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**WGA**

WALLBRIDGE GILBERT  
AZTEC

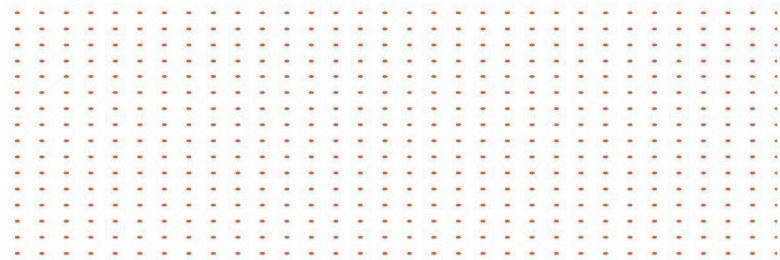
RYMAN HEALTHCARE

**62-94 Jacksons  
Road, Mulgrave  
VIC 3170**

**STORMWATER MANAGEMENT  
STRATEGY**

Project No. WGA211901  
Doc No. WGA211901-RP-CV-0001[B]  
Rev. B

16 December 2021



WGA

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**Revision History**

Rev	Date	Issue	Originator	Checker	Approver
<b>A</b>	8/12/2021	Issued for Comment	SK	CP	CP
<b>B</b>	16/12/2021	Issued for TP Submission	SK	CP	CP

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**Appendix A** Legal Point of Discharge

**Appendix B** Catchment Plan

**Appendix C** Site Drainage Layout Plan

**Appendix D** OSD Calculations

**Appendix E** Treatment Train Units General Assembly and Maintenance Schedule

# 1 INTRODUCTION

## 1.1 BACKGROUND

Wallbridge Gilbert Aztec (WGA) was engaged by Ryman Healthcare to prepare a stormwater treatment and management strategy for the proposed development of a new retirement community located at 62-94 Jacksons Road, Mulgrave VIC 3170.

This strategy applies methodologies to manage both the quantity and quality of stormwater from the proposed development.

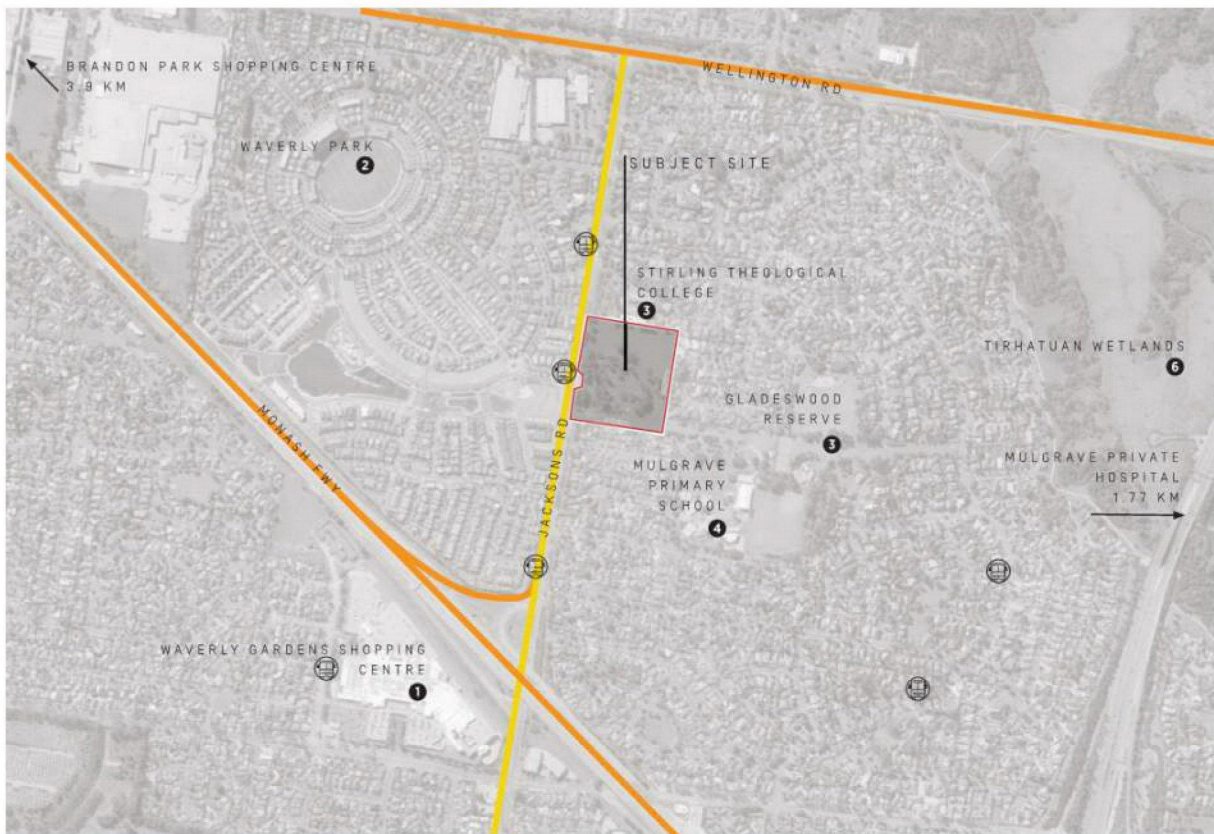


Figure 1: Site Locality

## 1.2 SCOPE AND PURPOSE

This strategy addresses the stormwater quality treatment requirements and management defined in The City of Monash Clause 22.04 Stormwater Management Policy, Urban Stormwater Best Practice Environmental Management Guidelines (BPEMG) and by the Environment Protection Authority (EPA).

These requirements apply to:

- Stormwater runoff volume and flow management
- Quality of stormwater discharged

The intent of this report is to provide the strategic basis for the management of stormwater on the development based on the following:

- Reduction in peak discharge and flow management through on-site detention
- Reduction in pollutants through the implementation of WSUD practices
- Schematic layout of the drainage network and connection to the Legal Point of Discharge (LPD)

This report presents the proposed strategy. Detailed design of stormwater elements will be undertaken during a future design development phase.

## 1.3 STORMWATER MANAGEMENT REQUIREMENTS

The following listed authorities have guidelines and requirements relevant to stormwater quality and treatment.

### 1.3.1 City of Monash (Council)

- The City of Monash Clause 22.04 Stormwater Management Policy
  - Discharge to the legal point of discharge is to be restricted to the pre-development 5-year ARI, 5 min storm event for 10-year ARI post-development.
- The City of Monash Clause 53.18 Stormwater Management in Urban Development

### 1.3.2 Urban Stormwater Best Practice Environmental Management Guidelines (CSIRO, 1999)

The BPEMG establishes stormwater quality objectives and best practice for stormwater management necessary to meet the State Environment Protection Policy (Water for Victoria).

- The following listed water quality treatment reduction targets of the typical urban average annual load as follows:
  - Total Suspended Solids (TSS) – 80%
  - Total Phosphorus (TP) – 45%
  - Total Nitrogen (TN) – 45%
  - Retention of litter – 70%

### 1.3.3 References

The stormwater management strategy is developed to encompass the design criteria in accordance with the following recognised references:

- City of Monash Clause 22.04 Stormwater Management Policy
- The City of Monash Clause 53.18 Stormwater Management in Urban Development

- State Environment Protection Policy (Waters of Victoria), Environment Protection Authority (2003)
- Urban Stormwater Best Practice Environmental Management Guidelines, CSIRO (1999)
- Water Sensitive Urban Design – Engineering Procedures: Stormwater, Melbourne Water, CSIRO (2005)
- Australian Runoff Quality, Engineers Australia (2006)

These handbooks and guidelines are considered Australian and Victorian practice standards and cover all aspects of stormwater management. This includes the design for stormwater quality improvement. The Stormwater Management Strategy adopts the design standards, principles and practices covered by the handbooks.

# 2 DEVELOPMENT OVERVIEW

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## 2.1 EXISTING SITE

The site is located at 62-94 Jacksons Road, Mulgrave and is currently a reserve approximately 4.7 hectares in size. It is bounded by Jacksons Road to the West, residential properties to the South and East and Stirling Theological College to the North. The site generally falls from the South-West towards the North-East, from RL88.80 to RL77.40, at a fall of approximately 1 in 23.

## 2.2 PROPOSED DEVELOPMENT OVERVIEW

The proposed development will consist of approximately 70 Villas surrounding a central six-storey multipurpose building, including lower ground floor predominately used for parking facilities. The multistorey building has four four-storey towers with a shared ground and lower ground floor level and comprises of 103 two-bed and three-bed units, as well as a café, salon, library, and other facilities within the shared ground floor level. Further car parking and activities area including bocce and lawn bowls facilities is provided along the southern boundary of the site.



Figure 2: Proposed Development



# 3 STORMWATER MANAGEMENT STRATEGY

## 3.1 LEGAL POINT OF DISCHARGE (LPD)

The existing site is currently serviced by a stormwater pit located in the North-East corner (the natural low point) of the site within a drainage easement approximately 9m<sup>2</sup> in area. This connects to the 375mm diameter Council system running within the easement travelling North between the residential properties and the theological college. This system has been called the Morawa Drive drainage network.

The legal point of discharge for the site is to an existing 300mm diameter VicRoads drain via a 900x600 side entry pit to be constructed to VicRoads standards. This system has been called the Jacksons Road drainage network.

Council's intent was for the entire site drainage network and overland flow to be directed towards the Jacksons Road LPD. However, given the existing site levels and the extensive retaining wall heights required to ensure that this was achievable, a compromise was developed with Council such that a smaller portion of the site could be directed to the Morawa Drive drainage network provided the OSD catered for the 100-year event. As such two LPDs are provided to the site, with the catchment breakdown listed below in Table 1:

**Table 1: Catchment Breakdown**

JACKSON ROAD DRAINAGE NETWORK		MORAWA DRIVE DRAINAGE NETWORK	
Area Description	Area (m <sup>2</sup> )	Area Description	Area (m <sup>2</sup> )
Dwellings (Roofs)	14,663	Dwellings (Roofs)	4,953
Pavement/Hardstand	10,062	Pavement/Hardstand	3,828
Landscape	9,869	Landscape	3,606
<b>Total</b>	<b>34,594</b>	<b>Total</b>	<b>12,387</b>

Legal Point of Discharge is provided in Appendix A. Site Catchment breakdown is provided in Appendix B.

## 3.2 SITE DRAINAGE LAYOUT

The site drainage layout outlines the intent to capture all roof, road and hardstand and landscape drainage and divert to either of the two LPDs provided for the site (Jacksons Road and Morawa Drive).

Each of the villa's roof drainage will be connected to 2,000L above ground tanks located within each property with overflow connected to the internal road drainage network. It is proposed that 40% of the above ground tanks form part of the overall detention volume required.

The central multistorey building will capture all the roof drainage and divert it to a rainwater tank located in the lower ground floor, which will then outlet to the internal road drainage network associated with the Jacksons Road LPD.

End of line underground SPEL Chamber OSD tanks within the road reserves will provide the remainder of the detention volume required prior to outletting to either the Jacksons Road or Morawa Dr LPD at the calculated permissible site discharge flow.

The proposed site drainage layout plan is provided in Appendix C.

## 3.3 ON SITE DETENTION

### 3.3.1 On Site Detention Sizing

The existing site characteristics are described in Section 2.1. As required by Council the development discharge rate is to be restricted to the pre-development 5-year ARI, 5 min storm event and two LPDs will be provided as per Section 3.1.

The 5 min, 5-year ARI pre-development peak flow was calculated using the following parameters:

- Coefficient of runoff – 0.3
- 5-year ARI (20% AEP) Rainfall Intensity – 85mm/hr
- Site Area (Jacksons Road) – 34,594m<sup>2</sup>
- Site Area (Morawa Drive) – 12,387m<sup>2</sup>

This results in a pre-development flow of 241.1L/s and 87.2L/s respectively for the two catchments.

For the Jacksons Road LPD, a detention assessment has been undertaken for the 10-year ARI event, limiting the discharge to the pre-development flow of 245.04L/s, using the following parameters:

- Site Area – 34,594m<sup>2</sup>
- Coefficient of runoff – 0.68
- Required OSD – 148.95m<sup>3</sup>

For the Morawa Drive LPD, a detention assessment has been undertaken for the 100-year ARI event, limiting the discharge to the pre-development flow of 87.74L/s, using the following parameters:

- Site Area – 12,387m<sup>2</sup>
- Coefficient of runoff – 0.68
- Required OSD – 153.20m<sup>3</sup>

Refer to Table 2 for OSD Storage Volume Summary.

**Table 2: OSD Storage Volume**

<b>JACKSONS ROAD DRAINAGE NETWORK</b>		<b>MORAWA DRIVE DRAINAGE NETWORK</b>	
<b>OSD Description</b>	<b>Volume (m<sup>3</sup>)</b>	<b>OSD Description</b>	<b>Volume (m<sup>3</sup>)</b>
Property Tanks (42 Villas)	33.6	Property Tanks (28 Villas)	22.4
SPEL Chamber Underground OSD	63	SPEL Chamber Underground OSD	139
Multistorey Building Tank	57.5	–	–
<b>Total</b>	<b>154.1 (148.95 Required)</b>	<b>Total</b>	<b>161.4 (153.20 Required)</b>

A copy of the OSD calculations is provided in Appendix D. Note: OSD requirements will be confirmed by City of Monash following Town Planning Submission.

### **3.4 STORMWATER QUALITY ASSESSMENT**

#### **3.4.1 Treatment Requirements**

The design of the site treatment system aims to treat stormwater in accordance with the standards as defined by WSUD best practice, namely a reduction in pollutants as listed below:

- Total Suspended Solids (TSS) – 80%
- Total Phosphorus (TP) – 45%
- Total Nitrogen (TN) – 45%
- Retention of litter – 70%

#### **3.4.2 MUSIC Modelling**

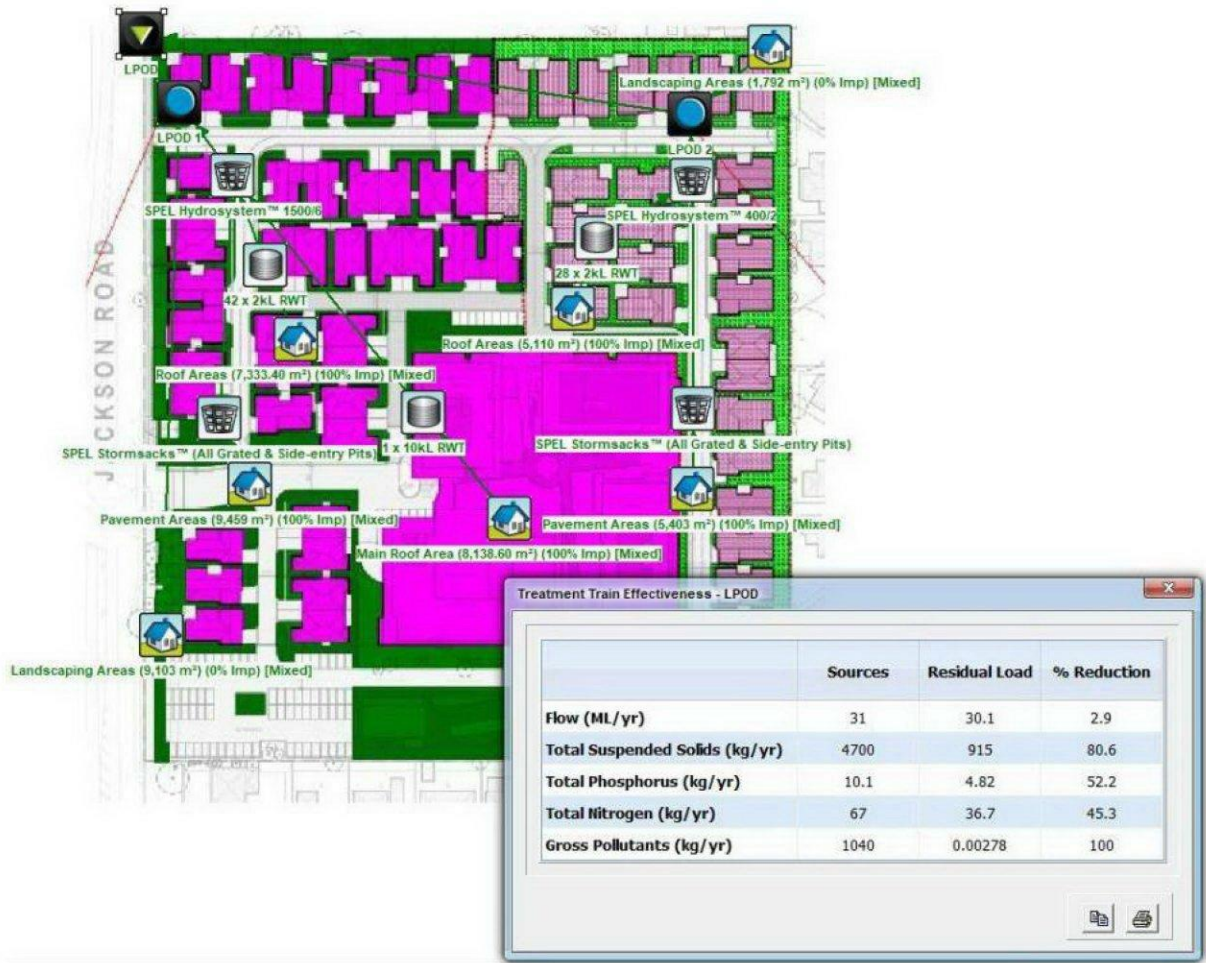
A stormwater quality simulation was carried out using the MUSIC, an industry recognised tool for the assessment of water sensitive urban design and best practice stormwater management.

MUSIC modelling assesses the site impervious and pervious areas through various improvement measures to determine if the proposed treatment train will meet the specified water quality objectives.

#### **3.4.3 Modelling Assessment and Results**

The development was assessed as two separate catchments, one to the Jacksons Road LPD and the other to the Morawa Drive LPD as discussed in the above sections. Reuse from the rainwater tanks for the villas as well as the multistorey building were taken into consideration in the treatment train. Reuse requirements can be refined further during detailed design.

The treatment train consists of SPEL Stormsacks being provided at all grated and side entry pits as well as a SPEL Hydrosystem Unit provided at the downstream end of the drainage network. Visual representation of the treatment train for the site is provided below:



**Figure 3: Proposed Treatment Train**

Based on the proposed treatment train, the following reductions are achieved as summarised in Table 3 below:

**Table 3: Treatment Train Results**

POLLUTANT	REDUCTION REQUIRED	REDUCTION ACHIEVED
Total Suspended Solid (TSS)	80%	80.6%
Total Phosphorous (TP)	45%	52.2%
Total Nitrogen (TN)	45%	45.3%
Gross Pollutants	70%	100%

The results indicate that water quality compliance has been met.

### 3.5 MAINTENANCE SCHEDULE

The design proposes the use of SPEL Stormsacks and SPEL Hydrosystem units to treat the stormwater runoff developed on site, which requires the following maintenance schedule:

- Stormsacks – require a visual inspection and emptying out every four months. Replacement of sacks is required every three years.
- Hydrosystem – require a visual inspection every four months. The filter cartridge requires replacement every five-seven years subject to silt conditions on site as well as vault cleaned out via vacuum truck prior to installation of new filter units.

Maintenance access to the under-ground OSD tank will be provided via inspection pits in the road. General assembly of the proposed treatment train units as well as a maintenance schedule is provided in Appendix E.

### 3.6 STORMWATER, EROSION AND DRAINAGE MANAGEMENT PLAN

During the construction phase of the development a Stormwater, Erosion and Drainage Management Plan (SEDMP) shall be implemented in accordance with the Environment Protection Act Victoria 1970 (EPA). A plan will be prepared to meet the requirements in accordance with the EPA's Code of Practice for the Construction and Building Industry (1999) as part of the construction documentation phase of the development.

The SEDMP encompasses surface stormwater management practices that shall be implemented during the construction phase by the contractor. The SEDMP provides a guide to the constructor to plan site management measures that should be implemented in order to prevent sediment and pollutant exports during construction. Whilst the site's conditions will change as the construction progresses, it is the environmental duty of the constructor to ensure that the site SEDMP is progressively maintained and upgraded to suit changing site conditions.

The SEDMP shall include, but not be limited to:

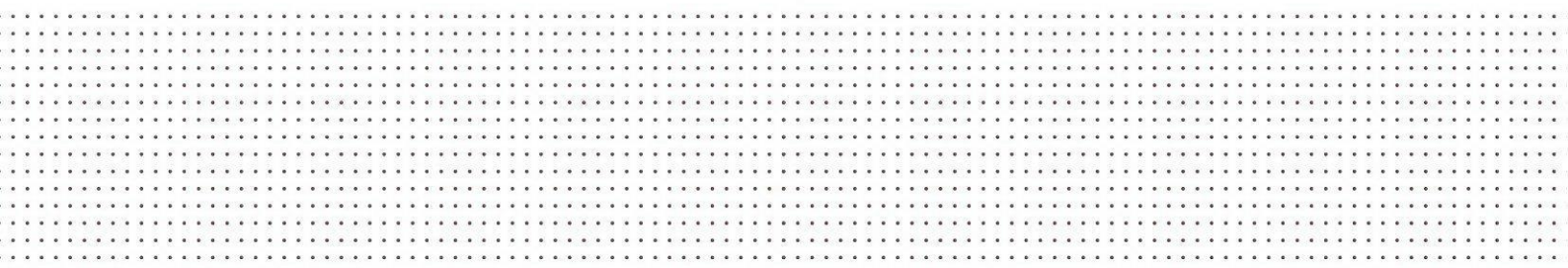
- Perimeter site fencing to compound
- Sediment traps
- Silt fences
- Single site access point with shaker pad and other measures as deemed necessary to prevent sediment entering Council roadways

These elements shall be considered, and where appropriate they should be included as part of the design of the SEDMP. It is understood that the SEDMP would be prepared as part of the contractor's Construction Environment Management Plan.

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# APPENDIX A

## LEGAL POINT OF DISCHARGE





CITY OF MONASH

## Point of Discharge Report

**ADDRESS:** 62-94 JACKSONS ROAD MULGRAVE VIC 3170

**PREPARED BY:** Ethan

**DATE:** 24 November 2021

**REFERENCE:** DRAIN52 & acarey@wga.com.au

● **Point of Discharge** (Regulation 133 of the Building Regulations 2018\*)

The north-east & north-west corner of the property.

● **Point of Connection** (Section 200 of Local Government Act\*\*)

The location of the Point of Connection for a Aged Care Facility on this site is to direct the entire site's stormwater drainage to two locations :

1. North-east corner of the property where it must be collected and free drained via a pipe into the existing Council pit at the easement to be constructed to Council's standards.
2. North-west corner of the property where it must be collected and free drained via a pipe to the existing 300 mm VicRoads drain via a 900 mm x 600 mm side entry pit to be constructed to VicRoad's standards.  
Note: If the Point of Connection cannot be located then notify Councils Engineering Department immediately.



**\*Building Act**

Building Regulations 2018

Reg. 133(2) - The report of the relevant Council indicating the location of the point of discharge from an allotment either within the allotment or at the allotment boundary must be obtained in relation to an application for a building permit for the carrying out of building work that includes a stormwater drainage system.

**\*\*Local Government Act 1989**

Section 200(1) - A Council may give the owner or occupier of any building or land a notice requiring that person to carry out any work for the drainage of a building or of surface or storm water on any land.

Approved by:

(Authorised Officer)

Please read notes overleaf

**Notes:**

**Any new drainage work within the road reserve or connection into a Council easement drain requires the approval of the Council's Engineering Division prior to the works commencing. The excavation for the drainage works in the road reserve or easement must be inspected prior to the backfilling of the drainage trenches and prior to the concrete pour of any pits being constructed. Engineering permits must be obtained and are to be inspected by Council (telephone 9518 3555). Works on Council's stormwater system without a valid permit may occur an infringement in accordance with Council's Local Law 3.**

Council records indicate that a 300 mm diameter stormwater private drain (offset unknown, depth unknown) is contained within the centre Drainage and Sewerage easement.

Sewer information should be obtained from Yarra Valley Water.

This development will require Town Planning Permit approval prior to any Building Permit being issued. The Town Planning Permit will provide specific details in regards to additional drainage design requirements and should be referred to prior any drainage design being undertaken. Engineering Plans for the drainage works must be submitted to and approved by the Engineering department prior to the commencement of works. The plans are to show sufficient information to determine that the drainage works will meet all drainage conditions of the Planning Permit.

**Disclaimer:**

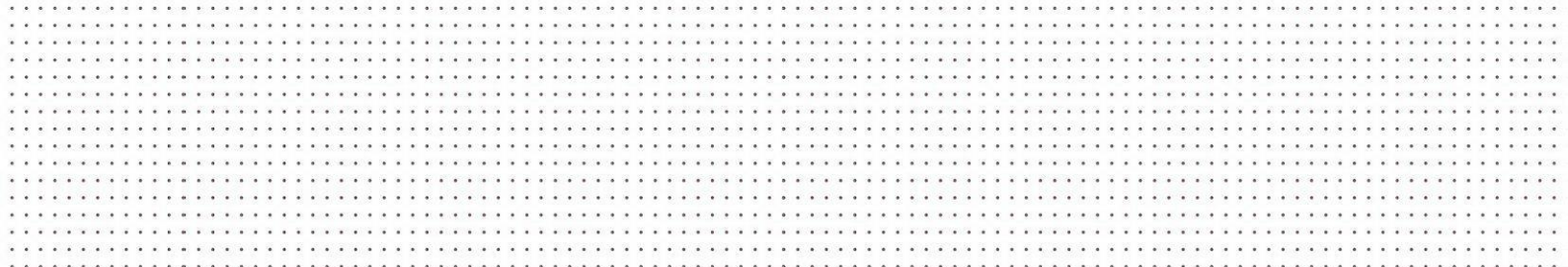
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# APPENDIX B

## CATCHMENT PLAN



- ROAD
- LANDSCAPE
- BUILDING FOOTPRINT
- FOOTPATH PAVING

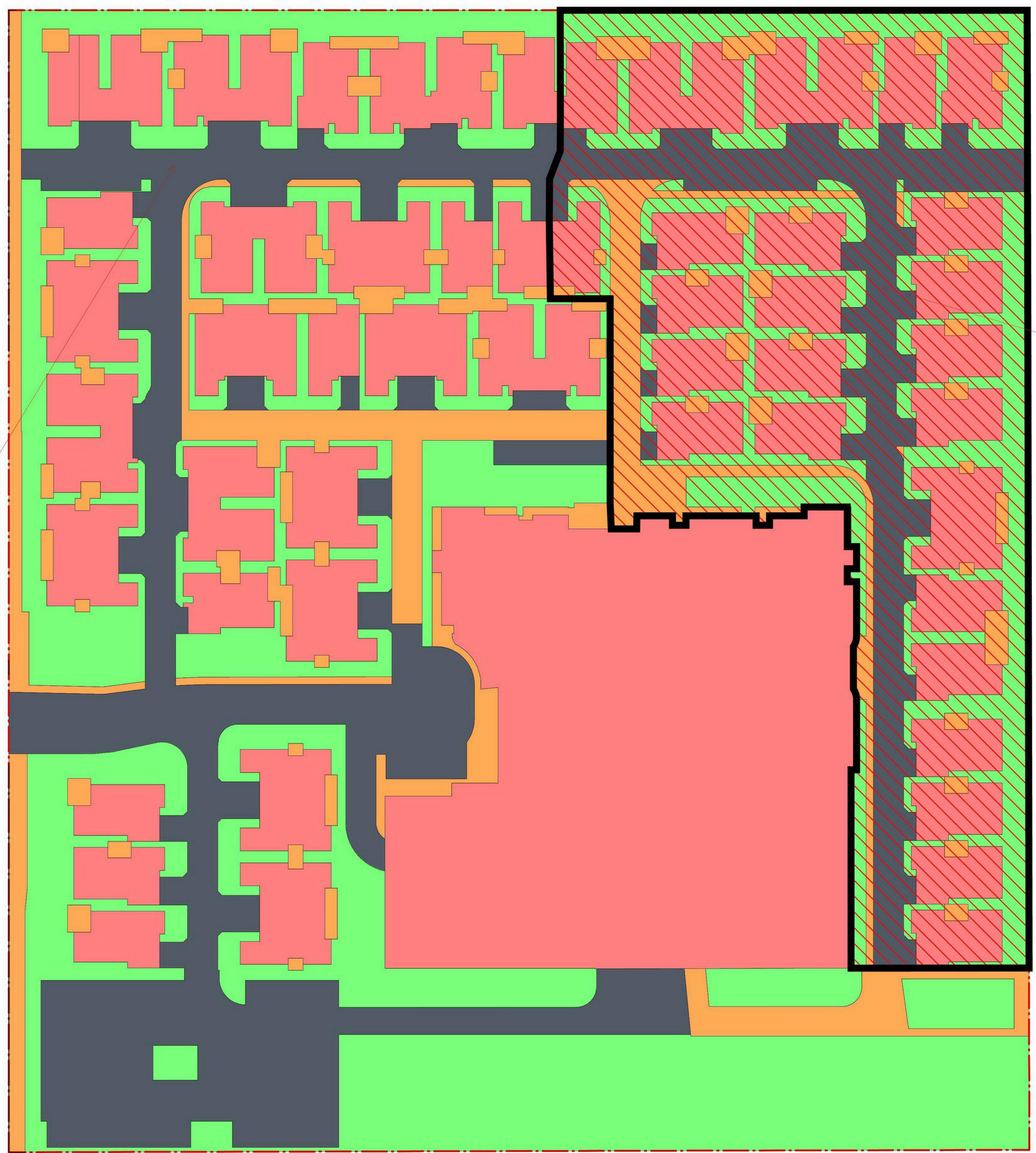
TOTAL SITE AREA:  
46981 sqm

ROAD AREA:  
8960 sqm

LANDSCAPE AREA:  
13475 sqm

BUILDING FOOTPRINT AREA:  
19616 sqm

FOOTPATH PAVING AREA:  
4930 sqm



Catchment to Jacksons Road LPD  
Total = 34,594m<sup>2</sup>  
Roof = 14,663m<sup>2</sup>  
Pavement + Hardstand = 10,062m<sup>2</sup>  
Landscape = 9,869m<sup>2</sup>

Catchment to Morawa Drive LPD  
Total = 12,387m<sup>2</sup>  
Roof = 4,953m<sup>2</sup>  
Pavement + Hardstand = 3,828m<sup>2</sup>  
Landscape = 3,606m<sup>2</sup>

**WGA** WALLBRIDGE  
GILBERT  
AZTEC

JOB NUMBER: WGA211901  
DESIGNER: SKhoshaba  
DATE: 1/12/2021  
SKETCH No.: SK-CV-0004  
REVISION: [A]  
SCALE: 1:500

**V / A**  
**ARCHITECTS**

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REV	DESCRIPTION	DATE	BY	KEY PLAN

KEY PLAN



NORTH POINT

THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE PRIOR TO COMMENCING ANY WORK OR MAKING OF ANY SHOP DRAWINGS. FIGURED DIMENSIONS MUST BE USED IN PREFERENCE TO SCALING. SCALED DIMENSIONS MUST BE VERIFIED ON SITE. SHEET TO BE PRINTED IN COLOUR. THIS DRAWING IS COPYRIGHT AND REMAINS THE PROPERTY OF THE ARCHITECT.

STATUS TOWN PLANNING

**PROJECT**  
MULGRAVE RETIREMENT VILLAGE  
**ADDRESS**  
62 - 94 JACKSONS ROAD, MULGRAVE

**CLIENT**  
RYMAN  
**DRAWING TITLE**  
SITE AREA CALCULATION

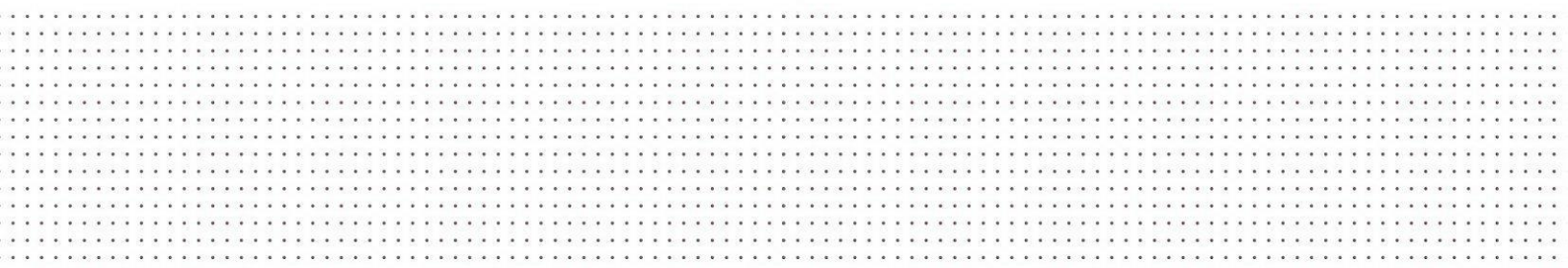
SCALE: 1:500 / DRAWN BY: Author / CHECKED BY: Checker / PROJECT No: 2110053 / DRAWING No: SK-111 / REV: 1

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# APPENDIX C

## SITE DRAINAGE

## LAYOUT PLAN



CENTURION COURT

Connection to VicRoads drainage system in Jacksons Road

SPEL Hydrosystem 1500/6

63m<sup>3</sup> OSD provided by SPEL Chamber under the road (4.8m x 13.2m footprint)

2m<sup>3</sup> Rain Water Tank provided to each unit, 40% included as part of OSD volume. 42 units connected to Jacksons Rd LPD system (33.6m<sup>3</sup> OSD provided)

Ridge Line

Connection to Morawa Drive LPD

SPEL Hydrosystem 400/2

139m<sup>3</sup> OSD provided by SPEL Chamber under the road (4.8m x 28.4m footprint)

Pit and pipe network to be sized to convey 100 year flow

2m<sup>3</sup> Rain Water Tank provided to each unit, 40% included as part of OSD volume. 28 units connected to Morawa Drive LPD system (22.4m<sup>3</sup> OSD provided)

Basement OSD tank outlet to connect to Jacksons Rd LPD system

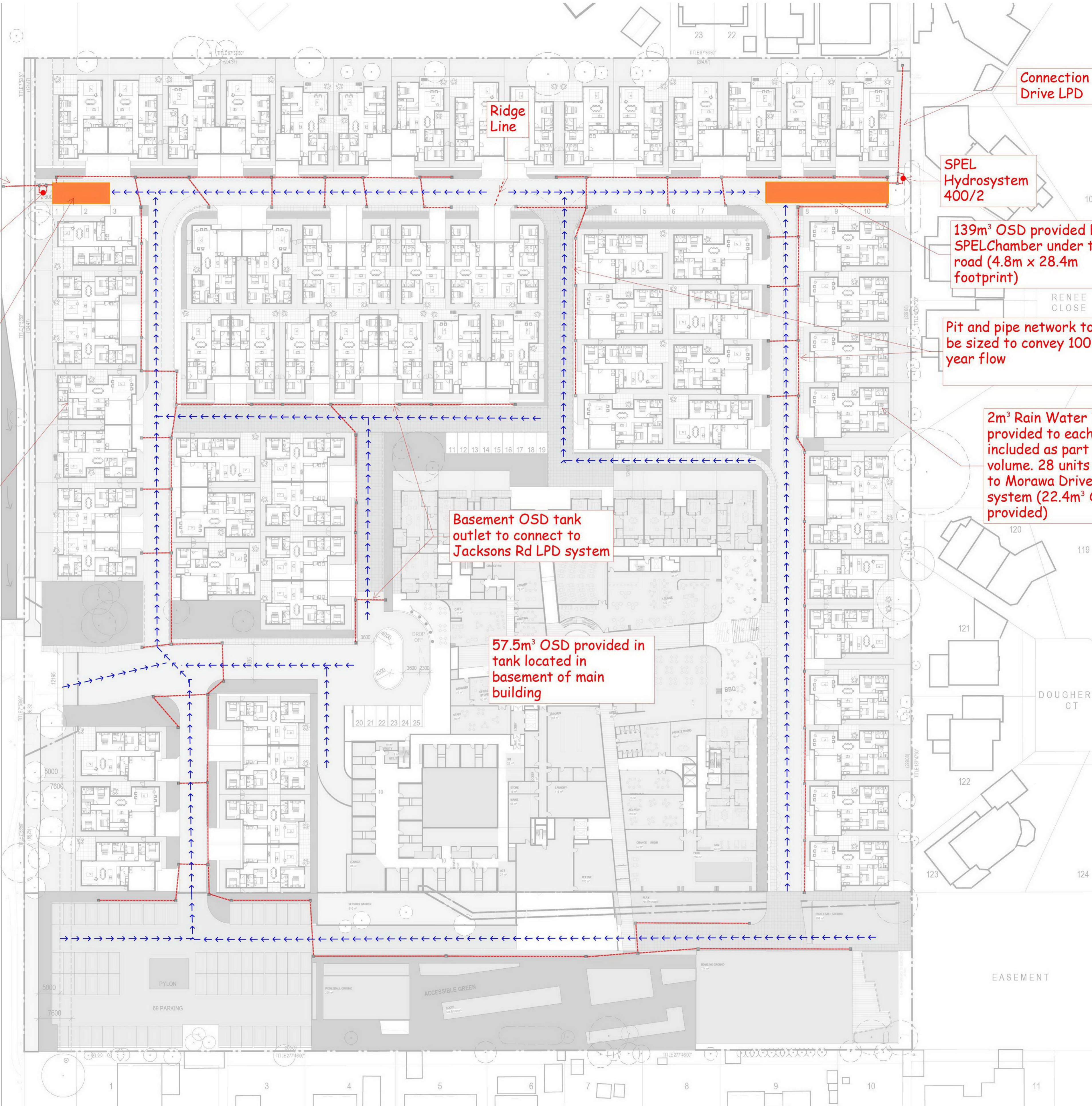
57.5m<sup>3</sup> OSD provided in tank located in basement of main building

**LEGEND**

- Proposed pit
- Proposed pipe
- Overland flow path
- OSD tank

**WGA** WALLBRIDGE GILBERT AZTEC

JOB NUMBER: WGA211901  
DESIGNER: SKhoshaba  
DATE: 1/12/2021  
SKETCH No.: SK-CV-0003  
REVISION: [A]  
SCALE: 1:500



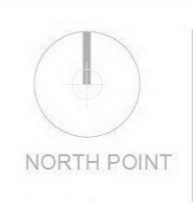
- SITE BOUNDARY
- MAIN ROAD
- SHARED PEDESTRAIN ROAD
- FOOTPATH
- SHARED LANDSCAPE
- POS TO VILLAS & APARTMENTS

STATUS TOWN PLANNING

VIA ARCHITECTS

REV	DESCRIPTION	DATE	BY
2			
A	ISSUE FOR COORDINATION	19/11/2021	

KEY PLAN



PROJECT MULGRAVE RETIREMENT VILLAGE  
ADDRESS 62 - 94 JACKSONS ROAD, MULGRAVE

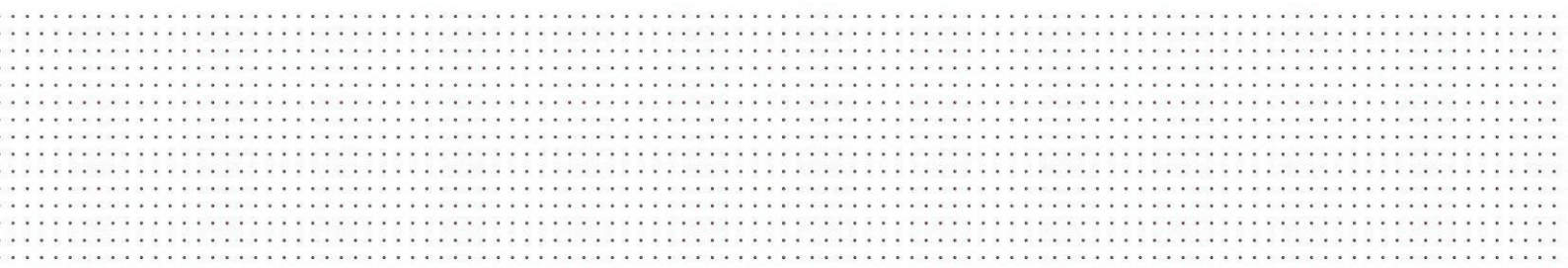
CLIENT RYMAN  
DRAWING TITLE MASTERPLAN GROUND LEVEL



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# APPENDIX D

## OSD CALCULATIONS



**Basic Stormwater Detention Assessment**

Job No: WGA211901

Title: Ryman Mulgrave - Jacksons Rd LPD

Location:

MONASH

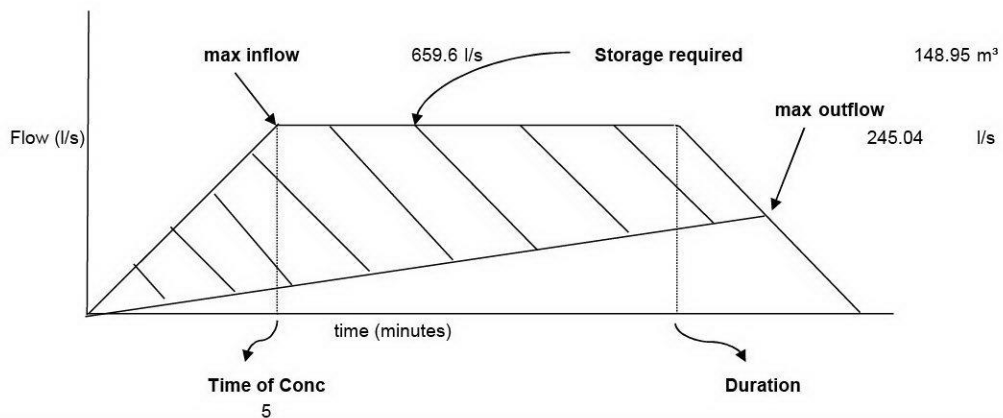
Date: 3/12/2021

Designer: SK

Checked: CP

Area: 34,594 m<sup>2</sup>  
 Coeff Permeability: 0.68  
 Time of conc.: 5 min  
 ARI Storm: 10 Year  
 Max Outflow Qp (PSD): 245.04 l/sec

N	Duration min	Intensity mm/hr	Inflow rate Ip l/sec	Inflow Vol Vi m3	Max Storage Smax m3
0	5.00	101	659.6	197.89	124.38
1	6.00	94	615.3	221.51	133.29
2	7.00	88	577.8	242.68	139.77
3	8.00	84	545.7	261.93	144.31
4	9.00	79	517.8	279.61	147.29
5	10.00	75	493.3	295.98	148.95
6	15.00	62	404.3	363.86	143.32
7	20.00	53	347.3	416.71	122.66
8	25.00	47	306.9	460.36	92.80
9	30.00	42	276.5	497.74	56.67
10	40.00	36	233.3	559.93	-28.17
11	50.00	31	203.6	610.93	-124.19
12	60.00	28	181.8	654.51	-227.64
13	70.00	25	164.9	692.77	-336.40
14	100.00	20	131.1	786.84	-683.40
15	130.00	17	110.5	861.76	-1049.56
16	160.00	15	96.4	925.15	-1427.24
17	190.00	13	86.0	980.78	-1812.67
18	220.00	12	78.1	1030.81	-2203.71
19	250.00	11	71.8	1076.58	-2599.02
20	280.00	10	66.6	1118.99	-2997.69
21	310.00	10	62.3	1158.65	-3399.09
22	340.00	9	58.6	1196.03	-3802.78
23	370.00	8	55.5	1231.48	-4208.41
24	400.00	8	52.7	1265.25	-4615.71
25	430.00	8	50.3	1297.56	-5024.47
26	460.00	7	48.1	1328.58	-5434.52
27	490.00	7	46.2	1358.45	-5845.73
28	520.00	7	44.5	1387.27	-6257.97
29	550.00	7	42.9	1415.15	-6671.17
30	580.00	6	41.4	1442.17	-7085.22



LOCALITY:MONASH	A	B	C	D	E	F	G
ARI 1 in 10	3.325861695	-0.627379114	-0.02752558	0.007170047	0.000417	-0.0000424	-0.0000432

**Basic Stormwater Detention Assessment**

Job No: WGA211901

Title: Ryman Mulgrave - Morawa Drive LPD

Location:

MONASH

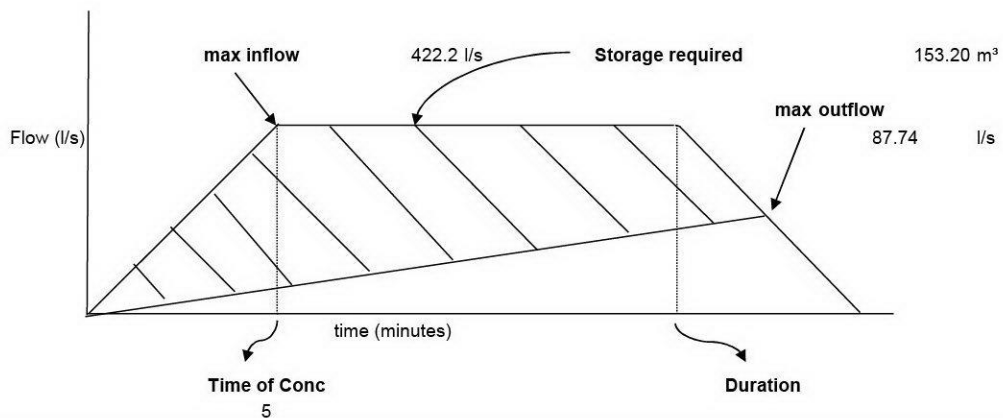
Date: 3/12/2021

Designer: SK

Checked: CP

Area: 12,387 m<sup>2</sup>  
 Coeff Permeability: 0.68  
 Time of conc.: 5 min  
 ARI Storm: 100 Year  
 Max Outflow Qp (PSD): 87.74 l/sec

N	Duration min	Intensity mm/hr	Inflow rate Ip l/sec	Inflow Vol Vi m3	Max Storage Smax m3
0	5.00	180	422.2	126.67	100.35
1	6.00	168	393.4	141.62	110.03
2	7.00	158	368.5	154.78	117.93
3	8.00	148	347.1	166.59	124.47
4	9.00	140	328.4	177.32	129.94
5	10.00	133	312.0	187.17	134.53
6	15.00	108	252.8	227.50	148.53
7	20.00	92	215.4	258.48	153.20
8	25.00	81	189.3	283.91	152.30
9	30.00	73	169.8	305.61	147.68
10	40.00	61	142.3	341.51	130.94
11	50.00	53	123.6	370.80	107.58
12	60.00	47	109.9	395.69	79.82
13	70.00	42	99.4	417.43	48.92
14	100.00	34	78.4	470.47	-55.97
15	130.00	28	65.7	512.30	-172.07
16	160.00	24	57.0	547.49	-294.81
17	190.00	22	50.7	578.27	-421.96
18	220.00	20	45.9	605.93	-552.24
19	250.00	18	42.1	631.23	-684.87
20	280.00	17	39.0	654.71	-819.32
21	310.00	16	36.4	676.72	-955.24
22	340.00	15	34.2	697.53	-1092.37
23	370.00	14	32.3	717.32	-1230.51
24	400.00	13	30.7	736.25	-1369.51
25	430.00	12	29.2	754.42	-1509.27
26	460.00	12	28.0	771.94	-1649.68
27	490.00	11	26.8	788.88	-1790.68
28	520.00	11	25.8	805.29	-1932.20
29	550.00	11	24.9	821.23	-2074.19
30	580.00	10	24.0	836.74	-2216.61

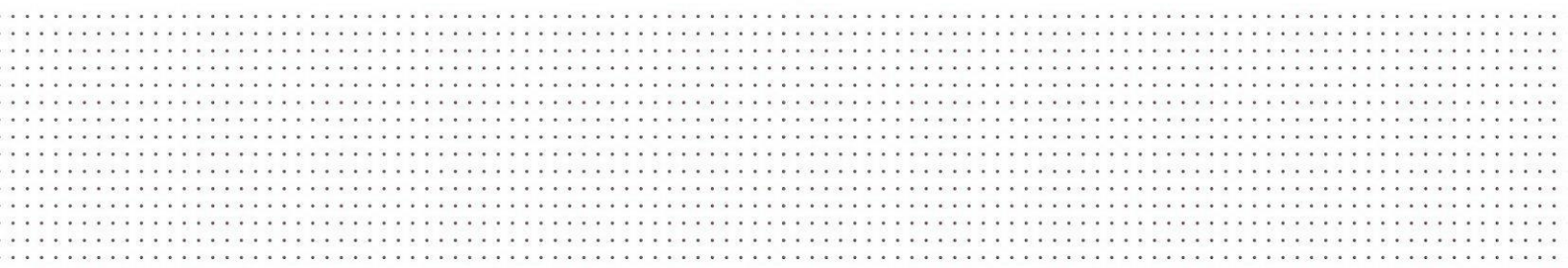


LOCALITY:MONASH	A	B	C	D	E	F	G
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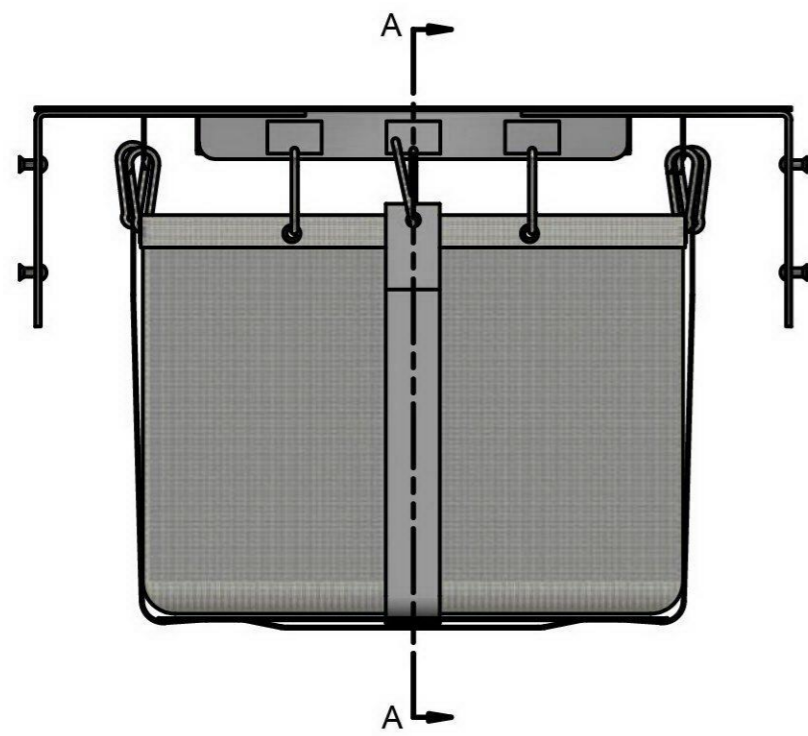
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# APPENDIX E

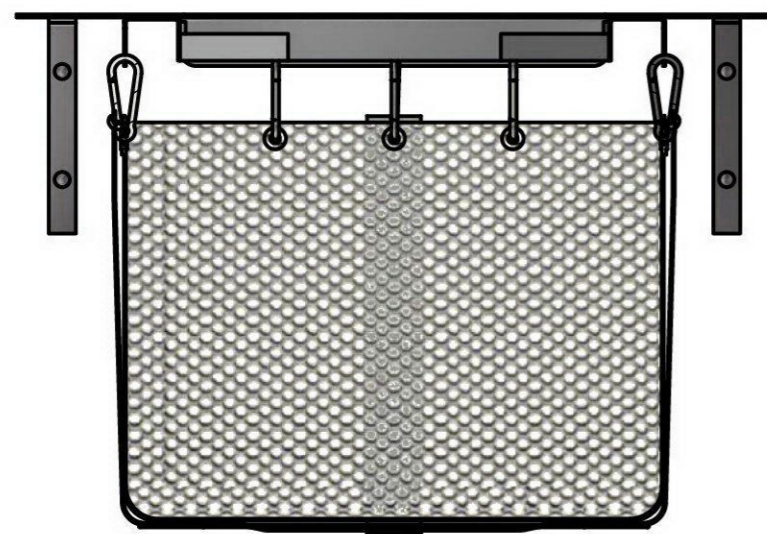
## TREATMENT TRAIN UNITS GENERAL ASSEMBLY AND MAINTENANCE SCHEDULE



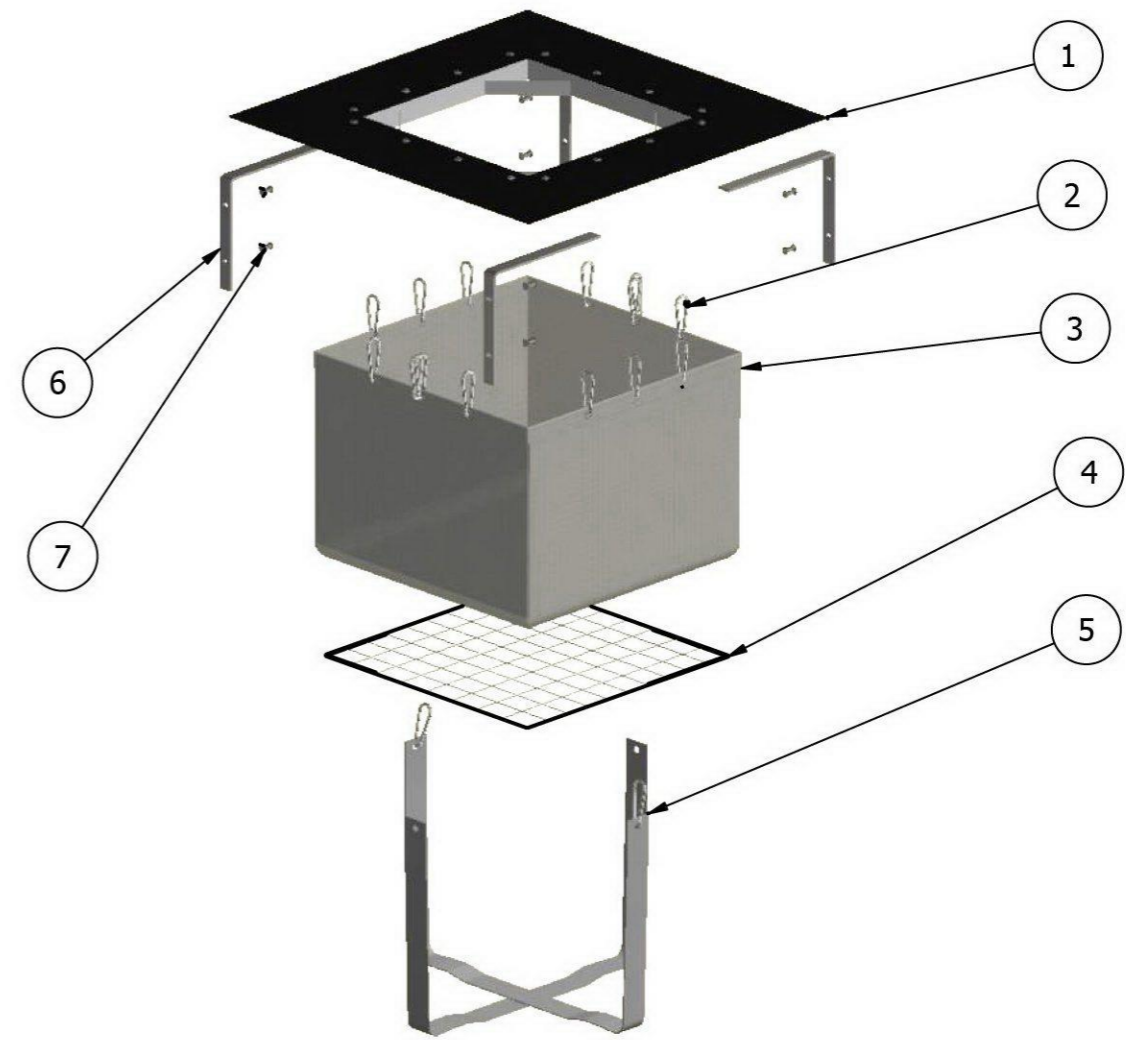




**ELEVATION VIEW**



**SECTION A-A**



**ISOMETRIC EXPLOSION VIEW**

ITEM	PART NAME	MODEL NO. - QTY			
		SSS.4545.C1	SSS.6060.C1	SSS.6090.C1	SSS.7575.C1
1	STORMSACK BODY METAL & POLY	1	1	1	1
2	CARABINER CLIP	12	16	18	32
3	CHTCHMENT BAG	1	1	1	1
4	BAG SUPPORT - METAL MESH	0	1	1	1
5	STRAP 50mm	0	2	2	2
6	GAL. SUPPORT BRACKETS	0	4	4	4
7	ALUMINIUM KNOCKING	0	8	8	8

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

ALL INTERCONNECTING PIPEWORK, PITS AND ASSOCIATED DRAINAGE BY OTHERS

CLIENT:

CONFIDENTIAL - The drawings must not be disclosed to any third parties without written permission from SPEL STORMWATER. Unauthorised disclosure may result in prosecution.  
 • SPEL STORMWATER - This drawing is the property of SPEL STORMWATER ABN: 83 151 832 629 and is subject to return on demand. It is submitted for the use only in connection with the proposal and contracts of SPEL STORMWATER with the expressed conditions that it is not to be reproduced or copied in any form. This data must only be used in accordance with our standard terms and conditions.  
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Drawn	Date
M.M	9/12/2020
Check	Date
Verified	Date
Approved	Date
Request No.	
ASSEMBLY DRAWING	



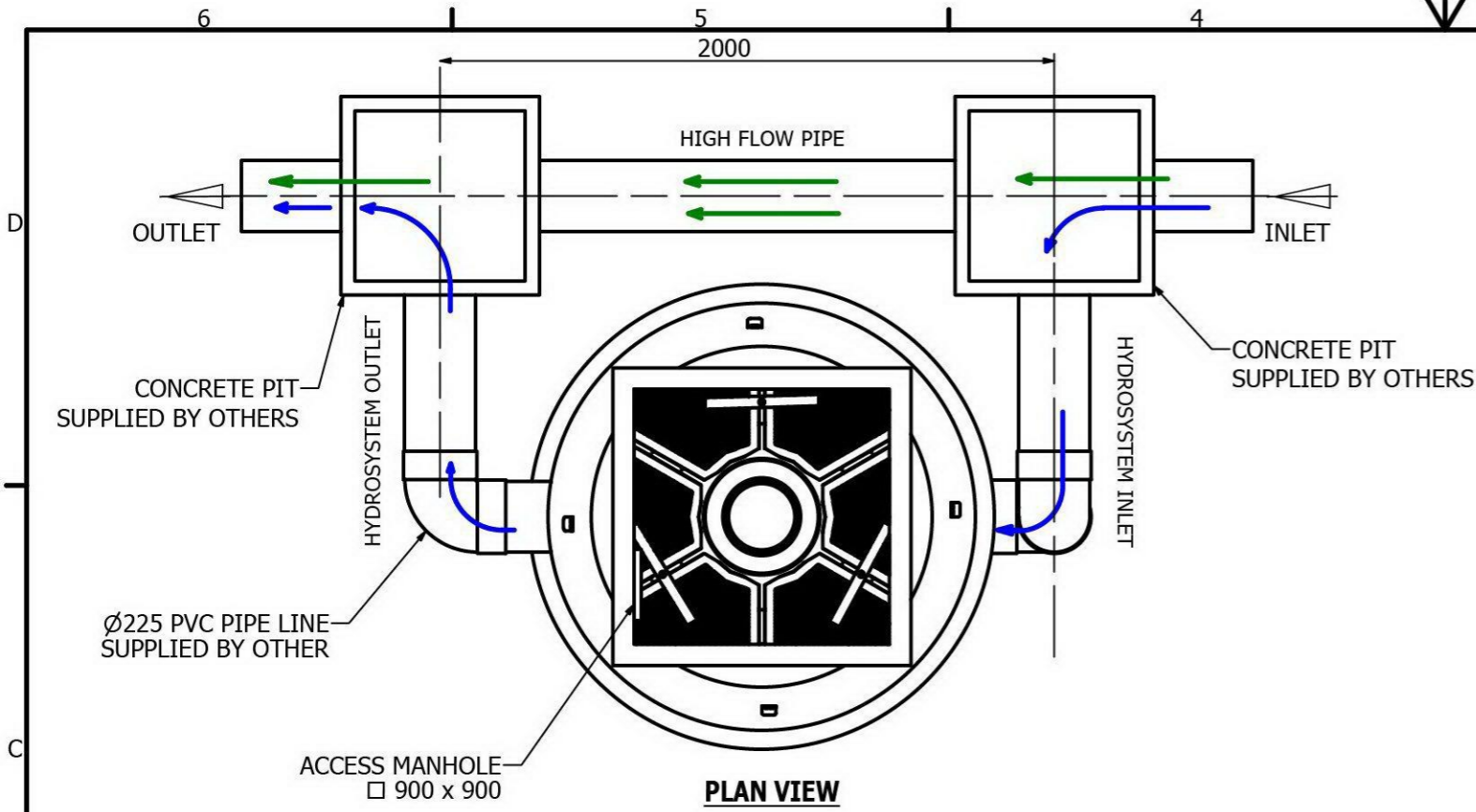
PROJECT :

TITLE  
 SPEL STOMSACK  
 ASSEMBLY DRAWING

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

CUSTOMER CODE : DWG No. SP20-SS28600-C

1	INITIAL RELEASE	M.M	9/12/2020	CHECKED BY
REV	DESCRIPTION	DESIGNER	DATE	CHECKED BY



**PLAN VIEW**

REVISION HISTORY				
REV	DESCRIPTION	DESIGNER	DATE	APPROVED
1	INITIAL RELEASE	P.Z.	17/07/2018	

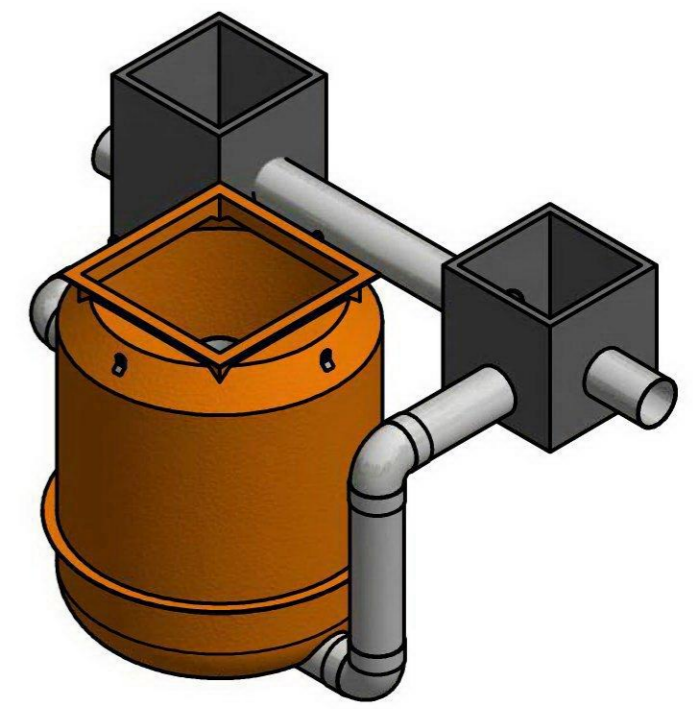
Site Level Confirmation	
Finished Surface Level (FSL) RL:	
Access Cover Thickness	mm
Inlet Invert Level RL:	
Outlet Invert Level RL:	
Company:	
Name:	
Date:	

APPROVED.....

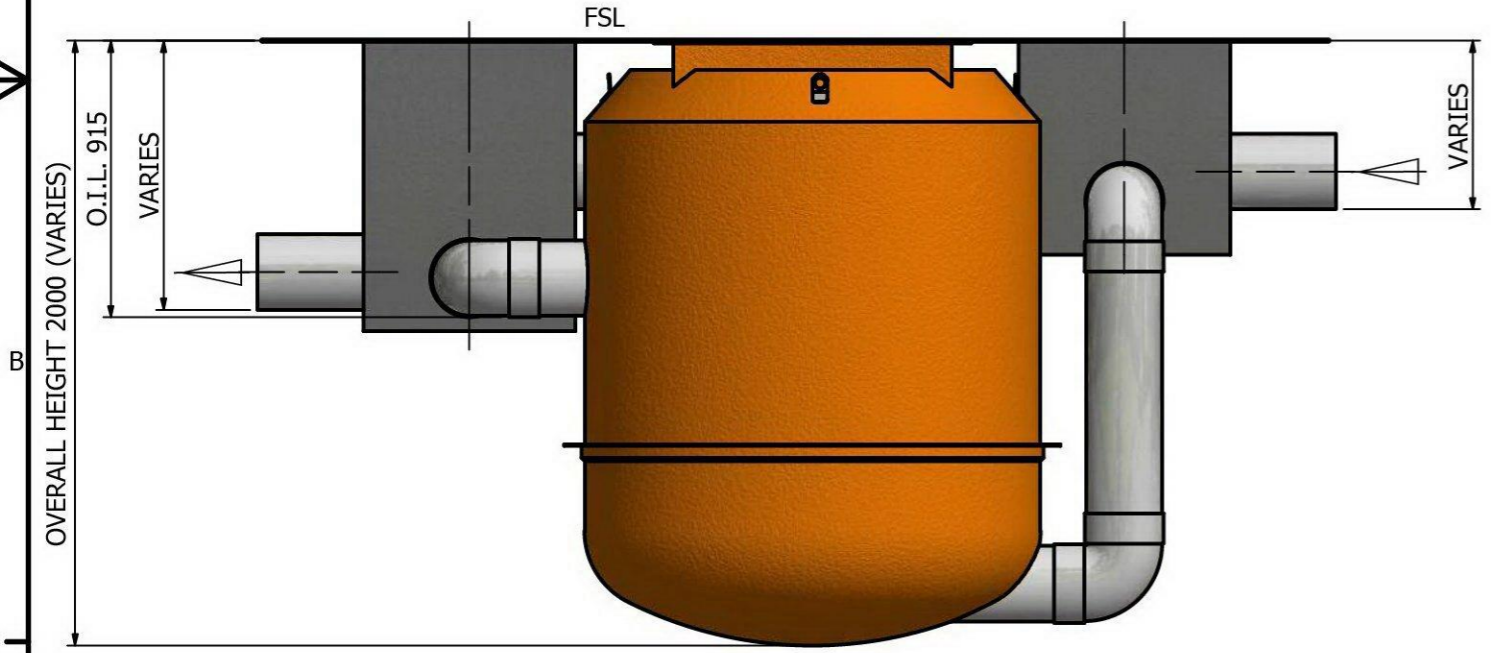
NAME.....

SIGNED.....

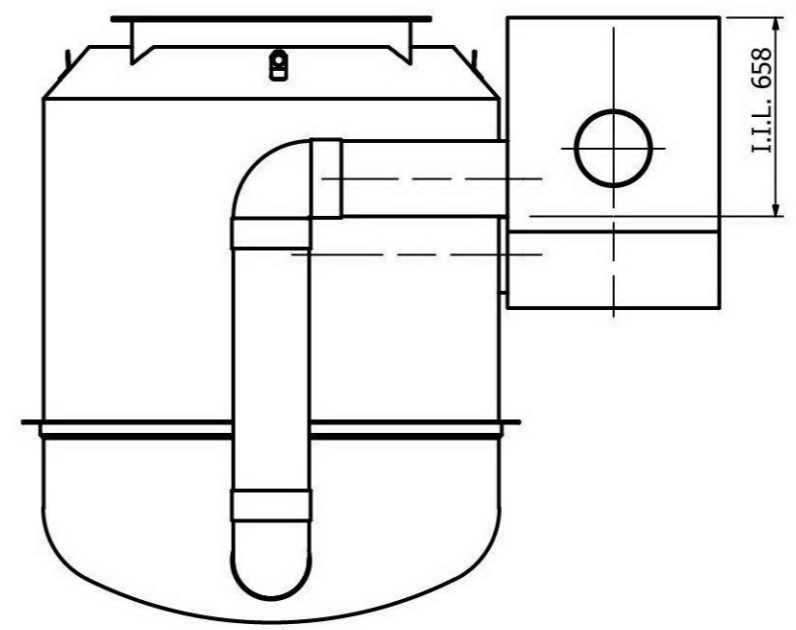
DATE...../...../.....



**ISOMETRIC VIEW**



**ELEVATION VIEW**



**SIDE VIEW**

**ISSUE FOR APPROVAL**

NOT FOR CONSTRUCTION

← HIGH FLOW BYPASS  
← TREATMENT FLOW

NOTICE:  
SYSTEM PIPEWORK MUST HAVE AT LEAST 250 MM OF FALL TO OPERATE CORRECTLY.

TOLERANCE: ALL DIMENSIONS 10mm UNLESS OTHERWISE STATED.

CLIENT:

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Drawn	Date
P.Z.	17/07/2018
Check	Date
Verified	Date
Approved	Date
Request No.	
RN2945	

100 Silverwater Road Silverwater NSW 2128  
 PH: 1300 773 500 | E: sales@spel.com.au  
 www.spel.com.au

PROJECT :			
TITLE SPEL HYDROSYSTEM 1500 SHS.150D-1500C-06.225.PVC FRP TANK 1500 DIA. HYDROSYSTEM 1500 GENERAL ARRANGEMENT			
SCALE	N.T.S	SIZE	A3
SHEET	1	REV	1
CUSTOMER CODE :	DWG No. SP18-HY20730-S		

D:\Vault Working Folder\Designs\SPEL\PRODUCTS\HYDROSYSTEM\1500 SERIES\STANDARD LAYOUT\SP18-HY20730-S.dwg

REVISION HISTORY

REV	DESCRIPTION	DESIGNER	CREATION DATE	CHECKED BY
1	INITIAL RELEASE	R.R.	07/07/2020	P.Z.

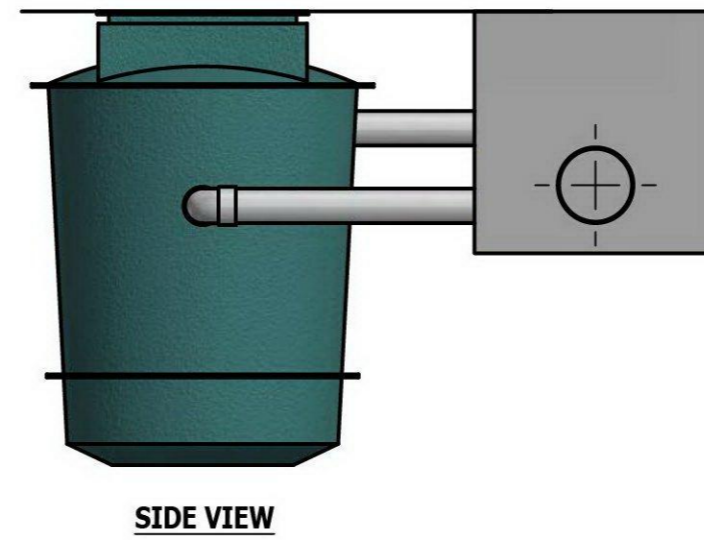
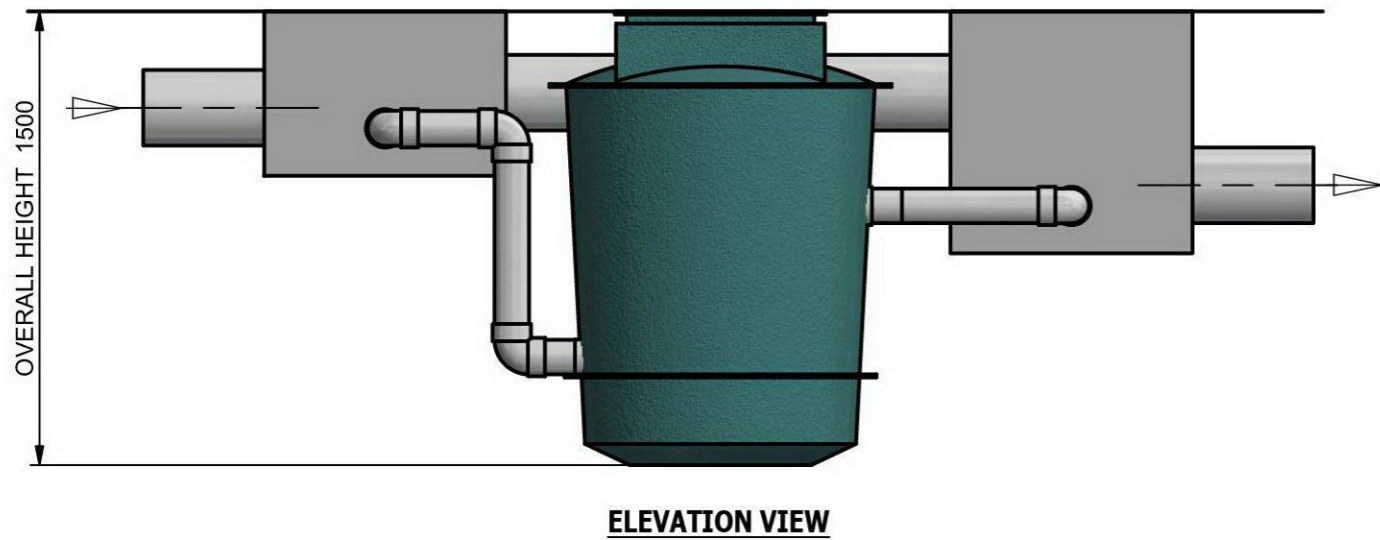
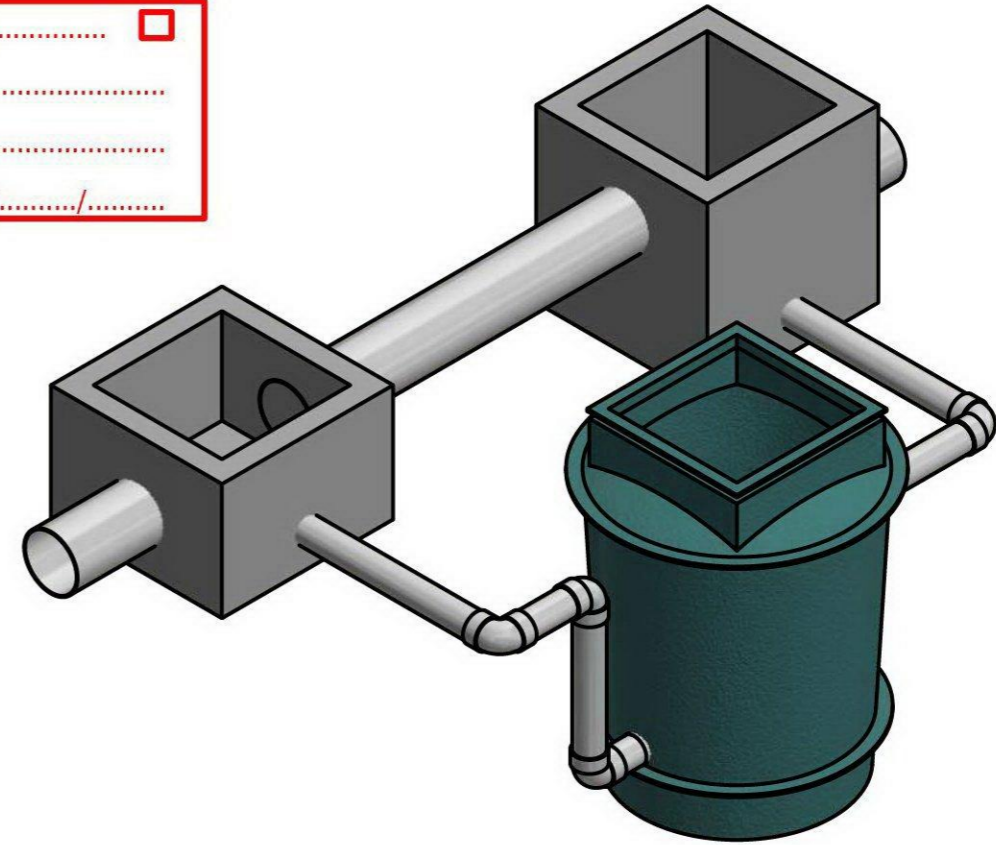
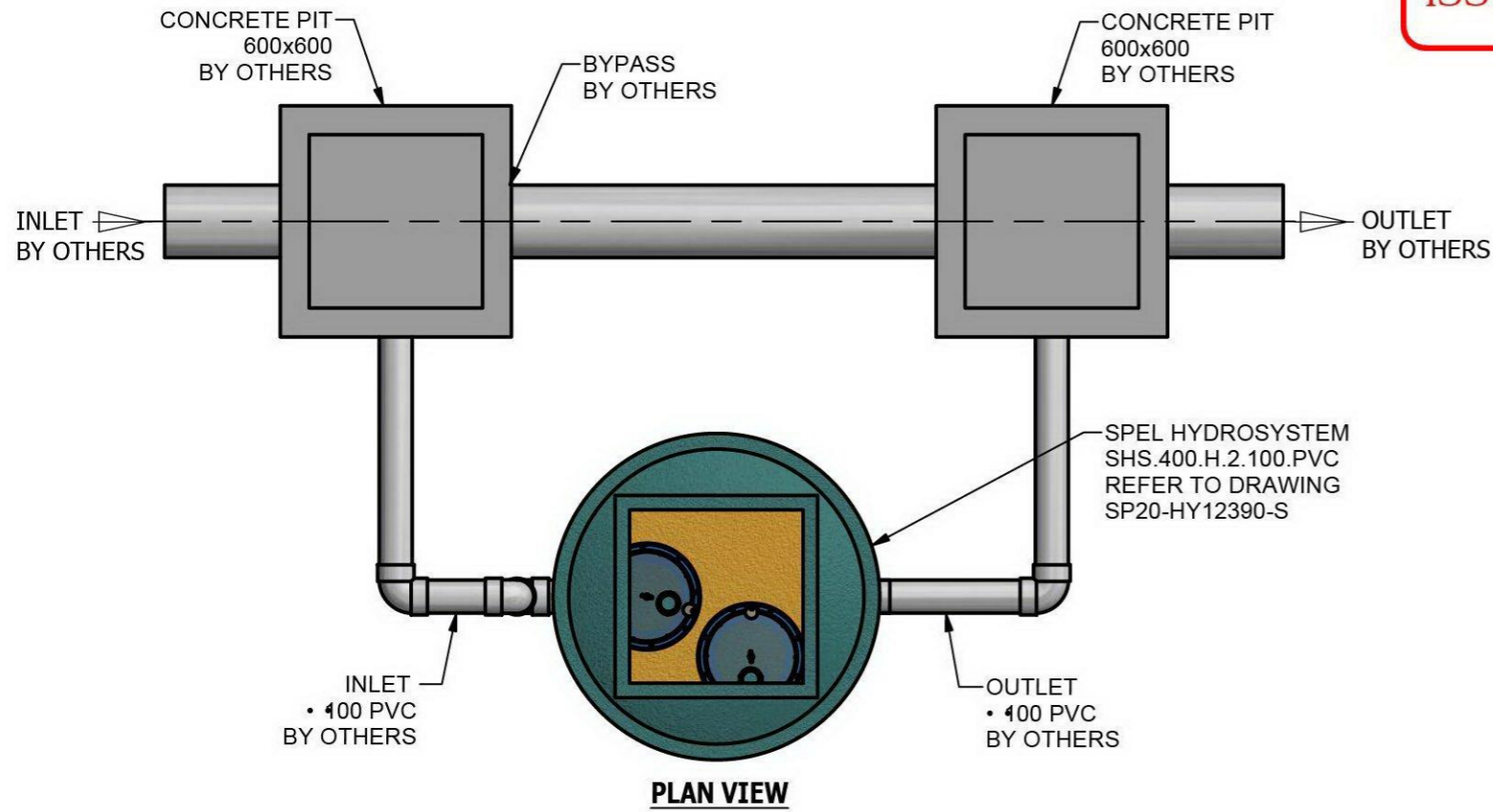
**ISSUE FOR APPROVAL**  
NOT FOR CONSTRUCTION

APPROVED.....

NAME.....

SIGNED.....

DATE...../...../.....



Site Level Confirmation	
Finished Surface Level (FSL)	RL:
Access Cover Thickness	mm
Inlet Invert Level	RL:
Outlet Invert Level	RL:
Company:	
Name:	
Date:	

- NOTES:
- 1: THE COMBINED HEIGHT OF AN EXTENSION-RISER & LID EXCEEDING 1000mm WILL REQUIRE THE TANK TO BE OF HEAVY DUTY CONSTRUCTION
  - 2: SYSTEM PIPEWORK MUST HAVE AT LEAST 250 MM OF FALL TO OPERATE CORRECTLY

TOLERANCE: ALL DIMENSIONS TO CLOSEST 10mm +/- 30mm UNLESS OTHERWISE STATED.

CLIENT:

DISTRIBUTOR :

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Drawn R.R. Date 07/07/2020

Check P.Z. Date 07/07/2020

Verified Date

Approved Date

Request No. RN4498

**SPEL**  
ENVIRONMENTAL  
INTEGRATED WATER SOLUTIONS

100 Silverwater Road Silverwater NSW 2128  
PH: 1300 773 500 | E: sales@spel.com.au  
www.spel.com.au

PROJECT : SHS.400.H.02.100.PVC

TITLE SPEL HYDROSYSTEM WITH BYPASS SHS.400.H.2.100.PVC GENERAL ARRANGEMENT

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

CUSTOMER CODE : DWG No. SP20-HY15300-S

C:\Users\robin\Documents\Vault\Designs\SPEL\PRODUCTS\HYDROSYSTEM\400 SERIES\STANDARD\HS.400-HM FILTER ELEMENT\TAPERED TANK\2 HYDRO SP20-HY15300-S.dwg



**spelstormwater**  
joy in water



**VIC 21-1179-MC**

**62-94 JACKSON  
ROAD, MULGRAVE**

**VIC and TAS Office**

L1 90 William St Melbourne  
VIC 3000

**P** + 61 2 8705 0255

**E** [maintenance@spel.com.au](mailto:maintenance@spel.com.au)

<b>Estimated and drafted on this date:</b>	2 December 2021
--------------------------------------------	-----------------



PHONE: (02) 8705 0255  
 EMAIL: maintenance@spel.com.au  
 OFFICE: L1 90 Williams St, Melbourne VIC 3000  
 www.spel.com.au

## SPEL STORMWATER QUALITY TREATMENT DEVICE MAINTENANCE AGREEMENT

FOR

**VIC 21-1179-MC - 62-94 JACKSON ROAD, MULGRAVE**

This Equipment Maintenance Agreement (the "Maintenance Agreement") is made and effective  
 \_\_\_/\_\_\_/\_\_\_

BETWEEN: SPEL Total Stormwater (the "Service Provider"), of  
 191 Station Street, Corio VIC 3214 (ABN:32 379 724 600) hereafter known as SPEL

AND: \_\_\_\_\_ (the "Client") of  
 \_\_\_\_\_

### SUMMARY

**This 10 year maintenance contract covers the monitoring and servicing of the SPEL Stormsacks, and SPEL Hydrosystem at 62-94 Jackson Road, Mulgrave**

Where the Client has requested the provision of maintenance and the Service Provider is willing to provide such services as per the terms of this agreement both parties agree to:

#### 1. WARRANTY

SPEL operational warranty on the SPEL Stormsacks, and SPEL Hydrosystem is in place for as long as there is an active maintenance regime with SPEL on the specified units.

- Excludes construction silt loads
- Excludes unusual/accidental silt loads
- SPEL maintains the site

Goods sold shall only have the benefit of a manufacturer's warranty if the purchaser has complied with the manufacturer's instructions in relation to installation, maintenance and operation of the said goods.

#### 2. MAINTENANCE CALLS

Service Provider agrees to provide maintenance service including three [3] times maintenance visit annually and interim calls as required at the installation address specified above on the equipment listed. All charges specified are those currently in effect and are subject to change only at the time of subsequent annual renewal. The new charges shall become effective upon the date specified in the renewal invoice. Client calls hereunder are restricted to the normal working hours of the Service Provider.

All service commenced outside of Service Provider's normal working hours will be charged at published rates for service time and expense only.

#### 3. SERVICES

The following services are included:

##### **Maintenance Summary**

The SPEL Hydrosystem system will be inspected per visit.

The SPEL Hydrosystem change out maintenance process comprises the removal and replacement of each SPEL Hydrosystem cartridge and the cleaning of the silt out of the vault or manhole. In the event these works are required, Client will be notified accordingly of the additional cost of vacuum truck prior to works being undertaken.

The SPEL personnel that enter the tank [if necessary] will be trained in confined space entry.

**Life Cycle Cost (LCC)** – The maintenance requirements are very site specific and relates to the sediment load and sediment characteristics.



PHONE: (02) 8705 0255  
 EMAIL: maintenance@spel.com.au  
 OFFICE: L1 90 Williams St, Melbourne VIC 3000  
 www.spel.com.au

### Maintenance Triggers

The basic activities included in the maintenance contract are as follows:

- Visual inspection of the vault and filter conditions per service
- If there is a silt build up, it will need to be vacuumed out an additional cost. Costing to be confirmed at time of activity and will be additional cost to the standard contract value outlined below.
- TSS accumulation in the filters is what dictates the life cycle of individual filter.

Optimum performance of the equipment covered by this Agreement can be expected only if supplies provided by, or meeting the specifications of Service Provider are used. Service Provider shall have full and free access to the equipment to provide service thereon. If persons other than Service Provider's representatives perform maintenance or repairs, and as a result further work is required by Service Provider to restore the equipment to operating condition, such repairs will be billed at Service Provider's published time and material rates then in effect.

### 4. ANNUAL RATE FOR SERVICES

ACTIVITY	FREQUENCY [subject to site characteristics]	COST BREAK-DOWN [subject to CPI index]
<b>Inspection and Maintenance:</b> 15 SPEL Stormsacks, 6 cartridge Hydrosystem 1500/6, and 2 cartridge Hydrosystem 400/2  - Visual inspection of the Stormsacks, and Hydrosystem conditions. - SPEL technician onsite. Empty the Stormsacks.	Every four months 3 x per year	\$1,779.00 per annum
<b>Replacement Factors:</b> SPEL Stormsack bag and SPEL Hydrosystem Cartridge replacement – allowance for 3 times change out of Stormsacks and 1 time replacement of Hydrosystem cartridges throughout the 10 year period.  -All old SPEL Filters and Stormsack bags removed, disposed and replaced.  Note: The vault to be cleaned out via a vacuum truck prior to installation of the new filter units, price on application.	Based on the past experience we estimate the life of the SPEL Hydrosystem Cartridges to be between 5 – 7 years, subject to silt condition on the site. SPEL System Silt Removal is dictated by silt condition on site  The Stormsack bags to be changed out in year 3, 6 and 9.	1 x Labour, travel expenses  45 x SPEL Stormsack bags Replacement  06 x SPEL 1500/6 Hydrosystem Cartridges Replacement  02 x SPEL 400/2 Hydrosystem Cartridges Replacement  Total once in 10 years = \$32,256.00  Per annum = \$3,226.00
<b>SUMMARY</b>		
Replace the Stormsacks and Hydrosystem cartridge in accordance with above in 10 years, turnkey operation		
<ul style="list-style-type: none"> <li>• Inspection and Maintenance: \$1,779.00 per annum</li> <li>• Replacement Factors: \$3,226.00 per annum</li> <li>• Total Investment Value Per Annum: \$5,005.00 + (GST)</li> </ul>		

The annual rate for maintenance of SPEL Stormsack, and SPEL Hydrosystem, for a 10 year term is \$5,005.00 + (GST) and shall be paid upon receipt of invoice. The annual rate shall be indexed by CPI at each annual renewal date. Any payment not made by the 30<sup>th</sup> day of the month shall be considered overdue and in addition to Service Provider's other remedies, Service Provider may levy a late payment charge equal to 4% per month on any overdue amount. SPEL to send maintenance report per service.



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#### 4.2 EXCLUSIONS

ACTIVITY	FREQUENCY [subject to site characteristics]	COST BREAK-DOWN [subject to CPI index]
Vacuum out, removal and disposal of pollutants  Note: Cigarette holes in Stormsack bags is not eligible for warranty	When necessary, based on the maintenance inspection and report	<b>This is an additional cost to the regular maintenance contract and has not been included in the annual rate indicated below.</b>  Costing to be confirmed at time of activity based on extent of pollutants removed and disposed.

#### 5. PAYMENTS

For service as specified above on the equipment listed, the undersigned Client agrees to pay in advance the total annual charge specified above to Service Provider, in accordance with the terms specified on the face of the invoice. There shall be added to the charges provided for in this Agreement amounts equal to any taxes, however designated, levied or based on such charges or on this Agreement, or on the services rendered or parts supplied pursuant hereto, including GST.

#### 6. BINDING AGREEMENT

The undersigned Client represents that he is the owner of the equipment, or that they have the owner's authority to enter into this agreement. This Agreement is subject to acceptance by Service Provider. It takes effect on the date written above and continues in effect for one year and will remain in force thereafter, with automatic annual renewal at the indexed rates, until cancelled in writing by either party or at the end of contract period – whichever is earlier.



**PHONE:** (02) 8705 0255  
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**OFFICE:** L1 90 Williams St, Melbourne VIC 3000  
[www.spel.com.au](http://www.spel.com.au)

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written.

**Client Signature**

**SPEL Total Stormwater**  
191 Station Street, Corio VIC 3214

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Authorized Signature

Name:

Name:

Date:

Date:

Billing Entity:

ABN:

Contact:

Phone:

Billing address:

Accounts Email:





Sam Khoshaba  
SENIOR CIVIL ENGINEER

Telephone: 03 9696 9522

Email: [skhoshaba@wga.com.au](mailto:skhoshaba@wga.com.au)

---

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Facsimile: 08 8232 0967

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**PERTH**

Level 1, 66 Kings Park Road  
West Perth WA 6005  
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**WHYALLA**

1/15 Darling Tce  
Whyalla SA 5600  
Phone: 08 8644 0432

**WALLBRIDGE GILBERT AZTEC**

[www.wga.com.au](http://www.wga.com.au)

[melbourne@wga.com.au](mailto:melbourne@wga.com.au)

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