

Oran Park High School and Oran Park Public School Stormwater Management Report (incorporating Integrated Water Management)

15 February 2017 | 16-158

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Document control

Rev No	Date	Revision details	Approved	Verified	Prepared
A	7.12.16	Preliminary Issue		CMW	CMW
B	22.12.16	Updated draft issue		CMW	JL
C	9.1.17	Updated draft	CMW		CMW
D	12.1.17	Integrated water management added, flooding updated.	CMW		CMW
E	25.1.17	Minor update to draft	CMW	JL	CMW
F	15.2.17	Approved Issue	CMW	KEX	CMW

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Introduction

The new Oran Park High School is proposed to be located at the corner of South Circuit and Holden Drive, adjacent to the existing primary school. Refer to Figure 1 for the location of the site. The new school will eventually cater for 2,000 students in Years 7 to 12.

The existing Oran Park Public School will be expanded to cater for 1,000 students from Kindergarten to Year 6.

This report has been prepared to document stormwater management issues associated with the proposed high school and the expansion to the existing Oran Park Primary School. Issues to be discussed include existing drainage on the site, current flood situation, the proposed works and the proposed stormwater management measures.

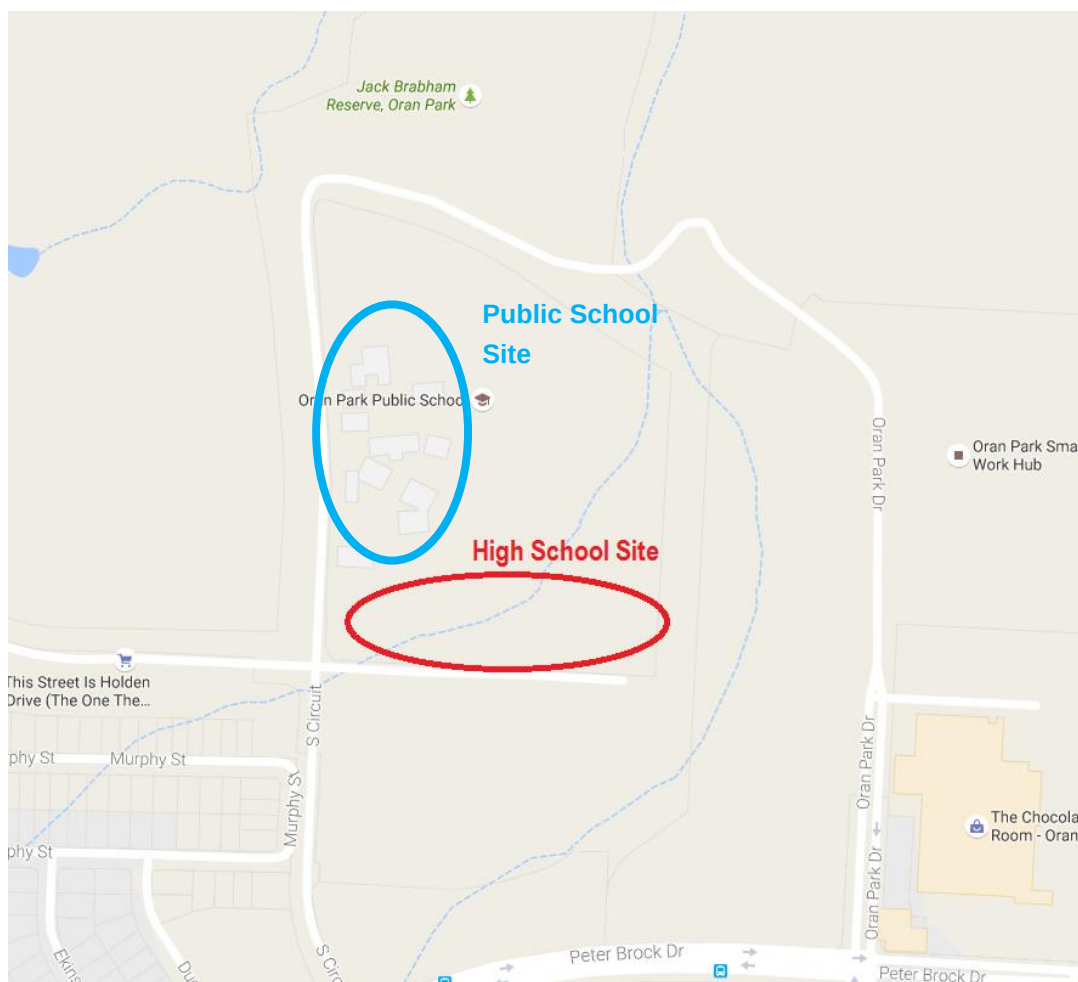


Figure 1 – Site Location

1 Existing site

The site of the proposed high school is adjacent to the existing Oran Park Public School. The combined site for both schools is bounded by South Circuit to the west, Holden Circuit to the south, Dick Johnson Drive to the north and Julia Creek to the east. The site falls downwards towards the north-east corner.

The primary school is generally located along the western and northern boundaries of the site, with the buildings adjacent to South Circuit and the sports field along the northern side. Stormwater drainage from the buildings and carparks is collected by a piped drainage system that discharges into a bio-retention basin on the eastern boundary, before discharging into Julia Creek. Surface runoff from the sports field and nearby parts of the site drains to a second major bio-retention basin adjacent to Dick Johnson Drive before discharging to the Council system to the north.

The part of the site in which the new high school will be located is currently undeveloped, with no formal drainage system.

2 Flooding information and building levels

The section 149 planning certificate for the site details that the site is subject to flooding. From the flood maps on Council's website, the flooding is located along the eastern site boundary, and is due to the adjacent creek.

A Flood Certificate was obtained from Council, which details that the 1%AEP flood level along the eastern boundary varies from 89.7 at the northern boundary to 91.9m at the southern boundary. See certificate in Appendix A for further details.

From the levels provided on the certificate, the only area of the site subject to flooding in the 1% AEP event is an area on the eastern boundary, in the vicinity of the existing bio-retention basin. Refer to Figure 2 for the approximate flood extent. Along the remainder of the eastern boundary, the flood extent is contained within Julia Creek to the east.

Council requires a freeboard of 500mm between the 1%AEP flood level and the floor level in the adjacent building. Therefore at the southern end of the site, adjacent to Holden Drive, the minimum floor level is 92.40m.

The minimum floor level proposed for the main buildings on the site is RL95.00, which is well above the minimum floor level required by Council to comply with flooding controls. A store area and toilets will be located at RL92.66m, which is also above the required level.

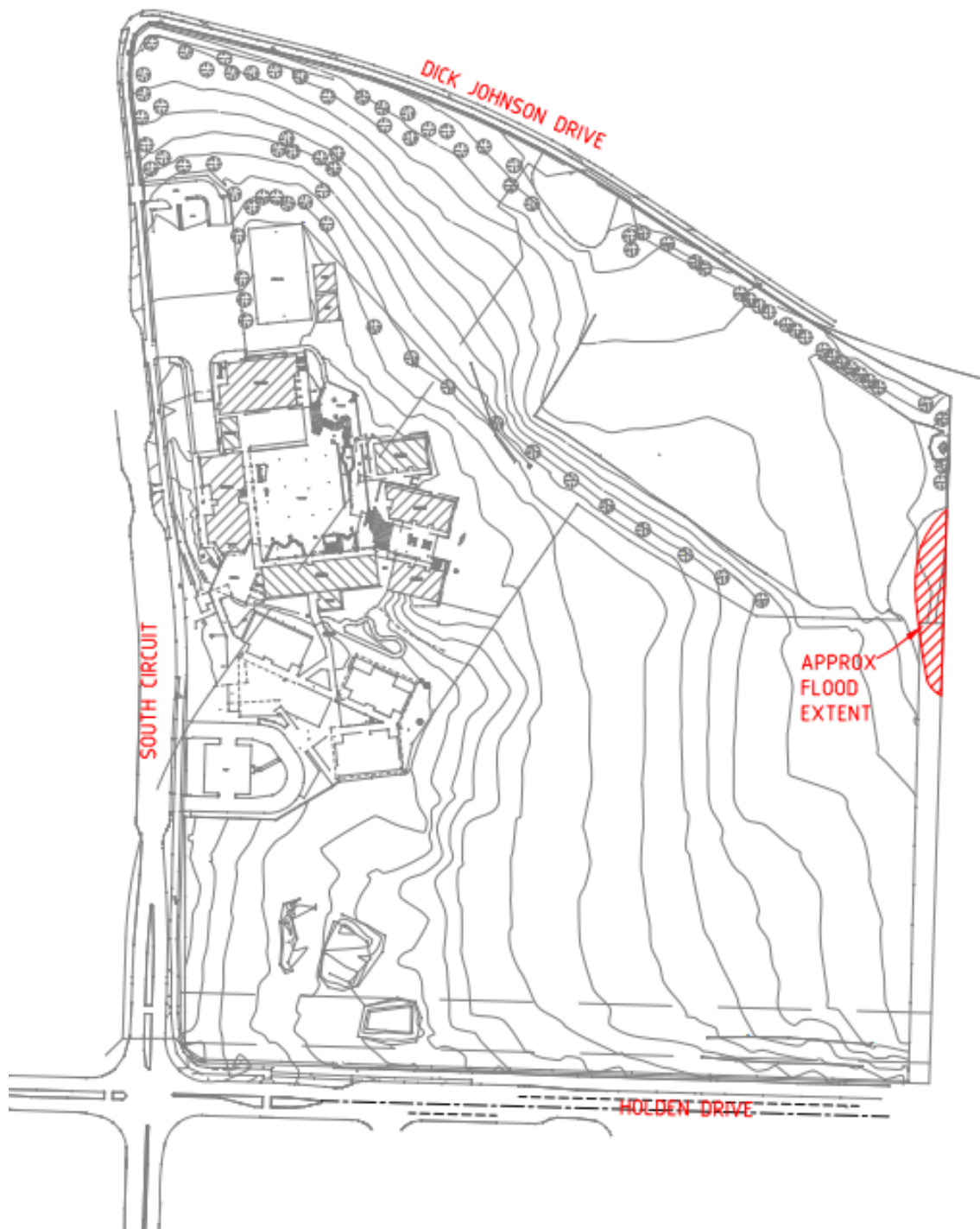


Figure 2 – Approximate flood extent on site

3 Proposed development

The works proposed for the site consist of a new high school and associated facilities as well as expansion to the existing primary school. Buildings will be located along the western and southern boundaries. Additional wings will extend to the north, with large courtyards between. A hall will be located on the eastern part of the site, with a parking area between the hall and the eastern boundary.

4 Stormwater management

The new buildings proposed for the primary school site will be located over parts of the existing stormwater drainage system. These pipes will be relocated around the new buildings. Stormwater drainage from the new works, including downpipes, will connect to the existing system and the existing bio-retention basins.

The majority of rainwater from the roofs of the high school will be collected by a piped network and drain to rainwater tanks, located adjacent to the parking area on the eastern boundary. Water collected by the tanks will be used to flush toilets in parts of the high school, as well as for irrigation of some sections of landscaping.

Stormwater from ground areas will drain by overland flow to pits or swales, depending on the location. The western courtyard will drain to a bioswale / raingarden located to the west of the seating steps. The central courtyard will drain to a raingarden / bio-retention basin located in the northern part of the courtyard. The outdoor games courts will drain to a third, smaller raingarden located to the east of the games courts.

Outlets from the new bio-retention basins / swales and rainwater tanks will drain to a pipe network, which will connect to Julia Creek to the east, adjacent to the existing bio-retention basin that serves the primary school.

Refer to the Stormwater Concept Plan in Appendix B for further details on the location of the proposed stormwater management measures.

Pipe systems throughout the site will be designed for a 1 in 20 year ARI storm event. Overland flow paths will be provided to cater for the 1 in 100 year storm event.

The bio-retention basins, swales and rainwater tanks will form part of the water quality improvement measures proposed for the site. Other measures will include proprietary devices to remove litter. The measures will be modelled with MUSIC, to ensure they meet the treatment levels required by Council.

Refer to Drawing SW1 in Appendix B for further details of the stormwater management measures.

During construction, erosion and sediment control measures will be provided in accordance with the “Blue Book” (Managing Urban Stormwater – Soils and Construction). Measures will include silt fences on the low side of the site, sediment basins and construction exits for vehicles. Refer to Drawing SW2 in Appendix B for a plan detailing the measures proposed.

5 Integrated water management

The following measures will be provided on the site, to minimise water usage and to reduce energy consumption:

- A rainwater tank will collect runoff from roofs. The collected water will be used to flush toilets and to provide irrigation water for nearby landscaped areas.
- All tapware will be AAA rated, to minimise flows. As per Schools Standards, taps on basin will be timed, to minimise water loss from taps
- Typically, all basins will have cold water only, unless hot or tempered water is required under the Educational Facilities Standards and Guidelines (EFSG)
- All toilets will be dual flush.
- Within landscaped areas, the selected plants will have low water requirements.

6 Conclusion

Stormwater management measures on the site will be provided to collect stormwater and improve stormwater quality prior to discharge to the Council system in Julia Creek. Measures to be provided include bio-swales, raingradens / bio-retention basins, rainwater tanks and proprietary treatment devices.

Council provided flood levels for the adjacent Julia Creek. For the 1%AEP event, flooding only extends into the site along a section of the eastern boundary, where it does not impact the proposed works.

Building levels at the site are all set a minimum of 500mm above the 1%AEP flood level. At the south-eastern corner of the site, the minimum floor level to comply with this is 92.40mAHD.

Within the development, water saving measures will be provided. Water collected by the rainwater tanks will be used for toilet flushing and irrigation, all toilets will be dual flush and taps will be timed operation.

Appendix A

Flood Certificate

**Camden Council**

37 John Street, Camden NSW 2570 DX 25807

PO Box 183, Camden 2570 ABN: 31 117 341 764

Telephone: 02 4654 7777 Fax: 02 4654 7829

Email: mail@camden.nsw.gov.au

WOOLACOTIS CONSULTING ENGINEERS
P.O.BOX 5612
CHATSWOOD WEST, 1515

Dear WOOLACOTIS CONSULTING ENGINEERS

FLOOD CERTIFICATE

Thank you for your recent enquiry requesting a flood certificate from Camden Council, please find below details on your inquiry, the Flood Certificate and some general information on flooding. A plan showing the extent of inundation has also been included as part of the Flood Certificate.

PROPERTY ADDRESS: 390 South Circuit ORAN PARK
LOT: 1000 DP: 1164435

CONTACT PERSON: Jessica Lal

ISSUE DATE: 30 September 2016

DETAILS OF ENQUIRY

Interest in Property: (✓ one) ☐ Owner ☐ Purchaser ☐ Valuer ☒ Unknown

Reason for Certificate: ☐ Purchase ☐ Valuation ☐ Sale ☒ Unknown
(✓ one)

Impacts of Climate Change:

Climate change has not been considered as part of Council's Floodplain Risk Management Study and Plan.

It is expected that existing flood behaviour and levels will change due to the impacts of climate change.

COUNCIL'S FLOOD RISK MANAGEMENT POLICY

Council has a duty of care to ensure that development of flood affected properties is carried out in a reasonable manner and to encourage the use of land which is compatible with the indicated flood hazard.

The development of individual property needs to be balanced against the broader community expectations and physical constraints of the land. Council seeks to manage development on flood prone property so as to minimise financial and personal risk to the community.

CAMDEN COUNCIL

FLOOD CERTIFICATE



ISSUE DATE: 30 September

2016

Property Details:	390 South Circuit ORAN PARK		
	LOT: 1000 DP: 1164435 Parish: COOK		
Flood Information:	Available		
PMF Level:	Not Available	Estimated 1% AEP Flood Level:	(See Map A)
Flood Planning level			
(Based on 1% AEP Flood Level plus Freeboard)	Based on the 1% AEP + 500mm freeboard	Estimated 2% AEP Flood Level:	Not Available
Flood Velocity during 1% AEP flood:	Available on request	Estimated 5% AEP Flood Level:	(See Map A)
Hydraulic Category: (√ one)	Not Available	Estimated 10% AEP Flood Level:	Not Available
Hazard Category: (√ one)	Not Available		
Source of Data:	Julia Reserve (OS2) and Julia Creek Hydraulic Modelling, Brown Consulting, 2010		
	Please note that the cross section locations are approximations based on the report		
	Please note that the Upper South Creek Flood Risk Management Study and Plan is currently being completed. As such, the information provided in this Flood Certificate may be subject to change.		
Are Works As Executed Plans available?	No		

Important Note: (✓ one)	✓ A Property Below the Flood Planning Level: Council considers the land in question to be below the flood planning level and therefore subject to flood related development controls. The conditions as set out in Council's Flood Risk Management Policy will reduce flood risk in flood events up to the Flood Planning Level; however the property may still be subject to flooding at higher levels during rare flood events. □ A Property Above the Flood Planning Level but below the PMF: Council considers the land in question to be above the flood planning level and therefore its Flood Risk Management Policy does not impose flood related development controls. However the property may still be subject to flooding in very rare flood events. □ A Property Above the Probable Maximum Flood: Council considers the land in question to be above the Probable Maximum Flood and therefore it is not flood affected.
Flood Related Development Controls:	Flood related development controls will vary depending on the flood hazard of a site, its hydraulic category and the type of development that is proposed. Please refer to the following documents for information on the NSW State Government's Floodprone Land Policy and Council's flood related development controls. Camden Council Flood Risk Management Policy http://www.camden.nsw.gov.au/page/flood_information.html NSW Floodplain Development Manual 2005 - http://www.environment.nsw.gov.au/floodplains/manual.htm Camden Council Development Control Plan: DCP 2011
Mine Subsidence	Beneath the urban area of Camden and localities nearby lie significant resources of coal. Should the extraction of this coal be undertaken by underground mining then there is the potential for subsidence to occur. If subsidence occurred in flood prone areas the effects of flooding could be aggravated. Applicants for all proposed developments should be aware of the potential for mine subsidence in some areas of the Camden LGA. In areas where Council has been advised by the Mine Subsidence Board of possible mine subsidence areas; this information has been included on Council's Section 149 certificates. Section 149 certificates can be obtained from the Development Branch of Council's Development & Environment Division. Levels of anticipated subsidence can be obtained from the Mine Subsidence Board and must be included in the determination of the Flood Planning Level.
Climate Change	Climate change has not been considered as part of Council's Floodplain Risk Management Study and Plan. It is expected that existing flood behaviour and levels will change due to the impacts of climate change.

Glossary:

Annual Exceedance Probability (AEP) means the chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage – for example a 1% AEP flood event has a 1% chance of occurring in any one calendar year.

Australian Height Datum (AHD) is a common national surface level datum corresponding approximately to mean sea level.

flood fringe is that part of the floodplain remaining after the floodway and flood storage areas have been defined.

flood planning level means the combination of flood levels and freeboards selected for planning purposes, as determined in floodplain risk management studies and incorporated in floodplain risk management plans.

floodplain risk management plan is a plan developed in accordance with the principles and guidelines contained in the NSW Government Floodplain Management Manual. Usually includes both written and diagrammatic information describing how particular areas of flood prone land are to be used and managed to achieve defined objectives.

floodplain risk management study is a study that identifies and compares various risk management options. This includes an assessment of their social, economic, ecological and cultural impacts, together with opportunities to maintain and enhance river and floodplain environments.

flood prone land means the land susceptible to flooding by the probable maximum flood event (that is, land within the floodplain) as indicated on the map marked "Flood Prone Land" deposited in the office of the Council as amended from time to time.

floodway means those parts of the floodplain where a significant discharge of water occurs during floods. They are often aligned with natural defined channels. Floodways are areas that, even if only partially blocked, would cause a significant redistribution of flood flow, or a significant increase in flood levels.

flood storage areas are those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of a flood.

flood study is a technical investigation of flood behaviour. It defines the nature of flood risk by establishing the extent, level and velocity of floodwaters. The study also provides information on the distribution of flood flows across various sections of the flood plain for the full range of flood events up to and including the Probable Maximum Flood (PMF).

Freeboard is a factor of safety typically used in relation to the setting of floor levels, levee crest levels, etc. It is usually expressed as the difference between the adopted flood planning level and the flood used to determine the flood planning level. Freeboard provides a factor of safety to compensate for uncertainties in the estimation of flood levels across the floodplain, such as wave action, localised hydraulic behaviour and other effects such as mine subsidence and climate change. Freeboard is included in the flood planning level.

probable maximum flood (PMF) is the largest probable flood that could conceivably occur at a particular location, usually estimated from probable maximum precipitation. Generally, it is not physically or economically possible to provide complete protection against this event. The PMF defines the extent of flood prone land, that is, the floodplain.

DISCLAIMER:

The purpose of this certificate is to appraise you of certain flood related information know or believed by Council to apply to the property the subject of the certificate.

In issuing certificates, Council applies reasonable care to ensure accuracy of information to the best of its knowledge. However, the certificate may contain errors and / or omissions. Importantly, flood information and levels are subject to change (without notice) based upon matters such as new or improved flood study data and changes to the built and / or natural environments. Responses provided within the certificate are current for the day of issue only.

Council does not warrant that the information contained within this certificate will suit the requirements of the applicant.

Reliance on this flood certificate alone cannot be made to justify development or the use of land for any particular purpose, or the inability or undesirability to develop or use land for any particular purpose. In many instances, it may be appropriate and / or necessary for applicants to obtain independent flooding / hydrological advice from appropriately qualified and experienced expert/s.

In accordance with section 733 of the Local Government Act 1993, Council is not liable in respect of any advice furnished in good faith by the Council relating to the likelihood of any land being flooded or the nature or extent of any such flooding, or anything done or omitted to be done in good faith by the Council in so far as it relates to the likelihood of land being flooded or the nature or extent of any such flooding.

CAMDEN COUNCIL – FLOOD STUDY FREQUENTLY ASKED QUESTIONS

Why do Councils prepare floodplain management studies and plans?

Councils have a key responsibility to manage development within floodplains. To do so, Council requires a strategic plan which considers potential flood risks and balances these against the beneficial use of the floodplain by development

Through a floodplain risk management study, consideration is given to a range of environmental, social, economic, financial and engineering issues. As a result of the study, a floodplain risk management plan is developed and identifies how best to manage flood risks in the floodplain for the foreseeable future.

This means that if you want to redevelop or build on your land, you will be able to build in a way that is appropriate to the flood risk. This will ensure that your investment is better protected from future damage and that buildings do not make flooding worse for neighbours.

How do flood models work and what do the flood maps mean?

The flood models include rainfall, land surface and water catchment data. Flood simulation models help us to be best prepared for rare flood levels that may have never been experienced or recorded since European settlement.

The flood maps summarise the forecast or predicted impact of flooding from the simulation models.

The 1% AEP (Annual Exceedance Probability) flood, also known as the 1 in 100 year flood event, has a 1% chance of happening in any given year. This scenario helps to inform building standards and ensures that floor heights, drains and basements are appropriate for an area.

Why do flood levels change over time?

Floods of varying scales will happen in the future. As the size of a flood increases, the chance that it will occur becomes fewer. Because some of these rare floods haven't been seen since European settlement, the height of future floodwaters is normally predicted using computer models. These computer models simulate flood levels and speeds for a range of flood events and flood probabilities. Given the importance of estimating flood levels accurately, Councils and the State Government engage experts to establish and operate the computer models.

From time to time the computer models are revised and predicted flood levels can change. The reasons why the computer models are revised can include:

- new rainfall or ground topography information becomes available;
- new floods occur which provide additional data from which to fine-tune the models;
- better computer models become available as the science of flood modelling improves and computer capabilities increase; or
- flood mitigation works may have been carried out, or development within the catchment may have occurred, that was not previously considered in the models.

Will my property value be altered if my property is flood affected?

Research in Australia* indicates that such policies do not have a noticeable effect on property values, particularly in high value markets such as Sydney where other factors are more dominant.

The value of any property can vary significantly depending upon a multitude of factors for example global financial conditions, interest rates, adjoining development, proximity to major roads or airports, and specific site conditions, among other factors. Ultimately, it is the market that determines the value and Council is not qualified to provide advice on this aspect.

If your property is now classified as being flood affected, the actual flood risks on your property have not changed; it's only that the flood information is now more transparent through the flood mapping process. A prospective purchaser of your property upon making enquiries themselves could also have discovered the actual flood risk and factored this into the value.

If your property is above the flood planning level, generally there will be no controls on normal residential type development and consequently impacts on the use of your property will be negligible.

* Dr Stephen Yeo, "Are Residential Property Values Adversely Affected by Disclosure of Flood Risk?" Proceedings of the 44th Annual Floodplain Management Authorities Conference, Coffs Harbour May 2004.

My property was never classified as 'flood prone' or 'flood liable' before. Now it is. Why?

The State Government changed the meaning of the terms 'flood prone', 'flood liable' and 'floodplain' in 2001. Prior to this time, these terms generally related to land below the 1% AEP flood level. These terms now relate to all land that could possibly be inundated up to the probable maximum flood (PMF).

The reason the Government changed the definition of these terms was because there was always some land above the 1% AEP flood level that was at risk of being inundated in rarer and more extreme flood events.

History has shown that these rarer flood events can and do happen (e.g. the 1990 flood in Nyngan, the 1996 flood in Coffs Harbour and the 1998 flood in Katherine).

In 2007 alone rainfall exceeding the 1 in 100 year event occurred in Flinders Ranges SA, Campbelltown NSW, Newcastle NSW, Macalister River Vic, and Sunshine Coast QLD. The largest flood that was known to occur in Camden was in 1873 which is estimated to be a 1 in 200 year (0.5% AEP) flood.

Will I be able to get house and contents insurance?

Council is not in a position to advise you on this matter, your policy is a matter between you and your insurer. You will need to contact them directly.

Obviously insurance policies and conditions may change over time or between insurance companies, and you should confirm the specific details of your coverage with your insurer.

It is noted that the Insurance Council of Australia is undertaking its own flood mapping arrangements and Councils are required to provide their own flood information to the ICA to ensure that flood risks are accurately identified for insurance purposes.

How have the flood risk maps been prepared?

Because some large and rare floods have not been experienced during recorded events since European settlement, computer models are used to simulate the depths and velocities of major floods.

These computer models are normally established and operated by flooding experts employed by local and state government authorities. Because of the critical importance of the flood level estimates produced by the models, such modelling is subjected to close scrutiny before flood information is formally adopted by a Council. Maps of flood risks (low, medium and high) are prepared after consideration of such issues as:

- flood levels and velocities for a range of possible floods;
- ground levels;
- flood warning time and duration of flooding;
- suitability of evacuation and access routes; and
- emergency management during major floods.

Will the Flood Risk maps change over time?

Yes. All mapping undertaken by Council is subject to ongoing review. As these reviews take place, it is conceivable that changes to the mapping will occur, particularly if new flood level information or ground topography information becomes available. However this is not expected to occur very often and the intervals between revisions to the maps would typically be in the order of five years.

Is Climate Change Considered?

Often, flood studies consider the potential future changes to rainfall intensity on flood levels, as recognised by the State Government. To date, Council has not considered climate change impacts when determining flood levels. No decision has been made at this stage as to how to recognise this future risk, and will be considered further in future investigations.

What is Overland Flow Flooding?

Overland flow is defined as surface runoff before it enters a defined waterway. It is caused by rainfall which flows downhill and concentrates in low points.

Most local stormwater flow systems are designed to remove water from the catchment quickly in small events (less than the 1% event). Larger events such as the 1% event exceed local pipe carrying capacity resulting in a build-up of water downstream. This results in local overland flows through individual properties that are required to be considered through the requirements of the State Government's Floodplain Development Manual.

What is the 1% AEP or 100 year flood?

A 1% AEP (Annual Exceedance Probability) flood is the flood that will occur or be exceeded on average once every 100 years.

Extreme floods can happen at any time. In Australia new buildings are usually built above the 100-year flood level. This is not a flood which happens once every 100 hundred years but one which has a 1 in 100 or 1% chance of occurring in each and every year. In a 70 year lifetime there is a 50/50 chance of a 1 in 100 flood being exceeded at any location. Two such floods can occur one after the other as happened in Kempsey NSW in 1949 and 1950.

What is the probable maximum flood (PMF)?

The PMF is the largest flood that could possibly occur. It is a very rare and improbable flood and is much greater than the 1% flood. Despite this, a number of historical floods in Australia have approached the magnitude of a PMF. Every property potentially inundated by a PMF will have some flood risk, even if it is very small.

Under the State Government changes implemented during 2001, Councils must now consider all flood risks, even these potentially small ones, when managing floodplains. As part of the State Government changes, the definitions of the terms 'flood liable', flood prone' and 'floodplain' has been changed to refer to land inundated by the PMF.

The PMF is used by councils and the SES in disaster planning and emergencies. There are no development controls imposed on residential properties for managing the PMF, as the likelihood of such an event occurring is so small that it is not reasonable for residential dwellings to accommodate the PMF. However the PMF is used for controlling high value/risk developments such as aged care facilities, emergency facilities and hospitals.

What is the Flood Planning Level?

When you make major modifications to your building or construct a new building, you will have to make the property comply with any requirements for building or development which apply to flood prone land in your local government area. The principle flood control for existing flood prone land is to ensure floor levels are controlled to ensure that future flood damages are minimized to protect your investment and to ensure that building and development does not make flooding worse on neighbouring land.

In order to provide a suitable level of protection to future development, the common standard to ensure that habitable spaces such as living areas within a house are protected is to adopt the 100 year event as the flood control, together with a suitable freeboard above the 100 year flood level.

The freeboard recognizes that there is always some residual uncertainty with regards to the model predictions, while local structures and features may cause obstructions and wave effects.

The Flood Planning Level for residential development is the level based on the 100 year event plus the freeboard, which in Camden is either 500mm or 600mm depending on which catchment is considered. The image below provides information on the definition of PMF, Flood Planning Level and the 1% (100 year) flood event.

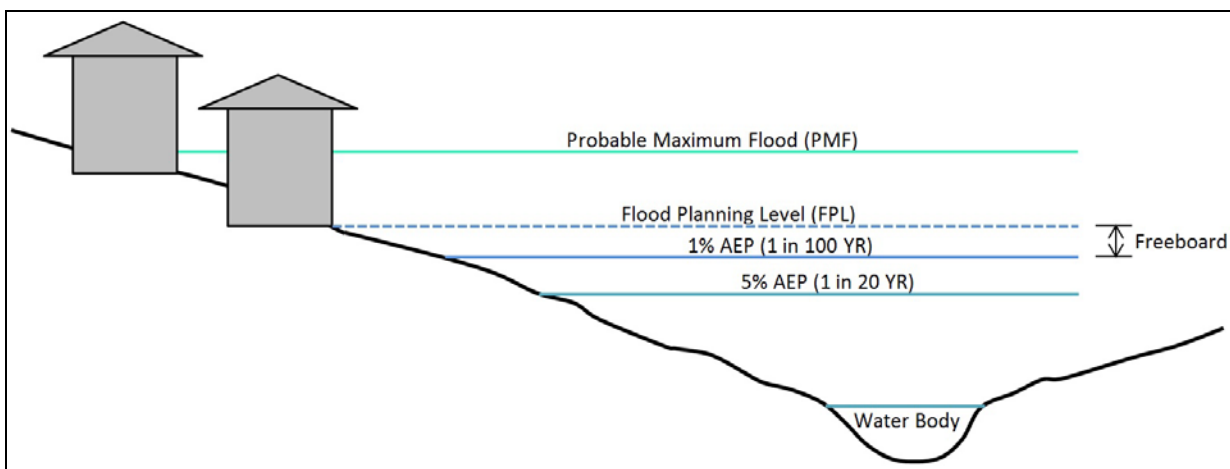
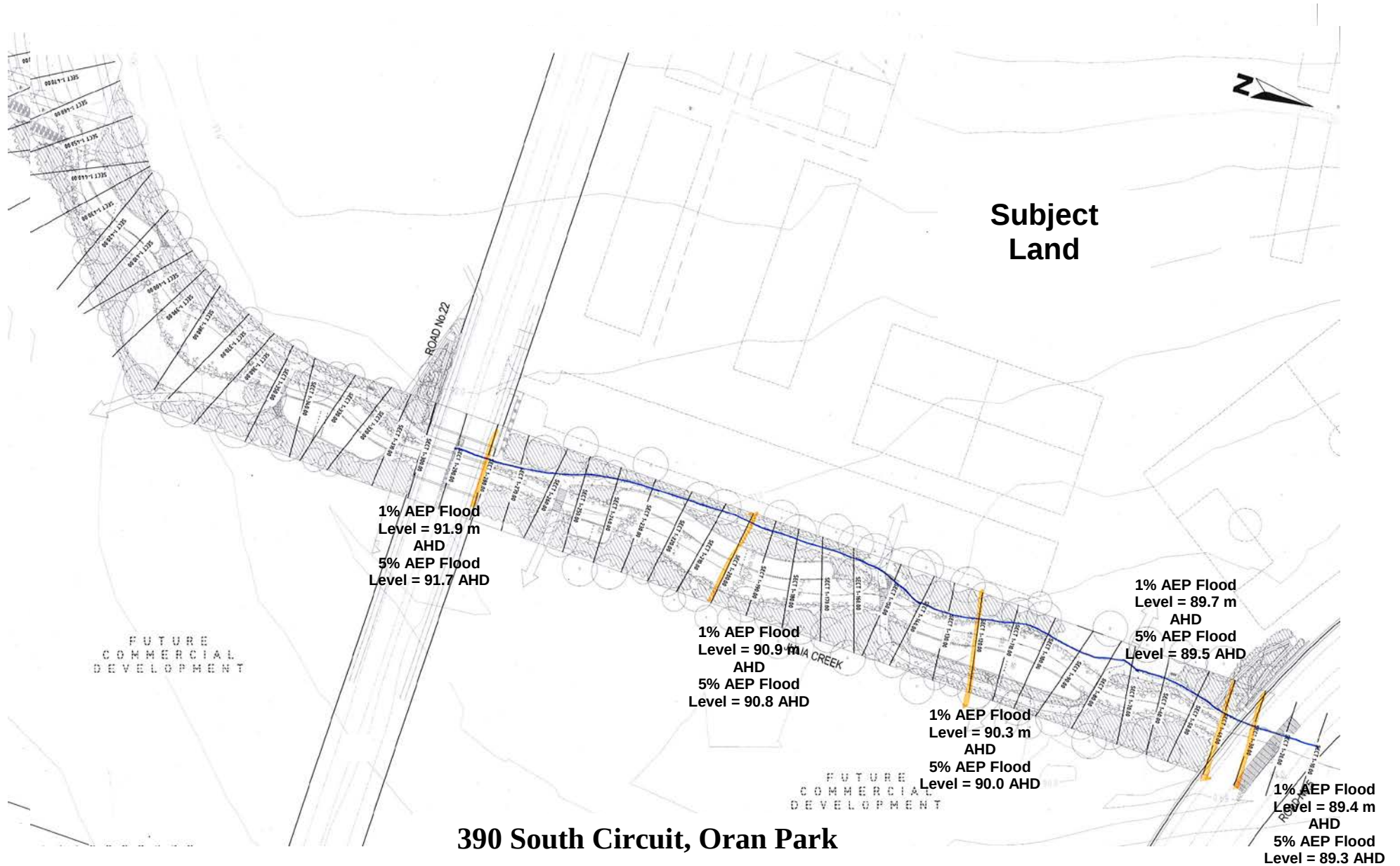


Fig: Flood level definitions

Map A





CAMDEN COUNCIL

PO Box 183 Camden NSW 2570 DX 25807
Telephone 02 4654 7777
Email: mail@camden.nsw.gov.au
www.camden.nsw.gov.au ABN: 31 117 341 764

Please contact our Customer Relation team on 02 4654 7777
for your nearest Camden Council location and operating hours.

OFFICE USE ONLY:

Paid 16490
Receipt # 1466996
Officer Kerli
Date 26/8/16
☒ EFT/Credit ☐ CHQ ☐ Cash

APPLICATION FOR CERTIFICATES

Financial Year 2016-2017

Tick	PLANNING & ZONING INFORMATION	FEE	CODE	Tick	OTHERS	FEE	CODE
	Section 149 (2) (per lot)	\$53.00	185		Geotech - Written Statement	\$67.40	36
	Section 149 (2) and (5) (per lot) additional information	\$133.00	185		Outstanding Notices	\$118.00	195
	Urgent 149 (within 24 hours) (per lot) additional fee	\$73.00	186		Noxious Weeds	\$129.90	135
				☒	Flood Certificate	\$164.90	222
					88G Certificate Job 310.4650.1049.267	\$30.00	

Tick	RATES INFORMATION	FEE	CODE
	603 Certificate Turn-around 7-10 days	\$75.00	30
	Additional Fee for Urgent 603 (within 4 Hours)	\$60.00	31

PLEASE USE BLACK PEN ONLY

How do you wish to receive the Certificate:
☒ Returned by Email ☐ Collected
☐ Returned by DX ☐ Returned by Mail

SECTION 1: DETAILS OF APPLICANT

Name/Company: WOOLACOTT'S CONSULTING ENGINEERS
DX Address:
Postal Address: PO Box 5612 CHATSWOOD WEST 1515
Telephone No: 02 8241 9900 Fax No: Mobile No:
Applicant Reference: 16-158 Contact name:
Please print email address clearly: office@woolacotts.com.au



SECTION 2: PROPERTY DETAILS

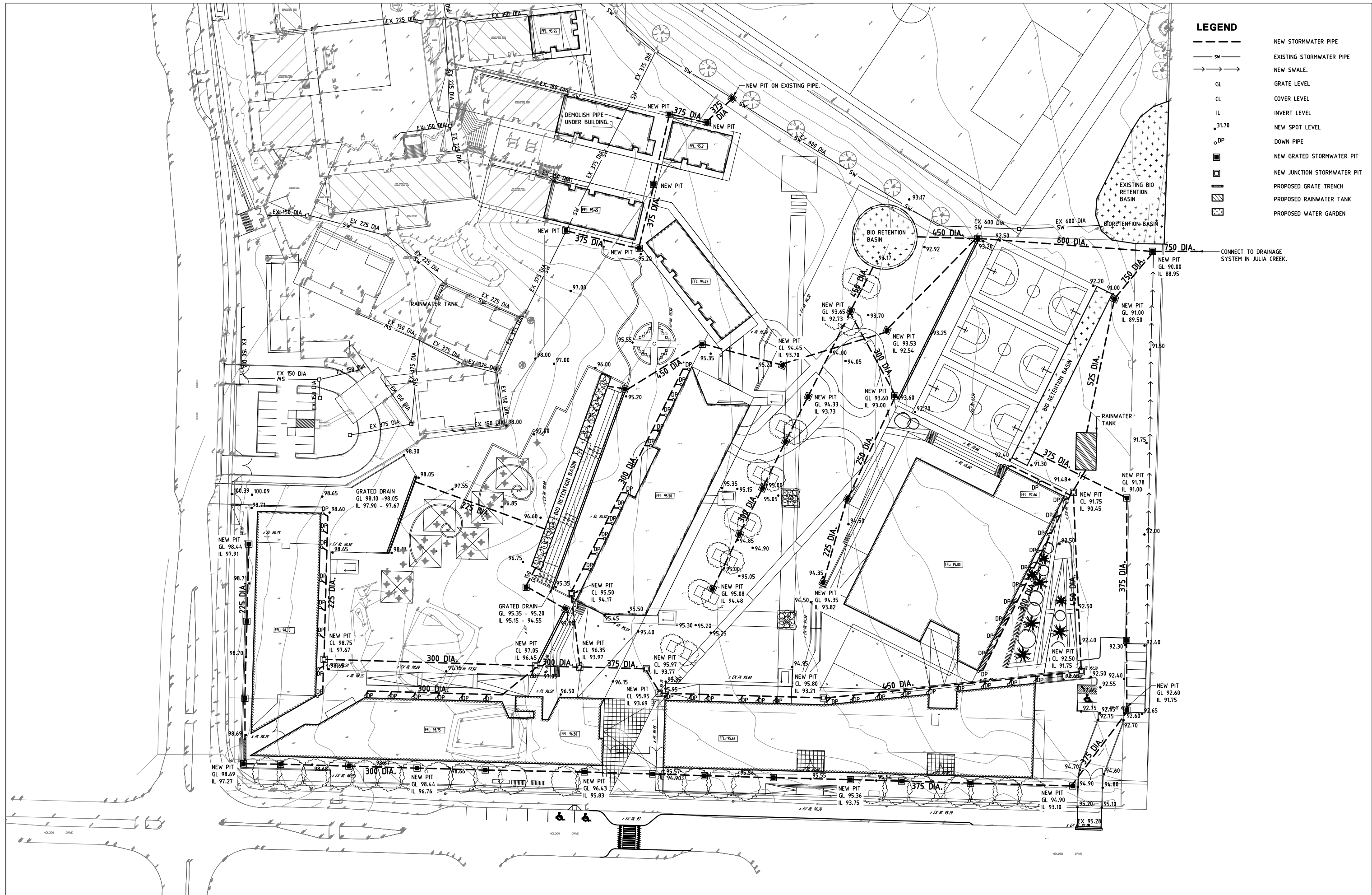
PROPERTY DETAILS: Lot: 1000 Section: DP / SP: 1164435
House No: 390 Street: SOUTH CIRCUIT Suburb: ORAN PARK
NATURE OF PROPERTY: vacant land/house/unit: SCHOOL
VENDORS FULL NAME:
PURCHASER/S FULL NAME: Phone:
NEW SUBDIVISIONS: where lot is part of a recent subdivision, details of land before subdivision are requested
Subdivider:
ot: Section: DP / SP:

SECTION 3: CREDIT CARD AUTHORISATION

☐ Visa Card ☐ Expire

Appendix B

Drawings



No.	Date	Description	Ver.	Appr.



PERUMAL
PEDAVOLI
ARCHITECTS

Architect
PERUMAL PEDAVOLI
LVL 2, 458-468 WATTLE STREET
ULTIMO, NSW, 2007

Woolacotts
CONSULTING ENGINEERS
T +61 2 8241 9900 | www.woolacotts.com.au
Ground Floor, 12a Brown Street, Chatswood, NSW 2067
This drawing is copyright and must not be used, reproduced or copied wholly or in part without
written permission of Woolacotts Consulting Engineers Pty Ltd.

ORAN PARK
HIGH SCHOOL

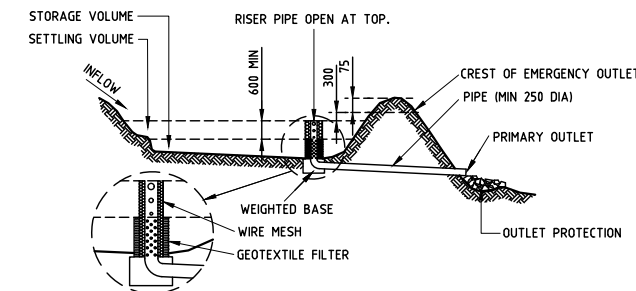
STORMWATER DRAINAGE
CONCEPT PLAN

Date	FEBRUARY 2017	Approved	C.M.W 15.02.17	Verified	J.C 15.02.17	Prepared	J.K 15.02.17
Scale @ A1	1:500	Job number	16-158	Drawing number	SW1	Amendment	

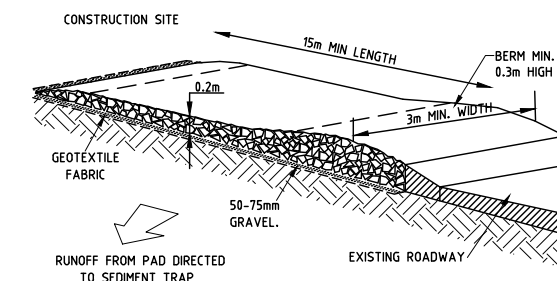


EROSION CONTROL NOTES

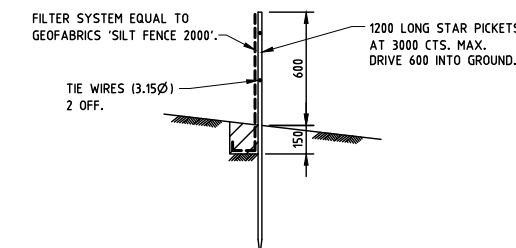
- E1 INSTALL SILT FENCES ON LOW SIDE OF SITE AND AS REQUIRED BY LOCAL COUNCIL PRIOR TO COMMENCEMENT OF TOPSOIL STRIPPING.
- E2 INSTALL DRAINAGE SYSTEM AND SILT FENCES AROUND PITS AS SOON AS PRACTICABLE.
- E3 REINSTATE GRASS COVER AS SOON AS PRACTICABLE.



CROSS SECTION OF TYPICAL SEDIMENT BASIN.



TEMPORARY CONSTRUCTION ENTRY/EXIT
TO BE PROVIDED WHERE CONSTRUCTION VEHICLES
LEAVE SITE.



SILT FENCE DETAIL
TO BE PLACED AROUND LOW SIDE OF WORKS AND
AS REQUIRED TO PREVENT SOIL WASHING OFF SITE.

EROSION AND SEDIMENT CONTROL DETAILS

PROVIDE AS REQUIRED TO PREVENT SILT FROM LEAVING THE SITE.

LEGEND

- TEMPORARY SITE ENTRY/EXIT
- SILT FENCE
- SWALE

No.	Date	Description	Ver.	Appr.



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ORAN PARK
HIGH SCHOOL

EROSION & SEDIMENT
CONTROL PLAN

Date: FEBRUARY 2017
Scale @ A1: 1:500, 20

Job number: 16-158

Approved: C.M.W. 15.02.17

Drawing number: SW2

Verified: J.K. 15.02.17

Prepared: J.K. 15.02.17
Amendment