



10 September 2024

Health Infrastructure  
C/- TSA Management  
2/54 Tamar Street  
Ballina, NSW 2478  
Attn: Andrew Neill

Via email: [andrew.neill@tsamgt.com](mailto:andrew.neill@tsamgt.com)

Dear Andrew

Our ref: 24050081\_L01\_V02\_Flood\_Risk\_Assessment

## 24050081 Bathurst Hospital Redevelopment – Flood Risk Assessment

This Flood Risk Assessment has been prepared by Water Technology on behalf of Health Infrastructure for the redevelopment of the Bathurst Hospital at 361-365 Howick Street, Bathurst.

The site is located at 361-365 Howick Street, Bathurst, in the Bathurst Local Government Area. It is occupied by Bathurst Health Service, a Level C referral facility in the Western NSW Local Health District.

This report accompanies a State Significant Development Application that seeks approval for the construction and operation of a new-build expansion, refurbishment and repurposing works to the existing Bathurst Health Service main hospital building. Proposed works will include:

- A new-build, multi-storey health services building expansion toward Mitre St (including 1 plant level) to include overnight inpatient accommodation and non-admitted care services and a new hospital front-of house and entrance
- A new-build, two-storey expansion to the Emergency department and Operating Theatres (plus 1 plant level)
- A new-build, single-storey expansion to the existing Cancer Service building – Daffodil Cottage
- Refurbishment and repurposing to areas of the existing hospital
- Site establishment, demolition of some existing structure, cut and fill and remediation works
- Vehicular circulation and car parking improvements
- Tree removal
- Landscape works
- Alteration and amplification of existing hospital plant and services infrastructure
- For a detailed project description, refer to the Environmental Impact Statement prepared by Ethos Urban.

This letter sets out the potential flood risks at the site and concludes that a full Flood Impact and Risk Assessment for the proposed redevelopment is not required.

This assessment is based on the following data that is available for flooding in Bathurst:

- Maps of the flood planning area from the Bathurst Regional Local Environmental Plan 2014
- Floodplain Levels Issue Form issued for the site by Bathurst Regional Council (29 January 2024) – Attachment 1.



**Table 1 Relevant SEARs requirement**

Item	SEARS Requirement	Relevant Section of Report
15.	Identify any flood risk on-site having regard to adopted flood studies, the potential effects of climate change, and any relevant provisions of the NSW Floodplain Development Manual.	Sections 1 and 3
	Assess the impacts of the development, including any changes to flood risk on-site or off-site, and detail design solutions and operational procedures to mitigate flood risk where required.	Sections 2, 3 and 4
SEARS Cover Letter	Where the development could alter flood behaviour, affect flood risk to the existing community or expose its users and occupants to flood risk, provide a flood impact and risk assessment (FIRA) prepared in accordance with the Flood Impact and Risk Assessment – Flood Risk Management Guide LU01 and the Flood Risk Management Manual 2023. The scope of the FIRA should be confirmed with the Department prior to undertaking the assessment and must have regard to Council and Government studies and guidance.	<p>The proposed redevelopment:</p> <ul style="list-style-type: none"> <li>■ is not identified as being affected by flooding caused by the Macquarie River and would not be inundated by overland flooding. Thus, it would not alter flood behaviour (Section 2).</li> <li>■ would not directly increase flood risk to life for the existing community and would indirectly decrease it (Section 3).</li> <li>■ would not expose its users and occupants to flood risk (Section 3).</li> </ul> <p>Therefore, a full Flood Impact and Risk Assessment is not required.</p>
	Detail design solutions and operational procedures to mitigate flood risk where required. Where relevant, prepare and submit detailed management measures required to minimise the impacts of flooding on the development and minimise flood risk to the community, including an Emergency Management Plan (prepared in consultation with SES). The plan must consider access to and from the site, and evacuation issues during significant flood events (including the PMF) from both local catchments and/or regional catchments.	<p>Section 4</p> <p>The site is not subject to riverine or overland flooding (Section 2), is located outside of the flood planning area (Section 1) and indirectly decreases flood risk to the community (Section 3). Therefore, detailed management measures are not relevant or required.</p>

## 1 FLOOD BEHAVIOUR

Bathurst Hospital is located 400 m south-west of the Macquarie River, which flows north-westwards around Bathurst's northern margin.

The Bathurst Regional Local Environmental Plan (LEP) 2014 maps the site as outside of the flood planning area (Figure 1). Section 9.6.3 of the Bathurst Regional Development Control Plan (DCP) 2014 defines the flood planning area based on the designated flood:

*1% AEP flood level plus a free board of 0.5 metres as determined by the Bathurst Computer Based Flood Model, as amended, for the Macquarie River and the Queen Charlotte's Vale Creek.*

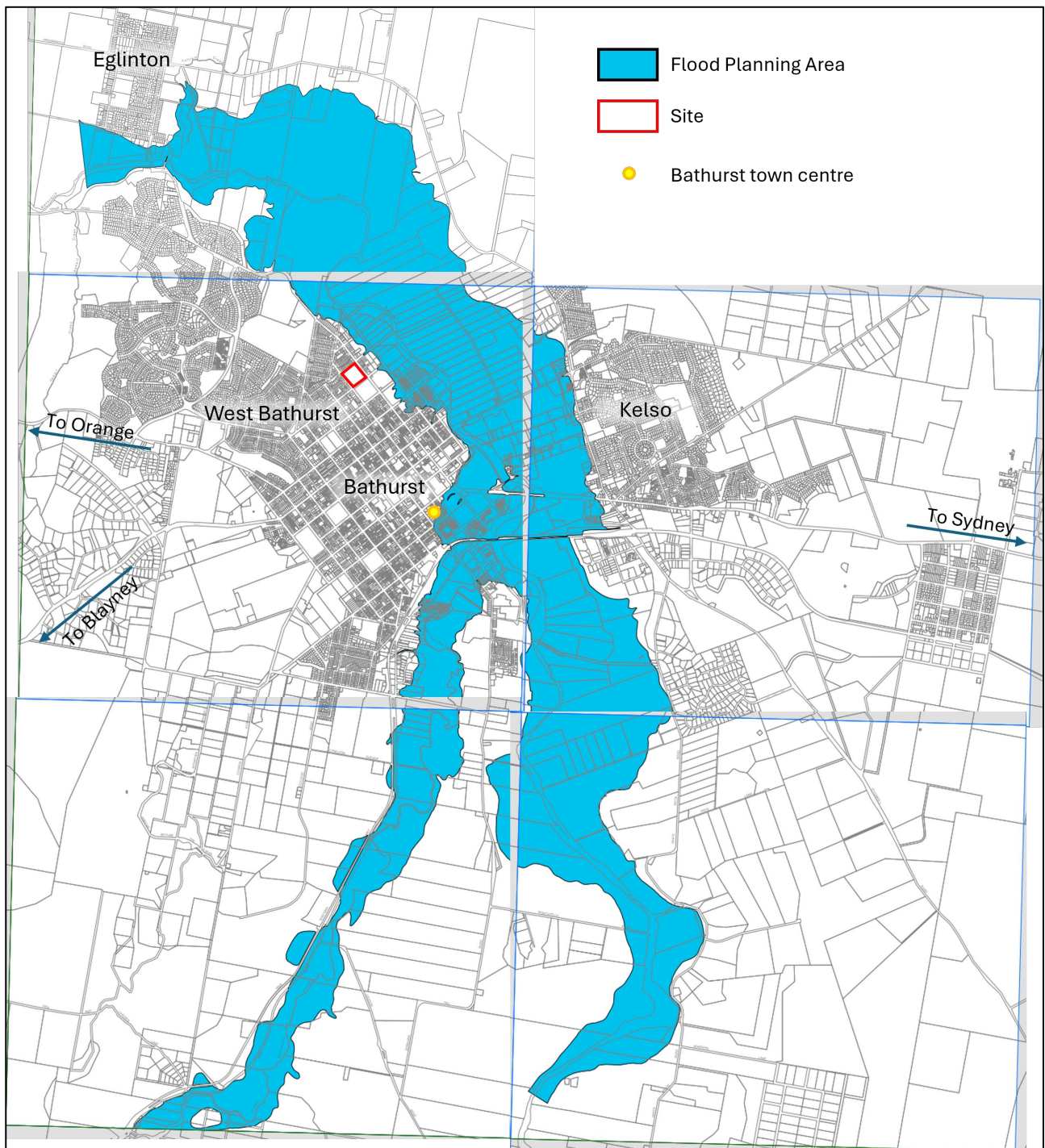


Figure 1 Flood planning area



Therefore, the flood planning area represents the extent of the 1% Annual Exceedance Probability (AEP) flood plus 0.5 m freeboard. It can be concluded that the hospital site is more than 0.5 m above the 1% AEP flood level, which has a 1% probability of occurring in any given year.

The Floodplain Levels Issue Form issued for the site by Bathurst Regional Council on 29 January 2024 (Attachment 1) indicates that the Probable Maximum Flood (PMF) level applicable to the site for flooding of the Macquarie River is 655.50 m AHD. The PMF is the largest flood that can occur. Ground levels on site vary between 657.80 m AHD and 681.25 m AHD. Therefore, the hospital site is at least 2.3 m above the PMF level and above the largest possible riverine floods.

Figure 2 shows the extent of the riverine PMF based on the PMF level issued by Council. The PMF level in the figure is the 655.50 m AHD topographic contour based on a 1m resolution digital elevation model (NSW Spatial Services, 2011). This will most accurately represent the PMF extent in proximity to the site. Upstream of the site (in the south-eastern corner of the map, near Bathurst town centre) the PMF contour will slightly underestimate the extent of the PMF, while downstream of the site (the northernmost portion of the map) will overestimate the extent.

Figure 2 indicates that the site is not subject to riverine flooding and the 4 roads surrounding the site (Howick Street, Mitre Street, Durham Street and Commonwealth Street) are not inundated adjacent to the site.

As the site is not within the flood planning area and has not been identified by Council as having the possibility of flooding it is not subject to the flood-related development controls in Section 5.21 of the LEP or Section 9.6 of the DCP. It is noted that Council's adopted flood model does not include overland flooding and overland flooding is not identified as a concern for urban areas in Bathurst in Council's Floodplain Management Policy 2008. Further, a high level assessment of the local topography indicates that the site is located on a ridge (Figure 2). Overland flows could potentially impact neighbouring properties but won't directly affect the hospital site. These flows may isolate the site for short periods of time, but as they would not directly impact the site the hospital would not be subject to flood-related development controls. Overland flood modelling for the site therefore is not required.

The site is not isolated by riverine flooding in events up to and including the PMF (Figure 2) and would be accessible from most of the city west of the Macquarie River, although in large events access to the hospital from the suburbs east of the river (Eglington, Laffing Waters and Kelso) and from Sydney via the A32 Great Western Highway would be cut by floodwaters.

The regional roads from Bathurst towards Orange (via the A32 Mitchell Highway) and towards Blayney (via the A41 Mid Western Highway) are not mapped by Council as subject to flooding (LEP 2014), although it is possible that they could be subject to creek flooding which would likely have a duration of a few hours.

## 2 IMPACT OF THE REDEVELOPMENT ON FLOODING

The proposed redevelopment is not identified as being affected by flooding caused by the Macquarie River and would not be inundated by overland flooding.

## 3 FLOOD RISK ASSESSMENT

Although the proposed redevelopment would increase the capacity of the hospital, it would not place more people or property in the floodplain as the site is not subject to flooding and is not in the floodplain. Therefore, it does not directly increase flood risk to life or to property.

The proposed development would indirectly decrease flood risk to life by increasing the capacity of medical facilities that can cater to the Bathurst population during a flood.



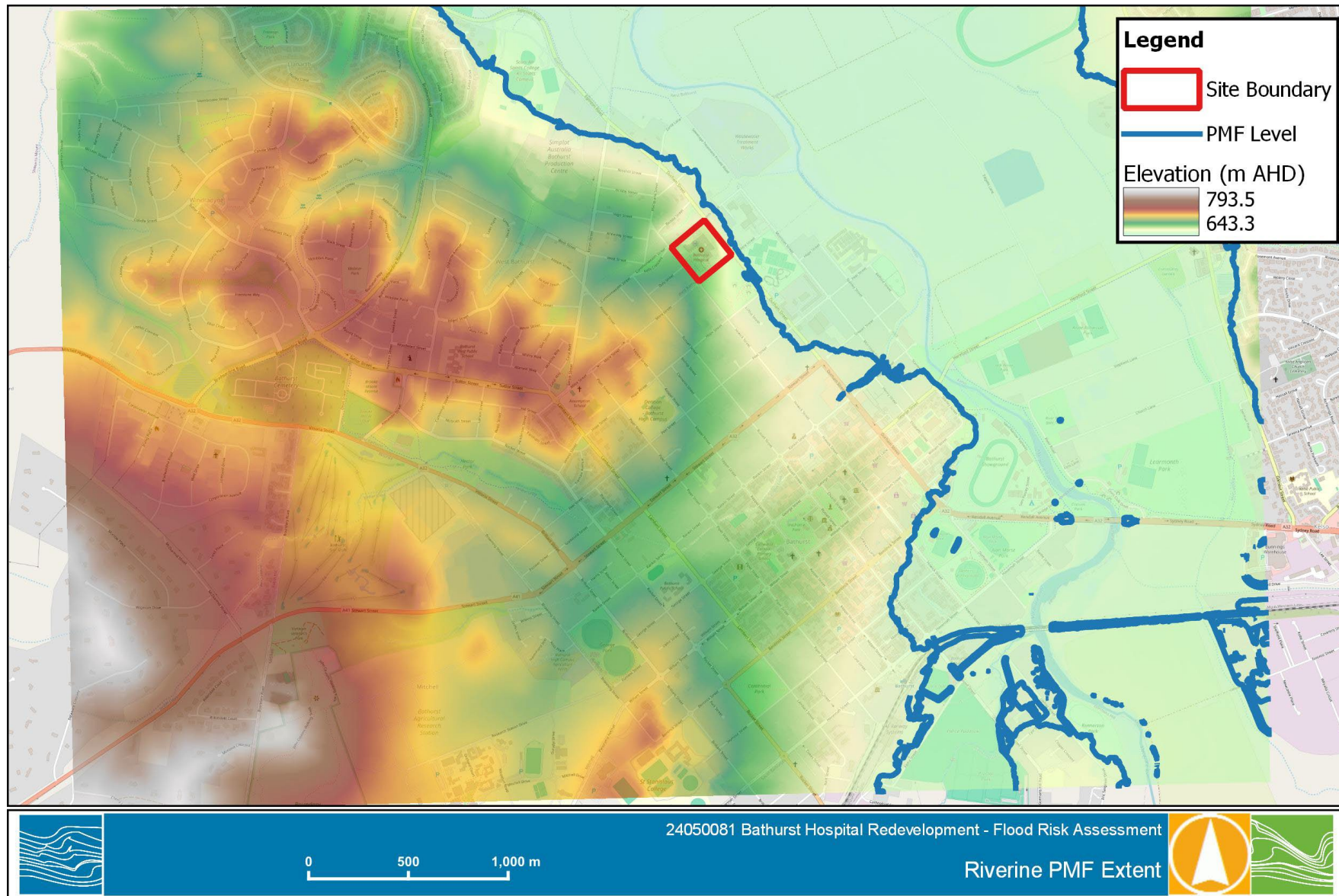


Figure 2 Riverine PMF extent



During a flood, essential services, such as power, water or wastewater services, to the site may be cut due to floodwaters. However, this would be the case in both existing and post-development conditions and the probability of this occurring would not be impacted by the proposed development. Therefore, the development does not increase flood risk to life by increasing the probability of disruption of essential services. The proposed development would increase the number of people who could be on site if services are cut during a flood, but in existing conditions these people would be located elsewhere in Bathurst likely facing the same disruption of services, but without medical staff on hand.

It should be noted that during a large riverine flood occupants of the suburbs east of the Macquarie River would not be able to access the hospital, including both potential patients and staff. This would be the case in both existing and post-development conditions and does not represent an increased flood risk to life.

Therefore, the proposed redevelopment would not increase flood risk to life or to property in post-development conditions relative to existing conditions. In fact, it would indirectly decrease flood risk to life.

## 4 POTENTIAL FLOOD RISK MITIGATION MEASURES

In light of the discussion of flood risk in Section 3 of this letter, the following measures will be incorporated into the proposed redevelopment to address the risk of disruption to hospital services during a flood (also see Attachment 2):

- Upgrade the existing back-up power supply and on-site water retention
- Update the Business Continuity Plan to account for the increased staffing demand as a result of the redevelopment.

The above measures are intended to address the risk of disruption to services at the site, which already exists. They are not required to address the flood risk resulting from the proposed redevelopment, which is negligible.

## 5 CONCLUSION

In summary, the site of the existing hospital is not impacted or isolated by riverine flooding. Therefore, the proposed redevelopment of the hospital would not impact riverine flood behaviour or increase the riverine flood risk to life or to property at the site or in the wider Bathurst area. Rather, it would indirectly decrease flood risk to life by increasing the capacity of medical facilities that would serve the Bathurst community during a flood.

Yours sincerely

Filippo Dall'Osso  
Natural Hazards Group Manager  
filippo.dallosso@watertech.com.au  
**WATER TECHNOLOGY PTY LTD**

Water Technology pays respect to all First Nations peoples, their cultures and to their Elders, past and present.



## Attachment 1 – Floodplain Levels Issue Form



29 January 2024

Ms Rhiannon Garrett  
Water Technology Pty Ltd  
Suite 3, Level 1/20 Wentworth St  
PARRAMATTA NSW 2150

Email: [rhiannon.garrett@watertech.com.au](mailto:rhiannon.garrett@watertech.com.au)

Dear Ms Garrett

**Floodplain Levels Issue Form 2023/10, Property: 361-365 Howick Street, West Bathurst, Lot 100, DP 1126063**

Reference is made to your application for flood levels for the subject property. **Enclosed** is completed Floodplain Levels Issue Form.

The Probable Maximum Flood (PMF) has been provided upon request. The PMF represents the probable maximum flooding occurring in any one year, and the levels issued hereunder represent the estimated PMF.

It is the responsibility of the applicant to obtain the services of a Registered Surveyor in order to determine the site levels and whether, in fact, the site is within the designated Flood Area.

A Surveyor's Certificate, verifying site levels, is to be lodged with Council with any Development Application.

Note that this FLC is based upon flooding of the Macquarie River only. It is the responsibility of the applicant to assess the hydrology and hydraulics of the subject property and dispose of all stormwater runoff which passes over or through the subject property, in accordance with Council's Engineering Guidelines.

Yours faithfully

Darren Sturgiss  
**DIRECTOR  
ENGINEERING SERVICES**



**BATHURST REGIONAL COUNCIL****FLOODPLAIN LEVELS ISSUE FORM****(THIS FORM DOES NOT CONSTITUTE APPROVAL FOR BUILDING)**

The Probable Maximum Flood (PMF) is estimated using ground level information and hydrologic records for the Macquarie River Floodplain.

The Computer Modelling technique used produces a three (3) dimensional picture of the estimated PMF across the Bathurst Floodplain. Flood and Rainfall Records are continually updated to include new Events and, accordingly, the PMF is regularly estimated using these updated records. Because of this, the Designated Flood Levels are varied from time to time based on the additional information.

The flood level issued on this form is based on data collected up to and including the 1998 flood event.

The PMF represents the probable maximum flooding occurring in any one (1) year, and the levels issued hereunder represent the estimated 1PMF based on the hydraulic and hydrologic records current on the date of this Form.

This Form states the Designated Flood Level, based on the Macquarie River floodplain model, in the immediate vicinity of the subject site of the Application. It is the responsibility of the Applicant to obtain the services of a Registered Surveyor in order to determine the site levels and whether, in fact, the site is within the Designated Flood Area.

The Flood Prone Area is that area affected by inundation by the Designated Flood. Any works proposed to be undertaken within the Flood Prone Area requires the lodging of a Development Application. Approval is at Council's discretion.

A Surveyor's Certificate, verifying site levels, is to be lodged with the Council prior to or with any Development Application.

**APPLICANT'S CONTACT DETAIL:**

**Rhiannon Garrett  
Water Technology Pty Ltd  
Suite 3, Level 1/20 Wentworth St  
Parramatta NSW 2150**

**SUBJECT SITE:**

**361-365 Howick Street  
Lot 100 DP 1126063  
West Bathurst NSW 2795**

**SOURCE OF REQUEST**

**External Application**

**DATE OF APPLICATION:**

**22 January 2024**

**DESIGNATED FLOOD LEVEL (AHD):**

**655.50 AHD**

**SPECIFIED ADOPTED FLOOD:**

**Macquarie River Floodplain Model 2007**

Flood Levels Issued By: Xian J Checked By: [Signature]

Approved by Director Engineering Services: [Signature] Date: 29/1/24

**FLOOD LEVELS ARE VALID FOR ONE YEAR FROM THE DATE OF ISSUE**



## Attachment 2 – Suggested Mitigation Measures



**Table 2** Mitigation measures to address the risk of disruption of services during a flood

Project Stage Design (D) Construction (C) Operation (O)	Mitigation Measures	Relevant Section of Report
D	Upgrade of the existing back-up power supply and on-site water retention	Section 4
O	Update the Business Continuity Plan to account for the increased staffing demand as a result of the redevelopment	Section 4