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Date: 17 September 2024
Your Ref: DC/23/0306
Our Ref : NA/3983/2024_002_r0
Email: natasha@herringtonconsulting.co.uk

Horsham District Council
Parkside
Chart Way
Horsham
West Sussex
RH12 IRL

Further information related to the discharge of condition 3 for the proposed development at Sluetts Farm Buildings, Two Mile Ash, Horsham, West Sussex

This letter has been prepared with reference to planning application reference DC/23/0306 and is aimed at providing further information to discharge planning condition 3 (herein referred to as 'Condition 3') for the proposed development at the above address. Condition 3 relates to the safe management of surface water runoff through the use of Sustainable Drainage Systems (SuDS) and in addition, requires a strategy to manage the foul drainage.

The proposed development comprises the erection of a temporary agricultural workers dwelling.

The details of Condition 3 are quoted below:

Planning Condition 3

"No development shall commence until a drainage strategy detailing the proposed means of foul and surface water disposal has been submitted to and approved in writing by the Local Planning Authority. The development shall be carried out in accordance with the approved scheme.

Reason: As this matter is fundamental to ensure that the development is properly drained and to comply with Policy 38 of the Horsham District Planning Framework (2015)."

Herrington Consulting Limited (HCL) prepared a surface and foul water drainage strategy to discharge Condition 3 (May 2024), which is referenced within this letter. The following comments have been received from Horsham District Council in response to HCL's previous report and are summarised in blue below. Additional information relating to each comment are subsequently provided.

- An assessment of how surface water would flow across the site in normal and rainfall conditions should be provided.

  This plan has been provided within the enclosed documents.

- Measurement of the total site area, with supporting catchment plans and calculations is required to support Table 2 of the Discharge of Conditions Letter which states that 38m2 is to drain to the geo-cellular storage tank, it is noted that this includes a 10% allowance for urban creep.

  The total site area is approximately 2560m^2. A catchment plan delineating the proposed areas to be drained are shown in yellow in Figure 1. The area of the proposed dwelling is approximately 34m^2. When a 10% allowance is applied for urban creep, the area to be drained has been rounded up to 38m^2.

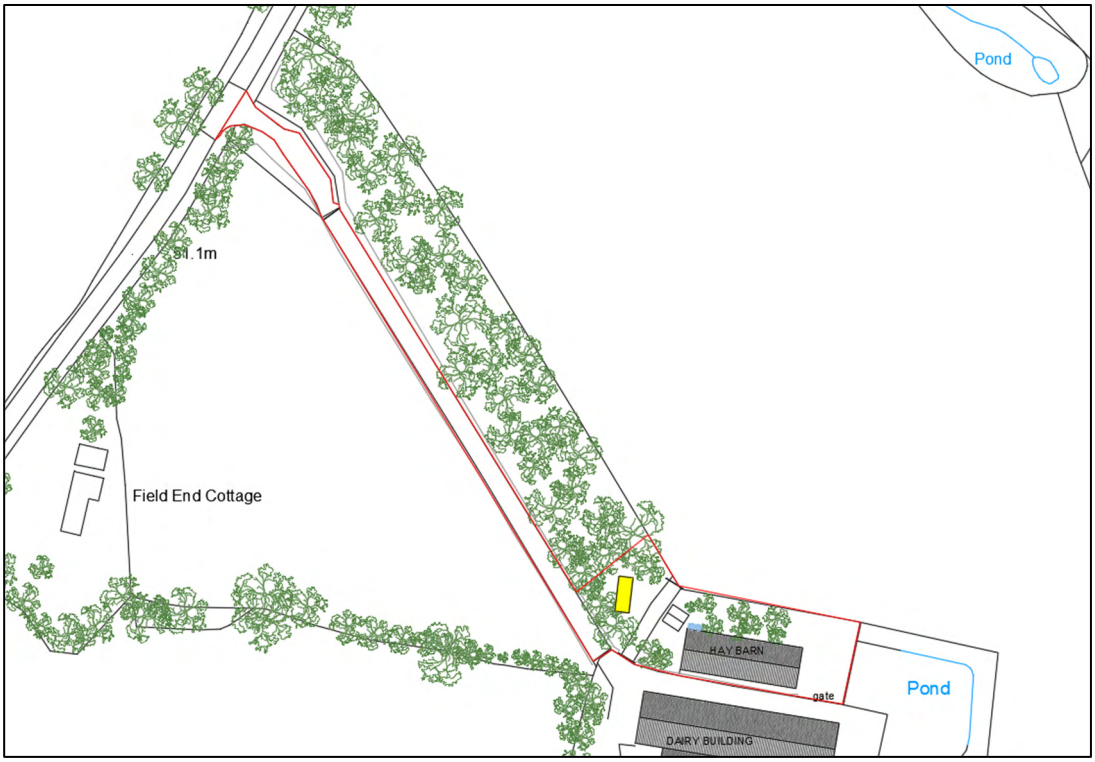


Figure 1 – Site boundary (red) and area to be drained (yellow).

- The volume of storage required to attenuate the 1 in 100 (1% annual exceedance probability (AEP) +45% climate change design event has not been provided. Please provide calculations to confirm the minimum attenuation storage volume required.

  This is provided on Page 7 of the appended calculations.

- The greenfield runoff rate is calculated for the site, enclosed in The Discharge of Conditions Letter. The Discharge of Conditions Letter considers that a limiting discharge rate of 2.0l/s is likely to be acceptable by the LPA. Flow control devices have improved to prevent blockages at low rates and lower discharge rates are achievable with guarded control devices.

  Noted. No additional information required.

- Page 5 and Table 2 in the Discharge of Conditions Letter states that runoff is to be restricted to 0.9l/s using a 26mm orifice plate at invert level and an overflow at top of tank is to be provided. The surface

water drainage strategy does not restrict runoff to the greenfield runoff rate, and betterment to the existing runoff rates has therefore not been achieved. However, as the impermeable area of the development is small, it is considered that the existing QBAR greenfield runoff rate of 0.022 l/s is not achievable, and for this development limiting the runoff rate to 0.9 l/s is considered to be acceptable. Due to the proposed small orifice plate of 26mm, pre-treatment, guarding of controls and a well-defined management and maintenance strategy needs to be put in place to limit silt and debris entering the drainage system and causing blockages and reducing effective storage.

An Aqua-Swirl vortex separator (manufactured by SDS) is proposed to be included upstream of the geo-cellular storage tank. This will limit the volume of sediment that is permitted to enter the tank and will therefore reduce the risk of blockage.

- The simulation parameters used in the Surface Water Management calculations within the Discharge of Conditions Letter should be reviewed. The Time of Entry and Time of Concentration for such a small catchment i.e. the footprint of the building is likely to be much lower than 4mins and 30mins respectively. The simulation shows the incorrect design flow of 1.5 l/s, this should be amended to 0.9 l/s. The design depth would be the depth of the tank i.e. 0.4m or the depth to the overflow pipe, if lower than 0.4m from invert level.

  Noted. The simulation parameters have been updated within the hydraulic model as requested above.

- The Surface Water Management Calculations enclosed within the Discharge of Conditions Letter shows that during the design event, the water level in the tank reaches 351mm. The tank is 400mm in depth, assuming the overflow pipe would be 100mm in diameter, the overflow would discharge during the design event before the full capacity of the storage tank is used, and discharge to the watercourse would be unrestricted. Therefore, the overflow pipe should be set above the top water level of the design event to prevent unrestricted flow. An overflow may be better located in the flow control chamber rather than the storage tank to allow the full storage capacity of the tank be utilised. It would also be difficult to maintain the overflow pipe or clearing any blockages if placed within the cellular storage tank. The invert level of the overflow must be at an appropriate level to operate as an exceedance control rather than during lesser flows.

  Noted. The overflow has been relocated to the flow control chamber.

- Evidence of measures to prevent pollution of the receiving watercourse should be provided.

  An Aqua-Swirl vortex separator (manufactured by SDS) has been included within the surface water drainage strategy. The Simple Index Approach has been applied and the pollution indices have been compared to the treatment mitigation indices for the vortex separator. A summary of the analysis is shown in Table 1 below.

	Total Suspended solids (TSS)	Metals	Hydro-carbons
Pollution Hazard Indices	0.2	0.2	0.05
Mitigation Indices for the SDS Aqua Swirl Vortex Separator	0.7	0.6	0.7
Comparison	Sufficient Treatment	Sufficient Treatment	Sufficient Treatment

Table 1 – Simple Index Approach Summary

- The drawing Indicative Surface Water Drainage Layout (07 May 2024, 3983_DWG_r0) enclosed within the Discharge of Conditions Letter provides an indicative surface water drainage layout. A detailed drainage layout plan is required which should reference all assets showing characteristics such as; pipe sizes and materials, gradients, and manhole type, depth, size, SuDS dimensions, materials and depths. Please provide a revised drawing with a higher resolution.
  An additional surface water drawing has been included within the enclosed documents.

- The drawing Indicative Surface Water Drainage Layout shows proposed pipes are in close proximity to existing trees. The impact to existing tree root zones, and of the tree roots on pipe and manhole operation, maintenance and long term structural integrity should be taken into consideration in the drainage layout. The manholes must be located so they are easily accessible.
  Pipes have been relocated to avoid existing trees.

- Ground levels should be reviewed at the detailed design stage to confirm that a gravity outfall to the watercourse can be achieved.
  Noted. No additional information required at this stage.

- The Discharge of Conditions Letter states that surface water will be discharged into the ordinary watercourse located in proximity to the site. Provide evidence of third-party agreement to discharge surface water into the watercourse.
  Correspondence with the applicant has confirmed that the watercourse is within the applicant's ownership.

- A generic non site specific SuDS Maintenance Schedule is enclosed within the Discharge of Conditions Letter which includes the required maintenance actions and frequency. A site-specific Maintenance and Management Plan including access requirements, maintenance responsibility, and proprietary device manuals, for all drainage features and SuDS devices should be provided.
  An additional maintenance and management plan has been included at the end of this letter.

- Drawings showing conveyance routes for flows exceeding the 1% AEP plus climate change event should be provided.
  An exceedance plan has been provided within the enclosed documents of this letter.

- The drawing Indicative Foul Water Drainage Layout (07 May 2024, 3983_DWG_r0) enclosed within the Discharge of Conditions Letter provides an indicative foul water drainage layout. The Discharge of Conditions Letter states that the design peak flow rate is calculated to be 0.05l/s in accordance with Design and Construction Guidance, based on 4000l/dwelling/day. In line with best practice, where foul drainage is discharged via a pumping main, the pumping main should discharge to a new manhole to allow the final connection to be discharged via a gravity outfall into the existing network. The requirement for air release valves must be considered when topographic information is available at the detailed design stage.

  Noted. An additional manhole has been provided to allow the final connection to be discharged via gravity into the existing sewer.

- The Indicative Foul Water Drainage Layout drawing shows proposed pipes are in close proximity to existing trees. The impact to existing tree root zones, and of the tree roots on pipe and manhole operation, maintenance and long term structural integrity should be taken into consideration in the drainage layout. The manholes must be located so they are easily accessible.

  The proposed pipes have been relocated to avoid existing trees.

- We request a detailed drainage layout in line with Sewerage Sector Guidance and/or Building Regulations Part H to be provided, showing pipe sizes, materials, gradients, and outfall location.

  An additional foul drainage layout is included within the enclosed documents.

- Southern Water require a formal application for a connection to the public foul sewer. Confirmation of permission to connect to the public sewer should be provided and consultation with Southern Water is required.

  An application to Southern Water has been sumbitted. A response is still to be received at the time of preparing this letter.

The information contained within this document provides additional details to demonstrate how surface water runoff and foul effluent will be managed on site and I trust that this information will be sufficient to enable Condition 3 to be discharged in full.

Yours faithfully,

Natasha Ames BA (Hons) MA GradCIWEM
Environmental Analyst
On behalf of Herrington Consulting Ltd.

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3. ALL DIMENSIONS ARE TO BE CHECKED BY THE CONTRACTOR PRIOR TO STARTING THE WORKS ON SITE. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.
4. ALL DRAINAGE SYSTEMS WILL NEED TO BE INSTALLED AND DESIGNED FOR SUITABLE LOADING REQUIREMENTS.
5. THE CONTRACTOR SHALL OBTAIN PRIOR APPROVAL AND ALL NECESSARY LICENCES FROM THE THE HIGHWAY AUTHORITY AND/OR SEWERAGE UNDERTAKER BEFORE CARRYING OUT ANY WORKS.
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KEY:

- SURFACE WATER DRAIN
- MH — SURFACE WATER MANHOLE
- PPIC — SURFACE WATER PPIC
- RWP — RAINWATER PIPE
- FLOW CONTROL DEVICE
- GEOCELLULAR STORAGE
- DRAINAGE DITCH
- HEADWALL

RWP

1.00 100Ø 1:80.0

VORTEX SEPARATOR TREATMENT DEVICE

GEO-CELLULAR STORAGE TANK
CL: 55.77
IL: 54.77
DIMENSIONS (L x W x D): 1.5 m x 1 m x 0.4 m
STORAGE VOLUME: 0.5 m³
POROSITY: 0.95

NOTE:
ALL LEVELS ARE BASED ON AERIAL HEIGHT DATA. ONCE TOPOGRAPHIC SURVEY DATA IS AVAILABLE, LEVELS SHOULD BE REVIEWED AS PART OF DETAILED DESIGN FOR THE PROPOSED DRAINAGE NETWORK.

INL 100Ø 1:80.0

1.00 100Ø 1:80.0

SW 2
CL: 55.91
IL: 54.73

RWP

FLOW CONTROL CHAMBER
26 mm ORIFICE PLATE
DISCHARGE RATES
1:2YR = 0.4 l/s
1:30YR = 0.6 l/s
1:100YR + 45%cc = 0.8 l/s

1.00 100Ø 1:80.0

SW 3
CL: 56.12
IL: 54.60

PROPOSED CONNECTION TO EXISTING DRAINAGE DITCH

SW 4
CL: 55.97
IL: 54.47

1.002 100Ø 1:80.0

HAY BA

SCALE 1 : 100 @ A1

1 m 0 10 m

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Rev	Description	Author	Checked	Date
P1	Second issue	NA	SM-B	17/09/24
P0	First issue	NA	EC	07/05/24

CLIENT: CHRIST'S HOSPITAL FOUNDATION

PROJECT: SLUETTS FARM, HORSHAM

SCALE	PROJ REF	ORIGINATOR	CHECKED BY
1:100	3983	NA	EC

HC DWG REF: 3983_DWG_r2

DWG TITLE	DWG No.
INDICATIVE SURFACE WATER DRAINAGE LAYOUT	HC-3983-501

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KEY:

SITE BOUNDARY

CATCHMENT TO BE DRAINED TO SUDS

N

S

Drain

Pond

Drain

51.1m

Field End Cottage

49.7m

HAY BARN

gate

Pond

DAIRY BUILDING

gate

SILAGE CLAMPS

CATTLE SHED NORTH

SCALE 1 : 100 @ A1

1 m 0 10 m

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PROJECT: SLUETTS FARM, HORSHAM

SCALE	PROJ REF	ORIGINATOR	CHECKED BY
1:100	3983	NA	SM-B

HC DWG REF: 3983_DWG_r2

DWG TITLE: CATCHMENT PLAN

DWG No.: HC-3983-502

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- RWP — RAINWATER PIPE
- FLOW CONTROL DEVICE
- GEOCELLULAR STORAGE
- DRAINAGE DITCH
- HEADWALL
- FLOW ROUTE DURING EXCEEDANCE OR BLOCKAGE SCENARIO

HAY BARN

DAIRY BUILDING

Pond

gate

gate

SCALE 1 : 100 @ A1

1 m 0 10 m

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P0	First issue	NA	SM-B	17/09/24

CLIENT: CHRIST'S HOSPITAL FOUNDATION

PROJECT: SLUETTS FARM, HORSHAM

SCALE	PROJ REF	ORIGINATOR	CHECKED BY
1:100	3983	NA	EC

HC DWG REF: 3983_DWG_r2

DWG TITLE: EXCEEDANCE PLAN

DWG No.: HC-3983-502

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KEY:

- EXISTING FOUL WATER SEWER
- EXISTING FOUL WATER CHAMBER
- FOUL WATER DRAIN
- FOUL WATER RISING MAIN
- MH FOUL WATER MANHOLE
- FOUL PUMPING STATION

FW 1
CL: 55.67
IL: 55.07

1:000 1000
1:40.0

INDICATIVE LOCATION OF PROPOSED TYPE 1 FOUL PUMPING STATION (KLARGESTER AQUAPUMP, OR SIMILAR. TO BE CONFIRMED AT DETAILED DESIGN)
CL: 55.71
IL: 53.7 (ASSUMED)
TO BE CONFIRMED AT DETAILED DESIGN

NOTE:
ALL LEVELS ARE BASED ON AERIAL HEIGHT DATA. ONCE TOPOGRAPHIC SURVEY DATA IS AVAILABLE, LEVELS SHOULD BE REVIEWED AS PART OF DETAILED DESIGN FOR THE PROPOSED DRAINAGE NETWORK.

FOUL RISING MAIN

FW2
CL: 56.16
IL: 55.1 (ASSUMED)
TO BE CONFIRMED FOLLOWING SURVEY AT DETAILED DESIGN

CONNECTION VIA GRAVITY

PROPOSED CONNECTION TO EXISTING FOUL WATER SEWER THAT SERVES THE WIDER SITE

INVERT LEVEL OF EXISTING SEWER TO BE CONFIRMED AT DETAILED DESIGN

FW3
CL: 56.16
IL: 55.0 (ASSUMED)
TO BE CONFIRMED FOLLOWING SURVEY AT DETAILED DESIGN

DAIRY

SCALE 1 : 100 @ A1

1 m 0 10 m

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CLIENT: CHRIST'S HOSPITAL FOUNDATION

PROJECT: SLUETTS FARM, HORSHAM

SCALE	PROJ REF	ORIGINATOR	CHECKED BY
1:100	3983	NA	EC

HC DWG REF: 3983_DWG_r2

DWG TITLE	DWG No.
INDICATIVE FOUL WATER DRAINAGE LAYOUT	HC-3983-601

Design Settings

Rainfall Methodology	FEH-22	Maximum Time of Concentration (mins)	30.00	Preferred Cover Depth (m)	1.200
Return Period (years)	100	Maximum Rainfall (mm/hr)	200.0	Include Intermediate Ground	✓
Additional Flow (%)	45	Minimum Velocity (m/s)	1.00	Enforce best practice design rules	x
CV	1.000	Connection Type	Level Soffits		
Time of Entry (mins)	1.00	Minimum Backdrop Height (m)	0.200		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1_TANK	0.003	1.00	55.770	1200	282.737	602.367	1.000
2			55.910	1200	286.918	596.153	1.234
3			56.120	1200	278.224	590.512	1.574
4_OUTFALL			55.970	1200	267.785	590.748	1.555

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1_TANK	2	7.490	0.600	54.770	54.676	0.094	80.0	100	1.15	169.0
1.001	2	3	10.364	0.600	54.676	54.546	0.130	80.0	100	1.35	169.0
1.002	3	4_OUTFALL	10.442	0.600	54.546	54.415	0.131	80.0	100	1.55	169.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.861	6.8	3.0	0.900	1.134	0.003	0.0	46	0.834
1.001	0.861	6.8	3.0	1.134	1.474	0.003	0.0	46	0.834
1.002	0.861	6.8	3.0	1.474	1.455	0.003	0.0	46	0.834

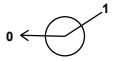
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Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	7.490	80.0	100	Circular	55.770	54.770	0.900	55.910	54.676	1.134
1.001	10.364	80.0	100	Circular	55.910	54.676	1.134	56.120	54.546	1.474
1.002	10.442	80.0	100	Circular	56.120	54.546	1.474	55.970	54.415	1.455

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1_TANK	1200	Manhole	Adoptable	2	1200	Manhole	Adoptable
1.001	2	1200	Manhole	Adoptable	3	1200	Manhole	Adoptable
1.002	3	1200	Manhole	Adoptable	4_OUTFALL	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
1_TANK	282.737	602.367	55.770	1.000	1200	Manhole	Adoptable	 0	1.000	54.770	100	Circular
2	286.918	596.153	55.910	1.234	1200	Manhole	Adoptable	 1	1.000	54.676	100	Circular
								0	1.001	54.676	100	Circular
3	278.224	590.512	56.120	1.574	1200	Manhole	Adoptable	 1	1.001	54.546	100	Circular
								0	1.002	54.546	100	Circular
4_OUTFALL	267.785	590.748	55.970	1.555	1200	Manhole	Adoptable	 1	1.002	54.415	100	Circular

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Simulation Settings

Rainfall Methodology	FEH-22	Winter CV	1.000	Drain Down Time (mins)	10080	Check Discharge Rate(s)	x
Rainfall Events	Singular	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0	Check Discharge Volume	x
Summer CV	1.000	Skip Steady State	x	Starting Level (m)			

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	10	0	100	0	10	0
30	0	10	0	100	45	10	0

Node 2 Online Orifice Control

Flap Valve	✓	Invert Level (m)	54.676	Design Flow (l/s)	0.9	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Depth (m)	0.400	Diameter (m)	0.026		

Node 1_TANK Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Pit Width (m)	1.000	Inf Depth (m)	
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	54.770	Pit Length (m)	1.500	Number Required	1
Safety Factor	2.0	Time to half empty (mins)	10	Depth (m)	0.400		

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Results for 2 year +10% A Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1_TANK	9	54.794	0.024	1.1	0.0610	0.0000	OK
30 minute summer	2	19	54.763	0.087	0.7	0.0989	0.0000	OK
30 minute summer	3	20	54.562	0.016	0.4	0.0185	0.0000	OK
30 minute summer	4_OUTFALL	20	54.431	0.016	0.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1_TANK	1.000	2	0.9	0.419	0.126	0.0297	
30 minute summer	2	Orifice	3	0.4				
30 minute summer	3	1.002	4_OUTFALL	0.4	0.464	0.056	0.0086	0.4

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Results for 30 year +10% A Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	1_TANK	20	54.867	0.097	2.0	0.2487	0.0000	OK
30 minute summer	2	20	54.867	0.191	1.3	0.2157	0.0000	SURCHARGED
30 minute summer	3	20	54.566	0.020	0.6	0.0230	0.0000	OK
30 minute summer	4_OUTFALL	20	54.435	0.020	0.6	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	1_TANK	1.000	2	1.3	0.427	0.187	0.0584	
30 minute summer	2	Orifice	3	0.6				
30 minute summer	3	1.002	4_OUTFALL	0.6	0.527	0.087	0.0117	1.0

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Results for 100 year +10% A Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	1_TANK	20	54.915	0.145	2.5	0.3708	0.0000	SURCHARGED
30 minute summer	2	20	54.914	0.238	1.3	0.2692	0.0000	SURCHARGED
30 minute summer	3	21	54.568	0.022	0.7	0.0244	0.0000	OK
30 minute summer	4_OUTFALL	21	54.436	0.021	0.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	1_TANK	1.000	2	1.3	0.464	0.187	0.0586	
30 minute summer	2	Orifice	3	0.7				
30 minute summer	3	1.002	4_OUTFALL	0.7	0.545	0.098	0.0128	1.3

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Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	1_TANK	21	55.021	0.251	3.7	0.6422	0.0000	SURCHARGED
30 minute summer	2	21	55.020	0.344	1.6	0.3887	0.0000	SURCHARGED
30 minute summer	3	21	54.570	0.024	0.8	0.0269	0.0000	OK
30 minute summer	4_OUTFALL	21	54.438	0.023	0.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	1_TANK	1.000	2	1.6	0.528	0.236	0.0586	
30 minute summer	2	Orifice	3	0.8				
30 minute summer	3	1.002	4_OUTFALL	0.8	0.575	0.119	0.0146	1.9

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Project: 3983 – Sluetts Farm, Horsham

Date: 17 September 2024
Revision: FINAL

1. Background Information

1.1 This maintenance and operation manual has been prepared to support the maintenance and inspection program to ensure that the drainage system at the above site is adequately maintained throughout its lifetime.

1.2 For this site, the owner will be responsible for the maintenance and inspection of the drainage system. It should, however, be noted that it may be necessary to involve specialist contractors to undertake specific maintenance tasks that are required.

1.3 The following sections provide a summary of the maintenance requirements for each element of the drainage system, including any manufacturer specific requirements.

2. Maintenance and Operation

2.1 Storm water pipes and manholes

2.1.1 Pipes and manholes should be inspected regularly to ensure sediment does not restrict hydraulic capacity.

2.1.2 Cleaning of sewers involving jetting/vacuuming, should be carried out as necessary to remove sediment or debris build-up.

2.1.3 Sediment should be removed in consultation with the environmental regulator to confirm appropriate protocols.

2.2 Geo-cellular Storage

2.2.1 Geo-cellular storage systems should be inspected monthly for the initial three months following installation, and annually thereafter. During this inspection, all inlets, outlets, vents, and overflows should be inspected to ensure that they are in good condition and operating as designed.

2.2.2 Debris and sediment should be removed from the catchment surface and from pre-treatment structures, as required based on regular inspection.

2.2.3 Repairs to inlets, outlets, overflow pipes, and vent mechanisms should be carried out as required, based on regular inspections.

2.2.4 Replacement of tank or geotextile should be carried out, as required, if significant damage is observed.

2.2.5 A survey of inside the tank, and any sediment trap mechanisms should be carried out every 5 years (or as required if regular monitoring should demonstrate high siltation rates) to remove sediment as necessary.

2.3 Orifice Plate

2.3.1 Following installation of the flow control all extraneous material i.e. building materials should be removed from the unit and the chamber.

2.3.2 After the system is made live, and assuming that the chamber design is satisfactory, the flow control device should be inspected monthly for three months and thereafter at six monthly intervals with hose down if required.

2.4 Hydrodynamic Vortex Separator

2.4.1 SDS Aqua Swirl Hydrodynamic Separator requires inspection on handover, then subsequently at 3, 6 and 12 month intervals, and annually thereafter, or as deemed necessary from the details obtained from previous inspections.

2.4.2 The single chamber system can be inspected and maintained entirely from the surface thereby eliminating the need for confined space entry.

2.4.3 Furthermore, the entire structure is accessible for visual inspection from the surface. There are no areas of the structure that are blocked from visual inspection or periodic cleaning. Inspection of any free-floating oil and floatable debris can be directly observed and maintained through the manhole access provided directly over the swirl chamber.