

NAXOS

ENGINEERS

SITE BASED STORMWATER MANAGEMENT MASTER PLAN (MINISTERIAL INFRASTRUCTURE DESIGNATION)



PROPOSED MASTER PLAN OF ORMISTON COLLEGE

97 DUNDAS STREET WEST, ORMISTON QLD 4160

ROHRIG (QLD) PTY LTD

LOCAL AUTHORITY: Redland City Council
REPORT NUMBER: 25-132 – SBSMMP – V2
DATE PREPARED: April 2025
APPLICATION No: TBC

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2.0 INTRODUCTION

Naxos Engineers Pty Ltd has been engaged by our client Rohrig (QLD) Pty Ltd, to prepare a Site-Based Stormwater Management Master Plan for Ormiston College.

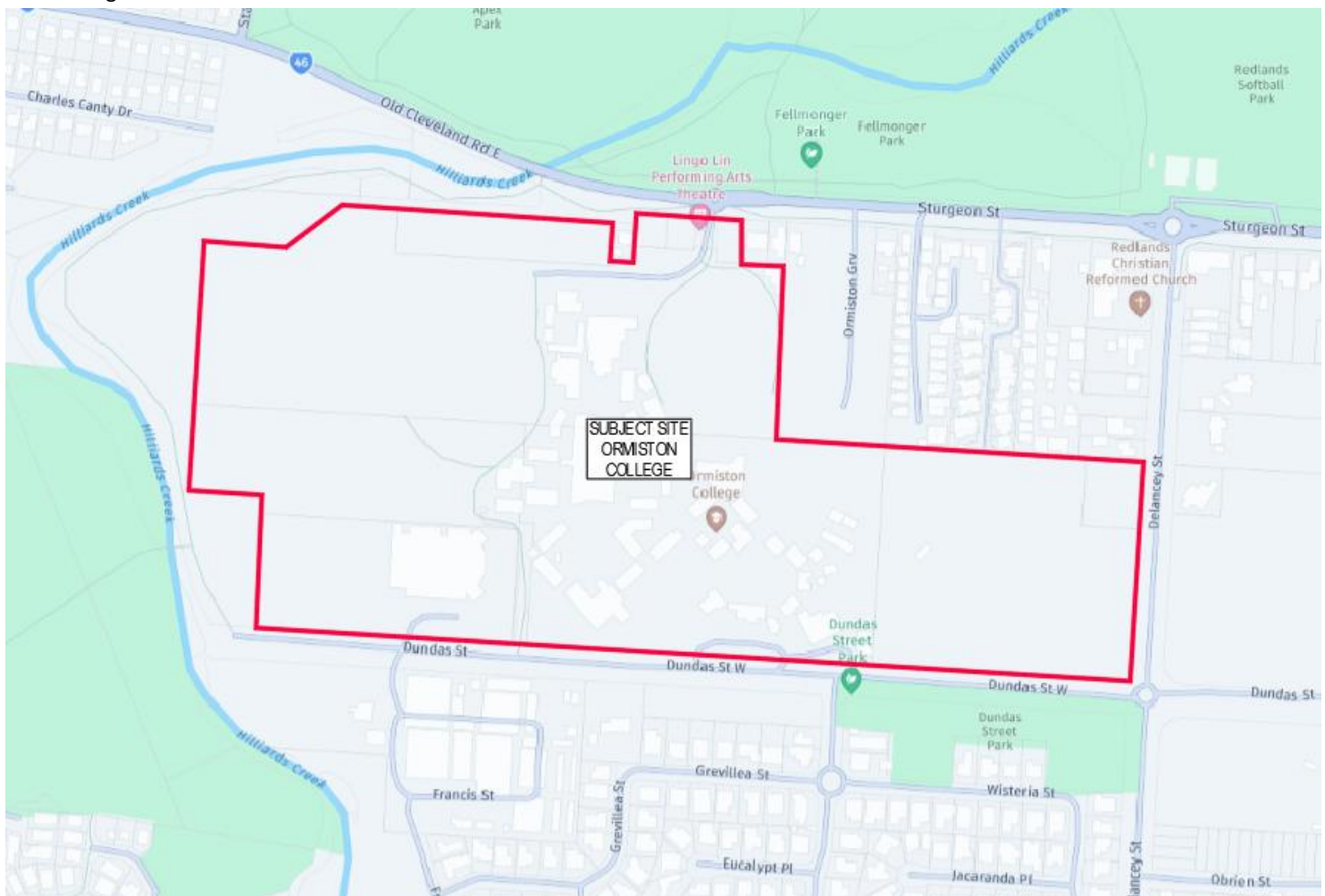
This Report will form part of the Development Application which will be submitted to Ministerial Infrastructure Designation (MID) as supporting documentation for the proposed master plan.

2.1.AVAILABLE INFORMATION

- Master Plan prepared by Rohrig (Appendix A)
- Detail Survey Plan prepared by AJS Surveys (Appendix B)
- Redland City Council Red-E-Map Data (Appendix C)

2.2.LOCALITY PLAN

Figure 2-1 SITE LOCATION



3.0 SCOPE OF REPORT

This Report will address the following stormwater issues:

- Identify the location of the lawful discharge points for the proposed Development,
- Prepare a stormwater concept plan for the proposed Development.

STORMWATER QUANTITY

- Identify the increase in stormwater runoff that will be generated by the Development (if any),
- If required identify management strategies to ensure that stormwater discharge from the Development is maintained at pre-Development flows for all storm events up to and including Q100, and
- Identify the location of the lawful discharge points for the Development and demonstrate that the proposed stormwater discharge will not adversely affect the downstream properties and drainage systems.

STORMWATER QUALITY

- Identify the Development sites classification (high or low risk) and the relevant planning policies and guidelines that the Development must comply with,
- If applicable, identify Water Quality Objective Targets as determined by Local Authority Planning Schemes & Department of Environment & Resource Management.
- Identify a suitable “stormwater treatment train” aimed to comply with the set Water Quality Objectives.
- If applicable, demonstrate compliance to the determined Water Quality Objectives with the use of “Model for Urban Stormwater Improvement Conceptualisation” Software (MUSIC Version 6.0.1).
- Prepare a conceptual stormwater layout highlighting all stormwater quality treatment devices proposed for this Development.
- Provide details on monitoring and maintenance requirements for all stormwater treatment devices incorporated within this Development.

EROSION AND SEDIMENT CONTROL

- Provide details of an Erosion and Sediment Control Management Plan which can be developed at the later stage during Operational Work.

4.0 SITE CHARACTERISTICS

4.1.LOCATION

The subject site, Ormiston College, is located at 97 Dundas Street West, Ormiston, within the Redland City Council local government area. The site is formally described as an amalgamation of the following lots:

Table 4-1 LOT DESCRIPTIONS

Lot Description	Area (m ²)
Lots 1-5 on RP109238	4,226
Lot 1 on RP127130	8,108
Lots 100-102 on SP306734	142,794
Lots 1 & 2 on RP110831	49,264
Lot 3 on RP49638	66,563

4.2.SITE DESCRIPTION

The site has a total area of approximately 270 955m² or 27.1 Ha and features a natural slope with grades of up to 4%. The land falls from the south-eastern corner to the north-western corner, directing surface runoff towards Hilliards Creek. The site is bounded by Dundas Street West to the north and Old Cleveland Road East to the north. The site is surrounded by predominantly residential Development, with patches of open space and environmental corridors. Ormiston College operates as a private educational facility, comprising various academic, sporting, and recreational facilities.

Figure 4-2 AERIAL PHOTOGRAPH



4.3.EXISTING LAND USE

The subject site is currently occupied by Ormiston College, a private school. The site contains a range of academic buildings, sporting fields, car parking areas, and associated infrastructure to support the school's operations as pictured in Figure 4-3.

The site is predominantly developed, with built structures, landscaped areas, and internal road networks, while sections of the site remain as open space to accommodate recreational activities. The site also includes drainage infrastructure, directing stormwater towards Hilliards Creek, which runs along the western boundary of the site.

Figure 4-3 EXISTING MASTER PLAN



Please refer to Appendix A for the Existing Master Plan

4.4.EXISTING STORMWATER DISCHARGE

4.4.1. STORMWATER QUANTITY

The existing stormwater discharge system at the subject site consists of multiple drainage catchments that direct runoff to an existing 25m x 10m on-site detention (OSD) system and ultimately discharge to Hilliards Creek. The OSD system is located north of the Bank of Queensland Oval (BOQ).

The design of this system was completed by JN Consulting Engineers (Job Ref : 19020055, RCC Ref : OPW/19/0108) , with as-constructed documentation provided by AllRoads. Relevant plans are included in Appendix E.

As the college moves forward with the implementation of the proposed Master Plan, the existing catchments and drainage infrastructure will be modified to accommodate new infrastructure, removal of outdated systems, upgrades to current facilities, and changes to internal catchments. With the end goal being to integrate with the existing stormwater discharge system.

The three main stormwater catchments are outlined below:

1. Western Catchment (Playing Fields and Hockey Facilities)

This catchment includes the hockey pitch, tartan track, and two playing fields to the west, along with adjacent car parks and buildings. Runoff from this area is captured by an internal drainage system and directed to the OSD before being discharged to Hilliards Creek.

Additionally, the ongoing construction of the Roseland Tennis Courts located on Lot 1 RP 127130, includes the installation of an ancillary stormwater quality treatment tank. Runoff from the tennis courts will be collected, treated, and then directed to the OSD before ultimately discharging to Hilliards Creek.

2. Central Catchment (Main School Precinct)

The largest catchment encompasses the junior and senior school buildings, car parks, footpaths, and other structures. Initially, runoff from this area was discharged directly to a headwall at Hilliards Creek. However, with the installation of the OSD system, flows are now diverted to the detention system before being discharged.

3. Eastern Catchment (Open Green Space along Delancy Street)

This smaller catchment consists of open green space along the eastern boundary. Unlike the other two catchments, runoff here is not collected by the internal drainage system but instead sheet flows into an existing swale along Delancy Street.

It is noted that the existing Lawful Points of Discharge - Hilliards Creek for Catchments 1 & 2 and the Existing Delancy Street Swal for Catchment 3, will remain unchanged throughout the Master Plan.

Please refer to Appendix D for Concept Engineering Plans which details the existing site catchments on drawing SK-001.

Please refer to Appendix E for details regarding the existing stormwater infrastructure including JN Design plans and AllRoads as built plans.

4.4.2. STORMWATER QUALITY

A review of all available information indicates that there are currently no existing stormwater quality treatment measures servicing the school. Stormwater runoff from the site is generally discharged without treatment, with the exception of the water quality infrastructure associated with the Roseland Tennis Courts Development.

As part of the approved Development under RCC reference MCU/22/0084 and Naxos reference 22-077, stormwater runoff from the new tennis courts will be treated using eight SPEL SF30EMC filters and three SPEL Stormsack's (GPT), before flows are directed into the existing drainage network and ultimately discharged to Hilliards Creek.

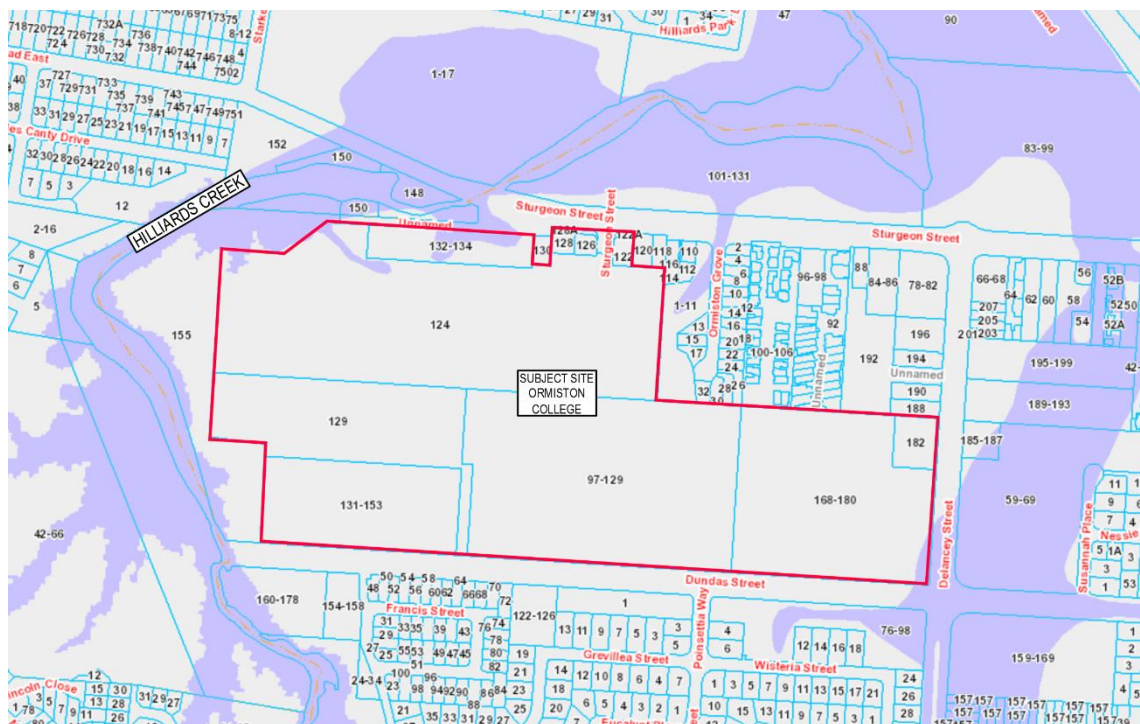
4.5.RCC FLOODING

A review of the RCC City Plan Version 12 Flood Mapping indicates that the site has minimal flood-prone areas. The designated flood-affected areas are primarily located along the site boundaries, particularly adjacent to Hilliards Creek.

The majority of the site remains outside mapped flood-prone areas, suggesting that flood risks are largely confined to peripheral sections of the property. All proposed works within the master plan will be undertaken outside the mapped flood-prone areas, ensuring no impact on designated flood-affected zones.

The extent of these flood-prone areas is illustrated in Figure 4-4 below.

Figure 4-4 FLOOD OVERLAY – RCC CITY PLAN V12



5.0 PROPOSED SITUATION

5.1. PROPOSED LAND USE

The Ormiston College Proposed Master Plan (Rohrig - drawing A-01-0001 Revision X) outlines the Development approach to expand the college's infrastructure and facilities. The proposed works include a combination of new buildings, extensions to existing structures, additional sporting facilities, upgraded parking areas, and improved pedestrian connectivity.

Construction will occur gradually over time, working towards the final master plan while ensuring minimal disruption to the college's operations. All proposed works will be undertaken outside mapped flood-prone areas, ensuring no impact on existing overland flow paths or the adjacent Hilliards Creek.

Refer to Appendix A for the Proposed Master Plan

5.2. DEVELOPED STORMWATER DISCHARGE

5.2.1. STORMWATER QUANTITY

The implementation of the proposed Master Plan will involve the construction of new buildings, renovations to existing structures, and additional pathways, car parks, and associated infrastructure.

While these changes will result in a slight increase in impervious area, the overall impact is expected to be minimal due to the scale of the site. The total increase in impervious surfaces is estimated to be in the range of 3–5%, which is considered negligible in the context of the overall catchment.

From a stormwater quantity perspective, the existing 25m x 10m OSD system located north of the BOQ Oval is expected to remain sufficient to service the proposed Master Plan. Although there will be a minor increase in discharge rates, the impact is anticipated to be negligible. Additionally, given that the site is located at the lower end of the broader catchment, further attenuation of stormwater flows is not considered necessary or advisable, as it may impede the natural flow regime and create unintended consequences upstream.

The proposed Ormiston College Master Plan has been developed to ensure that the existing internal catchment layout and lawful points of discharge are preserved. While new infrastructure such as buildings, pathways, and recreational facilities will be constructed, the existing catchment boundaries and flow paths will be largely maintained.

The three primary internal catchments identified in the pre-development scenario (refer to Section 4.4.1) will continue to function as they currently do, with minor modifications to internal drainage as needed to accommodate new development footprints. These updates will be undertaken in a way that does not alter the overall direction of flow or increase the risk to downstream receivers.

No changes are proposed to the existing lawful points of discharge, which are the existing Delancy Street Swale for Catchment 3 and Hilliards Creek for all other Catchments.

5.2.2. STORMWATER QUALITY

As part of the implementation of the Master Plan, the existing stormwater catchments will be reconfigured into smaller sub-catchments, each treated independently. This approach will allow for targeted stormwater quality treatment measures that align with changes in land use, runoff characteristics, and impervious area distribution.

To ensure effective stormwater quality management, treatment devices will be progressively integrated into the site's drainage network. As new buildings are constructed and existing structures are renovated, additional SPEL filters will be installed within proposed stormwater tanks to accommodate changes in catchment properties, including variations in roof area, ground cover, and landscaped spaces. These treatment systems are outlined in the following Sections

The proposed stormwater management strategy has been designed to retain these existing discharge locations and internal catchments.

6.0 STORMWATER QUALITY MASTER PLAN

6.1.SITE CLASSIFICATION

The implementation of a suitable stormwater management plan for the proposed Master Plan is determined from the following:

- Identify if compliance with the Department of Environment and Resource Management, State Planning Policy is required, or
- Identify if compliance with the local authorities Stormwater Quality is required, or
- Implement Best Management Practice Guidelines for low-risk sites as per local authority Development guidelines.

Either compliance objective will still be designed based on the following key principles:

- The use of Water Sensitive Urban Design (WSUD) principles is to be adopted throughout the site where possible,
- Water Quality controls are to be considered under two separate phases of the Development, the construction phase and the operational phase,
- The construction phase requires the assessment of the site during the construction and maintenance period of the Development.
- The operational phase requires assessment of the site over the total life of the site and its water quality control measures.

6.2.STORMWATER QUALITY MASTER PLAN OVERVIEW

The proposed stormwater quality management strategy for the Ormiston College Master Plan has been designed to be adaptable as new buildings, car parks, and pathways are constructed. Stormwater treatment measures will be progressively integrated to ensure compliance with water quality objectives.

Rather than implementing a series of separate treatment systems, stormwater quality management will be centralised through a single dedicated treatment chamber. A significant portion of runoff from the junior and senior school precincts will be collected via an internal drainage system and directed to this chamber. The Full Height Atlan Vault will be designed to accommodate modular ATLAN FIL-3.0 Full Height Filters, allowing additional units to be installed over time as impervious and roofed areas increase and the college advances towards the master plan.

The proposed stormwater treatment chamber will function as ancillary system to the existing OSD tank, ensuring that water quality treatment is independent of existing quantity control measures.

Further it is proposed that as the Development proceeds, all existing gully pits across the site will be gradually fitted with Stormsacks or an approved equivalent, to aid in the removal of pollutants.

It is noted that under the State Planning Policy (SPP) Water Quality Assessment Benchmarks, Developments with a total disturbance area of less than 2,500m² are not required to implement stormwater quality treatment measures. Consequently, only Master Plan elements exceeding this threshold will require stormwater quality treatment, as summarised in Table 6-3 below. It should be noted that items that have been deemed to have no measurable impact to stormwater quality are shown in the Table 6-2 below and are not included in Table 6-3.

Table 6-2 MASTER PLAN ITEMS WITH NO IMPACT TO STORMWATER QUALITY

Master Plan Item Number	Description/Notes	Reasoning
D01	Full Perimeter Fence	No impervious ground surfaces added.
D11	Outdoor Play Area	Area will remain 100% pervious.
D16	Additional Covered Entries to Existing Sports Center	Minor increase in roof area will not exceed 2500m ² .
D20	Junior School Sports Field & Lighting	Field will remain 100% pervious.
D21	External Shaded Seating	Minimal shade sail coverage - No increase in roof area.
D22	Covered Concrete Pathway	Small addition of impervious ground area – will be much smaller than 2500 m ² .
D23	Additional Street Parking	Not within the site.
D25	Additional Sports Field Lighting.	Installation of lighting will have negligible effect

It is noted that stormwater quality during construction of all Master Plan items will be managed independently in accordance with Section 10 of this Report.

Table 6-3 STORMWATER QUALITY IDENTIFICATION

Master Plan Item Number	Area (m ²)	Surface Type	Treatment Required	Description/Discharge Location
D02	887	Roof	NO	Hilliards Creek
D03	446	Roof	NO	Hilliards Creek
D04	4315	Ground	N/A	Treatment is provided under separate DA (MCU/22/0084)
D05	2060	Ground	N/A	Completed late 2024, Hilliards Creek
D06-D07	6076	Mixed	YES	Hilliards Creek,
S01 & D08	3072	Roof	YES	Hilliards Creek
D09	1105	Ground	NO	Hilliards Creek
D10	561	Roof	NO	Hilliards Creek
D12	1812	Mixed	NO	Existing Court Covering, Hilliards Creek
D13	175	Ground	NO	Hilliards Creek
D14	360	Ground	NO	Hilliards Creek
D15	738	Ground	NO	Hilliards Creek
D17-D18	1952	Mixed	NO	Delancy Street Open Drain (Asset ID: 423822)
J01-J10 & D24	3066	Mixed	YES	Hilliards Creek

The Master Plan Item Numbers above are shown on the Rohrig Overall Master Plan A-01-0002 Rev X in Appendix A.

6.3.STATE PLANNING POLICY ASSESSMENT

To determine whether compliance with the Department of Environment and Resource Management (DERM) State Planning Policy 4/10 Healthy Waters is required, it is required to undertake the State Planning Policies Assessment Benchmarks for Water Quality. Below is an extract from the state Planning Policy July 2017 (page 46) detailing the Assessment Benchmarks in table format. If any of the trigger questions are answered Yes, then compliance is expected with the State Planning Policy. If all trigger questions are answered No, then stormwater quality best management practices will be adopted.

Table 6-4 STATE PLANNING POLICY CHECKLIST

Development Application Types			
Material Change in Use MCU	Yes / No?	Reconfiguration of Lots ROL	Yes / No?
A material change of use for an urban purpose that involves premises 2500m ² or greater in size? AND , If yes:	YES	Reconfiguring a lot for an urban purpose that involves premises 2500m ² or greater in size AND will result in six or more lots? OR;	N/A
Will result in six or more dwellings. OR	N/A	Operational work for an urban purpose that involves disturbing a land area. 2500m ² or greater in size?	N/A
Will result in an impervious area greater than 25% Development area?	YES		

Based on the assessment criteria outlined in Table 6-4, the Master Plan elements identified in Table 6-3 as requiring stormwater treatment have been evaluated against the State Planning Policy (SPP) benchmarks. As these elements involve a total disturbance area exceeding 2,500m² and/or result in an impervious area greater than 25% of the net Development area, they are considered high-risk in terms of water quality impacts. Therefore, the State Planning Policy is applicable to these items, and compliance with local authority requirements for stormwater quality management is expected.

6.4.POLLUTANT CONCERNS

The pollutants of concern are summarised below. These pollutants can have adverse environmental impacts within the downstream catchment. It is proposed to adopt Site-Based Water Sensitive Urban Design to provide capture and treatment to the below mentioned pollutants.

Table 6-5 TYPICAL POLLUTANTS

POLLUTANT	SOURCE
LITTER	PAPER, CONSTRUCTION PACKAGING, FOOD WASTE, CEMENT, OFF - CUTS
SEDIMENT	UNPROTECTED EXPOSED SOILS, STOCKPILES, EROSION
HYDROCARBONS	FUEL AND OIL SPILLS, LEAKS FROM MACHINERY
TOXIC MATERIALS	CEMENT SLURRY, ASPHALT PRIMER, SOLVENTS, CLEANING AGENTS
PH ALTERING SUBSTANCES	ACID SULPHATE SOILS, CEMENT SLURRY, WASH WATER
THERMAL POLLUTION	VEHICLES AND MACHINERY, INCREASED IMPERVIOUS AREAS

6.5.CONSTRUCTION PHASE

During the construction phase, the potential exists for significant increases in the number of pollutants, particularly sediment, escaping from the site. During this period, an Erosion and Sediment Control Plan is required to be prepared as part of the overall Environmental Management Plan prepared for the construction phase.

An Erosion and Sediment Control Plan will be prepared during the detailed design phase of the Development. This plan will be prepared in accordance with Local Authority Guidelines and with recognised industry standards. This plan may also be submitted to Redland City Council for Operational Works Approval.

6.6.OPERATIONAL PHASE

Table 6-3 State Planning Policy Checklist above has identified the Development as a 'High Risk' site.

As this Development has been identified as 'High risk', selection of appropriate Stormwater Quality Improvement devices is required to ensure relevant Water Quality Objectives can be achieved. A stormwater treatment model is to be produced to assess pollutants and the performance of the proposed stormwater treatment train to be adopted for this Development.

6.7.WATER QUALITY OBJECTIVES

For this Development, it is necessary to identify the Water Quality Objectives (WQO's) with regards to the future stormwater discharge from the site. Based on "Urban Stormwater Quality Planning Guidelines 2010" obtained from Queensland Government, Department of Environment and Resource Management, the removal of the following pollutants from stormwater discharge will be required to meet the Water Quality Objectives.

Table 6-6 WATER QUALITY OBJECTIVES

INDICATOR	ENTIRE % REDUCTION
TSS (Total Suspended Solids)	80%
TP (Total Phosphorus)	60%
TN (Total Nitrogen)	45%
GP (Gross Pollutants)	90%

7.0 MUSIC MODELLING

MUSIC Version V6.3.0 was used to assess pollutants and the performance of the proposed stormwater treatment train to be adopted for this Development. Modelling was undertaken in accordance with “Water by Design – Music Modelling Guidelines Version 1.0 – 2010”

7.1.RAINFALL DATA & MODELLING PARAMETERS

The following rainfall data & modelling parameters were input into the MUSIC model:

Council:	Redland City Council
Station ID:	40265 Redlands
Climate Period for MUSIC:	01/01/1997 to 31/12/2006
Mean Annual Rainfall over Period:	1178mm
Time Step Adopted:	6 minutes

7.2.POLLUTANT EXPORT PARAMETERS

The following pollutant export parameters were obtained from “Water by Design – Music Modelling Guidelines Version 1.0 – 2010” and the below table represented the values adopted for this MUSIC model.

Table 7-7 POLLUTANT GENERATION INPUTS

Land Use	Flow Type	Surface Type	Total Suspended Solids (Log10 mg/L)		Total Phosphorus (Log10 mg/L)		Total Nitrogen (Log10 mg/L)	
			Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
RESIDENTIAL URBAN	Baseflow Parameters	Roof	N/A	N/A	N/A	N/A	N/A	N/A
		Roads	1.00	0.34	-0.97	0.31	0.20	0.20
		Ground Level	1.00	0.34	-0.97	0.31	0.20	0.20
	Stormflow Parameters	Roof	1.30	0.39	-0.89	0.31	0.26	0.23
		Roads	2.43	0.39	-0.30	0.31	0.26	0.23
		Ground Level	2.18	0.39	-0.47	0.31	0.26	0.23

7.3.SOURCE NODE PARAMETERS

Music source nodes with the following parameters have been used to model the proposed Master Plan Item catchments, for further detail refer to SK002 within Appendix D.

Figure 7-5 GROUND (ROAD & FOOTPATH) NODES

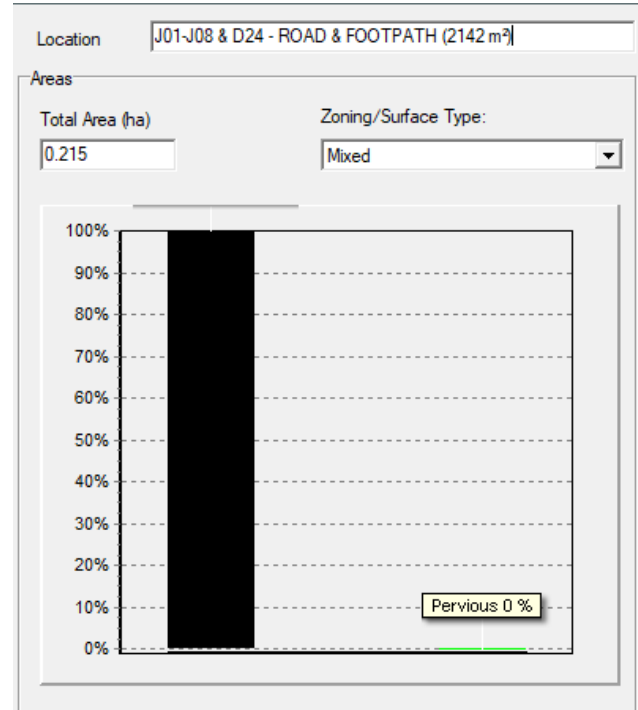
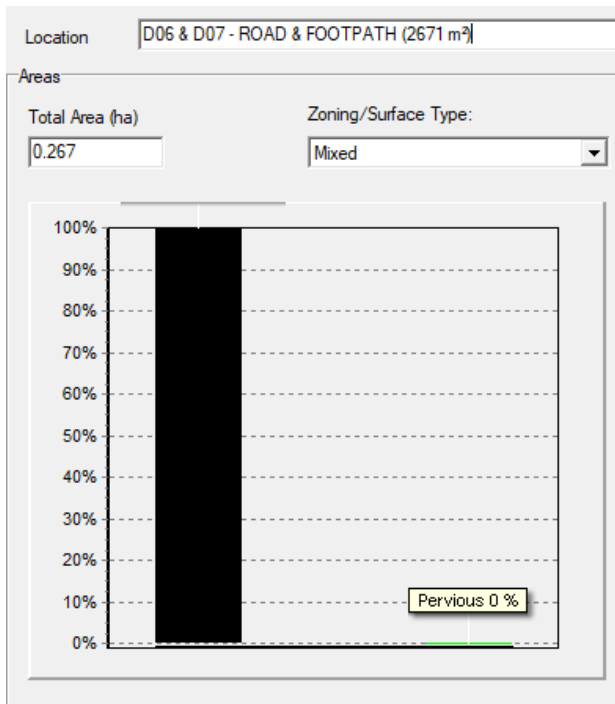


Figure 7-6 GROUND (LANDSCAPE) NODES

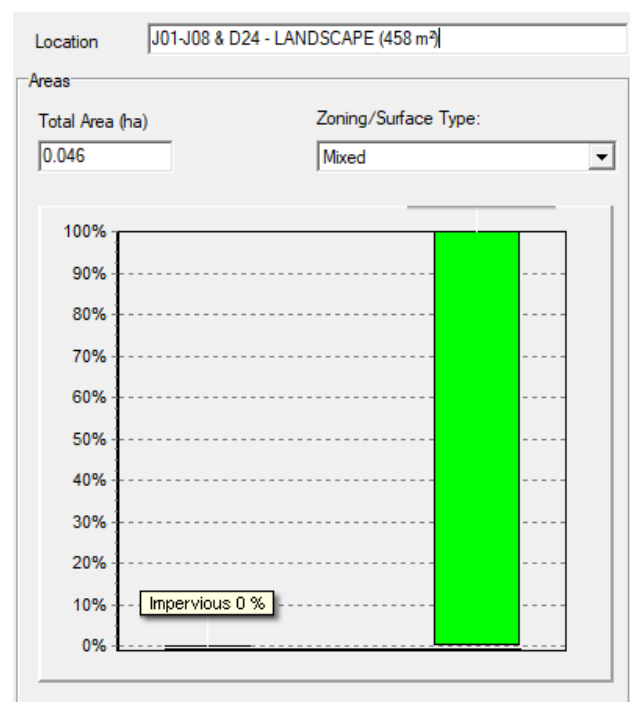
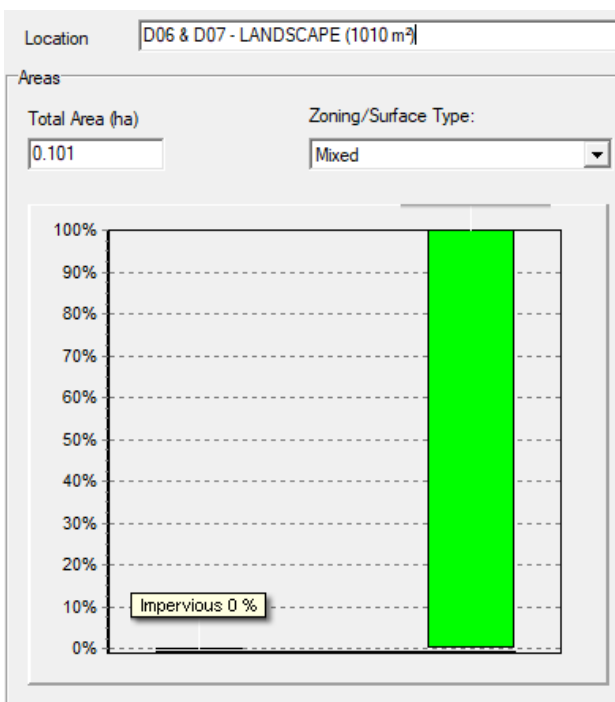
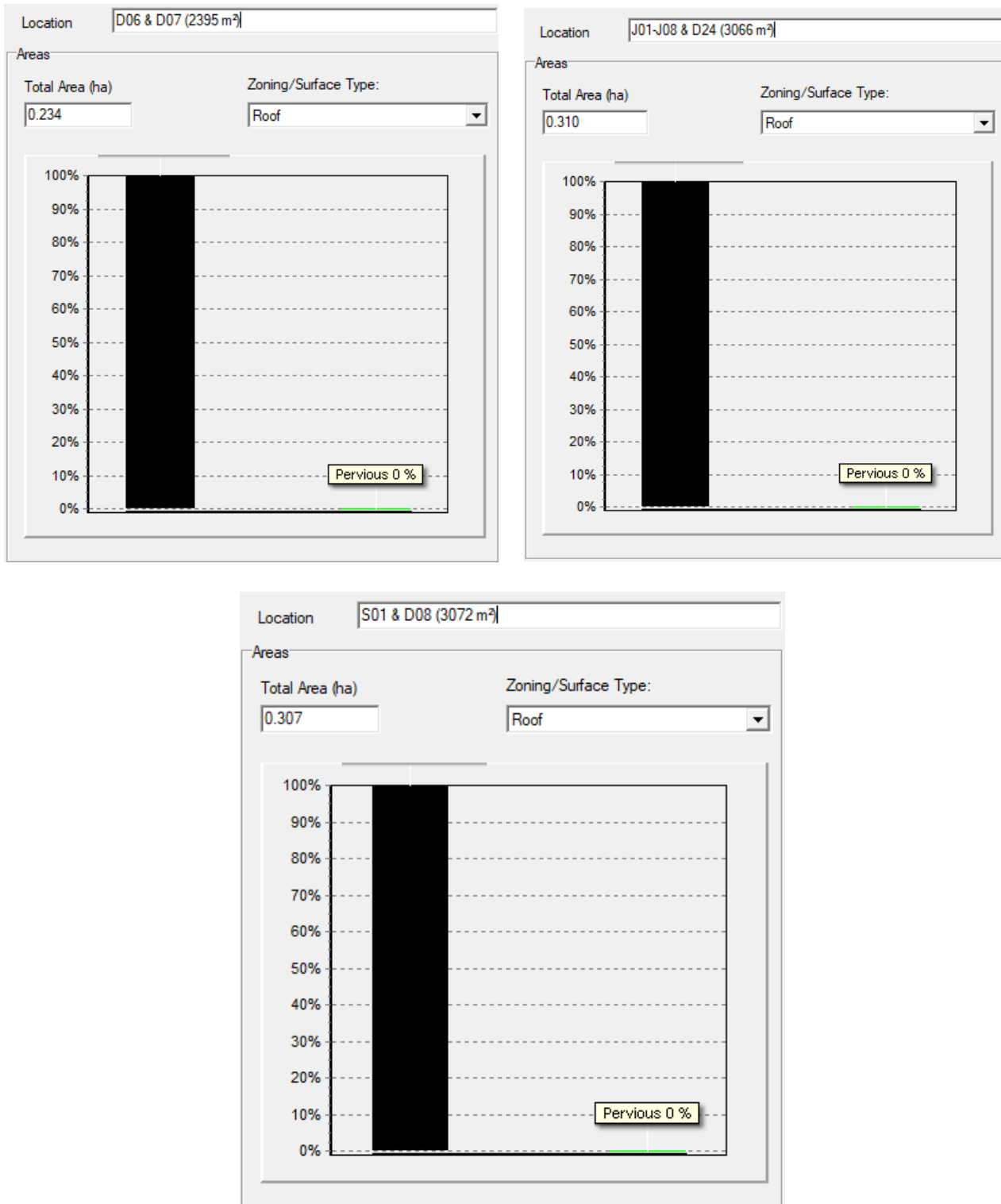


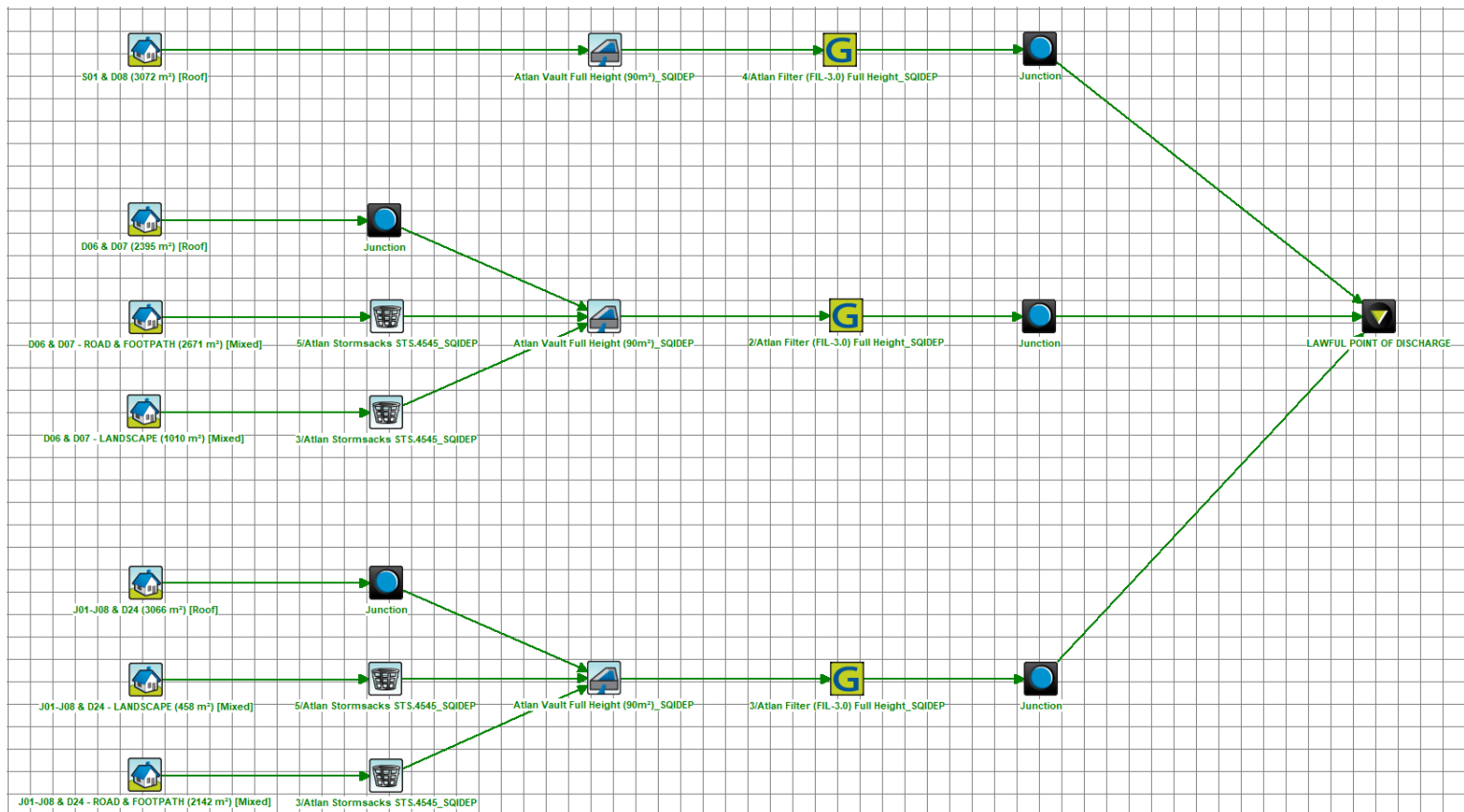
Figure 7-7 ROOF NODES



7.4.STORMWATER QUALITY MANAGEMENT STRATEGY

The below MUSIC model meets the applicable Water Quality Objectives by selecting and testing various stormwater management methods. The adopted diagrammatic “stormwater treatment train” for all stages of this Development are illustrated below;

Figure 7-8 PROPOSED STORMWATER TREATMENT TRAIN TO BE ADOPTED



A link to the MUSIC model file (.sqz) is available to access within Appendix G.

The following Section outlines the parameters used for the various types of stormwater quality improvement devices utilised within the treatment train shown above.

7.5.TREATMENT NODE PARAMETERS

Music treatment nodes with the following parameters have been used to within model.

Figure 7-9 ATLANT STORMSACK NODES

Location

3/Atlan Stormsacks STS.4545_SQIDEP

Inlet Properties

Low Flow By-pass (cubic metres per sec)

0.00000

High Flow By-pass (cubic metres per sec)

0.03000

Target Element

☒ Gross Pollutants (kg/ML)
 ☐ Total Phosphorus (mg/L)
 ☐ Total Suspended Solids (mg/L)
 ☐ Total Nitrogen (mg/L)

Gross Pollutants (kg/ML)

Transfer Functions

☒ Concentration Based Capture Efficiency
 ☐ Flow Based Capture Efficiency
 ☐ Both

Concentration Based Capture Efficiency

Input	Output
0.0000	0.0000
15.0000	0.0000

Flow Based Capture Efficiency

Inflow (m ³ /s)	% Capture
0.0000	100.0000
1.0000	100.0000

Location

5/Atlan Stormsacks STS.4545_SQIDEP

Inlet Properties

Low Flow By-pass (cubic metres per sec)

0.00000

High Flow By-pass (cubic metres per sec)

0.05000

Target Element

☒ Gross Pollutants (kg/ML)
 ☐ Total Phosphorus (mg/L)
 ☐ Total Suspended Solids (mg/L)
 ☐ Total Nitrogen (mg/L)

Gross Pollutants (kg/ML)

Transfer Functions

☒ Concentration Based Capture Efficiency
 ☐ Flow Based Capture Efficiency
 ☐ Both

Concentration Based Capture Efficiency

Input	Output
0.0000	0.0000
15.0000	0.0000

Flow Based Capture Efficiency

Inflow (m ³ /s)	% Capture
0.0000	100.0000
1.0000	100.0000

Figure 7-10 ATLANT FILTER NODES

Location: 2/Atlan Filter (FIL-3.0) Full Height_SQIDEP

Inlet Properties

Low Flow By-pass (cubic metres per sec): 0.00000
High Flow By-pass (cubic metres per sec): 0.00600

Target Element

☒ Flow (cubic metres per sec)
☐ Gross Pollutants (kg/ML)
☐ Total Suspended Solids (mg/L)
☐ Total Phosphorus (mg/L)
☐ Total Nitrogen (mg/L)

Flow (cubic metres per sec)

Transfer Functions

☒ Concentration Based Capture Efficiency
☐ Flow Based Capture Efficiency
☐ Both

Concentration Based Capture Efficiency

Inflow	Outflow
0.0000	0.0000
10.0000	10.0000

Flow Based Capture Efficiency

Inflow (m ³ /s)	% Capture
----------------------------	-----------

Location: 3/Atlan Filter (FIL-3.0) Full Height_SQIDEP

Inlet Properties

Low Flow By-pass (cubic metres per sec): 0.00000
High Flow By-pass (cubic metres per sec): 0.00900

Target Element

☒ Flow (cubic metres per sec)
☐ Gross Pollutants (kg/ML)
☐ Total Suspended Solids (mg/L)
☐ Total Phosphorus (mg/L)
☐ Total Nitrogen (mg/L)

Flow (cubic metres per sec)

Transfer Functions

☒ Concentration Based Capture Efficiency
☐ Flow Based Capture Efficiency
☐ Both

Concentration Based Capture Efficiency

Inflow	Outflow
0.0000	0.0000
10.0000	10.0000

Flow Based Capture Efficiency

Inflow (m ³ /s)	% Capture
----------------------------	-----------

Location: 4/Atlan Filter (FIL-3.0) Full Height_SQIDEP

Inlet Properties

Low Flow By-pass (cubic metres per sec): 0.00000
High Flow By-pass (cubic metres per sec): 0.01200

Target Element

☒ Flow (cubic metres per sec)
☐ Gross Pollutants (kg/ML)
☐ Total Suspended Solids (mg/L)
☐ Total Phosphorus (mg/L)
☐ Total Nitrogen (mg/L)

Flow (cubic metres per sec)

Transfer Functions

☒ Concentration Based Capture Efficiency
☐ Flow Based Capture Efficiency
☐ Both

Concentration Based Capture Efficiency

Inflow	Outflow
0.0000	0.0000
10.0000	10.0000

Flow Based Capture Efficiency

Inflow (m ³ /s)	% Capture
----------------------------	-----------

Figure 7-11 ATLAN VAULT NODE

Location	Atlan Vault Full Height (90m ²)_SQIDEP
Inlet Properties	
Low Flow By-pass (cubic metres per sec)	0.00000
High Flow By-pass (cubic metres per sec)	100.0000
Storage Properties	
Surface Area (square metres)	90.0
Extended Detention Depth (metres)	0.85
Exfiltration Rate (mm/hr)	0.00
Evaporative Loss as % of PET	0.00
Outlet Properties	
Low Flow Pipe Diameter (mm)	45
Overflow Weir Width (metres)	0.5
Notional Detention Time (hrs)	4.89
☐ Use Custom Outflow and Storage Relationship Define Custom Outflow and Storage Not Defined	

7.6.MUSIC ANALYSIS / RESULTS

A MUSIC analysis was conducted for the Proposed Master Plan, assessing each of the identified Master Plan elements requiring treatment individually. The results of the annual pollutant load reductions for each element are presented below, followed by a summary table consolidating the overall treatment performance.

Table 7-8 SUMMARY OF RESULTS FOR D06-D07

INDICATOR	WQO's Target	WQO's ACHIEVED	OBJECTIVES MET
TSS (Total Suspended Solids)	80%	81.2 %	YES
TP (Total Phosphorus)	60%	69.3 %	YES
TN (Total Nitrogen)	45%	54 %	YES
GP (Gross Pollutants)	90%	100%	YES

Table 7-9 SUMMARY OF RESULTS FOR D08 & S01

INDICATOR	WQO's Target	WQO's ACHIEVED	OBJECTIVES MET
TSS (Total Suspended Solids)	80%	80.6 %	YES
TP (Total Phosphorus)	60%	70.1 %	YES
TN (Total Nitrogen)	45%	56 %	YES
GP (Gross Pollutants)	90%	100%	YES

Table 7-10 SUMMARY OF RESULTS FOR J01-J08 & D24

INDICATOR	WQO's Target	WQO's ACHIEVED	OBJECTIVES MET
TSS (Total Suspended Solids)	80%	80.7 %	YES
TP (Total Phosphorus)	60%	68.%	YES
TN (Total Nitrogen)	45%	53.6 %	YES
GP (Gross Pollutants)	90%	100%	YES

Table 7-11 SUMMARY OF RESULTS FOR COMBINED

INDICATOR	WQO's Target	WQO's ACHIEVED	OBJECTIVES MET
TSS (Total Suspended Solids)	80%	80.9 %	YES
TP (Total Phosphorus)	60%	69.0 %	YES
TN (Total Nitrogen)	45%	54.3 %	YES
GP (Gross Pollutants)	90%	100%	YES

Extracts of the results presented in the tables above can be found in the Figures below.

Figure 7-12 D06-D07 RESULTS MUSIC EXTRACT

	Sources	Residual Load	% Reduction
Flow (ML/yr)	5.17	5.18	0
Total Suspended Solids (kg/yr)	1330	250	81.2
Total Phosphorus (kg/yr)	0.801	0.246	69.3
Total Nitrogen (kg/yr)	9.35	4.3	54
Gross Pollutants (kg/yr)	119	0	100

Figure 7-13 D08 & S01 RESULTS MUSIC EXTRACT

	Sources	Residual Load	% Reduction
Flow (ML/yr)	3.05	3.05	0
Total Suspended Solids (kg/yr)	92.4	17.9	80.6
Total Phosphorus (kg/yr)	0.51	0.152	70.1
Total Nitrogen (kg/yr)	6.4	2.82	56
Gross Pollutants (kg/yr)	73.1	0	100

Figure 7-14 J01-J08 & D24 RESULTS MUSIC EXTRACT

	Sources	Residual Load	% Reduction
Flow (ML/yr)	5.31	5.31	0
Total Suspended Solids (kg/yr)	1120	217	80.7
Total Phosphorus (kg/yr)	0.83	0.266	68
Total Nitrogen (kg/yr)	9.85	4.57	53.6
Gross Pollutants (kg/yr)	125	0	100

Figure 7-15 COMBINED RESULTS MUSIC EXTRACT

	Sources	Residual Load	% Reduction
Flow (ML/yr)	13.5	13.5	0
Total Suspended Solids (kg/yr)	2540	485	80.9
Total Phosphorus (kg/yr)	2.14	0.664	69
Total Nitrogen (kg/yr)	25.6	11.7	54.3
Gross Pollutants (kg/yr)	317	0	100

8.0 STORMWATER QUALITY BEST MANAGEMENT PRACTICES

8.1.SELECTION OF SQBMP's

There exist a number of publications describing the different types, functions, applications, and performance of many SQBMP's. Water Sensitive Urban Design should be used to look at the integration of SQBMP's within any Stormwater Quality Management Plan. Some of the more typical SQBMP's are listed in the below table for consideration.

Table 8-12 TYPICAL SQBMP'S

STORMWATER QUALITY BEST MANAGEMENT PRACTICES	
Treatment Device / Practice	Benefits
Site Maintenance	Reduce the amount of gross pollutants and sediment runoff generated by the Development by maintaining vegetated areas and the removal of debris and litter.
Rubbish Bins	Reduce the amount of gross pollutants generated by the Development by collecting and dumping litter and/or waste.
Filter Baskets (within inlet pits)	Reduction in gross pollutants and total suspended solids generated by the Development by filtering water prior to entering the stormwater system which traps litter, debris and fine sediment.
Gross Pollutant Traps (GPT's)	Removal of gross pollutants generated by the Development site. Some GPT's that are available on the market today can also remove hydrocarbons from runoff, thus reducing any oil and fuel pollutants generated by the Development.
Rainwater Re-Use	Re-using generated site runoff for landscaping and irrigation purposes etc. will reduce pollutant loads generated by the Development site.
Grass Swales	Directing site runoff to grass swales prior to discharging will have a reduction to the total pollutants generated by the Development.
Sand Filters (Bio-Retention)	Directing site runoff to a bio-retention basin prior to discharging will have a reduction to the total pollutants generated by the Development.

8.2.ADOPTED SQBMP's

When choosing to adopt selected SQBMP's, it is important to identify the expected pollutants that the proposed Development will generate during its operational phase. A summary of the expected typical pollutants can be found within Table 6-5 of this Report.

Based on the expected pollutants and this sites use as a School, the following is a summary of the SQBMP's that are recommended to be adopted as a minimum.

- Site Maintenance
- Rubbish Bins
- Filter Baskets

Site Maintenance

As this site is a school, it is assumed that regular landscaping and general maintenance will occur including the removal of any rubbish or debris within the site by the Grounds Keepers thereby removing the gross pollutants on site.

Rubbish Bin

The Site will have existing rubbish bins for general waste to remove gross pollutants generated by the Development.

Filter Baskets

As part of the sites internal stormwater infrastructure, all inlet pits placed in hardstand and/or driveway areas are to be installed with Council-approved Filter Baskets to prevent debris and fine sediment entering the stormwater system. Filter Baskets are effective at removing gross pollutants and total suspended solids from stormwater runoff and are capable of operating under a high flow scenario (relative catchment).

Refer to Appendix G for Filter Basket Maintenance Documentation.

Figure 8-16 EXAMPLE FILTER BASKET 1



9.0 MONITORING AND MAINTENANCE

9.1.MAINTENANCE REQUIREMENTS

Routine maintenance of the proposed infrastructure is required to minimise the potential for untreated stormwater discharging from the site.

The stormwater treatment device(s) shall be maintained using the following documentation;

- Manufacturers specifications for proprietary stormwater management devices,
- Maintenance checklists and rectification works attached to this Report.

9.2.MAINTENANCE FREQUENCY

More detailed performance information with regard to maintenance frequency and scheduled maintenance tasks for the site can be obtained by actively developing a maintenance log (refer below); however, it does not supersede maintenance requirements outlined in the manufacturers' specifications for proprietary elements of the SBSMP.

9.3.MAINTENANCE RECORD

A record of all maintenance checks for all stormwater controls on-site should be kept to evolve an appropriate maintenance routine to reflect the particular characteristics of the adopted treatment devices. It will also allow management of the site to refine the maintenance frequencies listed in this Report, which were based on generic devices located in typical urban environments.

The record is to be used to create a chain of responsibility for maintenance and should include details of the following:

- The date of maintenance,
- The name of the persons performing the maintenance,
- What types of maintenance actions were performed for each water quality device,

The environmental state of the device including an estimate of the type and weight of litter removed and the amount of sediment captured where appropriate.

10.0 EROSION AND SEDIMENT MANAGEMENT

10.1. OBJECTIVES

The objective of Erosion and Sediment Management is to limit soil erosion and control sediment discharge from the proposed Development by using suitable control devices during the four (4) primary phases; Existing, Earthworks, Construction and the Proposed Use.

Typical erosion and sediment control measures that will be incorporated into these Development phases are highlighted in the following section.

10.2. EROSION & SEDIMENT MANAGEMENT DURING DEVELOPMENT PHASES

PHASE 1 - EXISTING

Prior to construction commencing, the following sediment and erosion control measures will be implemented to minimise disturbance and ensure water quality is maintained:

- Designation of transport routes to ensure minimal vegetation disturbance. Transport routes will have construction exits in accordance with IECA Aust Guidelines,
- Construction entry/exit to be installed and will comprise of a designed gravel pad or placement of hardwood logs in accordance with the IECA Aust Guidelines,
- Install sediment fences around the proposed site (along tow of batter alignment),
- Install check dams if required, and
- Install dust control fences adjacent to the proposed earthworks areas (along property boundary) if required.

PHASE 2 - EARTHWORKS AND PHASE 3 - CONSTRUCTION

The following measures will be undertaken to mitigate water quality impacts during construction phase:

- Sediment fences to be erected at the base of all batters and stockpiles to prevent sediment transportation off site,
- Turf filter strips to be placed along all road verges,
- Diversion swales to divert sediment laden water,
- Rock check dams are to be placed intermittently along diversion swales,
- Re-vegetation of all disturbed areas as soon as possible,
- All sediment control structures to be maintained in an effective manner and inspected after each stormwater event. No structure is to accumulate sediment above 40% of its capacity,
- Regular monitoring of water quality to determine the effectiveness of the sediment and erosion control measures.

10.3. EROSION CONTROL MEASURES

The time of disturbance on-site should be kept to a minimum by ensuring that construction works immediately follow the earthworks phase. Consideration to staging works should be given to minimise the area of exposed works at any given time.

Areas that may be subject to concentrated flow and that have been cleared may require turfing to ensure gully erosion does not start.

Any overburden that is not to be taken off-site should be stockpiled nearby and covered to prevent the mobilization of any particles into the drainage system.

The remaining exposed areas of the site are to be damped down as deemed necessary by the site supervisor to prevent dust. All batters are to have mulch or erosion control mats installed immediately after achieving final level.

Dust fencing is to be installed around the perimeter of earthworks to prevent wind velocities at ground level over the site if required.

The site is to be landscaped and revegetated in accordance with the approved Landscape Plans immediately after completion of construction activities to minimise the risk of erosion from exposed earthworks.

10.4. SEDIMENT CONTROL MEASURES

With reference to the IECA Aust Guidelines and Current Best Practice methods, there are four fundamental sediment control principles that have been identified for use during construction for this Development site and are as follows:

Construction Exit

A dedicated construction exit is to be located at the sites entry and exit point for vehicles. This exit will be established to facilitate the removal of soil, mud, dust and debris from the tyres of vehicles prior to leaving the construction site. The construction exit can comprise of a gravel pad designed or placement of hardwood logs, constructed and maintained in accordance with the IECA Aust Guideline. Alternatively, a vibratory grid system can be hired or constructed. The advantages of the grid system include ease of movement, and they can be used for several years.

Sediment Fences

Sediment fencing is to be established down slope of any exposed earthworks where there is a risk of contaminated water leaving the site prior to clearing and site works commencing. Sediment fencing may be required at regular spacing down the disturbed grade to limit rutting caused by concentration of sheet flow. Sediment fences shall be used to protect any temporary stockpile areas on an as-needs basis. Sediment collected from sediment barriers is to be regularly removed and either taken off site as part of the earthworks phase of the proposed Development or stockpiled for use during revegetation.

Sediment Barriers

Sediment barriers are to be constructed around all stormwater drainage inlet points where contaminated water may drain to. This will aid in ensuring sediments are settled out prior to flows entering the underground stormwater drainage system. Sediment barriers are to be gravel wrapped in geotextile 'sausage' or similar.

Turf Filter Strips

If required, turf filter strips approximately 600mm minimum wide can be placed on the upstream side of the proposed concreted footpath. These will act in conjunction with sediment fences to further treat any overland flow from the site. Turf filter strips are to be constructed and maintained in accordance with the IECA Aust Guidelines.

It is recommended that the measures outlined above are to be utilised throughout all construction works occurring on site as the College works towards the Proposed Master Plan.

Erosion and Sediment control is to be managed on-site on a case by case basis with the input of RCC and Naxos Engineers.

11.0 CONCLUSION

11.1. LAWFUL POINT OF DISCHARGE

As previously mentioned, the existing Lawful Points of Discharge for the site, Hilliards Creek and the existing Delancy Street swale, will remain unchanged throughout the works towards the Master Plan.

11.2. STORMWATER QUANTITY

The implementation of the proposed Master Plan will involve the construction of new buildings, upgrades to existing structures, and additional pathways, car parks, and associated infrastructure. While these changes will result in a slight increase in impervious area, the overall impact is expected to be minimal, with an estimated increase of 3–5%. The existing 25m x 10m OSD system located north of the BOQ Oval is expected to remain sufficient to manage stormwater flows, with any minor increase in discharge rates considered negligible. Given the site's location at the lower end of the broader catchment, further attenuation measures are not deemed necessary as they may disrupt the natural flow regime. The existing stormwater management framework, combined with appropriate integration of new infrastructure, will ensure the continued effective management of stormwater quantity and quality across the site.

Additionally, the proposed 90m² Atlan Vault, while not formally included in detention calculations, will contribute to increased on-site detention storage. This additional storage will help offset minor works as outlined in the Master Plan, supporting the overall stormwater management strategy and compliance with Local Authority requirements.

11.3. STORMWATER QUALITY

As part of the Master Plan implementation, the existing stormwater catchments will be reconfigured into smaller sub-catchments, allowing for targeted stormwater quality treatment measures that align with changes in land use, runoff characteristics, and impervious area distribution. To ensure effective stormwater quality management, treatment devices will be progressively integrated into the site's drainage network as new infrastructure is developed.

The Master Stormwater Quality Plan consists of the following:

A 90m² Atlan Vault will be constructed next to the existing OSD Tank located in the northeast corner of the site. The proposed Vault will be design and constructed to accommodate the nine Atlan Filters which are required to service the completed Master Plan.

As elements that are identified as requiring treatment in Table 6-3 are completed, the respective amount of Atlan Filters is to be installed into the proposed Atlan Vault as per Table 11-1 below.

Table 11-13 TYPICAL SQBMP'S

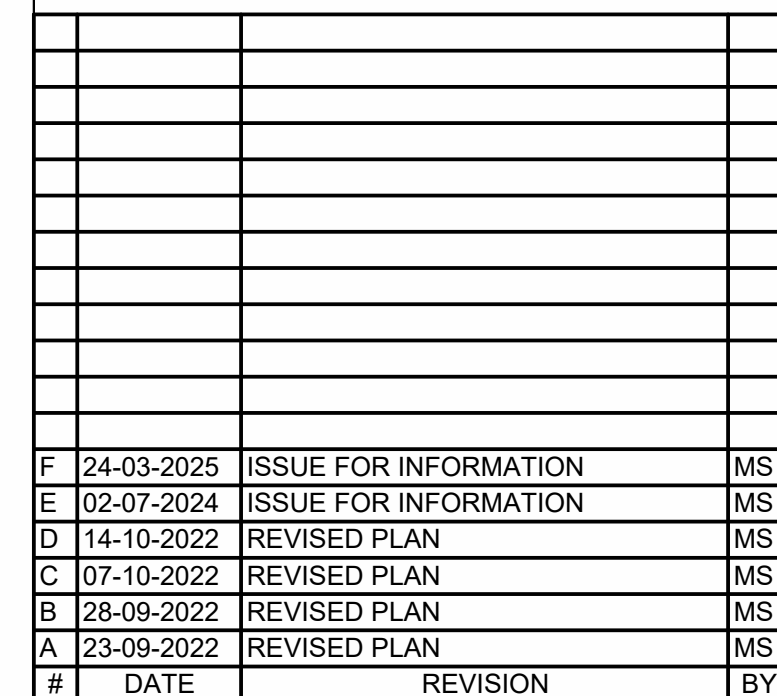
Catchment/Master Plan Elements	Filters Required	Stormsacks/Gutter Leaf Catchers Required
D01 & D08	4	0
D06 & D07	2	8
J01-J08 & D24	3	8

It is required that all outlined stormwater quality improvement devices in Table 11-12 are installed prior to the completion of the proposed Master Plan elements and reconnection to the existing internal drainage system.

11.4. EROSION AND SEDIMENT CONTROL

Respective Erosion and Sediment Control (ESC) plans will be completed as part of the eventual construction of each of the Master Plan elements and shall incorporate the recommendations included within this Report. This Report and plan shall remain on site at all times, and it is the responsibility of the Contractor on-site to ensure the assembly and maintenance of all devices throughout the Development.

Appendix A – MASTER PLAN



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PROJECT

MASTERPLAN DEVELOPMENT

JOB No. **QC2120**

TITLE

COVER SHEET

DRAWING No.	ISSUE
A-00-0001	F

ADDRESS
97 Dundas Street West, Ormiston, QLD, 4160

REAL PROPERTY DESCRIPTION

Lot 1-5 on RP109238
Lot 1 on RP122772
Lot 1 on RP127130
Lot 100-102 on SP306734
Lot 1 & 2 on RP110831
Lot 3 on RP49638

- EXISTING BUILDINGS, STRUCTURES AND EMBELLISHMENTS
- NEW DEVELOPMENT WORKS
- DX

NEW GENERAL SCHOOL DEVELOPMENT
- JX

NEW JUNIOR SCHOOL DEVELOPMENT
- SX

NEW SECONDARY SCHOOL DEVELOPMENT
- EX

EXISTING BUILDINGS, STRUCTURES AND EMBELLISHMENTS

X	24-03-2025	ISSUE FOR INFORMATION	MS
W	24-02-2025	ISSUE FOR INFORMATION	MS
V	23-04-2024	ISSUE FOR INFORMATION	AS
U	13-03-2024	ISSUE FOR INFORMATION	MS
T	12-03-2024	ISSUE FOR INFORMATION	MS
S	08-03-2024	ISSUE FOR INFORMATION	MS
R	14-10-2022	REVISED PLAN	MS
Q	07-10-2022	REVISED PLAN	MS
P	28-09-2022	REVISED PLAN	MS
O	23-09-2022	REVISED PLAN	MS
N	21-03-2022	REVISED PLAN	MS
M	01-03-2022	REVISED PLAN	MS
L	03-12-2021	REVISED PLAN	CG
K	26-11-2021	JUNIOR SCHOOL & ELC REVISED	CG
J	16-11-2021	DELANCY ST PARKING REVISED	CG
I	10-11-2021	MASTER PLAN REVISED	CG
H	02-11-2021	MASTER PLAN REVISED	CG
G	22-10-2021	TENNIS COURTS REVISED	CG
#	DATE	REVISION	BY

rohrig

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CLIENT

ORMISTON COLLEGE

PROJECT

MASTERPLAN DEVELOPMENT

JOB No.

QC2120

TITLE

PROPOSED MASTER PLAN

DRAWN

APPROVED

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MS SS

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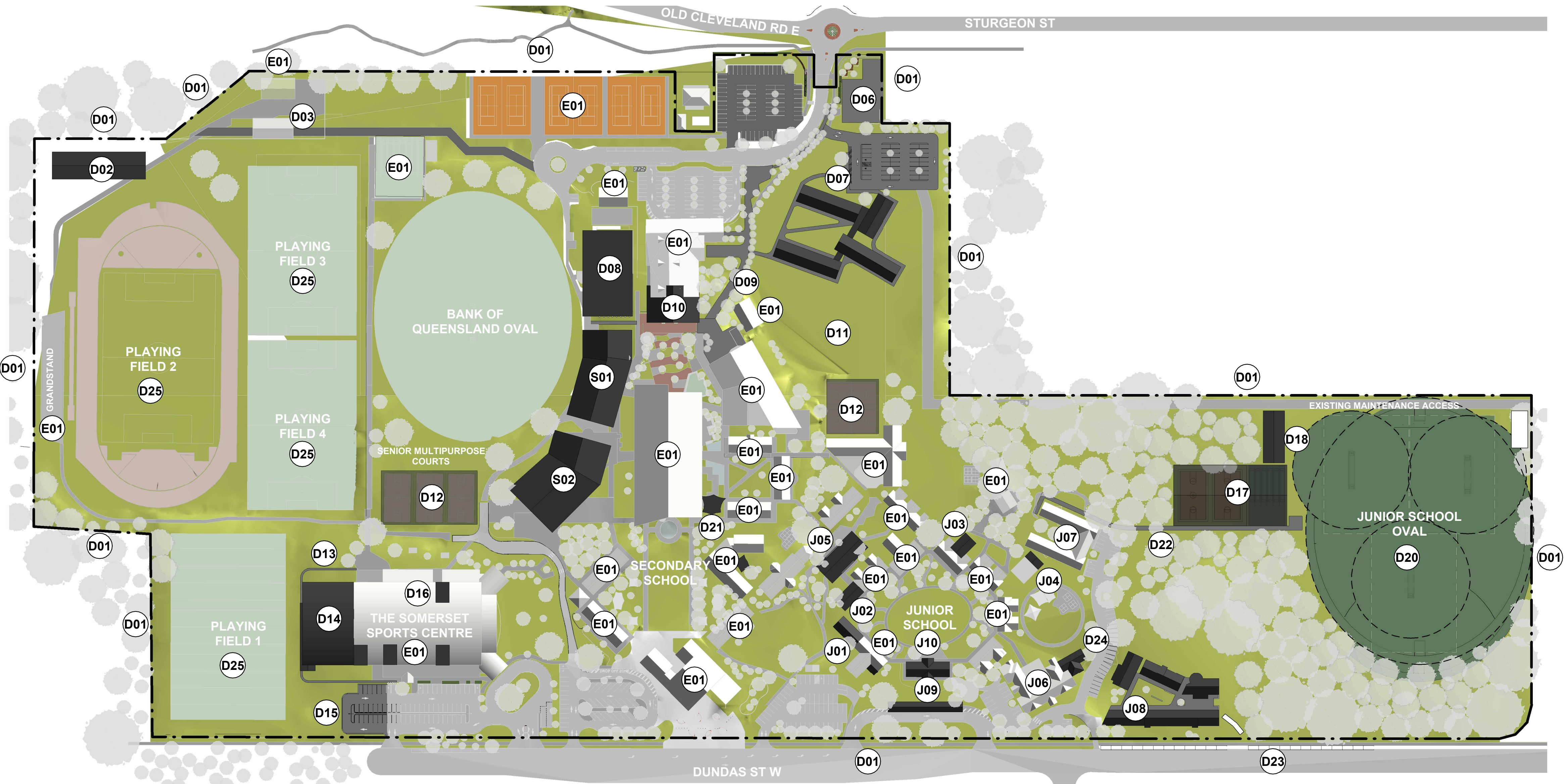
IN

DRAWING No.

A-01-0001

ISSUE

X



- D01 NEW FULL PERIMETER BOUNDARY SECURITY FENCE WITH AUTOMATIC VEHICULAR SLIDING GATES, PEDESTRIAN ACCESS GATES AND KOALA CROSSING AS REQUIRED
- D02 NEW MULTI USE BUILDING- EDUCATIONAL TEACHING SPACES AND STORAGE (2 STOREY)
- D03 NEW MULTI USE BUILDING- UTILITIES, MAINTENANCE AND ARCHIVE (2 STOREY)
- D06 NEW GROUNDS/GREEN KEEPERS' SHEDS
- D07 NEW BOARDING FACILITY (3 STOREY) AND ASSOCIATED CARPAKING/DROP OFF ZONE
- D08 NEW AQUATIC CENTRE (50m POOL) & MULTI-USE EDUCATIONAL BUILDING (2 STOREY)
- D09 NEW STURGEON STREET CONNECTION PATH AND LANDSCAPE
- D10 LINGO LIN PERFORMING ARTS THEATRE EXTENSION
- D11 NEW OUTDOOR PLAY AREA
- D12 COVERED AREA TO EXISTING MULTIPURPOSE COURTS
- D13 NEW CONCRETE CONNECTION PATHWAY
- D14 SPORTS COURT EXTENSION AND NEW GRANDSTAND (2 STOREY)
- D15 CARPARK EXTENSION TO DUNDAS ST W CARPARK
- D16 SOMERSET SPORTS CENTRE COVERED ENTRIES
- D17 NEW INDOOR MULTI PURPOSE COURTS WITH ENCLOSED CRICKET PITCH AND NETS
- D18 NEW STORAGE SHED INC NEW CHANGE ROOMS / AMENITIES (1 STOREY)
- D20 NEW JUNIOR SCHOOL SPORTS FIELDS WITH EXTERNAL SPORTS LIGHTING
- D21 NEW EXTERNAL SHADED SEATING
- D22 NEW CONCRETE COVERED CONNECTION PATHWAY FOR BRANCH FALL PROTECTION
- D23 NEW COUNCIL STREET PARALLEL PARKING
- D24 EXTENSION TO EXISTING CARPARK
- D25 NEW FIELD LIGHTING TO EXISTING FIELD
- J01 BUILDING EXTENSION- YEAR 4 (1 STOREY)
- J02 BUILDING EXTENSION- YEAR 5 (1 STOREY)

- J03 NEW CHANGEROOM/AMENITIES (1 STOREY)
- J04 EXTENSION TO AMENITIES (1 STOREY)
- J05 EXTENSION TO CHANGEROOM/AMENITIES (1 STOREY)
- J06 REPURPOSE AND EXTEND EXISTING PREP FOR GRADE 1 GLAS (1 STOREY)
- J07 REPURPOSE EXISTING ELC FOR PREP PRECINCT (1 STOREY)
- J08 NEW EARLY LEARNING CENTRE AND CONNECTED CARPARK (1 STOREY)
- J09 NEW COVERED JUNIOR SCHOOL DROP OFF ZONE
- J10 NEW ADMINISTRATION BUILDING (2 STOREY)
- S01 NEW BUSINESS STUDIES AND ARTS PRECINCT (3 STOREY)
- S02 NEW MULTI-USE BUILDING- EDUCATIONAL TEACHING SPACES WITH AMENITIES (2 STOREY)

- E01 EXISTING BUILDINGS, STRUCTURES AND EMBELLISHMENTS

EXISTING CARPARKING

- ADMINISTRATION CARPARKING 48
- BUS STOP 1
- EXISTING STREET PARKING 9
- JUNIOR SCHOOL CARPARKING 51
- LINGO LIN PERFORMING ARTS CENTRE CARPARKING 73
- PREP SCHOOL CARPARKING 41
- SPORTS CENTRE CARPARKING 43
- STURGEON STREET CARPARKING 72
- 338

NEW CARPARKING

- EARLY LEARNING CARPARKING (D24) 18
- NEW CARPARKING (D07) 39
- NEW COUNCIL STREET PARALLEL PARKING (D23) 24
- SOMERSET SPORTS CENTRE ADDITIONAL CARPARKING (D15) 26
- 107

ADDRESS
97 Dundas Street West, Ormiston, QLD, 4160

REAL PROPERTY DESCRIPTION

Lot 1-5 on RP109238
Lot 1 on RP122772
Lot 1 on RP127130
Lot 100-102 on SP306734
Lot 1 & 2 on RP110831
Lot 3 on RP49638

S	24-03-2025	ISSUE FOR INFORMATION	MS
R	24-02-2025	ISSUE FOR INFORMATION	MS
Q	23-04-2024	ISSUE FOR INFORMATION	AS
P	09-04-2024	ISSUE FOR INFORMATION	MS
O	19-03-2024	ISSUE FOR INFORMATION	MS
N	13-03-2024	INTERNAL ISSUE FOR DISCUSSION	MS
M	13-03-2024	ISSUE FOR INFORMATION	MS
L	12-03-2024	ISSUE FOR INFORMATION	MS
K	08-03-2024	ISSUE FOR INFORMATION	MS
J	29-02-2024	ISSUE FOR INFORMATION	MS
I	18-10-2022	UPDATED KOALA HABITAT	MS
H	14-10-2022	REVISED PLAN	MS
G	07-10-2022	REVISED PLAN	MS
F	28-09-2022	REVISED PLAN	MS
E	23-09-2022	REVISED PLAN	MS
D	21-03-2022	REVISED PLAN	MS
C	03-12-2021	REVISED PLAN	CG
B	12-11-2021	REVISED ISSUED	CG
#	DATE	REVISION	BY



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248 ABBOTSFORD ROAD, BOWEN HILLS QLD 4006
PO BOX 86 ALBION DC QLD 4010 AUSTRALIA
PHONE: (07) 3257 4411 FAX: (07) 3257 2211
EMAIL: qld@rohrig.com.au



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CLIENT
ORMISTON COLLEGE

PROJECT
MASTERPLAN DEVELOPMENT

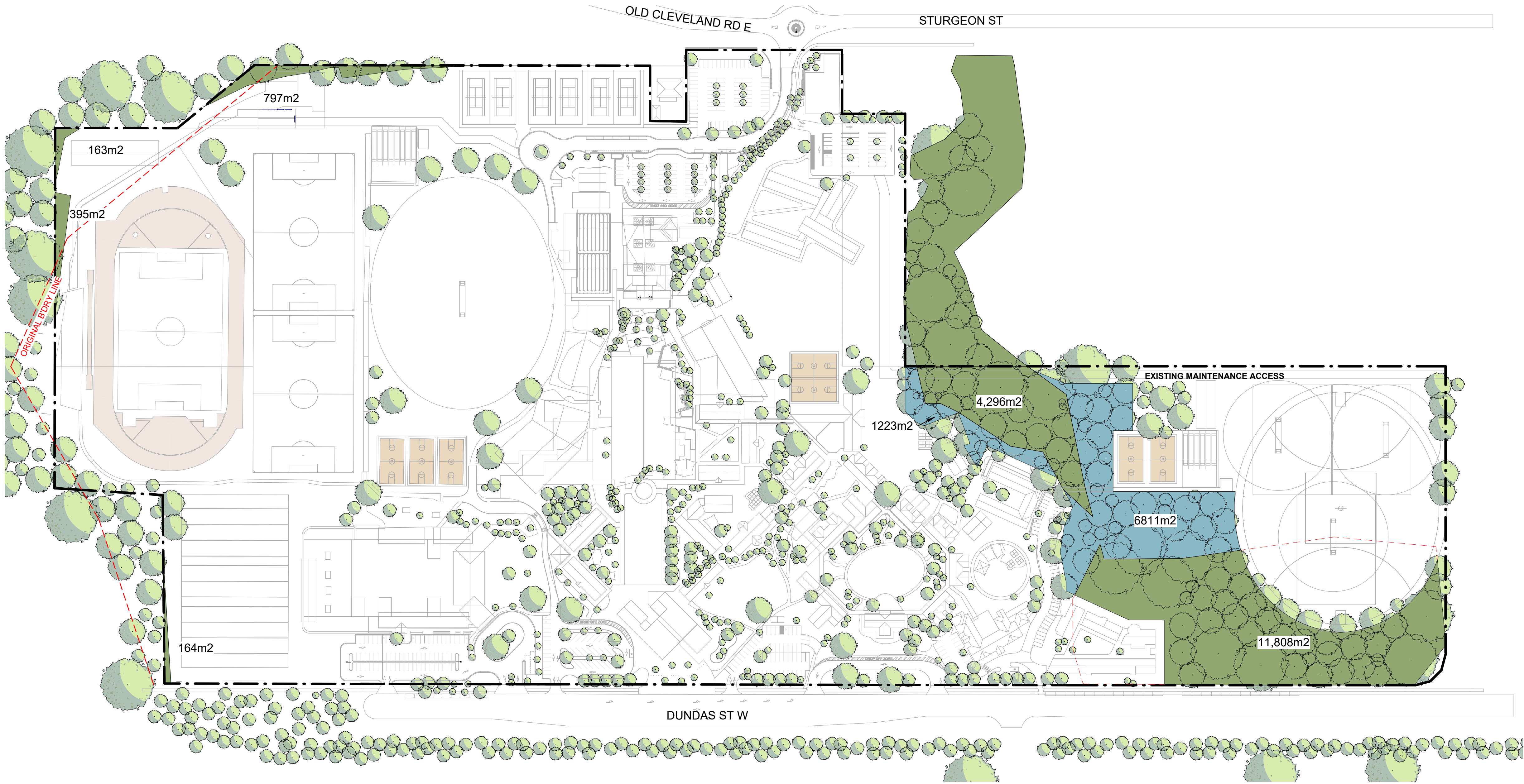
JOB No.
QC2120

TITLE
MASTER PLAN KOALA ZONE

DRAWN	APPROVED	15	0	15	30	45	60	75
MS	SS	SCALE 1:1500 at A1						

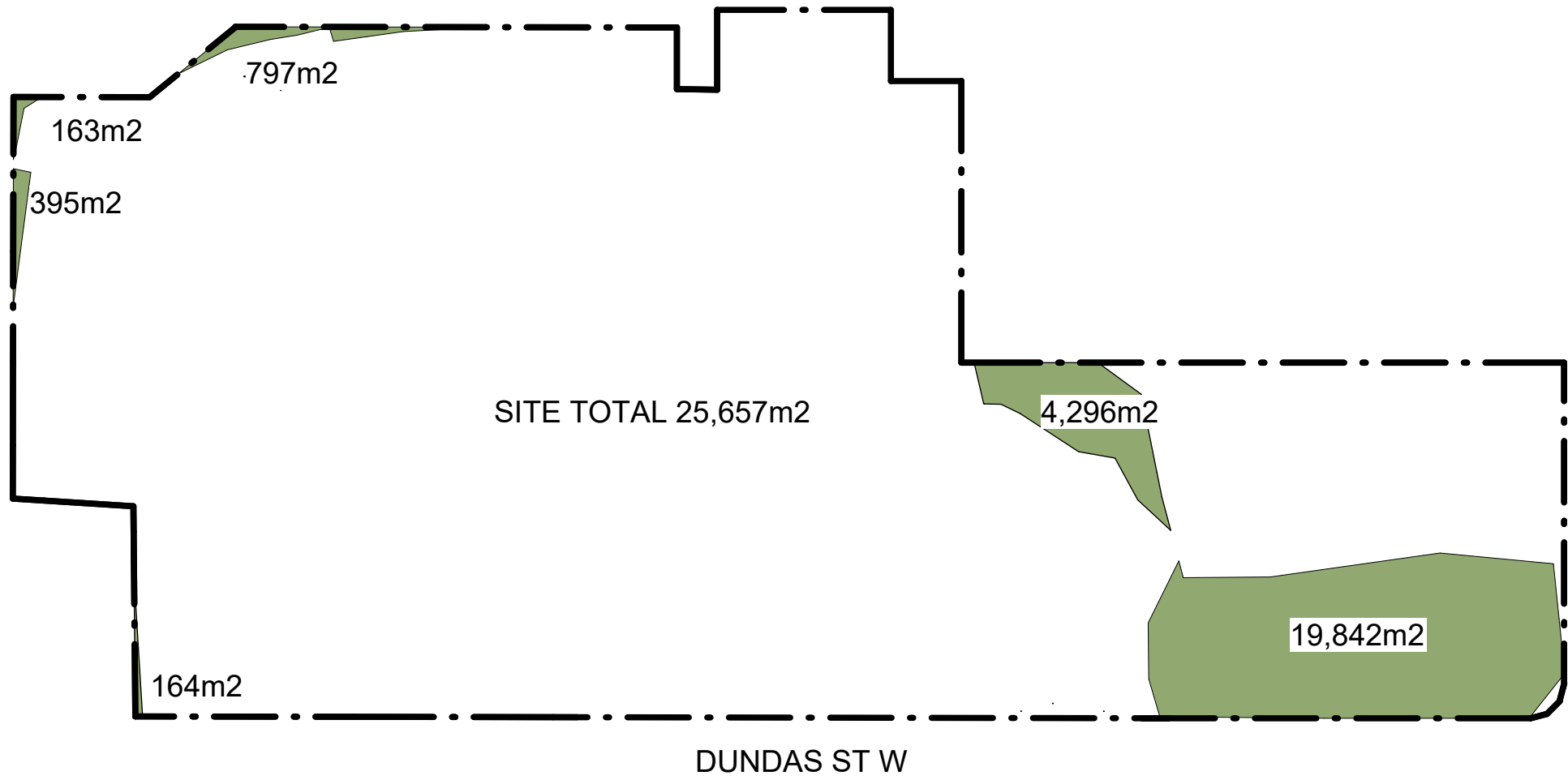
DRAWING No.
A-01-0005

ISSUE
S



1 MASTERPLAN- KOALA ZONES WITH JWA AREAS
A1 = 1 : 1500

	EXISTING KOALA HABITAT	PROPOSED KOALA HABITAT
KOALA HABITAT EXISTING (CORE)	25,657 m2	17,623 m2
NEW KOALA HABITAT (CORE)	-	8,034 m2
TOTAL KOALA HABITAT REQUIRED	-	25,657 m2
TOTAL KOALA HABITAT ACHEIVED	25,657 m2	25,657 m2
DIFFERENCE		0 m2



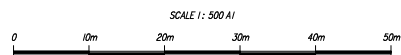
2 KOALA ZONES- EXISTING WITH JWA AREAS
A1 = 1 : 3500

Appendix B – DETAIL SURVEY

Origin of PSNs - EGA Coordinates	
PSN 25578	E: 54412.532 N: 695682.546 M: 7.02
PSN 25579	E: 54408.428 N: 695683.331 M: 13.98
Grid	Scale 0.9999

LEGEND	
GENERAL	
Kerb & Road Kerb Lip	
Channel / Road Kerb Invert	
Channel / Road Kerb	
Channel / Road Kerb Block	
Bitumen Edge	
Bitumen Centre Line	
Building Edge	
Veg Cone Edge	
Concrete Edge	
Paving Edge	
Rock Edge	
Vegetation Edge	
Top of Bank	
Bottom of Bank	
Change of Grade	
Fence	
WATER	
Drinking Water Main	
Water Service	
Non Drinking Water Main	
Water Fire Service	
Valve	
Hydrant	
Water	
SEWER	
Gravity Sewer Main	
Sewer Rising Main	
Manhole Lid	
Centre of Manhole	
Sewer Marker Plaque	
Marker Post	
STORMWATER DRAINAGE	
Storm water	
Surface Drain Invert Line	
Ag Pipe Line	
Manhole Lid	
Centre of Manhole	
Drainage Grate	
Kerb Outlet	
ELECTRICITY	
Under Ground Electricity	
Overhead Electricity	
Pit	
Light Pole	
Marker	
Power Pole	
TELCO / COMMUNICATIONS	
Telecom Lines	
Optic Fibre	
Overhead Cam's	
Pit	
Pillar	
Marker	
Power Pole	
GAS SERVICE	
Gas Main	
Valve	
Meter	
Marker	
Vent	
SURVEY MARKS	
Survey Station	
Permanent Mark By Others	
Boundary Peg by Other	
Photo Control Point	
Temporary Bench Mark	

Notes	
-	This plan is prepared for the client from a combination of field survey and existing records for the purpose as instructed by the client and should not be used for any other purpose.
-	The site boundaries shown herein were not marked by the author of the line of survey and have been determined by plan dimension only and not by field measurement.
-	Services shown herein have been located where possible by field survey. If not able to be located then services have been plotted from the records of relevant authorities where available and have been noted accordingly on this plan. Where such records do not exist or are considered inadequate, a notation has been made herein.
-	Contours depicted are surveyed ground levels and may not represent Ground Level as defined by the planning scheme for the overall determination of height.
-	Prior to any demolition, excavation or construction on the site, the relevant authority should be contacted for possible location of further underground services and detailed locations of all services. This note is an integral part of this plan.
-	Cadastral boundaries are extracted by title dimensions and/or digitising from existing cadastral maps and/or DCDs. These boundaries have not been verified and are approximate only.



Intrax

1000 Intrax Drive
Villages 1 NSW 15A 1 69.3

Surveying Group

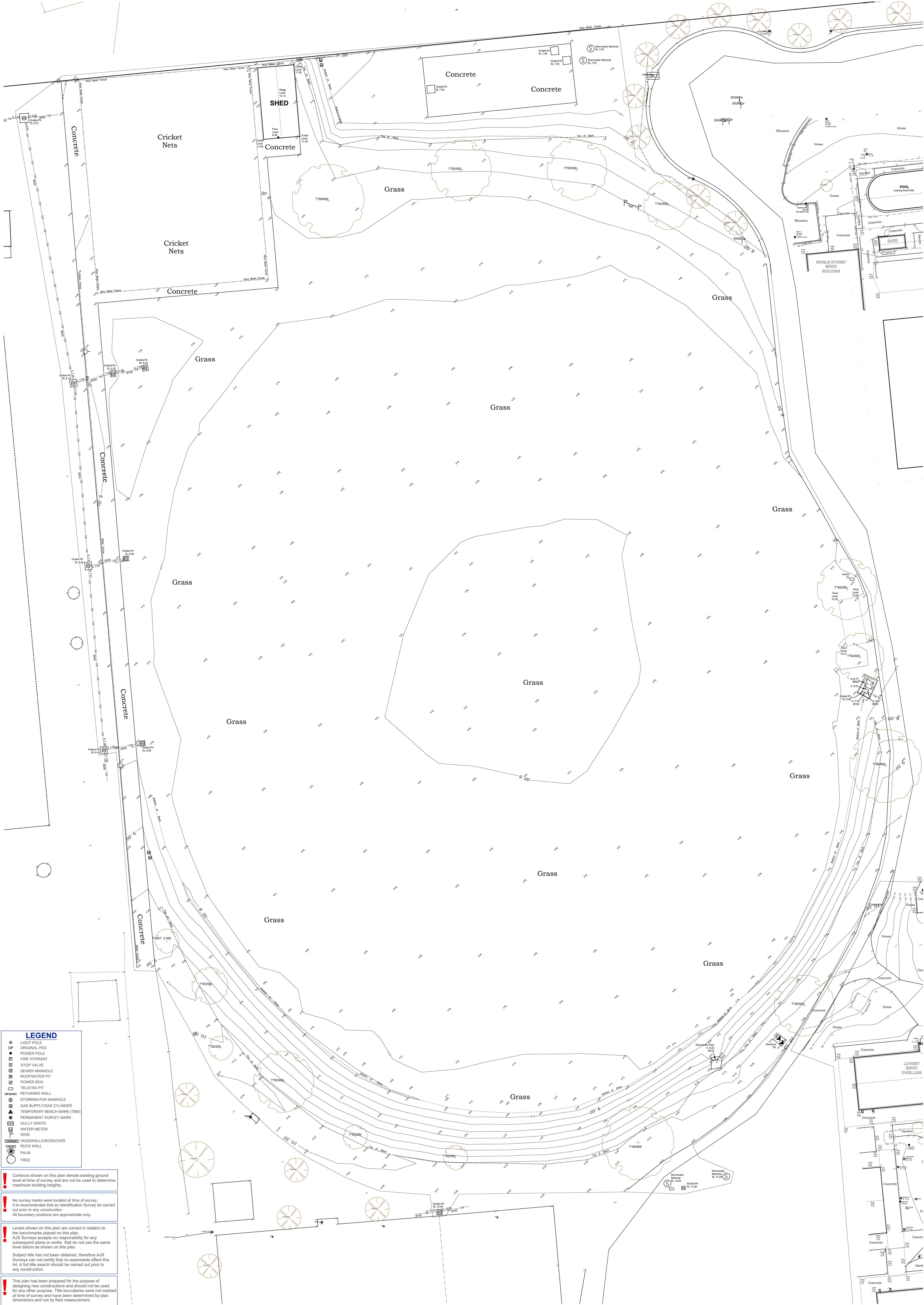
Garden Square, Ground Floor D2,
640 Kenneth Rd, Upper Mt. Gravatt QLD 4122
PH 1300 INTRAX (1300 468 777)
www.intraxgroup.com.au

ROHRIG (QLD)

SURVEYOR:	RS/R/KB
DATE OF SURVEY:	04.11.20
CONTOUR INTERVAL:	0.25m
LEVEL DATUM:	AHD DERIVED
ORIGIN:	PSN 25578 RL 13.98
MERIDIAN:	MQA2020 Zone56

Contour & Detail Survey
Ormiston College
Dundas Street West, Ormiston

DATE:	05.11.20
DRAWN:	AS
CHECKED:	AS
APPROVED:	AS
SITE NO:	SH30741
PROJECT NO:	PAJ 357441
DATE:	01.11.20
BY:	ORIGINAL ISSUE
DATE:	11.11.20
BY:	REV 1



LEGEND

- Light Pole
- Original Peg
- Power Pole
- Fire Hydrant
- Stop Valve
- Sewer Manhole
- Roofwater Pit
- Power Box
- Telstra Pit
- Retaining Wall
- Stormwater Manhole
- Gas Supply Gas Cylinder
- Temporary Bench Mark (TBM)
- Permanent Survey Mark
- Gully Grate
- Water Meter
- Sign
- Headwall/Crossover
- Rock Wall
- Palm
- Tree

Contours shown on this plan denote existing ground level at time of survey and are not used to determine maximum building heights.

No survey marks were located at time of survey. It is recommended that an Identification Survey be carried out prior to any construction. All boundary positions are approximate only.

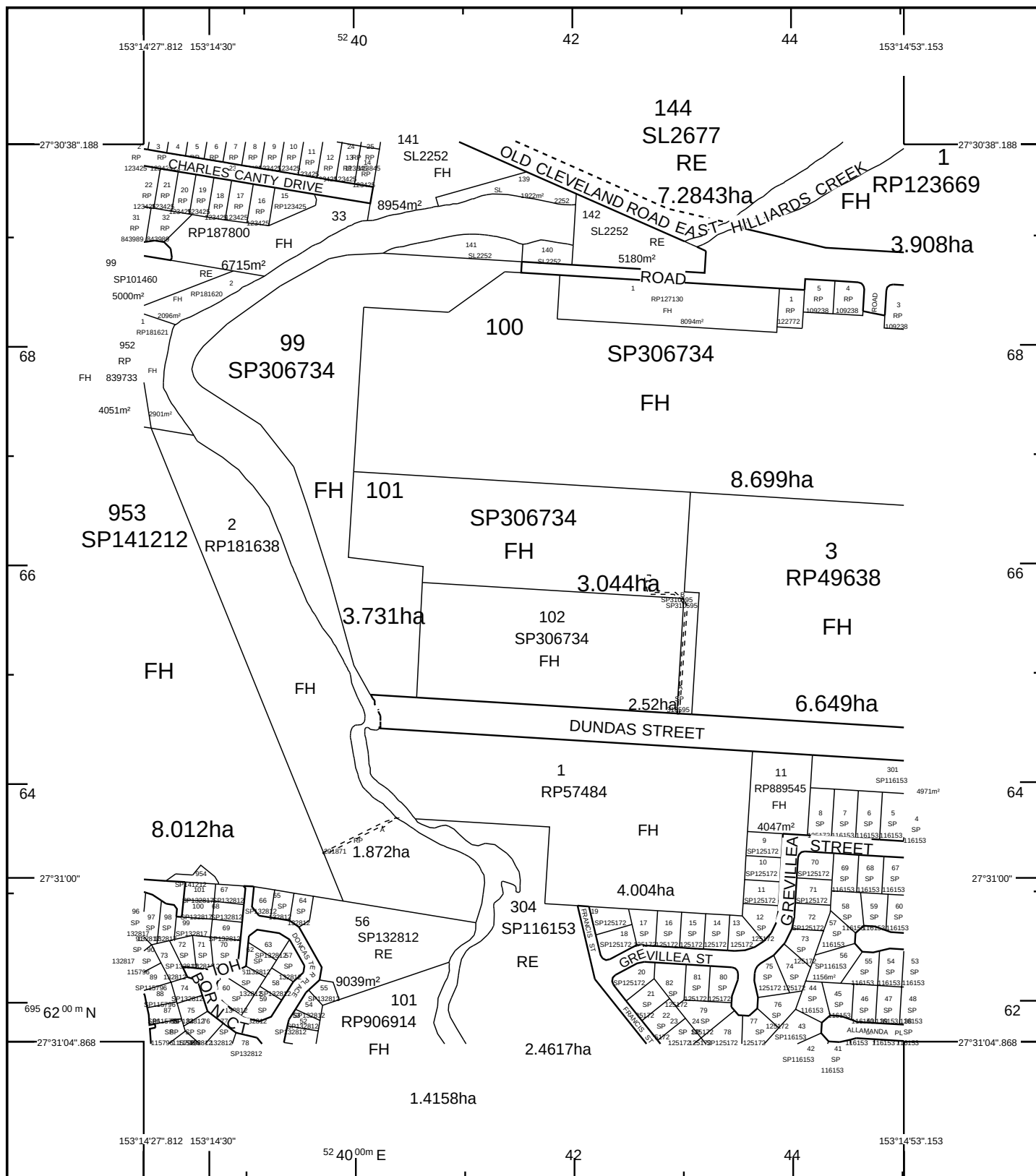
Levels shown on this plan are correct in relation to the benchmarks placed on this plan. AJS Surveys accepts no responsibility for any subsequent plans or works that do not use the same level datum as shown on this plan.

Subject title has not been obtained, therefore AJS Surveys can not certify that no easements affect this lot. A full title search should be carried out prior to any construction.

This plan has been prepared for the purpose of designing new constructions and should not be used for any other purpose. Title boundaries were not marked at time of survey and have been determined by plan dimensions and not by field measurement. Unless noted otherwise only visible services have been located.

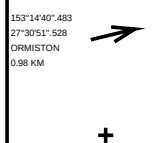
Prior to any demolition, excavation or construction on the site, the relevant authorities should be contacted for accurate location of all services.

REVISIONS	ASSOCIATED CONSULTANTS:	SURVEYOR: JRM DRAWN: POR DATE: 21/12/2021 CHECKED: JRM	DATUM: LEVEL DATUM: AHD PSM 28578 RL 13.198m HORIZ DATUM: ARBITRARY COORD ORIGIN: ARBITRARY MERIDIAN: ARBITRARY	CLIENT: ORMISTON COLLEGE	SITE: Dundas Street West, Ormiston Lot 100 on SP 306734	SCALE: 1:200 (A0) PLAN REF: J0061-Master
-----------	-------------------------	---	---	--------------------------	--	---



STANDARD MAP NUMBER
9542-41111

MAP WINDOW POSITION &
NEAREST LOCATION



SUBJECT PARCEL DESCRIPTION

DCDB
Lot/Plan 101/SP306734
Area/Volume 3.044ha
Tenure FREEHOLD
Local Government REDLAND CITY
Locality ORMISTON
Segment/Parcel 20516/99

CLIENT SERVICE STANDARDS

PRINTED (dd/mm/yyyy) 15/02/2021

DCDB 14/02/2021

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For further information on SmartMap products visit
<https://www.qld.gov.au/housing/buying-owning-home/property-land-valuations/smartmaps>

SmartMap

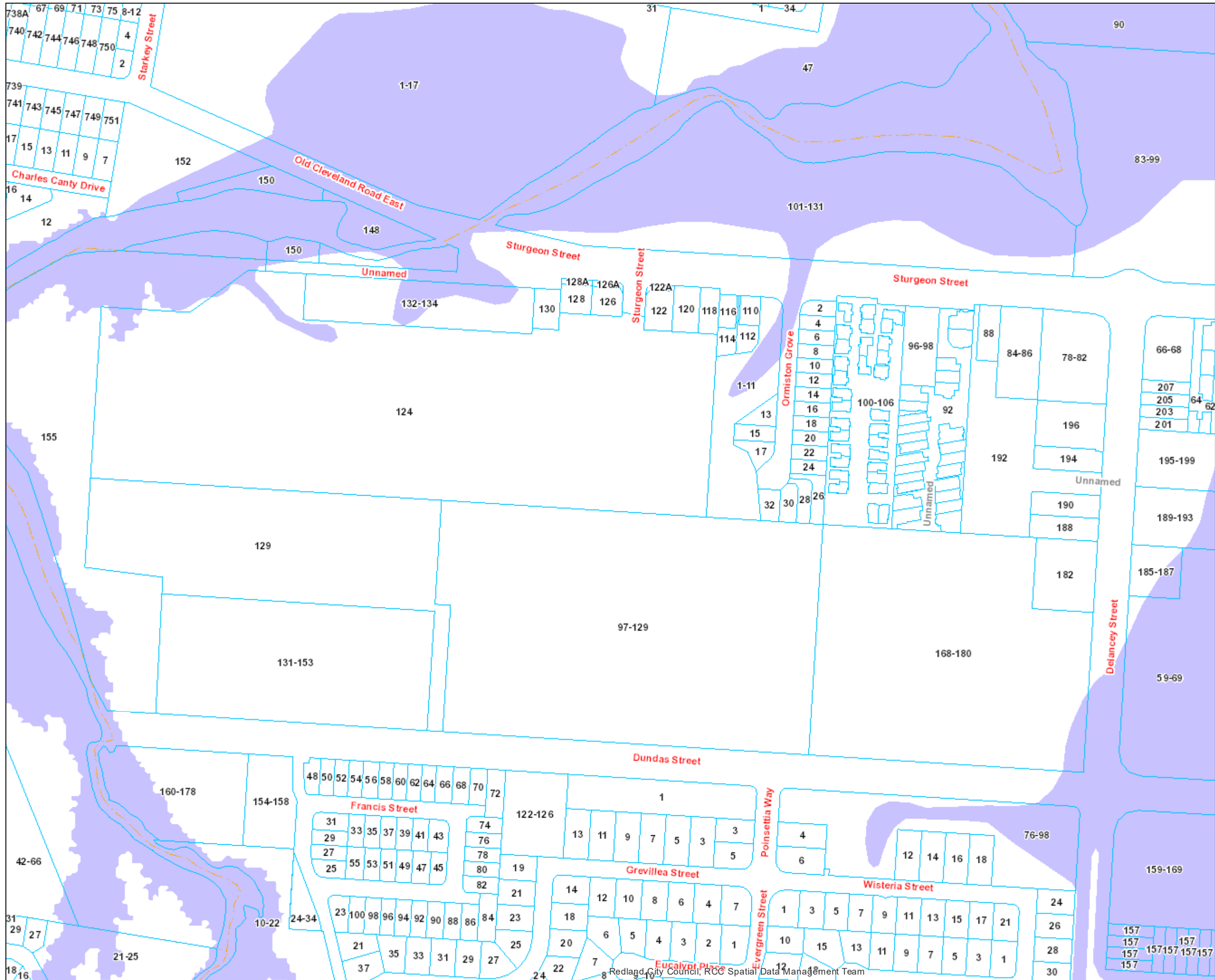
An External Product of
SmartMap Information Services

Based upon an extraction from the
Digital Cadastral Data Base



**Queensland
Government**
(c) The State of Queensland,
(Department of
Natural Resources,
Mines and Energy) 2021.

Appendix C – RED-E-MAP DATA



Flood

Legend

Current Lot

Suburb
Boundary

Flood and Storm Tide Hazard Overlay

2016 Storm
Tide Inundation
Area

2100 Storm
Tide Inundation
Area

Flood Prone
Area

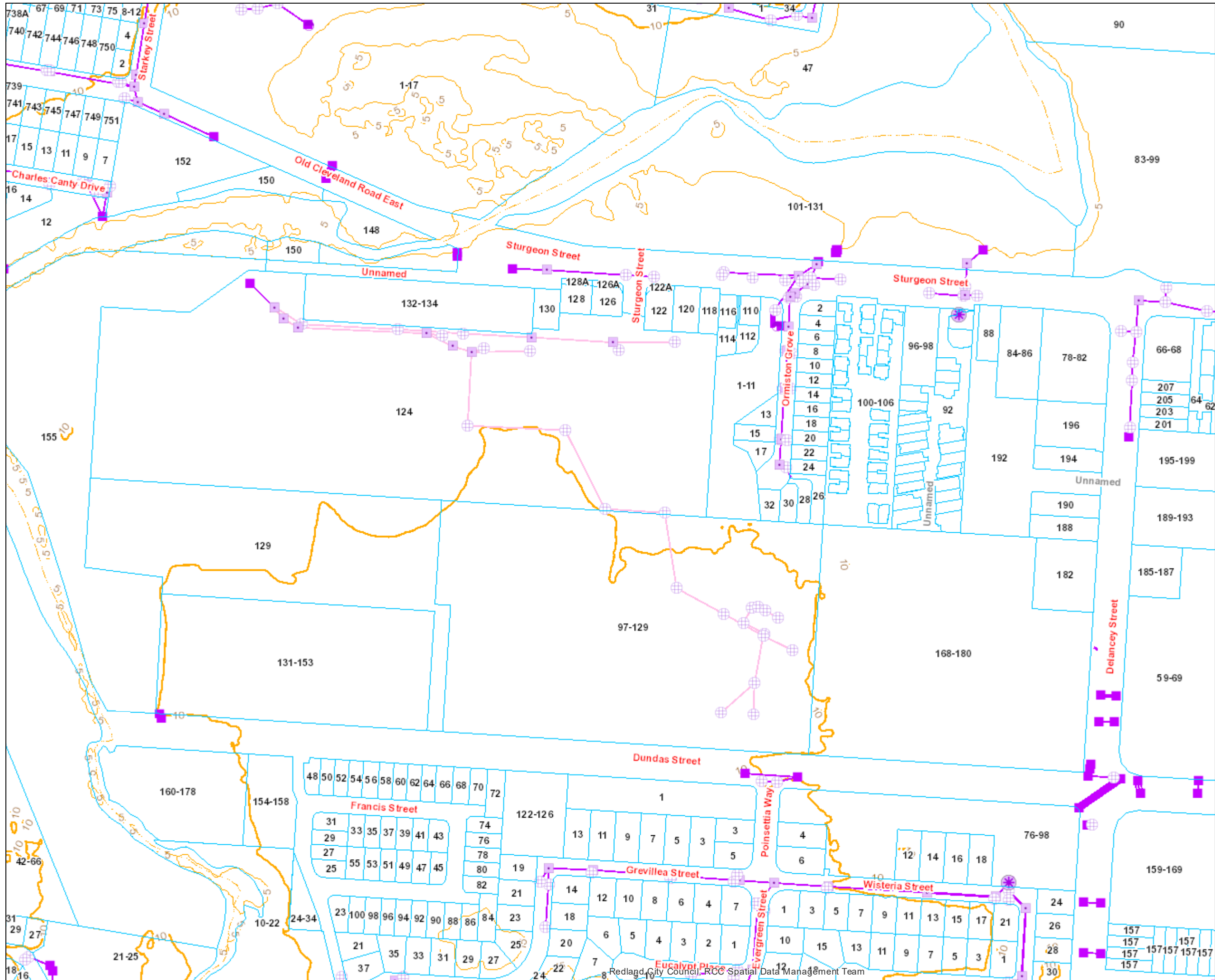
Drained
Constrained
Land

Scale @ A3:
1:3,000

Date:
3/5/2025



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Stormwater

Legend

- Current Lot
- Suburb Boundary

Stormwater GPTs

- All other values
- Gross Pollutant Trap - Complex
- Gross Pollutant Trap - Simple
- Wsud Feature - Non Gpt

Stormwater Pits

- All other vlaues
- Manhole
- Pit
- Stormwater End Structures

Stormwater Drains

- All other vlaues
- Box
- Pipe
- Box, Private
- Pipe, Private

Contours 5m

- 0m AHD
- 5
- 10

Scale @ A3: 1:3,000

Date: 3/5/2025

Redland CITY COUNCIL
INFORMATION PURPOSES ONLY

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Appendix D – CONCEPT ENGINEERING PLANS

LEGEND

SITE BOUNDARY

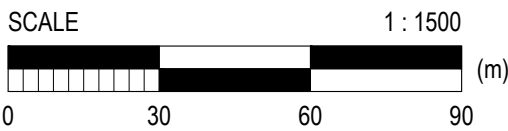
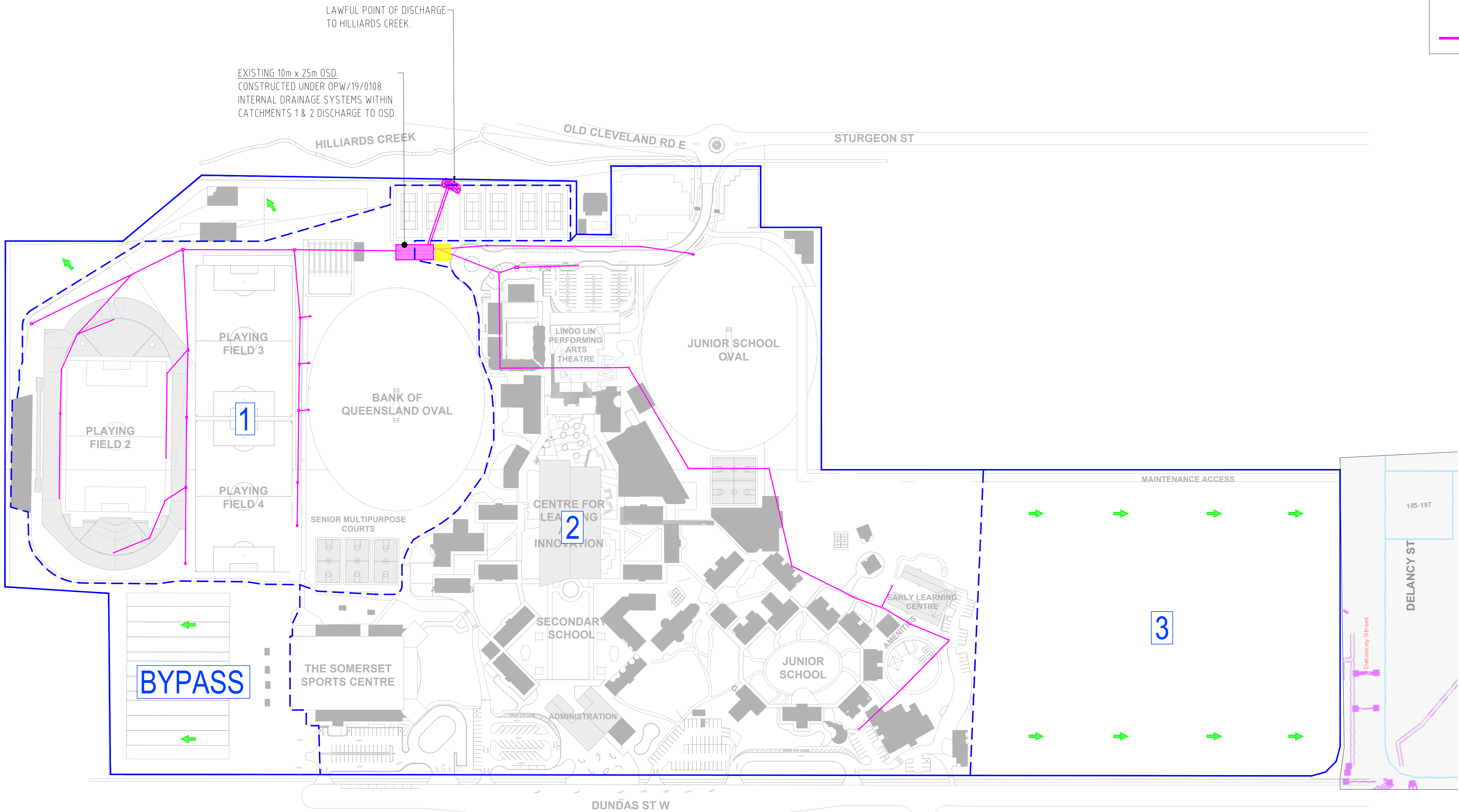
INTERNAL CATCHMENT BOUNDARY

OVERLAND FLOW DIRECTION

EX

CATCHMENT LABEL

EXISTING STORMWATER



ISSUE FOR APPROVAL

NAXOS
ENGINEERS

T 1300 598 544
E info@naxosengineers.com.au
Level 1, Suite B
557 Gregory Terrace, Fortitude Valley, Qld 4006
PO Box 224, Spring Hill QLD 4004
NAXOSENGINEERS.COM.AU

AMENDMENTS			
No.	DATE	DESCRIPTION	DRAWN
A	11.03.2025	DRAFT ISSUE	JB
B	02.04.2025	ISSUE FOR APPROVAL	JB

Associated Consultant: ROHRIG			
Approved: GREGG TYQUIN			
Drawn: JB		Design: JB	
Checked: GT		Supervisor: GF	
RPEQ. 1528		Date: 11.03.2025	

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North:

Orig. Dwg. Size
A1

Size of Land:
27.1 HA
Scale:
1:1500

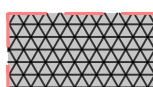
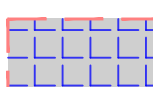
Client:
ROHRIG (QLD) PTY LTD
Project:
ORMISTON COLLEGE MASTER PLAN

Job No.
25-132
Drawing No.
SK001

Revision:
B

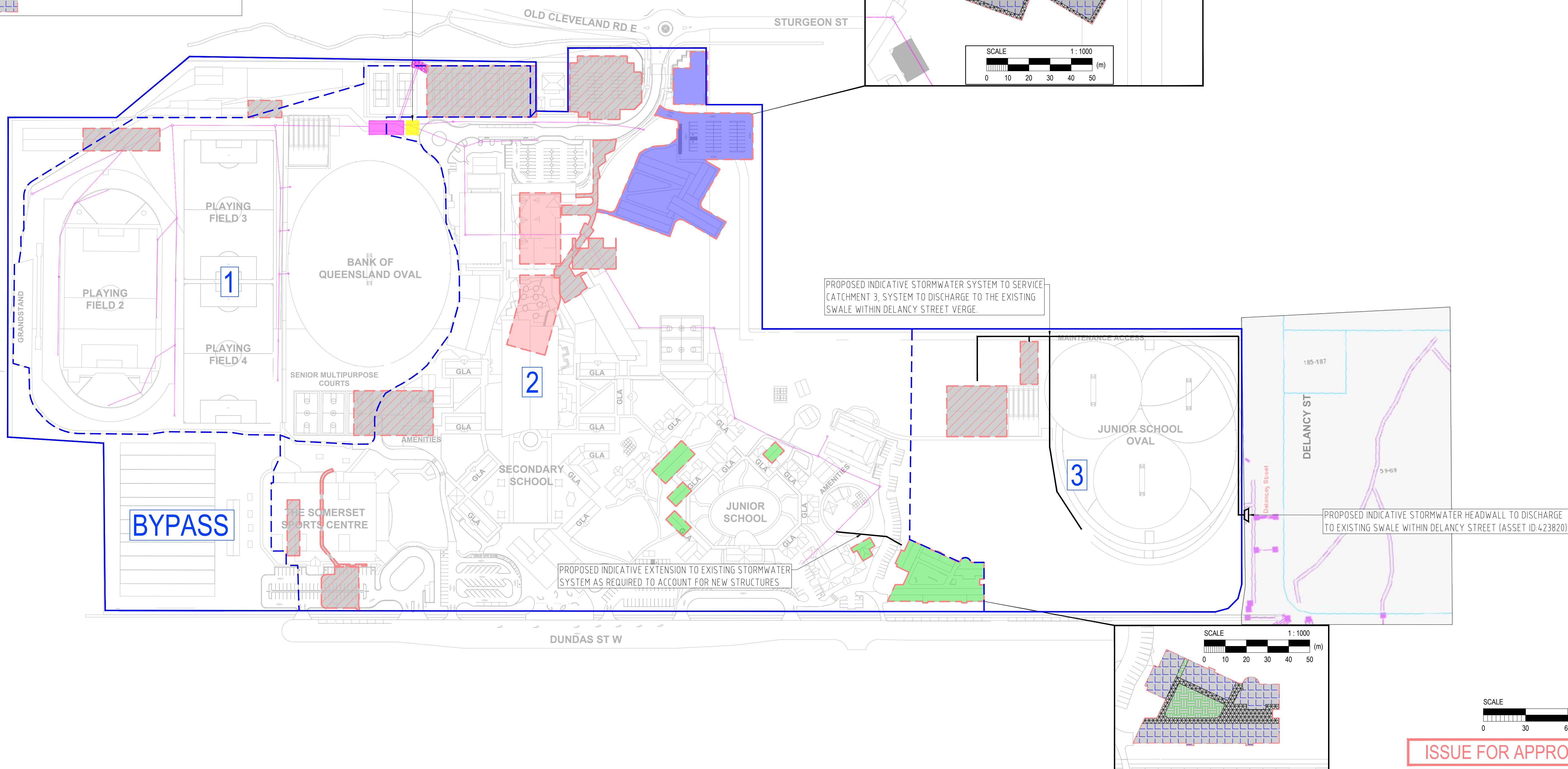
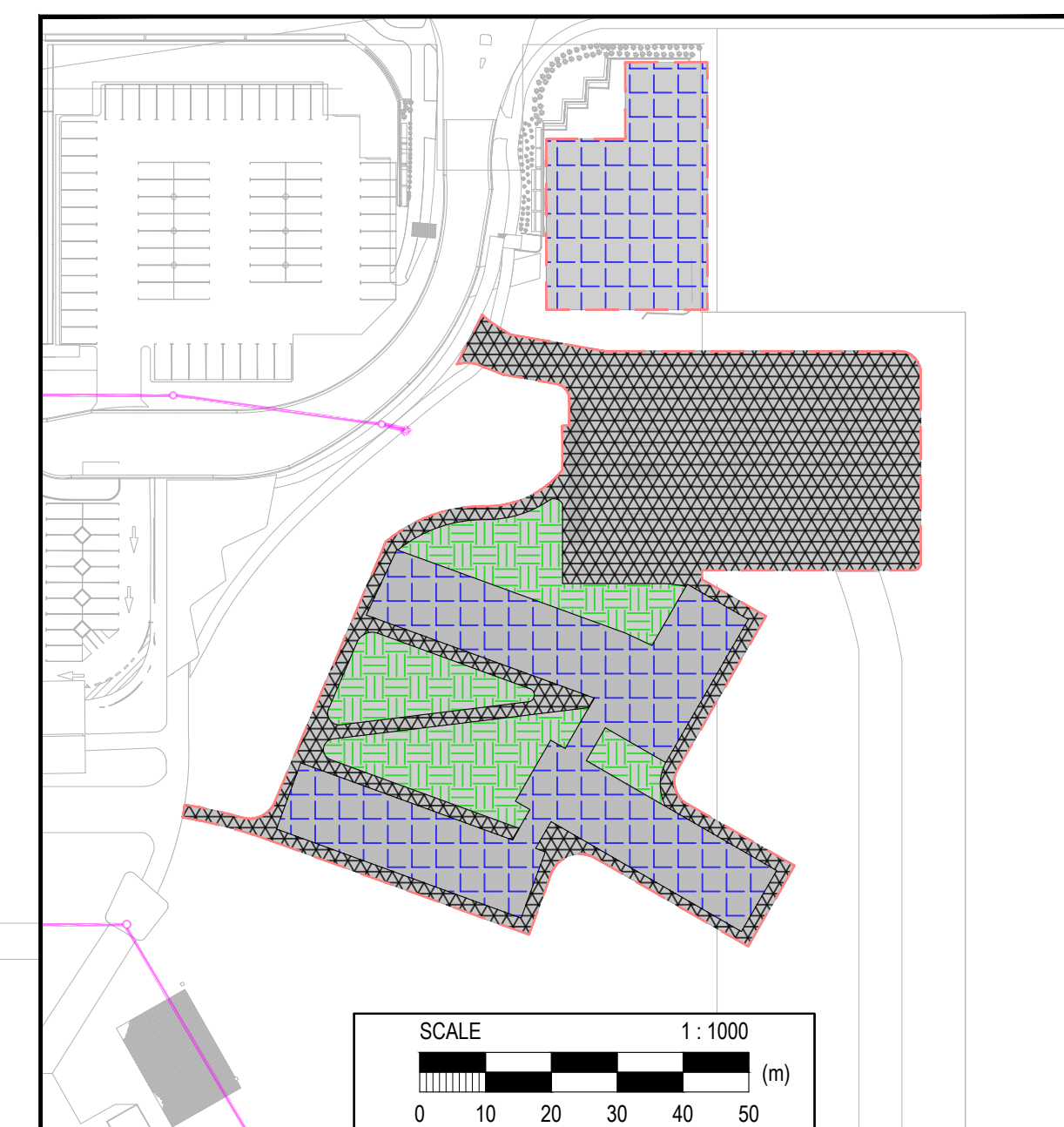
EXISTING SITE PLAN

LEGEND

- | | |
|---|--|
|  | SITE BOUNDARY |
|  | INTERNAL CATCHMENT BOUNDARY |
|  | PROPOSED CATCHMENT BOUNDARY |
|  | EXISTING STORMWATER |
|  | PROPOSED STORMWATER |
|  | OVERLAND FLOW DIRECTION |
|  | PROPOSED ELEMENT OF MASTER PLAN THAT DOES NOT REQUIRE STORMWATER QUALITY TREATMENT. |
|  | GROUND (LANDSCAPE) HATCH |
|  | GROUND (ROAD) HATCH |
|  | ROOF HATCH |

STORMWATER CATCHMENT TABLE					
CATCHMENT NAME	HATCH COLOUR	CATCHMENT AREA (m²)	ROOF AREA (m²)	GROUND (ROAD) AREA (m²)	GROUND (LANDSCAPE) AREA (m²)
SO1 & D08		3072	3072	0	0
D06 & D07		6076	2395	2671	1010
J01-J08 & D24		3066	2142	466	458

PROPOSED INDICATIVE 10m x 9m SPEL CHAMBER.
TO BE GRADUALLY FITTED WITH SPEL FILTER
CARTRIDGES AS DEVELOPMENT OCCURS. REFER
TO SBSMP PREPARED BY NAXOS ENGINEERS FOR
FURTHER DETAIL.



ISSUE FOR APPROVAL

NAXOS
ENGINEERS

T 1300 598 544
E info@naxosengineers.com.au
Level 1, Suite B
557 Gregory Terrace, Fortitude Valley, Qld 4006
PO Box 224, Spring Hill QLD 4004
NAXOSENGINEERS.COM.AU

AMENDMENTS			
No.	DATE	DESCRIPTION	DRAWN
A	11.03.2025	DRAFT ISSUE	JB
B	02.04.2025	ISSUE FOR APPROVAL	JB

Associated Consultant:
ROHRIG

Approved: GREGG TYQUIN

RPEQ. 1528	Date: 11.03.2025
------------	------------------

Drawn:	Design:
--------	---------

Checked:	Supervisor
GT	GF

Design:

Supervisor	GF
------------	----

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North:



Orig. Drg. Size

Size of Land:	27.1 HA
Scale:	1:1500

Client:	
Project	

PROPOSED MASTER PLAN

ROHRIGH (QLD) PTY LTD

ORMISTON COLLEGE MASTER PLAN

Job No.
25-132

Drawing No.	SK002
-------------	-------

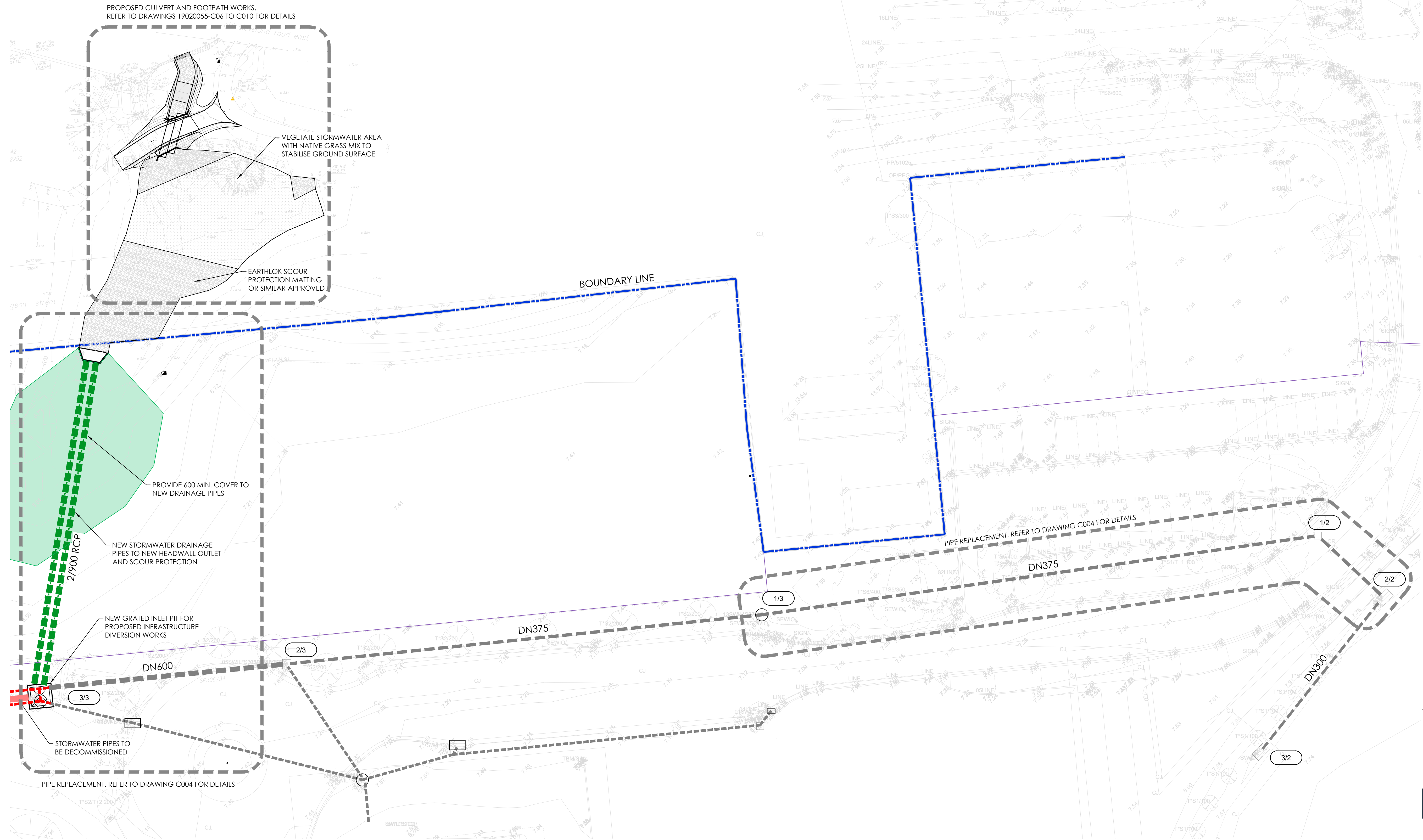
Revision:

B

B

Appendix E – EXISTING STORMWATER DOCUMENTATION

NOT TO BE USED FOR CONSTRUCTION			
AMDT	DATE	DESCRIPTION	BY
P1	06.09.19	ISSUED FOR DA	HK
P2	10.09.19	ISSUED FOR DA	HK
P3	16.09.19	TENDER ISSUE	HK
1	05.06.20	ISSUED FOR CONSTRUCTION	AW
2	25.06.20	MINOR AMENDMENTS	AW



STORMWATER LAYOUT PLAN

SCALE 1:250



CLIENT
ORMISTON COLLEGE

STATUS
PRELIMINARY

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DISCIPLINE
CIVIL DESIGN

DRAWING TITLE
STORMWATER LAYOUT PLAN

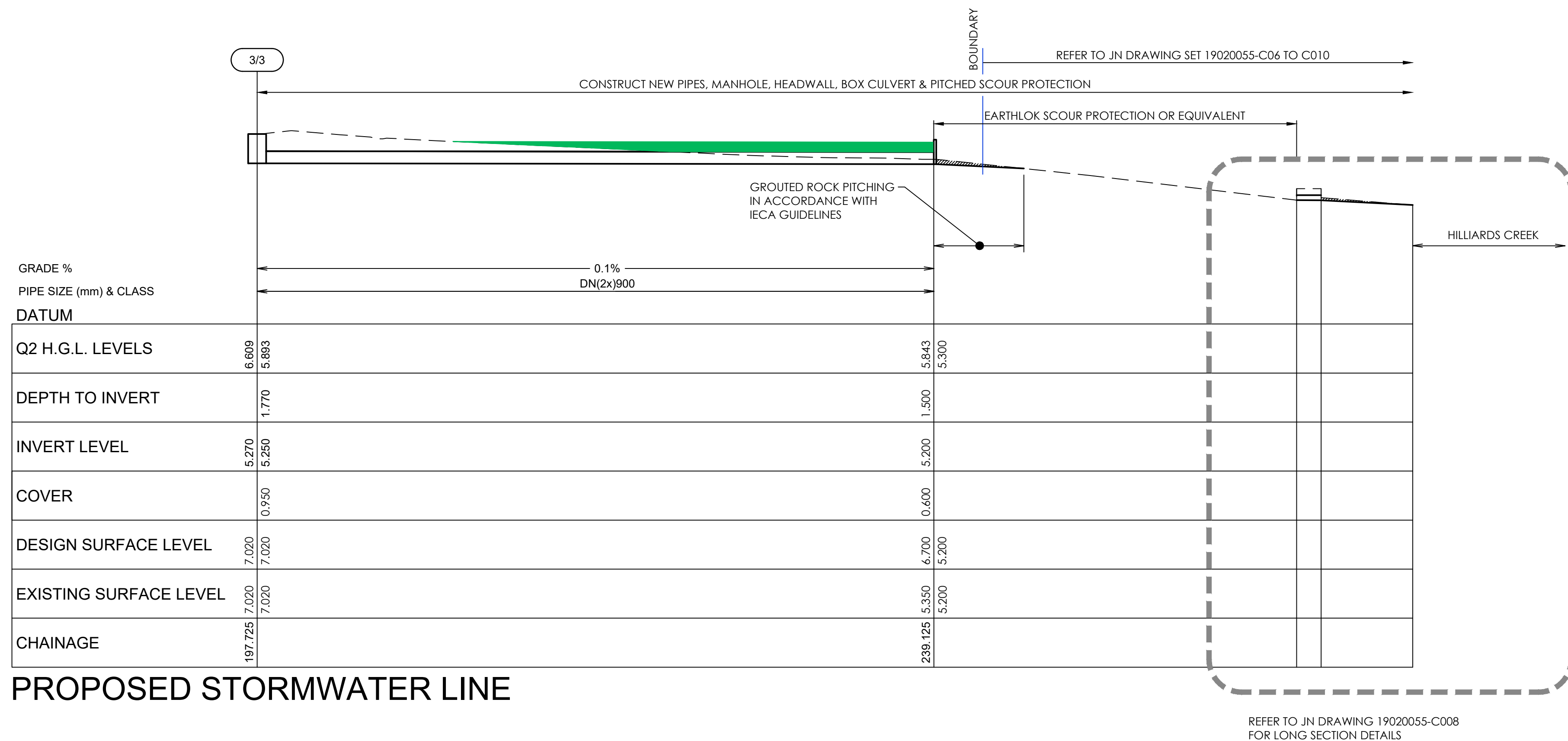
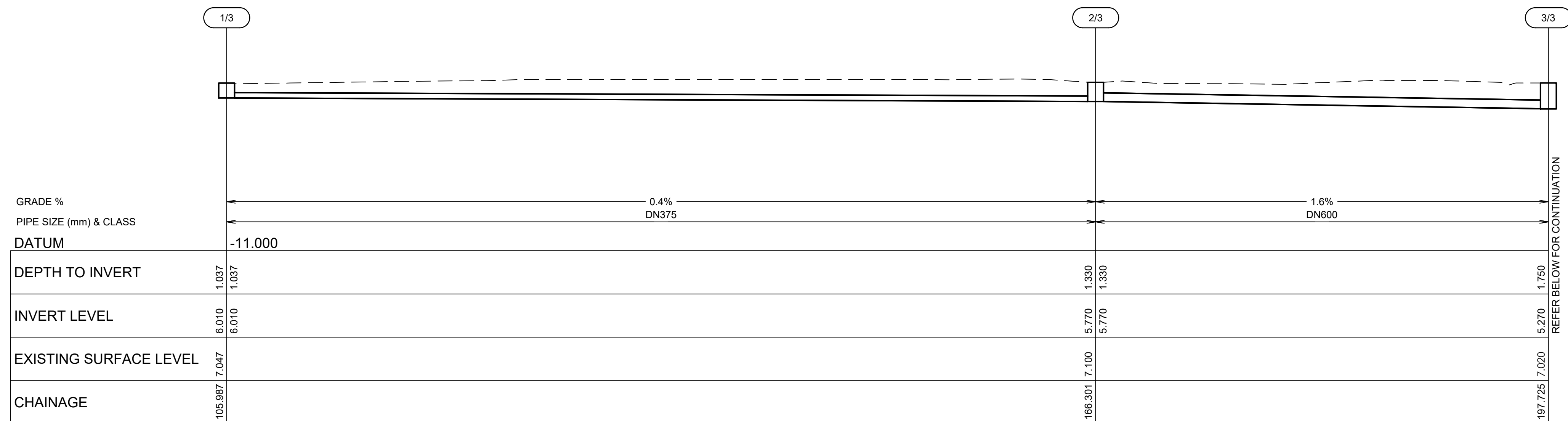
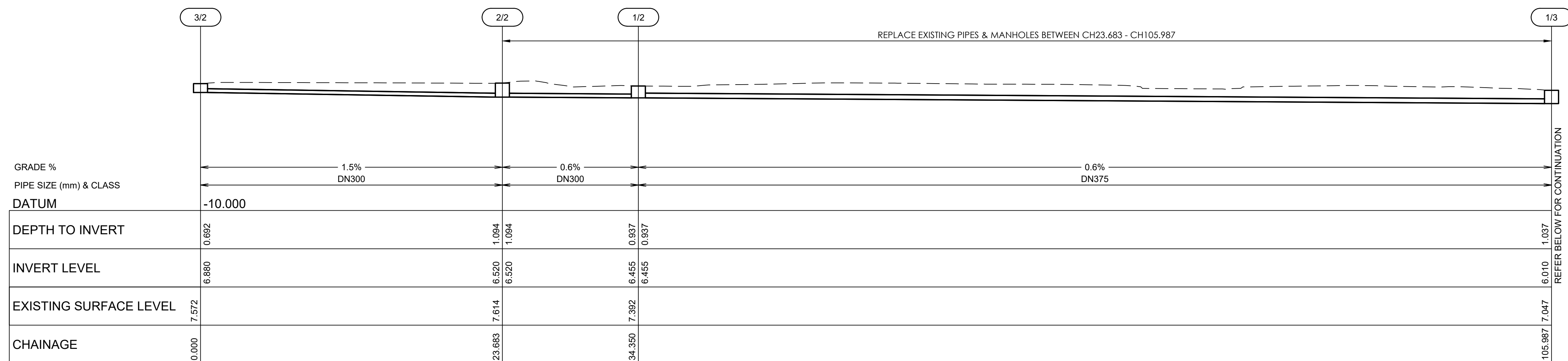
PROJECT
STORMWATER CONNECTION TO HILLIARDS CREEK

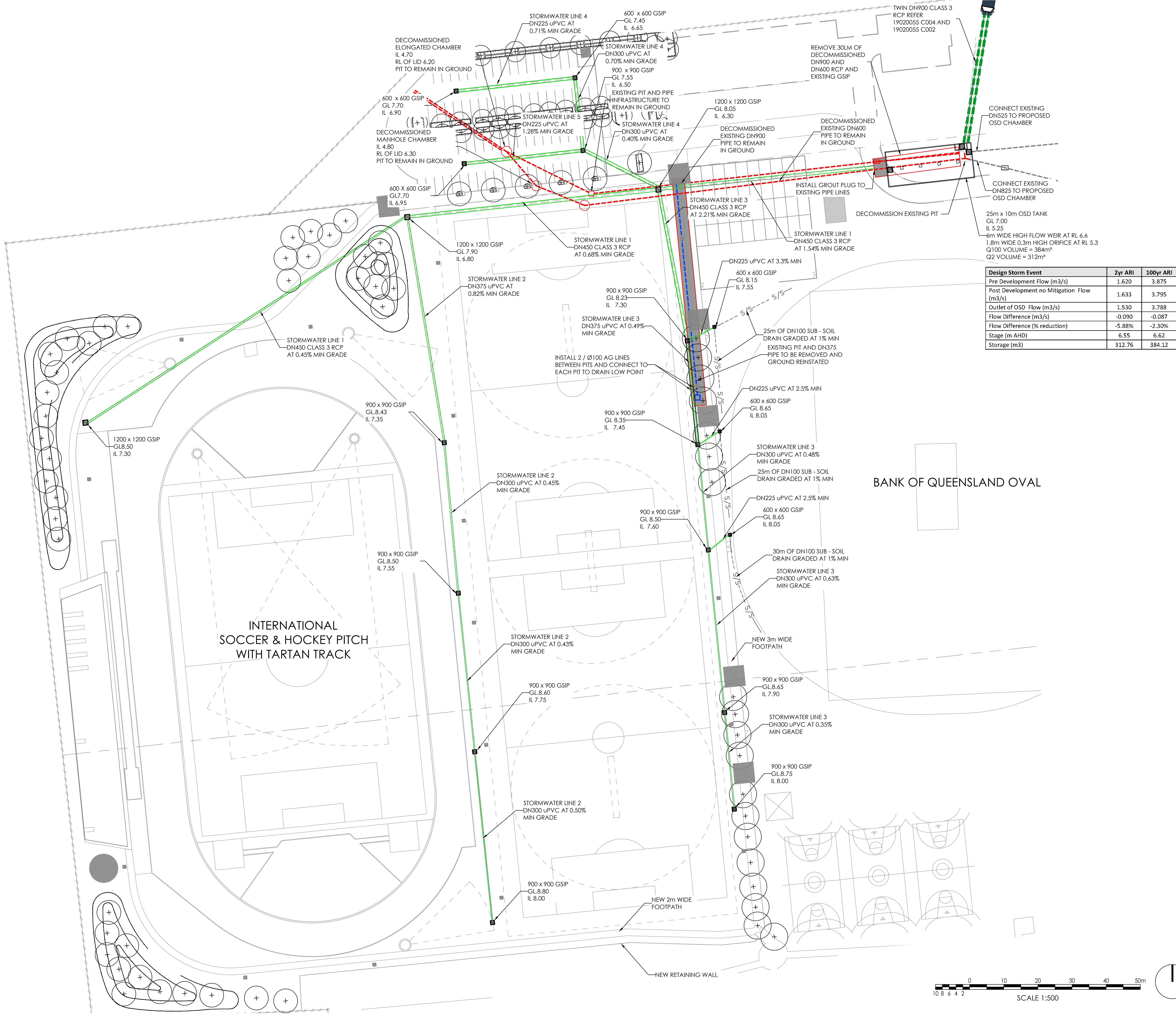
ADDRESS
97 DUNDAS STREET
ORMISTON COLLEGE

PROJECT DETAILS
DESIGN SR
DRAWN HK
DATE SEPT 2019
DRG SIZE A1
SCALE AS SHOWN
PROJECT SF
MGR
WWW.JN.COM.AU

19020055
C003 2

NOT TO BE USED FOR CONSTRUCTION			
AMD#	DATE	DESCRIPTION	BY
P1	06.09.19	ISSUED FOR DA	HK
P2	10.09.19	ISSUED FOR DA	HK
P3	16.09.19	TENDER ISSUE	HK
1	05.06.20	FOR CONSTRUCTION	AW





NOT TO BE USED FOR CONSTRUCTION

AMDT	DATE	DESCRIPTION	BY
A	11.06.20	ISSUED FOR TENDER	DJ
B	16.06.20	ISSUED FOR TENDER	DJ
C	06.07.20	ISSUED FOR TENDER	DJ
D	10.07.20	ISSUED FOR TENDER	DJ
E	03.09.20	ISSUED FOR CONSTRUCTION	DJ

LEGEND

- DECOMMISSIONED PIPES
- AREA OF EXISTING PIPEWORK TO BE REMOVED AND GROUND REINSTATED

Design Storm Event	2yr ARI	100yr ARI
Pre Development Flow (m3/s)	1.620	3.875
Post Development no Mitigation Flow (m3/s)	1.633	3.795
Outlet of OSD Flow (m3/s)	1.530	3.788
Flow Difference (m3/s)	-0.090	-0.087
Flow Difference (% reduction)	-5.88%	-2.30%
Stage (m AHD)	6.55	6.62
Storage (m3)	312.76	384.12



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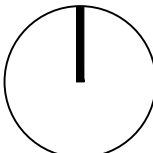
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ADDRESS
97 DUNDAS STREET
ORMISTON COLLEGE

PROJECT DETAILS

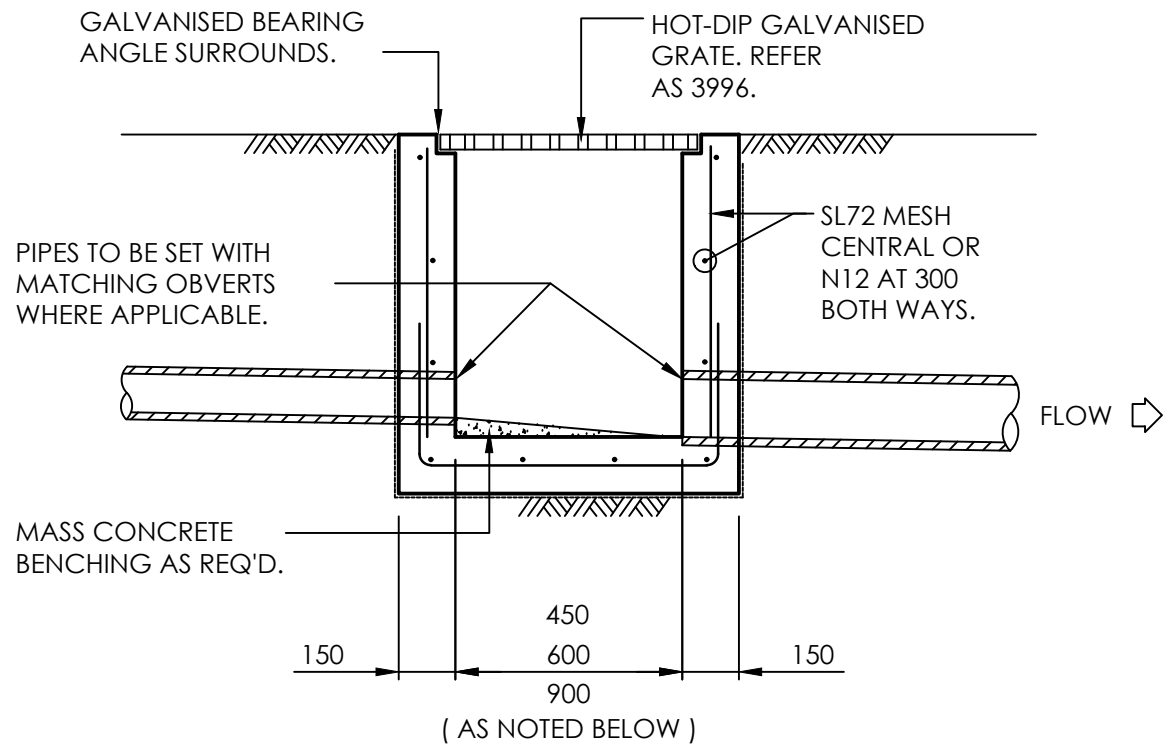
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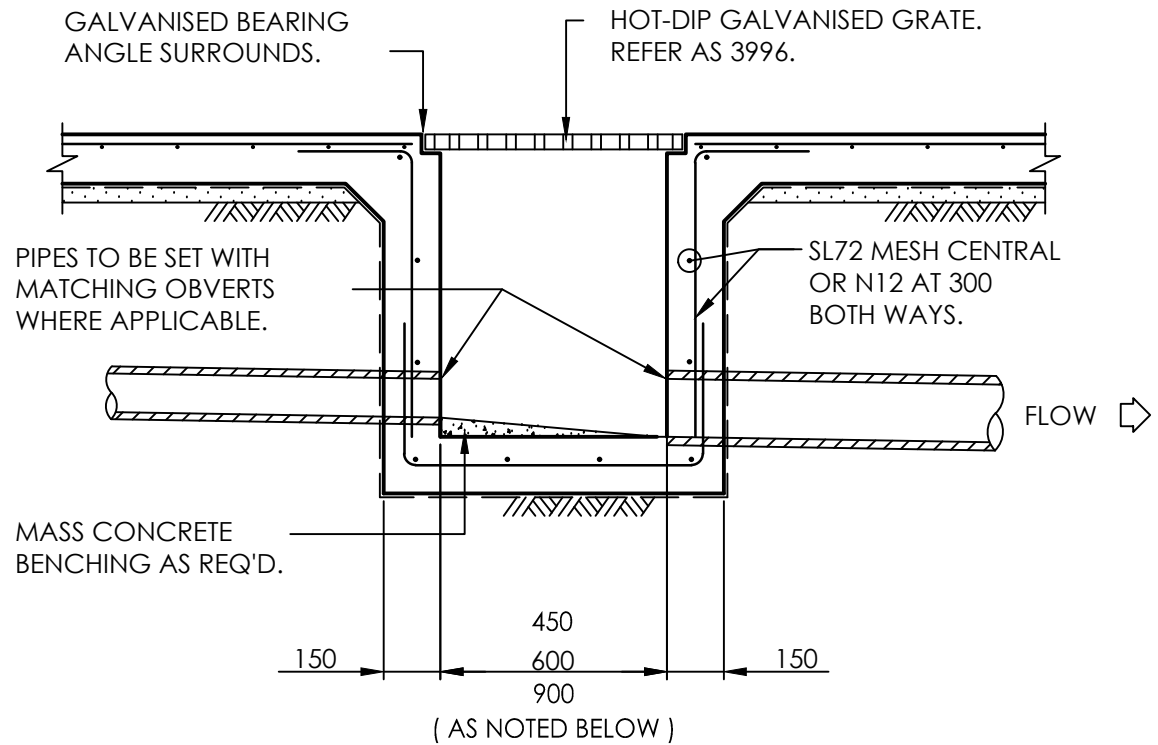


TYPICAL GRATED INLET PIT
- NATURAL SURFACE

MINIMUM INTERNAL DIMENSIONS FOR STORMWATER PITS		PIT MINIMUM INTERNAL DIMENSIONS (mm)	
DEPTH TO INVERT OF OUTLET	< 600	WIDTH	LENGTH
		450	450
> 600		600	600
> 900		600	900
> 1200		900	900
STEP IRONS SHALL BE PROVIDED FOR PITS WITH DEPTHS EXCEEDING 1200mm			

NOTES

- REINFORCEMENT NOTED IS ONLY REQUIRED FOR PITS EXCEEDING 900 DEEP. SUBJECT TO COUNCIL REQUIREMENTS. PITS GREATER THAN 3000 DEEP WILL REQUIRE STRUCTURAL ENGINEERS DESIGN.
- PROVIDE 900 x 3000 LONG SUBSOIL DRAINAGE STUB PIPE SURROUNDED WITH 100mm THICKNESS OF NOMINAL 20mm COARSE FILTER MATERIAL WRAPPED IN GEOTEXTILE FILTER FABRIC. (BIDUM A24 OR APPROVED SIMILAR). TO BE PARALLEL TO UPSTREAM SIDE OF EACH INLET PIPE.
- ALTERNATIVE PIT CONSTRUCTION MAY BE USED SUBJECT TO THE ENGINEERS APPROVAL.
- CONCRETE STRENGTH F_c = 32 MPa

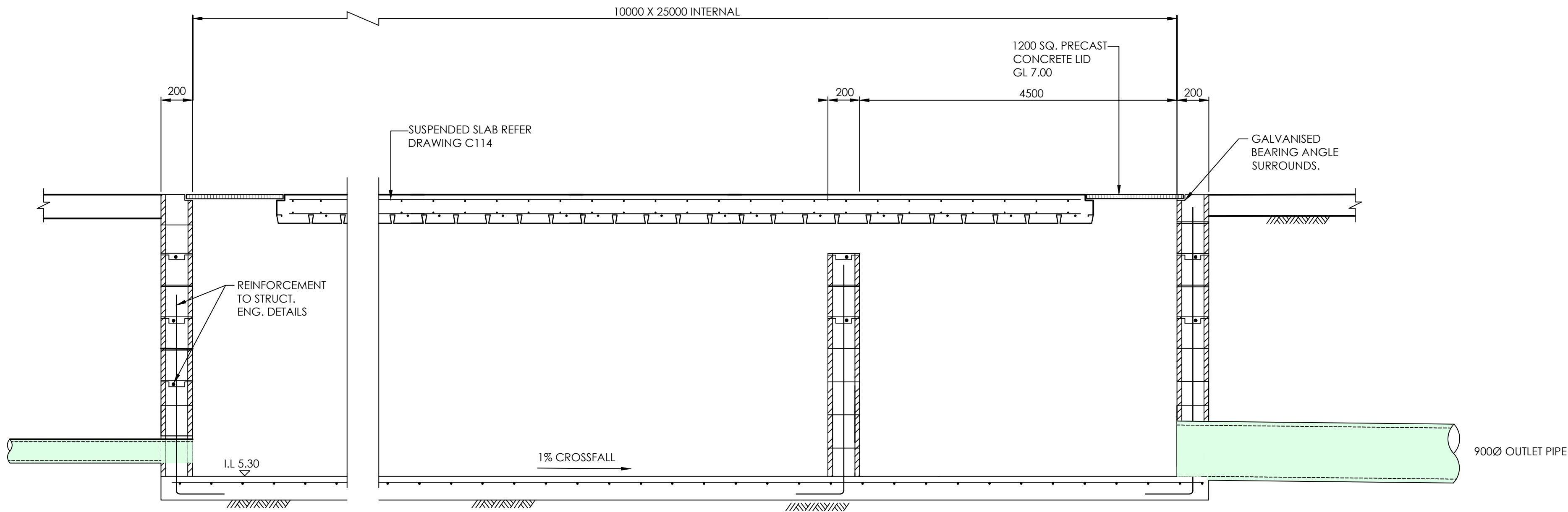


TYPICAL GRATED INLET PIT -
CONCRETE SURFACE

MINIMUM INTERNAL DIMENSIONS FOR STORMWATER PITS		PIT MINIMUM INTERNAL DIMENSIONS (mm)	
DEPTH TO INVERT OF OUTLET	< 600	WIDTH	LENGTH
		450	450
> 600		600	600
> 900		600	900
> 1200		900	900
STEP IRONS SHALL BE PROVIDED FOR PITS WITH DEPTHS EXCEEDING 1200mm			

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- ALTERNATIVE PIT CONSTRUCTION MAY BE USED SUBJECT TO THE ENGINEERS APPROVAL.
- CONCRETE STRENGTH F_c = 32 MPa



ON SITE DETENTION TANK DETAIL
N.T.S

CONTRACTOR IS TO VERIFY THE LEVEL OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF EXCAVATION FOR DRAINAGE.

Design Storm Event	2yr ARI	100yr ARI
Pre Development Flow (m3/s)	1.620	3.875
Post Development no Mitigation Flow (m3/s)	1.633	3.795
Outlet of OSD Flow (m3/s)	1.530	3.788
Flow Difference (m3/s)	-0.090	-0.087
Flow Difference (% reduction)	-5.88%	-2.30%
Stage (m AHD)	6.55	6.62
Storage (m3)	312.76	384.12



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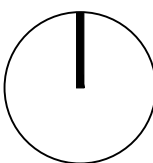
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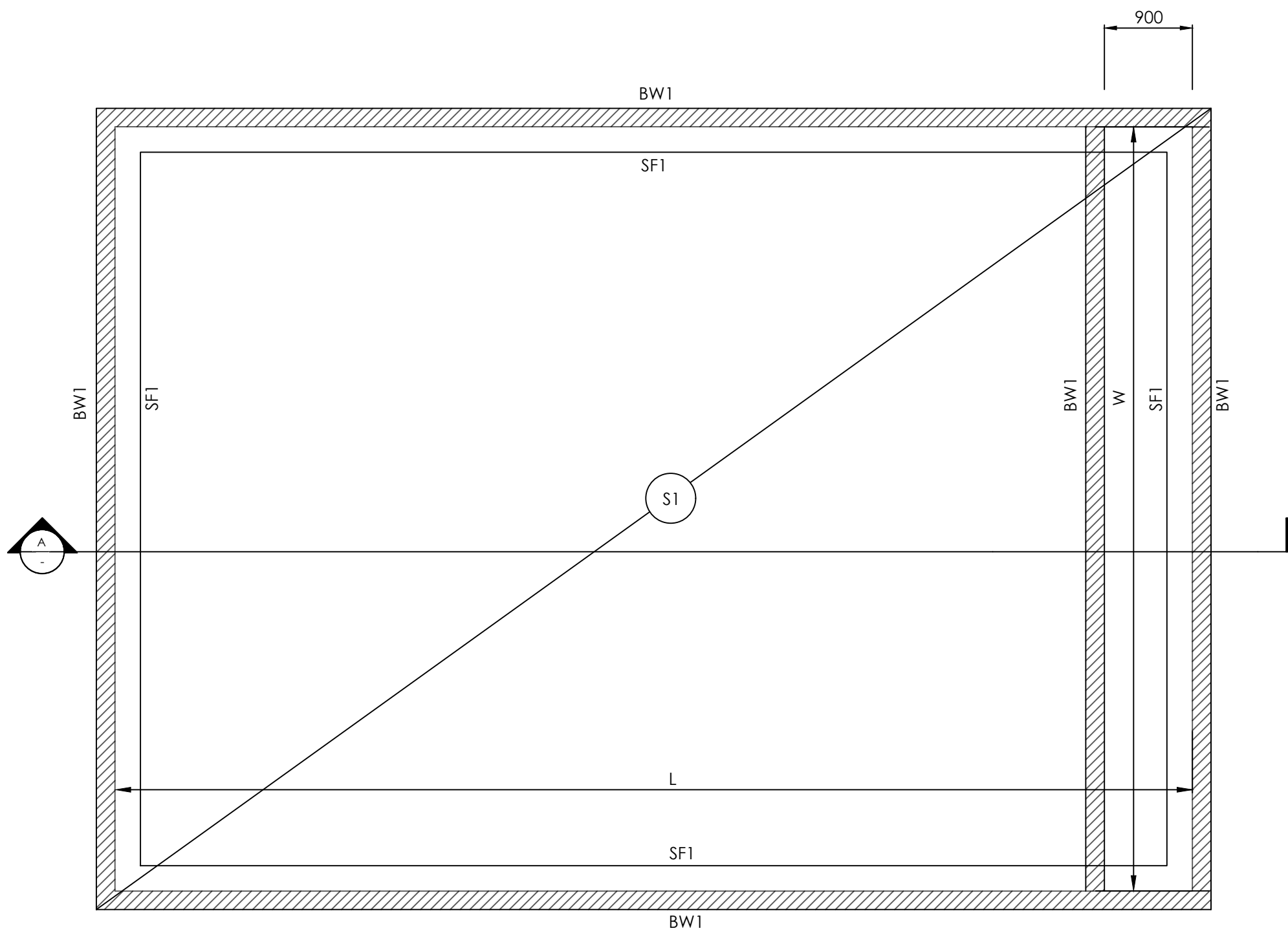
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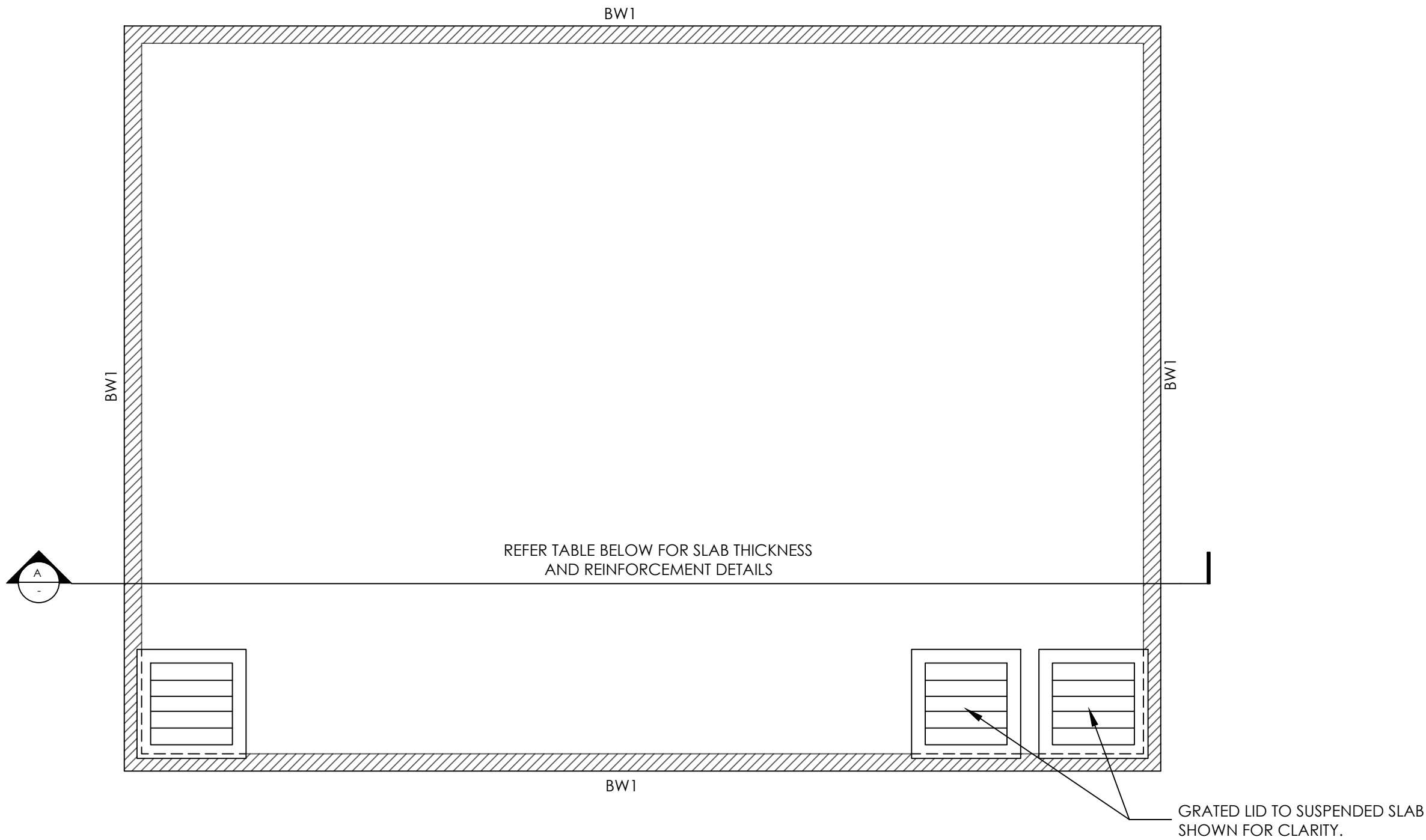
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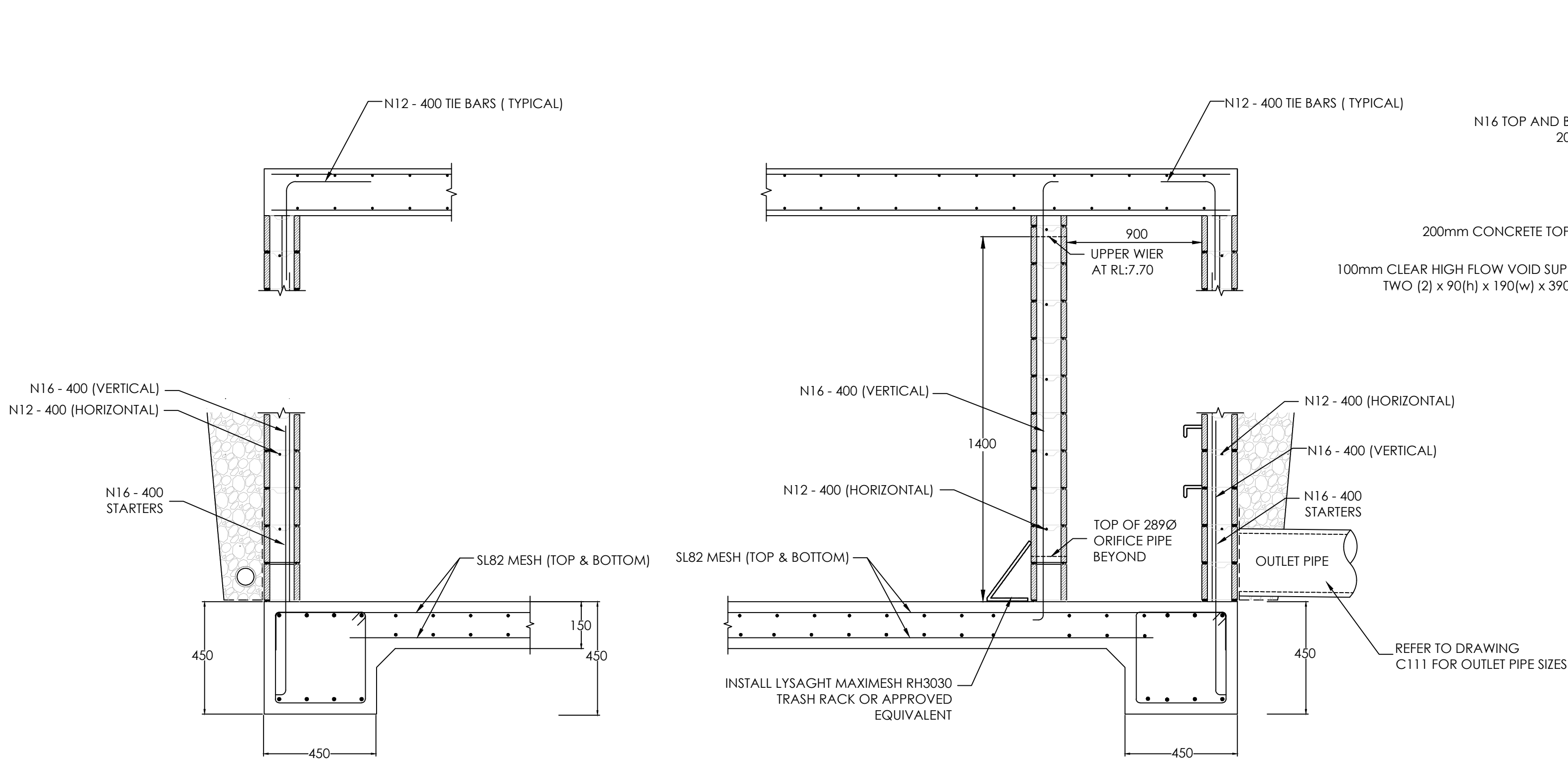


SLABS & FOOTINGS LAYOUT PLAN
SCALE 1:50

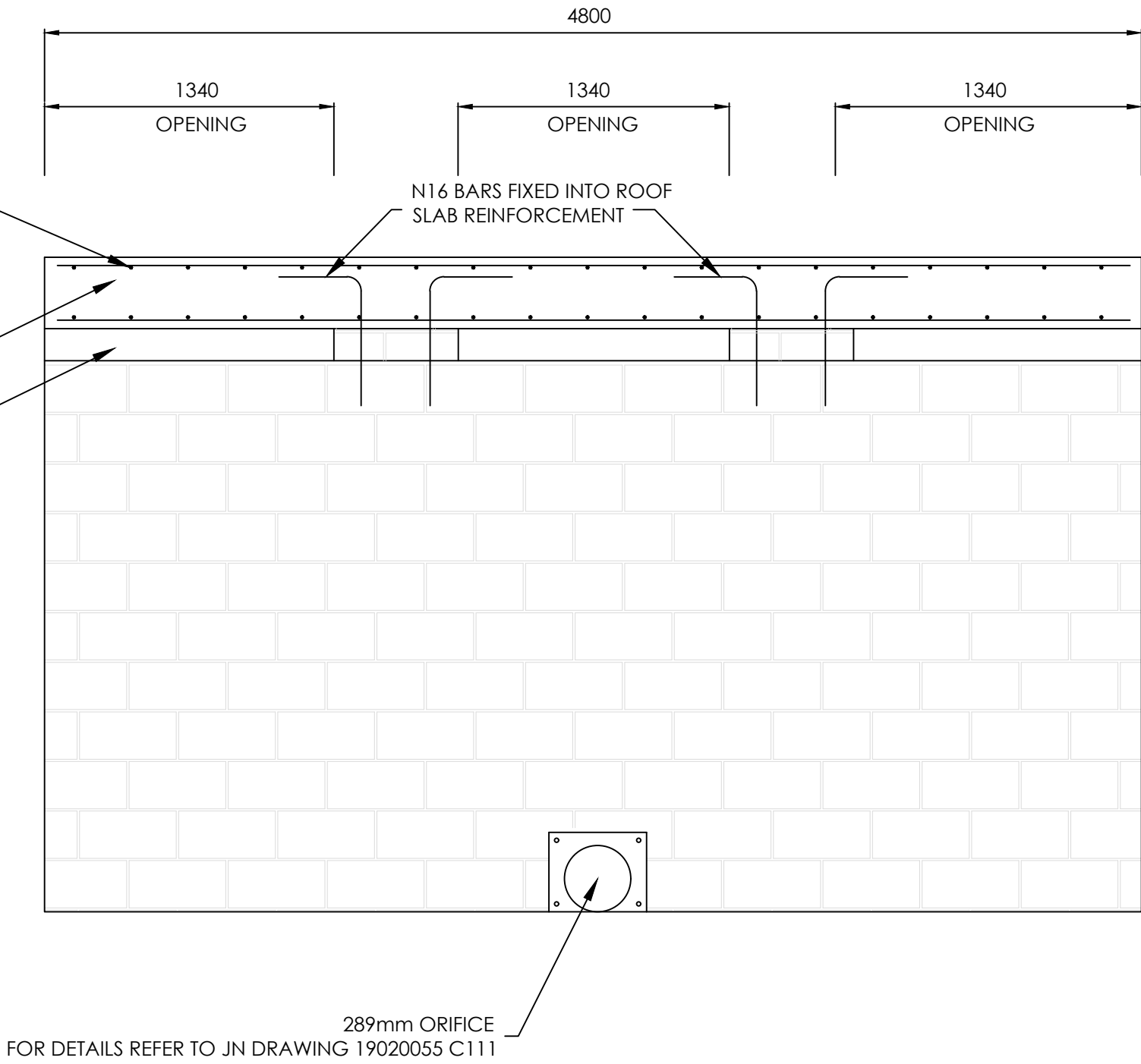


SUSPENDED SLAB PLAN
SCALE 1:50

DETENTION TANK LOCATION	LENGTH (L)	WIDTH (W)	DEPTH (D)	SLAB THICKNESS	BOTTOM REINFORCEMENT	TOP REINFORCEMENT
ORMISTON COLLEGE - TARTAN CAR PARK	15000	4800	1700	200	N16- 200 BOTTOM IN BOTH DIRECTIONS	N12- 250 BOTH DIRECTIONS



SECTION A
SCALE NTS
TYPICAL SECTION THROUGH DETENTION TANK



OSD DIVIDING WALL SECTION DETAIL
SCALE N.T.S



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PROJECT

SPORTING FIELD DEVELOPMENT

DRAWING TITLE

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ADDRESS

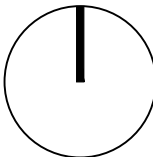
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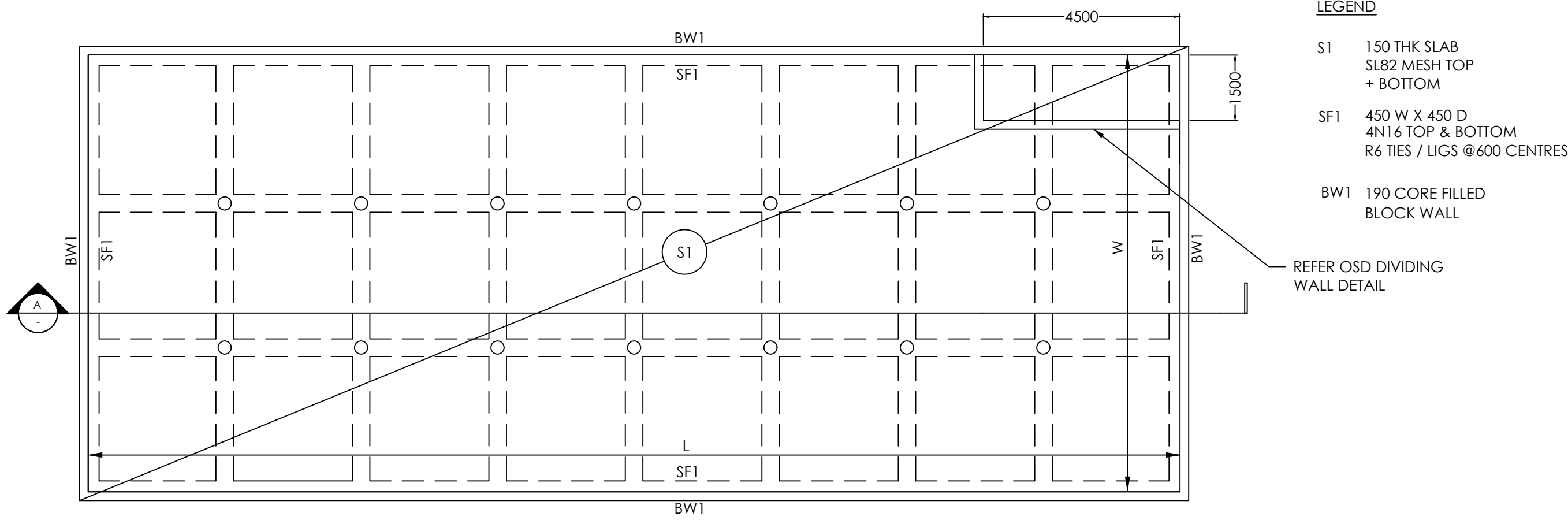
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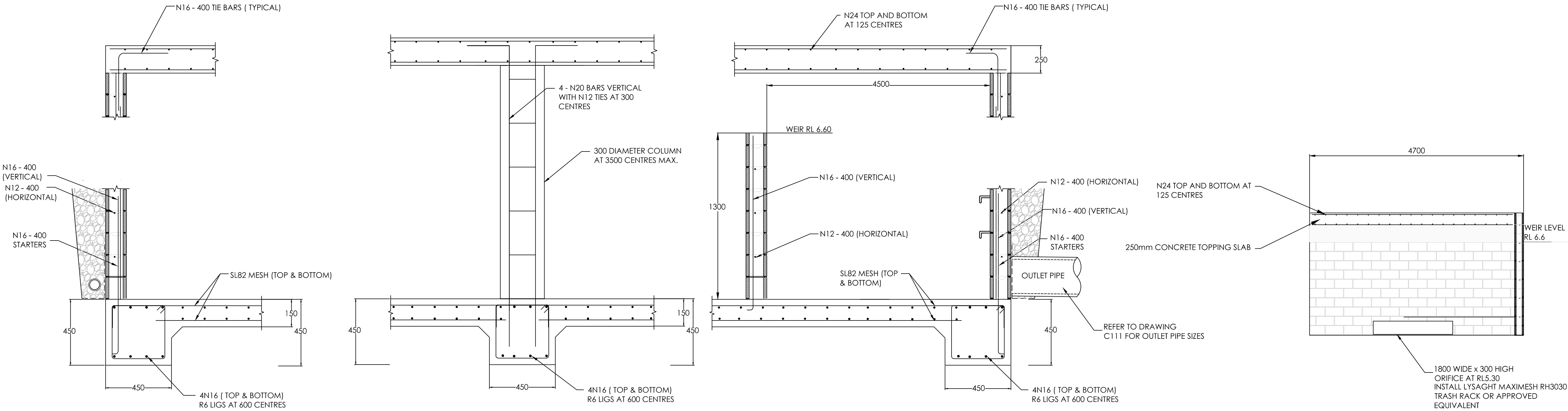


SLABS & FOOTINGS LAYOUT PLAN
SCALE 1:100



SUSPENDED SLAB PLAN
SCALE 1:100

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ORMISTON COLLEGE - TARTAN CAR PARK	25000	10000	1700	250	N24 - 125 BOTTOM IN BOTH DIRECTIONS	N24 - 125 BOTH DIRECTIONS



SECTION A
SCALE NTS
TYPICAL SECTION THROUGH DETENTION TANK

OSD DIVIDING WALL DETAIL
SCALE N.T.S



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DRAWING TITLE

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PROJECT

OSD TANK STRUCTURAL DETAILS PLAN

ADDRESS

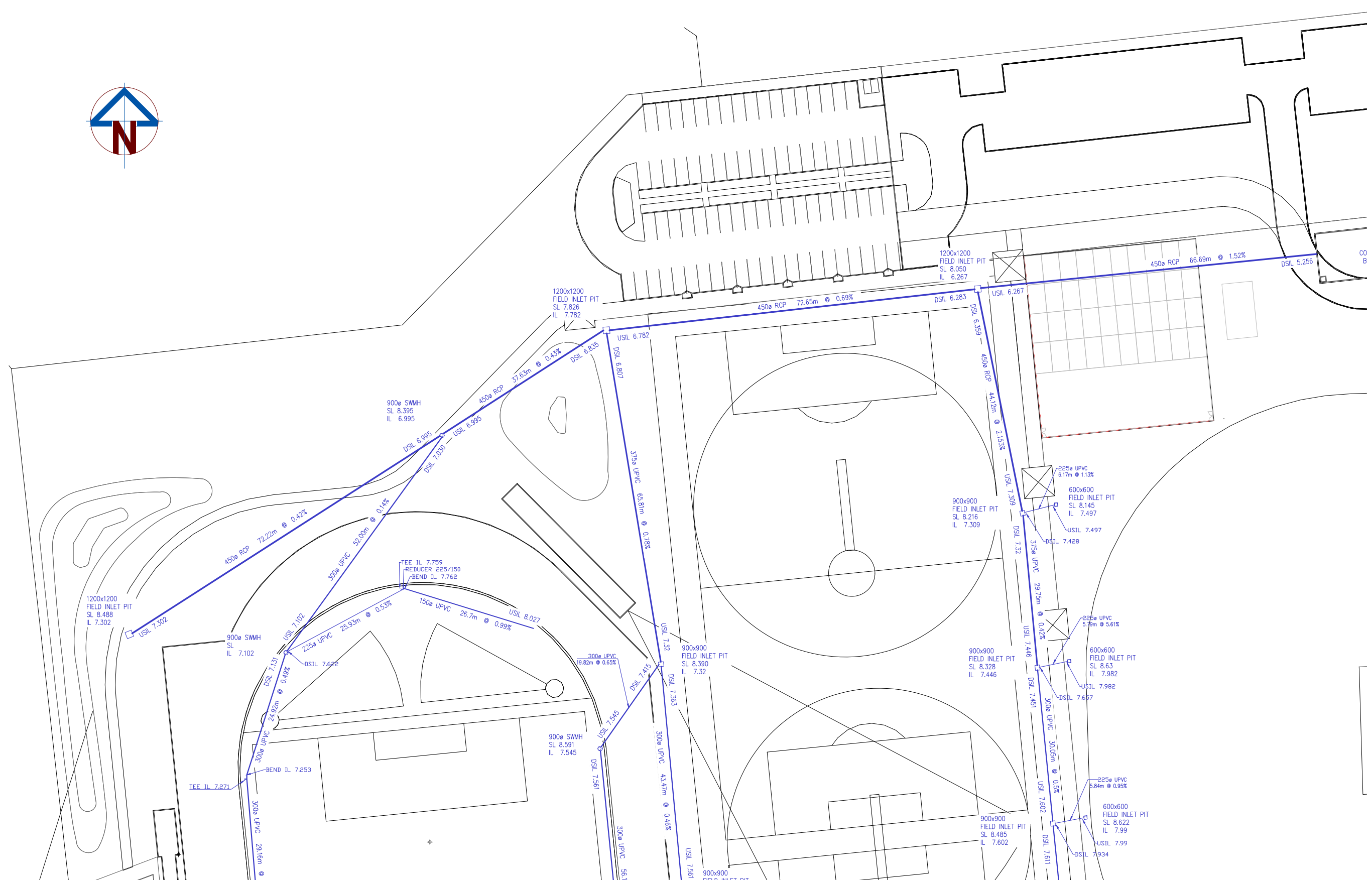
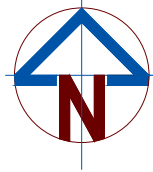
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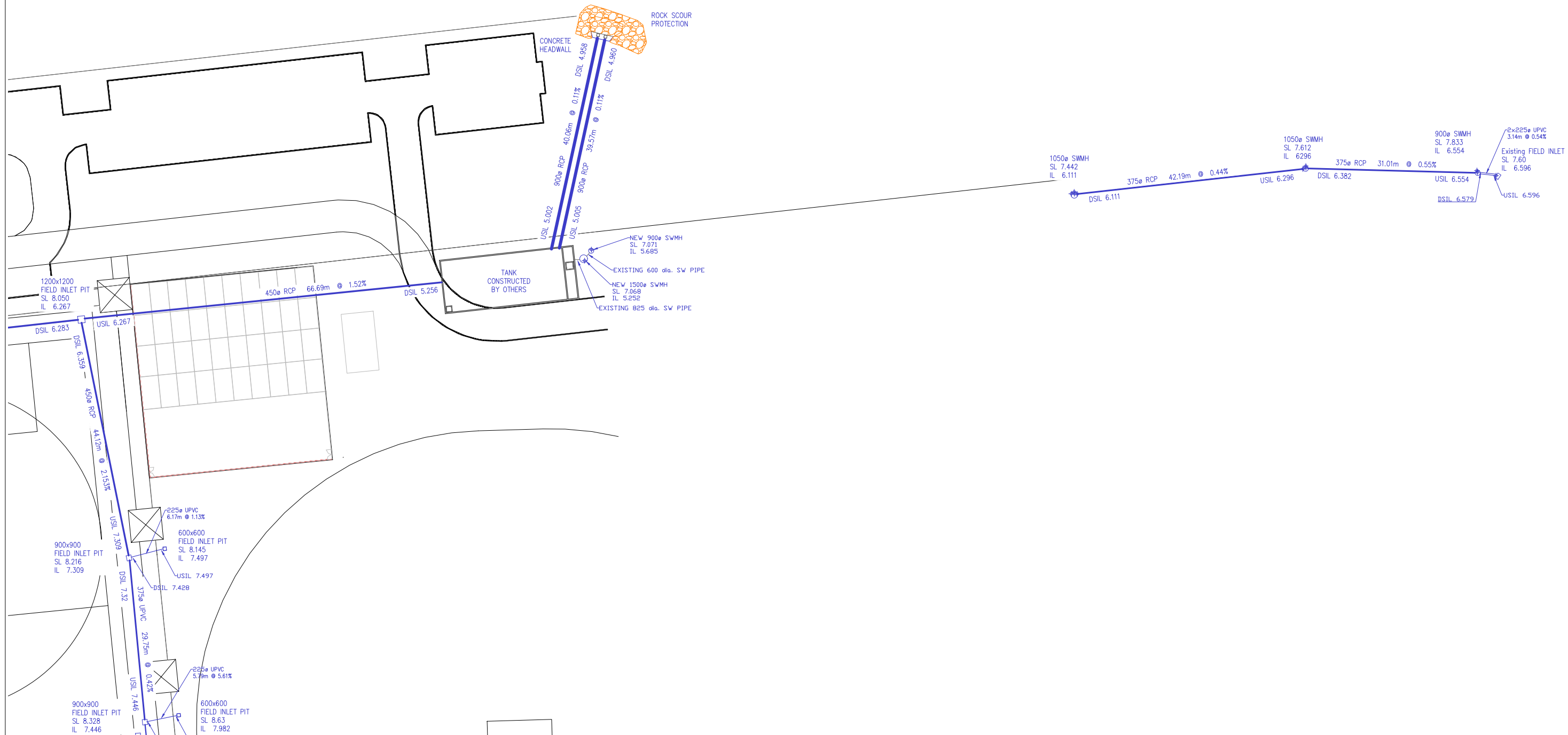
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Street Address	ORMISTON COLLEGE
RP Description	

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Origin	
Parish of	
County of	
DATE	23.09.20
JOB NO	AR3004
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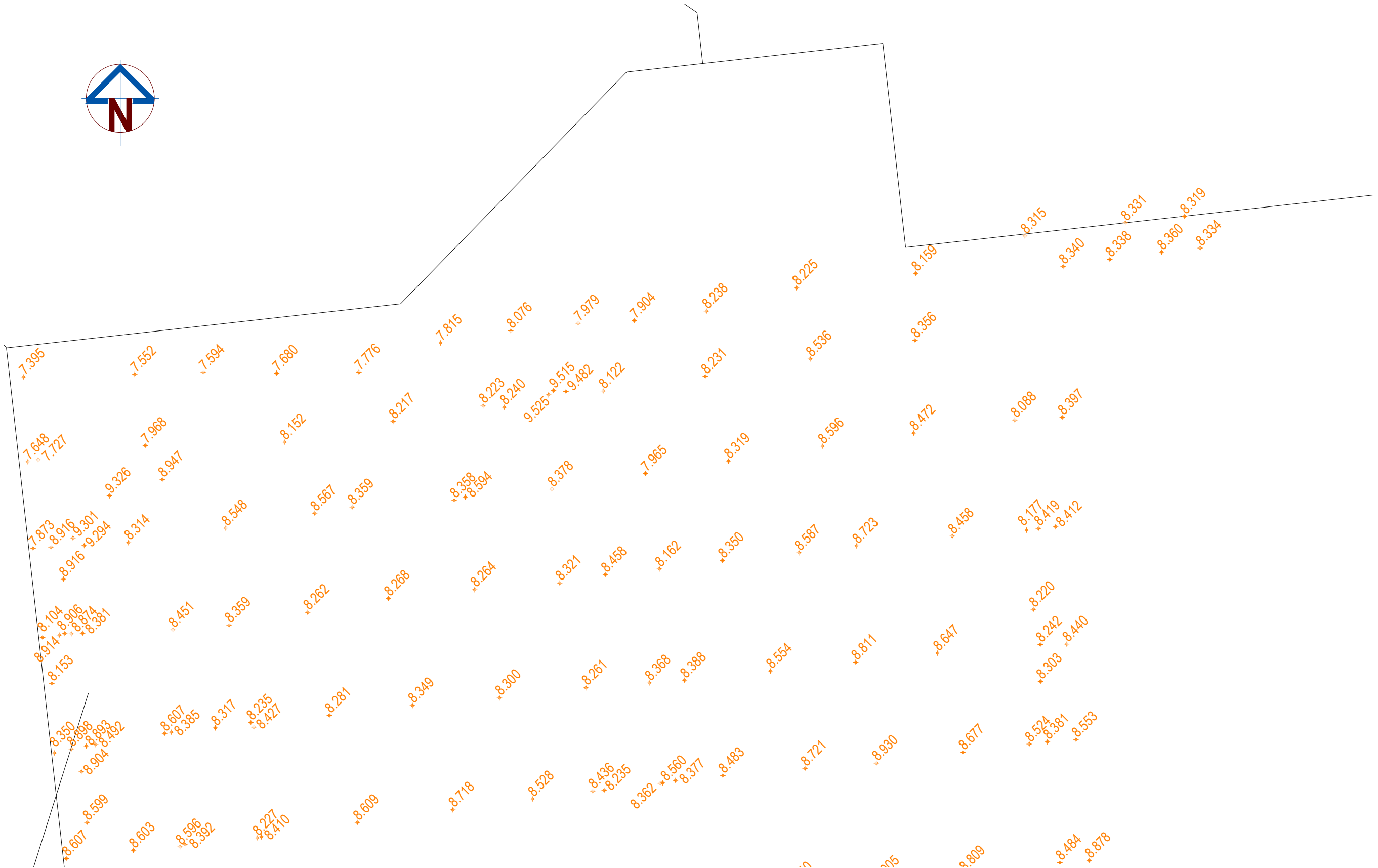
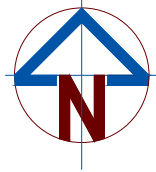


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Email: info@allroads.net.au

Plan No: AR3004-106 A



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			Allroads			AHD						JOB NO				AR3004	
			Title			AS-CONSTRUCTED STORMWATER		Origin		Contour Interval:		12d				DM	
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												CHECKED					
												QT					
			Street Address		ORMISTON COLLEGE		Parish of		County of		Scale						
			RP Description														



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Street Address	ORMISTON COLLEGE
RP Description	

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Parish of	

Azimuth	
Contour Interval:	
County of	

DATE	07.09.20
JOB NO	AR3004
12d	
SURVEYED	SR
CHECKED	
QT	
Scale	



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Plan No:

AR3004-104

A



Appendix F – ATLAN

INSTALLATION MANUAL

AtlanFilter

(Formerly SPELFilter)



CONTENTS

Introduction	03
Vault Types	03
Install Prerequisites	03
Health & Safety	04
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Installation	06
Install Examples	07



INTRODUCTION

Understanding how to correctly and safely install the AtlanFilter (formerly SPELFilter) is essential for the preservation of the filter's condition and its operational effectiveness.

The AtlanFilter is a highly engineered Stormwater filtration device designed to remove fine sediments, heavy metals, nitrogen and phosphorus from stormwater runoff.

The AtlanFilter relies on a spiral wound media filter cartridge. The Filters can be housed in either a concrete or fiberglass structure that evenly distributes the flow between cartridges. Flow through the filter cartridges is gravity driven and self-regulating, which makes the AtlanFilter system a low maintenance, high performance stormwater treatment device.

This manual will provide the necessary steps that are to be taken to correctly and efficiently install the AtlanFilter product.

VAULT TYPES

There are three vault types, which the AtlanFilter can be installed into:

1. Precast vault: Monolithically poured concrete vault (base and walls).
2. Cast in place vault: Custom designed for site.
3. Fiberglass vault: Must be made by an approved supplier.



FIGURE 2 AtlanFilter install

INSTALL PRE-REQUISITES

- Vault must be clean from all debris, etc.
- Vault must be easily accessible.
- 900 x 900mm lid must be installed correctly and operational.
- Structure of the tank must be safe and hazard free.

HEALTH & SAFETY

PERSONAL HEALTH & SAFETY

When carrying out the necessary installation operations of the AtlanFilter all contractors and staff personnel must comply with all current workplace health and safety legislation.

The below measures should be adhered to as practically as possible.

- Comply with all applicable laws, regulations and standards.
- All those involved are informed and understand their obligations in respect of the workplace health and safety legislation.
- Ensure responsibility is accepted by all employees to practice and promote a safe and healthy work environment.



FIGURE 3 Safety materials

PERSONAL PROTECTIVE EQUIPMENT/SAFETY EQUIPMENT

When carrying out the necessary installation operations of the AtlanFilter, wearing the appropriate personal protective equipment and utilising the adequate safety equipment is vital to reducing potential hazards.



Personal protective equipment/safety equipment in this application includes:

- Eye protection
- Safety apron
- Fluorescent safety vest
- Form of skin protection
- Puncture resistant gloves
- Steel capped safety boots
- Ear muffs
- Hard hat/s
- Sunscreen

IF CLASSED AS CONFINED SPACE

- Harness
- Gas detector
- Tripod
- Spotter

MATERIALS REQUIRED

MATERIALS REQUIRED TO INSTALL ATLANFILTERS

When installing the AtlanFilter, having the necessary tools and equipment is vital to an efficient and effective installation process.

Manifold pipework is to be supplied by plumber or on-site contractor.

Tools that will be required include:

- PVC pipe primer
- PVC pipe cement
- Hammer drill
- Hammer
- Hole saw
- Battery/power drill
- Hack saw
- Ratchet kit
- Shovel
- Tripod
- Winch/chain block for lowering Filters into vault
- Ladder
- Sikaflex gun

Items/products that will be included:

- AtlanFilter/s
- Weir wall & fixings
- Energy dissipater (if required)
- Pipework & fittings
- Fixings
- Anti-floatation brackets



FIGURE 4 AtlanFilter install set-up

INSTALLATION

AtlanFilter installation procedures may vary depending on the configuration of the AtlanFilters, the type of vault and engineers specs. Installation instructions for manhole AtlanFilter systems and precast vault AtlanFilter systems are contained in this section.

Custom AtlanFilter systems may have particular installation issues that will be addressed during the design.

INSTALLATION OF A ATLAN FILTER SYSTEM PROCEDURE

1. Implement pre-start safety measures.

Ensure that the area in which operational works are to be carried out is cordoned off, to prevent unauthorised access. Adequate safety barriers must be erected. Area in which work is to be carried out must be clean, safe and hazard free. (Refer to figure 4.)

2. Set-up gantry tripod above manhole.

Assemble and position the gantry above the manhole safely and as practically as possible. Attach the winch or chain block to the gantry for lifting the Atlan Filters. Perform safety procedures ie. Attach harnesses etc. (if confined space).

3. Open manhole lid.

Once you have sent up the Gantry and ensured that the area is safe to operate in, you can proceed to open the manhole lid, using lid lifters.

4. Conduct gas tests (If tank is classed confined space).

Once the lids have been removed to a safe distance to prevent tripping, you must then proceed to conduct gas tests. Perform necessary gas tests according to the confined space regulations.

5. Once confined space has been deemed safe to operate in, enter tank safely.

Once you have carried out the required gas test and the work area is deemed safe, you may then enter the pit via a ladder or winch system to assess the work area you will be operating in. Ensure all confined space procedures are followed.

6. Set up weir wall over outlet pipe and energy dissipater over inlet pipe (if required).

When installing the weir wall you must ensure that it is securely bolted to the tank wall and completely sealed. Centre the aluminium weir over the outlet pipe and fix weir to tank wall with the supplied fixings. Then use Sikaflex to seal around the edge of the weir and filter outlet pipework.

7. Install pipework and AtlanFilters.

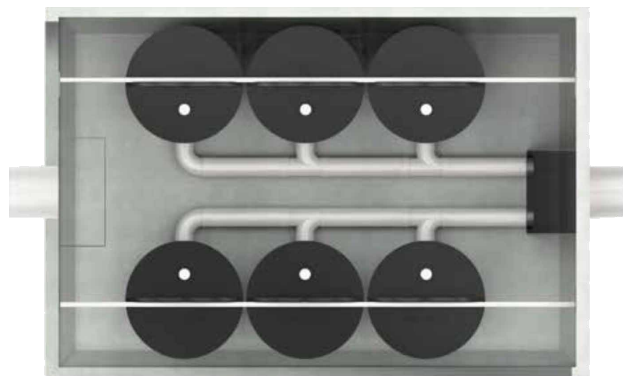
Please refer to the below standard install diagrams for the Atlan Filters. Then refer to your site specific drawings, as site requirements may require something different to the standard layout. Lower filters into tank, position into place, connect filter outlet pipework with the supplied fittings.

8. Install anti-floatation bars.

Please refer to the detailed drawings showing how the anti-floatation (Anchor) bars are to be installed.

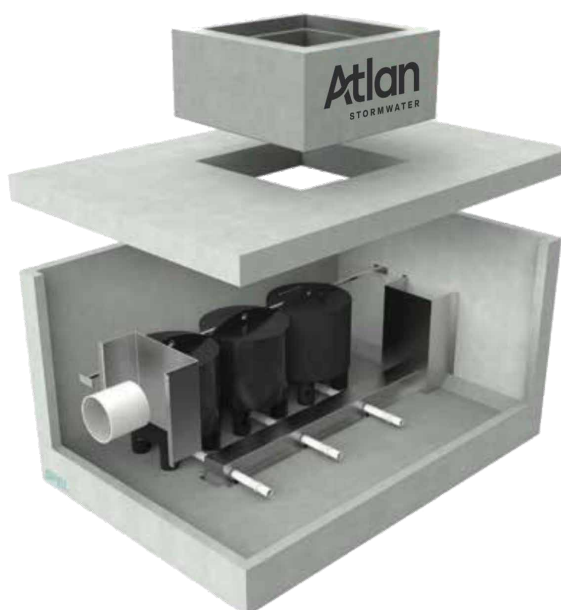
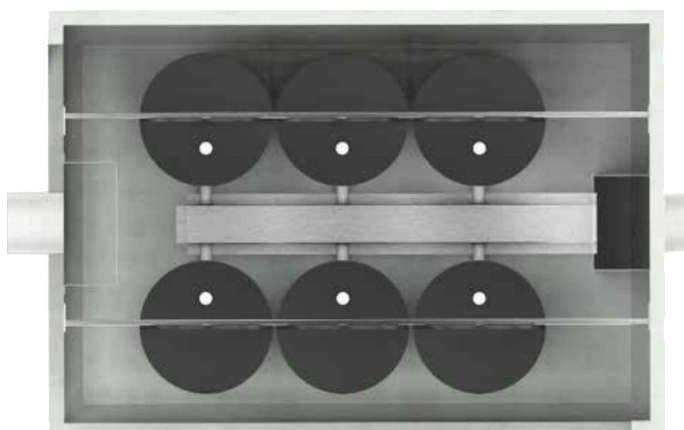
INSTALL EXAMPLES

FIGURE 5
Standard install with PVC Outlet pipework



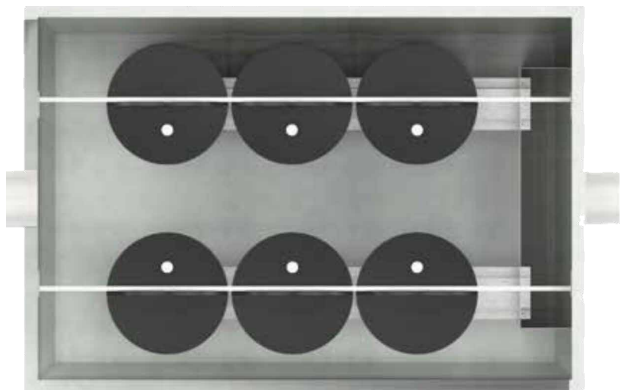
INSTALL EXAMPLES

FIGURE 6 Standard install with Channel
system Outlet pipework (1)



INSTALL EXAMPLES

FIGURE 7 Standard install with Channel
system Outlet pipework (2)



INSTALLATION MANUAL

AtlanFilter



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SA OFFICE 9 Hampden Road, Mount Barker SA 5251 P: 1300 773 500 sales@atlan.com.au	QLD SUNSHINE COAST BRANCH 19-27 Fred Chaplin Cct, Bells Creek, QLD 4551 P: 1300 773 500 qld.sales@atlan.com.au	WA OFFICE P: +61 8 9350 1000 P: 1800 335 550 sales@atlan.com.au
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Joy in water

'We believe clean waterways are a right not a privilege and we work to ensure a Joy in Water experience for you, with your children and grandchildren.'

Andy Hornbuckle

OPERATION & MAINTENANCE MANUAL

AtlanFilter

(Formerly SPELFilter)



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Site Exit and Clean Up16



INTRODUCTION

Understanding how to correctly and safely maintain the AtlanFilter (formerly SPELFilter) is essential for the preservation of the filter's condition and its operational effectiveness. The AtlanFilter is a highly engineered stormwater filtration device designed to remove sediments, heavy metals, nitrogen and phosphorus from stormwater runoff.

The filters can be housed in either a concrete or fibreglass structure that evenly distributes the flow between cartridges.

Flow through the filter cartridges is gravity driven and self-regulating, which makes the AtlanFilter system a low maintenance, high performance stormwater treatment device.

This guide will provide the necessary steps that are to be taken to correctly and efficiently ensure the life of the AtlanFilter product.



Figure 1 - AtlanFilters in a concrete chamber / vault

FEATURES

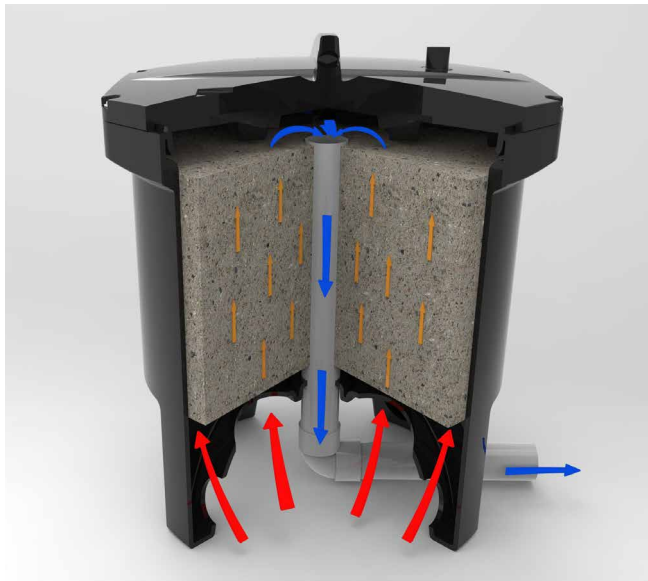


Figure 2 - Diagram of water flow through AtlanFilter

The AtlanFilter has a patented design that facilitates influent flow over the entire surface area of the media, providing consistent pollutant removal within a small footprint.

The AtlanFilter provides highly effective media filtration using gravity flow conditions, without the need for moving parts or floating valves. This eliminates the risk of mechanical failure, such as stuck valves and seizing components during its service life. This provides highly robust treatment performance.

Hydraulic head provided by a suitably sized weir in the filter vault forces stormwater through the filter media via the inlet ports underneath the filter cartridge.

Refer to the table below for minimum head required for the AtlanFilter cartridges to assist in sizing the weir.

The water to be treated enters the AtlanFilter cartridge via an upwards direction as the water level builds up around the AtlanFilter. This 'up flow' reduces the amount of sediment that could enter the media cartridge, as the sediment is allowed to drop to the vault floor under gravity. Any remaining sediment in the water is introduced through the filter media under hydraulic pressure and is filtered.

Water is filtered through the media, where dissolved and particulate Total Nitrogen and Total Phosphorus are removed via reaction with the media, in addition to the removal of Total Suspended Solids / sediment.

AtlanFilter Media Self-Backwash feature

A one-way air release valve located at the top of the filter cartridge allows air to escape as the cartridge fills up with water. This creates a siphonic flow condition as the air is completely evacuated from inside the AtlanFilter cartridge. Siphonic flow conditions are maintained until such time the water level outside of the cartridge falls beneath the inlet ports underneath the filter. At this moment, the water level inside the AtlanFilter cartridge is higher than the surrounding water level.

The water inside the AtlanFilter cartridge is then expelled upon the break of the siphon, and the water flows down and out of the inlet ports under gravity, onto the vault floor.

This is a highly effective backwash of the media and allows the expulsion of a high proportion of sediment out from the AtlanFilter media. The expelled sediment can be removed either manually or with a vacuum from the vault floor.

This backwash effect allows the media to remain highly conductive and is the key to the industry leading longevity of the AtlanFilter cartridge system, which does not need replacement for at least 5 years, and typically will achieve up to 6-8 years of service, subject to the AtlanFilter being regularly maintained in accordance with this guideline and in accordance with the specific needs of the catchment.



Figure 3 - Typical Outlet Weir Wall

FEATURES

Self Supporting Feet

Each AtlanFilter cartridge stands on 4 feet, which negates the need for the construction of a false floor in the vault. The feet are bolted to the vault floor with the supplied stainless steel angles and M10 bolts. The feet allow a clear height from the vault floor up to the inlet ports of 240mm. The absence of a false floor allows plenty of room for backwashed sediment to evacuate from underneath the cartridges and thereby avoid blocking the inlet ports to the AtlanFilter from sediment buildup. It is for this reason that Atlan recommended the sediment buildup not exceed 150mm above the vault floor, so as to avoid blocking the inlet ports of the AtlanFilter. Blockage of the inlet ports due to sediment accumulation in the vault floor will cause the AtlanFilter to go into bypass and be ineffective. Hence it is important to keep up to date with monitoring and maintaining the AtlanFilter vault.



Figure 4 - Bolting the feet.



Figure 5 - Underside of the AtlanFilter showing the screened inlet ports and the connection for the outlet pipe in the middle.



Figure 6 - the top of the AtlanFilter showing the location of the one way air valve.

SIZES

Atlan Stormwater manufactures two height cartridges for varying site constraints as shown below. Each cartridge is designed to treat stormwater at a flow rate of 1.5 litres per second and 3.0 litres per second for the half height cartridge (model no. FIL-1.5) and full-height cartridge (model no. FIL-3.0) respectively.

	Full Height FIL-3.0	Half Height FIL-1.5
AtlanFilter total height	860mm	660mm
AtlanFilter Diameter	740mm	740mm
Minimum Head required	850mm	550mm
Treatment flow rate	3.0 L/s	1.5 L/s
Height of inlet ports above vault floor	250mm	250mm
Filtered water collection pipe diameter	50mm	50mm

AtlanFilter Full Height - FIL-3.0



AtlanFilter Half Height - FIL1.5



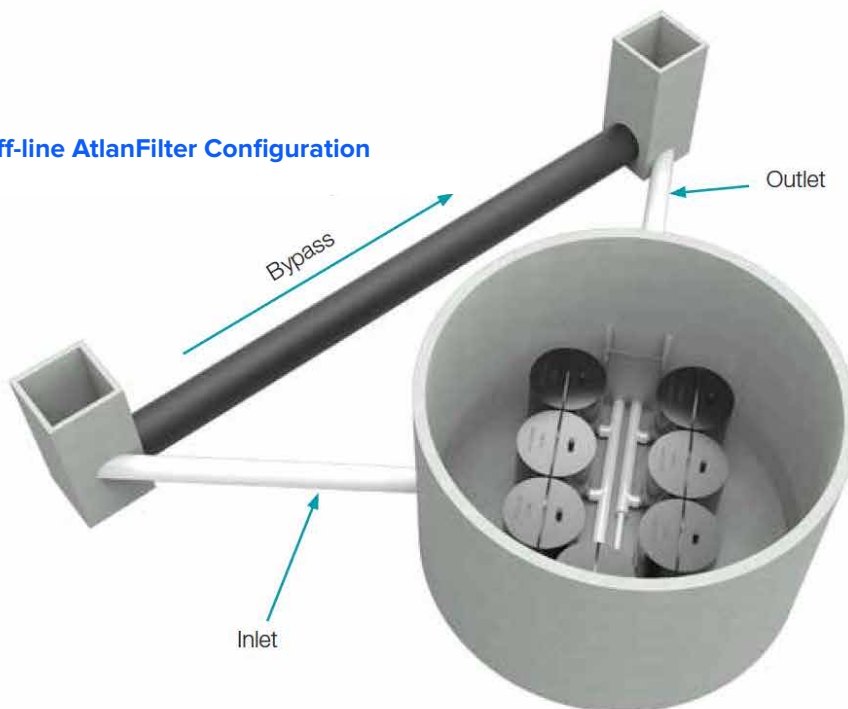
SYSTEM CONFIGURATION

AtlanFilter cartridges are installed in concrete or fibreglass tanks commonly referred to as 'vaults'. The vault selection and configuration are based on site characteristics and/or constraints; computational stormwater quality modelling; and selected AtlanFilter models. Typical AtlanFilter system configurations are shown below.

In-line AtlanFilter Configuration



Off-line AtlanFilter Configuration



HEALTH AND SAFETY

A. Personal health & safety

When carrying out the necessary installation operations of the AtlanFilter all contractors and staff personnel must comply with all current workplace health and safety legislation.

The below measures should be adhered to as practically as possible.

- Comply with all applicable laws, regulations and standards.
- All those involved are informed and understand their obligations in respect of the workplace health and safety legislation.
- Ensure responsibility is accepted by all employees to practice and promote a safe and healthy work environment.

B. Personal protective equipment/safety equipment

When carrying out the necessary installation operations of the AtlanFilter, wearing the appropriate personal protective equipment and utilising the adequate safety equipment is vital to reducing potential hazards.

Personal protective equipment / safety equipment in this application includes:

- Eye protection
- Safety apron
- Fluorescent safety vest
- Form of skin protection
- Puncture resistant gloves
- Steel capped safety boots
- Ear muffs
- Hard hat/s
- Sunscreen

C. Confined space

In the event access is required into the vault, confined space permits will be required which is not covered in this Guide. Typical equipment required for confined space entry include:

- Harness
- Gas detector
- Tripod
- Spotter

D. Traffic Control

It is not uncommon for Atlan Filter cartridges to be installed underneath trafficable areas. Minimum traffic control measures will need to be put in place in accordance with traffic control plans set out by respective local and state road authorities.



Vaults are to be treated as confined space.

Entry by permit only.



Monitor weather conditions prior to operation maintenance. Do not enter a vault during an episode of heavy rain as this can create a risk of drowning.



MAINTENANCE FREQUENCY

The AtlanFilter's design allows for a greater life span when frequently maintenance. Maintenance is broken up into three categories which include:

- Standard inspection
- General cleaning
- Cartridge replacement.

Standard Inspection

Standard inspections are conducted at regular four month intervals. At this time, an approved trained maintenance officer or Atlan representative shall undertake all measures outlined in Maintenance Procedure, Standard Inspection.

General Cleaning

At the end of each standard inspection, trigger measures will identify if general cleaning is required.

General cleaning will need to be executed immediate during standard inspections if the follow triggers are satisfied:

- Build-up of debris/pollutants within the vault greater than 150mm;
- Accumulation of debris/pollutants on the outlet chamber of the AtlanFilter vault;
- After large storm events, tidal or flooding impacts at the request of the owner;

Cartridge Replacement

Stormwater treatment is dependent on the effectiveness of the AtlanFilter cartridge system. As the AtlanFilter ages, pollutants will inundate the cartridge and ultimately reduce the treatment flow rate. At this point, a AtlanFilter flow test apparatus will be utilities to determine if replacement cartridges are required.

Based on the [site] concept modelling (MUSIC) and previous industry experience, we estimate the life of the AtlanFilter to be between 6 - 8 years. As a minimum requirement, each AtlanFilter cartridge should be replaced within 10 years.

The life cycle of the AtlanFilter can be impacted if standard inspections and general maintenance is not undertaken in accordance with this operation and maintenance Guide.

Other factors that will affect the above life cycle of the AtlanFilter include:

- Installation of cartridge system during construction phase and impacted by construction sediment loads;
- Neglecting to install pre-treatment using an industry approved GPT or a surface inlet pit trash bag such as the Atlan StormSack.
- Unforeseen environmental hazards affecting the AtlanFilter functionality.

MAINTENANCE PROCEDURES

Stormwater pollutants captured and retained by the AtlanFilter system need to be periodically removed to ensure environmental values are upheld. All associated maintenance works is heavily dependent on the site's operational activities and generated stormwater pollutants. To ensure the longevity of the installed AtlanFilter treatment system, it is imperative that the procedures detailed in this Guide are followed and all appropriate measures are actioned immediately.

Standard inspection

The standard inspection requires personal experience of Atlan products to visual inspection the vault and filter conditions.

Confined space requirements may not be required if a full inspection and assessment of each AtlanFilter can be achieved at surface level without being deemed a confined space entry.

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Confined space requirements may not be required if a full inspection and assessment of each AtlanFilter can be achieved at surface level without being deemed a confined space entry.

Site Inspection Procedures

1. Implement pre-start safety measures

Ensure that the area in which operational works are to be carried out is cordoned off, to prevent unauthorised access. Adequate safety barriers must be erected.

Area in which work is to be carried out must be clean, safe and hazard free. (Refer to figure 4.)

2. Set-up gantry tripod above manhole

Assemble and position the gantry above the manhole safely and as practically as possible. Attach the winch or chain block to the gantry for lifting the Atlan Filters.

Perform safety procedures ie. Attach harnesses etc. (if confined space).

3. Open manhole lid

Once you have set up the Gantry and ensured that the area is safe to operate in, you can proceed to open the manhole lid, using lid lifters.

4. Conduct gas tests

(If tank is classed confined space)

Once the lids have been removed to a safe distance to prevent tripping, you must then proceed to conduct gas tests. Perform necessary gas tests according to the confined space regulations.

5. Once confined space has been deemed safe to operate in, enter tank safely

Once you have carried out the required gas test and the work area is deemed safe, you may then enter the pit via a ladder or winch system to assess the work area you will be operating in. Ensure all confined space

6. AtlanFilter system assessment

Perform a review of the AtlanFilter system using the AtlanFilter assessment report/checklist. Sign off and forward a copy of the report to property manager and Atlan representative.

7. Reinstate AtlanFilter system and disposal

At the completion of the site inspection, ensure the site is reinstated back to its initial state and all pollutants are removed from the site in line with pollutant disposal procedures.

8. Sign off and forward a copy of the report to property manager and Atlan representative

GENERAL CLEANING

Vacuum out of Filter tank, removal, and disposal of pollutants at the completion of a standard inspection, general cleaning may be deemed necessary immediately or scheduled for a future date. Steps undertaken for general cleaning should be in general accordance with the procedure outlined below but not limited.

1. Implement pre-start safety measures

Ensure that the area in which operational works are to be carried out is cordoned off, to prevent unauthorised access. Adequate safety barriers must be erected.

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6. AtlanFilter system assessment

Perform a review of the AtlanFilter system using the AtlanFilter assessment report/checklist.

7. Pollutant removal from tank

Perform clean-up using a licenced vacuum truck contractor or wet/dry vacuum, depending on level of sediment built up and/or tank size.

8. Reinstate AtlanFilter system and disposal

At the completion of the site inspection, ensure the site is reinstated back to its initial state and all pollutants are removed from the site in line with pollutant disposal procedures.

9. Sign off and forward a copy of the report to property manager and Atlan representative

CARTRIDGE RECYCLING AND REPLACEMENT

AtlanFilter cartridges can be swapped out for new cartridges. The spent AtlanFilter cartridges can be collected from site and sent to Atlan Stormwater's facilities, where the spent media will be removed from the cartridge in factory conditions and disposed of in accordance with environmental regulations.

The AtlanFilter cartridge will be recharged with new media, thereby recycling and repurposing the cartridge.

AtlanFilter replacement procedures may vary depending on the configuration of the AtlanFilters, the type of vault and engineers' specs. Replacement instructions for manhole AtlanFilter systems and precast vault AtlanFilter systems are contained in this section.

At the completion of a standard inspection, AtlanFilter replacement may be deemed necessary immediately or scheduled for a future date. Steps undertaken for cartridge replacement should be in general accordance with the procedure outlined below but not limited.

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Ensure that the area in which operational works are to be carried out is cordoned off, to prevent unauthorised access. Adequate safety barriers must be erected.

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5. Once confined space has been deemed safe to operate in, enter tank safely

Once you have carried out the required gas test and the work area is deemed safe, you may then enter the pit via a ladder or winch system to assess the work area you will be operating in. Ensure all confined space procedures are followed.

6. Remove exhausted cartridges

Disconnect all internal pipe work from inside the vault. Unbolt anti-floatation measures and remove cartridges from the vault using Gantry Tripod method.

7. Pollutant removal

Using a wet/dry vacuum or sucker truck, suck out all the residual pollutant from the vault.

8. Install pipework and AtlanFilters

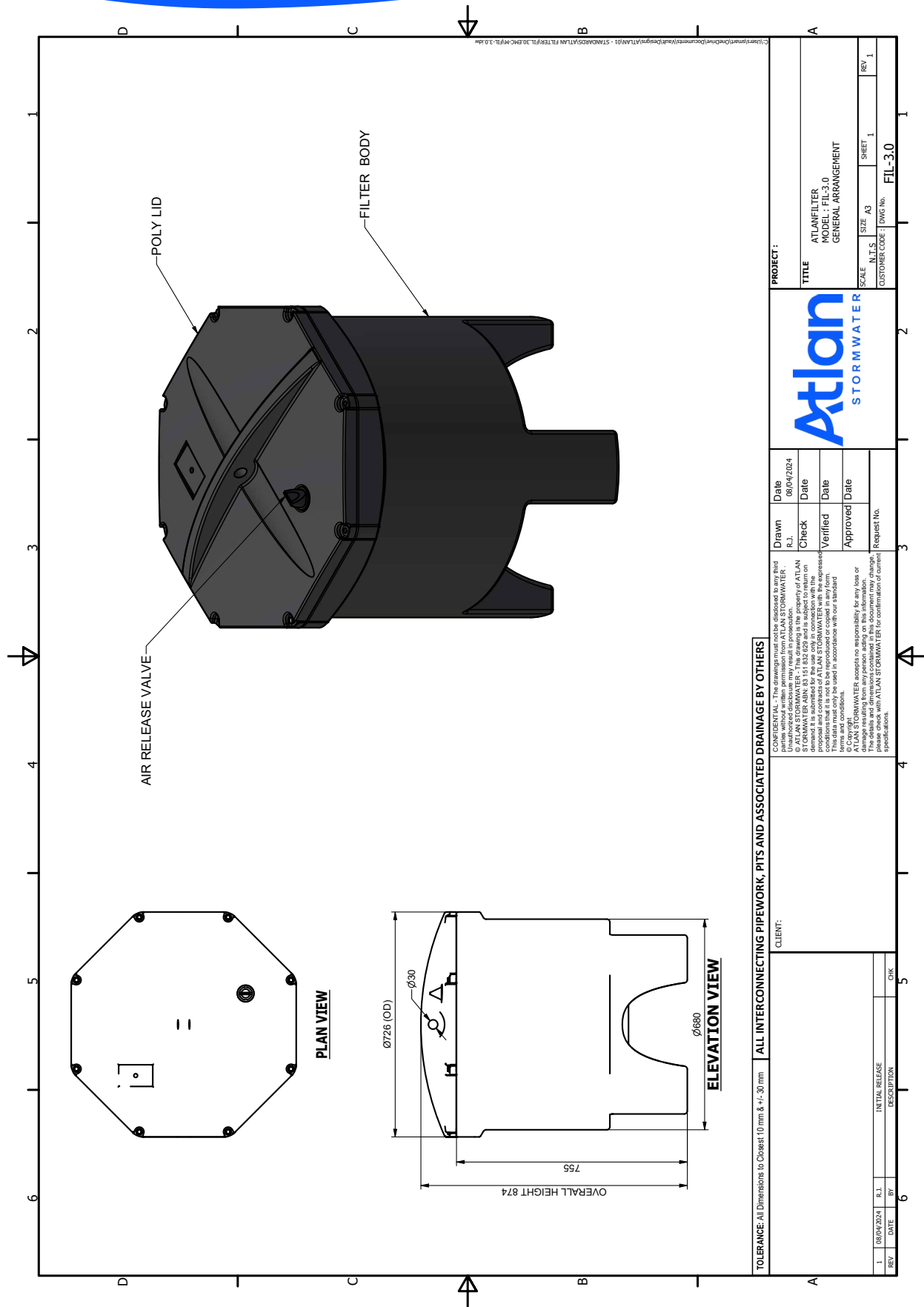
Please refer to the below standard install diagrams for the AtlanFilters. Then refer to your site specific drawings, as site requirements may require something different to the standard layout. Lower filters into tank, position into place, connect filter outlet pipework with the supplied fittings.

9. Install anti-floatation system

Please refer to the detailed drawings showing how the anti-floatation (anchor) bars are to be installed.

10. Sign off and forward a copy of the report to property manager and Atlan representative

Drawing Full Height



TOLERANCE: All Dimensions to Closest 10 mm & +/- 30 mm

ALL INTERCONNECTING PIPEWORK, PITS AND ASSOCIATED DRAINAGE BY OTHERS

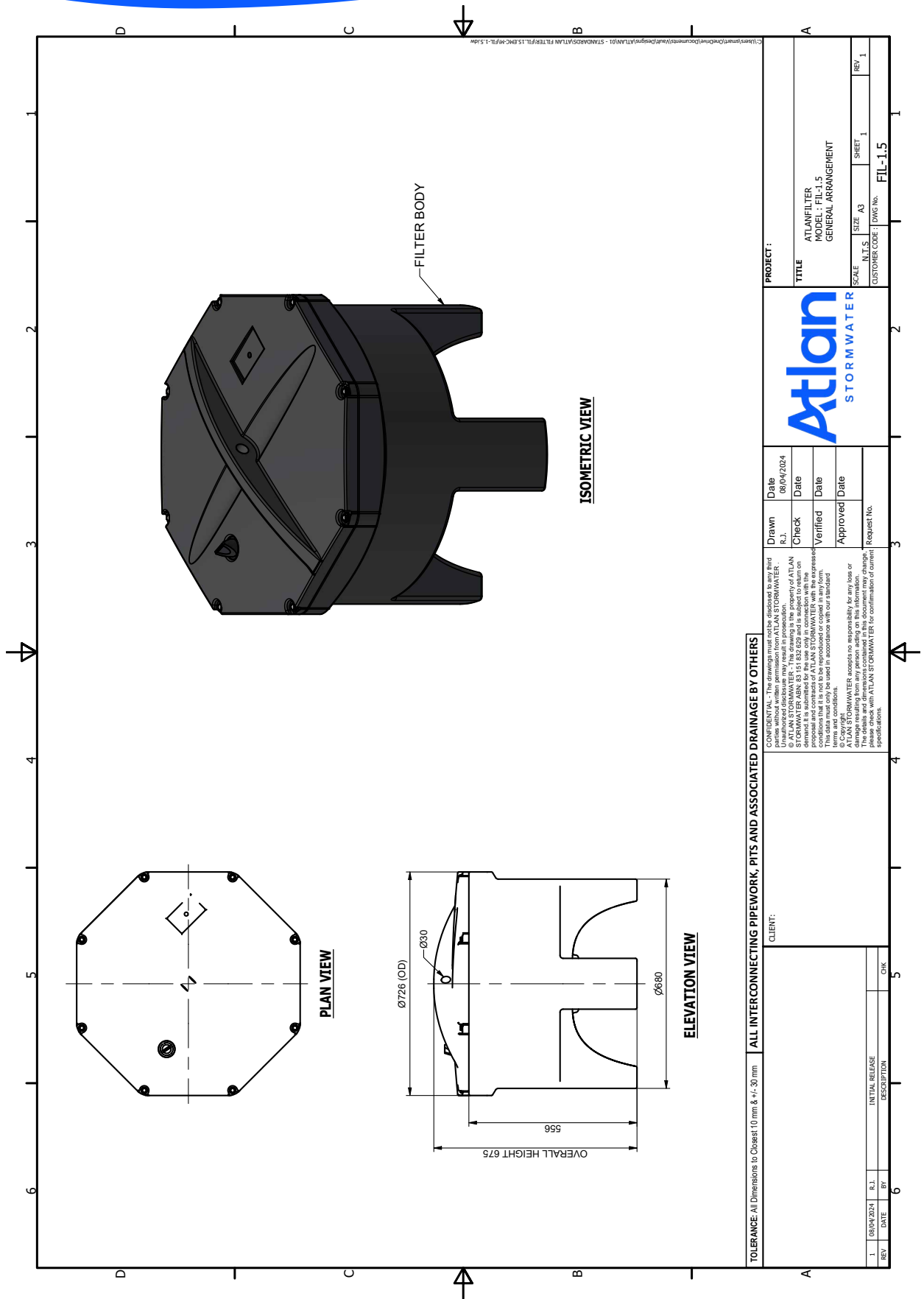
CLIENT:

REV	DATE	BY	R.I.	INITIAL RELEASE	DESCRIPTION	CHK
1	08/04/2024					

Drawn		Date	PROJECT :	
K.I.		08/04/2024	TITLE	
Check		Date	ATLAN FILTER	
Verified		Date	MODEL : FIL-3.0	
Approved		Date	GENERAL ARRANGEMENT	
Request No.			SCALE	
			N.T.S.	
			SIZE	
			A3	
			SHEET	
			1	
			REV	
			1	
			CUSTOMER CODE	
			DWG No.	
			FIL-3.0	



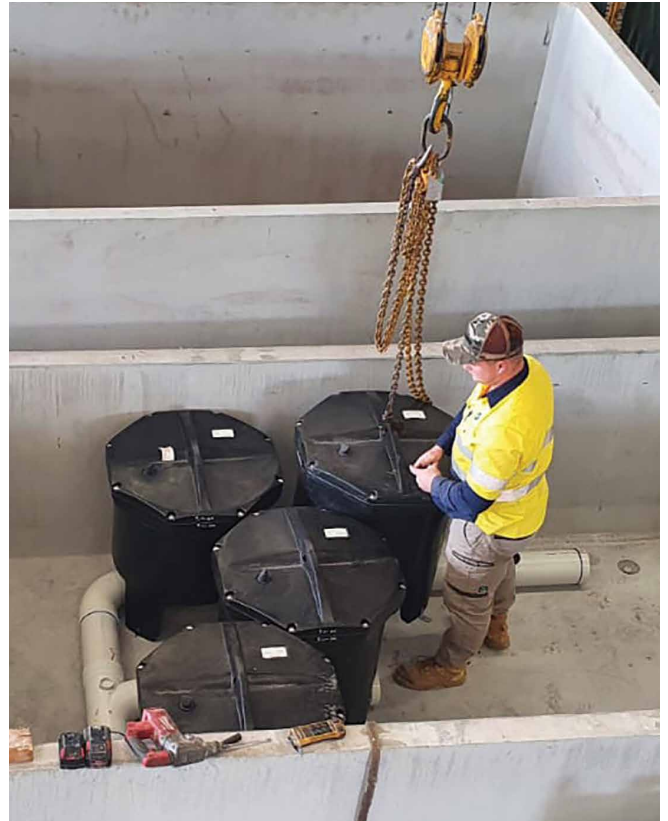
Drawing Half Height



SITE EXIT & CLEAN UP

At the end of the scheduled maintenance, approved contractors or Atlan maintenance crew are required to reinstate the site to pre-existing conditions. Steps included but limited to are:

- Ensure all access covers are securely inserted back into their frames;
- Remove and dispose collected pollutants from the site in accordance with local regulator authorities;
- Retrieve all traffic control measures and maintenance tools; and
- Return all exhausted and/or damaged Atlan products to Atlan Stormwater to begin recycling program.



Joy in water

'We believe clean waterways are a right not a privilege and we work to ensure a Joy in Water experience for you, with your children and grandchildren.'

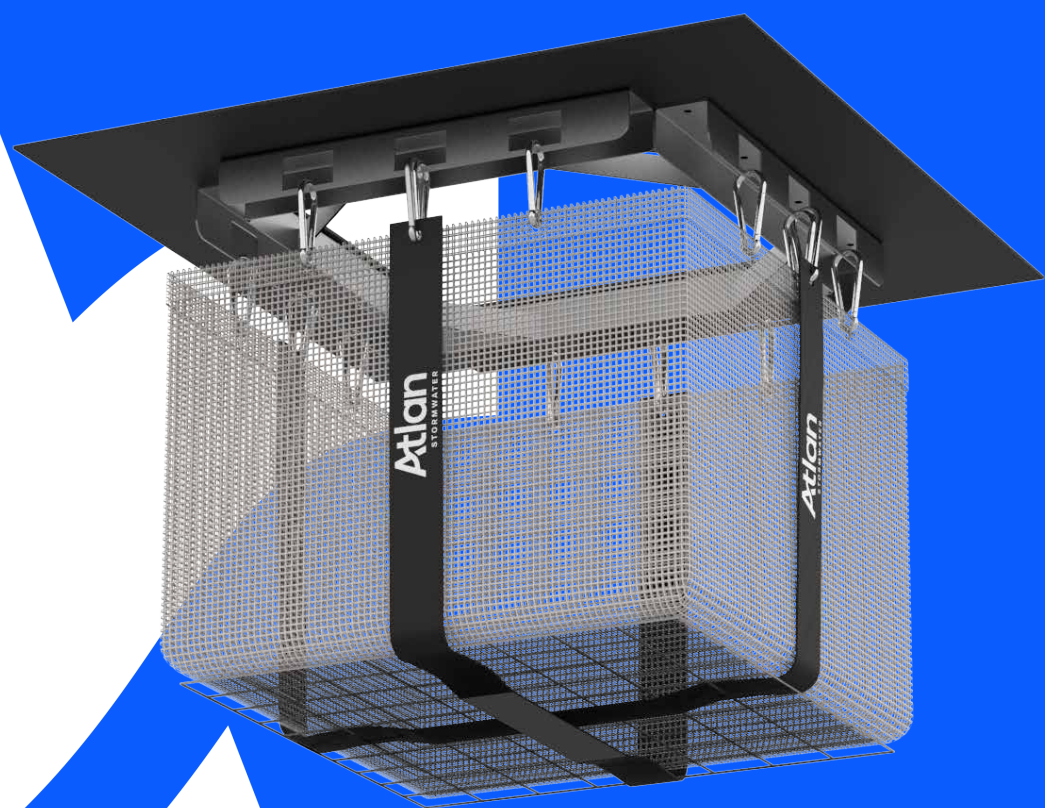
Andy Hornbuckle

Atlan
STORMWATER

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Silverwater NSW 2128
atlan.com.au

OPERATION & MAINTENANCE MANUAL

StormSack



INTRODUCTION

Maintenance of the Atlan StormSack is essential to preservation of its condition to ensure lifetime operational effectiveness.

The Atlan StormSack is a highly engineered water quality device that is deployed directly in the stormwater system as primary treatment to capture contaminants close to the surface for ease of maintenance.

To ensure full operational capacity, it is vital to ensure that the pollutants it captures are periodically removed, and filtration components are thoroughly cleaned.

This manual should be used in conjunction with the relevant site traffic management and safety plans, as well as any other provided documentation from Atlan.

The Atlan StormSack provides effective filtration of solid pollutants and debris typical of urban runoff, while utilising the existing or new storm drain infrastructure. The StormSack is designed to rest on the flanges of conventional catch basin frames and is engineered for most hydraulic and cold climate conditions.



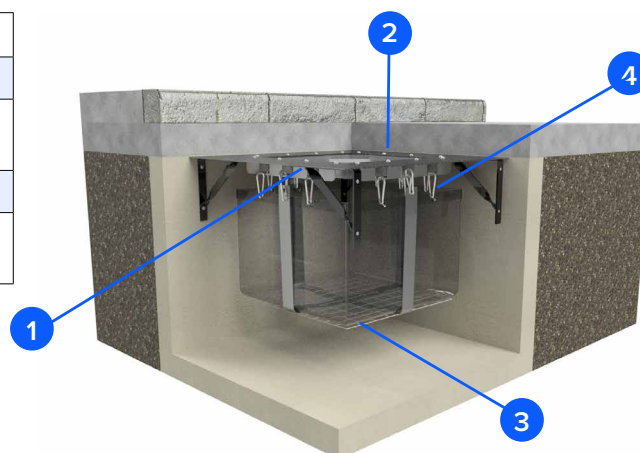
Typically the StormsSack is serviceable from the street level, and therefore maintenance does not usually require confined space entry into the catch basin structure. The unit is designed to be maintained in place with a vacuum hose attached to a sweeper or sucker truck.

COMPONENTS

- Adjustable Flange Deflector: Black HDPE attached to support frame
- Catchment Bag: 200micron woven poly fabric
- Support Hardware: Stainless steel 304
- Bag Support: Stainless steel 304 mesh
- Replaceable Oil Boom: Polypropylene 3 inch (76 mm) diameter (optional add-on)

Application	Regulatory Issue	Target Pollutants
Council Storm Drain Retrofits	At-source litter capture	Sediment, Litter, O&G
Commercial/Retail/Residential	Stormwater Compliance	Sediment, Litter, O&G
Litter Prone Urban Areas	Cost effective litter control	Litter $\geq$ 5 mm
Scrap Metal/Solid Waste/Oil Storage/Etc	Industrial Multi-Sector General Permit	Gross Pollutants, O&G
Part of Treatment Train	Council Stormwater Quality Improvement Targets	Sediment, Litter, O&G
Construction Sediment/Erosion	Sediment Control Plan	Sediment/Erosion Control

Features	
1.	Aluminium frame
2.	Black poly surround secured to frame • Can be cut to suit on site
3.	Reinforced StormSack bag
4.	Carabiners attach bag to frame for easy service and replacement



Standard StormSack to suit Pit Sizes
450x450mm
600x600mm
900x600mm
900x900mm

Custom sizes (i.e. 1200x900mm) can be manufactured on short lead times.

HEALTH & SAFETY

IMPORTANT: A full site based risk assessment should be completed prior to commencing work on your Atlan StormSack.

PERSONAL HEALTH & SAFETY

When carrying out maintenance operations of the Atlan StormSack all contractors and staff personnel must comply with all current workplace health and safety legislation. The below measures should be adhered to as practically as possible:

- Comply with all applicable laws, regulations and standards.
- All those involved are informed and understand their obligations in respect of the workplace health and safety legislation.
- Ensure responsibility is accepted by all employees to practice and promote a safe and healthy work environment.

PERSONAL PROTECTIVE EQUIPMENT

When carrying out maintenance operations of the Atlan StormSack, wearing the appropriate personal protective equipment is vital to reducing potential hazards. Personal protective equipment in this application includes:

- Eye protection
- Safety apron
- Fluorescent safety vest
- Form of skin protection
- Puncture resistant gloves
- Steel capped safety boots

CAPTURED POLLUTANTS

The material captured by the Atlan StormSack can be harmful and needs to be handled correctly. The nature and amount of the captured pollutants depends on the characteristics of the site.

Pollutants can include from organic material such as leaves and sticks through to debris such as plastics, glass and other foreign objects such as syringes.

EQUIPMENT HANDLING

Handling activities such as removing the drain grate as well as managing pedestrians and other

non-worker personnel at the site should be exercised in accordance with specified safety procedures and guidelines.

CONFINED SPACES

Confined space entry procedures are not covered in this manual. It is requested that all personnel carrying out maintenance of the Atlan StormSack must evaluate their own needs for confined space entry and compliance with occupational health and safety regulations. Non trained staff are not permitted to participate in any confined space entries.

When maintenance operations cannot be carried out from the surface and there is a need to enter confined space, only personnel that currently hold a Confined Space Entry Permit are allowed to enter the confined space.

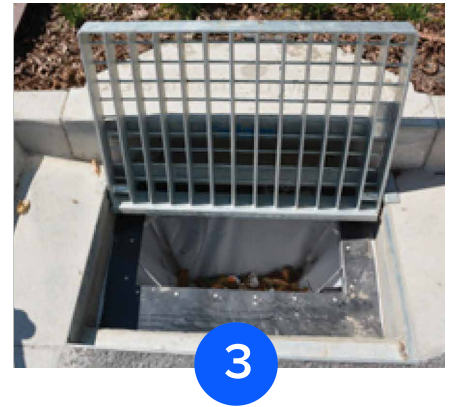
TRAFFIC MANAGEMENT

Typically stormwater gully pits are situated on roads and carparks, or adjacent to roads in a footpath or swale. As traffic requirements vary depending on the circumstance of the site, separate traffic control plans should be prepared for each site.

The specific road safety requirements for each site can be obtained from the relevant road authority to ensure all maintenance operations comply with the laws and regulations. State government publications can also be useful to find out the signage requirements, placement of safety cones and barricades that are required when working on public roads.

MAINTENANCE OF THE ATLAN STORMSACKS IS A SPECIALIST ACTIVITY

When carrying out maintenance operations of the Atlan StormSack, factors such as equipment handling methods, pollutants and site circumstances can impose potential risks to the maintainer and nearby civilians.



OPERATIONS

GENERAL MONITORING

The Atlan StormSack must be checked on a regular basis to analyse whether it requires maintenance or cleaning. As gully pit grates are usually quite heavy, it is vital to exercise the correct lifting techniques and also ensure that the area surrounding the open pit is shielded from access of non-work personnel.

To ensure optimal performance of the Atlan StormSack, the material collected by the filter bag should not exceed the level of approximately a half to two thirds of the total bag depth. When this material collected is showing signs of exceeding this level they should be scheduled to be emptied.

It is also recommended that additional monitoring is conducted following moderate to extreme rainfall events, especially when previous months have had little or no rainfall.



GULLY PIT COVER REMOVAL

Opening a hinged pit cover

1. Insert the lifting hooks beneath the grate.
2. Check hinge points are not damaged and debris is not caught in the hinge area.
3. Fully open pit grate, ensuring that the grate will stay in the open position without any external forces applied. Grates that do not remain open without being held, should be removed or secured during maintenance activities.

Opening a non-hinged pit cover

1. Place lifting hooks beneath grate, where possible in the four corners of the grate. Concrete lids may have Gatic lifting points, a key arrangement or holes in the lid, which may require special equipment such as Gatic lifters. Alternatively if safe to do so grip the grade with your hands.
2. Position each person on either side of the grate.
3. Lift the grate, ensuring that good heavy lifting posture is used at all times.
4. Place the grate on angle on the gutter, to allow for the lifting hooks to be removed.
5. For extremely heavy one-piece grates and concrete Gatic covers, insert the lifters in place and slide the lids back.



REPAIRS

Depending on the extent of the damage to the Atlan StormSack unit, it can usually be repaired.

Filter Bag Tears

Small tears to the filter bag can be repaired by either sewing the tear back together with additional fabric to increase the strength of the stitching, or by sewing a patch of filter material onto the filter bag.

Spill Procedures

In the event of a spill discharging into a gully pit, all effected sediment must be removed from the filter bags and the filter bags are to be removed and replaced with new filter bags.

Replacement Parts

If large tears or irreparable damage to the frame and structure are present, it is advisable to replace the components.

All required spare parts can be sourced directly from Atlan Stormwater.



CLEANING METHODS

CLEANING USING AN VACUUM TRUCK

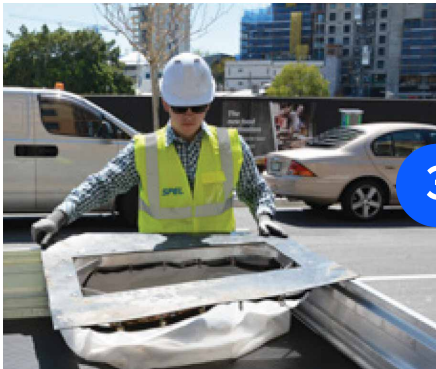
1. Open gully pit.
2. Place the vacuum hose, suck out all of the sediment, organic leaf material, litter and other materials that were collected in the filter bag.
3. Allow the filter bag to be sucked up in the vacuum hose for a few seconds to allow for the filter mesh pores to be cleaned.
4. Use the vacuum hose to remove any build-up of material around the overflows and in the bottom of the pit.
5. Remove filter back from pit.
6. Remove any sediment and litter caught in the gully pit grate.
7. Back opening channels are to be cleared of any debris to ensure flow is not hindered.
8. Thoroughly examine the structural integrity of the filter bag and frame.
9. Reinstall filter bag and gully pit covers.



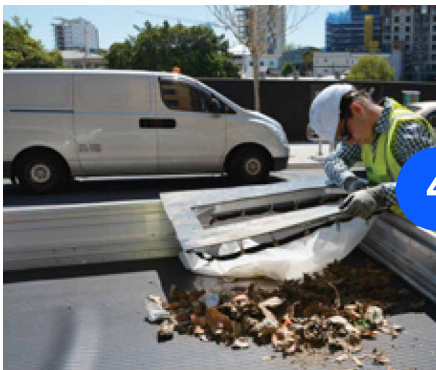
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2



3



4



7

CLEANING BY HAND

CAUTION: Correct PPE must be worn - refer to page three. Remain alert for dangerous objects and wildlife.

1. Open gully pit.
2. Using the correct lifting technique, lift the StormSack out by the diagonal lifting corners fitted to the frame. For extremely heavy and overfilled bags either use a hydraulic lifting arm to lift the StormSack, or remove excess material using a shovel or etc. Take care not to damage the bag when removing litter from the bag.
3. Lift the StormSack clear of the stormwater pit and position over the collection bin or vehicle.
4. Lift and empty the bag by holding the bottom lifting loops only.
5. Brush the StormSack with a stiff brush to remove the sediment from the filter pores.
6. Thoroughly examine the structural integrity of the filter bag and frame.
7. Reinstall StormSack and gully pit covers.

MATERIAL DISPOSAL

Collected materials can be potentially harmful to humans and the environment. Once all captured material from the Atlan StormSack has been removed, it must be taken off site and disposed of at a transfer station or a similar approved disposal site.

BLOCKAGE TROUBLESHOOTING

In the unlikely event of surface flooding around a gully pit which has an Atlan StormSack fitted, the following steps should be carried out:

- Check the overflow bypass.
- If overflow is clear and surface flooding still exists remove the Atlan StormSack and check the outlet pipe for blockages.
- Removal of the Atlan StormSack can be difficult if clogged with sediment and holding water.
- If the filter is clogged brush the side walls to dislodge particles trapped at the interface allowing water to flow through the filter.
- If the outlet pipe is blocked a vacuum truck may be required to unblock it. Litter can be removed from the Atlan StormSack using the vacuum truck before removal. If a vacuum truck is not available please follow the hand maintenance cleaning steps prior to unblocking the outlet pipe.

ATLAN STORMSACK MAINTENANCE CHECKLIST

SITE DETAILS

Client

Location of system on site

Site address

Site contact name and number

CHECKLIST ITEMS

YES/NO

COMMENTS

Is the pit free from pollutants and debris?

Is there movement or damage to the cage?

Is there movement or damage to the plastic pit seals?

Is structural integrity in good condition including fixings, joints and connections?

Is the filter bag pores clean and not clogged?

Is the filter bag damaged in any way?

Are the inlet and outlet pipes free from debris and damage?

Is the cover grate free from debris and damage?

Does the StormSack need repairs or replacement parts?

Has captured material been disposed of responsibly at an approved disposal site?

MAINTENANCE & REPAIR NOTES

SIGN OFF

Name of service technician

Date

Joy in water

'We believe clean waterways are a right not a privilege
and we work to ensure a Joy in Water experience for you,
with your children and grandchildren.'

Andy Hornbuckle

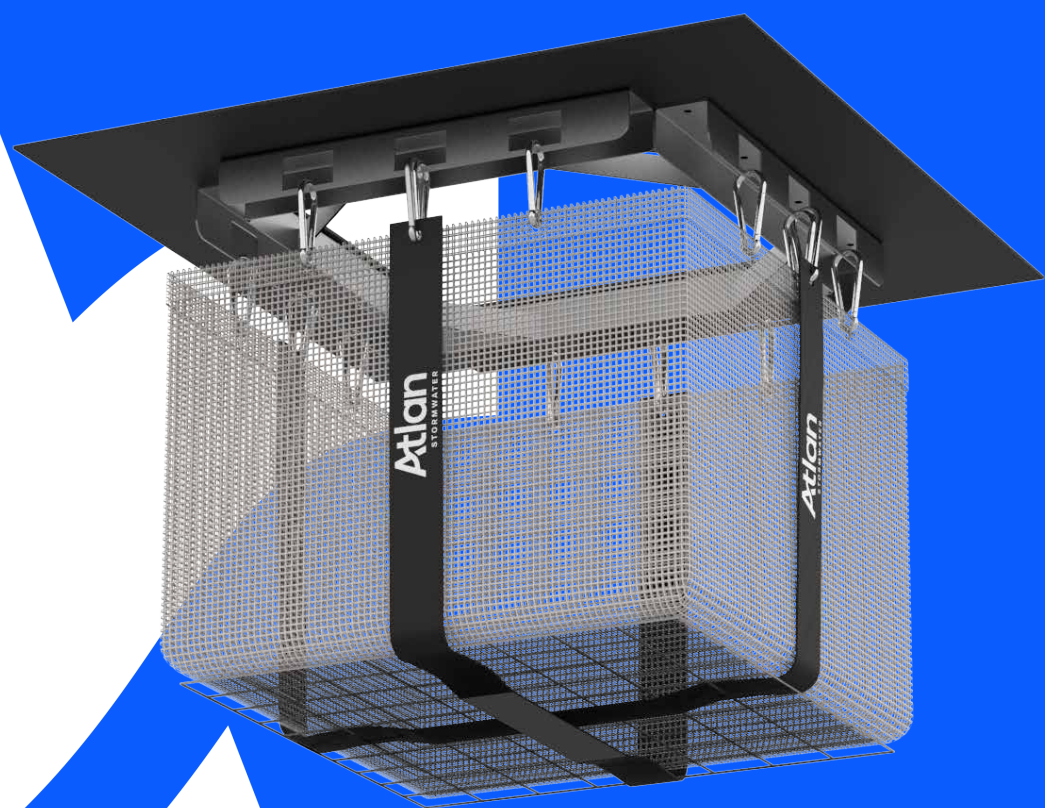


Atlan
STORMWATER

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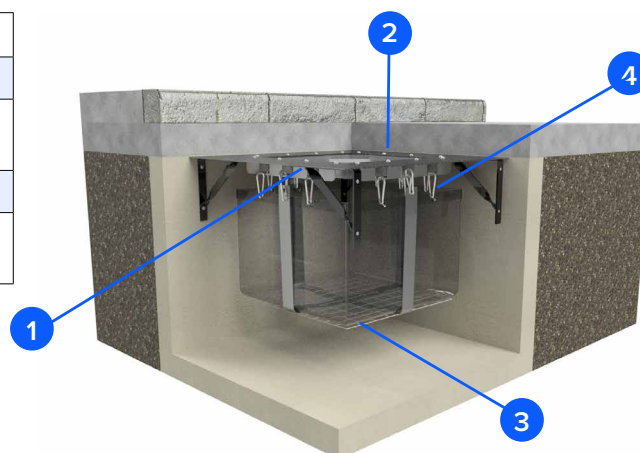
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Custom sizes (i.e. 1200x900mm) can be manufactured on short lead times.

HEALTH & SAFETY

IMPORTANT: A full site based risk assessment should be completed prior to commencing work on your Atlan StormSack.

PERSONAL HEALTH & SAFETY

When carrying out maintenance operations of the Atlan StormSack all contractors and staff personnel must comply with all current workplace health and safety legislation. The below measures should be adhered to as practically as possible:

- Comply with all applicable laws, regulations and standards.
- All those involved are informed and understand their obligations in respect of the workplace health and safety legislation.
- Ensure responsibility is accepted by all employees to practice and promote a safe and healthy work environment.

PERSONAL PROTECTIVE EQUIPMENT

When carrying out maintenance operations of the Atlan StormSack, wearing the appropriate personal protective equipment is vital to reducing potential hazards. Personal protective equipment in this application includes:

- Eye protection
- Safety apron
- Fluorescent safety vest
- Form of skin protection
- Puncture resistant gloves
- Steel capped safety boots

CAPTURED POLLUTANTS

The material captured by the Atlan StormSack can be harmful and needs to be handled correctly. The nature and amount of the captured pollutants depends on the characteristics of the site.

Pollutants can include from organic material such as leaves and sticks through to debris such as plastics, glass and other foreign objects such as syringes.

EQUIPMENT HANDLING

Handling activities such as removing the drain grate as well as managing pedestrians and other

non-worker personnel at the site should be exercised in accordance with specified safety procedures and guidelines.

CONFINED SPACES

Confined space entry procedures are not covered in this manual. It is requested that all personnel carrying out maintenance of the Atlan StormSack must evaluate their own needs for confined space entry and compliance with occupational health and safety regulations. Non trained staff are not permitted to participate in any confined space entries.

When maintenance operations cannot be carried out from the surface and there is a need to enter confined space, only personnel that currently hold a Confined Space Entry Permit are allowed to enter the confined space.

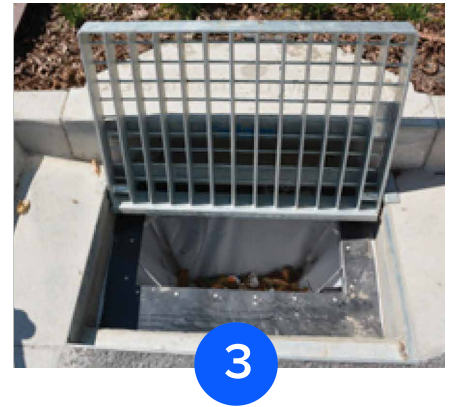
TRAFFIC MANAGEMENT

Typically stormwater gully pits are situated on roads and carparks, or adjacent to roads in a footpath or swale. As traffic requirements vary depending on the circumstance of the site, separate traffic control plans should be prepared for each site.

The specific road safety requirements for each site can be obtained from the relevant road authority to ensure all maintenance operations comply with the laws and regulations. State government publications can also be useful to find out the signage requirements, placement of safety cones and barricades that are required when working on public roads.

MAINTENANCE OF THE ATLAN STORMSACKS IS A SPECIALIST ACTIVITY

When carrying out maintenance operations of the Atlan StormSack, factors such as equipment handling methods, pollutants and site circumstances can impose potential risks to the maintainer and nearby civilians.



OPERATIONS

GENERAL MONITORING

The Atlan StormSack must be checked on a regular basis to analyse whether it requires maintenance or cleaning. As gully pit grates are usually quite heavy, it is vital to exercise the correct lifting techniques and also ensure that the area surrounding the open pit is shielded from access of non-work personnel.

To ensure optimal performance of the Atlan StormSack, the material collected by the filter bag should not exceed the level of approximately a half to two thirds of the total bag depth. When this material collected is showing signs of exceeding this level they should be scheduled to be emptied.

It is also recommended that additional monitoring is conducted following moderate to extreme rainfall events, especially when previous months have had little or no rainfall.



GULLY PIT COVER REMOVAL

Opening a hinged pit cover

1. Insert the lifting hooks beneath the grate.
2. Check hinge points are not damaged and debris is not caught in the hinge area.
3. Fully open pit grate, ensuring that the grate will stay in the open position without any external forces applied. Grates that do not remain open without being held, should be removed or secured during maintenance activities.

Opening a non-hinged pit cover

1. Place lifting hooks beneath grate, where possible in the four corners of the grate. Concrete lids may have Gatic lifting points, a key arrangement or holes in the lid, which may require special equipment such as Gatic lifters. Alternatively if safe to do so grip the grade with your hands.
2. Position each person on either side of the grate.
3. Lift the grate, ensuring that good heavy lifting posture is used at all times.
4. Place the grate on angle on the gutter, to allow for the lifting hooks to be removed.
5. For extremely heavy one-piece grates and concrete Gatic covers, insert the lifters in place and slide the lids back.



REPAIRS

Depending on the extent of the damage to the Atlan StormSack unit, it can usually be repaired.

Filter Bag Tears

Small tears to the filter bag can be repaired by either sewing the tear back together with additional fabric to increase the strength of the stitching, or by sewing a patch of filter material onto the filter bag.

Spill Procedures

In the event of a spill discharging into a gully pit, all effected sediment must be removed from the filter bags and the filter bags are to be removed and replaced with new filter bags.

Replacement Parts

If large tears or irreparable damage to the frame and structure are present, it is advisable to replace the components.

All required spare parts can be sourced directly from Atlan Stormwater.



CLEANING METHODS

CLEANING USING AN VACUUM TRUCK

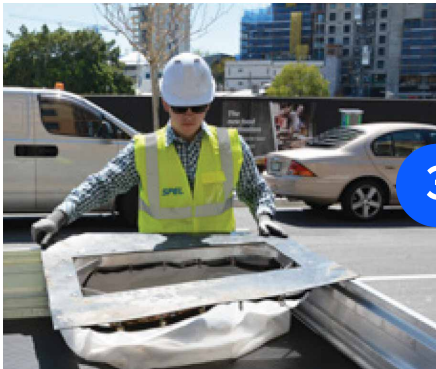
1. Open gully pit.
2. Place the vacuum hose, suck out all of the sediment, organic leaf material, litter and other materials that were collected in the filter bag.
3. Allow the filter bag to be sucked up in the vacuum hose for a few seconds to allow for the filter mesh pores to be cleaned.
4. Use the vacuum hose to remove any build-up of material around the overflows and in the bottom of the pit.
5. Remove filter back from pit.
6. Remove any sediment and litter caught in the gully pit grate.
7. Back opening channels are to be cleared of any debris to ensure flow is not hindered.
8. Thoroughly examine the structural integrity of the filter bag and frame.
9. Reinstall filter bag and gully pit covers.



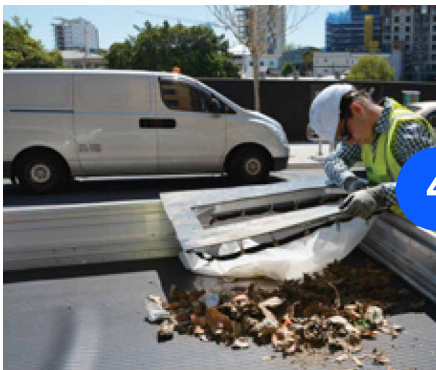
1



2



3



4



7

CLEANING BY HAND

CAUTION: Correct PPE must be worn - refer to page three. Remain alert for dangerous objects and wildlife.

1. Open gully pit.
2. Using the correct lifting technique, lift the StormSack out by the diagonal lifting corners fitted to the frame. For extremely heavy and overfilled bags either use a hydraulic lifting arm to lift the StormSack, or remove excess material using a shovel or etc. Take care not to damage the bag when removing litter from the bag.
3. Lift the StormSack clear of the stormwater pit and position over the collection bin or vehicle.
4. Lift and empty the bag by holding the bottom lifting loops only.
5. Brush the StormSack with a stiff brush to remove the sediment from the filter pores.
6. Thoroughly examine the structural integrity of the filter bag and frame.
7. Reinstall StormSack and gully pit covers.

MATERIAL DISPOSAL

Collected materials can be potentially harmful to humans and the environment. Once all captured material from the Atlan StormSack has been removed, it must be taken off site and disposed of at a transfer station or a similar approved disposal site.

BLOCKAGE TROUBLESHOOTING

In the unlikely event of surface flooding around a gully pit which has an Atlan StormSack fitted, the following steps should be carried out:

- Check the overflow bypass.
- If overflow is clear and surface flooding still exists remove the Atlan StormSack and check the outlet pipe for blockages.
- Removal of the Atlan StormSack can be difficult if clogged with sediment and holding water.
- If the filter is clogged brush the side walls to dislodge particles trapped at the interface allowing water to flow through the filter.
- If the outlet pipe is blocked a vacuum truck may be required to unblock it. Litter can be removed from the Atlan StormSack using the vacuum truck before removal. If a vacuum truck is not available please follow the hand maintenance cleaning steps prior to unblocking the outlet pipe.

ATLAN STORMSACK MAINTENANCE CHECKLIST

SITE DETAILS

Client

Location of system on site

Site address

Site contact name and number

CHECKLIST ITEMS

YES/NO

COMMENTS

Is the pit free from pollutants and debris?

Is there movement or damage to the cage?

Is there movement or damage to the plastic pit seals?

Is structural integrity in good condition including fixings, joints and connections?

Is the filter bag pores clean and not clogged?

Is the filter bag damaged in any way?

Are the inlet and outlet pipes free from debris and damage?

Is the cover grate free from debris and damage?

Does the StormSack need repairs or replacement parts?

Has captured material been disposed of responsibly at an approved disposal site?

MAINTENANCE & REPAIR NOTES

SIGN OFF

Name of service technician

Date

Joy in water

'We believe clean waterways are a right not a privilege
and we work to ensure a Joy in Water experience for you,
with your children and grandchildren.'

Andy Hornbuckle

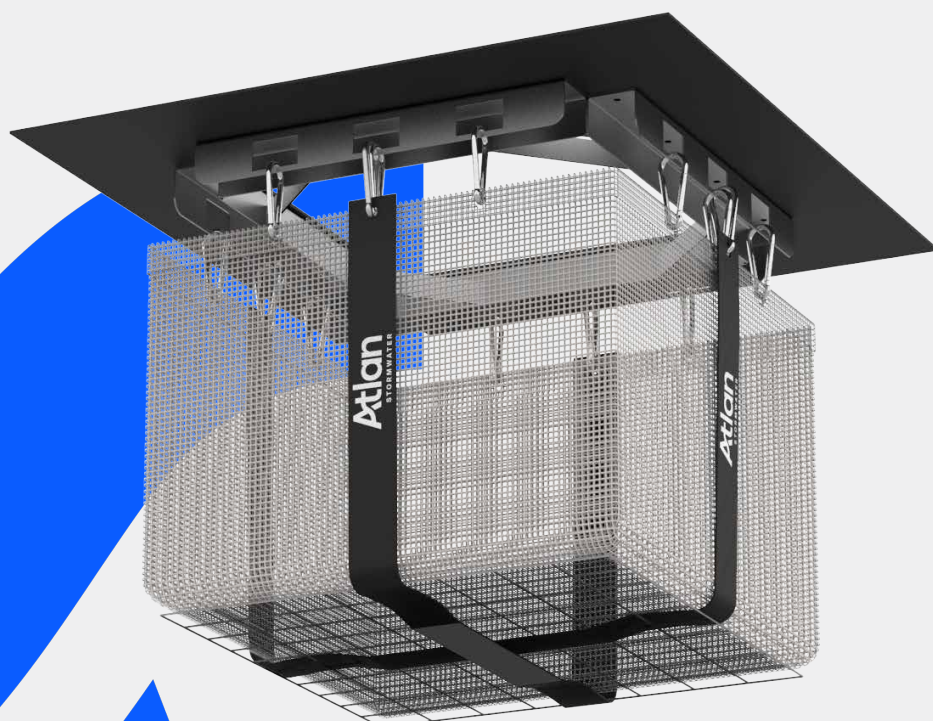


Atlan
STORMWATER

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INSTALLATION MANUAL

StormSack



INTRODUCTION

The purpose of this manual is to indicate the safest and most efficient method in installing the StormSack.

INSTALLATION

The aim of all StormSack installations is to install the largest unit into each pit, without influencing the hydraulic performance of the pit or drainage system. To provide clarification on certain aspects of the installation the following tolerances are included.

SAFETY

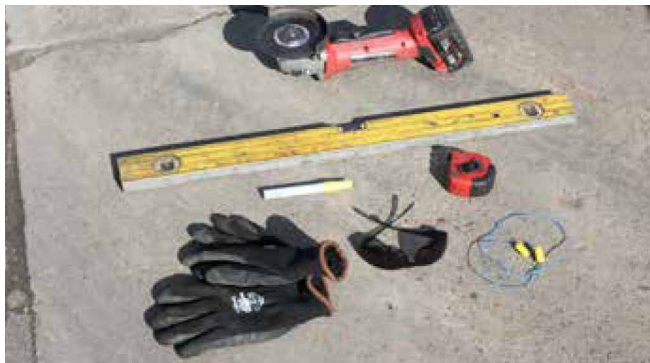
PERSONAL PROTECTIVE EQUIPMENT

The following personal protective equipment is required by staff for install activities:

- High visibility vest or shirt
- Safety footwear (Steel cap toe)
- Gloves (leather palmed riggers gloves or similar)

Note: Personnel on construction and private sites must also adhere to the specific safety requirements of each work site.

INSTALLATION



1. TOOLS REQUIRED

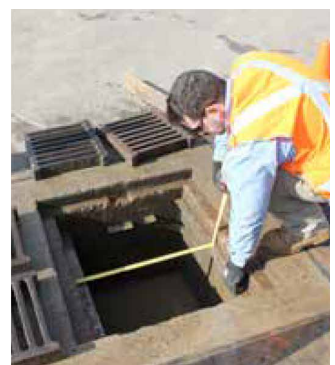
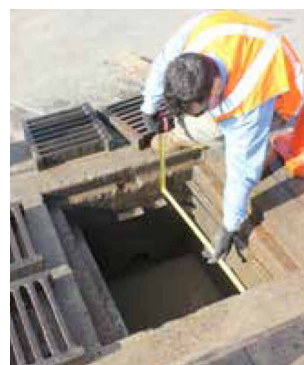
- Tape measure
- Marker pen/texta
- Gloves
- Safety glasses
- Hearing protection
- Level/straight edge
- Grinder



2. SET UP SAFETY CONES AROUND PIT BEFORE OPENING



3. REMOVE GRATES FROM PIT READY FOR STORMSACK INSTALLATION



4. MEASURE LENGTH & WIDTH OF GRATE SUPPORT LEDGE FOR STORMSACK TO SIT ON



5. USE MEASURING TAPE AND MARKER TO MARK PLASTIC STORMSACK SUPPORT SHEET TO BE CUT OFF



8. ONCE THE PLASTIC STORMSACK SUPPORT SHEET HAS BEEN TRIMMED TO SUIT GRATE OPENING SIMPLY INSTALL INTO GRATE SUPPORT LEDGE



6. USE LEVEL/STRAIGHT EDGE TO MARK A STRAIGHT CUTTING LINE

9. RE-INSTALL GRATES



7. USE ANGLE GRINDER WITH CUTTING BLADE OR SIMILAR TO CUT PLASTIC STORMSACK SUPPORT SHEETING TO MATCH OPENING SIZE

INSTALLATION MANUAL

StormSack



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SA OFFICE 9 Hampden Road, Mount Barker SA 5251 P: 1300 773 500 sales@atlan.com.au	QLD SUNSHINE COAST BRANCH 19-27 Fred Chaplin Cct, Bells Creek, QLD 4551 P: 1300 773 500 qld.sales@atlan.com.au	WA OFFICE 2 Modal Cres Canning Vale WA 6155 P: +61 8 9350 1000 P: 1800 335 550 sales@atlan.com.au
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Joy in water

'We believe clean waterways are a right not a privilege and we work to ensure a joy in water experience for you and future generations.'

Andy Hornbuckle

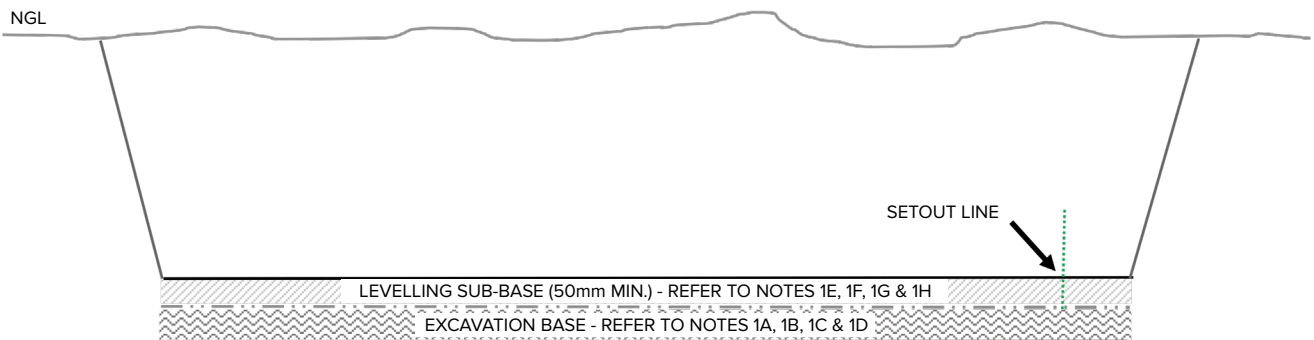
INSTALLATION MANUAL

AtlanVault

(Formerly SpelVault)



PROCEDURE FOR INSTALLATION



NOTE BEFORE

Consult “General Notes” page of the tank plan for full installation information and notes on countering hydrostatic uplift (buoyancy) if required.

1. EXCAVATION PREPARATION

1A. The line of influence from adjacent structures is to be less than 45° from the tank base excavation to structure footing.

1B. Excavated base to be uniform, not to be founded on a cut/fill platform, the base slab is to be wholly founded in either cut or fill.

1C. Excavation Size: It is suggested that the excavation footprint be 600mm larger on all sides of the tank footprint. The depth of excavation needs to allow for sub-base (see note 1E).

1D. Excavation Bearing Capacity: The excavation bearing capacity is dependent on the cover over the tank (Depth of dig). Refer to table on the general notes page, in the tank plan of the specific tank being installed, for the excavation bearing capacity required.

Excavation bearing capacity and sub-base to extend 300mm minimum beyond the perimeter of the tanks. If the natural bearing capacity is not achieved and remediation measures are to be used, the Project Engineer’s advice is needed to provide the distance to extend bearing capacity.

1E. Sub-base levelling layer to be 50mm minimum, compacted sand or road base, that achieves CBR40 when tank is subject to vehicle loading. 5-10mm drainage gravel is an acceptable sub-base material, 10mm Maximum to be strictly adhered to. CBR15 acceptable when tank is not subject to vehicle loading.



ALIGN TANK WITH
SETOUT LINE



1F. Take time to screed sub-base to a laser level, this will save the time of lifting tanks and re-levelling if gaps between tanks are present.

1G. Water can follow inlet pipe bedding, it is recommended that to maintain the tanks sub-base integrity, the tank installation be designed with appropriate excavation drainage, designed and approved by a suitably qualified Civil Engineer.

1H. Mark up base with setout lines. This is particularly important when there are large number of tanks in a modular system to ensure as they are placed they are running straight, so you do not end up hitting the excavation wall.

2. LIFTING NOTES

2a. Tank lifting pin arrangement has been approved to 15.0t (SWL) limit as specified on the tank drawing. If additional fixtures are required to increase the total weight above this limit a suitably qualified and experienced Engineer to be consulted for a specific lifting design prior to the tanks fabrication.

2b. The erector shall coordinate with the site Project Engineer for site access, ground conditions and planned lifting equipment prior to the tank delivery.

2c. Rigging arrangement shall ensure the load is evenly distributed between all lifting anchors. If additional fixtures have been install such as concrete weir walls a spreader bar may be required.

2d. Only use lifting pins provided when lifting, damaged lifting pins shall not be used unless capacity is verified and approved by a suitably qualified and experienced Engineer

3. TANK PLACEMENT

3a. Trucks to be pre-arranged for a time to meet your crane.

Tanks to be placed in excavation as per safe lifting protocols of crane company.

Ensure even rigging is being used to prevent tanks bedding into levelling layer unevenly which will cause gaps between tanks.

3b. IMPORTANT NOTE TO PREVENT POINT LOADING OF THE CONCRETE TANK AND CRACKING.

If the tanks are not going to be placed in the hole straight away, (Excavation cave in, hit rock, contaminated soils...) it is imperative that the tanks are only stored on ground that is prepared flat, preferably with a levelling layer of a granular material with a size no greater than 10mm.

Alternatively the tanks can be placed on timbers. Timbers to be aligned approximately under the lifting pins. Tanks cannot be stored, or installed on a concrete base without a levelling separation layer or timbers.

4. MODULAR TANK INSTALLATION—SEALING TANKS TOGETHER

Once first tank is placed, run a thick bead of polyurethane sealant (Sika, adheseal or similar supplied by Atlan), around the rectangular cut-out in the tank wall (Primary Seal).

Lower the second tank to the excavation base and skim the second tank to butt up against the first tank. Enter the tank and inside the void between both tanks seal with sealant (Secondary Seal).

SEALANT PRE APPLIED



PREPARING TO SKIM A TANK INTO PLACE



PRIMARY SEAL



SECONDARY SEAL

SEALING OF TANK LIDS

Place a thick bead of sealant to the outer edge on the top of the tank wall, and then lower the tank lid onto the tank.

The tank lid has a rebated section that will locate into the tank. Final seal to outer edge of lid join if required.



5. BACKFILLING

5a. Backfill around the tank with a well draining granular material in layers no thicker than 500mm.

5b. Compact pavement subgrades above the tank lid with light duty hand operated compaction equipment. Do not use heavy mechanical compaction techniques (such as vibratory or static rollers) above or adjacent to the tank walls within 1500mm of tanks without engineer's approval.

Pavement Subgrades above tank to be as directed by the Project Civil Engineer.

5c. Refer to table below for maximum machine size to be used to shift backfill over tank lids.*

*Machine to be driven in straight forward or straight back in reverse, no turning, or pivoting with the bucket.

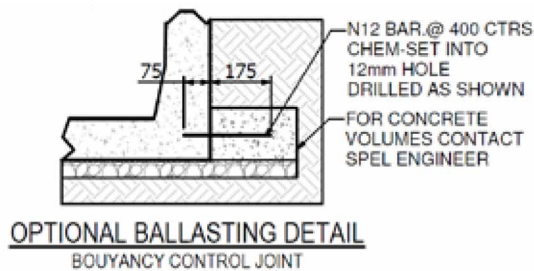
*As per 5b light duty hand operated compaction equipment only to be used to achieve compaction of pavement sub-grades.

MAXIMUM EXCAVATOR LOADS FOR BACKFILLING OVER 150MM TANK LID*			
UNIFORM LOADS	Nil Cover	200mm Cover	400mm Cover
13.0T EXCAVATOR	OK*	OK*	OK*
15.0T EXCAVATOR	Not Permissible	OK*	OK*
20.0T EXCAVATOR	Not Permissible	OK*	OK*
25.0T EXCAVATOR	Not Permissible	Not Permissible	OK*
30.0T EXCAVATOR	Not Permissible	Not Permissible	OK*
*Machine to be driven in straight forward or straight back in reverse, no turning, or pivoting with the bucket. *Light duty hand operated compaction equipment only to be used to achieve compaction of pavement sub-grades			

6. HYDROSTATIC SURCHARGE AND UPLIFT

6a. If the tank installation is likely to experience a high water table consult Atlan for a site specific ballasting plan. If this install manual is being read prior to procurement, advise Atlan at quote stage so that the most economical and easy to install ballasting solution can be provided.

Single tanks & Single row tank farms



ANTI-BOUYANCY CONTROL ONLY REQUIRED FOR TANKS IN HIGH WATER TABLE REFER TO HYDROSTATIC SURCHARGE AND UPLIFT NOTES

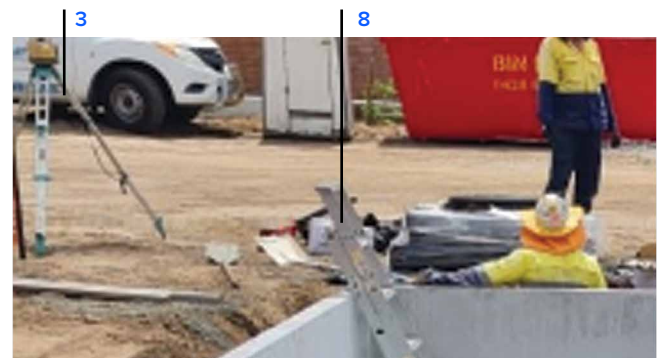
Large Tank Farms

Ballasting rings poured onsite will not be suitable for centre tanks in large tank farm modular solutions.

Contact Atlan prior to procurement so that the most economical and easy to install ballasting solution can be provided.

7. SUGGESTED EQUIPMENT

1. Crane & Dogman
2. String line
3. Survey Equipment for level base
4. Shovel for levelling
5. Screed for levelling
6. Excavation Marking Paint
7. Caulking Gun suitable for a 600ml sealant sausage
8. Ladders
9. Tape measure
10. Steel Bar
11. Tank plan, and tank payout plan



INSTALLATION MANUAL

AtlanVault



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'We believe clean waterways are a right not a privilege and we work to ensure a joy in water experience for you and future generations.'

Andy Hornbuckle

AtlanVault

Modular precast on-site stormwater detention system



atlan.com.au

Atlan
STORMWATER



APPLICATIONS

- Residential
- Commercial
- Industrial
- Retail sites
- Subdivisions
- Urban infrastructure

FEATURES



A modular precast on-site stormwater detention system (OSD) that has the proven strength & durability of concrete, is simple & fast to install, and easily accessible for maintenance.

The AtlanVault can be arranged in a modular configuration to achieve small to very large OSD requirements with flexibility in footprint design.

It is a robust solution for stormwater detention typically installed under carpark in commercial premises, or the common driveways in multi-unit developments. The AtlanVault is selected for its easy access for maintenance, strong traffic rating, simple installation protocol, and ability for large volumes to be installed in a single day and truck trafficable immediately.

- Flexibility in footprint design for optimum layouts
- Flexible heights to suit site levels
- Truck trafficable. Delivered to site cured to 50MPa. The tanks can be installed, backfilled and trafficable immediately, maintaining site accessibility.
- Modules do not rely on stone backfill for stormwater storage or support, so there are smaller excavations and less spoil to dispose of compared to other systems.
- Units are delivered to site to meet clients cranes and are generally installed immediately. This is no on-site storage of modules required so on-site space is optimised.
- AtlanFilter cartridges can be designed to be contained in these systems so water quality outcomes can be achieved without additional separate tanks.





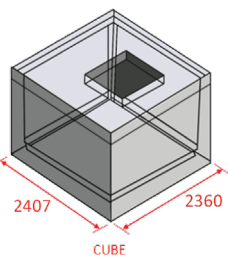
COMPARISON

OSD SYSTEMS	ATLANVAULT/MEGAVALT	CONVENTIONAL CAST INSITU OR BLOCK & SLAB
STRUCTURAL ENGINEERING	All required structural certification provided by Atlan Stormwater and Engineering Partners minimising onsite inspections and increasing construction efficiency.	Structural engineering requires 'Hold Points' and visual inspection to ensure correct construction methods are achieved. Potential delays and risk of trade error is higher.
CONSTRUCTION PROGRAM EFFICIENCIES	Construction timeline savings of up to 90% can be achieved, with a guaranteed reduction of labour required on site.	Multiple trades required to complete the scope providing a slower construction timeline and increased risk of poor weather and delays.
SAFETY	Reduces the amount of labour required to complete the works. Significantly decreased open excavation time. Minimises the requirement of Confined Space Entry during tank construction.	Increased time with an open excavation due to increased sub-contractor involvement. Co-ordination on safety plans and inductions with increased involvement and supervision required. Exposed reinforcement contributing to trip hazards. Confined Space Entry is required.
ENVIRONMENTAL IMPACT	- Minimal construction waste. - Decreased excavation time. - Decreases risk of silt release. - No concrete truck washouts required.	- Increased construction waste from palletised construction materials to complete the scope. - Concrete truck washouts required.
QUALITY	Tanks constructed to ISO9001 Quality Standards. Atlan Stormwater engineering partners provide product 'sign-off'.	Hold points and visual sign off by the project Certified Engineers.
ORGANISATIONS REQUIRED	Atlan Stormwater offer a 'Turnkey' Solution from design and manufacture through to construction.	Multiple trades.



SIZES & CAPACITIES

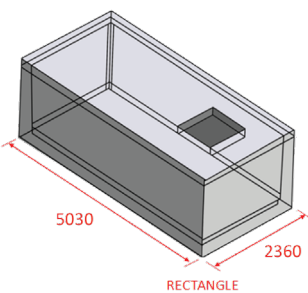
NOTE: Internal heights only provided as tank lid thickness is dependant on traffic rating & soil/slab cover. Visit our website to download plans and drawings.



CUBE

2407mm long x 2360mm wide

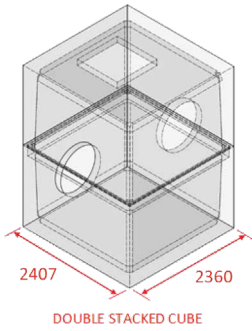
INTERNAL HEIGHT	CAPACITY kL
900	4.085
950	4.371
1000	4.550
1100	5.018
1150	5.252
1200	5.488
1250	5.723
1300	5.959
1350	6.196
1464	6.737



RECTANGLE

5030mm long x 2360mm wide

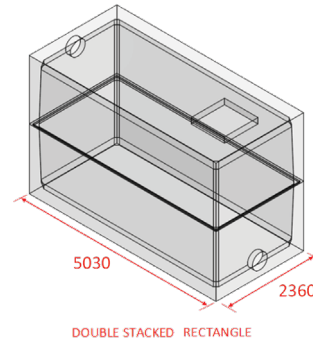
INTERNAL HEIGHT	CAPACITY kL
900	9.064
950	9.577
1000	10.090
1100	11.119
1150	11.635
1200	12.152
1250	12.669
1300	13.187
1350	13.706
1464	14.892



DOUBLE STACKED CUBE

2407mm long x 2360mm wide

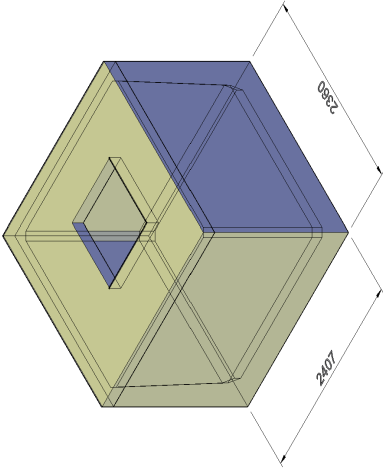
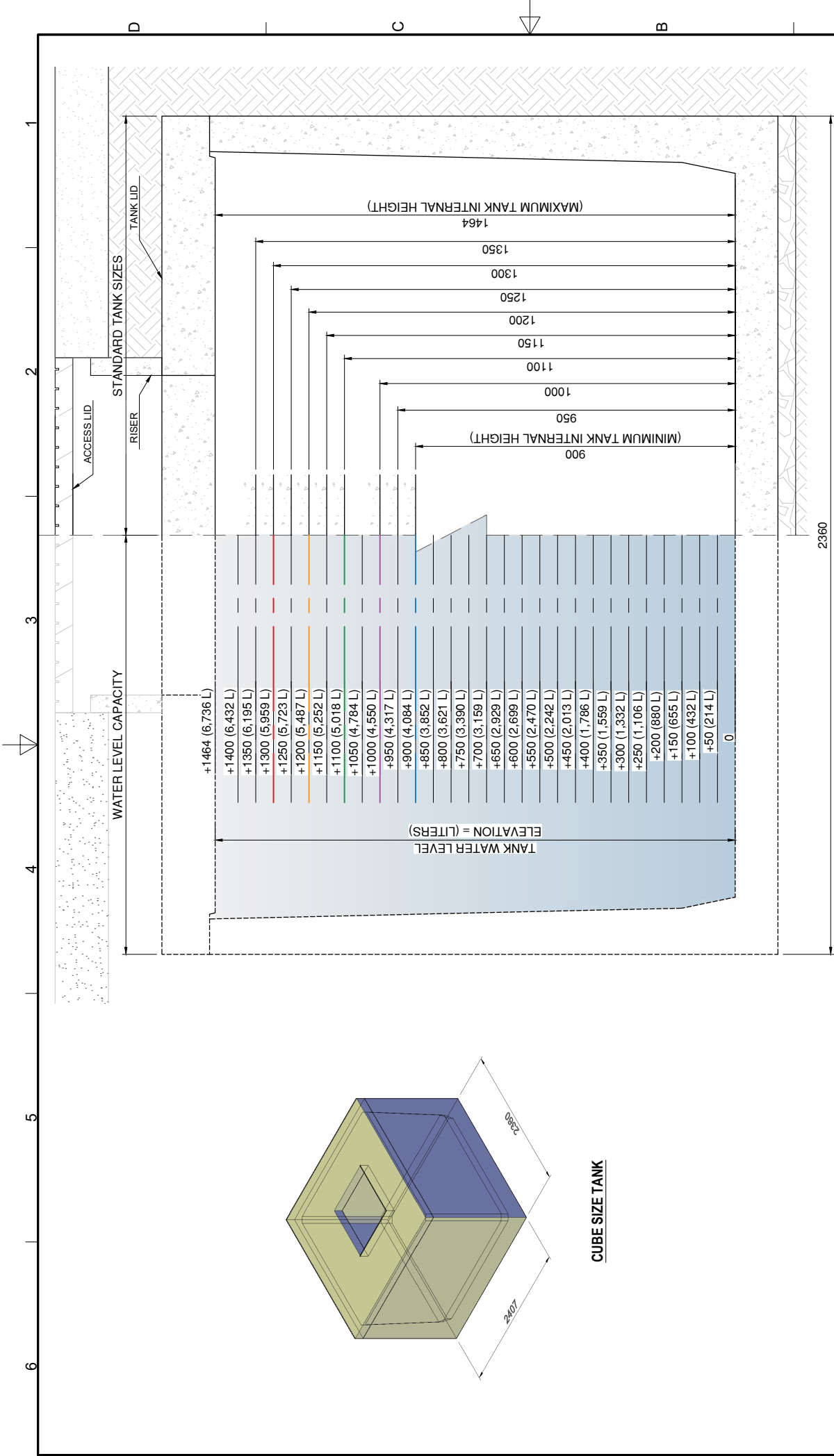
BASE SECTION INTERNAL HEIGHT	TOP SECTION INTERNAL HEIGHT	INTERNAL HEIGH	CAPACITY kL
884	916	1800	8.170
934	916	1850	8.456
984	916	1900	8.635
984	966	1950	8.921
984	1016	2000	9.100
1134	916	2050	9.337
1184	916	2100	9.573
1184	966	2150	9.859
1184	1016	2200	10.038
1334	916	2250	10.281
1334	966	2300	10.567
1439	916	2355	10.703
1439	966	2405	10.989
1438	1016	2455	11.168
1334	1166	2500	11.448
1439	1116	2555	11.636
1439	1166	2605	11.870
1439	1216	2655	12.106
1439	1266	2705	12.341
1439	1316	2755	12.577
1439	1366	2805	12.814
1439	1471	2910	13.388



DOUBLE STACKED RECTANGLE

5030mm long x 2360mm wide

BASE SECTION INTERNAL HEIGHT	TOP SECTION INTERNAL HEIGHT	INTERNAL HEIGH	CAPACITY kL
884	916	1800	18.128
934	916	1850	18.640
984	916	1900	19.154
984	966	1950	19.666
984	1016	2000	20.180
1134	916	2050	20.699
1184	916	2100	21.215
1184	966	2150	21.728
1184	1016	2200	22.241
1334	916	2250	22.770
1334	966	2300	23.283
1439	916	2355	23.858
1439	966	2405	24.372
1438	1016	2455	24.885
1334	1166	2500	25.341
1439	1116	2555	25.915
1439	1166	2605	26.431
1439	1216	2655	26.915
1439	1266	2705	27.466
1439	1316	2755	27.984
1439	1366	2805	28.493
1439	1471	2910	29.596



CUBE SIZE TANK

WATER LEVEL DIAGRAM

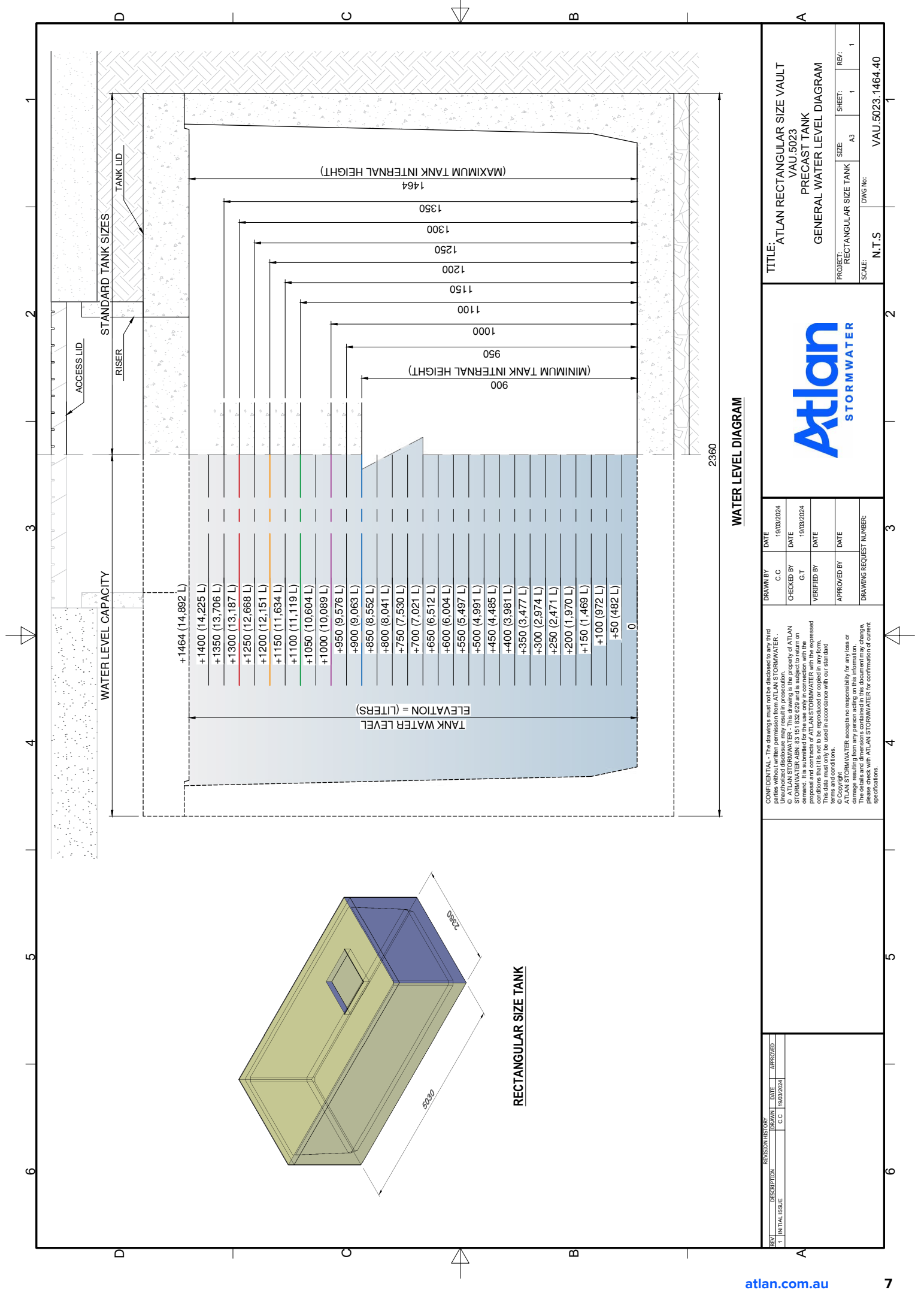
REVISION HISTORY			
REV	DESCRIPTION	DRAWN	DATE
1	INITIAL ISSUE	C.C.	19/03/2024

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DRAWN BY	DATE
C.C.	19/03/2024
CHECKED BY	DATE
G.T.	19/03/2024
VERIFIED BY	DATE
APPROVED BY	DATE
DRAWING REQUEST NUMBER:	

ATLAN CUBE SIZE VAULT
VAU 2423
PRECAST TANK
GENERAL WATER LEVEL DIAGRAM

TITLE:		PROJECT:		SCALE:	
ATLAN CUBE SIZE VAULT VAU 2423 PRECAST TANK GENERAL WATER LEVEL DIAGRAM		CUBE SIZE TANK		N.T.S	
SHEET:		SIZE:		DWG No:	
1		A3		VAU 2423.1464.40	
REV:		REV:			
1		1			



AtlanVault

Modular precast on-site stormwater detention system



'We believe clean waterways are a right not a privilege
and we work to ensure a Joy in Water experience for
you, with your children and grandchildren.'

Andy Hornbuckle

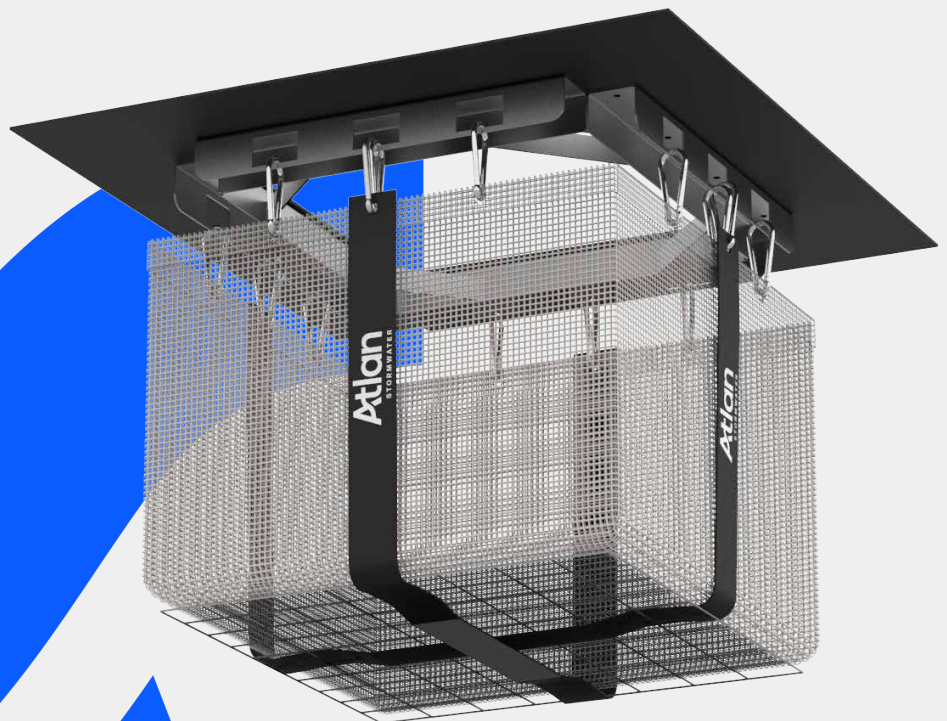
Atlan
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0724

INSTALLATION MANUAL

StormSack



INTRODUCTION

The purpose of this manual is to indicate the safest and most efficient method in installing the StormSack.

INSTALLATION

The aim of all StormSack installations is to install the largest unit into each pit, without influencing the hydraulic performance of the pit or drainage system. To provide clarification on certain aspects of the installation the following tolerances are included.

SAFETY

PERSONAL PROTECTIVE EQUIPMENT

The following personal protective equipment is required by staff for install activities:

- High visibility vest or shirt
- Safety footwear (Steel cap toe)
- Gloves (leather palmed riggers gloves or similar)

Note: Personnel on construction and private sites must also adhere to the specific safety requirements of each work site.

INSTALLATION



1. TOOLS REQUIRED

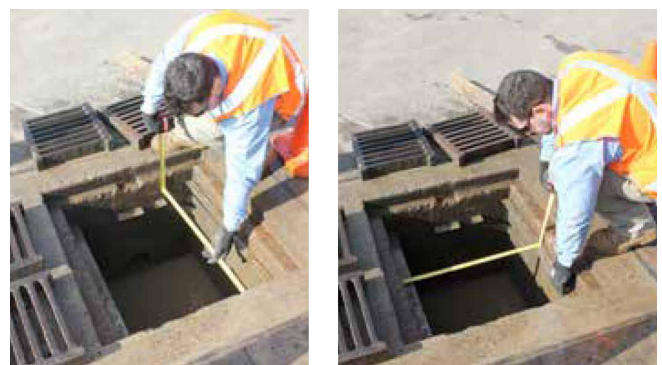
- Tape measure
- Marker pen/texta
- Gloves
- Safety glasses
- Hearing protection
- Level/straight edge
- Grinder



2. SET UP SAFETY CONES AROUND PIT BEFORE OPENING



3. REMOVE GRATES FROM PIT READY FOR STORMSACK INSTALLATION



4. MEASURE LENGTH & WIDTH OF GRATE SUPPORT LEDGE FOR STORMSACK TO SIT ON



5. USE MEASURING TAPE AND MARKER TO MARK PLASTIC STORMSACK SUPPORT SHEET TO BE CUT OFF



8. ONCE THE PLASTIC STORMSACK SUPPORT SHEET HAS BEEN TRIMMED TO SUIT GRATE OPENING SIMPLY INSTALL INTO GRATE SUPPORT LEDGE



6. USE LEVEL/STRAIGHT EDGE TO MARK A STRAIGHT CUTTING LINE

9. RE-INSTALL GRATES



7. USE ANGLE GRINDER WITH CUTTING BLADE OR SIMILAR TO CUT PLASTIC STORMSACK SUPPORT SHEETING TO MATCH OPENING SIZE

INSTALLATION MANUAL

StormSack



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Joy in water

'We believe clean waterways are a right not a privilege and we work to ensure a joy in water experience for you and future generations.'

Andy Hornbuckle

Appendix G – MUSIC LINK



25-132 - ORMISTON
COLLEGE (MASTER P