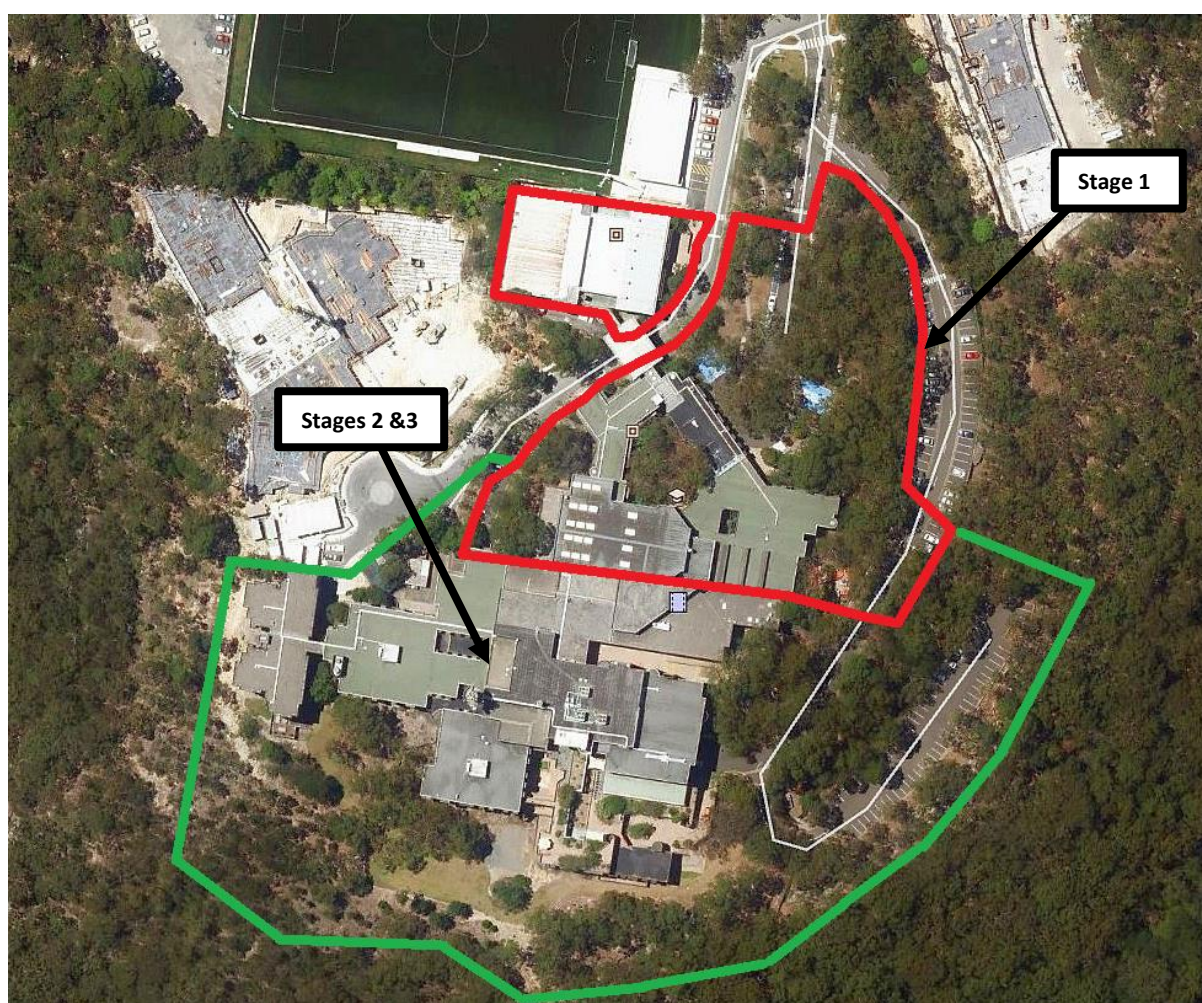


# **Flood Emergency Management Plan**

## **Lindfield Learning Village Stage 2 & 3**

### **Schools Infrastructure NSW**

**100 Eton Road, Lindfield NSW 2070**



<b>DOCUMENT TITLE</b>	Flood Emergency Management Plan
<b>PROJECT</b>	Lindfield Learning Village Stage 2 & 3
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## EXECUTIVE SUMMARY

This Flood Emergency Management Plan has been prepared by EFWW on behalf of School Infrastructure NSW. It accompanies a Response to Submissions Report in support of State Significant Development Application (SSD 16\_8114) for Lindfield Learning Village (the site).

The purpose of this Flood Emergency Management Plan is for the management of an evacuation due to a flooding event and to promote a situational awareness of expected flooding behaviour and risks, identify measures to become flood prepared, and recommended course of action during and after flood events.

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

This plan is based on the understanding of the stormwater behaviour within the school precinct as identified in the report Overland Flow Assessment and Stormwater Management prepared by EFWW (ref:21951 issue:N).

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# 1 INTRODUCTION

## 1.1 PURPOSE

EWFW Consulting Engineers Pty Ltd (EWFW) has been engaged to prepare a Flood Emergency Evacuation Plan for the proposed Lindfield Learning Village development (the site) at 100 Eton Road, Lindfield. The preparation of this plan is based on our understanding of the existing topography of the site and its surroundings, the proposed development works and the constraints surrounding this development.

In undertaking the preparation of this manual, EWFW hereby advises that it has no control over any approvals, additional third-party requirements, competitive development costs, nor does it have any control over any increase in statutory or service fees, nor can guarantee the capacity of the drainage system for future developments. All existing infrastructure that is to be retained should be inspected prior to commencement of works and post completion of works to ensure its integrity for ongoing use.

This plan produced by EWFW is provided on an as is basis of its best judgement and accepted engineering practices at the time of writing.

## 1.2 SITE LOCATION

The site is located within Ku-ring-gai Council's (Council) local governing area. The site is currently developed with multiple buildings, roads and carparks, landscaped areas and heavily vegetated areas.



FIGURE 1-1 - SITE LOCATION PLAN - GOOGLE MAPS

## 1.3 REFERENCE DOCUMENTS

The following documents have been reviewed in order to develop this report and should be read in conjunction to this report:

TABLE 1-1 REFERENCE DOCUMENTS

Document	Reference
Ku-ring-gai Council Development Control Plan 2016 Part 24	DCP 24
NSW State Emergency Services – Flood Safe Website 2016 accessed from <a href="http://www.floodsafe.com.au">http://www.floodsafe.com.au</a>	SES FSW
NSW State Emergency Services - Emergency Business Continuity Plan 2017 accessed from <a href="http://www.sesemergencyplan.com.au/business/index.php">http://www.sesemergencyplan.com.au/business/index.php</a>	SES EBCP
Bureau of Meteorology Service Level Specification for Flood Forecasting and Warning Services for New South Wales and the Australian Capital Territory – Version 3.13 2013	BOM FFWS
Department of Agriculture, Water and the Environment – Australia's Biodiversity and Climate Change 2009	ABCC
EWFW Overland Flow Assessment and Stormwater Report 2020	21951R001

## 1.4 GLOSSARY OF TERMINOLOGY

TABLE 1-2 GLOSSARY TABLE

Annual Exceedance Probability (AEP)	The chance of a storm event of a given size occurring in any one year, expressed as a percentage. For example, if a peak flood discharge of 500 m <sup>3</sup> /sec has an AEP of 5%, it means that there is a 5% chance (i.e. a 1 in 20 chance) of a peak discharge of 500 m <sup>3</sup> /s (or larger) occurring in any one year. (see also average recurrence interval)
Australian Height Datum (AHD)	National survey datum corresponding approximately to mean sea level.
Astronomical Tide	Astronomical Tide is the cyclic rising and falling of the Earth's oceans water levels resulting from gravitational forces of the Moon and the Sun acting on the Earth.
Attenuation	Weakening in force or intensity.
Average Recurrence Interval (ARI)	The estimated average time period between random rain events of the same duration and size as a probability of occurring in any one year. For example, if a peak discharge of 500m <sup>3</sup> /sec has an average recurrence interval of 20 years based on historical data, it means that there is a 1 in 20 chance of an event occurring in any one year. (see also annual exceedance probability)
Calibration	The adjustment of model configuration and key parameters to best fit an observed data set.
Catchment	The area of land that drains to a point.
Design flood event	A hypothetical flood event representing a specific likelihood of occurrence (for example the 100 year ARI or 1% AEP storm event).
Development	Existing or proposed works that may or may not be impacted by flooding.
Discharge	The rate of flow of water measured in terms of volume per unit time, for example, cubic meters per second (m <sup>3</sup> /s).



Flood	Relatively high stormwater flows, which overtop the natural or artificial banks, and inundate floodplains and/or coastal inundation resulting from super elevated sea levels and/or waves overtopping coastline defences.
Flood behaviour	The pattern / characteristics / nature of a flood.
Flood fringe	Land that may be affected by flooding but is not designated as floodway or flood storage
Flood hazard	A source of potential harm or a situation that has potential to cause harm.
Flood level	The height or elevation of floodwaters relative to a datum (typically the Australian Height Datum). Also referred to as “stage”.
Flood liable land	see flood prone land
Floodplain	Land that is periodically inundated due to floods. The floodplain includes all land that is susceptible to inundation by the probable maximum flood (PMF) event.
Floodplain management	The co-ordinated management of activities that occur on the floodplain.
Floodplain risk management plan	A document outlining a range of actions aimed at improving floodplain management. The plan is the principal means of managing the risks associated with the use of the floodplain. A floodplain risk management plan needs to be developed in accordance with the principles and guidelines contained in the NSW Floodplain Management Manual. The plan usually contains both written and diagrammatic information describing how particular areas of the floodplain are to be used and managed to achieve defined objectives.
Flood planning levels (FPL)	Flood planning levels selected for planning purposes are derived from a combination of the adopted flood level plus freeboard, as determined in floodplain management studies and incorporated in floodplain risk management plans. Selection should be based on an understanding of the full range of flood behaviour and the associated flood risk. It should also consider the social, economic and ecological consequences associated with floods of different severities. Different FPLs may be appropriate for different categories of land use and for different flood plans. The concept of FPLs supersedes the “standard flood event” in past NSW FDMs. As FPLs do not necessarily extend to the limits of flood prone land, floodplain risk management plans may apply to flood prone land beyond that defined by the FPLs.
Flood prone land	Land susceptible to inundation by the probable maximum flood (PMF) event. Under the merit policy, the flood prone definition should not be seen as necessarily precluding development. Floodplain Risk Management Plans should encompass all flood prone land (i.e. the entire floodplain).
Flood risk	The potential danger to life and potential damage to property resulting from flooding. The degree of flood hazard varies with circumstances across the full range of flood events.
Flood source	The source of the floodwaters.
Flood storage	Floodplain area that is intended for the temporary storage of floodwaters during a flood event.
Floodway	Area of a floodplain that has an substantial amount of discharge during a flood event.
Freeboard	Factors of safety usually expressed as a height above the adopted flood level thus determine the flood planning level. Freeboard tends to compensate for factors such as wave action, localised hydraulic effects and uncertainties in the design flood levels.
Geomorphology	The study of the origin, characteristics and development of landforms.
Gauging (tidal and flood)	Measurement of flows and water levels during tides or flood events.
Historical flood	A flood that has actually occurred.
Hydraulic	Relating to water flow in rivers, estuaries and coastal systems; in particular, the evaluation of flow parameters such as water level and velocity.
Hydrodynamic	Pertaining to the movement of water.
Hydrograph	A graph showing how a river or creek’s discharge changes with time.
Hydrographic survey	Survey of the bed levels of a waterway
Hydrologic	Pertaining to rainfall-runoff processes in catchments
Hydrology	The term given to the study of the rainfall-runoff process in catchments
Hyetograph	A graph showing the distribution of rainfall over time.



Intensity Frequency Duration (IFD) Curve	A statistical representation of rainfall showing the relationship between rainfall intensity, storm duration and frequency (probability) of occurrence.
Isohyets	Equal rainfall contour.
Morphological	Pertaining to geomorphology
Peak flood level, flow or velocity	The maximum flood level, flow or velocity that occurs during a flood event.
Pluviometer	A rainfall gauge capable of continuously measuring rainfall intensity
Probable maximum flood (PMF)	An extreme flood deemed to be the maximum flood likely to occur.
Probability	A statistical measure of the likely frequency or occurrence of flooding.
Riparian	The interface between land and waterway. Literally means “along the river margins”
Runoff	The amount of rainfall from a catchment that actually ends up as flowing water in the river or creek
Stage	See flood level.
Stage hydrograph	A graph of water level over time.
Sub-critical	Refers to flow in a channel that is relatively slow and deep.
Topography	The shape of the surface features of land
Velocity	The speed at which the floodwaters are moving. A flood velocity predicted by a computer flood model is quoted as the depth averaged velocity, i.e. the average velocity throughout the depth of the water column or velocity across the whole river or creek section.
Validation	A test of the appropriateness of the adopted model configuration and parameters (through the calibration process) for other observed events.
Water level	See flood level.

## 2 METHODOLOGY

The existing site is currently developed and is occupied by multiple buildings, internal road network and carparking system, and landscape areas to which it has a mix of impervious and pervious areas. The site stormwater runoff flows into the Blue Gum Creek drainage system through the existing internal site infrastructure that discharges into Council's stormwater system for drainage conveyance onto Blue Gum Creek.

The Flood Emergency Management Plan has been prepared based on an overland flow assessment and findings as detailed in EWWF report 21951R001. This report details the information pertaining to the flow routes, depths and velocities which have been used to prepare the plan. In addition to this, the plan is also based on flood information obtained from the Ku-ring-gai Council through a Flood Enquiry Application and subsequent correspondence with Council.

As the site is currently situated at the top of the catchment, the site is not subjected to flood impacts, however is subjects to overland flow routes through the site. Due to the shear nature of the terrain, in particular the natural gradient of the site, large flow velocities are expected through these routes and are addressed within.

Utilisation of the existing and proposed buildings, in particular the suspended levels, have been nominated as temporary refuge locations for personnel. Routes have also been highlighted for personnel leaving the site subject to all direction by chief personnel nominated within this plan.

Approvals should be obtained WHS officers from the Department of Education pertaining to their standards of emergency management protocols and evacuation drills for this site.

Dialogue with Lindfield Primary School should be commenced to obtain their approval for the external refuge on their property in the event of site evacuation.

### 3 FLOOD BEHAVIOUR

A brief description of the findings from 21951R001 have been defined this section for reference. For detailed information, 21951R001 should be referred to.

#### 3.1 FLOOD SOURCE

The site is split into 13 sub catchments within the Eton Road site. The northern portion is relatively flat and primarily comprises of low to high density residences and the Lane Cove National Park in its surroundings. The southern portion consists of buildings, roadways, carparking areas and bushland, and has steeper terrain which is susceptible to high flow velocities contained within the roadways and other flow routes - refer Figure 3-1.

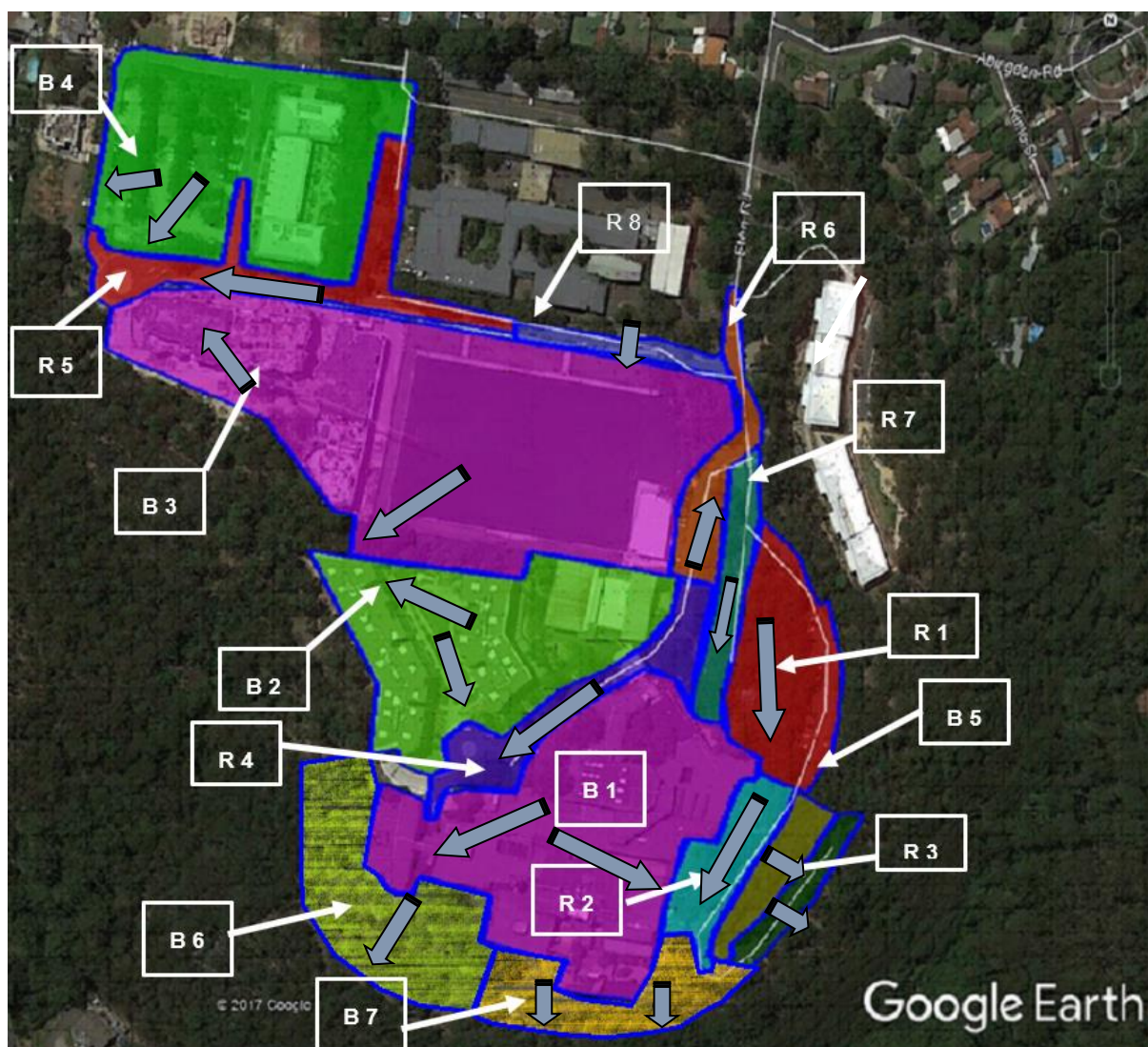


FIGURE 3-1 - CATCHMENT PLAN AND GENERAL SLOPE DIRECTION - *GOOGLE EARTH*

## 3.2 EXISTING DRAINAGE SYSTEM

In rainfall events where flows exceed the piped system capacity, surface water runoff is generally conveyed within the road system as uncontrolled flow. When this occurs, there is potential for high hazard flooding conditions resulting from combined high flow velocities and depths.

The existing site in ground drainage system, comprising of pits and pipes, is assumed to be at capacity in the 1% Annual Exceedance probability event, and has been conservatively modelled as blocked.

## 3.3 CATCHMENT DETAILS, PEAK FLOW DEPTH AND VELOCITIES

TABLE 3-1 - CATCHMENT DETAILS

Catchment	Area (ha)	Upstream Level (m AHD)	Downstream Level (m AHD)	Length of biggest runoff (m)	General Slope (%)
R 1	0.55	66	61	135	3.7
R 2	0.28	61	54	105	6.7
R 3	0.17	54	52	75	2.7
R 4	0.27	66	53	165	7.9
R 5	0.37	69	63	210	2.9
R 6	0.2	67	65	150	1.3
R 7	0.19	67	66	125	0.8
R 8	0.1	67	63	100	1.0
B 1	1.691	51	46	59	8.5
B 2	1.1	54	43	70	15.7
B 3	2.41	62	58	63	6.3
B 4	1.25	-	-	-	-
B 5	0.21	59	51	32	25
B 6	1.08	55	47	69	11.2
B 7	0.83	52	45	48	19.4

Peak flow depths and velocities have been adopted from the DRAINS developed model based on the information above are presented below in Table 3-2 - Catchment Flow Values.

TABLE 3-2 - CATCHMENT FLOW VALUES

Catchment	Area (ha)	AEP 1% (m <sup>3</sup> /s)	Maximum Depth (mm)	Maximum flow width(m)	Maximum DxV	Maximum Velocity (m/s)
R 1	0.55	0.392	184	5.2	0.42	2.3
R 2	0.28	1.041	164	4.7	0.52	3.2
R 3	0.17	0.963	129	3.5	0.28	2.1
R 4	0.27	1.298	179	5.1	0.58	3.2
R 5	0.37	1.398	204	5.7	0.53	2.6
R 6	0.2	0.151	111	2.9	0.13	1.2
R 7	0.19	0.136	118	3.1	0.11	0.9
R 8	0.1	0.078	96	2.3	0.09	0.9

### 3.4 FLOOD HAZARD CATEGORY

Attention should be drawn catchments R1–R5 as the flow velocities within these catchments are potential hazards due velocities exceeding 2m/sec. Reviewing the depth and velocity depth products, these catchments are demonstrate as high hazards. We note that the site is within a low flood risk precinct and is subjected to overland flow routes traversing through it.

Response time from beginning of the rain event to the peak water level is expected to be in the order of 1 to 3 hours. **It is imperative prompt action is taken to avoid adverse exposure to flood hazards.**

Evacuation should be the last priority, due to water velocities is likely to cause a loss of footing and being swept downstream. Velocities greater than 2m/sec is in the High Hazard range, and unsafe to venture into, thus navigating through these flows is extremely hazardous and has risk of vehicles or personnel being washed downstream - refer to **Error! Reference source not found.** and Figure 3-3.

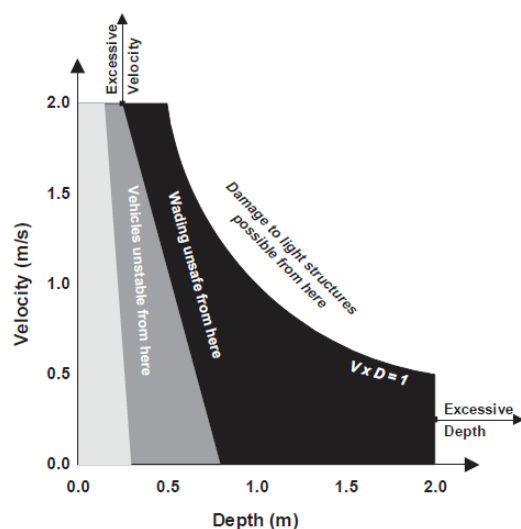


FIGURE 3-2 - VELOCITY DEPTH RELATIONSHIPS

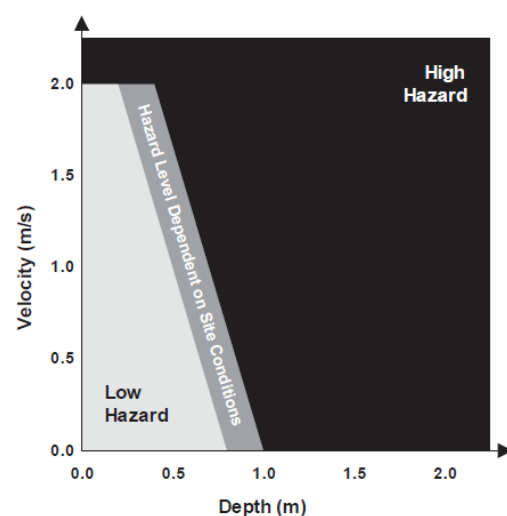


FIGURE 3-3 - PROVISIONAL HAZARD CATEGORIES

## 4 FLOOD AND EVACUATION WARNINGS

A network of rainfall gauge stations is maintained throughout the greater Watsons Bay catchment. These provide information to the Bureau of Meteorology (BoM) as one source of information informing their flood warning system. BoM should issue one of five types of warnings through local radio, television and through their website <http://www.bom.gov.au/> and <http://www.bom.gov.au/nsw/warnings/>. In addition, the NSW State Emergency Service (SES) may issue a flood bulletin, evacuation warning or evacuation order. Due to the sensitive nature of this location, the DoE should also register for automatic text and email notifications from the Early Warning Network which filters and passes on BoM warnings, and install a Dipstick Flood Alert System onsite to alert designated staff when flooding has reached a certain level.

The warning types are as follows:

### 4.1 SEVERE WEATHER WARNING

Severe weather warnings are issued by BoM for potentially dangerous weather conditions. The 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 Section 10, as well as observed values from around the state.

### 4.2 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.

### 4.3 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.

### 4.4 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 FFWS

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

### 4.5 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.

Real time river and harbour height data is available from the BoM website. As at January 2017, this link was <http://www.bom.gov.au/nsw/flood/>.

All warnings will be issued through the website, radio and television. Radio frequencies can include ABC Sydney (702AM, 92.9FM, 206.352MHz digital), Triple J (105.7FM), 2DayFM (104.1FM), Triple M (104.9FM), Nova (96.9FM), KIIS (106.5FM), 2GB (873AM), 2UE (954AM). All public and Commercial television stations should broadcast warnings.

## **4.6 SES FLOOD BULLETINS**

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

## **4.7 EVACUATION WARNING**

The SES/NSW Police may issue an evacuation warning which allows time to prepare for evacuation. This needs to be considered with respects to the modelled flow velocities to prevent from putting personnel at risk.

## **4.8 EVACUATION ORDER**

The SES may issue an Evacuation Order if evacuation is required. If this occurs evacuation must be undertaken in accordance with their direction only. Broadcast will be via radio/TV, door knock, automated telephone message or SMS.

## **4.9 EARLY WARNING NETWORK AUTOMATED TEXT AND EMAIL SERVICE**

The property can 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 or property owners to notify them of the situation.

## **4.10 ON-SITE EMERGENCY TONE**

The PA system will have an uninterrupted power supply and be configured to sound an emergency tone meaning all visitors, staff and students shall assemble in the designated assembly point (the Auditorium) under the direct of staff and flood wardens.

This tone will be tested every drill, or once a term. Should it be inoperable in the event of an emergency, an air horn and handheld loudspeaker is located within the Flood Emergency Kit.

## **4.11 DIPSTICK FLOOD ALERT SYSTEM**

The Dipstick Flood Alert System by Tuftec (<http://tuftec.com.au>) will provide a failsafe for notification on-site in the event that no warnings are issued by either the Bureau or the SES. This device senses when water reaches a pre-determined level and sends a text with an alert and rate of rise to nominated stakeholders including Council and all Flood Wardens.



## 5 FLOOD RESPONSE PERSONNEL

Summarised below in Table 5-1 are the key personnel, their location and responsibilities in managing the flood response.

**TABLE 5-1 - FLOOD RESPONSE PERSONNEL**

<b>Personnel</b>	<b>Location</b>	<b>Responsibilities</b>
<b>Department of Education WHS Directorate</b>	Blacktown	Coordinate preparation of school specific Emergency Management Plan implementing recommendations of this report.
<b>Chief Flood Warden – Principal</b>	On-site	Coordinate flood evacuation drills - one on the first school day, Monitor weather at 4pm daily for upcoming extreme rainfall events, Receive notifications from Early Warning Network and Dipstick Flood Alert System, (if installed). Decide when Evacuation required, Liaison with SES or Emergency Services personnel if they attend site.
<b>First Aid Officer</b>	On-site	Prepare and maintain Flood Emergency Kit, Manage student Individual Health Care Plans, Coordinate assistance for staff and students with mobility difficulties.
<b>Deputy Chief Flood Warden</b>	On-site	Undertake Chief Flood Warden duties when Chief Warden unavailable, Receive text notifications from EWN and Dipstick.
<b>Floor Wardens</b>	On-site	Receive text notifications from EWN and Dipstick. Assist Chief Flood Warden with evacuations.
<b>Staff</b>	On-site	- Maintain calm and direct students through evacuation process.
<b>Primary Refuge</b>	On-site	School Auditorium
<b>Secondary Refuge</b>	On-site	School Gym
<b>Off Site Refuge</b>	Lindfield Primary School	- Principal of Lindfield P/S - Nominated contact for offsite refuge point.

## 6 ASSEMBLY POINTS AND ROUTES

### 6.1 EMERGENCY ASSEMBLY POINT

The Auditorium has been nominated as the primary emergency assembly point during a flood event. Levels in this area range from approximately 59m AHD to 63m AHD, and above the 1%AEP flow level. A secondary assembly point at the School Gym can also be considered by the nominated key personnel should it be deemed required. Access to this secondary point will be via the suspended foot bridge – refer Figure 6-1.

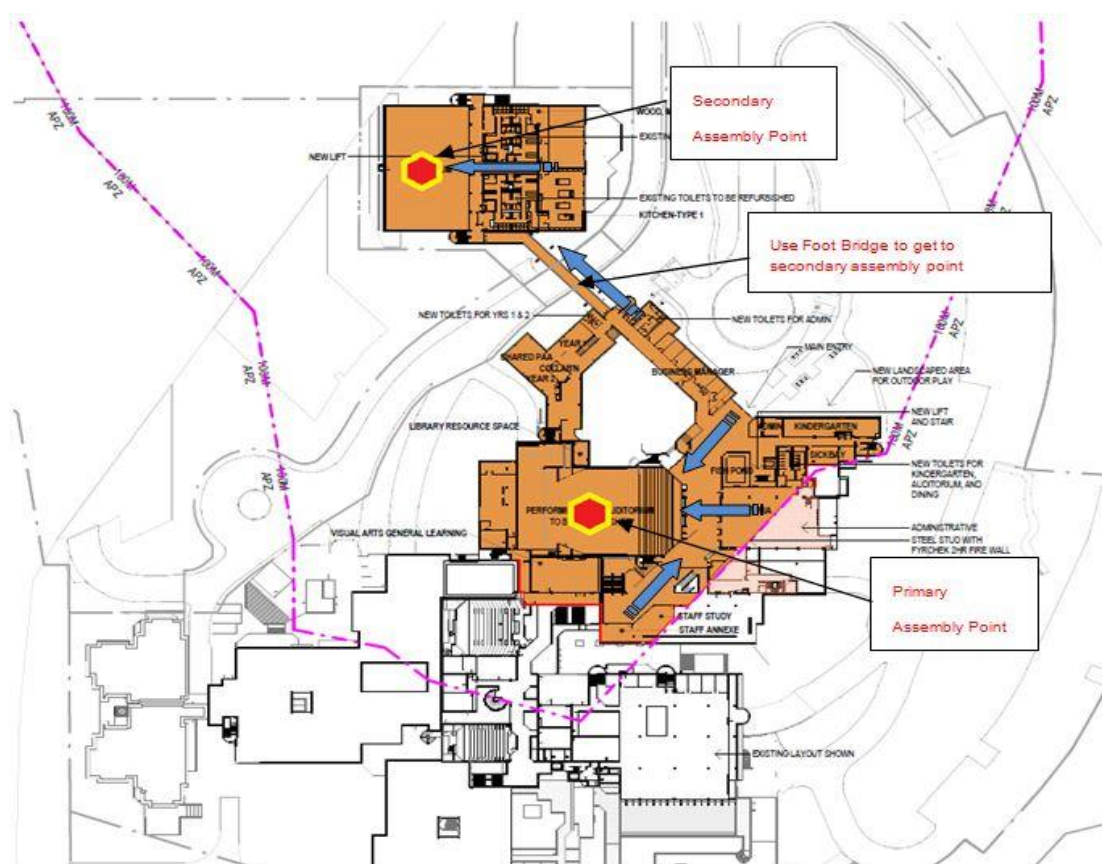


FIGURE 6-1 - EMERGENCY ASSEMBLY POINT

The most vulnerable students should be positioned at the top of the stairs at the highest point, including kindergarten and students with mobility limitations.

This location is central and provides a functional response for the widest variety of situations –both in class or during lunch or recess breaks.

Once everyone is accounted for, evacuation to the agreed refuge under the control of the nominated Flood Wardens and guidance of staff, in collaboration with advice and directions provided by the SES. Two emergency egress points have been nominated for flooding which are located on the high side of the site as shown in Appendix A.

## 6.2 FLOOR LEVELS AND ONSITE REFUGE

The lowest floor level on this site have been nominated at RL66.28m AHD which is approximately 500mm above the 1%AEP flood level (66.79m AHD). In the event of a PMF flood event, refuge on the second storey needs to be sought. The second storey has a finished floor level of RL75.43m AHD which is approximately 8.54m above the PMF level (66.89 AHD).

Onsite refuge is recommended for the above, subject to conditions experienced and advice from the SES. Should an evacuation be undertaken, this should be completed in a timely manner in advance of the peak flows.

Should personnel be isolated on-site, they should **Call 000 immediately** and relocate most upper storey floor unless told otherwise. They should not try to evacuate by foot or vehicle through rising flood water.

## 6.3 EMERGENCY CONTACT

For emergency assistance during flood events, the SES should be contacted on 132 500.

If a life-threatening situation is presented, Police, Fire or Ambulance should be immediately contacted on 000.

The Principal of Lindfield Public School on (02) 94161903 to ensure they are ready to accept the whole school population.

## 7 FLOOD RESPONSE PREPARATION

It is the responsibility of the key personnel to ensure that they well prepared for a flood event. This should be achieved through:

- induction training provided by DoE;
- evacuation drills;
- evacuation routes on maps;
- education of flood risks and behaviour; and
- the preparation and maintenance of a Flood Safe Emergency Kit

The abovementioned is considered key to understanding the risks associated with flooding and being well prepared. This should be displayed in conjunction with other emergency information (such as fire, etc) throughout the property.

### 7.1 EVACUATION DRILLS

Evacuation drills are designed to increase flood awareness. These drills are to be undertaken biannually for familiarisation of procedures when responding to a flood event.

It is also an opportunity to outline expected flood levels and the dangers of entering flood water. Lessons held after drills could be based on material designed by the SES available from <https://www.ses.nsw.gov.au/resources-folder/school-resources/>.

For students transitioning from other schools, it is expected they will be inducted by nominated familiar with the standard emergency tone and assembly response. For kindergarten students, a special assembly will be held in order to familiarise them with the emergency tone and response procedure.

### 7.2 FLOOD EMERGENCY KIT

Potential items for a flood emergency kit are outlined on [www.floodsafe.com.au](http://www.floodsafe.com.au) and referenced below:

- A copy of the school emergency evacuation management plan,
- Chemical register,
- Air horn and handheld loudspeaker,
- Portable radios with spare batteries,
- A torch with spare batteries,
- A first aid kit,
- Candles and waterproof matches,
- Waterproof bag for valuables,
- A copy of emergency numbers.

In addition to the above, the following also need to be considered:

- Sign in Book for visitors and contractors,
- Individual Health Care Essential items including asthma puffers, diabetic medication and epi pens,
- Drinking water and non-perishable food items.

The kit should be kept in a location within the school in a high position 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 Principal & Deputy Principal or designated officers.

**TRIGGER FOR REVIEW AND EDUCATION;** Three monthly checking of the emergency kit to ensure all items are in suitable working order. Twice yearly evacuation drill and reminder of the flood risks.

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

### 7.3 MONITORING OF WEATHER SITUATION

It is the responsibility of the Chief Flood Warden (the Principal) to monitor the weather situation of is 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 local radio station and the BoM website.

If heavy rain has commenced, they are also responsible for monitoring the river level adjacent to the school and coordinating a response accordingly should the Dipstick device be triggered.

**TRIGGER FOR MONITORING;** Continuous, 4pm daily

**BY WHO;** Chief Flood Warden.

## 8 FLOOD RESPONSE ACTIONS

### 8.1 CANCELLATION OF SCHOOL IF EXTREME RAINFALL PREDICTED

In order to eliminate the risk to life of students and staff, it is recommended school be cancelled on any day there should be predicted rainfall of 150mm (i.e. 30% chance of rain 100-150mm). This number represents approximately the amount of rainfall required to produce the 1%AEP peak flows.

The Chief Flood Warden is responsible for reviewing the weather forecasts daily and distributing notification of cancellation to parents and guardians via text, email and other public media.

Consideration should also be given to;

- Blocking floor wastes and toilets,
- Securing objects that are likely to float and cause damage,
- Turning off mains power, water and gas,
- Relocating chemicals above the predicted water level,
- Packing Individual Health Care Plan requirements into the Emergency Kit,

#### TRIGGERS FOR CANCELLATION OF SCHOOL

Weather forecast of **150mm or more** of rain.

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

### 8.2 EVACUATION DURING SCHOOL HOURS

Once a flood warning or bulletin for the area has been issued or the Dipstick Flood Alert System has been triggered, the following needs to be undertaken:

- Sound evacuation tone.
- Chief Flood Warden goes to the Emergency Assembly Point.
- Staff directs all students to the Emergency Assembly Point.
- Flood wardens clear all classrooms within the buildings.
- Roll call to ensure everyone is accounted for.
- Call ahead to make sure refuge point is ready to accept students, if not already done so.
- Leave signage undercover that evacuation has occurred, and to where.
- Control evacuation to higher ground.
- Wait it out at the designated refuge point.
- Maintain regular communication with staff and students providing updates to the situation.

#### TRIGGERS FOR EVACUATION;

When there is an Issue of a **Generalised Flood Warning** for flooding of the Blue Gum Creek & Lane Cove River.

**Dipstick Flood Alert System** activated.

Weather forecast of **150mm or more** of rain.

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

### 8.3 EVACUATION OUTSIDE SCHOOL HOURS

Should the school facilities be used outside school hours;

- Maintain register of all persons on-site.
- The school shall nominate a Flood Warden to receive all text messages and email notifications for the site in after-hours events.
- Sound Emergency Tone and Make Announcements over PA system.
- Direct everyone to Emergency Assembly Point.
- Roll call to ensure everyone is accounted for.
- Call ahead to make sure refuge point is ready.
- Leave signage undercover that evacuation has occurred, and to where.
- Control evacuation to higher ground.
- Wait it out at the designated refuge point.

#### TRIGGERS FOR EVACUATION;

When there is an Issue of a **Generalised Flood Warning** for flooding of the Blue Gum Creek & Lane Cove River.

**Dipstick Flood Alert System** activated.

Weather forecast of **150mm or more** of rain.

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

### 8.4 EMERGENCY SERVICES ATTENDING SITE

It is noted self-motivated evacuation is consistent with the plan. 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

### 8.5 AFTER A FLOOD EVENT

Once a Final Flood Warning or SES "All Clear" has been received;

- Parents to collect students from refuge points.
- 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 TO SCHOOL;** All clear given by SES or emergency services and school inspected by representatives from Department of Education.

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

## **9 REVISION OF THE FLOOD EMERGENCY MANAGEMENT PLAN**

This plan should be revised should a flood study for the Blue Gum Creek Catchment, Sugarbag Creek Catchment, and the Lane Cove River Catchment is revised to capture any changes in the flood plain since the last study and the new design rainfall patterns developed as part of Australian Rainfall and Runoff 2016.

The Chief Flood Warden shall be responsible for contacting Council every six months during the period of operation to ensure the latest flood data is being used.

## 10 CONCLUSION

The site is located in a low flood plain risk area, thus not susceptible to flooding from Blue Gum Creek & Lane Cove River. The site is subjected to overland flows, thus the preparation of this Flood Emergency Management plan. The proposed development is situated in a location outside the 1% AEP flood extent and low hazard area in the 1% AEP.

It would be safer to assemble in the nominated preferable assembly points nominated within this report, until the threat has passed, and stormwater flows has subsided.

The site is impacted (in the lower levels) by up to 610mm of water in the PMF event and evacuation offsite or to nominated refuge points is recommended. Evacuation off site should be a low priority unless directed otherwise.

Storm water flows are predicted along the internal roadway but will not inundate or enter the building, with flows being confined to the roadway.

The proposed new driveway extension would be inaccessible, due to these flows. This additional hardstand contributes minimally to total flows it is subjected to.

The high-water velocities, travelling along the road would be hazardous, and there are dangers of being swept downstream.

The school should nominate a number of flood wardens to monitor and control the flood situation as well as undertaking evacuation drills biannually. This will provide an opportunity to raise awareness of the flood behaviour around the site and what to do in the event of an emergency.

## **11 ASSUMPTIONS, LIMITATIONS AND LIABILITY**

### **11.1 ASSUMPTIONS AND LIMITATIONS**

The information contained in this document is provided for the sole use of the recipient and no reliance should be placed on the information by any other person. In the event that the information is disclosed or furnished to any other person, EWWF accepts no liability for any loss or damage incurred by that person whatsoever as a result of using the information.

This report is prepared in good faith and with due care for information purposes only and should not be relied upon as providing any warranty or guarantee as to the nature and condition of the site, building and/or its services or equipment. In particular, attention is drawn to the nature of the inspection and investigations undertaken and the limitations these impose in determining with accuracy the state of the building, its services or equipment.

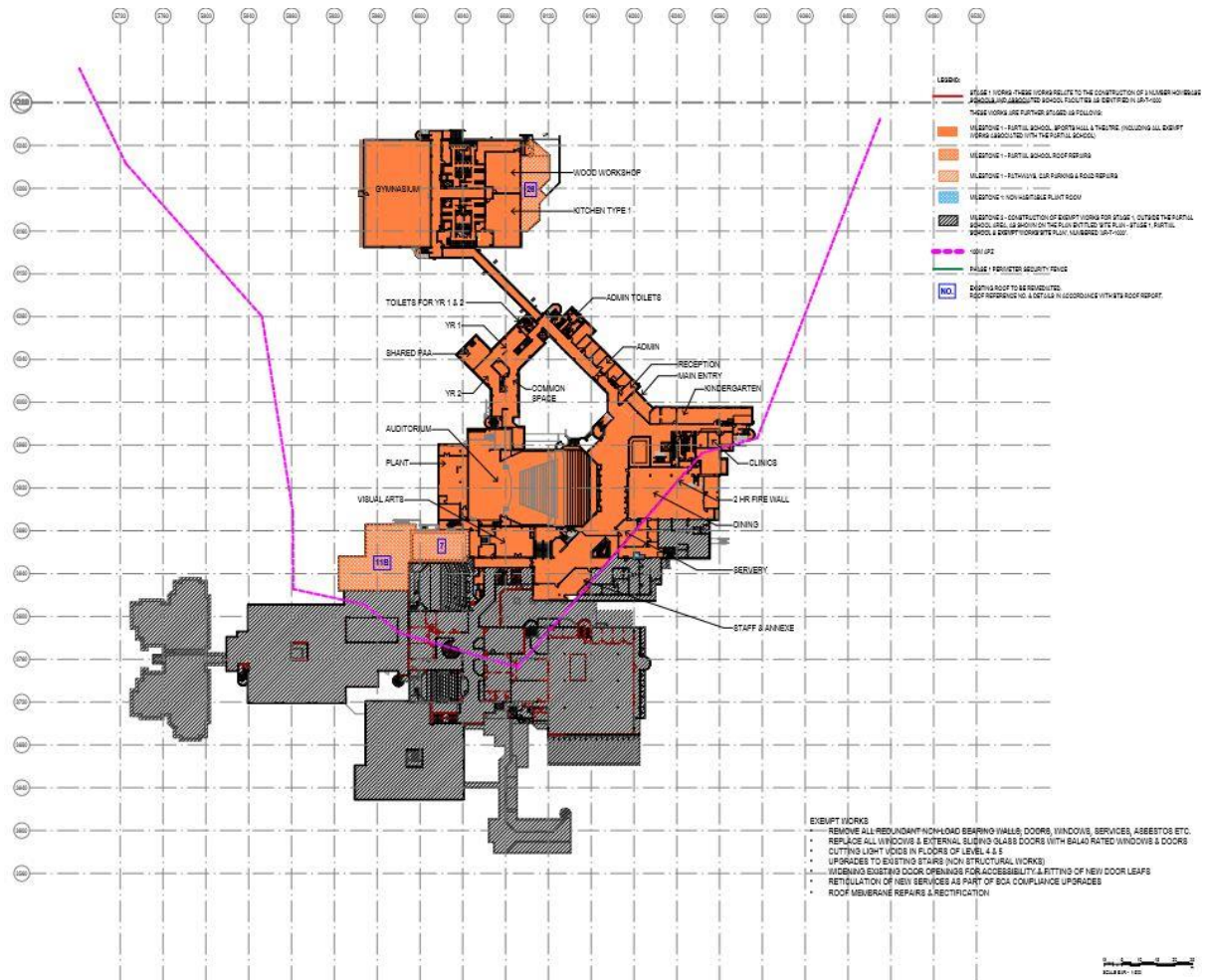
Due to the limitations of our access to services in the preparation of this report, users of this report should not rely on any statements or representations contained within, but should undertake further and more detailed investigations to satisfy themselves as to the correctness of any statement or representation contained in this report.

### **11.2 LIABILITY**

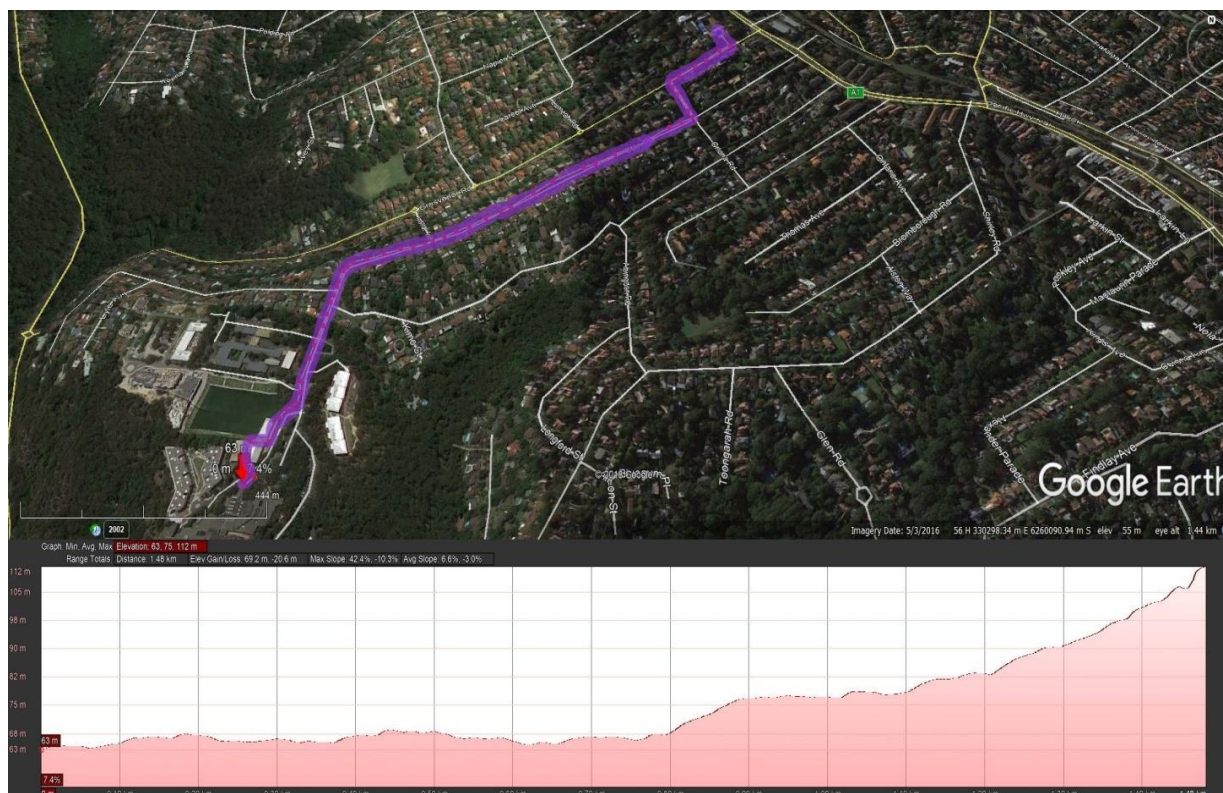
EWWF shall not be held liable for any loss or damage resulting from any defects associating in the installation of the proposed measures nor damage to any services or equipment during this stage. Any non compliance of the installation or its service, or equipment with any legislative or operational requirements, shall not be the responsibility of EWWF whether or not such defect or non compliance is referred to or reported upon in this report, unless such defect or non compliance has been made apparent to a competent Engineer for the purpose of preparation of this report.

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## APPENDIX B – LOWER LEVEL FLOOR PLAN



## APPENDIX C – FLOOD EVACUATION ROUTE



The Flood Escape Route from the site would be from the assembly area to Eton St being at the top of the ridge and on solid ground.



## APPENDIX D – RISK MATRIX

WHEN	WHAT	BY WHO
Prior to Flooding	Assemble Emergency Kit	First Aid Officer
	Check Kit every three months	First Aid Officer
	Coordinate Evacuation Drills twice per year	Chief Flood Warden
	Post Evacuation drills and lesson on flood risks	Staff
	Monitor weather situation at 4pm every evening	Chief Flood Warden
	Apply to Council every three months for updated flood information	Chief Flood Warden
When Extreme Rainfall is Likely	Rainfall predicted to be <b>150mm or greater.</b>	Chief Flood Warden
	Make decision that <b>School is Cancelled.</b>	Chief Flood Warden
	Notify parents via email / text	Chief Flood Warden
	If decision to Cancel school, was too late; or children were unable to be picked up. Prepare the non-perishable food and water to be taken to the emergency assembly point.	Chief Flood Warden / First Officer
During School Evacuation	<b>Text / Email from Early Warning Network received or Dipstick Flood Alert activated</b>	Chief Flood Warden
	<b>Pack Individual Health Care Plan</b> requirements into the Emergency Kit trolley	First Aid Officer
	<b>Sound Evacuation Tone</b> and Chief Warden to Emergency Assembly Point	Chief Warden
	Staff and students to Emergency Evacuation Point	Staff
	Flood wardens to <b>Clear Buildings &amp; Classrooms</b>	Flood Wardens
	<b>Roll Call.</b> Ensure everyone is accounted for prior to leaving site.	Staff, Flood Wardens, Chief Warden
	<b>Leave Signage</b> undercover at main entries detailing refuge point	Chief Flood Warden
	<b>Turn off</b> mains gas, electricity and water	Chief Flood Warden
	<b>Control</b> evacuation to higher ground	Staff
	<b>Wait it out</b> at refuge point	All
	Maintain regular communication with staff and students	Flood Wardens
	<b>Do not attempt to drive or walk through floodwaters. If stranded on-site, move to top level and call 000 immediately.</b>	All
Once Risk has Passed / After a Flood	Parents to collect students from refuge points.	Parents
	Check all services and structural stability of school.	Qualified persons