

NEPEAN CREATIVE AND PERFORMING ARTS HIGH SCHOOL

FLOOD RISK MANAGEMENT PLAN



Prepared for: Schools Infrastructure NSW
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NEPEAN CREATIVE AND PERFORMING ARTS HIGH SCHOOL

FLOOD RISK MANAGEMENT PLAN

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Executive Summary

enstruct Group have been engaged by Schools Infrastructure NSW (SINSW) to provide a Flood Risk Management Plan (FRMP) for the development of Nepean Creative and Performing Arts High School at 115-119 Great Western Highway, Emu Plains.

The aim of the FRMP is to assess the impact of a 1% Annual Exceedance Probability (AEP) storm and larger events up to and including the Probable Maximum Flood (PMF), and recommend appropriate procedures to maximise safety and reduce risk of death and injury due to flooding and flood water. This report will raise awareness of the risk of flooding and will include flood warnings, safe evacuation routes, designated safe assembly areas, and evacuation management plans.

The FRMP will also discuss the flooding conditions in the vicinity of the site, proposed methods of detecting flooding, proposed routes for refuge, and details of management of all personnel on site during a flooding event.

Nepean River flooding is monitored by gauges and informs emergency services hours prior to flood water rising. Flood bulletins and weather warnings will inform flood threat level.

The site is located within a Low Flood Island as categorised by Penrith City Council and it is recommended that all site occupants are to leave the site following Nepean River flood warnings being issued, whilst evacuation routes are safe to utilise.

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I. Definitions

For the purpose of this Plan, the definitions below apply:

Assembly area(s)

The designated place or places where people assemble during the course of an evacuation.

Emergency

An event that arises internally, or from external sources, which may adversely affect the occupants or visitors in a facility, and which requires an immediate response.

Emergency plan

The written documentation of the emergency arrangements for a facility, generally made during the planning process. It consists of the preparedness, prevention and response activities and includes the agreed emergency roles, responsibilities, strategies, systems and arrangements.

Emergency Planning Committee (EPC)

Elected persons from the school community who are responsible for the documentation and maintenance of the flood risk management plan and strategy at Nepean Creative and Performing Arts High School.

Emergency Control Organiser (ECO)

A person or persons appointed by the emergency planning committee to direct and control the implementation of the facility's emergency response procedures.

Evacuation

The orderly movement of people from a place of danger.

Refuge

An area that is specifically designed to protect people from flood and provides direct access to an exit (SES).

Notes:

1. An area of refuge is intended to facilitate a safe delay in egress from the floor or area, thus constituting a space for people to await assistance for their evacuation.
2. Refuges are normally nominated by the relevant warden.

Warden intercommunication point (WIP)

The location on a floor or evacuation zone that includes a handset provided through which instructions can be received from the intercommunication panel via the emergency intercom system.

II. Abbreviations

The following abbreviations are used in this Emergency Plan document:

AHD	Australian Height Datum
AEP	Annual Exceedance Probability
AP	Assembly Point
ARI	Average Recurrence Interval
DDA	Disability Discrimination Act
ECO	Emergency Control Organization
EPC	Emergency Planning Committee
FERP	Flood Emergency Response Plan
FRMP	Flood Risk Management Plan
FFL	Finished Floor Level
PMF	Probable Maximum Flood
SES	State Emergency Service
WIP	Warden Intercommunication Point

1 Introduction

The site is located within the Penrith City Council Local Government Area (LGA). This report is based on flood information obtained from:

- Penrith City Council Nepean River Flood Study;
- Penrith City Council Stormwater Drainage Policy;
- Flood Planning Certificate issued by Elias Ishak (Penrith City Council) dated 24 November 2020; and
- enstruct prepared Flood Statement dated 21 January 2021.

1.1 Site Location

Nepean Creative and Performing Arts High School is located at 115-119 Great Western Highway (Figure 1), Emu Plains, within the Penrith City Council Local Government Area (LGA). The school site has an area of approximately 12.30ha. Site levels fall gently from south to north towards the train line, from RL 26m AHD at the southern boundary, to RL 24.5m AHD along the northern boundary (Figure 2). The site is bounded by a railway track to the north, Old Bathurst Road to the north east, the Great Western Highway on the south east, and residential buildings along Gardenia Avenue on the south western boundary.

1.2 Hall Location

The school site, as per the Penrith City Council Nepean River Flood Study and as shown in Figure 3, is free from 1% AEP flooding impacts, but is impacted by the 0.5% AEP event.



Figure 1: Site Location (Source: Google Maps)



Figure 2: Site Contours (Source: Penrith Council)

2 Flood Risk

Penrith City Council provides a Nepean River Flood Study which indicates that the Nepean Creative and Performing Arts High School as a whole is impacted by 1% AEP and larger storm events. **Figure 3** and **Figure 4** indicate the susceptibility of the site to flood hazards in the 1% AEP and PMF storm events respectively, due to its proximity to the Nepean River.

Advice from Council indicates that the site is located in a Low Flood Island which causes the evacuation routes to be obstructed for storms at and above the 1% AEP.



Figure 3: Penrith City Council 1% AEP storm event flood depths and extents (Source: Nepean River Flood Study Volume 2 Flood Maps)

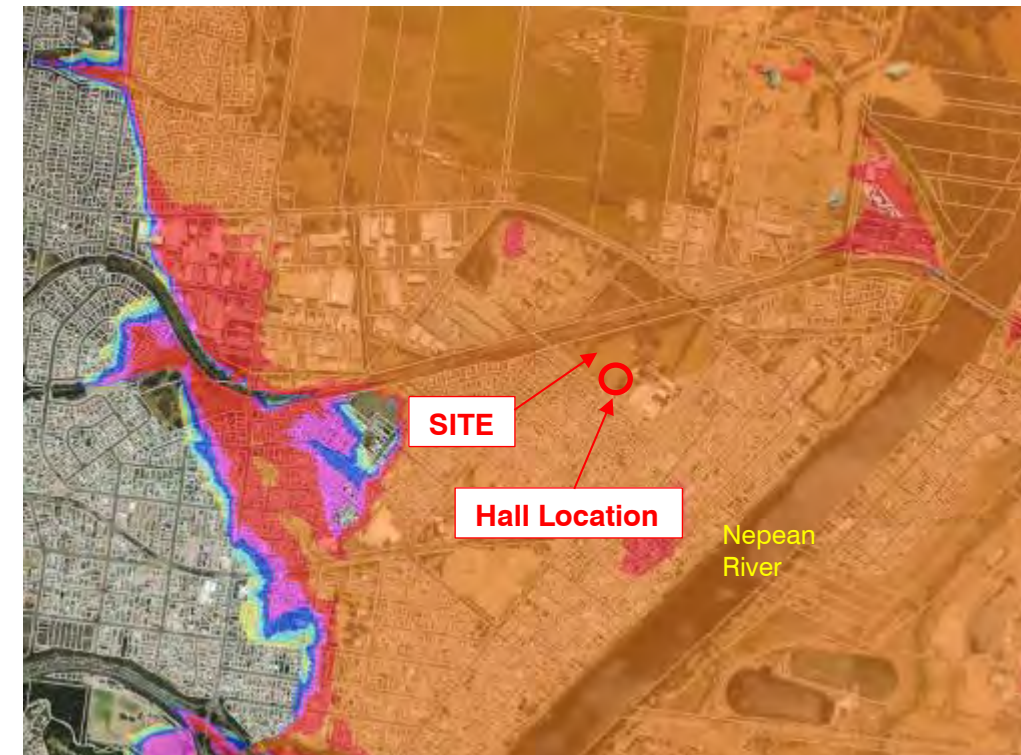


Figure 4: Penrith City Council PMF storm event flood depths and extents (Source: Nepean River Flood Study Volume 2 Flood Maps)

3 Flood Planning Requirements

A minimum freeboard of 500mm over the 1% AEP water surface level shall be provided for habitable floor levels, 100mm freeboard for garages and non-habitable flood levels, and 300mm for crest of driveway ramps, as per the Penrith Stormwater Drainage Policy requirements (Section 3.1.2 Table 4).

A Flood Planning Certificate issued by Elias Ishak (Penrith Council) indicates a Flood Planning Level of RL 26.50m AHD (**Appendix A**) is to be applied to the proposed hall.

4 Flood and Evacuation Warnings

There are a number of official flood warnings issued by the Bureau of Meteorology, State Emergency Service (SES) and NSW Police which can assist in the preparation of a potential flood. The warning types are:

Severe Weather Warnings (Bureau of Meteorology):

Severe Weather Warnings are provided for potentially hazardous or dangerous weather that is not directly related to severe thunderstorms, tropical cyclones or bushfires. They are issued for sustained winds of gale force; wind gusts of 90km/h or more; very heavy rain that may lead to flash flooding and abnormally high tides.

Severe Thunderstorm Warnings (Bureau of Meteorology):

A Severe Thunderstorm Warning is issued if the severe phenomena are directly caused by the thunderstorm and include wind gusts of 90km/h or more; gale force winds; tornados; blizzards\ heavy rainfall that is conducive to flash flooding; hail with a diameter of at least 2cm; abnormally high tides and unusually large surf waves expected to cause dangerous conditions on the coast.

Flood Watch (Bureau of Meteorology):

A Flood Watch is issued by the Bureau of Meteorology if flood producing rain is expected to happen in the near future and flooding is expected to be above Minor level. A Flood Watch covers a river basin or catchment. The general weather forecasts can also refer to flood producing rain. You should be prepared to act should flooding occur.

Flood Warning (Bureau of Meteorology):

A Flood Warning is issued by the Bureau of Meteorology when flooding is expected to occur or is happening. Flood Warnings provide a predicted flood level and time at which a river will reach that level. Flood Warnings are issued in relation to flood gauges which are situated at a certain point on a river. Flood Warnings may contain observed, peak or predicted river heights.

The address below can be visited to check flood warnings for the Nepean River.

<http://www.bom.gov.au/nsw/warnings/flood/nepean-hawkesburyrivers.shtml>

NSW SES Flood Bulletins (SES):

NSW SES Flood Bulletins provide information on likely flood consequences and what actions are required to protect yourself and your property.

Evacuation Warning (SES):

When flooding is likely to cut evacuation routes or inundate property, the NSW SES issues an Evacuation Warning to indicate that you should get prepared to evacuate. Being prepared will allow you to respond quickly if an Evacuation Order is issued.

The Hawkesbury Nepean River Valley flood sensors will issue an evacuation warning to the Hawkesbury-Nepean catchment area for water heights above 8.9m in the Nepean River, 6-8 hours prior to the flood risk occurring (SES Provision of and Requirements for Flood Warning Report dated February 2018).

In the unlikely event that Warragamba Dam breaks, the SES will not be able to give prior warning. Once the evacuation warning is issued, staff and students are to leave the site as soon as possible.

Other warnings will be:

Monitor the flood situation:

In addition to receiving an official warning, monitoring the situation before flooding begins to impact the site is important. Monitoring the situation can be undertaken by personally witnessing the height and rate at which floodwaters are rising; maintaining contact with other people in the building and local and government radio stations to receive and share updates on the flood situation.

The likelihood of flash flooding:

Severe Weather Warnings and Severe Thunderstorm Warnings issued by the Bureau of Meteorology warn of the possibility of flash flooding.

When flash flooding is likely, leaving low-lying businesses (evacuation) well before flash flooding begins is the best action to take, but only if it is safe to do so. If you are trapped by rising floodwater, seek refuge in the nearest building within the school site. Stay there and call '000' (triple zero) if you need rescue.

All warnings will be issued through the Bureau of Meteorology website, television and local radio stations for weather warnings such as 702 ABC SYDNEY 702 AM, 2CH 1170 AM, 2DAY FM 104.1 FM, 2GB 873 AM, 2ME 1638 AM, 2SM/GORILLA 1269 AM, 2UE 954 AM, C91.3 FM 91.3 FM, MIX 106.5 106.5 FM, NOVA 96.9 FM, RADIO 2MORO 1620 AM, RADIO 2RDJ 88.1 FM, SBS RADIO 97.7 FM, SYDNEY'S 95.3 95.3 FM, TRIPLE M 104.9 FM and WFSM 101.7 FM.

5 Flood Response Preparation

It is the responsibility of the Emergency Planning Committee as part of the site Emergency Management Plan that they prepare the building for a flood event. This will be achieved through induction training, nomination of flood wardens reporting to the Chief Warden, education of flood risks and behaviour, and the preparation and maintenance of a Floodsafe Emergency Kit.

The Emergency Planning Committee is also to organise evacuation drills and flood emergency kits to prepare all site personnel for flood risks.

5.1 Evacuation Drills

Evacuation drills run through the flood management procedure onsite and are designed to increase flood awareness for all students, staff, and visitors of the campus. These drills are to be undertaken annually to familiarise all personnel of the procedures when responding to a flood event.

5.2 Flood Emergency Kit

Potential items for a flood emergency kit are outlined at www.floodsafe.com.au and reproduced below:

- A copy of the building Emergency Management Plan;
- A torch with spare batteries;
- A first aid kit;
- Waterproof bag for valuables;
- A copy of emergency numbers; and
- Battery operated radio with AM and FM frequency access (with spare batteries).

The kit should be kept in each classroom or office area for efficient deployment in the event of an emergency. The contents of the kit and management during a flood event will be the responsibility of the Chief Warden. This storage area should also be used for protecting hazardous materials and valuable goods from flood water.

6 Flood Response Personnel

Summarised below are the personnel involved in the management of the flood response at the site, and corresponding responsibilities.

Table 1: Personnel and Responsibilities

Personnel	Responsibility
Emergency Control Organisation	<ul style="list-style-type: none">• Coordinate flood evacuation drills
Chief Warden	<ul style="list-style-type: none">• Monitor weather daily for upcoming extreme rainfall events;• Decide when evacuation is required;• Liaise with SES or Emergency Services personnel if they attend site; and• Manage the evacuation process in consultation with Emergency Services.

7 Emergency Contact

The Chief Warden is to be contactable via the WIP phone at all times to ensure they are ready to assist any students or staff.

- For emergency assistance during flood events, please call the SES on 132 500.
- If you are in a life-threatening situation please call Police, Fire or Ambulance on “000” (triple zero).
- Local Penrith Police Station on 4721 9444.

8 Assembly Point (AP) and Evacuation Routes

As per **Section 2**, the school site is located in a Low Flood Island. This requires a unique evacuation plan in the event of a flooding emergency as the nature of the site causes the evacuation routes to be obstructed for storms at and above the 1% AEP.

Since the official SES flood warnings will be issued to the LGA 6-8 hours prior to a flood emergency in the Nepean River catchment area, it is recommended that the school campus is shut to prevent people from entering the site if the warning is issued overnight, or students are to assemble with a teacher to register that they are present before organising to leave the site into suitable care or to travel home. This warning buffer allows sufficient time for site occupants to leave the site through provided evacuation routes before they are obstructed as the water level rises in large storm events. If occupants delay leaving the site they may become isolated by the flood water as the site is in a Low Flood Island which may prevent safe exit from the site until the storm event subsides.

As the site is bounded by a railway track and the Great Western Highway, the staff and students are to remain in classrooms and evacuate under the guidance of emergency services and teachers. All people are to use the site entry/exit shown in **Figure 5**.

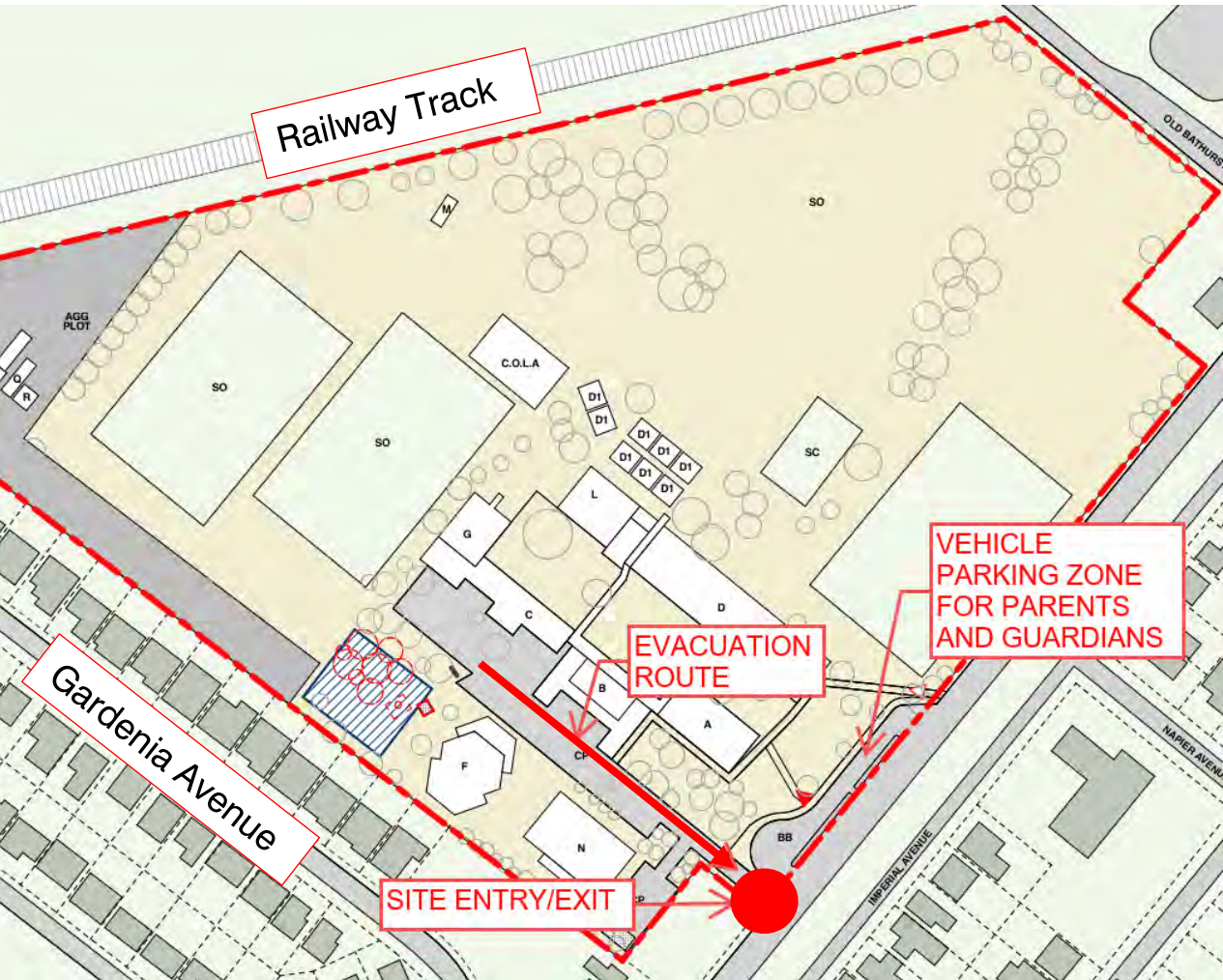


Figure 5: Evacuation Route and Site Entry/Exit

9 Flood Response Actions

9.1 Evacuation during Work Hours and After hours

This section relates to flood notifications of the Nepean River and not a dam break. Once a Flood Warning or Flood Bulletin for the Emu Plains area or Penrith City Council LGA has been issued;

- Sound evacuation tone;
- Chief Flood Warden to be on hand if staff call or require guidance;
- Leave signage at site entrance that evacuation has occurred;
- Chief Flood Warden to make contact with emergency services to request assistance;
- Staff to supervise all students in their care and take a roll of attendance;
- Staff to assist students in their care to organise a suitable relocation to a safe refuge;
- Students and teachers to move towards the site entrance in an orderly fashion when transport arrives;
- Chief Flood Warden to maintain regular communication with students, staff and visitors, providing updates on the situation;
- Site to be shut down, where possible of all, but essential power; and
- Staff to leave the site following student evacuation.

9.2 Dam Break

In the unlikely event of a dam break or a catastrophic failure at Warragamba Dam, the time staff and students have to safely evacuate the school campus is reduced as these events will cause a more sudden volume and velocity of water to flow over the banks of the river. Students and staff should follow the same procedure as identified in **Section 9.1** but must exit the school premises as soon as possible.

10 Revision of Flood Emergency Response Plan

This plan should be reviewed if the Penrith City Council requirements or Penrith City Council Nepean River Flood Study, Plans and Maps are revised, and if the street drainage surrounding the site is upgraded.

The Emergency Planning Committee shall be responsible for ensuring the Flood Risk Management Plan is reviewed annually and updated as required. As part of the review, the Emergency Planning Committee shall contact Council annually to confirm if any new street drainage upgrades are planned or have been constructed.

11 Conclusion

Since the official flood warnings will be issued to the Hawkesbury-Nepean catchment area 6-8 hours prior to a flood emergency in the Nepean River, it is recommended that the campus occupants leave the site at the time of warning. This allows for sufficient time to leave the site through provided evacuation routes before they are obstructed as the water level rises in large storm events. If occupants delay leaving the site they may become isolated by the flood water as the site is in a Low Flood Island which may prevent safe exit from the site until the storm subsides.

It is the responsibility of the Emergency Planning Committee as part of the site Emergency Management Plan that they prepare the building for a flood event. This will be achieved through induction training, nomination of flood wardens reporting to the Chief Warden, education of flood risks and behaviour, and the preparation and maintenance of a Floodsafe Emergency Kit.

This FRMP is to be reviewed if Penrith City Council Nepean River Flood Study, Plans and Maps are revised, and if the street drainage surrounding the site is upgraded.

Yearly review of this plan required to ensure procedures and contacts are current.