

Stormwater Management Report

Genesis Care Campbelltown

Prepared for Erilyan / 08 April 2021

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1.2 Proposed Development

The proposed is a health and wellbeing centre which is considered a commercial development. The proposed architectural plan prepared by Team2 Architects as shown on Figure 2, and consists of a four-storey building with associated car park area, driveways, and access egresses.

The proposed development also includes redevelopment of a part of Camden Road along the eastern site boundary (refer to TTW-SKC10 drawing for design earthworks details).



Figure 2 Proposed Development Layout Plan (Prepared by Team2 Architects)

1.3 Reference Documents

This report has been prepared in accordance with the following guidelines and policies:

- Bureau of Meteorology IFD data – sourced from <http://www.bom.gov.au>
- Australian Rainfall and Runoff (2019) – with AR&R (2016) rainfall datasets sourced from BoM
- Campbelltown Development Control Plan (DCP, 2015)
- Engineering Design for Development, Volume 2, Campbelltown DCP (2009)

1.4 Project Scope and Objectives

The purpose of this report is a DA application for the proposed redevelopment. The scope of this report is detailed below:

- Documentation of requirements of WSUD for the development area.
- Stormwater quantity management to achieve water quantity objectives based on Part 4 of Engineering Design for Development, Volume 2, Campbelltown DCP 2009.
- Treatment train specification to achieve water quality treatment targets detailed in Part 4 of Engineering Design for Development, Volume 2, Campbelltown DCP 2009.

2.0 Flood Conditions

The site falls within Bow Bowing Creek catchment. Molino Stewart Pty Ltd conducted a flood risk management study for this catchment on behalf of the Campbelltown City Council and summarised the outcomes in Bow Bowing Bunbury Curran Creek Strategic Floodplain Risk Management Study and Plan Report (August 2018) which will be referred to as 'Council's flood study' from now on.

The Council's flood study includes the catchment flood behaviour and impacts analysis using multiple 2D flood modelling simulations as well as the flood risk management study and plan. As part of the study, Molino Stewart Pty Ltd updated all the 11 TUFLOW models that had previously been developed as part of the original flood studies for the Bow Bowing Bunbury Curran Creek catchment to better reflect the contemporary catchment conditions. The updated models eventually used to re-simulate a range of flood events from 20% AEP up to the PMF across the catchment.

Based on the Council's flood study, the site is subject to overland flows and is primarily unaffected by floodwaters (hazard \geq H2) during events smaller than the PMF (map 56 of the Council's flood study as shown in Figure 3).

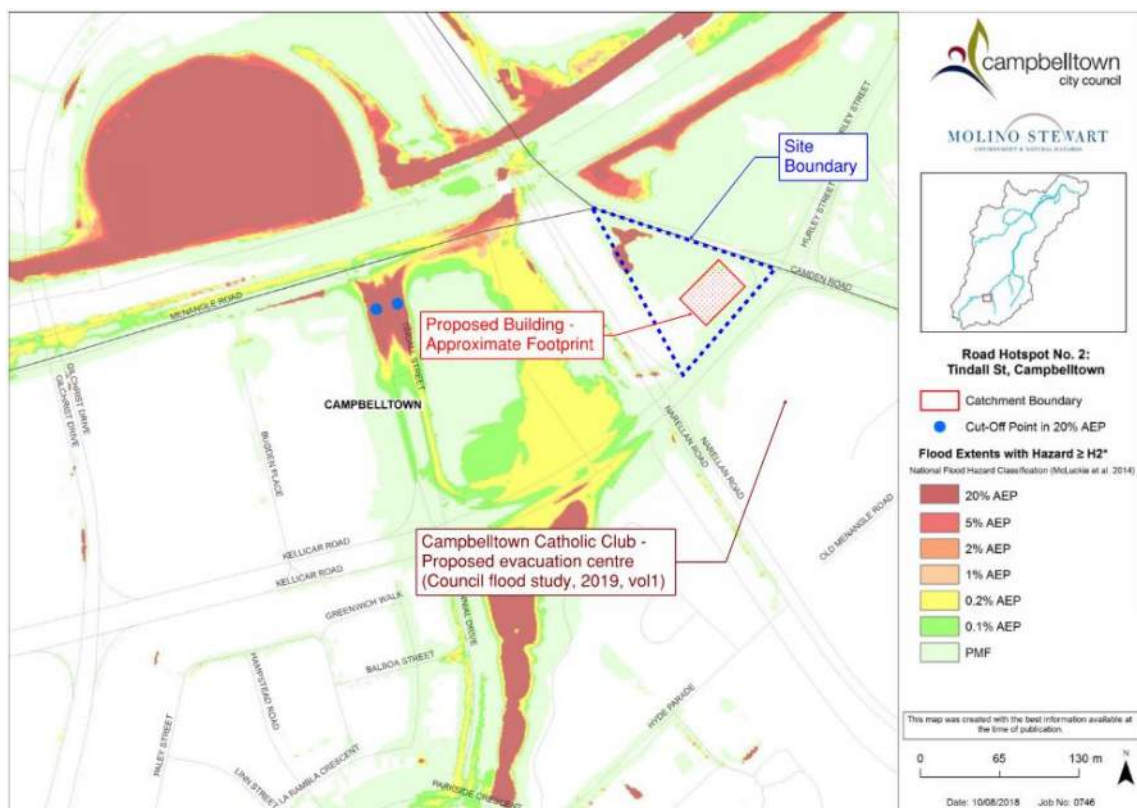


Figure 3 Flood Extent Map (Map 56 of the Council's Flood Study, 2018)

There is only a small area on the site which is affected by floodwaters during events equal and greater than the 20% AEP. The affected area is an existing depression at north-western part of the site (aligned with the existing sag point at Camden Road) that local stormwaters puddle up within during storm events.

Preliminary investigations suggests that ponding on the site is likely associated with an existing sediment basin adjacent to the south-western site boundary (refer Section 3 for more details).

The proposed building is located at the area of the land which is predominantly out of high hazard flood extents up to and including the PMF (refer Figure 3). In addition, the Campbelltown Catholic Club across Kellicar Road south-east of the site has been nominated as evacuation centre by the Council's flood risk assessment report.

The Council prepared a Stormwater Advice Letter (17 February 2021) in addition to a stormwater network map in response to the stormwater advice request made by TTW for the site (see Appendix A and Appendix B).

With respect to the 1% AEP and PMF, the levels provided by the Campbelltown City Council for the site are detailed in Table 1 for the locations shown in Figure 4.

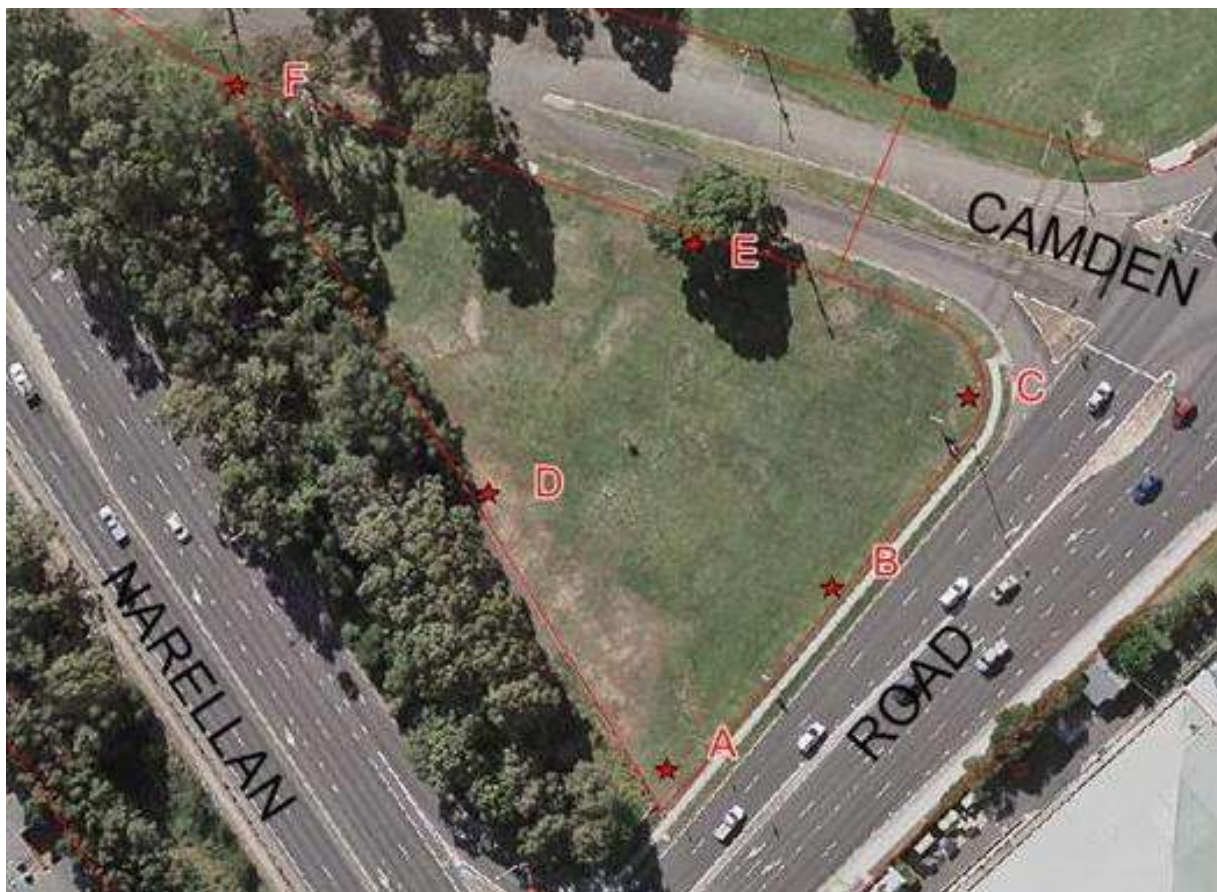


Figure 4 Location of Reported 1% AEP and PMF Flood Levels

Table 1 Site Flood Levels (Received from Campbelltown City Council, 26 February 2021)

Location	1% AEP flood level (mAHD)	PMF level (mAHD)
A	68.7	68.8
B	N/A	68.8
C	68.2	68.4
D	67.8	68.1
E	N/A	67.8
F	67.3	67.8

Council later updated their flood model to include more hydraulic details of the site's vicinity. The updated flood depths (received on 1 March 2020) are shown in Figure 5 and updated flood levels detailed in Table 2.



Figure 5 Location of Reported 1% AEP and PMF Flood Levels

Table 2 Site Flood Levels (Received from Campbelltown City Council, 1 April 2021)

Location	1% AEP Flood Level (mAHD)	PMF Level (mAHD)
A	N/a	68.8
B	N/a	68.8
C	68.2	68.4
D	67.8	68.1
E	67.6	68.0
F	67.2	68.0

Based on the foregoing, it is reasonable to assume that upstream overland flows are effectively contained within the surrounding roads during major events and therefore, the site location is not associated with high flood risks during large events.

Council also confirms that based on the updated flood modelling results, flooding is relatively minor at the proposed building location and therefore, no FPL applies to the proposed building (see Appendix D).

3.0 Stormwater Quantity Management

3.1 Site existing drainage mechanism

The site and Camden Road catchment boundaries were delineated using available survey data prepared by Veris Surveyors (November 13, 2020) as shown in Figure 6.

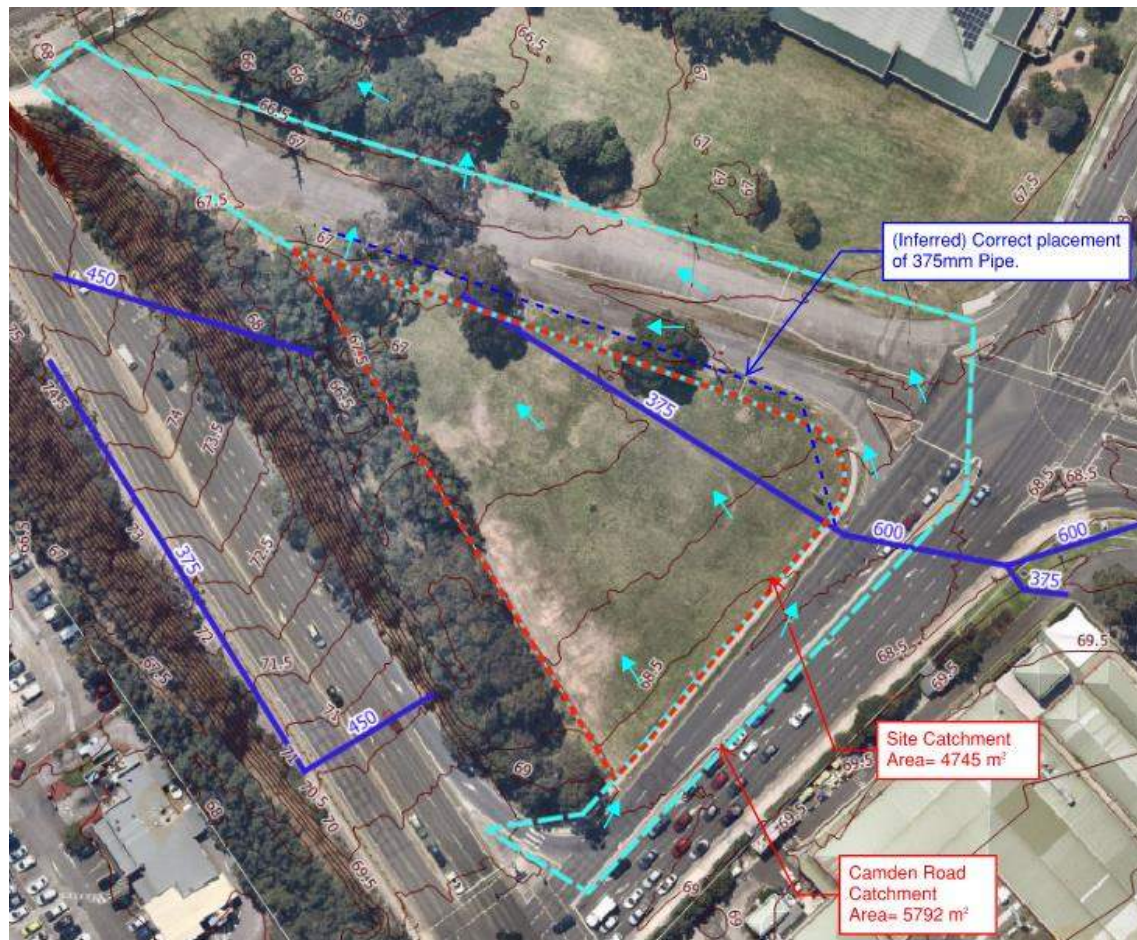


Figure 6 Site Catchment and Camden Road Catchment Plan

The site catchment is generally bounded with Kellicar Road to the southeast and Camden Road to the northeast. Catchment stormwaters run as overland sheet flows in southwest – northeast direction and discharge off the site through northern site boundary at a point adjacent to the existing sag point at Camden Road. Stormwaters at Camden road sag point then overtop onto a land at northern side of Camden Road.

According to the stormwater network map received from Campbelltown City Council (Appendix B), there is an existing 375mm drainage pipe on the site running from Kellicar Road towards northeast. The Campbelltown City Council' stormwater engineers however are of the opinion that the pipe is more likely to be located at back of kerb in Kellicar and Camden Roads. Additional CCTV survey could not be completed as the 375mm pipe was fully blocked and out of service.

Furthermore, survey details and preliminary site visits revealed that there is also an existing 450mm drainage pipe at Camden Road adjacent to northern site boundary. The pipe likely discharges to Birunji Creek and at this stage, seems the most plausible site drainage point of connection to Council's stormwater network. The Council is also of the view that connection to Birunji Creek might be possible however, recommends further investigation as well as consultation with Council (Refer Appendix A). Additional CCTV survey could not confirm the pipe outlet location due to the pipe blockage.

3.2 Narellan Road Drainage Mechanism

There is a fenced (and heavily vegetated) area along the site western boundary which is ostensibly part of Narellan Road drainage system based on the Narellan Road drainage plan received from Campbelltown City Council (Appendix C).

According to Narellan Road drainage plan the existing drainage system consists of a grassed open drain along the northern embankment of Narellan Road followed by a sedimentation basin. The basin receives stormwater flows from Narellan Road (for an extent between Narellan Bridge to intersection of Narellan Road and Kellicar Road) via an existing 450mm pipe. The basin drains towards the Birunji Creek Culvert under the railway at southern side of Narellan Road by a 450mm drainage pipe. Additional CCTV survey confirmed that the 450mm pipe conveys stormwaters from the sediment basin into an existing swale southern side of Narellan Road however, the additional survey was not able to confirm the southern swale's discharge point. The drainage mechanism of Narellan Road at this area is shown in Figure 7.

Existing surface levels also suggest that water ponding on the site (as previously discussed in Section 2) is likely associated with the existing sediment basin as stormwaters overflow from basin onto the site and flow towards the sag point at Camden Road, during events equal and greater than the 20% AEP.

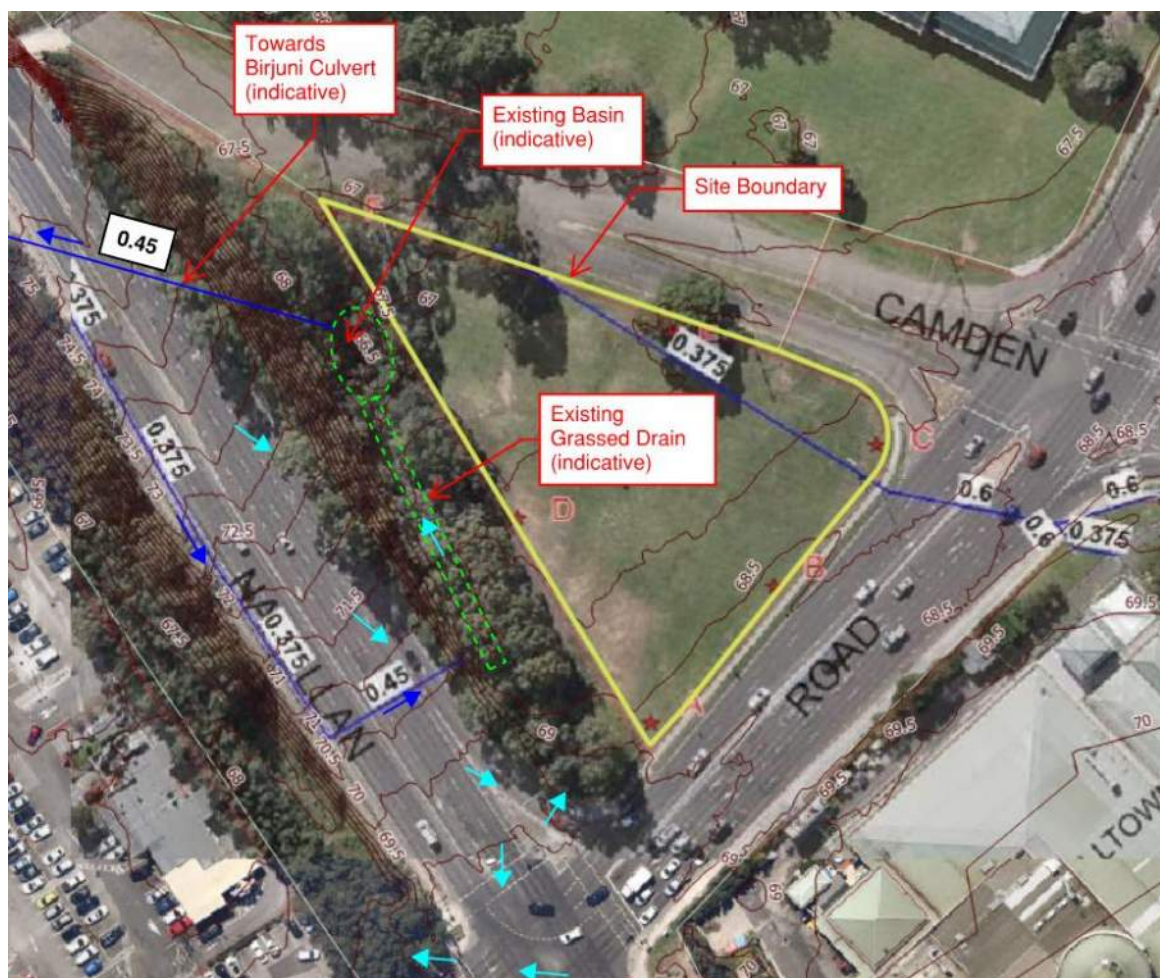


Figure 7 Narellan Road Drainage Mechanism

3.3 Camden Road Drainage Design

Campbelltown Council requires Camden Road along the site northern boundary to be upgraded as part of the development. Proposed preliminary Camden Road design is detailed in TTW-SKC05 and TTW-SKC06 drawings. TTW-SKC07 also shows the bulk earthworks of Camden Road as well as the site. Proposed

stormwater works are summarised as followings:

- Existing 375mm pipe from Kellicar Road to Camden Road (running through the site):
Considering the pipe location and its poor condition, we recommend the pipe to be removed and replaced with a proposed pipe along Camden Road (as part of Camden Road upgrade works). Refer to TTW-SKC05 & TTW-SKC06 drawings for the proposed pipe details.
- Existing 450mm drainage pipe at Camden Road adjacent to northern site boundary:
The existing pipe can be retained and utilised if the pipe is able to provide enough hydraulic head to allow connection to the site. (requires the pipe levels as well as outlet level and location to be confirmed).
- Proposed drainage connection from Camden Road to Birunji Creek:
A new pipe has been proposed to convey stormwaters from Camden Road to Birunji Creek. This new pipe connection will be provided in case the existing 450mm pipe deemed unsuitable and unretainable (refer TTW-SKC05 & TTW-SKC06 drawings for the proposed drainage connection to Birunji Creek).

3.4 Site Drainage Modelling and Design

Site stormwater quantity performance objectives are based on Campbelltown City Council Engineering Design Guide for Development (2015), Part 2.10. Water Cycle Management and Campbelltown City Development Control Plan (2009), Part 4. Stormwater Design as follows:

- All stormwater systems shall be sized to accommodate the 100-year ARI event
- On-site detention (OSD) is to be provided to ensure the maximum discharge from the post-development site is not to exceed the pre-developed flows for all storms up to the 100-year ARI event.
- Major design storm event being 1% AEP.
- Minor design storm event being 10% AEP (refer to Table 4-5 of Engineering Design for Development, 2015).
- DRAINS hydrological and hydraulic modelling package was used with the IL-CL engine to determine preliminary site storage requirements and ensure post development discharge is less than or equal to pre-development discharge of the site. DRAINS input data are as follows:
- Intensity Frequency Duration (IFD) data and rainfall temporal patterns were based on the Bureau of Meteorology (BOM 2016) Rainfall IFD Data System and the Australian Rainfall & Runoff (ARR 2019) Data Hub.
- Model parameters are consistent with those of recommended in Campbelltown City Council Engineering Design for Development, 2015.
- Impervious and pervious fractions were based on aerial maps for the predevelopment condition model and based on architectural plan (provided by TEAM2 Architecture) for the post development condition model.

The site pervious / impervious fractions for predevelopment and post development conditions are detailed in Table 3.

Table 3 Site Catchment - Pervious / Impervious Areas

Catchment	Impervious Area (m ²)	Pervious Area (m ²)	Impervious (%)	Pervious (%)
Existing (site)	0	4745	100	0
Proposed (site)	4033	712	85	15
Existing (Camden Rd)	4634	1158	80	20
Proposed (Camden Rd)	5213	579	90	10

DRAINS models were developed for predevelopment and post development site conditions to assess the site peak discharges in both minor and major events under a range of storm durations between 5 minutes to 90 minutes.

Figure 8 shows the model set up layouts for both site predevelopment and post development conditions. The model results for minor and major events are presented in Figure 9 and Figure 10, respectively.

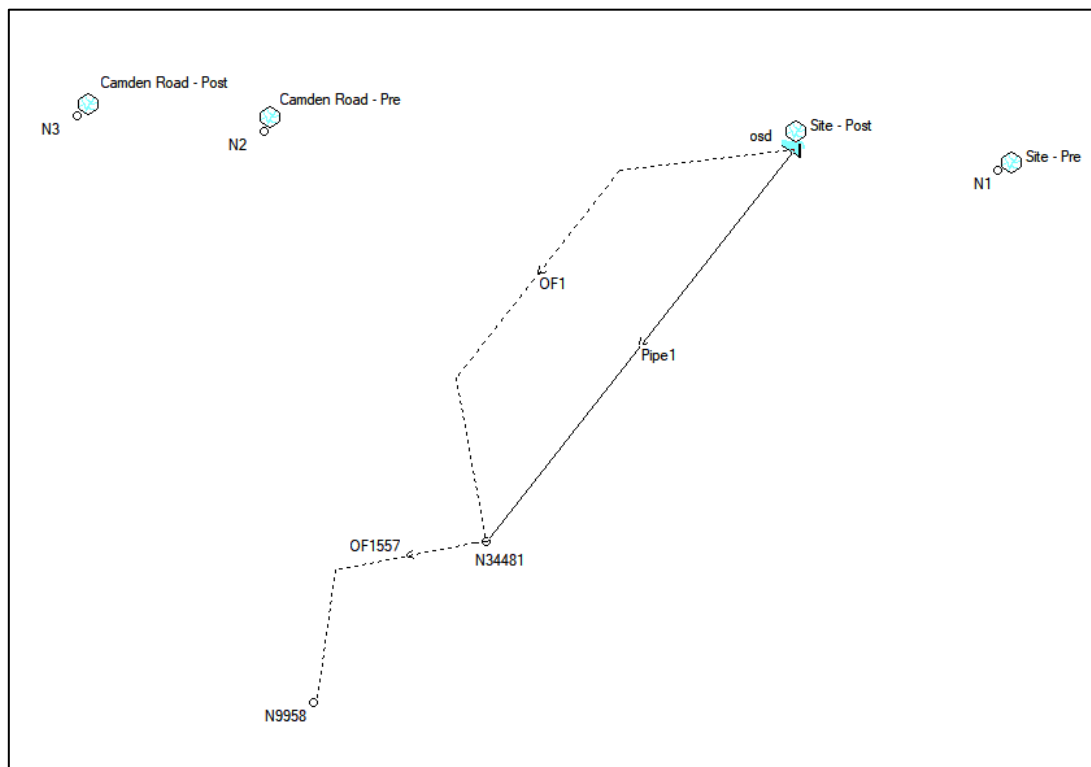


Figure 8 DRAINS Model Layout – Camden Road (left) and the Site (right)

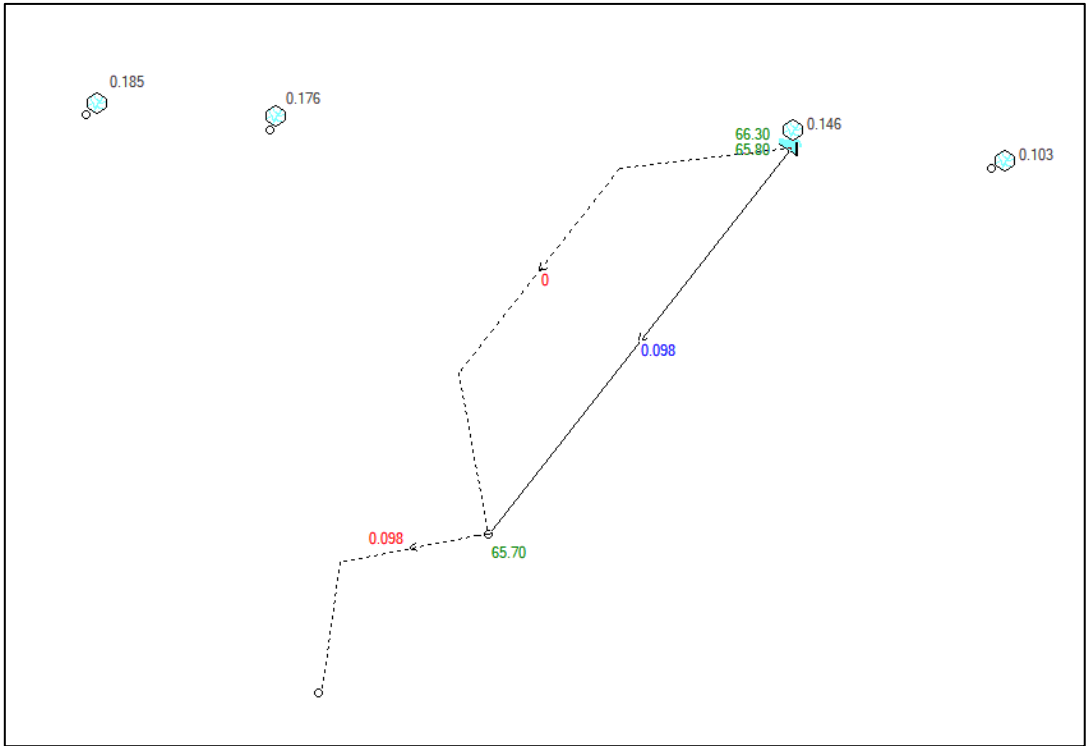


Figure 9 DRAINS Model Results – Minor Event (10% AEP)

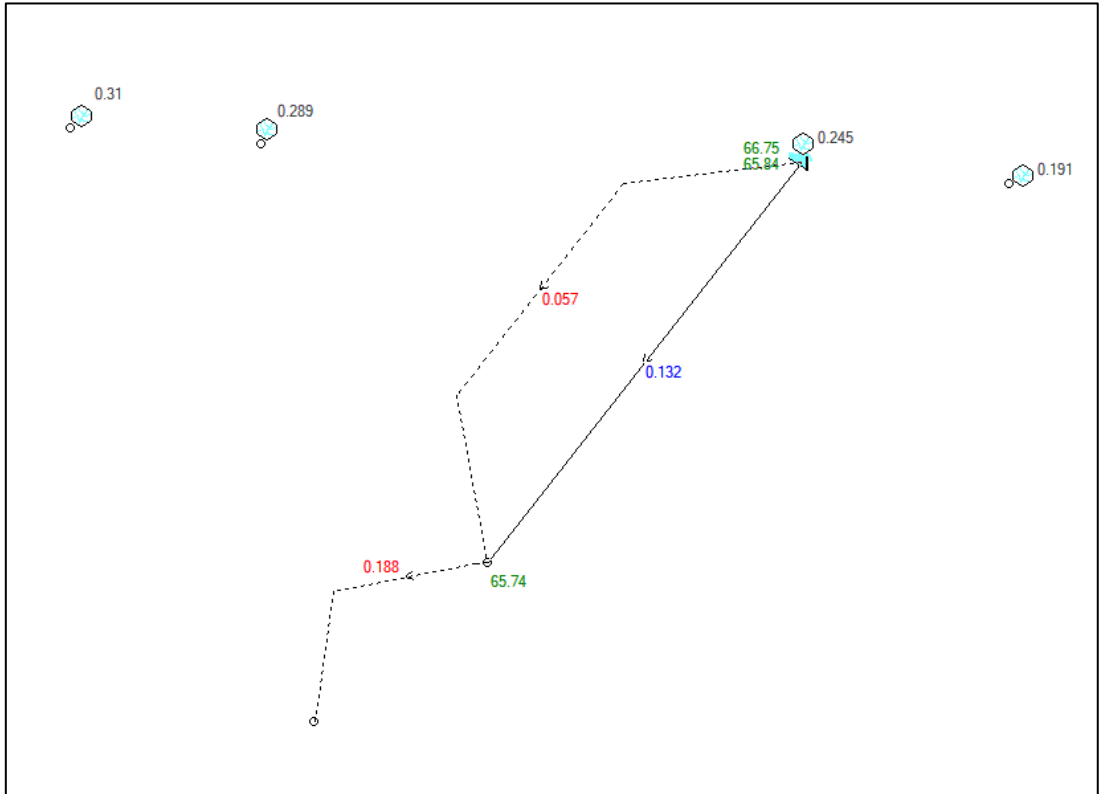


Figure 10 DRAINS Model Results – Minor Event (1% AEP)

3.5 DRAINS Model Results

DRAINS modelling results indicate that approximately 61m³ of on-site detention is required to ensure post development peak flowrates do not exceed predevelopment values. Refer to TTW-SKC06 drawing for the proposed OSD location and details. Table 4 summaries the site peak discharge flowrates in existing and proposed conditions for a range of storm events from 20%AEP up to 1% AEP. Table 5 also shows the Camden Road peak flowrates during both major and minor storm events. It is notable that the proposed stormwater management plan is preliminary and might be further optimised during detail design stage.

Table 4 Results of DRAINS modelling (Site)

Storm Event (AEP)	Peak Discharge (m ³ /s)		Change (m ³ /s)
	Existing	Post Development	
20%	0.080	0.079	-0.001
10%	0.103	0.096	-0.007
5%	0.125	0.109	-0.016
2%	0.155	0.151	-0.004
1%	0.191	0.191	0.000

Table 5 Results of DRAINS modelling (Camden Road)

Storm Event	Peak Discharge (m ³ /s)		Change (m ³ /s)
	Existing	Post Development	
Minor (10% AEP)	0.289	0.310	0.021
Major (1% AEP)	0.176	0.185	0.009

4.0 Stormwater Quality Management

4.1 Methodology and Modelling

The Campbelltown City Council Engineering Design for Development (2015) has provided pollutant reduction targets as water quality criteria which are applicable to all urban developments. The targets (detailed in Table 6) are total values to be achieved from a development site.

Table 6 Pollutant reduction targets based the Campbelltown City Council Engineering Design for Development (2015)

Pollutant	Desired Target
Reduction in annual total suspended solids (TSS) export load	80%
Reduction in average annual total phosphorus (TP) export load	45%
Reduction in average annual total nitrogen (TN) export load	45%

The Model for Urban Stormwater Improvement Conceptualisation (MUSIC) was developed to assess the pollutant generation from the proposed development and to evaluate the effectiveness of proposed treatment train. Model parameters are as follows:

- 6-minute pluviograph rainfall data from the Lucas Heights was used.
- Catchment areas and pervious / impervious fractions for the proposed development are as per Table 7.

Table 7 Catchment Parameters - MUSIC Modelling

Surface	Area (m ²)	Pervious (%)	Impervious (%)
Roof	1280	0	100
Car Park	3290	17	83
Landscape	140	100	0
Bypass	50	0	100

To achieve the pollutant reduction targets, an iterative approach was used for post-development modelling to determine appropriate types and sizes of stormwater treatment devices.

To satisfy the required treatment objectives in accordance with principles of WSUD, the proposed preliminary treatment train was designed as detailed in Table 8. Rainwater tank for the proposed development is design by DSA Consulting. Refer to TTW-SKC05 drawing for the location of rainwater tank. The model layout for the proposed development is shown in Figure 11.

It is notable that the proposed treatment train arrangement is preliminary and be further optimised during detail design stage.

Table 8 Proposed Treatment Train

Device Name	Number of Device	Volume (KL)	Device Model	Max Flow Rate (l/s)
Rainwater Tank	1	50		-
Storm Filter	12	-	Storm Filter (P sorb 690mm)	10.8

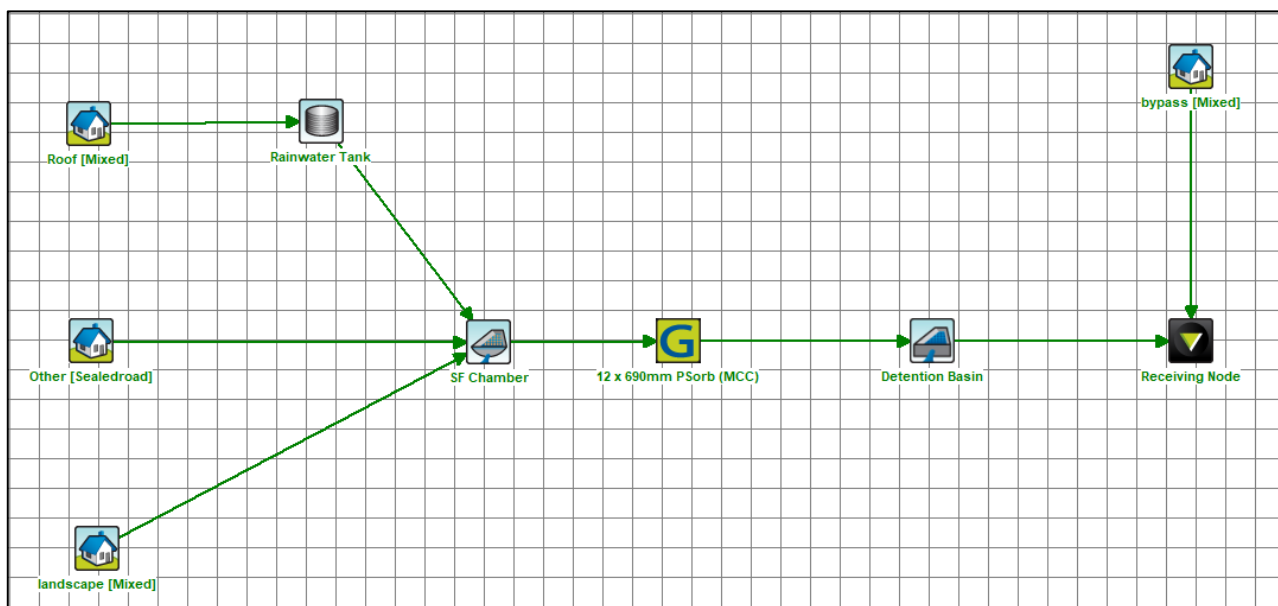


Figure 11 Proposed Treatment Train Layout

4.2 MUSIC Model Results

MUSIC modelling results demonstrate that the required reduction criteria can be achieved for the site with the implementation of the proposed treatment train. Proposed treatment effectiveness is represented in Table 9.

Table 9 Proposed Treatment Train Effectiveness

Pollutant	Sources	Residual Load	Reduction (%)
Flow (ML/yr)	4.01	4.01	0
Total Suspended Solids (kg/yr)	1200	208	82.7
Total Phosphorus (kg/yr)	2.1	0.656	68.8
Total Nitrogen (kg/yr)	10.2	5.45	46.4
Gross Pollutants (kg/yr)	106	1.22	98.8

MUSIC results demonstrate that the required reduction criteria can be achieved for the site with the implementation of the proposed treatment train.

5.0 Complying development on flood control lots

The Council's Stormwater Advice Letter states that the site is defined as a flood control lot and subject to Exempt and Complying Development Codes (2008) requirements. The following provides a compliance assessment of the proposed development in accordance with requirements of Exempt and Complying Development Codes (2008), regulation 5A.30.

1. Development under this code must not be carried out on any part of a flood control lot, other than a part of the lot that the council or a professional engineer who specialises in hydraulic engineering has certified, for the purposes of the issue of the complying development certificate, as not being any of the following:
 - (a) a flood storage area,
 - (b) a floodway area,
 - (c) a flow path,
 - (d) a high hazard area,
 - (e) a high-risk area.

As discussed in Section 2, the proposed development is not located on any of the above.

2. Development that is carried out under this code on any part of a flood control lot must meet the following requirements:
 - (a) if there is a minimum floor level adopted in a development control plan by the relevant council for the lot, the development must not cause any habitable room in the dwelling house to have a floor level lower than that floor level.

Based on the flood data acquired from Council (refer to Table 2), the flooding is relatively minor at the proposed building and therefore, no FPL applies (Refer Appendix D).

- (b) any part of the building that is erected at or below the flood planning level is constructed of flood compatible material,

Based on the flood data acquired from Council (refer to Table 2), the flooding is relatively minor at the proposed building and therefore, no FPL applies (Refer Appendix D).

- (c) any part of the building that is erected is able to withstand the forces exerted during a flood by water, debris and buoyancy up to the flood planning level (or if an on-site refuge is provided on the lot, the probable maximum flood level)

Based on the flood data acquired from Council (refer to Table 2 & Figure 4)), the flooding is relatively minor at the proposed building and therefore, no FPL applies (Refer Appendix D).

(d) the development must not result in increased flooding elsewhere in the floodplain,

The proposed development is located outside of flood storage / flood storage. Onsite detention basin is also proposed to ensure discharge flowrates in post development conditions are maintained to equal or less than predevelopment conditions during all events up to and including the 1%AEP. Therefore, increase of flooding elsewhere in the floodplain is not expected.

(e) the lot must have pedestrian and vehicular access to a readily accessible refuge at a level equal to or higher than the lowest habitable floor level of the building,

Reliable pedestrian and vehicular access and egress is available during flood events. (refer Figure 4).

(f) vehicular access to the building will not be inundated by water to a level of more than 0.3m during a 1:100 ARI (average recurrent interval) flood event,

Based on Council's flood extent map (as shown in Figure 4), the site as well as Camden Road are predominantly flood free during events up to and including the 1%AEP. In addition, the proposed site earthworks will resolve the water ponding on north-western part of the onsite. Therefore, reliable pedestrian and vehicular access and egress is available during flood events. Furthermore, the Campbelltown Catholic Club across Kellicar Road south-east of the site has been nominated as evacuation centre by the Council's flood risk assessment report.

(g) the lot must not have any open car parking spaces or carports lower than the level of a 1:20 ARI (average recurrent interval) flood event.

All the car parks will be above the 5%AEP flood levels. (refer Figure 5 for existing flood conditions and TTW-SKC05 & TTW-SKC06 for design surface levels).

The floor level must also comply with the requirements set out in Clause 3.1.3.3, Volume 2 of National Construction Code 2019.

Based on the foregoing the proposed development will meet the requirements of Exempt and Complying Development Codes (2008).

6.0 Conclusion

- Based on Council's flood extent map (as shown in Figure 4), the site as well as Camden Road are predominantly flood free during events up to and including the 1%AEP. In addition, the proposed site earthworks will resolve the water ponding on north-western part of the onsite.
- Based on the flood data acquired from Council (refer to Table 2 & Figure 4)), the flooding is relatively minor at the proposed building and therefore, no FPL applies (Refer Appendix D).
- The existing 375mm pipe from Kellicar Road to Camden Road is currently fully blocked and redundant. We recommend the pipe to be removed and replaced with a proposed drainage pipe along Camden Road (as part of Camden Road upgrade works). Refer to TTW-SKC05 & TTW-SKC06 drawings for the proposed pipe details.
- A new pipe drainage network is proposed as part of Camden Road upgrade. The proposed drainage pipe discharges stormwaters from Camden Road to Birunji Creek at southern side of Narellan Road. Refer to TTW-SKC06 drawing for details.
- The site stormwater pipe network is to be connected to the proposed drainage pipe at Camden Road. Refer to TTW-SKC06 drawing for details.

- The existing 450mm drainage pipe at Camden Road can be retained and utilised if the pipe conditions deemed suitable and it is able to provide enough hydraulic head to allow connection from the site. (requires the pipe levels as well as outlet level and location to be confirmed).
- A new drainage pipe has been proposed to convey stormwaters from Camden Road to Birunji Creek. This new pipe connection will be provided in case the existing 450mm pipe deemed unsuitable and / or unretainable (refer TTW-SKC05 & TTW-SKC06 drawings for the proposed connection to Birunji Creek).
- Preliminary hydraulic modelling indicates that provision of OSD achieves water quantity objectives. Detailed design of the site drainage system and OSD basin including location, dimensions, outlet control, overflow weir and final volume will need to be undertaken during the detailed design stage of the development.
- Water quality assessment results indicate that post development water quality objectives will be met by the proposed stormwater treatment train, which is comprised of a rainwater tank, a storm filter unit (12 Psorb filters) followed by an OSD.
- Compliance assessment of the proposed development confirms the proposed development will meet the requirements of Exempt and Complying Development Codes (2008)
- Further refinement of the proposed design and models at detailed design stage may alter the sizes and locations of proposed treatment structures as well as life cycle cost estimation however, performance outcomes of the final design are to achieve specification provided in this report.

Prepared by
TAYLOR THOMSON WHITTING (NSW) PTY LTD
in its capacity as trustee for the
TAYLOR THOMSON WHITTING NSW TRUST

Authorised By
TAYLOR THOMSON WHITTING (NSW) PTY LTD
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TAYLOR THOMSON WHITTING NSW TRUST

ALI ATTAR
Senior Engineer

Stephen Brain
Technical Director/Director

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Appendix A

Stormwater Advice Letter - Campbelltown City Council

17 February 2020

Ali Attar
Ali.attar@ttw.com.au

Dear Mr Attar

Stormwater Advice – Corner of Kellicar Road & Camden Road (Lot 1 DP 883417 & 1003625)

I refer to your stormwater advice request form dated 18 January 2021 for the above mentioned property.

Council advises as follows:

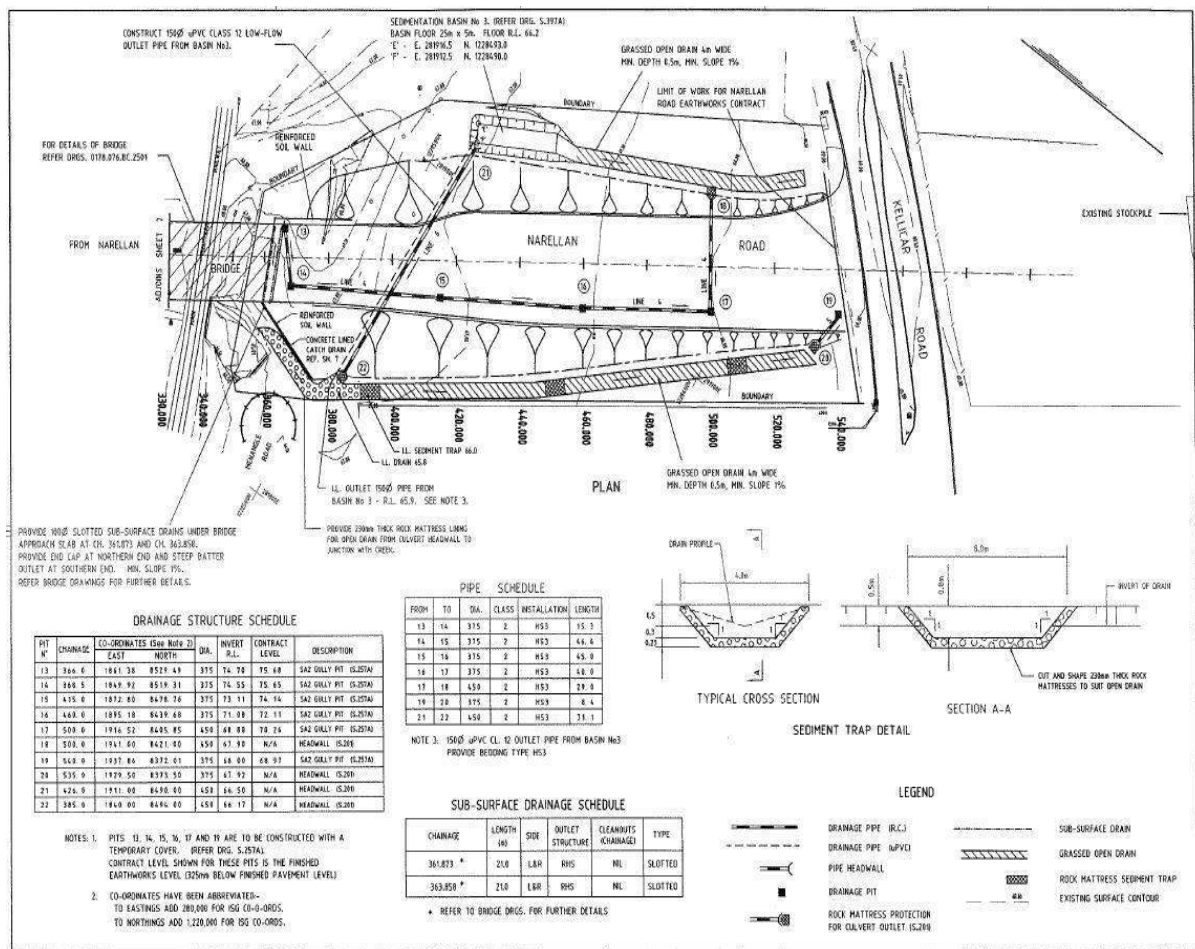
1. The above mentioned property is a Flood Control Lot with respect to 1% Annual Exceedance Probability (AEP) flood.

A Flood Control Lot is defined in the State Environment Planning Policy (Exempt and Complying Development Codes) 2008 - REG 1.5 as “a lot to which flood related development controls apply in respect of development for the purposes of industrial buildings, commercial premises, dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (other than development for the purposes of group homes or seniors housing).
2. Council recommends that you liaise with Transport for New South Wales regarding the 450 mm pipe discharging to the swale and sediment basin in the batter of Narellan Road adjacent to the site (copy of Roads and Traffic Authority of NSW plan attached) in the Narellan Road Reserve. A further assessment is required to determine the impact this may have on the proposed development. The applicant will need to liaise with Transport for New South Wales to determine what access requirements they may have.
3. There is some ponding in the road reserve for Old Camden Road which will need to be addressed. It is understood that this proposal will be formalising the kerb and gutter in this roadway and such works will need to intercept and manage these flows. A further investigation is required in consultation with Council regarding an appropriate discharge point. Once the flows in the road are managed, there should be no impact from these flows on the development proposal.
4. Any application for this site will need to demonstrate how drainage from the lot is to be connected to Council's drainage system. The existing pipe drainage system to Fisher's Ghost Creek in Koshigaya Park along Hurley Street is running full and cannot cater for additional flows from the proposed site without upgrade. It may be possible to connect to Birunji Creek to the South but this require further investigation. These options should be considered in consultation with Council.
5. Any development of this site will require drainage to be accommodated in accordance with the Campbelltown City Council Engineering Design Guide for Development

6. Development consent and/or construction consent may be required for any development of this property.
7. As requested, please find details of Council's stormwater network in the vicinity of the abovementioned property enclosed with this letter. This does appear to be missing some information as discussed above.
8. If you require any further information, please contact Cathy Kinsey, Coordinator Stormwater and Structural Design at cathy.kinsey@campbelltown.nsw.gov.au or 0418 995 084.

Yours sincerely


per **Mark Wolczak**
PK



Appendix B

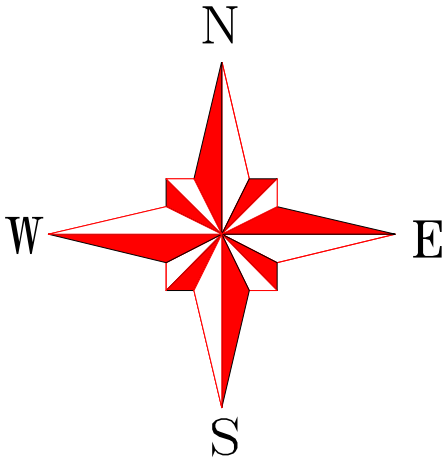
Stormwater Network Map - Campbelltown City Council



Lot 1 DP 883417
Camden Road
Campbelltown

Council's Information
Stormwater network
on Aerial Photo base

Pipe diameter in mm



Accuracy of the information shown on this plan is not guaranteed.

All service levels and locations should be confirmed on site.

This information shall not be made public without the written permission of Council's Executive Manager Infrastructure.

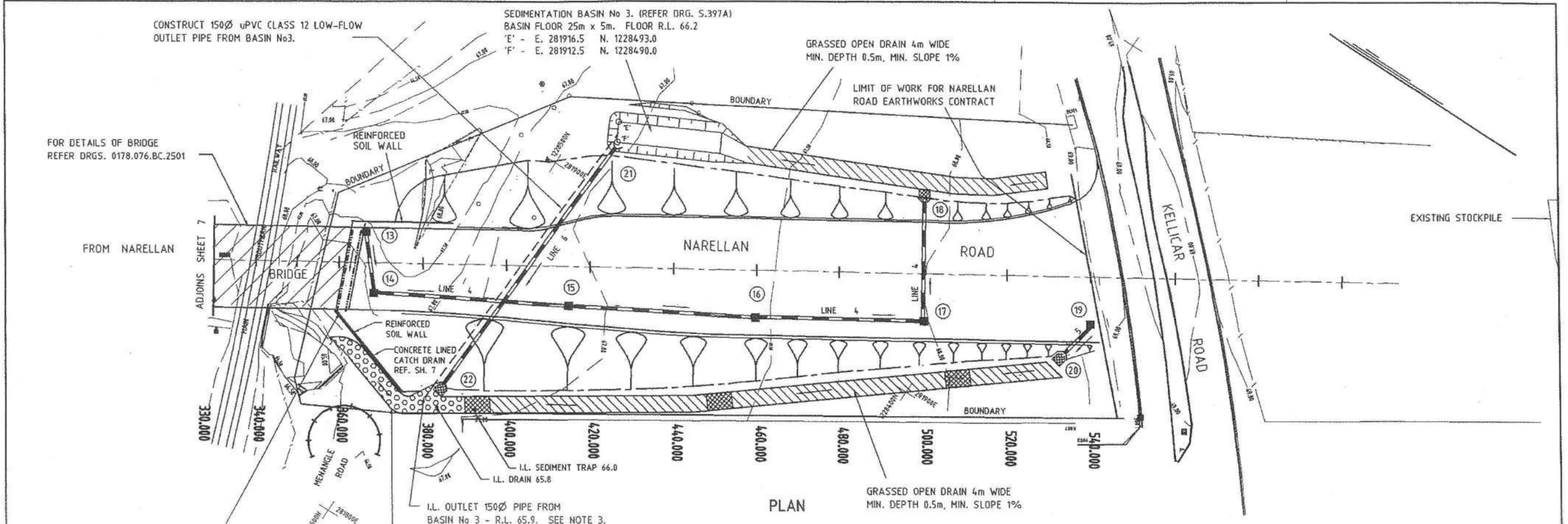
Council does not have details of drainage lines within private property where these service only private lots.

The contour information is based on Airborne LaserSurvey provided by NSW Land and Property Information 2011. Any changes to the topography since that time may not be reflected in these plans.

Appendix C

Narellan Road drainage plan

0178.076.RC.2500



DRAINAGE STRUCTURE SCHEDULE

PIT N°	CHAINAGE	CO-ORDINATES (See Note 2)		DIA.	INVERT R.L.	CONTRACT LEVEL	DESCRIPTION
		EAST	NORTH				
13	366.0	1861.38	8529.49	375	74.70	75.68	SA2 GULLY PIT (S.257A)
14	368.5	1849.92	8519.31	375	74.55	75.65	SA2 GULLY PIT (S.257A)
15	415.0	1872.80	8478.76	375	73.11	74.14	SA2 GULLY PIT (S.257A)
16	440.0	1895.18	8439.68	375	71.08	72.11	SA2 GULLY PIT (S.257A)
17	500.0	1916.52	8405.85	450	68.80	70.26	SA2 GULLY PIT (S.257A)
18	500.0	1941.00	8421.00	450	67.90	N/A	HEADWALL (S.201)
19	540.0	1937.86	8372.01	375	68.00	68.97	SA2 GULLY PIT (S.257A)
20	535.0	1929.50	8373.50	375	67.92	N/A	HEADWALL (S.201)
21	426.0	1911.00	8490.00	450	66.50	N/A	HEADWALL (S.201)
22	385.0	1840.00	8494.00	450	66.17	N/A	HEADWALL (S.201)

- NOTES: 1. PITS 13, 14, 15, 16, 17 AND 19 ARE TO BE CONSTRUCTED WITH A TEMPORARY COVER. (REFER DRG. S.257A).
CONTRACT LEVEL SHOWN FOR THESE PITS IS THE FINISHED EARTHWORKS LEVEL (325mm BELOW FINISHED PAVEMENT LEVEL)
2. CO-ORDINATES HAVE BEEN ABBREVIATED:-
TO EASTINGS ADD 280,000 FOR ISG CO-ORDS.
TO NORTHINGS ADD 1,220,000 FOR ISG CO-ORDS.

PIPE SCHEDULE

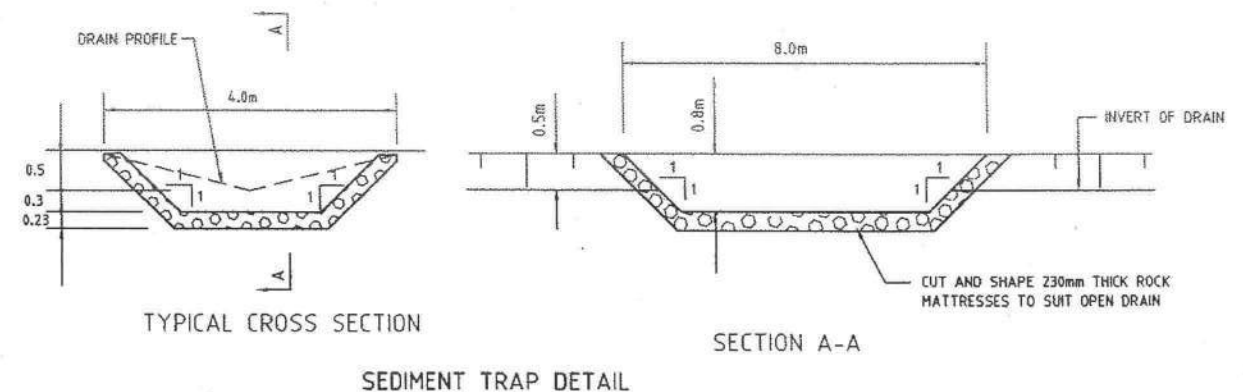
FROM	TO	DIA.	CLASS	INSTALLATION	LENGTH
13	14	375	2	HS3	15.3
14	15	375	2	HS3	46.6
15	16	375	2	HS3	45.0
16	17	375	2	HS3	40.0
17	18	450	2	HS3	29.0
19	20	375	2	HS3	8.4
21	22	450	2	HS3	71.1

NOTE 3: 150Ø uPVC CL. 12 OUTLET PIPE FROM BASIN No.3
PROVIDE BEDDING TYPE HS3

SUB-SURFACE DRAINAGE SCHEDULE

CHAINAGE	LENGTH (m)	SIDE	OUTLET STRUCTURE	CLEANOUTS (CHAINAGE)	TYPE
361.873 *	21.0	L&R	RHS	NIL	SLOTTED
363.858 *	21.0	L&R	RHS	NIL	SLOTTED

* REFER TO BRIDGE DRGS. FOR FURTHER DETAILS



LEGEND

	DRAINAGE PIPE (R.C.)		SUB-SURFACE DRAIN
	DRAINAGE PIPE (uPVC)		GRASSED OPEN DRAIN
	PIPE HEADWALL		ROCK MATTRESS SEDIMENT TRAP
	DRAINAGE PIT		EXISTING SURFACE CONTOUR
	ROCK MATTRESS PROTECTION FOR CULVERT OUTLET (S.201)		

3	CONCRETE LINED CATCH DRAIN ADDED	SWR	13/7/95	COMPUTER FILE REFERENCES	PREPARED BY SWR SERVICES PTY. LTD.	PREPARED DATE	12/4/95	DECIDED DATE	29/6/95	ROADS AND TRAFFIC AUTHORITY OF N.S.W. CITY OF CAMPBELLTOWN MR 178 - NARELLAN ROAD RECONSTRUCTION FROM BLAXLAND ROAD TO KELICAR ROAD DRAINAGE PLAN - CH. 330 TO CH. 540 FILE: 76.1567 REG No: 0178.076.RC.2500	SHEET 8 OF 18 SHEETS	
2	ISSUED FOR CONSTRUCTION	SWR	4/7/95	DESIGN MODEL: NAR GROUND	DESIGN	R.C.	12/4/95	D.W.	29/6/95			
1	ISSUED TO RTA	SWR	1/5/95	DESIGN MODEL: NAR DESIGN	CAD DRAWING	P.B.	13/4/95	D.W.	29/6/95			
No	AMENDMENT DETAIL	AUTH	DATE	SWR CAD REFERENCE: C:\ACAD\WORK\328_88	PROJECT DESIGNER	D. WATSON	29/6/95	PROJECT MANAGER	D. COWAN	29/6/95	DRAWN BY CAD	DO NOT AMEND MANUALLY
SCALES PLAN: 0 5 10 15 20 25m LONGITUDINAL SECTION: 0 5 10 15 20 25m VERT. 0 1 2 3 4 5m		DATUM: AHD GRID: ISG		ROADLOC: START: FINISH:		SWR SERVICES PTY. LTD. 17 ROBERT AVENUE CAMPBELLTOWN NSW 2607 TEL: 0633 200 000 FAX: 0633 200 001						

Appendix D

Council's Confirmation on FPL Requirement

Ali Attar

From: Aaron Biffin <Aaron.Biffin@campbelltown.nsw.gov.au>
Sent: Tuesday, 6 April 2021 8:52 AM
To: Ali Attar
Cc: Cathy Kinsey
Subject: RE: Re: Genesis Campbelltown - flood section

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Ali,

As the flooding is relatively minor at the proposed building location, no FPL applies.

Thanks,

Aaron



Aaron Biffin
Civil Infrastructure Engineer

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M: [0428 538 429](tel:0428538429)
E: Aaron.Biffin@campbelltown.nsw.gov.au
W: www.campbelltown.nsw.gov.au



Campbelltown City Council acknowledges and respects the Dharawal people as traditional custodians of this land, and extends these respects to all Aboriginal Elders, past and present, and people from all Aboriginal nations.

From: Ali Attar <ali.attar@ttw.com.au>
Sent: Thursday, 1 April 2021 5:04 PM
To: Aaron Biffin <Aaron.Biffin@campbelltown.nsw.gov.au>
Cc: Cathy Kinsey <cathy.kinsey@campbelltown.nsw.gov.au>
Subject: RE: Re: Genesis Campbelltown - flood section

Hi Aaron,

Thanks for the additional flood results.

Provided flood map shows that the proposed building is unaffected by 100 year floodwaters (see attached). Considering that, do flood planning level requirements apply for the proposed building? If yes, please advise FPL relative to the proposed building.