115-117 Dutton Street, Yagoona

Stormwater Management Plan

Prepared For:	Cedar Design & Construct
Date:	29th October 2024
Prepared By:	Ian Harris
Project Ref:	0496

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1 Introduction

Enscape studio have been commissioned by Cedar Design & Construct to prepare this Stormwater Management Report (SMR) in support of the Development Application for the proposed development at 115-177 Dutton Street, Yagoona. The sites real address is Lots 18 & 19, DP9795.

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 City of Canterbury-Bankstown 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.

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

- 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.

2 Existing Site Characteristics

2.1 Property Detail

Address:	115-117 Dutton Street, Yagoona
Real Property Description:	Lots 18 & 19, DP 9795
Total Site Area:	2,112m^2 (0.2112Ha)

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

The proposed development is situated within the City of Canterbury-Bankstown Council and will consist of a multi-storey residential building with two levels of basement..

The site is bounded by:

- Residential development to the north, south and west
- Dutton Street to the east

Refer to locality plan in figure 1.

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

2.2 Topography

The topography of the site generally falls from the north western corner of the site towards the south eastern corner. The site falls from RL52.10m AHD to RL48.25m AHD.

Dutton Street falls from North to South in the vicinity of the site.

2.3 Stormwater Catchments

The properties of 239 and 241 William Street drain onto the rear of the development. The design of the development will allow these overland flows to be conveyed across the site towards Dutton Street. The extract below indicates the general contours in the area.

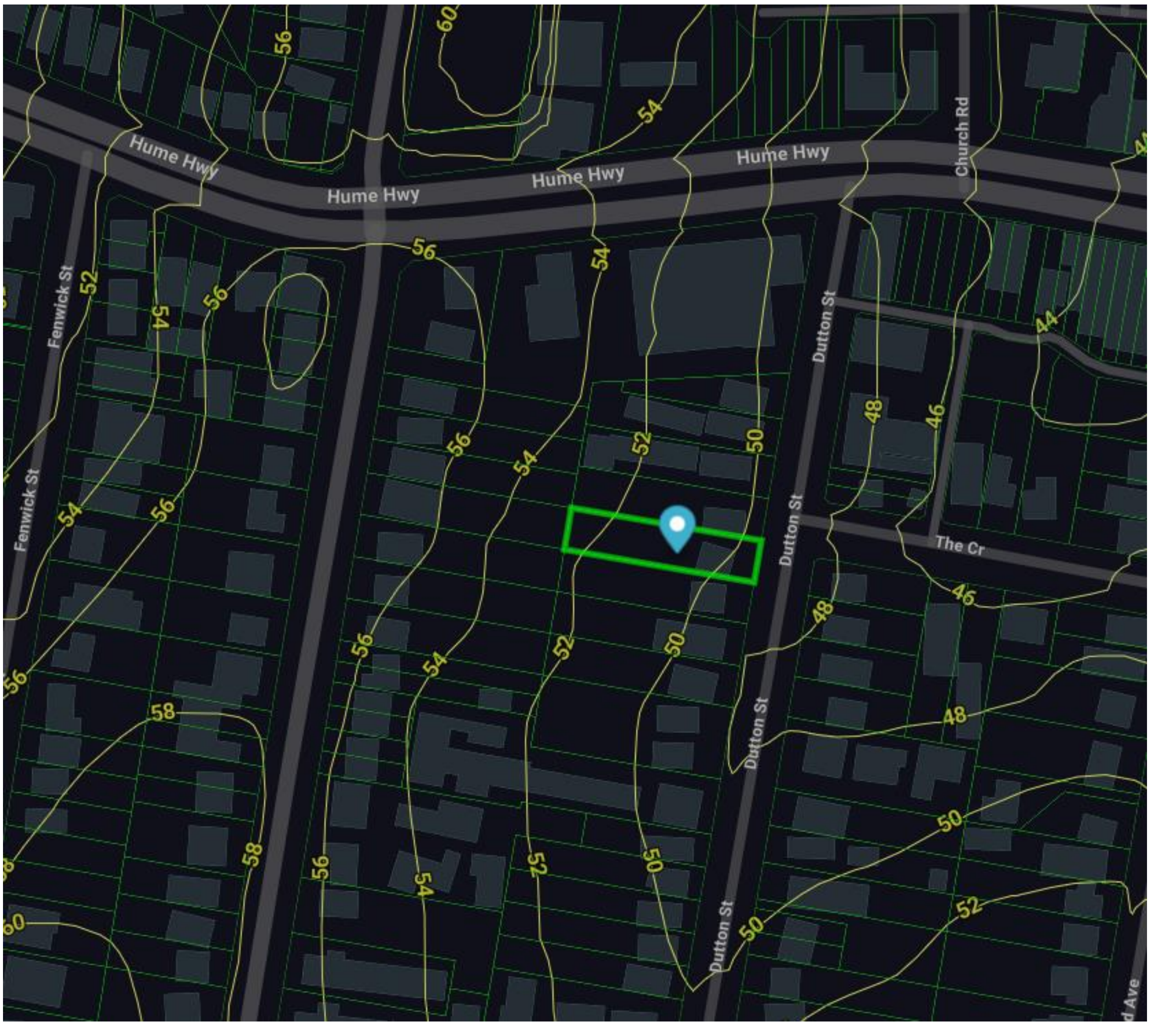

Figure 2: Upstream Catchment Plan (Source: Mecone Mosaic 2024)

2.4 Existing Stormwater Discharge

Currently the stormwater discharge from the site is made via two direct connections to the kerb and gutter on Dutton Street.

3 Local Authority Requirements

The stormwater requirements for the subject site is governed by the Canterbury-Bankstown Development Control Plan 2023 – Development Engineering Standards Guide – June 2023. A summary of the key requirements for the development of the Stormwater management system for this development are summarized below.

3.1 Stormwater Conveyance Requirements

Council's Development Engineering Standards Guide 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	10	In Ground (Piped)
Major Drainage System	100	Overland

3.2 On Site Detention Requirements

Council's Development Engineering Standards Guide states that the post development peak discharge rates from the site are to be limited to the Pre-development peak discharge rates.

3.3 Stormwater Quality Treatment

Council's Development Engineering Standards Guide 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;
- 55% removal of total phosphorous; and
- 45% removal of total nitrogen.

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 (10 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 Legal Point of Discharge

It is proposed that as part of the development a new stormwater connection will be made to the existing stormwater drainage inlet pit on the other side of Dutton Street. The proposed arrangement can be referenced in the stormwater management drawings included in Appendix A of this report.

5 Stormwater Attenuation

As noted in Section 3.2, the post development peak discharge rates are to be restricted to the pre development peak discharge rates from the site.

Hydraulic modelling has been undertaken using DRAINS to confirm the On Site Detention tank size required to achieve the attenuated discharge rates.

The table below summarises the output of the modelling.

Table 2: On Site Detention Results

Design Storm (ARI)	Pre-Development Peak Discharge (L/s)	Post-Development Unattenuated Peak Discharge (L/s)	Post-Development Attenuated Peak Discharge (L/s)
10	52	81	52
100	91	118	83

Modelling has indicated that a storage volume of $23m^3$ will e required to provide sufficient water storage to allow for the required attenuation. The discharge from the tank will be controlled using an orifice plate with a 195mm diameter orifice.

The details and arrangement of the On Site Detention can be referenced in the stormwater management drawings included in Appendix A of this report.

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.

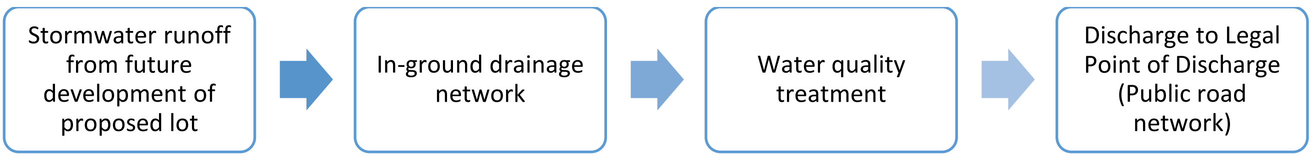

Figure 3: Proposed Water Quality Treatment Train

Further discussion on each element of this treatment train is provided below.

6.2.1 EnviroPod Pit Inlet Trap (or approved equivalent)

EnviroPod's (or other similar approved equivalents) provide effective removal of TSS and gross pollutants. EnviroPod's are a filter cage system which are inserted into roadway gully pits to filter and remove pollutants before the water enters the piped drainage system. It is proposed to place EnviroPod filters within every stormwater inlet pit.

Parameters	TSS	TP	TN	GP
Input (mg/L)	100	10	10	14.8
Output (mg/L)	46	7	8.7	0
Reduction (%)	54	30	13	100

Figure 13: EnviroPod Pit Inlet Trap (Source: Stormwater 360)

6.2.2 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.

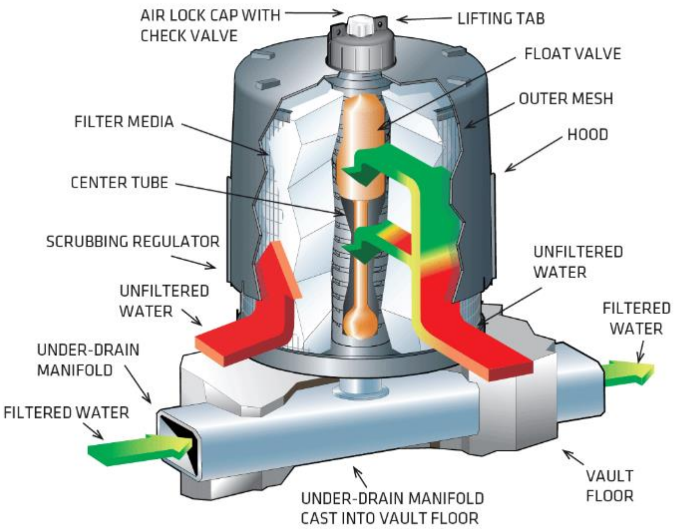

Figure 8: Stormwater360 Stormfilter (Source: Stormwater360)

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 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:

- 5 x OceanGuard sacks and
- 1 x Stormfilter Cartridge.

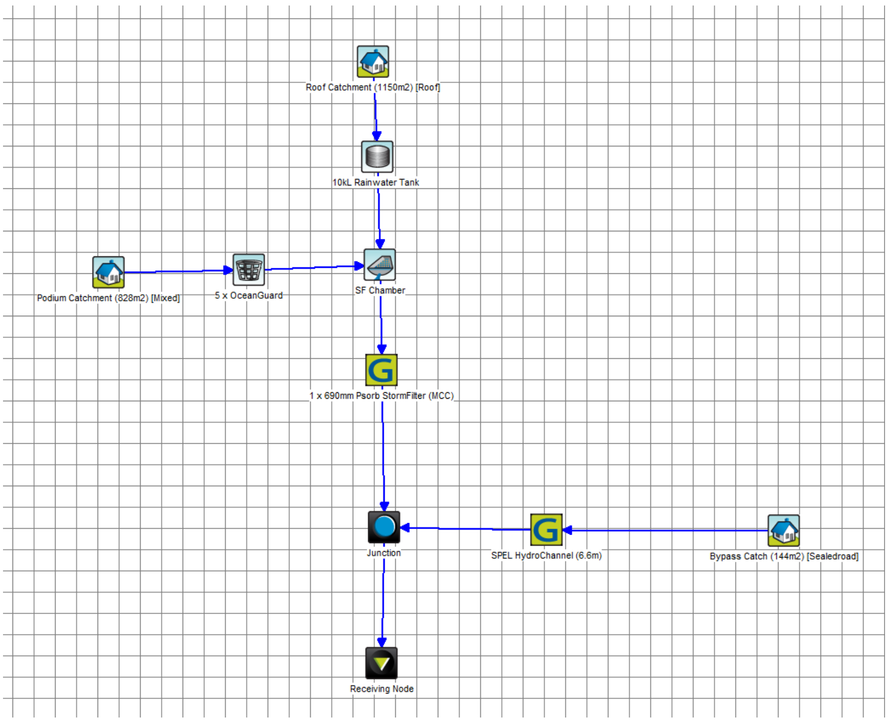

Figure 4 MUSIC Model

MUSIC Output

	Sources	Residual Load	% Reduction
Flow (ML/yr)	2.36	1.72	27.2
Total Suspended Solids (kg/yr)	211	27.7	86.9
Total Phosphorus (kg/yr)	0.553	0.176	68.2
Total Nitrogen (kg/yr)	5.53	2.45	55.6
Gross Pollutants (kg/yr)	56.3	0	100

Figure 5 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 3: Treatment Train Efficiencies

Indicator	Total Site Reduction	Site Targets	Target Achieved
Gross Pollutants	100	90%	Yes
Total Suspended Solids (TSS)	86.9	85%	Yes
Total Phosphorus (TP)	68.2	55%	Yes
Total Nitrogen (TN)	55.6	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. City of Canterbury-Bankstown 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 – Stormwater Management Drawings

CIVIL ENGINEERING WORKS

DEVELOPMENT APPLICATION

SITE LOCATION PLAN
SCALE 1:500

PROJECT SUMMARY

SITE ADDRESS:	115-117 DUTTON STREET, YAGOONA
LEGAL DESCRIPTION:	LOTS 18 & 19, DP 9795
LOCAL GOVERNMENT AREA:	CITY OF CANTERBURY BANKSTOWN
SITE AREA:	2,112m²
DEVELOPMENT DESCRIPTION:	MULTI-STOREY RESIDENTIAL DEVELOPMENT WITH BASEMENT

CEDAR DESIGN & CONSTRUCT	115-117 DUTTON STREET, YAGOONA	enscape studio	0496	C-01	A
CLIENT	PROJECT	tel 0411 267 151 info@enscapestudio.com.au ABN 91 649 181 171	PROJECT No	DRAWING No	REV

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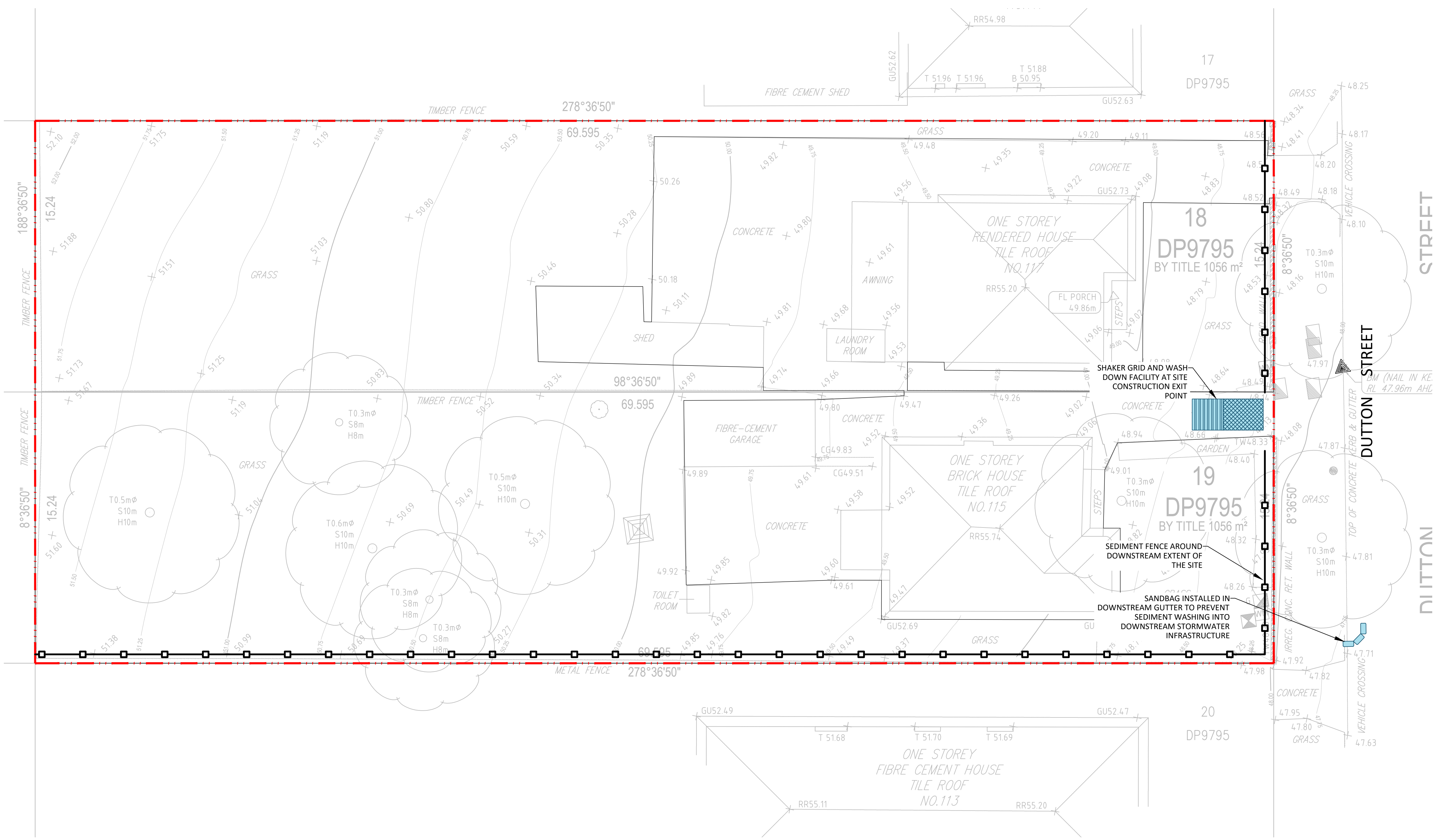
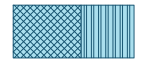
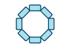


LEGEND

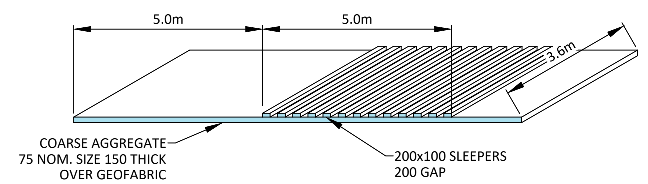
— · · —	SITE BOUNDARY
———	PROPOSED SITE HOARDING
	VEHICLE SHAKEDOWN DEVICE
—■——■—	PROPOSED SILT FENCE
	PROPOSED SANDBAG PROTECTION

EROSION AND SEDIMENT CONTROL NOTES

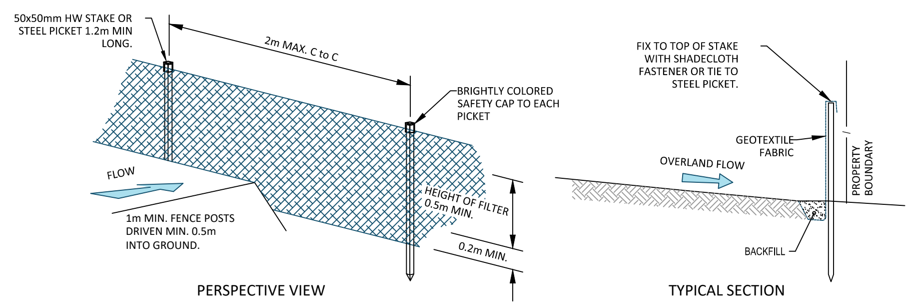
1. ALL WORK SHALL BE GENERALLY CARRIED OUT IN ACCORDANCE WITH:
   - LOCAL AUTHORITY REQUIREMENTS,
   - EPA - POLLUTION CONTROL MANUAL FOR URBAN STORMWATER,
   - DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT MANUAL- "URBAN EROSION & SEDIMENT CONTROL".
2. EROSION AND SEDIMENT CONTROL DRAWINGS AND NOTES 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

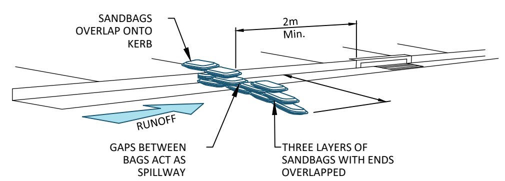
1. PRIOR TO COMMENCEMENT OF EXCAVATION THE FOLLOWING SOIL MANAGEMENT DEVICES MUST BE INSTALLED:
   - CONSTRUCT SILT CONTROL DEVICES BELOW THE SITE AND ACROSS ALL POTENTIAL RUNOFF SITES.
   - CO-ORDINATE CONSTRUCTION ENTRY/EXIT ROUTES WITH PROJECT MANAGER. ARRANGE SUITABLE LOCATION FOR THE INSPECTION 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



SEDIMENT FENCE DETAIL



SANDBAG KERB INLET SEDIMENT TRAP

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1:250 A3

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A	ISSUED FOR APPROVAL	IH	IH	29.10.24

CLIENT: CEDAR DESIGN & CONSTRUCT

PROJECT: 115-117 DUTTON STREET YAGOONA

TITLE: SEDIMENT & EROSION CONTROL PLAN

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
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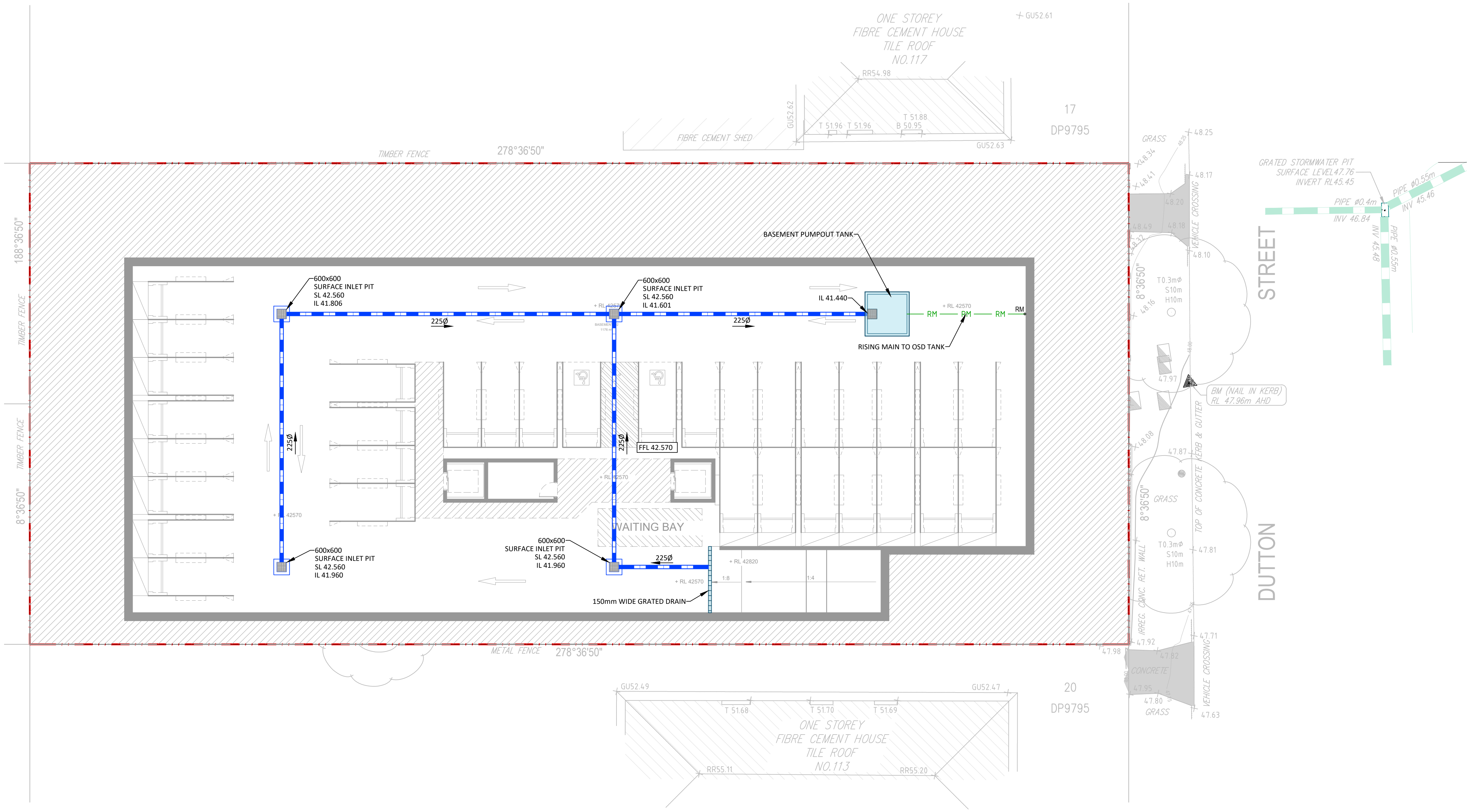

LEGEND

- PROPOSED SITE BOUNDARY
- PROPOSED STORMWATER PIPE
- PROPOSED GRATED PIT
- PROPOSED GRATED DRAIN
- ON SITE DETENTION TANK/ BASEMENT PUMP OUT
- 150Ø UPVC — PROPOSED PIPE SIZE AND FLOW DIRECTION
- ∘DP — PROPOSED DOWNPIPE
- OVERLAND FLOW

STORMWATER MANAGEMENT NOTES

SITE INFORMATION

ADDRESS:	115-117 DUTTON STREET, YAGOONA
LOCAL GOVERNMENT AREA:	CANTERBURY BANKSTOWN COUNCIL
SITE AREA:	2,112m²

DEVELOPMENT CONTROL REQUIREMENTS

GOVERNING DOCUMENT:	CANTERBURY-BANKSTOWN DEVELOPMENT CONTROL PLAN 2023 - DEVELOPMENT ENGINEERING STANDARDS GUIDE - JUNE 2023
DESIGN STORMS:	MINOR = 10 YEAR MAJOR = 100 YEAR

DISCHARGE ATTENUATION REQUIREMENT:

1. POST DEVELOPMENT PEAK DISCHARGE RATES FROM THE SITE ARE TO BE LIMITED TO THE PRE-DEVELOPMENT PEAK DISCHARGE RATES.

WATER QUALITY TREATMENT REQUIREMENTS:

- 90% REMOVAL OF GROSS POLLUTANTS (> 5MM);
- 85% REMOVAL OF TOTAL SUSPENDED SOLIDS;
- 55% REMOVAL OF TOTAL PHOSPHOROUS; AND
- 45% REMOVAL OF TOTAL NITROGEN.

SITE ATTENUATION DESIGN

ALLOWABLE PEAK DISCHARGE RATES:	10 YEAR ARI 100 YEAR ARI	= 52L/s = 91L/s
UNATTENUATED POST DEVELOPMENT DISCHARGE RATES:	10 YEAR ARI 100 YEAR ARI	= 81L/s = 118L/s
ATTENUATED POST DEVELOPMENT DISCHARGE RATES:	10 YEAR ARI 100 YEAR ARI	= 52L/s = 70L/s

REFER TO DRAINS CALCULATIONS BY ENSCAPE STUDIO FOR MORE INFORMATION.

OSD DESIGN SUMMARY

OSD VOLUME REQUIRED:	23.0m³
OSD VOLUME PROVIDED:	25.3m³
OSD DIMENSIONS:	WIDTH 3.3m LENGTH 7m DEPTH 1.1m
INVERT OF OUTLET:	47.70m AHD
ORIFICE PLATE DIAMETER:	193mm

1:125 2.5 0 2.5 5 A1
1:250 A3

REV	DESCRIPTION	DRAWN	APP'D	DATE
B	LAYOUT UPDATED	IH	IH	16.06.25
A	ISSUED FOR APPROVAL	IH	IH	29.10.24

CLIENT: CEDAR DESIGN & CONSTRUCT

PROJECT: 115-117 DUTTON STREET YAGOONA

TITLE: STORMWATER MANAGEMENT PLAN - BASEMENT 2

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
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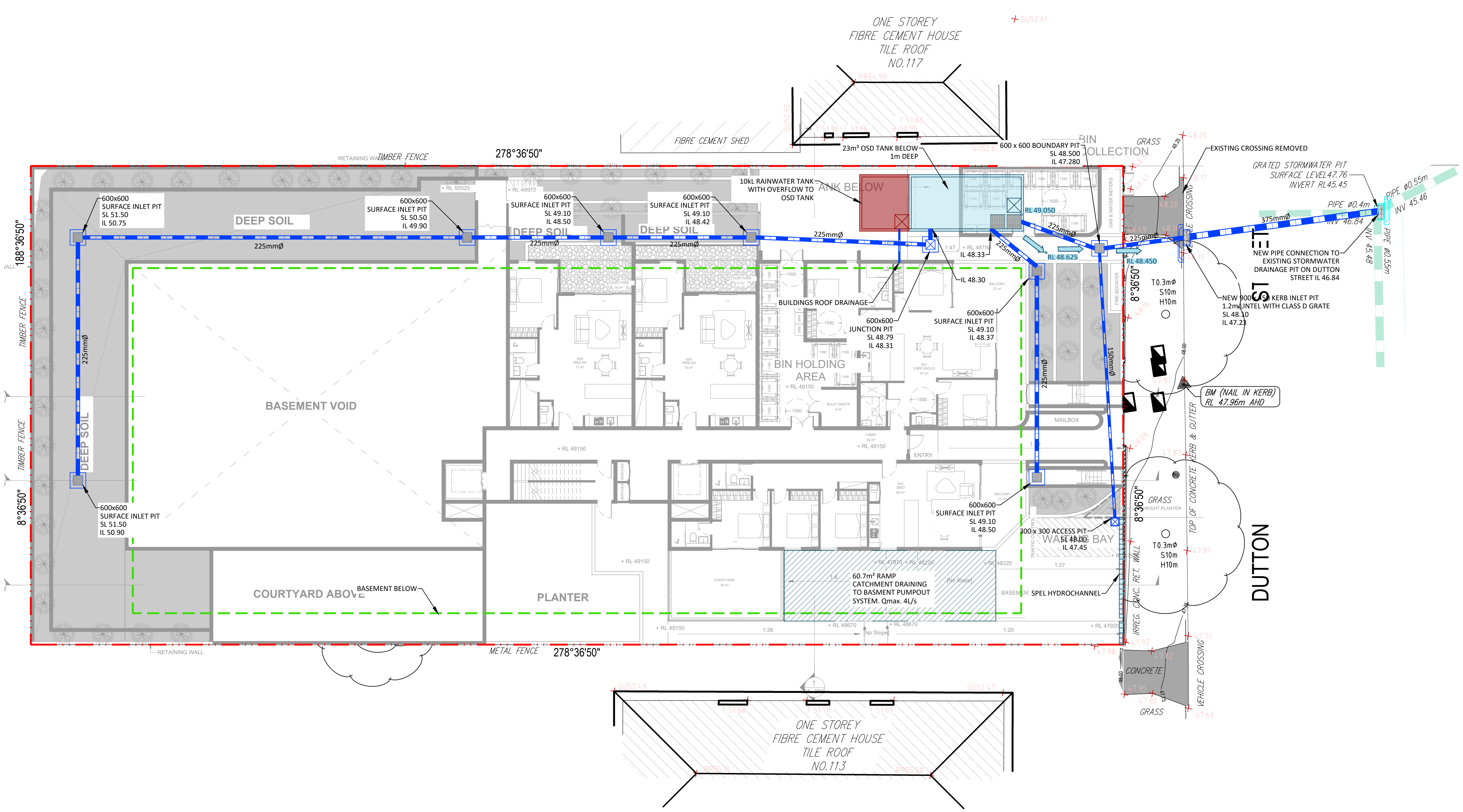

LEGEND

- PROPOSED SITE BOUNDARY
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- PROPOSED GRATED PIT
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- 150Ø UPVC — PROPOSED PIPE SIZE AND FLOW DIRECTION
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- OVERLAND FLOW

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ATTENUATED POST DEVELOPMENT DISCHARGE RATES:	10 YEAR ARI	= 52L/s
	100 YEAR ARI	= 70L/s

REFER TO DRAINS CALCULATIONS BY ENSCAPE STUDIO FOR MORE INFORMATION.

OSD DESIGN SUMMARY

OSD VOLUME REQUIRED:	23.0m³	
OSD VOLUME PROVIDED:	25.3m³	
OSD DIMENSIONS:	WIDTH	3.3m
	LENGTH	7m
	DEPTH	1.1m
INVERT OF OUTLET:	47.70m AHD	
ORIFICE PLATE DIAMETER:	193mm	

1:125 2.5 0 2.5 5 A1
1:250 A3

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B	LAYOUT UPDATED	IH	IH	16.06.25
A	ISSUED FOR APPROVAL	IH	IH	29.10.24

CLIENT: CEDAR DESIGN & CONSTRUCT

PROJECT: 115-117 DUTTON STREET YAGOONA

TITLE: STORMWATER MANAGEMENT PLAN - GROUND FLOOR

0496-C-11.dwg

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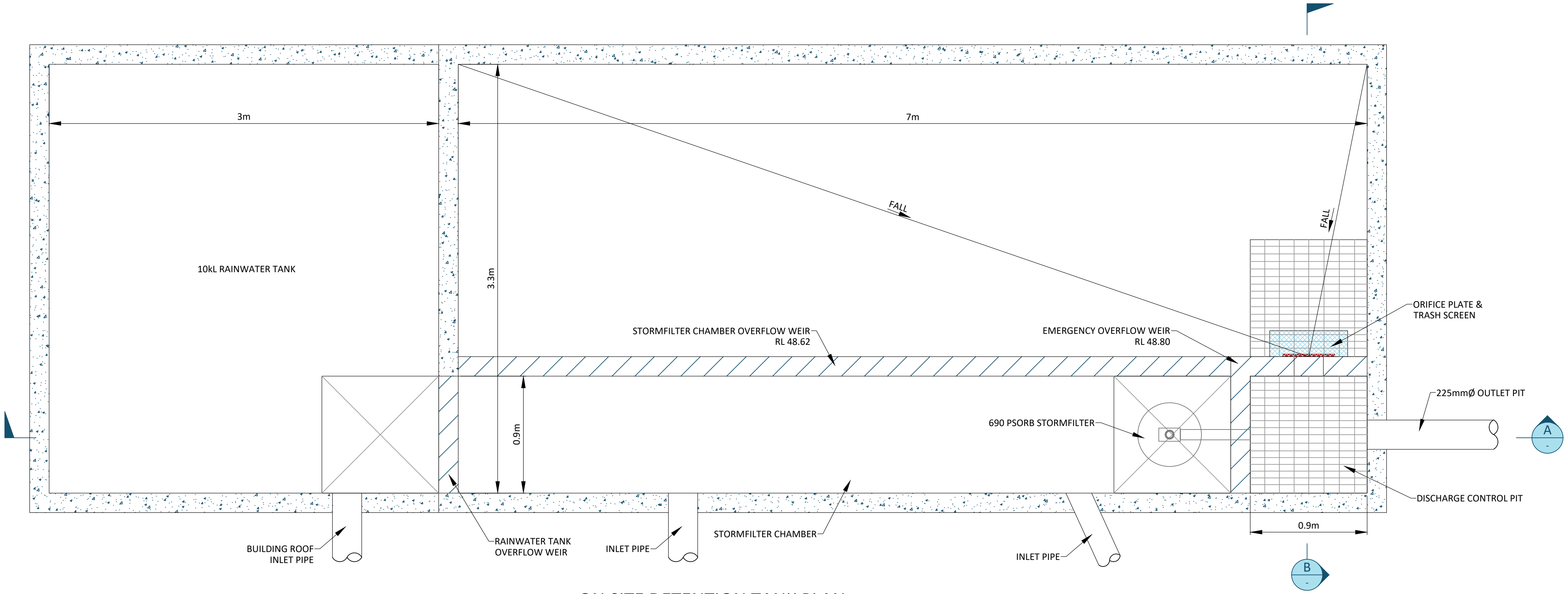
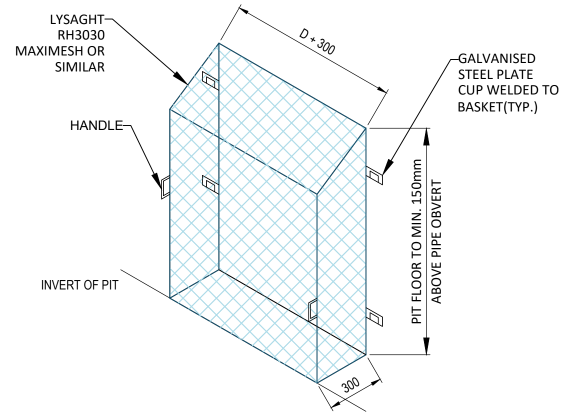
PRELIMINARY
NOT FOR CONSTRUCTION

SCALE @ A1	PROJECT No	DRAWING No	REV
AS NOTED	0496	C-11	B

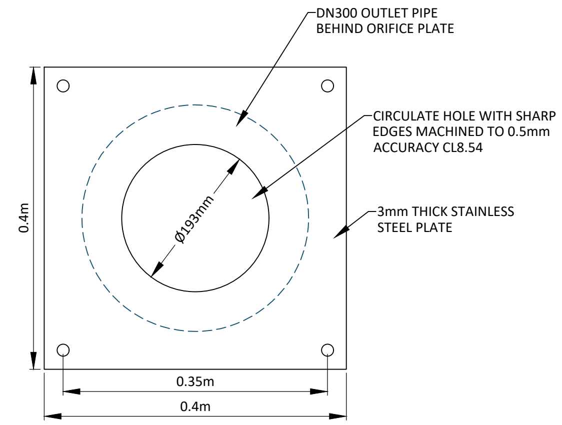
16/06/2025 3:10:33 PM



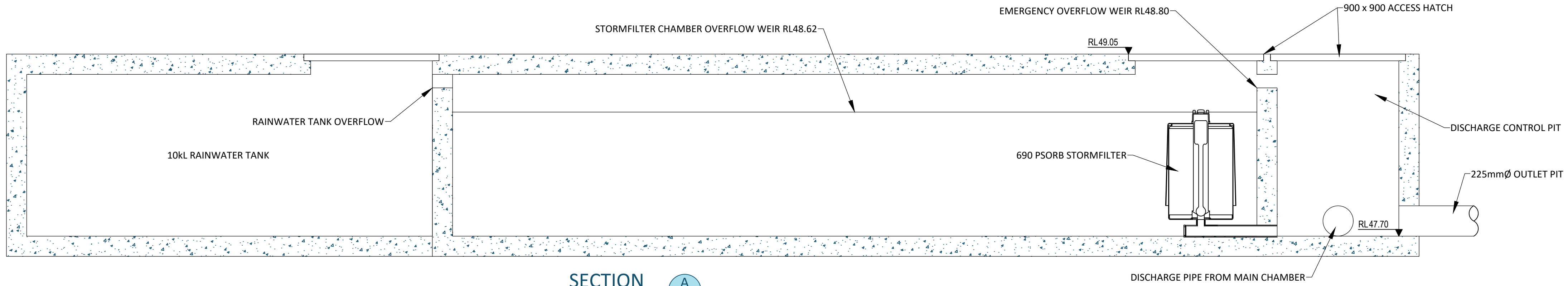
ON SITE DETENTION TANK PLAN
SCALE 1:20



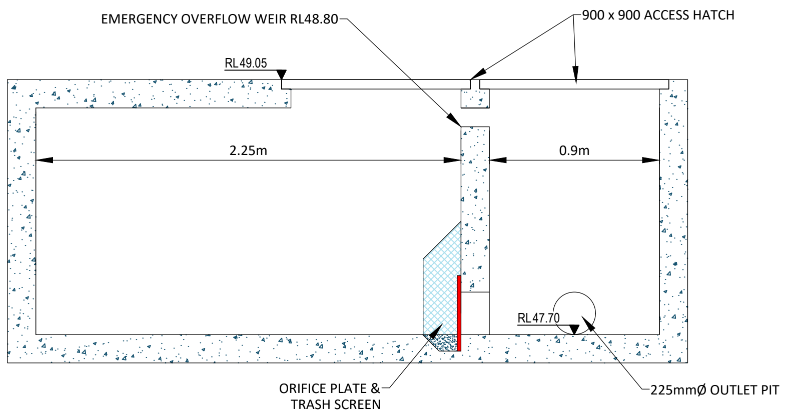
SCREEN MESH DETAIL
SCALE 1:20



ORIFICE PLATE DETAIL
SCALE 1:5



SECTION A
SCALE 1:20



SECTION B
SCALE 1:20

1:10 0.1 0 0.1 0.2 0.3 0.4 0.5 A1
1:20 A3
1:20 0.2 0 0.2 0.4 0.6 0.8 1 A1
1:40 A3

REV	DESCRIPTION	DRAWN	APP'D	DATE
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B	RAINWATER TANK ADDED	IH	IH	16.06.25
A	ISSUED FOR APPROVAL	IH	IH	29.10.24

CLIENT: CEDAR DESIGN & CONSTRUCT

PROJECT: 115-117 DUTTON STREET YAGOONA

TITLE: STORMWATER MANAGEMENT DETAILS SHEET 1

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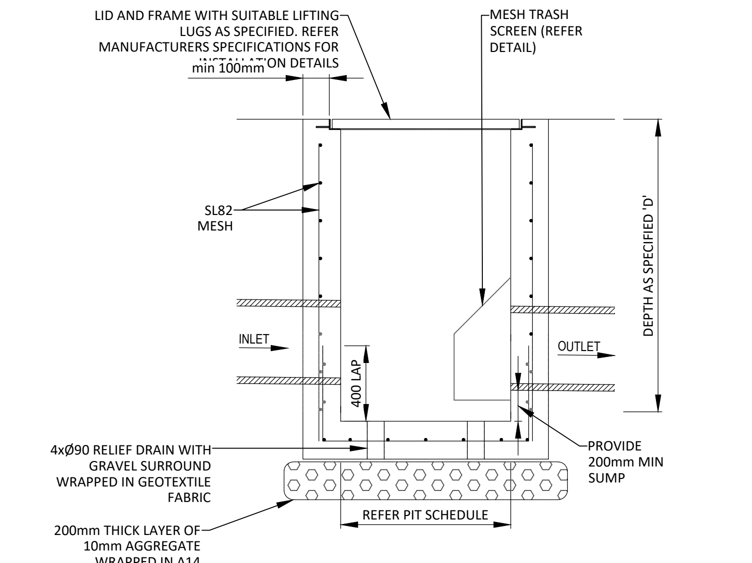
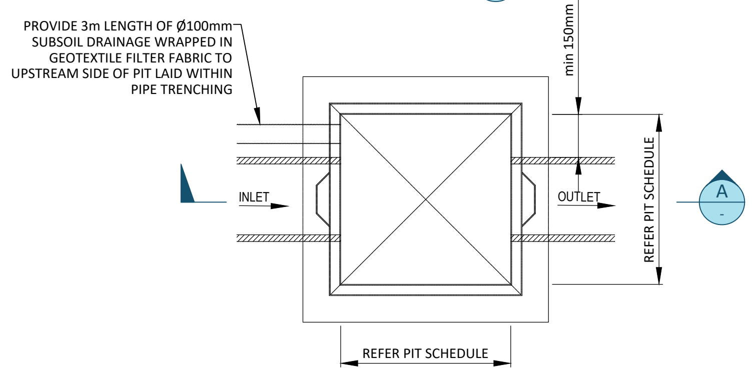
SCALE @ A1	PROJECT No	DRAWING No	REV
AS NOTED	0496	C-15	B

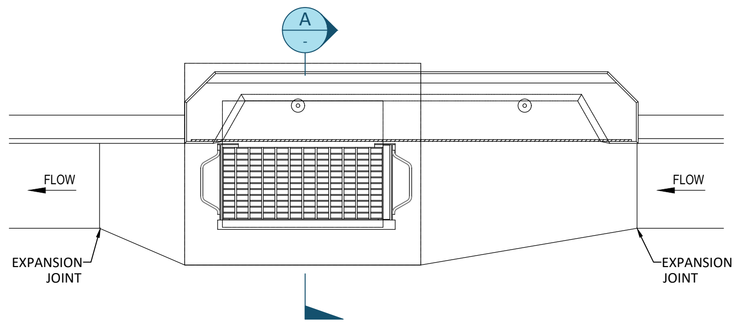
0496-C-15.dwg
16/06/2025 3:11:55 PM



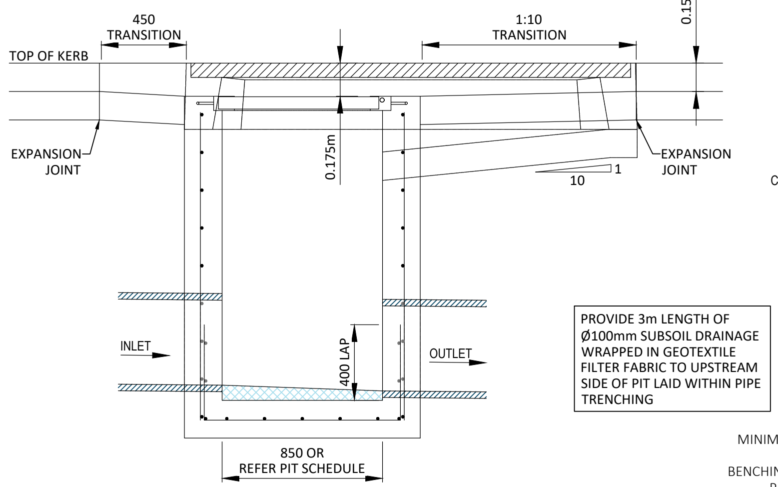
SECTION A
SCALE 1:20



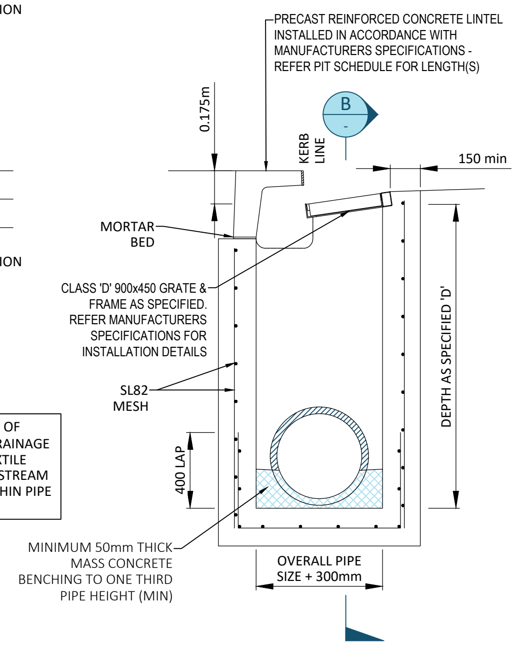
BOUNDARY JUNCTION PIT PLAN
SCALE 1:20



PLAN

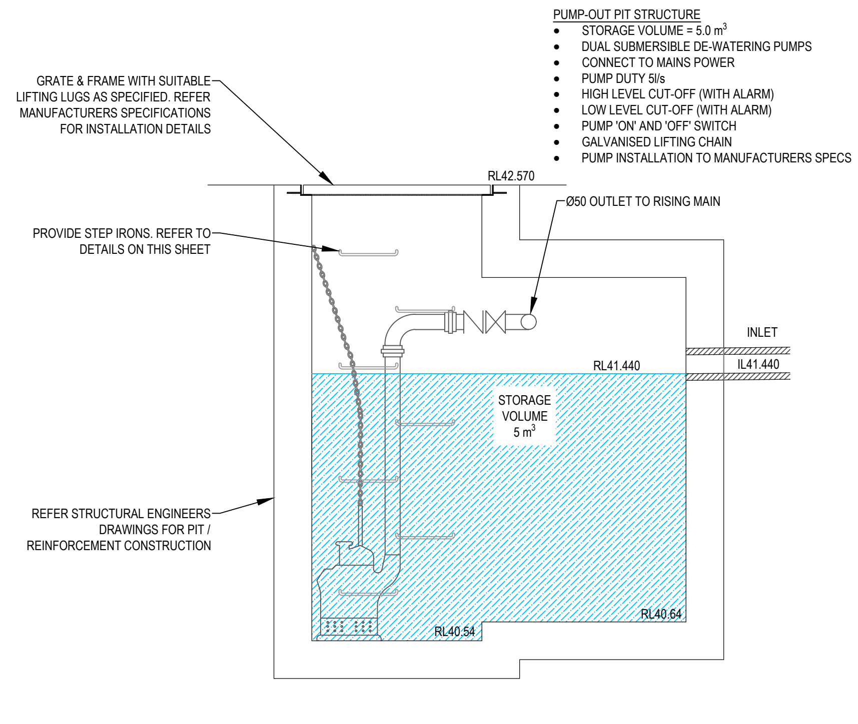


SECTION A
SCALE 1:20

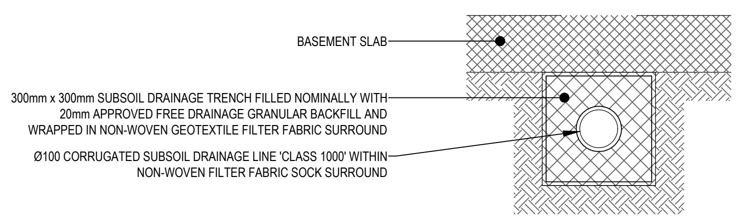


SECTION B
SCALE 1:20

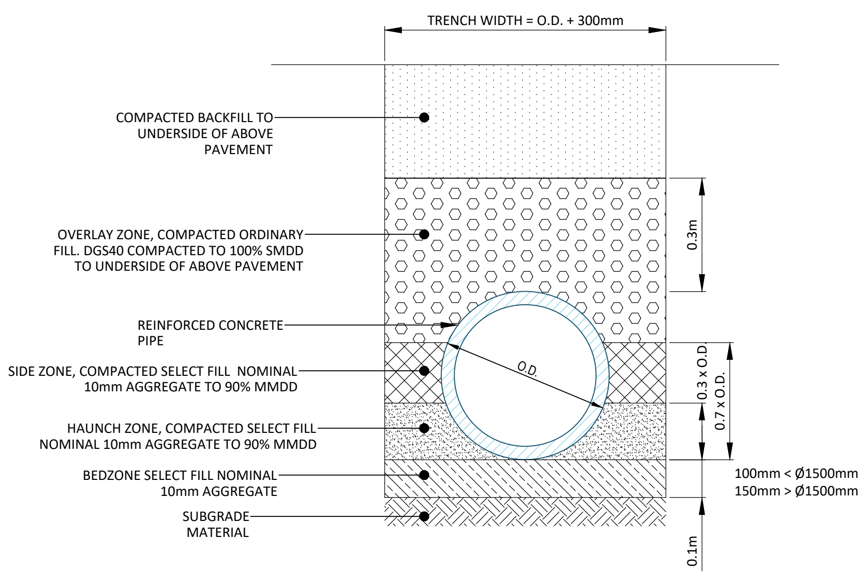
KERB INLET PIT DETAIL
SCALE 1:20



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



SUBSOIL DRAINAGE TRENCH DETAIL
(SCALE 1:10)



TYPICAL PIPE TRENCH DETAIL
SCALE 1:10

1:10	0.1	0	0.1	0.2	0.3	0.4	0.5	A1
1:20								A3
1:20	0.2	0	0.2	0.4	0.6	0.8	1	A1
1:40								A3

REV	DESCRIPTION	DRAWN	APP'D	DATE
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A	ISSUED FOR APPROVAL	IH	IH	29.10.24

CLIENT
CEDAR DESIGN & CONSTRUCT

PROJECT
115-117 DUTTON STREET YAGOONA

TITLE
STORMWATER MANAGEMENT DETAILS SHEET 2

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SCALE @ A1	PROJECT No	DRAWING No	REV
AS NOTED	0496	C-16	A

0496-C-16.dwg
29/10/2024 1:52:47 PM

Appendix B – MUSIC Model Output

Source nodes
Location,Roof Catchment (1150m2),Podium Catchment (828m2),Bypass Catch (144m2)
ID,1,2,5
Node Type,UrbanSourceNode,UrbanSourceNode,UrbanSourceNode
Zoning Surface Type,Roof,Mixed,Sealedroad
Total Area (ha),0.115,0.083,0.014
Area Impervious (ha),0.115,0.0261728731343283,0.014
Area Pervious (ha),0,0.0568271268656716,0
Field Capacity (mm),80,80,80
Pervious Area Infiltration Capacity coefficient - a,200,200,200
Pervious Area Infiltration Capacity exponent - b,1,1,1
Impervious Area Rainfall Threshold (mm/day),1,1,1
Pervious Area Soil Storage Capacity (mm),120,120,120
Pervious Area Soil Initial Storage (% of Capacity),25,25,25
Groundwater Initial Depth (mm),10,10,10
Groundwater Daily Recharge Rate (%),25,25,25
Groundwater Daily Baseflow Rate (%),5,5,5
Groundwater Daily Deep Seepage Rate (%),0,0,0
Stormflow Total Suspended Solids Mean (log mg/L),1.3,2.2,2.43
Stormflow Total Suspended Solids Standard Deviation (log mg/L),0.32,0.32,0.32
Stormflow Total Suspended Solids Estimation Method,Stochastic,Stochastic,Stochastic
Stormflow Total Suspended Solids Serial Correlation,0,0,0
Stormflow Total Phosphorus Mean (log mg/L),-0.89,-0.45,-0.3
Stormflow Total Phosphorus Standard Deviation (log mg/L),0.25,0.25,0.25
Stormflow Total Phosphorus Estimation Method,Stochastic,Stochastic,Stochastic
Stormflow Total Phosphorus Serial Correlation,0,0,0
Stormflow Total Nitrogen Mean (log mg/L),0.3,0.42,0.34
Stormflow Total Nitrogen Standard Deviation (log mg/L),0.19,0.19,0.19
Stormflow Total Nitrogen Estimation Method,Stochastic,Stochastic,Stochastic
Stormflow Total Nitrogen Serial Correlation,0,0,0
Baseflow Total Suspended Solids Mean (log mg/L),1.1,1.1,1.2
Baseflow Total Suspended Solids Standard Deviation (log mg/L),0.17,0.17,0.17
Baseflow Total Suspended Solids Estimation Method,Stochastic,Stochastic,Stochastic
Baseflow Total Suspended Solids Serial Correlation,0,0,0
Baseflow Total Phosphorus Mean (log mg/L),-0.82,-0.82,-0.85
Baseflow Total Phosphorus Standard Deviation (log mg/L),0.19,0.19,0.19
Baseflow Total Phosphorus Estimation Method,Stochastic,Stochastic,Stochastic
Baseflow Total Phosphorus Serial Correlation,0,0,0
Baseflow Total Nitrogen Mean (log mg/L),0.32,0.32,0.11
Baseflow Total Nitrogen Standard Deviation (log mg/L),0.12,0.12,0.12
Baseflow Total Nitrogen Estimation Method,Stochastic,Stochastic,Stochastic
Baseflow Total Nitrogen Serial Correlation,0,0,0
Flow based constituent generation - enabled,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),1.55,0.618,0.189

OUT - TSS Mean Annual Load (kg/yr),40.3,102,68.7
OUT - TP Mean Annual Load (kg/yr),0.225,0.216,0.112
OUT - TN Mean Annual Load (kg/yr),3.41,1.66,0.458
OUT - Gross Pollutant Mean Annual Load (kg/yr),37.5,14.2,4.57
Rain In (ML/yr),1.71303,1.23636,0.208543
ET Loss (ML/yr),0.162405,0.618437,0.019771
Deep Seepage Loss (ML/yr),0,0,0
Baseflow Out (ML/yr),0,0.137418,0
Imp. Stormflow Out (ML/yr),1.55063,0.358128,0.188772
Perv. Stormflow Out (ML/yr),0,0.122383,0
Total Stormflow Out (ML/yr),1.55063,0.480511,0.188772
Total Outflow (ML/yr),1.55063,0.617929,0.188772
Change in Soil Storage (ML/yr),0,-2E-6,0
TSS Baseflow Out (kg/yr),0,1.8692,0
TSS Total Stormflow Out (kg/yr),40.2766,100.52,68.678
TSS Total Outflow (kg/yr),40.2766,102.389,68.678
TP Baseflow Out (kg/yr),0,0.022863,0
TP Total Stormflow Out (kg/yr),0.224704,0.193601,0.112114
TP Total Outflow (kg/yr),0.224704,0.216464,0.112114
TN Baseflow Out (kg/yr),0,0.298675,0
TN Total Stormflow Out (kg/yr),3.41232,1.3638,0.457781
TN Total Outflow (kg/yr),3.41232,1.66248,0.457781
GP Total Outflow (kg/yr),37.5219,14.4523,4.56789

No Imported Data Source nodes

USTM treatment nodes
Location,10kL Rainwater Tank ,SF Chamber
ID,3,7
Node Type,RainWaterTankNode,SedimentationBasinNode
Lo-flow bypass rate (cum/sec),0,0
Hi-flow bypass rate (cum/sec),100,100
Inlet pond volume,0,0
Area (sqm),5,4.5
Initial Volume (m^3),10,0
Extended detention depth (m),0.2,0.77
Number of Rainwater tanks,1,
Permanent Pool Volume (cubic metres),10,0
Proportion vegetated,0,0
Equivalent Pipe Diameter (mm),50,24
Overflow weir width (m),10,2
Notional Detention Time (hrs),0.107,0.817
Orifice Discharge Coefficient,0.6,0.6
Weir Coefficient,1.7,1.7
Number of CSTR Cells,2,1
Total Suspended Solids - k (m/yr),400,1
Total Suspended Solids - C* (mg/L),12,20
Total Suspended Solids - C** (mg/L),0,20
Total Phosphorus - k (m/yr),300,1
Total Phosphorus - C* (mg/L),0.13,0.13
Total Phosphorus - C** (mg/L),0,0.13
Total Nitrogen - k (m/yr),40,1
Total Nitrogen - C* (mg/L),1.4,1.4
Total Nitrogen - C** (mg/L),0,1.4
Threshold Hydraulic Loading for C** (m/yr),0,3500
Horizontal Flow Coefficient, ,
Reuse Enabled,On,Off
Max drawdown height (m),2,

```
Annual Demand Enabled,On,Off
Annual Demand Value (ML/year),2.25,
Annual Demand Distribution,PET,
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,Off
Daily Demand Value (ML/day), ,
Custom Demand Enabled,Off,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,-9999
Proportion of upstream impervious area treated, ,
Exfiltration Rate (mm/hr),0,0
Evaporative Loss as % of PET,0,0
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),1.55,1.53
IN - TSS Mean Annual Load (kg/yr),40.3,43.9
IN - TP Mean Annual Load (kg/yr),0.225,0.282
```

IN - TN Mean Annual Load (kg/yr),3.41,3.32
IN - Gross Pollutant Mean Annual Load (kg/yr),37.5,0.00
OUT - Mean Annual Flow (ML/yr),0.909,1.53
OUT - TSS Mean Annual Load (kg/yr),22.7,43.9
OUT - TP Mean Annual Load (kg/yr),0.130,0.284
OUT - TN Mean Annual Load (kg/yr),2.01,3.32
OUT - Gross Pollutant Mean Annual Load (kg/yr),0.00,0.00
Flow In (ML/yr),1.55062,1.52709
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),0,0
Orifice / Filter Out (ML/yr),0.589142,0.844578
Weir Out (ML/yr),0.320077,0.683018
Transfer Function Out (ML/yr),0,0
Reuse Supplied (ML/yr),0.651502,0
Reuse Requested (ML/yr),2.24998,0
% Reuse Demand Met,28.9559,0
% Load Reduction,41.3642,-0.0331349
TSS Flow In (kg/yr),40.2766,43.8758
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),0,0
TSS Orifice / Filter Out (kg/yr),14.6041,22.8495
TSS Weir Out (kg/yr),8.12901,21.0444
TSS Transfer Function Out (kg/yr),0,0
TSS Reuse Supplied (kg/yr),12.5262,0
TSS Reuse Requested (kg/yr),0,0
TSS % Reuse Demand Met,0,0
TSS % Load Reduction,43.5575,-0.0412528
TP Flow In (kg/yr),0.224704,0.281761
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),0,0
TP Orifice / Filter Out (kg/yr),0.0846689,0.155219
TP Weir Out (kg/yr),0.0455669,0.128394
TP Transfer Function Out (kg/yr),0,0
TP Reuse Supplied (kg/yr),0.090783,0
TP Reuse Requested (kg/yr),0,0
TP % Reuse Demand Met,0,0
TP % Load Reduction,42.0412,-0.657295
TN Flow In (kg/yr),3.41232,3.32171
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),0,0
TN Orifice / Filter Out (kg/yr),1.30056,1.80295
TN Weir Out (kg/yr),0.707787,1.51481
TN Transfer Function Out (kg/yr),0,0
TN Reuse Supplied (kg/yr),1.35759,0
TN Reuse Requested (kg/yr),0,0
TN % Reuse Demand Met,0,0
TN % Load Reduction,41.1442,0.118915
GP Flow In (kg/yr),37.5219,0
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
PET Scaling Factor, ,

Generic treatment nodes
Location,1 x 690mm Psorb StormFilter (MCC),5 x OceanGuard,SPEL HydroChannel (6.6m)
ID,6,8,10
Node Type,GenericNode,GPTNode,GenericNode
Lo-flow bypass rate (cum/sec),0,0,0
Hi-flow bypass rate (cum/sec),0.0009,0.1,0.00396
Flow Transfer Function
Input (cum/sec),0,0,0
Output (cum/sec),0,0,0
Input (cum/sec),10,10,10
Output (cum/sec),10,10,10
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,True
Input (kg/ML),0,0,0
Output (kg/ML),0,0,0
Input (kg/ML),14.9393,14.7808,15
Output (kg/ML),0,0,0
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,True
Input (mg/L),0,0,0
Output (mg/L),0,0,0
Input (mg/L),100,50,50
Output (mg/L),44.1,39.5,10.5
Input (mg/L), , ,
Output (mg/L), , ,
Input (mg/L), , ,
Output (mg/L), , ,
Input (mg/L), , ,
Output (mg/L), , ,
Input (mg/L), , ,
Output (mg/L), , ,
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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,True
Input (mg/L),0,0,0
Output (mg/L),0,0,0
Input (mg/L),10,10,5
Output (mg/L),1.39,7,0.9
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,True
Input (mg/L),0,0,0
Output (mg/L),0,0,0
Input (mg/L),1000,20.8,1000
Output (mg/L),66,8,60
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,Off
TSS Flow based Efficiency, , ,
TP Flow based Efficiency Enabled,Off,Off,Off
TP Flow based Efficiency, , ,
TN Flow based Efficiency Enabled,Off,Off,Off
TN Flow based Efficiency, , ,
GP Flow based Efficiency Enabled,Off,Off,Off
GP Flow based Efficiency, , ,
IN - Mean Annual Flow (ML/yr),1.53,0.618,0.189
IN - TSS Mean Annual Load (kg/yr),43.9,102,68.7
IN - TP Mean Annual Load (kg/yr),0.284,0.216,0.112
IN - TN Mean Annual Load (kg/yr),3.32,1.66,0.458
IN - Gross Pollutant Mean Annual Load (kg/yr),0.00,14.2,4.57
OUT - Mean Annual Flow (ML/yr),1.53,0.618,0.189
OUT - TSS Mean Annual Load (kg/yr),23.6,21.1,4.12
OUT - TP Mean Annual Load (kg/yr),0.156,0.152,20.2E-3
OUT - TN Mean Annual Load (kg/yr),2.36,1.31,96.1E-3
OUT - Gross Pollutant Mean Annual Load (kg/yr),0.00,0.00,0.00
Flow In (ML/yr),1.52754,0.617945,0.188774
ET Loss (ML/yr),0,0,0
Infiltration Loss (ML/yr),0,0,0
Low Flow Bypass Out (ML/yr),0,0,0
High Flow Bypass Out (ML/yr),0.721582,0,0
Orifice / Filter Out (ML/yr),0,0,0
Weir Out (ML/yr),0,0,0
Transfer Function Out (ML/yr),0.806001,0.617945,0.188774
Reuse Supplied (ML/yr),0,0,0
Reuse Requested (ML/yr),0,0,0
% Reuse Demand Met,0,0,0
% Load Reduction,-0.00261858,0,0
TSS Flow In (kg/yr),43.8902,102.384,68.678
TSS ET Loss (kg/yr),0,0,0
TSS Infiltration Loss (kg/yr),0,0,0
TSS Low Flow Bypass Out (kg/yr),0,0,0
TSS High Flow Bypass Out (kg/yr),22.1708,0,0
TSS Orifice / Filter Out (kg/yr),0,0,0
TSS Weir Out (kg/yr),0,0,0
TSS Transfer Function Out (kg/yr),1.43372,21.1423,4.12068
TSS Reuse Supplied (kg/yr),0,0,0
TSS Reuse Requested (kg/yr),0,0,0
TSS % Reuse Demand Met,0,0,0
TSS % Load Reduction,46.2192,79.35,94
TP Flow In (kg/yr),0.283611,0.216461,0.112114
TP ET Loss (kg/yr),0,0,0
TP Infiltration Loss (kg/yr),0,0,0
TP Low Flow Bypass Out (kg/yr),0,0,0
TP High Flow Bypass Out (kg/yr),0.135312,0,0
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TP Orifice / Filter Out (kg/yr),0,0,0
TP Weir Out (kg/yr),0,0,0
TP Transfer Function Out (kg/yr),0.020614,0.151524,0.02018
TP Reuse Supplied (kg/yr),0,0,0
TP Reuse Requested (kg/yr),0,0,0
TP % Reuse Demand Met,0,0,0
TP % Load Reduction,45.0212,29.9994,82.0005
TN Flow In (kg/yr),3.31768,1.66249,0.457782
TN ET Loss (kg/yr),0,0,0
TN Infiltration Loss (kg/yr),0,0,0
TN Low Flow Bypass Out (kg/yr),0,0,0
TN High Flow Bypass Out (kg/yr),1.60126,0,0
TN Orifice / Filter Out (kg/yr),0,0,0
TN Weir Out (kg/yr),0,0,0
TN Transfer Function Out (kg/yr),0.756975,1.31336,0.096134
TN Reuse Supplied (kg/yr),0,0,0
TN Reuse Requested (kg/yr),0,0,0
TN % Reuse Demand Met,0,0,0
TN % Load Reduction,28.9192,21.0005,79
GP Flow In (kg/yr),0,14.2207,4.56788
GP ET Loss (kg/yr),0,0,0
GP Infiltration Loss (kg/yr),0,0,0
GP Low Flow Bypass Out (kg/yr),0,0,0
GP High Flow Bypass Out (kg/yr),0,0,0
GP Orifice / Filter Out (kg/yr),0,0,0
GP Weir Out (kg/yr),0,0,0
GP Transfer Function Out (kg/yr),0,0,0
GP Reuse Supplied (kg/yr),0,0,0
GP Reuse Requested (kg/yr),0,0,0
GP % Reuse Demand Met,0,0,0
GP % Load Reduction,100,100,100

Other nodes
Location,Receiving Node,Junction
ID,4,9
Node Type,ReceivingNode,JunctionNode
IN - Mean Annual Flow (ML/yr),1.72,1.72
IN - TSS Mean Annual Load (kg/yr),27.7,27.7
IN - TP Mean Annual Load (kg/yr),0.176,0.176
IN - TN Mean Annual Load (kg/yr),2.45,2.45
IN - Gross Pollutant Mean Annual Load (kg/yr),0.00,0.00
OUT - Mean Annual Flow (ML/yr),1.72,1.72
OUT - TSS Mean Annual Load (kg/yr),27.7,27.7
OUT - TP Mean Annual Load (kg/yr),0.176,0.176
OUT - TN Mean Annual Load (kg/yr),2.45,2.45
OUT - Gross Pollutant Mean Annual Load (kg/yr),0.00,0.00
% Load Reduction,27.2,27.2
TSS % Load Reduction,86.9,86.9
TN % Load Reduction,55.6,55.6
TP % Load Reduction,68.2,68.2
GP % Load Reduction,100,100

Links
Location,Drainage Link,Drainage Link,Drainage Link,Drainage Link,Drainage Link,Drainage Link,Drainage Link,Drainage Link,Drainage Link
Source node ID,1,3,7,6,9,2,8,5,10
Target node ID,3,7,6,9,4,8,7,10,9

Muskingum-Cunge Routing,Not Routed,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),1.55,0.909,1.53,1.53,1.72,0.618,0.618,0.189,0.189
IN - TSS Mean Annual Load (kg/yr),40.3,22.7,43.9,23.6,27.7,102,21.1,68.7,4.12
IN - TP Mean Annual Load (kg/yr),0.225,0.130,0.284,0.156,0.176,0.216,0.152,0.112,20.2E-3
IN - TN Mean Annual Load (kg/yr),3.41,2.01,3.32,2.36,2.45,1.66,1.31,0.458,96.1E-3
IN - Gross Pollutant Mean Annual Load (kg/yr),37.5,0.00,0.00,0.00,0.00,14.2,0.00,4.57,0.00
OUT - Mean Annual Flow (ML/yr),1.55,0.909,1.53,1.53,1.72,0.618,0.618,0.189,0.189
OUT - TSS Mean Annual Load (kg/yr),40.3,22.7,43.9,23.6,27.7,102,21.1,68.7,4.12
OUT - TP Mean Annual Load (kg/yr),0.225,0.130,0.284,0.156,0.176,0.216,0.152,0.112,20.2E-3
OUT - TN Mean Annual Load (kg/yr),3.41,2.01,3.32,2.36,2.45,1.66,1.31,0.458,96.1E-3
OUT - Gross Pollutant Mean Annual Load (kg/yr),37.5,0.00,0.00,0.00,0.00,14.2,0.00,4.57,0.00

Catchment Details
Catchment Name,0496 - WSUD Design
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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