropping to 16–16.5 m AHD towards the junction of Raglan and Cope Streets (see Figure 1-4).

Along the eastern edge (Cope Street), elevation falls from around 16–16.5 m AHD near Raglan Street to approximately 14.5–15 m AHD near Wellington Street. Similarly, the western boundary along Botany Road slopes from about 16.5–17 m AHD at Raglan Street to 14.5–15 m AHD at Wellington Street.

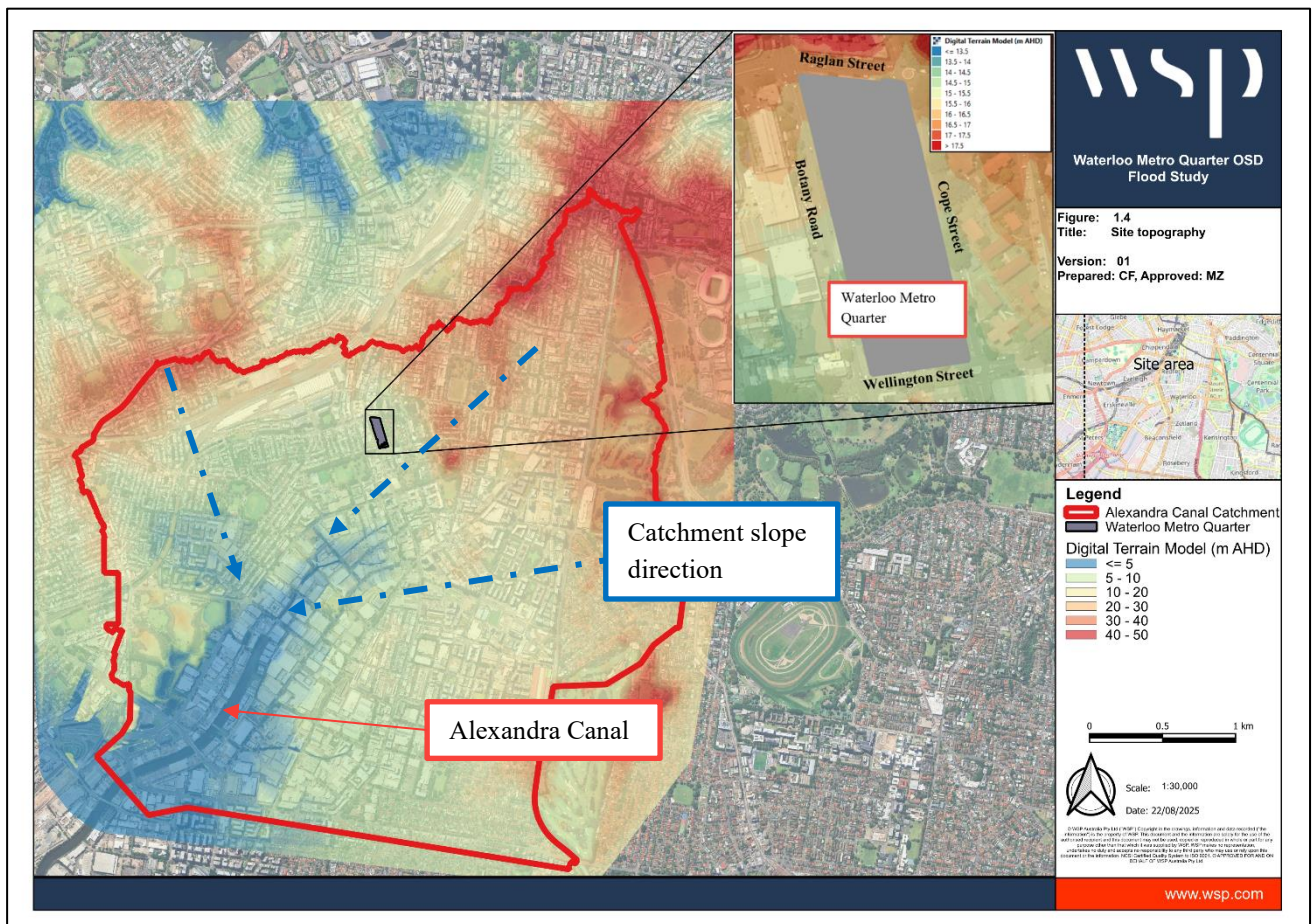


Figure 1-4: Alexandra Canal Catchment and site topography

1.7 Record of flooding

Flooding across the Alexandra Canal Catchment typically results from a combination of overland flow and mainstream flooding. For the WMQ, overland flooding is what dominates while areas further south-east surrounding the Alexandra Canal and adjacent to open channels are particularly susceptible to mainstream flood events.

Figure 1-5 shows flooding evidence from 2010 and 2025 at Botany Road and Buckland Street intersection as one of the site's critical points. These images demonstrate historical flooding issues and constrains of the area for development works. Water in this area flows from north to south, eventually collecting in low-lying zones near the Botany Road and Buckland Street intersection, where the terrain creates a bathtub effect that leads to localised ponding.

The 2025 records have been sourced from construction workers at the site; while the 2010 image was sourced from Waterloo South Flooding and Stormwater Study (AECOM, 2020).



Figure 1-5: Waterloo site flooding records from 2010 (left) and 2025 (right)

2 Proposed development

The WMQ OSD comprises four separate buildings: Southern, Central, and Northern Building and the Waterloo Metro Station, a basement carpark, and public domain works adjacent to the Waterloo Metro station.

Figure 2-1 shows the approximate footprint of the existing area and the proposed Central Precinct development.

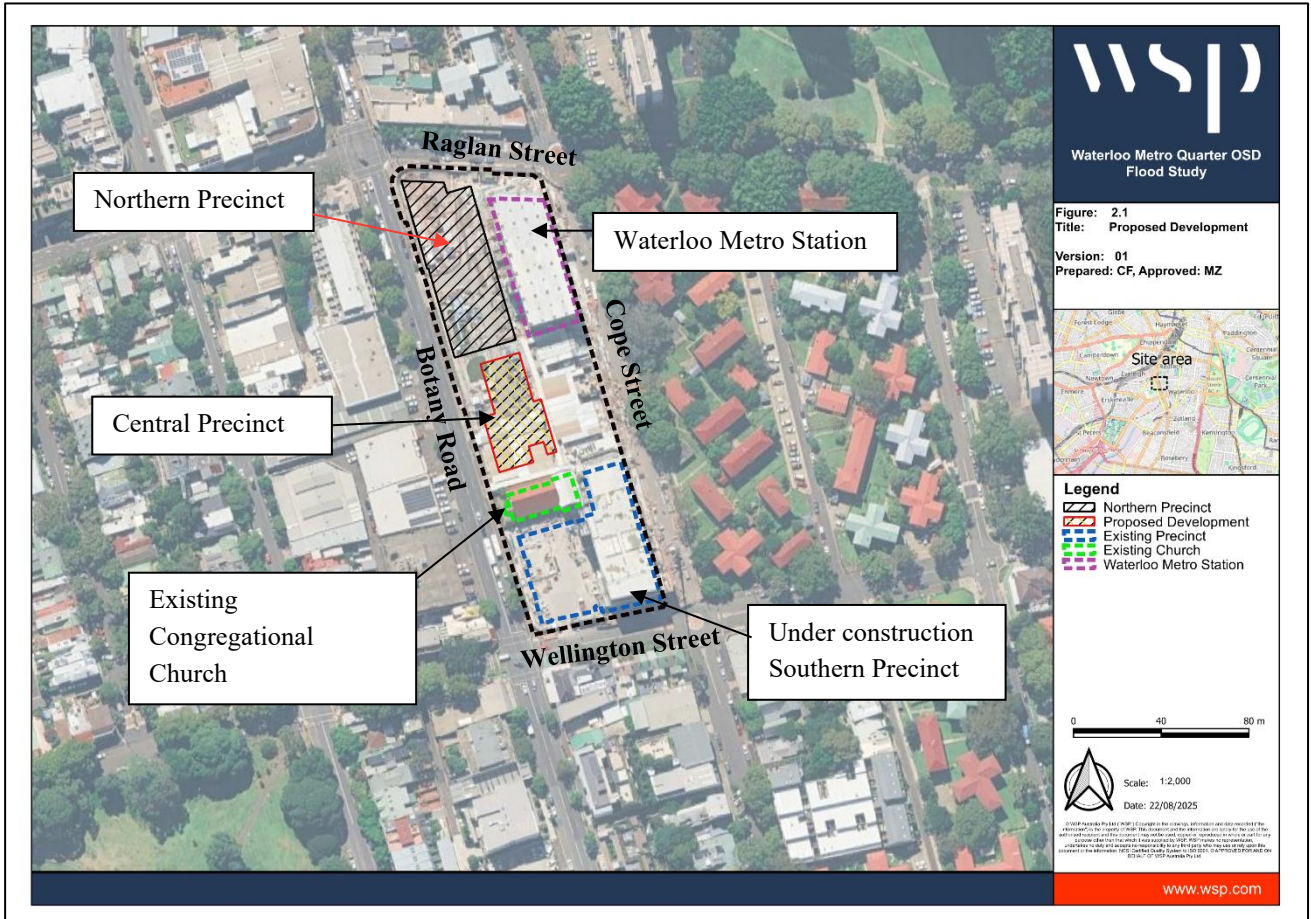


Figure 2-1: Proposed development site

The Central Precinct is proposed between the Northern Precinct and The Waterloo Congregational Church exactly mid-block along Botany Road. The Central building is a 24 storey mixed used building including a co-living housing tower above a three storey podium containing retail and community facility in the form of a childcare.

Figure 2-2 shows the Central Precinct’s proposed development concept design.

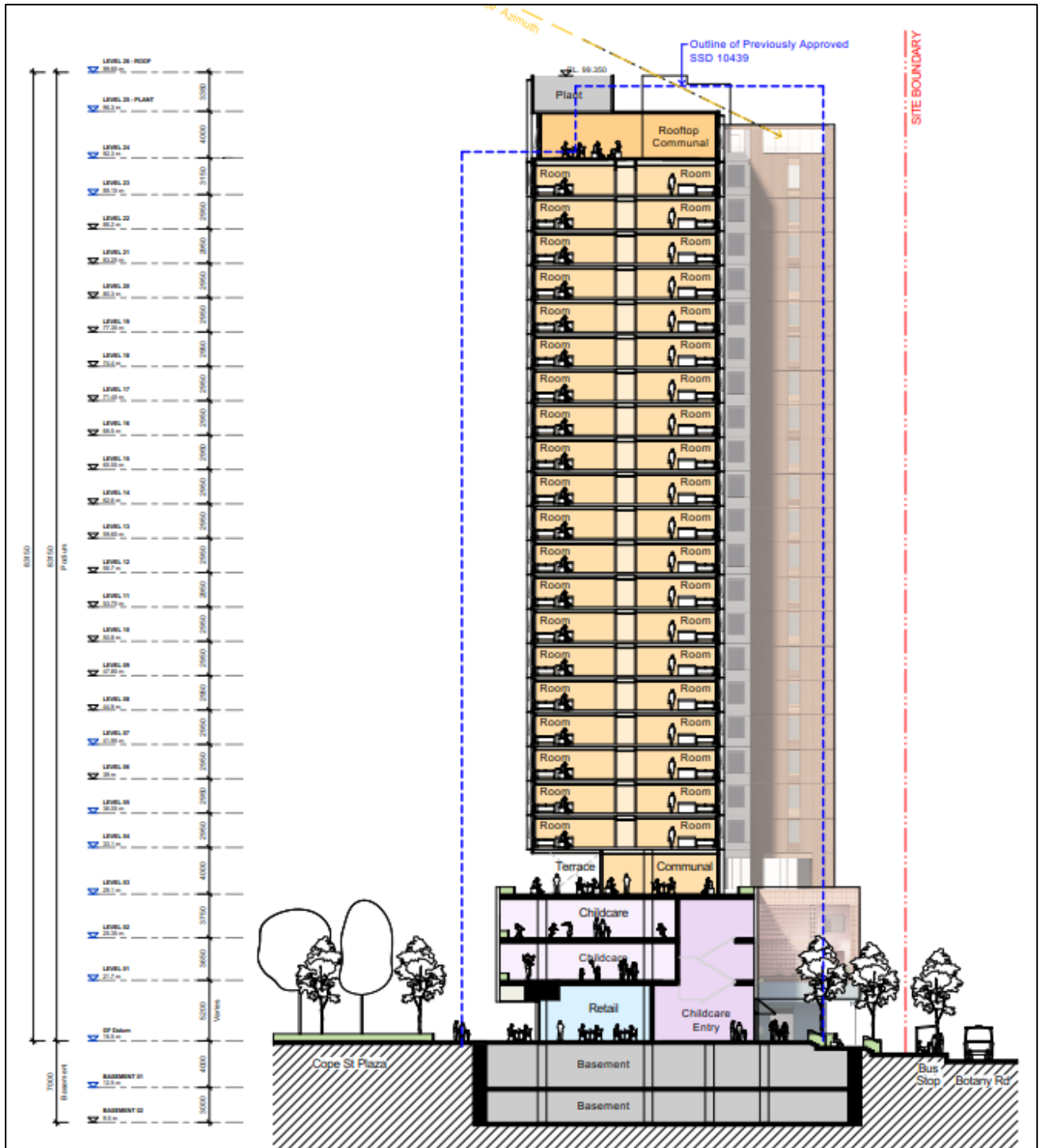


Figure 2-2: Central Precinct design development: longitudinal section from Raglan Street view

3 Project requirements

This report has been informed by and refers to the following documents, policies, and guidelines:

- *Water Quality, Flooding and Stormwater Report, Waterloo Metro Quarter* (AECOM, 2018)
- *Interim floodplain management policy* (CoS, 2014)
- *Flood Impact and Risk Assessment guideline LU01 NSW* (NSW, 2023)
- *Flood Risk Management Manual NSW* (NSW, 2023)
- *Australian Rainfall and Runoff 2019 guidelines* (Ball, et al., 2019)
- *Alexandra Canal Floodplain Risk Management Study Plan* (CoS, 2013)
- *Alexandra Canal Catchment Flood Study Model Update – ARR2018 Hydrology* (WMAwater, 2020)
- *Alexandra Canal Flood Model Update* (WMAwater, 2023)

WSP engaged with the City of Sydney’s flood engineer to confirm the project requirements, and the hydraulic model methodology.

3.1 Planning Secretary’s Environmental Assessment Requirements

This report addresses to Item 16 of the Planning Secretary’s Environmental Assessment Requirements (SEARs) issued by Department of Planning, Infrastructure and Housing (DPHI) on 13 February 2025. Specifically, the report has been prepared to respond to the requirements included in Table 3-1.

Table 3-1: Overview of the SEARs

Item	Description of requirement	Section reference
16	<ul style="list-style-type: none"> • Identify the flood planning level as set out in the relevant council LEP or SEPP and identify any: <ul style="list-style-type: none"> ○ flood risks on site having regard to adopted flood studies ○ the potential effects of climate change, and ○ any relevant provisions of the NSW Flood Risk Management Manual. 	<p>FPLs have been identified in accordance with the Interim Floodplain Management Policy from the City of Sydney in Section 5.1. Building levels have been coordinated with the site architect to ensure that acceptable levels of property safety are achieved. When needed a stepped-up zone above flood planning level was proposed for evacuation and protection against PMF level.</p> <p>Overland flood risk at the site has been identified from a previous council study and a characterisation of existing flood conditions at the site. Please refer to Section 4.</p> <p>A climate change sensitivity test was conducted by increasing rainfall intensity and sea level. Flood depths, velocities and hazards have been modelled for post-development scenario. Sensitivity results are consistent with those of the previous approved application in 2021. Please refer to Section 4.3.4</p> <p>This report aligns well with the planning practices and the provisions of the NSW Flood Risk Management Manual have been taken into consideration throughout this flood study. Please refer to Sections 4.1, 4.2, 4.3, 6.</p>
	<ul style="list-style-type: none"> • Where the development is occurring on flood prone land a flood impact and risk 	<p>Flood modelling for existing and proposed scenarios has been done to analyse the flood constraints for the proposed</p>

Item	Description of requirement	Section reference
	assessment (FIRA) must be prepared having regard to the Flood Impact and Risk Assessment Guideline - LU01 (FIRA guide). When determining the scope and category of the FIRA the requirements outlined in the FIRA guide must be considered.	development. This has been produced for the 5% AEP, 1% AEP and PMF flood event and encompasses the area surrounding the WMQ. The assessment addressed relevant provisions of the Flood Impact and Risk Assessment Guideline. Please refer to Section 6. Flood models for post-development scenario have been prepared, assessing impacts of the development on the flooding behaviour, flood levels and hazards. These are shown in Section 6.
	<ul style="list-style-type: none"> Detail any flood risk management measures that are to be incorporated as part of the development having regard to relevant guidelines (including any design solutions, flood modification measures, property modification measures, operational procedures or Flood Emergency Response Plan). 	Potential mitigation measures to offset adverse flooding impacts consider appropriate building flood planning levels and internal design considerations. Please refer to Section 5.1. Flood emergency supporting measures have been identified for the occupants and management of the building to minimise the potential consequences of flood exposure. Please refer to Section 7.

This report has also been prepared in response to the following conditions of consent issued for the Amending Concept SSDA (SSDA 10441) for the OSD as summarised in Table 3-2

Table 3-2: Flooding and Stormwater Assessment

Item	Description of requirement	Section reference
B23	Future development conditions shall be accompanied by a flood and stormwater impact assessment. The assessment must demonstrate the conclusion and recommendations of the concept water quality flooding and stormwater report dated 31 October 2018 prepared by AECOM	This flood impact assessment report describes the flood conditions and flood impacts at the site. Flood conditions are discussed in Section 4, flood levels in Section 5 and flood impacts in Section 6.

3.2 Flood Planning Level

FPL have been defined according to the Interim Floodplain Management Policy (CoS, 2014).

Table 3-3 summarises the FPL requirements.

Table 3-3: FPL requirements

Flood Planning Levels		
Residential	Habitable rooms	1% AEP flood level + 0.5 m or PMF (whichever is higher)
	Non-habitable rooms such as a laundry or garage (excluding below-ground car parks)	1% AEP flood level
Industrial or commercial	Retail Floor Levels	1% AEP flood level – with stepped-up zone inside property for shelter in place evacuation for emergency response.

Below-ground garage/car park	All other below-ground car parks	1% AEP flood level + 0.5 m or the PMF (whichever is the higher)
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3.3 Engagement with the City of Sydney flood engineer

WSP engaged with the City of Sydney to present the proposed development and to confirm the City of Sydney requirements from a flood risk perspective.

During the meeting held on 18 June 2025, the following items were discussed:

Flood model

WSP was provided with the latest City of Sydney Alexandra Canal TUFLOW flood model (2023 model). The flood model should be used to inform the flood risk assessment.

Flood Planning Levels

City of Sydney Interim Floodplain Management Policy (CoS, 2014) should be adopted to inform FPL requirements.

For the substation, the City of Sydney has confirmed the FFL requirement at the 1% AEP level, subject to Ausgrid's agreement that this standard is acceptable.

Climate change

Climate change should be assessed as a sensitivity analysis. Council suggested adopting 10% increase in rainfall intensity and sea level rise scenario for the year 2100 for the climate change scenario.

Flood impact

It was agreed that the proposed development is expected to mimic what was discussed and agreed as part of the previous approved applications for Northern (SSD-10440), Central (SSD-10439), Southern Precinct (SSD-10437), Basement Car Park (SSD-10438) and Amending Concept (SSD-10441) by the Department of Planning and Environment in 2021.

4 Flood conditions

Alexandra Canal Floodplain Risk Management Study and Plan of the City of Sydney Council (NSW, 2014) reported that flooding conditions through the Alexandra Canal Catchment are a combination of overland flow and mainstream flooding.

Mainstream flooding tends to occur around Alexandra Canal and open channels, whereas elsewhere, flooding is primarily a result of overland flow and capacity of the stormwater network and overland flow paths.

Figure 4-1 from the CoS study shows that the WMQ site lies in flood prone land with susceptibility to overland flooding as main source of flooding during the 1% AEP flood event. Water ponding appears to be an issue at Cope and Wellington Street intersection and southern part of the WMQ site.

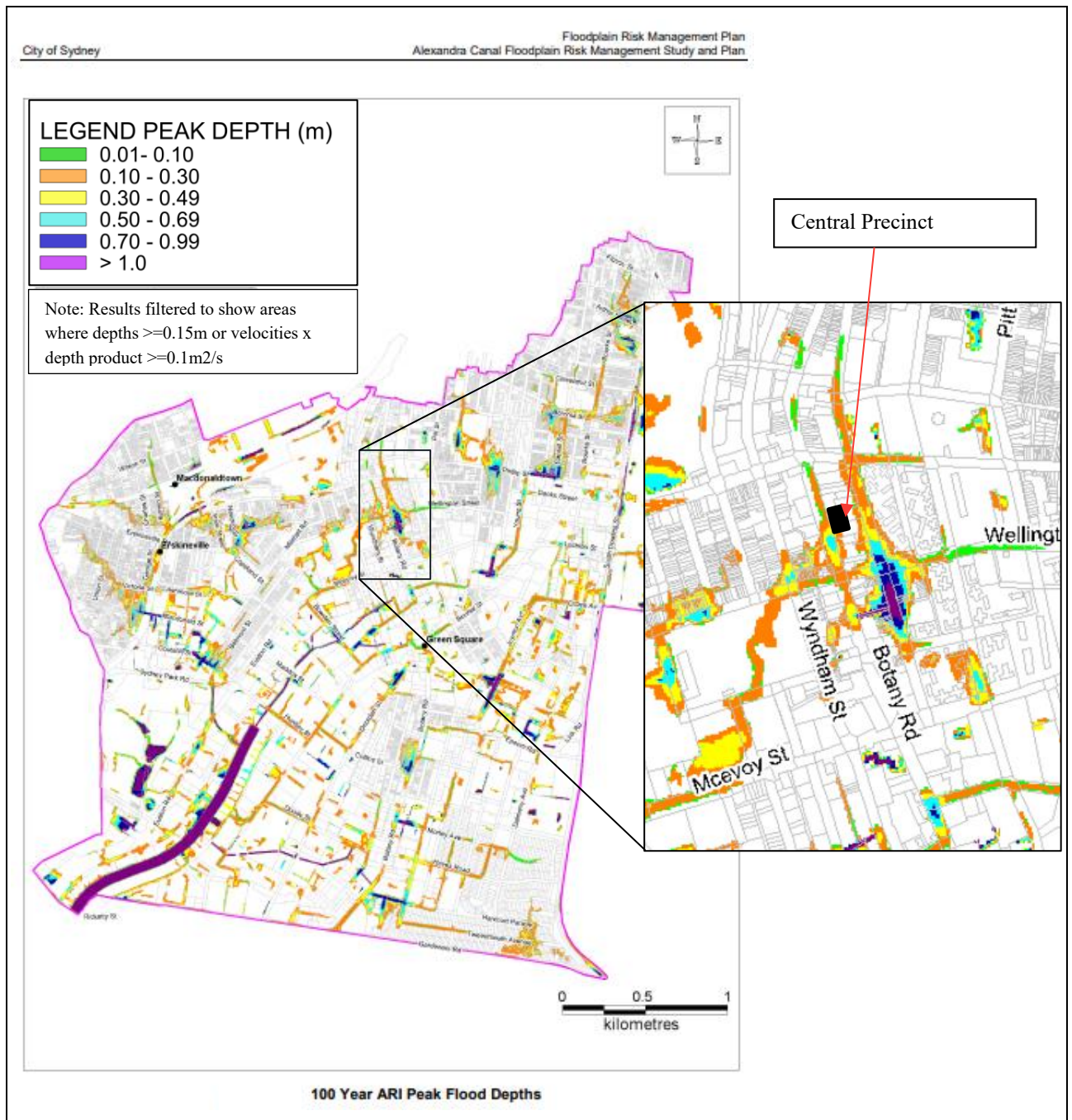


Figure 4-1: Overland flooding 1% AEP for Alexandra Canal Catchment in relation to Central Precinct (NSW, 2014)

Mainstream and tidal flooding are not relevant to the WMQ site due to the location almost on top of the catchment.

4.1 Hydraulic modelling

Hydraulic modelling was completed by WSP to assess the overland flow conditions and flood impacts of the proposed development within the catchment contributing to surface water runoff at the site.

The hydraulic modelling was based on an updated version of the Alexandra Canal Catchment flood model developed by WMAwater in September 2020 and then updated by WMAwater in 2023.

This flood model is currently ‘adopted’ by the CoS to inform the flood conditions within the Alexandra Canal Catchment.

WSP model updates included the following:

- Including the latest topography survey at the WMQ site to improve representation of terrain in the surrounding streets.
- Including the design surface for post-development conditions including concept design surface data around Northern and Central Precinct, concept design data within the WMQ area and Cope Street Plaza, and surface data along Cope Street and the intersections with Raglan and Wellington Street.

WSP considered the following model scenarios:

- Existing scenario: it represents the pre-development site conditions as baseline for flood behaviour and is reflective of the existing local landforms (considers an entire building over the WMQ site for the modelling).
- Post-development scenario: it represents the post-development site conditions and considers the addition of the WMQ proposed design layout as separated buildings for the modelling,

The flood model assessed the 5%, 1% AEP flood event and the PMF flood event.

Climate change was also considered as part of the assessment. Council suggested to adopt a 10% increase in rainfall intensity (for developments with lifespan of more than fifty years) and a sea level rise of 90 cm by 2100 as per the NSW Government Coastal Planning Guideline (NSW, 2023) for the climate change scenario.

The following modelling information is relevant to the adopted model to ensure its suitability for use in the assessment:

- For the 5% and 1% AEP design events, two critical storm durations were considered (30 minute and 60 minute), with the envelope of both durations taken as the final design flood behaviour for that event. This is based on a full ensemble of temporal patterns for a range of duration up to 180 minutes, where the process indicated that the 30-minute and 60-minute durations are critical for most of the catchment and study area (WMAwater, 2020).
- For the PMF event, a 90-minute storm duration was adopted as critical as per the main catchment study reference (WMAwater, 2020) – using a run duration long enough to ensure peak water levels at the site and surrounding areas are properly captured.

The hydraulic structures (i.e., culverts and pipe network) around the site are included in the model to correctly represent the site’s flood conveyance. The sizes of the hydraulic structures and parameters are those adopted in the 2023 update Alexandra Canal Catchment Flood Study Model ((WMAwater, 2020) for further details).

4.2 Existing flood conditions

The flood model updated by WSP as described in Section 4.1 was used to inform the existing flood conditions at the site.

4.2.1 *Flood mechanisms*

As observed from the hydraulic modelling, surface runoff travels southward conveyed along Botany Road and Cope Street. A portion of this flow is redirected by Raglan Street toward Botany Road. Wellington Street features a low-lying area from mid-block where water tends to accumulate, resulting in greater depth before continuing its path in the south-west direction.

The model results show that the WMQ site and surrounding area are expected to be affected by flooding during the 5%, 1% AEP event and the PMF.

4.2.2 Flood level and flood depths

Flood depths and levels have been assessed for the 5%, 1% AEP and the PMF flood events. Flood depths and levels maps are included presented in Figure 4-2 to Figure 4-4.

Flood depths are up to 450 mm at Botany Rd mid-block in front of the Central Precinct for the 5% AEP event. Topographic depressions located a bit further south in front of the Congregational Church cause localised water ponding and water depths can be expected up to 600 mm.

Water depths during PMF flood event are up to 1,3 m from mid-block along Botany Rd due to ponding from further south.

Table 4-1 shows the maximum flood level around the Central Precinct for different flood events.

Table 4-1: Maximum flood level for modelled AEP events

Flood event	Maximum flood level (m AHD)
5% AEP	15.703 (Mid-block along Botany Road)
1% AEP	15.722 (Mid-block along Botany Road)
PMF	16.444 (Mid-block along Botany Road)

4.2.3 Flow velocities

Flow velocity maps have been prepared for maps for the 5%, 1% AEP and the PMF flood events.

Flow velocity maps are included in Figure 4-5 to Figure 4-7.

The flood model results indicate that there are flow velocities below 1.50 m/s west of the Central Building at Botany Road during the 5% and 1% AEP events.

Flow velocities decrease along Botany Road as they approach Wellington Street, where the water slows within a topographic depression.

For the 5% AEP, flow velocities are up to 1.30 m/s along Botany Road near the Central Building.

For the 1% AEP, flow velocities are up to 1.40 m/s along Botany Road near the Central Building.

For the PMF, flow velocities are up to 1.86 m/s along Botany Road near the Central Building.

4.2.4 Flood hazard

Flood hazard maps have been prepared for the 5%, 1% AEP and the PMF flood events.

The flood hazard category, as outlined by Australian Emergency Management Institute in 2014 (AEMI, 2014), is expressed as the relative vulnerability to flood hazard by assessing flood depth and velocity interaction.

The flood hazard is categorised from H1 to H6 as outlined by ARR2019 (Ball, et al., 2019). Flood hazard categories are defined as follow:

- H1: Generally safe for vehicles, people and buildings.
- H2: Unsafe for small vehicles.
- H3: Unsafe for all vehicles, children and the elderly.
- H4: Unsafe for all people and vehicles.

- H5: Unsafe for all people and all vehicles. Buildings require special engineering design and construction.
- H6: Unconditionally dangerous. Not suitable for any type of development or evacuation access. All building type considered vulnerable to failure.

The flood hazard maps are included Figure 4-8 to Figure 4-10.

For the 5% and 1% AEP storm events assessed, flood hazards in front of the Central building are mostly H1 (generally safe for people, vehicles and buildings) with some zones mid-block south of Botany Rd up to H3 (Unsafe for all vehicles, children and the elderly) due to the topographic depression in front of the church.

H4 hazard areas are mainly expected for the PMF event in front of the building along Botany Rd.



Waterloo Metro Quarter OSD Flood Study

Figure: 4.2
Title: Flood Depth
Existing Scenario - 5% AEP

Version: 01
Prepared: CF, Approved: MZ



Legend

- Existing Building
- Flood Level (0.25m interval)

Flood Depth (m)

- <= 0.10
- 0.10 - 0.30
- 0.30 - 0.50
- 0.50 - 0.70
- 0.70 - 1
- > 1



0 40 80 m

Scale: 1:2,500

Date: 22/08/2025

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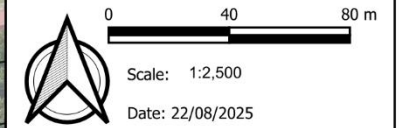
Waterloo Metro Quarter OSD Flood Study

Figure: 4.3
Title: Flood Depth
Existing Scenario - 1% AEP

Version: 01
Prepared: CF, Approved: MZ



- Legend**
- Existing Building
 - Flood Level (0.25m interval)
- Flood Depth (m)**
- <= 0.10
 - 0.10 - 0.30
 - 0.30 - 0.50
 - 0.50 - 0.70
 - 0.70 - 1
 - > 1



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Waterloo Metro Quarter OSD Flood Study

Figure: 4.4
Title: Flood Depth
Existing Scenario - PMF

Version: 01
Prepared: CF, Approved: MZ

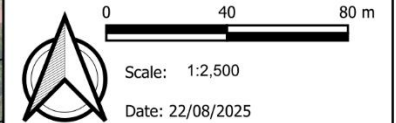


Legend

- Existing Building
- Flood Level (0.25m interval)

Flood Depth (m)

- ≤ 0.10
- 0.10 - 0.30
- 0.30 - 0.50
- 0.50 - 0.70
- 0.70 - 1
- > 1



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Waterloo Metro Quarter OSD Flood Study

Figure: 4.5
Title: Flood Velocity
Existing Scenario - 5% AEP

Version: 01
Prepared: CF, Approved: MZ



Legend

Existing Building

Flow velocity (m/s)

- <= 0.25
- 0.25 - 0.5
- 0.5 - 0.75
- 0.75 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- > 3



0 40 80 m

Scale: 1:2,500

Date: 22/08/2025

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Waterloo Metro Quarter OSD Flood Study

Figure: 4.6
Title: Flood Velocity
Existing Scenario - 1% AEP










Version: 01
Prepared: CF, Approved: MZ



Legend

 Existing Building

Flow velocity (m/s)

-  <= 0.25
-  0.25 - 0.5
-  0.5 - 0.75
-  0.75 - 1
-  1 - 1.5
-  1.5 - 2
-  2 - 2.5
-  2.5 - 3
-  > 3



0 40 80 m

Scale: 1:2,500

Date: 22/08/2025

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Waterloo Metro Quarter OSD Flood Study

Figure: 4.7
Title: Flood Velocity
Existing Scenario - PMF

Version: 01
Prepared: CF, Approved: MZ



Legend

 Existing Building

Flow velocity (m/s)

-  ≤ 0.25
-  0.25 - 0.5
-  0.5 - 0.75
-  0.75 - 1
-  1 - 1.5
-  1.5 - 2
-  2 - 2.5
-  2.5 - 3
-  > 3



0 40 80 m

Scale: 1:2,500

Date: 22/08/2025

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Waterloo Metro Quarter OSD Flood Study

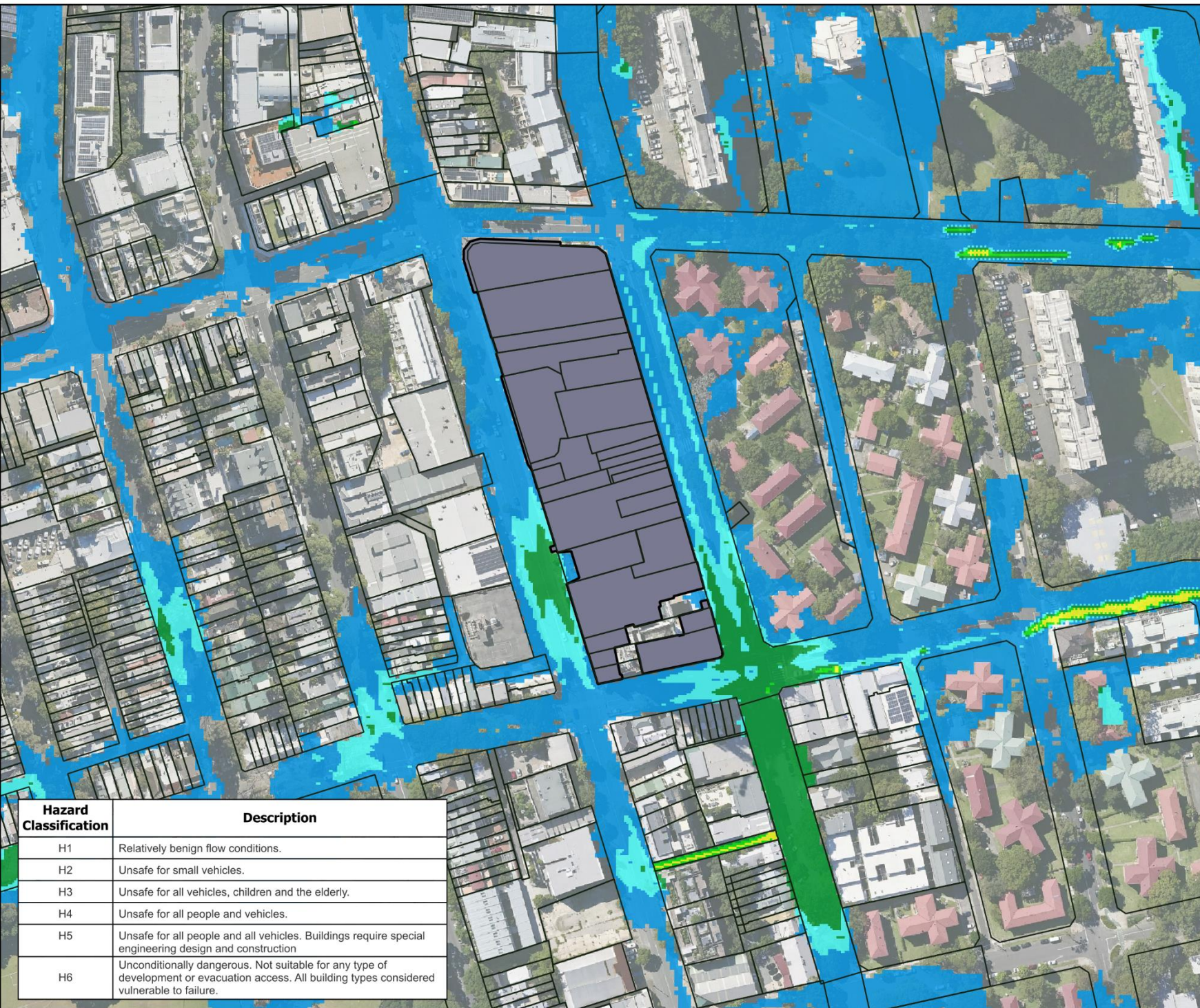
Figure: 4.8
Title: Flood Hazard
Existing Scenario - 5% AEP

Version: 01
Prepared: CF, Approved: MZ

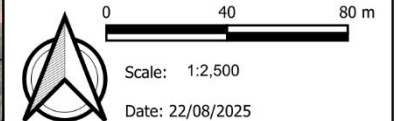


Legend

-  Existing Building
- Flood Hazard Category**
-  H1
-  H2
-  H3
-  H4
-  H5
-  H6



Hazard Classification	Description
H1	Relatively benign flow conditions.
H2	Unsafe for small vehicles.
H3	Unsafe for all vehicles, children and the elderly.
H4	Unsafe for all people and vehicles.
H5	Unsafe for all people and all vehicles. Buildings require special engineering design and construction
H6	Unconditionally dangerous. Not suitable for any type of development or evacuation access. All building types considered vulnerable to failure.



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Waterloo Metro Quarter OSD Flood Study

Figure: 4.9
Title: Flood Hazard
Existing Scenario - 1% AEP

Version: 01
Prepared: CF, Approved: MZ



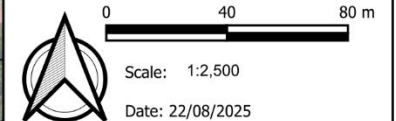
Legend

Existing Building

Flood Hazard Category

- H1
- H2
- H3
- H4
- H5
- H6

Hazard Classification	Description
H1	Relatively benign flow conditions.
H2	Unsafe for small vehicles.
H3	Unsafe for all vehicles, children and the elderly.
H4	Unsafe for all people and vehicles.
H5	Unsafe for all people and all vehicles. Buildings require special engineering design and construction
H6	Unconditionally dangerous. Not suitable for any type of development or evacuation access. All building types considered vulnerable to failure.



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Figure: 4.10
Title: Flood Hazard
Existing Scenario - PMF

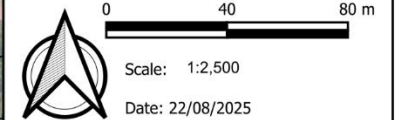
Version: 01
Prepared: CF, Approved: MZ



Legend

- Existing Building
- Flood Hazard Category**
- H1
- H2
- H3
- H4
- H5
- H6

Hazard Classification	Description
H1	Relatively benign flow conditions.
H2	Unsafe for small vehicles.
H3	Unsafe for all vehicles, children and the elderly.
H4	Unsafe for all people and vehicles.
H5	Unsafe for all people and all vehicles. Buildings require special engineering design and construction
H6	Unconditionally dangerous. Not suitable for any type of development or evacuation access. All building types considered vulnerable to failure.



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4.3 Post-development flood conditions

4.3.1 *Flood level and flood depths*

Model results indicate that flood depths and levels remain unchanged around the Central Precinct. There are minor localised increases along Botany Road in flood levels ranging from 10 to 30 mm during 5% and 1% AEP events which are attributed to model noise.

Footprint of Central Precinct is not affected by flood waters for the 5% and 1% AEP events. Flood waters are expected on the street up to the PMF. Only during PMF event there is affectation to Central building surroundings.

Flood depth and level maps for the proposed development are included in Figure 4-11 to Figure 4-13.

4.3.2 *Flow velocities*

Model results show that there are negligible changes in flow velocity along the mid-block section of Botany Road for the proposed development. Flow velocities do not affect the Central Precinct during the 5% and 1% AEP events.

Floodwaters only rise and reach podium levels during the PMF event. Flow velocities at the building are expected to stay below 0.2 m/s.

Flow velocity maps for the proposed development are included in Figure 4-14 to Figure 4-16.

4.3.3 *Flood hazard*

Flood hazard maps are included in Figure 4-17 to Figure 4-19.

Flood hazards along main streets remain consistent with observed existing conditions.

Flood hazards are expected along Botany Road (west of the Central building) with H1 hazard category (generally safe for people, vehicles and buildings) with some zones mid-block south of Botany Rd up to H3 (Unsafe for all vehicles, children and the elderly) during the 5% and 1% AEP storm events assessed.

Central building is not affected by flood waters during 5% and 1% AEP events, so no flood hazard expected around the precinct.

H4 hazard category areas are expected during the PMF event west of the Central building. For this flood event only, floodwaters are expected to reach the building podium level although presenting up to H2 hazard levels, which is still below the threshold for more severe impacts.



Waterloo Metro Quarter OSD Flood Study

Figure: 4.11
Title: Flood Depth
Proposed Scenario - 5% AEP

Version: 01
Prepared: CF, Approved: MZ



Legend

- Proposed Building
- Flood Level (0.25m interval)

Flood Depth (m)

- ≤ 0.10
- 0.10 - 0.30
- 0.30 - 0.50
- 0.50 - 0.70
- 0.70 - 1
- > 1



0 40 80 m

Scale: 1:2,500

Date: 22/08/2025

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Waterloo Metro Quarter OSD Flood Study

Figure: 4.12
Title: Flood Depth
Proposed Scenario - 1% AEP

Version: 01
Prepared: CF, Approved: MZ



Legend

- Proposed Building
- Flood Level (0.25m interval)

Flood Depth (m)

- ≤ 0.10
- 0.10 - 0.30
- 0.30 - 0.50
- 0.50 - 0.70
- 0.70 - 1
- > 1



0 40 80 m

Scale: 1:2,500

Date: 22/08/2025

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Waterloo Metro Quarter OSD Flood Study

Figure: 4.13
Title: Flood Depth
Proposed Scenario - PMF

Version: 01
Prepared: CF, Approved: MZ

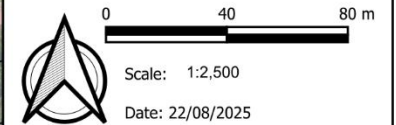


Legend

- Proposed Building
- Flood Level (0.25m interval)

Flood Depth (m)

- ≤ 0.10
- 0.10 - 0.30
- 0.30 - 0.50
- 0.50 - 0.70
- 0.70 - 1
- > 1



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Waterloo Metro Quarter OSD Flood Study

Figure: 4.14
Title: Flood Velocity
Proposed Scenario - 5% AEP


Version: 01
Prepared: CF, Approved: MZ



Legend

 Proposed Building

Flow velocity (m/s)

-  ≤ 0.25
-  0.25 - 0.5
-  0.5 - 0.75
-  0.75 - 1
-  1 - 1.5
-  1.5 - 2
-  2 - 2.5
-  2.5 - 3
-  > 3



0 40 80 m

Scale: 1:2,500

Date: 22/08/2025

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Waterloo Metro Quarter OSD Flood Study

Figure: 4.15
Title: Flood Velocity
Proposed Scenario - 1% AEP

Version: 01
Prepared: CF, Approved: MZ



Legend

Proposed Building

Flow velocity (m/s)

- <= 0.25
- 0.25 - 0.5
- 0.5 - 0.75
- 0.75 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- > 3



0 40 80 m

Scale: 1:2,500

Date: 22/08/2025

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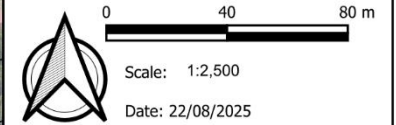
Waterloo Metro Quarter OSD Flood Study

Figure: 4.16
Title: Flood Velocity
Proposed Scenario - PMF

Version: 01
Prepared: CF, Approved: MZ



- Legend**
- Proposed Building
 - Flow velocity (m/s)
 - <= 0.25
 - 0.25 - 0.5
 - 0.5 - 0.75
 - 0.75 - 1
 - 1 - 1.5
 - 1.5 - 2
 - 2 - 2.5
 - 2.5 - 3
 - > 3



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Waterloo Metro Quarter OSD Flood Study

Figure: 4.17
Title: Flood Hazard
Proposed Scenario - 5% AEP

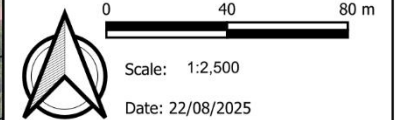
Version: 01
Prepared: CF, Approved: MZ



Legend

- Proposed Building
- Flood Hazard Category
 - H1
 - H2
 - H3
 - H4
 - H5
 - H6

Hazard Classification	Description
H1	Relatively benign flow conditions.
H2	Unsafe for small vehicles.
H3	Unsafe for all vehicles, children and the elderly.
H4	Unsafe for all people and vehicles.
H5	Unsafe for all people and all vehicles. Buildings require special engineering design and construction
H6	Unconditionally dangerous. Not suitable for any type of development or evacuation access. All building types considered vulnerable to failure.



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**Waterloo Metro Quarter OSD
Flood Study**

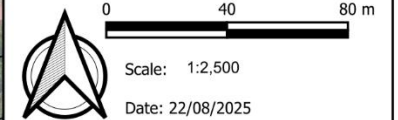
Figure: 4.18
Title: Flood Hazard
Proposed Scenario - 1% AEP

Version: 01
Prepared: CF, Approved: MZ

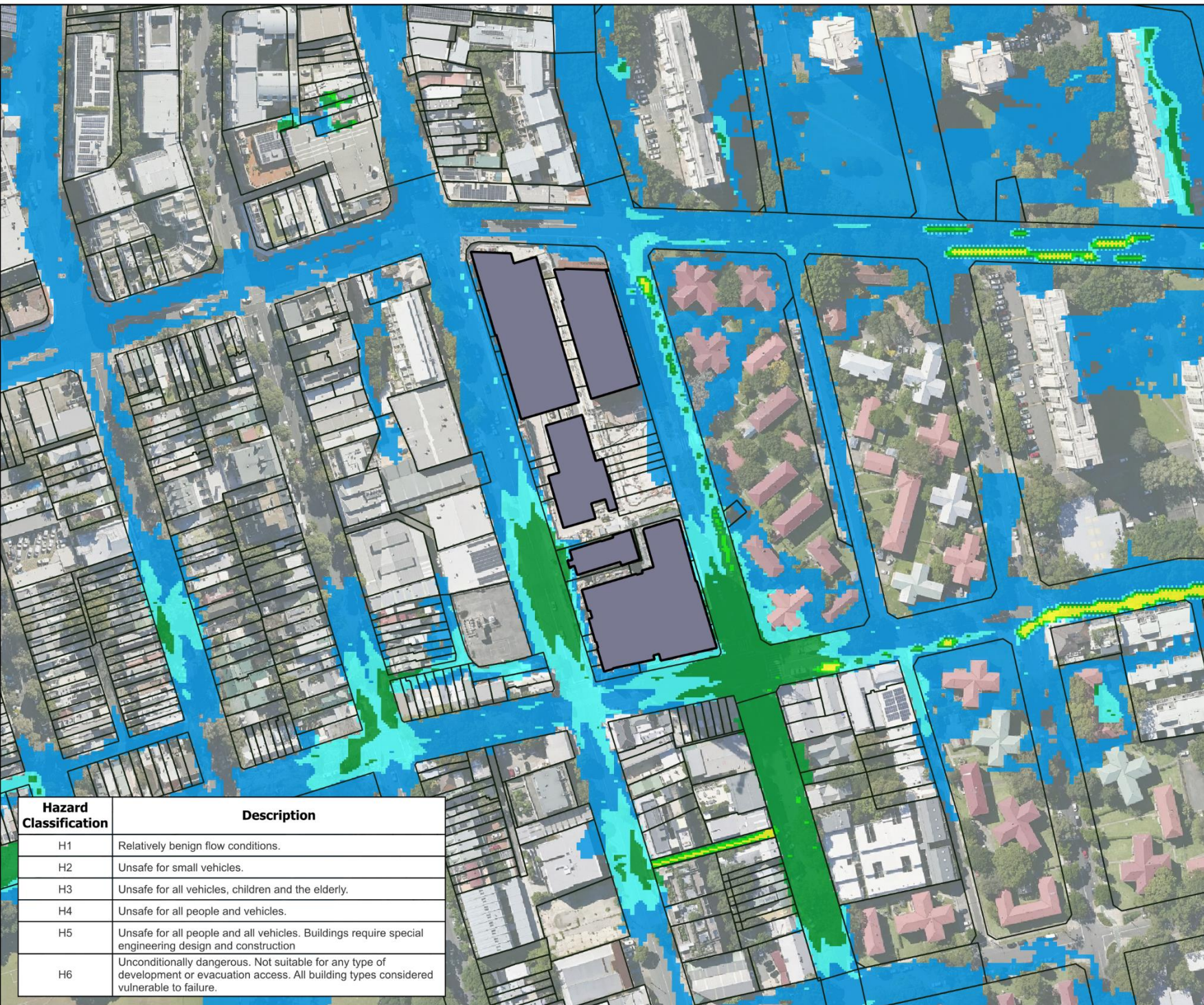


Legend

-  Proposed Building
- Flood Hazard Category**
-  H1
-  H2
-  H3
-  H4
-  H5
-  H6



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Hazard Classification	Description
H1	Relatively benign flow conditions.
H2	Unsafe for small vehicles.
H3	Unsafe for all vehicles, children and the elderly.
H4	Unsafe for all people and vehicles.
H5	Unsafe for all people and all vehicles. Buildings require special engineering design and construction
H6	Unconditionally dangerous. Not suitable for any type of development or evacuation access. All building types considered vulnerable to failure.



Waterloo Metro Quarter OSD Flood Study

Figure: 4.19
Title: Flood Hazard
Proposed Scenario - PMF

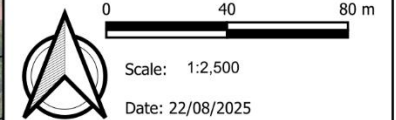
Version: 01
Prepared: CF, Approved: MZ



Legend

- Proposed Building
- Flood Hazard Category
 - H1
 - H2
 - H3
 - H4
 - H5
 - H6

Hazard Classification	Description
H1	Relatively benign flow conditions.
H2	Unsafe for small vehicles.
H3	Unsafe for all vehicles, children and the elderly.
H4	Unsafe for all people and vehicles.
H5	Unsafe for all people and all vehicles. Buildings require special engineering design and construction
H6	Unconditionally dangerous. Not suitable for any type of development or evacuation access. All building types considered vulnerable to failure.



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4.3.4 *Climate change analysis*

A climate change sensitivity analysis has been undertaken for the 1% AEP to assess the possible effects of climate change to the flood conditions for the proposed development.

The assessment approach was discussed and confirmed in a meeting on 18 June 2025 with the City of Sydney Council.

For the climate changes sensitivity analysis CoS flood engineer suggest to:

- Consider an increase in rainfall intensity of 10%.
- Adopt sea level rise of 90 cm by 2100 as per the NSW Government Coastal Planning Guideline (NSW, 2023) was also considered.

Climate change results are included in Figure 4-20 to Figure 4-22.

4.3.4.1 Flood depth and flood level

Increases in flood depth at streets locations around the site are up to 50 mm across Botany Road, however the increase due to climate change does not affect the Central building as seen in 1% AEP event. FFLs for Central Precinct are still above the 1% AEP + climate change.

4.3.4.2 Flood hazard

There are not variations in flood hazard patterns due to climate change.



Waterloo Metro Quarter OSD Flood Study

Figure: 4.20
Title: Flood Depth
Proposed Scenario - 1% AEP + 10% CC

Version: 01
Prepared: CF, Approved: MZ

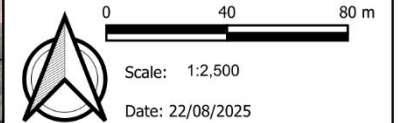


Legend

- Proposed Building
- Flood Level (0.25m interval)

Flood Depth (m)

- ≤ 0.10
- 0.10 - 0.30
- 0.30 - 0.50
- 0.50 - 0.70
- 0.70 - 1
- > 1



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Waterloo Metro Quarter OSD Flood Study

Figure: 4.21
Title: Flood Velocity
Proposed Scenario - 1% AEP + 10% CC

Version: 01
Prepared: CF, Approved: MZ



Legend

Proposed Building

Flow velocity (m/s)

- <= 0.25
- 0.25 - 0.5
- 0.5 - 0.75
- 0.75 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- > 3



0 40 80 m

Scale: 1:2,500

Date: 22/08/2025

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Figure: 4.22
Title: Flood Hazard
Proposed Scenario - 1% AEP + 10% CC

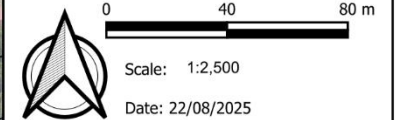
Version: 01
Prepared: CF, Approved: MZ



Legend

- Proposed Building
- Flood Hazard Category**
- H1
- H2
- H3
- H4
- H5
- H6

Hazard Classification	Description
H1	Relatively benign flow conditions.
H2	Unsafe for small vehicles.
H3	Unsafe for all vehicles, children and the elderly.
H4	Unsafe for all people and vehicles.
H5	Unsafe for all people and all vehicles. Buildings require special engineering design and construction
H6	Unconditionally dangerous. Not suitable for any type of development or evacuation access. All building types considered vulnerable to failure.



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5 Flood Planning Level

5.1 Finished Floor Level

Minimum building floor levels have been defined based on flood model results and in accordance with project requirements indicated in Section 0.

Figure 5-1 shows the Central Precinct ground floor layout and internal subareas according to Table 3-3, which were considered to inform the corresponding FPLs.

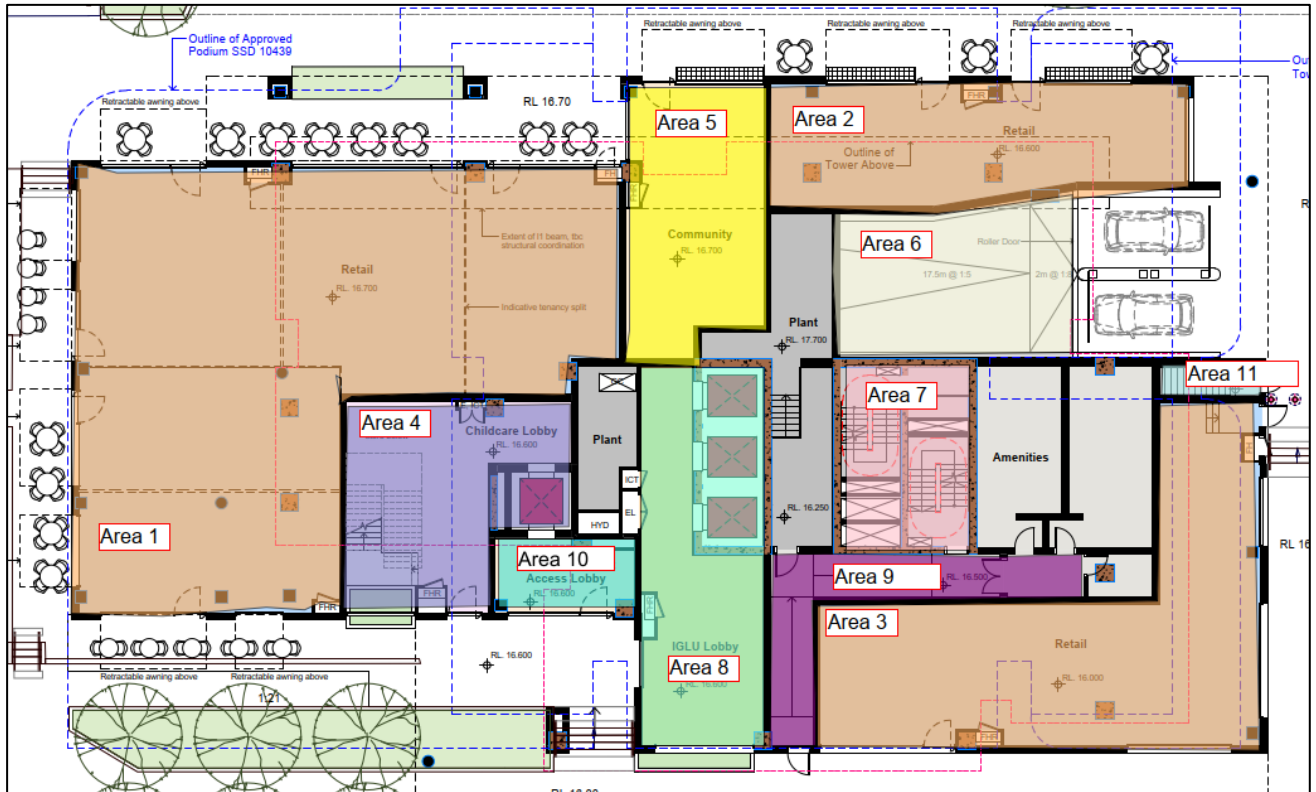


Figure 5-1: Central Precinct – ground level floor subareas

The results of the hydraulic model produced for the proposed development scenario have been used to inform the building floor levels for the Central Precinct. Table 5-1 shows the proposed development’s required FPLs.

Table 5-1: The FPL required for the Central Precinct development

Area	Classification	FPL requirements (refer to Table 3-3)	Flood level as per hydraulic model results (m AHD)	Proposed minimum FFL (m AHD)	Compliance
1	Retail	1% AEP flood.	PMF: 16.442 1%+500mm: 16.120 1%AEP: 15.620 (project requirement)	16.700	YES
2	Retail	1% AEP flood.	PMF: 16.511 1%+500mm: 16.217 1%: 15.717 (project requirement)	16.600	YES
3	Retail	1% AEP flood.	PMF: 16.445 1%+500mm: 16.062 1%: 15.562 (project requirement)	16.000 (An evacuation exit is provided for flood protection against PMF flood level)	YES

Area	Classification	FPL requirements (refer to Table 3-3)	Flood level as per hydraulic model results (m AHD)	Proposed minimum FFL (m AHD)	Compliance
4	Childcare Lobby	<i>1% AEP flood level + 0.5 m or the PMF</i>	PMF: 16.442 (project requirement) 1%+500mm: 16.106 1%: 15.606	16.600	YES
5	Community	<i>1% AEP flood.</i>	PMF: 16.533 1%+500mm: 16.220 1%: 15.720 (project requirement)	16.700	YES
6	Basement entry ramp	<i>1% AEP flood level + 0.5 m or the PMF</i>	PMF: 16.511 (project requirement) 1%+500mm: 16.212 1%: 15.712	16.600	YES
7	Access to underground car park (fire stair)	<i>1% AEP flood level + 0.5 m or the PMF.</i>	PMF: 16.444 (project requirement) 1%+500mm: 16.063 1%: 15.563	16.500	YES
8	IGLU lobby	<i>1% AEP flood level + 0.5 m or the PMF</i>	PMF: 16.444 (project requirement) 1%+500mm: 16.063 1%: 15.563	16.600	YES
9	Entrance to amenities, plants and fire stairs	<i>1% AEP flood level + 0.5 m or the PMF</i>	PMF: 16.444 (project requirement) 1%+500mm: 16.063 1%: 15.563	16.500	YES
10	Shared Basement lobby	<i>1% AEP flood level + 0.5 m or the PMF</i>	PMF: 16.443 (project requirement) 1%+500mm: 16.063 1%: 15.563	16.600	YES
11	Egress stair to L02	<i>1% AEP flood.</i>	PMF: 16.445 1%+500mm: 16.051 1%: 15.551 (project requirement)	Stairs providing access to upper levels.	
(*) area not subject to flooding up to and including the 1% AEP flood event. Nearest 1% AEP has been taken to inform Flood Planning Levels at that area.					

As indicated in Figure 5-1, access to the basement is provided through the following areas:

- Area 4 – lift access;
- Area 6 – basement entry ramp access;
- Area 7 – stair access;
- Area 8 – lift access;
- Area 9 – stairs access;
- Area 10 – lift access via Shared Basement Lobby.

These zones have adopted considerations in the design and FPLs that provide protection for the 1% AEP flood level + 0.5 m or the PMF (whichever is higher).

Table 5-1 does not include upper floors as will not be affected by flooding (i.e., level 01 of the Central building is at 21.7 m AHD which is approximately 5 m higher than the PMF flood level).

6 Flood impact

The potential changes in flood conditions caused by the Central Building must be considered in conjunction with the broader WMQ area. The WMQ development includes changes to surface elevations along footpaths and street levels.

Although this is a new development application, the model results showed impacts that are associated to the entire WMQ area and not to the inclusion of the current proposed development. These impacts associated to the WMQ area were discussed and approved in previous SSD applications, for which planning consent has been granted. These are documented in the following applications and planning notification letters:

- Northern Building: Application SSD-10440 (planning consent granted)
- Central Building: Application SSD-10439 (planning consent granted)
- Southern Building: Application SSD-10437 (planning consent granted)
- Basement Car Park: Application SSD-10438 (planning consent granted)

WMQ flood impacts are limited to Cope and Raglan Streets (see Figure 6-1 to Figure 6-6) with no expected impacts in front of Central Building along Botany Road. The impacts on Cope and Raglan Streets are caused by changes in surface level around Raglan and Cope Street that are not associated with the Central building. These changes have been already approved in the previous SSD application for WMQ area.

It is noted that areas along Cope Street and the extent of Raglan Street outside the Northern Precinct are under construction.

This application relates solely to the Central Precinct (SSD-79307746) and includes a revised layout for the precinct, along with minor adjustments to the footpaths along Botany Road and Raglan Street.

6.1 Change in flood mechanisms

Central Building does not alter existing flood mechanisms.

Model results indicate that surface water runoff is largely confined and conveyed along Botany Road and Cope Street, flowing from north to south towards Wellington Street and eventually in direction to Alexandra Canal as per pre-development conditions.

6.2 Change in flood level

Model results for the 5% AEP, 1% AEP, and PMF flood events indicate localised changes in flood levels (+-10 to +-30 mm) along Botany Road near the Central Building. These changes are negligible and attributed to model noise.

Changes in flood levels observed in Cope Street and Raglan Street are not caused by the Central Building. Instead, they result from modifications to the street surface and footpath at the intersection of Raglan and Cope Streets, intersection of Cope and Wellington Streets, as well as along Cope Street. These changes were previously assessed and approved as part of the SSD applications for the WMQ area.

Figure 6-1 to Figure 6-3 show the change in flood level around the site area for the 5% AEP, 1% AEP and PMF events.

6.3 Change in flood hazard

There are no adverse changes in flood hazard caused by the central building.

Figure 6-4 to Figure 6-6 show the change in flood hazard to the site area for the 5% AEP, 1% AEP and PMF events. As discussed above changes in flood hazard in Cope Street are caused by changes in surface level along Cope and Raglan Street.



Waterloo Metro Quarter OSD Flood Study

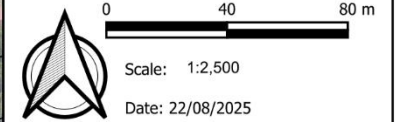
Figure: 6.1
Title: Change in Flood Level
Proposed Scenario - 5% AEP

Version: 01
Prepared: CF, Approved: MZ



Legend

- Proposed Building
- Change Flood Level (m)
 - 0.05 and less
 - 0.05 to -0.025
 - 0.025 to -0.01
 - No change (-0.01 to 0.01)
 - 0.01 to 0.025
 - 0.025 to 0.05
 - 0.05 to 0.075
 - 0.075 to 0.100
 - 0.100 to 0.125
 - 0.125 and more
 - Was wet now dry
 - Was dry now wet



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Waterloo Metro Quarter OSD Flood Study

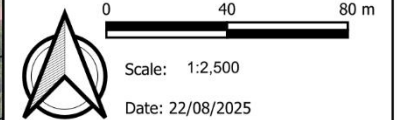
Figure: 6.2
Title: Change in Flood Level
Proposed Scenario - 1% AEP

Version: 01
Prepared: CF, Approved: MZ



Legend

- Proposed Building
- Change Flood Level (m)
 - 0.05 and less
 - 0.05 to -0.025
 - 0.025 to -0.01
 - No change (-0.01 to 0.01)
 - 0.01 to 0.025
 - 0.025 to 0.05
 - 0.05 to 0.075
 - 0.075 to 0.100
 - 0.100 to 0.125
 - 0.125 and more
 - Was wet now dry
 - Was dry now wet



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Waterloo Metro Quarter OSD Flood Study

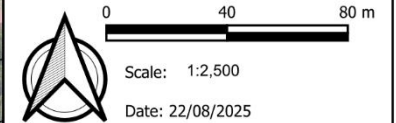
Figure: 6.3
Title: Change in Flood Level
Proposed Scenario - PMF

Version: 01
Prepared: CF, Approved: MZ



Legend

- Proposed Building
- Change Flood Level (m)
 - 0.05 and less
 - 0.05 to -0.025
 - 0.025 to -0.01
 - No change (-0.01 to 0.01)
 - 0.01 to 0.025
 - 0.025 to 0.05
 - 0.05 to 0.075
 - 0.075 to 0.100
 - 0.100 to 0.125
 - 0.125 and more
 - Was wet now dry
 - Was dry now wet



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Figure: 6.4
Title: Change in Flood Hazard
Proposed Scenario - 5% AEP

Version: 01
Prepared: CF, Approved: MZ



Legend

- Proposed Building
- Change in Flood Hazard**
- Increase 2 categories
- Increase 1 category
- No change
- Decrease 1 category
- Decrease 2 categories



0 40 80 m

Scale: 1:2,500

Date: 27/08/2025

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Figure: 6.5
Title: Change in Flood Hazard
Proposed Scenario - 1% AEP

Version: 01
Prepared: CF, Approved: MZ



Legend

- Proposed Building
- Change in Flood Hazard**
- Increase 2 categories
- Increase 1 category
- No change
- Decrease 1 category
- Decrease 2 categories



0 40 80 m

Scale: 1:2,500

Date: 27/08/2025

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Waterloo Metro Quarter OSD Flood Study

Figure: 6.6
Title: Change in Flood Hazard
Proposed Scenario - PMF

Version: 01
Prepared: CF, Approved: MZ



Legend

- Proposed Building
- Change in Flood Hazard**
- Increase 2 categories
- Increase 1 category
- No change
- Decrease 1 category
- Decrease 2 categories



0 40 80 m

Scale: 1:2,500

Date: 27/08/2025

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7 Flood emergency response

FFLs have been adopted to be at or above the FPLs. Flood protection in case of an emergency can be achieved by evacuating to areas above the PMF flood level.

Figure 7-1 below shows the areas above the PMF (green area inside the building and yellow area outside the building).

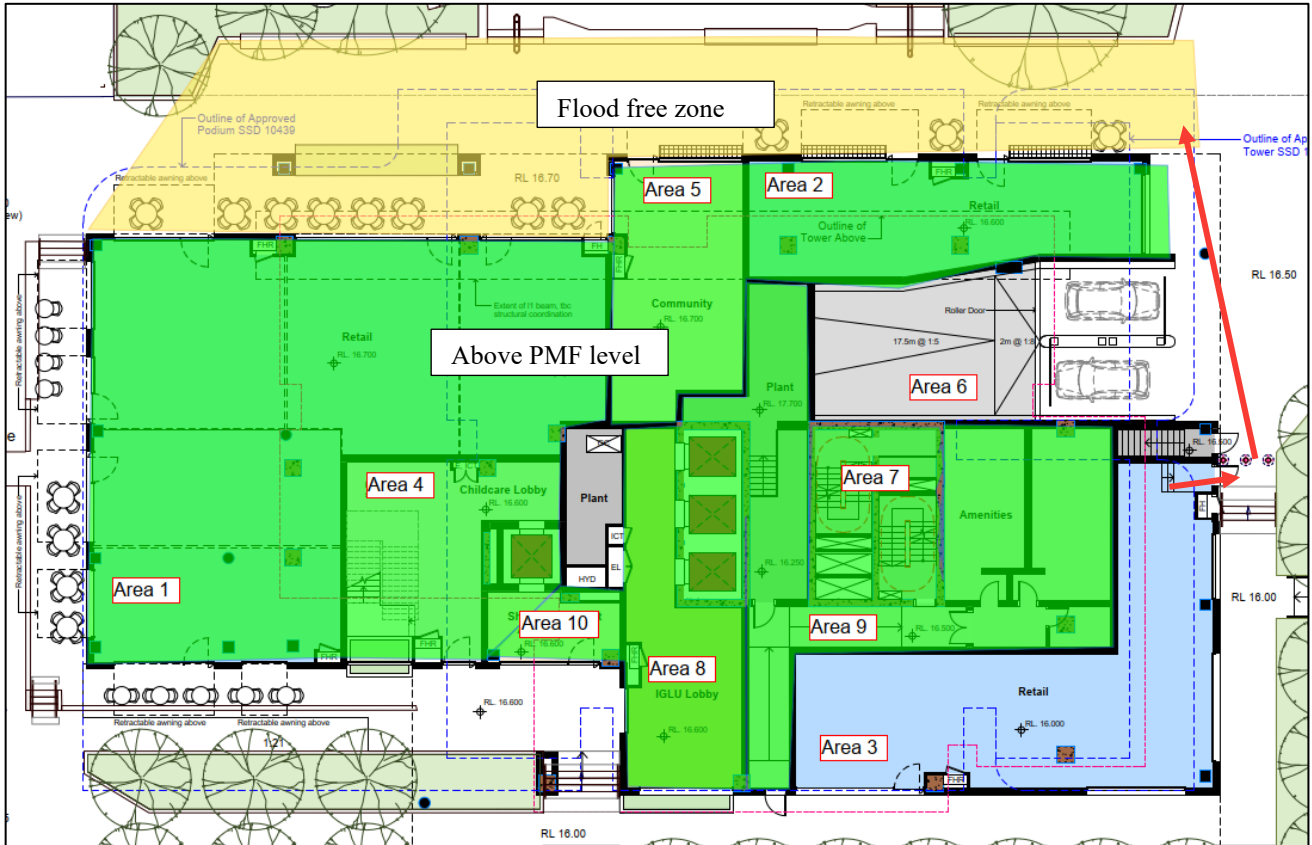


Figure 7-1: Central Building areas above PMF

- Occupants of area 1, 2, 4, 5, 7, 8, 9 and 10 can remain safe as the FFL is above the PMF flood level.
- Occupants of area 3 need to evacuate to areas above the PMF flood level either inside or outside the building.

A flood and emergency and evacuation plan will be provided at a later stage before occupancy of the building. The plan will document how people can be evacuated and remain safe during a flood emergency.

8 Cumulative flood risk

The cumulative impact assessment considers other nearby developments along with the project and assesses the scale and nature of the cumulative impacts on key issues.

This assessment has considered relevant future projects within the Alexandra Canal Catchment that in combination with this project, could result in a material cumulative impact on hydrology and flooding.

Table 8.1 shows relevant projects under assessment and proposed developments to date surrounding the WMQ site for cumulative impact.

Table 8.1: SSD projects near WMQ site

	Related developments to current subject SSD	SSD
1	Northern Precinct	(SSD-79307758)
2	Waterloo Metro Quarter - Second Amending Concept	(SSD-79307765)
3	Southern Precinct (under construction)	(SSD-10437)
	Projects currently subject to environmental assessment	
4	Waterloo Mixed-Use Development – 881–885 Bourke Street	(SSD-80441462)
5	Early Works for Waterloo Mixed-Use Development at 881-885 Bourke Street	(SSD-80911502)
	Projects under assessment	
6	New Health Research Facility at 100-108 Botany Road	(SSD-63067458)

Only two projects (but three SSDs) are external to the current SSD application and have been reviewed to identify potential cumulative impacts to flood risk, Waterloo Mixed Use Development – 881–885 Bourke Street (SSD-80441462) (item 4 in Table 8.1), Early works of Waterloo mixed-use development (SSD-80911502) (item 5 in Table 8.1) and New Health Research Facility at 100-108 Botany Road (SSD-63067458) (item 6 in Table 8.1).

Waterloo Mixed Use Development – 881–885 Bourke Street (SSD-80441462) (item 4 in Table 8.1) and early works of Waterloo mixed-use development (SSD-80911502) (item 5 in Table 8.1) are located within a separate local catchment that drains southward and joins the Alexandra Canal downstream of the WMQ project. As a result, the developments under SSD-80441462 and SSD-80911502 are not considered further.

The New Health Research Facility (SSD-63067458) is located on the western site of Botany Road opposite the WMQ site. The flood impact assessment (SMEC, 2024) for the New Health Research Facility (SSD-63067458) indicates that the development will lead to some increase in flood levels within the project boundary but no impacts beyond the boundary. Mitigation is proposed to manage the impact for within the project boundary. Since the project estimates no impacts to flood behaviour along Botany Road (the common connection between the projects) and the projects proposed a shelter in place strategy for a flood emergency it is not expected to contribute to cumulative flood risks or result a change to the management of a flood emergency as a result of both projects being developed.

Figure 8-1 shows the location of proposed developments to date within the Alexandra Canal Catchment.

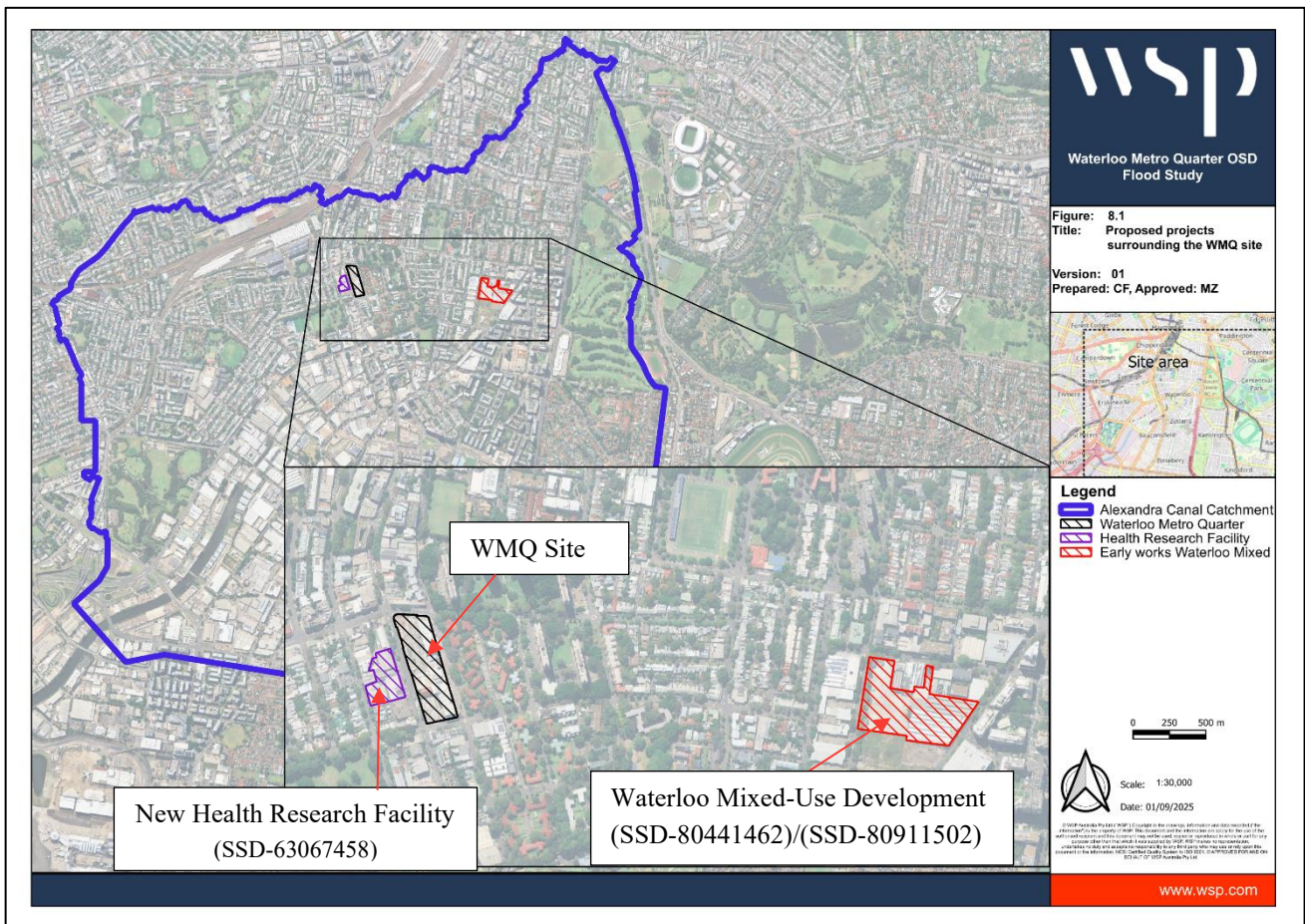


Figure 8-1: Relevant developments nearby WMQ site

9 Conclusion

WSP conducted a flood impact assessment on behalf of WL Developer Pty Ltd to support SSD application for the WMQ at 150 Cope Street, Waterloo.

This report relates to the Central Precinct (SSD-79307746) only.

The assessment has been prepared in accordance with the Planning Secretary's Environmental Assessment Requirements (SEARs) issued by the Department of Planning, Housing and Infrastructure (DPHI) and requirements agreed upon in consultation with the City of Sydney's flood engineer.

Under pre-development conditions, modelling shows that the site experiences overland flow flooding during all storm events, including the PMF. In these scenarios, floodwaters travel south along Botany Road and Cope Street toward Alexandra Canal.

Flood Planning Levels and Finished Floor levels

Finished Floor Levels have been designed to be above the Flood Planning Levels.

Flood impacts

Model results shows that the Central Building will not cause adverse flood impacts to adjacent areas properties.

Flood emergency response

During a flood emergency occupants of the central building can be safe as the Finished Floor Level is above the PMF flood level. Only one retail area (area 3) would require occupants to evacuate to an adjacent area which is above the PMF flood level.

10 References

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