Austral Public School Upgrade

Stormwater Management Report

Prepared for: NSW Department of Education (DoE)

Date: 17th January 2025

Prepared by: Harshil Lal

Ref: 304000720

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Stantec

Revision

Site Address:	205 Edmondson Avenue, Austral, NSW 2179
Real Property Description:	Lot 1, DP398105 Lot 1, DP398106 Lot 1, DP509613 Lot 2, DP509613 Lot 1, DP512119 Lot 865 DP2475
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:	304000720-SWMP_009

Vivie Eccles

Project Technical Lead, Civil Team Lead

For and on behalf of
Stantec Australia Pty Ltd

Revision	Date	Comment	Prepared By	Approved By
001	30.03.23	Preliminary Concept Design	LPT	MDR
002	15.12.23	50% Schematic Design	LPT	MDR
003	02.02.24	95% Schematic Design	LPT	JMB
004	23.02.24	Issued for DA	LPT	JMB
005	08.03.24	Issued for DA	LPT	JMB
006	18.03.24	Issued for DA	LPT	JMB
007	06.06.24	Issued for DA	LPT	VE
008	17.01.24	Issued for REF	HAL	VE

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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 Austral Public School (APS) (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 the upgrades to the existing APS at 205 Edmondson Avenue, Austral, NSW, 2179 (the site).

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

This SWMP illustrates that the proposed activity complies with the conditions set out by Liverpool City Council, Australian Rainfall and Runoff (ARR) 2019, Australian Standards and best engineering practices.

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), Australian Rainfall and Runoff ARR (2019), Australian Standards and best engineering practices.

The proposed activity involves alterations and additions to the existing APS, including the following:

- Demolition of existing structures and removal of trees, as well as other site preparation works;
- The erection of a new 3-storey building comprising teaching spaces that includes 20 permanent teaching spaces and 3 support teaching spaces;
- Refurbishment and change of school function of Building I from classrooms to a Library;
- At-grade parking (57 new spaces, including 1 accessible space);
- New driveway and access gate from Edmondson Road;
- Erection of a substation within the site on the northern boundary;
- Upgrade of the sports field;
- Internal pathways, fencing, utility upgrades and associated works; and
- Off-site public domain improvements including retention and upgrading of the Kiss & Drop area and a temporary pedestrian road crossing on Tenth Avenue.

The intent of the activity is to allow for upgrades to APS that will provide a CORE 35 primary school compliant with the EFSG. The works will increase the capacity of the school from 681 students and 40 FTE teachers to 734 students and 64 FTE teachers, respectively. Furthermore, provision within the expanded 734 student capacity will be made for the creation of 30 support class students places.

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
- Stormwater Network Maintenance during Operation

The following will be achieved with the correct application of this SWMP:

- Appropriate standards to be maintained on all aspects of stormwater within the site,
- Pollution control to be maintained,
- Establishment of a unified, clear, and concise stormwater management strategy.

Figure 1 below show the scope of works for the proposed activity.

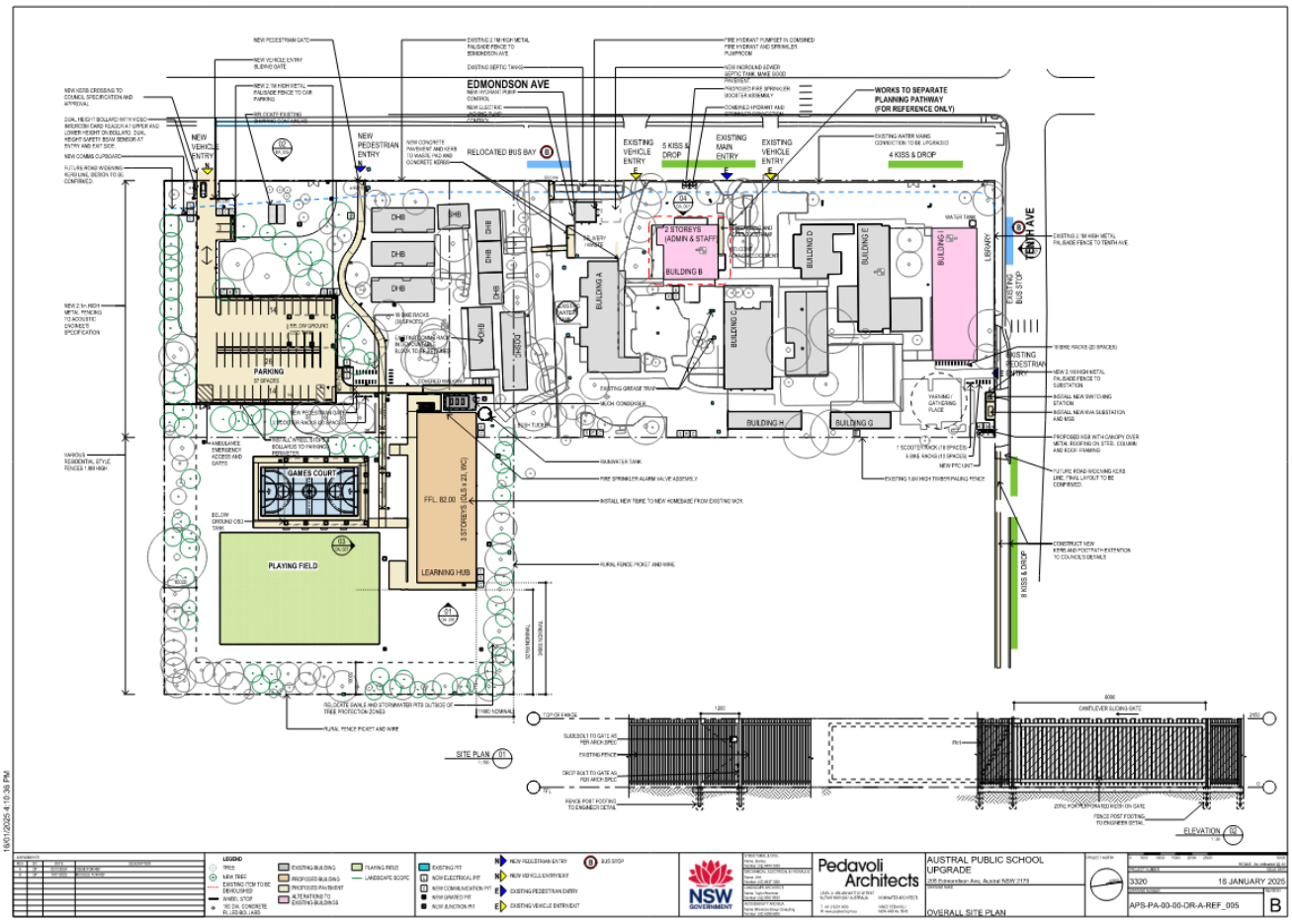


Figure 1: Proposed Site Plan (Source: Pedavoli Architects, Overall Site Plan (Rev B)

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:

- Liverpool Development Control Plan 2008 Part 1 General Controls for all development
- Liverpool City Council On-Site Stormwater Detention Standard
- Schedule One- Austral & Leppington North Precincts
- 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

4. Existing Site Characteristics

4.1 Property Detail

The proposed activity forms part of the site with the following property details:

Site Address:	205 Edmondson Avenue, Austral, NSW 2179 *Located on the southern-eastern corner of the intersection between Edmondson Avenue and Tenth Avenue*
Real Property Description:	Lot 1, DP398105 Lot 1, DP398106 Lot 1, DP509613 Lot 1, DP512119 Lot 2, DP509613 Lot 865, DP2475
Site Area:	29,860m^2 (Approx. 2.986 Ha)
Area of Activity:	15,253 m^2 (Approx. 1.525 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-educational primary (K-6) public school with:

- 8 permanent buildings;
- 14 demountable structures;
- interconnected paths;
- covered walkways;
- play areas: and
- at-grade parking.

The Austral Community Pre-school is also located within the site.

The existing buildings are clustered in the northern part of the site, ranging between 1 to 2 storeys in height. There is a sports oval in the south-eastern portion of the site, and a densely vegetated informal play area located in the south-western portion of the site.

Refer to locality plan in Figure 2 for further clarification.

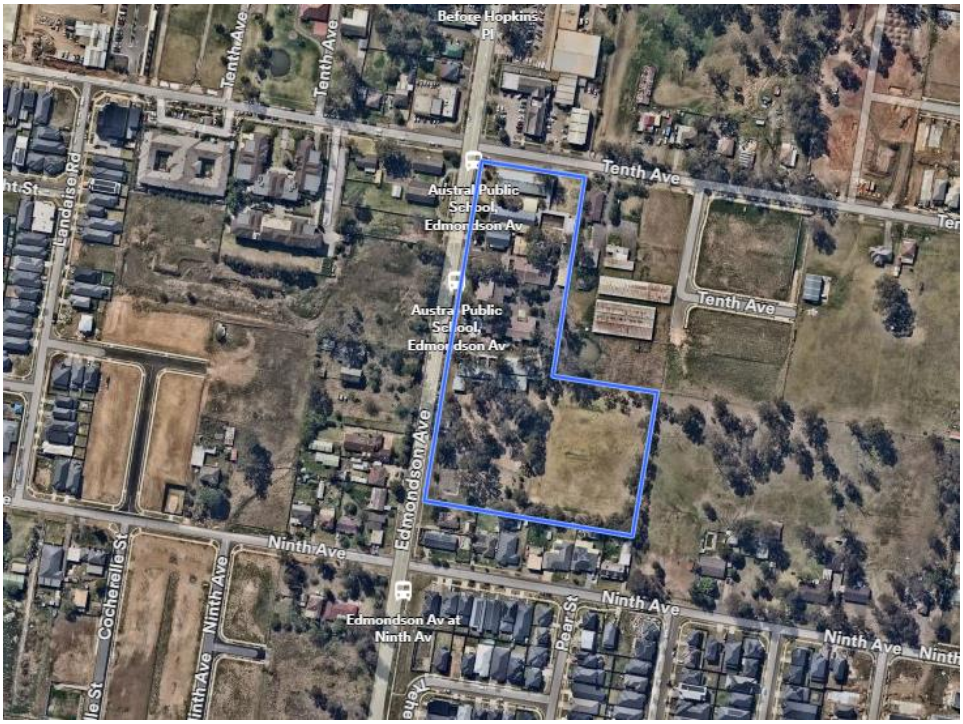


Figure 2: Aerial image of site (source: NearMap, taken 7 Sept 2023)

4.2 Topography

The topography of the site has been determined by analysis of survey documents and through Mecone Mosaic. Ground surface across the site is dipping gently toward the western boundary. The minimum ground surface elevation across the site is RL 78 m AHD and change in level across the site from the southern boundary to the northern boundary varies at 8m. The high point of the site located along the eastern boundary at a level of RL 85.75 m AHD and the low point located along the western boundary at a level of RL 78 m AHD, this is an average slope of 7 %.

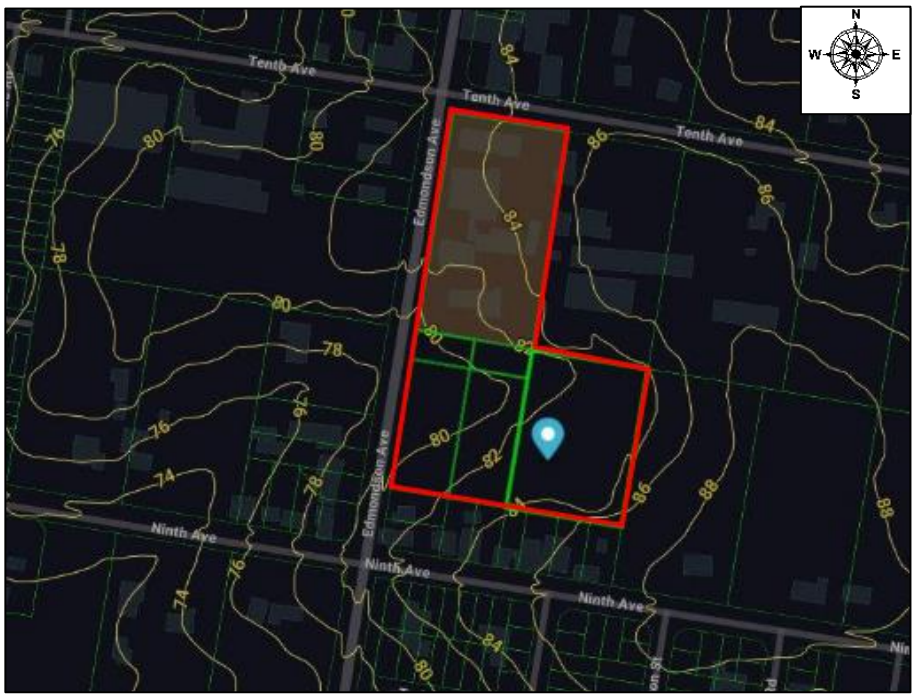


Figure 3: Site Topography (Mecone Mosaic 2023)

4.3 Stormwater Catchments

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

A minor portion of the neighbouring lot to the East of the site, in its existing condition, discharges overland flow toward the proposed activity site. However, these flows are captured by a dam within Lot 866/ DP2475.

4.4 Existing Stormwater Infrastructure

Through survey and information provided by council, it has been determined that the site contains pit and pipe infrastructure. It is assumed all 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 three existing rainwater tanks, minimum of one in each site catchment, capturing stormwater for re-use onsite (uses to be confirmed).

Existing stormwater networks is proposed to be retained post activity.

4.5 Existing Stormwater Discharge

Analysis of survey and information provided by council indicates that the site contains two kerb inlet pits along Edmondson Avenue. It is assumed that the site discharges to these inlet pits. The first discharge point is positioned near the southeastern boundary of the activity site and, generally captures the area south of the service road entrance, and discharges through an existing 450mm diameter RCP along the southern perimeter. The second discharge point is positioned near the northern boundary of the site at the Edmondson Avenue and Tenth Avenue intersection. This pit generally captures the area north of the service road entrance, and discharges to a council owned 375mm diameter pipe. Refer to Figure 4 and Figure 5 for an illustration of the assumed discharge locations.

Overland flow is collected via a network of grated inlet pits around the site discharging either north or south to the respective site discharge points.

Figure 4: Discharge Location at Southern Boundary along Edmondson Ave (Source: Google Street View, 2020)

Figure 5: Discharge Location at Edmondson Avenue and Tenth Avenue Intersection (Source: Google Street View, 2021)

5. Local Authority Requirements

Design requirements for stormwater management on the site have been set out in The Liverpool City Council DCP 2008. 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 (Liverpool City Council DCP 2016 and EFSG)

5.2 On-Site Detention Requirements

The Liverpool City Council SCP 2008, states that On-Site Detention (OSD) systems provide temporary storage of stormwater runoff from developments and restrict discharge from the site at a rate which council's existing drainage system is capable of accommodating. OSD may only be used where:

- The existing or proposed stormwater pipe system that is unable to cater for the increase in discharge due to development.
- The development will involve an increase in impervious area on the site.
- It is intended to connect stormwater directly to the street kerb and gutter only and the discharge exceeds 20 litres per second for the 10% AEP.

OSD will not be required where:

- The increased discharge for all storms up to and including a 100-year ARI can be accommodated by the existing stormwater pipe system.
- A building addition or internal alteration is within the footprint (plan area) of the existing building.
- The additional impervious surfaces (e.g. roof, driveway, paving) total is less than 30sqm in plan area.
- The sub-division of an existing development does not change the buildings or the impervious areas of the site.
- Sites substantially inundated by flooding.
- The development contributes funds of a major basin strategy that mitigates the impact of the increased impervious area and there are no other local drainage issues requiring OSD.
- Calculations shall account for the total development site area.

The OSD storage is to be designed to the storage/ discharge relationship appropriate to the development type. Computations must be performed for the existing site conditions for a low recurrence interval (20% AEP), a medium recurrence interval (10% or 5% or 2% AEP), and the upper value, which will be the 1% AEP storm. Times of concentration for the site are to be calculated and not assumed. The rate of stormwater runoff (both piped and overland) from the post developed site is not to exceed the rate of runoff from the pre-developed site for the above storm events.

In determining the site PSD the pre-activity stormwater flow at the proposed discharge point shall be based on the actual area contributing area to the discharge point. For example, where existing part site slopes to the rear and part of the site

frontage, and if the proposed discharge is to the site frontage the pre-developed catchment area to determine the flow rate is to be the portion draining to the frontage only.

As much as possible, runoff from impervious site areas is to be drainage into the OSD system. Any bypass areas are to be pervious, unless utilised for vehicular or pedestrian movement, however the impervious areas shall be minimised. The roof gutter and drainage system adjoining bypass areas shall be designed to convey the design stormwater flows (e.g. 1% AEP storm event) into the OSD system with no gutter overflow.

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 gazetted 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 Austral Public School, 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

Flood maps have been attained from Liverpool City Council's overland flood study for the subject site. The flood modelling confirms that the site is subject to flooding in the 1% AEP and PMF storm events, as such, flood related development controls apply to the site. Refer to Figure 6 and Figure 7 below for further information.

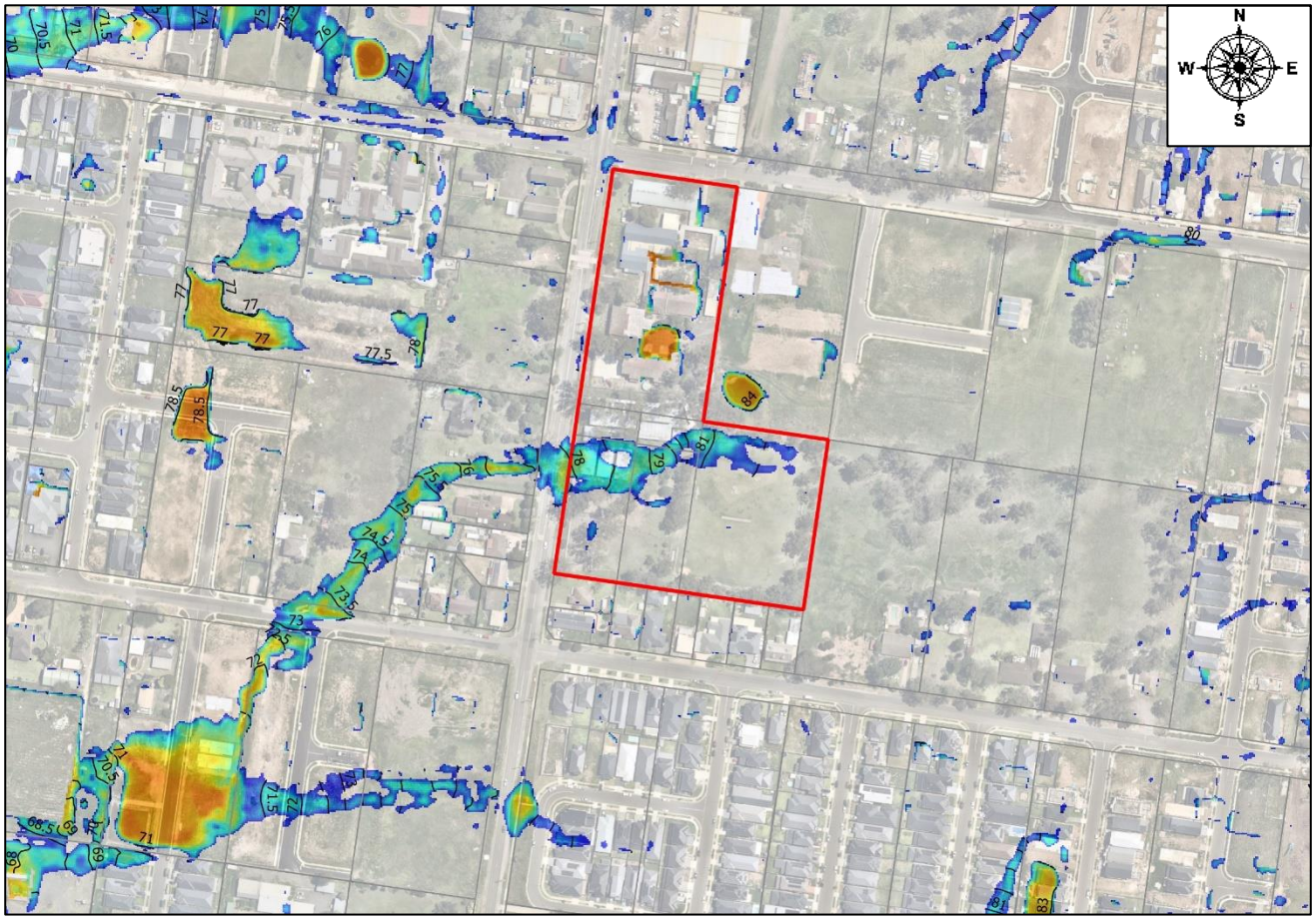


Figure 6: 1% AEP Flood Event Flood Map (Liverpool City Council, 2024)

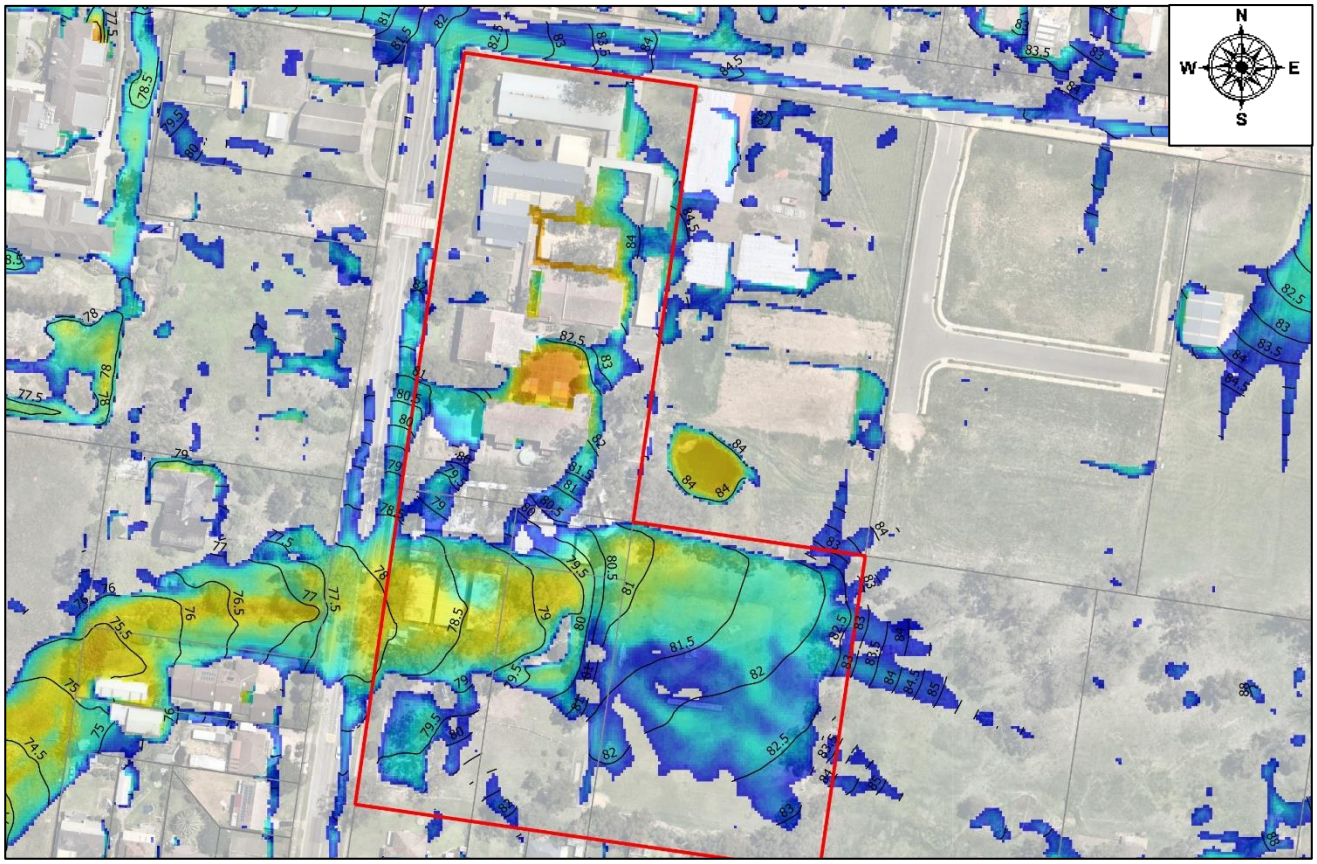


Figure 7: PMF Flood Event Flood Map (Liverpool City Council, 2024)

Stantec have investigated the flooding in and around the activity site. Based on the Flood maps provided by Liverpool City Council, it has been found that the northern portion, and the proposed building of Stage 1 is subject to flooding from overland flows.

The Liverpool Development Control Plan 2008 General Controls for all development, Section 9 Flooding Risk, states that floor levels must be no lower than the PMF level. The proposed building at Austral Public School is set at RL 82.00m, which sits above the PMF level through this area. The proposed FFL therefore satisfies Council's DCP flood planning requirement.

Stantec have assessed the proposed activity site flood maps in the post-activity condition. Refer to the Flood Impact Assessment (FIA) report prepared by Stantec Australia for further information.

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.

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 storm 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 guidelines.

The drainage of new paved driveways, paths and sports courts is collected by surface pits and directed to the on-site detention tank, where it will further 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) 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 an on-site detention tank.

7.3 Legal Point of Discharge

As discussed in Section 4.5, the activity area will have two legal points of discharge in the kerb inlet pit situated along Edmondson Avenue, on the southern boundary of the site and at the intersection between Edmondson Avenue and Tenth Avenue.

8. Stormwater Attenuation

The attenuation of stormwater discharge from the site will be provided in accordance with The Liverpool Development Control Plan 2008 and the On-Site Stormwater Detention Standard 2021. The rate of stormwater runoff (both piped and overland) from the post developed site is not to exceed the rate of runoff from the pre-developed site the low recurrence interval (20% AEP), a medium recurrence interval (10% or 5% or 2% AEP), and the upper value, which will be the 1% AEP storm.

The stormwater drainage system on site must be able to collect and convey all site runoff to the OSD system in a 1% AEP storm 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 storm event.

OSD 1 is proposed to sit underneath the sports court. Approximately 0.8954Ha of catchment area is reticulating to this OSD. The proposed volume for OSD 1 is 532m^3. The orifice diameter of the belowground OSD has been sized at a diameter of 250mm, so as to restrict the site discharge within the minor 20% AEP storm event, up to the major 1% AEP storm event. Refer to Table 2 for the discharge rates, and the pre-activity and post-activity discharge rates.

AEP Rainfall Event	OSD 1 Pre-Activity Discharge (m^3/s)	OSD 1 Post-Activity Discharge (m^3/s)
50%	0.051	0.020
20%	0.108	0.046
10%	0.153	0.060
5%	0.193	0.069
2%	0.258	0.080
1%	0.313	0.088

Table 2: DRAINS Results Summary OSD 1

OSD 2 is proposed to sit underneath the carpark. Approximately 0.2514Ha of catchment area is reticulating to this OSD. The proposed volume for OSD 2 is 150m^3. The orifice diameter of the belowground OSD has been sized at a diameter of 100mm, so as to restrict the site discharge within the minor 20% AEP storm event, up to the major 1% AEP storm event. Refer to Table 3 for the discharge rates, and the pre-activity and post-activity discharge rates.

AEP Rainfall Event	OSD 2 Pre-Activity Discharge (m^3/s)	OSD 2 Post-Activity Discharge (m^3/s)
50%	0.014	0.008
20%	0.030	0.011
10%	0.043	0.012
5%	0.054	0.014
2%	0.072	0.015
1%	0.088	0.017

Table 3: DRAINS Results Summary OSD 2

Refer to Table 4 for the total site discharge rates that meet 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)	Total Post Activity Discharge (m^3/s)
50%	0.093	0.028	0.024	0.052
20%	0.187	0.057	0.041	0.098
10%	0.264	0.072	0.056	0.128
5%	0.334	0.083	0.071	0.154
2%	0.443	0.095	0.092	0.187
1%	0.535	0.105	0.110	0.215

Table 4: Stage 1 DRAINS Results Summary

9. Water Quality Treatment

In the Liverpool City Council require 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 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:

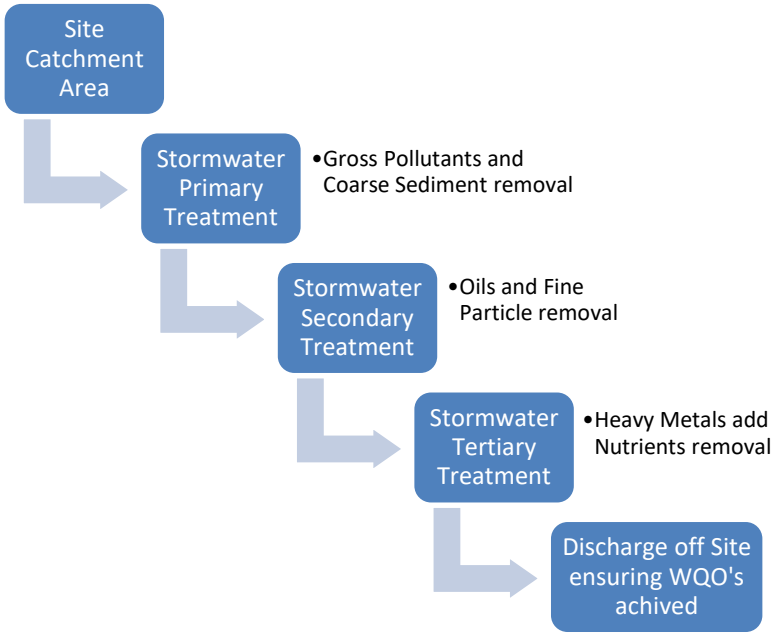


Figure 8: Treatment Train

9.2 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.

9.2.1 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:

- 5 x 690Psorb StormFilter cartridges within 15m^2 StormFilter Chamber in OSD Tank 1
- 4 x 690Psorb StormFilter cartridges within 15m^2 StormFilter Chamber in OSD Tank 2
- 2x OceanGuard Basket within Inlet Pit
- 1x Rainwater Tank
- Grassed Swale

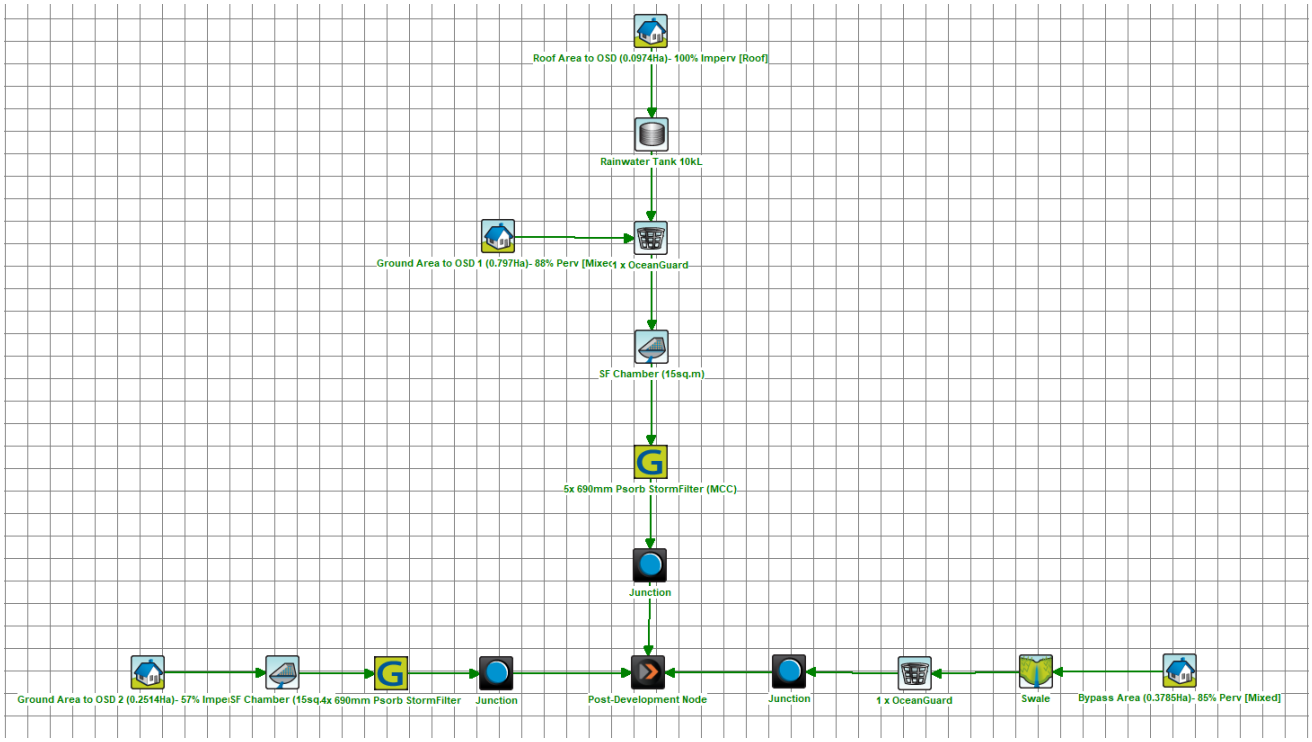


Figure 9: MUSIC Model Treatment Train

	Sources	Residual Load	% Reduction
Flow (ML/yr)	4.89	4.64	5.1
Total Suspended Solids (kg/yr)	691	119	82.8
Total Phosphorus (kg/yr)	1.6	0.482	69.8
Total Nitrogen (kg/yr)	13	6.55	49.5
Gross Pollutants (kg/yr)	106	0	100

Figure 10: 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.

- 5 x 690Psorb StormFilter cartridges within 15m^2 StormFilter Chamber in OSD Tank 1
- 4 x 690Psorb StormFilter cartridges within 15m^2 StormFilter Chamber in OSD Tank 2

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. Two (2) Oceanguard Baskets have been proposed for the site and will be installed into the proposed grated pits.

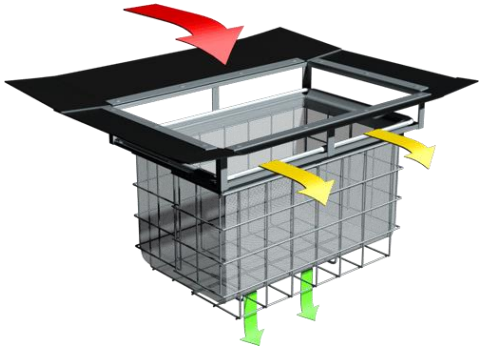


Figure 11: OceanGuard Basket (OceanProtect Website)

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) 10kL Rainwater tank has been proposed for the site and shall be incorporated into the stormwater drainage system and will collect run-off from 0.0964Ha of non-trafficable roof area. Downpipes will take the collected water from the roof area to the specific RWT; this tank will also include first flush devices.

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

Landscape Irrigation Recycle Water Demand Rainwater Tank		
Total	Landscape Area (Ha)	Water Demand (kL/year)
	1.13	4520

Table 5: Recycle Water Reuse Demand Rates

9.2.5 Grassed swale

A grassed swale is a deliberately formed surface depression for the conveyance of stormwater runoff that include a vegetated infiltration trench within the channel invert for the purpose of water quality treatment through the filtration of sediment and biological uptake of nutrients. The swale has been proposed for the activity site and shall be positioned along the western boundary, capturing majority of the bypass catchment.

The proposed grassed swale has been incorporated into the MUSIC model and contributes to the systems pollution reduction.

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%	82.8%
Gross Pollutants	85%	100%
Total Nitrogen (TN)	30%	49.5%
Total Phosphorus (TP)	30%	69.8%

Table 6: 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%	82.8%
Gross Pollutants	90%	95%	100%
Total Nitrogen (TN)	45%	60%	49.5%
Total Phosphorus (TP)	60%	70%	69.8%

Table 7: 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 2 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 Liverpool City 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 Liverpool City Council Development Control Plan DCP 2008. 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 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.

12.3 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

12.4 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.
OSD and Discharge Control			
Blockage of orifice plate	Six Monthly	Maintenance Contractor	Remove grate and screen to inspect orifice. See attached Site Stormwater plan for location of Discharge Control Pit.
Orifice structure size and connection to wall	Five Years	Maintenance Contractor	Compare orifice diameter to approved design (see Works as Executed Drawing) and ensure edge of orifice is not pitted or damaged.
Trash rack blockage	Six Monthly	Maintenance Contractor	Remove grate and screen if required to clean it.
Trash rack condition and connection to wall.	Annually	Maintenance Contractor	Remove grate and rack screen. Check corrosion in particular corners. Check screen fixings to wall for stability and corrosion. Repair as required.
Condition and performance of flap valves	Annually	Maintenance Contractor	Remove grate. Test valve hinge by moving flap to full extent and allowing it to drop back into normal position. Flap should freely swing at hinge.

Blockage of overflow weirs	Six Monthly	Maintenance Contractor	Remove grate and open cover to ventilate underground storage if present. Ensure weir clear of blockages.
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 development application 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 1.03ha with cut of up to 4 metres for new internal hardstand areas. 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 APS will increase the impervious surface on the site and will require suitable stormwater drainage to manage stormwater runoff. Stormwater will be managed via existing kerb and gutter drainage along Edmonson Avenue. The new inground stormwater network will convey runoff via underground pipes and will be treated via OceanProtect Filter Baskets and StormFilter Cartridge Systems. Additionally, a grassed swale has been proposed for the activity site and shall be positioned along the western boundary, capturing majority of the bypass catchment, contributing to the system's pollution reduction. 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 Construction:

The proposed activity of the site involves localised earthworks required to grade the site, which includes filling the proposed building pad area and cutting into the proposed carpark and recreational use area. Overall, the earthworks result

in removal of 800 cubic metres of material from the site, and redistribution of surface flows. This has been assessed by the Flood Impact Assessment to not have the potential to impact localised flood behaviour. The resulting impacts of the proposed activity will be contained within the road reserve and will not have additional impact on the activity site, or the road compared to the existing scenario.

Mitigation measures:

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

Impacts during Operation:

The areas of flooding throughout the activity site are of internally generated runoff and do not present a flood issue in all storm events. The proposed grading of the sports court allows for a clear overland flow path from the east of the site toward the western boundary, and into Edmondson Avenue. Throughout this area there are numerous stormwater pits and pipes which will assist in conveying the ponded stormwater. This flow path has allowed for decreased flood depths around the proposed building, and a clear diversion of stormwater in the major storm events.

In the PMF storm event, the activity results in a maximum flood level increase of 10mm within Lot 866, however, the encroachment of flood impact is still narrow, being less than 2m into the cadastral boundary. The impact is still considered to be minor given that the lot is affected by the PMF in the pre-developed case, and the hazard category in the lot is not increased in the post-activity case. The flood level impact to Edmondson Avenue, road reserve, increases to approximately 90mm but similar to the 1% AEP event the maximum flood hazard category across the road is not increased.

Mitigation measures:

The results of flooding in the 1% AEP and PMF storm events considered reasonable, and no further mitigation is required within this area. Based on the flood mapping prepared by Stantec Australia, it can be confirmed that by setting the flood planning level no lower than the PMF level, the flooding will not adversely impact the proposed activity.

The current floor level is set at FFL 82.00m, which is set above PMF level and meets the planning control specifications. The results in the post-activity condition for the 1% AEP and PMF storm events show that the proposed building shall not be adversely affected by external flooding or stormwater egress. The FFL is considered suitable and hence no further mitigation measures are required.

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	To ensure buildings / the site is adequately drained.

		impacts. A grassed swale is also introduced to capture the majority of catchment that directly bypasses the OSD systems.	
4	Flooding	The proposed grading of the sports court creates a clear overland flow path directing stormwater from the site's east to the western boundary and into Edmondson Avenue, supported by stormwater pits and pipes. This design reduces flood depths around the proposed building and effectively diverts stormwater during major storm events. By setting the FFL at 82.00m, above the PMF level, the proposed activity complies with planning controls and is protected from flooding in 1% AEP and PMF storm events. The FFL is deemed suitable, requiring no additional mitigation measures.	To increase safety of site occupants.

Table 8: 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

Stantec

SINSW

NSW GOVERNMENT Education School Infrastructure

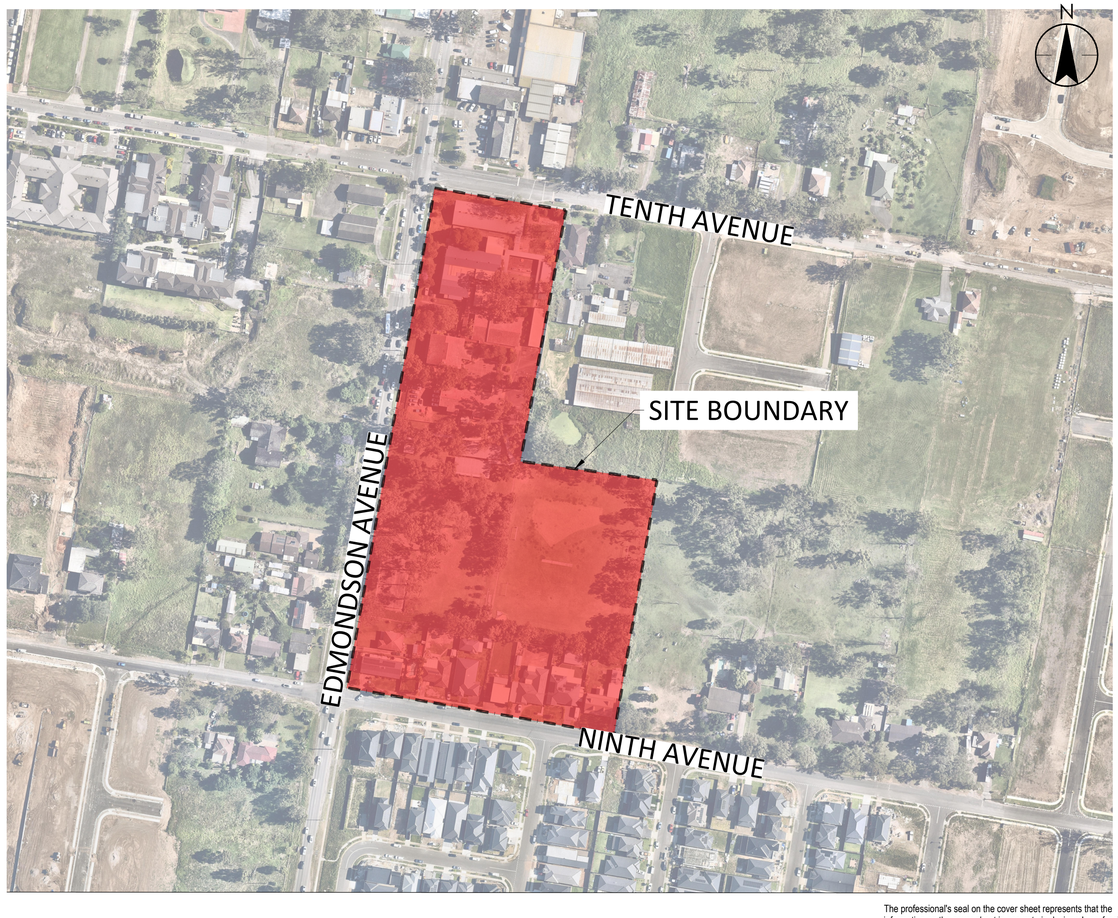
AUSTRAL PUBLIC SCHOOL UPGRADE

EDMONDSON AVENUE, AUSTRAL,
NSW 2179

ISSUED FOR REF
2025.01.17

Stantec Project Number: 304000720

DRAWING LIST	
NO.	DRAWING NAME
CI-1-000-001	COVER SHEET, DRAWING REGISTRY AND LOCALITY PLAN
CI-1-007-001	GENERAL NOTES
CI-1-050-001	EXISTING CONDITIONS PLAN
CI-1-060-001	GENERAL ARRANGEMENT PLAN
CI-1-066-001	SITEWORKS DETAILS
CI-1-070-001	EROSION AND SEDIMENT CONTROL PLAN
CI-1-076-001	EROSION AND SEDIMENT CONTROL DETAILS
CI-1-100-001	BULK EARTHWORKS PLAN
CI-1-440-001	PAVEMENT PLAN
CI-1-446-001	PAVEMENT DETAILS
CI-1-500-001	MUSIC CATCHMENT PLAN
CI-1-500-002	DRAINS CATCHMENT PLAN
CI-1-520-001	STORMWATER DRAINAGE PLAN
CI-1-526-001	STORMWATER DRAINAGE DETAILS SHEET 1 OF 7
CI-1-526-002	STORMWATER DRAINAGE DETAILS SHEET 2 OF 7
CI-1-526-003	STORMWATER DRAINAGE DETAILS SHEET 3 OF 7
CI-1-526-004	STORMWATER DRAINAGE DETAILS SHEET 4 OF 7
CI-1-526-005	STORMWATER DRAINAGE DETAILS SHEET 5 OF 7
CI-1-526-006	STORMWATER DRAINAGE DETAILS SHEET 6 OF 7
CI-1-526-007	STORMWATER DRAINAGE DETAILS SHEET 7 OF 7
CI-1-527-001	STORMWATER PIT SCHEDULE



GENERAL NOTES

1. DESIGN HEREIN HAS BEEN PREPARED BY STANTEC AUSTRALIA PTY LTD LEVEL 9, THE FORUM, 203 PACIFIC HIGHWAY, ST LEONDARDS NSW 2065
2. CONTRACTOR TO CHECK WITH ENGINEER IF THESE NOTES ARE TO SUPPLEMENT A CIVIL SPECIFICATION.
3. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.
4. 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.
5. ALL DIMENSIONS ARE IN MILLIMETRES (mm) & ALL LEVELS ARE IN METRES (m), UNO (UNLESS NOTED OTHERWISE).
6. NO DIMENSION SHALL BE OBTAINED BY SCALING THE DRAWINGS.
7. ALL LEVELS AND SETTING OUT DIMENSIONS SHOWN ON THE DRAWINGS SHALL BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORKS.
6. 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.
7. CAD FILES / DTM FILES TO BE SUPPLIED IN AUTOCAD FORMAT FOR SETOUT PURPOSES (UPON REQUEST).

SURVEY NOTES

1. THE EXISTING SITE CONDITIONS SHOWN ON THE FOLLOWING DRAWINGS HAVE BEEN SHOWN AS PER THE TOPOGRAPHIC SURVEY RECEIVED ON 24/05/2024 PREPARED BY MONTEATH & POWYS, REFERENCE '220216C_08', DATED 24/05/2024.
2. 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.
3. IF AN EXISTING SERVICES PLAN HAS BEEN SUPPLIED THIS DOES NOT TAKE PRECEDENCE OVER ORIGINAL SURVEY PLAN.
4. CONTRACTOR TO REVIEW ORIGINAL SURVEY PLAN AND NOTES. THIS INCLUDES REVIEW OF SUBSURFACE UTILITY CLASS INFORMATION

PROTECTION OF TREES

1. 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

1. 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.
2. 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.
3. 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.
4. 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.
5. EXISTING BUILDINGS, EXTERNAL STRUCTURES AND TREES SHOWN ON THESE DRAWINGS ARE FEATURES EXISTING PRIOR TO ANY DEMOLITION WORKS.
6. 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.
7. ALL AREAS WITHIN THE EXTENT OF WORKS TO BE SCANNED FOR EXISTING UTILITY SERVICES AND LOCATIONS PRIOR TO CONSTRUCTION.
8. 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.
9. 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.
10. THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES SERVICES TO ALL BUILDINGS NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED.
11. 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.
12. PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL GAIN WRITTEN APPROVAL OF THEIR PROGRAMME FOR THE RELOCATION/CONSTRUCTION OF TEMPORARY SERVICES.
13. 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

1. 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.
2. 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.
3. THE CIVIL CONTRACTOR (TRENCH PROVIDER) IS TO ARRANGE ON SITE MEETING WITH ALL SERVICE AUTHORITIES PRIOR TO THE INSTALLATION OF CONDUITS.
4. THE CIVIL CONTRACTOR TO CO-ORDINATE INSTALLATION OF ELECTRICITY, GAS,TELECOMMUNICATION, WATER AND SEWER SERVICES.
5. ELECTRICITY, GAS AND TELECOMMUNICATION SERVICES ARE TO BE LAID FOLLOWING THE INSTALLATION OF STORMWATER, SEWER AND WATER SERVICES AND KERB AND GUTTER.
6. ALL UTILITY AUTHORITY REPRESENTATIVES TO INSPECT ROAD CROSSINGS PRIOR TO SEALING.
7. ALL ELECTRICAL ROAD CROSSINGS TO BE CLASS 6 (ORANGE) uPVC CONDUITS.
8. ALL GAS ROAD CROSSINGS TO BE uPVC GREY SEWER GRADE CONDUITS.
9. 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.
10. ALL SERVICE PIT COVERS AND MARKERS ARE TO BE LAID WHOLLY WITHIN THE CONCRETE FOOTPATH. CONTACT SUPERINTENDANT SHOULD DIFFICULTIES ARISE.
11. 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.
12. 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 IT'S LOCATION TELSTRA WILL SEEK COMPENSATION FOR DAMAGES CAUSED TO IT'S PROPERTY AND LOSSES CAUSED TO TELSTRA AND IT'S CUSTOMERS.

STORMWATER DRAINAGE NOTES

1. 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.
2. THE CONTRACTOR IS TO EXERCISE DUE CARE AND ATTENTIION 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.
3. PIPES 300 DIA. AND LARGER TO BE REINFORCED CONCRETE CLASS '3' APPROVED SPIGOT AND SOCKET WITH RUBBER RING JOINTS. U.N.O.
4. PIPES LESS THAN OR EQUAL TO 225 DIA. SHALL BE uPVC DWV GRADE CLASS SN8 IN ACCORDANCE WITH AS/NZS 1260:2009-PVC-U PIPES AND FITTINGS FOR DRAIN, WASTE AND VENT APPLICATION WITH SOLVENT WELDED JOINTS.
5. EQUIVALENT STRENGTH REINFORCED CONCRETE OR FIBROUS REINFORCED CONCRETE PIPES MAY BE USED SUBJECT TO APPROVAL BY THE SUPERINTENDENT.
6. CONTRACTOR IS TO ENSURE THAT ALL DRAINAGE STRUCTURES ARE ADEQUATELY REINFORCED AND SHALL PROVIDE DESIGN CERTIFICATION FOR ALL REINFORCED CONCRETE LIDS.
7. 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.
8. 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)
9. 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.
10. 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

1. ALL INTERNAL WORKS WITHIN PROPERTY BOUNDARIES ARE TO COMPLY WITH THE REQUIREMENTS OF AS 3500 3.1 (2006) AND AS/NZS 3500 3.2 (2010).
2. PRECAST PITS MAY BE USED EXTERNAL TO THE BUILDING SUBJECT TO APPROVAL BY STANTEC AUSTRALIA.
3. ENLARGERS, CONNECTIONS AND JUNCTIONS TO BE PREFABRICATED FITTINGS WHERE PIPES ARE LESS THAN 300 DIA.
4. 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.
5. CARE IS TO BE TAKEN WITH LEVELS OF STORMWATER LINES. GRADES SHOWN ARE NOT TO BE REDUCED WITHOUT APPROVAL.
6. AT ALL TIMES DURING CONSTRUCTION OF STORMWATER PITS, ADEQUATE SAFETY PROCEDURES SHALL BE TAKEN TO ENSURE AGAINST THE POSSIBILITY OF PERSONNEL FALLING DOWN PITS.
7. 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.
8. 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.
9. ANY DAMAGE TO THE WORKS DUE TO STORMWATER FLOWS OR FLOODING DURING THE CONSTRUCTION PERIOD IS AT THE CONTRACTOR'S RISK.
10. SETOUT POINTS FOR STORMWATER STRUCTURES ARE AS INDICATED IN THE DRAWINGS UNLESS OTHERWISE NOTED.
11. ALL PAVED SURFACE LEVELS AND GRADES TO BE COORDINATED WITH GULLY PIT LEVELS TO ENSURE NO UNDRAINED AREAS OCCUR.
12. THE SIDES OF ALL PIPE TRENCH EXCAVATIONS DEEPER THAN 1.0m SHALL BE FULLY SUPPORTED AT ALL TIMES AND HAVE APPROPRIATE EDGE PROTECTION.
13. 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.
14. 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.
15. SUBSOIL DRAINAGE PIPES TO BE SLOTTED PIPE AND FILTER 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.
16. 100mm DIA. SUBSOIL DRAINAGE SHALL BE PROVIDED IN THE FOLLOWING LOCATIONS AND CONNECTED TO THE SITE STORMWATER DRAINAGE SYSTEM, UNO.:-
    - 16.1. UNDER KERBS AND ADJACENT TO ALL PAVEMENTS
    - 16.2. AT THE BASE OF THE HIGH SIDE OF ALL RETAINING WALLS
    - 16.3. AROUND THE BUILDING SLAB FOOTPRINT
    - 16.4. AROUND ALL STORMWATER PITS
28. STORMWATER STRUCTURES ARE TO BE CONSTRUCTED PERPENDICULAR TO THE INCOMING PIPEWORK UNLESS OTHERWISE NOTED.
29. 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.
25. PRE-CAST PITS MUST HAVE LIFTING ANCHORS.
26. WORKING LOADS ARE THOSE DUE TO FILL MATERIAL AND STANDARD HIGHWAY VEHICLES AS PER AS3725. CONSTRUCTION LOADS HAVE NOT BEEN ALLOWED FOR.
27. ALL EXPOSED EDGES ON STORMWATER PITS TO BE ROUNDED TO 5mm RAD. UNO.
28. 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.
29. 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.
30. PITS DEEPER THAN 1200mm SHALL HAVE ACCESS LADDERS OR STEP IRONS INSTALLED AND SHALL BE IN ACCORDANCE WITH THE LOCAL OR STATUTORY REQUIREMENTS.
31. WHERE A PIT IS IDENTIFIED AS A CONFINED SPACE, PIT COVERS SHALL BE PROVIDED WITH STANDARD CONFINED SPACE SIGNAGE.
32. 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.
33. THE CONTRACTOR SHALL OBTAIN A ROAD OPENING PERMIT FOR ANY WORKS WITHIN THE PUBLIC ROAD RESERVE AND COMPLY WITH ALL AUTHORITY REQUIREMENTS.
34. 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.
35. MINIMUM GRADES FOR GRAVITY STORMWATER DRAINAGE SHALL CONFORM TO AS 3500 PART 3 AS FOLLOWS, UNO:-
    - 35.1. 1% FOR 100mm AND 150mm DIA. PIPES
    - 35.2. 0.5% FOR 225mm DIA. PIPES
    - 35.3. 0.4% FOR 300mm DIA. PIPES
    - 35.4. 0.33% FOR 375mm DIA. PIPES
36. MINIMUM DEPTH OF COVER SHALL BE AS FOLLOWS, UNO:-
    - 36.1. 300mm IN PRIVATE PROPERTY (NON-VEHICULAR TRAFFIC)
    - 36.2. 450mm IN PUBLIC AREAS
    - 36.3. 600mm IN VEHICULAR TRAFFICABLE AREAS (FOOTWAY/ROADWAYS)

STORMWATER DRAINAGE NOTES

37. BED ALL PIPES FIRMLY AND EVENLY ONTO IMPORTED BEDDING FILL MATERIAL.
38. LAY AND JOINT ALL PIPES IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION AND
    - AS 3725 BURIED FLEXIBLE PIPELINES
    - AS 2566 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)
39. ALLOW TO TEST ALL PIPES AND PITS TO MANUFACTURERS REQUIREMENTS.

EROSION AND SEDIMENT CONTROL NOTES

GENERAL INSTRUCTIONS

1. THE SITE SUPERINTENDENT/ENGINEER WILL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE LOCATED AS DOCUMENTED.
2. ALL WORK SHALL BE GENERALLY CARRIED OUT IN ACCORDANCE WITH
    - 2.1. LOCAL AUTHORITY REQUIREMENTS
    - 2.2. EPA REQUIREMENTS
    - 2.3. NSW DEPARTMENT OF HOUSING MANUAL "MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION", 4th EDITION, MARCH 2004.
3. MAINTAIN THE EROSION CONTROL DEVICES TO THE SATISFACTION OF THE SUPERINTENDENT AND THE LOCAL AUTHORITY.
4. WHEN STORMWATER PITS ARE CONSTRUCTED, PREVENT SITE RUNOFF ENTERING UNLESS SEDIMENT FENCES ARE ERECTED AROUND PITS.
5. 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

6. 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:
    - 6.1. INSTALL A SEDIMENT FENCE ALONG THE BOUNDARIES AS SHOWN ON PLAN. REFER DETAIL.
    - 6.2. CONSTRUCT STABILISED CONSTRUCTION ENTRANCE TO LOCATION AS DETERMINED BY SUPERINTENDENT/ENGINEER. REFER DETAIL.
    - 6.3. INSTALL SEDIMENT BASIN AS SHOWN ON PLAN
    - 6.4. INSTALL SEDIMENT TRAPS AS SHOWN ON PLAN.
7. 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

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

SEDIMENT CONTROL

10. 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.
11. 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.
12. 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.
13. TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES WILL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE REHABILITATED.

OTHER MATTERS

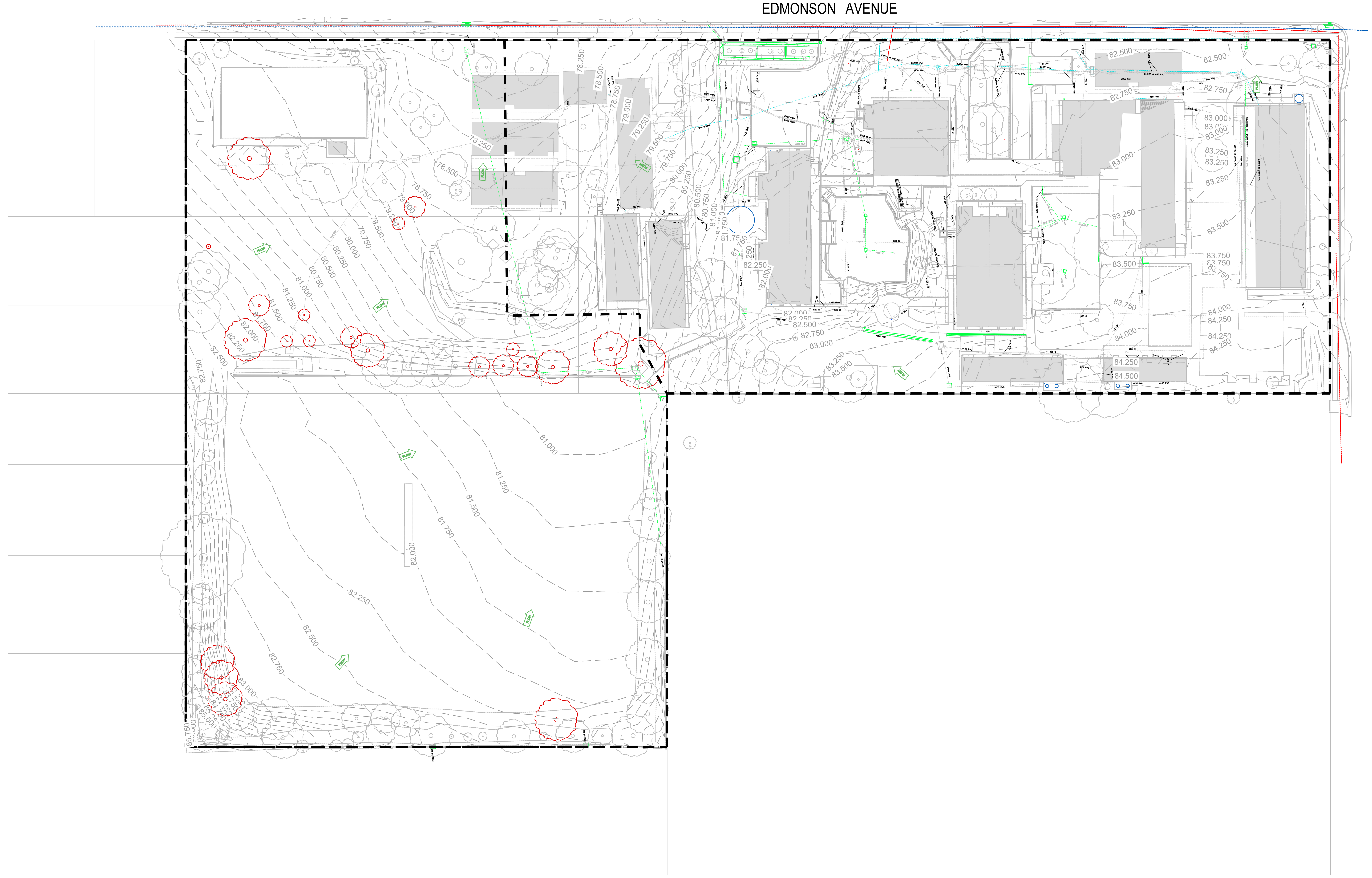
13. ACCEPTABLE RECEPTORS WILL BE PROVIDED FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER.
14. ANY EXISTING TREES WHICH FORM PART OF THE FINAL LANDSCAPING PLAN WILL BE PROTECTED FROM CONSTRUCTION ACTIVITIES BY:
    - 14.1. PROTECTING THEM WITH BARRIER FENCING OR SIMILAR MATERIALS INSTALLED OUTSIDE THE DRIP LINE
    - 14.2. ENSURING THAT NOTHING IS NAILED TO THEM
    - 14.3. PROHIBITING PAVING, GRADING, SEDIMENT WASH OR PLACING OF STOCKPILES WITHIN THE DRIP LINE EXCEPT UNDER THE FOLLOWING CONDITIONS.
    - 14.4. 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
    - 14.5. 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
    - 14.6. CARE IS TAKEN NOT TO CUT ROOTS UNNECESSARILY NOR TO COMPACT THE SOIL AROUND THEM.

ASPHALTIC CONCRETE NOTES

1. GENERAL
    - 1.1. MINERAL AGGREGATED SHALL COMPLY WITH AUSTRALIAN STANDARDS
    - 1.2. MINERAL FILLER SHALL COMPPLY WITH AS 2357 MINERAL FILLERS OR ASPHALT
    - 1.3. BITUMEN BINDER SHALL COMPLY WITH AS 2008.
2. MIX PROPORTIONS
    - 2.1. JOB MIX - 10mm NOMINAL SIZE AGGREGATE. MINIMUM BITUMEN CONTENT BY MASS OF TOTAL MASS - 5.1%
    - 2.2. MIX STABILITY SHALL BE BETWEEN 16kN AND 36kN AS DETERMINED BY AS 2891
    - 2.3. AIR VOIDS IN COMPACTED MIX SHALL BE BETWEEN 4% AND 7% OF THE TOTAL VOLUME OF THE MIX
    - 2.4. VOIDS FILLED IN BINDER - BETWEEN 65% AND 80% OF AIR VOIDS IN THE TOTAL MINERAL AGGREGATE FILLED BY BINDER IN ACCORDANCE WITH AUSTRALIAN STANDARDS
3. PAVEMENT PREPARATION
    - 3.1. 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
    - 3.2. 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
4. TACK COATING
    - 4.1. 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/m^2. APPLICATION SHALL BE BY MEANS OF A MECHANICAL SPRAYER WITH A SPRAY BAR.
5. SPREADING
    - 5.1. ALL ASPHALTIC CONCRETE SHALL BE SPREAD WITH A SELF-PROPELLING PAVING MACHINE
    - 5.2. 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

    - 5.3 ASPHALTIC CONCRETE SHALL NOT BE LAID WHEN THE ROAD SURFACE IS WET OR WHEN COLD WINDS CHILL THE MIX, ADVERSELY AFFECTING SPREADING AND COMPACTION
    - 5.4 THE MINIMUM COMPACTED THICKNESS IS 30mm OVER EXISTING SEALED PAVEMENTS AND 50mm OVER NEW PAVEMENTS
6. JOINTS
    - 6.1. THE NUMBER OF JOINTS BOTH LONGITUDINAL AND TRANSVERSE SHALL BE KEPT TO A MINIMUM
    - 6.2. THE DENSITY AND SURFACE FINISH AT JOINTS SHALL BE SIMILAR TO THOSE OF THE REST OF THE LAYER
7. COMPACTION
    - 7.1. ALL COMPACTION SHALL BE UNDERTAKEN USING SELF-PROPELLED ROLLERS
    - 7.2. INITIAL ROLLING SHALL BE COMPLETE BEFORE THE MIX TEMPERATURE FALLS BELOW 105°C
    - 7.3. SECONDARY ROLLING SHALL BE COMPLETED BEFORE THE MIX TEMPERATURE FALLS BELOW 60°C
    - 7.4. MINIMUM CHARACTERISTICS VALUE OF RELATIVE COMPACTION OF A LOT WHEN TESTED IN ACCORDANCE WITH AS 2150
8. FINISHED PAVEMENT PROPERTIES
    - 8.1. 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.
9. OTHER
    - 9.1. ASPHALTIC CONCRETE SHALL CONFORM TO RMS. SPECIFICATION R116.
    - 9.2. 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 50m^3 BASECOURSE MATERIAL PLACED.
    - 9.3. 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 50m^3 OF SUB-BASE COURSE MATERIAL PLACED.
    - 9.4. AS AN ALTERNATIVE TO THE USE OF IGNEOUS ROCK AS A SUB-BASE MATERIAL IN (9.2) A CERTIFIED



LEGEND

— · · — · · —	PROPOSED SITE BOUNDARY
— · — · —	EXTENT OF WORKS
▨	EXISTING BUILDING
— — 82.500 — —	EXISTING CONTOURS
— E — — E —	EXISTING ELECTRICAL
— C —	EXISTING TELECOM
— W —	EXISTING WATER
— D —	EXISTING STORMWATER PIPE
☐	EXISTING STORMWATER PIT
▬	EXISTING KERB INLET PIT
FLOW	OVERLAND FLOW PATH
○	EXISTING TREES TO BE DEMOLISHED

NOTES

1. EXISTING SERVICES SHOWN ON THE PLANS ARE LOCATED APPROXIMATELY BASED ON INFORMATION SUPPLIED BY THE RELEVANT AUTHORITIES, AND SURVEY RECEIVED ON 24/05/2024 PREPARED BY MONTEATH & POWYS PTY LTD, REFERENCE '220216C_08', DATED 24/05/2024. STANTEC DOES NOT TAKE RESPONSIBILITY FOR THE SUITABILITY OR LOCATION/DEPTH OF THE EXISTING SERVICES.
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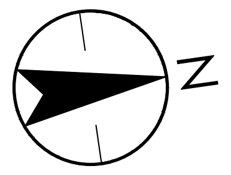
3. ALL AREAS WITHIN THE EXTENT OF WORKS TO BE SCANNED FOR EXISTING UTILITY SERVICES AND LOCATIONS PRIOR TO CONSTRUCTION.



1:500 5 0 5 10 15 20 25 A1
1:1000 A3

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Key Plan: (NTS)

I	ISSUED FOR REF	HAL	AT	2025.01.17
H	ISSUED FOR DA	LPT	VE	2024.06.06
G	ISSUED FOR DA	LPT	VE	2024.05.21
F	ISSUED FOR DA	LPT	JMB	2024.03.18
E	ISSUED FOR DA	LPT	JMB	2024.03.08
D	ISSUED FOR DA	LPT	JMB	2024.02.23
C	95% SCHEMATIC DESIGN	LPT	JMB	2024.02.02
B	50% SCHEMATIC DESIGN	LPT	MDR	2023.12.15
A	CONCEPT DESIGN	LPT	MDR	2023.03.31
Issued/Revision		By	Appd	YYYY.MM.DD

Issue Status

PRELIMINARY

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Notes

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NSW GOVERNMENT Education School Infrastructure

Client/Project
SINSW

AUSTRAL PUBLIC SCHOOL UPGRADE

205 EDMONDSON AVENUE, AUSTRAL, NSW 2179

File Name: 304000720-CI-1-050-001.DWG	-	-	-	2023.03.31
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
EXISTING CONDITIONS PLAN

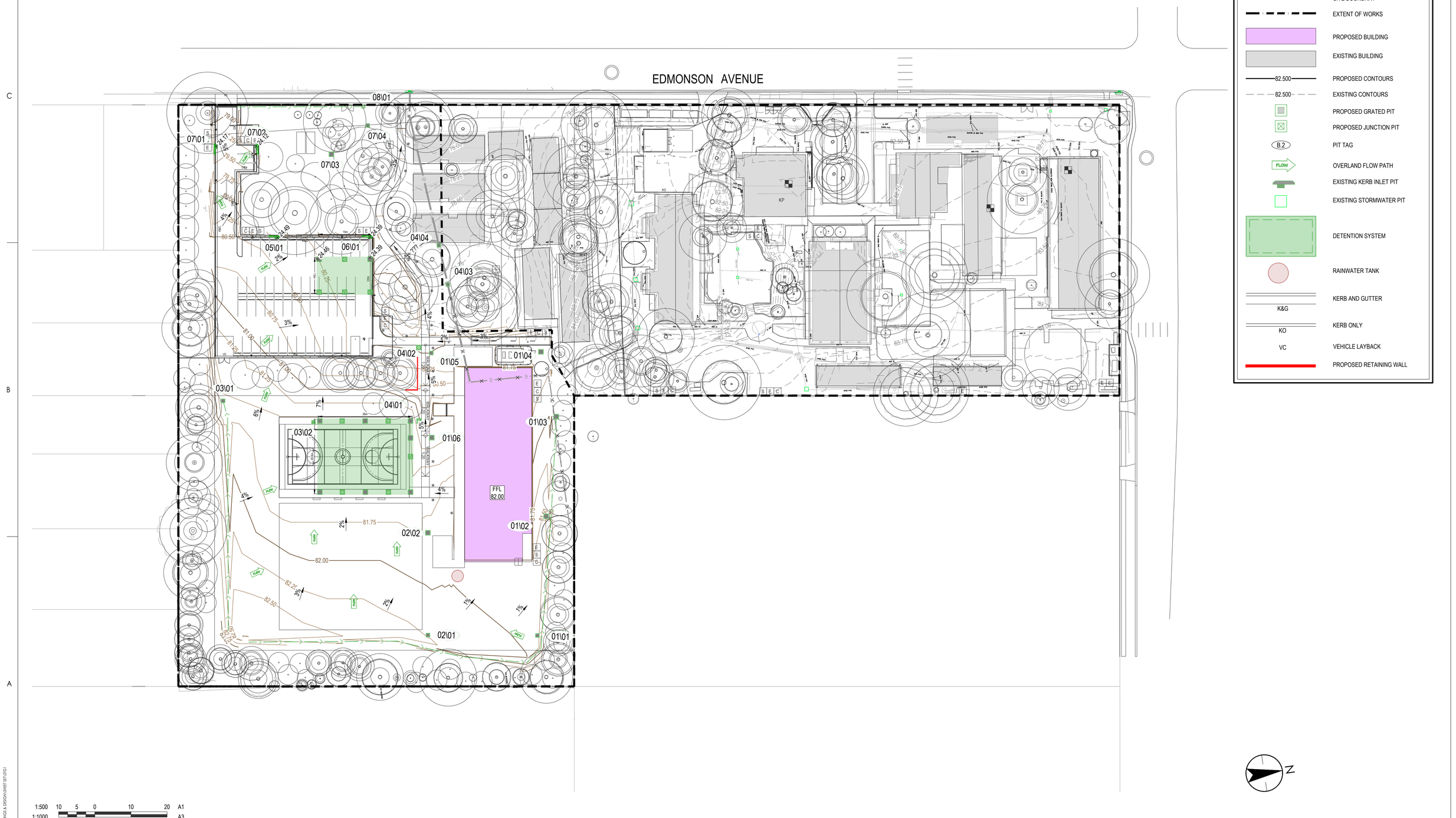
Project No.
304000720

Scale
1:500

Revision
I

Drawing No.
CI-1-050-001

ORIGINAL SHEET - ISO A1 COORD - MGA/YY-Zone DATUM - mAHD



LEGEND

- SITE BOUNDARY
- EXTENT OF WORKS
- PROPOSED BUILDING
- EXISTING BUILDING
- 82.500 — PROPOSED CONTOURS
- 82.500 — EXISTING CONTOURS
- PROPOSED GRATED PIT
- PROPOSED JUNCTION PIT
- B.2 — PIT TAG
- FLOW — OVERLAND FLOW PATH
- EXISTING KERB INLET PIT
- EXISTING STORMWATER PIT
- DETENTION SYSTEM
- RAINWATER TANK
- K&G — KERB AND GUTTER
- KO — KERB ONLY
- VC — VEHICLE LAYBACK
- PROPOSED RETAINING WALL

N

Key Plan: (NTS)

I	ISSUED FOR REF	HAL	AT	2025.01.17
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AUSTRAL PUBLIC SCHOOL UPGRADE

205 EDMONDSON AVENUE, AUSTRAL, NSW 2179

File Name: 304000720-CI-I-060-001.DWG	-	-	-	2023.03.31
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title

GENERAL ARRANGEMENT PLAN

Project No. 304000720

Scale 1:500

Revision I

Drawing No. **CI-1-060-001**

Plotted: 3/02/2025 3:02:36 PM By: LAL HASHIM
\\AU201.01.AD\...\PROJECTS\304000720\PROJECT DOCUMENTATION\CIVIL\DRAWINGS & DESIGN\SHEET SETS\TG1
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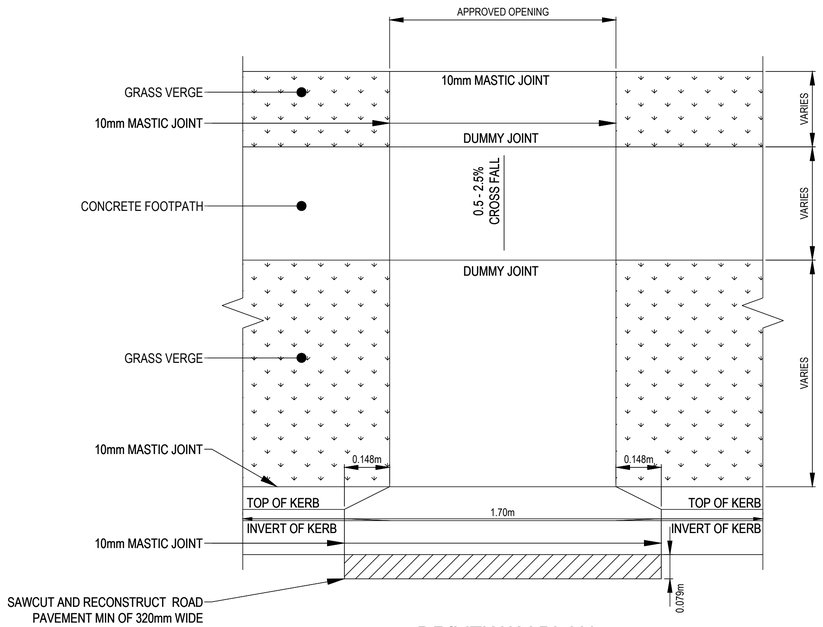
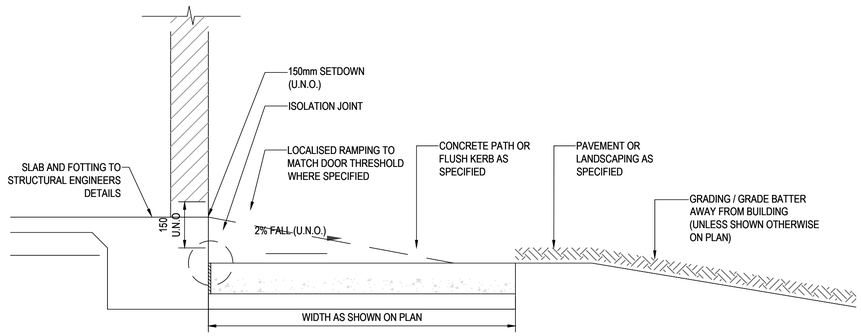
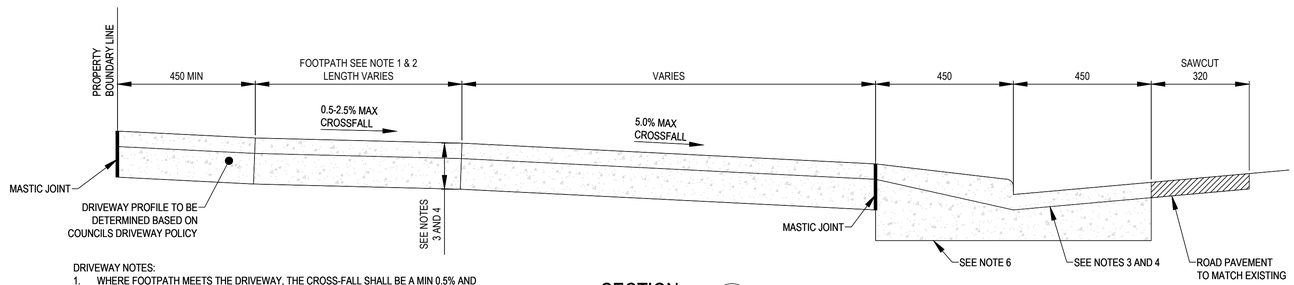


DRIVEWAY PLAN
N.T.S

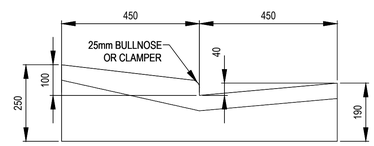


TYPICAL BUILDING PERIMETER/ SET DOWN
N.T.S



SECTION 1
SCALE 1:10

DRIVEWAY NOTES:
1. WHERE FOOTPATH MEETS THE DRIVEWAY, THE CROSS-FALL SHALL BE A MIN 0.5% AND MAX 2.5%, GRADED TOWARDS THE ROAD.
2. WHERE THE FOOTPATH MEETS THE DRIVEWAY, DUMMY JOINTS ARE TO BE PROVIDED. SAW CUT JOINTS WILL NOT BE ACCEPTABLE.
3. REDISDENTIAL DRIVEWAY - 110mm THICKNESS, 25MPa (MINIMUM) COMPRESSIVE STRENGTH AT 28 DAYS WITH SL62 MESH PLACED CENTRALLY AS PER SPECIFICATION.
4. INDUSTRIAL DRIVEWAY - 150mm THICKNESS, 25MPa (MINIMUM) COMPRESSIVE STRENGTH AT 28 DAYS WITH SL82 MESH PLACED CENTRALLY AS PER SPECIFICATION.
5. MATERIAL - DRIVEWAYS SHALL BE ALL CONSTRUCTED IN PLAIN CONCRETE. NO STENCILED, STAMPED, PATTERNED, COLOURED CONCRETE OR ANY OTHER TYPE OF COSMETIC FINISH IS PERMITTED.
6. EXISTING SUBBASE TO BE PROOF ROLLED WITH A SUITABLE ROLLER. AREAS WHICH SHOW VISIBLE HEAVE UNDER COMPACTION SHOULD BE OVER EXCAVATED FURTHER 300mm AND REPLACED WITH COMPACTED AND APPROVED FILL. BEDDING MATERIAL SHALL BE DGB20 (DENSELY GRADED BASE) 100mm LAYER COMPACTED TO 98%.
7. A MINIMUM 320mm WIDTH OF ASPHALT IN FRONT OF GUTTER IS TO BE REMOVED AND REPLACED WITH HOT MIX. APPLICANT CAN OBTAIN QUOTATION FROM COUNCIL.
8. ALL EXPOSED EDGES TO BE ROUNDED TO 10mm AND SURFACES BE BROOM FINISHED.
9. LAYBACK, GUTTER AND KERB SHALL BE STEEL TROWLED FINISHED.
10. IT IS THE RESPONSIBILITY OF THE OWNER TO ENGAGE THE SERVICES OF A QULAIFIED PROFESSIONAL TO DESIGN ALL DRIVEWAYS (INTERNAL AND EXTERNAL) IN ACCORDANCE WITH AS/NZS 2890.1 2004 OFF STREET CAR PARK STANDARDS.



LAYBACK DETAIL
SCALE 1:10

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

Key Plan: (NTS)

I	ISSUED FOR REF	HAL	AT	2025.01.17
H	ISSUED FOR DA	LPT	VE	2024.06.06
G	ISSUED FOR DA	LPT	VE	2024.05.21
F	ISSUED FOR DA	LPT	JMB	2024.03.18
E	ISSUED FOR DA	LPT	JMB	2024.03.08
D	ISSUED FOR DA	LPT	JMB	2024.02.23
C	95% SCHEMATIC DESIGN	LPT	JMB	2024.02.02
B	50% SCHEMATIC DESIGN	LPT	MDR	2023.12.15
A	CONCEPT DESIGN	LPT	MDR	2023.03.31
Issued/Revision		By	Appd	YYYY.MM.DD

Issue Status

PRELIMINARY

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Notes

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NSW GOVERNMENT Education School Infrastructure

Client/Project
SINSW

AUSTRAL PUBLIC SCHOOL UPGRADE

205 EDMONDSON AVENUE, AUSTRAL, NSW 2179

File Name: 304000720-CI-1-066-001.DWG	-	-	-	2023.03.31
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
SITEWORKS DETAILS

Project No.
304000720

Scale
AS SHOWN

Revision
I

Drawing No.
CI-1-066-001

Plotted: 3/02/2025 3:02:52 PM By: LAL, HASHA
\\AU201.01\DATA01_CIFS\SHARED_PROJECTS\304000720\PROJECT DOCUMENTATION\CIVIL\DRAWINGS & DESIGN\SHEET SETS\TG\
ORIGINAL SHEET - ISO A1 COORD - MGA/YY-Zone DATUM - mAHD

TEMPORARY SEDIMENT BASIN LOCATION OVERLAND FLOW FROM ALL AREAS TO BE DIRECTED TO THE TEMPORARY SEDIMENT BASIN. SETTLEMENT AND TREATMENT PRIOR TO DISCHARGE FROM SITE TO BE UNDERTAKEN IN ACCORDANCE WITH:
- COUNCIL EROSION AND SEDIMENT CONTROL POLICY
- GEOTECHNICAL AND ENVIRONMENTAL ASSESSMENT

TEMPORARY SEDIMENT BASIN DETAILS:
- TOTAL VOLUME= 265 cu.m
- SETTLING ZONE VOLUME= 177 cu.m
- SEDIMENT STORAGE VOLUME= 88 cu.m

BASIN SIZING CAN BE REDUCED OR REMOVED FOLLOWING STABILISING DISTURBED SOILS WITH STRUCTURE AND INSTALLATION OF PROPOSED STORMWATER NETWORK. EMERGENCY PUMP TO NEARBY STORMWATER NETWORK

EDMONSON AVENUE

SITE GATE

SHAKER GRID DEVICE TO BE LOCATED AT SITE ENTRY

DEMOLISH PAVEMENT TO INSTALL STABILISED CONSTRUCTION ACCESS

SEDIMENT FENCE TO BE LOCATED AROUND SITE WHERE NECESSARY

PROVIDE SANDBAG PROTECTION AROUND ALL EXISTING/ PROPOSED STORMWATER INLET STRUCTURES FOR PROTECTION AGAINST SEDIMENT AND DEBRIS

TOPSOIL STOCKPILE WITH SEDIMENT FENCING TO BE CONFIRMED

SITE FENCE TO BE LOCATED AROUND SITE WHERE NECESSARY

LEGEND

- SITE BOUNDARY
- EXTENT OF WORKS
- VEHICLE SHAKEDOWN DEVICE
- PROPOSED SILT FENCE
- PROPOSED SITE FENCE
- SITE GATE
- SANDBAG PIT PROTECTION
- SEDIMENT TRAP FOR KERB INLET PITS
- PROPOSED GRATED DRAIN
- PROPOSED GRATED PIT
- PROPOSED JUNCTION PIT
- EXISTING STORMWATER PIT
- EXISTING KERB INLET PIT
- PROPOSED CATCH DRAIN
- PROPOSED SEDIMENT BASIN
- PROPOSED STOCKPILE

NOTES

1. MINIMISE THE AREA OF SITE BEING DISTURBED AT ANY ONE TIME.
2. WORKS IN PROXIMITY OF EXISTING TREES TO BE CARRIED OUT IN ACCORDANCE WITH ARBORIST CONSULTANT ADVICE. PROVIDE TREE PROTECTION WHERE REQUIRED.
3. SEDIMENT AND EROSION CONTROL PLAN IS INDICATIVE ONLY.

N

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

Key Plan: (NTS)

I	ISSUED FOR REF	HAL	AT	2025.01.17
H	ISSUED FOR DA	LPT	VE	2024.06.06
G	ISSUED FOR DA	LPT	VE	2024.05.21
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AUSTRAL PUBLIC SCHOOL UPGRADE

205 EDMONDSON AVENUE, AUSTRAL, NSW 2179

File Name: 304000720-CI-1-070-001.DWG | Dwn. - | Dsgn. - | Chkd. - | 2023.03.31 YYYY.MM.DD

Title
EROSION AND SEDIMENT CONTROL PLAN

Project No. 304000720
Scale 1:500
Revision I
Drawing No. **CI-1-070-001**

Plotted: 3/02/2023 3:03:10 PM By: LAL, HASHIL
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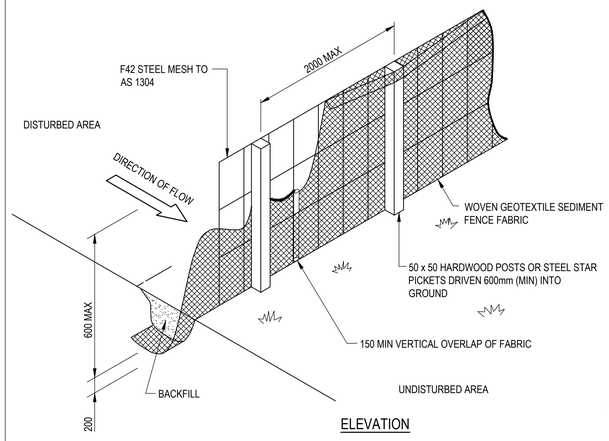
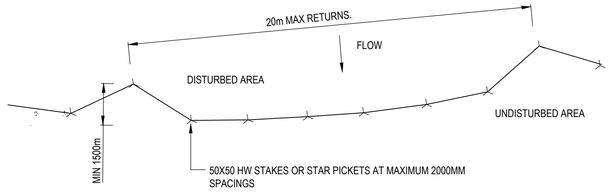
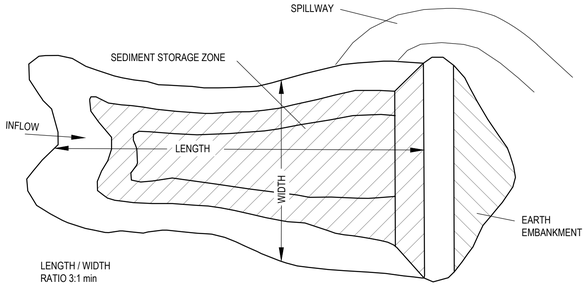
ORIGINAL SHEET - ISO A1 COORD - MGA/YY-Zone DATUM - mAHD



ELEVATION

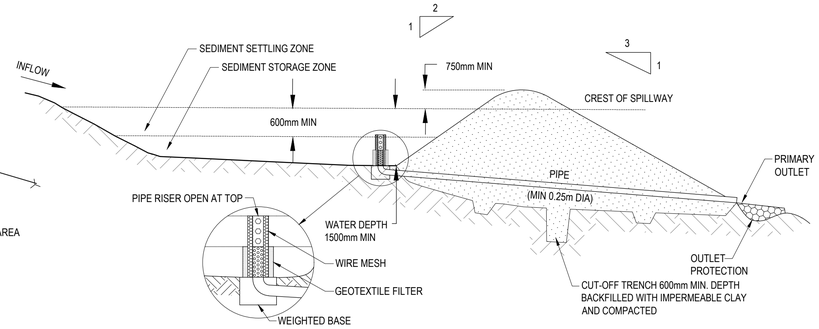


PLAN



PLAN VIEW

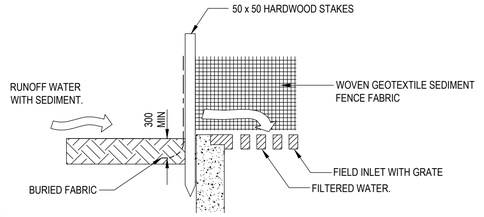
NOTES:
1. REMOVE ALL VEGETATION AND TOPSOIL FROM UNDER THE DAM WALL AND FROM WITHIN THE STORAGE AREA
2. CONSTRUCT A CUT-OFF TRENCH 500mm DEEP AD 1200mm WIDE ALONG THE CENTRELINE OF THE EMBANKMENT EXTENDING TO A POINT ON THE GULLY WALL LEVEL WITH THE RISER CREST.
3. MAINTAIN THE TRENCH FREE OF WATER AND RECOMPACT THE MATERIALS WITH EQUIPMENT AS SPECIFIED IN THE SWMP TO 95% STANDARD PROCTOR DENSITY
4. SELECT FILL FOLLOWING THE SWMP THAT IS FREE OF ROOTS, WOOD, ROCK, LARGE STONE OR FOREIGN MATERIAL.
5. PREPARE THE SITE UNDER THE EMBANKMENT BY RIPPING TO AT LEAST 100mm TO HELP BONG COMPACTED FILL TO THE EXISTING SUBSTRATE
6. SPREAD THE FILL IN 100mm TO 150mm LAYERS AND COMPACT IT AT OPTIMUM MOISTURE CONTENT FOLLOWING THE SWMP
7. CONSTRUCT THE EMERGENCY SPILLWAY
8. REHABILITATE THE STRUCTURE FOLLOWING THE SWMP



CROSS-SECTION

SEDIMENT BASIN DETAIL

SCALE N.T.S



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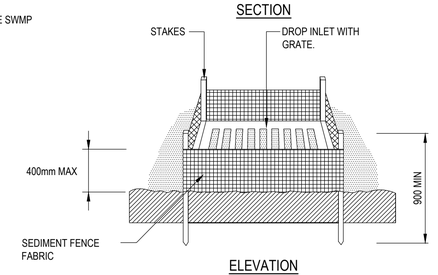


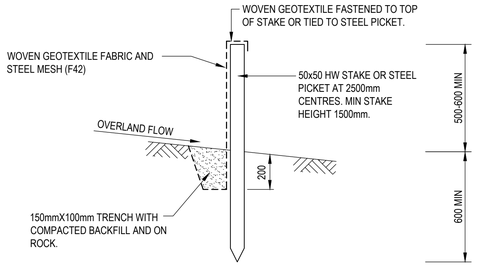
ELEVATION

GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP

SCALE N.T.S.

NOTES

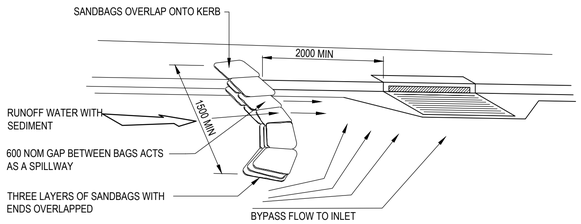
1. THIS PLAN IS TO BE READ IN CONJUNCTION WITH OTHER ENGINEERING PLANS AND ANY WRITTEN INSTRUCTIONS THAT MAY BE ISSUED.
2. THE CONTRACTOR SHALL IMPLEMENT ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO DISTURBANCE OF THE RELATED CATCHMENT AREA AND TO THE STANDARD OF 'MANAGING URBAN STORMWATER, SOIL & CONSTRUCTION' & COUNCIL SPECIFICATIONS.
3. ALL SUBCONTRACTORS SHALL BE INFORMED OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWN SLOPE AREAS.
4. LAND DISTURBANCE SHALL BE LIMITED TO THAT NECESSARY FOR IMPLEMENTATION OF THE PLANS OF WORKS. BUFFER ZONES AND LAND NOT TO BE DISTURBED SHALL BE CLEARLY MARKED WITH BARRIER FENCE. 'SILT' FENCE FOR STRAW BALE SEDIMENT TRAPS SHALL BE PLACED AT REGULAR INTERVALS IMMEDIATELY DOWNSLOPE OF ALL UNPROTECTED DISTURBED LANDS.
5. THE LOCATION OF 'SILT' FENCES, BARRIER FENCES, SEDIMENT TRAPS AND OTHER DEVICES ARE INDICATIVE ONLY AND FINAL LOCATIONS ARE TO BE DECIDED ON SITE. VARIATIONS WILL BE PERMITTED TO BEST SUIT THE CIRCUMSTANCES. CONTRACTOR TO PREPARE DETAILED CONSTRUCTION SEDIMENT AND EROSION CONTROL PLAN.
6. ALL SOIL EROSION AND SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED FOLLOWING EACH STORM EVENT AND ANY NECESSARY MAINTENANCE WORK SHALL BE UNDERTAKEN TO ENSURE THEIR CONTINUED PROPER OPERATION. SEDIMENT SHALL BE REMOVED FROM THE SOIL EROSION & SEDIMENT CONTROL STRUCTURES WHEN
7. NO MORE THAN 40% CAPACITY HAS BEEN REACHED. THESE STRUCTURES SHALL CONTINUE IN PROPER OPERATION UNTIL ALL DEVELOPMENT ACTIVITIES HAS BEEN COMPLETED AND THE SITE FULLY ESTABLISHED.
8. WHERE THE AREA TO BE DISTURB CONTAINS TREES TO REMAIN, AN ARBORIST CONSULTANT SHOULD PROVIDE ADVICE ON PROCEDURES AND MEASURES TO BE PLACED.
9. TEMPORARY REHABILITATION SHALL BE UNDERTAKEN WITHIN 14 WORKING DAYS BEFORE EITHER WORKS CONTINUE OR PERMANENT REHABILITATION IS UNDERTAKEN.
10. ALL OF THE SOIL STORAGE, REVEGETATION AND SEDIMENT AND EROSION CONTROL MANAGEMENT DEVICES/MEASURES SHALL BE IMPLEMENTED TO NSW ENVIRONMENT PROTECTION AUTHORITY (EPA) AND DEPARTMENT OF LAND AND WATER REQUIREMENTS.
11. ALL SEDIMENT AND EROSION CONTROL MANAGEMENT MEASURES/DEVICES SHOWN ON THE PLANS SHALL BE IMPLEMENTED PRIOR TO CONSTRUCTION, AND MAINTAINED DURING AND AFTER.



SECTION DETAIL

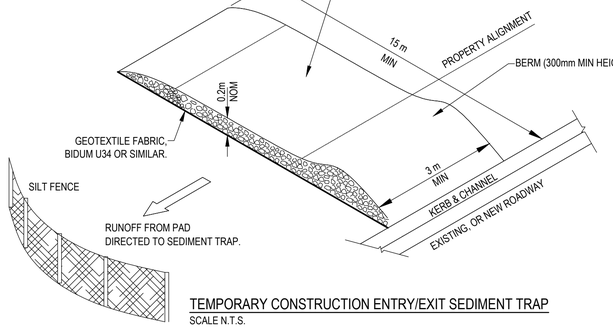
SEDIMENT FENCE DETAIL

SCALE N.T.S.



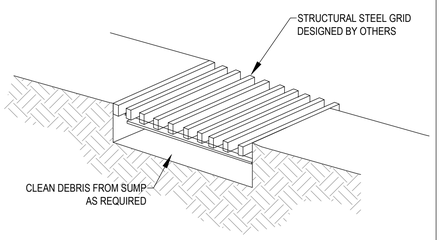
SANDBAG KERB INLET SEDIMENT TRAP

SCALE N.T.S.



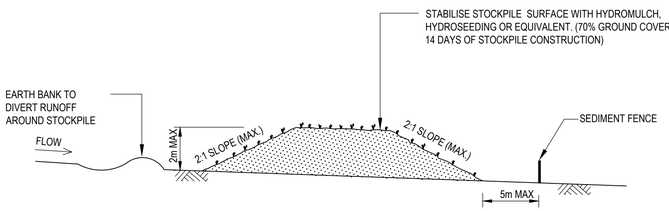
TEMPORARY CONSTRUCTION ENTRY/EXIT SEDIMENT TRAP

SCALE N.T.S.



SHARKER PAD

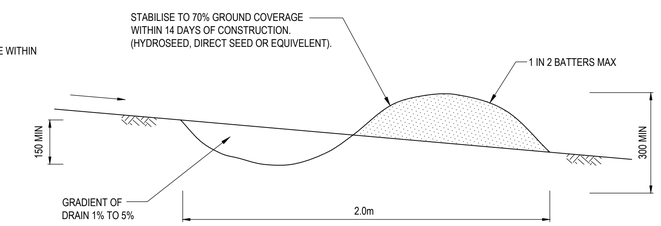
SCALE N.T.S



TYPICAL STOCKPILE CONFIGURATION

SCALE N.T.S.

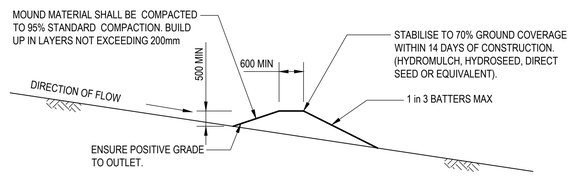
NOTE:
1. LOCATE STOCKPILES AT TOP OF CATCHMENT ON FLAT GROUND AND NOT WITHIN 5m OF CONCENTRATED FLOW PATHS.



CATCH DRAIN / EARTH BANK DETAIL

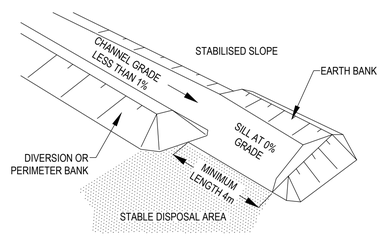
SCALE N.T.S.

NOTES:
1. ONLY TO BE USED AS TEMPORARY BANK WHERE MAXIMUM UPSLOPE LENGTH IS 80 METRES.
2. BUILD DRAINS WITH CIRCULAR, PARABOLIC OR TRAPEZOIDAL CROSS SECTIONS RATHER THAN V SHAPED



DIVERSION CHANNEL/ BANK DETAIL

SCALE: NTS



LEVEL SPREADER (OR SILL)

SCALE N.T.S

Key Plan: (NTS)

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AUSTRAL PUBLIC SCHOOL UPGRADE

205 EDMONDSON AVENUE, AUSTRAL, NSW 2179

File Name: 304000720-CI-1-076-001.DWG	-	-	-	2023.03.31
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title

EROSION AND SEDIMENT CONTROL DETAILS

Project No.	Scale
304000720	NTS
Revision	Drawing No.
I	CI-1-076-001

Plotted: 3/02/2023 3:03:19 PM By: JAL-MARSHALL
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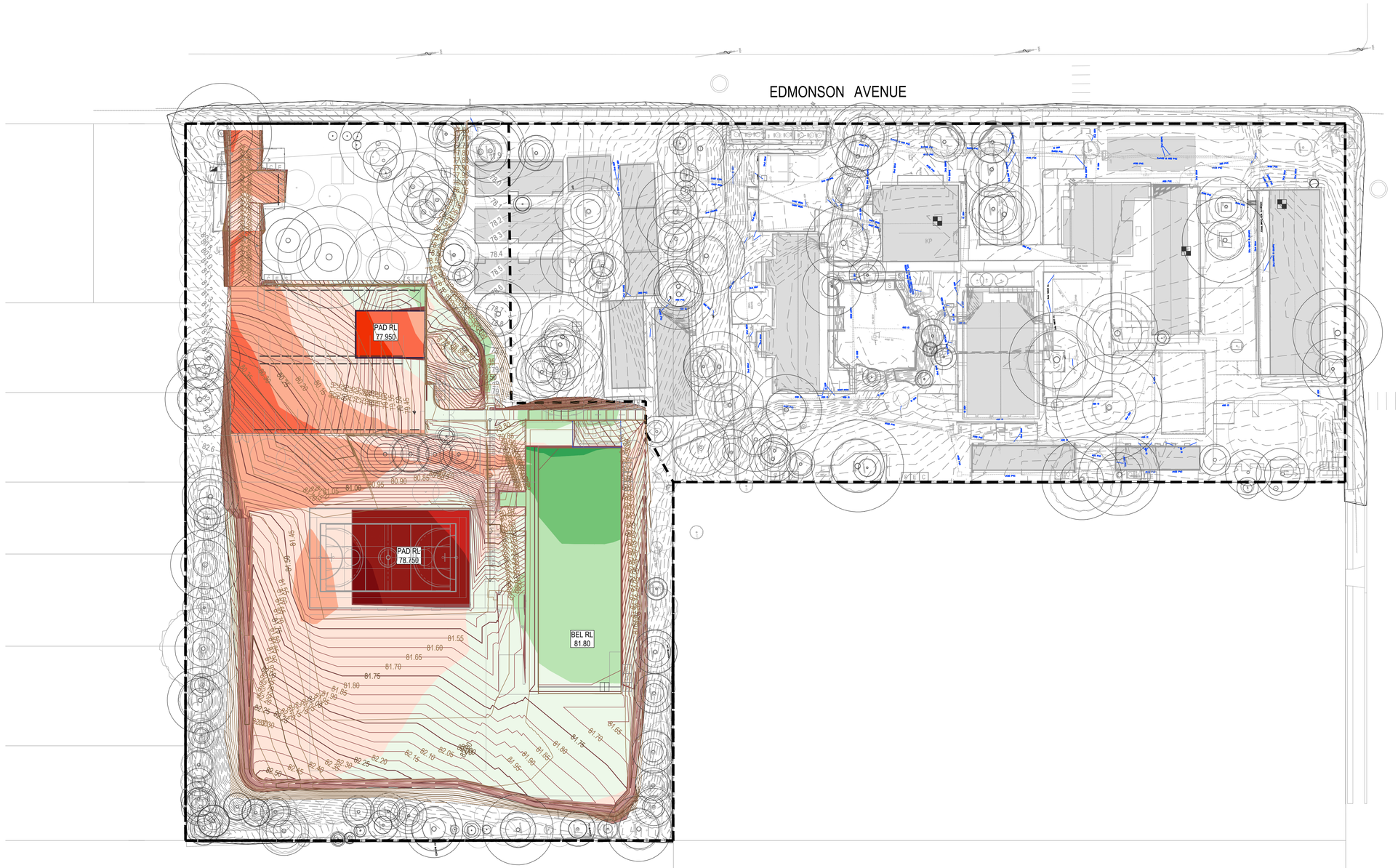
ORIGINAL SHEET - ISO A1 COORD - MGA/YY-Zone DATUM - mAHD



LEGEND

- SITE BOUNDARY
- EXTENT OF WORKS
- 14.0 — BULK EARTHWORKS CONTOURS
- 18.0 — EXISTING CONTOURS
- BEL — BULK EARTHWORKS LEVEL

NOTES

1. VOLUMES ARE INDICATIVE ONLY AND ARE BASED ON A COMPARISON BETWEEN THE DESIGN SURFACE AND THE SURVEYED SURFACE.
2. NOTE THAT ALL VOLUMES DEPICTED ARE SOLID VOLUMES ONLY AND MAY NOT REFLECT DETAILED EARTHWORKS.
3. NO ALLOWANCE HAS BEEN MADE FOR BULKING FACTORS.
4. NO ALLOWANCE HAS BEEN MADE FOR DETAILED EARTHWORKS; ie ON SITE DETENTION TANKS, RAINWATER TANK, SERVICE TRENCHING, DETAILED EXCAVATION, FOOTINGS, RETAINING WALLS, PAVEMENT BOXING, BUILDING SLABS AND THE LIKE.
5. THE CONTRACTOR SHALL USE FINAL SURFACE LEVELS AND TYPICAL PAVEMENT DETAILS FOR ACTUAL EARTHWORKS LEVELS.
6. TOPSOIL STRIPPING OF 200mm HAS BEEN ASSUMED FOR THE PURPOSE OF THE BULK EARTHWORKS. REFER GEOTECH REPORT FOR FURTHER INFORMATION.
7. BULK EARTHWORKS CUT/FILL VOLUME CONSIDERATIONS:
   - 200mm TOPSOIL HAS BEEN CONSIDERED TO BE REMOVED.
   - 200mm STRUCTURAL SLAB UNDER BUILDING PADS.
   - 400mm THICKNESS FOR TRAFFICABLE PAVEMENT.
5. THE SURVEY SURFACE AS PROVIDED HAS BEEN UTILISED FOR COMPARISON PURPOSES.
6. STANTEC DOES NOT TAKE RESPONSIBILITY FOR ACCURACY OF EXISTING SURVEY.
7. BULK EARTHWORKS DOES NOT TAKE INTO CONSIDERATION ANY CONTAMINDATED MATERIAL AND ANY REMEDIATION STRATEGY WORKS.

Elevations Table

Number	Minimum Elevation	Maximum Elevation	Color
1	-4.00	-3.50	
2	-3.50	-3.00	
3	-3.00	-2.50	
4	-2.50	-2.00	
5	-2.00	-1.50	
6	-1.50	-1.00	
7	-1.00	-0.50	
8	-0.50	0.00	
9	0.00	0.50	
10	0.50	1.00	
11	1.00	1.50	
12	1.50	2.00	
13	2.00	2.50	

CUT AND FILL VOLUME

CUT: 4,652 m^3
FILL: 1,794 m^3
CUT: 2858 m^3

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

Key Plan: (NTS)

I	ISSUED FOR REF	HAL	AT	2025.01.17
H	ISSUED FOR DA	LPT	VE	2024.06.06
G	ISSUED FOR DA	LPT	VE	2024.05.21
F	ISSUED FOR DA	LPT	JMB	2024.03.18
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D	ISSUED FOR DA	LPT	JMB	2024.02.23
C	95% SCHEMATIC DESIGN	LPT	JMB	2024.02.02
B	50% SCHEMATIC DESIGN	LPT	MDR	2023.12.15
A	CONCEPT DESIGN	LPT	MDR	2023.03.31
Issued/Revision		By	Appd	YYYY.MM.DD

Issue Status

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St Leonards, NSW 2065
Tel: +61 2 8484 7000

Client/Project Logo
NSW Education School Infrastructure

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SINSW

AUSTRAL PUBLIC SCHOOL UPGRADE

205 EDMONDSON AVENUE, AUSTRAL, NSW 2179

File Name: 304000720-CI-1-100-001.DWG | - Dwn. | - Dsgn. | - Chkd. | 2023.03.31 YYYY.MM.DD

Title
BULK EARTHWORKS PLAN

Project No. 304000720
Scale 1:500
Revision I
Drawing No. **CI-1-100-001**

Plotted: 5/02/2025 3:03:37 PM By: LAL, MASEL
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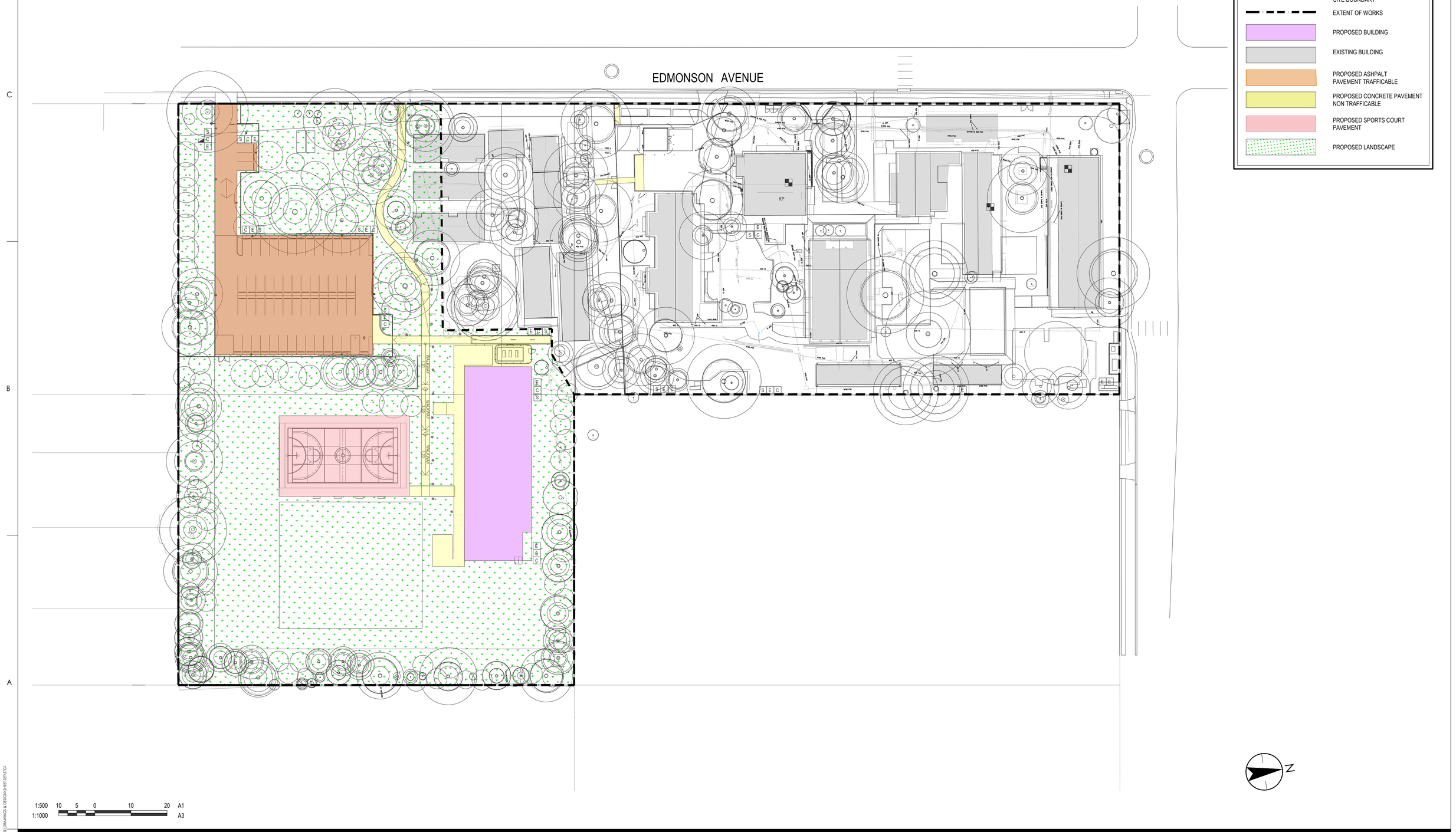

Key Plan: (NTS)

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H	ISSUED FOR DA	LPT	VE	2024.06.06
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205 EDMONDSON AVENUE, AUSTRAL, NSW 2179

File Name: 304000720-CI-1-440-001.DWG	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD
	-	-	-	2023.03.31

Title

PAVEMENT PLAN

Project No. 304000720

Scale 1:500

Revision I

Drawing No. **CI-1-440-001**

Plotted: 3/03/2025 3:04:18 PM By: LAL - HASPEL
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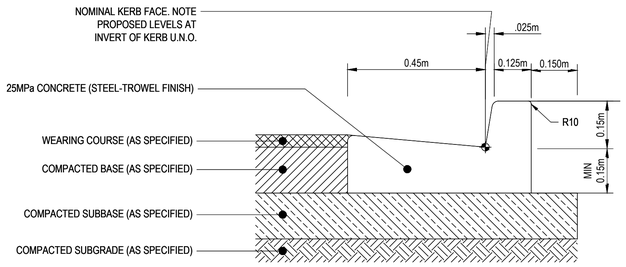
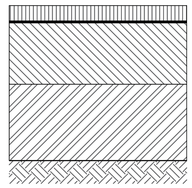


KERB AND GUTTER DETAIL
(SCALE 1:10)



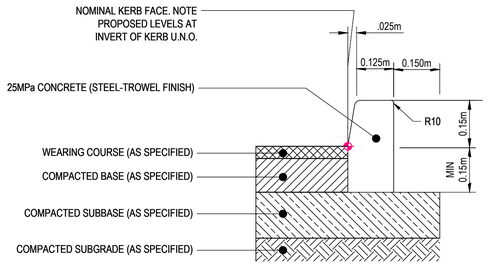
50mm AC10 SURFACING
7mm PRIMER SEAL

200mm THICK BASE.
DGB20 (CBR 80).
98% MODIFIED COMPACTION.

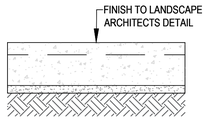
250mm THICK SUB-BASE.
DGS40 (CBR 45).
95% MODIFIED COMPACTION.

COMPACTED SUBGRADE (CBR 3%)

PROPOSED ASPHALT PAVEMENT TRAFFICABLE
(SCALE 1:10)



KERB ONLY 'KO' DETAIL
(SCALE 1:10)



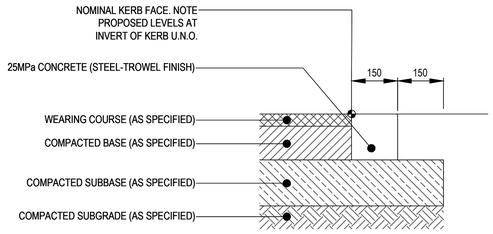
FINISH TO LANDSCAPE
ARCHITECTS DETAIL

140mm CONCRETE 32MPa WITH
SL92 MESH 40mm COVER

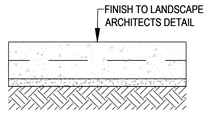
25mm SAND BEDDING

COMPACTED SUBGRADE (MIN 3%)

PROPOSED SPORTS COURT PAVEMENT
(SCALE 1:10)



FLUSH KERB DETAIL (FK)
(SCALE 1:10)



FINISH TO LANDSCAPE
ARCHITECTS DETAIL

120mm CONCRETE 25MPa WITH
SL72 MESH CENTRALLY PLACED

25mm SAND BEDDING

COMPACTED SUBGRADE (MIN 3%)

PROPOSED CONCRETE PAVEMENT NON TRAFFICABLE
(SCALE 1:10)

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

Key Plan: (NTS)

H	ISSUED FOR REF	HAL	AT	2025.01.17
G	ISSUED FOR DA	LPT	VE	2024.06.06
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Issued/Revision		By	Appd	YYYY.MM.DD

Issue Status

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AUSTRAL PUBLIC SCHOOL UPGRADE

205 EDMONDSON AVENUE, AUSTRAL, NSW 2179

File Name: 304000720-CI-1-446-001.DWG	-	-	-	2023.12.15
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
PAVEMENT DETAILS

Project No.
304000720

Scale
1:10

Revision
H

Drawing No.
CI-1-446-001

Plotted: 3/07/2025 3:04:33 PM By: LAL, HARSHIL
\\AU2012-FIL\AP1_CIP\SHARED_PROJECTS\304000720\PROJECT DOCUMENTATION\CIVIL\DRAWINGS & DESIGN SHEET SETUTG1

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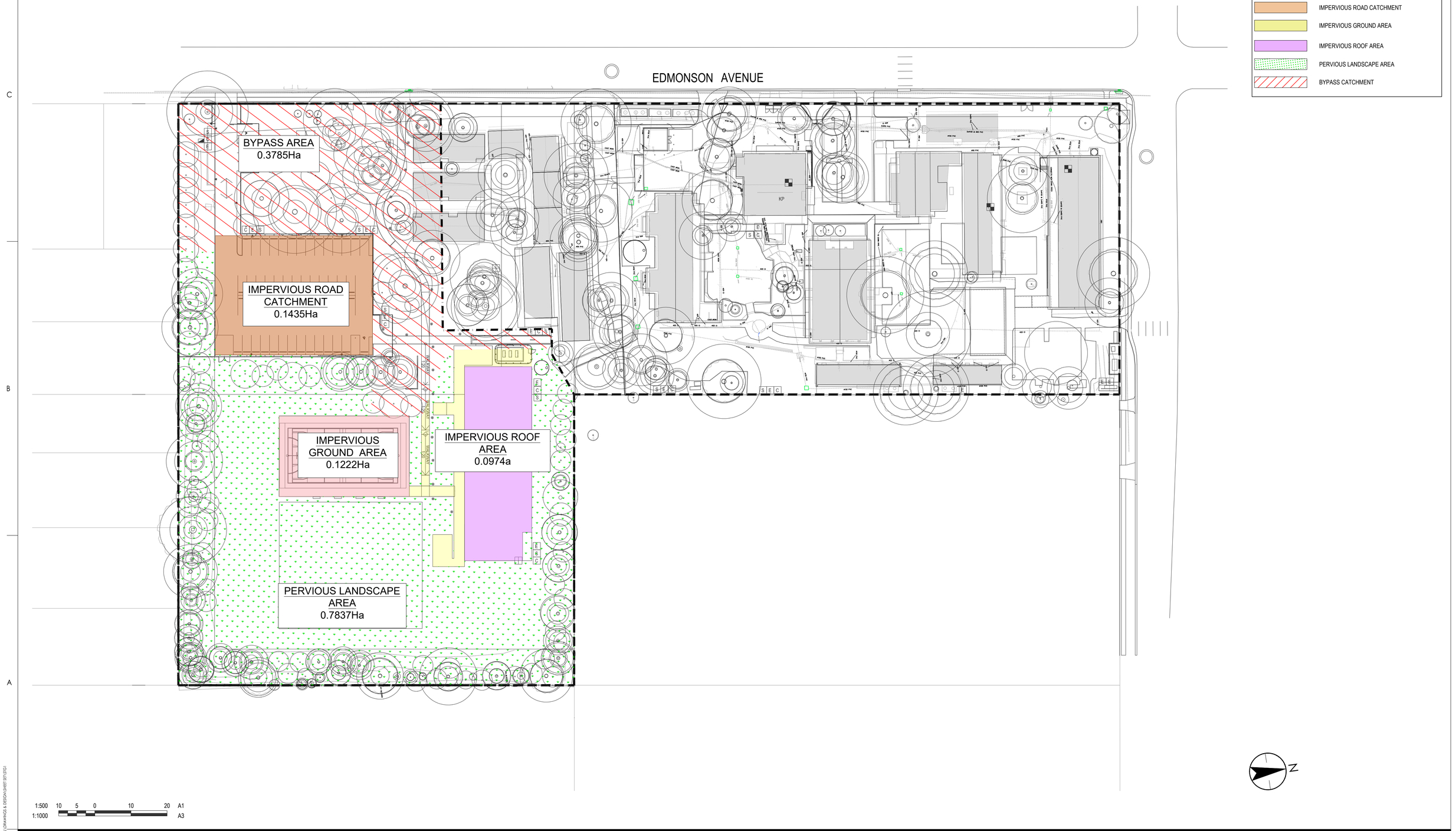

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205 EDMONDSON AVENUE, AUSTRAL, NSW 2179

File Name: 304000720-CI-1-500-001.DWG	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD
	-	-	-	2023.12.15

Title
MUSIC CATCHMENT PLAN

Project No.
304000720

Scale
1:500

Revision
H

Drawing No.
CI-1-500-001

Plotted: 3/01/2025 3:04:51 PM By: LAL - HASPEL
\\AUS01.PAMD_CP\SHARED_PROJECTS\304000720\PROJECT DOCUMENTATION\CIVIL\DRAWINGS & DESIGN\SHEET SET\STG1

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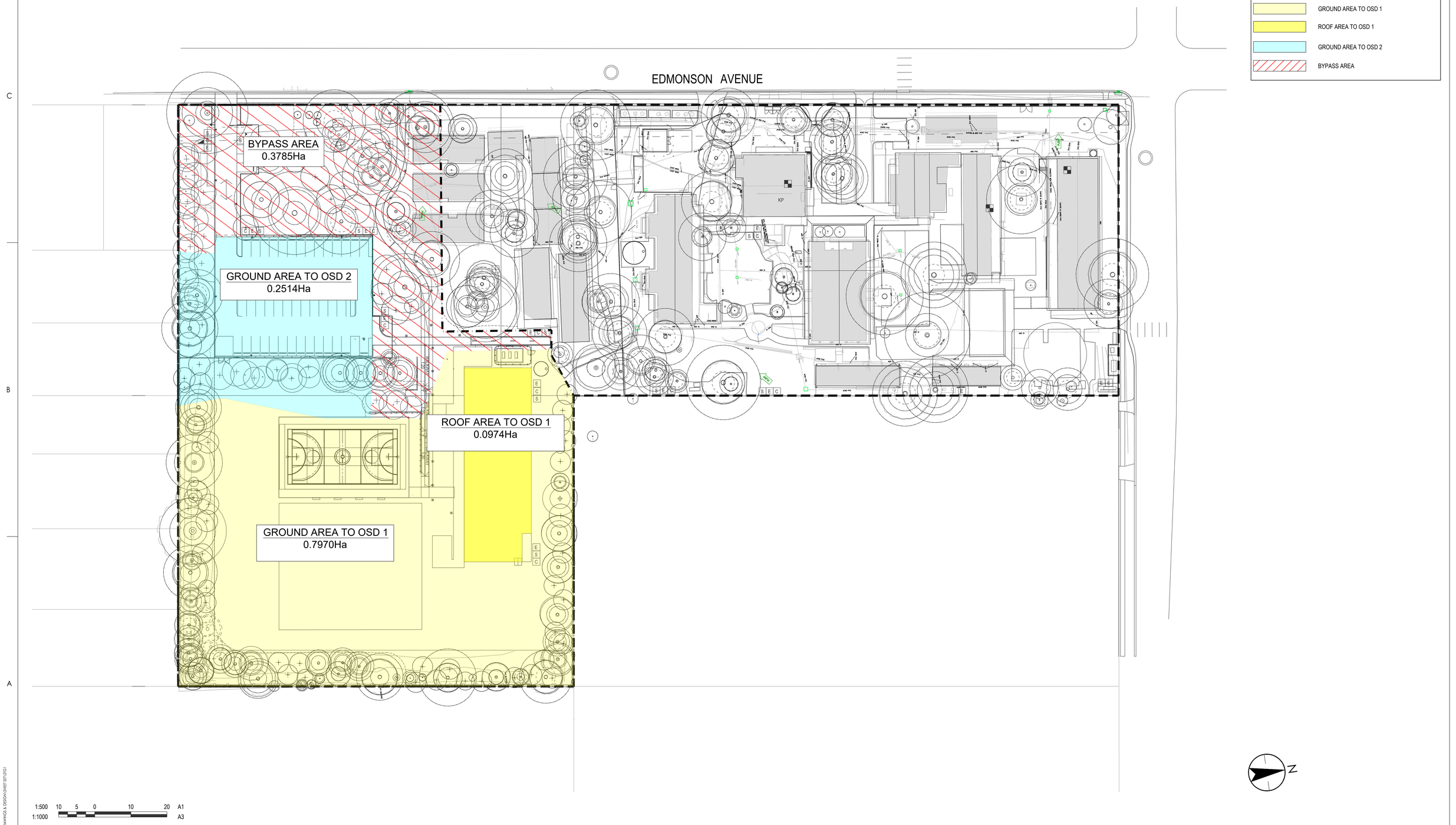

Key Plan: (NTS)

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G	ISSUED FOR DA	LPT	VE	2024.06.06
F	ISSUED FOR DA	LPT	VE	2024.05.21
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AUSTRAL PUBLIC SCHOOL UPGRADE

205 EDMONDSON AVENUE, AUSTRAL, NSW 2179

File Name: 304000720-CI-1-500-002.DWG	-	-	-	2023.12.15
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Title

DRAINS CATCHMENT PLAN

Project No. 304000720

Scale 1:500

Revision H

Drawing No. **CI-1-500-002**

Plotted: 30/2/2023 3:55:11 PM By: JAL HASHIL
\\AUS01-FS1\AD_CDP\SHARED_PROJECTS\304000720\PROJECT DOCUMENTATION\CIVIL\DRAWINGS & DESIGN\SHEET SETUP.DWG
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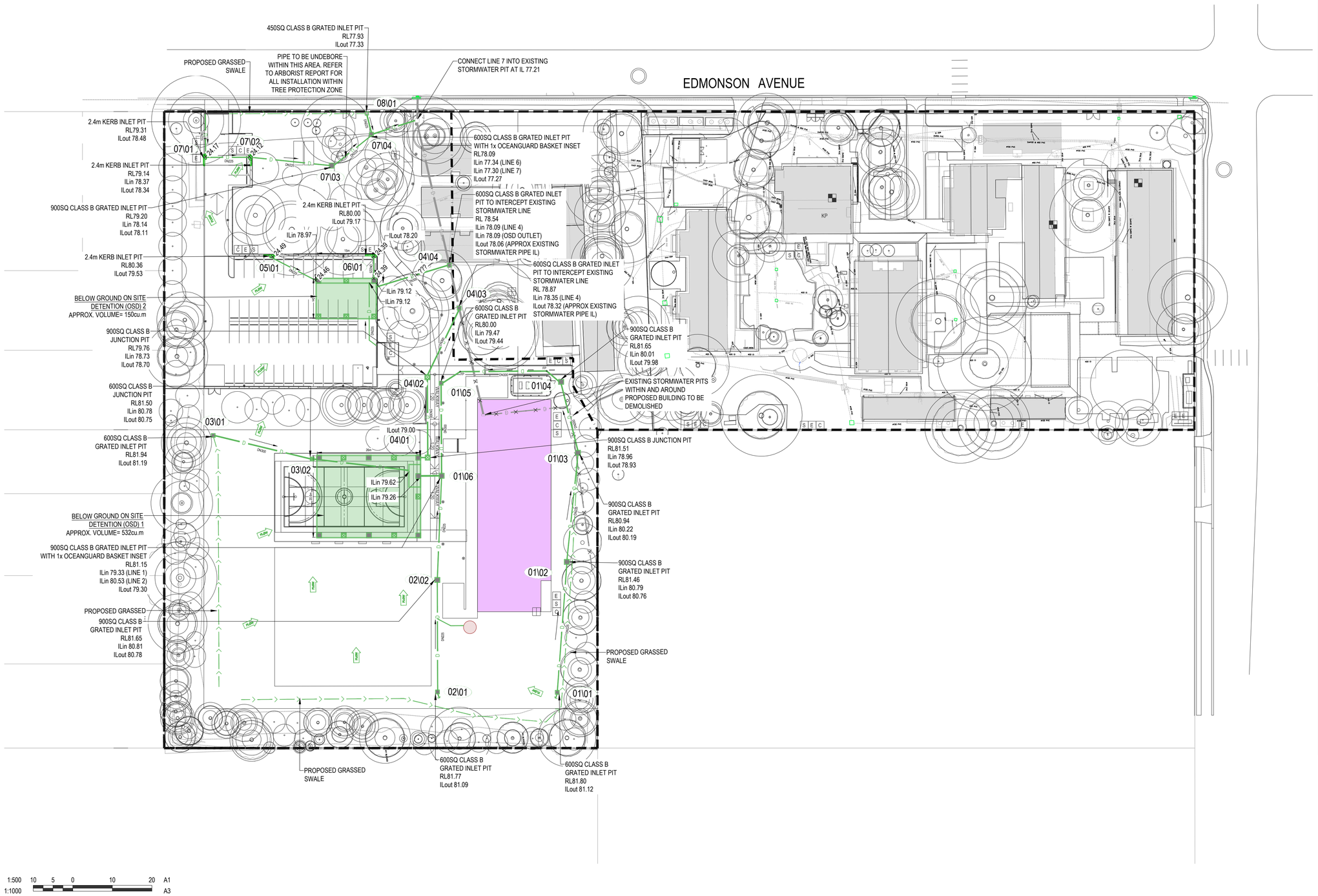

LEGEND

- SITE BOUNDARY
- EXTENT OF WORKS
- PROPOSED BUILDING
- EXISTING BUILDING
- DN375 D — PROPOSED STORMWATER PIPE INCLUDING DIAMETER SIZE
- PROPOSED GRATED DRAIN PROVIDE CLASS D GALV GRATING
- PROPOSED GRATED PIT
- PROPOSED JUNCTION PIT
- B.2 — PIT TAG
- FLOW — OVERLAND FLOW PATH
- EXISTING KERB INLET PIT
- EXISTING STORMWATER PIT
- ON-SITE DETENTION SYSTEM
- RAINWATER TANK
- D — EXISTING STORMWATER PIPE
- EXISTING SERVICE TO BE REMOVED
- FP — FLUSH POINT

NOTES

1. ALL STORMWATER PIPES TO HAVE A MINIMUM OF 1% SLOPE IN DIRECTION SHOWN UNO.
2. ALL IN-GROUND STORMWATER PIPES TO BE uPVC, UNLESS TRAFFICABLE.
3. ALL IN-GROUND STORMWATER PIPES TO BE MINIMUM 450 BELOW LANDSCAPED SURFACES AND 600 BELOW SURFACES IN TRAFFICABLE AREA.
4. GRATES, FRAMES AND COVERS IN ROADWAYS TO BE CLASS D.
5. GRATES AND FRAMES NOT IN ROADWAYS TO BE CLASS B.
6. STORMWATER PIPES ARE TO BE INSTALLED IN ACCORDANCE WITH AS 3725.
7. ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH COUNCIL STANDARDS AND CONSTRUCTION SPECIFICATIONS.
8. THE CONTRACTOR SHALL VERIFY LOCATIONS OF EXISTING SERVICES WITH ALL RELEVANT AUTHORITIES BEFORE COMMENCING CONSTRUCTION.
9. EXISTING STORMWATER NETWORK NEED TO BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
10. CONTRACTOR TO LOCATE AND EXPOSE ALL EXISTING SERVICES BEFORE CONSTRUCTION STARTS. EXISTING SERVICES TO BE RELOCATED WHERE NEEDED TO AVOID CLASHING.
11. ALL GRATED DRAINS WITHIN LANDSCAPE AREAS TO BE ACO DRAIN K200 AND WITHIN TRAFFICABLE AREAS TO BE ACO DRAIN K300 OR APPROVED EQUIVALENT.
12. ALL GRATED DRAINS WITH PEDESTRIAN ACCESS TO HAVE HEELSAFE GRATE.
13. FOR DOWNPIPES THAT WILL BE CONNECTED INTO THE RWT REFER TO THE HYDRAULIC CONSULTANT DOCUMENTATION. THOSE DPs THAT ARE BYPASSING THE RWT TO BE CONNECTED DIRECTLY INTO THE STORMWATER NETWORK.
14. CONTRACTOR TO ENSURE THAT THE BASE OF THE INFITLRATION TRENCH IS TO BE AT LEAST 1.0m ABOVE THE UNDERLYING WATER TABLE OR ROCK STRATUM, IF PRESENT. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORKS.
15. IF DURING CONSTRUCTION OF THE STORMWATER SYSTEM, LAYERED SOILS SUCH AS CLAY LENSES OR INDURATED MATERIAL ARE IDENTIFIED, FURTHER GEOTECHNICAL ADVICE SHOULD BE SOUGHT.

N

Key Plan: (NTS)

I	ISSUED FOR REF	HAL	AT	2025.01.17
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NSW GOVERNMENT Education | School Infrastructure

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AUSTRAL PUBLIC SCHOOL UPGRADE

205 EDMONDSON AVENUE, AUSTRAL, NSW 2179

File Name: 304000720-CI-1-520-001.DWG	-	-	-	2023.03.31
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title

STORMWATER DRAINAGE PLAN

Project No. 304000720

Scale 1:500

Revision I

Drawing No. **CI-1-520-001**

Plotted: 3/02/2023 3:05:38 PM By: LAL - HASHE
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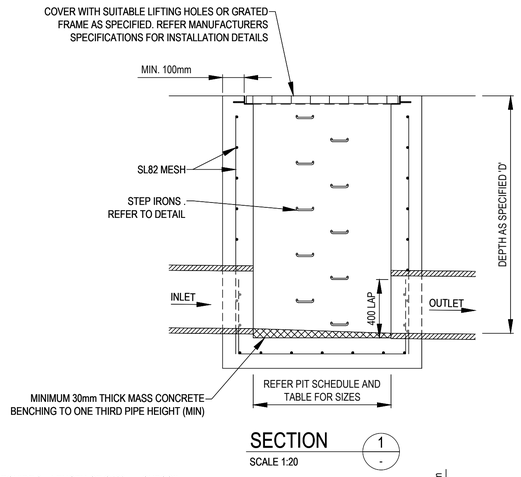
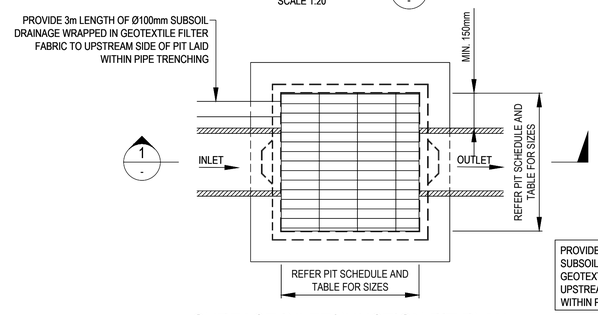


SECTION 1
SCALE 1:20

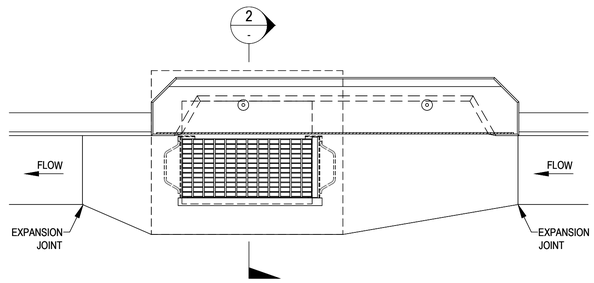
INTERNAL PIT DIMENSIONS (MIN.)		
'D'	'X'	'Y'
D < 600	450	450*
600 < D < 900	600	600*
900 < D < 1200	600	900
D > 1200	900	900

NOTE: PITS DENOTED *SHALL BE USED ONLY WHERE SPECIFIED IN DRAINAGE SCHEDULE OR ON PLAN

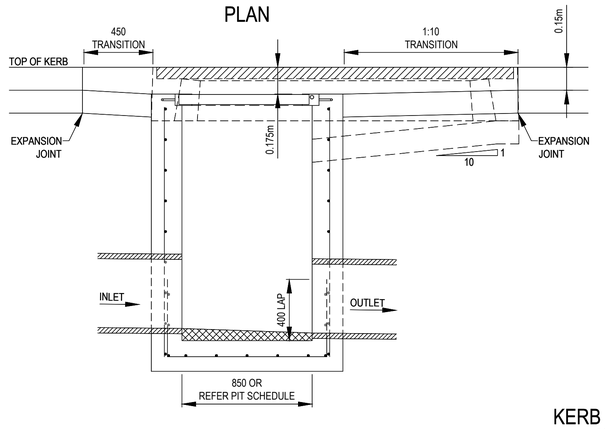


PROVIDE 3m LENGTH OF Ø100mm SUBSOIL DRAINAGE WRAPPED IN GEOTEXTILE FILTER FABRIC TO UPSTREAM SIDE OF PIT LAID WITHIN PIPE TRENCHING

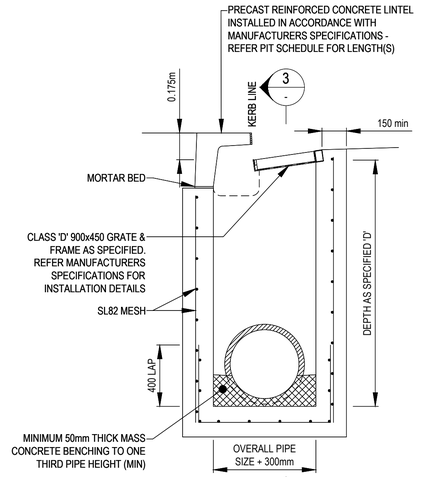
SURFACE INLET/JUNCTION PIT PLAN
SCALE 1:20



PLAN



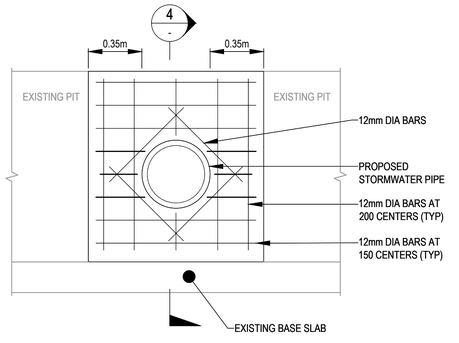
SECTION 3
SCALE 1:20



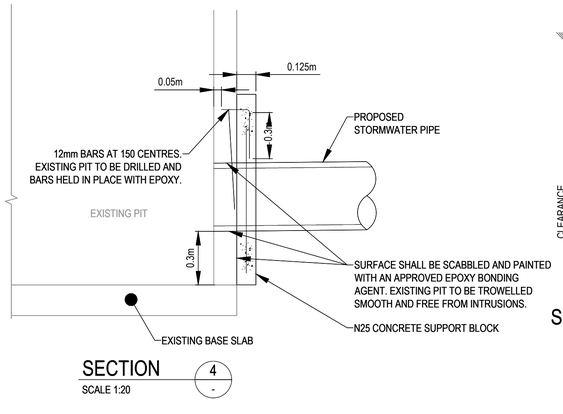
SECTION 2
SCALE 1:20

KERB INLET PIT
SCALE 1:20

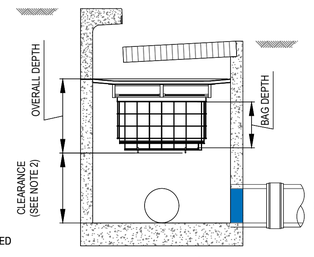
PROVIDE 3m LENGTH OF Ø100mm SUBSOIL DRAINAGE WRAPPED IN GEOTEXTILE FILTER FABRIC TO UPSTREAM SIDE OF PIT LAID WITHIN PIPE TRENCHING



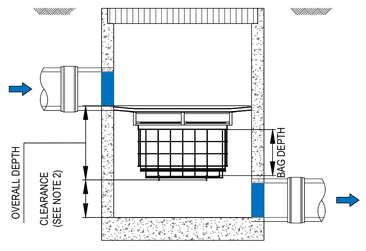
STORMWATER PIPE CONNECTION INTO EXISTING PIT
SCALE 1:20



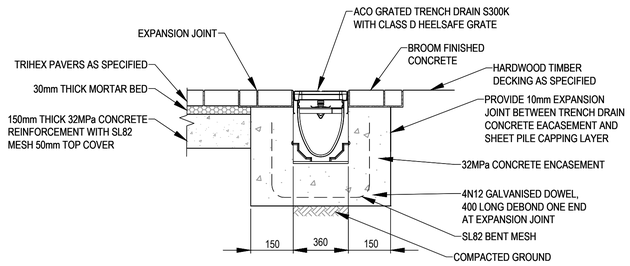
SECTION 4
SCALE 1:20



PIT FILTER BASKET
SURFACE FLOW CONFIGURATION
SCALE 1:20



PIT FILTER BASKET
PIPE FLOW CONFIGURATION
SCALE 1:20



TRENCH DRAIN DETAIL
(SCALE NTS)

1:20 0.2 0 0.2 0.4 0.6 0.8 1 A1
1:40 A3

Key Plan: (NTS)

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I ISSUED FOR REF	HAL	AT	2025.01.17
H ISSUED FOR DA	LPT	VE	2024.06.06
G ISSUED FOR DA	LPT	VE	2024.05.21
F ISSUED FOR DA	LPT	JMB	2024.03.18
E ISSUED FOR DA	LPT	JMB	2024.03.08
D ISSUED FOR DA	LPT	JMB	2024.02.23
C 95% SCHEMATIC DESIGN	LPT	JMB	2023.02.02
B 50% SCHEMATIC DESIGN	LPT	MDR	2023.12.15
A CONCEPT DESIGN	LPT	MDR	2023.03.31

Issue Status

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NSW GOVERNMENT Education School Infrastructure

Client/Project
SINSW

AUSTRAL PUBLIC SCHOOL UPGRADE

205 EDMONDSON AVENUE, AUSTRAL, NSW 2179

File Name: 304000720-CI-1-526-001.DWG	Dwn.	Dsgn.	Chkd.	2023.03.31
	-	-	-	YYYY.MM.DD

Title
STORMWATER DRAINAGE DETAILS
SHEET 1 OF 7

Project No.
304000720

Scale
AS SHOWN

Revision
I

Drawing No.
CI-1-526-001

Plotted: 30/03/2023 3:05:51 PM By: LAL, HASHIL
\\AUS01-FSYAFD_CIFS\SHARED_PROJECTS\304000720\PROJECT DOCUMENTATION\CIVIL\DRAWINGS & DESIGN\SHEET SET\STG1
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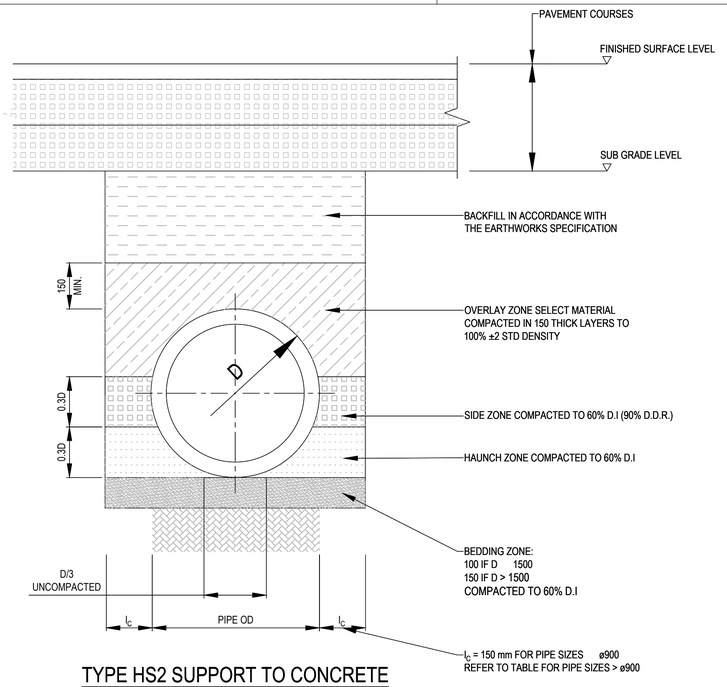
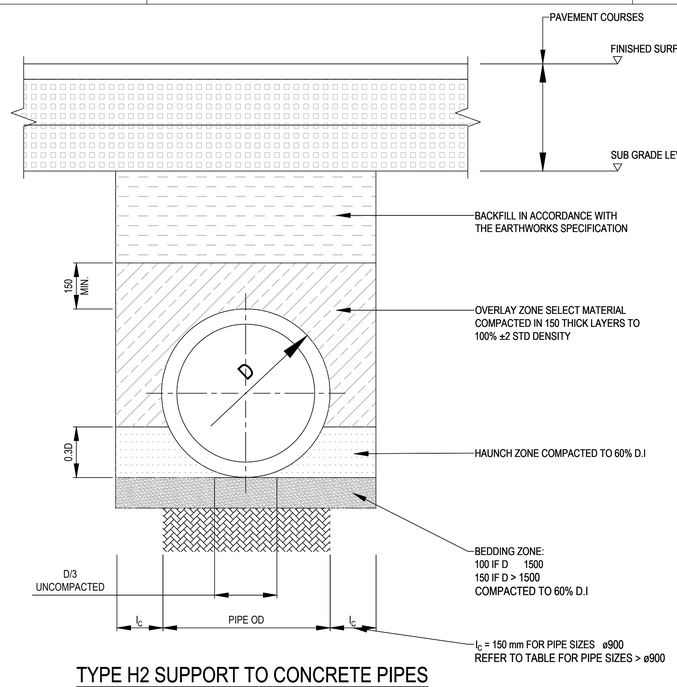


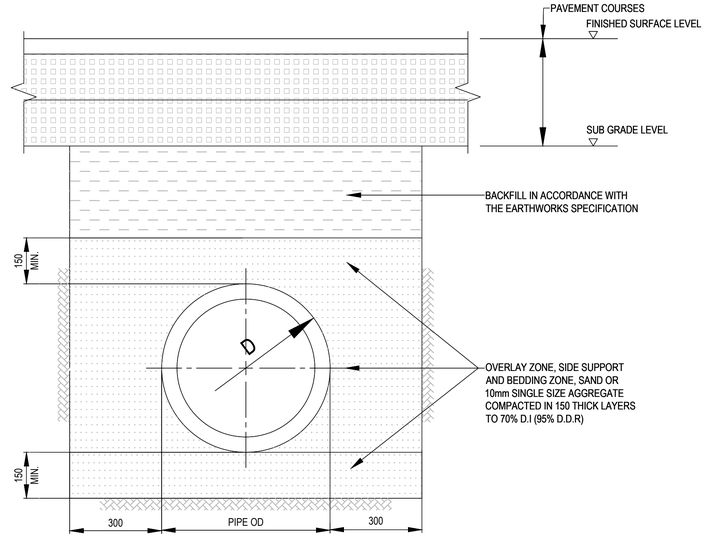
TYPE HS2 SUPPORT TO CONCRETE PIPES UNDER PAVEMENT (VEHICULAR)

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)

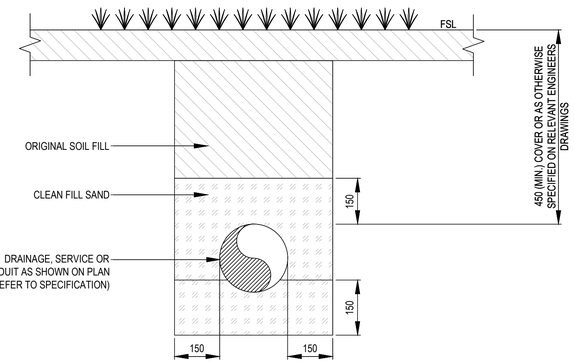
SIEVE SIZE (mm)	WEIGHT PASSING (%)
19.00	100
9.50	100 TO 50
2.60	100 TO 30
0.60	50 TO 15
0.075	25 TO 0

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

Key Plan: (NTS)

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

I	ISSUED FOR REF	HAL	AT	2025.01.17
H	ISSUED FOR DA	LPT	VE	2024.06.06
G	ISSUED FOR DA	LPT	VE	2024.05.21
F	ISSUED FOR DA	LPT	JMB	2024.03.18
E	ISSUED FOR DA	LPT	JMB	2024.03.08
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C	95% SCHEMATIC DESIGN	LPT	JMB	2023.02.02
B	50% SCHEMATIC DESIGN	LPT	MDR	2023.12.15
A	CONCEPT DESIGN	LPT	MDR	2023.03.31
Issued/Revision		By	Appd	YYYY.MM.DD

Issue Status

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205 EDMONDSON AVENUE, AUSTRAL, NSW 2179

File Name: 304000720-CI-1-526-001.DWG	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD
	-	-	-	2023.03.31

Title
STORMWATER DRAINAGE DETAILS
SHEET 2 OF 7

Project No. 304000720
Scale 1:10
Revision I
Drawing No. CI-1-526-002

Plotted: 3/02/2023 3:55:53 PM By: LAL - HASPHL
\\AUS021-FP\APD_CPI\SHARED_PROJECTS\304000720\PROJECT DOCUMENTATION\CIVIL\DRAWINGS & DESIGN\SHEET SETUP.DWG
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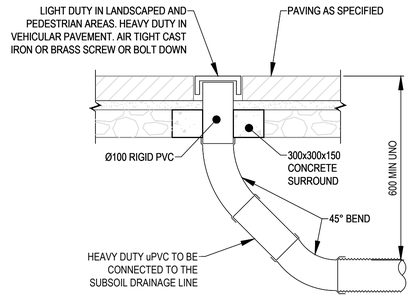
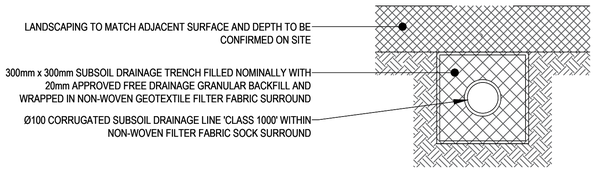


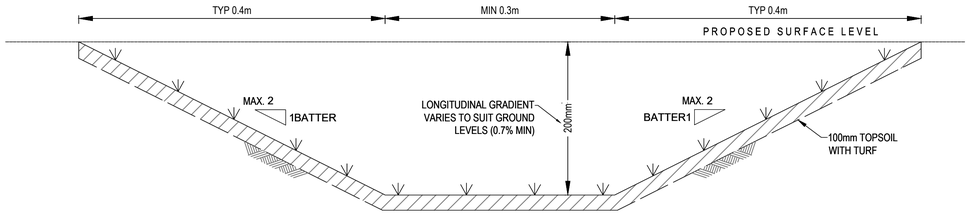
FLUSH OUT RISER IN PAVED AREAS

(SCALE 1:10)



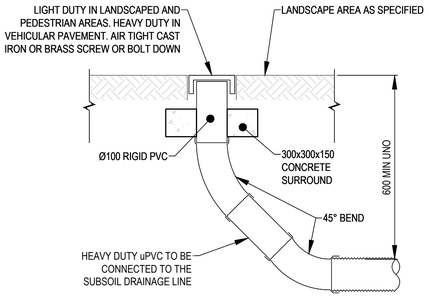
SUBSOIL DRAINAGE TRENCH DETAIL - UNDER LANDSCAPE AREAS

(SCALE 1:10)



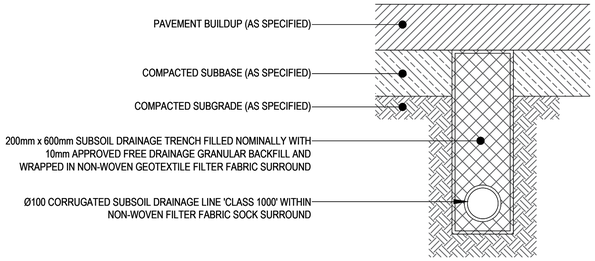
TYPICAL GRASS SWALE DETAIL

SCALE 1:10



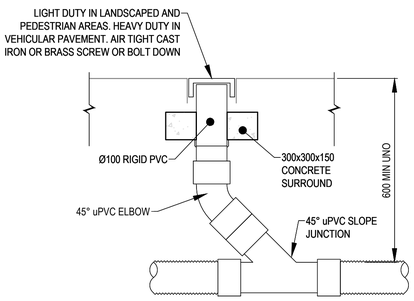
FLUSH OUT RISER IN LANDSCAPED AREAS

(SCALE 1:10)



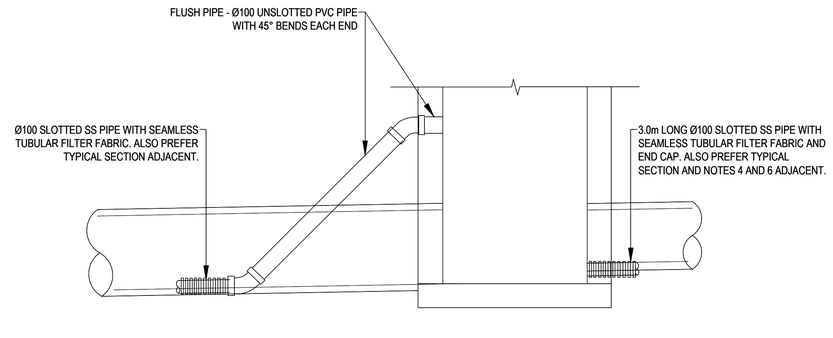
SUBSOIL DRAINAGE TRENCH DETAIL - UNDER PAVEMENT BUILTUP

(SCALE 1:10)



INTERMEDIATE FLUSH OUT RISER

(SCALE 1:10)



SUBSOIL DRAINAGE CONNECTION INTO STORMWATER PIT

NTS

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

Key Plan: (NTS)

I	ISSUED FOR REF	HAL	AT	2025.01.17
H	ISSUED FOR DA	LPT	VE	2024.06.06
G	ISSUED FOR DA	LPT	VE	2024.05.21
F	ISSUED FOR DA	LPT	JMB	2024.03.18
E	ISSUED FOR DA	LPT	JMB	2024.03.08
D	ISSUED FOR DA	LPT	JMB	2024.02.23
C	95% SCHEMATIC DESIGN	LPT	JMB	2023.02.02
B	50% SCHEMATIC DESIGN	LPT	MDR	2023.12.15
A	CONCEPT DESIGN	LPT	MDR	2023.03.31
Issued/Revision		By	Appd	YYYY.MM.DD

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File Name: 304000720-CI-1-526-001.DWG	-	-	-	2023.03.31
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title

STORMWATER DRAINAGE DETAILS
SHEET 3 OF 7

Project No. 304000720

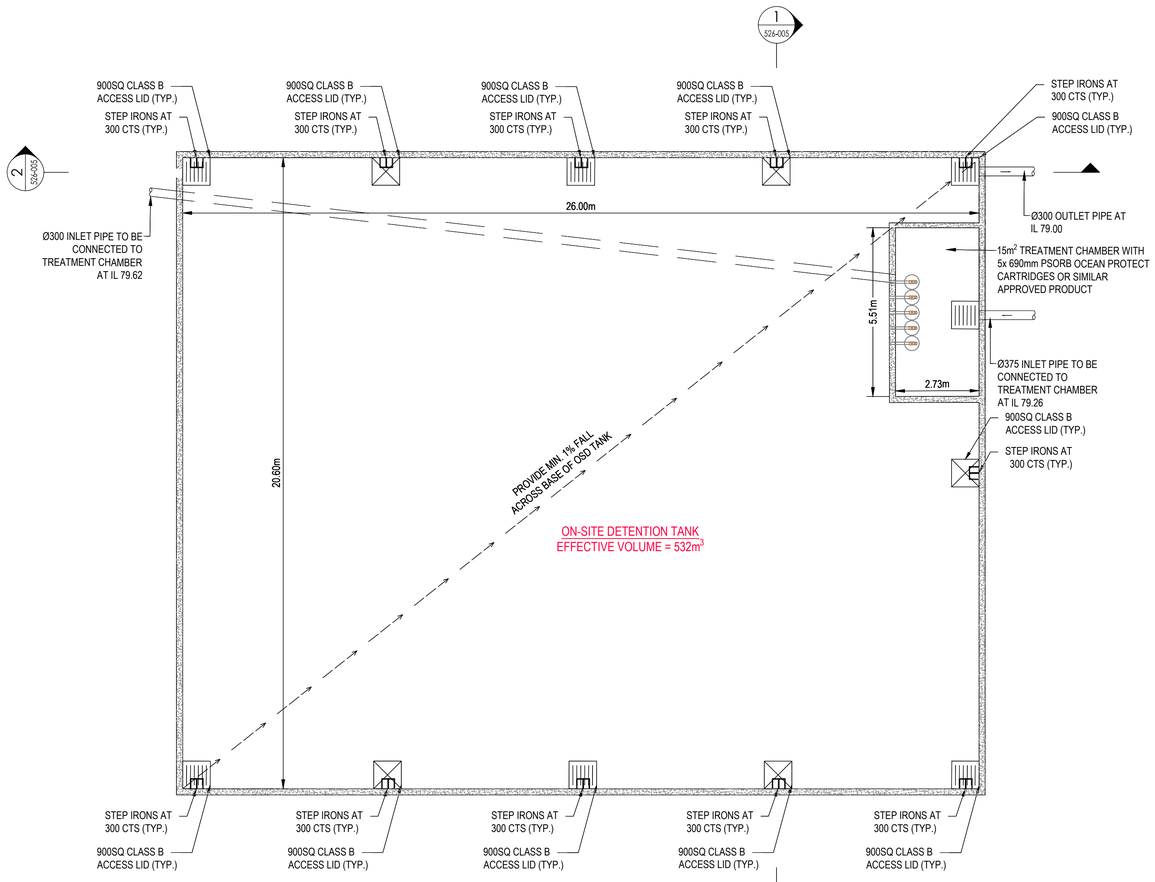
Scale AS SPECFIED

Revision I

Drawing No. **CI-1-526-003**

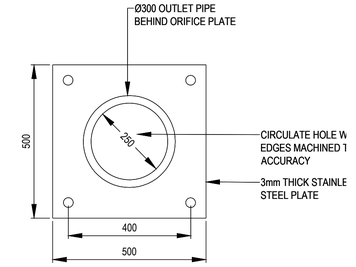
Plotted: 3/02/2023 3:05:56 PM By: JAL, HARSHIL
\\AUS01\244\APD_CPS\SHARED_PROJECTS\304000720\PROJECT DOCUMENTATION\CIVIL\DRAWINGS & DESIGN\SHEET SETS\SD1

ORIGINAL SHEET - ISO A1 COORD - MGA/YY-Zone DATUM - mAHD



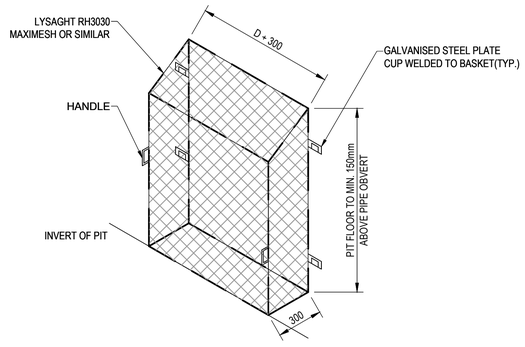
ON-SITE DETENTION (OSD) TANK PLAN 1

SCALE 1:100



ORIFICE PLATE DETAIL OSD TANK 1

SCALE 1:10



SCREEN MESH DETAIL

N.T.S.

1:10 0.1 0 0.1 0.2 0.3 0.4 0.5 A1
1:20 A3
1:100 1 0 1 2 3 4 5 A1
1:200 A3

Key Plan: (NTS)

I	ISSUED FOR REF	HAL	AT	2025.01.17
H	ISSUED FOR DA	LPT	VE	2024.06.06
G	ISSUED FOR DA	LPT	VE	2024.05.21
F	ISSUED FOR DA	LPT	JMB	2024.03.18
E	ISSUED FOR DA	LPT	JMB	2024.03.08
D	ISSUED FOR DA	LPT	JMB	2024.02.23
C	95% SCHEMATIC DESIGN	LPT	JMB	2023.02.02
B	50% SCHEMATIC DESIGN	LPT	MDR	2023.12.15
A	CONCEPT DESIGN	LPT	MDR	2023.03.31
	Issued/Revision	By	Appd	YYYY.MM.DD

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File Name: 304000720-CI-I-526-001.DWG	-	-	-	2023.03.31
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title

STORMWATER DRAINAGE DETAILS
SHEET 4 OF 7

Project No. 304000720

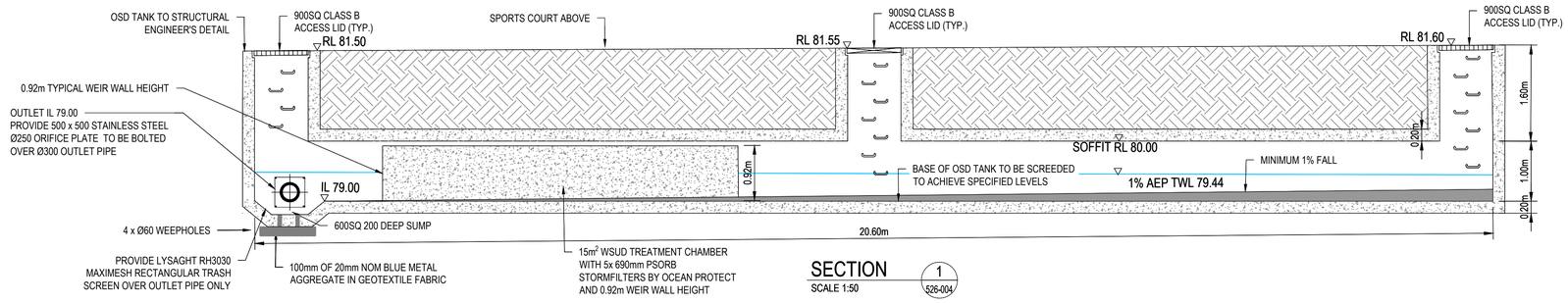
Scale 1:100

Revision I

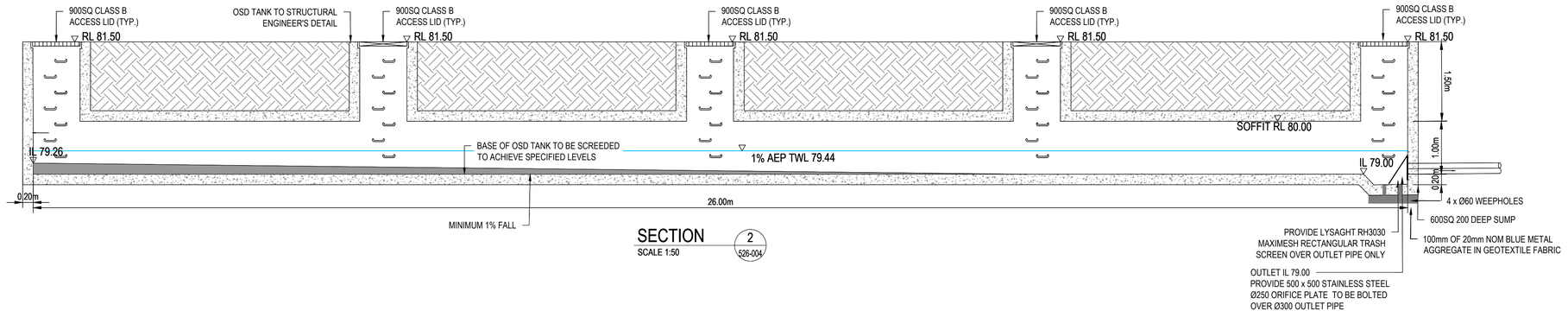
Drawing No. **CI-1-526-004**

Plotted: 3/02/2023 3:16:03 P.M. By: LAL, HARSHIL
\\AU201.SHARE_CIP\SHARED_PROJECTS\304000720\PROJECT DOCUMENTATION\CIVIL\DRAWINGS & DESIGN\SHEET SETS\ISG\

ORIGINAL SHEET - ISO A1 COORD - MGA/YY-Zone DATUM - mAHD



SECTION 1
SCALE 1:50
526-004



SECTION 2
SCALE 1:50
526-004

1:50 1 0.5 0 1 2 A1
1:100 A3

Key Plan: (NTS)

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H	ISSUED FOR DA	LPT	VE	2024.06.06
G	ISSUED FOR DA	LPT	VE	2024.05.21
F	ISSUED FOR DA	LPT	JMB	2024.03.18
E	ISSUED FOR DA	LPT	JMB	2024.03.08
D	ISSUED FOR DA	LPT	JMB	2024.02.23
C	95% SCHEMATIC DESIGN	LPT	JMB	2023.02.02
B	50% SCHEMATIC DESIGN	LPT	MDR	2023.12.15
A	CONCEPT DESIGN	LPT	MDR	2023.03.31
Issued/Revision		By	Appd	YYYY.MM.DD

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AUSTRAL PUBLIC SCHOOL UPGRADE

205 EDMONDSON AVENUE, AUSTRAL, NSW 2179

File Name: 304000720-CI-1-526-001.DWG	-	-	-	2023.03.31
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
STORMWATER DRAINAGE DETAILS
SHEET 5 OF 7

Project No. 304000720
Scale NTS
Revision I
Drawing No. **CI-1-526-005**

Plotted: 3/02/2025 3:06:03 PM By: LAL MARSHL
\\AU001-FP-MP01_CIFS\SHARED_PROJECTS\304000720\PROJECT DOCUMENTATION\CIVIL\DRAWINGS & DESIGN\SHEET SETS\TG1

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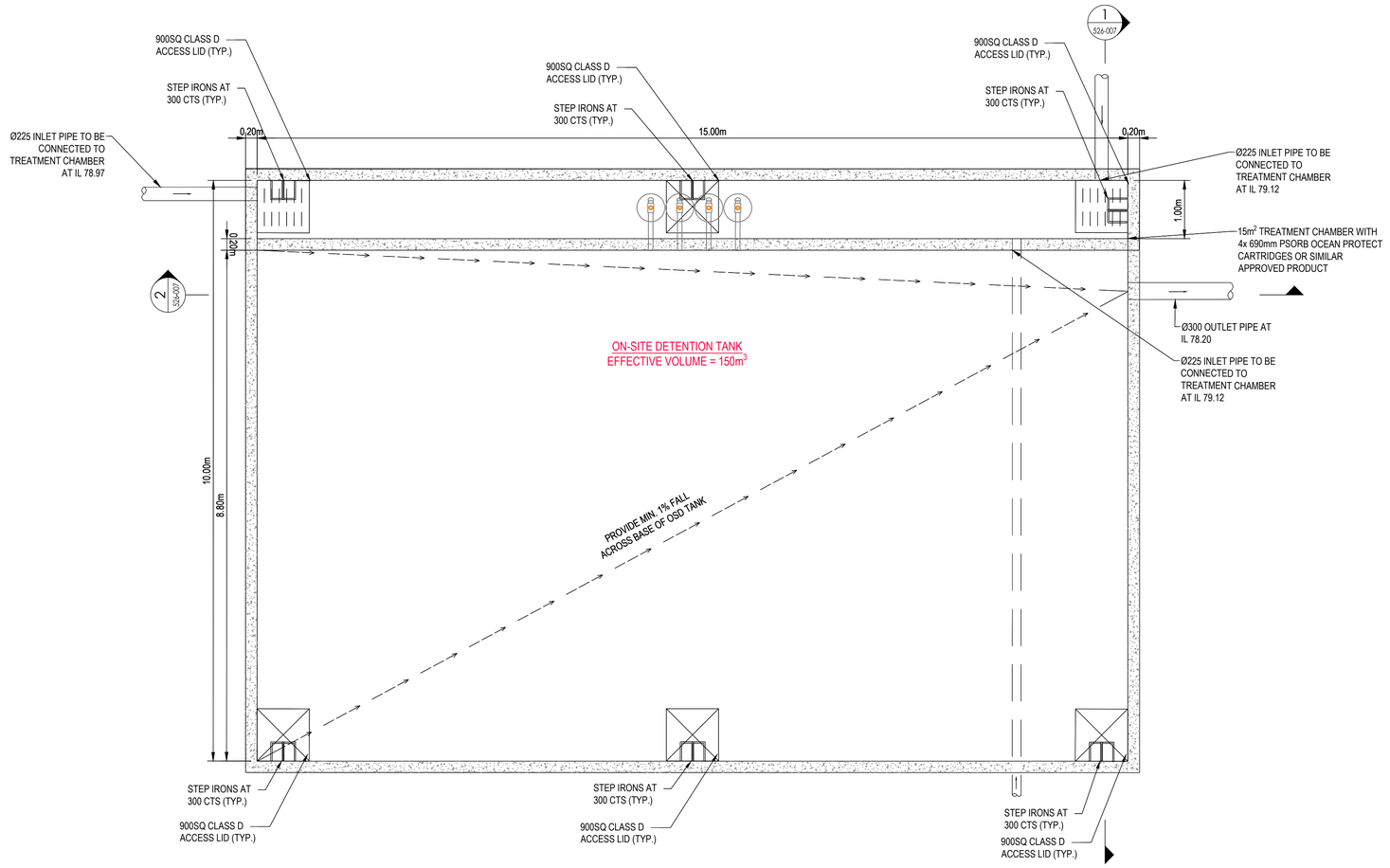
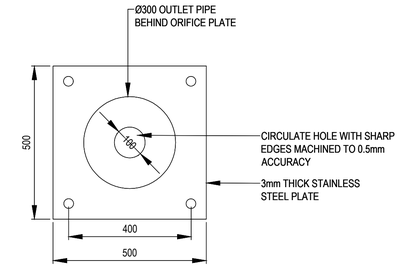


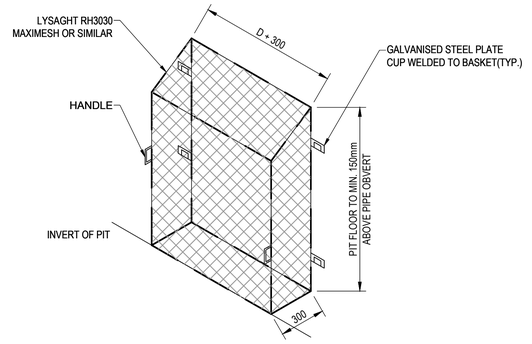
ON-SITE DETENTION (OSD) TANK PLAN 2

SCALE 1:50



ORIFICE PLATE DETAIL
OSD TANK 2

SCALE 1:10



SCREEN MESH DETAIL

N.T.S.

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

1:50 1 0.5 0 1 2 A1
1:100 A3

Key Plan: (NTS)

G	ISSUED FOR REF	HAL	AT	2025.01.17
F	ISSUED FOR DA	LPT	JMB	2024.06.06
E	ISSUED FOR DA	LPT	VE	2024.05.21
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B	ISSUED FOR DA	LPT	JMB	2024.02.23
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Issued/Revision		By	Appd	YYYY.MM.DD

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205 EDMONDSON AVENUE, AUSTRAL, NSW 2179

File Name: 30400720-CI-I-526-001.DWG	-	-	-	2024.02.02
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title

STORMWATER DRAINAGE DETAILS
SHEET 6 OF 7

Project No. 304000720

Scale 1:100

Revision G

Drawing No. **CI-1-526-006**

Plotted: 3/07/2023 3:56:08 P.M. By: LAL, HARSHIL
\\AU201.SYDAD_CIP\SHARED_PROJECTS\304000720\PROJECT DOCUMENTATION\CIVIL\DRAWINGS & DESIGN\SHEET SETS\TG\

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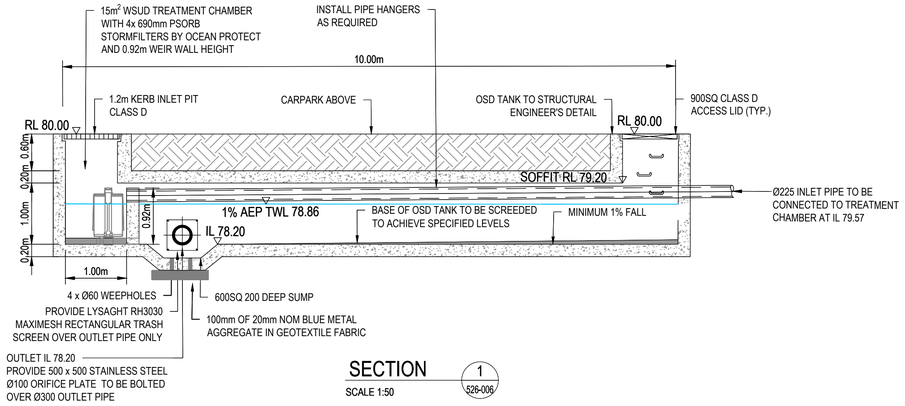

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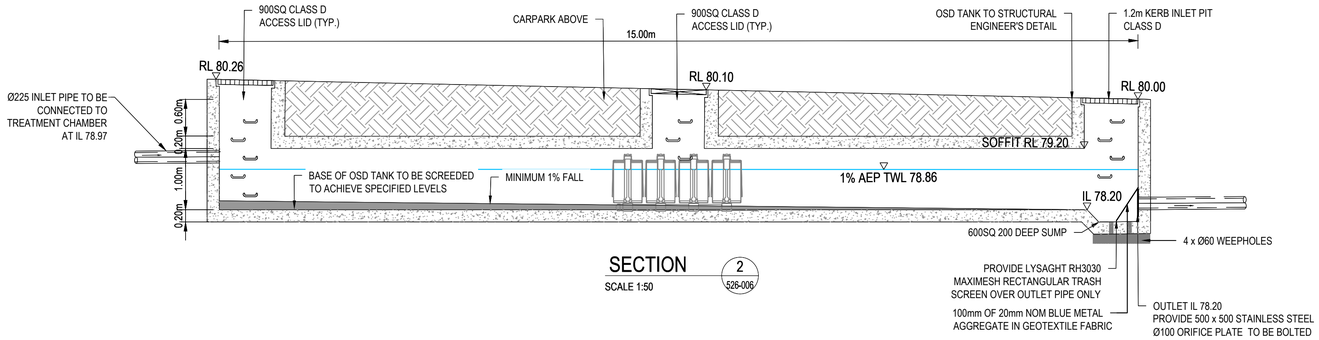
SCALE 1:50
526-006



SECTION 2
SCALE 1:50
526-006

1:50 1 0.5 0 1 2 A1
1:100 A3

Key Plan: (NTS)

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F	ISSUED FOR DA	LPT	JMB	2024.06.06
E	ISSUED FOR DA	LPT	VE	2024.05.21
D	ISSUED FOR DA	LPT	JMB	2024.03.18
C	ISSUED FOR DA	LPT	JMB	2024.03.08
B	ISSUED FOR DA	LPT	JMB	2024.02.23
A	95% SCHEMATIC DESIGN	LPT	JMB	2024.02.02
Issued/Revision		By	Appd	YYYY.MM.DD

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AUSTRAL PUBLIC SCHOOL UPGRADE

205 EDMONDSON AVENUE, AUSTRAL, NSW 2179

File Name: 304000720-CI-1-526-001.DWG	-	-	-	2024.02.02
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
STORMWATER DRAINAGE DETAILS
SHEET 7 OF 7

Project No. 304000720
Scale 1:500
Revision G
Drawing No. **CI-1-526-007**

Plotted: 3/02/2025 3:06:11 PM By: LAL MARSHL
I:\AU\SYD\247\MP01_CIP\SHARED_PROJECTS\304000720\PROJECT DOCUMENTATION\CIVIL\DRAWINGS & DESIGN\SHEET SETS\TG1
ORIGINAL SHEET - ISO A1 COORD - MGA/YYY-Zone DATUM - mAHD

PITS	SL (m AHD)	IL	PIT DEPTHS (m)	PIT TYPE	PIT SIZE	PIT CLASS	COMMENTS
01\01	81.80	81.12	0.68	GRATED INLET PIT	600x600	CLASS B	-
01\02	81.46	80.76	0.70	GRATED INLET PIT	900x900	CLASS B	-
01\03	80.94	80.19	0.75	GRATED INLET PIT	900x900	CLASS B	-
01\04	81.65	79.98	1.67	GRATED INLET PIT	900x900	CLASS B	-
01\05	80.01	79.44	0.57	GRATED INLET PIT	600x600	CLASS B	-
01\06	81.15	79.30	1.85	GRATED INLET PIT	900x900	CLASS B	FIT WITH 1x OCEANPROTECT BASKET INSET
02\01	81.78	81.10	0.68	GRATED INLET PIT	600x600	CLASS B	-
02\02	81.68	80.79	0.89	GRATED INLET PIT	900x900	CLASS B	-
03\01	81.94	81.19	0.75	GRATED INLET PIT	600x600	CLASS B	-
03\02	81.50	80.75	0.75	JUNCTION PIT	600x600	CLASS B	-
04\01	81.51	78.93	2.58	JUNCTION PIT	900x900	CLASS B	-
04\02	79.76	78.70	1.06	JUNCTION PIT	900x900	CLASS B	-
04\03	78.87	78.32	0.55	GRATED INLET PIT	600x600	CLASS B	-
04\04	78.54	78.06	0.48	GRATED INLET PIT	600x600	CLASS B	-
05\01	80.36	79.53	0.83	2.4m KERB INLET PIT	900x450	CLASS D	-
06\01	80.00	79.17	0.83	2.4m KERB INLET PIT	900x450	CLASS D	-
07\01	79.31	78.48	0.83	2.4m KERB INLET PIT	900x450	CLASS D	-
07\02	79.14	78.34	0.80	2.4m KERB INLET PIT	900x450	CLASS D	-
07\03	79.20	78.11	1.09	GRATED INLET PIT	900x900	CLASS B	-
07\04	78.09	77.27	0.82	GRATED INLET PIT	600x600	CLASS B	FIT WITH 1x OCEANPROTECT BASKET INSET
08\01	77.93	77.33	0.60	GRATED INLET PIT	450x450	CLASS B	-

Key Plan: (NTS)

Issued/Revision	By	Appd	YYYY.MM.DD
G ISSUED FOR REF	HAL	AT	2025.01.17
F ISSUED FOR DA	LPT	JMB	2024.06.06
E ISSUED FOR DA	LPT	VE	2024.05.21
D ISSUED FOR DA	LPT	JMB	2024.03.18
C ISSUED FOR DA	LPT	JMB	2024.03.08
B ISSUED FOR DA	LPT	JMB	2024.02.23
A 95% SCHEMATIC DESIGN	LPT	JMB	2024.02.02

Issue Status

PRELIMINARY

NOT FOR CONSTRUCTION

This document is suitable only for the purpose noted above.
Use of this document for any other purpose is not permitted.

Colour Disclaimer
This drawing has been documented in colour. This drawing is required to be printed in colour. Failure to do so may result inloss of information. Black and white printing may be used if specific black and white documents have been obtained from Stantec.

Notes

Stantec

Stantec Australia Pty. Ltd.
Level 6, Building B
207 Pacific Highway
St Leonards, NSW 2065
Tel: +61 2 8484 7000

Client/Project Logo

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AUSTRAL PUBLIC SCHOOL UPGRADE

205 EDMONDSON AVENUE, AUSTRAL, NSW 2179

File Name: 304000720-CI-1-527-001.DWG	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD
	-	-	-	2024.02.02

Title
STORMWATER PIT SCHEDULE

Project No.
304000720

Scale
NTS

Revision
G

Drawing No.
CI-1-527-001

Plotted: 3/02/2025 3:06:18 PM By: JAL, HARSHIL
\\AUSD1-FP1\MPL_CPP\SHARED_PROJECTS\304000720\PROJECT DOCUMENTATION\CIVIL\DRAWINGS & DESIGN\SHEET SETS\TG1

ORIGINAL SHEET - ISO A1 COORD - MGA/YY-Zone DATUM - mAHD

Appendix B MUSIC-LINK

MUSIC-*link* Report

Project Details		Company Details	
Project:	Austral Public School	**Company:**	Stantec
Report Export Date:	18-Mar-24	**Contact:**	Lauren Todd
Catchment Name:	Austral MUSIC Model REV c	**Address:**	Level 9, The Forum, 203 Pacific Highway Sydney NSW 2065 AUSTRALIA
Catchment Area:	1.525ha	**Phone:**	
Impervious Area*:	25.86%	**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

Node: Post-Development Node	Reduction
Flow	5.07%
TSS	82.3%
TP	69.4%
TN	49.7%
GP	100%

Treatment Nodes

Node Type	Number
Rain Water Tank Node	1
Sedimentation Basin Node	2
Swale Node	1
Generic Node	2
GPT Node	2

Source Nodes

Node Type	Number
Urban Source Node	4

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	1 x OceanGuard	Hi-flow bypass rate (cum/sec)	None	99	0.02
GPT	1 x OceanGuard	Hi-flow bypass rate (cum/sec)	None	99	0.02
Post	Post-Development Node	% Load Reduction	None	None	5.07
Post	Post-Development Node	GP % Load Reduction	90	None	100
Post	Post-Development Node	TN % Load Reduction	45	None	49.7
Post	Post-Development Node	TP % Load Reduction	65	None	69.4
Rain	Rainwater Tank 10kL	% Reuse Demand Met	None	None	5.508
Sedimentation	SF Chamber (15sq.m)	% Reuse Demand Met	None	None	0
Sedimentation	SF Chamber (15sq.m)	% Reuse Demand Met	None	None	0
Sedimentation	SF Chamber (15sq.m)	High Flow Bypass Out (ML/yr)	None	None	0
Sedimentation	SF Chamber (15sq.m)	High Flow Bypass Out (ML/yr)	None	None	0
Swale	Swale	Bed slope	0.01	0.05	0.01
Urban	Bypass Area (0.3785Ha)- 85% Perv	Area Impervious (ha)	None	None	0.058
Urban	Bypass Area (0.3785Ha)- 85% Perv	Area Pervious (ha)	None	None	0.320
Urban	Bypass Area (0.3785Ha)- 85% Perv	Total Area (ha)	None	None	0.379
Urban	Ground Area to OSD 1 (0.797Ha)- 88% Perv	Area Impervious (ha)	None	None	0.095
Urban	Ground Area to OSD 1 (0.797Ha)- 88% Perv	Area Pervious (ha)	None	None	0.701
Urban	Ground Area to OSD 1 (0.797Ha)- 88% Perv	Total Area (ha)	None	None	0.797
Urban	Ground Area to OSD 2 (0.2514Ha)- 57% Imperv	Area Impervious (ha)	None	None	0.143
Urban	Ground Area to OSD 2 (0.2514Ha)- 57% Imperv	Area Pervious (ha)	None	None	0.107
Urban	Ground Area to OSD 2 (0.2514Ha)- 57% Imperv	Total Area (ha)	None	None	0.251
Urban	Roof Area to OSD (0.0983Ha)- 100% Imperv	Area Impervious (ha)	None	None	0.098
Urban	Roof Area to OSD (0.0983Ha)- 100% Imperv	Area Pervious (ha)	None	None	0
Urban	Roof Area to OSD (0.0983Ha)- 100% Imperv	Total Area (ha)	None	None	0.098

Only certain parameters are reported when they pass validation

Failing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Post	Post-Development Node	TSS % Load Reduction	85	None	82.3
Sedimentation	SF Chamber (15sq.m)	Notional Detention Time (hrs)	8	12	0.677
Sedimentation	SF Chamber (15sq.m)	Notional Detention Time (hrs)	8	12	0.525
Sedimentation	SF Chamber (15sq.m)	Total Nitrogen - k (m/yr)	500	500	1
Sedimentation	SF Chamber (15sq.m)	Total Nitrogen - k (m/yr)	500	500	1
Sedimentation	SF Chamber (15sq.m)	Total Phosphorus - k (m/yr)	6000	6000	1
Sedimentation	SF Chamber (15sq.m)	Total Phosphorus - k (m/yr)	6000	6000	1
Sedimentation	SF Chamber (15sq.m)	Total Suspended Solids - k (m/yr)	8000	8000	1
Sedimentation	SF Chamber (15sq.m)	Total Suspended Solids - k (m/yr)	8000	8000	1
Urban	Roof Area to OSD (0.0983Ha)- 100% Imperv	Baseflow Total Phosphorus Standard Deviation (log mg/L)	0.19	0.19	0

Only certain parameters are reported when they pass validation

Appendix C Council Correspondence

From: Straney, Ryan
Sent: Tuesday, 20 February 2024 4:35 PM
To: Todd, Lauren
Subject: FW: PL-4/2024 - Austral Public School (205 Edmondson Avenue, Austral) - Flood levels

FYI

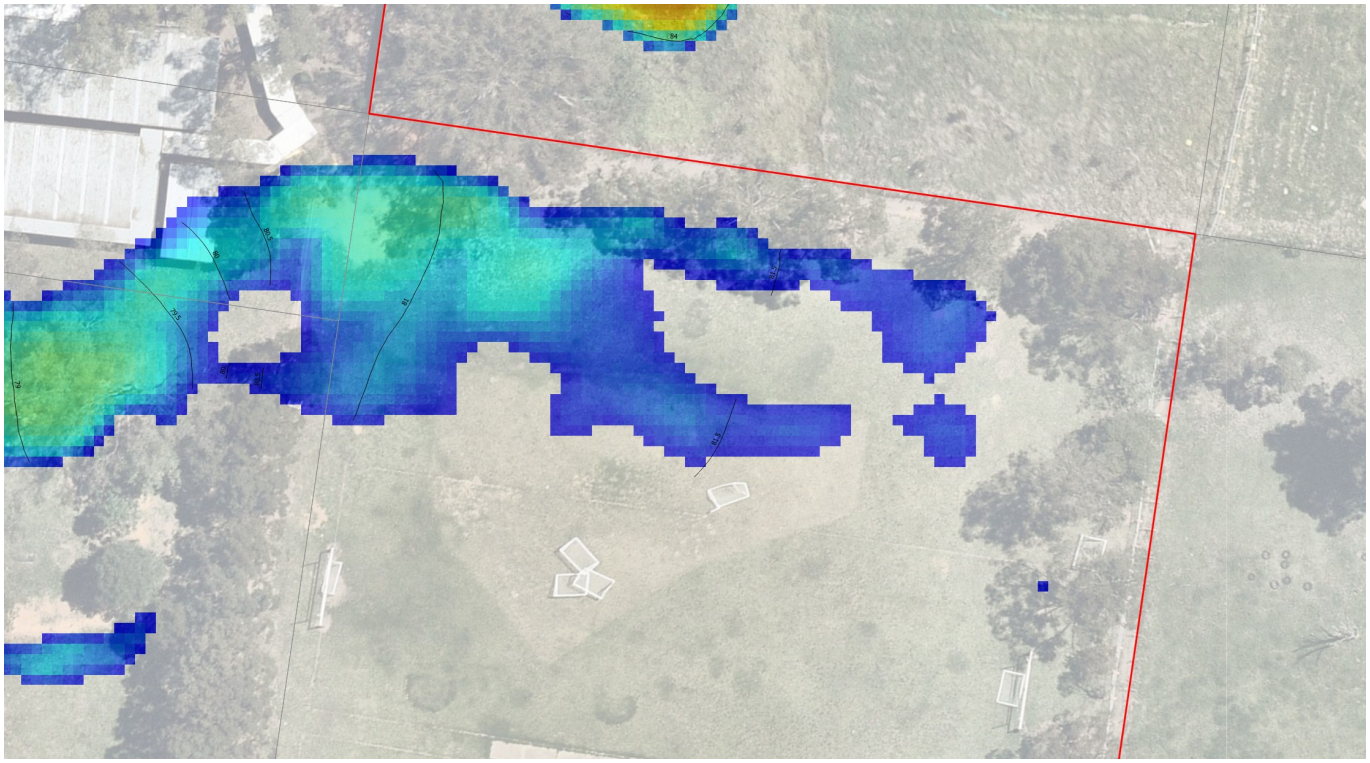
From: Zeaul Hoque <HoqueZ@liverpool.nsw.gov.au>
Sent: Monday, February 19, 2024 11:59 AM
To: Rocco Bombardiere <Rocco.Bombardiere@ctpg.com.au>
Cc: Nicholas Beck <BeckN@liverpool.nsw.gov.au>; Straney, Ryan <Ryan.Straney@stantec.com>
Subject: RE: PL-4/2024 - Austral Public School (205 Edmondson Avenue, Austral) - Flood levels

> You don't often get email from hoquez@liverpool.nsw.gov.au. Learn why this is important

Hi Rocco

The 1% AEP flood levels at the proposed building site vary between 81-81.5m AHD (please see the zoomed map below). So, the proposed building FFL at 82m AHD satisfies the DCP requirement.

1% AEP flood map:



Kind Regards

Zeaul Hoque
Floodplain Engineer

LIVERPOOL CITY COUNCIL

02 8711 7747 | | HoqueZ@liverpool.nsw.gov.au
Customer Service: 1300 36 2170 | 3 Hoxton Park Road Liverpool, NSW 2170, Australia
www.liverpool.nsw.gov.au

We acknowledge the traditional custodians of the land that now resides within Liverpool City Council's boundaries, the Darug and Dharawal nations and pay our respects to their Elders past, present and emerging.

From: Rocco Bombardiere <Rocco.Bombardiere@ctpg.com.au>
Sent: Friday, February 16, 2024 5:08 PM
To: Zeaul Hoque <HoqueZ@liverpool.nsw.gov.au>
Cc: Nicholas Beck <BeckN@liverpool.nsw.gov.au>; Straney, Ryan <Ryan.Straney@stantec.com>
Subject: RE: PL-4/2024 - Austral Public School (205 Edmondson Avenue, Austral) - Flood levels

Thanks Zeaul,

Our Civil consultant Stantec has requested the below. Are you able to assist please.

Is there an interactive version of the 1% AEP flood mapping or a data sheet that references the specific flood level in this location. It is unclear from the attached images if the 1% AEP level is 81m, 81.5m or 82m. From my reading of the image the flood levels are between 81-81.5m which would ensure the required 500mm freeboard from the FFL stated in the Liverpool Council DCP.

Kind regards

Rocco

Rocco Bombardiere
Associate Director

ctpg

Carmichael Tompkins Property Group
Suite 9.03, Level 9 Aurora Place, 88 Phillip Street, Sydney NSW 2000
T: +61 (0)2 9160 6305
M: +61 (0)438 678 912
E: rocco.bombardiere@ctpg.com.au
www.ctpg.com.au

Sydney | Melbourne

From: Zeaul Hoque <HoqueZ@liverpool.nsw.gov.au>
Sent: Wednesday, February 14, 2024 3:16 PM
To: Rocco Bombardiere <Rocco.Bombardiere@ctpg.com.au>
Cc: Nicholas Beck <BeckN@liverpool.nsw.gov.au>
Subject: PL-4/2024 - Austral Public School (205 Edmondson Avenue, Austral) - Flood levels

Hi Rocco

As a follow-up of today's Pre-DA meeting, please find attached flood levels (obtained from Council's overland flood study) for the subject site. Please confirm if you have received the flood maps.

Kind Regards

Zeaul Hoque
Floodplain Engineer

LIVERPOOL CITY COUNCIL

02 8711 7747 | | HoqueZ@liverpool.nsw.gov.au
Customer Service: 1300 36 2170 | 3 Hoxton Park Road Liverpool, NSW 2170, Australia
www.liverpool.nsw.gov.au

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Appendix D Flood Impact Assessment

Design with
community in mind

Level 9, The Forum
203 Pacific Highway
St Leonards NSW 2065
Tel +61 2 8484 7000

For more information please visit
www.stantec.com

Stantec