

Civil Engineering Design Report

Upgrade to Dundas Public School

Revision B

SINSW Group 2
Project Reference: 132564

January 2025

Prepared For:

School Infrastructure NSW (SINSW) & Department of Education (DoE)

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REV	ISSUE/AMENDMENT	WRITTEN BY	REVIEWED BY	DATE
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1 Introduction

1.1 Proponent

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

1.2 Landowner

The Minister for Education and Early Learning is the landowner.

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

The purpose of the REF is to assess the potential environmental impacts of the activity prescribed by State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP) as “development permitted without consent” on land carried out by or on behalf of a public authority under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The activity is to be undertaken pursuant to Chapter 3, Part 3.4, Section 3.37 of the T&I SEPP and in consideration of the stakeholder and community participation plan.

The proposed activity is for upgrades to the existing DPS at 85 Kissing Point Road, Dundas NSW 2117 (the site).

The purpose of this report is to provide information on how the new proposed upgrade will affect stormwater run-off and to demonstrate the measures that have been taken to minimise the impact on the surrounding buildings.

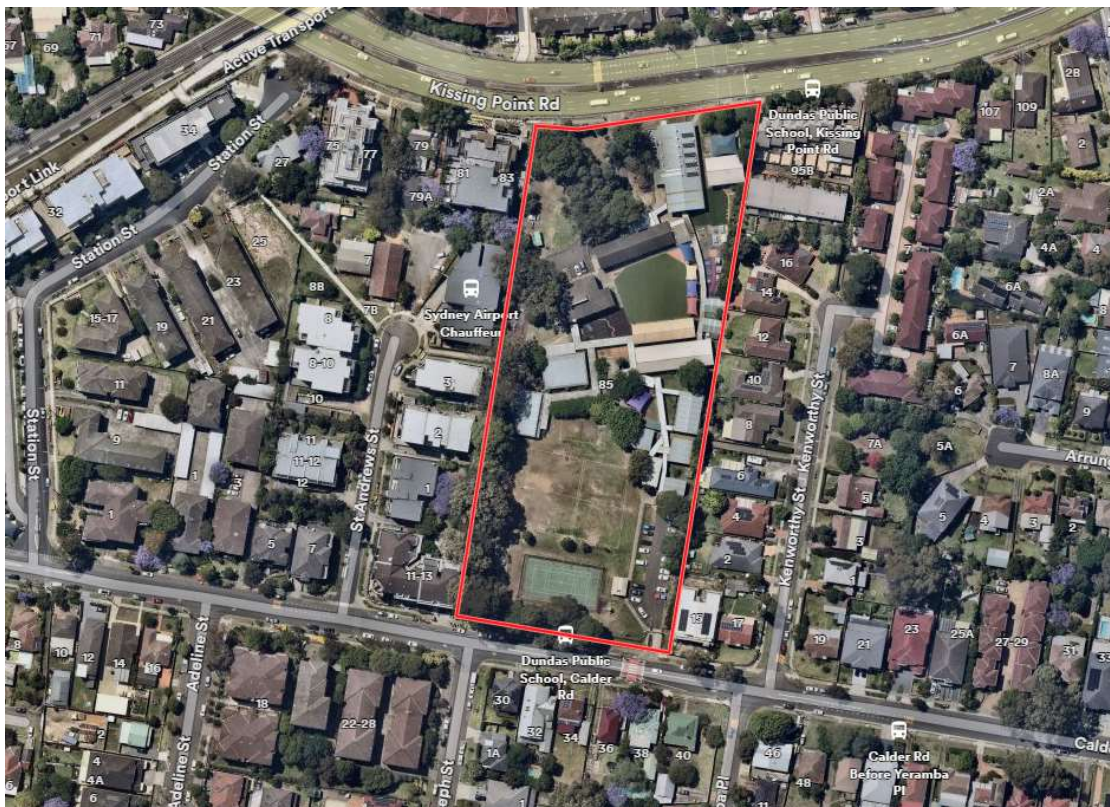


Figure 1-1: Aerial image of the site, outlined in red (Source: NearMap, taken 30 October 2024)

2 Site Description

2.1 Existing Site Description

DPS is located at 85 Kissing Point Road, Dundas. The school site is bound by Kissing Point Road to the north and Calder Road to the south. Kenworthy Street is located parallel to the site to the east as is Saint Andrews Street to the west. The site has an area of 1.99 ha and comprises 1 allotment legally known as Lot 3 DP 610.

The site currently comprises an existing co-education primary (K-6) public school with 9 permanent buildings, 6 demountable structures (1 demountable includes 2 classrooms), interconnected covered walkways, play areas, on-grade parking, sports court and green spaces with mature trees.

Majority of the buildings are 1 storey with only one 2-storey building being Building A (Admin/staff hub and amenities building). Buildings are clustered to the north of the site, with the southern part comprising of a large play area/informal sports oval and a sports court.

The general topography of the site falls in two directions. One is falling to an approximate 5% grade towards Kissing Point Road while the other one, where the new development activity sits, is falling at approximately 2.5% grade towards Calder Road.

2.2 Proposed Activity Description

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

- Creation of 6 new teaching spaces and 2 learning commons in a single-story building
- Installation of covered walkways connecting the new building to the existing school network
- Landscaping and external works around the new building and eastern entry
- Upgrades to site infrastructure and services to support the new building.

The intent of the activity is to increase the number of permanent teaching spaces (PTS) from 9 to 15 and students from 331 to 391.

Figure 2-1 below show the scope of works for the proposed activity.

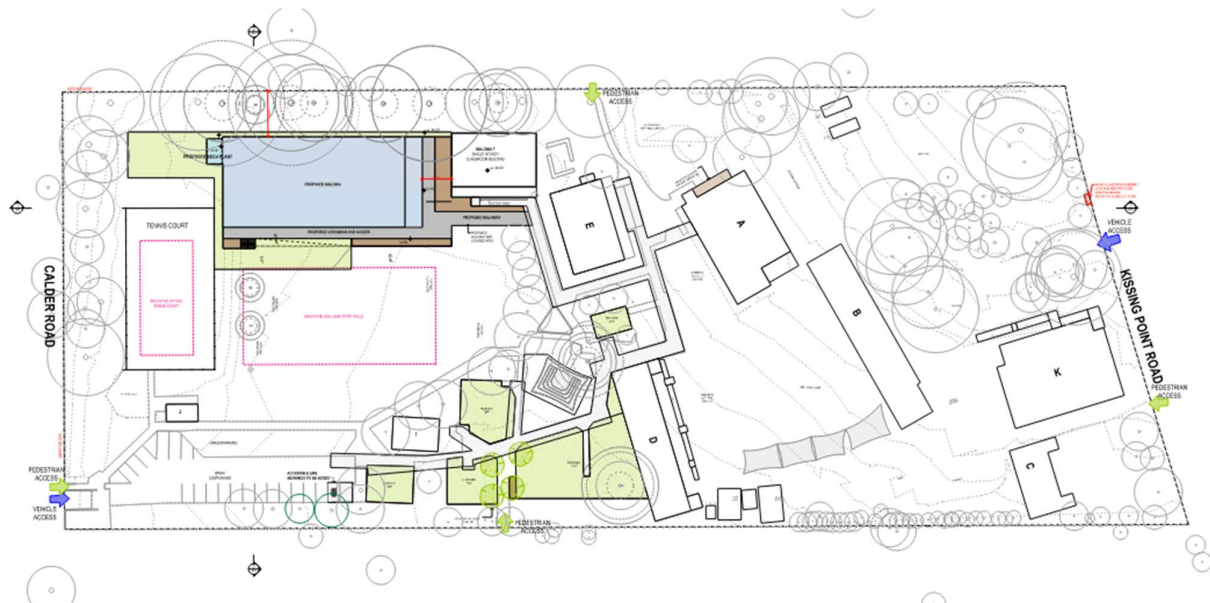


Figure 2-1: Proposed Scope of Works – (Source: Fulton Trotter Architects, Proposed Site Plan (Rev 04))

2.3 Existing Flooding Conditions

Dundas PS proposed building site is unaffected by flooding in 1% AEP event and PMF event from either mainstream or local overland sources and is consequently situated outside the Flood Risk Precincts. As a result, no flood controls will apply to the proposed development activity. Refer to the figure below for the existing flood extent of the area.

Due to the increase in the impervious area of the proposed buildings, an OSD Tank is required.



Figure 10: Flood depths around Dundas Public School in the PMF event (adapted from the Parramatta River Flood Study, 2024)

Figure 2-2: PMF flood depths surrounding DPS (Source: Stantec Report)

3 Proposed Development Activity

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

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- Installation of covered walkways connecting the new building to the existing school network
- Landscaping and external works around the new building and eastern entry
- Upgrades to site infrastructure and services to support the new building.

Refer to the figure below for the proposed Schematic Plan for Dundas Public School by Fulton Trotter Architects.

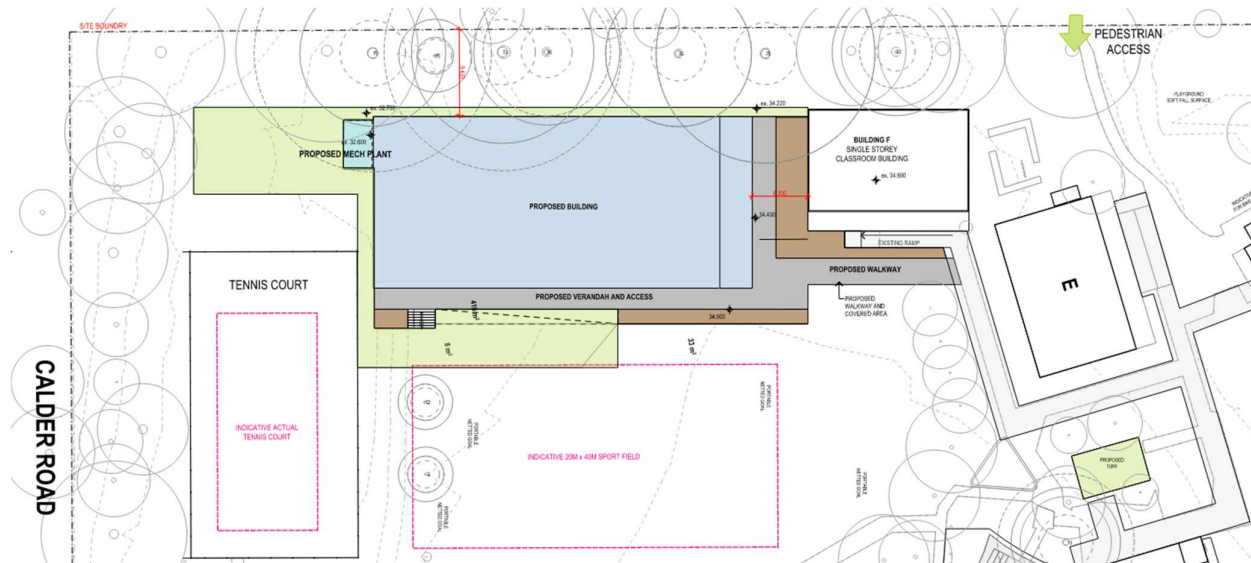


Figure 3-1: Proposed 100% Schematic Plan for Dundas Public School – Fulton Trotter Architects

3.1 Earthworks

The earthwork quantities associated with the proposed development activity are provided in the figures below:

- Cut – 175 m³
- Fill – 9 m³

The majority of the earthworks involve cut and will require export of approximately 166 m³ of cut material.

3.2 Legal Point of Discharge (LPoD)

The stormwater layouts presented above have identified one existing stormwater discharge location along Calder Road via kerb adaptors as per the current site discharge.

Refer to Appendix A for the Stormwater Layout plan for the proposed development activity.

3.3 Stormwater Drainage Strategy

In support of the proposed development activity, additional stormwater drainage will be required to convey generated stormwater from the new impervious and adjoining pervious areas into the existing stormwater drainage network.

Meinhardt's preliminary recommendation is that detention storage of approx. 57 m³ be provided. This is to ensure peak discharge flows draining from the proposed development activity can be managed by the downstream drainage systems from the developed site. A permissible site discharge will be determined using DRAINS modelling.

A summary of the schematic stormwater drainage design is presented in the image below.

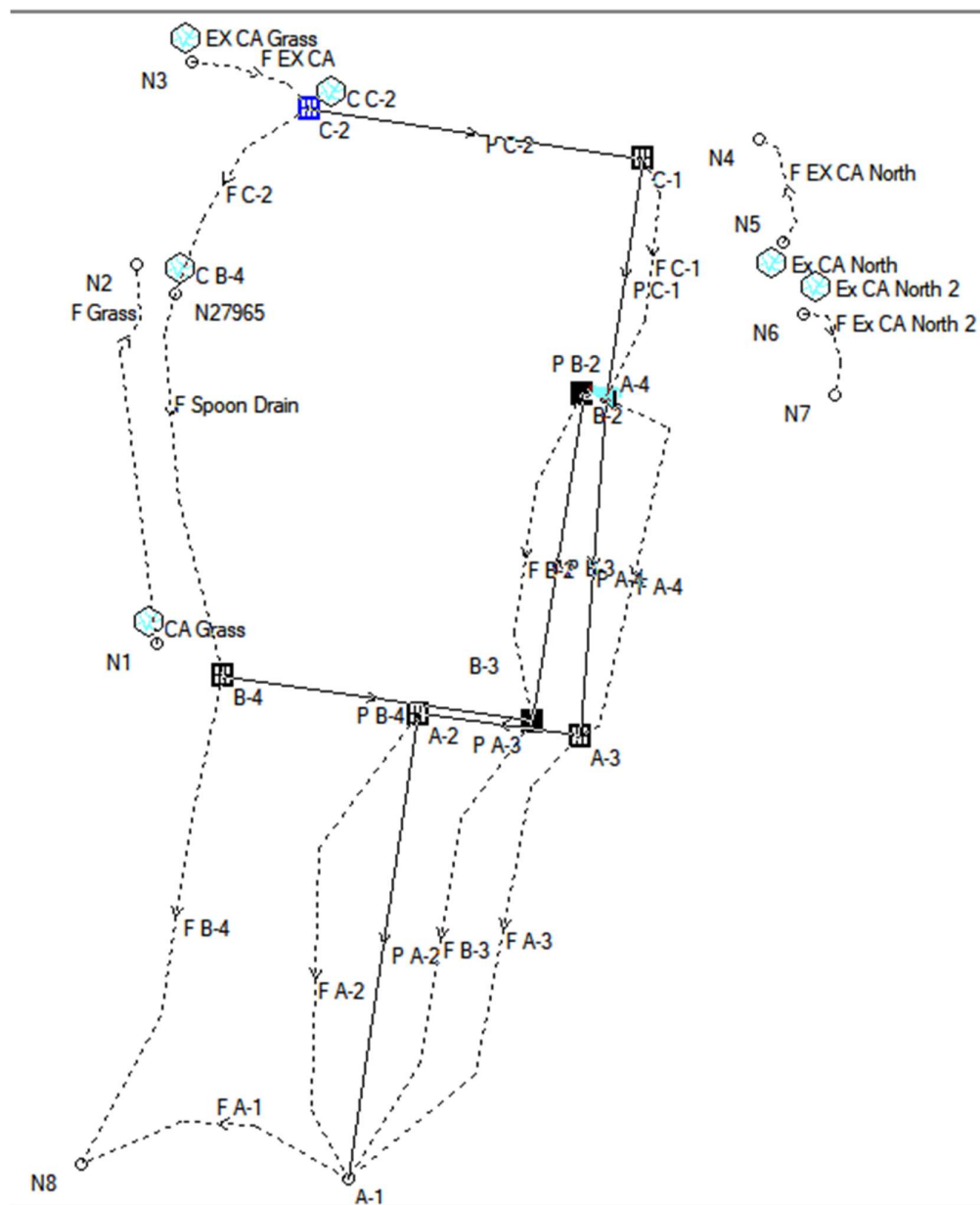


Figure 3-2: Site Preliminary DRAINS Layout

3.4 Stormwater Quantity Management

The stormwater quantity analysis of the existing and developed site conditions has been undertaken with reference to the requirements and procedure outlined by:

- Development Engineering Design Guidelines, City of Parramatta
- Australian Rainfall and Run-off Volumes 1 & 2 (Aust R&R)

The following section of the report discusses the proposed development activity's impact on peak stormwater run-off from the site and compares the existing site condition to ensure a no worsening effect to downstream properties.

The hydrological model adopted was the Extended Rational Method with hyetograph input as specified in Australian Rainfall and Run-off (AR&R) Volumes 1 and 2.

The following design parameters were used in the stormwater drainage calculations:

- Design storm is 1 in 100-year ARI as per Engineer Design Guidelines 2018 final V2, Chapter 5.1.
- The Major storm considered is 1 in 100 ARI.
- Rainfall data is from BOM.
- Site area ± 0.1089ha 100% impervious

3.4.1 Existing Catchment

Catchment Area

The existing area where the proposed building will be constructed is an open space with 100% pervious percentage.

The existing area of approximately 0.1089 ha which is mostly draining towards south at an average grade of approximately 2.5% and has a pervious factor of 100%. No existing stormwater system is present within the area to be developed.

3.4.2 Stormwater Compliance

The developed site catchment is summarised below:

- Area – 0.1089 Ha
- Total time of concentration (t_c) – 5 and 7 minutes
- Percent Impervious – 100%

This site is governed by the following two documents:

- Engineer Design Guidelines, June 2018
- On-site Stormwater Detention Handbook, 4th Edition

Tailwater level is set to top of kerb as stated in Engineer Design Guidelines, June 2018

Storm Event	Tailwater Level Assumptions
100yr	30.16
50yr	30.16
20yr	30.16
10yr	30.16
5yr	30.16
2yr	30.16

Table 1 – Assumed Tailwater Levels

3.4.3 DRAINS Configuration

The DRAINS Program was used in modelling the various stages of the project, i.e., pre-development, post-development and mitigated flows required not to impact surrounding areas with the proposed development activity.

Please refer to the figure below for the DRAINS Configuration.

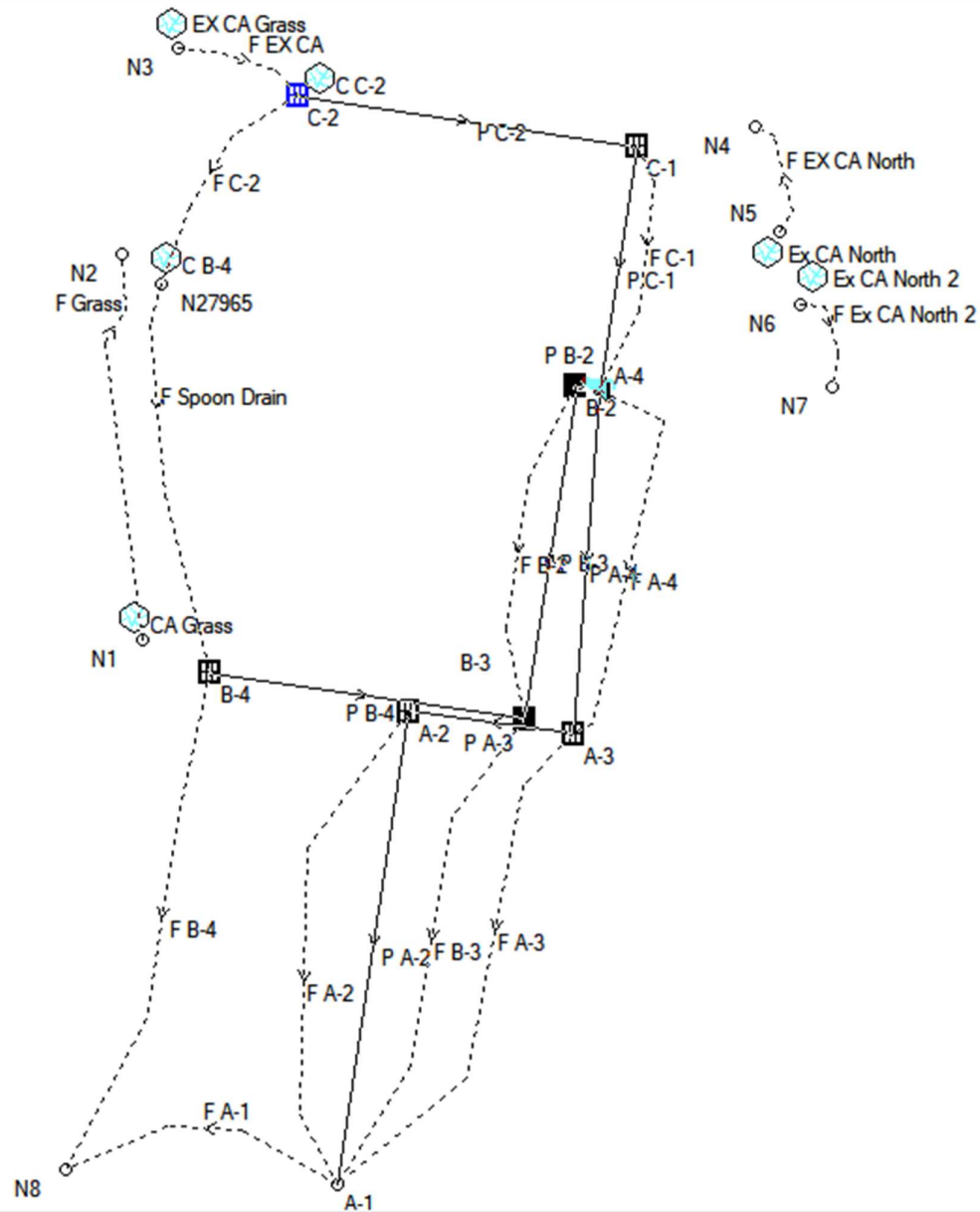


Figure 3-3: DRAINS Configuration - Developed Site

3.4.4 Stormwater Quantity Comparison

Peak flow rates from the developed site were determined by modelling various storm durations for each ARI storm. The Permissible Site Discharge and Post-Developed flows are also provided are outlined in the table below:

ARI Storm Event	Permissible Site Discharge (PSD) Rate (L/s)	Mitigated Flow (L/s)
Q ₂	14	9
Q ₅	14	10
Q ₁₀	14	11
Q ₂₀	14	12
Q ₅₀	14	13
Q ₁₀₀	14	15

Table 2 – PSD and Mitigated Flows

As shown in Table 4, the peak flow rate of stormwater run-off has decreased through the formalised stormwater system and mitigation measures as discussed below, except for the 1:100 year storm event that is just 1l/s over the PSD and deemed to be acceptable.

3.4.5 Stormwater Detention

It is proposed to use an OSD Tank which will assist to mitigate the flows to meet the Permissible Site Discharge Rate. The OSD Tank will need to have a detention storage volume of about 57 cubic meters. This storage volume has now been confirmed by the DRAINS modelling process during schematic design and the larger initial volumes as per the council std for concept design stage is now superseded.

3.5 Stormwater Quality Management Strategy

3.5.1 Operational Phase

The stormwater quality management proposed for this portion of the development are required to achieve the following pollutant load reduction objectives:

The following Greenstar targets

- 80 % reduction in total suspended solids load (TSS)
- 60 % reduction in total phosphorus load (TP)
- 45 % reduction in total nitrogen load (TN)
- 90 % reduction in gross pollutant load

Pollutants typically generated during the operational phase of the development activity include:

- Litter/gross pollutants
- Sediment

- Nutrients (N & P)
- Hydrocarbons (oils and grease); and
- Heavy metals.

In order to meet these pollutant reduction targets; stormwater treatment measures are required. These treatment measures (located on site as indicated in Figure 4 below) are detailed in the attached stormwater layout plan in Appendix C and are summarised as follows:

- Five number of (5) x 690 PSorb Stormfilters or equivalent.

Stormwater modelling has been carried out using MUSIC modelling software to determine the required infrastructure needed to meet the Water Quality Objectives (WQOs) above.

3.5.2 MUSIC Model

MUSIC modelling for this development activity was carried out using the MUSIC program and data collected from Bureau of Meteorology. The developed site catchment details from the MUSIC model are outlined in Table below.

Table 3 - Developed Site MUSIC Catchment Details

Catchment	Area (ha)	% Effective Impervious
Roof Area	0.1089	100 % Impervious
Overall Area [ha]	0.1089	

The layout for the music model, including the treatment train effectiveness is detailed in Figure 4.

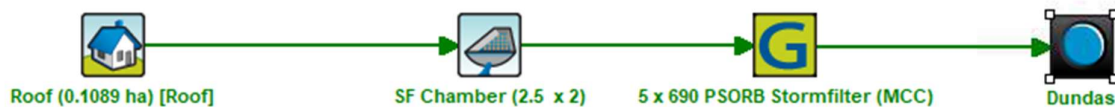
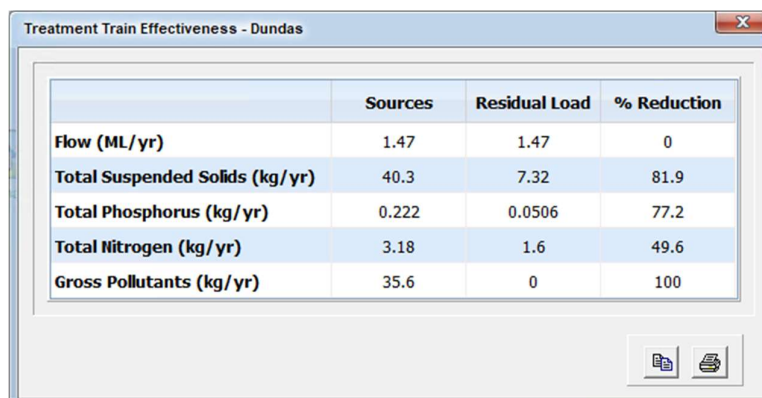


Figure 4 - MUSIC Layout and Treatment Effectiveness for Developed Site

The results are presented below:



	Sources	Residual Load	% Reduction
Flow (ML/yr)	1.47	1.47	0
Total Suspended Solids (kg/yr)	40.3	7.32	81.9
Total Phosphorus (kg/yr)	0.222	0.0506	77.2
Total Nitrogen (kg/yr)	3.18	1.6	49.6
Gross Pollutants (kg/yr)	35.6	0	100

Figure 5 - MUSIC Results for Developed Activity

The developed site treatment train effectiveness is also outlined in the table below.

Table 4 - Treatment train effectiveness

Pollutants	Reduction Targets (%)	Results (%)
	Green Star (B)	Overall
Total Suspended Solids (kg/yr) TSS	80	81.9
Total Phosphorus (kg/yr) TP	60	77.2
Total Nitrogen (kg/yr) TN	45	49.6
Gross Pollutants (kg/yr)	90	100

Based on the MUSIC modelling results in the table above, the proposed treatment train achieves the required pollutant load reduction objectives for all pollutants. The treatment train is considered adequate for the development activity including compliance with Greenstar (B).

3.6 Construction Phase

Pollutants typically generated during construction phase are described in Table 5 below.

Table 5 - Pollutants typically generated during the construction phase

Pollutant	Sources
Litter (Gross Pollutants)	Paper, construction packaging, food packaging, cement bags.
Sediment	Unprotected exposed soils and stockpiles during earthworks and building.
Hydrocarbons	Fuel and oil spills, leaks from construction equipment.
Toxic materials	Cement slurry, asphalt prime, solvents, cleaning agents, wash waters.
pH altering substances	Acid sulphate soils, cement slurry and wash waters.

4 Erosion and Sediment Control

Management of stormwater run-off during construction is necessary to avoid pollution of downstream waterways from sediment and gross pollutant loading.

Please refer to Appendix B for the initial Erosion and Sediment Control Plan. This plan will be used as a live document as construction progress on site by the contractor.

Impacts of inadequate erosion and sediment control downstream from the site include:

- traffic safety problems;
- blocked drains;
- local flooding problems;
- aesthetic pollution of drainage paths; and
- damage to local ecosystems.

Best practice erosion and sediment controls must be installed to minimise the discharge of sediment laden run-off during construction. Erosion and sediment control plans shall be developed during detailed design phase and must be continually maintained and amended as required to minimise environmental harm.

Erosion and sediment control plans are based on three sets of control measures:

- drainage control;
- erosion control; and
- sediment control.

These control measures must be maintained in an effective operational condition. Sediment disposal from site is to occur to the satisfaction of council. Defects in erosion and sediment control devices, such as sediment fences, are to be inspected and documented. Upon Inspection, the Contractor is to determine whether the device should be replaced or repaired. Documentation is to include how the damage was caused and what measures can be implemented to reduce the possibility of repeat occurrences. Any damage to either permanent or temporary water quality control structures or devices is to be immediately rectified at the contractor's expense.

Other measures include, but is not limited to the following:

- Temporary access to site with shaker pad
- An indicative stockpile area with sediment fence around it during construction.
- Geotextile inlet pit filters or sandbags to be placed around existing stormwater pits.

The design of these measures is to be in accordance with the Landcom "Blue Book".

The effectiveness of the erosion and sediment control devices can be monitored by visual audits. All ESC measures are to be inspected:

- at least daily (when work is occurring on site) or weekly (when work is not occurring on site);
- within 24 hours of expected rain; and
- within 18 hours of a rainfall event (i.e. an event of sufficient intensity and duration to mobilise sediment on site).

Drainage paths are to be inspected to ensure the sediment fences are not being bypassed as a result of soil erosion.

Sediment laden run-off shall be prevented from entering neighbouring properties. This shall be achieved by landscaping disturbed areas immediately after and prior to a rainfall event.

5 Maintenance and Monitoring Requirements

Periodic maintenance and monitoring of stormwater devices proposed in this report is crucial to ensure effective operation and design life.

Inspect field inlet grates, pits and underground pipes for blockage or damage at least 6 monthly or after significant rainfall event. The gross pollutant filter baskets within inlet pits and bioretention basin shall be inspected and maintained preferably by the manufacturer to avoid damage to units and to ensure adequate cleaning and record keeping. For the first 12 months routine inspections of treatment devices shall be carried out monthly with routine clean out at alternate months. Results of the initial 12 months maintenance program shall be used to determine future maintenance intervals. Refer to manufactures maintenance and monitoring methodology for specific details.

Maintenance of ESC measures must occur in accordance with Table 7 where applicable.

Table 6 - ESC Maintenance Requirements

ESC Measure	Maintenance Trigger	Timeframe for Completion of Maintenance
Sediment basins (where applicable)	When settled sediment exceeds the volume of the sediment storage zone	Within 7 days of the inspection.
Other ESC measures	The capacity of ESC measures falls below 75%.	By the end of the day.

Sediment accumulation on ESC devices is to be removed and disposed of to the satisfaction of Council.

6 Mitigation Measures

Mitigation measures are required for a Review of Environmental Factors (REF) and are actions or measures to avoid, minimise, rectify (by repairing, rehabilitating or restoring) and/or reduce or eliminate over time (by preservation and maintenance) the adverse environmental impacts of a Division 5.1 Activity under the EP&A Act.

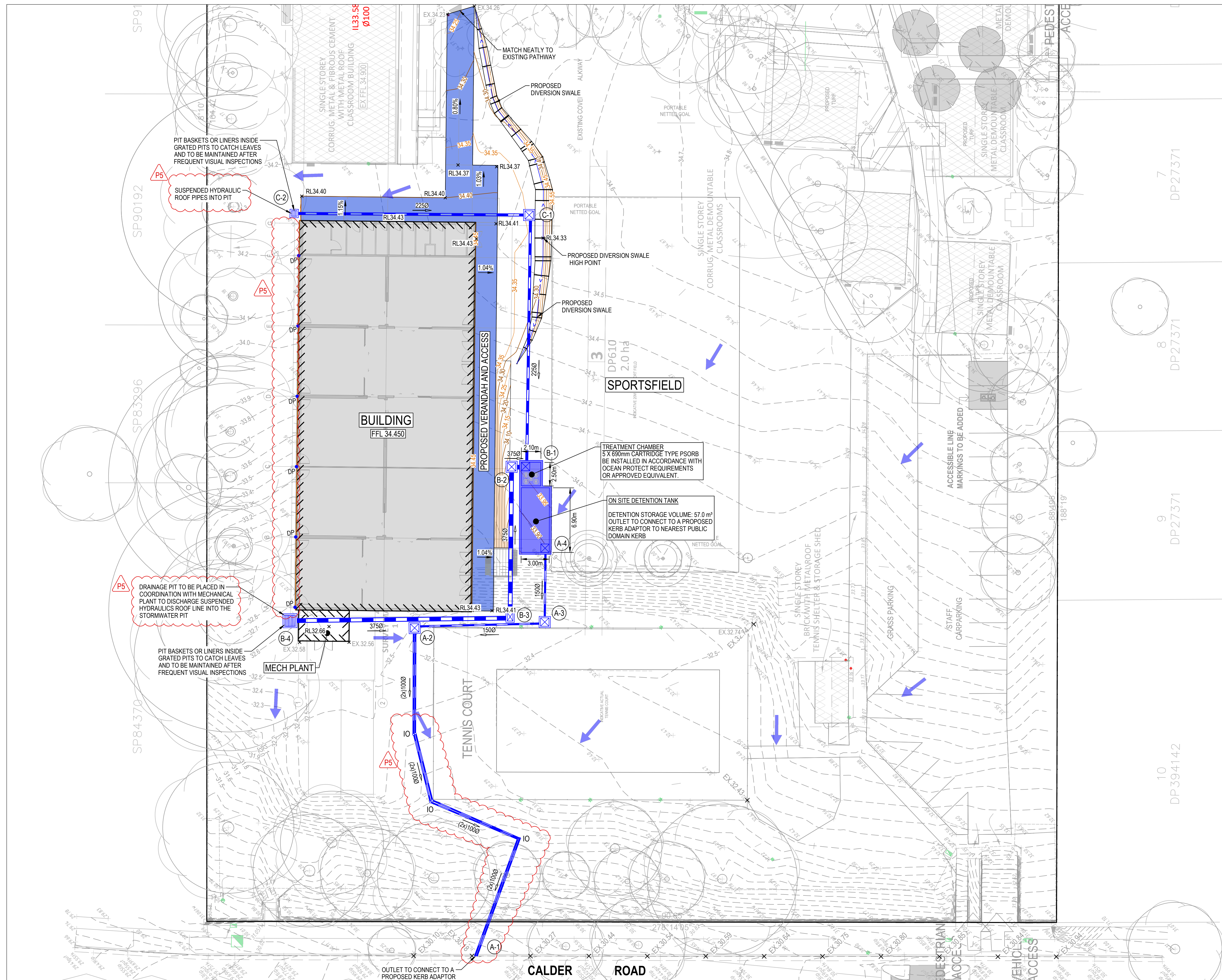
The following mitigation measures discussed throughout this report are summarised as follows:

Mitigation Number/Name	Aspect/Section	Mitigation Measure	Reason for Mitigation Measure
Stormwater Quality Management	Section 3.5	Stormwater runoffs generated by the proposed development activity will be collected thru the proposed drainage system and will then be treated in a chamber with 5-units of 690 PSorb Stormfilters or equivalent.	The proposed development activity generated an increased in pollutants, so it is required to reduce them to meet Greenstar B Pollutant Load reduction targets before the stormwater runoff leaves the property.
Stormwater Quantity Management	Section 3.4	The proposed development activity flow rate is mitigated thru implementing the use of On-site Detention Tank.	The Parramatta Council requires a Permissible Site Discharge for new/additional developments, and it is specified in On-Site Stormwater Detention Handbook, Appendix Q. Therefore, the use of OSD is required to temporarily detain stormwater runoff and limit the discharge flow rate leaving the site.
Erosion and Sediment Control	Section 4	Construction pollutants will be mitigated by installing erosion and sediment control devices such as hay bales, sediment fences and geotextile pit filters in the site.	It is necessary to manage stormwater runoff during construction to avoid pollution of downstream waterways from sediment and gross pollutant loading.
Overland Flow Management	Appendix A (Civil Siteworks) Stormwater Surface Flows	The whole site is assessed to identify the runoff flow directions during minor and major storm events. Stormwater runoff will be collected through a pit and pipe drainage system and will be mitigated by using OSD Tank. External catchment flows will be diverted by a diversion channel and will not be catered for by the proposed development activity's piped system.	The proposed development activity requires design and diversion of surface flows to keep water away from the building.

Appendix A:

Civil Siteworks Plan, and

Erosion and Sediment Control Plan



LEGEND	
ITEM	DESCRIPTION
156.6	EXISTING SURFACE CONTOURS
156.6	PROPOSED SURFACE CONTOURS
+156.60	EXISTING SURFACE SPOT LEVELS
+156.600	PROPOSED SURFACE SPOT LEVELS
- - -	TITLE BOUNDARY
RW	PROPOSED RETAINING WALL
EX.D	EXISTING STORMWATER DRAIN
2250	PROPOSED STORMWATER DRAIN AND FLOW DIRECTION
SYNCHONIC CONNECTION (REFER HYDRAULIC ENGINEERS DRG'S)	
AG	PROPOSED 1000 UPVC AGRICULTURAL DRAIN CLASS 400
>	PROPOSED SPOON DRAIN
⊕	EXISTING STORMWATER PIT
⊕	EXISTING STORMWATER PIT TO BE MODIFIED
⊕	PROPOSED STORMWATER PIT
GI	1000 GRATED INLET (UNLESS NOTED OTHERWISE)
DP	DOWNSPIPE
IO	INSPECTION OPENING
TG	TRENCH GRATE
→	OVERLAND FLOW ARROW
	LIGHT DUTY CONCRETE PAVEMENT-PEDESTRIAN
EX.S	EXISTING SEWER
EX.G	EXISTING GAS
EX.W	EXISTING WATER
EX.W(R)	EXISTING RECYCLED WATER
EX.E	EXISTING ELECTRICITY
EX.E OH	EXISTING OVERHEAD ELECTRICITY
EX.E LV	EXISTING LOW VOLTAGE ELECTRICITY
EX.E HV	EXISTING HIGH VOLTAGE ELECTRICITY
EX.T	EXISTING TELECOM CABLE
EX.FD	EXISTING FIBRE OPTIC CABLE
EX.NBN	EXISTING NBN COMMS CABLE
X	EXISTING FEATURES TO BE REMOVED

THESE PLANS ARE BASED UPON THE EXISTING CONDITIONS
SURVEY PREPARED BY SDG PTY LTD, REFERENCE No 9010 REV A
DATED 11 SEPTEMBER 2024.

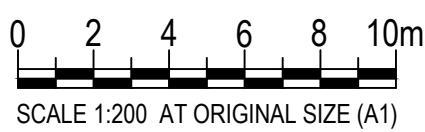
THESE DESIGN PLANS SHALL BE READ IN CONJUNCTION WITH GEOTECHNICAL
REPORT No. A201023.0722.03, A v 1f DATED 28 FEBRUARY 2024 PREPARED BY
ADE CONSULTING GROUP. THE PROVISIONS AND RECOMMENDATIONS
CONTAINED WITHIN THE REPORT ARE TO BE STRICTLY COMPLIED WITH. ALL
COMPACTION REQUIREMENT RESULTS SHALL BE CARRIED OUT IN
ACCORDANCE WITH GEOTECHNICAL REPORT RECOMMENDATIONS.



WARNING
PROPOSED SERVICES
THE LOCATION AND EXTENT OF PROPOSED SERVICES IS INDICATIVE
ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION. REFER TO
AUTHORISED DOCUMENTATION BY RELEVANT AUTHORITY FOR
CONSTRUCTION DETAILS

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE
ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO
GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

REV	DESCRIPTION	BY	DES	CHKD	DATE
P1	ISSUED FOR 75% SCHEMATIC DESIGN	D.J.	M.D.	Y.C.	22.11.24
P2	ISSUED FOR 100% SCHEMATIC DESIGN	D.J.	M.D.	Y.C.	18.12.24
P3	ISSUED FOR 100% SCHEMATIC DESIGN	D.J.	M.D.	Y.C.	13.01.25
P4	FOR COORDINATION	D.J.	M.D.	Y.C.	17.02.25
P5	UPDATE AFTER ARBORIST REVIEW OF TPZ	D.J.	M.D.	Y.C.	19.02.25



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CLIENT



School Infrastructure NSW

TITLE

CIVIL SITeworks PLAN

PROJECT

DUNDAS PUBLIC SCHOOL
85 KISSING POINT ROAD, DUNDAS NSW 2117

STATUS

SCHEMATIC DESIGN
NOT TO BE USED FOR CONSTRUCTION

DRAWN

D.J.

DESIGNED

M.D.

CHECKED

Y.C.

APPROVED

SEPT 2024

DATE

1:200

SCALE @ A1

PROJECT No

132564

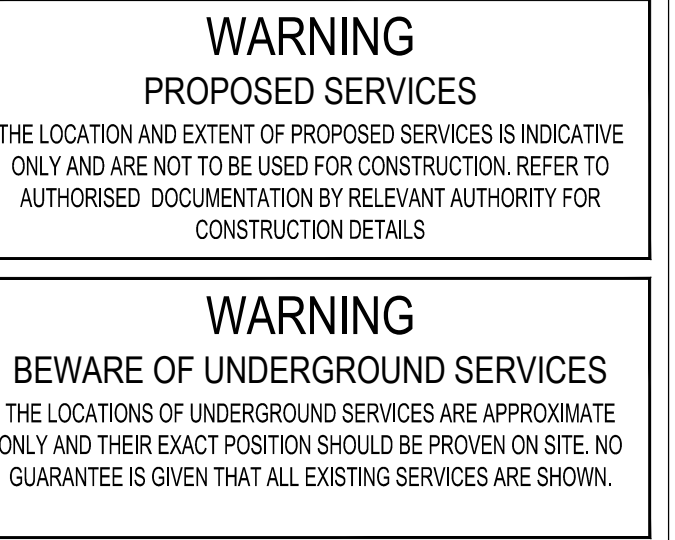
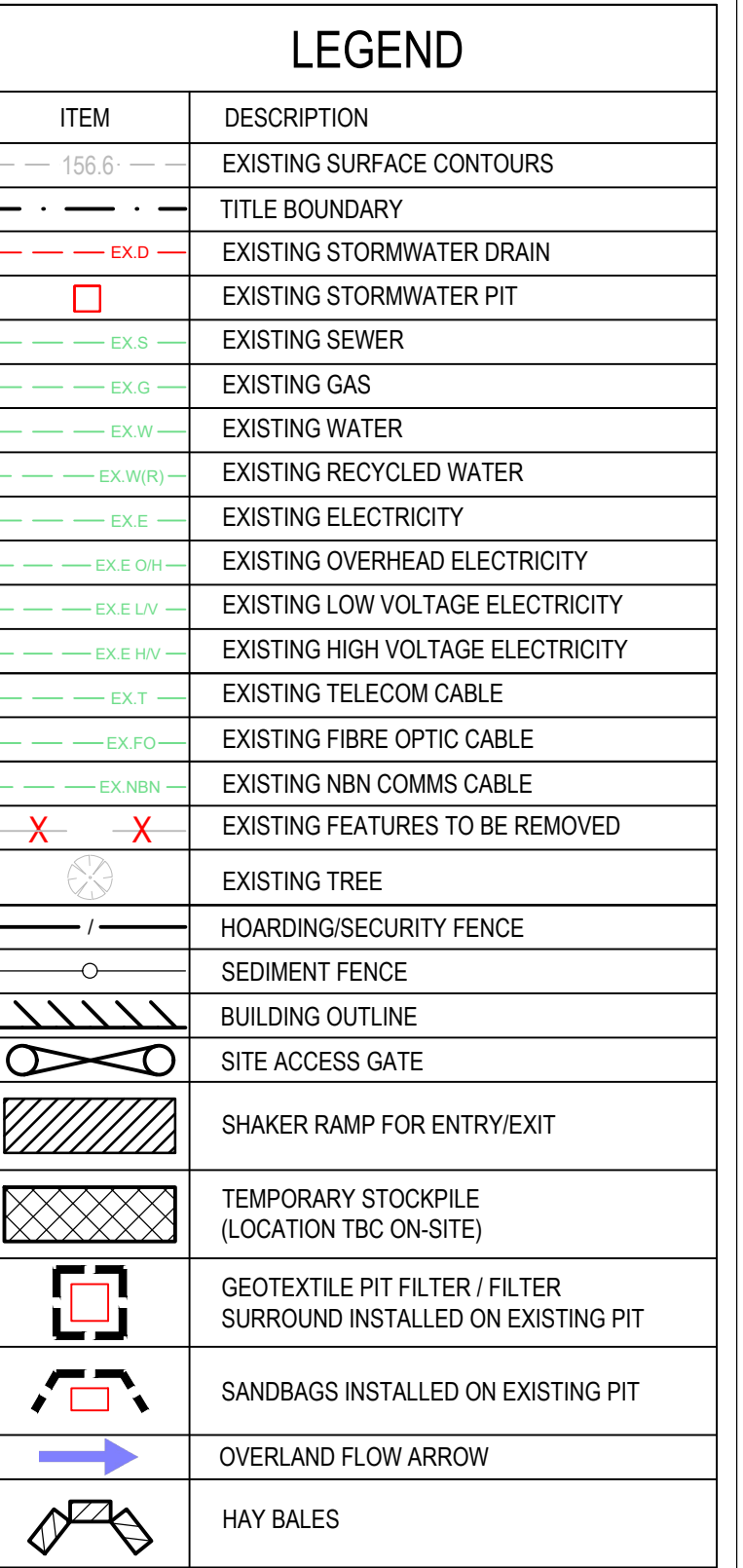
DRAWING No

DUPS-MHT-00-00-DR-C-0101

REV

P5

NSW PLOT TIME: 05:29:2025, 11:32am



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SCALE 1:200 AT ORIGINAL SIZE (A1)

DRAWN D.J	DESIGNED M.D	CHECKED Y.C	APPROVED	DATE SEPT 2024	SCALE @ A1 1:200
PROJECT No 132564		DRAWING No DUPS-MHT-00-00-DR-C-0060			REV P3