DATE	REVISION	ISSUED BY	REVIEWED BY	COMMENT
23/11/2023	A	J. MENDIOLEA (RPEQ 19751)	W. RASPOTNIK (RPEQ 2360)	*Issued for Approval*

SPRING GROVE

STORMWATER MANAGEMENT PLAN

35 CASSINO DRIVE, CASINO NSW 2470

DATE	REVISION	ISSUED BY	REVIEWED BY	COMMENT
27/02/2024	A	J. MENDIOLEA (RPEQ 19751)	W. RASPOTNIK (RPEQ 2360)	*Issued for MCU Application*

CONTENTS

1. INTRODUCTION

1.1 SCOPE

Spaceframe Buildings has been engaged to deliver the design and construction of a cold storage facility for Spring Grove Fresh Goods Company at 35 Cassino Drive, Casino. The site is currently undeveloped and has a total area of 12045m^2. The development is proposed to be staged as three separate stages as described herein. This report seeks to outline the Stormwater Management strategy that will be adopted for the site throughout it's life and demonstrate the compliance of the provided solution at the specific stages of the development.

1.2 REFERENCE DOCUMENTATION

The following documents were considered for the proposed development:

- Healthy Land and Waterways: MUSIC Modelling Guidelines, 2018
- Mid-Richmond Flood Planning Matrix – Urban, 2012
- Richmond Valley Flood Study 2023 – Report
- Richmond Valley Council geographic information systems

2. SITE CHARACTERISTICS

2.1 EXISTING SITE INFOMATION

The proposed site for the new food processing facility is 35 Cassino Dr, Casino. The area of the proposed development in its existing state is undeveloped. The site sits within the Richmond Valley Council jurisdiction.

Figure 1: Site Location

2.2 TOPOGRAPHY

A site survey was undertaken in 2022, reporting relatively flat levels with a minor slope from north to south. The highest point on the site sits at 22.04m in the northeast corner, with the lowest of 21.16m in the southwest corner. The plot currently has water falling into three existing catch drains that discharge site runoff to the existing council drain. The existing site survey is provided in Appendix A for reference.

2.3 LEGAL POINT OF DISCHARGE

As an undeveloped lot in an existing estate, the site is seen to have existing legal points of discharge (LPD). Council mapping software informs the location of these, and they are as described in Figure 2 below. LPDs exist at the western and southern boundaries of the site.

Figure 2: Legal Point of Discharge

3. PROPOSED DEVELOPMENT

3.1 STAGED DEVELOPMENT

Given funding considerations, the development of 35 Cassino Drive will proceed in a series of stages, and as such the Stormwater Management strategy at the site must be comply with relevant legislation at all stages. Figures 3 and 4 below describe the initial and complete developments, with these two stages the key scenarios described within this document. Plans informing Stages 1-3 of the project are provided in Appendix B for reference.

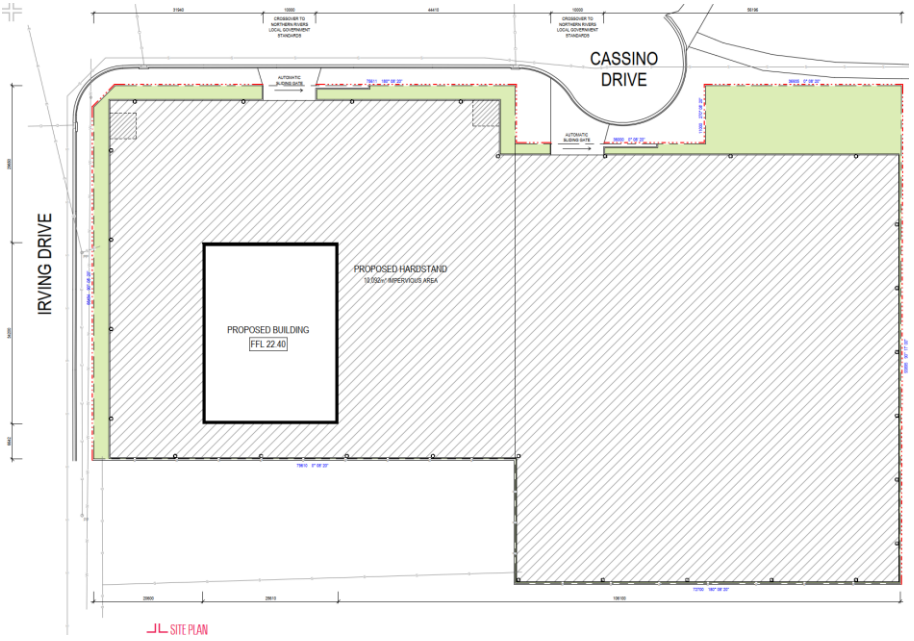

Figure 3: Stage 1 Development - Hardstand

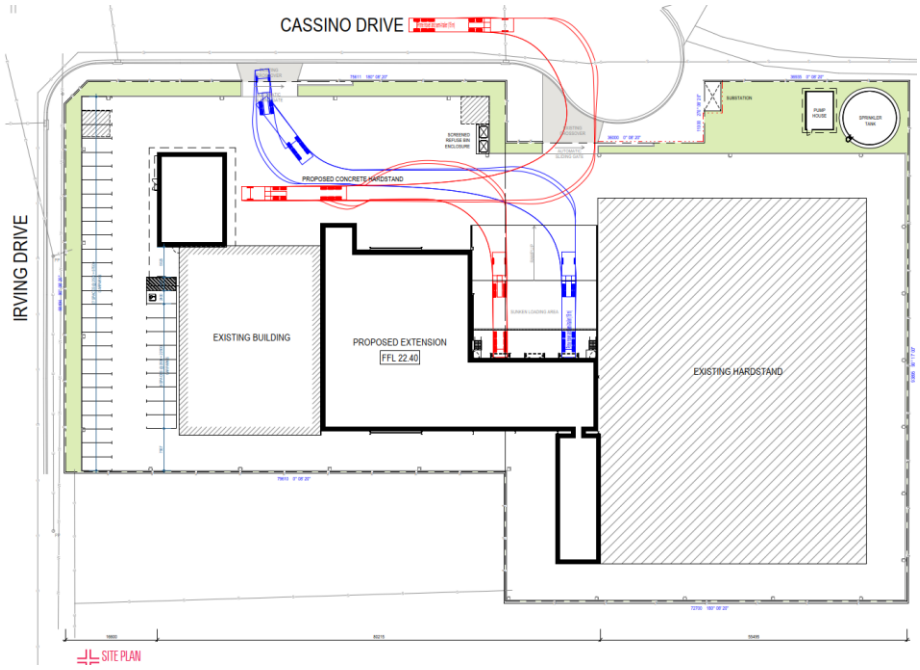

Figure 4: Stage 3 Development

A summary of the land use changes for the key stages in the proposed development are presented in Table 1.

Table 1: Site Usage – Area Information

Area Use	**Existing Area (m^2)**	**Proposed Stage 1 Area (m^2)**	**Proposed Stage 3 Area (m^2)**
Pervious Ground (Gravel or Pavement)	12045	859	859
Hardstand	0	10346	5711
Roof	0	840	5475
Total Imperious Area	**0**	**11186**	**11186**

4. STORMWATER QUANTITY

4.1 FLOODING REQUIREMENTS

An assessment of the 2023 Flood Study adopted by Richmond Valley Council since September 2023 with reference to the 1998 Hazard categories in the current Floodplain Management plan indicates that the site has a Low Flood Hazard.

An assessment against the Richmond Flood Planning Matrix was undertaken as described in Figure 5 below.

FLOOD PLANNING MATRIX ***Mid Richmond***

TABLE 1: RESIDENTIAL, COMMERCIAL AND INDUSTRIAL DEVELOPMENT WITHIN AN URBAN AREA

Controls	Development / Building Type	No Hazard	Flood Hazard Category					Additional Constraint[1]
			Rare Low Hazard[2]	Low Hazard	High Depth Hazard	High Isolation Hazard	High Floodway Hazard	Rare High Floodway Hazard[2]
Land Use Suitability & Fill Level	Existing Lot - including infill subdivision	N/A	SF1	SF1	SF1	SF1		SF1
	(this line not used)							
	Subdivision - en globo	N/A	SF2	SF2	SF2			
	Emergency Services Site (Hospitals, etc.)	N/A	SF3a	SF3a				
	Other Community Service Building (School, etc.)	N/A	SF3b	SF3b				
Floor Level	New Habitable Building	N/A	FL2c	FL2c	FL2c	FL2c		FL2c
	New Commercial or Industrial Building	N/A	FL2a	FL2a	FL2a	FL2a		FL2a
	New Emergency Service Building (Hospitals, etc.)	FL3a	FL3a	FL3a				
	New Other Community Service Building (School, etc.)	FL3b	FL3b	FL3b				
	New Ancillary Building (eg shed, carport)	N/A	FL1	FL1	FL1	FL1		FL1
	Building Extension	N/A	FL4a	FL4a	FL4b	FL4b		FL4b
	(this line not used)							
Building Components		N/A	BC1	BC1	BC1	BC1		BC1
Structural	Ancillary Building (eg. shed, carport)	N/A	SS1	SS1	SS1	SS1		SS2
Soundness	Other Building	N/A	SS1	SS1	SS2	SS2		SS3
Flood Effect	Existing Lot - including infill subdivision	N/A	FE1	FE2	FE2	FE2		FE2
	Subdivision - en globo	N/A	FE2	FE2	FE2			FE3
	New Ancillary Building (eg shed, carport)	N/A	FE1	FE2	FE2	FE2		FE2
	Building Extension	N/A	FE1	FE1	FE2	FE2		FE3
	Other Developments (road raising, etc)	N/A	FE1	FE2	FE2	FE2	FE3	FE3
Evacuation & Access	Existing Lot - including infill subdivision	N/A	EA1	EA1	EA1	EA1		EA1
	Subdivision - en globo	N/A	EA3	EA3	EA3			
	Emergency Service Site (Hospitals, etc.)	N/A	EA4a	EA4a				
	Other Community Service Site (Schools, etc.)	N/A	EA4b	EA4b				
Flood Awareness, etc		N/A	FA2	FA2	FA2	FA2	FA2	FA2

Figure 5: Flood Planning Matrix

The key requirements as described within this matrix are presented in Table 2 below.

Item	Classification	Description
Land use suitability and fill level	SF1	No minimum fill level required
Floor Level	FL2a	FFL min greater than or equal to 1:100 year flood
Structural Soundness	SS1	No structural soundness requirements for flood/debris forces
Flood Effect	FE2	Flood impact to be considered by council. Council to review if engineer report required
Evacuation and access	EA1	Council to provide information on flood evacuation strategy

Based on the above, Flood Considerations are suitably addressed through ensuring the FFL is greater than the 1:100 year flood.

Noting the Flood Effect consideration, Council was contacted to provide their assessment as to the requirement for flood modelling/reporting. It was confirmed via email 06/12/2023 that this was not required on the basis the site location is a fringe and wide flood plain.

Figure 6 below indicated the 1:100 year flood level that will serve as the minimum FFL for the project.

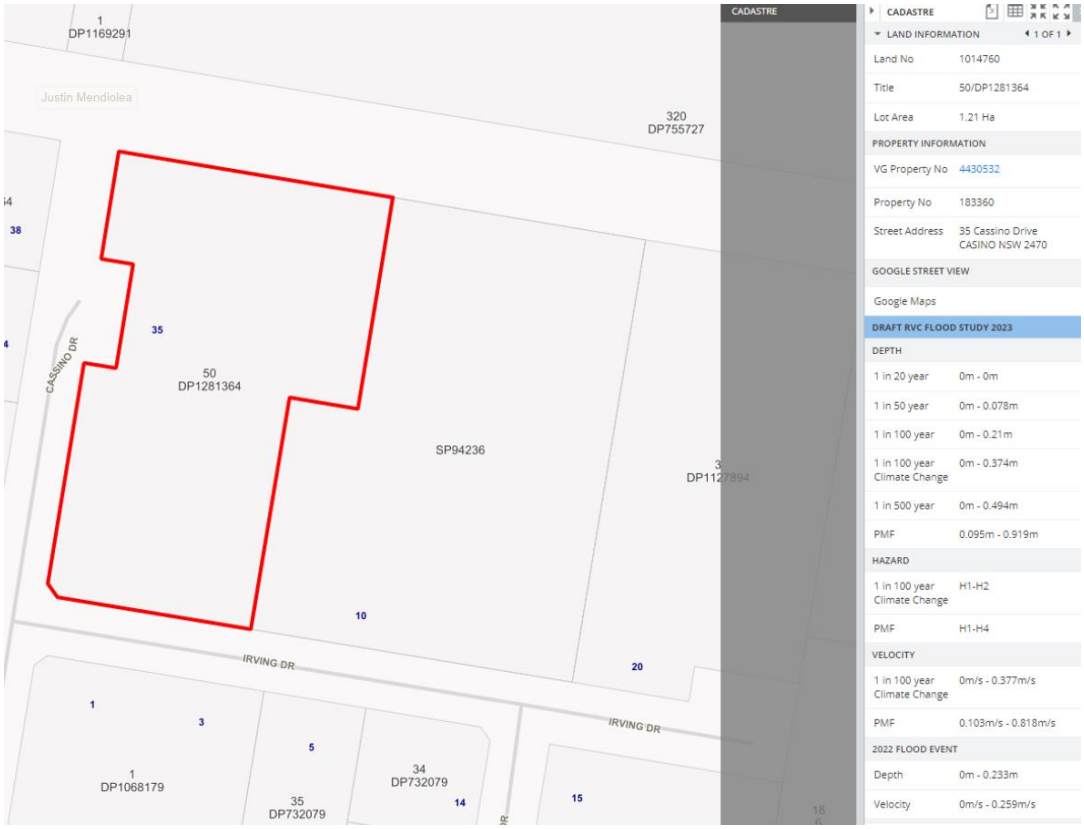

Figure 6: 1:100 year flood level

The 1:100 flood level sits min 0.21m above the existing site which has a maximum level of 22.04, and therefore a minimum floor level of 22.25 AHD is satisfactory. Noting this, the project will proceed with a minimum FFL of 22.40.

Further detailed flooding information in support of the above is provided in Appendix C for reference.

4.2 DETENTION

As this is a new development on an undeveloped block of pervious soil, on-site detention systems (OSD) must be provided in the development to mitigate peak flows and ensure no actionable nuisance downstream of the development.

Detailed Rational Method Calculation have been undertaken to determine the required OSD volumes and are provided in Appendix D for reference.

As described in Appendix D, the volume of detention required to mitigate 1% AEP peak flows with consideration to pit and pipe storage is 222m^3, which will be apportioned between the LPDs based on catchment area. 126m^3 and 99m^3 of storage will be provided in the OSD tanks located adjacent Cassino Drive and Irving Drive respectively.

The proposed development is acceptable from a Stormwater Quantity perspective as it discharges to the LPD, has identified and addressed the risk of flooding with respect to the planning matrix, and suitably mitigates 1% AEP peak flows through the provision of OSD devices.

5. STORMWATER QUALITY

5.1 OPERATIONAL PHASE – PROPOSED STRATEGY

As described herein, the development will be staged. As such a Stormwater Quality treatment strategy needs to be designed for both the initial and complete stages of development. To address this, separate MusicX models will be created to undertake pollutant load reduction calculation in order to demonstrate the suitability of the treatment system for each instance.

5.2 STORMWATER QUALITY MODELLING

MUSICX software was used to assess the quality of the stormwater runoff and provide pollutant reductions achieved by the bioretention system.

5.2.1 MusicX Climate Data

Meteorological data for the site has been used as described in Figure 7 below, taken from MUSIC software.

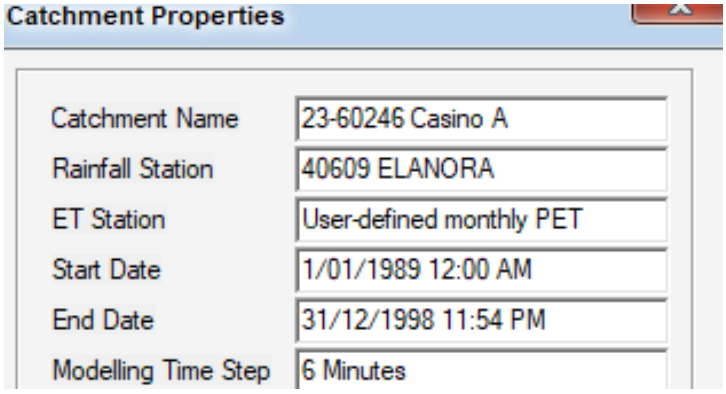

Figure 7: Site Rainfall Station

5.2.2 MusicX Model – Stage 1 - Hardstand Only

Source nodes are used to describe the land use of the proposed development being modelled. Stormwater concentration parameters and runoff generation parameters for Urban sources nodes were used and broken into the land uses seen in Table 4.

A schematic diagram of the treatment train for the Stage 1 development can be seen in Figure 7.

Table 3: MUSICX Model – Source Node Information – Stage 1

Catchment	Area (ha)	Impervious Area (%)
Hardstand 1	0.5890	100
Hardstand 2	0.5350	100

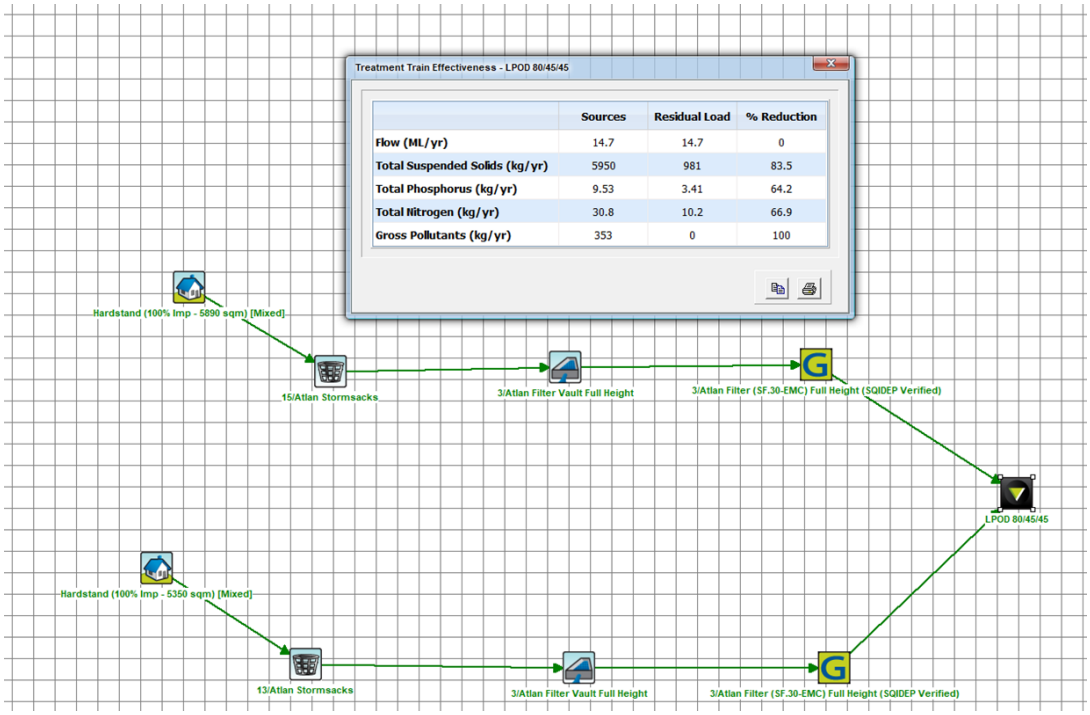

Figure 8: MUSICX Model – Schematic diagram of treatment train – Stage 1

5.2.3 MusicX Model – Stage 3

A schematic diagram of the treatment train can be seen in Figure 8.

Table 4: MUSICX Model – Source Node Information – Stage 3

Catchment	Area (ha)	Impervious Area (%)
Hardstand 1	0.29	100
Roof 1	0.33	100
Hardstand 2	0.20	100
Roof 2	0.28	100

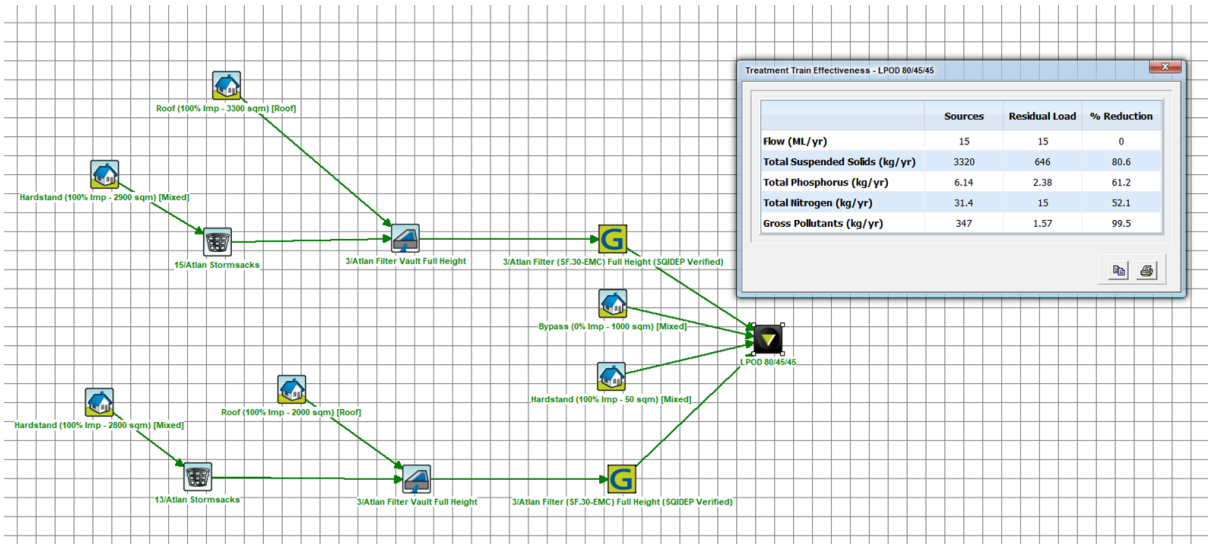

Figure 9: MUSICX Model – Schematic diagram of treatment train – Stage 3

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Version: 1, Version Date: 10/05/2024

5.3 MODELLING RESULTS

The estimated pollutant reductions from the treatment train for the proposed development modelled using MUSICX are outlined in Table 5 below.

Table 5: MUSICX Model – Pollutant Reductions

	% Reduction Required	STAGE 1	STAGE 3
TSS (kg/yr)	80	83.5	80.6
TP (kg/yr)	60	64.2	61.2
TN (kg/yr)	45	66.9	52.4
GP (kg/yr)	90	100	99.5

As described above, the pollutant load reductions are in accordance with the relevant legislation.

Atlan Proprietary Device information and SQIDEP Certificates are provided in Appendix E for reference.

6. STORMWATER QUALITY – CONSTRUCTION PHASE

Stormwater Management during the construction phase will involve three fundamental aspects:

- Ensuring Stormwater Quantity (ie Drainage Control) is maintained
- Ensuring Water Quality of any runoff is appropriate
- Ensuring Erosion and Sediment Controls are implemented

6.1 DRAINAGE CONTROL

Drainage Control targets during the Construction phase are informed by the Environmental Protection Act (1994), specifically the procedural guide titled 'Releases to waters from land development sites 2500m^2 and greater'.

All stormwater flow paths must have concentrated flow paths to convey flows for all rain events as follows:

DISTURBED AREA OPEN TIMEFRAMES		
<12 MONTHS	**12-24 MONTHS**	**>24 MONTHS**
1 in 2 Year ARI	1 in 5 Year ARI	1 in 10 Year ARI
39% AEP	18% AEP	10% AEP

Note: The site does not have drainage structures located immediately up slope of an occupied property given the development of the wider estate is ongoing, as such the 10% AEP design consideration will not be made in this development as construction will not exceed 24 months.

6.2 STORMWATER QUALITY

Stormwater quality targets during the Construction phase are informed by the Environmental Protection Act (1994), specifically the procedural guide titled 'Releases to waters from land development sites 2500m^2 and greater'. Key pollutants identified in State Planning Policy are considered and treated as below:

- Total nitrogen and phosphorus are managed through sediment control measures
- Any site discharge will ensure <50mg/L Total Suspended Solids concentration.
- Bins and regular site cleans will ensure litter and other waste products are not discharged from the site.
- Washbays, cattle grids and rumble pits will be installed to allow vehicle cleaning, and this wash bay runoff will be directed to onsite systems rather than discharged form site.

6.3 EROSION AND SEDIMENT CONTROL PLAN

A detailed ESCO Plan will be submitted in future OPW approvals. Notwithstanding this, the below information describes at a high level the ESC activities that will be undertaken prior to and during construction.

- Site Inspection and monitoring will reflect the Best Practice Erosion and Sediment Control document, specifically Section 6.17. A summary of the key requirements during the construction phase are as summarised below:
  - The ESCP (that will be subsequently developed) is to be considered a live document that is to be modified as site conditions change, or if adopted devices/measures do not achieve the required performance measures.
  - All erosion and sediment control measures should be inspected:

- Daily during periods of rain
- Weekly as a minimum
- 24 hours prior to expected rainfaill
- Within 18 hours of a rainfall event of sufficient intensity to generate runoff.

Responsibilities of project team members will be as follows:

Table 6: ESC Roles and Responsibilities

ROLE	RESPONSIBILITY
Construction Manager	- Overall responsibility for the implementation of the ESC - Notify the administrator of any non-compliances - Ensure measures to reduce erosion and sediment generation are implemented
Site Manager / Foreman	- Undertake inspection of all control devices as described in Section 6.1 above (and reflective of Clause 6.17 of IECA 2008). - Monitor daily rainfall - Maintain the ESC devices throughout the duration of the project
Subcontractors	- Report any damage to ESC devices to Site Manager

7. CONCLUSION

The proposed development involves the construction of a food processing facility at 35 Cassino Dr, Casino. Currently the site is undeveloped, and over the coming years will undergo development in a number of separate stages as the operations at the site grow. This document seeks to describe the Stormwater Management Strategy that will be implemented at the site for the life of the building and demonstrates the compliance throughout the different stages of development.

As the lot as current is undeveloped, on site detention must be provided to mitigate peak flows. 222m3 of OSD will be provided to mitigate peak flows up to and including the 1% AEP design event.

From a stormwater quality perspective, proprietary Atlan stormsacks and filters will be used to ensure pollutant load reductions are in accordance with relevant legislation. These proprietary filters are SQIDEP certified and will be housed in the OSD tanks. All run-off in the development will be captured and conveyed in a stormwater network designed in accordance with AS3500.3.

The Stormwater Concept Designs for the key stages of the proposed development are provided in Appendix F.

APPENDIX A SITE SURVEY

CAUTION: COUNCIL SERVICE PLANS INDICATE WATER & SEWER MAINS IN THIS VICINITY SERVICES LOCATOR UNABLE TO LOCATE.

PEG

93.895

NAIL IN CONCRETE FOOTING

36.935

GRAVEL TRACK

LOT 1
DP1127894

PEG

11

PEG

72.7

CONCRETE DRIVEWAY

SITE BENCH MARK
DRILL HOLE & WING IN KERB
RL 21.50 (AHD)

36

(CONCRETE SEAL)

PEG

PEG

82.895

FENCE POST ON CORNER

SEWER INSPECTION

FENCE POST ON CORNER

70.495

(BITUMEN SEAL)

WALL (0.18) CLEAR

INDUSTRIAL SHED

(ROOF RIDGE)

CASSINO DRIVE

UPRIGHT KERB AND GUTTER

75.61

LOT 533
DP1047352

79.61

SP94236

WALL (0.24) CLEAR

NOTE: UNABLE TO OBSERVE INLET PIT AT TIME OF SURVEY. TRUCK PARKED ON TOP.

PEG

5.655

PEG

66.495

POSSIBLE FIRE HYDRANT NOT VISIBLE - UNDER WATER

SEWER INSPECTION

NAIL IN CONCRETE FOOTING

UPRIGHT KERB AND GUTTER

NOTE: COUNCIL SERVICE PLANS INDICATE STORMWATER PIT IN THIS VICINITY. UNABLE TO LOCATE.

IRVING DRIVE

LEGEND:

- BOUNDARY
- FENCE
- OVERHEAD ELECTRICITY
- TELCOMMUNICATIONS CABLE
  UNDERGROUND LOCATION & DEPTH AS OBSERVED BY SERVICES LOCATOR (11.03.2022)
- WATER MAIN
  UNDERGROUND LOCATION & DEPTH AS OBSERVED BY SERVICES LOCATOR (11.03.2022)
- SEWER MAIN (APPROXIMATE)
  SOURCE: RICHMOND VALLEY COUNCIL (7.03.2022)
- *NOTE: SECTION OF SEWER MAIN AS LOCATED BY SERVICES LOCATOR*
- STORMWATER PIPE

IMPORTANT:
SERVICES SHOWN HEREON HAVE BEEN LOCATED BY FIELD SURVEY. PRIOR TO ANY EXCAVATION OR CONSTRUCTION, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR THE EXACT LOCATION OF ALL SERVICES. UNDERGROUND SERVICES HAVE NOT BEEN INVESTIGATED. ALL LEVELS SHOWN ARE GROUND LEVELS UNLESS OTHERWISE INDICATED.

0 10m

NORTHERN RIVERS LAND SOLUTIONS © 2012
76 Tamar Street
BALLINA NSW 2478
PO Box 1324
M: 0414 217 664
P: 61 2 6681 6696
F: 61 2 6681 6410
E: tony.hart@nrls.com.au
www.nrls.com.au

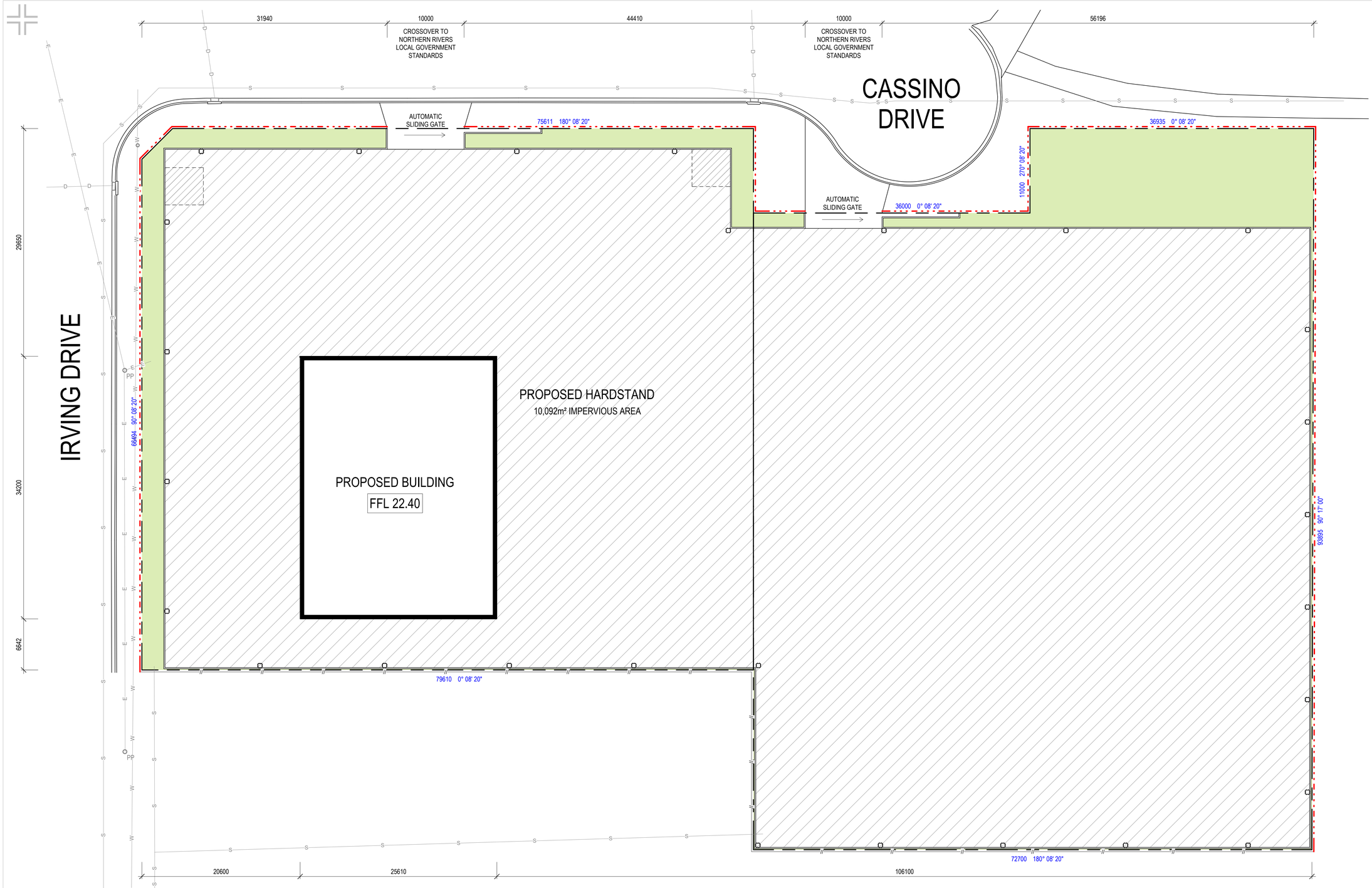
SCALE:	1:500 (A3)	CONTOURS:	0.25m INTERVAL	CLIENT:	SPACE FRAME
SURVEY:	PF	DATUM:	AHD		
DRAWN:	azaCAD	ORIGIN:	SSM 89261		
DATE:	11th MAR '22		RL 20.938	LGA:	RICHMOND VALLEY
CAD REF:	22037-01			SOURCE:	AERIAL: SIX

DETAIL SURVEY AND BOUNDARY MARKS PLACED FOR LOT 1 DP1127894 AND LOT 533 DP1047352

11 & 35 CASSINO DRIVE, CASINO

(THIS PLAN MAY NOT BE THE LATEST ISSUE) **ISSUE: A**

APPENDIX B DEVELOPMENT STAGING PLANS



SITE PLAN
1 : 250 @ A1

GENERAL NOTES

UNLESS NOTED OTHERWISE:

1. INDUSTRIAL CROSSOVERS TO BE CONSTUCTED AS PER LOCAL AUTHORITY STANDARD DETAIL DRAWINGS.
2. 150mm WIDE CONCRETE KERBING TO CARPARK AND DRIVEWAY PERIMETER - WHERE SHOWN.
3. PROVIDE DISABLED ACCESS FROM CARPARK TO BUILDING RAMPS TO BE MAXIMUM GRADES OF 1:20 ACROSS CAR TURNING AREA WITH MAXIMUM 3mm STEP UP FROM RAMP TO FLOOR TO COMPLY WITH AS1428.1-2001.
4. ALL RAMPS FROM CARPARK TO TENANCY ENTRY DOORS TO BE 1:14 MAXIMUM GRADIENT.

KEY

- E — E — EXISTING ELECTRICAL
- // — // — EXISTING FENCING
- G — G — EXISTING GAS
- S — S — EXISTING SEWER
- D — D — EXISTING STORMWATER
- T — T — EXISTING TELECOM
- W — W — EXISTING WATER LINE
- PROPOSED FENCING: 1.8m HIGH BLACK PVC COATED CHAINWIRE WITH 3x ROWS BARBED WIRE
- PROPOSED FENCING: 1.8m HIGH SPEARTOP, BLACK POWDERCOATED.

SITE INFORMATION

SITE AREA

LOT 1 on DP1127894 & LOT 533 on DP1047352		**12,045 m²**
IMPERVIOUS AREA	92%	11,089 m²
LANDSCAPING	8%	956 m²

FLOOR AREA

TOTAL	**872 m²**
STAGE 1	
GROUND FLOOR	
DRYSTORE	872 m²

SITE PLAN_STAGE 1

SPRING GROVE

35 CASSINO DRIVE
CASINO NSW 2470

DWG N° 11440-11-3 by IM

DATE 27/02/2024

space frame
DESIGN + CONSTRUCT SOLUTIONS

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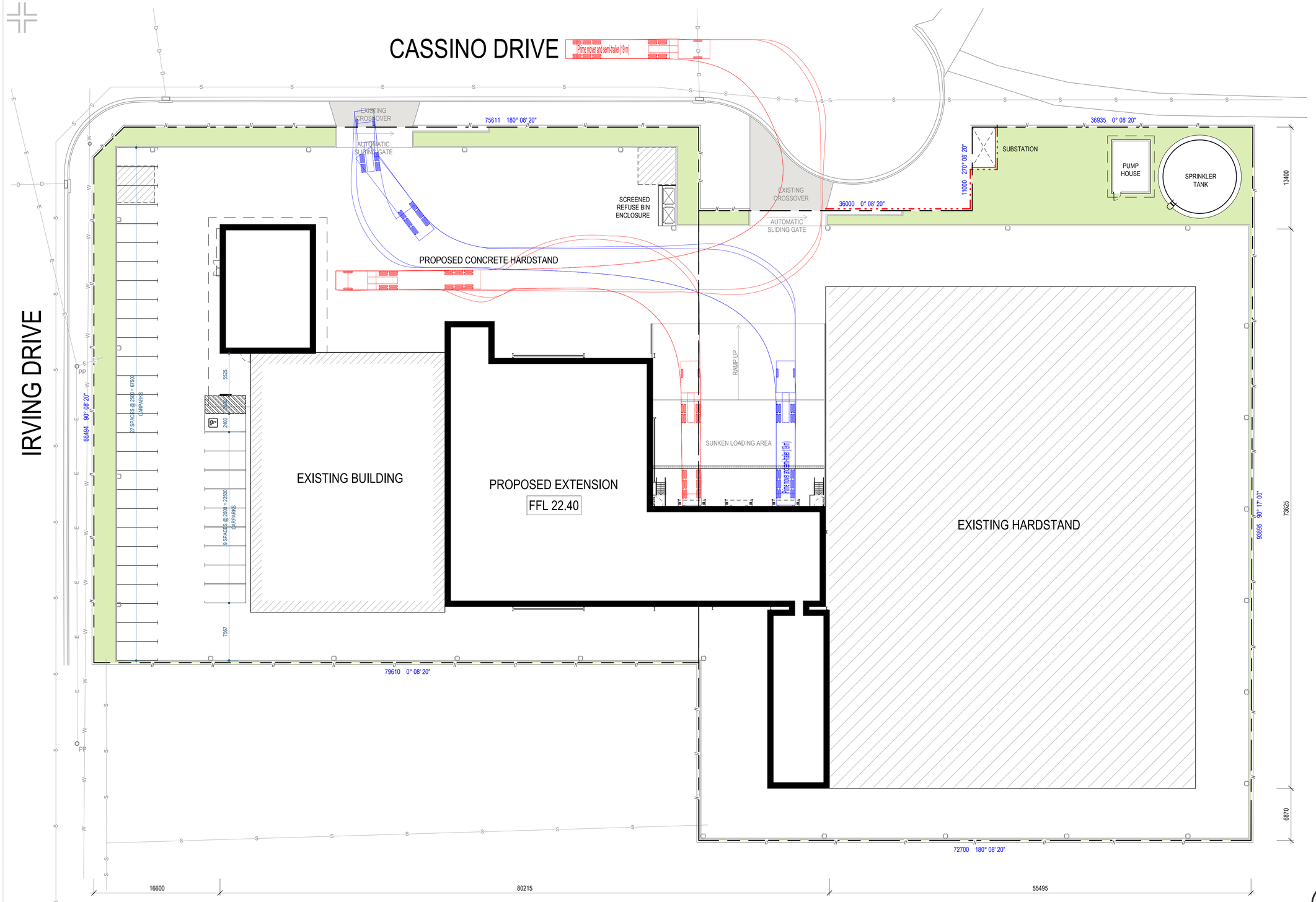

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FLOOR AREA

TOTAL	**2,692 m²**
STAGE 1	
GROUND FLOOR	
DRYSTORE	872 m²
	872 m²
STAGE 2	
GROUND FLOOR	
ANTEROOM	300 m²
BLAST FREEZERS	70 m²
CHARGING	50 m²
CHILLER	315 m²
DOCK OFFICE	30 m²
FREEZER 1	512 m²
OFFICE	205 m²
PLANT	141 m²
FIRST FLOOR	
OFFICE	195 m²
	1,819 m²

PARKING

CAR PARKS (INCLUDING PWD)	37

SITE PLAN_STAGE 2

SPRING GROVE

35 CASSINO DRIVE
CASINO NSW 2470

DWG N° 11440-21-3 by IM
DATE 27/02/2024

space frame
DESIGN + CONSTRUCT SOLUTIONS

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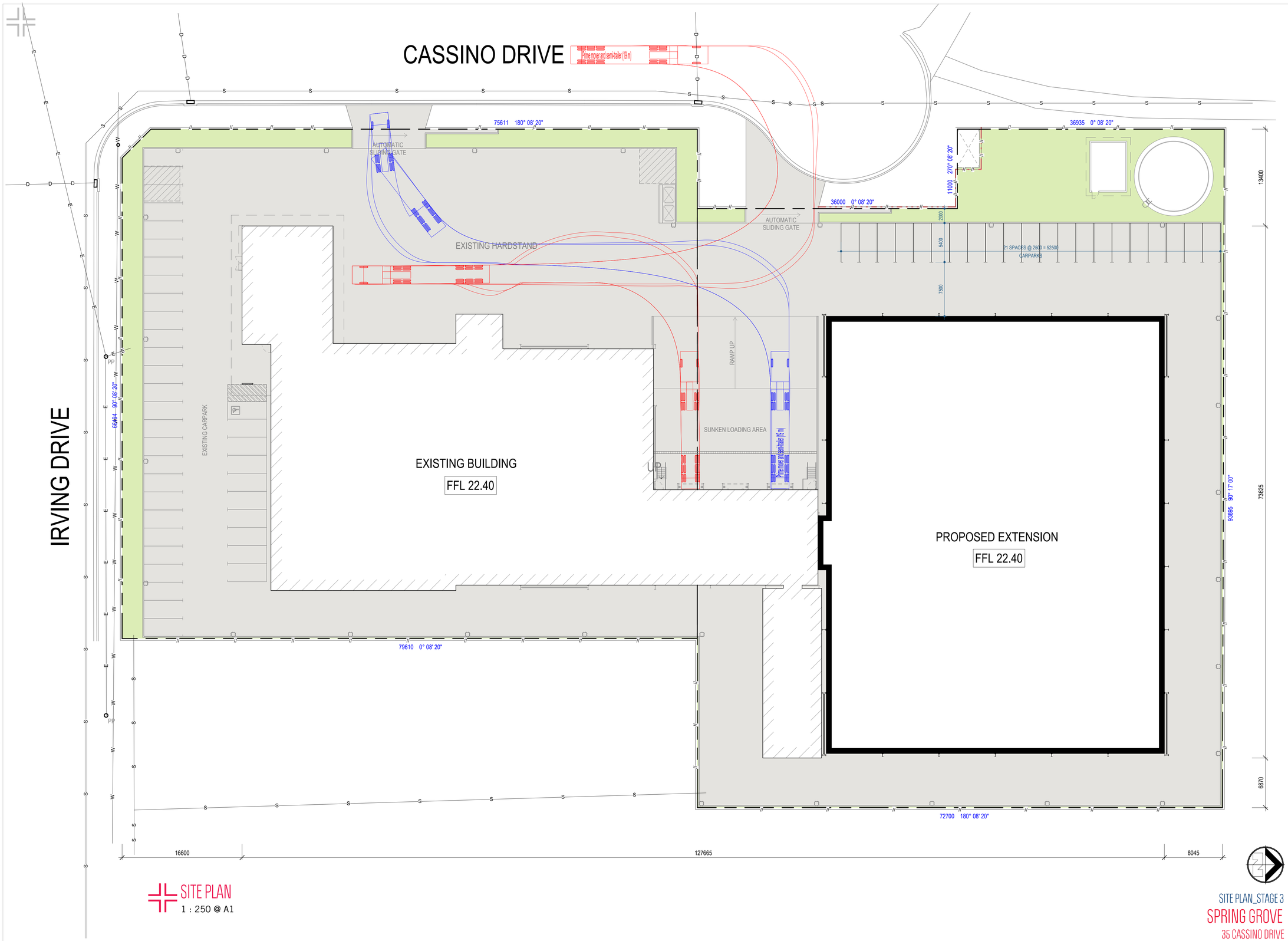

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LANDSCAPING	8%	956 m²

FLOOR AREA

TOTAL	**5,532 m²**
STAGE 1	
GROUND FLOOR	
DRYSTORE	872 m²
	872 m²
STAGE 2	
GROUND FLOOR	
ANTEROOM	300 m²
BLAST FREEZERS	70 m²
CHARGING	50 m²
CHILLER	315 m²
DOCK OFFICE	30 m²
FREEZER 1	512 m²
OFFICE	205 m²
PLANT	141 m²
FIRST FLOOR	
OFFICE	195 m²
	1,819 m²
STAGE 3	
GROUND FLOOR	
FREEZER 3	2,840 m²
	2,840 m²

PARKING

CAR PARKS (INCLUDING PWD)	58

SITE PLAN_STAGE 3

SPRING GROVE

35 CASSINO DRIVE
CASINO NSW 2470

DLUG N° 11440-31-3 by IM

DATE 27/02/2024

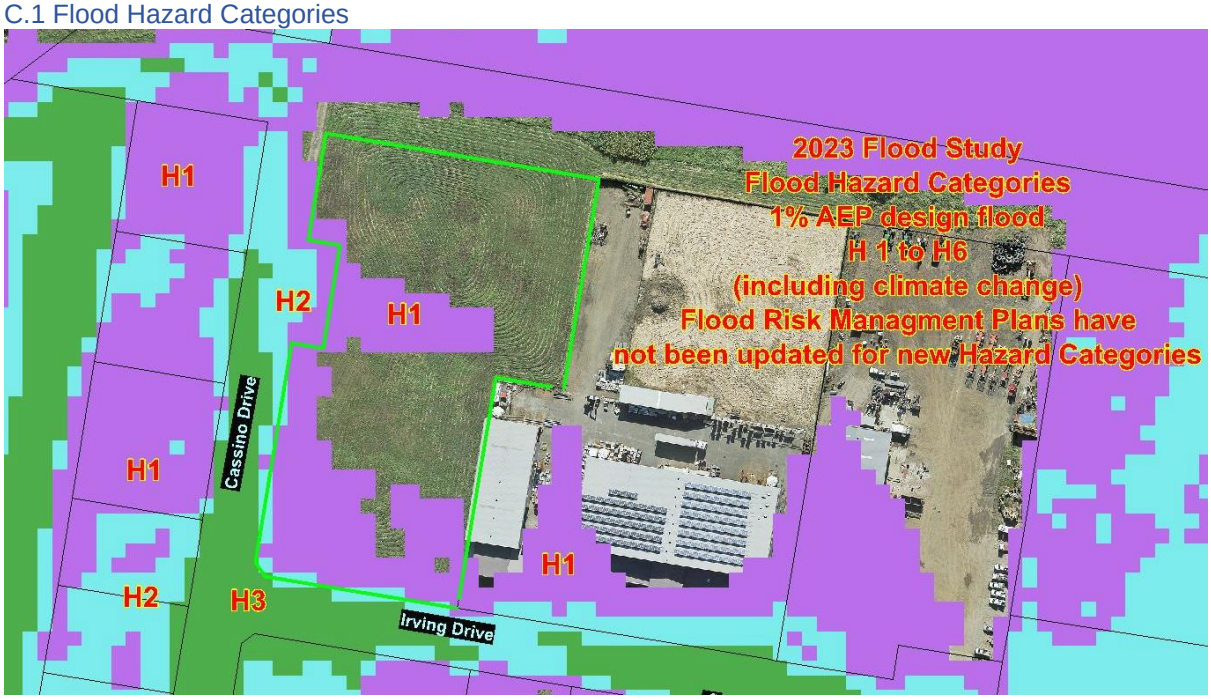
space frame
DESIGN + CONSTRUCT SOLUTIONS

J:\1.Projects\2.Current_Projects\11440-N-Spring_Grove_Casino\3. CAD Drawings\4_Quote\8.CAD\4742_MCU.rvt

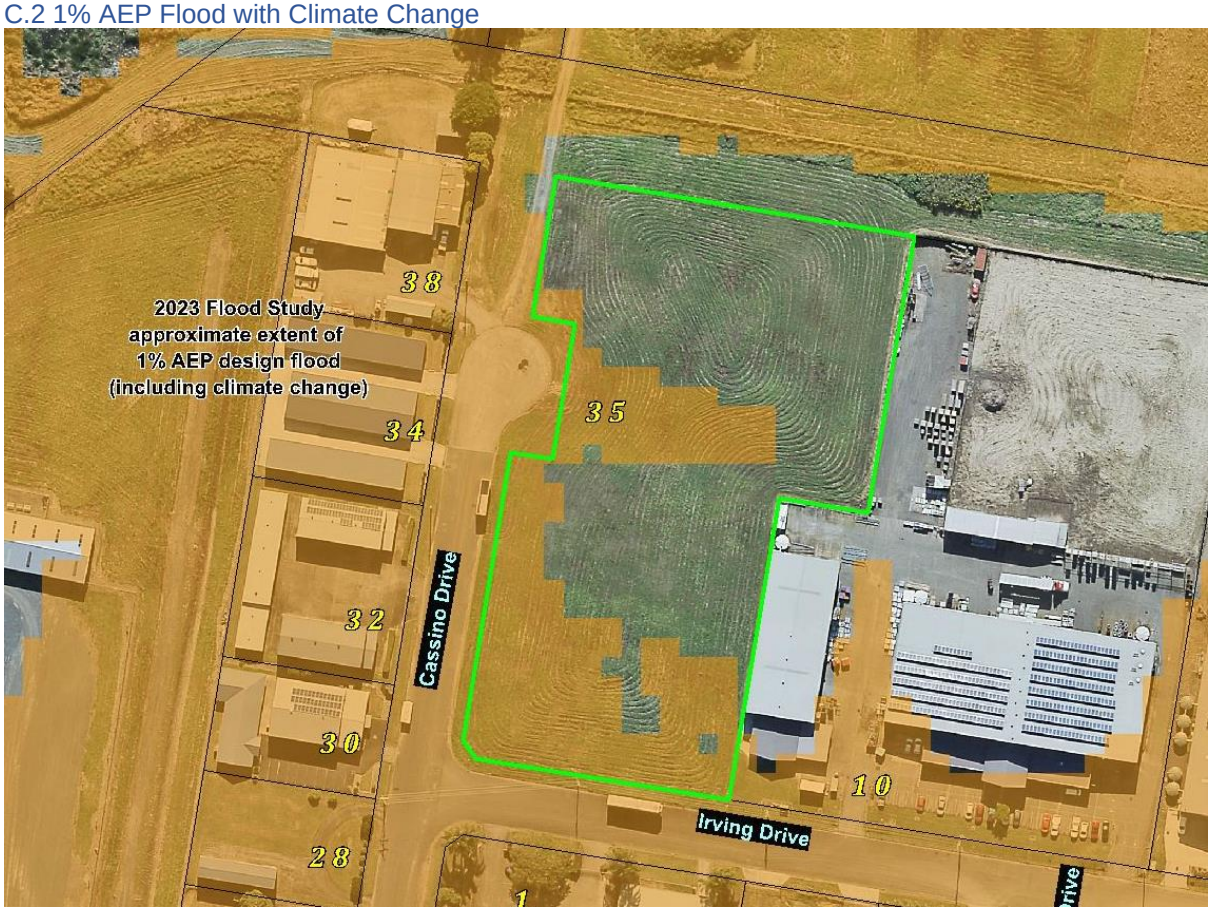
27/02/2024 9:39:41 AM

APPENDIX C FLOODING INFORMATION

C.1 Flood Hazard Categories



C.2 1% AEP Flood with Climate Change



C.3 1% AEP Flood with Climate Change

C.4 Planning Matrix Comments – Richmond Valley Council

Control Measures

RICHMOND VALLEY COUNCIL

Casino Flood Planning Matrix - URBAN

N/A	Controls Not Applicable
////////	Unsuitable Land Use - Not considered suitable for development
	LAND USE SUITABILITY & MINIMUM FILL LEVEL
SF1	Consider for development subject to the controls below. No minimum fill level required.
SF2	Consider for development subject to the controls below. For residential and commercial areas, the minimum fill level to be greater than or equal to the 100 year flood level. For industrial areas, the minimum fill level to be greater than or equal to the 10 year flood level.
SF3a	Consider for development subject to the controls below. Minimum fill level greater than or equal to the PMF flood level. Mid-Richmond: If no site exists that can practically fulfill the above PMF requirement, the 500 year flood level plus 0.5m may substitute
SF3b	Consider for development subject to the controls below. Council to give consideration on the benefits of using the development during and after a flood emergency. If the site is to be used for a flood emergency, the minimum fill level should preferably be greater than or equal to the PMF flood level. Mid-Richmond: If no site exists that can practically fulfill the above PMF requirement, the 500 year flood level plus 0.5m may substitute
	MINIMUM FLOOR LEVEL
FL1	No minimum floor level required (Council to advise developer of flood risk and potential damage to building & contents. Flood levels available on request)
FL2a	All floor levels to be greater than or equal to the 100 year flood level
FL2b	Not used
FL2c	All floor levels to be greater than or equal to the 100 year flood level plus 0.5m
FL3a	All floor levels to be greater than or equal to the PMF flood level. Mid-Richmond: If no site exists that can practically fulfill the above PMF requirement, the 500 year flood level plus 0.5m may substitute
FL3b	If practical, some or all floor levels to be greater than or equal to the PMF flood level, so that these buildings will be available for accommodation / storage during and after a flood emergency. Mid-Richmond: If no site exists that can practically fulfill the above PMF requirement, the 500 year flood level plus 0.5m may substitute
FL4a	All floor levels to be as close to the *minimum floor level* above (habitable or other) as practical and not less than the floor level of the existing building being extended if the existing floor level is less than or equal to the minimum floor level. If the extended weatherproof area exceeds 50% of the existing weatherproof area, the extension is treated as a new building. The extended weatherproof area is measured as the cumulative area of any previous extensions plus the proposed extension.
FL4b	As for FL4a with the maximum percentage increase in extended weatherproof area to be: (a) 50% if the extension's floor level is less than one (1) metre below the 100 year flood level; (b) 25% if the extension's floor level is greater than two (2) metres below the 100 year flood level; or (c) pro-rata between 50% and 25% for floor levels from one (1) metre to two (2) metres below the 100 year flood level.
	BUILDING COMPONENTS
BC1	Buildings to have flood compatible material below the higher of (a) the minimum floor level or (b) the 1 in 100year flood level plus 0.5m.
	STRUCTURAL SOUNDNESS
SS1	No structural soundness requirements for the force of floodwater, debris & buoyancy
SS2	Engineers report to prove that structures subject to a flood up to the 100 year event can withstand the force of floodwater, debris & buoyancy.
SS3	Engineers report to prove that structures subject to a flood up to the 500 year event can withstand the force of floodwater, debris & buoyancy.
	FLOOD EFFECT
FE1	No action required
FE2	The flood impact of the development to be considered by Council, with Council having the right to request an engineer's report (see FE3 below)
FE3	Engineers report required to prove that the development will not result in adverse flood impact elsewhere
	EVACUATION/ACCESS
EA1	Council to provide information on flood evacuation strategy
EA2	Not used
EA3	Reliable access for pedestrians and transport required during the 100yr ARI event. Council to provide information on flood evacuation strategy
EA4a	Emergency service site - should have good access up to the PMF and preferably not cut off from the main residential area(s)

Structural assessment for flood is not required.
7-9 Dyraaba – zero velocity
35 Cassino – very low or no velocity

7-9 Dyraaba St – pond area & 33 Cassino – fringe & wide floodplain

No Flood effect assessment required

Justin Mendiolea

From:	Brian Eggins <brian.eggins@richmondvalley.nsw.gov.au>
Sent:	Wednesday, 6 December 2023 4:27 AM
To:	Justin Mendiolea
Cc:	Melinda Budd; Travis Eggins
Subject:	Flood Information Enquiry - 35 Cassino Drive (50 1281364) clarification of flood report and detailed flood modelling FW: 11440- Spaceframe Buildings
Attachments:	11440 - Cassino Drive - Flood Planning Matrix.pdf; [11440-31]-{2}-SITE PLAN_STAGE 3.pdf; a Flood Hazard Categories H1 to H6 - D vs V AIDR_2017b .JPG; a Flood Hazard Categories OLD RVC Floodplain Risk Management Plans definitions.pdf; 35 Cassino Drive infrastructure.JPG; 35 Cassino Drive approx extent 2023 1%AEP design flood.JPG; 35 Cassino Drive 2010 Flood Hazard Category.JPG; 35 Cassino Drive 2023 Flood Hazard Category.JPG; 35 Cassino Drive 2023 1% AEP [100] Flood Levels incl CC.JPG; 35 Cassino Drive 2023 0.2% AEP [500] Flood Levels incl CC.JPG; 35 Cassino Drive assessment of 1998 Hazard using 2023 levels.JPG; Casino Flood Planning Urban Matrix Table.JPG; Casino Flood Planning Urban Matrix code details.JPG
Follow Up Flag:	Follow up
Flag Status:	Flagged

Good morning Justin,

I will leave the planning related enquiry to one of our planners.

Please find attached a number of files and screen shots of the property.

An assessment of the 2023 Flood Study (adopted by Council 19 September 2023) with the nearest calculation back to the 1998 Flood Hazard Categories in the still current Floodplain Risk Management Plan(s) indicates that the site is Low Hazard.

Council is transitioning from the old multiple flood studies with the corresponding Floodplain Risk Management Plan(s), to the new 2023 flood study with design floods being over a much larger area and the generation of the new standards for Flood Hazard Categories, etc.
The latest 2023 design flood levels are being used, however the new Flood Hazards H1 to H6 are not yet part of Council's Floodplain Risk Management Plan(s).

Now that the new flood study component has been finalised, the impacts of the new flood study and new hazard categories will be incorporated into a new combined/updated Floodplain Risk Management Plan (assessment of issues/preparation/public exhibition/adjustment/adoption).
The preparation and public exhibition of a new consolidated & updated Floodplain Risk Management Plan can now proceed.
As the flood hazards are determined by the velocity and depth at the centroid of the modelling cells (60m in 2010), and the new study uses a variety of smaller cell sizes with new velocities and depths, individual locations could have lower to higher levels/velocities than earlier models.

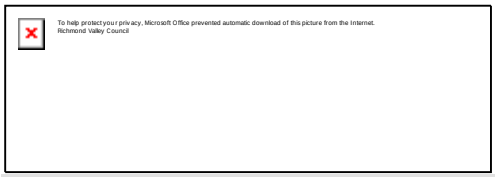
Note: The 2023 flood study was nearing completion when the February/March 2022 major flood event occurred. The significant amount of data collected was then incorporated by our consultant into our new study by calibration against a flood that was well in excess of a 1% Annual Exceedance Probability event in many areas, and included a review of the Flood Frequency Analysis.
Thus our new 2023 flood study is now fully up to date.

In summary

- The new 2023 Flood study was adopted by Council 19 September 2023
- Council has been including its adopted climate change scenario into all flood modelling since 2010.
- There has not been any changes to the current standards.
- The Flood Planning Level (FPL) for residential development is still the 1% Annual Exceedance Probability (AEP) flood level plus a 0.5m freeboard.
- Council's existing Floodplain Risk Management Plan(s) allow for higher Flood Planning Levels for community, and emergency service developments, etc. and lower levels for commercial and industrial development.
- Structural certification against flooding is still a requirement for Flood Hazards greater than current Low Hazard.
- Flood compatible materials etc. is still a requirement below the Flood Planning Level.
- Residential rooms are NOT permitted below the residential Flood Planning Level, this is still a requirement.
- Councils 2021 Development Control Plan (DCP) also includes a depth limit of 2 metres of the 1%AEP flood for residential development.
- So the only change at the moment is using the new flood levels and velocities instead of the old levels and velocities.
- In the future some areas of High Depth may move into H5, with some back to a H4 with their appropriate future Risk Management Plan requirements due to refined smaller grid cells.

I hope this clarifies that structural certification against flooding is not a requirement as the property is within the current Low Hazard Category (1998) whilst using the most recent 2023 flood study flood height and velocity information.

Brian Eggins
Senior Development Engineer
Richmond Valley Council | Locked Bag 10, CASINO NSW 2470
T: 02 6660 0235 | M: 0419 497 495
E: brian.eggins@richmondvalley.nsw.gov.au | https://richmondvalley.nsw.gov.au



From: Melinda Budd <Melinda.Budd@richmondvalley.nsw.gov.au>
Sent: Tuesday, 5 December 2023 12:44 PM
To: Brian Eggins <brian.eggins@richmondvalley.nsw.gov.au>
Subject: FW: 11440 - 35 Cassino Drive - Spaceframe Buildings

Hi Brian,

Sorry I didn't mention these sites he said will become cold storage sites.

Something New.

Thanks

Mel

From: Justin Mendiolea <JustinMendiolea@spaceframe.com>
Sent: Tuesday, 5 December 2023 11:32 AM
To: Melinda Budd <Melinda.Budd@richmondvalley.nsw.gov.au>
Subject: 11440 - 35 Cassino Drive - Spaceframe Buildings

> You don't often get email from justinmendiolea@spaceframe.com. Learn why this is important

Hi Melinda

Thanks for taking the time to chat.

Project: 35 Cassino Drive, Casino NSW 2470

Flood Planning Matrix Assessment and Site Plan attached.

Based on the flood planning matrix, could I please have it confirmed whether Richmond Valley Council require a flood report and detailed flood modelling to support a MCU/DA for the proposed development?

Given the site's location mostly outside 1% AEP flood mapping and lower hazard risk I had assumed this wouldn't be required however would like to explicitly confirm so that I can then address this within the Stormwater Management Plan itself.

Regards

Justin Mendiolea | Chief Design Engineer

P +61 7 3890 9518
M +61 448 332 076
E JustinMendiolea@spaceframe.com

www.spaceframe.com | 225 Queensport Rd North, Murarrie Qld 4172 | PO Box 452, Morningside Qld 4170 | ABN 42 009 930 554 QBCC Licence 47553

APPENDIX D DETENTION CALCULATIONS

1. Rainfall IFD (Taken from BOM) – 35 Cassino Drive, Casino

Location

Label: Not provided

Latitude: -28.8555 [Nearest grid cell: 28.8625 (S)]

Longitude: 153.0693 [Nearest grid cell: 153.0625 (E)]

IFD Design Rainfall Intensity (mm/h)

Issued: 07 December 2023

Rainfall intensity for Durations, Exceedance per Year (EY), and Annual Exceedance Probabilities (AEP).
FAQ for New ARR probability terminology

Table | Chart

Unit: mm/h

	Annual Exceedance Probability (AEP)						
Duration	**63.2%**	**50%#**	**20%***	**10%**	**5%**	**2%**	**1%**
1 min	146	165	224	264	303	354	393
2 min	124	139	187	219	250	293	326
3 min	115	130	174	205	234	275	306
4 min	109	123	166	195	223	261	291
5 min	103	117	158	186	213	250	278
10 min	83.3	94.2	128	151	174	203	225
15 min	70.2	79.4	108	128	146	171	189
20 min	61.0	68.9	93.8	110	127	148	164
25 min	54.0	61.1	82.9	97.6	112	131	145
30 min	48.7	54.9	74.5	87.7	100	117	130
45 min	37.8	42.6	57.7	67.8	77.7	90.9	101
1 hour	31.3	35.2	47.5	55.9	64.1	75.2	83.7

2. Determine Time of concentration – Pre Development

Length of travel for overland flow taken as 85m. Slope 0.5%

Use Friends equation to determine travel time – assume n = 0.1

Table 4.6.5 – Surface roughness or retardance factors

Surface type	Horton's roughness coefficient n*
Concrete or Asphalt	0.010 – 0.013
Bare Sand	0.010 – 0.016
Gravelled Surface	0.012 – 0.030
Bare Clay-Loam Soil (eroded)	0.012 – 0.033
Sparse Vegetation	0.053 – 0.130
Short Grass Paddock	0.100 – 0.200
Lawns	0.170 – 0.480

Friend's Equation

$$t = (107n\,L^{0.333})/S^{0.2} \qquad (4.06)$$

where
- t = overland sheet flow travel time (min)
- L = overland sheet flow path length (m)
- n = Horton's surface roughness factor
- S = slope of surface (%)

	PRE-DEV
Overland Flow	
Hortons Roughness	0.015
Flow Length	150
Slope	0.8
Tc	9

Adopt Time of Concentration (Pre-dev) = 54 Minutes

3. Determine Time of Concentration – Post Development

Critical Flow Path occurs as stormwater travels across hardstand graded towards north then pipe run to bio basin at north boundary.

$$t = L/(60.V) = n \,.\, L \,/\, 60\,(R^{2/3}.\, S^{1/2}) \qquad (4.09)$$

V = average velocity (m/s)
n = Manning's roughness coefficient
R = hydraulic radius (m)
S = friction slope (m/m)
L = length of reach (m)
t = travel time (min)

	PRE-DEV	POST	
Overland Flow			
Hortons Roughness	0.1	0.01	
Flow Length	85	50	m
Slope	0.5	0.1	m/m
Tc	54	6	Minutes
Pipe Flow			
Pipe Length		250	m
Velocity		1.4	m/s
Tc		5.8	Minutes
TOTAL Tc	**54**	**12**	**Minutes**

Adopt Time of Concentration (Post-dev) = 12 Minutes

4. Determine C10 Values

Pre-Development C10 – 0% Impervious, (1)I(10) = 55.9mm/hr. Light cover bushland. Adopt 0.66

Table 4.5.4 – C_{10} values for zero fraction impervious [1]

Land description	Dense bushland			Medium density bush, or Good grass cover, or High density pasture, or Zero tillage cropping			Light cover bushland, or Poor grass cover, or Low density pasture, or Low cover bare fallows		
Intensity (mm/hr) $^1I_{10}$	**Soil permeability**			**Soil permeability**			**Soil permeability**		
	High	**Med**	**Low**	**High**	**Med**	**Low**	**High**	**Med**	**Low**
39–44	0.08	0.24	0.32	0.16	0.32	0.40	0.24	0.40	0.48
45–49	0.10	0.29	0.39	0.20	0.39	0.49	0.29	0.49	0.59
50–54	0.12	0.35	0.46	0.23	0.46	0.58	0.35	0.58	0.69
55–59	0.13	0.40	0.53	0.27	0.53	0.66	0.40	0.66	0.70
60–64	0.15	0.44	0.59	0.30	0.59	0.70	0.44	0.70	0.70
65–69	0.17	0.50	0.66	0.33	0.66	0.70	0.50	0.70	0.70
70–90	0.18	0.53	0.70	0.35	0.70	0.70	0.53	0.70	0.70

Post-Development C10 – Adopt 90% Impervious based on Catchment Area Breakdown. Adopt 0.86

Table 4.5.3 – Table of C_{10} values

Intensity (mm/hr) $^1I_{10}$	Fraction impervious f_i						
	0.00	0.20	0.40	0.60	0.80	0.90	1.00
39-44	Refer to Table 4.5.4	0.44	0.55	0.67	0.78	0.84	0.90
45-49		0.49	0.60	0.70	0.80	0.85	0.90
50-54		0.55	0.64	0.72	0.81	0.86	0.90
55-59		0.60	0.68	0.75	0.83	0.86	0.90
60-64		0.65	0.72	0.78	0.84	0.87	0.90
65-69		0.71	0.76	0.80	0.85	0.88	0.90
70-90		0.74	0.78	0.82	0.86	0.88	0.90

	Area (ha)	Fraction Impervious	C10
Pre	1.1	0	0.66
Post	1.1	0.9	0.86

5. Determine Runoff Volumes

Adopt Rational Method – Q = CIA/360

Rainfall intensity taken from BOM is linearly interpolated to suit Pre and Post development time of concentration.

Basha Method from QUDM 2017 used to determine required Detention Volume.

PRE DEVELOPMENT								
AEP	63%	50%	20%	10%	5%	2%	1%	
45	37.8	42.6	57.7	67.8	77.7	90.9	101	*mm/hr*
51	35.2	39.6	53.6	63.0	72.3	84.6	94.1	*mm/hr*
60	31.3	35.2	47.5	55.9	64.1	75.2	83.7	*mm/hr*
Q	**0.07**	**0.08**	**0.11**	**0.13**	**0.14**	**0.17**	**0.19**	*m/s*
POST DEVELOPMENT								
AEP	63%	50%	20%	10%	5%	2%	1%	
5	103	117	158	186	213	250	278	*mm/hr*
13	76.8	86.9	118.0	140.4	159.4	186.8	206.8	*mm/hr*
15	70.2	79.4	108	129	146	171	189	*mm/hr*
Q	**0.15**	**0.17**	**0.24**	**0.28**	**0.32**	**0.37**	**0.41**	*m/s*
DETENTION VOLUME CALCULATIONS								
AEP	63%	50%	20%	10%	5%	2%	1%	
Qo	0.07	0.08	0.11	0.13	0.14	0.17	0.19	*m3/s*
Qi	0.15	0.17	0.24	0.28	0.32	0.37	0.41	*m3/s*
Qi-Qo	0.08	0.09	0.13	0.15	0.17	0.20	0.23	*m3/s*
Vi	209	236	321	382	433	508	562	*m3*
r	0.54	0.54	0.55	0.55	0.55	0.55	0.55	
Vs/Vi (Basha)	0.46	0.46	0.46	0.47	0.46	0.46	0.46	
Vs	96	109	148	179	201	236	260	*m3*
A	1.09	1.09	1.09	1.09	1.09	1.09	1.09	ha
Vs/A	88	100	136	164	184	216	238	

As described above, 260m3 of on-site detention is required for 1% AEP flows.

6. Find design Detention Volume with permissible reductions
Account for pipe storage, RW tank storage and pit storage.

ITEM	NOTE		Volume
Pipe Storage	*450m @ 300mm Average Diameter*		32
Pits	*28 No. @ 0.2m3 per pit*		6
Total Storage Pipe and Pits			**38**
Total Detention Required			**222**

Required Storage	**222.0**	**m3**
Tank Storage Depth	**1.7**	**m**
Required Det Tank Size	**130.6**	**m2**
Tank 1 - Cassino Drive	**74.4**	**m2 (57% of Imp Area)**
Tank 2 - Irving Drive	**56.2**	**m2 (43% of Imp Area)**

As described above, 222m3 of on-site detention is required for 1% AEP flows with consideration to pipe and pit storage. 126m3 will be provided adjacent Cassino Drive and 99m3 at the basin at Irving Drive.

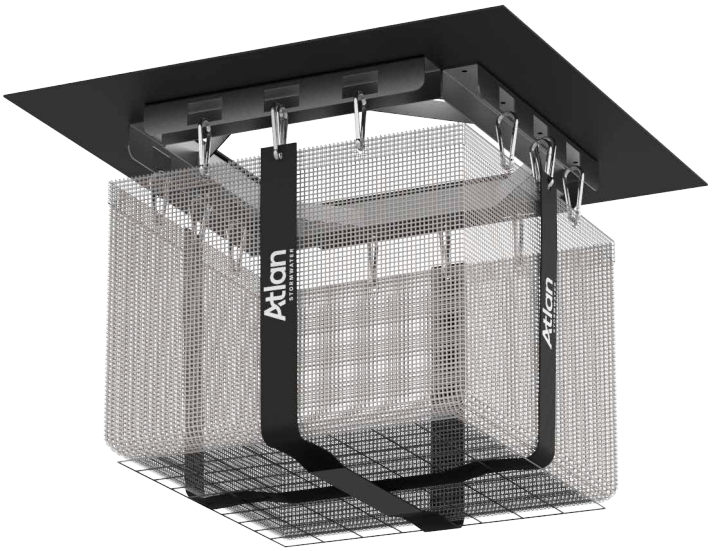
APPENDIX E ATLAN PRODUCT INFORMATION

StormSack

At-Source Gross Pollutant Trap

atlan.com.au

Atlan STORMWATER



APPLICATIONS

- Council storm drain retrofits
- Commercial / retail / residential
- Litter prone urban areas
- Scrap metal / solid waste / oil storage
- Part of treatment train
- Construction sediment / erosion

BENEFITS

- Can be modelled in MUSIC in conjunction with bio-retention
- Low cost gross pollutant capture
- Quick & easy installation
- Simple maintenance
- At-source capture
- Adjusts to custom pit sizes

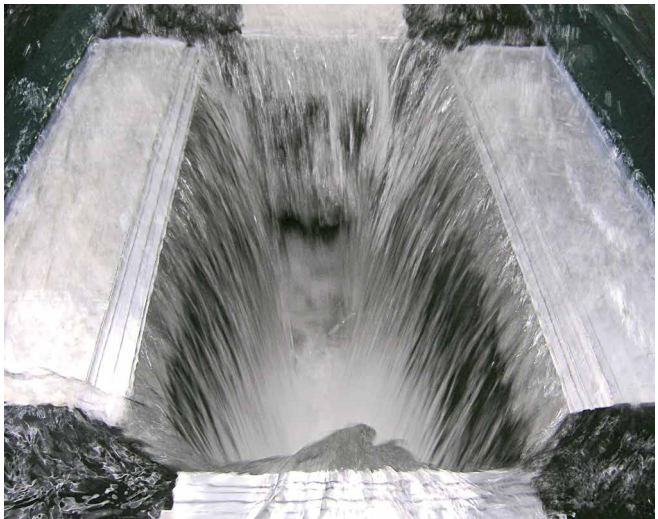
The Atlan StormSack is specifically designed for the capture of gross pollutants, sediment, litter, and oil and grease. Ideally suited for storm drain retrofits, the StormSack's unique design allows maintenance to be performed using conventional vacuum suction equipment.

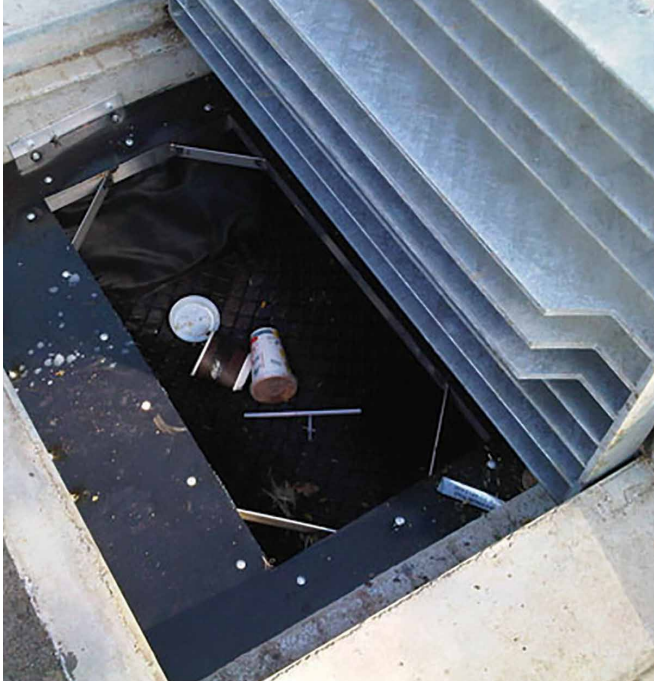
StormSack filtration solutions are highly engineered water quality devices that are deployed directly in the stormwater system to capture contaminants close the surface for ease of maintenance. Easily retrofitted into new or existing structures, StormSack filtration technology is a decentralized approach to stormwater treatment that essentially repurposes traditional site infrastructure and customizes it to meet specific site water quality goals. In this way, it satisfies important objectives of today's LID (Low Impact Development) criteria.

From an operations perspective, catch basins with StormSack filters are also easier and quicker to clean out because pollutants are trapped just under the grate.

The StormSack was introduced to the Australian market in 2012 and field testing is underway at several locations in South-east Queensland. Laboratory testing has shown capture of 99.99% of gross pollutants up to the bypass flow rate. Further results will be provided as they become available.

Recommended minimum clearance from bottom of StormSack to inside bottom of vault is 50mm. Typical frame adjustability range of 127mm in each direction.





HOW IT WORKS

This technology is a post developed stormwater treatment system. The StormSack provides effective filtration of solid pollutants and debris typical of urban runoff, while utilising 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.

Installation procedures shall include removing the storm grate, cleaning the ledge of debris and solids, measuring catch basin clear opening and adjusting flanges to rest on the grate support ledge. Install StormSack with splash guard under curb opening so the adjustable flanges are resting on the grate support ledge. Install corner filler pieces. Reinstall storm grate directly on support flanges rise shall be no more than 3mm.

FEATURES

POLLUTANT	EFFICIENCY
Gross Pollutants (GP)	100%
Total Suspended Solids (TSS)	61%
Total Phosphorus (TP)	28%
Total Nitrogen (TN)	45%

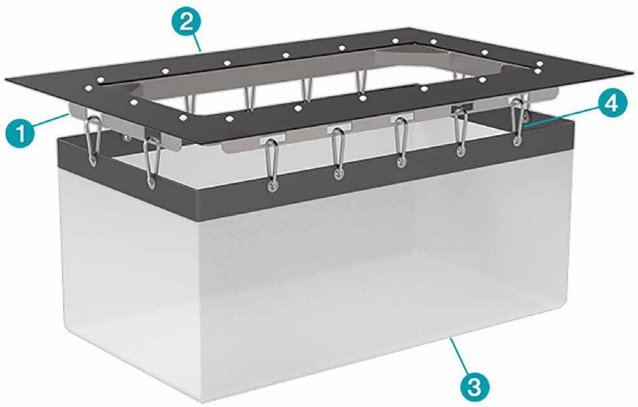
*Contact Atlan to confirm approved performance for the project LGA

MAINTENANCE

Typically the StormSack is serviceable from the street level, and therefore maintenance does not 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 a vactor truck. Use only Atlan replaceable parts.

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 ≥ 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

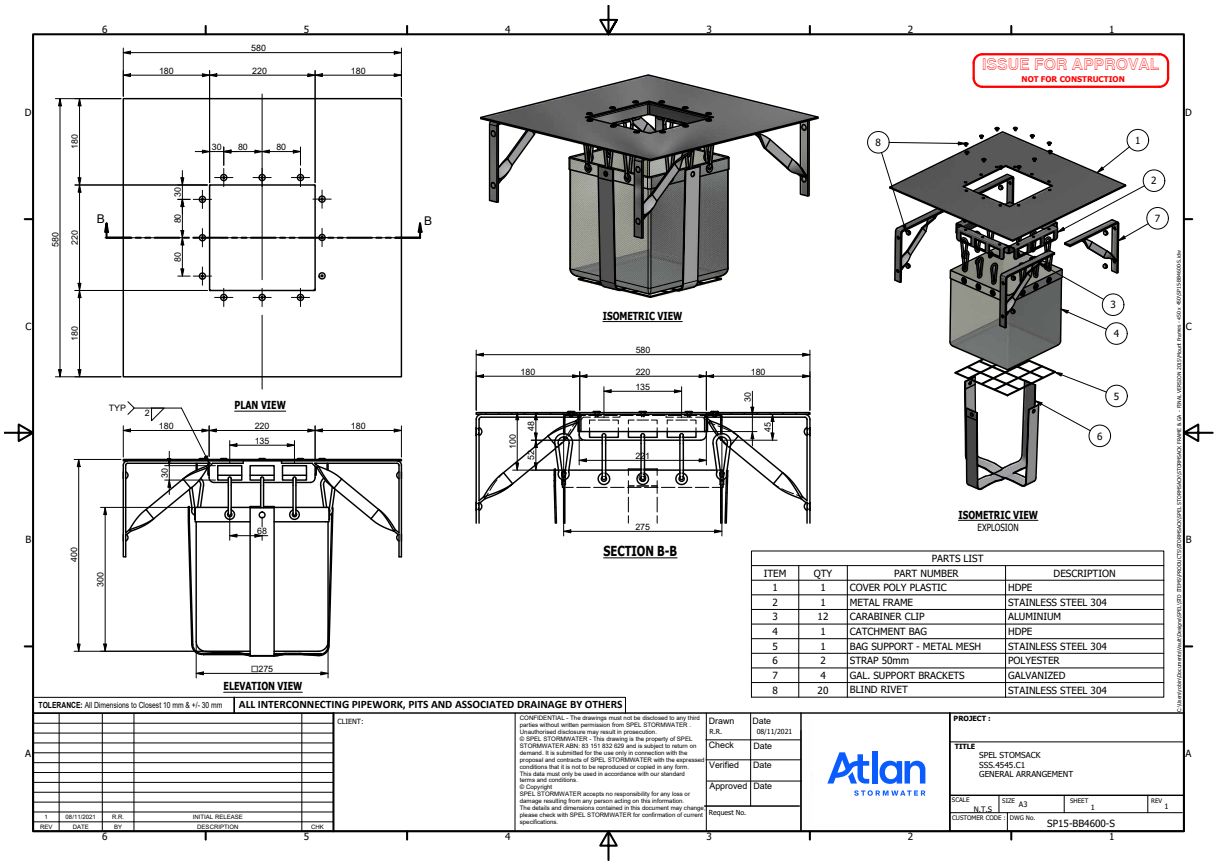
Features	
1.	1. Ultra-Durable Aluminium Frame • Available in 450x450mm, 600x600mm, 600x900mm and 900x900mm sizes • Custom pit arrangements upon request
2.	Black Poly Surround riveted to Frame • Can be cut to suit on site
3.	Reinforced Stormsack Bag • Bag has sewed eyelets • Square bottom design for even distribution
4.	Karabiners attach Bag to Frame for easy service & replacement
5.	5. Aluminium Support Angles & Fixings

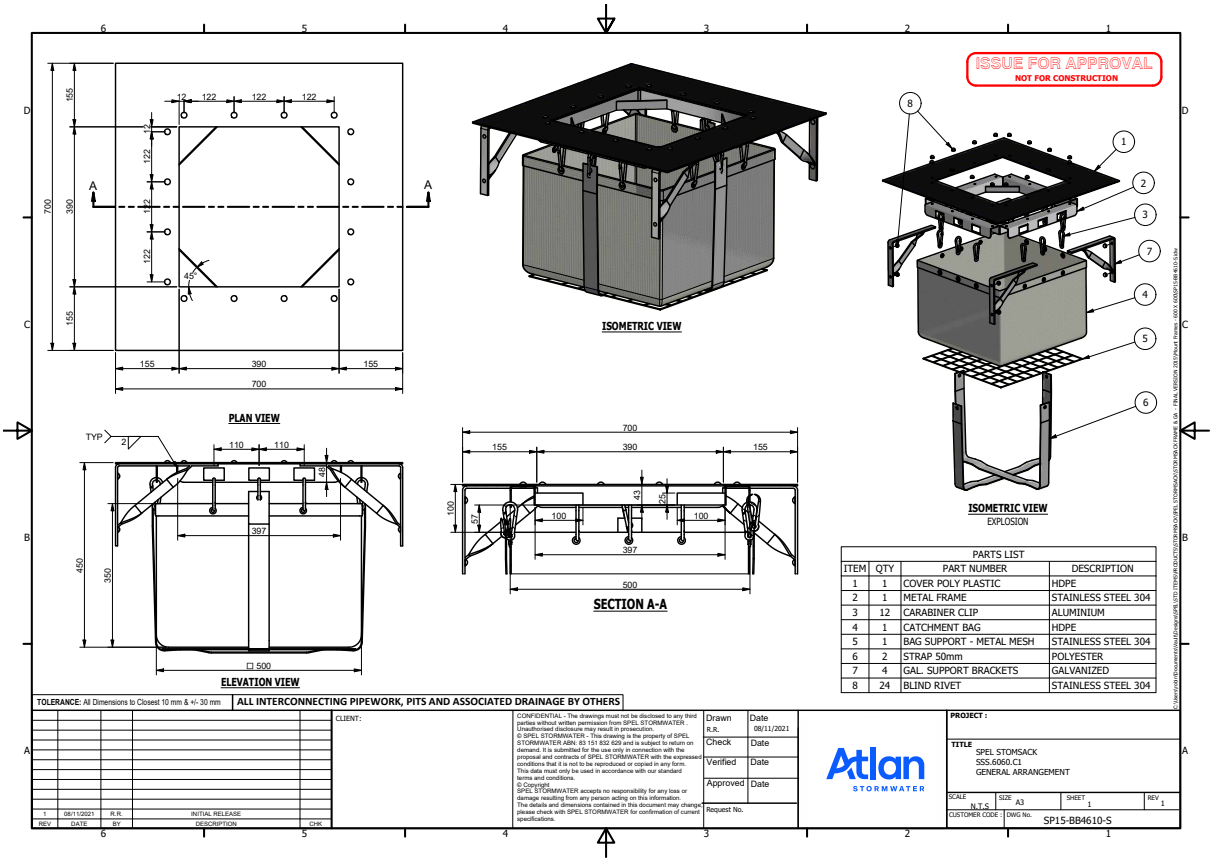


Standard StormSack to suit Pit Sizes
450x450mm
600x600mm
900x600mm
900x900mm

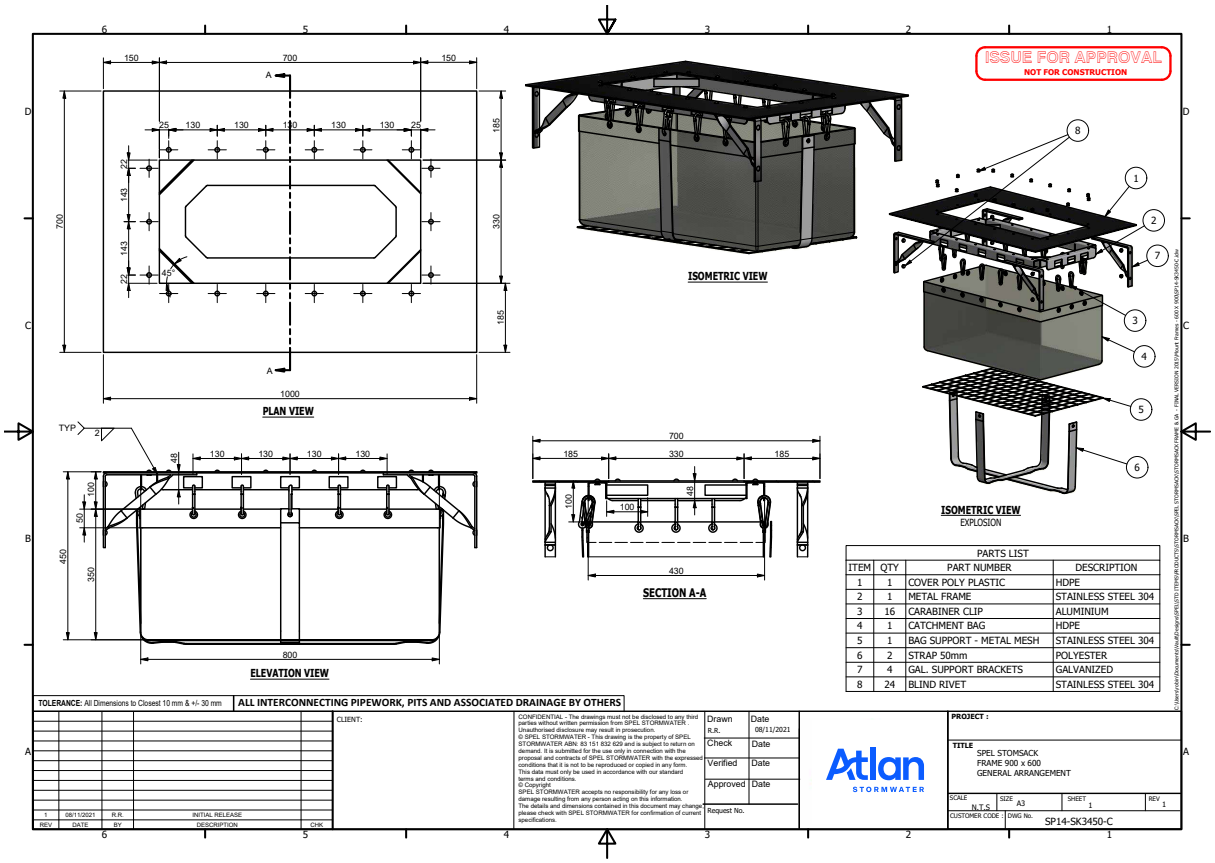
Custom sizes (i.e. 1200x900mm) can be manufactured on short lead times

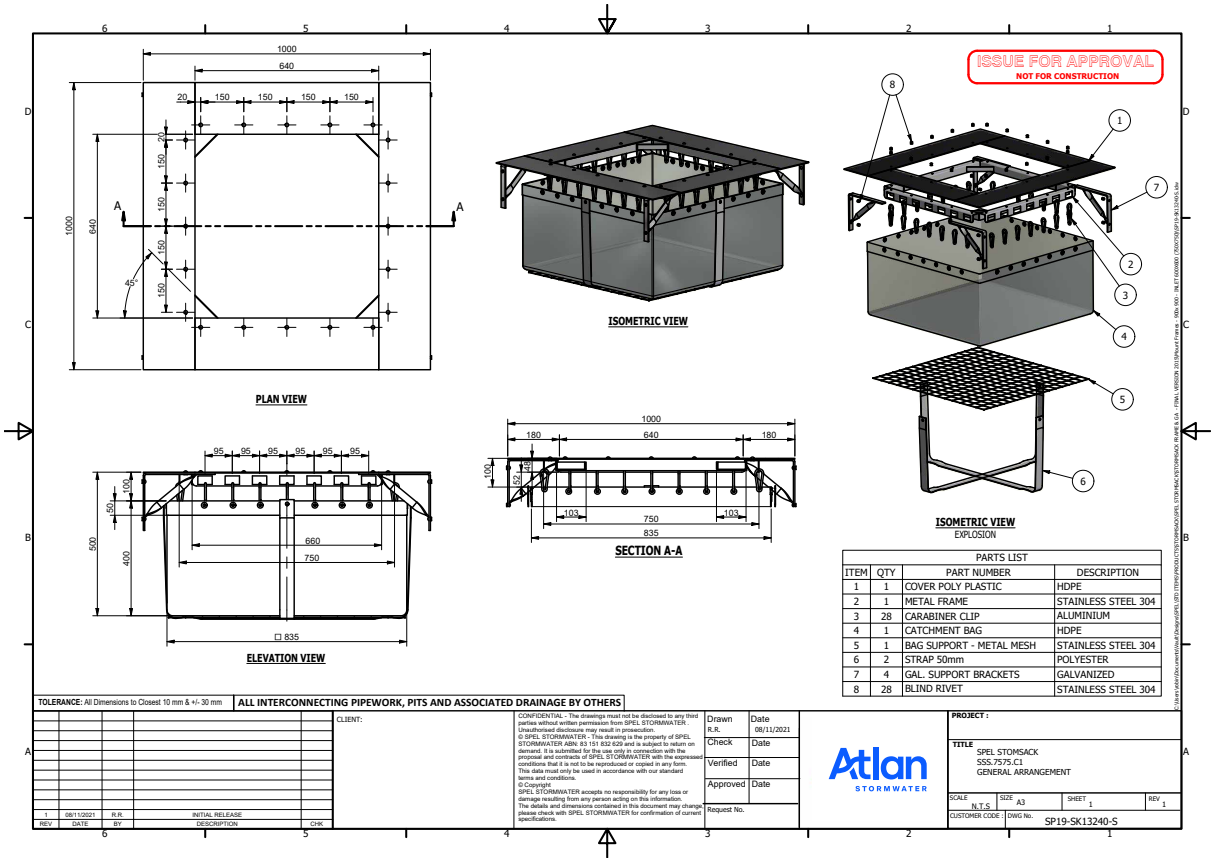
TECHNICAL DRAWINGS



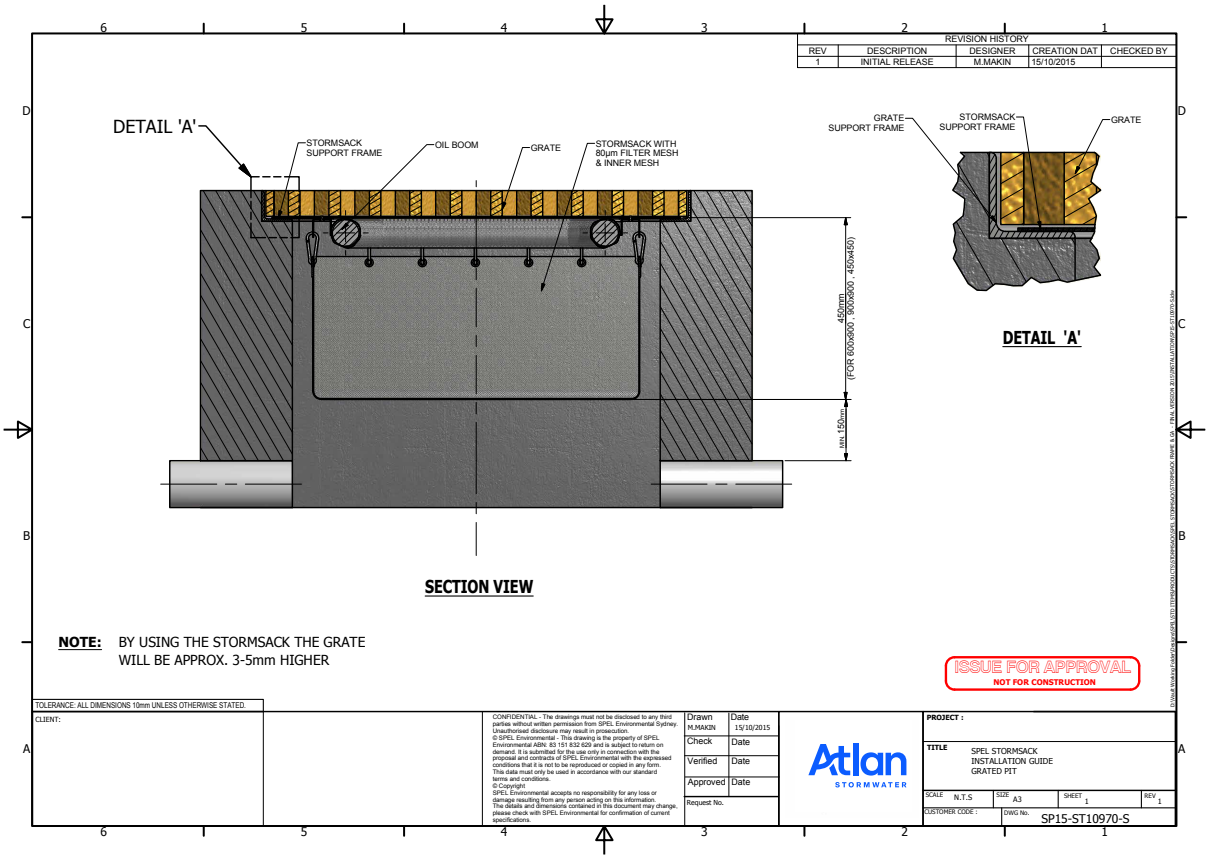


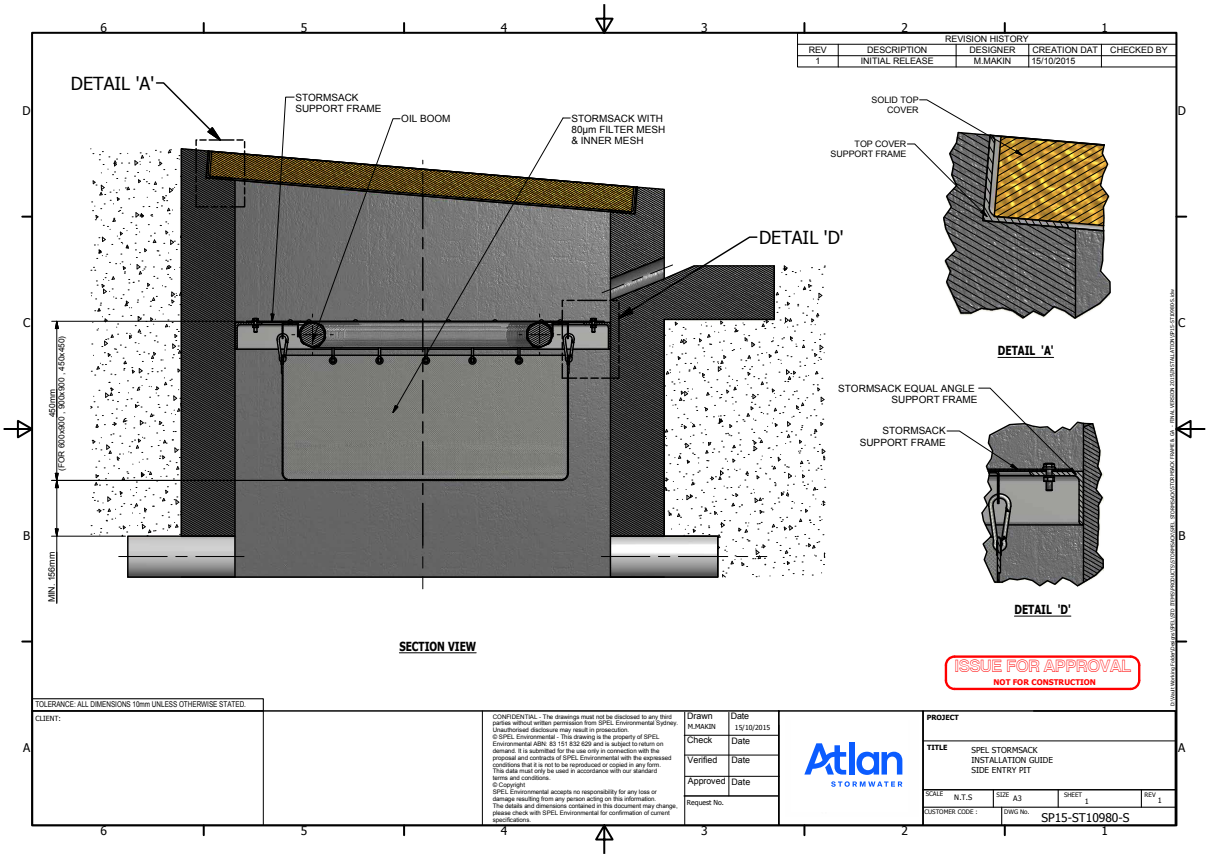
TECHNICAL DRAWINGS





INSTALLATION DETAILS





StormSack

At-Source Gross Pollutant Trap

NSW HEAD OFFICE 100 Silverwater Rd, Silverwater NSW 2128 PO Box 7138, Silverwater NSW 1811 P: +61 2 8705 0255 P: 1300 773 500 nsw.sales@atlan.com.au	**QLD MAIN OFFICE** 130 Sandstone Pl, Parkinson QLD 4115 P: +61 7 3271 6960 P: 1300 773 500 qld.sales@atlan.com.au	**VIC & TAS OFFICE** 897 Wellington Rd Rowville VIC 3178 P: +61 3 5274 1336 P: 1800 810 139 sales@atlan.com.au **VIC GEELONG BRANCH** 70 Technology Close, Corio VIC
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
NZ OFFICE WANGANUI 43 Heads Road Wanganu New Zealand P: +64 6 349 0088 sales@atlan.com.au atlan.co.nz	**NZ OFFICE WELLINGTON** 41 Raiha St Porirua Wellington New Zealand P: +64 4 239 6006 sales@atlan.com.au atlan.co.nz	**NZ OFFICE AUCKLAND** 100 Montgomerie Road Airport Oaks P: +64 9 276 9045 sales@atlan.com.au atlan.co.nz

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

Atlan STORMWATER

P 02 8705 0255 | sales@atlan.com.au
100 Silverwater Rd, Silverwater NSW 2128 Australia
atlan.com.au

Stormwater Quality Improvement Device Evaluation Protocol (SQIDEP)

VERIFICATION CERTIFICATE

Applicant Information

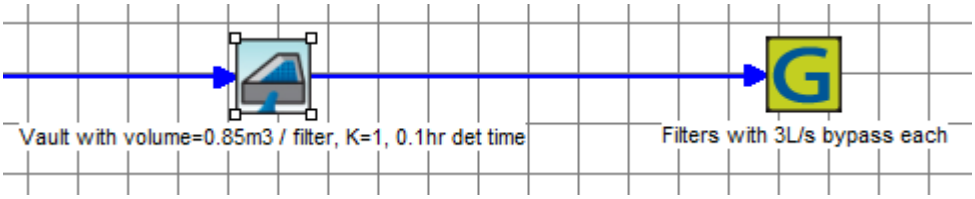
Applicant Name	**SPEL Stormwater Pty Ltd**
Applicant Address	**130 Sandstone Pl, Parkinson QLD 4115**
Phone Number	**+61 1300 773 500**
Email	**sales@spel.com.au**
Website	**www.spel.com.au**

Verified Technology	**SPELFilter**
Issue Date	**23 December 2022**
Reviewed Documents	• SPEL Body of Evidence application submission (Prepared by Drapper Environmental Consultants) • Statutory Declaration by Drapper Environmental Consultants • Hydrographs of compliant and partially compliant events at the Hilton Foods site showing inflow, outflow, rainfall and samples collected (42 items) • Sample collection and/or reset emails/site records at the Hilton Foods site (50 items) • Laboratory Chain of Custody forms, Quality Control reports, QC Compliance Reviews & Certificates of Analysis • Subsequent hydrograph plots for Hilton Foods site that included monitored outflow rates (and summary table of results) – (37 items), 17 October 2022.

Technology Information

Applicant's Verified Performance Claims	Treatable flow rate = 3 L/s per filter cartridge Total Suspended Solids (TSS) 85 % Total Phosphorus (TP) 74 % Total Nitrogen (TN) 59 % Total Petroleum Hydrocarbons 0 % Gross Pollutants 0 %

Maintenance performed during monitoring	None over 13 months

Verified method to model in MUSIC	Modelling a SPELFilter in MUSIC is as follows: 1. Use a detention basin node to represent the vault (with modified 'K' values and nominal detention time set to the treatment flow rate of the cartridges) 2. Use a generic node with the monitored pollutant reduction values and have a high flow bypass of 3 L/s per cartridge.  ● The input criteria for the node is; 1. Use a detention basin node to represent the vault ● with modified 'K' values with K=1 ● use size of 1m^2 per cartridge and 0.85m extended detention depth ● adopt a nominal detention time of 0.1 hours (plus or minus 10%). 2. Use a generic node with: ● a high flow bypass of 3 L/s per cartridge ● pollutant reductions of 85% for TSS ● pollutant reductions of 74% for TP ● pollutant reductions of 59% for TN. When entering the data into MUSIC the detention basin surface area and high flow bypass rate of the generic node is factored up depending on the number of filter cartridges proposed. All other values listed above remain the same (note: the *Notional Detention Time* is adjusted by changing the *Low Flow Pipe Diameter*).

Conditions	The limitations of the acceptance of these claims include: ● Pit insert "Stormsacks" (for coarse material capture) are used for inlets upstream of the SPELFilter installation to ensure longevity of the filters ● Regular inspection & maintenance should be performed in accordance with the Manufacturer's Maintenance Plans.

Independent Reviewers	Dr Robin Allison Dr Ricky Kwan

Accepted by Governance Panel	22 December 2022
Accepted by Stormwater Australia Board	23 December 2022

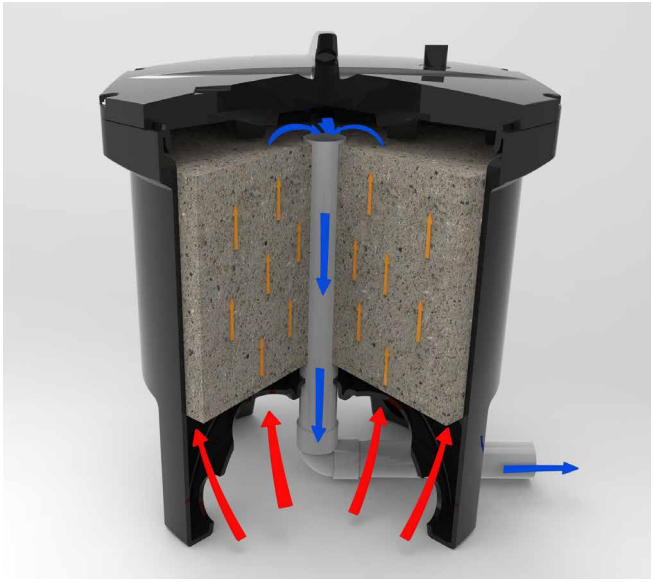
AtlanFilter

Cartridge filter for tertiary stormwater treatment

atlan.com.au

Atlan STORMWATER

Document Set ID: 1924982
Version: 1, Version Date: 10/05/2024



APPLICATIONS

- Car Parks & Shopping Centres
- Council Depots
- Industrial Estates
- Heavy Vehicle Maintenance
- Airport Aprons & Tarmacs
- Transport Depots & Loading Bays
- Tunnels
- Highways & Transport Corridors
- Recycling Yards

AtlanFilter is a cartridge filter system that incorporates an upflow treatment process that maximises surface treatment area. Flow through the filter cartridges utilises a self-regulating siphon which results in low maintenance and high performance stormwater treatment. Automatic backwash technology further lengthens the lifespan of the filter.

Hydraulic pressure forces water through the filter media resulting in a constant velocity throughout the filter area. This ensures consistent media contact time and treatment outcomes.

Optimised to suit your site specific water quality outcomes and local authority requirements, The AtlanFilter has no moving parts and uses a true siphon effect to ensure high-performance pollution removal. These devices maintain excellent removal efficiency whilst maintaining site surface yield.

FEATURES

The media cartridge provides a significantly greater surface contact area to footprint ratio than other filters.

With a flow rate of 3L/s per cartridge and underground installation, the AtlanFilter provides excellent removal efficiency whilst maintaining site surface yield.

- No moving parts, generating a true siphon effect
- Small footprint
- Inorganic filter media (doesn't leach nutrients)
- Can be deployed in various drainage structures such as manholes, OSD tanks, & vaults
- Contains no moving parts

Tested Treatment Efficiencies*

POLLUTANT	EFFICIENCY
Total Suspended Solids (TSS)	85%
Total Phosphorus (TP)	74%
Total Nitrogen (TN)	59%

*Contact Atlan to confirm approved performance for the project LGA

AtlanFilter is SQIDEP approved after passing Stormwater Australia's rigorous testing and performance assessment process.

BENEFITS

PROVEN SAND FILTER PERFORMANCE

The uniform size silica-sand filter media provides higher removal efficiencies than coarser types of media. AtlanFilter media is inorganic – it doesn't leach nitrogen and other nutrients.

Each AtlanFilter automatically backflushes under gravity. The backflush clears most sediment particles from out of the media and back into the vault floor, which allows the hydraulic conductivity from degrading throughout its service life. No moving parts are involved, which increases reliability. The AtlanFilter cartridge design life is in excess of 5 years.

HOW IT WORKS

The AtlanFilter has an upflow treatment process that maximises surface area. The innovative cartridge filter system provides excellent pollutant removal in a small footprint.

Hydraulic pressure forces water through the filter media, which discharges through the centre tube and out through the outlet collection manifold.

Upon completion of a treatment cycle, each cartridge backwashes and effectively dislodges particulates from the filtration layers. This reestablishes filter media porosity. The dislodged particles accumulate on the vault floor for easy removal during maintenance. AtlanFilter's design has no moving parts and generates a true siphon effect.

AtlanFilters are often installed downstream of nearby devices in a treatment train. For example, a Flowceptor Class 1 upstream greatly increases the life cycle interval of the AtlanFilter. These devices will remove larger gross pollutants, coarse sediments, total suspended solids and hydrocarbons - enabling the AtlanFilter to target fine particulate matter and nutrients.

FLEXIBILITY

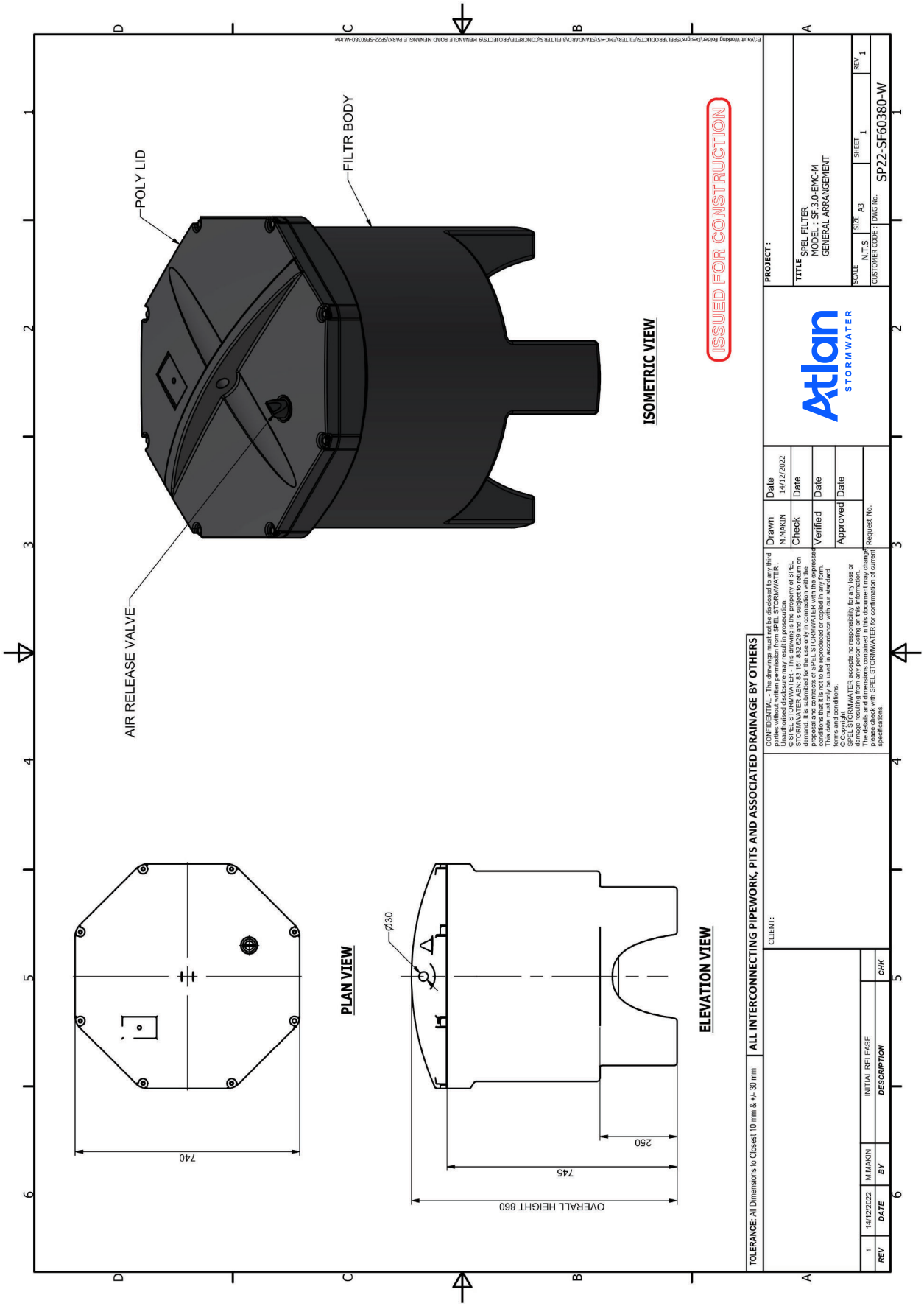
Due to greater surface area and high flow capacity, combined with the modular cartridge design, the AtlanFilter systems can be deployed in a variety of structures including manholes, precast vaults, and cast-in-place structures.

Each system is optimised to suit your specific site and local authority requirements by qualified and experienced professionals.

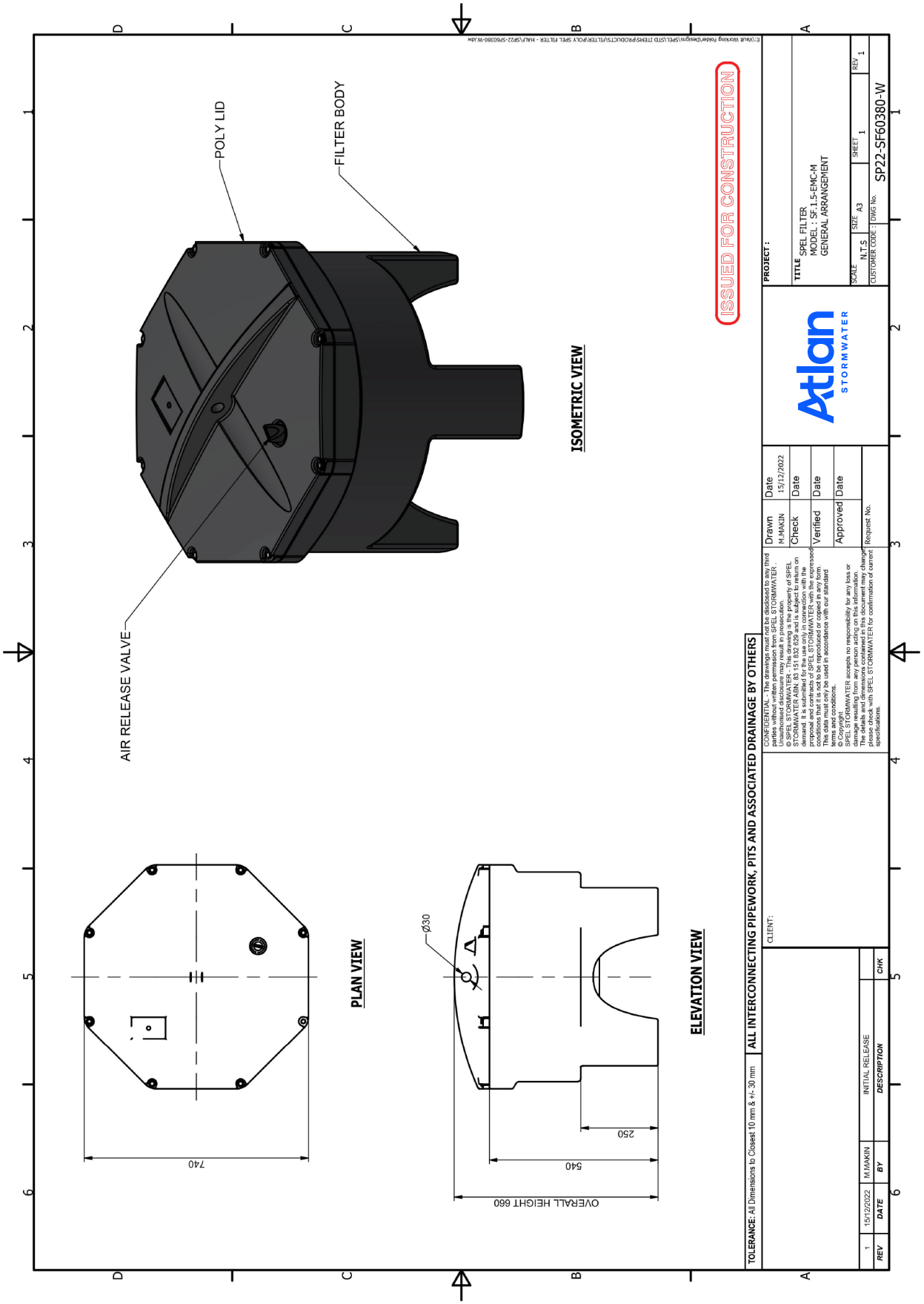
SIZE SPECIFICATIONS

ATLAN FILTER	FULL HEIGHT FIL.30-EMC-M	HALF HEIGHT FIL.15-EMC-M
Total height	860mm	660mm
Diameter	740mm	740mm
Minimum head required	850mm	550mm
Treatment flow rate	3.0L/s	1.5 L/s
Height of inlet ports above vault floor	250mm	250mm
Filtered water collection pipe diameter	50mm	50mm

DRAWING - FULL HEIGHT

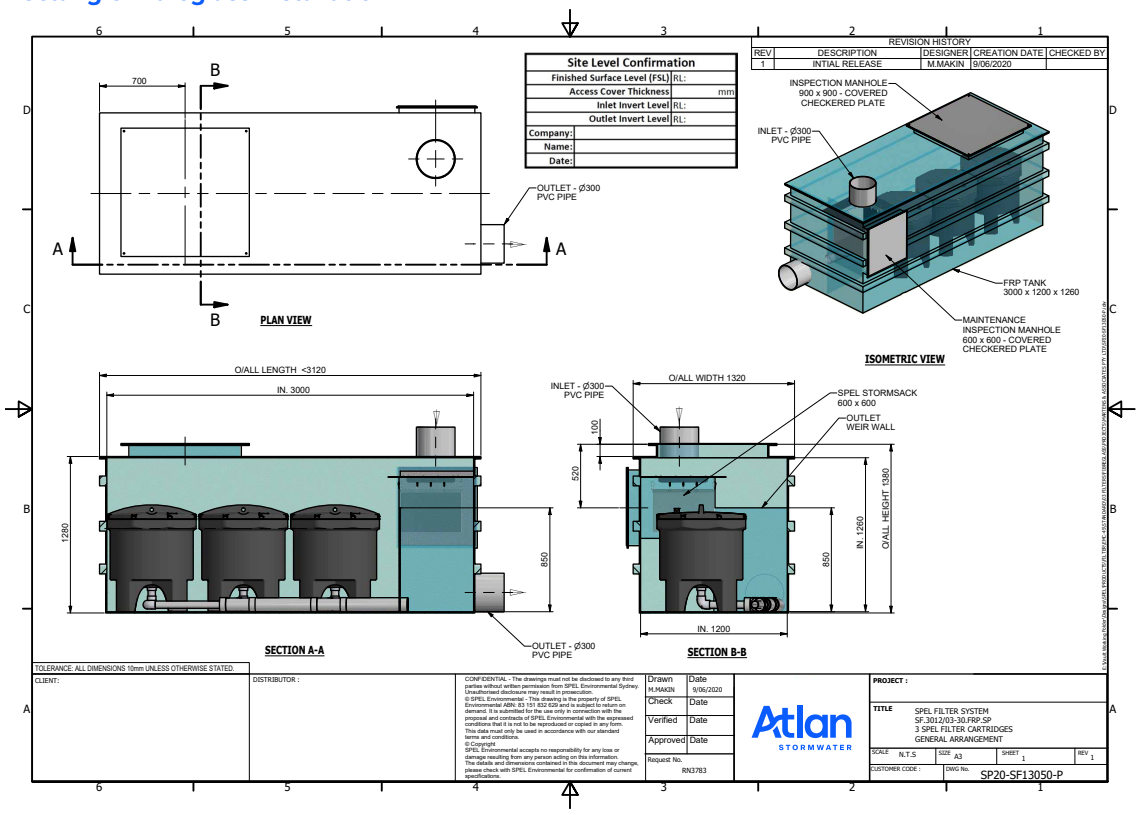


DRAWING - HALF HEIGHT

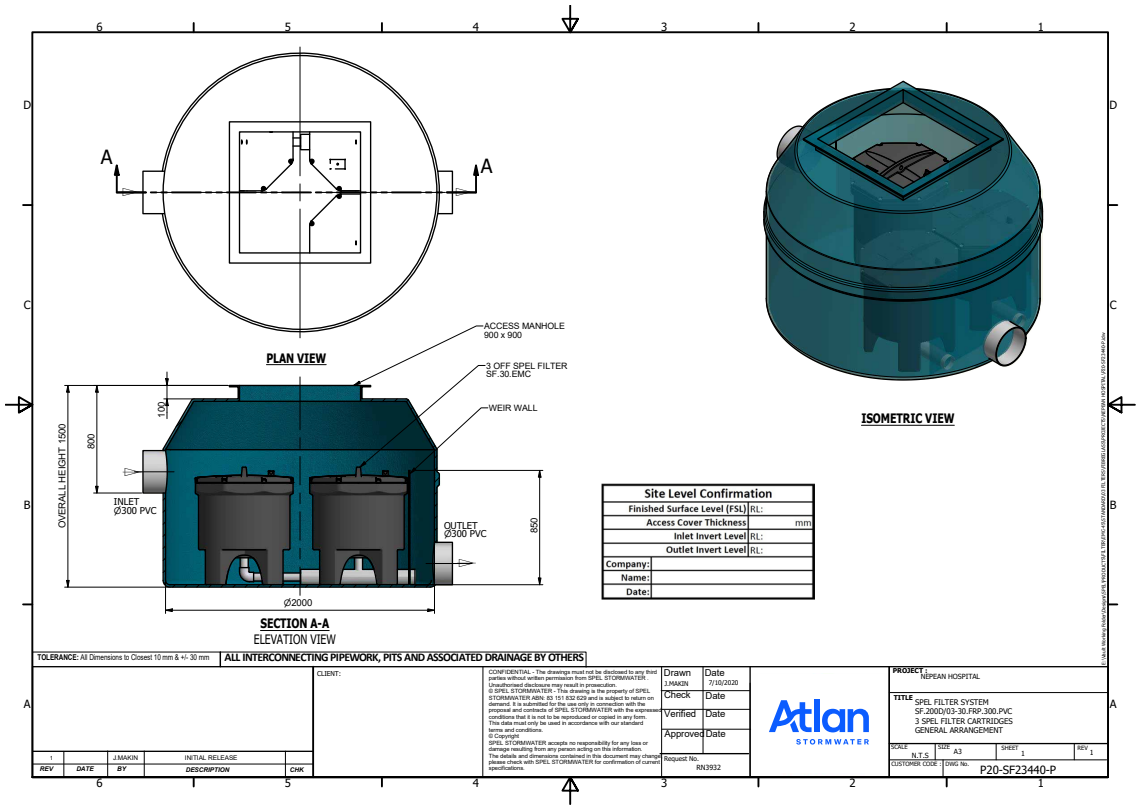


DRAWINGS

Rectangle Fibreglass Installation

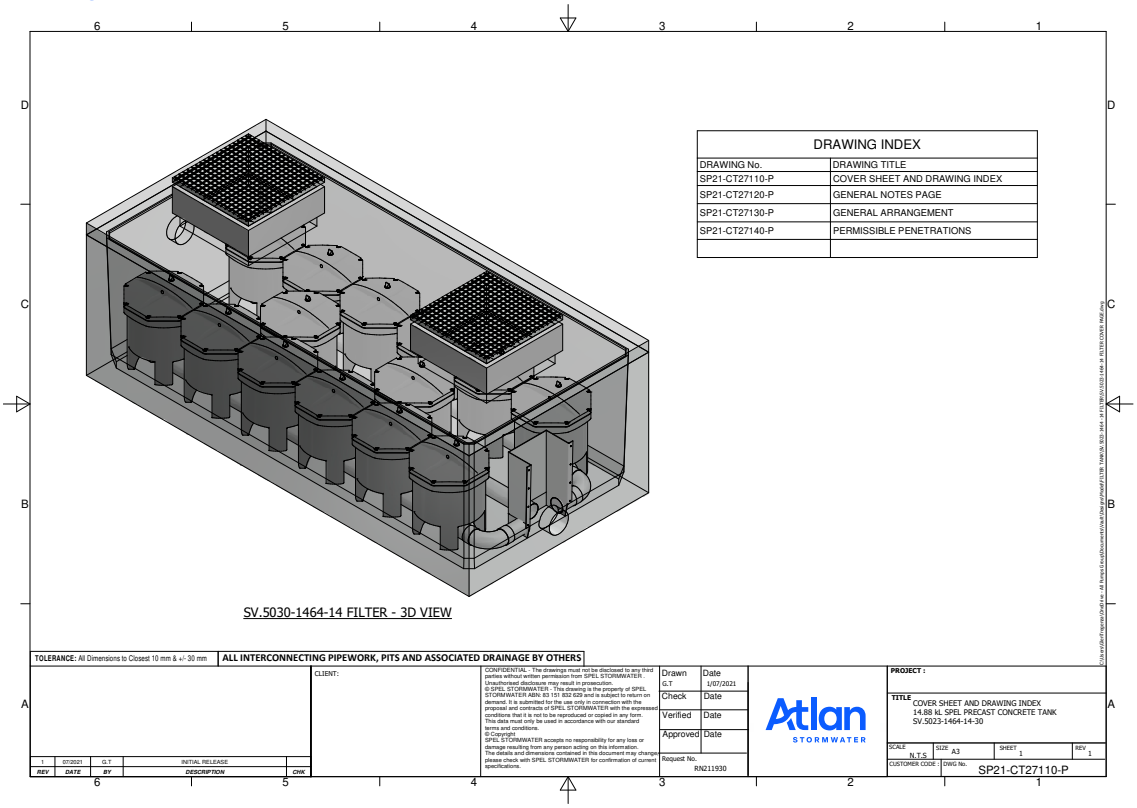


Round Fibreglass Tank Installation



DRAWINGS

Rectangle Concrete Installation



DRAWING INDEX	
DRAWING No.	DRAWING TITLE
SP21-CT27110-P	COVER SHEET AND DRAWING INDEX
SP21-CT27120-P	GENERAL NOTES PAGE
SP21-CT27130-P	GENERAL ARRANGEMENT
SP21-CT27140-P	PERMISSIBLE PENETRATIONS

SV.5030-1464-14 FILTER - 3D VIEW

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

ALL INTERCONNECTING PIPEWORK, PITS AND ASSOCIATED DRAINAGE BY OTHERS

CLIENT:

REV	DATE	BY	DESCRIPTION	CHK
1	07/2021	G.T	INITIAL RELEASE	

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Drawn	G.T	Date 1/07/2021
Check		Date
Verified		Date
Approved		Date
Request No.	RN211930	

Atlan STORMWATER

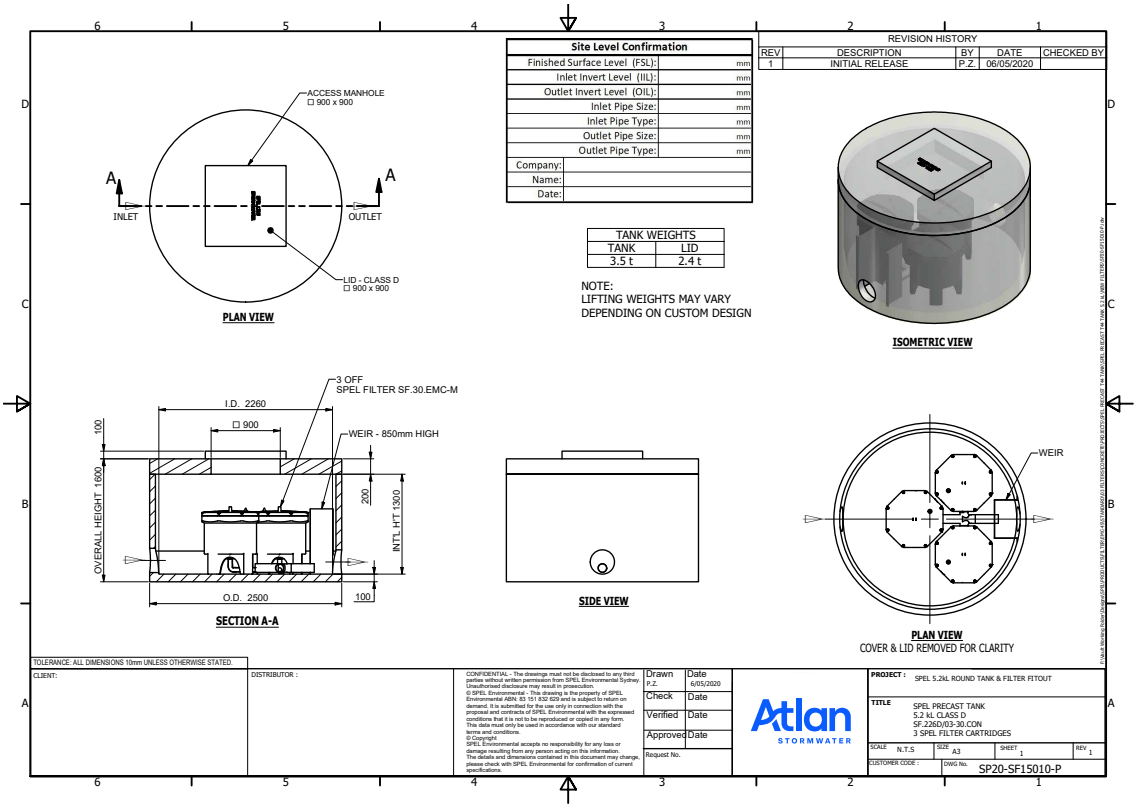
PROJECT :

TITLE: COVER SHEET AND DRAWING INDEX
14.88 kL SPEL PRECAST CONCRETE TANK
SV.5023-1464-14-30

SCALE N.T.S | SIZE A3 | SHEET 1 | REV 1

CUSTOMER CODE : | DWG No. SP21-CT27110-P

Round Concrete Tank Installation



Site Level Confirmation	
Finished Surface Level (FSL):	mm
Inlet Invert Level (IIL):	mm
Outlet Invert Level (OIL):	mm
Inlet Pipe Size:	mm
Inlet Pipe Type:	mm
Outlet Pipe Size:	mm
Outlet Pipe Type:	mm
Company:	
Name:	
Date:	

REVISION HISTORY				
REV	DESCRIPTION	BY	DATE	CHECKED BY
1	INITIAL RELEASE	P.Z.	06/05/2020	

ACCESS MANHOLE □ 900 x 900
INLET
OUTLET
LID - CLASS D □ 900 x 900

PLAN VIEW

TANK WEIGHTS	
TANK	LID
3.5 t	2.4 t

NOTE:
LIFTING WEIGHTS MAY VARY DEPENDING ON CUSTOM DESIGN

ISOMETRIC VIEW

3 OFF SPEL FILTER SF.30.EMC-M
I.D. 2260
□ 900
WEIR - 850mm HIGH
100
OVERALL HEIGHT 1600
200
INTL HT 1300
100
O.D. 2500

SECTION A-A

SIDE VIEW

WEIR

PLAN VIEW
COVER & LID REMOVED FOR CLARITY

TOLERANCE: ALL DIMENSIONS 10mm UNLESS OTHERWISE STATED.

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Drawn	P.Z.	Date 6/05/2020
Check		Date
Verified		Date
Approved		Date
Request No.		

Atlan STORMWATER

PROJECT : SPEL 5.2kL ROUND TANK & FILTER FITOUT

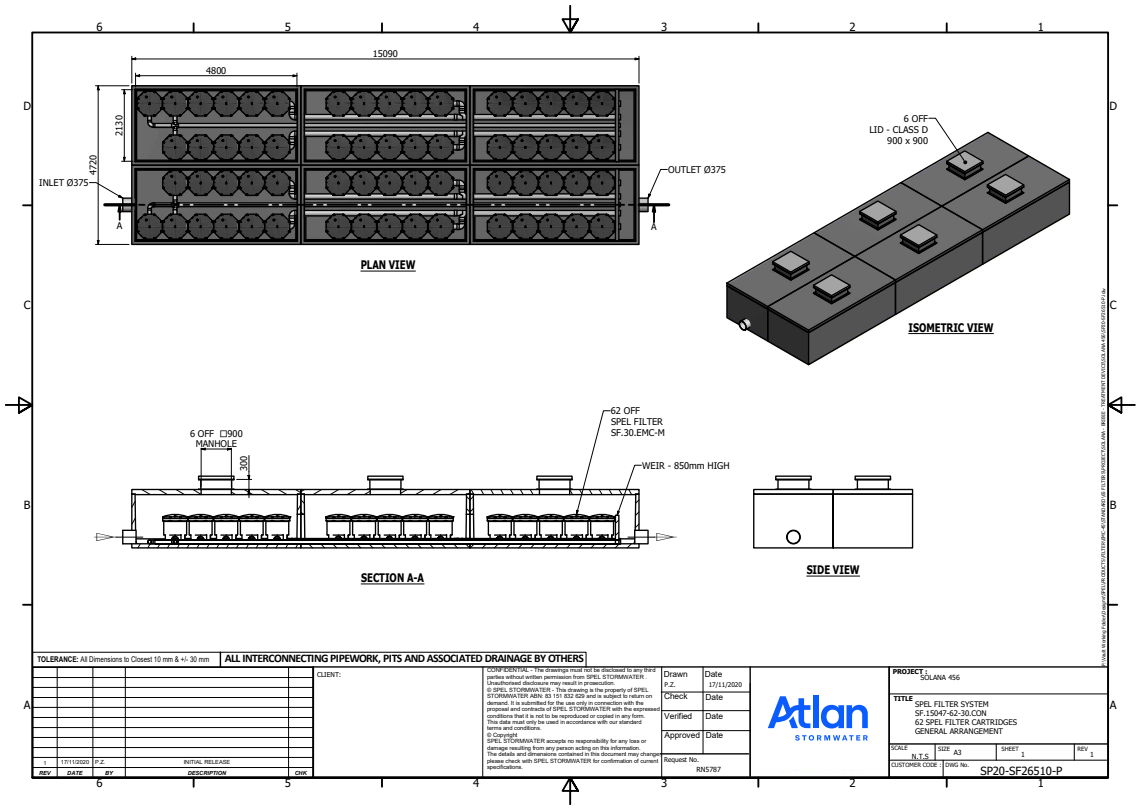
TITLE: SPEL PRECAST TANK
5.2 kL CLASS D
SF.226D/03-30.CON
3 SPEL FILTER CARTRIDGES

SCALE N.T.S | SIZE A3 | SHEET 1 | REV 1

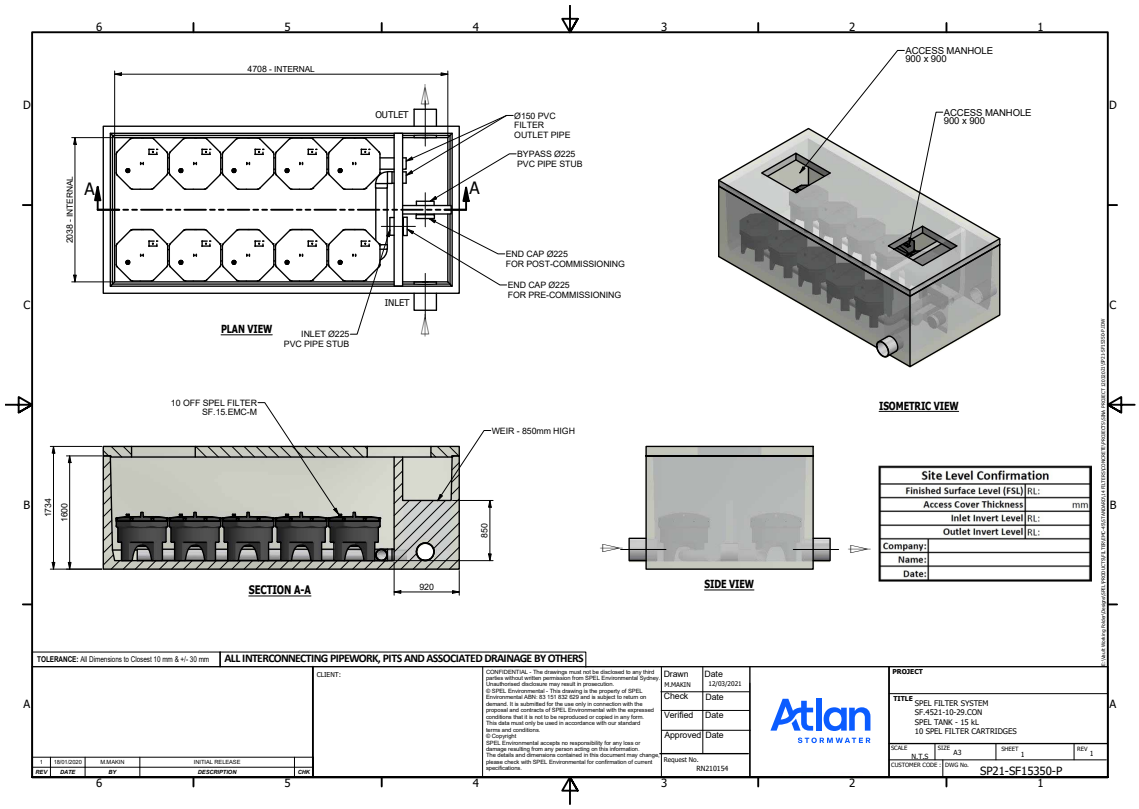
CUSTOMER CODE : | DWG No. SP20-SF15010-P

DRAWINGS

Modular Filtration Tank Installation



Internal Bypass Arrangement Tank



AtlanFilter

Cartridge filter for tertiary stormwater treatment

NSW HEAD OFFICE 100 Silverwater Rd, Silverwater NSW 2128 PO Box 7138, Silverwater NSW 1811 P: +61 2 8705 0255 P: 1300 773 500 nsw.sales@atlan.com.au	**QLD MAIN OFFICE** 130 Sandstone Pl, Parkinson QLD 4115 P: +61 7 3271 6960 P: 1300 773 500 qld.sales@atlan.com.au	**VIC & TAS OFFICE** 897 Wellington Rd Rowville VIC 3178 P: +61 3 5274 1336 P: 1800 810 139 sales@atlan.com.au **VIC GEELONG BRANCH** 70 Technology Close, Corio VIC
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
NZ OFFICE WANGANUI 43 Heads Road Wanganu New Zealand P: +64 6 349 0088 sales@atlan.com.au atlan.co.nz	**NZ OFFICE WELLINGTON** 41 Raiha St Porirua Wellington New Zealand P: +64 4 239 6006 sales@atlan.com.au atlan.co.nz	**NZ OFFICE AUCKLAND** 100 Montgomerie Road Airport Oaks P: +64 9 276 9045 sales@atlan.com.au atlan.co.nz

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

Atlan STORMWATER

P 02 8705 0255 | sales@atlan.com.au
100 Silverwater Rd, Silverwater NSW 2128 Australia
atlan.com.au

0723

APPENDIX F PROPOSED STORMWATER DESIGN

EXISTING RCP
20.29

IRVING DRIVE DETENTION TANK
HOLDING VOLUME = 99m3

3No. ATLAN FULL HEIGHT SQIDEP
FILTERS HOUSED IN TANK

EXISTING RCP
20.48

CROSSOVER TO
NORTHERN RIVERS
LOCAL GOVERNMENT
STANDARDS

CASINO DRIVE DETENTION TANK
HOLDING VOLUME = 126m3

3No. ATLAN FULL HEIGHT SQIDEP
FILTERS HOUSED IN TANK

EXISTING RCP
20.12

IRVING DRIVE

CROSSOVER TO

AUTOMATIC
SLIDING GATE

SCREENED
DRY WASTE BIN
ENCLOSURE

CAP CONNECTION
FOR FUTURE
STAGE

FUTURE MINIMUM FFL OF 22.25
REQUIRED BY FLOOD PLAN

PROPOSED HARDSTAND
10,092m² IMPERVIOUS AREA

PAVEMENT DESIGNED TO FALL TO
PERIMETER IN-GROUND PITS TYPICAL

PROPOSED BUILDING
FFL 22.40

CAP CONNECTION
FOR FUTURE
STAGE

300Ø
225Ø
150Ø
450Ø
375Ø
225
150
300

SCHEDULE:

150Ø	STAGE 1 HARDSTAND DRAINAGE PIPE (BLACKMAX)
150	ROOF DRAINAGE PIPE (BLACKMAX)
150	ROOF DOWNPIPE (PVC)
	GRATED PIT w/STORMSACK

SITE PLAN
1 : 250 @ A1

GENERAL NOTES

UNLESS NOTED OTHERWISE:

1. INDUSTRIAL CROSSOVERS TO BE CONSTUCTED AS PER LOCAL AUTHORITY STANDARD DETAIL DRAWINGS.
2. 150mm WIDE CONCRETE KERBING TO CARPARK AND DRIVEWAY PERIMETER - WHERE SHOWN.
3. PROVIDE DISABLED ACCESS FROM CARPARK TO BUILDING RAMPS TO BE MAXIMUM GRADES OF 1:20 ACROSS CAR TURNING AREA WITH MAXIMUM 3mm STEP UP FROM RAMP TO FLOOR TO COMPLY WITH AS1428.1-2001.
4. ALL RAMPS FROM CARPARK TO TENANCY ENTRY DOORS TO BE 1:14 MAXIMUM GRADIENT.

KEY

- E — E — EXISTING ELECTRICAL
- // — // — EXISTING FENCING
- G — G — EXISTING GAS
- S — S — EXISTING SEWER
- D — D — EXISTING STORMWATER
- T — T — EXISTING TELECOM
- W — W — EXISTING WATER LINE
- PROPOSED FENCING: 1.8m HIGH BLACK PVC COATED CHAINWIRE WITH 3x ROWS BARBED WIRE
- PROPOSED FENCING: 1.8m HIGH SPEARTOP, BLACK POWDERCOATED.

SITE INFORMATION

SITE AREA

LOT 1 on DP1127894 & LOT 533 on DP1047352		12,045 m²
IMPERVIOUS AREA	92%	11,089 m²
LANDSCAPING	8%	956 m²

FLOOR AREA

TOTAL	1,273 m²
STAGE 1	
GROUND FLOOR	
DRYSTORE	872 m²
OFFICE	205 m²
FIRST FLOOR	
OFFICE	195 m²

PARKING

CAR PARKS (INCLUDING PWD)	37

SITE PLAN_STAGE 1
SPRING GROVE
35 CASSINO DRIVE
CASINO NSW 2470
DWG N° 11440-11-4 by IM
DATE 27/02/2023

spaceframe
DESIGN + CONSTRUCT SOLUTIONS

J:\1 Projects\2 Current_Projects\11440-N-Spring_Grove_Casino\3. CAD Drawings\4_Quote\8.CAD\4742_MCU.rvt
27/02/2024 2:36:51 PM

EXISTING RCP
20.29

IRVING DRIVE DETENTION TANK
HOLDING VOLUME = 99m3

3No. ATLAN FULL HEIGHT SQIDEP
FILTERS HOUSED IN TANK

CASSINO DRIVE

EXISTING RCP
20.48

CASINO DRIVE DETENTION TANK
HOLDING VOLUME = 126m3

3No. ATLAN FULL HEIGHT SQIDEP
FILTERS HOUSED IN TANK

EXISTING RCP
20.12

IRVING DRIVE

EXISTING HARDSTAND

PROPOSED EXTENSION
FFL 22.50

EXISTING BUILDING

FUTURE MINIMUM FFL OF 22.25
REQUIRED BY FLOOD PLAN

DESIGN FFL = 22.4 MIN TBC

SUNKEN LOADING AREA

PROPOSED EXTENSION
FFL 22.50

STORMWATER PLAN
1 : 250 @ A1

SCHEDULE:

150Ø	STAGE 1 DRAINAGE PIPE (BLACKMAX)
150	STAGE 2, 3 ROOF DRAINAGE PIPE (BLACKMAX)
150	ROOF DOWNPIPE (PVC)
	GRATED PIT w/STORMSACK

STORMWATER PLAN_STAGE 3

SPRING GROVE

35 CASSINO DRIVE
CASINO NSW 2470

DWG N° 11440-34-1 by IM
DATE 07/11/2023

space frame
DESIGN + CONSTRUCT SOLUTIONS

N:\11440-N-Spring_Grove_Casino\11440-N-Spring_Grove_Casino\3. CAD Drawings\4_Quote\8.CAD\4742_MCU.rvt
7/11/2023 11:43:05 AM

DESIGN + CONSTRUCT SOLUTIONS

SPACEFRAME BUILDINGS PTY LTD ABN 42 009 930 554 QBCC Licence 47553
225 Queensport Rd North, Murarrie Qld 4172 Australia | PO Box 452, Morningside Qld 4170 Australia
P +61 7 3890 9500 | **F** +61 7 3890 9533 | **E** mail@spaceframe.com | **W** www.spaceframe.com