



# Flood Emergency Response Plan

for

## Bankstown Private Hospital

for Bankstown Private Hospital Pty Ltd

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## Report Details

**Project:** Bankstown Private Hospital  
 297-299 Canterbury Road, Revesby, NSW 2212

**Project Ref:** SY172981\_E01

**File Location:** \\incl-fp\job\_files1\SYDNEY 2017\SY172981 - Bankstown Private Hospital\E - Reports\SY172981\_E01\_Flood\_Emergency\_Response\_Plan\_[A].docx

### Revision History

Revision	Report Status	Prepared	Reviewed	Issue Date
A	For Approval	M Swan	A Brien	14/09/2020

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		Date
Prepared by	MS	11/09/2020
Checked by	GB	11/09/2020
Admin	HB	11/09/2020

## Flood Response Summary

The following provides a summary of the findings of this Flood Emergency Response Plan including a summary of the flood behaviour, floor levels with respect to the flood behaviour, the recommended flood response actions, and the recommended on-site and off-site flood refuge locations.

### Flood Levels

Table 1 – Summary of Flood Behaviour (subject site and vicinity)

Event	1% AEP	PMF
Flood Level (m AHD)	28.6 mAHD	28.7 mAHD
Flood Depth (m)	Up to 0.2m	Up to 0.2m
Velocity x Depth Product (m <sup>2</sup> /s)	0.05 – 0.1	0.05 – 0.2

### Floor Levels

Table 2 - Internal Floor Levels

Floor	Level (m AHD)	Relationship to Flood Levels
Basement Level 01 to 04	Below 26.50	<b>Below</b> 1% AEP and PMF
Ground Floor Level	30.50	Above 1% AEP and PMF
Level 01	34.80	Above 1% AEP and PMF
Level 02	39.40	Above 1% AEP and PMF
Level 03	43.20	Above 1% AEP and PMF
Level 04	47.00	Above 1% AEP and PMF

## Flood Response Actions

Table 3 – Flood Response Actions Summary

WHEN	WHAT	BY WHO
Prior to Flooding	Assemble <b>Emergency Kit</b>	First Aid Officer
	Check Floodsafe Kit every three months	First Aid Officer
	Coordinate <b>Evacuation Drills</b> twice per year (minimum)	Chief Flood Warden
	Sign up and maintain <b>Early Warning Network</b> and subscription	Chief Flood Warden Deputy Flood Warden
	Monitor weather situation at 4pm every afternoon	Chief Flood Warden
	Inductions for new staff to include flood risk associated with the subject site and evacuation procedure	Chief Flood Warden
On-site Refuge	<b>Warning has been issued and RAINFALL HAS STARTED</b>	Chief Flood Warden
	<b>Communicate</b> decision to remain on-site and organise seating and lighting.	Chief Flood Warden
	<b>Cancel non-essential activities</b> for the day	Chief Flood Warden
	<b>All persons in basements below ground floor to move</b> to nominated refuge point - <b>Ground Level Lobby</b>	All
	<b>Seek refuge in-place</b> throughout hospital (excluding below ground floor)	All
	<b>Wait it out</b> at nominated refuge point	All
	Maintain regular communication with staff, patients and facility users.	Chief Flood Warden
<b>Do not attempt to drive or walk through floodwaters. If stranded on-site and water inundates floor level, call 000 immediately.</b>	All	
Once Risk has Passed / After a Flood	Check all services and structural stability of buildings.	Qualified persons
	Return to operation.	Chief warden

## Key Personnel

Table 4 – Key Personal Summary

Person Organisation	Name	Number
Chief Flood Warden		
Deputy Flood Warden		
First Aid Officer		
SES	-	132 500
Police / Fire / Ambulance	-	000
Bankstown Council Customer Service Centre	-	(02) 9707 9000

**Example Signage**

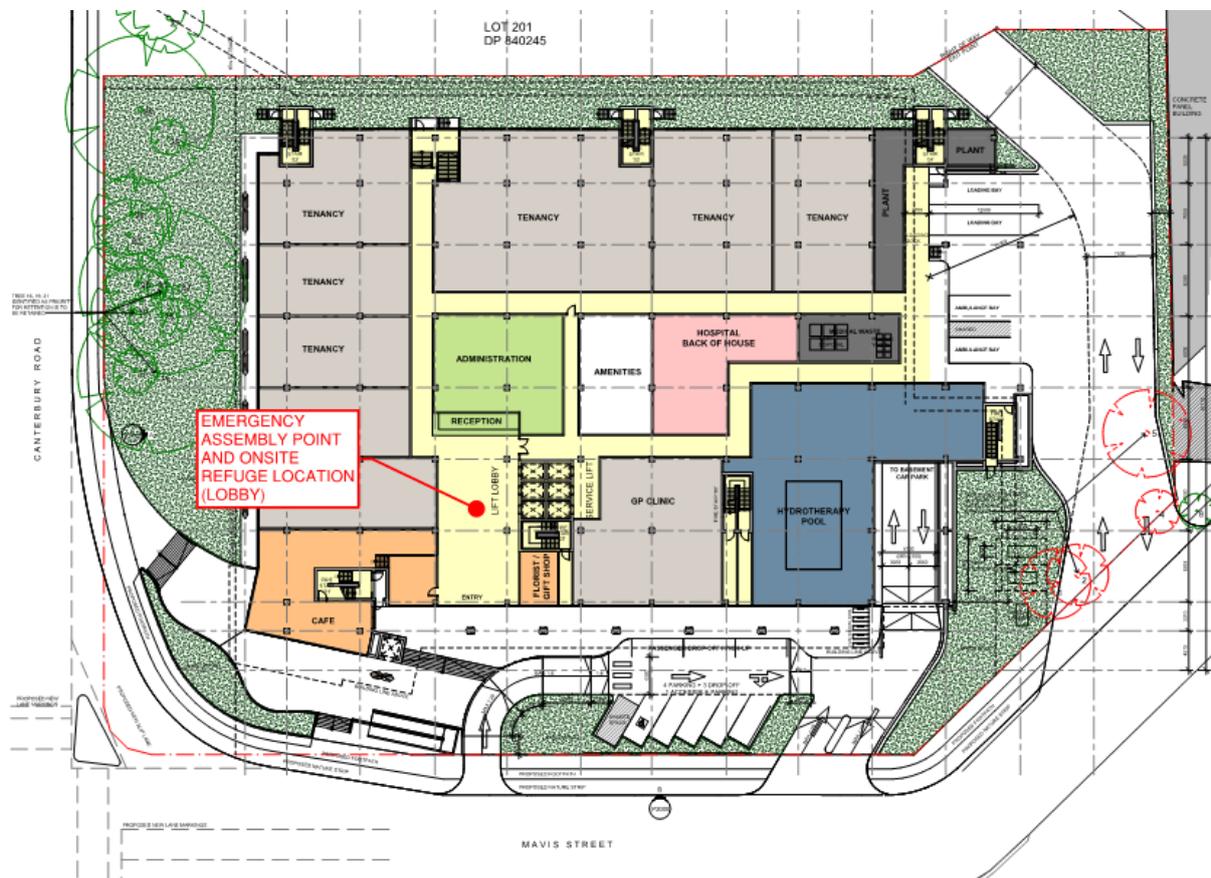
**Flood Emergency Assembly Point/ On-site Refuge**

This property is flood prone with predicted depths up to **0.25 metres**.

**Cancellation of non-essential services should be taken prior to rainfall commencing.**

Once rainfall has commenced, **refuge is available on all floors above and including the ground floor. The ground floor lobby can be used as a place of refuge for personnel who are not in any other tenancies in the facility** and no attempt should be made to evacuate elsewhere through floodwater by foot or vehicle.

Follow the direction of Flood Wardens and staff at all times. If no staff are present, use the intercom to call Bankstown Private hospital's base. If assistance is required, call the SES on 132 500. If in a life-threatening situation, call 000.





## Introduction

Northrop Consulting Engineers have been engaged by Bankstown Private Hospital to prepare a Flood Emergency Response Plan for the proposed hospital located at 297-299 Canterbury Road, Bankstown, Revesby NSW 2212 (the subject site).

This report has been prepared to support the *Gateway Determination – Planning Proposal at 297-299 Canterbury Road, Revesby* dated 6 March 2020. This plan specifically addresses section (ii):

- Evacuation Management Plan: Provide an evacuation management plan in consultation with NSW Health and NSW State Emergency Service to be consistent with the requirements of the Ministerial Direction 4.3-Flood Prone Land.

### Subject Site

The address of the subject site is 297 – 299 Canterbury Road, Revesby otherwise known as Lot 9 DP663160 and Lot 202 DP840245. The site is located within a General Industrial zone within the City of Canterbury Bankstown Local Government Area (LGA). Refer to **Figure 2** for the site location.

The site covers an area of approximately 9175 m<sup>2</sup>. The site is enclosed by Mavis Street on the North Eastern Boundary and Canterbury Road on the South Eastern Boundary. Cafes are located on the North Western Boundary and a warehouse is located on the South Western Boundary.

The subject site is burdened by an overland flow path easement that travels in a southerly direction along its western boundary. A pit and pipe network is located within the easement. The site is near the top of the catchment and therefore flow depths and velocities are generally low. Water runs along the easement, across Canterbury Road and continues downstream through the built-up suburbs of Revesby and Padstow before eventually entering Salt Pan Creek approximately 2km downstream.

A subject site locality plan is presented below in Figure 2.



**Figure 2 - Locality Plan (obtained from SIX Maps [www.maps.six.nsw.gov.au](http://www.maps.six.nsw.gov.au))**

This Flood Emergency Response Plan (FERP) has been prepared to:

- Promote satisfactory awareness of expected flood behaviour and flood risks associated with the subject site.
- Nominate roles and responsibilities when preparing for and responding to a flood emergency.
- Identify measures to monitor weather forecasts and highlight warning systems available.
- Provide education and awareness material for training programs with respect to flooding of the subject site.
- Identify potential evacuation and evasion procedures including evacuation routes and flood refuge opportunities.

Contained herein is a description of the methodology and information used to prepare this report, a summary of the likely flood behaviour, recommendations for flood preparation and recommended response actions during a flood event.

## Methodology and Available Data

This plan was developed based on the flood information obtained from the following locations:

- Stormwater System Report - 297 Canterbury Road, Revesby NSW 2212 prepared by City of Canterbury Bankstown and completed 3 Jan 2018.
- Flood Risk Assessment and Stormwater Management Report (Planning Proposal Submission) for the Proposed Development at 297-299 Canterbury Road, Revesby prepared by Northrop Consulting Engineers and completed 23 Jan 2018.
- Fairford Road Catchment Flood Study and Report prepared by BMT WBM and completed in July 2010.
- Bankstown City Flood Emergency Sub Plan prepared by NSW SES and completed November 2015.

The expected flood behaviour for the subject site is based on the above flood information and is summarised in the **Flood Behaviour** section of this plan.

A review of the Bureau of Meteorology (BoM) and State Emergency Service (SES) guidelines have been undertaken to report on the likely warning types described in the **Flood and Evacuation Warnings** section of this plan.

Consideration has been given to the personnel most likely to be on-site and responsible for flood emergency response. This is outlined in the **Flood Response Personnel** section of this plan.

Analysis of the site and nearby topography, in combination with the likely flood behaviour has informed the assembly points, evacuation routes and on-site refuge points nominated in the **Assembly Point and Evacuation Routes** and **Floor Levels and On-site Refuge** sections of this plan.

Contact numbers for relevant emergency response agencies are noted in the **Emergency Contact** section of this plan.

Finally, a review of the aforementioned flood studies, NSW State Flood Plan and Emergency Business Continuity Plan have contributed to the recommended preparation and response actions outlined in the **Flood Response Preparation** and **Flood Response Actions** sections of this plan.

We have reached out to NSW SES and NSW Health regarding this Flood Emergency Response Plan for their input and comment. This plan should be revised following their formal input.

# Flood Behaviour

## Flood Source and Behaviour

The site is positioned near the top of a catchment known as the Fairford Road catchment. This is a sub-catchment of the larger catchment network which runs downstream towards Salt Pan Creek.

A stormwater easement is located along the South Western boundary for the benefit of 299A Canterbury Road, Revesby, a neighbouring property. An overland flow path is located within the easement, with pit and pipe system underground.

Based on survey undertaken across the site by LTS Lockley, the general site levels fall from a maximum RL of approximately 31.79 m AHD at the Northern site corner, to a minimum ground surface RL of approximately 26.31 m AHD at the Southern site corner. The location and direction of the overland flow path is illustrated in **Figure 3** below.

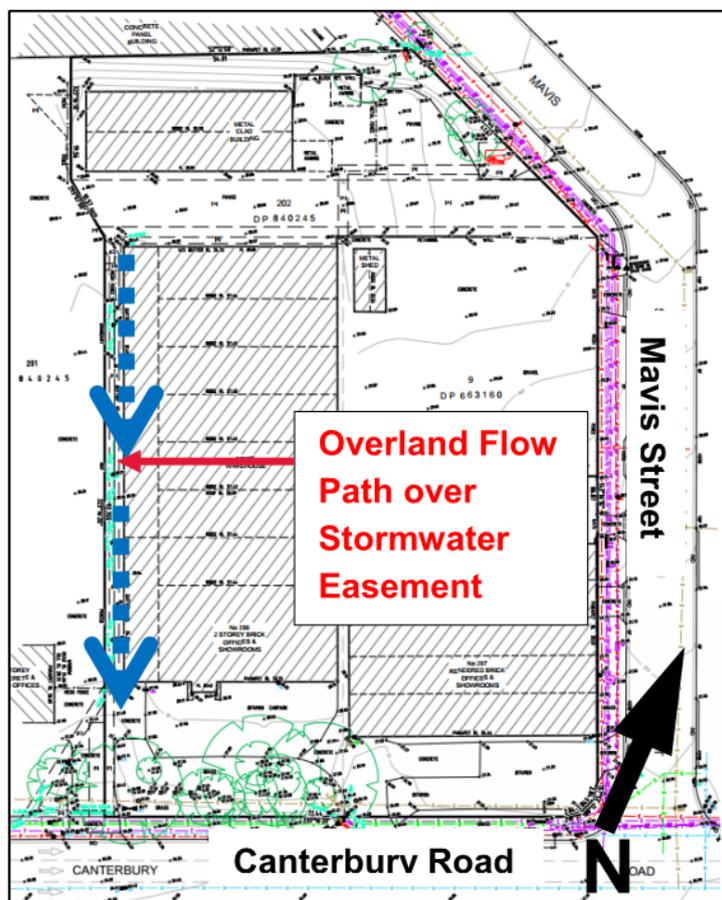


Figure 3 – Overland Flow Path over Stormwater Easement

Flooding of the site and the surrounding properties is expected to be derived by local overland flow from the neighbouring site, 299A Canterbury Road. Flow from this neighbouring site travels downstream and into the stormwater easement that runs between the two sites along the site boundary via the aforementioned easement. Flows continue downstream toward Canterbury Road, where the pit and pipe network in the road conveys flows from minor flood events, while major flood events are shown to overtop Canterbury Road and continue downstream through the properties on the south side of Canterbury Road.

Due to the high urbanisation of the upstream catchment, a quick response time is expected following commencement of rainfall. The Fairford Road Catchment Flood Study and Report suggests that the critical duration in the vicinity of the subject area ranges from 25 minutes to 2 hours and as such, the peak is expected to occur very quickly following the commencement of rainfall.

### Peak Flood Levels, Depth and Velocities

Peak flood levels for both the 1% AEP and Probable Maximum Flood (PMF) events are summarised in Table 5 below. The below flood level data is based on the information provided within Council's Stormwater System report.

It is important to note that the events defined in the below Table 5 are rare to extreme events which are not expected to occur every time it rains. The 1% AEP is commonly referred to as the "100-year flood event" while, the PMF has a nominal Annual Exceedance Probability of 1 in 10 million.

**Table 5 – Peak Flood levels**

Event	Flood Level (mAHD)
1% AEP	28.6
PMF	28.7

The following Table 6 presents the estimated flood depth at both Canterbury Road and Mavis Street frontages based on the peak flood depths presented in Council's Stormwater System Report (2018).

**Table 6 – Estimated Maximum Flood Depths at Canterbury Road and Mavis Street Frontages**

Event	Estimated Depth at Canterbury Road Frontage (m)	Estimated Depth at Mavis Street Frontage (m)
1% AEP	Up to 0.2	Up to 0.2
PMF	Up to 0.3	Up to 0.2

The PMF depth and flood contours have been extracted from Council's Stormwater System Report (2018) and are presented in Figure 4.

Figure 4 shows that the maximum flood depth across the site is 200mm which is low. In combination with the low velocity, this should be safe for able bodied adults to traverse, if necessary. We do not recommend walking or driving through flood water.

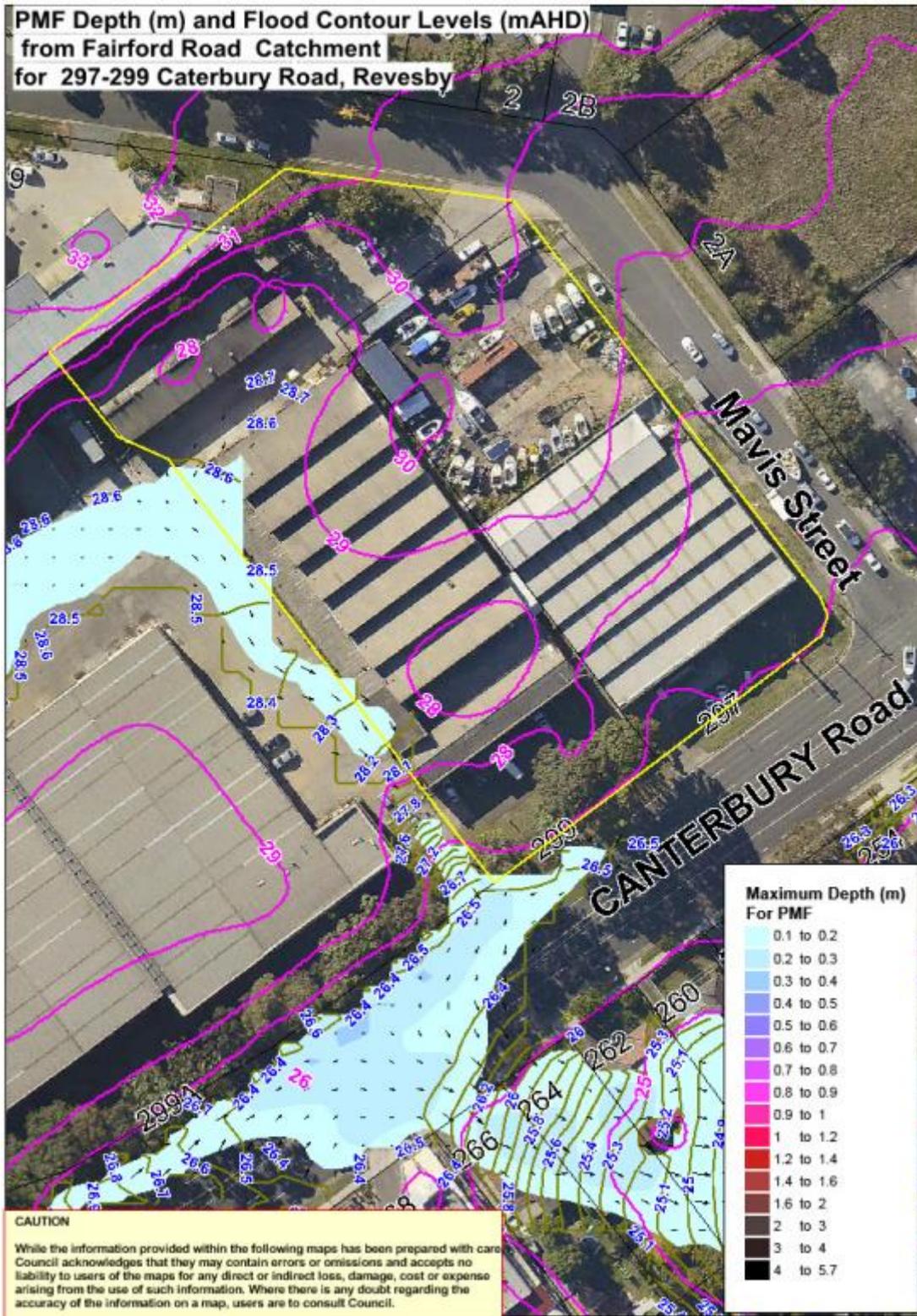


Figure 4 - PMF Depth and Contours

## Flood Hazard

An indication of likely flood hazard is given by multiplying the velocity of floodwater by depth. The latest Australian Rainfall and Runoff guidelines (ARR 2019) outline six hazard categories which are defined by the relationship between velocity and depth. The categories range from H1 to H6 with H1 being the lowest hazard category and H6 being the highest, with the most potential to create damage. These are defined below in Table 7.

**Table 7 - Hazard Categories as defined by ARR 2019**

Hazard Vulnerability Classification	Classification Limit (D and V in combination)	Limiting Still Water Depth (D)	Limiting Velocity (V)
H1	$D \cdot V \leq 0.3$	0.3	2.0
H2	$D \cdot V \leq 0.6$	0.5	2.0
H3	$D \cdot V \leq 0.6$	1.2	2.0
H4	$D \cdot V \leq 1.0$	2.0	2.0
H5	$D \cdot V \leq 4.0$	4.0	4.0
H6	$D \cdot V > 4.0$	-	-

Council's Stormwater System Report (2018) presents the velocity\*depth product, as shown below in Figure 5 for the PMF event.

The velocity depth product across the site is modelled to be between 0.05 to 0.1 m<sup>2</sup>/s during the PMF event which is low. This categorises the floodwaters in the H1 category which is generally safe for people, vehicles and buildings.

It is important to note that although the building may be able to withstand the flood flows during the PMF event, flood ingress could occur into the below ground basements. All staff, patients and visitors will not be safe in the lower levels of the facility. These areas, including basement level 1 and the three carparking levels below should be evacuated to the nominated onsite refuge location and not accessed during a flood event unless advised otherwise by emergency personnel.

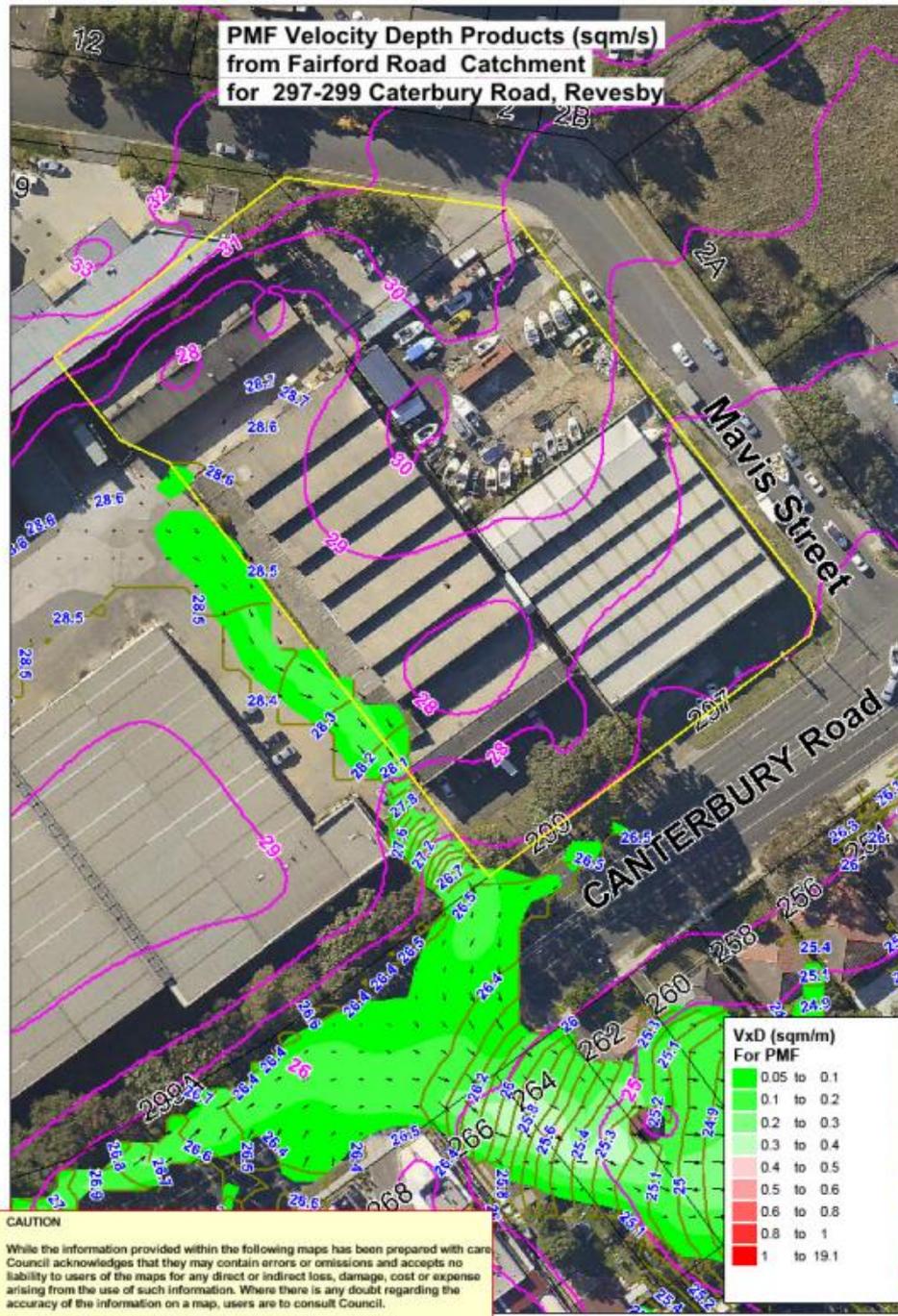


Figure 5 – Velocity x Depth product during PMF event (Council’s Stormwater System Report, 2018)

**Do not Drive or Walk through Floodwater.**

**Remember, If It’s Flooded, Forget It!**

## Flood and Evacuation Warnings

A network of rainfall gauge stations is maintained throughout the greater Sydney region. These provide information to the Bureau of Meteorology (BoM) as one source of information informing their flood warning system.

The Bureau should issue one of five types of warnings through local radio, television and through their website <http://www.bom.gov.au>. In addition, the SES may issue a flood bulletin, evacuation warning or evacuation order.

Due to the sensitive nature of this location, it is recommended the nominated Flood Wardens (described below) register for automatic text and email notifications from the Early Warning Network which filters and passes on BoM warnings.

The warning types are as follows:

### Severe Weather Warning

Severe weather warnings are issued by the Bureau for potentially dangerous weather conditions. A description of the threat will be included in the warning along with the time for next issue. It is noted that a severe weather warning does not imply that flooding will eventuate. Warnings are generally updated every six hours, or as the event dictates.

This type of warning should be accompanied with predicted extreme rainfall depth as discussed in the **Flood Response** section, as well as observed values from around the state.

### Severe Thunderstorm Warning

A severe thunderstorm warning will be issued if there is strong evidence that a severe thunderstorm will develop, or if a severe thunderstorm is reported. Flash flooding may occur during severe thunderstorms. Warnings are generally updated every three hours or shorter as required.

### Flood Alert/ Watch/ Advice

A flood alert/ watch/ advice will be issued if flood producing rain is expected. This provides an early warning that flooding may occur.

### Generalised Flood Warning

A generalised flood warning is to be issued when flooding is expected to occur in a given area. Three hours warning time is expected from issue of warning to peak flood level as per the "Service Level Specification for Flood Forecasting and Warning Services for New South Wales – Version 3.13" (Bureau of Meteorology, 2013).

This is the most likely warning type for the subject site should evacuation need to occur.

### Minor/ Moderate/ Severe Flood Warning

A more detailed flood warning may be issued based on any additional information available. Three hours warning time is expected from issue of warning to peak flood level.

All warnings will be issued through the website, radio and television. Radio frequencies include ABC Sydney (702AM), 2CH (1170AM), 2DAY FM (104.1FM), 2GB (873AM), 2GO FM(107.7FM), 2ME (1638AM), 2SM/GORILLA (1269AM), 2UE (954AM), Coast FM (96.3FM), MIX 106.5 (106.5FM), NOVA (96.9FM), Radio 2Moro (1620AM), SBS Radio (97.7FM), Star 1045 (104.5FM), Sydney's 95.3 (95.3 FM), Triple M (104.9FM), WFSM (101.7FM).

All public and commercial television stations should broadcast warnings.

### **SES Flood Bulletins**

The SES may issue a flood bulletin providing information of the likely flood consequences and recommended actions.

### **Evacuation Warning**

The SES may issue an evacuation warning which allows time to prepare for evacuation.

### **Evacuation Order**

The SES will issue an Evacuation Order if evacuation is required. If this occurs **evacuation must be undertaken**. Broadcast will be via radio/ TV, door knock, automated telephone message or SMS.

### **On-Site Emergency Communication**

The PA system is recommended it be configured to sound an emergency tone meaning all staff, patients and visitors in the basement levels below ground are to evacuate to ground level or above, and all other persons onsite are to shelter in place under the direction of staff and Flood Wardens. The tone will be tested every three months as a minimum.

Should a PA system be unavailable or inoperable in the event of an emergency, an air horn and handheld loudspeaker is located within the Flood Emergency Kit. These will be used to obtain people's attention and direct them to the emergency assembly point or facilitate evacuation offsite.

### **Early Warning Network Automated Text and Email Service**

The facility is to register for automatic alerts with the Early Warning Network ([www.ewn.com.au](http://www.ewn.com.au)) which will filter the above BoM warnings and send texts and emails to the Chief Flood Warden and all Flood Wardens to notify them of the situation.

## Flood Response Personnel

Summarised in Table 8 below are the facilities nominated emergency personnel, their location and responsibilities in managing flood response.

**Table 8 - Flood Response Personnel**

	Location	Responsibilities
<b>Chief Flood Warden</b>	On-site	<ul style="list-style-type: none"> <li>• Coordinate flood evacuation drills.</li> <li>• Monitor weather at 4pm daily for upcoming extreme rainfall events.</li> <li>• Receive notifications from the Early Warning Network.</li> <li>• Decide when Cancellation of activities, evacuation or refuge is required.</li> <li>• Communicate Cancellation and Evacuation to staff, patients and visitors.</li> <li>• Liaison with SES or Emergency Services personnel if they attend site.</li> <li>• Remain calm and direct visitors and staff through the emergency response procedures.</li> </ul>
<b>First Aid Officer</b>	On-site	<ul style="list-style-type: none"> <li>• Prepare and maintain Flood Emergency Kit.</li> <li>• Prepare and coordinate assistance for staff, patients and visitors with mobility difficulties.</li> </ul>
<b>Deputy Chief Flood Warden</b>	On-Site	<ul style="list-style-type: none"> <li>• Undertake Chief Flood Warden duties when Chief Flood Warden is unavailable.</li> <li>• Maintain calm and direct staff and visitors through the evacuation process.</li> </ul>
<b>Flood Wardens</b>	On-Site	<ul style="list-style-type: none"> <li>• Assist Chief and Deputy Chief Flood Warden with evacuations.</li> </ul>
<b>Staff</b>	On-site	<ul style="list-style-type: none"> <li>• Maintain calm and direct visitors onsite through evacuation or refuge processes.</li> </ul>

It is anticipated the Chief Warden, who oversees emergencies and evacuation will be nominated the role of Chief Flood Warden. It is recommended that at least one Flood Warden is assigned in each level and section of the facility.

All remaining staff are to assist the Flood Wardens with evacuation during a flood emergency.

## Assembly Point and Evacuation Routes

### Emergency Assembly Point

The following Figure 6 presents the nominated **Emergency Assembly Point** for flooding as the **Lobby on Ground Level**. All staff, patients and visitors within the basements below ground level are to immediately proceed to this location following declaration of an emergency. All other staff, patients and visitors on the ground floor or levels above are to shelter in place.

It is the responsibility of the Chief Flood Warden to make everyone onsite aware of the emergency and all staff, patients and visitors below ground level are to evacuate to the ground level refuge location early, prior to rainfall commencing.

It is possible that some patients may not be mobile at the time an emergency is declared. In such an event, these patients on ground level or the levels above should seek refuge in place, while any immobile patients in the basement level or below ground car parks will need to be relocated to the ground level or levels above by staff.

It should also be noted that major flood events are often accompanied by high winds and thunderstorms.

It is strongly recommended that in the event of a flood, the elevators are not used. There is the potential for flood waters to enter lift shafts, potentially disabling the lifts during a flood event.

Similarly, access into the basements should not be attempted. These areas have the potential for stormwater ingress during an extreme event and it is possible staff, patients or staff may become trapped.

In the event where a 1% AEP flood event or above is declared, the facility should cancel any non-essential procedures. This reduces the risk of people endangering themselves travelling to the facility.

There is a risk that power and essential services to the building may be cut off during a major flood event. We recommend back-up system to minimise the disruption in this case.

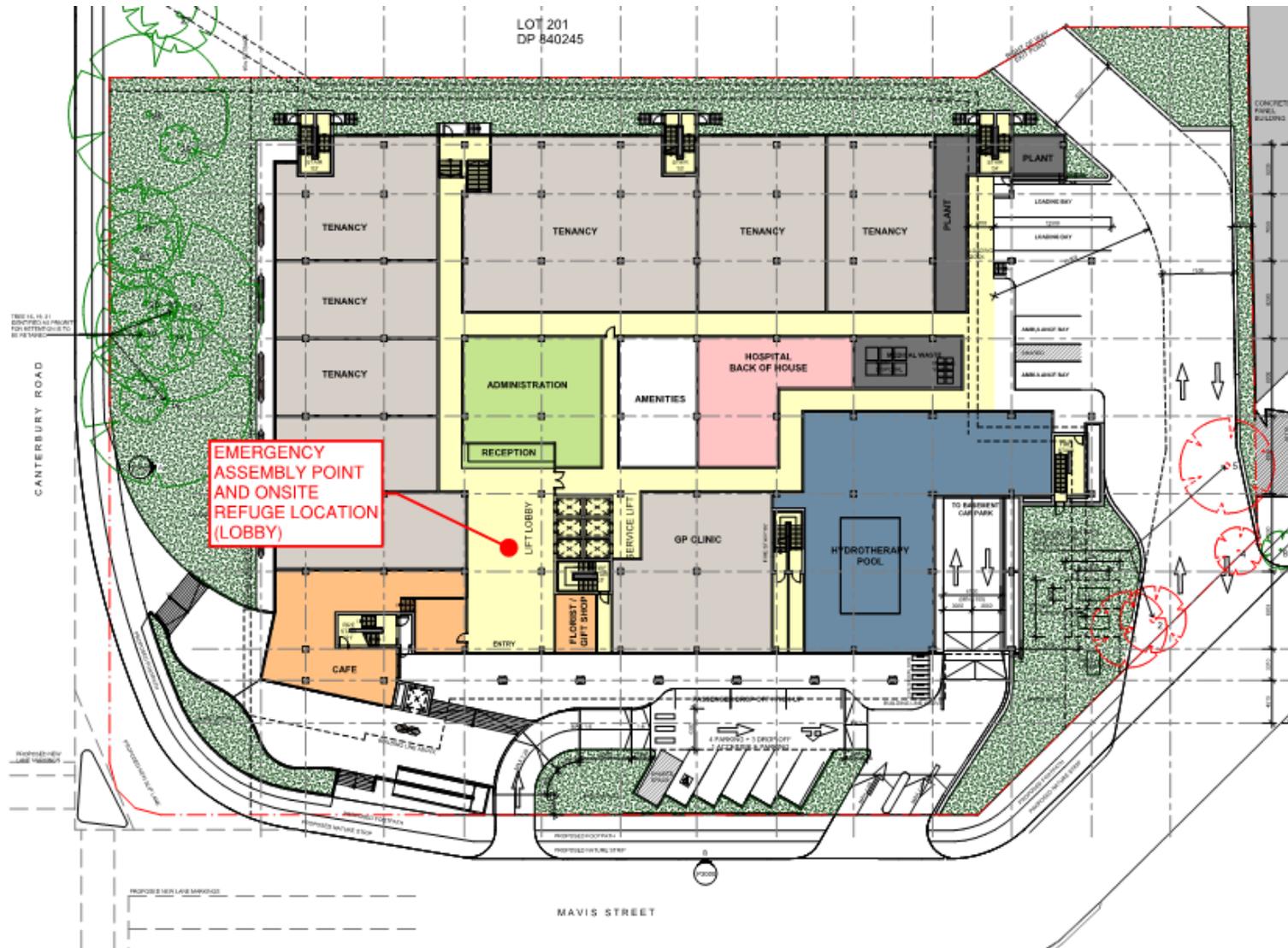


Figure 6 - Flood Emergency Assembly Point - Ground Level (Architectural Drawing Rev 1 dated 08.09.2020)

## Floor Levels and On-Site Refuge

### Floor Levels

The proposed medical facility has nine floors, six of which are considered habitable. The level of each floor is presented below in Table 9 (excluding basement car parks 02, 03 and 04). The floor levels with respect to the 1% AEP and PMF flood events are also presented in the below Table 9.

Table 9 - Internal Floor Levels

Floor	Level (m AHD)	Relationship to Flood Levels
<b>Basement Level 01 to 04</b>	Below 26.50	Below 1% AEP and PMF
<b>Ground Floor Level</b>	30.50	Above 1% AEP and PMF
<b>Level 01</b>	34.80	Above 1% AEP and PMF
<b>Level 02</b>	39.40	Above 1% AEP and PMF
<b>Level 03</b>	43.20	Above 1% AEP and PMF
<b>Level 04</b>	47.00	Above 1% AEP and PMF

### On-Site Refuge

In the event where an emergency is announced, refuge is to be sought on-site. As shown in Figure 6 above, all persons below ground level are to seek refuge in the **Ground Floor Lobby**. All other persons throughout the building including ground level and above are to **seek refuge in place**. We recommend staying onsite once rainfall has commenced.

The **Level 02, 03 and 04 lobby, public lounge and hallways** have also been nominated as additional **Refuge Spill Over Point**. Staff, patients and visitors may proceed to this secondary location **following roll call**, provided there is at least one Flood Warden at each of these refuge points, at all times. Level 02 is sited at an elevation of 39.40m AHD, approximately 10.7m above the PMF.

Should you become isolated on-site, move to **ground level** of the building and do not try to evacuate by foot or vehicle and never enter rising flood water.

**Call the SES on 132 500 if emergency supplies are getting low, or 000 if in a life-threatening situation. Remember if its flooded, forget it.**

### **Emergency Provisions for Essential Services**

It is recommended the following contingency measures be implemented and maintained to facilitate on-site refuge:

- Staff with first aid training on-site at all times during operation.
- Supply of medicines, non-perishable food items and bottled water to withstand isolation for 24 hours.

**Do not Drive or Walk through Floodwater.**

**Remember, If It's Flooded, Forget It!**

## Emergency Contact

For emergency assistance during flood events, please call the **SES** on **132 500**. The SES are also able to provide information on the surrounding area, including closed roads, fallen trees, etc.

If you are in a life-threatening situation please call **Police, Fire or Ambulance** on **000**.

## Flood Response Preparation

It is the responsibility of the staff to prepare the facility for a flood event. This will be achieved through; adequate design, induction training provided by the operator, nomination of flood wardens, education of flood risks and behaviour, and the preparation and maintenance of a *Floodsafe Emergency Kit*.

The information presented above is a summary of the flood behaviour and considered key to understanding the risks associated with flooding. This should be displayed in conjunction with other emergency information (such as fire, etc.) throughout the facility.

### Structural Certification

Certification should be provided by a suitably qualified structural engineer that the proposal building can withstand the forces of floodwater up to and including the PMF. This is due to the fact refuge on-site is recommended.

### Evacuation Drills

Evacuation drills are designed to increase flood awareness within the centre. These drills are to be undertaken twice per year to familiarise staff and facility users of the procedures when responding to a flood event.

It is also an opportunity to outline expected flood levels and dangers of entering flood water. The following link can be used as a resource for evacuating patients that are mobility impaired:  
<https://www.ses.nsw.gov.au/floodsafe/what-floodsafe-means-for-you/mobility-impaired/>.

For new staff it is expected they will be made familiar with the site flooding conditions and made familiar with the emergency procedures and response during the initial site induction.

### Floodsafe Emergency Kit

Although the storm event may only last a couple hours, there is the potential for flood water to remain for a longer period following completion of rainfall. As such, enough resources should be contained in the Flood Emergency Kit to ensure anyone trapped on site has enough supplies for a prolonged period. In the event were resources are getting low, the SES may be contacted to provide a re-supply/evacuation from the facility.

Potential items for a flood emergency kit are outlined at;  
<https://www.ses.nsw.gov.au/floodsafe/prepare-your-home/emergency-kit/>. Items outlined on the SES website and some additional items are presented below:

- Drinking water, medicines and non-perishable food items.
- A copy of the facilities emergency management plan.
- Chemical register.
- Air horn and hand-held loudspeaker.
- Portable radios with spare batteries.
- Torches with spare batteries.
- Lanterns with spare batteries.
- Two-way radio with spare batteries.
- A first aid kit.

- Candles and waterproof matches.
- Waterproof bag for valuables.
- A copy of emergency numbers.

The kit should be kept in the **Ground Level Amenities Room** in a roll trolley suitable for easy deployment in the event of an evacuation. The contents of the kit and management during a flood event will be the responsibility of the **First Aid Officer**.

### Storage of Sensitive Goods

#### TRIGGER FOR REVIEW AND EDUCATION:

- Three monthly checking of the emergency kit to ensure all items are in suitable working order.
- Six monthly evacuation drills and reminder of the flood risks.
- Inductions for new staff, highlighting the flood risk associated with the subject site.

**BY WHO:** Chief Flood Warden and First Aid Officer

All sensitive goods which are susceptible to damage from flood waters or, if exposed to floodwaters would have significant ramifications to the surrounding area, must not be stored in the basement car parks which are susceptible to flooding. The ground floor is above the PMF level and is therefore considered an appropriate place to store goods which are sensitive to water.

### Monitoring of Weather Situation

It is the responsibility of the Chief Flood Warden to monitor the weather situation and be aware if a warning has been issued. This will be achieved through automatic text messages and emails from the Early warning Network and checking of the local radio stations and the Bureau website.

#### TRIGGER FOR MONITORING:

- Continuous, 4pm daily

**BY WHO:** Chief Flood Warden

# Flood Response Actions

## Cancellation of Non-Essential Operations

In order to minimise the risk to life, it is recommended all non-essential services be cancelled if a **Generalised Flood Warning** or **Severe Weather Warning** with nominated rainfall depth equivalent to a 1% AEP flood event as presented in the following Table 10.

Table 10 - Rainfall triggers for cancellation

Rainfall Depth (mm)	Timescale
51	25-mins
77	1-hour
91	1.5-hours
102	2-hours

Once rainfall has commenced, refuge is to be sought on-site as discussed overleaf.

The aim is to eliminate/reduce the risk to life by removing as many staff, patients and visitors from the floodplain prior to the commencement of rainfall, provided there is enough time for them to return to a safe place of residence.

The Chief Flood Warden is responsible for reviewing the weather forecasts daily and notifying facility users and staff of the decision to close the facility and seek refuge on-site.

When a warning is received, consideration should be given to:

- Cancelling services and appointments for the day of the event.
- Blocking floor wastes and toilets.
- Securing objects that are likely to float and cause damage.
- Relocating chemicals above the predicted water level.
- Moving vehicles away from the site where possible.
- **Wait it out** at the designated refuge points.

## Refuge On-Site

Refuge can and should be sought onsite following notification or a major flood event or commencement of rainfall. The procedure for refuge on site should be carried out as the following:

- Sound air horn or PA system;
- Communicate decision to remain onsite.
- Communicate to all persons in basement levels (below ground level) to move to the emergency assembly point on ground level.
- Direct everyone in basement levels to Emergency Assembly Point.
- Assure the remaining staff, patients and visitors throughout the ground floor and levels above to remain in place and seek refuge onsite.

- Roll call to ensure everyone is accounted for.
- Explain that refuge is being sought on-site and the measures in place to make this safe to maintain calm.
- Seek Refuge and Wait it Out.

#### **TRIGGERS FOR REFUGE ONSITE**

- **Commencement of rainfall** in event when a **Severe Weather Warning** or **Generalised Flood Warning** is current.
- **Evacuation and off-site refuge is deemed impossible**

**RESPONSIBLE FOR THE DECISION:** Chief Flood Warden

It should also be noted that major flood events are often accompanied by high winds and thunderstorms. We recommend having NSW ambulances on standby at the hospital in case the hospital loses power during a flood event.

#### **Emergency Services Attending Site**

There is a possibility that emergency services such as Police, Fire, Ambulance or SES may attend site and assume control from the Chief Flood Warden. Once this has occurred, they are in control of the site and any response operations.

#### **TRIGGERS FOR EMERGENCY SERVICES TAKE CONTROL:**

- Police, Fire, Ambulance or SES attending site.

**RESPONSIBLE FOR THE DECISION;** Chief Flood Warden

#### **After a Flood**

Once a Final Flood Warning or SES “All Clear” has been received:

- A thorough check of services such as electricity, sewer, water and gas should be undertaken by qualified persons.
- Advice should be sought from a suitably qualified engineer as to the structural integrity of buildings prior to their use.
- Personal protective equipment should be worn during the clean-up and disinfectant used.

#### **TRIGGER FOR RETURN:**

- All clear given by SES or emergency services and building inspected by representatives appointed by the department of education.

**BY WHO:** SES, Emergency services, Flood wardens

## Revision of this Flood Evacuation Plan

This plan should be revised if the flood study for the Fairford Road Catchment is reviewed to capture changes in the catchment since the last study and the new design rainfall patterns developed as part of Australian Rainfall and Runoff 2019.

Notwithstanding the above, this plan shall be **revised every three years** or when there is a major operational change or flood event.

Revisions should be undertaken by a suitably qualified flood emergency response consultant.

## Conclusion

The subject site is affected by flooding caused by overland flow from the upstream catchment. A review of the proposed development has been undertaken in conjunction with the expected flood behaviour and it was concluded that:

- **Nominated flood wardens** will provide adequate direction in flood emergencies.
- **Cancellation of operations** is preferable prior to major and extreme events to eliminate community exposure to flood hazards.
- If rainfall has commenced for a predicted major or extreme event, all persons on ground level or above can **shelter in place on-site**, while all persons within the basement levels must move to the ground level refuge location. Refuge is available in the ground floor lobby for visitors, and all levels above and including the ground floor for staff, patients and site personnel.
- Through adoption of this plan, the proposed development adequately minimises the flood risks associated with the subject site. The recommendations contained herein assist in managing the risk to life of the staff, facility users and visitors to the subject site.

## References

- |                       |        |  |
|-----------------------|--------|--|
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