

FLOOD IMPACT RISK ASSESSMENT

Upgrade to Cammeray Public School 68 Palmer Street, Cammeray

Prepared for

NSW Department of Education

March 2025

ORION

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Document Control

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1. Executive Summary

Upgrade to Cammeray Public School

This document has been prepared in accordance with the Guidelines for Division 5.1 assessments by the Department of Planning, Housing and Infrastructure (formerly the Department of Planning and Environment), June 2022 and the addendum, Guidelines for Division 5.1 assessments – consideration of environmental factors for health services facilities and schools, October 2024. This can be accessed here: [Development without consent | Planning \(nsw.gov.au\)](https://www.planning.nsw.gov.au/development-without-consent)

1.1 Proponent

The Department of Education (DoE) is the landowner, proponent and determining authority pursuant to Section 5.1 of the *Environmental Planning and Assessment Act 1979* (the Act).

1.2 Landowner

The Minister for Education and Early Learning is the landowner.

1.3 Flood Impact Risk Assessment summary

This Flood Impact Risk Assessment for Cammeray Public School has been commissioned to evaluate current flood risk and to assess the impact on the proposed activity.

During our site inspection it was noted:

- The site is quite steep and is located near the crest of the local school sub-catchment.
 - There is no predicted flooding on the school site in all storm events up to the PMF event.
 - Miller Street, located on the western frontage of the site, is affected by overland flow in flood events from the 20% ARI storm event through to the PMF flood event. This does not exceed 150mm flow depth for the frontage of the school according to flood modelling.
 - The Council flood study does not address overland flow across the school site. The overland flow paths through the school must be considered when selecting the location for the proposed permanent classrooms that will replace the four demountable classrooms.
 - There are significant areas of the site with overland flow paths that are not contained by the inground drainage systems.
 - Mitigation of the overland flow risk has been achieved through a study of the external catchment flows toward the proposed classroom development and the design and construction of sufficient piped capacity and overland flow capacity to avoid overland flow ingress into the proposed classrooms and across the school site.
-

2. Introduction

This Flood Impact Risk Assessment has been prepared to support a Review of Environmental Factors (REF) for the Department of Education (DoE) for the upgrade of the Cammeray Public School (CPS) (the activity). The purpose of the REF is to assess the potential environmental impacts of the activity prescribed by State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP) as "development permitted without consent" on land carried out by or on behalf of a public authority under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The activity is to be undertaken pursuant to Chapter 3, Part 3.4, Section 3.37 of the T&I SEPP and in consideration of the stakeholder and community participation plan.

The proposed activity is for upgrades to the existing CPS at 68 Palmer Street, Cammeray NSW 2062 (the site).

The purpose of this report is to identify the flood impact risk to the site and to provide flood and overland flood mitigation recommendations for the development to address the risks identified.

2.1 Site Description

CPS is located at 68 Palmer Street, Cammeray on the northern side of Palmer Road, bound by Palmer Street to the south, Bellevue Street to the east and Miller Street to the west. The site has an area of 1.36 ha and comprises 11 allotments, legally described as:

Lot 11 DP 837836

Lot 1 DP 316130

Lot 1 DP 316706

Lot 1 DP 123406

Lot 2 DP 174370

Lot 1 DP 174370

Lot 4 Sec 35 DP 758790

Lot 5 Sec 35 DP 758790

Lot 66 DP 1049613

Lot 3 DP 571310

Lot 4 DP 571310

The site currently comprises an existing co-education primary (K-6) public school with 6 permanent buildings, 3 demountable structures, covered walkways linked at multiple levels, play areas, on-grade parking, sports court, covered outdoor learning area (COLA) and vegetation/green spaces with mature trees.

The existing school buildings are clustered towards the southern portion of the site and comprise both single and 2 storey buildings. The northern portion of the site contains the sports court, vegetable garden and play equipment. The north-western portion of the site is heavily

vegetated with trees of high landscape significance that are protected with fencing.

The site is identified as a locally listed heritage item (I0019) under Schedule 5 Environmental Heritage pursuant to the North Sydney Local Environmental Plan 2013 (NSLEP). The school is also identified in the Plateau Heritage Conservation Area (HCA) (Part 2 Schedule 5 of the NSLEP). The school is listed on the Department of Education (DoE) Section 170 Heritage Conservation Register as 'Cammeray Public School'. The site is approximately 115m from a State heritage item (I0004) being the electricity substation at 143 Bellevue Street and in close proximity to locally heritage listed items.

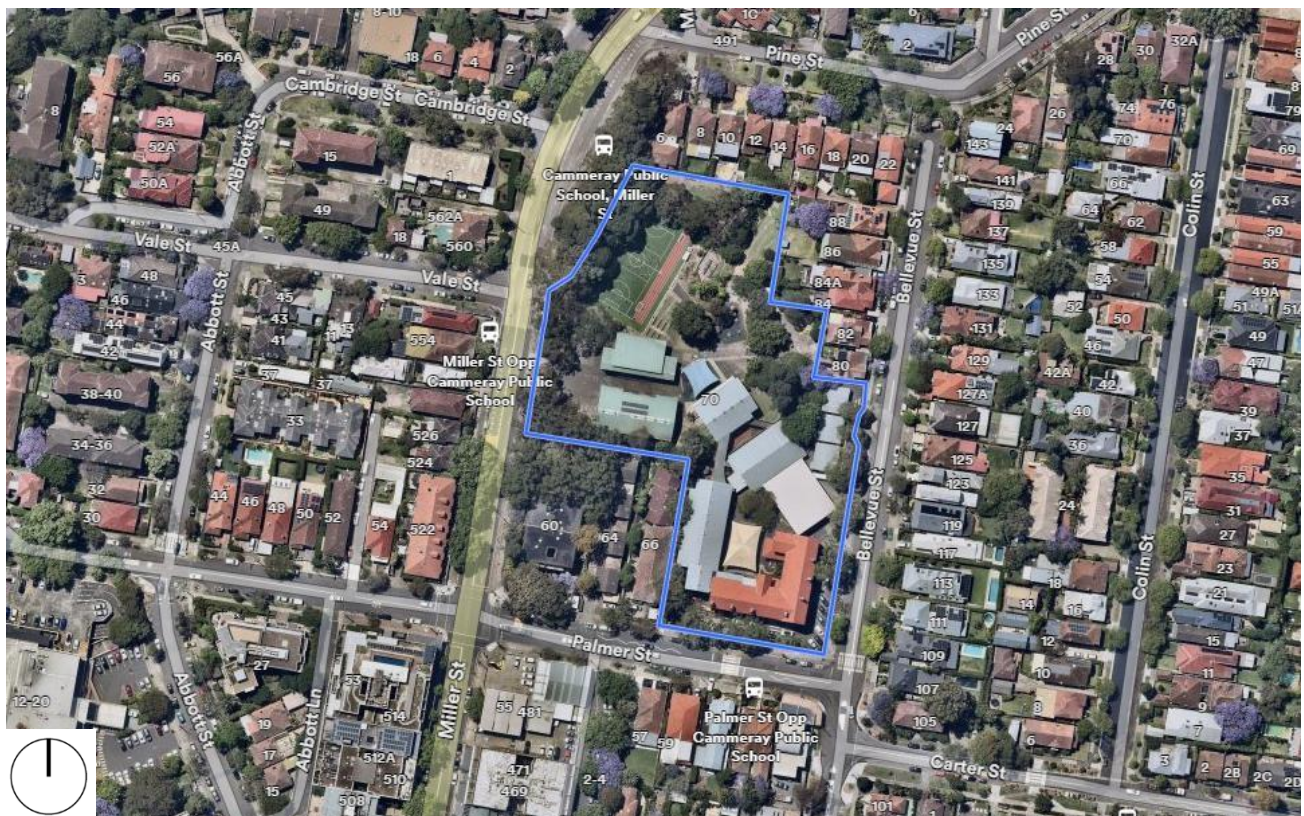


Figure 1 Aerial image of the site, outlined in blue (Source: NearMap, taken 30 October 2024)

3. Proposed Activity Description

The proposed activity involves upgrades to the existing CPS, including the following:

- Construction of 4 new permanent teaching spaces in a two-storey building incorporating 2 general learning spaces and 2 practical activity areas
- New egress lift and stairs for access to all building levels
- External covered walkways connecting the new building to the existing school network
- Landscaping and external works including compensatory planting
- Upgrades to site infrastructure and services to support the new buildings
- Removal of 3 temporary (demountable) classrooms from the eastern side of the school
- 50 bicycle parking spaces

The intent of the activity is to provide 4 permanent teaching spaces (PTS) plus 2 practical activity areas (PAA) across a two-storey addition, adjoining Building E. This will result in CPS retaining the capacity of a 'large' school (553-1,000 students) under EFSG (SINSW Education Facilities Standards and Guidelines).

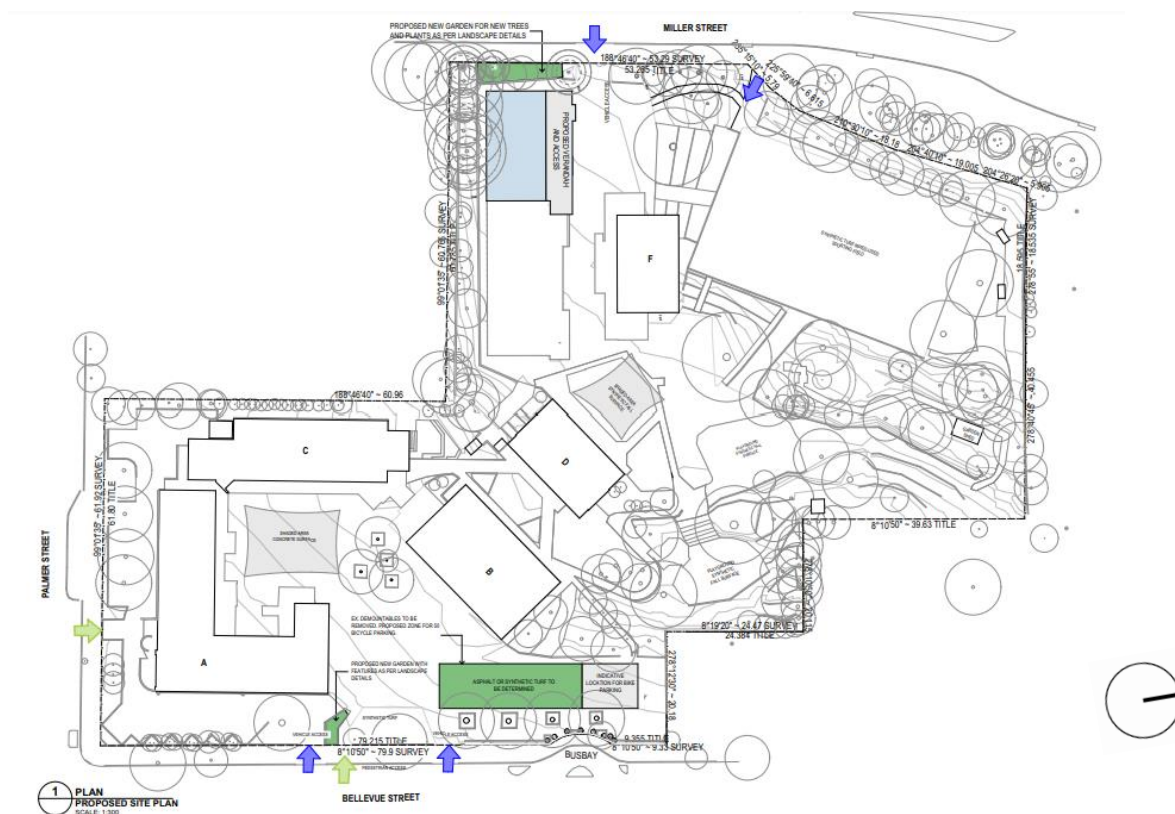


Figure 2 Proposed Scope of Work (Source: Fulton Trotter Architects, Proposed Site Plan (Rev P6))

4. Cumulative Impact Assessment

- There are significant areas of the site with overland flow paths that are not contained by the inground drainage systems.
- Mitigation of the overland flow risk has been achieved through a study of the external catchment flows toward the proposed classroom development and the design and construction of sufficient piped capacity and overland flow capacity to avoid overland flow ingress into the proposed classrooms and across the school site as part of the architectural, civil and hydraulic design.

5. Mitigation Measures

Mitigation Number/Name	Aspect/Section	Mitigation Measure	Reason for Mitigation Measure
Identification of overland flow catchment for the site and provision of suitable stormwater diversion measures	There are significant areas of the site with overland flow paths that are not contained by the inground drainage systems.	Mitigation of the overland flow risk has been achieved through a study of the external catchment flows toward the proposed classroom development and the design and construction of sufficient piped capacity and overland flow capacity to avoid overland flow ingress into the proposed classrooms and across the school site as part of the architectural, civil and hydraulic design.	To avoid overland flow ingress into the proposed classrooms, across the site, and to improve the current poor overland flow conditions in the vicinity of the proposed activity

6. Evaluation of Environmental Impacts

Based on our assessment with respect to flood impact risk, the activity will not have a significant impact on the environment. The overland flow risk can be adequately mitigated through recommended measures and is not considered to be a significant impact.

During our site inspection it was noted:

- The site is quite steep and is located near the crest of the local school sub-catchment.
- There is no predicted flooding on the school site in all storm events up to the PMF event.
- Miller Street, located on the western frontage of the site, is affected by overland flow in flood events from the 20% ARI storm event through to the PMF flood event. This does not exceed 150mm flow depth for the frontage of the school according to flood modelling.
- The Council flood study does not address overland flow across the school site. The overland flow paths through the school must be considered when selecting the location for the proposed permanent classrooms that will replace the four demountable classrooms.
- There are significant areas with overland flow that are not contained by the inground drainage systems.
- Mitigation of the overland flow risk has been achieved through a study of the external catchment flows toward the proposed classroom development and the design and construction of sufficient piped capacity and overland flow capacity to avoid overland flow ingress into the proposed classrooms and across the school site as part of the architectural, civil and hydraulic design.

6.1 Development Constraints

The intent of this flood impact risk assessment is to ensure that development of the site does not worsen the existing conditions for overland flow conditions for downstream properties, or worsen the existing overland flow conditions.

Mitigation of the overland flow risk has been achieved through a study of the external catchment flows toward the proposed classroom development and the design and construction of sufficient piped capacity and overland flow capacity to avoid overland flow ingress into the proposed classrooms and across the school site as part of the architectural, civil and hydraulic design.

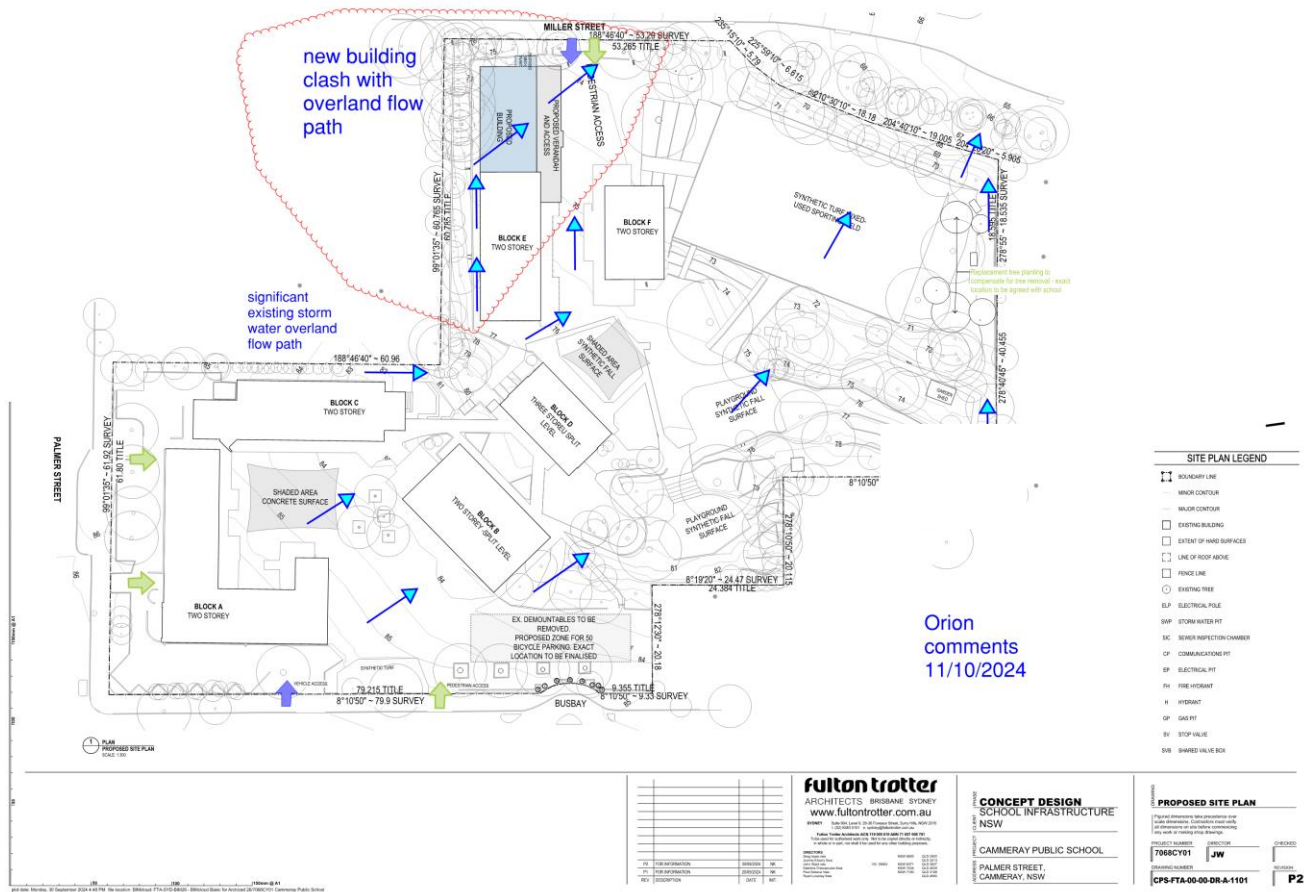


Figure 3 – Cammeray Public School proposed activity and overland flow constraints

6.2 Compliance Requirements for Stormwater Discharge Control and Water Quality

For the extent of the proposed activity, the development is required to:

- Provide stormwater measures to intercept, reuse and treat run-off water in accordance with North Sydney Council's DCP.
- Identify minor and major stormwater flow paths, with designation of annual exceedance probability in the design of the drainage system.
- Propose the method for dealing with stormwater drainage in a combination of pipes, channels and flow paths and indicate the AEP for capacity of the pipeline systems proposed.
- Implement temporary water quality and sediment control facilities such as sediment control fences and traps, vegetation buffer zones, temporary construction exits, controls on

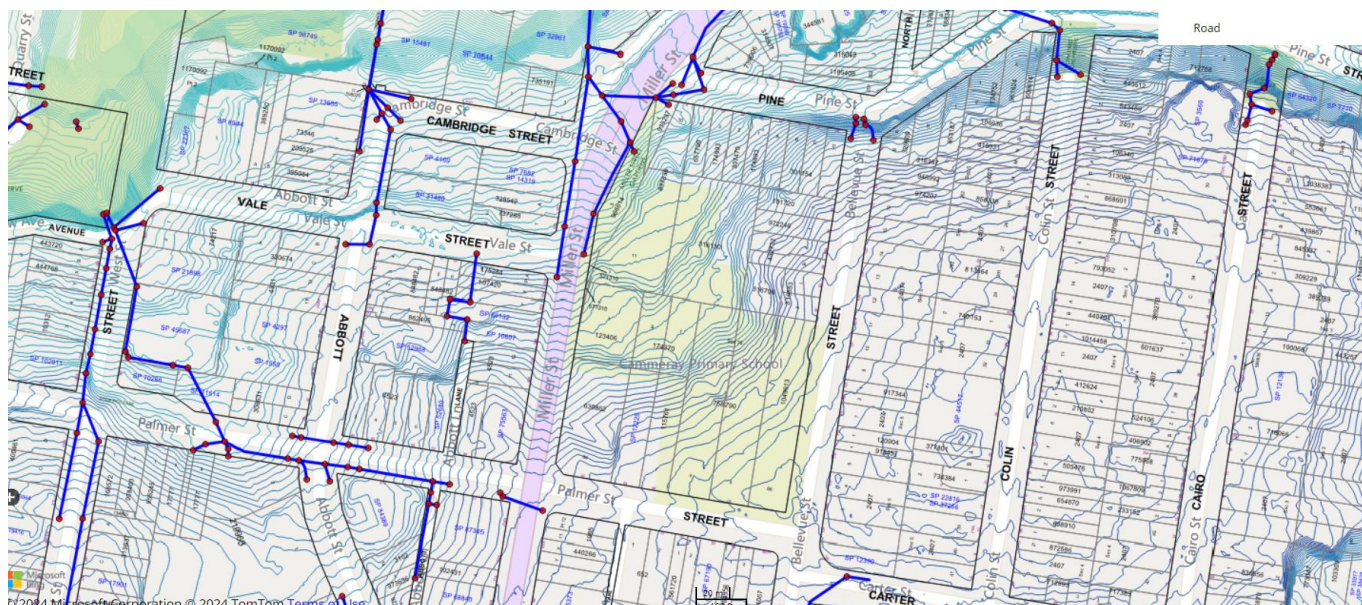
stockpiles, revegetated run-off flow areas, stabilisation works, etc.

- Identify discharge points for minor and major flows including any requirements for easements to discharge onto and across adjacent land.
- Propose methods for managing drainage issues along the property boundary that may impact on adjacent land.
- Incorporate maintenance requirements that ensure long term durability of proposed systems and facilities.

This flood impact risk assessment study has been carried out from available Council flood data and SES flood data. We include the following diagrams for reference:



Figure 4 68 Palmer Street, Cammeray - Six Maps



7. Reference Documents

In preparation for this Flood Impact Advice, the following documents were referred to:

- North Sydney LGA wide floodplain risk management study and plan November 2022 by GRC Hydro for North Sydney Council.
- North Sydney LGA Flood Study February 2017 by WMA Water for North Sydney Council
- North Sydney Council Development Control Plan 2013, Section 18 Stormwater Management
- North Sydney Council Floodplain management policy (interim 2022)
- NSW Floodplain Development Manual (DIPNR, 2005) (referenced by North Sydney Council's Floodplain Management Policy)
- NSW Department of Planning and Environment Flood Impact and Risk Assessment Guideline LU-01 (2023)
- Planning Circular PS 24-001 March 2024
- Six Maps
- Nearmap
- Fulton Trotter Concept design site plan

7.1 Current information obtained from North Sydney Council

As Part of this desktop assessment of flooding, overland flow and stormwater risks for the Cammeray Public school we have obtained and assessed the following information.

- We have gained permission to access North Sydney Council's current flood model, the North Sydney LGA wide floodplain risk management study and plan November 2022 by GRC Hydro for North Sydney Council
- We have referenced the previous flood study North Sydney LGA Flood Study February 2017 by WMA Water for North Sydney Council
- We have reviewed and assessed the impact of North Sydney Council Development Control Plan 2013, Section 18 Stormwater Management
- The site zoning from North Sydney Council's web site retains SP2 educational Establishment noting that the property has not been consolidated with respect to boundaries.

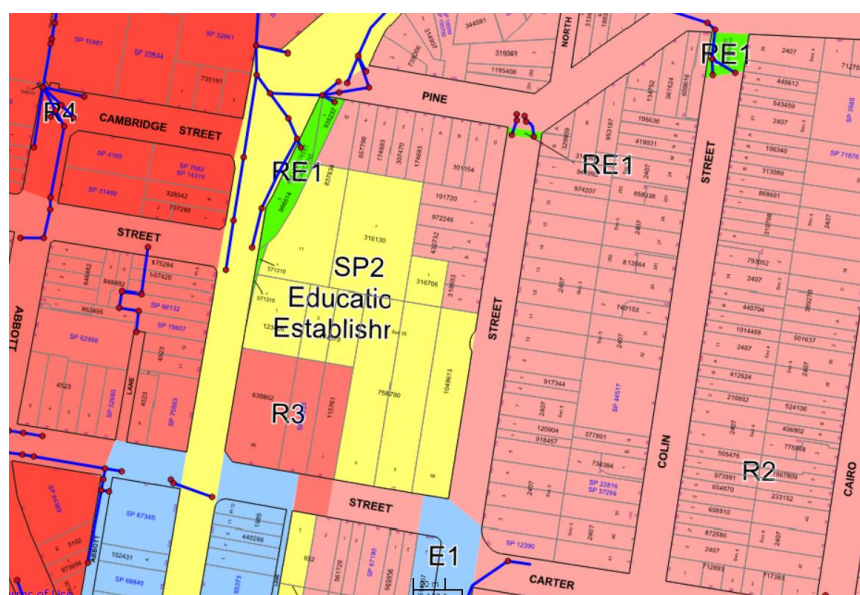


Figure 7: LEP zoning

We are aware that the intent of the proposed activity is to provide addition permanent classrooms for the school. The location of these proposed classrooms will not be affected by external flooding. The site is currently affected by overland flow issues due to inadequate internal stormwater drainage systems and the steep nature of the site. Mitigation of the overland flow risk has been achieved through a study of the external catchment flows toward the proposed classroom development and the design and construction of sufficient piped capacity and overland flow capacity to avoid overland flow ingress into the proposed classrooms and across the school site as part of the architectural, civil and hydraulic design.

8. Flood Impacts

We found that Miller Street is affected by flood impact of less than 150mm. Miller Street is steep, this flow is primarily overland flow in the road reserve. The Cammeray Public School site is noted as flood free. Miller Street is signposted as no stopping, no parking and clearway. The operation of the school is unlikely to be significantly affected by the 1% AEP flood Event or the PMF event. The road network would be affected outside the school, north from the site on Miller Street for a period of time not longer than 90 minutes in all storm events due to flood impact.

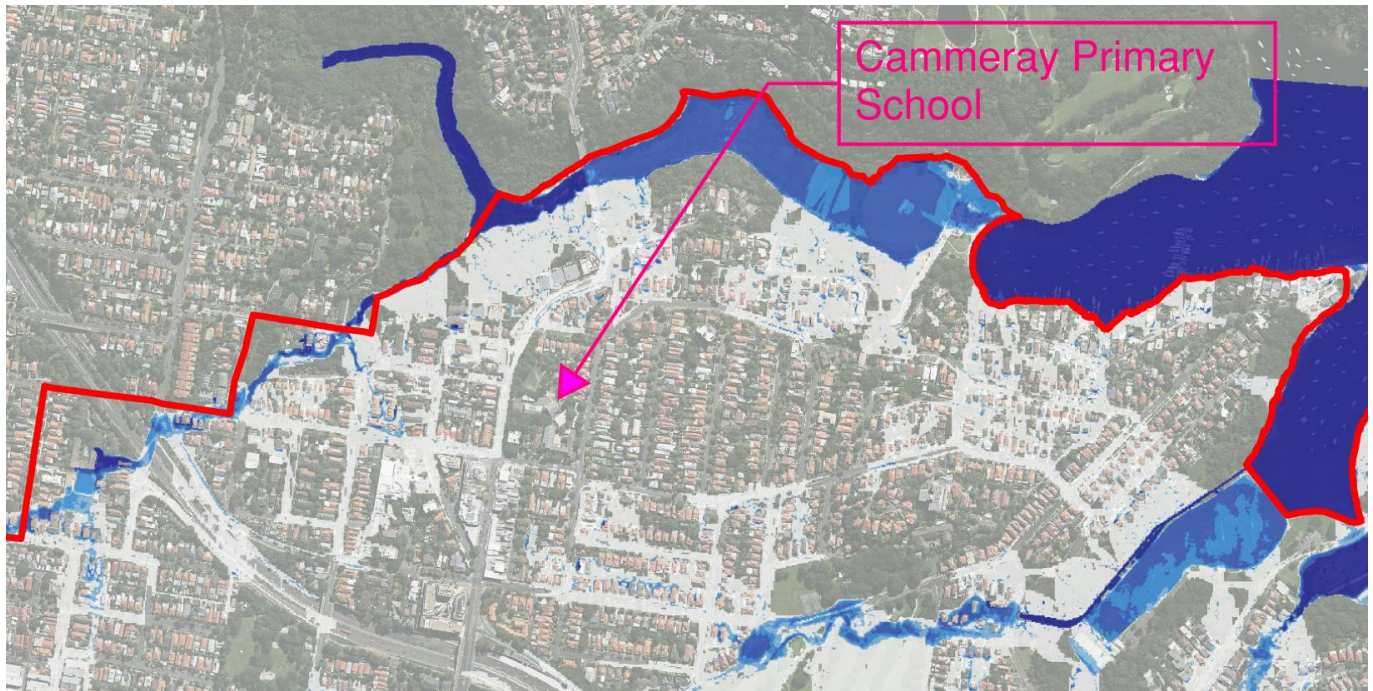


Figure 8: Design Flood (1% AEP) extent (WMA 2017), No Site Impact

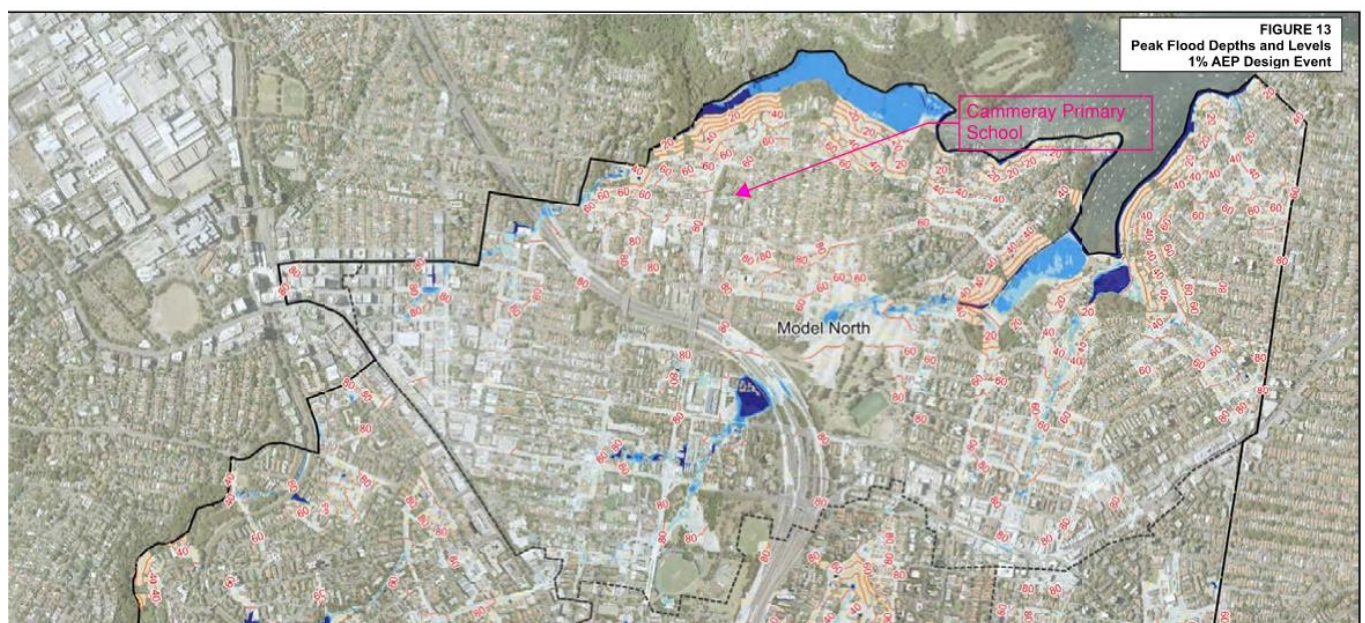


Figure 9: Updated 2022 FRMP with climate change, no change to site status

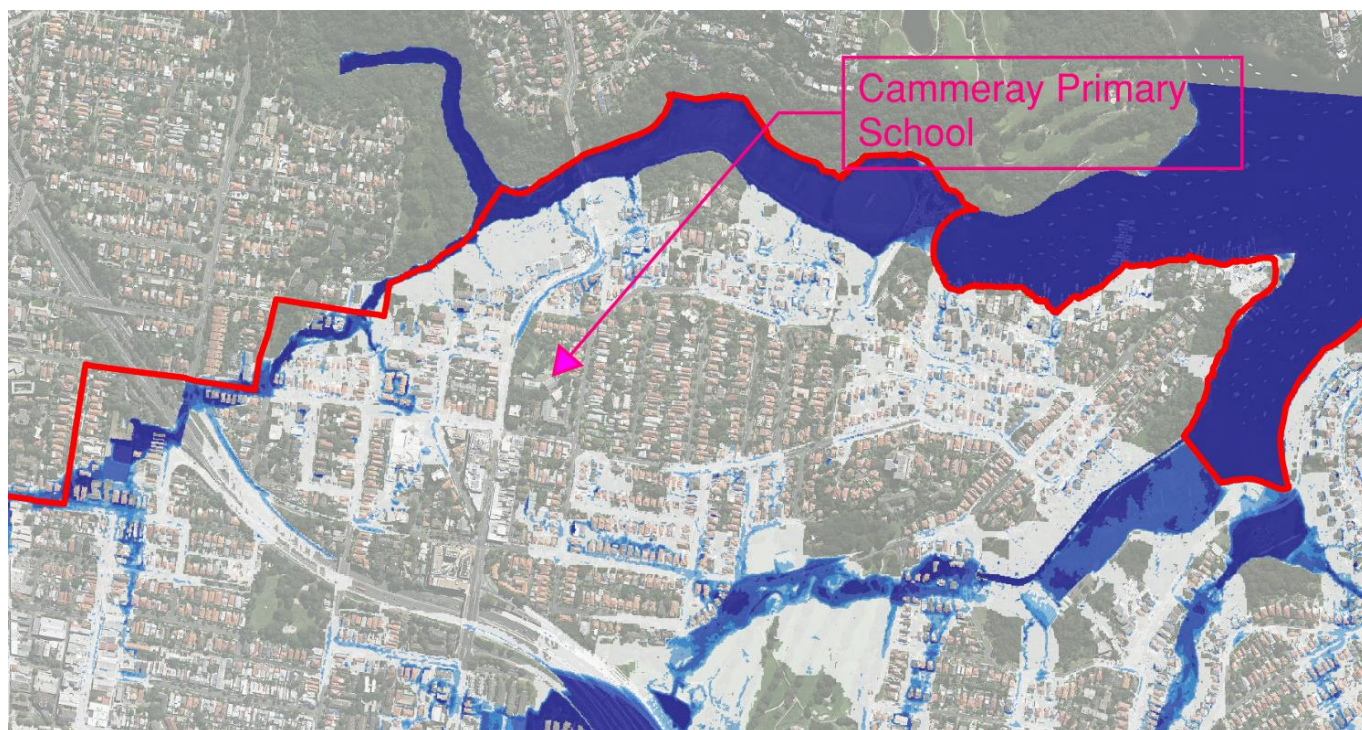


Figure 10: Probable Maximum Flood extent for Cammeray Public School (WMA 2017)

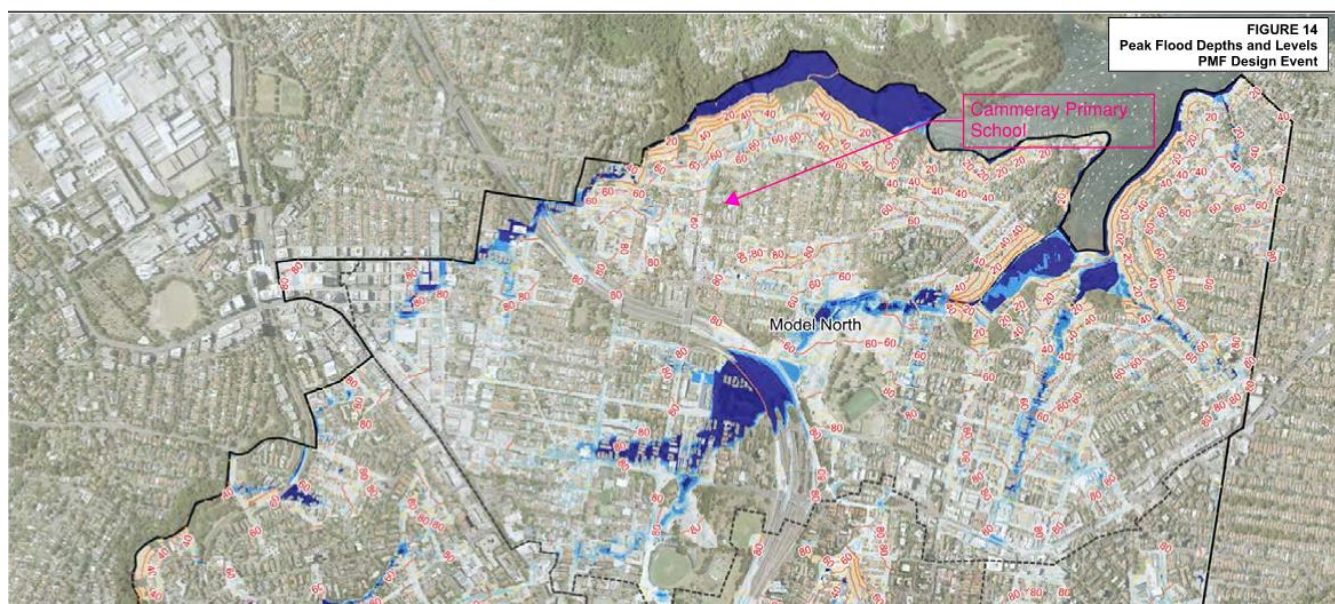


Figure 11: Probable Maximum Flood extent for Cammeray PS (GRC Hydro 2022), no change to site impact

8.1 Site 1 - Flood Site designation from GRC Hydro report

Table 37: Flood Affection at Educational Facilities

Education Facility	Location	Flooded
Cammeraygal High School	192 Pacific Highway, Wollstonecraft	Not flooded
Anzac Park Public School	2 Anzac Avenue, Cammeray	Partially flooded in PMF
Cammeragal Montessori School	Corner Walker & Lavender Street, Lavender Bay	Not flooded
Cammeragal Montessori School	12 Miller Street, North Sydney	Affected by PMF overland flow
Cammeragal Montessori School	1/181 Blues Point Road, North Sydney	Affected by PMF overland flow
Shore School	Blue Street, North Sydney	Partially affected by PMF overland flow
Shore Preparatory School	22 Edward Street, North Sydney	Affected by PMF overland flow
North Sydney Public School	Bay Road, Waverton	Not flooded
Neutral Bay Public School	Ben Boyd Road, Neutral Bay	Not flooded
Cammeray Public School	Palmer Street, Cammeray	Not flooded
St Mary's Catholic Primary School	40 Ridge Street, North Sydney	Not flooded
Marist College North Shore	270 Miller Street, North Sydney	Flooded and access issues in PMF
Wenona School	176 Walker Street, North Sydney	Affected by PMF overland flow
Loreto Kirribilli	85 Carabella Street, Kirribilli	Partially affected by PMF overland flow
Redlands Junior Campus	2 Allister Street, Cremorne	Affected by PMF overland flow
The Margaret Roberts Preparatory School	2 Allister Street, Cremorne	Affected by PMF overland flow
St Aloysius' College	47 Upper Pitt Street, Kirribilli	Affected by PMF overland flow
St Aloysius' College Junior School	29 Burton Street, Kirribilli	Not flooded

8.2 Flood Due Diligence

Requirement	Response
Identify any flood risk on-site in consultation with Council and having regard to the most recent flood studies for the project area and the potential effects of climate change, sea level rise and an increase in rainfall intensity.	No external flood risk for this site, however there is overland flow to be mitigated.
Assess the impacts of the activity, including any changes to flood risk on-site or off-site, and detail design solutions to mitigate flood risk where required.	<p>There is no significant impact by the activity to the flood risk other than the mitigation measures required due to an overland flow risk</p> <p>There are significant areas with overland flow that are not contained by the inground drainage systems.</p> <p>Mitigation of the overland flow risk has been achieved through a study of the external catchment flows toward the proposed classroom development and the design and construction of sufficient piped capacity and overland flow capacity to avoid overland flow ingress into the proposed classrooms and across the school site as part of the architectural, civil and hydraulic design.</p>
NSW Floodplain Development Manual (DIPNR, 2005).	Our assessment is in accordance with the intent of the NSW Floodplain Development Manual for this Flood Impact risk assessment as per the requirements of North Sydney Council's interim Flood policy of 2022.
NSW Department of Planning and Environment Flood Impact and Risk Assessment Guideline LU-01 (2023)	Our assessment is in accordance with the intent of the Flood Impact and Risk Assessment Guideline LU-01 for this Flood Impact risk assessment as per the requirements of North Sydney Council's interim Flood policy of 2022.

9. Site Inspection

Picture 1

There is erosion risk in bare earth areas.



Picture 2

A kerb and gutter has been installed to manage overland flow to downstream neighbour.



Picture 3

A kerb and gutter has been installed to manage overland flow from upstream neighbour.



Picture 4

Stone channels used to help control site overland flows.



Picture 5

Stone channels used to help control site overland flows.



Picture 6

There is erosion risk in bare earth areas.



Picture 7

A large impervious upstream catchment and undersized inlet capacity causes overland flows in rainfall events.



Picture 8

A large impervious upstream catchment and undersized inlet capacity causes overland flows in rainfall events.



Picture 9

A large impervious upstream catchment and undersized inlet capacity causes overland flows in rainfall events.



Picture 10

A large impervious upstream catchment and undersized inlet capacity causes overland flows in rainfall events.



Picture 11

A large impervious upstream catchment and undersized inlet capacity causes overland flows in rainfall events.



Picture 12

Erosion risk in bare earth areas with undercapacity inground drainage.



Picture 13

A large impervious upstream catchment and undersized inlet capacity causes overland flows in rainfall events.



Picture 14

Erosion risk in bare earth areas with undercapacity inground drainage.



Picture 15

Erosion risk in bare earth areas with undercapacity inground drainage, overflow concentrating flows through wall above.



Picture 16

Erosion risk in bare earth areas with undercapacity inground drainage, significant debris loading fence.



Picture 17

Erosion risk in bare earth areas
with undercapacity inground
drainage.



Picture 18

Erosion risk in bare earth areas
with undercapacity inground
drainage, overflow
concentrating flows.



Picture 19

Erosion risk in bare earth areas
with undercapacity inground
drainage, overflow
concentrating flows.



Picture 20

Erosion risk in bare earth areas
with undercapacity inground
drainage, overflow
concentrating flows.



Picture 21

Erosion risk in bare earth areas with undercapacity inground drainage, pit surcharge concentrating flows.



Picture 22

Miller Street subject to overland flows in Rain events.



Picture 23

Miller Street subject to overland
flows in Rain events.



Picture 24

Overland flows and debris loading affecting services conduits and surcharging from the services pit.



Picture 25

Overland flows and debris loading
affecting services conduits and
services pit.



Picture 26

Overland flows and debris loading
affecting building.



Picture 27

Overland flows and debris loading
affecting building.



Picture 28

Overland flows and debris loading
affecting building.



Picture 29

Brick channel drains to be checked for capacity and regularly maintained.



Picture 30

Channel drains to be checked for capacity and regularly maintained.



Picture 31

Large impervious external area
with limited external drainage
systems.



Picture 32

Large impervious external area
with limited external drainage
systems.



Picture 33

Large impervious external area
with limited external drainage
systems.



10. Stormwater drainage requirements

18.1.1 General Objectives

The general objectives of this Section of the DCP are to:

- O1 To establish a long term drainage strategy for affected land, that will control stormwater run off from development and minimise nuisance flow onto adjacent land.
- O2 To mimic pre-development or natural drainage systems as much as is possible.
- O3 To improve Council stormwater drainage systems by achieving a high level of compliance with Council's design and construction standards.
- O4 To minimise the impact of new development on the existing stormwater system.
- O5 To minimise the risk of injury to people and damage to private and public property from the effects of stormwater disposal.
- O6 To preserve, conserve and reinstate of heritage kerbs.

18.1.2 When does this section of the DCP apply?

This section of the DCP applies to all development applications that involve:

- (a) An increase in hard surface areas on a site; or
- (b) Any change to the existing stormwater drainage requirements of the site.

18.2 REQUIREMENTS

18.2.1 Objectives

- O1 To ensure that stormwater drainage systems are satisfactorily designed to minimise impacts to neighbouring properties.
- O2 To reduce stormwater discharge and improve stormwater quality through the incorporation of WSUD on-site.

18.2.2 Provisions

- P1 A *Stormwater Management Plan* is required for all developments and must demonstrate compliance with this section as well as the relevant stormwater management provisions contained in Part B: Section 1 – *Residential Development*, Part B: Section 2 – *Commercial and Mixed Use Development* or Part B: Section 3 – *Non-residential Development in Residential Zones* to the DCP.
- P2 New and reconstructed stormwater drainage systems should be designed and constructed to a minimum standard that complies with the technical requirements of the North Sydney Council *Performance Guide* and *Infrastructure Specification Manual*.
- P3 Stormwater drainage disposal from private property should not cause nuisance drainage problems to any other property. Nuisance drainage is any damage to other property from stormwater caused by the development of property.
- P4 Where stormwater drainage from private property cannot drain directly to a road without first draining through adjoining private property, an inter-allotment stormwater drainage easement is required. This easement should be sought by negotiation, mediation or by using mechanisms of s.88 of the *Conveyancing Act, 1919*.
- P5 Easement widths are governed by requirements for access and maintenance of pipes by appropriate machinery.
- P6 Zone of influence of stormwater pipes should not affect the structural stability of any structure, building or utility service.

North Sydney Development Control Plan 2013

Stormwater Management

- P7 Stormwater should not be diverted into an adjoining catchment unless it can be demonstrated that the diversion will not cause detriment to any property or structures.
- P8 Where an inter-allotment drainage easement cannot be obtained, Council may consider alternative proposals based on their merit.
- P9 Minimum permissible pipe size leading from down pipes to primary inter-allotment drainage pipes is 100mm internal diameter sewer grade pipe or greater as required to meet drainage design criteria. Minimum permissible pipe size for primary inter-allotment drainage systems is 150mm diameter sewer grade pipe.
- P10 Stormwater drains may not be constructed on public property without holding a *Street Opening Permit*, a Construction Certificate and design approved by Council.
- P11 Stormwater drainage systems through adjoining private property should be designed and constructed to allow for an emergency overflow path to be located within the inter-allotment drainage easement.
- P12 Pipes within an easement are permitted to carry only the amount of stormwater for which they are designed. Damage caused to property by unapproved works may be subject to legal action and a claim for damages.
- P13 Physical obstructions should not be placed within an easement or emergency overflow path that may block the flow of surface run-off.
- P14 Sandstone kerb and gutter with heritage significance is to be retained and not replaced with concrete.
- P15 The stormwater drainage is designed to ensure existing downstream systems are not adversely affected. It should:
- (a) 'fit' as much as possible, within the hydrology of the natural system;
 - (b) emphasise stormwater detention, vegetated overflow lines, sensitive location of discharge points and quality of receiving waters;
 - (c) minimise non-porous surfaces to reduce stormwater run-off;
 - (d) store water for re-use (such as in rainwater tanks);
 - (e) retain existing trees and;
 - (f) exclude land needed for natural or modified drainage, floodplains, remnant vegetation, environmental values;
 - (g) ensure stormwater drains are designed to accept rainwater only excluding other pollutants from the City's waterways.
- P16 On -site detention, preferably on unpaved or grass surfaces, is used to trap and remove contaminants from stormwater and increase infiltration into the ground. Where technically possible, on-site gravel filled retention pits are incorporated.

11. Flood Impact Requirements



Policy Owner: Director Open Space & Environment

Category: Strategic

Direction: 2. Our Built Infrastructure

1. STATEMENT OF INTENT

- 1.1 This Policy has been prepared in accordance with the guidelines provided in the *NSW Government Floodplain Development Manual* (2005) (FDM). The FDM guides councils in the development and implementation of local Floodplain Risk Management (FRM) Plans to produce robust and effective floodplain risk management outcomes.
- 1.2 In accordance with the FDM, the FRM process entails four sequential stages:
 - Stage 1: Flood Study
 - Stage 2: Floodplain Risk Management Study
 - Stage 3: Floodplain Risk Management Plan
 - Stage 4: Implementation of the Plan
- 1.3 North Sydney Council has produced a single FRM Plan for the entire local government area (LGA). FRM Plans consider the existing flood environment and recommend specific measures to manage the impact of flooding. In assessing the flood environment, elements such as known flood behaviour, evacuation issues, site access and the potential impact of sea level rise are taken into consideration. This information is used to create floodplain risk mapping for each catchment.
- 1.4 FRM Plans provide a range of measures that can be used to mitigate the impact of flooding. Invariably one of the most successful measures is the implementation of effective land use planning. This document provides the means for implementing the FRM Plans and associated mapping for the control of development on the floodplain within LGA.
- 1.5 The objectives of this Policy are to:
 - a) inform the community of this Policy with regard to the use of flood prone land;
 - b) establish guidelines for the development of flood prone land that are consistent with the *NSW Flood Policy* and *NSW Floodplain*

Development Manual (2005) as updated by the *Floodplain Management Guides*;

- c) control development and activity within the floodplains within the LGA having regard to the characteristics and level of information available for the floodplains;
- d) minimise the risk to human life and damage to property by controlling development on flood prone land;
- e) apply a merit based approach to all development decisions taking into account ecological, social and environmental considerations;
- f) ensure that the development or use of floodplains does not adversely impact upon the aesthetic, recreational and ecological values of the waterway corridors;
- g) ensure that all land uses and essential services are appropriately sited and designed in recognition of all potential floods;
- h) ensure that all development on the floodplain complies with Ecologically Sustainable Development (ESD) principles and guidelines; and
- i) promote building design that considers requirements for the development of flood prone land and to ensure that the development of flood prone land does not have significant impacts upon the amenity of an area.

2. ELIGIBILITY

- 2.1 This policy applies to all land that is within the Flood Planning Area.
- 2.2 Council's *Local Environmental Plan 2013* (NSLEP 2013) requires the consent authority to be satisfied that all new development adequately protects the safety of property and life, and avoid significant adverse impacts on flood behaviour and the environment. Specified flood planning controls apply to all land which is at or below the flood planning level. The requirements set out in NSLEP 2013 must be met before development consent is granted.
- 2.3 This Policy is to be read in conjunction with the North Sydney Floodplain Risk Management Plan, the NSLEP 2013 and *North Sydney Development Control Plan 2013* (NSDCP 2013). North Sydney LEP 2013 applies to, but is not limited to, the development types listed below:
 - a) Dwelling houses, semi-detached dwellings, attached dwellings, dual occupancies, multi dwelling housing (e.g. villas and townhouses) and residential flat buildings;
 - b) Business, office and retail developments, including mixed use developments;
 - c) Industrial developments; and

11.1 Flood Management Policy Compliance

Cammeray Public School is not within the North Sydney Council flood planning area.

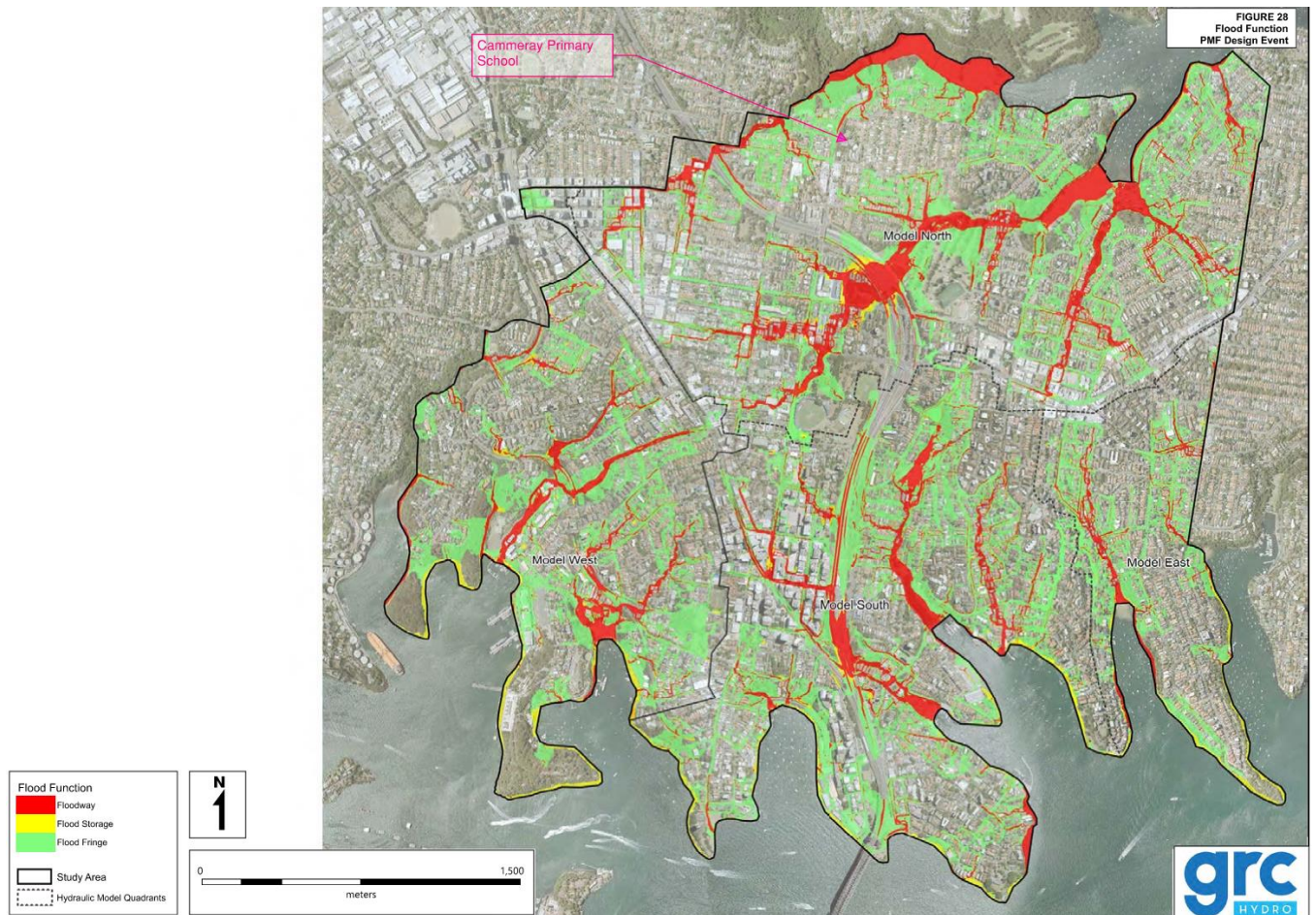


Figure 1: Flood function map – no flood function for Cammeray Public School

Cammeray Public School is not within a flood hazard area.

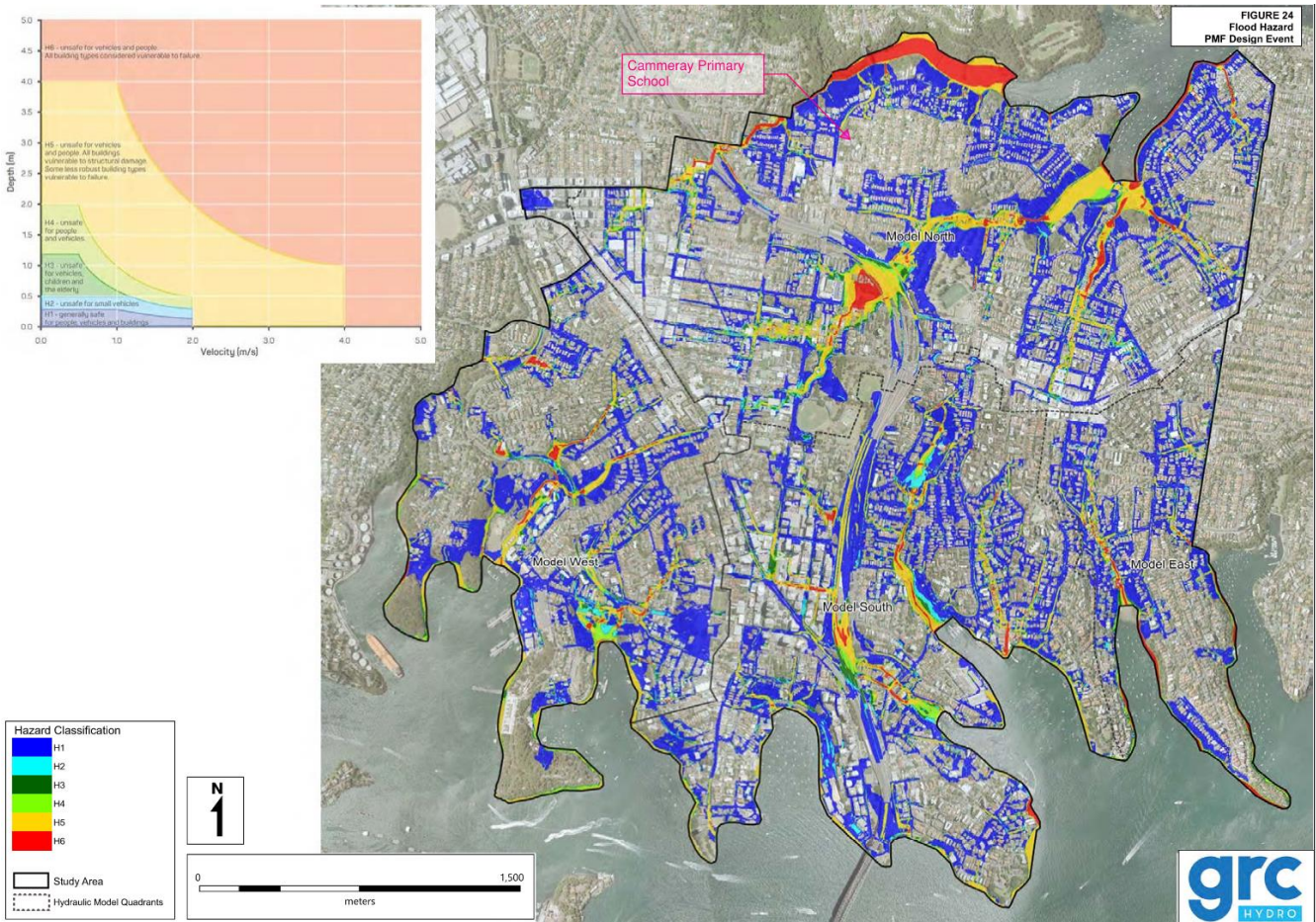


Figure 2: Flood hazard map – no hazard for Cammeray Public School

Cammeray Public School is outside of Council's flood emergency response zone.

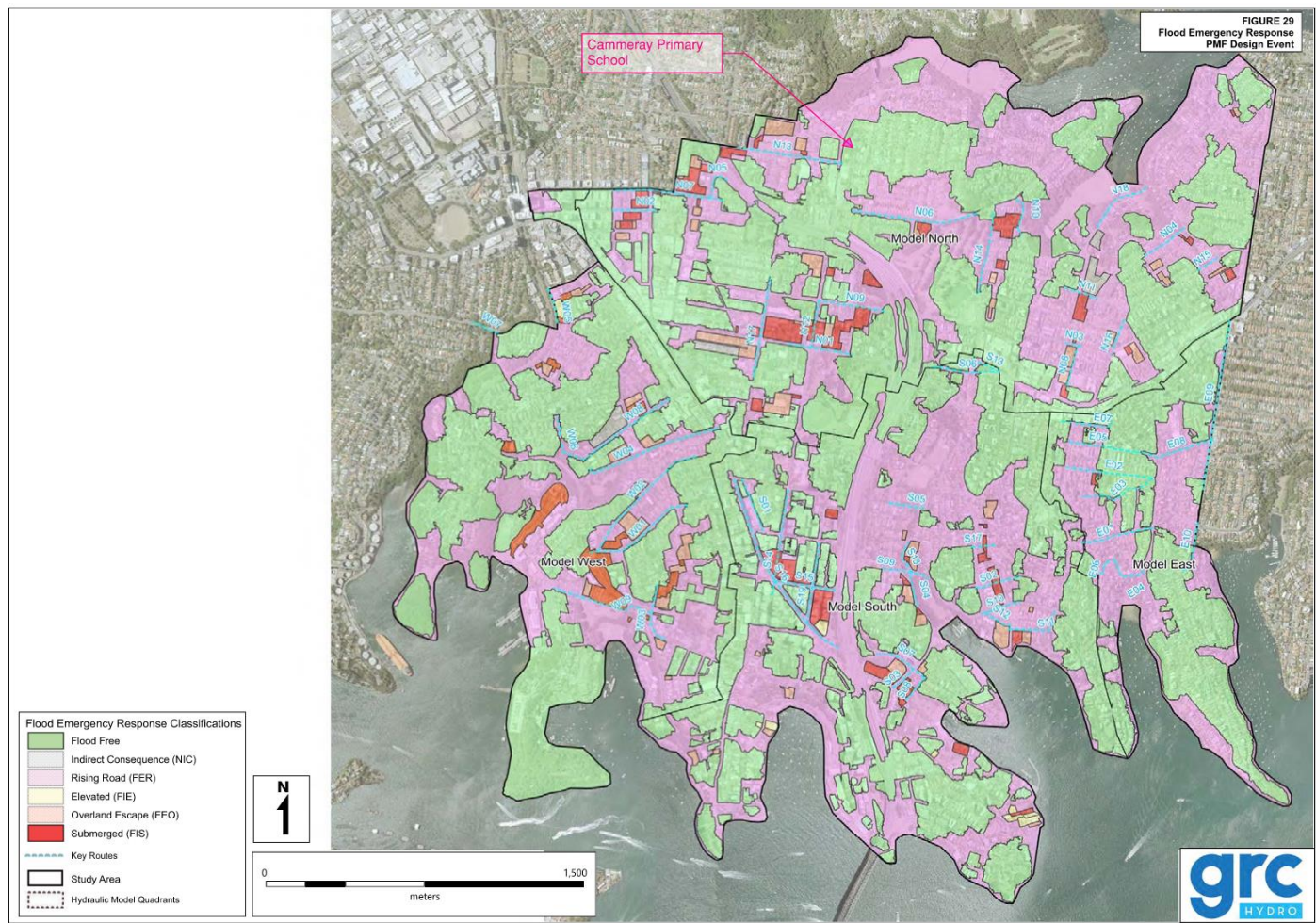


Figure 3: Flood Emergency Response Classification map – flood free classification for Cammeray PS

12. Conclusion - Site activity recommendations

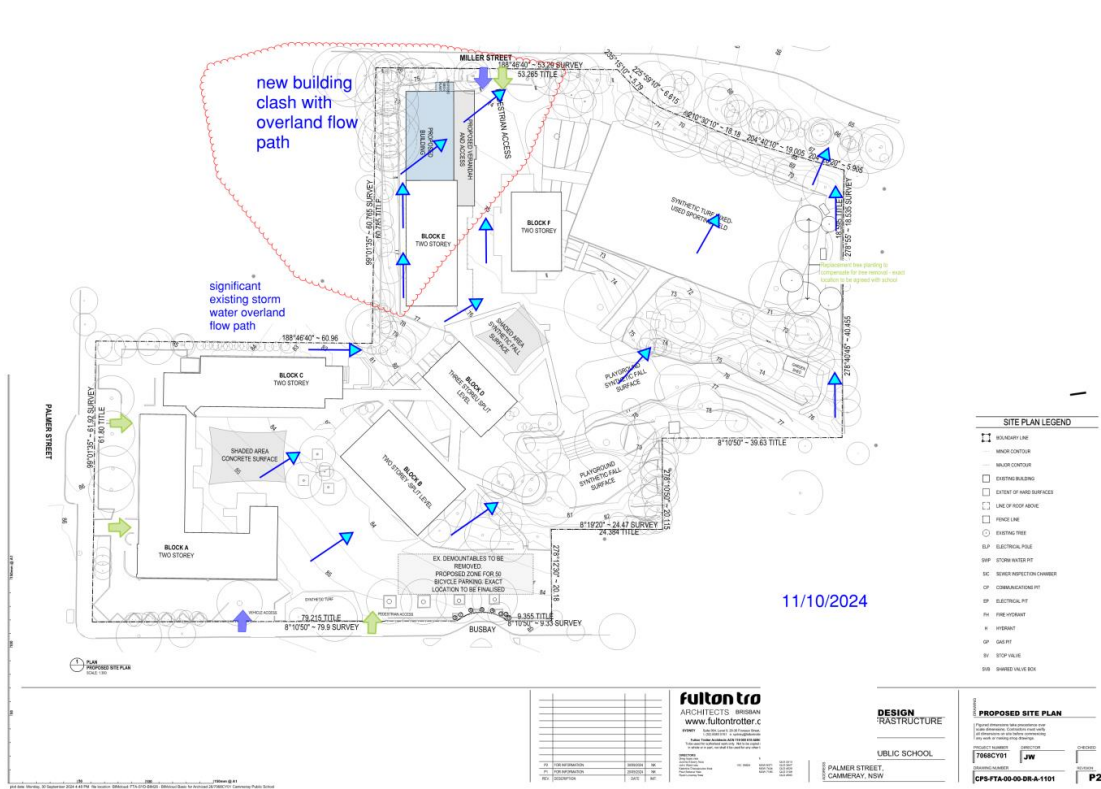
The Cammeray Public School site is noted as flood free.

The operation of the school is unlikely to be significantly affected by the 1% AEP flood Event or the PMF event.

The road network would be affected outside the school, north from the site on Miller Street for a period of time not longer than 90 minutes in all storm events due to flood impact.

As the amount of warning for significant or extreme flood events in North Sydney Council is effectively none (as noted in Councils flood reports), there is an opportunity that if a significant storm occurs while school is operating, the school can be used for shelter in place as it is above the PMF flood level and potentially a lesser risk than evacuating to another location across flood-affected roads.

This assessment option has been accepted by the SES for other sites; however, this site would need to be assessed on its own merits.



The location of these proposed classrooms will not be affected by external flooding, but will be affected by overland flow across the site.

Mitigation of the overland flow risk has been achieved through a study of the external catchment flows toward the proposed classroom development and the design and construction of sufficient piped capacity and overland flow capacity to avoid overland flow ingress into the proposed classrooms and across the school site as part of the architectural, civil and hydraulic design.

The stormwater connection for the site is to be directed to the adjacent piped drainage system on Miller street, subject to treatment compliance. The specific connection points are to be confirmed with Council and TfNSW.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'S. Brain', with a stylized, cursive script.

- **Orion Group** | Stephen Brain – Technical Director
- BE Civil (hons), MIE Aust, CPEng, NER 474 118, PRE0000910, DEP0001178, PDP0000390
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- Appendix A – Response to SI flood queries

13. Appendix A – SI Site Flood Assessment Queries

	Questions for Council	Council response
	Are you proposing to undertake an updated flood study?	No, not in the next 2 years
1.	Do you have funding to do a flood study?	No
2.	Do you have a flood study in draft that has not been released for public comment?	No
3.	Do you propose to put any flood studies on exhibition in the near future?	No
4.	Have any flood studies been exhibited but not yet endorsed	No
5.	What is the current flood study?	GRC Hydro 2022
	Flood Assessment to address	
1.	Is the proposal in a high-risk catchment?	No
2.	Is the proposal constrained by floodway, flood storage area or flood fringe area	No
3.	Is the proposed site constrained by the hazard vulnerability classification of the land.	No
4.	Is the proposed site constrained by frequency of inundation	Not on the site, Miller street to the west is flood affected up to 150mm in depth
5.	Does the proposed site provide for safe occupation and efficient and effective evacuation in flood events and how it is to be achieved	The site is above the PMF level and can provide safe occupation during a flood event if required.
6.	Are there any known evacuation constraints such as the flood emergency response classification for the area and available warning times (including rate of rise and when the evacuation route is cut off by floodwater)	The only flood risk to evacuation is flooding on Miller street to the west which is flood affected up to 150mm in depth
7.	Whether the proposal is for a sensitive or hazardous land use[4], or other higher risk uses[5] and what controls (if any) are proposed to reduce any identified risks	Tbc subject to geotechnical investigation
8.	Whether there may be adverse flooding impacts on	Mitigation of the overland

	surrounding properties	flow risk has been achieved through a study of the external catchment flows toward the proposed classroom development and the design and construction of sufficient piped capacity and overland flow capacity to avoid overland flow ingress into the proposed classrooms and across the school site as part of the architectural, civil and hydraulic design.
9.	Potential impacts of cut and fill and other building works on flood behaviour	Any basement or below ground construction should be assessed with respect to overland flow risk from within the site.
10.	Ability of proposed development to withstand flood impacts.	The structures can be designed to accommodate any overland flow loads where required, subject to analysis and building resolution.