

Leppington Public School Upgrade

Stormwater Management Report

Prepared for: NSW Department of Education (DoE)
Date: 17th January 2025
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Revision

Site Address: 144 Rickard Road, Leppington NSW 2179

Real Property Description: Lot 39C, DP8979
Lot 38E, DP8979
Lot 1, DP439310
Lot 1, DP 127446

Proposed Activity: Upgrades to school

Client: New South Wales Department of Education (DoE)

Authority: *Environmental Planning and Assessment Act 1979* Section 5.1

Landowner: The Minister for Education and Early Learning Behaviour

Authority Reference #: N/A

Stantec Reference: 304000722-SWMP_010

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Civil Project Technical Lead, Team Leader

For and on behalf of
Stantec Australia Pty Ltd

Revision	Date	Comment	Prepared By	Approved By
001	23.02.23	Preliminary Concept Design	LPT	MDR
002	30.03.23	Concept Design	LPT	MDR
003	11.12.23	50% Schematic Design	LPT	MDR
004	09.02.24	95% Schematic Design	LPT	JMB
005	22.03.24	100% Schematic Design	LPT	JMB
006	06.05.24	100% Schematic Design	LPT	MDR
007	06.06.24	100% DA Issue	LPT	VE
008	06.11.24	100% DA Issue	HAL	VE
009	17.01.24	Issued For REF	HAL	VE

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Contents

1.	Introduction	1
2.	Abbreviations Definitions	3
3.	Relevant Policies, Standards and Guidelines	4
4.	Existing Site Characteristics	5
4.1	Property Detail	5
4.2	Topography	6
4.3	Stormwater Catchments	7
4.4	Existing Stormwater Infrastructure	7
4.5	Existing Stormwater Discharge	7
5.	Local Authority Requirements	9
5.1	Stormwater Conveyance Requirements	9
5.2	On-Site Detention Requirements	9
6.	Cumulative Impact Assessment – Flooding	10
6.1	Existing Flooding	10
7.	Stormwater Conveyance	11
7.1	Roof Drainage	11
7.2	Surface Drainage	11
7.3	Legal Point of Discharge	11
8.	Stormwater Attenuation	12
9.	Water Quality Treatment	15
9.1	Potential Pollutants	15
9.2	Pollutant Reduction System	16
10.	Green Star Compliance	19
10.1	Code 26.1- Stormwater Peak Discharge Criteria	19
10.2	Code 26.2- Stormwater Pollution Targets	19
10.3	Code 30C- Improving on Green Star Benchmarks	19

Contents

11.	Water Sensitive Urban Design Strategy	21
12.	Stormwater Network Maintenance Schedule	22
12.1	Pit and Pipe Network	22
12.2	Water Quality Treatment Devices	22
12.3	OSD Tanks	22
12.4	Civil Structures	23
12.5	Stormwater Maintenance Schedule	24
13.	Erosion & Sedimentation Control	26
13.1	Stormwater Drainage Infrastructure Inlets	26
13.2	Construction Exit Protection	26
13.3	Downstream Site Boundaries	27
13.4	Sediment Runoff	27
14.	Evaluation of Environmental Impacts	28
14.1	Soils and Geology	28
14.2	Stormwater	28
14.3	Flooding	28
15.	Mitigation Measures	29
16.	Conclusion	29
Appendix A Civil Design Documentation		1
Appendix B Existing Flood Information		2
Appendix C MUSIC-LINK		3

1. Introduction

This Stormwater Management Plan (SWMP) has been prepared to support a Review of Environmental Factors (REF) for the Department of Education (DoE) for the upgrade of Leppington Public School (LPS) (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.

The proposed activity is for upgrades to the existing LPS at 144 Rickard Road, Leppington, NSW, 2179 (the site).

The purpose of this report is to outline the conceptual REF level stormwater design for the proposed Leppington Public School.

This SWMP illustrates that the proposed activity complies with the conditions set out by the State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP), Camden Council, Australian Rainfall and Runoff ARR (2019), Australian Standards and best engineering practices.

The purpose of this SWMP is to evaluate the quantity and quality of stormwater associated with the proposed activity plan so as to demonstrate to the DoE that an appropriate stormwater management strategy has been adopted.

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

- Demolition of existing structures and trees;
- Erection of a new 3-storey teaching space along the northern boundary that includes 20 permanent teaching spaces and 3 support teaching spaces;
- Erection of a new hall and COLA comprising of a hall, canteen and OSHC hub towards the eastern boundary of site;
- Extension of the existing library (Building E) and adjoining playground;
- Upgraded sports and play facilities;
- Relocation of the Yarning Circle;
- Erection of a substation and upgrades to site services;
- Footpaths, fencing and associated works; and
- Landscaping.

The intent of the activity is to allow for upgrades to LPS that will provide a ‘CORE 35’ school standard in line with the Educational Facilities Standards and Guidelines (EFSG). The activity will increase the capacity of the school from 430 to 621 students.

This SWMP specifically addresses the following items for both the construction and operational phases of the activity:

- Stormwater runoff volumes;
- Stormwater quality treatment measures;
- Water Sensitive Urban Design (WSUD) measures
- Erosion Sedimentation Control

2. Abbreviations Definitions

-	AEP	Annual Exceedance Probability
-	AHD	Australian Height Datum
-	ARI	Average Recurrence Interval
-	ARR	Australian Rainfall and Runoff
-	DA	Development Application
-	DCP	Development Control Plan
-	DN	Diameter Nominal (mm)
-	DPIE	Department of Planning, Industry and Environment
-	EFSG	Education Facilities Standards and Guidelines
-	EY	Exceedances per Year
-	GPT	Gross Pollutant Trap
-	IFD	Intensity-Frequency-Duration
-	IL	Invert Level
-	L/s	Litres per second
-	m/s	Metres per second
-	MUSIC	Model for Urban Stormwater Improvement Conceptualisation
-	OSD	On-site Stormwater Detention
-	PSD	Permissible Site Discharge
-	RCP	Reinforced Concrete Pipe
-	REF	Review of Environmental Factors
-	RL	Relative Level
-	SID	Safety In Design
-	SQID's	Stormwater Quality Improvement Devices
-	SSDA	State Significant Development Application
-	SSR	Site Storage Requirement
-	WQO's	Water Quality Objectives
-	WSC	Water Services Coordinator
-	WSUD	Water Sensitive Urban Design



3. Relevant Policies, Standards and Guidelines

The following listed policies, standards and guidelines were referred to in the preparation of this report:

- Camden Growth Centre Precinct DCP 2023
- Camden Council Development Control Plan 2019
- Camden Council Engineering Design Specification 2009
- Camden Council Engineering Construction Specification 2009
- Educational Facilities Standards & Guidelines (EFSG), NSW Department of Education
- Australian Rainfall & Runoff 2019
- AS3500 parts 0-5: 2021 Plumbing and Drainage
- Landcom Managing Urban Stormwater: Soils and Construction Volume 1 2004
- NSW Floodplain Development Manual 2005
- Guidelines for development adjoining land and water managed by DECCW (OEH, 2013)



4. Existing Site Characteristics

4.1 Property Detail

LPS is located at 144 Rickard Road, Leppington on the eastern side of Rickard Road, north of Ingleburn Road and south of Byron Road. The site has an area of 3.013 ha and comprises 4 allotments, legally described as:

Real Property Description:	Lot 39C, DP8979
	Lot 38E, DP8979
	Lot 1, DP439310
	Lot 1, DP 127446
Site Area:	Approx. 30,000m ² (3 Ha)
Area of Activity:	Approx. 19,300m ² (1.93 Ha)

The proposed activity can be seen on the Civil Design Documentation shown in Appendix A of this report.

The site currently comprises an existing co-education primary (K-6) public school with:

- 14 permanent buildings;
- 11 demountable structures (including 2 male/female toilet blocks);
- interconnected paths;
- covered walkways;
- play areas; and
- at-grade parking.

The site also contains locally listed heritage buildings along its southern boundary.

The buildings are 1 storey in height and there is a sports oval in the eastern portion of the site. The existing buildings are clustered in the north-western part of the site.

Refer to locality plan in Figure 2 for further clarification.





Figure 2: Aerial image of the site, outlined in red (Source: NearMap, taken 24 Sept 2024)

4.2 Topography

The topography of the site has been determined by analysis of survey documents and Mecone Mosaic. Ground surface across the site is dipping gently toward the north-east. The minimum ground surface elevation across the site is RL 91.2 m AHD and change in level across the site from the southern to northern boundary varies between 7m to 10m. There is a small crest to the south of the site. There is some evidence of cut and fill within and in the vicinity of sports field. The high point of the site located along the southern boundary at a level of RL 101.8 m AHD. There is an average slope of 3.4%.

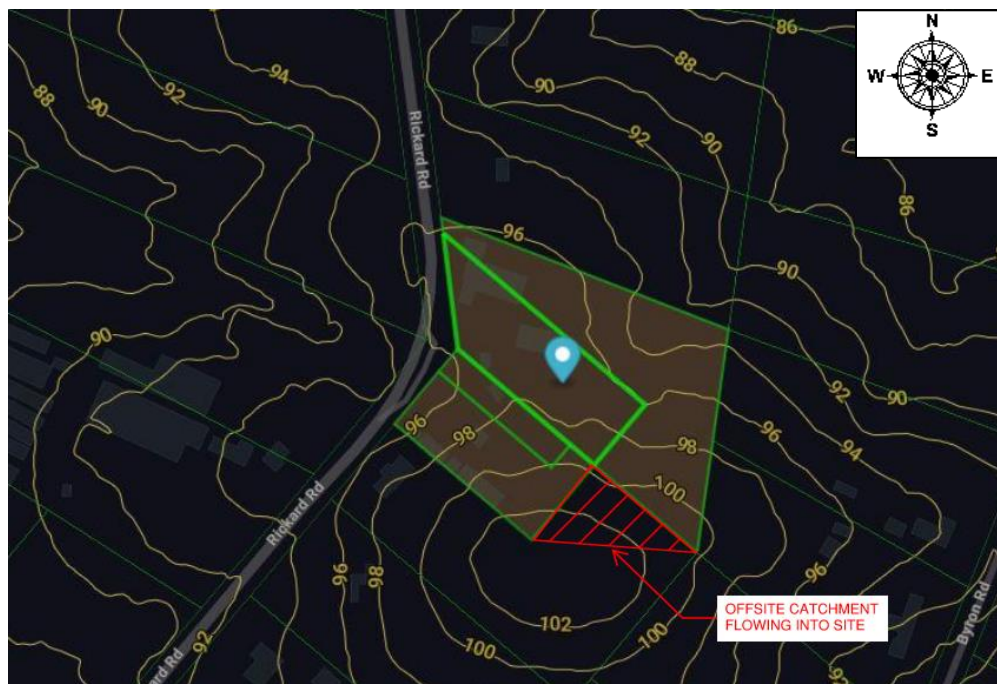


Figure 3: Site Topography (Mecone Mosaic 2022)

4.3 Stormwater Catchments

The surrounding area has been investigated to determine the likely impact of existing external stormwater catchments on the proposed site.

Based on available topographic information, an area of external catchment along the southeastern boundary appears to flow onto the site. The site is divided into the two catchments with the eastern section draining in a northeasterly direction and the western section draining in a westerly direction.

4.4 Existing Stormwater Infrastructure

Through survey information from Monteath & Powys ref '22/0216' dated 30/06/22, and BYDA information, it has been determined that the site contains pit and pipe infrastructure. According to the survey, roof catchments are conveyed through formalised gutter and downpipe systems and discharged into on lot inground drainage infrastructure before discharging from the site.

There are a number of existing stormwater pits and pipes within the activity site, where the existing stormwater will clash with the proposed activity, the stormwater will need to be located, diverted or removed.

Council infrastructure is located along Rickard Road on the downstream side of site in the form of kerb inlet pits. Refer to the figure below for an illustration of the existing stormwater infrastructure on site.

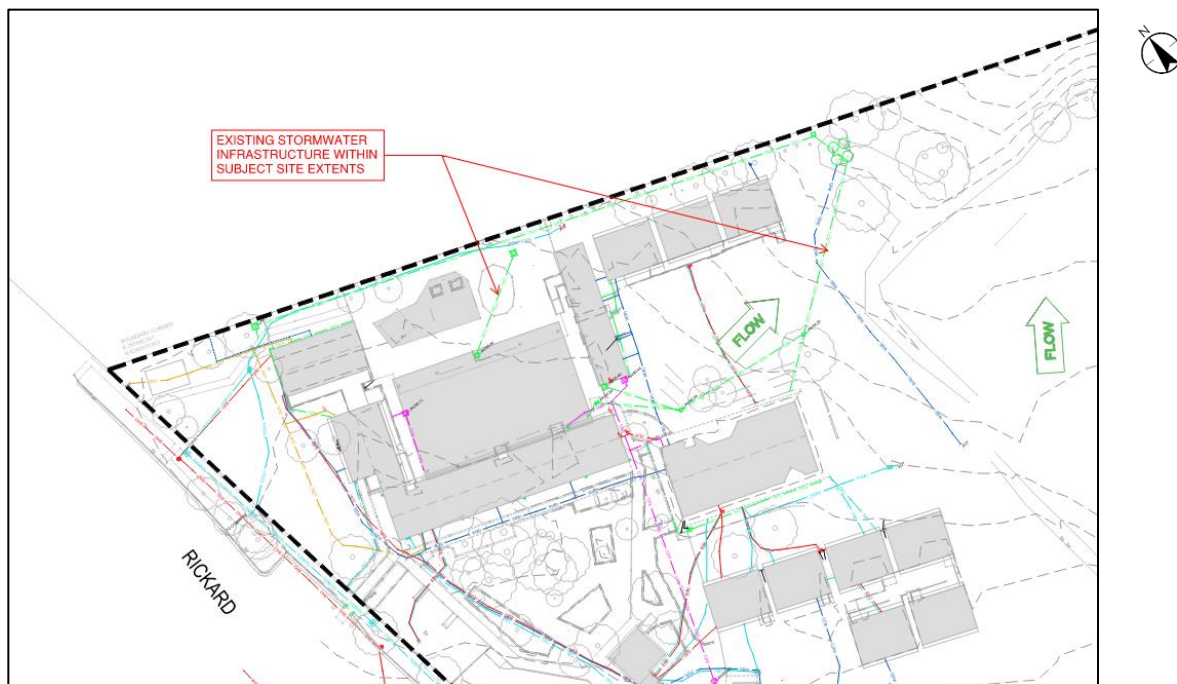


Figure 4: Existing Stormwater Infrastructure (Monteath & Powys, 2022)

4.5 Existing Stormwater Discharge

Analysis of survey information from Monteath & Powys ref '22/0216' dated 30/06/22 and DBYD information, indicates that the site discharges towards the landscaped area to the north of the site via overland flow. The rest of the site is discharged via stormwater pits that collect drainage and direct it to the existing kerb inlet pit on Rickard Road.

Majority of the existing buildings' stormwater connection and discharge is to remain, clash detection in areas where new services are proposed has been undertaken. Replacement of existing damaged stormwater network's items will be carried out by the contractor. Refer civil drawings for existing stormwater infrastructure to be removed within the extent of works boundary. There is known localised flooding to the east of the existing library building that leaves the playing field

waterlogged. Investigations of existing stormwater infrastructure to be carried out within this area. If existing stormwater network is damaged, replacement of these items is to be carried out by the contractor.

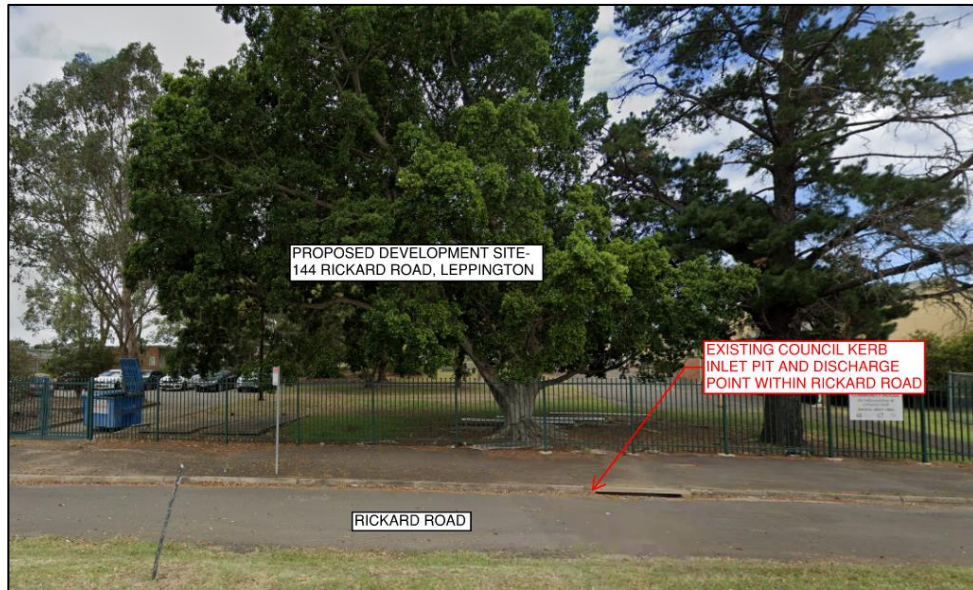


Figure 5: Existing Stormwater Discharge Point (Google Street View, 2020)

5. Local Authority Requirements

Design requirements for stormwater management on the site have been set out in The Camden Growth Centre Precincts Development Control Plan (2023). These requirements are summarised in the sections below.

5.1 Stormwater Conveyance Requirements

The Educational Facilities Standards and Guidelines (EFSG) states that the following design storm Annual Exceedance Probabilities (AEP)'s should be allowed for when designing the Stormwater runoff conveyance systems for the activity.

Design Parameter	Council Annual Exceedance Probabilities (AEP)	EFSG Annual Exceedance Probabilities (AEP)	Conveyance Method
Minor Drainage System	10%	5%	In Ground (Piped)
Major Drainage System	1%	1%	Overland

Table 1: Stormwater Drainage Serviceability (Camden Council DCP 2023 and EFSG)

5.2 On-Site Detention Requirements

The Camden Growth Centre Precincts Development Control Plan (2023) states that on-site detention (OSD) of stormwater is required for all development on land to which this DCP applies. The on-site detention system is to have a capacity sufficient to detain stormwater to meet the objectives of the Precinct Water Cycle Management Strategy and Council's Engineering Specifications (typically to maintain pre-development flooding conditions post-development and to treat stormwater quality to meet the requirements of clause 2.3.1).

The stormwater drainage system for the property must be able to collect and convey all site runoff to the OSD system in a 1% AEP event in the post-development critical storm and ensure that all runoff from any upstream properties bypasses the OSD storage in all storms up to and including the 1% AEP event.

The required OSD storage can be achieved through either below ground or above ground storage or a combination of below ground and above ground storage and ideally should be integrated with other WSUD measures where possible. Any above ground storage is to be designed in such a manner that amenity, public safety and the integrity of property are not compromised, and it does not interfere with overland flow paths or adversely affect flood behaviour.

The required upper and lower limits for sizing the OSD shall be informed by the following:

2yr ARI SSR* (m ³ /ha)	2yr ARI PSD** (l/s/ha)	100yr ARI SSR (m ³ /ha)	100yr ARI PSD (l/s/ha)
300	30	594	170

Table 2: Upper and Lower Limits for OSD (Camden Growth Centre Precinct DCP, 2023)

Below-ground OSD tanks will be approved for commercial and industrial developments only with an approved mesh screen and a minimum orifice outlet diameter of 25 mm. Discharge from above-ground OSD basins during storms in excess of the adopted pipe system capacity, is to be via a weir designed to have a maximum depth of flow of 150 mm in a 100-year ARI storm. All above-ground OSD basin outlets and below-ground OSD tank orifices are to be protected by a screening device to minimise blockage. An emergency overland flow path shall be provided for all OSD system in case of extremely large flows or blockage of OSD outlet.

Clause 2.3.1 Flooding from the Camden Growth Centre Precincts Development Control Plan (2023) states the following objectives:

- Limit the flow of stormwater from development to replicate pre-development flows
- Define the flood constraints and standards applicable to development in the Precincts;
- Minimise the potential of flooding impacts on development, essential services, other land uses and risk to human life



6. Cumulative Impact Assessment – Flooding

Cumulative impact refers to the combined effect of multiple projects or activities on the environment over time. It is critical to evaluate how the proposed project, in conjunction with other past, present, and reasonably foreseeable future actions, might affect the environment during both construction and operation.

Being located in the South West Growth Area (SWGA), the site and surrounds are likely to experience significant growth and densification. Further, the recently exhibited draft Leppington Town Centre Rezoning review, and associated draft Indicative Layout Plan, seeks to amend the land use zone, density and height of buildings in and around the Leppington Town Centre. This growth generally, together with the establishment of a new high school to the immediate south, will necessitate the need to address cumulative impacts of the proposal in context of the growing population in the area.

As such, when considering this activity to LPS, it is important to assess the impact of existing flooding on the proposed activity and also the impact of the proposed activity on existing or potential flooding both upstream and downstream of the activity.

6.1 Existing Flooding

6.1.1 Regional Flooding

The site has been identified in the Upper South Creek Floodplain Risk Management Study and Plan undertaken by Cardno and adopted by Camden Council in March 2019.

The site has been identified in Map 3, as seen in Figure 5 below. It has been determined that the site is not flood affected.

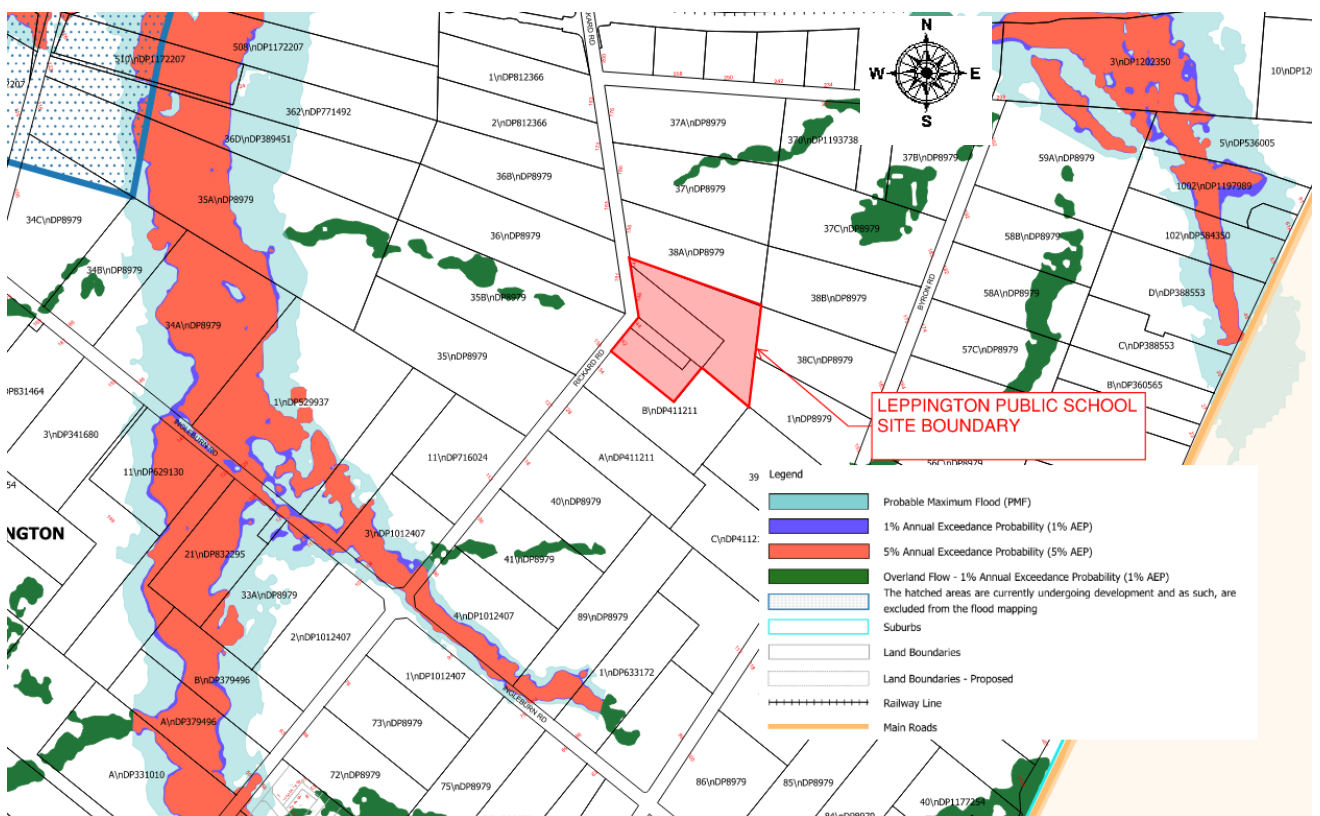


Figure 6: Mainstream Flood Events: 1% AEP, 5% AEP and PMF Flood Events (Upper South Creek Floodplain Risk Management Study and Plan 2019)

6.1.2 Local Flooding

Local or Nuisance flooding describes flooding occurring due to site specific constraints. Local flooding is often caused by local topographical constraints and stormwater drainage system capacity restrictions.

Stantec have assessed the local constraints surrounding and through the site to ascertain any areas where local flooding may be an issue. The topography of the site is such that there is no risk of flooding on the site as it currently exists.

There is known localised flooding to the east of the existing library building that leaves the playing field waterlogged. Investigations of existing stormwater infrastructure to be carried out within this area. If existing stormwater network is damaged, replacement of these items is to be carried out by the contractor. If existing stormwater network is found to be lacking, additional stormwater piping or subsoil drains may be required to mitigate flooding issues. The existing localised flooding has been reduced through the proposed site grading. With these grading changes, the low point of the site has been shifted towards the north-east corner of the site boundary.

7. Stormwater Conveyance

This section of the report discusses the systems proposed to allow for stormwater to be conveyed across the site to the legal point of discharge.

As discussed in Section 5.1 of this report council have set serviceability requirements for the stormwater conveyance network such that minor flows are conveyed through piped drainage, and major flows are discharged via controlled overland flow.

7.1 Roof Drainage

The drainage system will be designed in accordance with AS3500.3-2021 to convey the runoff from the roof to be collected off new buildings via downpipes to re-use rainwater tanks for use within the building's amenities and external landscaping.

7.2 Surface Drainage

The surface areas will be drained through a variety of methods, discussed below, in accordance with AS3500.3:2021 and Council's stormwater drainage and EFSG guidelines.

The surface runoff from new building roof, new paved driveways, and paths is collected by surface pits and directed to the on-site detention tank, where it will be discharged from the site.

7.2.1 In Ground Drainage

The in-ground drainage has been designed to meet the following criteria:

- In the minor design storm event (5% AEP event) there will be no surcharging of the in-ground drainage system and;
- In the major design storm event (1% AEP event) there will be no uncontrolled discharge from the site onto neighbouring properties or the surrounding street

Surface runoff from the buildings and surrounding landscapes areas will be directed to stormwater inlet structures using the design topography of these elements. The inlet structures have been designed to adequately convey the surface runoff into the in-ground drainage network to respective on-site detention tanks.

7.3 Legal Point of Discharge

As discussed in Section 4.5, the activity area will have one legal point of discharge in the kerb inlet pit situated along Rickard Road.



8. Stormwater Attenuation

The attenuation of stormwater discharge from the site will be provided in accordance with The Camden Growth Centre Precincts DCP 2023. The post-activity runoff must match the pre-activity or natural water runoff regime as closely as possible.

The DCP states that the required upper and lower limits for **sizing the OSD** shall be informed by:

- 300 m³/ha for the 50% AEP SSR, and 594m³/ha for the 1% AEP SSR
- 30 l/s/ha for the 50% AEP PSD, and 170 l/s/ha for the 1% AEP PSD

The stormwater drainage system on site must be able to collect and convey all site runoff to the OSD system in a 1% AEP event in the post-activity critical storm, and ensure that all runoff from any upstream properties bypasses the OSD storage in all storms up to and including the 1% AEP.

Based upon Camden Council's parameters, and the site conditions, the proposed OSD volume and discharge rates that are required for the activity site OSD 1 are as follows:

Area Reticulating to OSD Tank 1 (Ha)	Required 50% AEP SSR (m ³ /Ha)	Required 50% AEP PSD (L/s/ha)	Required 1% AEP SSR (m ³ /Ha)	Required 1% AEP PSD (L/s/ha)
0.2366	300	30	594	170
	Calculated 50% AEP SSR (m³)	Calculated 50% AEP PSD (L/s)	Calculated 1% AEP SSR (m³)	Calculated 1% AEP PSD (L/s)
	71	7	140	40

Table 3: On-Site Detention Tank Specifications for OSD 1

OSD 1 is proposed to sit adjacent to the adventure playground, under the landscaped area. Approximately 0.2366Ha of catchment area is reticulating to this OSD. Based off Camden Council parameters, the required 1% AEP SSR volume for OSD 1 is 140m³. The orifice diameter of the below ground OSD has been sized at a diameter of 90mm, so as to restrict the site discharge. Refer to Table 4 for the discharge rates, and the pre-activity and post-activity discharge rates. Investigations with council to be made in future REF phase to possibly reduce the SSR if it can be proven that PSD is met. The proposed tanks based off councils' requirements are large in volume and have a significantly reduced post-activity discharge rate when compared to the pre-activity rate.

AEP Rainfall Event	OSD 1 Pre-Activity Discharge (m ³ /s)	OSD 1 Post-Activity Discharge (m ³ /s)
50%	0.012	0.005
20%	0.026	0.007
10%	0.040	0.009
5%	0.049	0.012
2%	0.068	0.013
1%	0.079	0.014

Table 4: DRAINS Results Summary OSD 1



Based upon Camden Council's parameters, and the site conditions, the proposed OSD volume and discharge rates that are required for the activity site OSD 2 are as follows:

Area Reticulating to OSD Tank 2 (Ha)	Required 50% AEP SSR (m ³ /Ha)	Required 50% AEP PSD (L/s/Ha)	Required 1% AEP SSR (m ³ /Ha)	Required 1% AEP PSD (L/s/Ha)
0.5210	300	30	594	170
	Calculated 50% AEP SSR (m³)	Calculated 50% AEP PSD (L/s)	Calculated 1% AEP SSR (m³)	Calculated 1% AEP PSD (L/s)
	154	15	310	88

Table 5: On-Site Detention Tank Specifications for OSD 2

OSD 2 is proposed to sit underneath the carpark area. Approximately 0.5210Ha of catchment area is reticulating to this OSD. Based off Camden Council parameters, the required 1% AEP SSR volume for OSD 2 is 310m³. The orifice diameter of the belowground OSD has been sized at a diameter of 300mm, so as to restrict the site discharge to meet the calculated PSD results within the minor 50% AEP storm event, up to the major 1% AEP storm event. Refer to Table 6 for the discharge rates, and the pre-activity and post-activity discharge rates. Investigations with council to be made in future REF to possibly reduce the SSR if it can be proven that PSD is met. The proposed tanks based off councils' requirements are large in volume and have a significantly reduced post-activity discharge rate when compared to the pre-activity rate.

AEP Rainfall Event	OSD 2 1 Pre-Activity Discharge (m ³ /s)	OSD 2 Post-Activity Discharge (m ³ /s)
50%	0.020	0.020
20%	0.051	0.039
10%	0.078	0.054
5%	0.101	0.070
2%	0.142	0.090
1%	0.165	0.103

Table 6: DRAINS Results Summary OSD 2

Refer to Table 7 for the total site discharge rates, and the pre-activity and post-activity discharge rates.

AEP Rainfall Event	Pre-Activity Discharge (m ³ /s)	OSD 1 + OSD 2 Post-Activity Discharge (m ³ /s)	Bypass Post-Activity Discharge (m ³ /s)	Post-Activity Discharge (m ³ /s)
50%	0.137	0.05	0.083	0.133
20%	0.241	0.079	0.132	0.211
10%	0.332	0.084	0.168	0.252
5%	0.421	0.099	0.211	0.310



2%	0.545	0.100	0.245	0.345
1%	0.623	0.144	0.282	0.396

Table 7: Stage 1 DRAINS Results Summary

As demonstrated in table 7 above, OSD 1 and OSD 2 are sized based on the Camden council's parameters (SSR). The activity has been modelled using DRAINS software which indicates the stormwater network meets pre vs post activity conditions in lieu of the PSD requirements as set out within the Camden Growth Centre Precinct DCP (2023).



9. Water Quality Treatment

The Camden Growth Centre Precinct DCP Section 6.5 Ecologically Sustainable Development (2019) requires stormwater quality treatment on new developments to reduce the pollutant loading of stormwater discharged into the council drainage system.

This section of the report describes the proposed Stormwater Quality Improvement Devices (SQID's) and the effectiveness of the treatment system in achieving the reduction targets set by council for the proposed activity.

9.1 Potential Pollutants

There are a wide range of potential stormwater pollutant sources which occur from urbanised catchments, many which can be managed through appropriate stormwater quality treatment. Typical urban pollutants may include:

- Atmospheric deposition
- Erosion (including that from subdivision and building activities)
- Litter and debris
- Traffic emissions and vehicle wear
- Animal droppings
- Pesticides and fertilisers
- Application, storage and wash-off of car oil, detergents and other household and commercial solvents and chemicals
- Solid's accumulation and growth in stormwater systems
- Weathering of buildings

The following specific pollutants in urban stormwater assessed through water quality modelling and management include:

- Suspended Solids
- Litter
- Nutrients such as Nitrogen and Phosphorous
- Biological oxygen demand (BOD) and chemical oxygen demand (COD) materials
- Micro-organisms
- Toxic organics
- Trace metals
- Oils and surfactants

While only the key pollutants underlined above will be examined within the modelling, the Stormwater Quality Improvement Devices implemented are expected to assist in reducing a wide range of pollutants. For example, heavy metals are commonly associated with, and bound to fine sediments. This reduces the discharge of fine sediment during the construction and operational phases will also reduce the discharge of heavy metals to existing stormwater systems.



9.2 Pollutant Reduction System

In order to achieve the required pollutant reduction targets, a series of treatment devices are proposed within the stormwater network which form a treatment train.

The diagram below shows a typical treatment train:

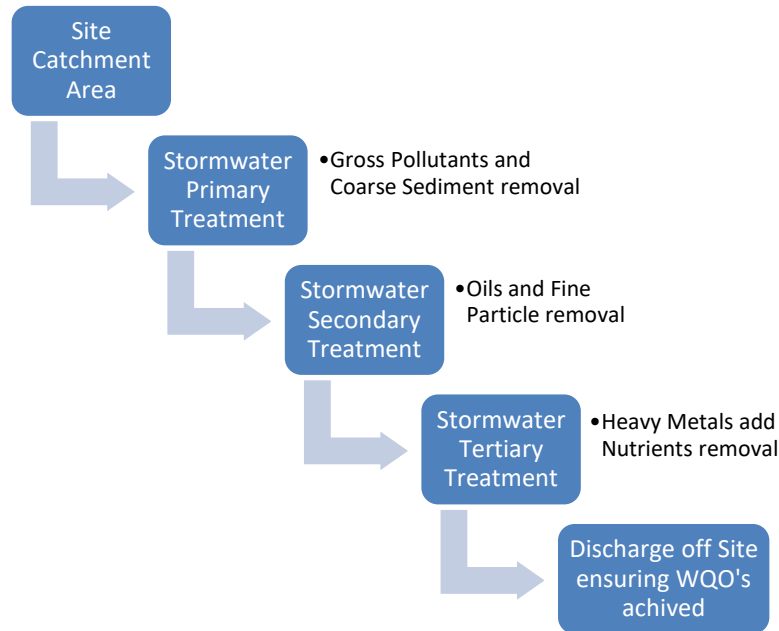


Figure 7: Treatment Train

9.2.1 Water Treatment Modelling

In order to demonstrate that the proposed treatment train meets the required reduction targets, a pollutant reduction model has been generated using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) Software program Version 6.3 by eWater CRC. Pollutant export rates are currently only available for Total Suspended Solids (TSS), Total Nitrogen (TN), Total Phosphorus (TP) and Gross Pollutants (GP). Therefore, only quantitative modelling for TSS, TN, TP & GN has been undertaken using MUSIC.

Modelling has only been undertaken on the post-activity site with SQID's installed so as to demonstrate the percentage reduction for each pollutant type.

The proposed treatment train includes the following:

- 3x Ocean Protect 690mm Psorb Cartridges to be located within a 5sq.m Stormfilter Chamber within OSD Tank 1
- 3x Ocean Protect 690mm Psorb Cartridges to be located within a 20sq.m Stormfilter Chamber OSD Tank 2
- 4x Ocean Protect OceanGuard within Grated Inlet Pits (minimum)
- 2x Rainwater Tanks

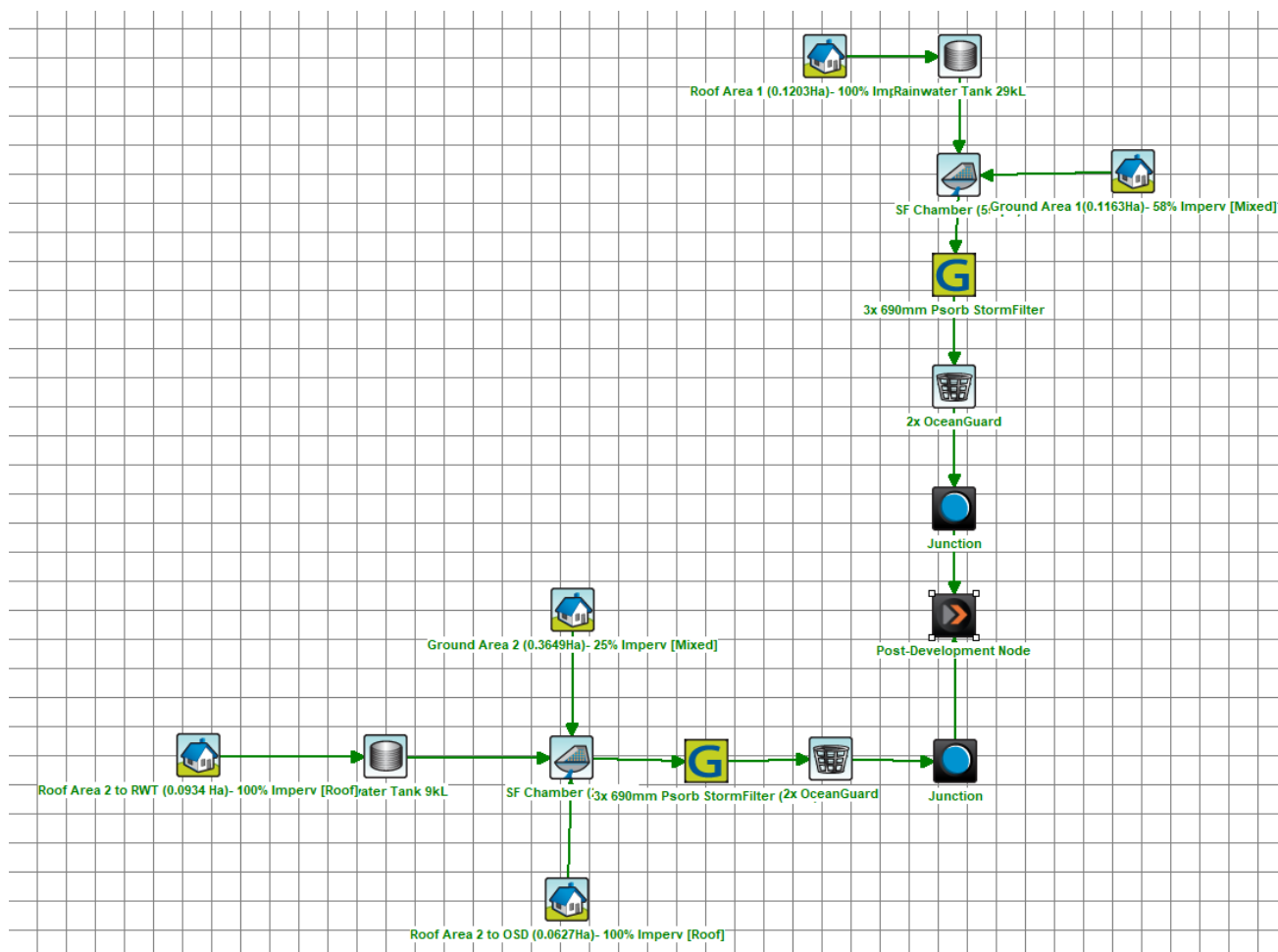


Figure 8: MUSIC Model Treatment Train

	Sources	Residual Load	% Reduction
Flow (ML/yr)	3.64	3.06	15.9
Total Suspended Solids (kg/yr)	347	34.7	90
Total Phosphorus (kg/yr)	0.928	0.217	76.7
Total Nitrogen (kg/yr)	9	3.56	60.5
Gross Pollutants (kg/yr)	98.8	0	100

Figure 9: MUSIC Modelling Results

9.2.2 Ocean Protect Cartridge Filters

The Ocean Protect Cartridge Filters clean stormwater through a patented passive filtration system, effectively removing pollutants to meet regulatory requirements. This treatment system uses rechargeable, self-cleaning, media-filled cartridges to absorb and retain pollutants from stormwater runoff including total suspended solids, hydrocarbons, nutrients, soluble heavy metals and other common pollutants.

- OSD Tank 1 will consist of 3 x 690Psorb StormFilter cartridges
- OSD Tank 2 will consist of 3 x 690Psorb StormFilter cartridges

9.2.3 OceanGuard Baskets

The OceanGuard Basket is a gully pit basket designed to capture pollution that runs into stormwater drains. It can be installed into existing and new stormwater pits. The system includes filtration bag liners, designed to remove gross pollutants, total suspended solids and attached pollutants.

The filtration bag, filtration cage and flow diverter work together to maximise the flow treated and pollutants captured. This efficient hydraulic design ultimately results in captured pollutants being retained in a dry state.

OceanGuard Baskets are cost-effective, highly efficient, easy to install and simple to maintain. Three (3) OceanGuard Baskets have been proposed for the site and will be installed into the proposed grated pits.

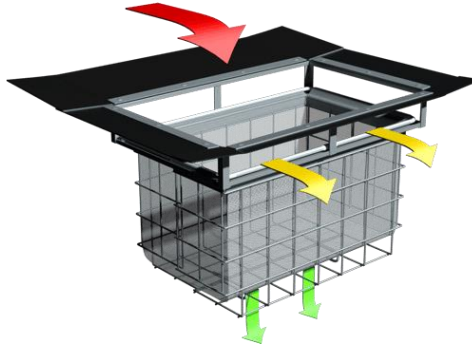


Figure 10: OceanGuard Basket (OceanProtect Website)

9.2.4 Rainwater Tank

A Rainwater Tank is a water storage system designed to be installed on a development to catch rainfall on roof surfaces. These tanks can provide water for non-potable uses such as, toilet flushing, hot water, laundry washing, vehicle washing, irrigation, and industrial wash down.

One (1) 29kL and One (1) 9kL rainwater tanks have been proposed for the site and shall be incorporated into the stormwater drainage system and will collect run-off from 0.2428Ha of non-trafficable roof area. Downpipes will be taking the collected water from the roof area to each specific RWT; these tanks will also include first flush devices.

The reuse demand for this site were further calculated and are summarized below:

Landscape Irrigation Recycle Water Demand			Landscape Irrigation Recycle Water Demand		
Rainwater Tank 1			Rainwater Tank 2		
	Area (Ha)	Water Demand (kL/year)		Area (Ha)	Water Demand (kL/year)
Total	0.0945	1018	Total	0.1483	1018

Table 8: Recycle Water Reuse Demand Rates

10. Green Star Compliance

10.1 Code 26.1- Stormwater Peak Discharge Criteria

The proposed stormwater design has achieved compliance to this criterion with peak flows for storm events ranging from the 20% AEP event up to and including the 1% AEP event not exceeding pre-activity peak flows for the equivalent storm events.

New OSD facilities within the activity site have been proposed to adequately attenuate site flows back to the pre-activity conditions, as outlined in Section 8.

This credit criterion is for 1 point.

10.2 Code 26.2- Stormwater Pollution Targets

In order to comply to this criterion, the project must meet the minimum reductions listed Column A of Table 26.2 of the Green Star Design and As-Built Submission Guidelines v1.3 when compared to untreated runoff.

The post-activity MUSIC Model comparison values are shown below:

Pollutant	Reduction Target (% of the typical urban annual load)	
	Column A of Table 26.2 (Green Star Design and As-Built Submission Guidelines v1.3)	Post-Activity MUSIC Model Results
Total Suspended Solids (TSS)	80%	90%
Gross Pollutants	85%	100%
Total Nitrogen (TN)	30%	60.5%
Total Phosphorus (TP)	30%	76.7%

Table 9: Comparison of Green Star Reduction Targets from Column A of Table 26.2 and Post-Activity MUSIC Results

As shown on the comparison table above, Code 26.2 – Stormwater Pollution Targets criterion has been met by the project which equates to 1 point credit.

10.3 Code 30C- Improving on Green Star Benchmarks

This criterion benchmark awards up to two (2) additional points may be awarded where projects can demonstrate achieving Pollution Reduction Targets from column B (1 point) or C (2 points) as stated in Table 26.1 of Green Star Design and As-Built Submission Guidelines v1.3.

Refer to the comparison of values shown below showing that the project has meet water quality targets on Column B for this criterion benchmark which is equivalent to 1 point.



Pollutant	Reduction Target (% of the typical urban annual load)		
	Table 26.2 (Green Star Design and As-Built Submission Guidelines v1.3)		Post-Activity MUSIC Model Results
	Column B	Column C	Results
Total Suspended Solids (TSS)	80%	90%	90%
Gross Pollutants	90%	95%	100%
Total Nitrogen (TN)	45%	60%	60.5%
Total Phosphorus (TP)	60%	70%	76.7%

Table 10: Comparison of Green Star Reduction Targets from Column B and C of Table 26.2 and Post-Activity MUSIC Results

In summary, Stantec's stormwater quantity and quality design has met design compliance requirements for 3 credit points as detailed above.

11. Water Sensitive Urban Design Strategy

WSUD Background Information

Design guidelines for Water Sensitive Urban Design (WSUD) on the site have been set out in the Camden Council Engineering Design Specification (2009). WSUD integrates land use and water management in the aim of minimising impacts of urban development on the natural water cycle. The WSUD design strategy for the proposed activity is as follows. No previous WSUD studies have been done for this site.

Site Context

Full site context has been provided in Section 4 above.

Proposed Activity

The proposed activity has been outlined in Section 7-9 above, as well as in Appendix A with the Civil Design Documentation.

WSUD Objectives and Targets

The DCP states that WSUD principals through the provision of a range of water quality devices need to be implemented for stormwater quality, specifically:

- To maintain or replicate the natural water cycle through the use of design techniques to create a functionally equivalent hydrological landscape
- To optimise the use of rainwater that falls on the site
- To minimise the amount of water transported out of the catchment resulting in a reduced demand for potable water

Constraints and Opportunities

There are always opportunities to adopt a range of WSUD measures for any development. There were no major constraints within or neighbouring the site such as flood plains, watercourses or sensitive environments that are required to be preserved or remediated as part of the proposed works.

Water Conservation

The proposed activity will include rainwater storage. This will provide water storage which will be reused in systems such as toilet flushing and landscape watering.

Stormwater Management

The proposed stormwater system has been designed as per Camden Growth Centres Precinct DCP (2023). The full extent of the stormwater management procedures undertaken in the design has been explored throughout the entirety of this SWMP.

Water Table Management

It is not expected that the proposed activity will have any impact on the existing water table. No impervious areas of the site will discharge to the ground and hence no groundwater quality measures are required to ensure WSUD requirements are met.



12. Stormwater Network Maintenance Schedule

In order to ensure the ongoing effective operation of the stormwater network and water quality treatment devices, the devices must be maintained in accordance with manufacturer recommendations/requirements and general best practice. It is noted that all pits are to be inspected in a safe manner that assesses localised risk and in accordance with maintenance contractor safe work method statements (SWMS).

The below summaries the various stormwater network components that will need to be maintained, whilst Schedule 1 below details required maintenance of specific items within the network requiring maintenance.

12.1 Pit and Pipe Network

A general inspection of the stormwater pit network is to be undertaken every six (6) months and after major storm events. The general inspection involves visual inspection inside pits, removal and disposal of larger gross pollutants within pits in accordance with waste disposal regulations to prevent blockages, and minimal rectification works as required. Inspection of general pits can coincide with inspection and maintenance of water quality pit inlets (if applicable).

12.2 Water Quality Treatment Devices

The filtration inserts, located within the pits, are to undergo minor service every three (3) months and after major storm events or a hazardous material spill. This involves inspection and evaluation of the filter bad and its condition, removal of captured pollutants, and the appropriate disposal of captured material in accordance with waste disposal regulations. The minor service is designed to return the ocean guard back to optimal operating performance. An inspection of the condition is to be particularly undertaken following major storm events to check for damage and higher than normal sediment accumulation. Refer to manufacturer's maintenance procedures for details of safely undertaking hand maintenance or vacuum maintenance of the ocean guards.

A major service of the ocean guards is undertaken on an as-required basis and involves the inspection of ocean guards to determine the need for filter bag replacement and support frame rectification. Replacement is based on the outcomes from the minor service whereby damage is detected. Contact manufacturer for assessment and replacement components and refer to manufacturer's maintenance procedures for safely replacing components.

A general inspection of the filtration cartridges located in a Stormfilter chamber within the OSD tank, is to be undertaken every six (6) months and after major storm events or a hazardous material spill. The general inspection involves visual inspection of the Stormfilter cartridges and chamber, removal and disposal of larger gross pollutants from the device in accordance with waste disposal regulations to prevent blockages, and minimal rectification works as required. Cartridges are also to be checked to ensure they are all firmly connected to the connectors.

A minor service of the Stormfilters, undertaken every twelve (12) months and after major storm events or a hazardous material spill, involves the evaluation of the Stormfilter cartridges and media, removal of accumulated sediment and a wash-down of the Stormfilter chamber. Refer to Ocean Protect maintenance procedures for details of safely undertaking maintenance of the Stormfilter cartridges. During this service, the cartridge media is to be inspected and replaced if it is revealed that the cartridge media is exhausted. If this is the case, a major service is to be undertaken to replace the Stormfilter cartridge media. Contact manufacturer for assessment and replacement components and refer to manufacturer's maintenance procedures for details of safely replacing the media components.

12.3 OSD Tanks

A general inspection of the OSD tank is to be undertaken at a minimum every six (6) months and after major storm events. The general inspection involves visual inspection inside the tank, condition of components such as orifice plates and valves, removal and disposal of larger gross pollutants within pits in accordance with waste disposal regulations to prevent blockages, and minimal rectification works as required. Inspection of general pits can coincide with inspection and maintenance of water quality pit inlets (if applicable). It is expected that the tanks are hosed out and cleaned on an annual basis to ensure required performance can be achieved.



12.4 Civil Structures

A general inspection of civil structures and associate drainage across a site should be undertaken annually. The general inspection involves visual inspection, with identified defects assessed by applicable qualified engineers



12.5 Stormwater Maintenance Schedule

Maintenance Action	Frequency	Responsibility	Procedure
Pit and Pipe Network			
Blockages of inlet and outlet pipes within pits	Six Monthly	Maintenance Contractor	Remove grate. Remove any debris/litter/sludge from within pits.
Condition of inlet grates	Six Monthly	Maintenance Contractor	Clear vegetation and any debris from the pit grate and repair as required.
Condition of pit structures and section of pipes at inlets/ outlets.	Two Years	Maintenance Contractor	Remove grate to inspect internal walls. Repair as required. Clear vegetation from external walls if necessary and repair as required. Notify structural engineer if detrimental features observed.
Overland flow paths and drainage swales	Six Monthly	Maintenance Contractor	Walk along the flow path and swale. Check batters and condition of path extent. Remove any debris/litter/sludge.
Survey pipe condition with CCTV's and repair defects as necessary	Five Years	Maintenance Contractor	Remove grate. Clear blockages for camera access. Operate camera in accordance with manufacturer specifications and operator standard procedures.
Water Quality Devices			
Blockages and debris within filtration manholes and devices	Six Monthly	Maintenance Contractor	Remove grate. Remove any debris/litter/sludge. Hose out tank and devices from outside manhole.
Blockages and debris within filtration cartridges inside storage manholes.	Six Monthly	Maintenance Contractor	Remove grate. Remove any debris/litter/sludge. Hose out tank and devices from outside manhole.
Blockages and water conveyance within filtration stormwater lines	Annual	Maintenance Contractor	Remove grate. Flow water through filtration stormwater line from inspection openings to remove blockages.
Condition of stormwater pit filtration inserts/ storm sacks	Annual	Manufacturer's Contractor	Remove inserts from pit to inspect. Repair as required.
Condition and performance of treatment tank components	Annual	Manufacturer's Contractor	Remove grate and follow SWMS procedures to enter into the tank. View and repair damaged components.
Condition and performance of filtration cartridges	Annual	Manufacturer's Contractor	Remove cartridges from pit to inspect. Repair as required.



Tank and pit wall defects and structural adequacy.	Two Years	Maintenance Contractor	Remove grate to inspect internal walls. Repair as required. Clear vegetation from external walls if necessary and repair as required.
Tank slab build-up of sediment and sludge.	Six Monthly	Maintenance Contractor	Remove grate and screen. Remove sediment/ sludge build up, check orifice and flap valves are clear.
Condition and fixing of step irons	Two Years	Maintenance Contractor	Remove grate to inspect step irons and connection into wall. Repair as required. Notify structural engineer if detrimental features observed.
OSD warning signage	Two Years	Maintenance Contractor	Remove grate to inspect signage and connections. Check for fading in sign and any vegetation growth over or near sign impacting visibility. Repair as required.
Civil Structures			
Check subsoil behind retaining walls drainage capacity via hose flushing	Annual	Maintenance Contractor	Blast with hose, water into inspection openings and pits to ensure conveyance through lines. Review outlets to ensure flow through line.
Condition of retaining walls and other structures, including cracking and stability	Annual	Maintenance Contractor	Walk along and inspect all visible faces of wall structure. Observe for cracking, crack width, any lean in on wall and moisture within structure. Notify structural engineer if detrimental features observed.
Check batters for signs of scour and erosion	Annual	Maintenance Contractor	Walk along bottom of embankments where possible. Check batter stability and vegetation. Notify civil engineer if detrimental features observed.



13. Erosion & Sedimentation Control

Landcom have published a design guide entitled “Managing Urban Stormwater - Soils and Construction” which is regarded as the standard to which erosion and sedimentation control should be designed to within NSW.

The control of erosion and sedimentation describes the measures incorporated during and following construction of a new development to prevent the pollution and degradation of the downstream watercourse.

An Erosion and Sediment Control Plan has prepared as part of the REF documentation and is included in Appendix A of this report.

13.1 Stormwater Drainage Infrastructure Inlets

Risk:

- Sediment from the construction site washing into the existing stormwater drainage inlet infrastructure.

Consequence:

- The sediment will then be conveyed into the downstream waterbody by stormwater runoff, contaminating the waterbody.
- The sediment will build up blocking the stormwater infrastructure and preventing stormwater conveyance to the downstream waterbody and impacting drainage upstream.

Mitigation:

- Sediment traps protection will be installed surrounding all existing stormwater drainage infrastructure inlets to prevent sediment entering the system.
- Temporary Stormwater Systems are to be installed where required to capture all site runoff within the zone of excavation. Runoff will be allowed to settle out suspended particles and debris, and an acceptable water of 50mg per litre of Non Filterable Residues (NFR) is required to be achieved prior to discharge.
- Installation of a fence around the perimeter of the basin is required as well as a rip rap to allow for bobcat access for periodic removal of sediment. Also, a perforated riser outlet pipe needs to be placed for the connection and discharge to an existing pit.

Maintenance:

- Frequent inspection of the sandbags to ensure they are arranged in a manner that prevents sediment from accessing the drainage system. If sediment is building up on the sandbags they should be cleared of sediment and re-established.
- All soil erosion and sediment control structures including temporary sediment basins and sediment traps shall be inspected following each storm event and any necessary maintenance work shall be undertaken to ensure their continued proper operation.

13.2 Construction Exit Protection

Risk:

- Spoil such as soil being conveyed from the site on the wheels of vehicles.



Consequence:

- Spoil being tracked onto the public road corridors where it is then washed into the existing stormwater drainage infrastructure and is then washed downstream polluting the downstream waterbody.
- Spoil being tracked onto the public road creating dangerous driving conditions for other road users.

Mitigation:

- A shaker grid and wash down facility will be installed at all exits from the construction site. All vehicles leaving the site will have their wheels washed down and pass over the shaker grid to remove any spoil collected on their wheels and retaining the spoil on site.

Maintenance:

- Frequent inspection of the shaker grid to ensure it is clean and still functioning.

13.3 Downstream Site Boundaries

Risk:

- Rainfall runoff falling on the site collecting sediment from the construction site and conveying it overland onto downstream properties and waterbodies.

Consequence:

- Sediment discharge polluting downstream properties and waterbodies.

Mitigation:

- Installation of sediment fences on all downstream boundaries of the site to collect sediment and prevent it discharging onto downstream properties or waterbodies.

Maintenance:

- Regular inspection of the sediment fences to ensure they are functioning correctly and are intact.
- If sediment build up is present it should be removed to ensure correct functionality of the fences.

13.4 Sediment Runoff

Risk:

- Sediment from the construction site washing into the existing stormwater drainage inlet infrastructure.

Consequence:

- The sediment will build up blocking the stormwater infrastructure and preventing stormwater conveyance to the downstream waterbody and impacting drainage upstream.

Mitigation:

- A sediment basin will be installed, and all overland flow directed towards it. The basins will attenuate stormwater flows allowing for the settlement of sediment preventing discharge into the downstream infrastructure.

Maintenance:

- Frequent inspection of the basins to ensure there is sufficient volume for the storage of settlement. If there is insufficient storage the basins should be cleared of sediment and re-established.



14. Evaluation of Environmental Impacts

14.1 Soils and Geology

Impacts during Construction:

The proposed activity will involve cut and fill to achieve the required levels for the construction of new carparking areas, buildings and external pavement. Bulk earthworks will disturb an area of approximately 9000m² with cut of up to 3 metres for the new internal carpark which will connect to Rickard Road. The extent of cut will not adversely affect soil stability of the site or adjoining land and is hence considered minor.

Mitigation measures:

Sediment and erosion control measures will be implemented to minimise the transfer of soil from the site. Where suitable, excavated material should be retained onsite and reused as fill material for the broader school redevelopment.

Impacts during Operation:

No ongoing impacts to soil or geology will occur during operation. The operational impacts of the proposed activity will be negligible.

Mitigation measures:

No adverse impacts are expected, and no additional mitigation measures are required.

14.2 Stormwater

Impacts during Construction:

Bulk earthworks during construction have the potential for sediment and erosion with resulting impacts to stormwater runoff quality from the site. Suitable mitigation measures are to be implemented to manage stormwater quality during construction.

Mitigation measures:

Sediment and erosion control measures will be implemented to minimise the transfer of soil from the site and minimise adverse impacts to stormwater quality. Subject to the implementation of appropriate sediment and erosion control measures, water quality impacts are expected to be negligible.

Impacts during Operation:

The upgrades to LPS will increase the impervious surface on the site and will require suitable stormwater drainage to manage stormwater runoff. Stormwater will be managed via newly constructed kerb and gutter drainage along Rickard Road. The new inground stormwater network will convey runoff via underground pipes and will be treated via OceanProtect Filter Baskets and StormFilter Cartridge Systems. The resulting stormwater quality impacts are considered negligible.

Mitigation measures:

No adverse impacts are expected, and no additional mitigation measures are required.

14.3 Flooding

Impacts during Operation:

The site has been identified in the Upper South Creek Floodplain Risk Management Study and Plan undertaken by Cardno and adopted by Camden Council in March 2019. The flood study determined that the site is not flood affected in all storm events up to and including the PMF event. Stantec have assessed the local constraints surrounding and through the site to



ascertain any areas where local flooding may be an issue. The topography of the site is such that there is no risk of flooding on the site as it currently exists. There is known localised flooding to the east of the existing library building that leaves the playing field waterlogged.

Mitigation measures:

Investigations of existing stormwater infrastructure to be carried out to the east of the existing library building. If existing stormwater network is damaged, replacement of these items is to be carried out by the contractor. If existing stormwater network is found to be lacking, additional stormwater piping or subsoil drains may be required to mitigate flooding issues.

15. Mitigation Measures

A summary of the mitigation measures to be implemented for the project are listed below:

Mitigation Number	Aspect/Section	Mitigation Measure	Reason for Mitigation Measure
1	General Measures	A copy of the approved plans and conditions/mitigation measures must be kept at an appropriate location on-site where the works are taking place and must be available for inspection on request.	To improve safety.
2	Geology and Soil Stability	Sediment and erosion control measures will be implemented to minimise the transfer of soil from the site during construction.	To prevent erosion as per Landcom 'Managing Urban Stormwater - Soils and Construction'.
3	Stormwater	Sediment and erosion control measures will be implemented to minimise the transfer of soil from the site and minimise adverse impacts to stormwater quality. The new inground stormwater network will convey runoff via underground pipes and will be treated via OceanProtect Filter Baskets and StormFilter Cartridge Systems to ensure negligible impacts.	To ensure buildings / the site is adequately drained.
4	Flooding	No immediate impacts to flooding are noted. In the event of field flooding, existing stormwater infrastructure is to be replaced, if damaged, or upgraded, if insufficient, to mitigate flood issues.	To increase safety of site occupants.
5	Existing Flooding	The existing site is known to flood to the east of the existing library. The proposed grading design has eliminated this risk. The detailed design for the Crown Certificate approval is to ensure catchment and disposal of stormwater is maintained.	To increase safety of site occupants.

Table 11: Table of Mitigation Measures

16. Conclusion

Investigations were undertaken during the preparation of this REF to assess the impacts of the proposed activity, as they relate to the protection and enhancement of the environment, taking into account all matters affecting or likely to affect the environment by reason of that activity, in accordance with the requirements of Section 5.1 of the Environmental Planning and Assessment Act 1979, and Chapter 3, Part 3.4, Section 3.37 of the T&I SEPP.

With the implementation of the proposed mitigation measures, there are considered to be no significant environmental impacts associated with the activity that cannot be adequately managed or mitigated. The detailed design for the works is being developed with the objective of minimising potential impacts on the local environment, particularly impacts to soil and geology, stormwater and flooding. The design and construction methodology would continue to be developed with this



overriding objective in mind, taking into account the input of stakeholders. The likely impacts resulting from the activity can be managed through the implementation of the mitigation measures listed in Section 14.



Appendix A Civil Design Documentation





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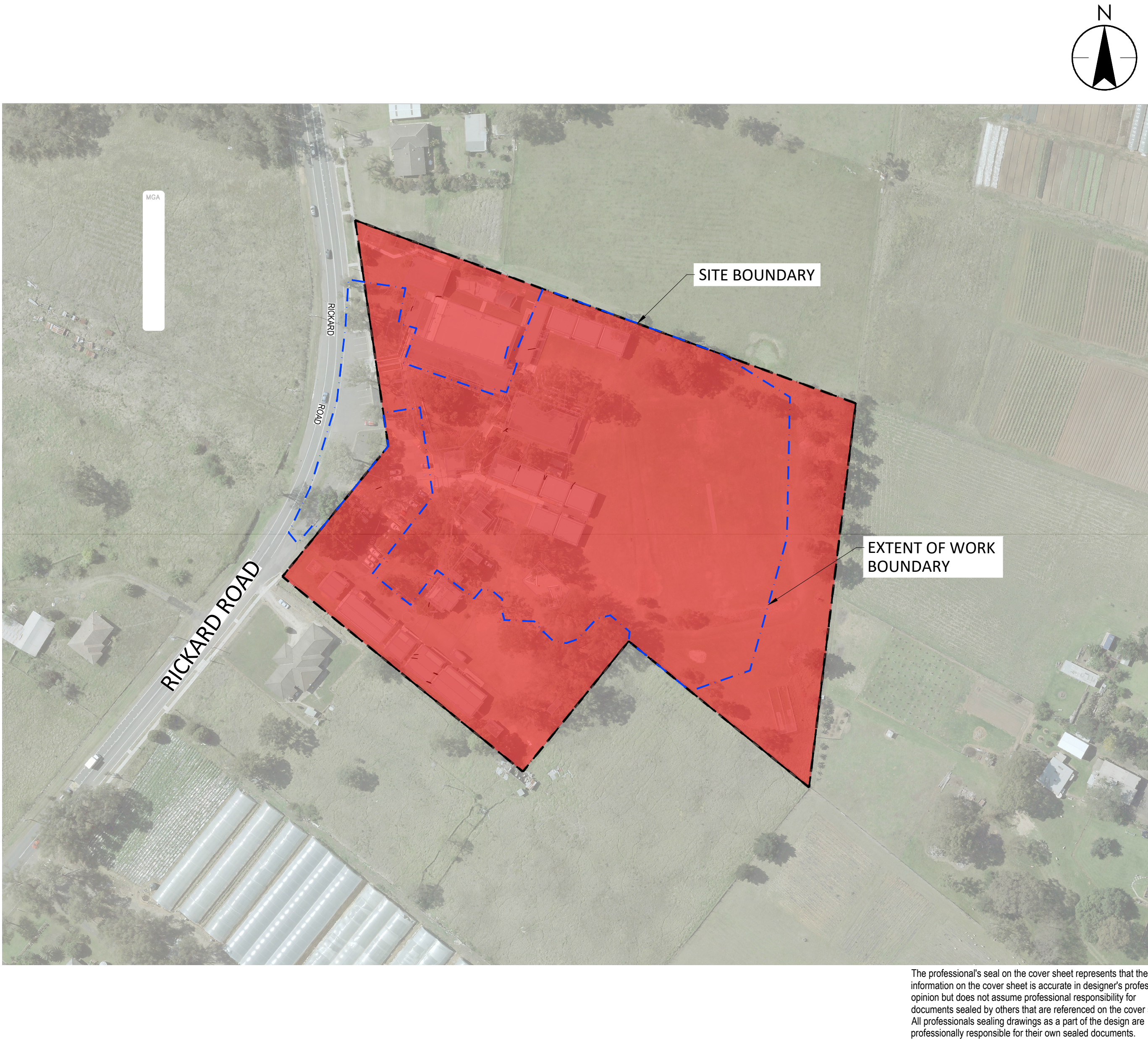
LEPPINGTON PUBLIC SCHOOL UPGRADE

RICKARD ROAD, LEPPINGTON,
NSW 2179

ISSUED FOR REF
2025.01.17

Stantec Project Number: 304000722

DRAWING LIST			
NO.	DRAWING NAME	REVISION	DATE
304000722-LPS-STA-00-XX-DR-C-000-001	COVER SHEET, DRAWING REGISTRY AND LOCALITY PLAN	H	2025.01.17
304000722-LPS-STA-00-XX-DR-C-007-001	GENERAL NOTES SHEET 1 OF 2	H	2025.01.17
304000722-LPS-STA-00-XX-DR-C-007-002	GENERAL NOTES SHEET 2 OF 2	H	2025.01.17
304000722-LPS-STA-00-XX-DR-C-050-001	EXISTING CONDITIONS PLAN	H	2025.01.17
304000722-LPS-STA-00-XX-DR-C-060-001	GENERAL ARRANGEMENT PLAN	H	2025.01.17
304000722-LPS-STA-00-XX-DR-C-066-001	SITEWORKS DETAILS	H	2025.01.17
304000722-LPS-STA-00-XX-DR-C-070-001	EROSION AND SEDIMENT CONTROL PLAN	H	2025.01.17
304000722-LPS-STA-00-XX-DR-C-076-001	EROSION AND SEDIMENT CONTROL DETAILS	H	2025.01.17
304000722-LPS-STA-00-XX-DR-C-100-001	BULK EARTHWORKS PLAN	H	2025.01.17
304000722-LPS-STA-00-XX-DR-C-440-001	PAVEMENT PLAN	H	2025.01.17
304000722-LPS-STA-00-XX-DR-C-446-001	PAVEMENT PLAN DETAILS	G	2025.01.17
304000722-LPS-STA-00-XX-DR-C-500-001	MUSIC CATCHMENT PLAN	G	2025.01.17
304000722-LPS-STA-00-XX-DR-C-500-002	DRAINS CATCHMENT PLAN	G	2025.01.17
304000722-LPS-STA-00-XX-DR-C-520-001	STORMWATER DRAINAGE PLAN	H	2025.01.17
304000722-LPS-STA-00-XX-DR-C-522-001	STORMWATER LONG SECTIONS	B	2025.01.17
304000722-LPS-STA-00-XX-DR-C-526-001	STORMWATER DRAINAGE DETAILS SHEET 1 OF 5	H	2025.01.17
304000722-LPS-STA-00-XX-DR-C-526-002	STORMWATER DRAINAGE DETAILS SHEET 2 OF 5	H	2025.01.17
304000722-LPS-STA-00-XX-DR-C-526-003	STORMWATER DRAINAGE DETAILS SHEET 3 OF 5	H	2025.01.17
304000722-LPS-STA-00-XX-DR-C-526-004	STORMWATER DRAINAGE DETAILS SHEET 4 OF 5	H	2025.01.17
304000722-LPS-STA-00-XX-DR-C-526-005	STORMWATER DRAINAGE DETAILS SHEET 5 OF 5	H	2025.01.17
304000722-LPS-STA-00-XX-DR-C-527-001	STORMWATER PIT SCHEDULE	F	2025.01.17



The professional's seal on the cover sheet represents that the information on the cover sheet is accurate in designer's professional opinion but does not assume professional responsibility for documents sealed by others that are referenced on the cover sheet. All professionals sealing drawings as a part of the design are professionally responsible for their own sealed documents.

P:\NSW\2022\22839.PM - AL - HANBL - 1\A00216A\PLT\SHARED PROJECT DOCUMENTS\HARD COPY\PROJECT DOCUMENTS\HARD COPY\DRAWINGS & DESIGN SHEET SET\10-01

GENERAL NOTES

- DESIGN HEREIN HAS BEEN PREPARED BY STANTEC AUSTRALIA PTY LTD LEVEL 9, THE FORUM, 203 PACIFIC HIGHWAY, ST LEONARDS NSW 2065
- CONTRACTOR TO CHECK WITH ENGINEER IF THESE NOTES ARE TO SUPPLEMENT A CIVIL SPECIFICATION
- ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.
- THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH OTHER SUCH WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
- ALL DIMENSIONS ARE IN MILLIMETRES (mm) & ALL LEVELS ARE IN METRES (m), UNO (UNLESS NOTED OTHERWISE).
- NO DIMENSION SHALL BE OBTAINED BY SCALING THE DRAWINGS.
- ALL LEVELS AND SETTING OUT DIMENSIONS SHOWN ON THE DRAWINGS SHALL BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORKS.
- EXISTING SERVICES WHERE SHOWN HAVE BEEN PLOTTED FROM SUPPLIED DATA AND SUCH THEIR ACCURACY CAN NOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF WORK.
- CAD FILES / DTM FILES TO BE SUPPLIED IN AUTOCAD FORMAT FOR SETOUT PURPOSES (UPON REQUEST).

SITEWORKS NOTES

- ORIGIN OF LEVELS:- REFER SURVEY NOTES.
- CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORK. ANY DISCREPANCIES TO BE REPORTED TO STANTEC.
- ALL WORK IS TO BE UNDERTAKEN IN ACCORDANCE WITH COUNCIL CONSTRUCTION SPECIFICATIONS, THE DETAILS SHOWN ON THE DRAWINGS AND THE SPECIFICATIONS AND THE DIRECTIONS OF THE PRINCIPALS REPRESENTATIVE.
- ALL WORKS TO BE COMPLETED IN ACCORDANCE WITH CAMDEN COUNCIL AND OTHER AUTHORITY REQUIREMENTS.
- ALL CONSTRUCTION UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE CURRENT WORKPLACE HEALTH AND SAFETY ACT.
- CONTRACTOR TO CONFIRM ALL CBR VALUES PRIOR TO COMMENCEMENT OF WORKS.
- WHERE NEW WORKS ABOUT EXISTING THE CONTRACTOR SHALL ENSURE THAT A SMOOTH EVEN PROFILE, FREE FROM ABRUPT CHANGES, IS OBTAINED.
- THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A REGISTERED SURVEYOR.
- CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER COMMUNICATIONS OR ELECTRICAL SERVICES. HAND EXCAVATE IN THESE AREAS ONLY.
- ALL TRENCH BACKFILL MATERIAL NOT IN PAVEMENTS SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT MATERIAL.
- UNLESS NOTED OTHERWISE IN CIVIL SPECIFICATION, ALL SERVICE TRENCHES UNDER VEHICULAR PAVEMENTS SHALL BE BACKFILLED WITH SAND TO 300mm ABOVE PIPE. WHERE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR APPROVED GRANULAR MATERIAL COMPACTED IN 150mm LAYERS TO MINIMUM 98% MODIFIED MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 5.2.1. (OR A DENSITY INDEX OF NOT LESS THAN 75).
- ON COMPLETION OF PIPE INSTALLATION, ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL AND GRASSED AREAS, AND ROAD PAVEMENTS.
- TRENCHES THROUGH EXISTING ROAD AND CONCRETE PAVEMENTS SHALL BE SAWCUT TO THE FULL DEPTH OF CONCRETE AND MIN. 50mm IN BITUMINOUS PAVING.
- MAKE SMOOTH TRANSITION TO EXISTING SERVICES AND MAKE GOOD.
- THESE PLANS ARE TO BE READ IN CONJUNCTION WITH COUNCIL CONSTRUCTION SPECIFICATIONS AND APPROVED LANDSCAPE, ELECTRICAL AND TELECOMMUNICATION DRAWINGS AND SPECIFICATIONS.
- WHERE NOTED ON THE DRAWINGS THAT WORKS ARE TO BE CARRIED BY OTHERS, (eg ADJUSTMENT OF SERVICES), THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CO-ORDINATION OF THESE WORKS.
- ON COMPLETION OF WORKS, ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL INCLUDING, BUT NOT LIMITED TO, KERBS, FOOTPATHS, CONCRETE AREAS, GRASS AND LANDSCAPED AREAS.

SURVEY NOTES

- THE EXISTING SITE CONDITIONS SHOWN ON THE FOLLOWING DRAWINGS HAVE BEEN SHOWN AS PER THE TOPOGRAPHIC SURVEY RECEIVED ON 15/05/2024 PREPARED BY MONTEATH & POWYS, REFERENCE '220216A_06', DATED 10/05/2024.
- THE INFORMATION IS SHOWN TO PROVIDE A BASIS FOR DESIGN. STANTEC DOES NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THE SURVEY BASE OR ITS SUITABILITY AS A BASIS FOR CONSTRUCTION DRAWINGS. SHOULD DISCREPANCIES BE ENCOUNTERED DURING CONSTRUCTION BETWEEN THE SURVEY DATA AND ACTUAL FIELD DATA, CONTACT STANTEC.
- IF AN EXISTING SERVICES PLAN HAS BEEN SUPPLIED THIS DOES NOT TAKE PRECEDENCE OVER ORIGINAL SURVEY PLAN.
- CONTRACTOR TO REVIEW ORIGINAL SURVEY PLAN AND NOTES. THIS INCLUDES REVIEW OF SUBSURFACE UTILITY CLASS INFORMATION

PROTECTION OF TREES

- WHERE STORMWATER DRAINAGE IS LAID IN THE VICINITY OF TREES / CANOPIES OF TREES, THE WORKS ARE TO BE COMPLETED TO THE PROJECT ARBORISTS REQUIREMENTS.

EXISTING SERVICES

- EXISTING SERVICES, WHERE SHOWN, HAVE BEEN PLOTTED FROM SUPPLIED DATA AND SUCH THEIR ACCURACY CAN NOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF WORK.
- EXISTING SERVICES SHOWN ON THE PLANS ARE LOCATED APPROXIMATELY BASED ON INFORMATION SUPPLIED BY THE RELEVANT AUTHORITIES AND/OR SURVEY RECEIVED. STANTEC DOES NOT TAKE RESPONSIBILITY FOR THE SUITABILITY OR LOCATION/DEPTH OF THE EXISTING SERVICES.
- STANTEC DOES NOT TAKE RESPONSIBILITY FOR ANY POSSIBLE DESIGN ADJUSTMENT OF ANY ADDITIONAL EXISTING SERVICES OR THE ASSOCIATED AUTHORITY NEGOTIATIONS AS A RESULT OF THE PROPOSED WORKS.
- THE INFORMATION IS SHOWN TO PROVIDE A BASIS FOR DESIGN. STANTEC DOES NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THE SURVEY BASE OR ITS SUITABILITY AS A BASIS FOR CONSTRUCTION DRAWINGS.
- EXISTING BUILDINGS, EXTERNAL STRUCTURES AND TREES SHOWN ON THESE DRAWINGS ARE FEATURES EXISTING PRIOR TO ANY DEMOLITION WORKS.
- THE CONTRACTOR SHALL UNDERTAKE POTHOLING AND/OR INVESTIGATION WORKS TO LOCATE ALL EXISTING SERVICES PRIOR TO COMMENCING WORKS. THIS INCLUDES CONFIRMING THE LOCATION AND DETAILS OF THE EXISTING SITE STORMWATER DISCHARGE.
- ALL AREAS WITHIN THE EXTENT OF WORKS TO BE SCANNED FOR EXISTING UTILITY SERVICES AND LOCATIONS PRIOR TO CONSTRUCTION.
- WHIST EVERY EFFORT HAS BEEN MADE TO AVOID CLASHES WITH EXISTING SERVICES, EXTENT AND QUALITY OF SUPPLIED DATA IS INSUFFICIENT FOR COMPLETE CLASH DETECTION ACCURACY. CONTRACTOR TO TAKE CARE WORKING AROUND EXISTING UTILITIES AND REPORT ANY POSSIBLE CLASHES BACK TO THE ENGINEER.
- THE CONTRACTOR SHALL ALLOW FOR THE CAPPING OFF, EXCAVATION, REMOVAL AND DISPOSAL IF REQUIRED OF ALL EXISTING SERVICES IN AREAS AFFECTED BY WORKS WITHIN THE CONTRACT AREA, AS SHOWN ON THE DRAWINGS UNLESS DIRECTED OTHERWISE BY THE SUPERINTENDENT.
- THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES SERVICES TO ALL BUILDINGS NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED.
- THE CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES TO MAINTAIN EXISTING SUPPLY TO BUILDINGS REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SERVICE AUTHORITY. ONCE DIVERSION IS COMPLETE AND COMMISSIONED, THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE RELEVANT SERVICE AUTHORITY.
- PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL GAIN WRITTEN APPROVAL OF THEIR PROGRAMME FOR THE RELOCATION/CONSTRUCTION OF TEMPORARY SERVICES.
- CLEARANCE AND COVER REQUIREMENTS SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY BEFORE COMMENCEMENT OF WORKS AND SHALL BE ADHERED TO AT ALL TIMES.

PROPOSED SERVICES NOTES

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH RELEVANT SERVICE AUTHORITY DOCUMENTATION AND CURRENT NSW STREETS OPENING CONFERENCE GUIDE TO CODES AND PRACTICES FOR STREETS OPENING LITERATURE.
- THE CONTRACTOR SHALL ATTEND, MANAGE & SUPERVISE THE PROVISION OF PUBLIC UTILITY SERVICES TO THE WORKS GENERALLY AS INDICATED ON THE SERVICES PLANS, NOTING THAT PRIOR & DURING CONSTRUCTION THE PUBLIC UTILITY AUTHORITIES WILL FINALISE THEIR DOCUMENTATION TO CONSTRUCTION ISSUE STANDARD.
- THE CIVIL CONTRACTOR (TRENCH PROVIDER) IS TO ARRANGE ON SITE MEETING WITH ALL SERVICE AUTHORITIES PRIOR TO THE INSTALLATION OF CONDUITS.
- THE CIVIL CONTRACTOR TO CO-ORDINATE INSTALLATION OF ELECTRICITY, GAS, TELECOMMUNICATION, WATER AND SEWER SERVICES.
- ELECTRICITY, GAS AND TELECOMMUNICATION SERVICES ARE TO BE LAID FOLLOWING THE INSTALLATION OF STORMWATER, SEWER AND WATER SERVICES AND KERB AND GUTTER.
- ALL UTILITY AUTHORITY REPRESENTATIVES TO INSPECT ROAD CROSSINGS PRIOR TO SEALING.
- ALL ELECTRICAL ROAD CROSSINGS TO BE CLASS 6 (ORANGE) uPVC CONDUITS.
- ALL GAS ROAD CROSSINGS TO BE uPVC GREY SEWER GRADE CONDUITS.
- FOR ALL STREET POLES, REFER TO THE ELECTRICAL ENGINEER'S DOCUMENTATION. STREET POLES TO BE POSITIONED THE APPROPRIATE DISTANCE FROM FACE OF KERB TO FACE OF POLE ACCORDING TO THE CURRENT NSW STREETS OPENING CONFERENCE GUIDE TO CODES AND PRACTICES FOR STREETS OPENING LITERATURE. CONTRACTOR TO ALLOW TO EXCAVATE AND BACKFILL TRENCH GENERALLY IN ACCORDANCE WITH NOTE 2.
- ALL SERVICE PIT COVERS AND MARKERS ARE TO BE LAID WHOLLY WITHIN THE CONCRETE FOOTPATH. CONTACT SUPERINTENDANT SHOULD DIFFICULTIES ARISE.
- TELSTRA'S PLANS SHOW ONLY THE PRESENCE OF CABLES AND PLANT. THEY ONLY SHOW THEIR POSITION RELATIVE TO ROAD BOUNDARIES, PROPERTY FENCES ETC. AT THE TIME OF INSTALLATION AND TELSTRA DOES NOT WARRANT OR HOLD OUT THAT SUCH PLANS ARE ACCURATE THEREAFTER DUE TO CHANGES THAT MAY OCCUR OVER TIME. DO NOT ASSUME DEPTH OR ALIGNMENT OF CABLES OR PLANT AS THESE VARY SIGNIFICANTLY.
- THE CONTRACTOR HAS A DUTY OF CARE WHEN EXCAVATING NEAR TELSTRA CABLES AND PLANT. BEFORE USING MACHINE EXCAVATORS TELSTRA PLANT MUST FIRST BE PHYSICALLY EXPOSED BY SOFT DIG POTHOLING TO IDENTIFY ITS LOCATION TELSTRA WILL SEEK COMPENSATION FOR DAMAGES CAUSED TO ITS PROPERTY AND LOSSES CAUSED TO TELSTRA AND ITS CUSTOMERS.

TELSTRA - DUTY OF CARE NOTE

TELSTRA'S PLANS SHOW ONLY THE PRESENCE OF CABLES AND PLANT. THEY ONLY SHOW THEIR POSITION RELATIVE TO ROAD BOUNDARIES, PROPERTY FENCES ETC. AT THE TIME OF INSTALLATION AND TELSTRA DOES NOT WARRANT OR HOLD OUT THAT SUCH PLANS ARE ACCURATE THEREAFTER DUE TO CHANGES THAT MAY OCCUR OVER TIME. DO NOT ASSUME DEPTH OR ALIGNMENT OF CABLES OR PLANT AS THESE VARY SIGNIFICANTLY. THE CONTRACTOR HAS A DUTY OF CARE WHEN EXCAVATING NEAR TELSTRA CABLES AND PLANT. BEFORE USING MACHINE EXCAVATORS TELSTRA PLANT MUST FIRST BE PHYSICALLY EXPOSED BY SOFT DIG POTHOLING TO IDENTIFY ITS LOCATION TELSTRA WILL SEEK COMPENSATION FOR DAMAGES CAUSED TO ITS PROPERTY AND LOSSES CAUSED TO TELSTRA AND ITS CUSTOMERS.

DEMOLITION NOTES

- ALL DEMOLISHED SWALES AND OPEN DRAINS TO BE STRIPPED AND INFILLED WITH SELECT FILL COMPACTED IN 300mm THICK LAYERS.
- ALL DEMOLISHED PAVEMENTS TO BE REMOVED DOWN TO SUBGRADE LEVEL. BUILD BACK UP TO FINISHED SURFACE WITH SELECT FILL COMPACTED IN 200mm THICK LAYERS TO CIVIL SPECIFICATION.
- ALL DISTURBED AREAS SHALL BE FINISHED WITH TOPSOIL AND DURABLE DRYLAND GRASS IN ACCORDANCE WITH LANDSCAPE ARCHITECTS SPECIFICATION.
- ALL BUILDING DEMOLITION WORKS SHALL INCLUDE SEQUENCING, DISCONNECTION AND DEMOLITION OF ALL ASSOCIATED BUILDING SERVICES.
- PRIOR TO REMOVAL OF TREES AND VEGETATION, TRADE CONTRACTOR SHALL SEEK ALL RELEVANT APPROVALS FROM THE MANAGING CONTRACTOR.
- ALL DEMOLISHED MATERIALS TO BE DISPOSED OFF SITE AT AN APPROVED WASTE COLLECTION AND PROCESSING FACILITY (UNLESS OTHERWISE DIRECTED IN WRITING BY THE MANAGING CONTRACTOR).
- REFER TO THE RELEVANT ENGINEERING DRAWINGS FOR TREATMENT, DIVERSION AND DEMOLITION OF EXISTING SERVICES AFFECTED BY THE WORKS, INCLUDING BUT NOT LIMITED TO ELECTRICAL, COMMUNICATIONS, HYDRAULIC SERVICES
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ANY PRIOR APPROVAL REQUIRED FROM COUNCIL WITH RESPECT TO POTENTIAL IMPACT ON TREES FOR ANY WORKS SHOWN ON THE DRAWINGS PRIOR TO THE COMMENCEMENT OF THOSE WORKS.

STORMWATER DRAINAGE NOTES

- ON COMPLETION OF STORMWATER INSTALLATION, ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL CONDITION, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL AND GRASSED AREAS AND ROAD PAVEMENTS, UNLESS DIRECTED OTHERWISE.
- THE CONTRACTOR IS TO EXERCISE DUE CARE AND ATTENTION DURING PIPE INSTALLATION ENSURING PIPES ARE NOT DAMAGES DURING CONSTRUCTION AND CONSTRUCTION TRAFFIC DOES NOT EXCEED THE LOAD SPECIFIED FOR THE PIPE PROPOSED. IF THE PROPOSED PIPE CLASS WILL NOT WITHSTAND THE CONSTRUCTION LOAD, THE CONTRACTOR IS TO UPGRADE PIPE CLASSES TO SUIT AT NO COST TO THE PRINCIPAL.
- PIPES 300 DIA. AND LARGER TO BE REINFORCED CONCRETE CLASS '3' APPROVED SPIGOT AND SOCKET WITH RUBBER RING JOINTS. U.N.O.
- PIPES LESS THAN OR EQUAL TO 225 DIA. SHALL BE uPVC DWV GRADE CLASS SN8 IN ACCORDANCE WITH ASINZS 1260:2009-PVC-U PIPES AND FITTINGS FOR DRAIN, WASTE AND VENT APPLICATION WITH SOLVENT WELDED JOINTS.
- EQUIVALENT STRENGTH REINFORCED CONCRETE OR FIBROUS REINFORCED CONCRETE PIPES MAY BE USED SUBJECT TO APPROVAL BY THE SUPERINTENDENT.
- CONTRACTOR IS TO ENSURE THAT ALL DRAINAGE STRUCTURES ARE ADEQUATELY REINFORCED AND SHALL PROVIDE DESIGN CERTIFICATION FOR ALL REINFORCED CONCRETE LIDS.
- ALL STORMWATER DRAINAGE LINES UNDER PROPOSED BUILDING SLABS TO BE uPVC PRESSURE PIPE, GRADE 6. ENSURE ALL VERTICALS AND DOWNPIPES ARE uPVC PRESSURE PIPE, GRADE 6 FOR A MIN OF 3.0m IN HEIGHT.
- PIPES TO BE INSTALLED TO TYPE H2 (NOT UNDER ROADWAYS) OR TYPE HS2 (UNDER ROADWAYS) SUPPORT IN ACCORDANCE WITH AS 3725 (2007). IN ALL CASES BACKFILL TRENCH WITH SAND TO 300mm ABOVE PIPE. WHERE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR APPROVED GRANULAR MATERIAL COMPACTED IN 150mm LAYERS TO MINIMUM 98% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 5.2.1. (OR A DENSITY INDEX OF NOT LESS THAN 75).
- PIT COVER LEVELS TO MATCH SURROUNDING FINISHED LEVELS. DESIGN FINISHED SURFACE LEVELS OF STRUCTURES ARE FOR THE CONTRACTORS GUIDANCE ONLY. ACTUAL FINISHED LEVELS SHALL BE SET OUT AS DIRECTED ON SITE IN KEEPING WITH THE REQUIREMENTS AND SPECIFICATIONS OF THE LOCAL AUTHORITY AND ACTUAL FINISHED GROUND LEVELS.
- STORMWATER PIT COVERS FOR JUNCTION AND GRATED PITS TO COMPLY WITH AS 3996 FOR:

LOAD CLASS	TYPICAL USE
CLASS A	INTERNAL PEDESTRIAN PRECINCTS ONLY. NO VEHICULAR TRAFFIC
CLASS B	EXTERNAL AREAS INCLUDING FOOTPATHS, FOOTWAYS AND LIGHT VEHICULAR TRAFFIC ONLY
CLASS D	CARS, TRUCKS (HIGHWAY TRAFFIC) AND COMMERCIAL VEHICULAR TRAFFIC
CLASS E	HEAVY DUTY FORKLIFTS AND EARTHMOVING EQUIPMENT

11. REFER TO TABLE BELOW FOR MINIMUM PIT DIMENSIONS (AS 3500.3 TABLE 7.5.2.1):			
DEPTH TO INVERT	WIDTH	LENGTH	
LESS THAN 600mm	450mm	450mm	
FROM 600mm TO 900mm	600mm	600mm	
FROM 900mm TO 1200mm	600mm	900mm	
MORE THAN 1200mm	900mm	900mm	

STORMWATER DRAINAGE NOTES

- ALL INTERNAL WORKS WITHIN PROPERTY BOUNDARIES ARE TO COMPLY WITH THE REQUIREMENTS OF AS 3500.3 (2006) AND ASINZS 3500.3.2 (2010).
- PRECAST PITS MAY BE USED EXTERNAL TO THE BUILDING SUBJECT TO APPROVAL BY STANTEC AUSTRALIA.
- ENLARGERS, CONNECTIONS AND JUNCTIONS TO BE PREFABRICATED FITTINGS WHERE PIPES ARE LESS THAN 300 DIA.
- PIPES FOR SUBSOIL DRAINS SHALL BE SLOTTED 100mm DIA. CLASS 1000 WRAPPED IN GEOFABRIC, UNO, COMPLYING WITH THE REQUIREMENTS OF AS2439. ALL SUBSOIL PIPES SHALL BE FACTORY SLOTTED HDPE, MIN. 100mm DIA. CLASS SN8, SIMILAR OR EQUAL TO VINIDEX DRAINCOIL, CERTIFIED uPVC, IN ACCORDANCE WITH AS1260, AS2032 (PIPE) & AS3789 (JOINTING) INSTALLED ON GEOTEXTILE FABRIC WITH 150mm SURROUND OF 25mm BLUE METAL AGGREGATE, UNO. WHERE SUBSOIL DRAINS PASS UNDER FLOOR SLABS AND PAVEMENTS, UNSLOTTED uPVC DWV GRADE CLASS SN8 SEWER GRADE PIPE IS TO BE USED.
- CARE IS TO BE TAKEN WITH LEVELS OF STORMWATER LINES. GRADES SHOWN ARE NOT TO BE REDUCED WITHOUT APPROVAL.
- AT ALL TIMES DURING CONSTRUCTION OF STORMWATER PITS, ADEQUATE SAFETY PROCEDURES SHALL BE TAKEN TO ENSURE AGAINST THE POSSIBILITY OF PERSONNEL FALLING DOWN PITS.
- ALL EXISTING STORMWATER DRAINAGE LINES AND PITS THAT ARE TO REMAIN ARE TO BE INSPECTED AND CLEANED. DURING THIS PROCESS ANY PART OF THE STORMWATER DRAINAGE SYSTEM THAT WARRANTS REPAIR SHALL BE REPORTED TO THE SUPERINTENDENT/ENGINEER FOR FURTHER DIRECTIONS. CCTV SHALL BE UNDERTAKEN OF EXISTING PIPES WHERE NECESSARY TO CONFIRM THEIR ADEQUACY PRIOR TO AND FOLLOWING CONSTRUCTION.
- THE CONTRACTOR IS TO ORGANISE AND STAGE CONSTRUCTION WORK AND UNDERTAKE ANY DIVERSION WORKS TO ENSURE THE EXISTING DRAINAGE IS ABLE TO CONVEY ALL STORMWATER FLOWS THAT MAY OCCUR DURING THE PERIOD OF THE CONSTRUCTION WORKS.
- ANY DAMAGE TO THE WORKS DUE TO STORMWATER FLOWS OR FLOODING DURING THE CONSTRUCTION PERIOD IS AT THE CONTRACTOR'S RISK.
- SETOUT POINTS FOR STORMWATER STRUCTURES ARE AS INDICATED IN THE DRAWINGS UNLESS OTHERWISE NOTED.
- ALL PAVED SURFACE LEVELS AND GRADES TO BE COORDINATED WITH GULLY PIT LEVELS TO ENSURE NO UNDRAINED AREAS OCCUR.
- THE SIDES OF ALL PIPE TRENCH EXCAVATIONS DEEPER THAN 1.0m SHALL BE FULLY SUPPORTED AT ALL TIMES AND HAVE APPROPRIATE EDGE PROTECTION.
- ALL NEW PIPES TO BE LAID IN AN UPSTREAM DIRECTION. THE LINE, LEVEL AND LOCATION OF EXISTING SERVICES CROSSING THE LINE OF THE PROPOSED STORMWATER PIPE SHALL BE DETERMINED BY EXCAVATION PRIOR TO THE LAYING OF THE PIPE. IF CONFLICT IS APPARENT, THE ENGINEER SHALL BE NOTIFIED AND INSTRUCTIONS AS TO WHETHER THE EXISTING SERVICE IS TO BE ADJUSTED OR THE PROPOSED PIPE INVERT ALTERED WILL BE ISSUED.
- PIPE BEDDING, HAUNCH AND BACKFILL TO BE AS SHOWN ON THE CIVIL DETAILS DRAWINGS AND THE CIVIL SPECIFICATION. WHERE TRENCHES ARE IN ROCK, THE PIPE SHALL BE BEDDED ON A MIN. 50mm CONCRETE BED OR 75mm THICK BED OF 12mm BLUE METAL UNDER THE BARREL OF THE PIPE. THE PIPE COLLAR AT NO POINT SHALL BEAR ON THE ROCK.
- SUBSOIL DRAINAGE PIPES TO BE SLOTTED PIPE AND FITTER SOCK CLASS 1000 TO AS2439 PART 1 LAID AT PREFERABLE MINIMUM GRADE 1 IN 100 OR ABSOLUTE MINIMUM 1 IN 200 WHERE LIMITED BY OUTFALL LEVELS.
- 100mm DIA. SUBSOIL DRAINAGE SHALL BE PROVIDED IN THE FOLLOWING LOCATIONS AND CONNECTED TO THE SITE STORMWATER DRAINAGE SYSTEM, UNO :-
 - UNDER KERBS AND ADJACENT TO ALL PAVEMENTS
 - AT THE BASE OF THE HIGH SIDE OF ALL RETAINING WALLS
 - AROUND THE BUILDING SLAB FOOTPRINT
 - AROUND ALL STORMWATER PITS
- STORMWATER STRUCTURES ARE TO BE CONSTRUCTED PERPENDICULAR TO THE INCOMING PIPEWORK UNLESS OTHERWISE NOTED.
- PRECAST COMPONENTS SHALL BE CONNECTED BY MEANS OF EPOXY OR CHEMICAL GROUTED BARS OF THE SAME DIAMETER AND SPACING AS THE SMALLER BARS IN THE RESPECTIVE COMPONENTS.
- PRE-CAST PITS MUST HAVE LIFTING ANCHORS.
- WORKING LOADS ARE THOSE DUE TO FILL MATERIAL AND STANDARD HIGHWAY VEHICLES AS PER AS3725. CONSTRUCTION LOADS HAVE NOT BEEN ALLOWED FOR.
- ALL EXPOSED EDGES ON STORMWATER PITS TO BE ROUNDED TO 5mm RAD. UNO.
- ALL MILD STEEL FIXTURES INCLUDING GRATES, FRAMES, STEP IRONS, LADDERS, ETC., SHALL BE HOT DIP GALVANISED. GALVANISING SHALL COMPLY WITH THE REQUIREMENTS OF AS1214 OR AS1650, AS APPROPRIATE.
- ALL CONNECTIONS TO EXISTING DRAINAGE PITS SHALL BE MADE IN A TRADESMAN-LIKE MANNER AND THE INTERNAL WALL OF THE PIT AT THE POINT OF ENTRY SHALL BE CEMENT RENDERED TO ENSURE A SMOOTH FINISH.
- PITS DEEPER THAN 1200mm SHALL HAVE ACCESS LADDERS OR STEP IRONS INSTALLED AND SHALL BE IN ACCORDANCE WITH THE LOCAL OR STATUTORY REQUIREMENTS.
- WHERE A PIT IS IDENTIFIED AS A CONFINED SPACE, PIT COVERS SHALL BE PROVIDED WITH STANDARD CONFINED SPACE SIGNAGE.
- CAPPED FLUSHING POINTS MUST BE PROVIDED FOR ALL SUBSOIL AND SEEPAGE DRAINAGE SYSTEMS AT THE END OF EACH PIPE, AT MAX. 30m SPACING AND AT CHANGES IN DIRECTION.
- THE CONTRACTOR SHALL OBTAIN A ROAD OPENING PERMIT FOR ANY WORKS WITHIN THE PUBLIC ROAD RESERVE AND COMPLY WITH ALL AUTHORITY REQUIREMENTS.
- PIPES SHALL BE TRUE TO GRADES SHOWN AND ALIGNED SO THAT THE CENTRES OF THE INLET PIPES INTERSECT WITH THE CENTRE OF THE OUTLET PIPE AT THE DOWNSTREAM FACE OF THE PIT.
- MINIMUM GRADES FOR GRAVITY STORMWATER DRAINAGE SHALL CONFORM TO AS 3500 PART 3 AS FOLLOWS, UNO:-
 - 1% FOR 100mm AND 150mm DIA. PIPES
 - 0.5% FOR 225mm DIA. PIPES
 - 0.4% FOR 300mm DIA. PIPES
 - 0.33% FOR 375mm DIA. PIPES
- MINIMUM DEPTH OF COVER SHALL BE AS FOLLOWS, UNO:-
 - 300mm IN PRIVATE PROPERTY (NON-VEHICULAR TRAFFIC)
 - 450mm IN PUBLIC AREAS
 - 600mm IN VEHICULAR TRAFFICABLE AREAS (FOOTWAY/ROADWAYS)

STORMWATER DRAINAGE NOTES

- BED ALL PIPES FIRMLY AND EVENLY ONTO IMPORTED BEDDING FILL MATERIAL.
- LAY AND JOINT ALL PIPES IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION AND
 - AS 3725 BURIED FLEXIBLE PIPELINES
 - AS 2666 LOADS ON BURIED FLEXIBLE PIPELINES
 - AS 1597.2 PRECAST REINFORCED CONCRETE BOX CULVERTS
 - AS 3500 NATIONAL PLUMBING AND DRAINAGE CODE
 - SYDNEY WATER REQUIREMENTS (WHERE APPLICABLE)
- ALLOW TO TEST ALL PIPES AND PITS TO MANUFACTURERS REQUIREMENTS.

EROSION AND SEDIMENT CONTROL NOTES

GENERAL INSTRUCTIONS

- THE SITE SUPERINTENDENT/ENGINEER WILL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE LOCATED AS DOCUMENTED
- ALL WORK SHALL BE GENERALLY CARRIED OUT IN ACCORDANCE WITH
 - LOCAL AUTHORITY REQUIREMENTS
 - EPA REQUIREMENTS
 - NSW DEPARTMENT OF HOUSING MANUAL "MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION", 4th EDITION, MARCH 2004.
- MAINTAIN THE EROSION CONTROL DEVICES TO THE SATISFACTION OF THE SUPERINTENDENT AND THE LOCAL AUTHORITY.
- WHEN STORMWATER PITS ARE CONSTRUCTED, PREVENT SITE RUNOFF ENTERING UNLESS SEDIMENT FENCES ARE ERECTED AROUND PITS.
- CONTRACTOR IS TO ENSURE ALL EROSION & SEDIMENT CONTROL DEVICES ARE MAINTAINED IN GOOD WORKING ORDER AND OPERATE EFFECTIVELY. REPAIRS AND OR MAINTENANCE SHALL BE UNDERTAKEN AS REQUIRED, PARTICULARLY FOLLOWING STORM EVENTS.

LAND DISTURBANCE

- WHERE PRACTICAL, THE SOIL EROSION HAZARD ON THE SITE WILL BE KEPT AS LOW AS POSSIBLE. TO THIS END, WORKS SHOULD BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:
 - INSTALL A SEDIMENT FENCE ALONG THE BOUNDARIES AS SHOWN ON PLAN. REFER DETAIL.
 - CONSTRUCT STABILISED CONSTRUCTION ENTRANCE TO LOCATION AS DETERMINED BY SUPERINTENDENT/ENGINEER. REFER DETAIL.
 - INSTALL SEDIMENT BASIN AS SHOWN ON PLAN
 - INSTALL SEDIMENT TRAPS AS SHOWN ON PLAN.
- UNDERTAKE SITE DEVELOPMENT WORKS IN ACCORDANCE WITH THE ENGINEERING PLANS. WHERE POSSIBLE, PHASE DEVELOPMENT SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF WORKABLE SIZE.

EROSION CONTROL

- DURING WINDY WEATHER, LARGE, UNPROTECTED AREAS WILL BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL.
- FINAL SITE LANDSCAPING WILL BE UNDERTAKEN AS SOON AS POSSIBLE AND WITHIN 20 WORKING DAYS FROM COMPLETION OF CONSTRUCTION ACTIVITIES.

SEDIMENT CONTROL

- STOCKPILES WILL NOT BE LOCATED WITHIN 2 METRES OF HAZARD AREAS, INCLUDING LIKELY AREAS OF CONCENTRATED OR HIGH VELOCITY FLOWS SUCH AS WATERWAYS. WHERE THEY ARE BETWEEN 2 AND 5 METRES FROM SUCH AREAS, SPECIAL SEDIMENT CONTROL MEASURES SHOULD BE TAKEN TO MINIMISE POSSIBLE POLLUTION TO DOWNSLOPE WATERS, E.G. THROUGH INSTALLATION OF SEDIMENT FENCING.
- ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) WILL BE REMOVED AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM PLACEMENT.
- WATER WILL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS IT IS RELATIVELY SEDIMENT FREE. I.E. THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND/OR ANY LIKELY SEDIMENT HAS BEEN FILTERED THROUGH AN APPROVED STRUCTURE.
- TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES WILL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE REHABILITATED.

OTHER MATTERS

- ACCEPTABLE RECEPTORS WILL BE PROVIDED FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER.
- ANY EXISTING TREES WHICH FORM PART OF THE FINAL LANDSCAPING PLAN WILL BE PROTECTED FROM CONSTRUCTION ACTIVITIES BY:
 - PROTECTING THEM WITH BARRIER FENCING OR SIMILAR MATERIALS INSTALLED OUTSIDE THE DRIP LINE
 - ENSURING THAT NOTHING IS NAILED TO THEM
 - PROHIBITING PAVING, GRADING, SEDIMENT WASH OR PLACING OF STOCKPILES WITHIN THE DRIP LINE EXCEPT UNDER THE FOLLOWING CONDITIONS.
 - ENCROACHMENT ONLY OCCURS ON ONE SIDE AND NO CLOSER TO THE TRUNK THAN EITHER 1.5 METRES OR HALF THE DISTANCE BETWEEN THE OUTER EDGE OF THE DRIP LINE AND THE TRUNK, WHICH EVER IS THE GREATER
 - A DRAINAGE SYSTEM THAT ALLOWS AIR AND WATER TO CIRCULATE THROUGH THE ROOT ZONE (E.G. A GRAVEL BED) IS PLACED UNDER ALL FILL LAYERS OF MORE THAN 300 MILLIMETRES DEPTH
- CARE IS TAKEN NOT TO CUT ROOTS UNNECESSARILY NOR TO COMPACT THE SOIL AROUND THEM.

ASPHALTIC CONCRETE NOTES

- GENERAL
 - MINERAL AGGREGATED SHALL COMPLY WITH AUSTRALIAN STANDARDS
 - MINERAL FILLER SHALL COMPLY WITH AS 2357 MINERAL FILLERS OR ASPHALT
 - BITUMEN BINDER SHALL COMPLY WITH AS 2008.
- MIX PROPORTIONS
 - JOB MIX - 10mm NOMINAL SIZE AGGREGATE. MINIMUM BITUMEN CONTENT BY MASS OF TOTAL MASS - 5.1%
 - MIX STABILITY SHALL BE BETWEEN 16kN AND 36kN AS DETERMINED BY AS 2891
 - AIR VOIDS IN COMPACTED MIX SHALL BE BETWEEN 4% AND 7% OF THE TOTAL VOLUME OF THE MIX
 - VOIDS FILLED IN BINDER - BETWEEN 65% AND 80% OF AIR VOIDS IN THE TOTAL MINERAL AGGREGATE FILLED BY BINDER IN ACCORDANCE WITH AUSTRALIAN STANDARDS
- PAVEMENT PREPARATION
 - THE EXISTING SURFACE TO BE SEALED SHALL BE DRY AND BROOMED BEFORE COMMENCEMENT OF WORK TO ENSURE COMPLETE REMOVAL OF ALL SUPERFICIAL AND FOREIGN MATTER
 - ALL DEPRESSIONS OR UNEVEN AREAS ARE TO BE TACK-COATED AND BROUGHT UP TO THE GENERAL LEVEL OR PAVEMENT WITH ASPHALTIC CONCRETE BEFORE LAYING THE MAIN COURSE
- TACK COATING
 - THE WHOLE AREA TO BE SHEETED WITH ASPHALTIC CONCRETE SHALL BE LIGHTLY AND EVENLY COASTED WITH RAPID SETTING BITUMEN COMPLYING WITH AUSTRALIAN STANDARDS. APPLICATION RATE FOR RESIDUAL BITUMEN SHALL BE 0.15 TO 0.3L/m². APPLICATION SHALL BE BY MEANS OF A MECHANICAL SPRAYER WITH A SPRAY BAR.
- SPREADING
 - ALL ASPHALTIC CONCRETE SHALL BE SPREAD WITH A SELF-PROPELLING PAVING MACHINE
 - THE ASPHALTIC CONCRETE SHALL BE LAID AT A MIX TEMPERATURE AS SPECIFIED BELOW:-

ROAD SURFACE TEMPERATURE IN SHADE (°C)	MIX TEMPERATURES (°C)
5 - 10	NOT PERMITTED
10 - 15	150
15 - 25	145
OVER 25	140

- ASPHALTIC CONCRETE SHALL NOT BE LAID WHEN THE ROAD SURFACE IS WET OR WHEN COLD WINDS CHILL THE MIX, ADVERSELY AFFECTING SPREADING AND COMPACTION
- THE MINIMUM COMPACTED THICKNESS IS 30mm OVER EXISTING SEALED PAVEMENTS AND 50mm OVER NEW PAVEMENTS
- JOINTS
 - THE NUMBER OF JOINTS BOTH LONGITUDINAL AND TRANSVERSE SHALL BE KEPT TO A MINIMUM
 - THE DENSITY AND SURFACE FINISH AT JOINTS SHALL BE SIMILAR TO THOSE OF THE REST OF THE LAYER
- COMPACTION
 - ALL COMPACTION SHALL BE UNDERTAKEN USING SELF-PROPELLED ROLLERS
 - INITIAL ROLLING SHALL BE COMPLETE BEFORE THE MIX TEMPERATURE FALLS BELOW 105°C
 - SECONDARY ROLLING SHALL BE COMPLETED BEFORE THE MIX TEMPERATURE FALLS BELOW 60°C
 - MINIMUM CHARACTERISTICS VALUE OF RELATIVE COMPACTION OF A LOT WHEN TESTED IN ACCORDANCE WITH AS 2150
- FINISHED PAVEMENT PROPERTIES
 - FINISHED SURFACES SHALL BE SMOOTH, DENSE AND TRUE TO SHAPE AND SHALL NOT VARY MORE THAN 10mm FROM THE SPECIFIED PLAN LEVEL AT ANY POINT AND SHALL NOT DEVIATE FROM THE BOTTOM OF A 3m STRAIGHT EDGE LAID IN ANY DIRECTION BY MORE THAN 5mm.
- OTHER
 - ASPHALTIC CONCRETE SHALL CONFORM TO RMS. SPECIFICATION R116.
 - ALL BASECOURSE MATERIAL SHALL BE IGNEOUS ROCK QUARRIED MATERIAL TO COMPLY WITH RMS. FORM 3051 (UNBOUND), RMS. FORM 3052 (BOUND) COMPACTED TO MINIMUM 98% MODIFIED DENSITY IN ACCORDANCE WITH AS 1289 5.2.1. FREQUENCY OF COMPACTION TESTING SHALL NOT BE LESS THAN 1 TEST PER 50m³ BASECOURSE MATERIAL PLACED.
 - ALL SUB-BASE COURSE MATERIAL SHALL BE IGNEOUS ROCK QUARRIED MATERIAL TO COMPLY WITH RMS. FORM 3051, 3051.1 AND COMPACTED TO MINIMUM 95% MODIFIED DENSITY IN ACCORDANCE WITH A.S 1289 5.2.1. FREQUENCY OF COMPACTION TESTING SHALL NOT BE LESS THAN 1 TEST PER 50m³ OF SUB-BASE COURSE MATERIAL PLACED.
 - AS AN ALTERNATIVE TO THE USE OF IGNEOUS ROCK AS A SUB-BASE MATERIAL IN (9.2) A CERTIFIED RECYCLED CONCRETE MATERIAL COMPLYING WITH RMS. FORM 3051 AND 3051.1 WILL BE CONSIDERED, SUBJECT TO MATERIAL SAMPLES AND APPROPRIATE CERTIFICATIONS BEING PROVIDED TO THE SATISFACTION OF STANTEC.
 - SHOULD THE CONTRACTOR WISH TO USE A RECYCLED PRODUCT THIS SHALL BE CLEARLY INDICATED IN THEIR TENDER AND THE PRICE DIFFERENCE BETWEEN AN IGNEOUS PRODUCT AND A RECYCLED PRODUCT SHALL BE CLEARLY INDICATED. THIS PRODUCT SHALL BE REVIEWED AND APPROVED BY THE ENGINEER.

Issue Status

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Client/Project Logo



Client/Project

SINSW

LEPPINGTON PUBLIC SCHOOL UPGRADE

RICKARD ROAD, LEPPINGTON, NSW 2179

File Name: LPS-STA-00-XX-DR-C-007-001.DWG

Dwn.

Dign.

Chkd.

2022.03.31

YYYY.MM.DD

Title

GENERAL NOTES
SHEET 1 OF 2

Project No.

304000722

Scale

NTS

Revision

H

Drawing No.

LPS-STA-00-XX-DR-C-007-001

RETAINING WALL NOTES

1. BASE MATERIAL SHALL BE COMPACTED TO MINIMUM 98% SMDM WITHIN 2% OF STANDARD OPTIMUM MOISTURE CONTENT (SMOC) DETERMINED BY THE STANDARD COMPACTION TEST IN ACCORDANCE WITH THE CURRENT AUSTRALIAN STANDARD AS 1289 5.1.1 MINIMUM ALLOWABLE BEARING PRESSURE OF 150kPa. GEOTECHNICAL ENGINEER EMPLOYED BY CONTRACTOR TO INSPECT AND CONFIRM.
2. DRAINAGE MATERIAL WITHIN AND IMMEDIATELY BEHIND THE WALL SHALL BE 12-20mm CLEAN AGGREGATE. DRAINAGE MATERIAL TO EXTEND A MINIMUM OF 300mm BEHIND THE RETAINING WALL. COMPACT THE DRAINAGE MATERIAL. ALTERNATIVELY, USE NO FINES CONCRETE AS FOLLOWS:-
 - 2.1. CONCRETE STRENGTH N15
 - 2.2. 210kg/m³ PORTLAND CEMENT
 - 2.3. MAXIMUM AGGREGATE SIZE 20mm
 - 2.4. W/C RATIO 0.45 TO 0.55
 - 2.5. DENSITY 1600 TO 2000kg/m³
3. INFILL SOIL SHALL BE CLASS 1 CONTROLLED FILL TO AS 4678, OR AS SPECIFIED ON THE DRAWINGS. UNSUITABLE SOILS, SUCH AS HEAVY CLAYS OR ORGANIC SOILS WITH HIGH PLASTICITY, SHALL NOT BE USED IN THE REINFORCED SOIL ZONE.
4. SPREAD BACKFILL IN UNIFORM LAYS OF 200mm UNCOMPACTED THICKNESS. COMPACT TO 95% SMDM. COMPACTION WITHIN 1.0m BEHIND THE WALL SHALL BE ACCOMPLISHED USING A HAND-OPERATED PLATE COMPACTOR AND SHALL BEGIN BY RUNNING THE PLATE DIRECTLY ON THE BLOCK, THEN COMPACTING IN PARALLEL PATHS, PROGRESSIVELY AWAY FROM THE WALL FACE.
5. WHERE ROADWAYS OR BUILDING STRUCTURES ARE LOCATED ABOVE THE REINFORCED ZONE, COMPACT TO 98% SMDM WITHIN 2% OF SMOC DETERMINED BY THE STANDARD COMPACTION TEST IN ACCORDANCE WITH AS 1289 5.1.1. COMPACTION TESTING SHALL BE TAKEN 1.2m BEHIND THE WALL.

C

B

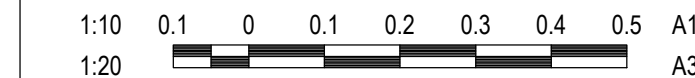
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Client/Project
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RICKARD ROAD, LEPPINGTON, NSW 2179

File Name: LPS-STA-00-XX-DR-C-066-001.DWG	-	-	-	2022.03.31
Dwn.	Dign.	Chkd.	YYYY.MM.DD	

Title

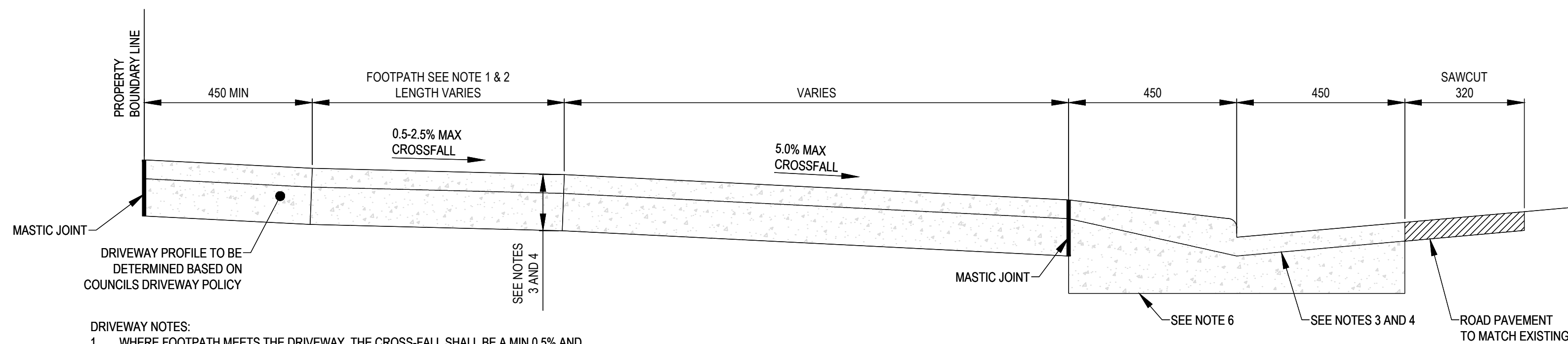
SITeworks DETAILS

Project No.
304000722

Revision
H

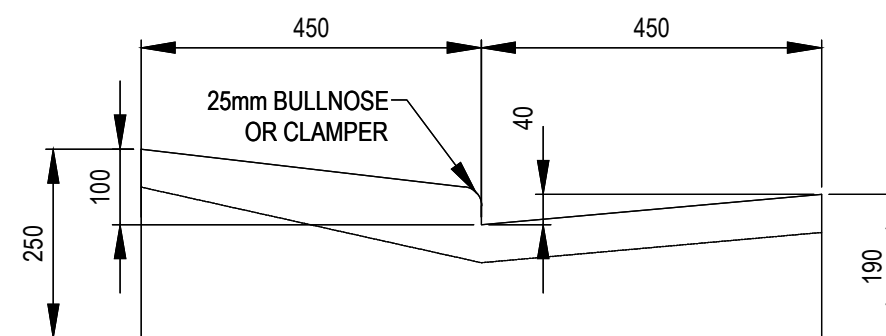
Drawing No.
LPS-STA-00-XX-DR-C-066-001

Scale
1:10



SECTION 1

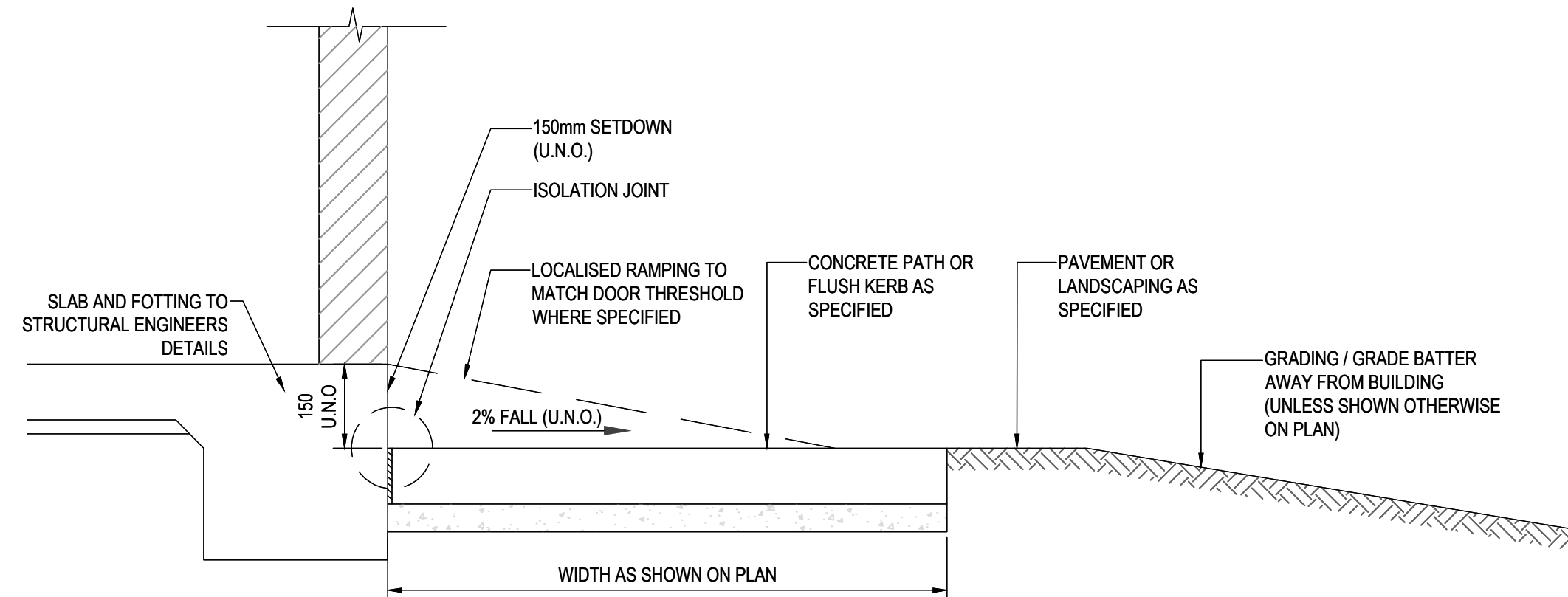
SCALE 1:10



LAYBACK DETAIL (VC)

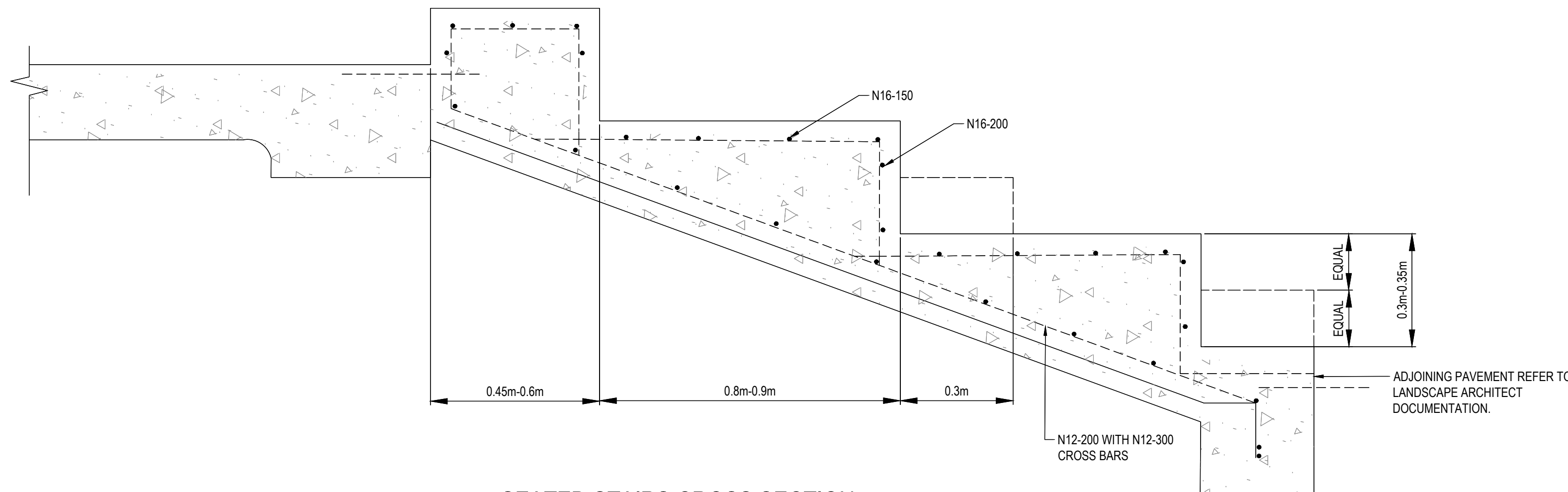
SCALE 1:10

LAYBACK IN ACCORDANCE WITH CAMDEN COUNCIL STANDARD DRAWINGS



TYPICAL BUILDING PERIMETER/ SET DOWN

N.T.S



SEATED STAIRS CROSS SECTION

SCALE 1:10

C

B

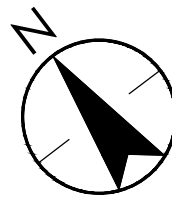
A



LEGEND

	SITE BOUNDARY
	EXTENT OF WORKS
	PROPOSED BUILDING
	EXISTING BUILDING
	PROPOSED ASPHALT PAVEMENT TRAFFICABLE
	PROPOSED CONCRETE PAVEMENT NON TRAFFICABLE
	PROPOSED CONCRETE HARDSTAND PAVEMENT
	PROPOSED SPORTS COURT PAVEMENT
	PROPOSED SOFTFALL AREA
	PROPOSED LANDSCAPE
	EXISTING PAVEMENT RE-SHEETED
	PROPOSED RETAINING WALL

1:500 10 5 0 10 20 A1
1:1000 A3



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Title

PAVEMENT PLAN

Project No.
304000722

Scale
1:500

Revision
H

Drawing No.
LPS-STA-00-XX-DR-C-440-001

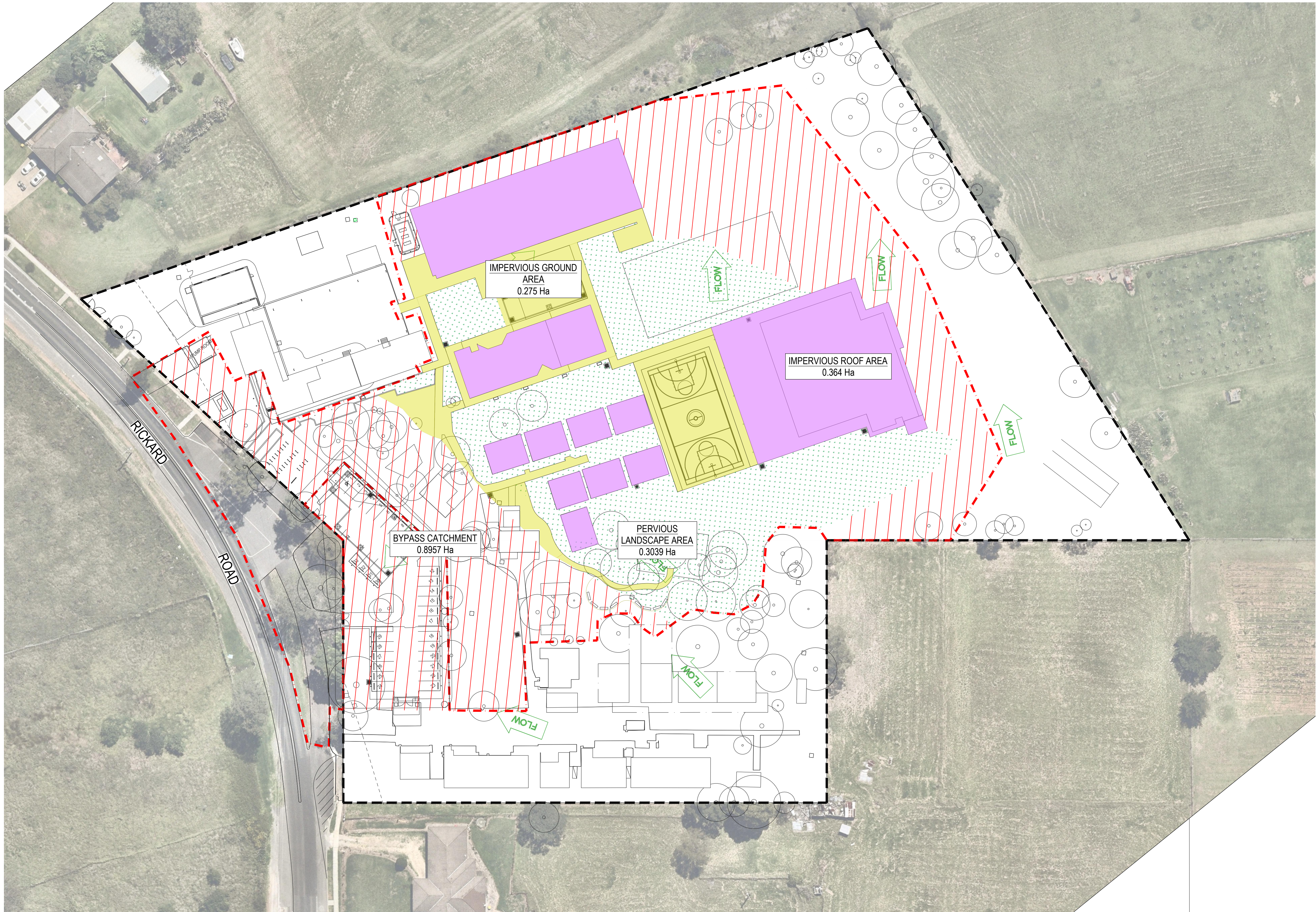
1
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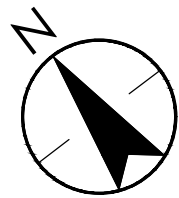
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LEGEND	
	SITE BOUNDARY
	EXTENT OF WORKS
	IMPERVIOUS ROAD CATCHMENT
	IMPERVIOUS GROUND AREA
	IMPERVIOUS ROOF AREA
	PERVIOUS LANDSCAPE AREA
	BYPASS CATCHMENT



G	ISSUED FOR REF	HAL	AT	2025.01.17
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E	100% SCHEMATIC DESIGN	LPT	VE	2024.06.06
D	100% SCHEMATIC DESIGN	LPT	MDR	2024.05.06
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B	95% SCHEMATIC DESIGN	LPT	JMB	2024.02.09
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Title

MUSIC CATCHMENT PLAN

Project No.
304000722

Scale
1:500

Revision
G

Drawing No.
LPS-STA-00-XX-DR-C-500-001

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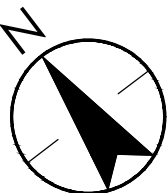
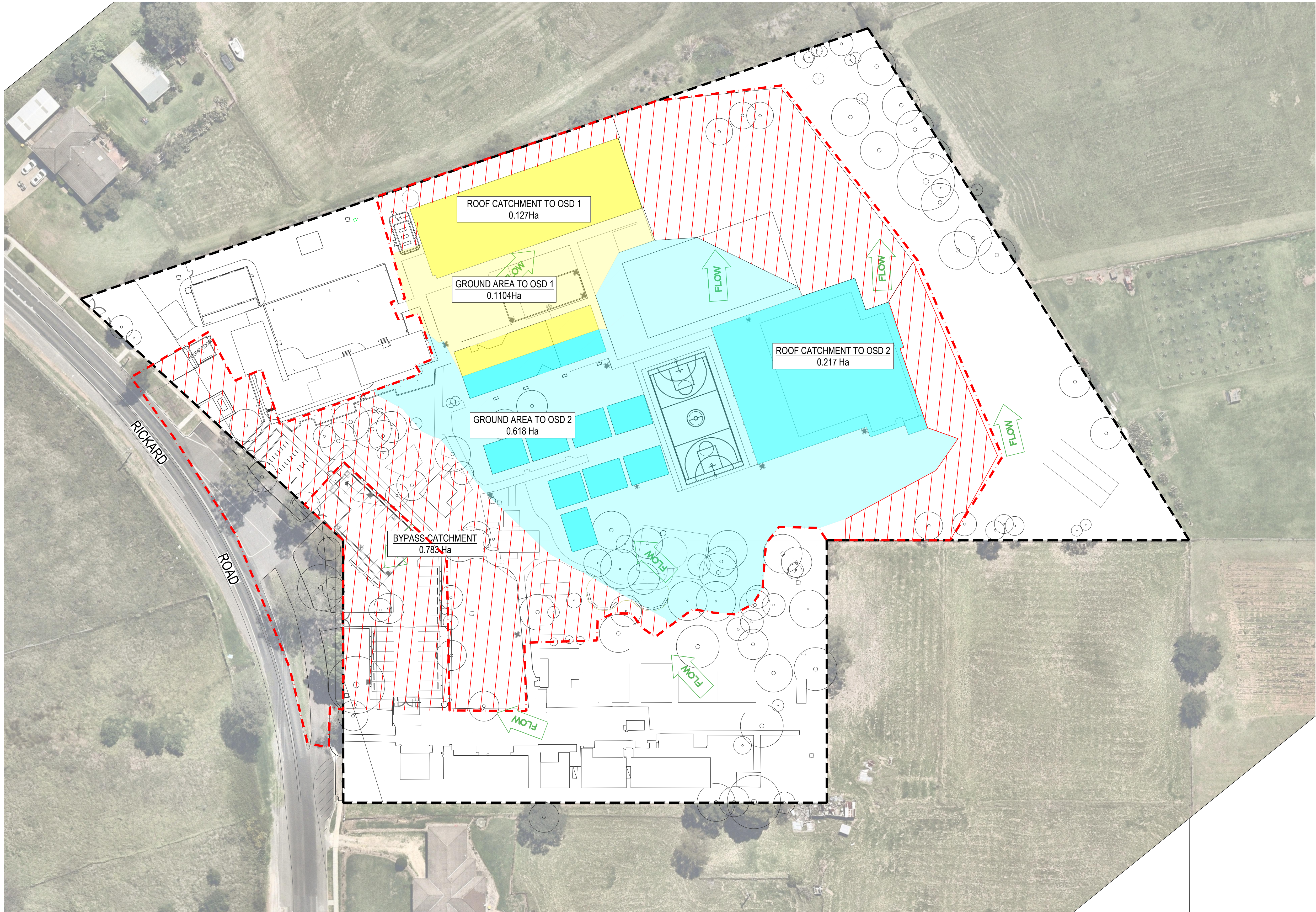
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PLANS: 30/03/2025 2:45:25 PM BY: ALI, HANR
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1:500 10 5 0 10 20 A1
1:1000 A3

LEGEND

- SITE BOUNDARY
- - - EXTENT OF WORKS
- GROUND AREA TO OSD 1
- ROOF AREA TO OSD 1
- GROUND AREA TO OSD 2
- ROOF AREA TO OSD 2
- BYPASS AREA



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D	100% SCHEMATIC DESIGN	LPT	MDR	2024.05.06
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YYYY.MM.DD

Title

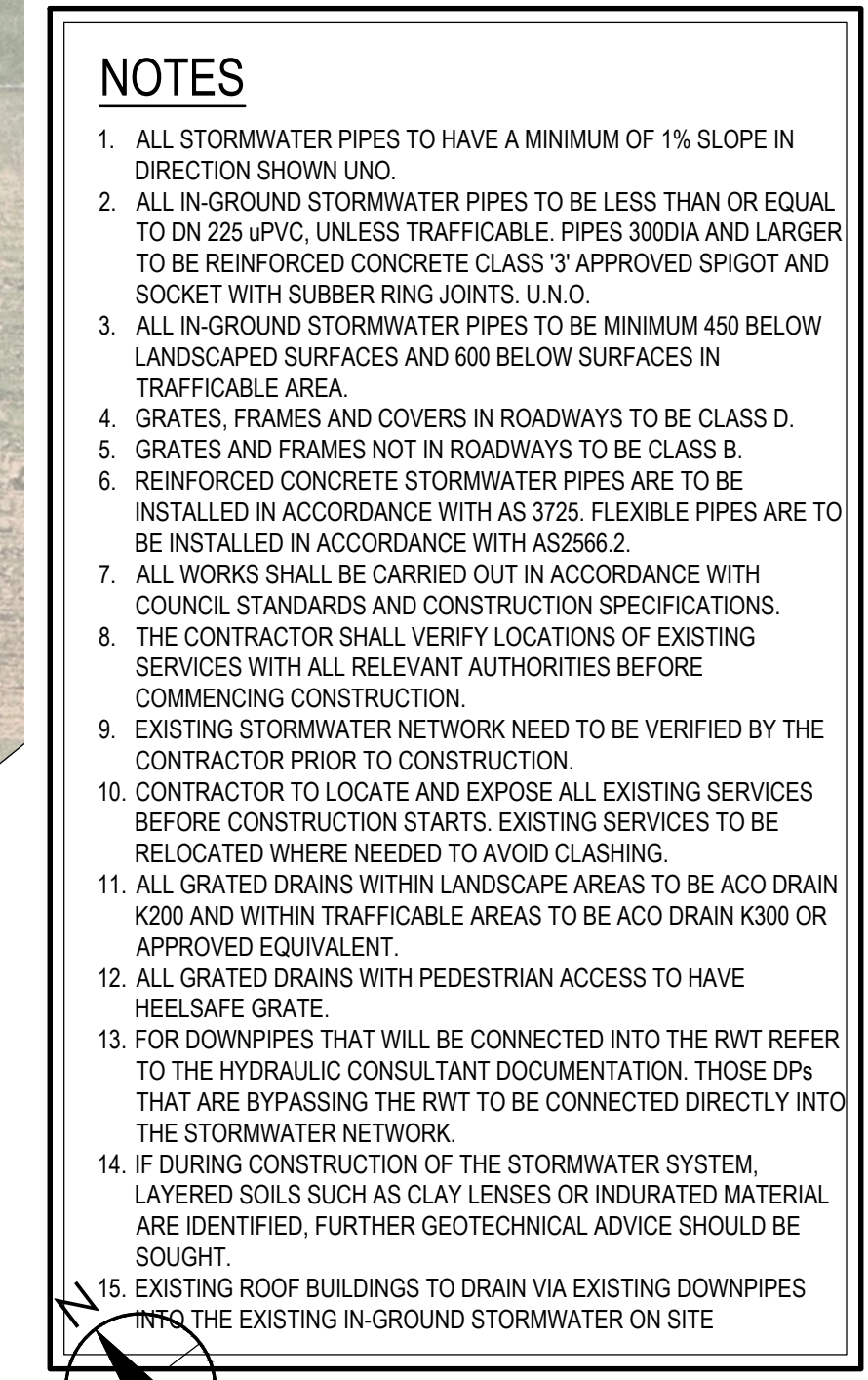
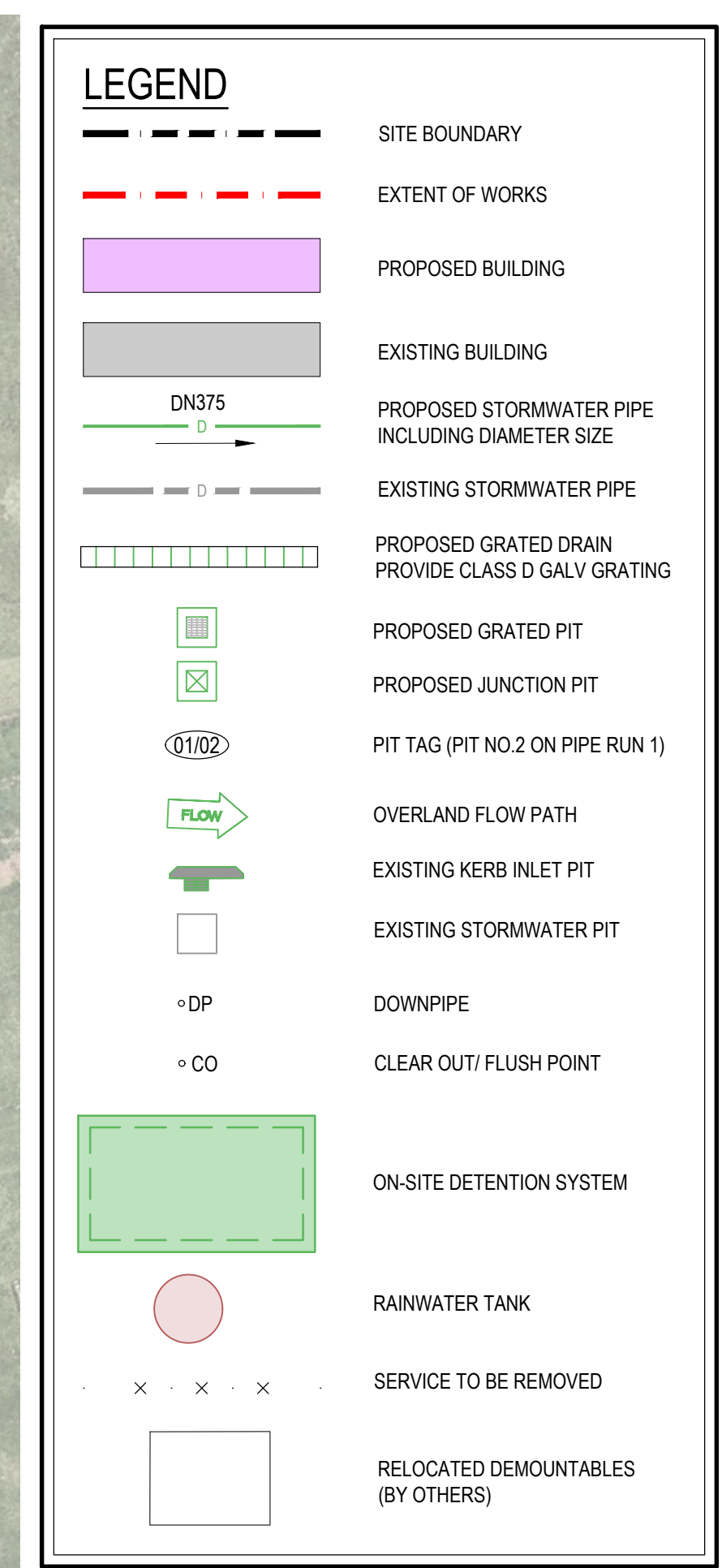
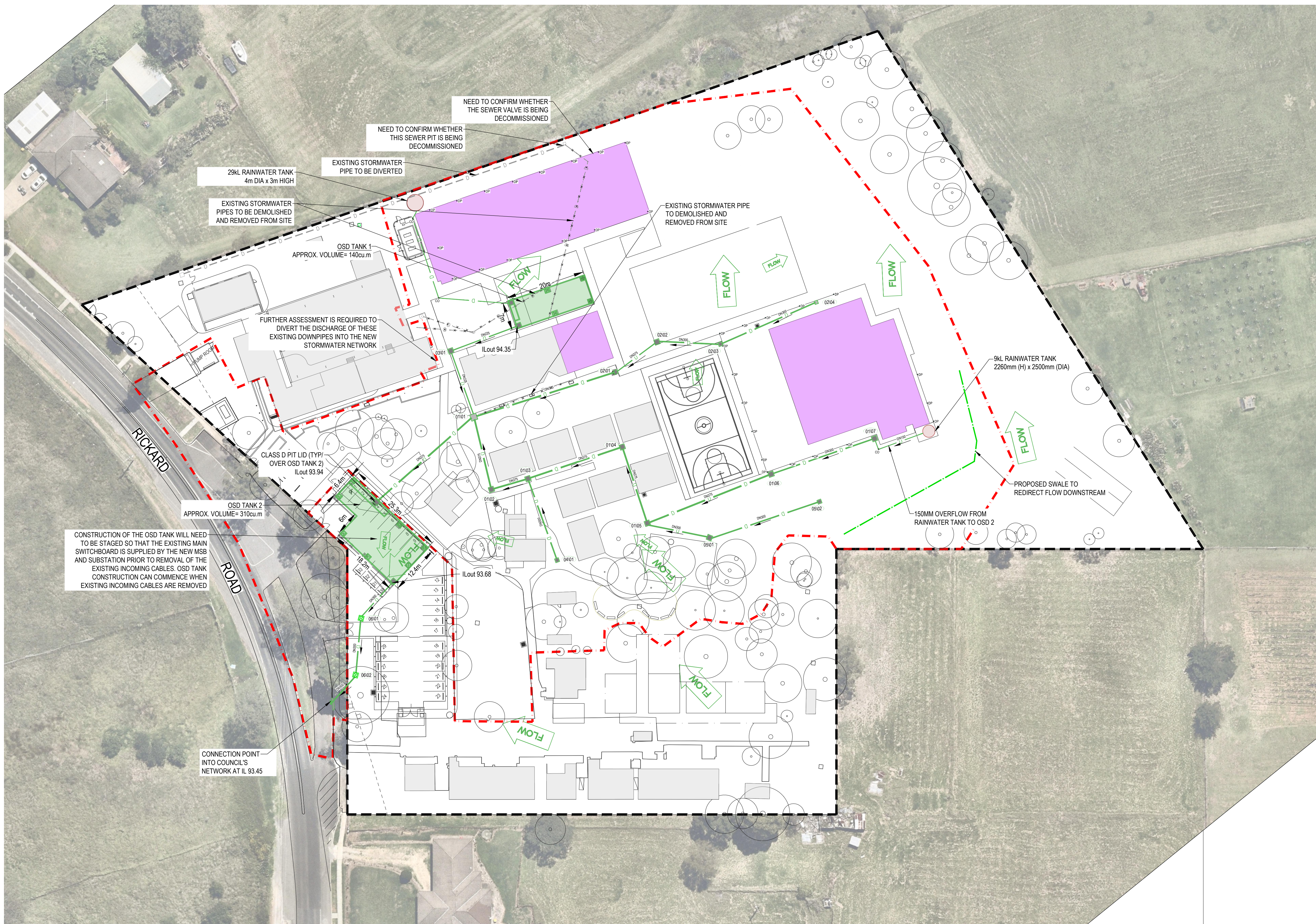
DRAINS CATCHMENT PLAN

Project No.
304000722

Scale
1:500

Revision
G

Drawing No.
LPS-STA-00-XX-DR-C-500-002



NOTES:

1. THERE ARE A SERIES OF BLOCKED OR INACCESSIBLE PIPES AND SMALL PITS. THIS STORMWATER INFRASTRUCTURE NEEDS TO BE INVESTIGATED PRIOR TO CONSTRUCTION.
2. FURTHER COORDINATION REQUIRED FOR THE FOOTPATHS AROUND THE EXISTING DEMOUNTABLES TO REMAIN.

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Title

STORMWATER DRAINAGE PLAN

Project No.
304000722

Drawing No.
LPS-STA-00-XX-DR-C-520-001

Scale
1:500

A



VERTICAL SCALE 1:100



VERTICAL SCALE 1:100



VERTICAL SCALE 1:100



VERTICAL SCALE 1:100



VERTICAL SCALE 1:10



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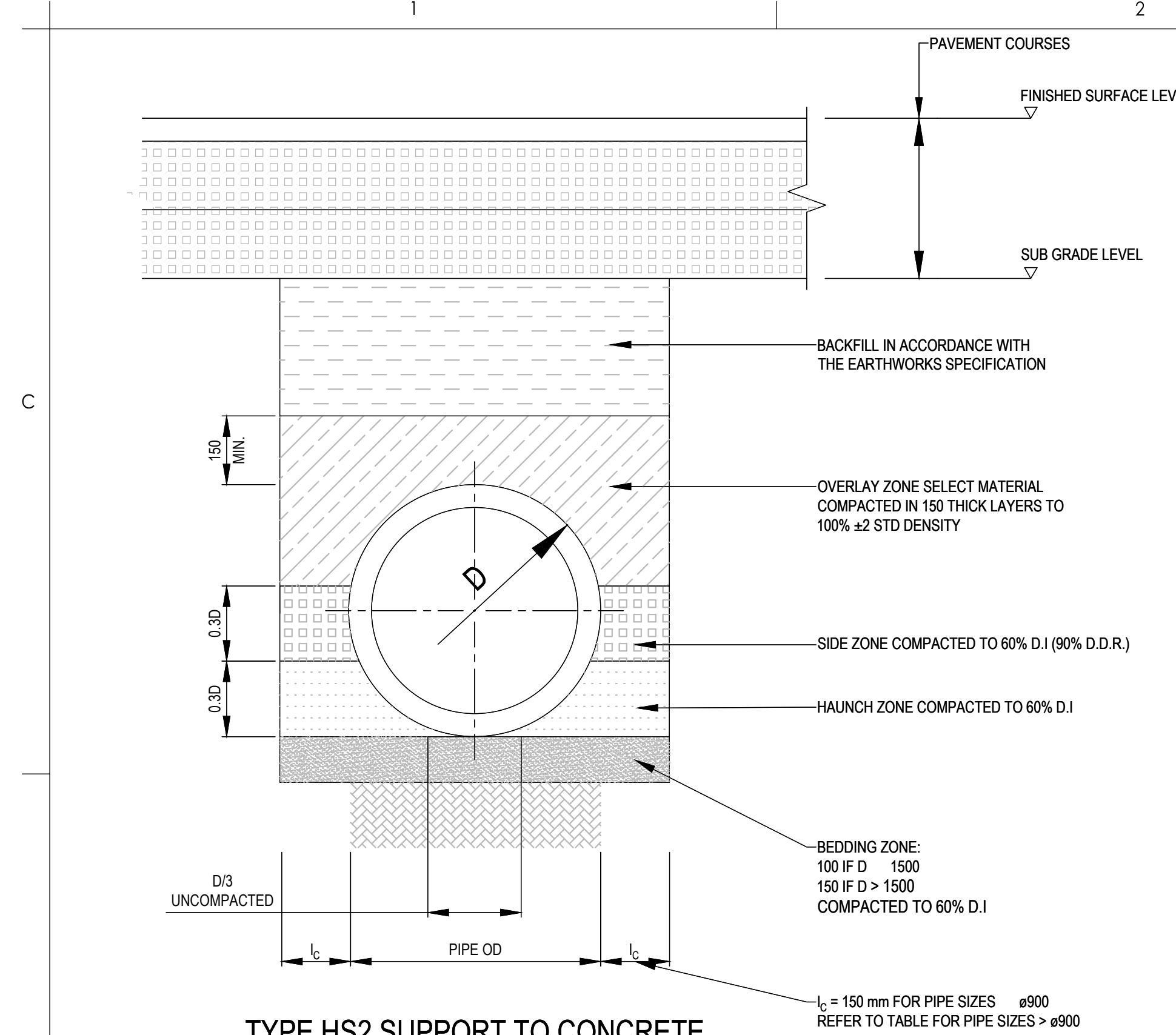
STORMWATER LONG SECTIONS

Project No.
304000722

Revis
B

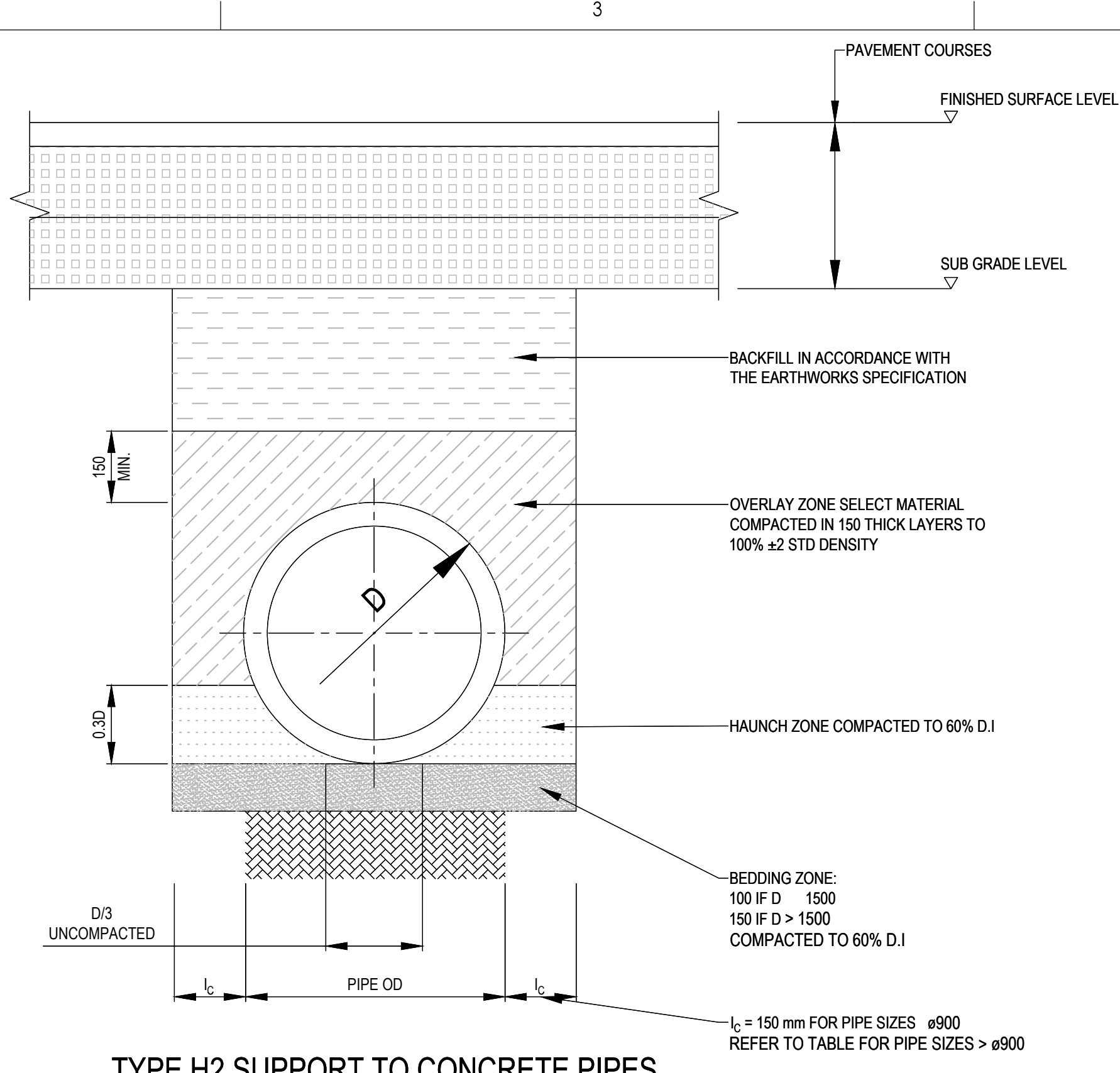
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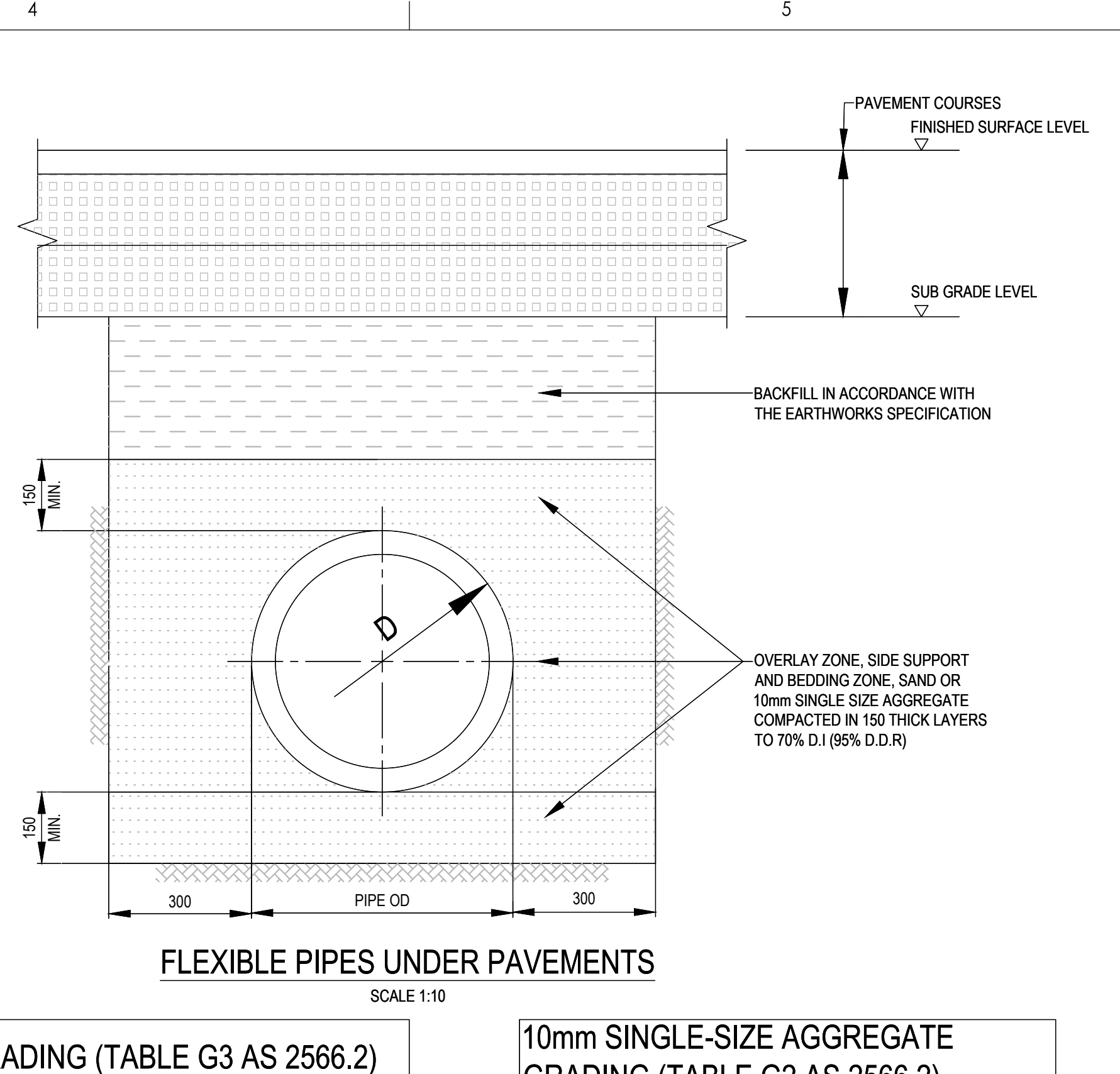
TYPE HS2 SUPPORT TO CONCRETE PIPES UNDER PAVEMENT (VEHICULAR)

SCALE 1:10



TYPE H2 SUPPORT TO CONCRETE PIPES UNDER PAVEMENT (NON-VEHICULAR)

SCALE 1:10



FLEXIBLE PIPES UNDER PAVEMENTS

SCALE 1:10

BEDDING & HAUNCH MATERIAL GRADING (TABLE 6 AS/NZS 3725)	
SIEVE SIZE (mm)	WEIGHT PASSING (%)
19.00	100
2.36	100 TO 50
0.60	90 TO 20
0.30	60 TO 10
0.15	25 TO 0
0.075	10 TO 0

SIDE ZONE WIDTH	
PIPE SIZE (mm)	l _c (mm)
ø900	150
ø1050	175
ø1200	200
ø1350	225
ø1500	250
ø1650	275
ø1800	300

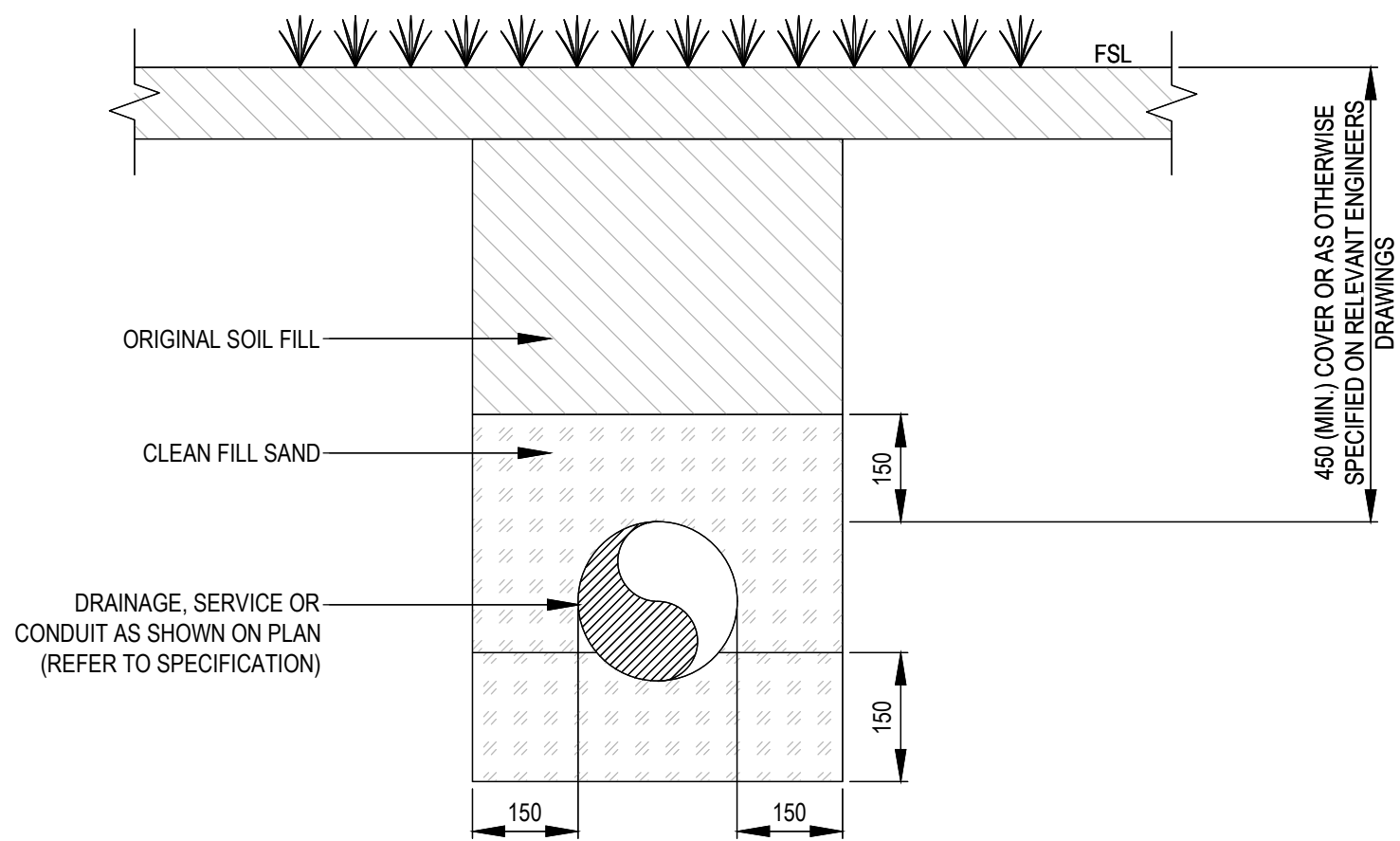
SIDE ZONE MATERIAL GRADING (TABLE 7 AS/NZS 3725)	
SIEVE SIZE (mm)	WEIGHT PASSING (%)
19.00	100
9.50	100 TO 50
2.60	100 TO 30
0.60	50 TO 15
0.075	25 TO 0

SAND GRADING (TABLE G3 AS 2566.2)

SIEVE SIZE (mm)	WEIGHT PASSING (%)
4.75	100 TO 90
2.36	90 TO 100
1.18	85 TO 100
0.60	70 TO 100
0.30	50 TO 100
0.15	0 TO 40
0.075	0 TO 5

10mm SINGLE-SIZE AGGREGATE GRADING (TABLE G2 AS 2566.2)

SIEVE SIZE (mm)	WEIGHT PASSING (%)
13.20	100
9.50	85 TO 100
4.75	0 TO 20
2.36	0 TO 5
0.075	0 TO 2



BACKFILL TO DRAINAGE, SERVICES AND CONDUITS IN LANDSCAPE AREAS (TYP.)

SCALE: NTS

- NOTES
1. TYPICAL DETAIL TO BE USED FOR ALL DRAINAGE SERVICES RUNNING UNDER LANDSCAPE
 2. DRAINAGE INCLUDES ALL GRAVITY SERVICES (INCLUDES CONCRETE AND PLASTIC PIPES)
 3. SERVICES INCLUDES ALL PRESSURE PIPES
 4. FOR NEW SERVICE PIPES OR CONDUITS, REFER TO PLANS FOR SIZES AND LOCATIONS

1:10 0.1 0 0.1 0.2 0.3 0.4 0.5 A1
1:20 A3

Issue/Revision	By	Appd	YYYY.MM.DD
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A CONCEPT DESIGN	LPT	MDR	2022.03.31

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Client/Project Logo



Client/Project

SINSW

LEPPINGTON PUBLIC SCHOOL UPGRADE

RICKARD ROAD, LEPPINGTON, NSW 2179

File Name: LPS-STA-00-XX-DR-C-526-001.DWG
Dwn. Dign. Chkd. 2022.03.31
YYYY.MM.DD

Title

STORMWATER DRAINAGE DETAILS
SHEET 2 OF 5

Project No.
304000722

Scale
1:10

Revision
H

Drawing No.
LPS-STA-00-XX-DR-C-526-002

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C

B

A

PIT SCHEDULE FOR: C-STRM										
PIT NAME	PIT TYPE	SETOUT COORDS	INTERNAL DIM [mm]	INLET Ø [mm]	INLET INV [m]	OUTLET Ø [mm]	OUTLET INV [m]	PIT FIN RL	PIT DEPTH [m]	COMMENTS
01/01	Reinforced Concrete	E: 297699.081 N: 6240232.757	W: 900 L: 900	Ø 375 Ø 375 Ø 229	94.077 94.410 94.070	Ø 375	94.036	96.117	2.081	OCEANGUARD PIT FILTER BASKET
01/02	Reinforced Concrete	E: 297690.974 N: 6240215.876	W: 900 L: 900	Ø 375	94.247	Ø 375	94.227	96.367	2.140	OCEANGUARD PIT FILTER BASKET
01/03	Reinforced Concrete	E: 297699.700 N: 6240212.269	W: 900 L: 900	Ø 375 Ø 300	94.342 95.546	Ø 375	94.322	96.396	2.073	OCEANGUARD PIT FILTER BASKET
01/04	Reinforced Concrete	E: 297722.961 N: 6240203.599	W: 900 L: 900	Ø 375	94.561	Ø 375	94.541	96.827	2.286	OCEANGUARD PIT FILTER BASKET
01/05	Reinforced Concrete	E: 297715.856 N: 6240184.909	W: 900 L: 900	Ø 375 Ø 300	94.741 96.091	Ø 375	94.721	96.993	2.272	OCEANGUARD PIT FILTER BASKET
01/06	Reinforced Concrete	E: 297747.518 N: 6240174.979	W: 900 L: 900	Ø 300	95.026	Ø 375	95.006	96.065	1.059	OCEANGUARD PIT FILTER BASKET
01/07	Reinforced Concrete	E: 297773.146 N: 6240165.659	W: 600 L: 600			Ø 300 Ø 150	95.299 95.191	96.057	0.866	OCEANGUARD PIT FILTER BASKET
02/01	Reinforced Concrete	E: 297733.450 N: 6240219.135	W: 900 L: 900	Ø 375	94.800	Ø 375	94.780	96.153	1.373	OCEANGUARD PIT FILTER BASKET
02/02	Reinforced Concrete	E: 297746.190 N: 6240218.442	W: 900 L: 900	Ø 300	94.922	Ø 375	94.902	95.811	0.909	
02/03	Reinforced Concrete	E: 297758.099 N: 6240208.148	W: 900 L: 900	Ø 300	95.150	Ø 300	95.048	96.089	1.042	
02/04	Reinforced Concrete	E: 297783.225 N: 6240201.138	W: 600 L: 600			Ø 300	95.359	96.140	0.781	
03/01	Reinforced Concrete	E: 297704.752 N: 6240249.111	W: 900 L: 900	Ø 229	94.208	Ø 229	94.208	96.099	1.891	
04/01	Reinforced Concrete	E: 297692.579 N: 6240191.891	W: 600 L: 600			Ø 300	95.762	96.790	1.028	
05/01	Reinforced Concrete	E: 297725.627 N: 6240172.356	W: 600 L: 600	Ø 300	96.270	Ø 300	96.250	97.544	1.294	OCEANGUARD PIT FILTER BASKET
05/02	Reinforced Concrete	E: 297752.556 N: 6240162.077	W: 600 L: 600			Ø 300	96.558	97.339	0.781	OCEANGUARD PIT FILTER BASKET
06/01	Reinforced Concrete	E: 297645.491 N: 6240211.387	W: 900 L: 900	Ø 300	93.586	Ø 300	93.586	94.515	0.930	
06/02	Reinforced Concrete	E: 297635.546 N: 6240201.321	W: 900 L: 900	Ø 300	93.473	Ø 300	93.473	94.496	1.023	

Issue Status

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Client/Project Logo



Client/Project

SINSW

LEPPINGTON PUBLIC SCHOOL UPGRADE

RICKARD ROAD, LEPPINGTON, NSW 2179

File Name: LPS-STA-00-XX-DR-C-527-001.DWG

- - - 2024.02.09
 Dwn. Dign. Chkd. YYYY.MM.DD

Title

STORMWATER PIT SCHEDULE

Project No.
 304000722

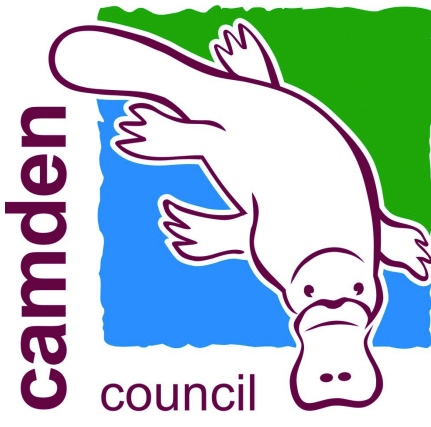
Scale
 NTS

Revision
 F

Drawing No.
 LPS-STA-00-XX-DR-C-527-001

Appendix B Existing Flood Information

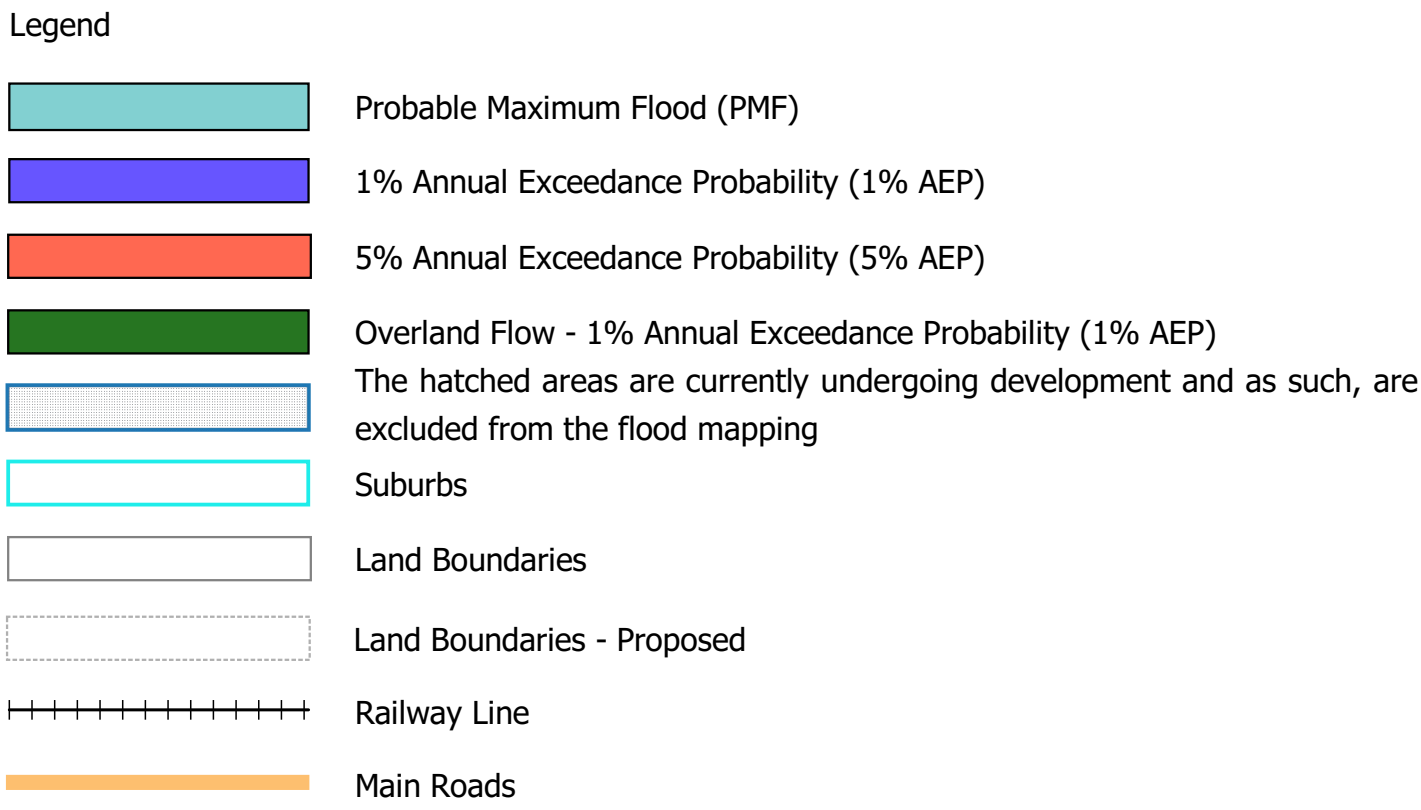




Mainstream Flood Extents:
1% AEP, 5% AEP and PMF Flood Events

Overland Flow: 1% AEP Flood Event

Upper South Creek Floodplain Risk
Management Study and Plan, March 2019



Flood Information

This map has been prepared by Council's Land Information Section based on the results provided in Upper South Creek Floodplain Risk Management Study and Plan, March 2019, Aerial Laser Survey 2008 and other survey data collected after Upper South Creek Flood Study, 2012.

The extent of flood inundation is approximate only.

For greater accuracy, you should obtain a Flood Certificate from Camden Council which will provide flood levels to Australian Height Datum (AHD) and these can be compared to actual site levels.

The Aerial Laser survey, 2008 has an accuracy of $\pm 150\text{mm}$ vertical and $\pm 270\text{mm}$ horizontal.

The flood extents shown in this map are for the South Creek Catchment only and areas that may be subject to flooding but are not part of the South Creek Catchment are not shown.

Any areas with flood depths less than 150mm are excluded from the flood extent mapping.

The flooding shown on these plans is for main stream flooding and overland flooding.

Mainstream flooding means inundation resulting from overbank flow from a waterway rather than by local runoff.

Overland Flow is local runoff on its way to a waterway, rather than overbank discharge from a waterway.

Overland flow flood extents are located outside the mainstream watercourses. The 1% AEP overland flow flood depth is generally greater than 0.15m and no more than 0.5m.

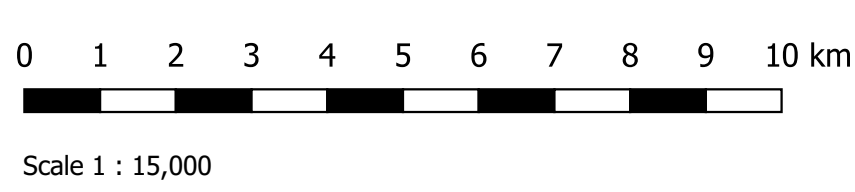
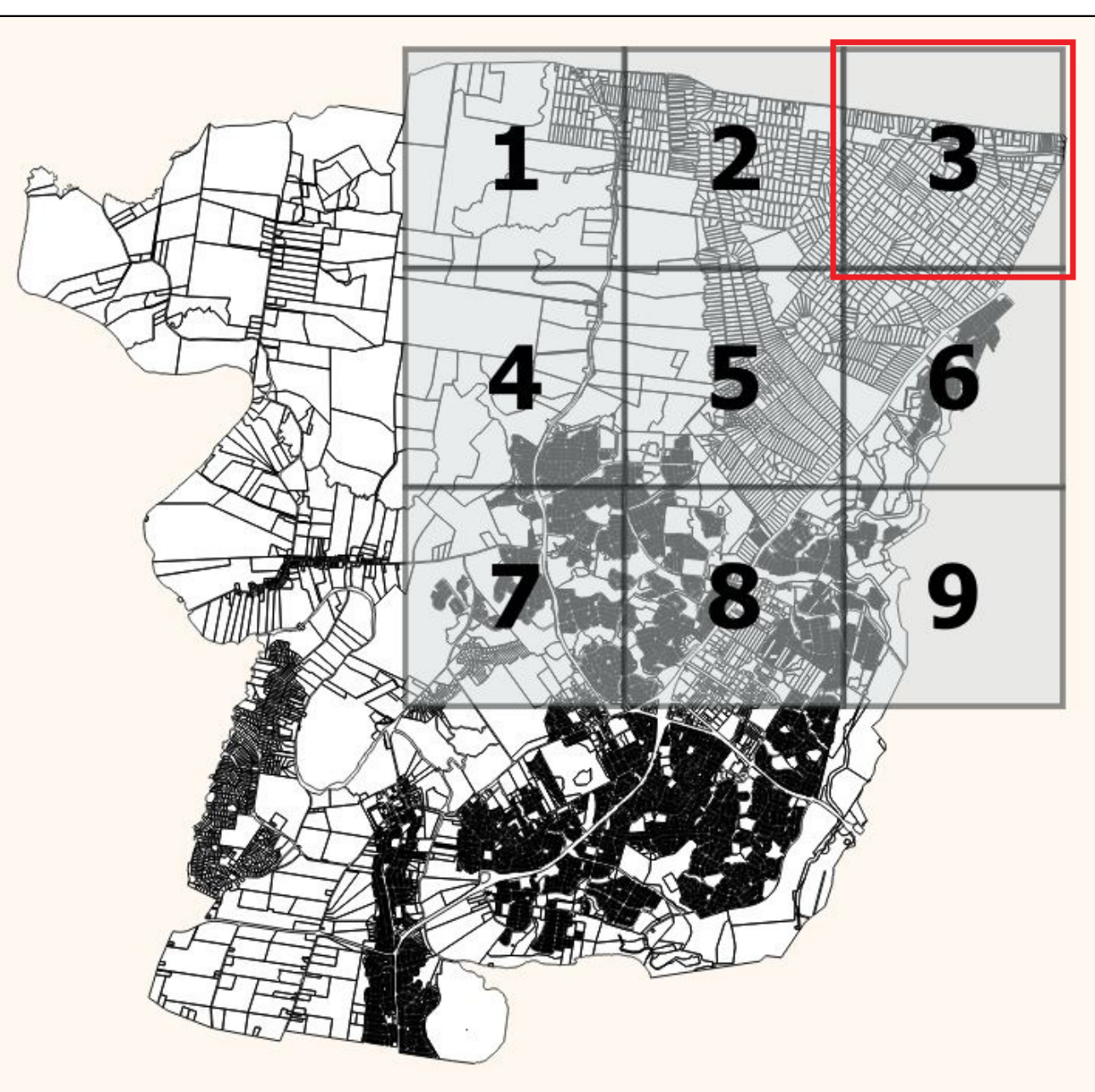
Climate Change has not been considered in flood mapping. It is expected that existing flood behaviour and levels will change due to the impacts of Climate Change.

The hatched areas are currently undergoing development and as such, are excluded from the study. These areas are Oran Park, Turner Road, part of Leppington and Catherine Field (Part) Precincts, and Gledswood Hills, Emerald Hills.

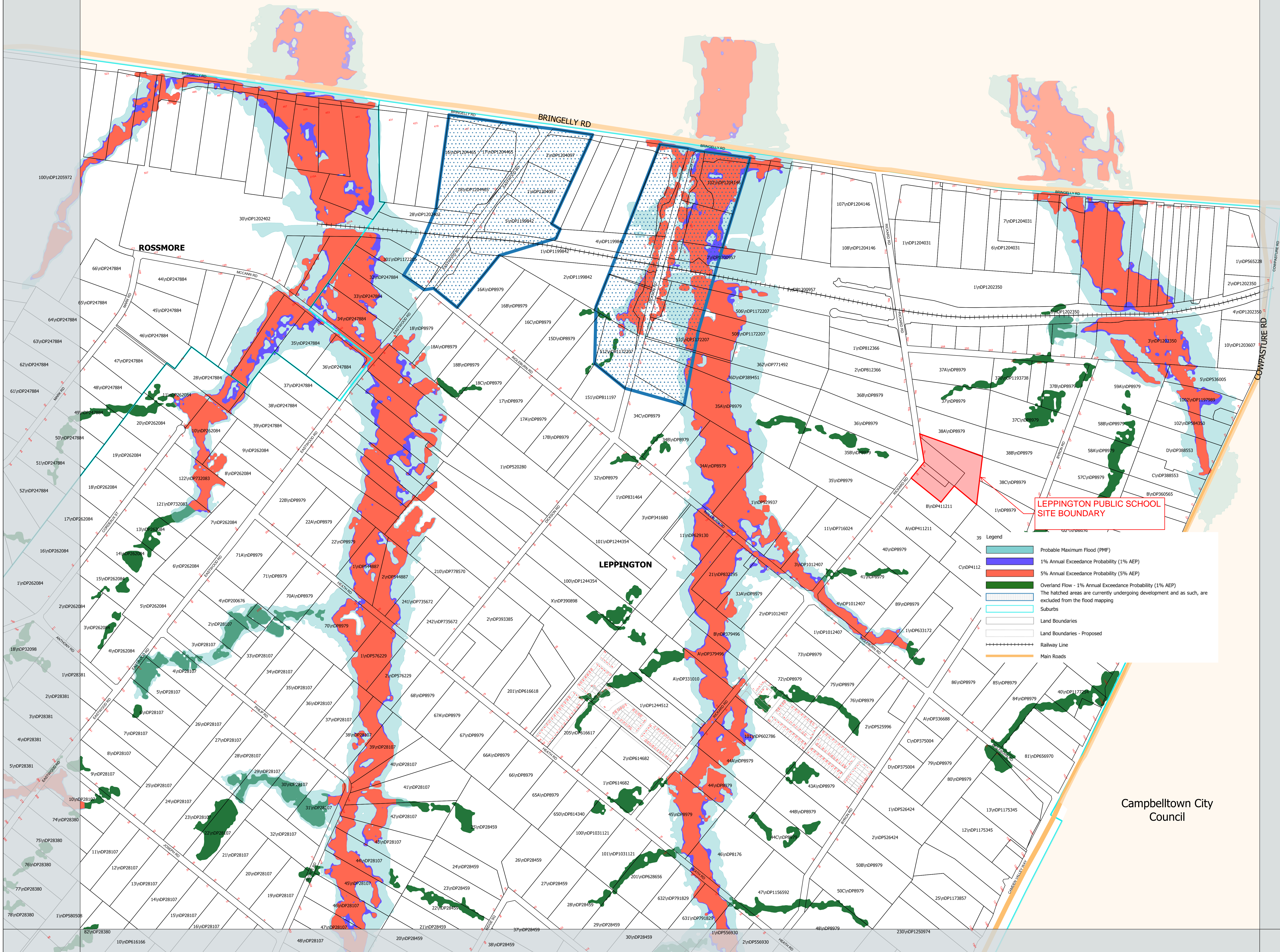
The information contained on these maps is to the best of Council's belief, correct. However, no warranty or guarantee is provided by Council and no liability is accepted for any loss or damage resulting from any person relying upon or using the information contained in the map. Flood information and levels are subject to change (without notice) based upon matters such as new or improved flood study data, climate change and changes to the build and / or natural environments.

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.

Map 3



Liverpool City Council



Campbelltown City Council

Appendix C MUSIC-LINK





MUSIC-link Report

Project Details		Company Details	
Project:	Leppington Public School	Company:	Stantec
Report Export Date:	06-May-24	Contact:	Lauren Todd
Catchment Name:	Leppington PS MUSIC Model REV4	Address:	Level 9, The Forum, 203 Pacific Highway Sydney NSW 2065
Catchment Area:	0.73ha	Phone:	
Impervious Area*:	54.36%	Email:	Lauren.Todd@stantec.com
Rainfall Station:	67035 LIVERPOOL(WHITLAM		
Modelling Time-step:	6 Minutes		
Modelling Period:	01-Jan-85 - 31-Dec-94 11:54:00 PM		
Mean Annual Rainfall:	783mm		
Evapotranspiration:	1261mm		
MUSIC Version:	6.3.0		
MUSIC-link data Version:	6.34		
Study Area:	Camden City Council		
Scenario:	Camden City Council		

* takes into account area from all source nodes that link to the chosen reporting node, excluding Import Data Nodes

Treatment Train Effectiveness		Treatment Nodes		Source Nodes	
Node: Post-Development Node	Reduction	Node Type	Number	Node Type	Number
Flow	13.6%	Rain Water Tank Node	2	Urban Source Node	5
TSS	90.6%	Sedimentation Basin Node	2		
TP	76.6%	Generic Node	2		
TN	60.2%	GPT Node	2		
GP	100%				

Comments

The MUSIC model flagged issues can be clarified based on the following details. The parameters that appear with errors in the Ocean Protect SF Chamber, such as Notional Detention Time, Nitrogen k value, Phosphorus k value and Suspended Solids k value, have been adopted from Ocean Protect's calculation spreadsheet which has been designed specifically for

stormfilters.

It is worth noting that 'k' values should be adjusted to 1 or 0 as default values exaggerate performance as the detention tank effectiveness has

already been measured and accounted for in the filter node reductions. The roof area parameters for baseflow have been set to '0' as no pollutant stormwater runoff is generated on this surface type.

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
GPT	1x OceanGuard	Hi-flow bypass rate (cum/sec)	None	99	0.02
GPT	3x OceanGuard	Hi-flow bypass rate (cum/sec)	None	99	0.06
Post	Post-Development Node	% Load Reduction	None	None	13.6
Post	Post-Development Node	GP % Load Reduction	90	None	100
Post	Post-Development Node	TN % Load Reduction	45	None	60.2
Post	Post-Development Node	TP % Load Reduction	65	None	76.6
Post	Post-Development Node	TSS % Load Reduction	85	None	90.6
Rain	Rainwater Tank 10kL	% Reuse Demand Met	None	None	23.49
Rain	Rainwater Tank 10kL	% Reuse Demand Met	None	None	21.86
Sedimentation	SF Chamber (20sqm)	% Reuse Demand Met	None	None	0
Sedimentation	SF Chamber (20sqm)	High Flow Bypass Out (ML/yr)	None	None	0
Sedimentation	SF Chamber (5sqm)	% Reuse Demand Met	None	None	0
Sedimentation	SF Chamber (5sqm)	High Flow Bypass Out (ML/yr)	None	None	0
Urban	Ground Area 1(0.1163Ha)- 58% Imperv	Area Impervious (ha)	None	None	0.067
Urban	Ground Area 1(0.1163Ha)- 58% Imperv	Area Pervious (ha)	None	None	0.048
Urban	Ground Area 1(0.1163Ha)- 58% Imperv	Total Area (ha)	None	None	0.116
Urban	Ground Area 2 (0.3796Ha)- 25% Imperv	Area Impervious (ha)	None	None	0.094
Urban	Ground Area 2 (0.3796Ha)- 25% Imperv	Area Pervious (ha)	None	None	0.284
Urban	Ground Area 2 (0.3796Ha)- 25% Imperv	Total Area (ha)	None	None	0.379
Urban	Roof Area 1 (0.1203Ha)- 100% Imperv	Area Impervious (ha)	None	None	0.12
Urban	Roof Area 1 (0.1203Ha)- 100% Imperv	Area Pervious (ha)	None	None	0
Urban	Roof Area 1 (0.1203Ha)- 100% Imperv	Total Area (ha)	None	None	0.12
Urban	Roof Area 2 to OSD (0.0211Ha)- 100% Imperv	Area Impervious (ha)	None	None	0.021
Urban	Roof Area 2 to OSD (0.0211Ha)- 100% Imperv	Area Pervious (ha)	None	None	0
Urban	Roof Area 2 to OSD (0.0211Ha)- 100% Imperv	Total Area (ha)	None	None	0.021
Urban	Roof Area 2 to RWT (0.0945 Ha)- 100% Imperv	Area Impervious (ha)	None	None	0.094
Urban	Roof Area 2 to RWT (0.0945 Ha)- 100% Imperv	Area Pervious (ha)	None	None	0
Urban	Roof Area 2 to RWT (0.0945 Ha)- 100% Imperv	Total Area (ha)	None	None	0.094

Only certain parameters are reported when they pass validation

Failing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Sedimentation	SF Chamber (20sqm)	Notional Detention Time (hrs)	8	12	1.21
Sedimentation	SF Chamber (20sqm)	Total Nitrogen - k (m/yr)	500	500	1
Sedimentation	SF Chamber (20sqm)	Total Phosphorus - k (m/yr)	6000	6000	1
Sedimentation	SF Chamber (20sqm)	Total Suspended Solids - k (m/yr)	8000	8000	1
Sedimentation	SF Chamber (5sqm)	Notional Detention Time (hrs)	8	12	0.28
Sedimentation	SF Chamber (5sqm)	Total Nitrogen - k (m/yr)	500	500	1
Sedimentation	SF Chamber (5sqm)	Total Phosphorus - k (m/yr)	6000	6000	1
Sedimentation	SF Chamber (5sqm)	Total Suspended Solids - k (m/yr)	8000	8000	1
Urban	Roof Area 1 (0.1203Ha)- 100% Imperv	Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.32	0
Urban	Roof Area 1 (0.1203Ha)- 100% Imperv	Baseflow Total Nitrogen Standard Deviation (log mg/L)	0.12	0.12	0
Urban	Roof Area 1 (0.1203Ha)- 100% Imperv	Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.82	0
Urban	Roof Area 1 (0.1203Ha)- 100% Imperv	Baseflow Total Phosphorus Standard Deviation (log mg/L)	0.19	0.19	0
Urban	Roof Area 1 (0.1203Ha)- 100% Imperv	Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.1	0
Urban	Roof Area 1 (0.1203Ha)- 100% Imperv	Baseflow Total Suspended Solids Standard Deviation (log mg/L)	0.17	0.17	0
Urban	Roof Area 2 to OSD (0.0211Ha)- 100% Imperv	Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.32	0
Urban	Roof Area 2 to OSD (0.0211Ha)- 100% Imperv	Baseflow Total Nitrogen Standard Deviation (log mg/L)	0.12	0.12	0
Urban	Roof Area 2 to OSD (0.0211Ha)- 100% Imperv	Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.82	0
Urban	Roof Area 2 to OSD (0.0211Ha)- 100% Imperv	Baseflow Total Phosphorus Standard Deviation (log mg/L)	0.19	0.19	0
Urban	Roof Area 2 to OSD (0.0211Ha)- 100% Imperv	Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.1	0
Urban	Roof Area 2 to OSD (0.0211Ha)- 100% Imperv	Baseflow Total Suspended Solids Standard Deviation (log mg/L)	0.17	0.17	0
Urban	Roof Area 2 to RWT (0.0945 Ha)- 100% Imperv	Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.32	0
Urban	Roof Area 2 to RWT (0.0945 Ha)- 100% Imperv	Baseflow Total Nitrogen Standard Deviation (log mg/L)	0.12	0.12	0
Urban	Roof Area 2 to RWT (0.0945 Ha)- 100% Imperv	Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.82	0
Urban	Roof Area 2 to RWT (0.0945 Ha)- 100% Imperv	Baseflow Total Phosphorus Standard Deviation (log mg/L)	0.19	0.19	0
Urban	Roof Area 2 to RWT (0.0945 Ha)- 100% Imperv	Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.1	0
Urban	Roof Area 2 to RWT (0.0945 Ha)- 100% Imperv	Baseflow Total Suspended Solids Standard Deviation (log mg/L)	0.17	0.17	0

Only certain parameters are reported when they pass validation

Design with
community in mind

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For more information please visit
www.stantec.com

