88 Waterloo Road, Macquarie Park

Stormwater Management Plan

Prepared For: Cottonwood Development Pty Ltd

Date: January 2026

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Project Ref: 0356

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1 Introduction

This Stormwater Management Report has been prepared by enscape studio to accompany a State Significant Development Application (**SSDA**) and concurrent Rezoning Proposal – SSD-94006708 for a mixed use development identified at 15-21 Cottonwood Crescent, Macquarie Park (the **site**).

The proposal includes provision for the demolition of existing buildings and construction of a residential development comprising two residential flat buildings above a common basement car park / sleaved podium incorporating residential, car parking, and a retail component within the Waterloo Road frontage and provision of 10% affordable housing.

The legal description of the site is outlined in below.

Property Address	Title Description
15 Cottonwood Crescent, Macquarie Park	SP8144
17 Cottonwood Crescent, Macquarie Park	SP7630
19 Cottonwood Crescent, Macquarie Park	SP7892
21 Cottonwood Crescent, Macquarie Park	SP7984

Note: for the purposes of reporting and branding of the proposal, we will also refer to the site as '**88 Waterloo Road, Macquarie Park**'.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (**SEARs**) issued for the project (SSD-94006708).

This SMR outlines the conceptual DA level stormwater design for the proposed development on the site.

This SMR illustrates that the proposed development complies with the Ryde City Council's DCP, Australian Rainfall and Runoff, Australian Standards and best engineering practise.

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

The SMR specifically addresses the following items for both the construction and operational phases of the development:

- Stormwater runoff volumes and detention (Stormwater Quantity);
- Stormwater quality treatment measures (Stormwater Quality),
- Erosion and Sedimentation Control.

This report concludes that the proposed development is suitable and warrants approval subject to the implementation of the following planned management and mitigation measures:

- Implementation of adequate erosion and sedimentation control measures;
- Implementation of adequate measures to control stormwater runoff impacting the development;
- Implementation of adequate stormwater quality control measures.

Following the implementation of the above management measures / mitigation measures, the remaining impacts are considered negligible and appropriate.

2 Existing Site Characteristics

2.1 Property Detail

Address: 15-21 Cottonwood Crescent, Macquarie Park

Total Site Area: 5,130m^2 (0.513Ha)

The proposed development can be seen on the concept design drawings in Appendix A of this report.

The proposed development is situated within the Ryde City Council LGA and will consist of a multi-storey mixed use development over a basement car park.

The site is bounded by:

- Waterloo Road to the north east;
- Cottonwood Crescent to the south east;
- Residential development to the south west and;
- Elouera Reserve to the north west.

Refer to locality plan in figure 1.

Figure 1: Site Location Plan (Source: Nearmaps 2024)

2.2 Topography

The site generally falls from the rear to the front of the site and from the north west of the development to the south east. The rear of the site having a level of approximately RL51.00m AHD whilst the front of the site has a level of RL42.00m AHD.

The site is currently developed with four residential four storey buildings with associated driveways and landscaping.

The cottonwood Crescent street topography falls from south west to north east towards Waterloo Road. The streets longitudinal grade is approximately 4.5%.

2.3 Stormwater Catchments

Two large upstream catchment impact the development site, these are catchments from the Elouera Reserve to the north east and Lachlan Avenue to the west. Further investigation into the impacts of these catchments has been undertaken buy Northrop Consulting Engineers and can be referenced in their Flood Assessment Report for the development.

The upstream catchments impact the northern and western boundary of the site. Measures have been put in place to control these flows as they enter the site and direct them away from the development. These measures are discussed further in future sections of this report.

2.4 Existing Stormwater Discharge

There is currently public in ground drainage infrastructure in both the Waterloo Road and Cottonwood Crescent. The current development discharges to this stormwater network through kerb connector discharge points into the Cottonwood Crescent street gutter, these discharge flow are then directed to the stormwater inlet structures at the Cottonwood Crescent/Waterloo Road intersection as per the existing scenario.

3 Local Authority Requirements

The stormwater requirements of the subject site is governed by the Ryde City Council Stormwater and Floodplain Management Technical Manual. A summary of the key requirements for the development of the Stormwater management system for this development are summarised below.

3.1 Stormwater Conveyance Requirements

Council's manual states that the following design storm Average Recurrence Intervals ARI's should be allowed for when designing the Stormwater runoff conveyance systems for the development.

Table 1: Stormwater Drainage Serviceability

Design Parameter	Design Storm ARI (Years)	Conveyance Method
Minor Drainage System	20	In Ground (Piped)
Major Drainage System	100	Overland

3.2 On Site Detention Requirements

During the preliminary discussions with council on the development council confirmed that if it could be shown that the introduction of on site detention for the development had negligible impact on the downstream stormwater system then there would be an opportunity to remove the requirement for On Site Detention.

3.3 Stormwater Quality Treatment

Council's Development Control Plan identifies the requirements for WSUD required for Council Approval. It states that:

Water quality measures are installed that meet the following environmental targets for stormwater runoff leaving the site:

- 90% removal of gross pollutants (> 5mm);
- 85% removal of total suspended solids;
- 60% removal of total phosphorous; and
- 45% removal of total nitrogen.

Refer to Section 6 of this report for further detail.

4 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 3.1 of this report Council have set minimum design parameters for the flows they require to be conveyed through the in ground drainage system and what they will allow to be conveyed in a controlled manner overland across the site.

4.1 Surface Drainage

The surface areas will be drained through a variety of methods, discussed below, in accordance with AS3500.3:2015 and Council's stormwater drainage guidelines.

4.1.1 In-Ground Drainage

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

- In the minor design storm event (20 year) there will be no surcharging of the in ground drainage system and;
- In the major design storm event (100 year) there will be no uncontrolled discharge from the site onto the residential properties to the east of the site.

Surface runoff from the development sites 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.

The runoff will then be conveyed underground across the site through a pit and pipe system and then to the legal point of discharge using gravity and the geometric falls of the pipe system.

4.2 Upstream Catchments

The upstream catchment discussed in Section 2.3 of this report will be dealt with in the following manner:

- A 500mm high sandstone block levee wall will be constructed along the northern boundary to redirect the flows coming off the Elouera Reserve towards Waterloo Road. The wall has been sized to ensure it has sufficient height to prevent runoff from the reserve entering the development for all events up to and including the PMF. There will be some minor regarding works undertaken within the site boundary to ensure there is positive gravity drainage towards Waterloo Road whilst also minimsing the impacts to existing tree root protection zones. The levee has been proposed as a sandstone wall to minimise the impacts on the natural ground and surrounding tree routes. The wall will be fully pointed to prevent water passing between the joints ion the wall. More detail on the proposed wall can be seen in the enscape studio drawings included in Appendix A of this report.
- The runoff from the Lachlan Avenue catchment will be caught in a grass formed swale along the western boundary of the site and directed towards Cottonwood Crescent. There will also be a flood protection wall installed as part of the development along the basement entry ramp to provide 500mm freeboard protection against the PMF flood event runoff. Again the location and detail of this arrangement can be reviewed in the drawings in Appendix A of this report.

4.3 Legal Point of Discharge

It is proposed that the multiple kerb connection points currently draining the site will be removed and replaced with a single direct connection into the in ground stormwater drainage network at the Cottonwood Crescent/Waterloo Road intersection. The location and detail of this connection can be reviewed in the drawings in Appendix A of this report.

5 Stormwater Attenuation

As noted in Section 3.2 of this report council have confirmed that if it could be proven that the provision of infrastructure to attenuate stormwater flows from the site will have negligible impact on the stormwater conveyance downstream of the development then the requirement for On Site Detention can be removed.

As part of their Flood Impact Assessment works Northrop Consulting Engineers undertook and analysis of the impact of providing On Site Detention for the development and found that the introduction of On Site Detention infrastructure for the development would have very limited impact on the conveyance of stormwater around the site. It is therefore proposed that there will be no On Site Detention for the site.

6 Stormwater Quality

This section of the report demonstrates the Stormwater Quality Improvement Devices (SQID's) to be implemented to reduce the flow of pollutants from the site.

6.1 Potential Pollutants

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

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

These pollutants in urban stormwater can be placed into various categories as follows. The pollutants underlined below are able to be readily modelled:

- 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. Thus reducing the discharge of fine sediment during the construction and operational phases will reduce the discharge of heavy metals to existing stormwater systems.

6.2 Pollutant Reduction System

In order to reduce the pollutants a series of treatment devices are proposed, which together, form a treatment train. The diagram below shows the proposed treatment train for this development.

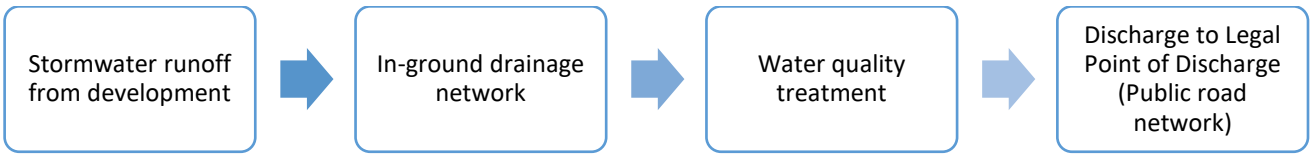


Figure 2: Proposed Water Quality Treatment Train

6.2.1 Stormwater360 Stormfilter Cartridges

The StormFilter stormwater treatment system uses rechargeable, self-cleaning, media-filled cartridges to absorb and retain the most challenging pollutants from stormwater runoff including total suspended solids, hydrocarbons, nutrients, soluble heavy metals, and other common pollutants.

Maintenance requirements and frequency are dependent on the pollutant load characteristics of each site. Maintenance activities may be required in the event of a chemical spill or due to excessive sediment loading from site erosion or extreme storms. Similarly, the system should be inspected after major storm events.

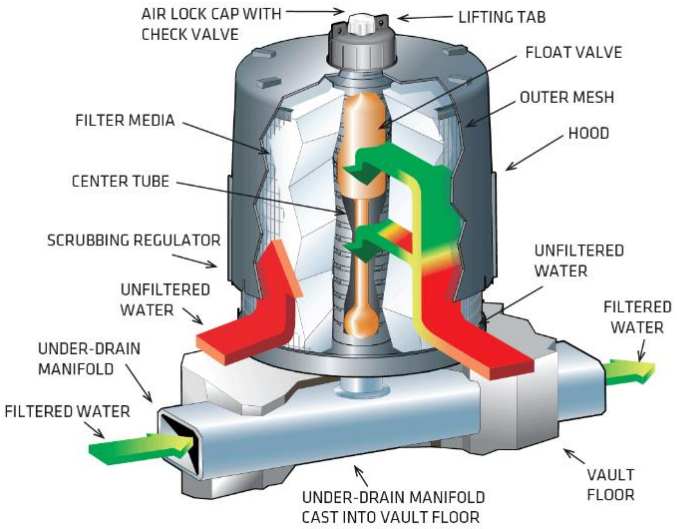


Figure 8: Stormwater360 Stormfilter (Source: Stormwater360)

Parameters	TSS	TP	TN	GP
Input (mg/L)	1000	10	100	1000
Output (mg/L)	675	6.2	63	100
Reduction (%)	33	48	37	90

6.3 Pollutant Reduction Modelling

In order to demonstrate that the proposed treatment train meets the required reduction targets, pollutant reduction modelling is proposed using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) Software program Version 6.2 by eWater CRC. Pollutant export rates are currently only available for Total Suspended Solids (TSS), Total Nitrogen (TN), Total Phosphorous (TP) and Gross Pollutants (GP). Therefore only quantitative modelling for TSS, TN, TP & GP has been undertaken using MUSIC.

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

6.3.1 MUSIC Program Setup

This section explains the setup of the MUSIC model with the detailed pollutant reduction calculations being included in the MUSIC results in Appendix B.

For Music Modelling (using MUSIC 6.3.0) the following parameters have been used in accordance with Ryde City Council WSUD Reference Guideline:

Table 2: MUSIC modelling parameters

Model Parameters	
Meteorological Data:	066037 Sydney Airport 1990-1999
Evaporation Data:	Sydney 1959
Time Step:	6 minute

Table 3: Catchment modelling parameters

Node Description	Area (Ha)	Percentage Impervious (%) / Area Impervious (Ha)		Land Use Rainfall and Pollutant Parameters
Urban Roof	0.1696	100	0.1696	Roof
Urban Building	0.079	100	0.079	Residential
Urban Landscape	0.2451	80	0.1961	Mixed
Urban Landscape (Bypass)	0.0193	0	0	Revegetated
	Total: 0.513Ha			

6.3.2 MUSIC Parameters

The following properties from Using MUSIC in Sydney's Drinking Water Catchment by NSW Sydney catchment authority have been used in the MUSIC Modelling based on the Land Use Rainfall and Pollutant Parameters.

Table 4: Recommended MUSIC Runoff Generation Parameters

Parameter	Urban Residential
Rainfall Threshold (mm)	1.0
Soil Capacity (mm)	120
Initial Storage (%)	25
Field Capacity	80
Infiltration Capacity Coefficient a	200
Infiltration Capacity Coefficient b	1.0
Initial Depth (mm)	10
Daily Recharge Rate (%)	25
Daily Drainage Rate (%)	5
Daily Deep Seepage Rate (%)	0

MUSIC Concentration Parameters

Table 5: MUSIC Concentration Parameters for Sydney Catchment Authority

Land-use Type	Parameters	TSS Log10 mg/L		TP Log10 mg/L		TN Log10 mg/L	
		Base Flow	Storm Flow	Base Flow	Storm Flow	Base Flow	Storm Flow
Roof Area	Mean	N/A	1.3	N/A	-0.89	N/A	0.3
	STD Dev	N/A	0.32	N/A	0.25	N/A	0.19
Building Area	Mean	1.2	2.15	-0.85	-0.60	0.11	0.30
	STD Dev	0.17	0.32	0.19	0.25	0.12	0.19
Landscape Area	Mean	1.15	1.95	-1.22	-0.66	-0.05	0.30
	STD Dev	0.17	0.32	0.19	0.25	0.12	0.19

6.3.3 Pollutant Reduction Results

A number of management measures have been considered with a focus on reducing polluted runoff volumes from the site. The WSUD principals proposed for stormwater treatment includes:

- 11 x Stormfilter Cartridges.
- 5 Oceanguard Sacks

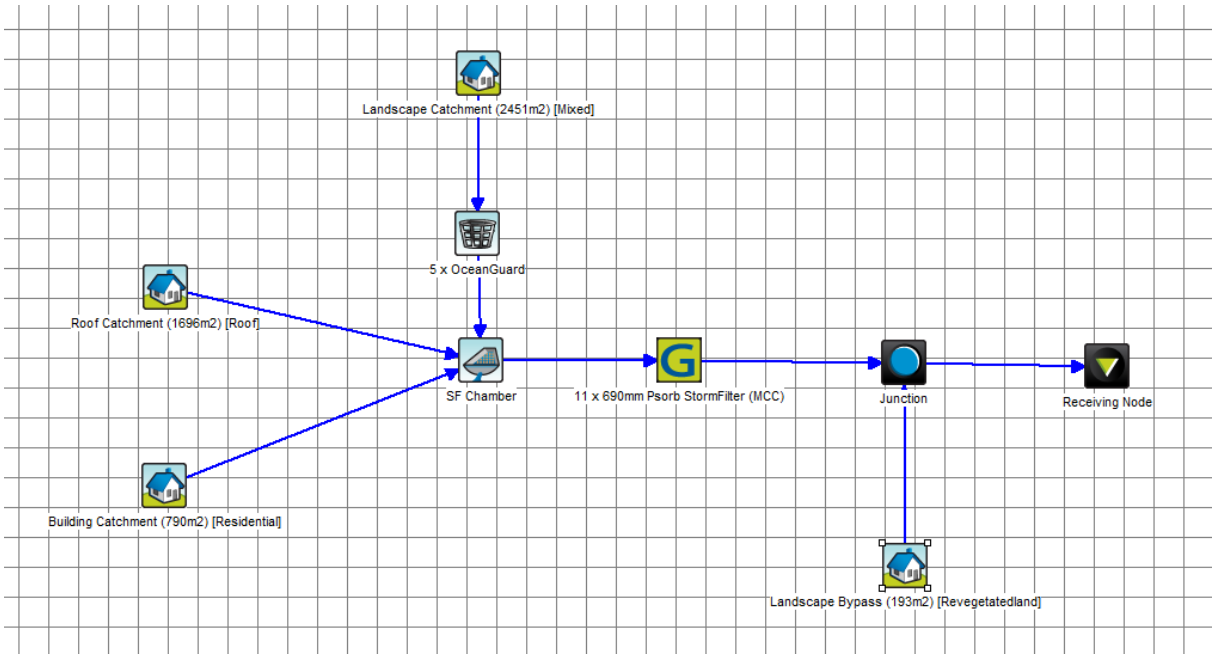


Figure 3 MUSIC Model

MUSIC Output

	Sources	Residual Load	% Reduction
Flow (ML/yr)	6.31	6.31	0
Total Suspended Solids (kg/yr)	814	118	85.5
Total Phosphorus (kg/yr)	1.83	0.557	69.5
Total Nitrogen (kg/yr)	16.1	8.59	46.8
Gross Pollutants (kg/yr)	153	0	100

Figure 4 MUSIC Results

The effectiveness of the treatment device proposed in the above section has been modelled using MUSIC with the overall treatment train efficiency results shown in Table 7 below.

Table 6: Treatment Train Efficiencies

Indicator	Total Site Reduction	Site Targets	Target Achieved
Gross Pollutants	100	90%	Yes
Total Suspended Solids (TSS)	85.5	85%	Yes
Total Phosphorus (TP)	69.5	65%	Yes
Total Nitrogen (TN)	46.8	45%	Yes

From the results presented above it can be seen that the proposed SQID's mean that the stormwater quality treatment meets with the reduction targets set for the development.

7 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. Ryde City Council specifies compliance with the Landcom design guide in there Stormwater and Floodplain Management Technical Manual.

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.

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:

- Sandbag protection will be installed surrounding all existing stormwater drainage infrastructure inlets to prevent sediment entering the system.

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.

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.

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.

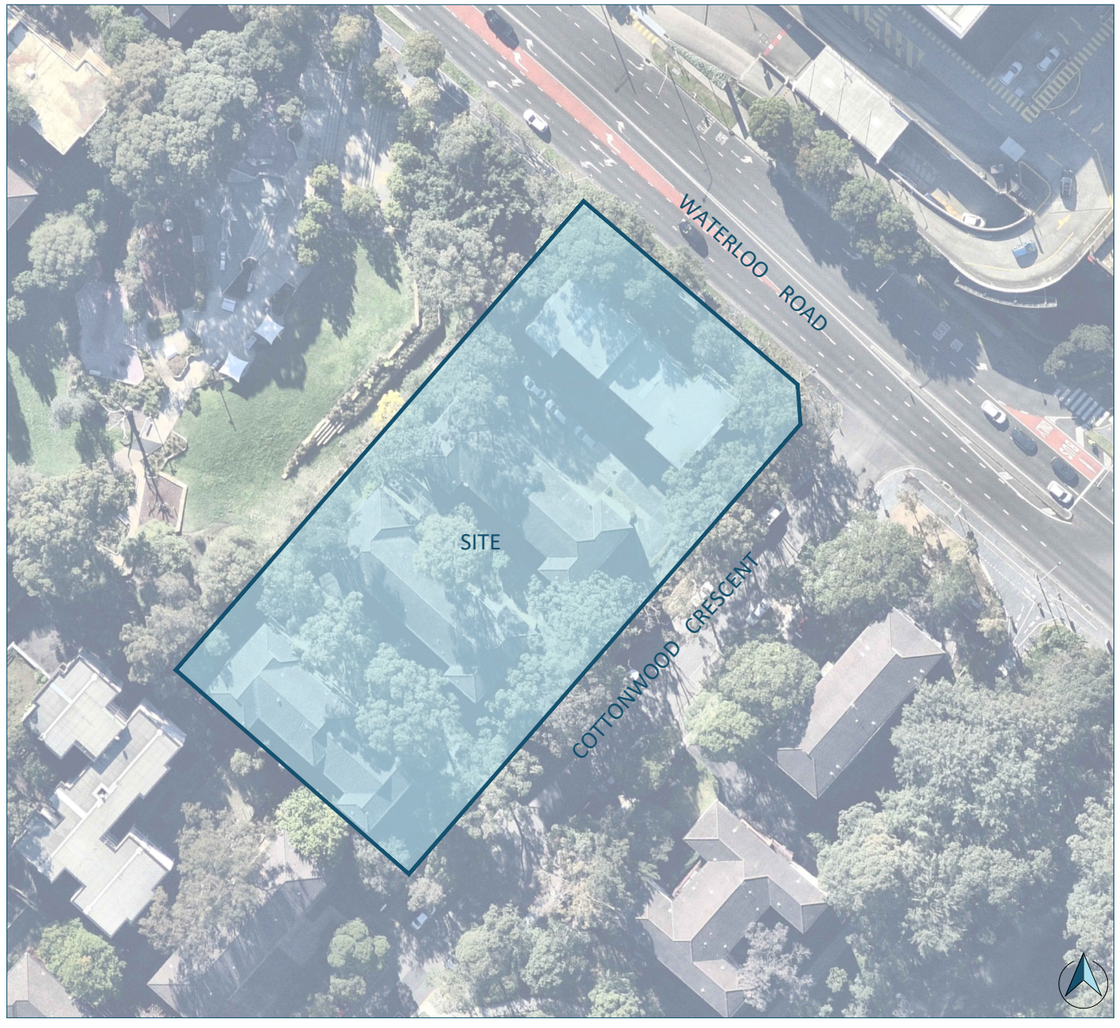
A Soil and Water Management Plan has prepared as part of the development application documentation and is included in Appendix A of this report.

The maintenance of these control measures throughout their intended lifespan will ensure that the risk of erosion and sedimentation pollution of the downstream watercourse will be minimized.

Appendix A – Civil Engineering Drawings

CIVIL ENGINEERING WORKS

DEVELOPMENT APPLICATION



SITE LOCATION PLAN
SCALE 1:500

PROJECT SUMMARY

SITE ADDRESS:	88 WATERLOO ROAD, MACQUARIE PARK
LOCAL GOVERNMENT AREA:	CITY OF RYDE COUNCIL
SITE AREA:	5,130m²
DEVELOPMENT DESCRIPTION:	MIXED USE MULTI STOREY DEVELOPMENT WITH THREE LEVELS OF BASEMENT

COTTONWOOD DEVELOPMENT PTY LTD
CLIENT

88 WATERLOO ROAD
PROJECT

enscape studio
tel 0411 267 151
info@enscapestudio.com.au
ABN 91 649 181 171

0356
PROJECT No

C-01
DRAWING No

B
REV

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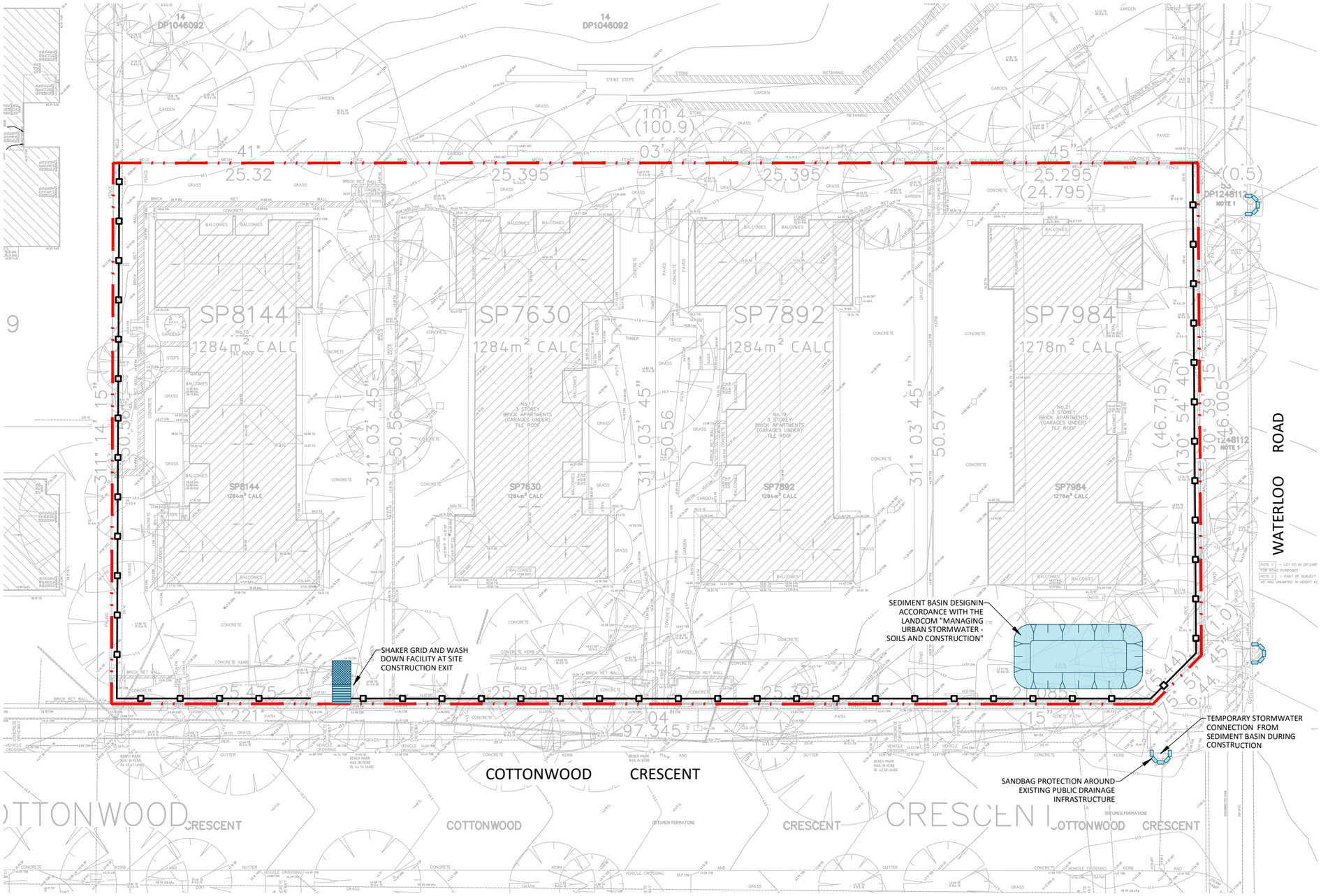


LEGEND

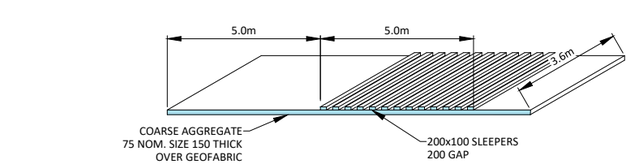
- SITE BOUNDARY
- PROPOSED SITE HOARDING
- VEHICLE SHAKEDOWN DEVICE
- PROPOSED SILT FENCE
- PROPOSED DIVERSION SWALE
- PROPOSED SEDIMENT BASIN
- PROPOSED SANDBAG PROTECTION

EROSION AND SEDIMENT CONTROL NOTES

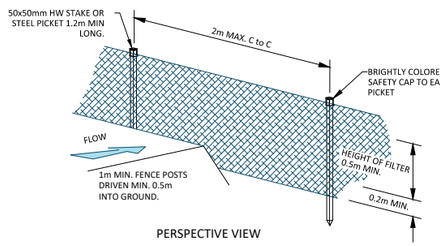
1. ALL WORK SHALL BE GENERALLY CARRIED OUT IN ACCORDANCE WITH:
   - LOCAL AUTHORITY REQUIREMENTS,
   - EPA - POLLUTION CONTROL MANUAL FOR URBAN STORMWATER,
   - DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT MANUAL- "URBAN EROSION & SEDIMENT CONTROL".
2. EROSION AND SEDIMENT CONTROL DRAWINGS AND NOTES ARE PROVIDED FOR THE WHOLE OF THE WORKS. SHOULD THE CONTRACTOR STAGE THESE WORKS THEN THE DESIGN MAY REQUIRE TO BE MODIFIED. VARIATION TO THESE DETAILS MAY REQUIRE TO BE APPROVED BY THE RELEVANT AUTHORITIES. THE EROSION AND SEDIMENT CONTROL PLAN SHALL BE IMPLEMENTED AND ADOPTED TO MEET THE VARYING SITUATIONS AS WORK ON SITE PROGRESSES.
3. MAINTAIN ALL EROSION AND SEDIMENT CONTROL DEVICES TO THE SATISFACTION OF THE SUPERINTENDENT AND THE LOCAL AUTHORITY.
4. WHEN STORMWATER PITS ARE CONSTRUCTED PREVENT SITE RUNOFF ENTERING THE PITS UNLESS SILT FENCES ARE ERECTED AROUND PITS.
5. MINIMISE THE AREA OF SITE BEING DISTURBED AT ANY ONE TIME.
6. PROTECT ALL STOCKPILES OF MATERIALS FROM SCOUR AND EROSION. DO NOT STOCKPILE LOOSE MATERIAL IN ROADWAYS, NEAR DRAINAGE PITS OR IN WATERCOURSES.
7. ALL SOIL AND WATER CONTROL MEASURES ARE TO BE PUT BACK IN PLACE AT THE END OF EACH WORKING DAY, AND MODIFIED TO BEST SUIT SITE CONDITIONS.
8. CONTROL WATER FROM UPSTREAM OF THE SITE SUCH THAT IT DOES NOT ENTER THE DISTURBED SITE.
9. ALL CONSTRUCTION VEHICLES SHALL ENTER AND EXIT THE SITE VIA THE APPROVED CONSTRUCTION ENTRY/EXIT ROUTE.
10. ALL VEHICLES LEAVING THE SITE SHALL BE CLEANED AND INSPECTED BEFORE LEAVING.
11. MAINTAIN ALL STORMWATER PIPES AND PITS CLEAR OF DEBRIS AND SEDIMENT. INSPECT STORMWATER SYSTEM AND CLEAN OUT AFTER EACH STORM EVENT.
12. CLEAN OUT ALL EROSION AND SEDIMENT CONTROL DEVICES AFTER EACH STORM EVENT.
13. ALL DISTURBED AREAS SHALL BE REVEGETATED AS SOON AS THE RELEVANT WORKS HAVE BEEN COMPLETED.

SEQUENCE OF WORKS

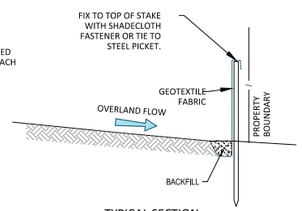
1. PRIOR TO COMMENCEMENT OF EXCAVATION THE FOLLOWING SOIL MANAGEMENT DEVICES MUST BE INSTALLED:
   - CONSTRUCT SILT CONTROL DEVICES BELOW THE SITE AND ACROSS ALL POTENTIAL RUNOFF SITES.
   - CO-ORDINATE CONSTRUCTION ENTRY/EXIT ROUTES WITH PROJECT MANAGER. ARRANGE SUITABLE LOCATION FOR THE INSPECTION OF TRUCKS PRIOR TO LEAVING SITE AND DIVERT RUNOFF TO SUITABLE CONTROL SYSTEM.
   - CONSTRUCT MEASURES TO DIVERT UPSTREAM FLOWS INTO EXISTING STORMWATER SYSTEM.
   - PROVIDE SANDBAG SEDIMENT TRAPS UPSTREAM OF EXISTING PITS.
   - LOCATE A 1.8 METRE CHAIN WIRE FENCE AROUND THE BOUNDARIES AND ATTACH HESSIAN CLOTH TO IT ON THE WINDWARD SIDE (TIES AT THE TOP CENTER AND BOTTOM AND AT 1 METRE INTERVALS.
2. DISTURBED AREAS ARE TO BE REGULARLY WATERED TO REDUCE DUST POLLUTION.
3. CONSTRUCT GEOTEXTILE FILTER PIT SURROUND AROUND ALL PROPOSED PITS AS THEY ARE CONSTRUCTED.
4. ON COMPLETION OF PAVEMENT PROVIDE SAND BAG KERB INLET SEDIMENT TRAPS AROUND PITS.
5. PROVIDE AND MAINTAIN A STRIP OF TURF ON BOTH SIDES OF ALL ROADS AFTER THE CONSTRUCTION OF KERBS.



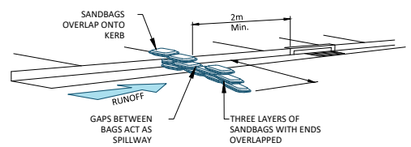
SHAKER GRID



PERSPECTIVE VIEW



TYPICAL SECTION



SANDBAG KERB INLET SEDIMENT TRAP

SEDIMENT FENCE DETAIL

1:200 2 0 2 4 6 8 10 A1
1:400 A3

REV	DESCRIPTION	DRAWN	APP'D	DATE
B	ISSUED FOR DEVELOPMENT APPLICATION	IH	IH	02.02.26
A	ISSUED FOR DEVELOPMENT APPLICATION	IH	IH	-.-.--

COTTONWOOD DEVELOPMENT PTY LTD — CLIENT
AJC ARCHITECTS — ARCHITECT
88 WATERLOO ROAD MACQUARIE PARK — PROJECT
SEDIMENT & EROSION CONTROL PLAN — TITLE

enscape studio
tel 0411 267 151
info@enscapestudio.com.au
ABN 91 649 181 171

PRELIMINARY
NOT FOR CONSTRUCTION

SCALE @ A1	PROJECT No	DRAWING No	REV
AS NOTED	0356	C-05	B

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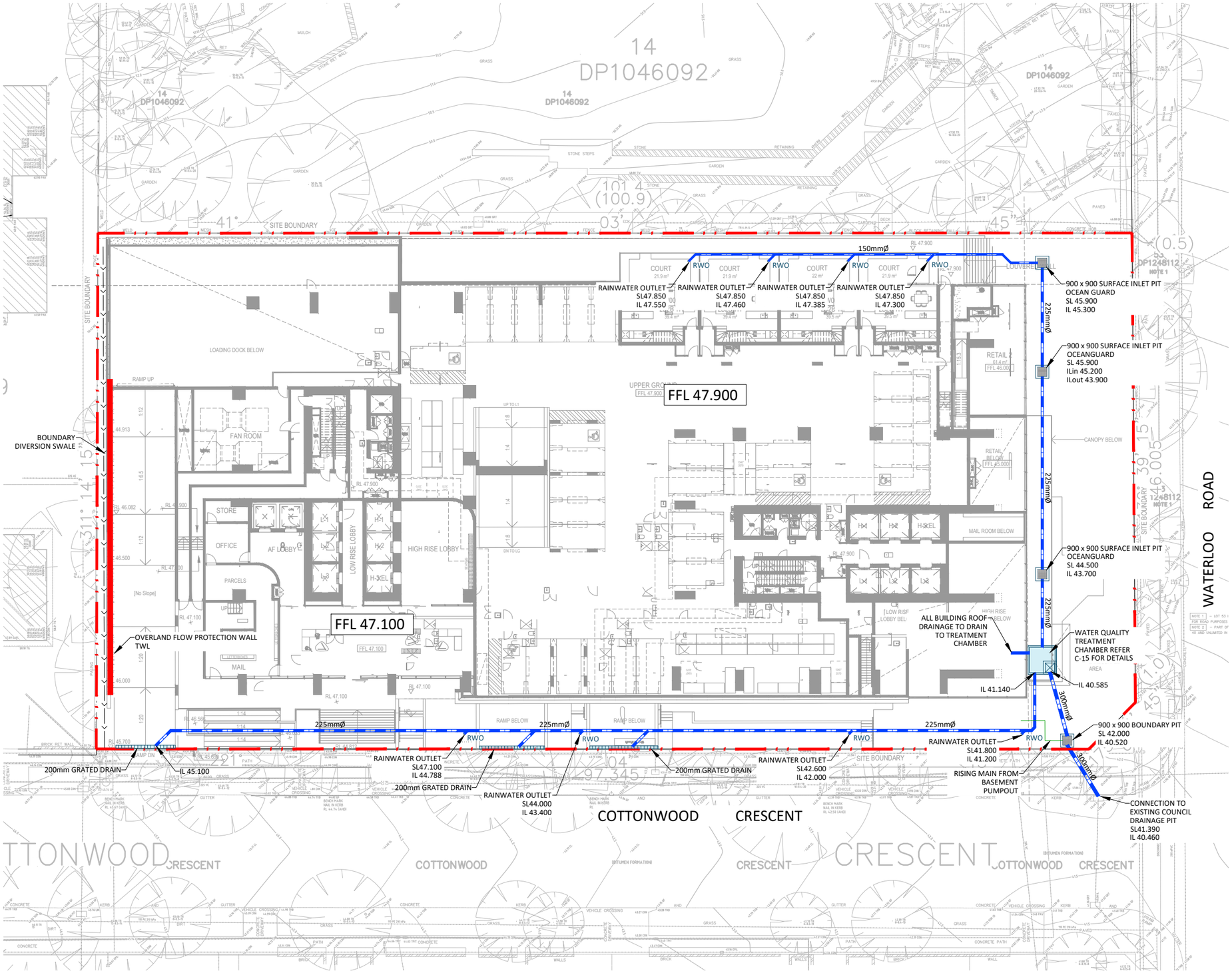

LEGEND

- PROPOSED SITE BOUNDARY
- PROPOSED STORMWATER PIPE
- PROPOSED STORMWATER PIPE
- PROPOSED OVERFLOW SWALE
- PROPOSED GRATED PIT
- PROPOSED GRATED DRAIN
- WATER TREATMENT DEVICE
- 150Ø UPVC — PROPOSED PIPE SIZE AND FLOW DIRECTION
- DP — PROPOSED DOWNPIPE
- RWO — PROPOSED RAINWATER OUTLET
- OVERLAND FLOW

STORMWATER MANAGEMENT NOTES

SITE INFORMATION

ADDRESS:	15 - 21 COTTONWOOD CRESCENT, MACQUARIE PARK
LOCAL GOVERNMENT AREA:	CITY OF RYDE COUNCIL
SITE AREA:	5,130m²

DEVELOPMENT CONTROL REQUIREMENTS

GOVERNING DOCUMENT:	CITY OF RYDE DEVELOPMENT CONTROL PLAN 2014. PART 8.2 - STORMWATER TECHNICAL MANUAL
DESIGN STORMS:	MINOR = 20 YEAR MAJOR = 100 YEAR

WATER QUALITY TREATMENT REQUIREMENTS:

- 90% REMOVAL OF GROSS POLLUTANTS (> 5MM);
- 85% REMOVAL OF TOTAL SUSPENDED SOLIDS;
- 60% REMOVAL OF TOTAL PHOSPHOROUS; AND
- 45% REMOVAL OF TOTAL NITROGEN.

WATER QUALITY DESIGN:

- 11 x Psorb 690 FILTER CARTRIDGES
- 5 x OCEANGUARD MESH BASKETS

WATER QUALITY POLLUTANT REDUCTION LEVELS ACHIEVED:

- 100% REMOVAL OF GROSS POLLUTANTS (> 5MM);
- 85.4% REMOVAL OF TOTAL SUSPENDED SOLIDS;
- 69.4% REMOVAL OF TOTAL PHOSPHOROUS; AND
- 47.1% REMOVAL OF TOTAL NITROGEN.

1:200 2 0 2 4 6 8 10 A1
1:400 A3

REV	DESCRIPTION	DRAWN	APP'D	DATE
B	ISSUED FOR DEVELOPMENT APPLICATION	IH	IH	02.02.26
A	ISSUED FOR DEVELOPMENT APPLICATION	IH	IH	--.--.--

COTTONWOOD DEVELOPMENT PTY LTD — CLIENT
AJC ARCHITECTS — ARCHITECT

88 WATERLOO ROAD MACQUARIE PARK — PROJECT
STORMWATER MANAGEMENT PLAN GROUND FLOOR — TITLE

0356-C-10.dwg

enscape studio
tel 0411 267 151
info@enscapestudio.com.au
ABN 91 649 181 171

PRELIMINARY
NOT FOR CONSTRUCTION

SCALE @ A1	PROJECT No	DRAWING No	REV
AS NOTED	0356	C-10	B

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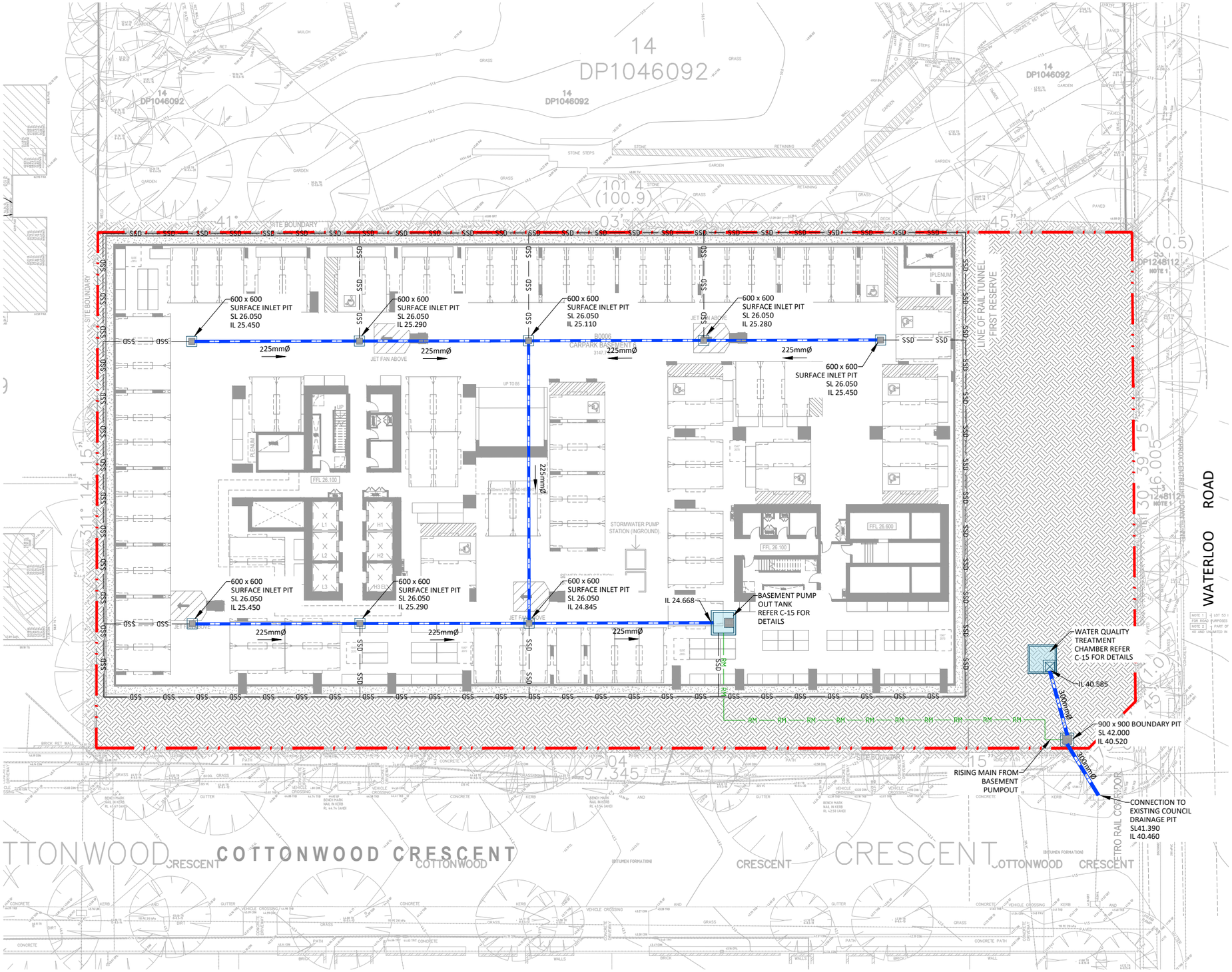

LEGEND

- PROPOSED SITE BOUNDARY
- PROPOSED STORMWATER PIPE
- PROPOSED STORMWATER PIPE
- SSD SSD PROPOSED HOB & SUBSOIL LINE
- PROPOSED OVERFLOW SWALE
- PROPOSED GRATED PIT
- PROPOSED GRATED DRAIN
- WATER TREATMENT DEVICE / BASEMENT PUMPOUT
- 150Ø UPVC PROPOSED PIPE SIZE AND FLOW DIRECTION
- DP PROPOSED DOWNPIPE
- RWO PROPOSED RAINWATER OUTLET
- OVERLAND FLOW

STORMWATER MANAGEMENT NOTES

SITE INFORMATION

ADDRESS:	15 - 21 COTTONWOOD CRESCENT, MACQUARIE PARK
LOCAL GOVERNMENT AREA:	CITY OF RYDE COUNCIL
SITE AREA:	5,130m²

DEVELOPMENT CONTROL REQUIREMENTS

GOVERNING DOCUMENT:	CITY OF RYDE DEVELOPMENT CONTROL PLAN 2014. PART 8.2 - STORMWATER TECHNICAL MANUAL
DESIGN STORMS:	MINOR = 20 YEAR MAJOR = 100 YEAR

WATER QUALITY TREATMENT REQUIREMENTS:

- 90% REMOVAL OF GROSS POLLUTANTS (> 5MM);
- 85% REMOVAL OF TOTAL SUSPENDED SOLIDS;
- 60% REMOVAL OF TOTAL PHOSPHOROUS; AND
- 45% REMOVAL OF TOTAL NITROGEN.

WATER QUALITY DESIGN:

- 11 x Psorb 690 FILTER CARTRIDGES
- 5 x OCEANGUARD MESH BASKETS

WATER QUALITY POLLUTANT REDUCTION LEVELS ACHIEVED:

- 100% REMOVAL OF GROSS POLLUTANTS (> 5MM);
- 85.4% REMOVAL OF TOTAL SUSPENDED SOLIDS;
- 69.4% REMOVAL OF TOTAL PHOSPHOROUS; AND
- 47.1% REMOVAL OF TOTAL NITROGEN.

REV	DESCRIPTION	DRAWN	APP'D	DATE
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B	ISSUED FOR DEVELOPMENT APPLICATION	IH	IH	02.02.26
A	ISSUED FOR DEVELOPMENT APPLICATION	IH	IH	-.-.-.-

CLIENT: COTTONWOOD DEVELOPMENT PTY LTD

ARCHITECT: AJC ARCHITECTS

PROJECT: 88 WATERLOO ROAD MACQUARIE PARK

TITLE: STORMWATER MANAGEMENT PLAN BASEMENT 6

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SCALE @ A1	PROJECT No	DRAWING No	REV
AS NOTED	0356	C-11	B

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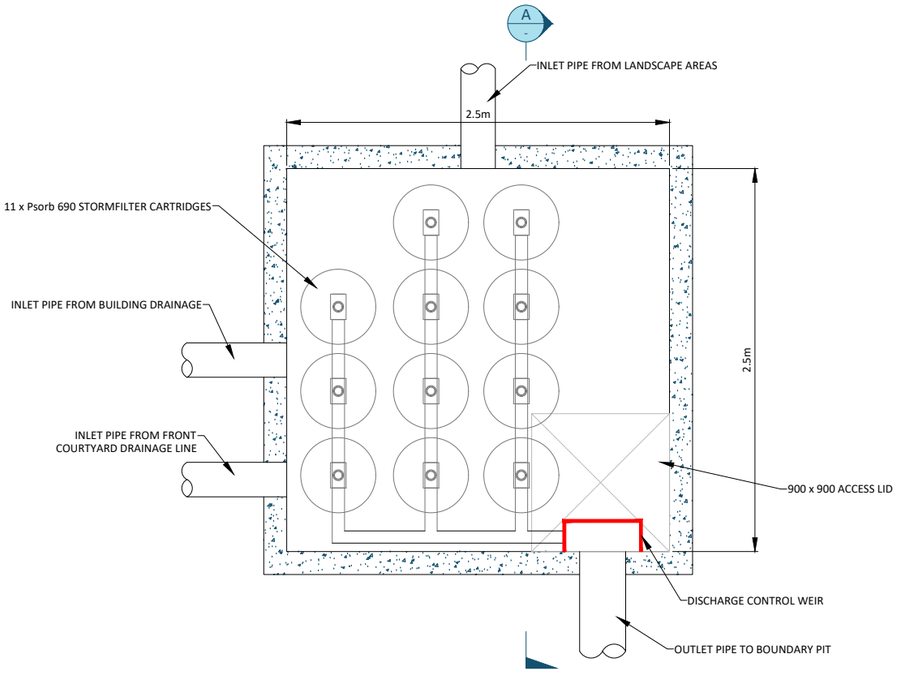
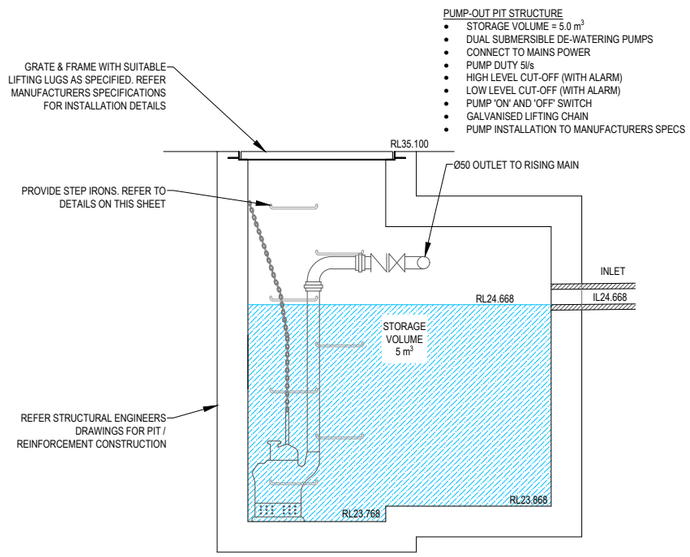
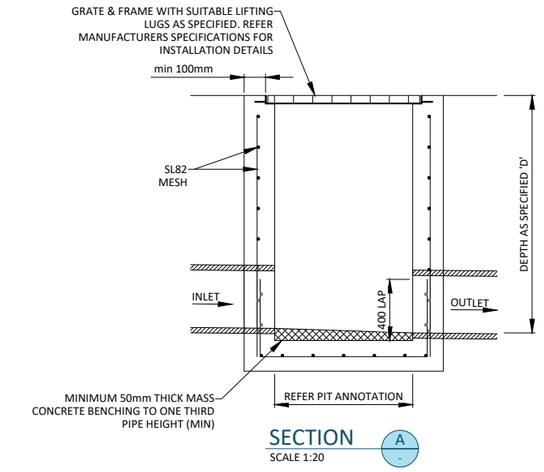


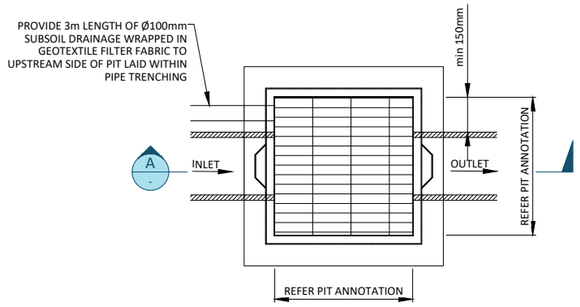
WATER QUALITY TREATMENT CHAMBER PLAN
SCALE 1:20



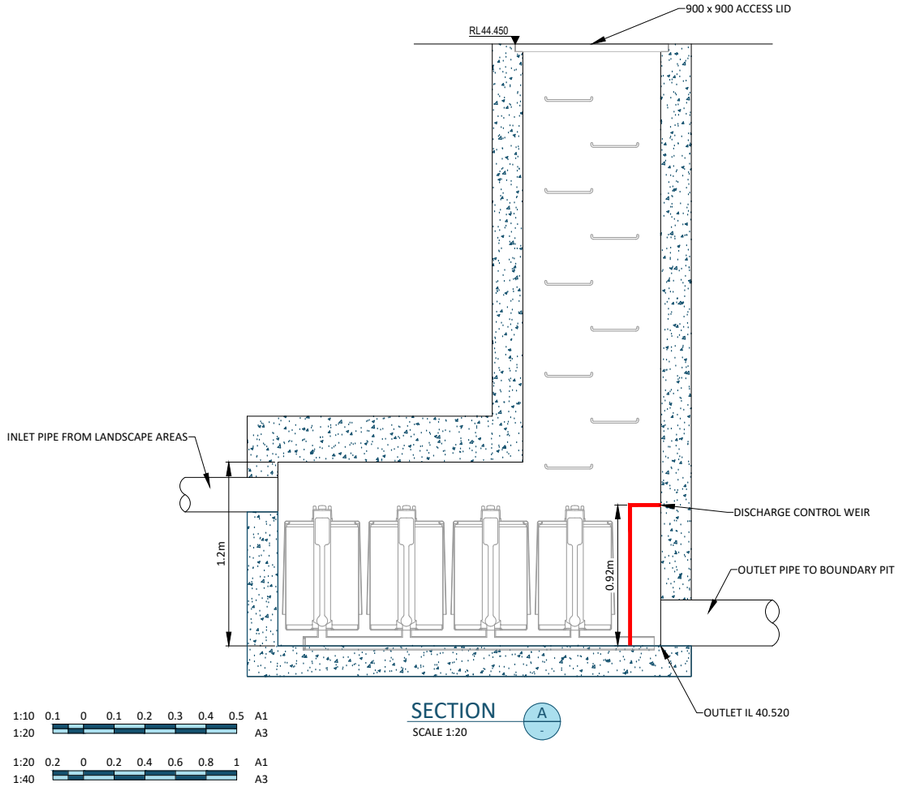
PUMP-OUT PIT DETAIL - BASEMENT DRAINAGE
SCALE 1:20



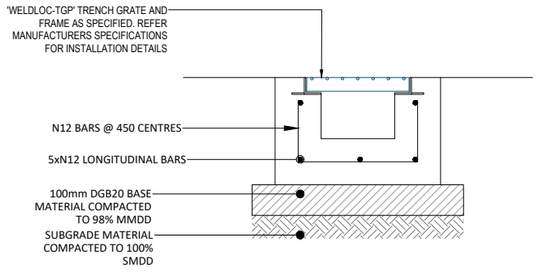
SECTION
SCALE 1:20



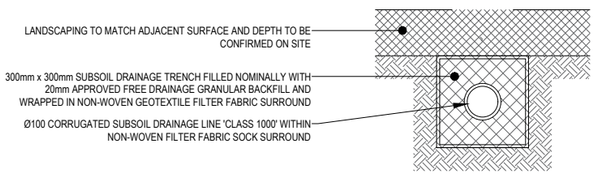
GRATED PIT DETAIL
SCALE 1:20



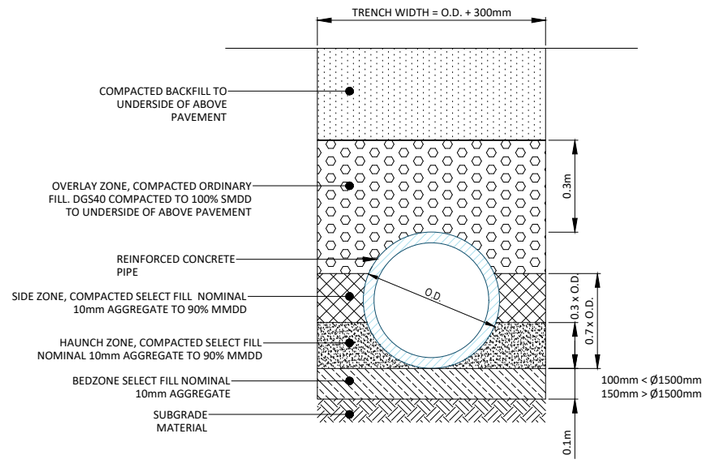
SECTION
SCALE 1:20



GRATED DRAIN DETAIL
SCALE 1:10



SUBSOIL DRAINAGE TRENCH DETAIL
(SCALE 1:10)



TYPICAL PIPE TRENCH DETAIL
SCALE 1:10

REV	DESCRIPTION	DRAWN	APP'D	DATE
B	ISSUED FOR DEVELOPMENT APPLICATION	IH	IH	02.02.26
A	ISSUED FOR DEVELOPMENT APPLICATION	IH	IH	--.--.--

COTTONWOOD DEVELOPMENT PTY LTD — CLIENT

AJC ARCHITECTS — ARCHITECT

88 WATERLOO ROAD MACQUARIE PARK — PROJECT

STORMWATER DRAINAGE DETAILS — TITLE

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ABN 91 649 181 171

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SCALE @ A1	PROJECT No	DRAWING No	REV

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Appendix B – MUSIC Model Output

Source nodes
Location,Landscape Bypass (193m2),Roof Catchment (1696m2),Building Catchment (790m2),Landscape Catchment (2451m2)
ID,1,2,3,6
Node Type,UrbanSourceNode,UrbanSourceNode,UrbanSourceNode,UrbanSourceNode
Zoning Surface Type,Revegetatedland,Roof,Residential,Mixed
Total Area (ha),0.019,0.17,0.079,0.245
Area Impervious (ha),0,0.17,0.079,0.196365671641791
Area Pervious (ha),0.019,0,0,0.0486343283582088
Field Capacity (mm),80,80,80,80
Pervious Area Infiltration Capacity coefficient - a,200,200,200,200
Pervious Area Infiltration Capacity exponent - b,1,1,1,1
Impervious Area Rainfall Threshold (mm/day),1,1,1,1
Pervious Area Soil Storage Capacity (mm),120,120,120,120
Pervious Area Soil Initial Storage (% of Capacity),25,25,25,25
Groundwater Initial Depth (mm),10,10,10,10
Groundwater Daily Recharge Rate (%),25,25,25,25
Groundwater Daily Baseflow Rate (%),5,5,5,5
Groundwater Daily Deep Seepage Rate (%),0,0,0,0
Stormflow Total Suspended Solids Mean (log mg/L),1.95,1.3,2.15,2.2
Stormflow Total Suspended Solids Standard Deviation (log mg/L),0.32,0.32,0.32,0.32
Stormflow Total Suspended Solids Estimation Method,Stochastic,Stochastic,Stochastic,Stochastic
Stormflow Total Suspended Solids Serial Correlation,0,0,0,0
Stormflow Total Phosphorus Mean (log mg/L),-0.66,-0.89,-0.6,-0.45
Stormflow Total Phosphorus Standard Deviation (log mg/L),0.25,0.25,0.25,0.25
Stormflow Total Phosphorus Estimation Method,Stochastic,Stochastic,Stochastic,Stochastic
Stormflow Total Phosphorus Serial Correlation,0,0,0,0
Stormflow Total Nitrogen Mean (log mg/L),0.3,0.3,0.3,0.42
Stormflow Total Nitrogen Standard Deviation (log mg/L),0.19,0.19,0.19,0.19
Stormflow Total Nitrogen Estimation Method,Stochastic,Stochastic,Stochastic,Stochastic
Stormflow Total Nitrogen Serial Correlation,0,0,0,0
Baseflow Total Suspended Solids Mean (log mg/L),1.15,1.1,1.2,1.1
Baseflow Total Suspended Solids Standard Deviation (log mg/L),0.17,0.17,0.17,0.17
Baseflow Total Suspended Solids Estimation Method,Stochastic,Stochastic,Stochastic,Stochastic
Baseflow Total Suspended Solids Serial Correlation,0,0,0,0
Baseflow Total Phosphorus Mean (log mg/L),-1.22,-0.82,-0.85,-0.82
Baseflow Total Phosphorus Standard Deviation (log mg/L),0.19,0.19,0.19,0.19
Baseflow Total Phosphorus Estimation Method,Stochastic,Stochastic,Stochastic,Stochastic
Baseflow Total Phosphorus Serial Correlation,0,0,0,0
Baseflow Total Nitrogen Mean (log mg/L),-0.05,0.32,0.11,0.32
Baseflow Total Nitrogen Standard Deviation (log mg/L),0.12,0.12,0.12,0.12
Baseflow Total Nitrogen Estimation Method,Stochastic,Stochastic,Stochastic,Stochastic
Baseflow Total Nitrogen Serial Correlation,0,0,0,0
Flow based constituent generation - enabled,Off,Off,Off,Off
Flow based constituent generation - flow file, , , ,
Flow based constituent generation - base flow column, , , ,
Flow based constituent generation - pervious flow column, , , ,

Flow based constituent generation - impervious flow column, , , ,
Flow based constituent generation - unit, , , ,
OUT - Mean Annual Flow (ML/yr),87.4E-3,2.29,1.07,2.87
OUT - TSS Mean Annual Load (kg/yr),5.17,58.0,195,555
OUT - TP Mean Annual Load (kg/yr),14.1E-3,0.345,0.307,1.16
OUT - TN Mean Annual Load (kg/yr),0.138,5.19,2.35,8.47
OUT - Gross Pollutant Mean Annual Load (kg/yr),0.00,55.5,25.8,71.9
Rain In (ML/yr),0.283023,2.53231,1.17678,3.64951
ET Loss (ML/yr),0.195564,0.240077,0.111565,0.781144
Deep Seepage Loss (ML/yr),0,0,0,0
Baseflow Out (ML/yr),0.04626,0,0,0.119303
Imp. Stormflow Out (ML/yr),0,2.29223,1.06521,2.64281
Perv. Stormflow Out (ML/yr),0.041199,0,0,0.10625
Total Stormflow Out (ML/yr),0.041199,2.29223,1.06521,2.74906
Total Outflow (ML/yr),0.087459,2.29223,1.06521,2.86836
Change in Soil Storage (ML/yr),-1E-6,0,0,-1E-6
TSS Baseflow Out (kg/yr),0.705575,0,0,1.6215
TSS Total Stormflow Out (kg/yr),4.4619,58.0486,195.021,553.878
TSS Total Outflow (kg/yr),5.16747,58.0486,195.021,555.5
TP Baseflow Out (kg/yr),0.003067,0,0,0.019928
TP Total Stormflow Out (kg/yr),0.01105,0.344956,0.307362,1.13974
TP Total Outflow (kg/yr),0.014117,0.344956,0.307362,1.15966
TN Baseflow Out (kg/yr),0.042748,0,0,0.258243
TN Total Stormflow Out (kg/yr),0.095685,5.18591,2.34566,8.20743
TN Total Outflow (kg/yr),0.138433,5.18591,2.34566,8.46567
GP Total Outflow (kg/yr),0,55.4672,25.7759,72.1284

No Imported Data Source nodes

USTM treatment nodes
Location,SF Chamber
ID,7
Node Type,SedimentationBasinNode
Lo-flow bypass rate (cum/sec),0
Hi-flow bypass rate (cum/sec),100
Inlet pond volume,0
Area (sqm),2.7
Initial Volume (m^3),0
Extended detention depth (m),0.77
Number of Rainwater tanks,
Permanent Pool Volume (cubic metres),0
Proportion vegetated,0
Equivalent Pipe Diameter (mm),78
Overflow weir width (m),2
Notional Detention Time (hrs),46.4E-3
Orifice Discharge Coefficient,0.6
Weir Coefficient,1.7
Number of CSTR Cells,1
Total Suspended Solids - k (m/yr),1
Total Suspended Solids - C* (mg/L),20
Total Suspended Solids - C** (mg/L),20
Total Phosphorus - k (m/yr),1
Total Phosphorus - C* (mg/L),0.13
Total Phosphorus - C** (mg/L),0.13
Total Nitrogen - k (m/yr),1
Total Nitrogen - C* (mg/L),1.4
Total Nitrogen - C** (mg/L),1.4
Threshold Hydraulic Loading for C** (m/yr),3500

Horizontal Flow Coefficient,
Reuse Enabled,Off
Max drawdown height (m),
Annual Demand Enabled,Off
Annual Demand Value (ML/year),
Annual Demand Distribution,
Annual Demand Monthly Distribution: Jan,
Annual Demand Monthly Distribution: Feb,
Annual Demand Monthly Distribution: Mar,
Annual Demand Monthly Distribution: Apr,
Annual Demand Monthly Distribution: May,
Annual Demand Monthly Distribution: Jun,
Annual Demand Monthly Distribution: Jul,
Annual Demand Monthly Distribution: Aug,
Annual Demand Monthly Distribution: Sep,
Annual Demand Monthly Distribution: Oct,
Annual Demand Monthly Distribution: Nov,
Annual Demand Monthly Distribution: Dec,
Daily Demand Enabled,Off
Daily Demand Value (ML/day),
Custom Demand Enabled,Off
Custom Demand Time Series File,
Custom Demand Time Series Units,
Filter area (sqm),
Filter perimeter (m),
Filter depth (m),
Filter Median Particle Diameter (mm),
Saturated Hydraulic Conductivity (mm/hr),
Infiltration Media Porosity,
Length (m),
Bed slope,
Base Width (m),
Top width (m),
Vegetation height (m),
Vegetation Type,
Total Nitrogen Content in Filter (mg/kg),
Orthophosphate Content in Filter (mg/kg),
Is Base Lined?,
Is Underdrain Present?,
Is Submerged Zone Present?,
Submerged Zone Depth (m),
B for Media Soil Texture,-9999
Proportion of upstream impervious area treated,
Exfiltration Rate (mm/hr),0
Evaporative Loss as % of PET,0
Depth in metres below the drain pipe,
TSS A Coefficient,
TSS B Coefficient,
TP A Coefficient,
TP B Coefficient,
TN A Coefficient,
TN B Coefficient,
Sfc,
S*,
Sw,
Sh,
Emax (m/day),
Ew (m/day),

IN - Mean Annual Flow (ML/yr),6.23
IN - TSS Mean Annual Load (kg/yr),367
IN - TP Mean Annual Load (kg/yr),1.46
IN - TN Mean Annual Load (kg/yr),14.2
IN - Gross Pollutant Mean Annual Load (kg/yr),81.2
OUT - Mean Annual Flow (ML/yr),6.23
OUT - TSS Mean Annual Load (kg/yr),366
OUT - TP Mean Annual Load (kg/yr),1.46
OUT - TN Mean Annual Load (kg/yr),14.2
OUT - Gross Pollutant Mean Annual Load (kg/yr),0.00
Flow In (ML/yr),6.22568
ET Loss (ML/yr),0
Infiltration Loss (ML/yr),0
Low Flow Bypass Out (ML/yr),0
High Flow Bypass Out (ML/yr),0
Orifice / Filter Out (ML/yr),4.68435
Weir Out (ML/yr),1.54166
Transfer Function Out (ML/yr),0
Reuse Supplied (ML/yr),0
Reuse Requested (ML/yr),0
% Reuse Demand Met,0
% Load Reduction,-0.00530063
TSS Flow In (kg/yr),367.423
TSS ET Loss (kg/yr),0
TSS Infiltration Loss (kg/yr),0
TSS Low Flow Bypass Out (kg/yr),0
TSS High Flow Bypass Out (kg/yr),0
TSS Orifice / Filter Out (kg/yr),279.74
TSS Weir Out (kg/yr),86.4232
TSS Transfer Function Out (kg/yr),0
TSS Reuse Supplied (kg/yr),0
TSS Reuse Requested (kg/yr),0
TSS % Reuse Demand Met,0
TSS % Load Reduction,0.342875
TP Flow In (kg/yr),1.46408
TP ET Loss (kg/yr),0
TP Infiltration Loss (kg/yr),0
TP Low Flow Bypass Out (kg/yr),0
TP High Flow Bypass Out (kg/yr),0
TP Orifice / Filter Out (kg/yr),1.10277
TP Weir Out (kg/yr),0.359557
TP Transfer Function Out (kg/yr),0
TP Reuse Supplied (kg/yr),0
TP Reuse Requested (kg/yr),0
TP % Reuse Demand Met,0
TP % Load Reduction,0.119734
TN Flow In (kg/yr),14.2195
TN ET Loss (kg/yr),0
TN Infiltration Loss (kg/yr),0
TN Low Flow Bypass Out (kg/yr),0
TN High Flow Bypass Out (kg/yr),0
TN Orifice / Filter Out (kg/yr),10.5493
TN Weir Out (kg/yr),3.61524
TN Transfer Function Out (kg/yr),0
TN Reuse Supplied (kg/yr),0
TN Reuse Requested (kg/yr),0
TN % Reuse Demand Met,0
TN % Load Reduction,0.386511

GP Flow In (kg/yr),81.2431
GP ET Loss (kg/yr),0
GP Infiltration Loss (kg/yr),0
GP Low Flow Bypass Out (kg/yr),0
GP High Flow Bypass Out (kg/yr),0
GP Orifice / Filter Out (kg/yr),0
GP Weir Out (kg/yr),0
GP Transfer Function Out (kg/yr),0
GP Reuse Supplied (kg/yr),0
GP Reuse Requested (kg/yr),0
GP % Reuse Demand Met,0
GP % Load Reduction,100
PET Scaling Factor,

Generic treatment nodes
Location,11 x 690mm Psorb StormFilter (MCC),5 x OceanGuard
ID,8,9
Node Type,GenericNode,GPTNode
Lo-flow bypass rate (cum/sec),0,0
Hi-flow bypass rate (cum/sec),0.0099,0.1
Flow Transfer Function
Input (cum/sec),0,0
Output (cum/sec),0,0
Input (cum/sec),10,10
Output (cum/sec),10,10
Input (cum/sec), ,
Output (cum/sec), ,
Input (cum/sec), ,
Output (cum/sec), ,
Input (cum/sec), ,
Output (cum/sec), ,
Input (cum/sec), ,
Output (cum/sec), ,
Input (cum/sec), ,
Output (cum/sec), ,
Input (cum/sec), ,
Output (cum/sec), ,
Input (cum/sec), ,
Output (cum/sec), ,
Input (cum/sec), ,
Output (cum/sec), ,
Gross Pollutant Transfer Function
Enabled,True,True
Input (kg/ML),0,0
Output (kg/ML),0,0
Input (kg/ML),14.9393,14.7808
Output (kg/ML),0,0
Input (kg/ML), ,
Output (kg/ML), ,
Input (kg/ML), ,
Output (kg/ML), ,
Input (kg/ML), ,
Output (kg/ML), ,
Input (kg/ML), ,
Output (kg/ML), ,
Input (kg/ML), ,
Output (kg/ML), ,
Input (kg/ML), ,

Output (kg/ML), ,
Input (kg/ML), ,
Output (kg/ML), ,
Input (kg/ML), ,
Output (kg/ML), ,
Total Nitrogen Transfer Function
Enabled,True,True
Input (mg/L),0,0
Output (mg/L),0,0
Input (mg/L),100,50
Output (mg/L),44.1,39.5
Input (mg/L), ,
Output (mg/L), ,
Input (mg/L), ,
Output (mg/L), ,
Input (mg/L), ,
Output (mg/L), ,
Input (mg/L), ,
Output (mg/L), ,
Input (mg/L), ,
Output (mg/L), ,
Input (mg/L), ,
Output (mg/L), ,
Input (mg/L), ,
Output (mg/L), ,
Total Phosphorus Transfer Function
Enabled,True,True
Input (mg/L),0,0
Output (mg/L),0,0
Input (mg/L),10,10
Output (mg/L),1.39,7
Input (mg/L), ,
Output (mg/L), ,
Input (mg/L), ,
Output (mg/L), ,
Input (mg/L), ,
Output (mg/L), ,
Input (mg/L), ,
Output (mg/L), ,
Input (mg/L), ,
Output (mg/L), ,
Input (mg/L), ,
Output (mg/L), ,
Input (mg/L), ,
Output (mg/L), ,
Input (mg/L), ,
Output (mg/L), ,
Total Suspended Solids Transfer Function
Enabled,True,True
Input (mg/L),0,0
Output (mg/L),0,0
Input (mg/L),1000,20.8
Output (mg/L),66,8
Input (mg/L), ,40.3
Output (mg/L), ,14.1
Input (mg/L), ,60.6

Output (mg/L), ,19.3
Input (mg/L), ,79.3
Output (mg/L), ,23.4
Input (mg/L), ,99.9
Output (mg/L), ,26.9
Input (mg/L), ,121
Output (mg/L), ,30
Input (mg/L), ,
Output (mg/L), ,
Input (mg/L), ,
Output (mg/L), ,
Input (mg/L), ,
Output (mg/L), ,
TSS Flow based Efficiency Enabled,Off,Off
TSS Flow based Efficiency, ,
TP Flow based Efficiency Enabled,Off,Off
TP Flow based Efficiency, ,
TN Flow based Efficiency Enabled,Off,Off
TN Flow based Efficiency, ,
GP Flow based Efficiency Enabled,Off,Off
GP Flow based Efficiency, ,
IN - Mean Annual Flow (ML/yr),6.23,2.87
IN - TSS Mean Annual Load (kg/yr),366,555
IN - TP Mean Annual Load (kg/yr),1.46,1.16
IN - TN Mean Annual Load (kg/yr),14.2,8.47
IN - Gross Pollutant Mean Annual Load (kg/yr),0.00,71.9
OUT - Mean Annual Flow (ML/yr),6.23,2.87
OUT - TSS Mean Annual Load (kg/yr),113,114
OUT - TP Mean Annual Load (kg/yr),0.543,0.812
OUT - TN Mean Annual Load (kg/yr),8.45,6.69
OUT - Gross Pollutant Mean Annual Load (kg/yr),0.00,0.00
Flow In (ML/yr),6.22582,2.86833
ET Loss (ML/yr),0,0
Infiltration Loss (ML/yr),0,0
Low Flow Bypass Out (ML/yr),0,0
High Flow Bypass Out (ML/yr),1.68659,0
Orifice / Filter Out (ML/yr),0,0
Weir Out (ML/yr),0,0
Transfer Function Out (ML/yr),4.53936,2.86833
Reuse Supplied (ML/yr),0,0
Reuse Requested (ML/yr),0,0
% Reuse Demand Met,0,0
% Load Reduction,-0.00218445,0
TSS Flow In (kg/yr),366.061,555.406
TSS ET Loss (kg/yr),0,0
TSS Infiltration Loss (kg/yr),0,0
TSS Low Flow Bypass Out (kg/yr),0,0
TSS High Flow Bypass Out (kg/yr),94.8964,0
TSS Orifice / Filter Out (kg/yr),0,0
TSS Weir Out (kg/yr),0,0
TSS Transfer Function Out (kg/yr),17.901,114.346
TSS Reuse Supplied (kg/yr),0,0
TSS Reuse Requested (kg/yr),0,0
TSS % Reuse Demand Met,0,0
TSS % Load Reduction,69.1862,79.4122
TP Flow In (kg/yr),1.4623,1.15963
TP ET Loss (kg/yr),0,0
TP Infiltration Loss (kg/yr),0,0

TP Low Flow Bypass Out (kg/yr),0,0
TP High Flow Bypass Out (kg/yr),0.394099,0
TP Orifice / Filter Out (kg/yr),0,0
TP Weir Out (kg/yr),0,0
TP Transfer Function Out (kg/yr),0.148485,0.811727
TP Reuse Supplied (kg/yr),0,0
TP Reuse Requested (kg/yr),0,0
TP % Reuse Demand Met,0,0
TP % Load Reduction,62.8951,30.0012
TN Flow In (kg/yr),14.1644,8.46551
TN ET Loss (kg/yr),0,0
TN Infiltration Loss (kg/yr),0,0
TN Low Flow Bypass Out (kg/yr),0,0
TN High Flow Bypass Out (kg/yr),3.94593,0
TN Orifice / Filter Out (kg/yr),0,0
TN Weir Out (kg/yr),0,0
TN Transfer Function Out (kg/yr),4.50641,6.68761
TN Reuse Supplied (kg/yr),0,0
TN Reuse Requested (kg/yr),0,0
TN % Reuse Demand Met,0,0
TN % Load Reduction,40.3266,21.0016
GP Flow In (kg/yr),0,71.9455
GP ET Loss (kg/yr),0,0
GP Infiltration Loss (kg/yr),0,0
GP Low Flow Bypass Out (kg/yr),0,0
GP High Flow Bypass Out (kg/yr),0,0
GP Orifice / Filter Out (kg/yr),0,0
GP Weir Out (kg/yr),0,0
GP Transfer Function Out (kg/yr),0,0
GP Reuse Supplied (kg/yr),0,0
GP Reuse Requested (kg/yr),0,0
GP % Reuse Demand Met,0,0
GP % Load Reduction,100,100

Other nodes
Location,Receiving Node,Junction
ID,4,5
Node Type,ReceivingNode,JunctionNode
IN - Mean Annual Flow (ML/yr),6.31,6.31
IN - TSS Mean Annual Load (kg/yr),118,118
IN - TP Mean Annual Load (kg/yr),0.557,0.557
IN - TN Mean Annual Load (kg/yr),8.59,8.59
IN - Gross Pollutant Mean Annual Load (kg/yr),0.00,0.00
OUT - Mean Annual Flow (ML/yr),6.31,6.31
OUT - TSS Mean Annual Load (kg/yr),118,118
OUT - TP Mean Annual Load (kg/yr),0.557,0.557
OUT - TN Mean Annual Load (kg/yr),8.59,8.59
OUT - Gross Pollutant Mean Annual Load (kg/yr),0.00,0.00
% Load Reduction,1.32E-3,1.32E-3
TSS % Load Reduction,85.5,85.5
TN % Load Reduction,46.8,46.8
TP % Load Reduction,69.5,69.5
GP % Load Reduction,100,100

Links
Location,Drainage Link,Drainage Link,Drainage Link,Drainage Link,Drainage Link,Drainage Link,Drainage Link,Drainage Link
Source node ID,2,3,7,8,1,5,6,9

Target node ID,7,7,8,5,5,4,9,7
Muskingum-Cunge Routing,Not Routed,Not Routed,Not Routed,Not Routed,Not Routed,Not Routed,Not Routed,Not Routed
Muskingum K, , , , , , , ,
Muskingum theta, , , , , , , ,
IN - Mean Annual Flow (ML/yr),2.29,1.07,6.23,6.23,87.4E-3,6.31,2.87,2.87
IN - TSS Mean Annual Load (kg/yr),58.0,195,366,113,5.17,118,555,114
IN - TP Mean Annual Load (kg/yr),0.345,0.307,1.46,0.543,14.1E-3,0.557,1.16,0.812
IN - TN Mean Annual Load (kg/yr),5.19,2.35,14.2,8.45,0.138,8.59,8.47,6.69
IN - Gross Pollutant Mean Annual Load (kg/yr),55.5,25.8,0.00,0.00,0.00,0.00,71.9,0.00
OUT - Mean Annual Flow (ML/yr),2.29,1.07,6.23,6.23,87.4E-3,6.31,2.87,2.87
OUT - TSS Mean Annual Load (kg/yr),58.0,195,366,113,5.17,118,555,114
OUT - TP Mean Annual Load (kg/yr),0.345,0.307,1.46,0.543,14.1E-3,0.557,1.16,0.812
OUT - TN Mean Annual Load (kg/yr),5.19,2.35,14.2,8.45,0.138,8.59,8.47,6.69
OUT - Gross Pollutant Mean Annual Load (kg/yr),55.5,25.8,0.00,0.00,0.00,0.00,71.9,0.00

Catchment Details
Catchment Name,0356-MUSIC Model
Timestep,6 Minutes
Start Date,1/01/1959
End Date,31/12/1959 11:54:00 PM
Rainfall Station, 66062 SYDNEY
ET Station,Monthly User Defined
Mean Annual Rainfall (mm), 1490
Mean Annual ET (mm), 1260

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