Our Ref: 13-23 Patty's Place Jamisontown- Flood Letter

Date: 31/01/25

Calardu Penrith Pty Ltd
C/- Andrea Brown (andrea.brown@tregantle.com)

Attention: Andrea Brown

Subject: 13-23 Patty's Place Jamisontown-Penrith Homemaker Centre Flood Impact and Risk Assessment and Stormwater Management

Dear Andrea,

This letter provides details and results of a Flood Impact and Risk Assessment (FIRA) undertaken in support of the recent proposal for a building extension for the Penrith Homemaker Centre at 13-23 Patty's Place Jamisontown. The stormwater management measures needed to be implemented to support the development are also identified and outlined.

The letter provides an overview of the key flood planning and related engineering controls that apply to the development and outlines how these controls will be satisfied through appropriate civil engineering design where necessary. The assessment provides hydraulic calculations that were developed to evaluate the proposed building extension's potential impacts on flood levels in the adjacent floodplain and also assesses how the flood risks at this location may affect the proposed development. The existing and developed flooding conditions were assessed and compared for a range of flood events. The assessment also considers the flood evacuation implications of the development proposal.

SITE DESCRIPTION

The site is located at 13-23 Patty's Place Jaminsontown (Lot 10 in DP1046110) which is currently zoned as E3: Productivity Support in Penrith Local Environmental Plan 2010. The site is bounded by the existing Penrith Homemaker buildings to the east and south, and vacant lots to the north and west. An existing watercourse, which has been embellished with a man-made dam, is located within the Northern portion of Lot 10 on the site's western boundary. The watercourse traverses in a southwesterly direction into Lot 11 in DP 1046110 which is adjacent to the portion of Lot 10 that is proposed for the Homemaker Centre extension. Refer to Plate 1 for the site context.

Plate 1 – Site Locality

PROPOSED DEVELOPMENT

The proposed development incorporates a building extension at the western end of the Penrith Homemaker Centre site (Refer to Plate 2).

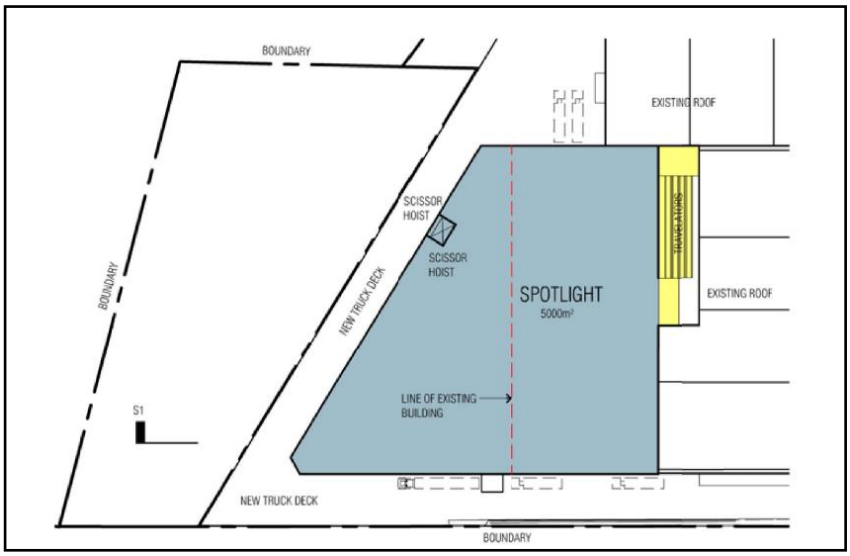


Plate 2 – Indicative Proposed Development Plan

The western end of the Homemaker extension is proposed as an elevated deck that will be suspended over an existing above-ground On-Site Detention (OSD) basin located near the western boundary of Lot 10. The

OSD basin function will be retained with the 950 m^3 basin storage being expanded by approximately 110 m^3 (12% larger) to accommodate the additional impervious areas created on the site.

INFORMATION REVIEW

In preparing this advice letter J. Wyndham Prince has undertaken a review of the following:

- Peach Tree and Lower Surveyors Creek Flood Study (PTLSCFS) (CSS,2019)
- Hawkesbury-Nepean River Flood Study Flood Maps (HNRFS) (Rhelm and CSS, 2024)
- Penrith Homemaker Centre Survey Plans (LTS Surveyors, 2024) (Ref No: 28342015 DT)
- Penrith Homemaker Centre Architectural Plans provided by Architectus 2024 (Ref No: Option 9 Plans)

FLOOD PLANNING CONTROLS

A summary of the stormwater and flood-related planning controls applicable to the development proposal is presented in Table 1. The table also outlines how the proposed development responds to these.

Table 1 – Flood Planning Requirements and Corresponding Responses

Clause.	Requirement	Response
LEP Clause 5.21: Flood Planning		
5.21	1) The objectives of this clause are as follows— a) to minimise the flood risk to life and property associated with the use of land, b) to allow development on land that is compatible with the flood function and behaviour on the land, taking into account projected changes as a result of climate change, c) to avoid adverse or cumulative impacts on flood behaviour and the environment, d) to enable the safe occupation and efficient evacuation of people in the event of a flood.	
5.2.1.2	Development consent must not be granted to development on land the consent authority considers to be within the flood planning area unless the consent authority is satisfied the development—	
5.2.1.2.a	Is compatible with the flood function and behaviour on the land	The proposed development does not propose any works on the existing watercourse on the site's western boundary. The development is to be supported by column structures elevated above the existing OSD basin and the surrounding floodplain. With the existing floodplain to be retained, the flood function and the behaviour of the land will remain relatively unchanged.
5.2.1.2.b	Will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties	The flood impact assessment outlined in this letter demonstrates that there are only incremental increases in extreme flood events. These will have no material impact on flood risks affecting people or property.
5.2.1.2.c	Will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood	The assessment outlined in this letter demonstrates compliance with this requirement.
5.2.1.2.d	Incorporates appropriate measures to manage risk to life in the event of a flood	The proposed works are generally outside of the mapped 1 in 100-year flood extents. As the site is substantially inundated in more extreme floods, the evacuation of patrons and staff of the centre is required for these circumstances. As there are no additional parking spaces necessary to service the expanded development, the development does not impact the existing evacuation operations or add to the risk.
5.2.1.2.e	Will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of riverbanks or watercourses	The proposed extended OSD basin will ensure no increases in stormwater discharge to the downstream water course and as such should see no impacts on erosion, siltation or stability. Suitable water

Clause.	Requirement	Response
		quality measures will also be implemented to meet Penrith Council's requirements for the management of waterborne pollutants.
NSW Ministerial Local Planning Direction		
4.1.1	A planning proposal must include provisions that give effect to and are consistent with:	
4.1.1.a	the NSW Flood Prone Land Policy	The proposed development complies with the NSW Flood Prone Land Policy (Section 1.1.1 of the NSW Floodplain Development Manual) in so far as there will be no adverse impact of flood-affected land and the provision of sufficient freeboard to the proposed floor levels. The assessment within this letter demonstrates these outcomes.
4.1.1.b	the principles of the Floodplain Development Manual 2005	As per comment to 4.1.1 a
4.1.1.c	the Considering flooding in land use planning guideline 2021	Clause 5.21 Flood Planning in Penrith LEP 2010 generally addresses the requirements of these guidelines and, as outlined above, the development proposal meets the flood planning requirements of the LEP. It is noted that while the Penrith LEP does not adopt any "Special Flood Consideration" requirements, the Homemaker development is not categorised as a "Sensitive and Hazardous development" under this guideline.
4.1.1.d	any adopted flood study and/or floodplain risk management plan prepared in accordance with the principles of the Floodplain Development Manual 2005 and adopted by the relevant council	As per comment to 4.1.1 a
4.1.2	A planning proposal must not rezone land within the flood planning area from Recreation, Rural, Special Purpose or Conservation Zones to a Residential, Employment, Mixed Use, W4 Working Waterfront or Special Purpose Zones.	The existing land use for Lot 10 is E3: Productivity Support. This clause is therefore not applicable.
4.1.3	A planning proposal must not contain provisions that apply to the flood planning area which:	
4.1.3.a	Permit development in floodway areas	The proposed development is not in a floodway area, Refer to Plate 6.
4.1.3.b	Permit development that will result in significant flood impacts to other properties	A Flood Impact and Risk Assessment (FIRA) was undertaken and is outlined in this letter. The assessment confirms that the development does not cause any adverse flood impacts on adjoining properties. Also, the existing OSD basin volume will be increased to ensure that no additional stormwater runoff will discharge from the site.
4.1.3.c	Permit development for the purposes of residential accommodation in high hazard areas	Not applicable to this proposal
4.1.3.d	Permit a significant increase in the development and/or dwelling density of that land	The proposed development involves a small extension of an existing commercial building and will not result in a significant increase of development. The minor increases in impervious areas of the site will be addressed by the augmentation of the existing OSD basin.
4.1.3.e	Permit development for the purpose of centre-based childcare facilities, hostels, boarding houses, group homes, hospitals, residential care facilities, respite day care centres and seniors housing in areas where the occupants of the development cannot effectively evacuate	Not applicable to this proposal
4.1.3.f	Permit development to be carried out without development consent except for the purposes of exempt development or agriculture. Dams,	The proposed development is to be carried out with development consent

Clause.	Requirement	Response
	drainage canals, levees, still require development consent	
4.1.3.g	Are likely to result in a significantly increased requirement for government spending on emergency management services, flood mitigation and emergency response measures, which can include but are not limited to the provision of road infrastructure, flood mitigation infrastructure and utilities	The proposed development will not require additional government spending on emergency services and flood mitigation infrastructure as existing flood evacuation routes will be utilised. No additional parking spaces are required or proposed for the development that would increase the burden on the route capacity. (refer to further discussion in the Flood Evacuation chapter of this letter)
4.1.3.h	Permit hazardous industries or hazardous storage establishments where hazardous materials cannot be effectively contained during the occurrence of a flood event.	Not applicable to this proposal
4.1.4	A planning proposal must not contain provisions that apply to areas between the flood planning area and probable maximum flood to which Special Flood Considerations apply which:	
4.1.4 a	permit development in floodway areas,	Special Flood Considerations do not apply to this type of development or this locality. Consequently, this directive does not apply to this proposal.
4.1.4 b	permit development that will result in significant flood impacts to other properties,	Special Flood Considerations do not apply to this type of development or this locality. Consequently, this directive does not apply to this proposal.
4.1.4 c	permit a significant increase in the dwelling density of that land	Special Flood Considerations do not apply to this type of development or this locality. Consequently, this directive does not apply to this proposal.
4.1.4 d	permit the development of centre-based childcare facilities, hostels, boarding houses, group homes, hospitals, residential care facilities, respite day care centres and seniors housing in areas where the occupants of the development cannot effectively evacuate,	Special Flood Considerations do not apply to this type of development or this locality. Consequently, this directive does not apply to this proposal.
4.1.4 e	are likely to affect the safe occupation of and efficient evacuation of the lot, or	Special Flood Considerations do not apply to this type of development or this locality. Consequently, this directive does not apply to this proposal.
4.1.4 f	are likely to result in a significantly increased requirement for government spending on emergency management services, and flood mitigation and emergency response measures, which can include but not limited to road infrastructure, flood mitigation infrastructure and utilities.	Special Flood Considerations do not apply to this type of development or this locality. Consequently, this directive does not apply to this proposal.
4.1.5	For the purposes of preparing a planning proposal, the flood planning area must be consistent with the principles of the Floodplain Development Manual 2005 or as otherwise determined by a Floodplain Risk Management Study or Plan adopted by the relevant council.	As outlined in the response to Planning Direction 4.1.1 above the proposed development complies with the principles of the Flood Prone Land Policy and the NSW Floodplain Development Manual (2005)
Consistency *A planning proposal may be inconsistent with this direction only if the planning proposal authority can satisfy the Planning Secretary (or their nominee) that:*		
a	the planning proposal is in accordance with a floodplain risk management study or plan adopted by the relevant council in accordance with the principles and guidelines of the Floodplain Development Manual 2005 or	As summarised above and outlined in this letter, the planning proposal is consistent with Local Planning Directive 4.1 Flooding so this consistency directive is not applicable.

Clause.	Requirement	Response
b	where there is no council adopted floodplain risk management study or plan, the planning proposal is consistent with the flood study adopted by the council prepared in accordance with the principles of the Floodplain Development Manual 2005 or	As summarised above and outlined in this letter, the planning proposal is consistent with Local Planning Directive 4.1 Flooding, so this consistency directive is not applicable.
c	the planning proposal is supported by a flood and risk impact assessment accepted by the relevant planning authority and is prepared in accordance with the principles of the Floodplain Development Manual 2005 and consistent with the relevant planning authorities' requirements, or	As summarised above and outlined in this letter, the planning proposal is consistent with Local Planning Directive 4.1 Flooding, so this consistency directive is not applicable.
d	the provisions of the planning proposal that are inconsistent are of minor significance as determined by the relevant planning authority	As summarised above and outlined in this letter, the planning proposal is consistent with Local Planning Directive 4.1 Flooding, so this consistency directive is not applicable.
Council Pre DA minutes dated 29 January 2024		
	The property is heavily affected by mainstream and local overland flow flooding	This comment related to an earlier proposal that proposed a more substantial extension into Lot 11. The development no longer extends beyond the mapped 100-year ARI flood extents. A hydraulic assessment of the impact of the development, as outlined within this letter, demonstrates that the proposal complies with the flood planning requirements of Penrith LEP 2010.
	The property is within the 1% AEP "floodway". Floodway is defined as Floodplain area where a significant discharge of water will occur during a flood event. The site is also within the 1% AEP H6 hazard classification. A H6 flood hazard classification means it is unsafe for vehicles and people as all building types are considered vulnerable to failure. No developments are allowed in these high hazard areas as there will be significant impact from flooding on the development	This comment related to an earlier proposal that proposed a more substantial extension into Lot 11. The development no longer extends beyond the mapped 100-year ARI flood extents.
	The 1% AEP flood level affecting the property is estimated to be RL27.3m AHD. This flood level is based on the Peach Tree and Lower Surveyors Creek Flood Study 2019.	The 1% AEP flood level is RL27.00 m AHD (taken from Figure 29.2 of the Peach Tree and Lower Surveyors Creek Flood Study). This level has been included as part of the design and reflected in the augmentation of the existing basin.
	Council does not support on site detention under habitable floors. The proposal to extend the current building footprint by suspending the slab over an existing detention basin is not supported for several reasons including: Planting, including ground covers, will not survive without sunlight, creating a sediment and erosion problem. Maintenance of the detention basin will be constrained due to limited access to the detention basin.	Permanent sediment and erosion control measures will be proposed to protect the basin by the implementation of permanent scour protection such as rock lining. Further design of these sediment and erosion control measures will be provided at the DA stage. The proposed building extension is to be elevated above the existing above-ground basin. Subject to final structural design it is estimated that there will be 2.62 m of vertical clearance between the floor of the basin and the underside of the structure. Suitable maintenance access will be provided to the OSD basin.
	Any further Planning Proposal is to address the objectives for flood planning in Penrith LEP and flood- prone land provisions in Penrith Development Control Plan 2014.	Agreed and addressed in this letter

Clause.	Requirement	Response
	The NSW Government's Reconstruction Authority Study for the Hawkesbury- Nepean Valley is anticipated to release updated flood modelling in the future.	The latest Hawkesbury-Nepean River Flood Study (Rhelm and CSS, 2024) was considered in this updated assessment.
	The site is affected during a PMF (Probable Maximum Flood) event. A PMF event is defined as the largest flood event that could occur in a given area. Future Planning Proposals should be accompanied by flood evacuation modelling. This is to present the flood evacuation modelling for the site and the risks people will face when evacuating. The flood modelling will also show whether the proposal will have an impact to the regional evacuation capacity in the Penrith region. New and updated information is to be included when preparing flood and evacuation assessments for future proposals.	The flood impact assessment outlined in this letter demonstrates that the proposed development will not adversely impact the flood behaviour for extreme floods such as the 0.2% AEP or the PMF at this location. The flood evacuation of patrons will navigate internally through the Penrith Homemaker Centre towards Mulgoa Road which will provide safe passage to the M4. Alternatively, patrons can also navigate via Patty's Place to Blaikie Road to Mulgoa Road. As there is no need to create any additional car spaces to support the proposed building extension there can be no increase in the potential traffic needing to evacuate the site during a flood emergency. Consequently, there is no impact on the Penrith regional flood evacuation capacity.
Penrith City Council DCP Section 3.5 Flood Planning		
	Council will not support the rezoning of land in a floodway or high hazard area	The site of the proposed development is no longer located in a floodway or a high-hazard area during the 100-year ARI flood event.
	Council will generally not support the rezoning of rural land situated below the 1% AEP (100 year ARI) flood where the development of that land may require or permit the erection of buildings or works even if the surface of the land can be raised to a level above the 1% AEP (100 year ARI) flood by means of filling	The amended development proposal no longer proposes works that extend beyond the mapped 100-year ARI flood extents.
	Where land below the flood planning level is currently zoned to permit urban development, Council will generally not support the rezoning of land to permit a higher economic use or an increase in the density of development.	The amended development proposal no longer proposes works that extend beyond the mapped 100-year ARI flood extents.

FLOOD ASSESSMENT

Available Flood Maps

The site is located within the Regional Hawkesbury-Nepean River catchment which was considered in the recently released Hawkesbury-Nepean River Flood Study (Rhelm and CSS, 2024). Flood maps from the study were made available from the NSW Reconstruction Authority for use in this Flood Impact and Risk Assessment.

Refer to Plates 3 to 5 below for the extracts of the HNRFS flood extents for the 1% AEP (1 in 100 yr.), 0.2% AEP (1 in 500 yr.) and PMF flood events.

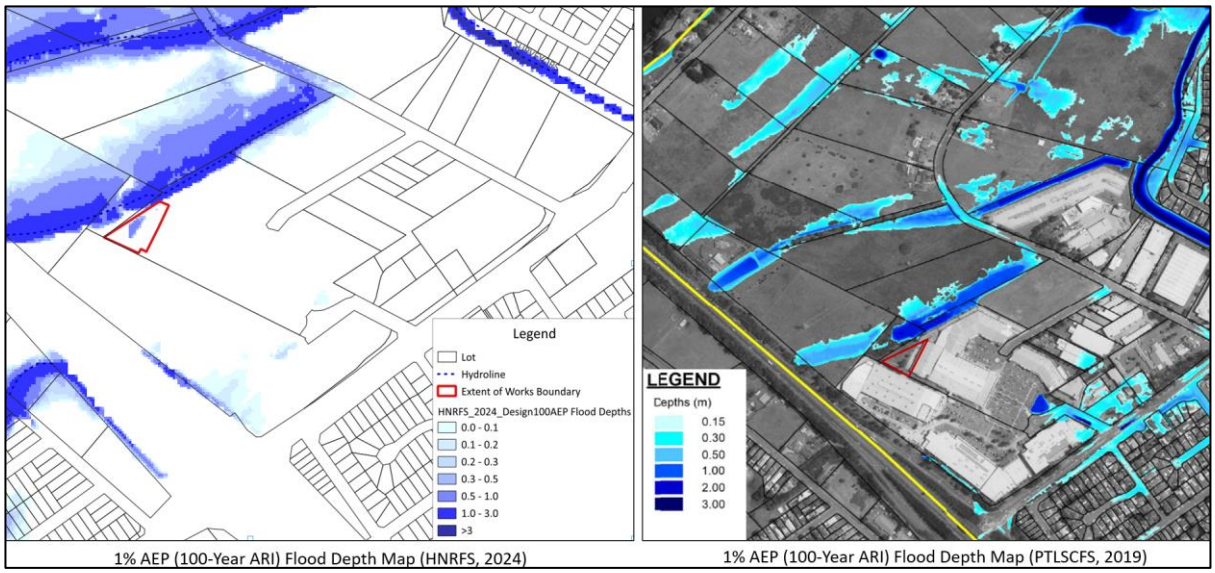


Plate 3 – 1% AEP (100 year ARI) Flood Depth Maps

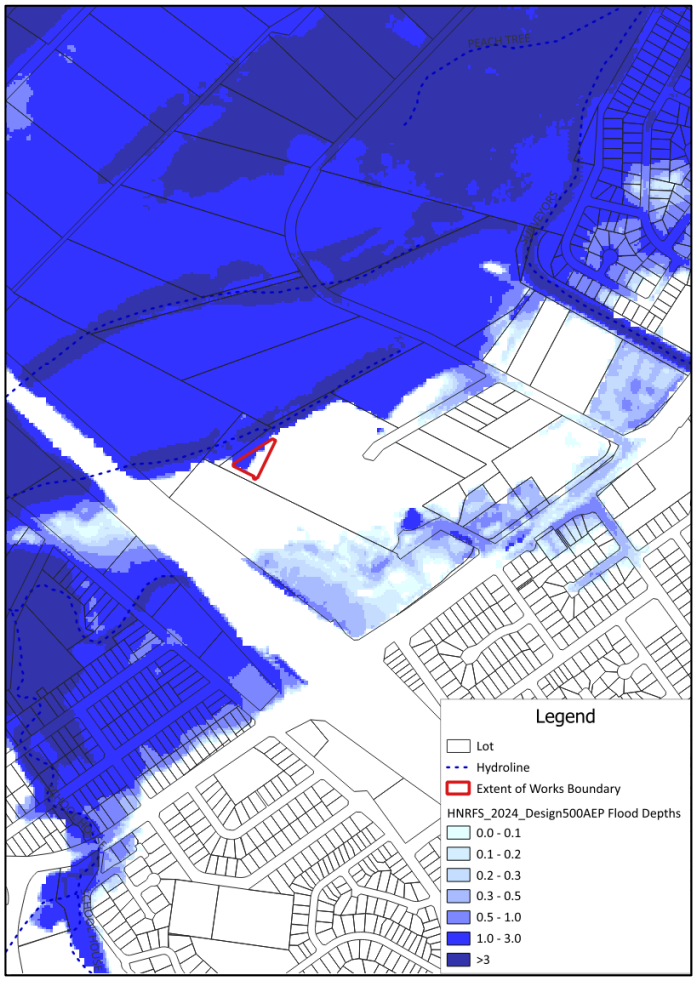


Plate 4 – 0.2% AEP (500 Year ARI) Flood Depth Map (HNRFS, 2024)

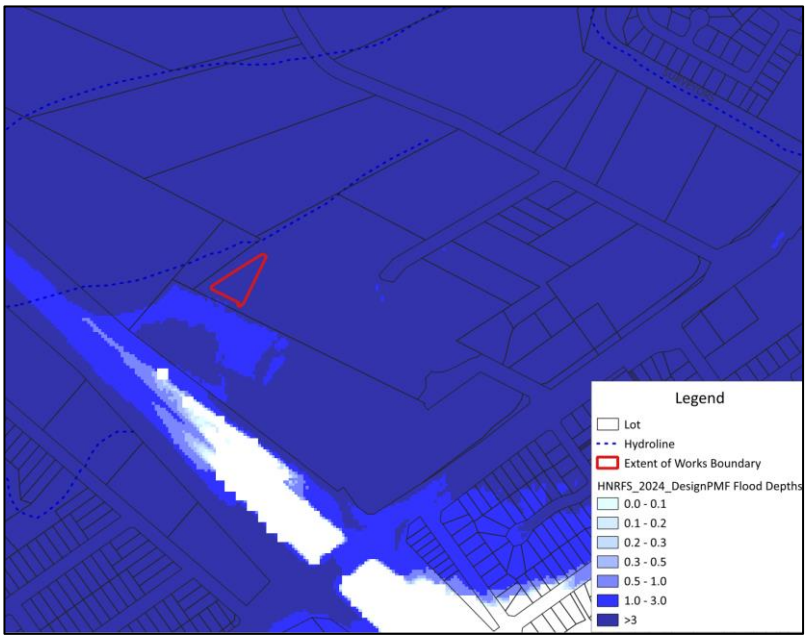


Plate 5 – PMF Flood Depth Map (HNRFS, 2024)

Key Flood Levels

Flood levels for the Penrith Homemaker Centre site derived from both the regional HNRFS (Rhelm and CSS, 2024) and the local Peach Tree and Lower Surveyors Creek Flood Study (CSS, 2019) (PTLSCFS 2019) are listed in Table 2.

Table 2 – Summary of the Flood Levels Impacting the Site

Flood Event	HNRFS 2024	PTLSCFS 2019
1% AEP	26.94 m AHD	27.00 m AHD
0.2% AEP	28.88 m AHD	27.06 m AHD
PMF	32.81 m AHD	27.35 m AHD

A summary of the applicable flood levels affecting the site and relating these to existing site levels and Hazards are summarised in Table 3.

Table 3 – Key Flood Levels, Depths and Hazards for the Penrith Homemaker Site

Flood Event	Flood Levels (m)	Minimum Site Levels within Development Extents (m)	Depth of Maximum Inundation (m)	Existing Flood Hazard
1% AEP	27.00	26.21	0.84	**H3** - Unsafe for vehicles, children and the elderly
0.2% AEP	28.88	26.21	2.67	**H5** - Unsafe for vehicles and people. All buildings are vulnerable to structural damage. Some less robust building types vulnerable to failure

Flood Event	Flood Levels (m)	Minimum Site Levels within Development Extents (m)	Depth of Maximum Inundation (m)	Existing Flood Hazard
PMF	32.81	26.21	6.60	**H5** - Unsafe for vehicles and people. All buildings are vulnerable to structural damage. Some less robust building types vulnerable to failure

It is noted that the proposed Homemaker extension is predominately a suspended slab and supporting piers with a Finished Floor Level of 29.72 which has a 2.72 m freeboard to the highest 1% AEP flood level (Peach Tree Creek) affecting this location.

Flood Planning Levels

In accordance with Penrith LEP (2010) and the Flood Risk Management Manual (2023), the flood planning-related levels affecting the site are determined as follows:

The Defined Flood Event (DFE)- The 1% (1 in 100 yr) AEP – the corresponding flood level affecting Lot 10 is RL 27.00 m AHD.

The Flood Planning Level (FPL) DFE and provision for Relevant Freeboard = RL 27.50 m AHD

The Flood Planning Area (FPA) As site levels in the western boundary of Lot 10 around the existing OSD basin are below the Flood Planning level then Lot 10 is partially within the Flood Planning Area.

Climate Change

The climate change guideline provided in the Australian Rainfall and Runoff (AR&R) 2019 Chapter 6 of Book 1 has been used to understand the potential climate hazards surrounding the Subject site. A six-step process is suggested in AR&R 2019 to incorporate climate change risks into the decision-making process and involve the estimation of design flood characteristics.

Application of Step 4 in the six-step process indicates for the 1% AEP event, the practitioner could consider the impact of the 0.2% AEP event to gain an understanding of the extent to which the risks of climate change may exceed the coping capacity of the facility to perform its intended function. The flood level for the 0.2% AEP flood event is provided in Tables 2 and 3 and is **RL 28.88 m AHD** which is 1.88 m higher than the current 1% AEP flood level affecting the site.

The finished floor level proposed for the Homemaker Centre extension is **RL 29.72 m AHD** and this maintains a freeboard of 0.84 m to the 0.2% AEP flood (as a proxy for a post-climate change 1% AEP flood). Consequently, It is concluded that the facility will maintain its intended function should the currently predicted degree of climate change-related impacts on flood events occur.

Flood Hydraulic Categories

The current flood Hydraulic Category mapping relevant to the Penrith Homemaker Centre site was obtained from both the regional HNRFS (Rhelm and CSS, 2024) and the local Peach Tree and Lower Surveyors Creek Flood Study (CSS, 2019) (PTLSCFS 2019) and extracts of the relevant flood maps from each are provided in Plate 6.

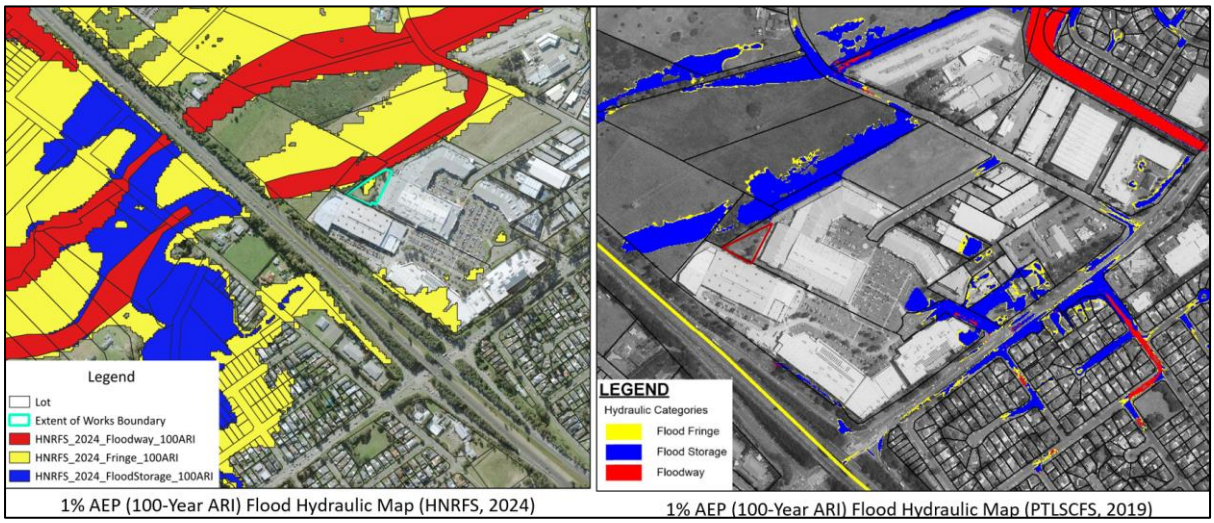


Plate 6 – Hydraulic Category Flood Maps

FLOOD IMPACT ASSESSMENT

Methodology

While it has become a common expectation that 2D hydrodynamic modelling and flood mapping is used to inform Flood Impact and Risk Assessments (FIRA's) for sites that are flood-affected, there are suitable and simpler alternatives for smaller sites, or where the potential impacts are marginal. This alternative approach is appropriate for the Penrith Homemaker project for the reasons outlined below.

Relevant Considerations

- The Development footprint is insignificant in terms of the nature of the Nepean River floodplain at this location.
- Development extents are generally outside of the 1% AEP flood extents that only marginally impact the site's western boundary.
- There is no impact on the floodway, flood storage or flood fringe areas in the floodplain during events up to the 1% AEP flood.
- The recently updated HNRFS flood maps are available in GIS to clearly define current flood levels and other parameters.

Consistent with this simpler approach a Manning's floodway evaluation was undertaken to conservatively estimate the potential afflux (i.e. the change in flood level due to the proposed works in the floodway) related to the proposed development. This process involved acquiring the pertinent flood levels mapped by the HNRFS (2024) for the events under consideration, constructing a hydraulic model of the existing and proposed floodway utilizing the U.S. Federal Highway Administration (FHWA) – Hydraulic Toolbox software, and comparing these to derive the associated flood afflux.

Flood Impacts

A Flood Impact and Risk Assessment (FIRA) was conducted to adequately assess the flood-related risks and impacts likely to arise from the proposed development extension. The potential flood impacts for the Penrith Homemaker site were assessed for the 1% AEP (1 in 100 yr.), 0.2% AEP (1 in 500 yr.) and PMF flood events using the Hydraulic Toolbox to replicate the behaviour of this portion of the Hawkesbury Nepean River floodplain.

The steps in the Hydraulic Toolbox assessment were:

- A representative floodway cross section located on the northern near end of the proposed building footprint was extracted from the site terrain and entered into Hydraulic Toolbox Software.
- The cross-section extended from the edge of the existing Homemaker building to a location within the 1% AEP flood extent around 200 m to the west. This was adopted to reflect the local floodplain environs around the proposed Penrith Homemaker site development. The location of the representative floodway section is indicated on Plate 7.
- Flow rates for the existing scenario were iterated in Hydraulic Toolbox until flood depths at the chosen cross-section (within the Penrith Homemaker site) matched the flood levels obtained from the Hawkesbury Nepean River Flood Study (HNRFS) for the relevant peak flood event.
- The hydraulic gradient of the local floodplain was derived from the HNRFS (2024) and was applied in Hydraulic Toolbox.
- Flow rates obtained from the existing scenario were used for the developed scenario and the cross-section inputs were defined based on the Penrith Homemaker site's proposed development extents. This accounted for the building extension impact on the floodway.
- Results were assessed in Hydraulic Toolbox to identify the expected increase in water surface levels across the building as being representative of the likely impact the building extension would have in the Hawkesbury Nepean River floodplain for events of this magnitude.
- The resulting flood afflux (changes arising to Flood depths) arising from each of the flood events assessed was recorded.

The floodway profile and cross-section, along with the results of the 1% AEP, 0.2% AEP and PMF assessments, are presented in Plates 7 to 12 below.

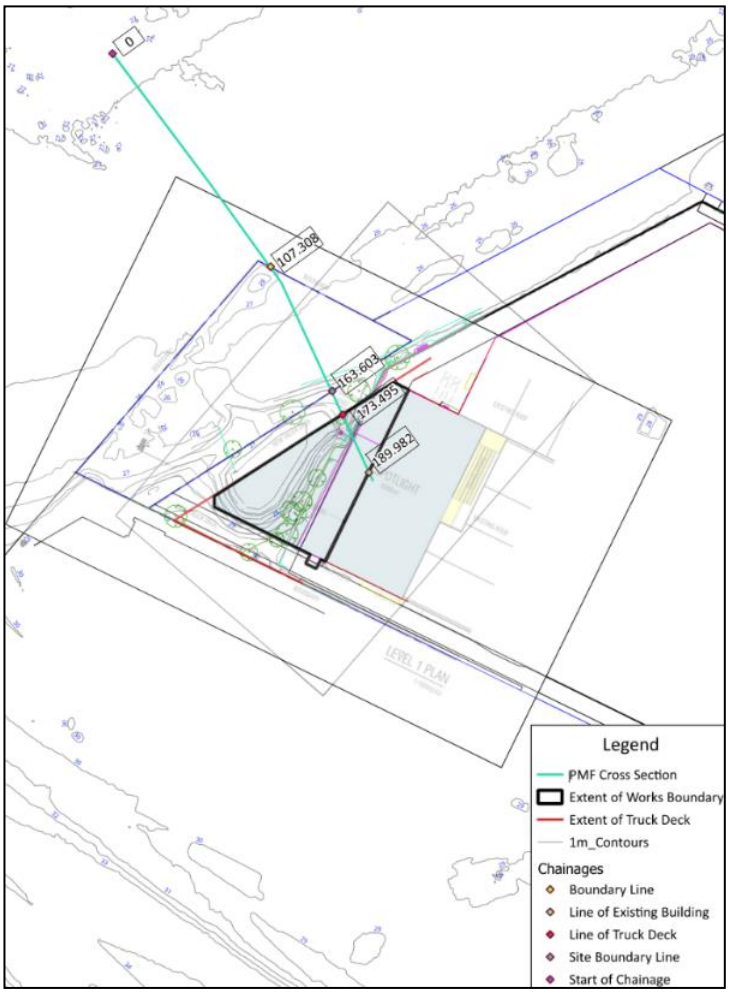


Plate 7 – Hydraulic Toolbox results – Floodway Profile 1% AEP, 0.2% AEP and PMF Flood Events

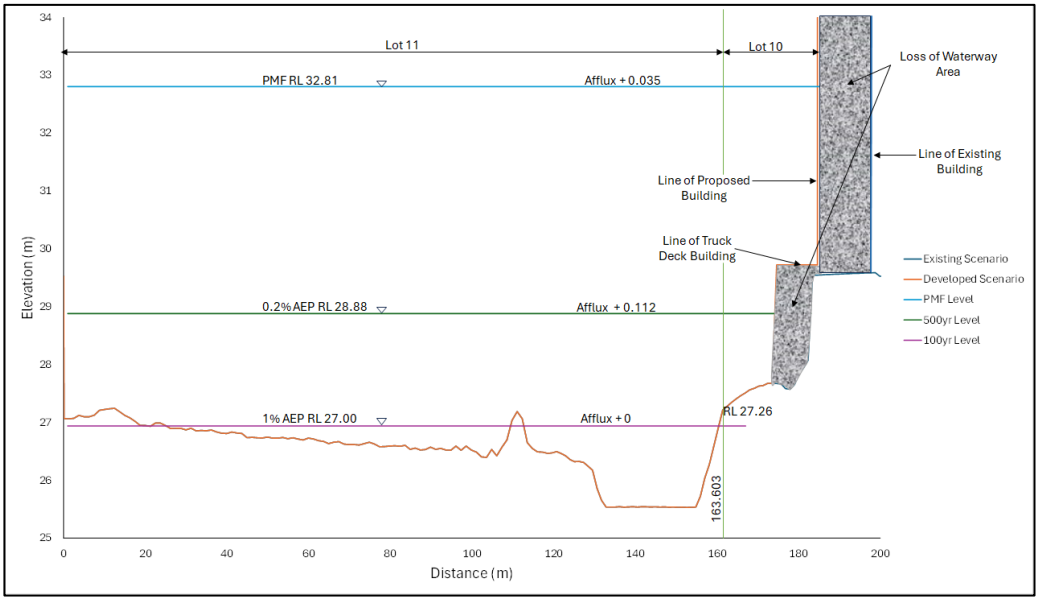
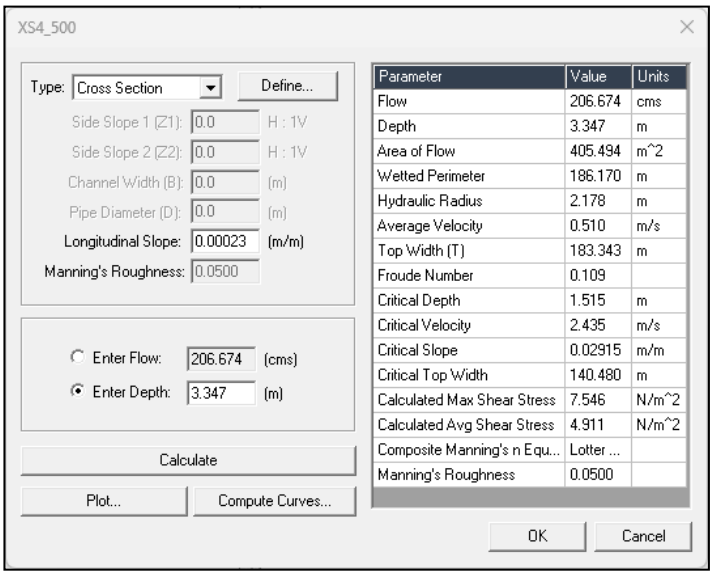
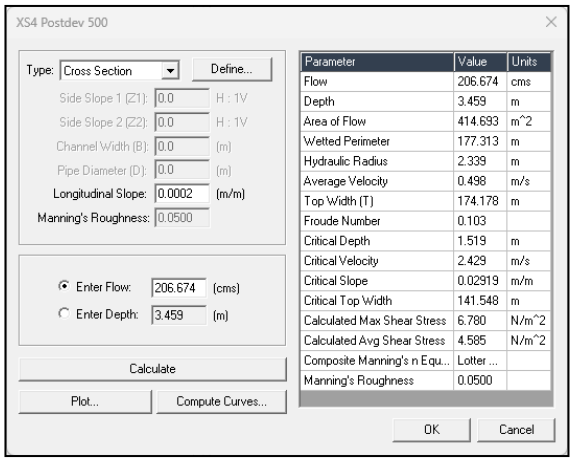


Plate 8 – Hydraulic Toolbox results – Floodway Cross Sections 1% AEP, 0.2% AEP and PMF Flood Events



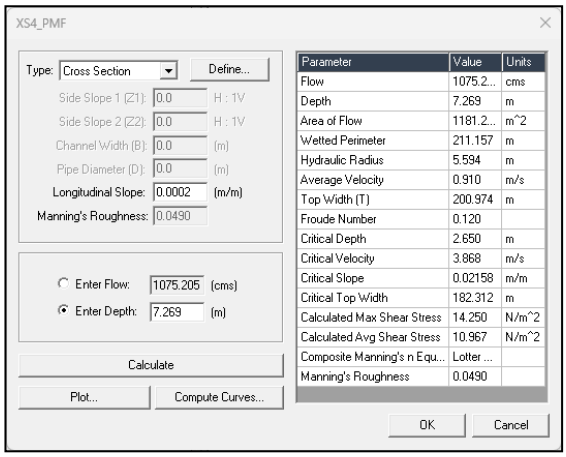
Parameter	Value	Units
Flow	206.674	cms
Depth	3.347	m
Area of Flow	405.494	m^2
Wetted Perimeter	186.170	m
Hydraulic Radius	2.178	m
Average Velocity	0.510	m/s
Top Width (T)	183.343	m
Froude Number	0.109	
Critical Depth	1.515	m
Critical Velocity	2.435	m/s
Critical Slope	0.02915	m/m
Critical Top Width	140.480	m
Calculated Max Shear Stress	7.546	N/m^2
Calculated Avg Shear Stress	4.911	N/m^2
Composite Manning's n Equ...	Lotter ...	
Manning's Roughness	0.0500	

Plate 9 – Hydraulic Toolbox results – Existing 0.2% AEP Flood



Parameter	Value	Units
Flow	206.674	cms
Depth	3.459	m
Area of Flow	414.693	m^2
Wetted Perimeter	177.313	m
Hydraulic Radius	2.339	m
Average Velocity	0.498	m/s
Top Width (T)	174.178	m
Froude Number	0.103	
Critical Depth	1.519	m
Critical Velocity	2.429	m/s
Critical Slope	0.02919	m/m
Critical Top Width	141.548	m
Calculated Max Shear Stress	6.780	N/m^2
Calculated Avg Shear Stress	4.585	N/m^2
Composite Manning's n Equ...	Lotter ...	
Manning's Roughness	0.0500	

Plate 10 – Hydraulic Toolbox results – Developed 0.2% AEP Flood



Parameter	Value	Units
Flow	1075.2...	cms
Depth	7.269	m
Area of Flow	1181.2...	m^2
Wetted Perimeter	211.157	m
Hydraulic Radius	5.594	m
Average Velocity	0.910	m/s
Top Width (T)	200.974	m
Froude Number	0.120	
Critical Depth	2.650	m
Critical Velocity	3.868	m/s
Critical Slope	0.02158	m/m
Critical Top Width	182.312	m
Calculated Max Shear Stress	14.250	N/m^2
Calculated Avg Shear Stress	10.967	N/m^2
Composite Manning's n Equ...	Lotter ...	
Manning's Roughness	0.0490	

Plate 11 – Hydraulic Toolbox results – Existing PMF Event Flood

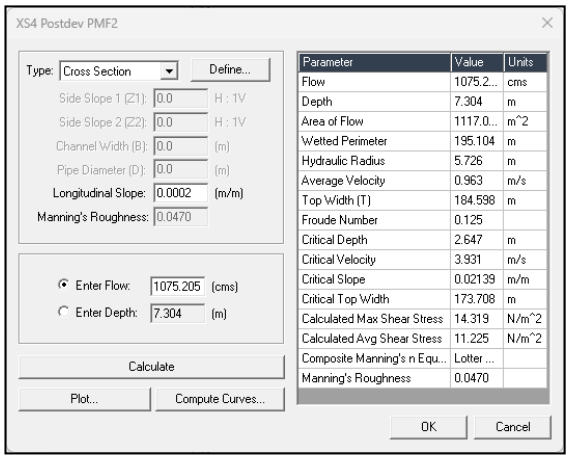


Plate 12 – Hydraulic Toolbox results – Developed PMF Event Flood

Afflux in a Regional Flood Event

The depth results presented in Table 4 demonstrate that there would be an afflux (flood level increase) of 0.112 m and 0.035 m in the respective 0.2% AEP and PMF flood events locally around the proposed building extension, and this would marginally increase the flood depths on adjacent properties.

It should be noted that these properties are already inundated by flood depths of greater than 2.67 m in the 0.2% AEP (1 in 500 yr.) and greater than 6.6 m in the PMF regional flood events.

The predicted increases for the Penrith Homemaker site represent small relative increases in flood depths.

In floods of this magnitude persons inhabiting the building would have already been advised by the SES to evacuate many hours ahead of the flood peak. Consequently, the risk to life is not measurably increased as a result of the Penrith Homemaker development extension. Flood hazards and associated building and other property damages would also not be measurably increased by the associated increased flood levels in these circumstances.

Table 4 – Hydraulic Toolbox Results

Parameter	0.2% AEP			PMF Event		
	Existing Condition	Developed Condition	Afflux	Existing Condition	Developed Condition	Afflux
Flow (cms)	206.674	206.674		1075.21	1075.21	
Depth (m)	3.347	3.459	+ 0.112	7.27	7.30	+ 0.035
Area of Flow (m2)	405.494	414.693		1181.23	1117.08	
Wetted Perimeter (m)	186.170	177.313		211.16	195.10	
Hydraulic Radius (m)	2.178	2.339		5.60	5.73	
Average Velocity (m/s)	0.510	0.498		0.913	0.963	
Top Width (T) (m)	183.343	174.178		201.0	184.6	
Froude Number	0.109	0.103		0.12	0.13	
Critical Depth (m)	1.515	1.519		2.65	2.65	
Critical Velocity (m/s)	2.435	2.429		3.87	3.93	
Critical Slope (m/m)	0.02915	0.02919		0.02158	0.02139	

Stormwater Management

Stormwater controls will be implemented that ensure that the proposed development does not adversely impact stormwater flow rates and water quality of the stormwater system downstream of the site.

Stormwater Quantity

OSD Basin

The Penrith Homemaker site building extension has previously made provisions to ensure post-developed flows are reduced to pre-developed values by implementing an on-site detention (OSD) basin. The existing OSD Basin has a volume of around 950 cu.m and services a catchment of approximately 3.3 hectares of the existing Homemaker site. The basin is located on the western edge of the Homemaker Centre and the proposed building extension will be suspended over the Basin.

It is estimated that the development will create an additional 3,100 m^2 of roof and hardstand area. Consequently, it is expected that the OSD basin volume will need to be increased by approximately 110 m^3 – representing a 12 % increase in its current size. This basin size and performance will be assessed and confirmed at the project DA stage.

Basin Maintenance

The vertical clearance between the proposed extension was assessed to confirm there is sufficient clearance to facilitate access to the OSD basin for maintenance purposes. The Architectural Plan–Option 9 provided on the 7th of July 2024 indicates the building levels as shown in Plate 13.

Assessment of the site confirms that there is a 2.62 m height clearance from the base of the existing OSD Basin to the underside of the proposed deck for maintenance access to the OSD Basin area (Refer to Plate 13 and Table 5 below).

Once the deck is extended over the basin the limited sunlight exposure may hinder the health and viability of the existing vegetation cover. It will be necessary to modify the surface finish of the OSD basin to provide a more permanent and maintainable surface finish. It is expected that this will be comprised of either rock pitching or a concrete slab. The specific solution will be resolved at the next development stages.

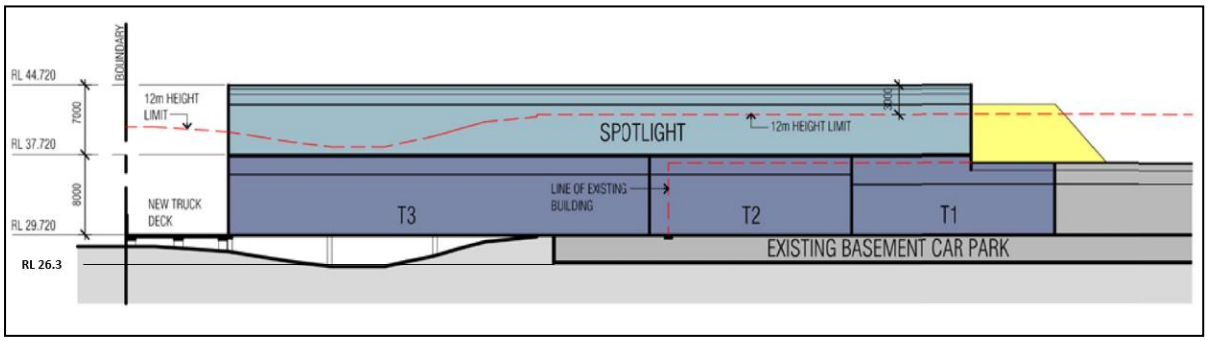


Plate 13 – Penrith Homemaker Centre Ground Floor Section

Table 5 – Height Clearance Calculations

Parameter	Value
New Finished Floor Level	29.72 m
Assumed Slab/Beam Thickness	0.8 m
Underside RL	28.92 m

Parameter	Value
OSD Basin Floor	26.30 m
Vertical Clearance	2.62 m

FLOOD EVACUATION

According to the email correspondence received from the Traffic Engineer Anton Reisch at Arc Traffic + Transport dated December 6, 2024, it is understood that 1697 car spaces exist or have already been committed to for the Homemaker site. This provision comfortably exceeds the requirement for parking spaces for the Homemaker site, including the proposed extension. Consequently, it is expected that the existing Flood Evacuation Plan for this portion of the Penrith area will have already accounted for the expected loads that include this expanded development. Flood evacuation of patrons and staff of the Homemaker Centre will utilize the M4 Western Motorway Evacuation Route and be directed east towards Sydney.

The Potential evacuation routes applicable for the Homemaker site are:

- Southeast towards Wolseley Street then southeast along Mulgoa Road to the Western Motorway (M4) Road for connection to the key convergence point.
- North along Pattys Place towards Blaikie Road, then east to Mulgoa Road for connection to the Western Motorway (M4) for connection to the key convergence point.

Evacuation to Homebush Bay is not relevant as the site will be occupied by commercial uses so there would be a minimal need for evacuees to find accommodation.

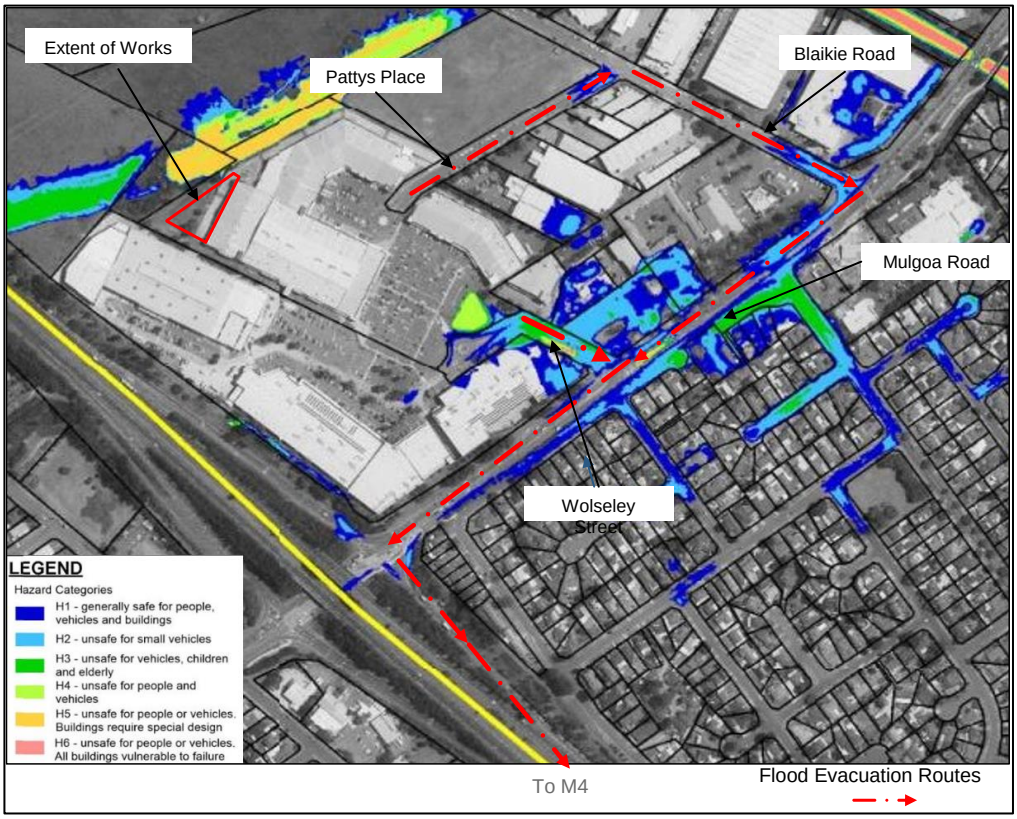


Plate 14 – Flood Evacuation Routes During 0.5% AEP Local Flooding (PTLSCS, 2019)

CONCLUSION

The Flood Risk and Impact Assessment was undertaken for the proposal to extend the Homemaker Centre at Penrith. The assessment confirms that while a portion of Lot 10 is located within the relevant Flood Planning Area at this location, the proposed finished floor level of the Homemaker Centre extension is located well above the 1% AEP flood level with a freeboard of more than 2.7 m. It is noted that the portion of the development within the footprint of the Flood Planning Area is predominately a suspended slab supported on piers. Consideration of potential climate-related increases by adopting the current 0.2% AEP flood level as a proxy for a post-climate 1% AEP level, demonstrates that the facility will maintain its intended function in these changed circumstances.

A flood impact assessment is outlined in this letter and demonstrates that the development would result in an incremental increase of 0.112 m and 0.035 m within the site in the 0.2% AEP and PMF flood events respectively. These are marginal increases in the overall significant depth of inundation in this part of the floodplain for these two events. Consequently, the risk to life and associated building and other property damages would not be measurably increased by the increased flood levels in these circumstances.

The stormwater management system currently in place for the Homemaker site can be expanded to remain compliant with Penrith City Council's requirements. This will be advanced at the next design stages of the project.

In addition, the proposal was assessed against the flood and stormwater-related requirements and controls contained within the NSW Ministerial Local Planning Directions and LEP Clause 5.21: Flood Planning and is fully compliant.

Should you require any further information, please do not hesitate to contact me at pmehl@jwprince.com.au or on 0428 323 377.

Yours faithfully

Peter Mehl

Director
MIE Aust CPEng NER

Glossary

Term	Definition
Exceedances per Year (EY)	The number of times a year that statistically a storm flow is exceeded.
Annual Exceedance Probability (AEP)	The chance of a flood of a given or larger size occurring in any one year is usually expressed as a percentage. For example, a 1% AEP event has a 1 in 100 chance of occurring each year.
Probable Maximum Flood (PMF)	The greatest depth of precipitation for a given duration that is meteorologically possible for 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. For smaller catchments, this is estimated to have an approximately 1 in 10,000,000 chance of occurring each year.
Peak Flow	Is the maximum stormwater runoff that occurs during a flood event
Defined Flood Event (DFE)	The flood event selected as a general standard for the management of flooding to development.
Flood Risk Management (FRM)	The management of flood risk to communities
Flood Planning Level (FPL)	The combination of the flood level from the DFE and freeboard selected for FRM purposes
Flood Planning Area (FPA)	The area of land below the FPL
Hydrology	The study of the rainfall and runoff process as it relates to the derivation of hydrographs for given floods.
Hydraulics	The study of fluid (usually water) behaviour and its applications in systems involving pressure and flow, such as pumps, pipes, and drainage systems.
Floodway	The portion of the floodplain which conveys a significant discharge of water during floods and is sensitive to changes that impact flow conveyance. They often align with naturally defined channels or form elsewhere in the floodplain.
Flood Storage	Areas of the floodplain that are outside floodways and which provide temporary storage of floodwaters during the passage of a flood and where flood behaviour is sensitive to changes that impact on temporary storage of water during a flood.
Flood Fringe	The remaining portion of the flood extents once the areas of 'floodway' and 'flood storage' have been defined.