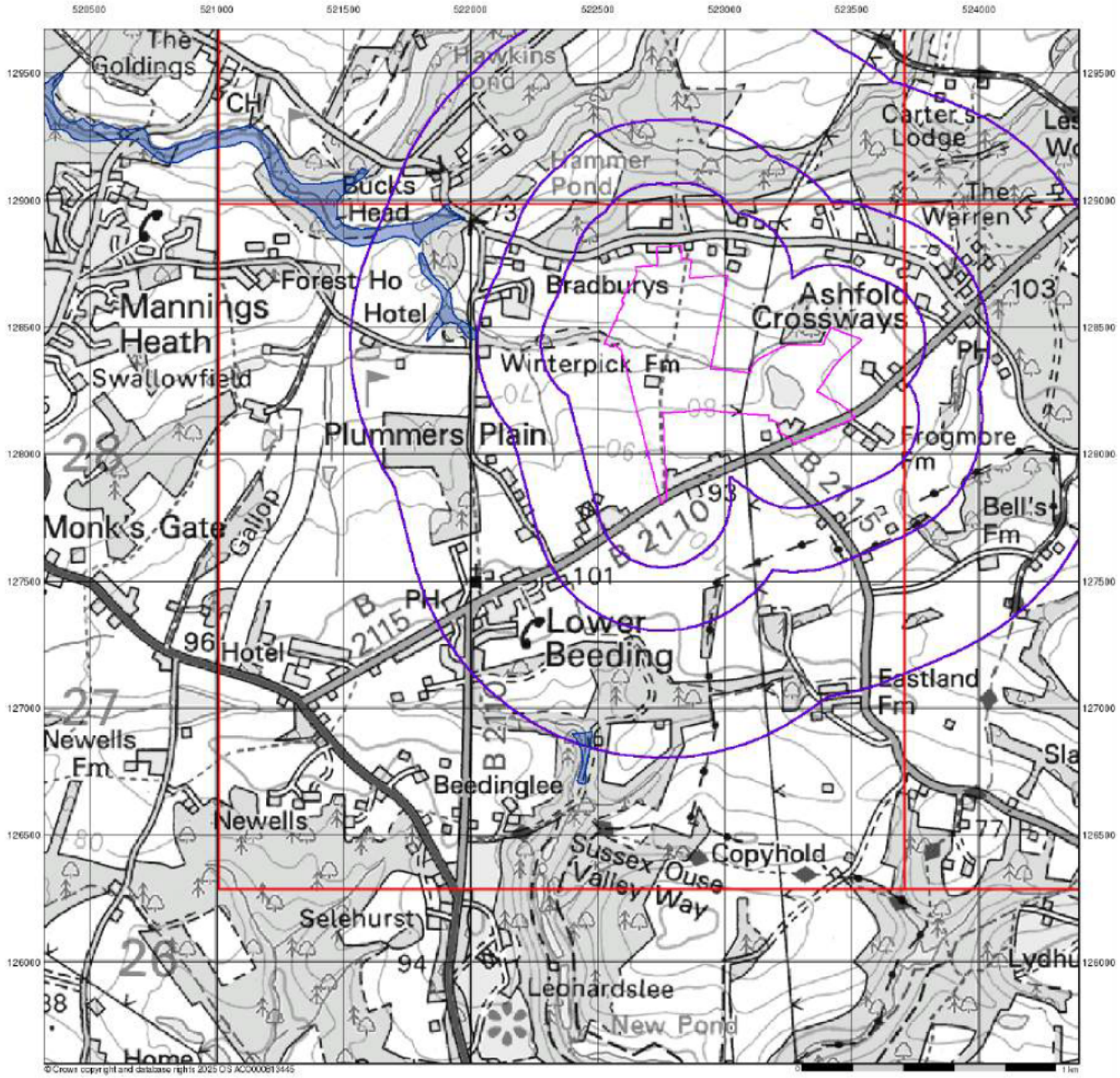


motion

BGS Flood Data (1:50,000)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

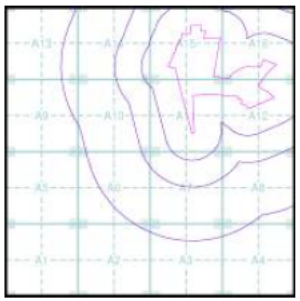
BGS Geological Indicators of Flooding

Coastal

Inland

Bodies of Water

BGS Flood Data Map - Slice A



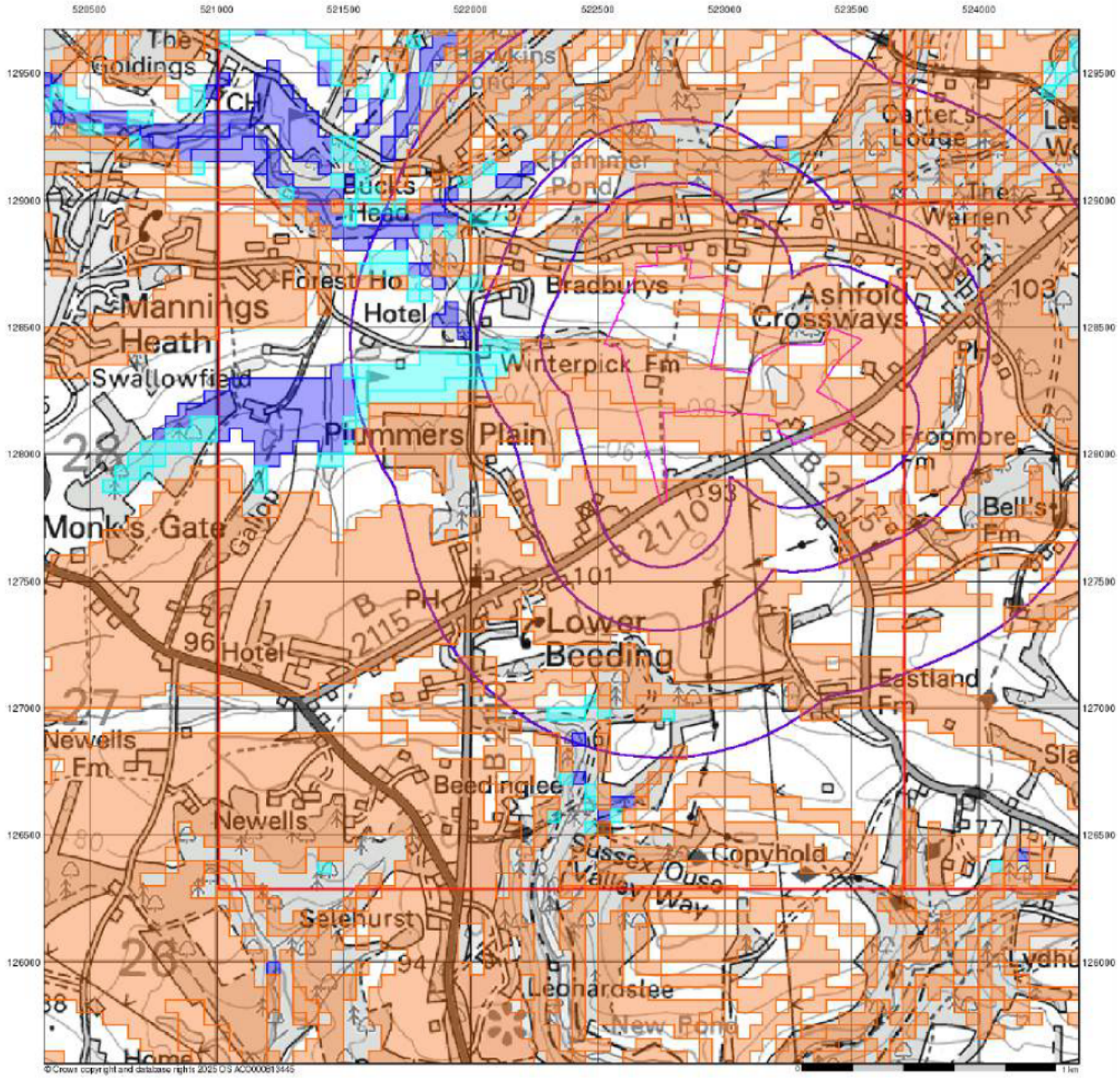
Order Details

Order Number:	369891876_1_1
Customer Ref:	1ecst2/2410067
National Grid Reference:	522690, 128000
Slice:	A
Site Area (Ha):	37.3
Search Buffer (m):	1000

Site Details

Site at, Plummers Plain, West Sussex

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



motion

BGS Flood Data (1:50,000)

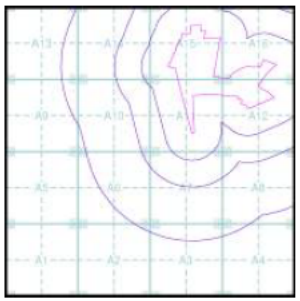
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

BGS Groundwater Flooding Susceptibility

- Potential for Groundwater Flooding to Occur at Surface
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Limited Potential for Groundwater Flooding to Occur

BGS Flood Data Map - Slice A



Order Details

Order Number:	369891876_1_1
Customer Ref:	1ecst2/2410067
National Grid Reference:	522690, 128000
Slice:	A
Site Area (Ha):	37.3
Search Buffer (m):	1000

Site Details

Site at, Plummers Plain, West Sussex

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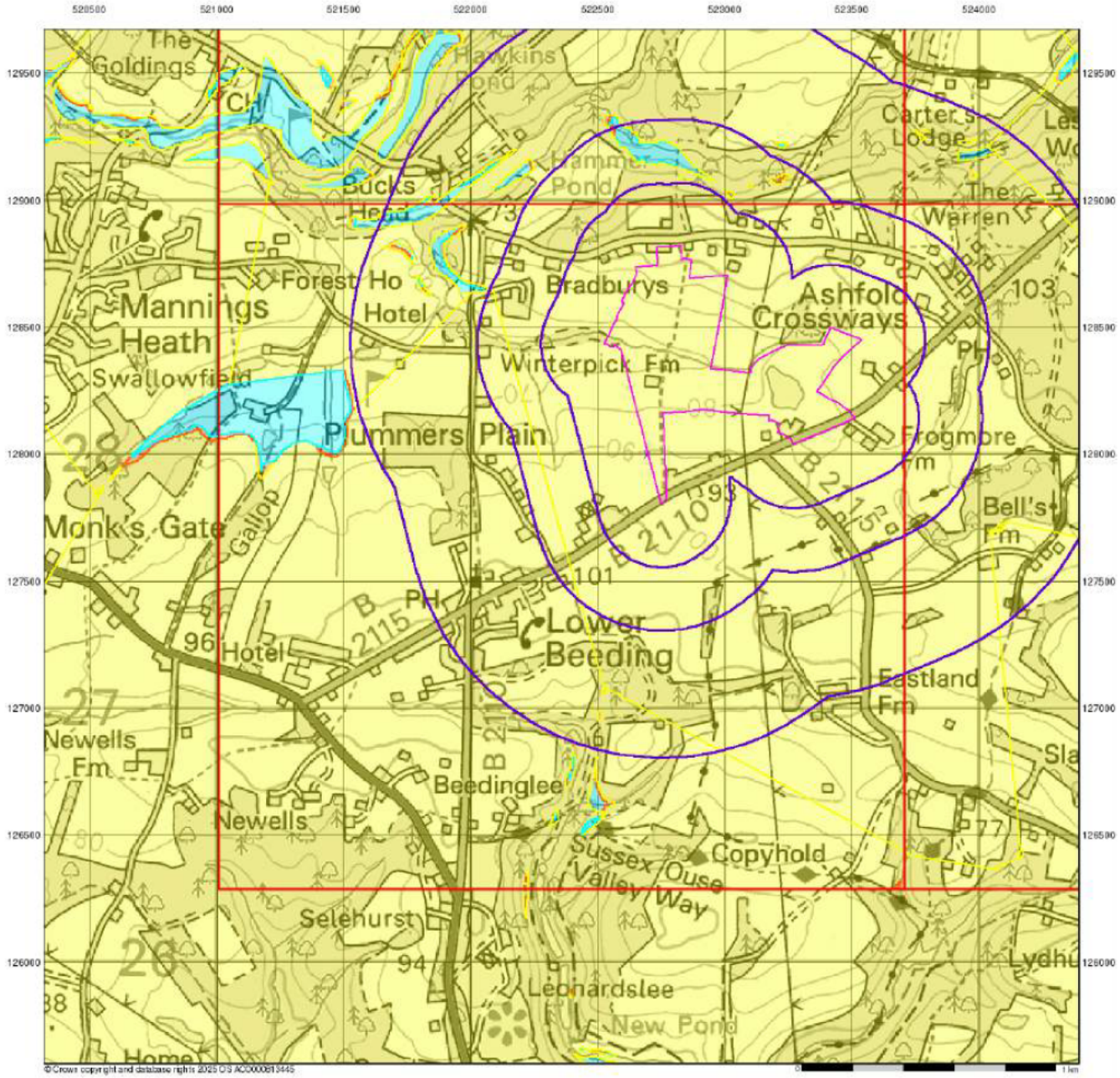
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



motion

GeoSmart Information Groundwater Flood Map (1:50,000)

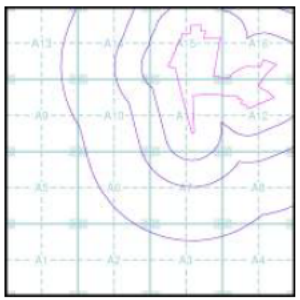
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice

GeoSmart Information Groundwater Flooding Risk

- High Risk
- Moderate Risk
- Low Risk
- Negligible Risk

GeoSmart Information Groundwater Flood Map - Slice A



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Order Details

Order Number:	369891876_1_1
Customer Ref:	1ecst2/2410067
National Grid Reference:	522690, 128000
Slice:	A
Site Area (Ha):	37.3
Search Buffer (m):	1000

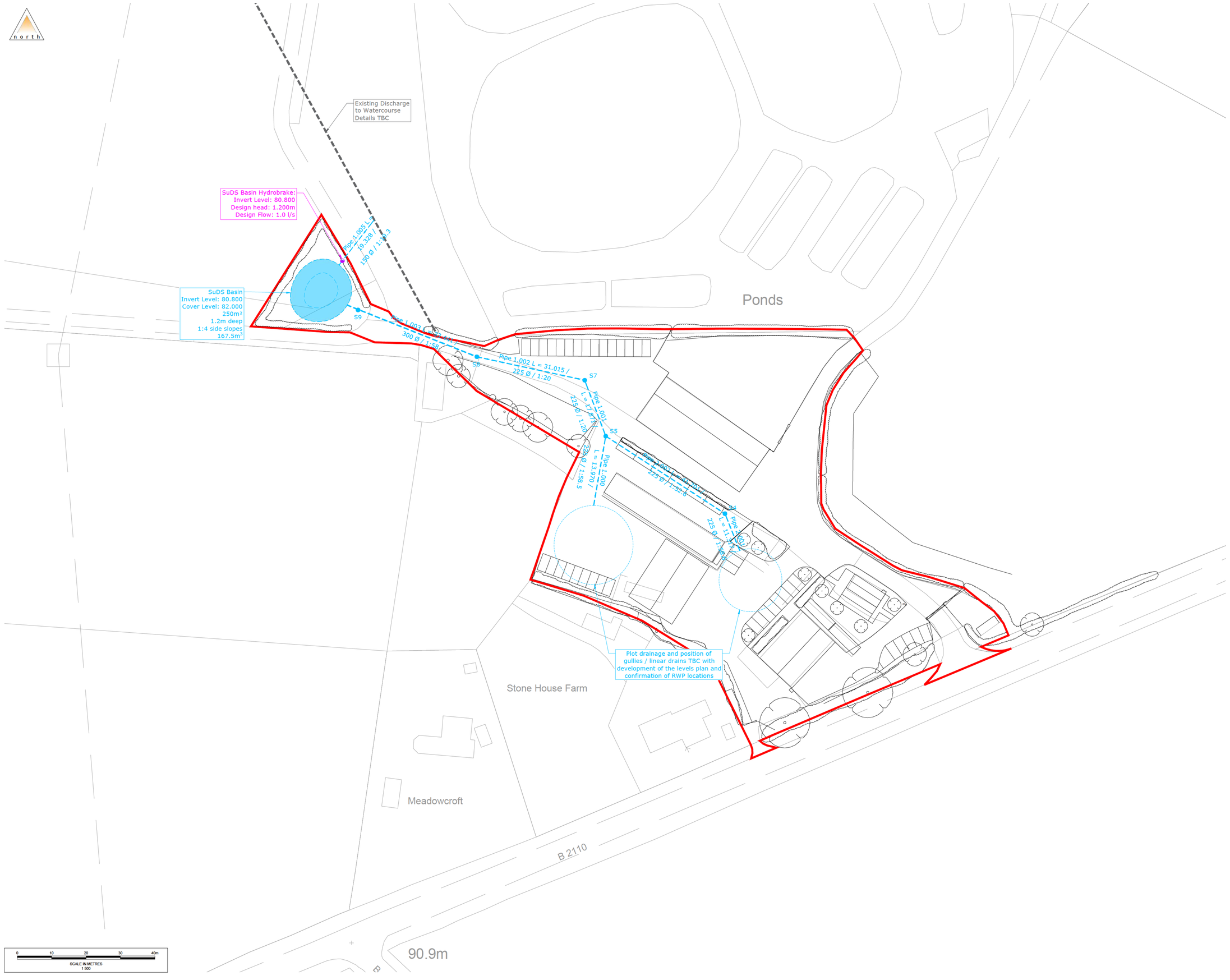
Site Details

Site at, Plummers Plain, West Sussex

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

Appendix O

Drainage Strategy Layouts



Notes

1. All levels and dimensions are to be checked on site before any work commences. All dimensions are in metres unless stated otherwise.
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3. This drawing shall be read in conjunction with all other relevant engineering details, drawings and specification.
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6. All works to the private drainage system to be in accordance with the Building Regulations Approved Document Part "H" 2015 edition.
7. 350mm min cover to be provided for private pipes laid in soft/paved areas. 900mm min cover to be provided for private pipes laid beneath roads/driveways unless not practicable. Where unachievable, shallow private drains may require protection using concrete surround or paving slabs bridging the trench, subject to the NHBC inspector's requirements.
8. All pipes shall be laid soffit to soffit with outgoing pipes unless otherwise stated.
9. Manholes situated within areas accessible to motor vehicles are to be fitted with suitable strength covers and frames. Please refer to the manhole schedule for guidance on this.

Legend

- New SuDS Basin
- New Surface Water Gravity Pipe
- Existing Surface Water Gravity Pipe
- New SW Inspection Chamber
- New Flow Control Structure

Rev.	Description	Drn	Chk	App	Date
P02	Second Issue	PA	PA	PA	28/02/2025
P01	First Issue	RW	PA	PA	26/02/2025

Drawing Status:

FOR PLANNING
NOT FOR CONSTRUCTION

motion
Guildford - Reading - London
www.motion.co.uk

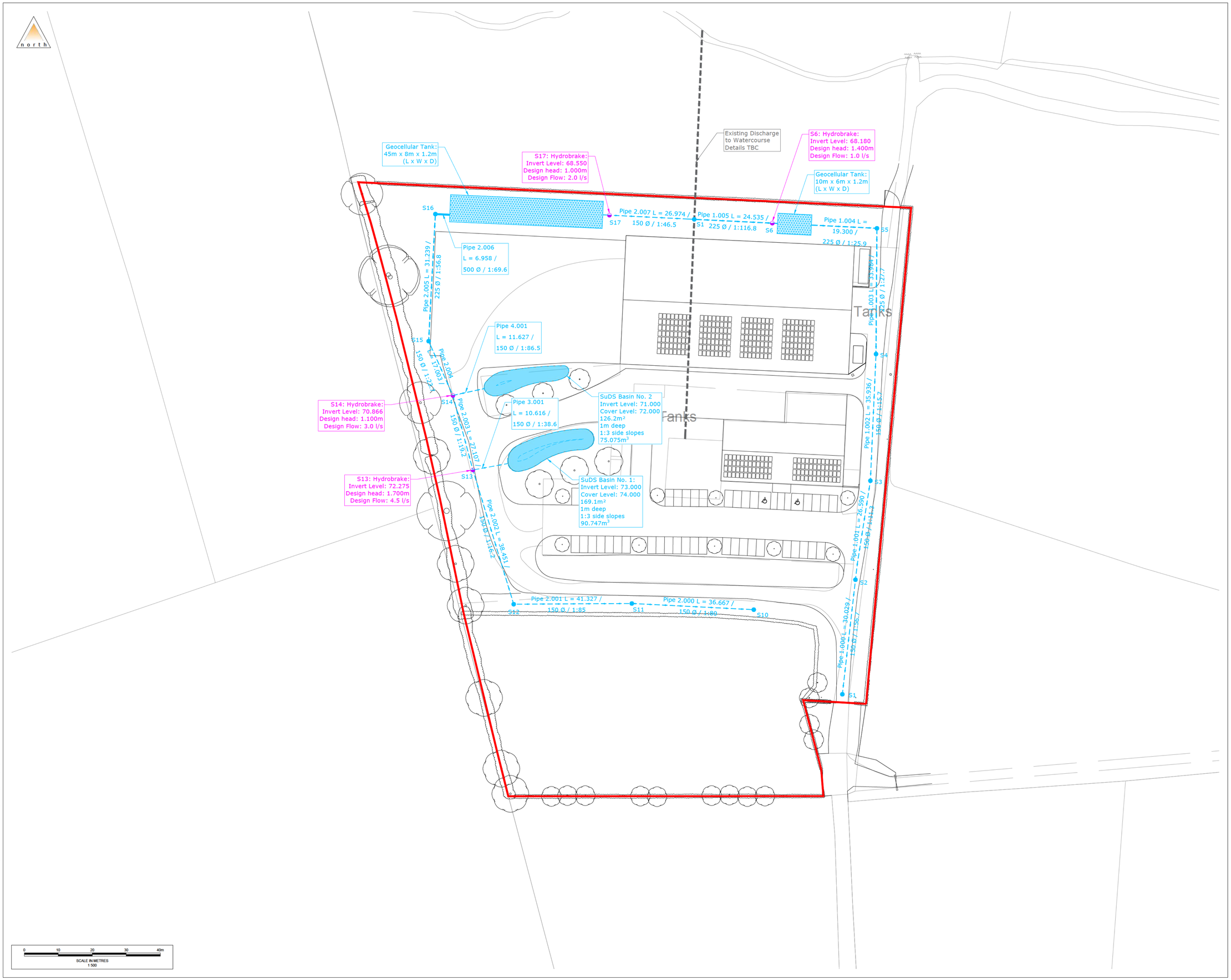
Client:
Lakeside Investments Limited

Project:
Stonehouse Farm

Title:
Stonehouse Business Park
Drainage Strategy

Scale: 1:500 (@ A1)

Drawing: 2501022-0502
Revision: P02



Notes

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2. Any discrepancies shall be reported to the engineer immediately, so that clarification can be sought prior to the commencement of works.
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Legend

- Gecellular Attenuation Tank
- New SuDS Basin
- New Surface Water Gravity Pipe
- Existing Surface Water Gravity Pipe
- New SW Inspection Chamber
- New Flow Control Structure

Rev.	Description	Drn	Chk	App	Date
P02	Second Issue	PA	PA	PA	28/02/2025
P01	First Issue	RW	PA	PA	26/02/2025

Drawing Status:

FOR PLANNING
NOT FOR CONSTRUCTION

motion
Guildford - Reading - London
www.motion.co.uk

Client:
Lakeside Investments Limitied

Project:
Stonehouse Farm

Title:
Lot 8
Drainage Strategy

Scale: 1:500 (@ A1)

Drawing: 2501022-0501
Revision: P02

C:\Users\phillen\Motion\Staffsite - 1ecd3 2501022\Drawings\2501022-0501-P01 [Drainage Strategy - Lot 8].dwg

n o r t h

104.7m

Hammerpond Road

Silo

Building 3 - Open Sided

Building 2

Building 1

Building 5

Temporary Building

Public Footpath

Jackson's Farm

Kee

e

Permeable Paviours:
Total Area: 130m²
Total Subbase Depth: 450mm
Total Volume: 17.550m³

Permeable Paviours:
Total Area: 130m²
Total Subbase Depth: 450mm
Total Volume: 17.550m³

Permeable Paviours:
Total Area: 120m²
Total Subbase Depth: 450mm
Total Volume: 16.200m³

S2: Orifice Plate:
Dia.: 0.037m
Design Head: 0.40m
Design Flow: 1.8 l/s

S7: Orifice Plate:
Dia.: 0.050m
Design Head: 0.45m
Design Flow: 3.5 l/s

S10: Orifice:
Dia.: 0.066m
Design Head: 0.45m
Design Flow: 6.0 l/s

Pipe 1.001 L = 11.219 /
150 Ø / 1:58.4

Geocellular Tank:
8m x 3m x 1.2m
(L x W x D)
95% porosity
Volume 31.929m³

Pipe 1.002 L = 24.460 /
150 Ø / 1:99.9

Pipe 1.003
L = 4.920 /
150 Ø / 1:12.9

Geocellular Tank:
12m x 3m x 1.2m
(L x W x D)
95% porosity

Pipe 2.001 L = 22.776 /
150 Ø / 1:100

Pipe 2.002 L = 10.128 /
150 Ø / 1:100

Pipe 3.001 L = 20.294 /
150 Ø / 1:100

Pipe 3.002
L = 6.675 /
150 Ø / 1:100

S5: Hydrobrake:
CL: 105.000 mAOD
IL: 102.725mAOD
Design Head: 2.40m
Design Flow:1.0 l/s

S9: Hydrobrake:
CL: 105.000 mAOD
IL: 103.141mAOD
Design Head: 2.00m
Design Flow:1.0 l/s

S12: Hydrobrake:
CL: 105.000 mAOD
IL: 103.194mAOD
Design Head: 1.85m
Design Flow:1.0 l/s

Pipe 1.004
L = 9.886 /
150 Ø / 1:90.9

Pipe 2.003 L = 16.383 /
150 Ø / 1:25.8

Pipe 3.003
L = 10.323 /
150 Ø / 1:60.0

Geocellular Tank:
12m x 3m x 1.2m
(L x W x D)
95% porosity

C

B

A

Pipe 1.005 L = 42.280 /
150 Ø / 1:148

Pipe 3.004 L = 31.857 /
150 Ø / 1:61.7

Pipe 1.006 L = 6.397m /
225 Ø / c.1.10

Discharge to watercourse
at bottom of valley

Dense Vegetation

Abandoned Building

Spoil Heap

Access Track

Post and Wire Fence

Overhead Wires

Concrete

Wooden Platform

Stones/Mud

0 4 8 12 16m
SCALE IN METRES
1:200

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Notes

1. All levels and dimensions are to be checked on site before any work commences. All dimensions are in metres unless stated otherwise.
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- Permeable Paviours
- Gecellular Attenuation Tank
- New Surface Water Gravity Pipe
- New SW Inspection Chamber
- New Flow Control Structure
- New Manhole

Rev.	Description	Drn	Chk	App	Date
P01	First Issue	RW	PA	PA	26/02/2025

Drawing Status:

FOR PLANNING
NOT FOR CONSTRUCTION

motion
Guildford - Reading - London
www.motion.co.uk

Client:
Lakeside Investments Limited

Project:
Stonehouse Farm - Jacksons Ridge

Title:
Jackson's Farm
Drainage Strategy

Scale: 1:200 (@ A1)

Drawing: 2410067-0501

Revision: P01

Appendix P

Stonehouse Business Park MicroDrainage Modelling Results

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 522650 128400 TQ 22650 28400
Data Type	Catchment
Maximum Rainfall (mm/hr)	550
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	1.000
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	0.600
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.052	4-8	0.055	8-12	0.051	12-16	0.050	16-20	0.002

Total Area Contributing (ha) = 0.209

Total Pipe Volume (m^3) = 8.464

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	13.970	0.239	58.5	0.110	15.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	7.475	0.178	42.0	0.045	15.00	0.0	0.600	o	150	Pipe/Conduit	
3.000	11.300	0.628	18.0	0.035	15.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	92.74	15.14	85.800	0.110	0.0	0.0	0.0	1.71	68.1	36.8
2.000	92.92	15.08	86.800	0.045	0.0	0.0	0.0	1.56	27.5	15.1
3.000	92.85	15.10	87.300	0.035	0.0	0.0	0.0	1.83	14.4	11.6

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
2.001	11.317	0.193	58.6	0.011	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.002	41.701	0.793	52.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	17.871	0.894	20.0	0.008	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	31.015	1.551	20.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	33.441	0.577	58.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	13.184	1.465	9.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	19.247	1.000	19.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
2.001	92.48	15.21	86.547	0.091	0.0	0.0	0.0	1.71	68.1	30.4
2.002	91.25	15.60	86.354	0.091	0.0	0.0	0.0	1.81	71.9	30.4
1.001	90.93	15.70	85.561	0.209	0.0	0.0	0.0	2.94	116.9	68.5
1.002	90.39	15.87	84.668	0.209	0.0	0.0	0.0	2.94	116.9	68.5
1.003	89.58	16.14	83.042	0.209	0.0	0.0	0.0	2.07	146.2	68.5
1.004	89.46	16.19	82.465	0.209	0.0	0.0	0.0	5.27	372.6	68.5
1.005	89.05	16.33	80.800	0.209	0.0	0.0	0.0	2.31	40.8«	68.5

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.015	0.015	0.015
	User	-	100	0.095	0.095	0.110
2.000	User	-	100	0.015	0.015	0.015
	User	-	100	0.030	0.030	0.045
3.000	User	-	100	0.005	0.005	0.005
	User	-	100	0.030	0.030	0.035
2.001	User	-	100	0.011	0.011	0.011
2.002	-	-	100	0.000	0.000	0.000
1.001	User	-	100	0.008	0.008	0.008
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.209	0.209	0.209

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.005	Outfall	81.000	79.800	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	100	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 522650 128400 TQ 22650 28400	Cv (Winter)	0.840
Data Type	Catchment	Storm Duration (mins)	30

Online Controls for Storm

Hydro-Brake® Optimum Manhole: SuDS Basin, DS/PN: 1.005, Volume (m³): 2.2

Unit Reference	MD-SHE-0064-2000-1200-2000
Design Head (m)	1.200
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	64
Invert Level (m)	80.800
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	2.0	Kick-Flo®	0.573	1.4
Flush-Flo™	0.282	1.8	Mean Flow over Head Range	-	1.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.5	0.800	1.7	2.000	2.5	4.000	3.5	7.000	4.5
0.200	1.7	1.000	1.8	2.200	2.6	4.500	3.7	7.500	4.7
0.300	1.8	1.200	2.0	2.400	2.7	5.000	3.9	8.000	4.8
0.400	1.7	1.400	2.1	2.600	2.8	5.500	4.0	8.500	5.0
0.500	1.6	1.600	2.3	3.000	3.0	6.000	4.2	9.000	5.1
0.600	1.5	1.800	2.4	3.500	3.3	6.500	4.4	9.500	5.2

Storage Structures for Storm

Tank or Pond Manhole: SuDS Basin, DS/PN: 1.005

Invert Level (m) 80.800

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	53.3	1.200	250.0

Volume Summary (Static)

Length Calculations based on Centre-Centre

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
1.000	6	0.792	0.555	0.000	1.347
2.000	1	0.792	0.132	0.000	0.924
3.000	2	0.792	0.089	0.000	0.880
2.001	3	1.078	0.450	0.000	1.528
2.002	4	1.296	1.658	0.000	2.954
1.001	5	1.345	0.711	0.000	2.055
1.002	7	1.507	1.233	0.000	2.740
1.003	8	1.932	2.364	0.000	4.296
1.004	9	1.170	0.932	0.000	2.102
1.005	SuDS Basin	1.357	0.340	167.499	169.196
Total		12.060	8.464	167.499	188.022

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Catchment
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 522650 128400 TQ 22650 28400	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 40, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	6	30 Summer	2	+0%					85.865	-0.160
2.000	1	30 Summer	2	+0%					86.844	-0.106
3.000	2	30 Summer	2	+0%	100/30 Summer				87.334	-0.066
2.001	3	30 Summer	2	+0%					86.607	-0.165
2.002	4	30 Summer	2	+0%					86.409	-0.170
1.001	5	30 Summer	2	+0%					85.629	-0.157
1.002	7	30 Summer	2	+0%					84.734	-0.158
1.003	8	30 Summer	2	+0%					83.121	-0.221
1.004	9	30 Summer	2	+0%					82.517	-0.248
1.005	SuDS Basin	360 Summer	2	+0%	2/15 Summer				81.240	0.290

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	6	0.000	0.19			11.0	OK	
2.000	1	0.000	0.19			4.5	OK	
3.000	2	0.000	0.26			3.5	OK	
2.001	3	0.000	0.16			9.3	OK	
2.002	4	0.000	0.14			9.3	OK	
1.001	5	0.000	0.20			21.1	OK	
1.002	7	0.000	0.19			21.1	OK	
1.003	8	0.000	0.16			21.1	OK	
1.004	9	0.000	0.07			21.1	OK	
1.005	SuDS Basin	0.000	0.05			1.8	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Catchment
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 522650 128400 TQ 22650 28400	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 40, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	6	30 Summer	30	+40%					85.922	-0.103
2.000	1	30 Summer	30	+40%					86.883	-0.067
3.000	2	30 Summer	30	+40%	100/30 Summer				87.368	-0.032
2.001	3	30 Summer	30	+40%					86.660	-0.112
2.002	4	30 Summer	30	+40%					86.456	-0.123
1.001	5	30 Summer	30	+40%					85.690	-0.097
1.002	7	30 Summer	30	+40%					84.792	-0.100
1.003	8	30 Summer	30	+40%					83.189	-0.153
1.004	9	30 Summer	30	+40%					82.559	-0.207
1.005	SuDS Basin	480 Winter	30	+40%	2/15 Summer				81.795	0.845

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	6	0.000	0.57			34.1	OK	
2.000	1	0.000	0.59			13.9	OK	
3.000	2	0.000	0.80			10.8	OK	
2.001	3	0.000	0.50			28.7	OK	
2.002	4	0.000	0.42			28.7	OK	
1.001	5	0.000	0.62			64.5	OK	
1.002	7	0.000	0.59			64.6	OK	
1.003	8	0.000	0.48			64.6	OK	
1.004	9	0.000	0.21			64.6	OK	
1.005	SuDS Basin	0.000	0.05			1.8	FLOOD RISK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Catchment
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 522650 128400 TQ 22650 28400	Cv (Winter)	1.000

Actually FEH2022. Please refer to Section 7 of report for details.

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 40, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	6	30 Summer	100	+45%					85.947	-0.078
2.000	1	30 Summer	100	+45%					86.900	-0.050
3.000	2	30 Summer	100	+45%	100/30 Summer				87.452	0.052
2.001	3	30 Summer	100	+45%					86.682	-0.091
2.002	4	30 Summer	100	+45%					86.475	-0.104
1.001	5	30 Summer	100	+45%					85.716	-0.070
1.002	7	30 Summer	100	+45%					84.818	-0.074
1.003	8	30 Summer	100	+45%					83.216	-0.126
1.004	9	30 Summer	100	+45%					82.573	-0.192
1.005	SuDS Basin	600 Winter	100	+45%	2/15 Summer				81.999	1.049

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	6	0.000	0.76			44.9	OK	
2.000	1	0.000	0.78			18.4	OK	
3.000	2	0.000	1.04			14.1	SURCHARGED	
2.001	3	0.000	0.65			37.7	OK	
2.002	4	0.000	0.55			37.8	OK	
1.001	5	0.000	0.81			85.0	OK	
1.002	7	0.000	0.78			85.0	OK	
1.003	8	0.000	0.64			85.2	OK	
1.004	9	0.000	0.28			85.1	OK	
1.005	SuDS Basin	0.000	0.05			2.0	FLOOD RISK	

Appendix Q

Lot 8 MicroDrainage Modelling Results

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 522650 128400 TQ 22650 28400
Data Type	Catchment
Maximum Rainfall (mm/hr)	550
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	1.000
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.337	4-8	0.072	8-12	0.015	12-16	0.015	16-20	0.001

Total Area Contributing (ha) = 0.440

Total Pipe Volume (m^3) = 12.465

Network Design Table for Storm

- Indicates pipe length does not match coordinates
« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	30.029	0.530	56.7	0.004	15.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	26.590	2.350	11.3	0.020	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	35.936	2.290	15.7	0.019	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.003	33.984	1.225	27.7	0.018	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.004	19.300#	0.746	25.9	0.025	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	91.96	15.37	76.270	0.004	0.0	0.0	0.0	1.34	23.7	1.3
1.001	91.49	15.52	75.740	0.024	0.0	0.0	0.0	3.01	53.2	7.9
1.002	90.76	15.76	73.390	0.043	0.0	0.0	0.0	2.56	45.2	14.0
1.003	90.07	15.98	71.025	0.061	0.0	0.0	0.0	2.49	99.2	19.9
1.004	89.70	16.11	69.800	0.086	0.0	0.0	0.0	2.58	102.7	28.0

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.005	24.535#	0.210	116.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	36.667	0.458	80.0	0.011	15.00	0.0	0.600	o	150	Pipe/Conduit	
2.001	41.327	0.486	85.0	0.013	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.002	38.451	2.370	16.2	0.014	0.00	0.0	0.600	o	150	Pipe/Conduit	
3.000	3.169	0.044	72.1	0.011	15.00	0.0	0.600	o	100	Pipe/Conduit	
3.001	10.616	0.275	38.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.003	27.107	1.409	19.2	0.025	0.00	0.0	0.600	o	150	Pipe/Conduit	
4.000	3.108	0.042	73.8	0.031	15.00	0.0	0.600	o	100	Pipe/Conduit	
4.001	11.627	0.134	86.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.004	17.003	0.716	23.7	0.032	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.005	31.239	0.550	56.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.006	6.958#	0.100	69.6	0.217	0.00	0.0	0.600	o	500	Pipe/Conduit	
2.007	26.974#	0.580	46.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.006	10.960	0.731	15.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.005	88.71	16.45	68.180	0.086	0.0	0.0	0.0	1.21	48.1	28.0
2.000	91.42	15.54	76.040	0.011	0.0	0.0	0.0	1.12	19.9	3.6
2.001	89.49	16.17	75.582	0.024	0.0	0.0	0.0	1.09	19.3	7.8
2.002	88.75	16.43	75.095	0.038	0.0	0.0	0.0	2.51	44.4	12.2
3.000	93.00	15.06	73.044	0.011	0.0	0.0	0.0	0.91	7.1	3.6
3.001	92.63	15.17	73.000	0.011	0.0	0.0	0.0	1.62	28.7	3.6
2.003	88.19	16.63	72.275	0.074	0.0	0.0	0.0	2.31	40.8	23.4
4.000	93.00	15.06	71.042	0.031	0.0	0.0	0.0	0.90	7.0«	10.4
4.001	92.40	15.24	71.000	0.031	0.0	0.0	0.0	1.08	19.1	10.4
2.004	87.81	16.76	70.866	0.136	0.0	0.0	0.0	2.08	36.7«	43.3
2.005	86.98	17.06	70.075	0.136	0.0	0.0	0.0	1.74	69.1	43.3
2.006	86.86	17.11	69.300	0.353	0.0	0.0	0.0	2.61	511.9	110.8
2.007	86.23	17.34	68.550	0.353	0.0	0.0	0.0	1.92	76.5«	110.8
1.006	86.11	17.38	67.970	0.440	0.0	0.0	0.0	4.08	288.4	136.7

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.004	0.004	0.004
1.001	User	-	100	0.020	0.020	0.020
1.002	User	-	100	0.019	0.019	0.019
1.003	User	-	100	0.018	0.018	0.018
1.004	User	-	100	0.025	0.025	0.025
1.005	-	-	100	0.000	0.000	0.000
2.000	User	-	100	0.011	0.011	0.011
2.001	User	-	100	0.013	0.013	0.013
2.002	User	-	100	0.014	0.014	0.014
3.000	User	-	100	0.011	0.011	0.011
3.001	-	-	100	0.000	0.000	0.000
2.003	User	-	100	0.025	0.025	0.025
4.000	User	-	100	0.031	0.031	0.031
4.001	-	-	100	0.000	0.000	0.000
2.004	User	-	100	0.032	0.032	0.032
2.005	-	-	100	0.000	0.000	0.000
2.006	User	-	100	0.217	0.217	0.217
2.007	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.440	0.440	0.440

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.006	Outfall	70.500	67.239	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	4	Number of Storage Structures	4	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	100	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 522650 128400 TQ 22650 28400	Cv (Winter)	0.840
Data Type	Catchment	Storm Duration (mins)	30

Online Controls for Storm

Hydro-Brake® Optimum Manhole: 6, DS/PN: 1.005, Volume (m³): 3.6

Unit Reference	MD-SHE-0043-1000-1400-1000
Design Head (m)	1.400
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	43
Invert Level (m)	68.180
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.400	1.0	Kick-Flo®	0.383	0.6
Flush-Flo™	0.189	0.7	Mean Flow over Head Range	-	0.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.6	0.800	0.8	2.000	1.2	4.000	1.6	7.000	2.1
0.200	0.7	1.000	0.9	2.200	1.2	4.500	1.7	7.500	2.1
0.300	0.7	1.200	0.9	2.400	1.3	5.000	1.8	8.000	2.2
0.400	0.6	1.400	1.0	2.600	1.3	5.500	1.9	8.500	2.3
0.500	0.6	1.600	1.1	3.000	1.4	6.000	1.9	9.000	2.3
0.600	0.7	1.800	1.1	3.500	1.5	6.500	2.0	9.500	2.4

Hydro-Brake® Optimum Manhole: 13, DS/PN: 2.003, Volume (m³): 2.8

Unit Reference	MD-SHE-0090-4500-1700-4500
Design Head (m)	1.700
Design Flow (l/s)	4.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	90
Invert Level (m)	72.275
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.700	4.5	Kick-Flo®	0.806	3.2
Flush-Flo™	0.398	4.0	Mean Flow over Head Range	-	3.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	0.600	3.8	1.600	4.4	2.600	5.5	5.000	7.5
0.200	3.7	0.800	3.2	1.800	4.6	3.000	5.9	5.500	7.8
0.300	3.9	1.000	3.5	2.000	4.8	3.500	6.3	6.000	8.1
0.400	4.0	1.200	3.8	2.200	5.1	4.000	6.7	6.500	8.4
0.500	3.9	1.400	4.1	2.400	5.3	4.500	7.1	7.000	8.7

Hydro-Brake® Optimum Manhole: 13, DS/PN: 2.003, Volume (m³): 2.8

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
7.500	9.0	8.000	9.3	8.500	9.6	9.000	9.9	9.500	10.1

Hydro-Brake® Optimum Manhole: 14, DS/PN: 2.004, Volume (m³): 1.9

Unit Reference	MD-SHE-0081-3000-1100-3000
Design Head (m)	1.100
Design Flow (l/s)	3.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	81
Invert Level (m)	70.866
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.100	3.0	Kick-Flo®	0.682	2.4
Flush-Flo™	0.333	3.0	Mean Flow over Head Range	-	2.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.4	0.800	2.6	2.000	4.0	4.000	5.5	7.000	7.1
0.200	2.9	1.000	2.9	2.200	4.1	4.500	5.8	7.500	7.3
0.300	3.0	1.200	3.1	2.400	4.3	5.000	6.1	8.000	7.6
0.400	3.0	1.400	3.4	2.600	4.5	5.500	6.3	8.500	7.8
0.500	2.9	1.600	3.6	3.000	4.8	6.000	6.6	9.000	8.0
0.600	2.7	1.800	3.8	3.500	5.1	6.500	6.9	9.500	8.2

Hydro-Brake® Optimum Manhole: 17, DS/PN: 2.007, Volume (m³): 4.5

Unit Reference	MD-SHE-0067-2000-1000-2000
Design Head (m)	1.000
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	67
Invert Level (m)	68.550
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	2.0	Kick-Flo®	0.599	1.6
Flush-Flo™	0.296	1.9	Mean Flow over Head Range	-	1.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.6	0.300	1.9	0.500	1.8	0.800	1.8	1.200	2.2
0.200	1.9	0.400	1.9	0.600	1.6	1.000	2.0	1.400	2.3

Hydro-Brake® Optimum Manhole: 17, DS/PN: 2.007, Volume (m³): 4.5

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
1.600	2.5	2.400	3.0	4.000	3.8	6.000	4.6	8.000	5.2
1.800	2.6	2.600	3.1	4.500	4.0	6.500	4.7	8.500	5.4
2.000	2.7	3.000	3.3	5.000	4.2	7.000	4.9	9.000	5.5
2.200	2.9	3.500	3.5	5.500	4.4	7.500	5.1	9.500	5.7

Storage Structures for Storm

Cellular Storage Manhole: 6, DS/PN: 1.005

Invert Level (m) 68.180 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	60.0	60.0	1.200	60.0	98.4	1.201	0.0	98.4

Tank or Pond Manhole: SuDS Basin 1, DS/PN: 3.001

Invert Level (m) 73.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	30.9	1.000	169.1

Tank or Pond Manhole: SuDS Basin 2, DS/PN: 4.001

Invert Level (m) 71.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	33.8	1.000	126.2

Cellular Storage Manhole: 17, DS/PN: 2.007

Invert Level (m) 68.550 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	360.0	360.0	1.200	360.0	487.2	1.201	0.0	487.2

Volume Summary (Static)

Length Calculations based on Centre-Centre

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
1.000	1	1.470	0.531	0.000	2.001
1.001	2	1.470	0.470	0.000	1.940
1.002	3	1.821	0.635	0.000	2.456
1.003	4	2.799	1.351	0.000	4.150
1.004	5	1.357	0.767	0.000	2.125
1.005	6	2.907	0.976	68.419	72.301
2.000	10	3.348	0.648	0.000	3.996
2.001	11	1.604	0.730	0.000	2.334
2.002	12	1.588	0.679	0.000	2.268
3.000	19	1.081	0.025	0.000	1.106
3.001	SuDS Basin 1	1.131	0.188	90.747	92.066
2.003	13	1.951	0.479	0.000	2.430
4.000	21	1.083	0.024	0.000	1.108
4.001	SuDS Basin 2	1.131	0.205	75.075	76.412
2.004	14	1.283	0.300	0.000	1.583
2.005	15	1.329	1.242	0.000	2.571
2.006	16	2.121	1.366	0.000	3.487
2.007	17	3.446	1.073	410.514	415.032
1.006	18	2.861	0.775	0.000	3.636
Total		35.781	12.465	644.755	693.002

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 4 Number of Storage Structures 4 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Catchment
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 522650 128400 TQ 22650 28400	Cv (Winter)	1.000

Actually FEH2022. Please refer to Section 7 of report for details.

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 40, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	30 Summer	2	+0%					76.282
1.001	2	15 Summer	2	+0%					75.766
1.002	3	15 Summer	2	+0%					73.429
1.003	4	15 Summer	2	+0%					71.073
1.004	5	15 Summer	2	+0%					69.857
1.005	6	360 Summer	2	+0%	2/120 Summer				68.457
2.000	10	30 Summer	2	+0%					76.063
2.001	11	30 Summer	2	+0%					75.622
2.002	12	30 Summer	2	+0%					75.130
3.000	19	30 Summer	2	+0%	30/15 Summer				73.073
3.001	SuDS Basin 1	30 Summer	2	+0%	30/15 Summer				73.060
2.003	13	30 Summer	2	+0%	2/15 Summer				73.193
4.000	21	180 Summer	2	+0%	2/30 Summer				71.248
4.001	SuDS Basin 2	180 Summer	2	+0%	2/30 Summer				71.246
2.004	14	180 Summer	2	+0%	2/15 Summer	100/1440 Summer			71.253
2.005	15	180 Summer	2	+0%					70.106
2.006	16	15 Summer	2	+0%					69.439
2.007	17	720 Summer	2	+0%	2/360 Summer				68.785
1.006	18	600 Summer	2	+0%					67.987

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.138	0.000	0.02			0.4	OK	
1.001	2	-0.124	0.000	0.07			3.5	OK	
1.002	3	-0.111	0.000	0.15			6.5	OK	
1.003	4	-0.177	0.000	0.10			9.4	OK	
1.004	5	-0.168	0.000	0.14			13.4	OK	
1.005	6	0.052	0.000	0.02		288	0.7	SURCHARGED	
2.000	10	-0.127	0.000	0.06			1.1	OK	
2.001	11	-0.110	0.000	0.16			2.9	OK	

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
2.002	12	-0.116	0.000	0.12			5.0	OK	
3.000	19	-0.071	0.000	0.18			1.1	OK	
3.001	SuDS Basin 1	-0.090	0.000	0.11			2.7	OK	
2.003	13	0.768	0.000	0.10			4.0	SURCHARGED	
4.000	21	0.106	0.000	0.37			2.1	SURCHARGED	
4.001	SuDS Basin 2	0.096	0.000	0.16			2.8	SURCHARGED	
2.004	14	0.237	0.000	0.09			3.0	SURCHARGED	
2.005	15	-0.194	0.000	0.05			3.0	OK	
2.006	16	-0.361	0.000	0.17			37.8	OK	
2.007	17	0.010	0.000	0.03		528	1.9	SURCHARGED	
1.006	18	-0.283	0.000	0.01			2.5	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 4 Number of Storage Structures 4 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Catchment
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 522650 128400 TQ 22650 28400	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 40, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	30 Summer	30	+40%					76.292
1.001	2	15 Summer	30	+40%					75.794
1.002	3	15 Summer	30	+40%					73.475
1.003	4	15 Summer	30	+40%					71.126
1.004	5	15 Summer	30	+40%					69.926
1.005	6	480 Winter	30	+40%	2/120 Summer				69.065
2.000	10	30 Summer	30	+40%					76.082
2.001	11	15 Summer	30	+40%					75.666
2.002	12	15 Summer	30	+40%					75.168
3.000	19	60 Winter	30	+40%	30/15 Summer				73.377
3.001	SuDS Basin 1	60 Winter	30	+40%	30/15 Summer				73.375
2.003	13	15 Summer	30	+40%	2/15 Summer				73.573
4.000	21	360 Winter	30	+40%	2/30 Summer				71.746
4.001	SuDS Basin 2	360 Winter	30	+40%	2/30 Summer				71.745
2.004	14	360 Winter	30	+40%	2/15 Summer	100/1440 Summer			71.753
2.005	15	360 Winter	30	+40%					70.106
2.006	16	15 Summer	30	+40%					69.599
2.007	17	1440 Summer	30	+40%	2/360 Summer				69.273
1.006	18	120 Winter	30	+40%					67.988

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.128	0.000	0.05			1.2	OK	
1.001	2	-0.096	0.000	0.28			14.2	OK	
1.002	3	-0.065	0.000	0.61			26.6	OK	
1.003	4	-0.124	0.000	0.42			38.8	OK	
1.004	5	-0.099	0.000	0.60			55.7	OK	
1.005	6	0.660	0.000	0.02		632	0.8	SURCHARGED	
2.000	10	-0.108	0.000	0.18			3.4	OK	
2.001	11	-0.066	0.000	0.56			10.5	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
2.002	12	-0.078	0.000	0.46			19.6	OK	
3.000	19	0.233	0.000	0.44			2.6	SURCHARGED	
3.001	SuDS Basin 1	0.225	0.000	0.14			3.5	SURCHARGED	
2.003	13	1.148	0.000	0.10			3.9	SURCHARGED	
4.000	21	0.604	0.000	0.45			2.5	FLOOD RISK	
4.001	SuDS Basin 2	0.595	0.000	0.17			3.0	FLOOD RISK	
2.004	14	0.737	0.000	0.09			3.0	FLOOD RISK	
2.005	15	-0.194	0.000	0.05			3.0	OK	
2.006	16	-0.201	0.000	0.67			147.1	OK	
2.007	17	0.498	0.000	0.03		1392	1.9	SURCHARGED	
1.006	18	-0.282	0.000	0.01			2.7	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 4 Number of Storage Structures 4 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Catchment
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 522650 128400 TQ 22650 28400	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 40, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	30 Summer	100	+45%					76.296
1.001	2	15 Summer	100	+45%					75.803
1.002	3	15 Summer	100	+45%					73.492
1.003	4	15 Summer	100	+45%					71.143
1.004	5	15 Summer	100	+45%					69.951
1.005	6	600 Winter	100	+45%	2/120 Summer				69.391
2.000	10	30 Summer	100	+45%					76.089
2.001	11	15 Summer	100	+45%					75.682
2.002	12	15 Summer	100	+45%					75.180
3.000	19	60 Winter	100	+45%	30/15 Summer				73.499
3.001	SuDS Basin 1	60 Winter	100	+45%	30/15 Summer				73.496
2.003	13	15 Summer	100	+45%	2/15 Summer				73.909
4.000	21	480 Winter	100	+45%	2/30 Summer				71.919
4.001	SuDS Basin 2	480 Winter	100	+45%	2/30 Summer				71.918
2.004	14	480 Winter	100	+45%	2/15 Summer	100/1440 Summer			71.925
2.005	15	2880 Summer	100	+45%					70.106
2.006	16	15 Summer	100	+45%					69.659
2.007	17	2160 Summer	100	+45%	2/360 Summer				69.549
1.006	18	1440 Winter	100	+45%					67.989

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.124	0.000	0.07			1.6	OK	
1.001	2	-0.087	0.000	0.36			18.5	OK	
1.002	3	-0.048	0.000	0.80			34.7	OK	
1.003	4	-0.107	0.000	0.54			50.6	OK	
1.004	5	-0.074	0.000	0.78			72.6	OK	
1.005	6	0.986	0.000	0.02		750	0.9	SURCHARGED	
2.000	10	-0.101	0.000	0.24			4.5	OK	
2.001	11	-0.050	0.000	0.73			13.7	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
2.002	12	-0.065	0.000	0.59			25.5	OK	
3.000	19	0.355	0.000	0.59			3.5	SURCHARGED	
3.001	SuDS Basin 1	0.346	0.000	0.14			3.7	SURCHARGED	
2.003	13	1.484	0.000	0.11			4.4	FLOOD RISK	
4.000	21	0.777	0.000	0.47			2.7	FLOOD RISK	
4.001	SuDS Basin 2	0.768	0.000	0.18			3.1	FLOOD RISK	
2.004	14	0.909	0.000	0.09			3.0	FLOOD RISK	
2.005	15	-0.194	0.000	0.05			3.0	OK	
2.006	16	-0.141	0.000	0.87			190.6	OK	
2.007	17	0.774	0.000	0.03		1944	2.0	SURCHARGED	
1.006	18	-0.281	0.000	0.01			2.9	OK	

Appendix R

Jacksons Ridge MicroDrainage Modelling Results

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 522650 128400 TQ 22650 28400
Data Type	Catchment
Maximum Rainfall (mm/hr)	550
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	1.000
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	0.900
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.095	4-8	0.129

Total Area Contributing (ha) = 0.224

Total Pipe Volume (m³) = 18.799

Network Design Table for Storm

- Indicates pipe length does not match coordinates
« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	2.168	0.100	21.7	0.000	15.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	11.219	0.192	58.4	0.036	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.002	11.691	0.117	99.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.003	4.970#	0.386	12.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.004	9.886	0.110	90.3	0.031	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	93.12	15.02	104.520	0.000	0.0	0.0	0.0	1.67	13.1	0.0
1.001	92.50	15.21	104.420	0.036	0.0	0.0	0.0	1.01	7.9«	12.0
1.002	91.87	15.40	104.178	0.036	0.0	0.0	0.0	1.01	17.8	12.0
1.003	91.78	15.43	104.061	0.036	0.0	0.0	0.0	2.82	49.9	12.0
1.004	91.28	15.59	102.725	0.067	0.0	0.0	0.0	1.06	18.7«	22.1

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.005	16.280	0.110	148.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	1.893	0.100	18.9	0.000	15.00	0.0	0.600	o	100	Pipe/Conduit	
2.001	22.776	0.228	100.0	0.043	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.002	10.128#	0.101	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.003	16.383	0.635	25.8	0.037	0.00	0.0	0.600	o	150	Pipe/Conduit	
3.000	2.799	0.100	28.0	0.000	15.00	0.0	0.600	o	100	Pipe/Conduit	
3.001	20.949	0.209	100.3	0.046	0.00	0.0	0.600	o	150	Pipe/Conduit	
3.002	6.675#	0.067	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
3.003	10.323	0.172	60.0	0.031	0.00	0.0	0.600	o	150	Pipe/Conduit	
3.004	31.857	0.516	61.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.006	397.278	36.862	10.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.005	90.27	15.92	102.616	0.067	0.0	0.0	0.0	0.82	14.6«	22.1
2.000	93.14	15.02	104.520	0.000	0.0	0.0	0.0	1.78	14.0	0.0
2.001	91.89	15.40	104.420	0.043	0.0	0.0	0.0	1.00	17.8	14.3
2.002	91.35	15.56	104.192	0.043	0.0	0.0	0.0	1.00	17.8	14.3
2.003	90.93	15.70	103.141	0.080	0.0	0.0	0.0	1.99	35.2	26.3
3.000	93.09	15.03	104.520	0.000	0.0	0.0	0.0	1.46	11.5	0.0
3.001	91.94	15.38	104.420	0.046	0.0	0.0	0.0	1.00	17.7	15.3
3.002	91.58	15.49	104.211	0.046	0.0	0.0	0.0	1.00	17.8	15.3
3.003	91.17	15.62	103.194	0.077	0.0	0.0	0.0	1.30	23.0«	25.3
3.004	89.90	16.04	103.022	0.077	0.0	0.0	0.0	1.28	22.7«	25.3
1.006	85.32	17.69	102.506	0.224	0.0	0.0	0.0	4.01	159.4	69.0

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.000	0.000	0.000
1.001	-	-	100	0.036	0.036	0.036
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.031	0.031	0.031
1.005	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.000	0.000	0.000
2.001	-	-	100	0.043	0.043	0.043
2.002	-	-	100	0.000	0.000	0.000
2.003	-	-	100	0.037	0.037	0.037
3.000	-	-	100	0.000	0.000	0.000
3.001	-	-	100	0.046	0.046	0.046
3.002	-	-	100	0.000	0.000	0.000
3.003	-	-	100	0.031	0.031	0.031
3.004	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.224	0.224	0.224

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.006	Outfall	66.500	65.644	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	6	Number of Storage Structures	6	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	100	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 522650 128400 TQ 22650 28400	Cv (Winter)	0.840
Data Type	Catchment	Storm Duration (mins)	30

Online Controls for Storm

Orifice Manhole: 2, DS/PN: 1.001, Volume (m³): 0.7

Diameter (m) 0.037 Discharge Coefficient 0.600 Invert Level (m) 104.420

Hydro-Brake® Optimum Manhole: 5, DS/PN: 1.004, Volume (m³): 2.6

Unit Reference	MD-SHE-0038-1000-2400-1000
Design Head (m)	2.400
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	38
Invert Level (m)	102.725
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.400	1.0	Kick-Flo®	0.337	0.4
Flush-Flo™	0.164	0.5	Mean Flow over Head Range	-	0.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.5	0.800	0.6	2.000	0.9	4.000	1.3	7.000	1.6
0.200	0.5	1.000	0.7	2.200	1.0	4.500	1.3	7.500	1.7
0.300	0.5	1.200	0.7	2.400	1.0	5.000	1.4	8.000	1.7
0.400	0.5	1.400	0.8	2.600	1.0	5.500	1.5	8.500	1.8
0.500	0.5	1.600	0.8	3.000	1.1	6.000	1.5	9.000	1.8
0.600	0.5	1.800	0.9	3.500	1.2	6.500	1.6	9.500	1.9

Orifice Manhole: 7, DS/PN: 2.001, Volume (m³): 0.7

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 104.420

Hydro-Brake® Optimum Manhole: 9, DS/PN: 2.003, Volume (m³): 2.3

Unit Reference	MD-SHE-0040-1000-2000-1000
Design Head (m)	2.000
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	40
Invert Level (m)	103.141
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.000	1.0	Kick-Flo®	0.355	0.5
Flush-Flo™	0.173	0.6	Mean Flow over Head Range	-	0.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake®

Hydro-Brake® Optimum Manhole: 9, DS/PN: 2.003, Volume (m³): 2.3

Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.5	0.800	0.7	2.000	1.0	4.000	1.4	7.000	1.8
0.200	0.6	1.000	0.7	2.200	1.0	4.500	1.4	7.500	1.8
0.300	0.5	1.200	0.8	2.400	1.1	5.000	1.5	8.000	1.9
0.400	0.5	1.400	0.9	2.600	1.1	5.500	1.6	8.500	1.9
0.500	0.5	1.600	0.9	3.000	1.2	6.000	1.6	9.000	2.0
0.600	0.6	1.800	1.0	3.500	1.3	6.500	1.7	9.500	2.0

Orifice Manhole: 10, DS/PN: 3.001, Volume (m³): 0.7

Diameter (m) 0.066 Discharge Coefficient 0.600 Invert Level (m) 104.420

Hydro-Brake® Optimum Manhole: 12, DS/PN: 3.003, Volume (m³): 2.1

Unit Reference	MD-SHE-0040-1000-1850-1000
Design Head (m)	1.850
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	40
Invert Level (m)	103.194
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.850	1.0	Kick-Flo®	0.360	0.5
Flush-Flo™	0.178	0.6	Mean Flow over Head Range	-	0.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.6	0.800	0.7	2.000	1.0	4.000	1.4	7.000	1.8
0.200	0.6	1.000	0.8	2.200	1.1	4.500	1.5	7.500	1.9
0.300	0.6	1.200	0.8	2.400	1.1	5.000	1.6	8.000	1.9
0.400	0.5	1.400	0.9	2.600	1.2	5.500	1.6	8.500	2.0
0.500	0.6	1.600	0.9	3.000	1.2	6.000	1.7	9.000	2.1
0.600	0.6	1.800	1.0	3.500	1.3	6.500	1.8	9.500	2.1

Storage Structures for Storm

Porous Car Park Manhole: 2, DS/PN: 1.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	13.0
Max Percolation (l/s)	36.1	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	104.420	Cap Volume Depth (m)	0.450

Cellular Storage Manhole: 5, DS/PN: 1.004

Invert Level (m)	102.725	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	28.0	28.0	1.200	28.0	55.6	1.201	0.0	55.6

Porous Car Park Manhole: 7, DS/PN: 2.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	13.0
Max Percolation (l/s)	36.1	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	104.420	Cap Volume Depth (m)	0.450

Cellular Storage Manhole: 9, DS/PN: 2.003

Invert Level (m)	103.141	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	36.0	36.0	1.200	36.0	72.0	1.201	0.0	72.0

Porous Car Park Manhole: 10, DS/PN: 3.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	12.0
Max Percolation (l/s)	33.3	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	104.420	Cap Volume Depth (m)	0.450

Cellular Storage Manhole: 12, DS/PN: 3.003

Invert Level (m)	103.194	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	36.0	36.0	1.200	36.0	72.0	1.201	0.0	72.0

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 6 Number of Storage Structures 6 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Catchment
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 522650 128400 TQ 22650 28400	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 720, 960, 1440, 2160, 2880, 4320, 5760
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 40, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	J1	240 Summer	2	+0%					104.528	-0.092
1.001	2	240 Summer	2	+0%	2/120 Summer				104.530	0.010
1.002	3	240 Summer	2	+0%	30/720 Winter				104.200	-0.128
1.003	4	240 Summer	2	+0%	30/480 Winter				104.076	-0.135
1.004	5	480 Summer	2	+0%	2/60 Summer				103.108	0.233
1.005	6	30 Winter	2	+0%					102.635	-0.131
2.000	J2	180 Summer	2	+0%					104.526	-0.094
2.001	7	180 Summer	2	+0%	30/15 Summer	100/480 Summer			104.528	-0.042
2.002	8	180 Summer	2	+0%	30/360 Summer				104.223	-0.119
2.003	9	480 Summer	2	+0%	2/60 Summer				103.540	0.249
3.000	J3	120 Summer	2	+0%					104.522	-0.098
3.001	10	120 Summer	2	+0%	30/15 Summer				104.522	-0.048
3.002	11	120 Summer	2	+0%	30/360 Summer				104.251	-0.110
3.003	12	480 Summer	2	+0%	2/60 Summer				103.575	0.231
3.004	13	30 Summer	2	+0%					103.038	-0.134
1.006	14	180 Summer	2	+0%					102.517	-0.214

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	J1	0.000	0.00			0.0	OK*	
1.001	2	0.000	0.12		104	0.9	SURCHARGED	
1.002	3	0.000	0.05			0.9	OK	
1.003	4	0.000	0.02			0.9	OK	
1.004	5	0.000	0.03		288	0.5	SURCHARGED	
1.005	6	0.000	0.04			0.5	OK	
2.000	J2	0.000	0.00			0.0	OK*	
2.001	7	0.000	0.09		63	1.5	OK	6
2.002	8	0.000	0.10			1.5	OK	
2.003	9	0.000	0.02		328	0.6	SURCHARGED	
3.000	J3	0.000	0.00			0.0	OK*	

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
3.001	10	0.000	0.14		48	2.4	OK	
3.002	11	0.000	0.16			2.4	OK	
3.003	12	0.000	0.03		320	0.6	SURCHARGED	
3.004	13	0.000	0.03			0.6	OK	
1.006	14	0.000	0.01			1.6	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 6 Number of Storage Structures 6 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Catchment
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 522650 128400 TQ 22650 28400	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 720, 960, 1440, 2160, 2880, 4320, 5760
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 40, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	J1	360 Winter	30	+40%					104.620	0.000
1.001	2	180 Summer	30	+40%	2/120 Summer				104.749	0.229
1.002	3	720 Winter	30	+40%	30/720 Winter				104.400	0.072
1.003	4	720 Winter	30	+40%	30/480 Winter				104.398	0.187
1.004	5	720 Winter	30	+40%	2/60 Summer				104.397	1.522
1.005	6	720 Winter	30	+40%					102.640	-0.126
2.000	J2	15 Summer	30	+40%					104.620	0.000
2.001	7	120 Summer	30	+40%	30/15 Summer	100/480 Summer			104.756	0.186
2.002	8	360 Winter	30	+40%	30/360 Summer				104.497	0.155
2.003	9	360 Winter	30	+40%	2/60 Summer				104.496	1.205
3.000	J3	15 Summer	30	+40%					104.620	0.000
3.001	10	60 Summer	30	+40%	30/15 Summer				104.743	0.173
3.002	11	480 Winter	30	+40%	30/360 Summer				104.424	0.063
3.003	12	480 Winter	30	+40%	2/60 Summer				104.424	1.080
3.004	13	480 Winter	30	+40%					103.041	-0.131
1.006	14	720 Winter	30	+40%					102.523	-0.208

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	J1	0.000	0.00			0.0	SURCHARGED*	
1.001	2	0.000	0.21		123	1.6	FLOOD RISK	
1.002	3	0.000	0.08			1.3	SURCHARGED	
1.003	4	0.000	0.03			1.3	SURCHARGED	
1.004	5	0.000	0.05		540	0.8	SURCHARGED	
1.005	6	0.000	0.06			0.8	OK	
2.000	J2	0.000	0.01			0.1	SURCHARGED*	
2.001	7	0.000	0.17		76	2.9	FLOOD RISK	6
2.002	8	0.000	0.15			2.4	SURCHARGED	
2.003	9	0.000	0.03		624	0.8	SURCHARGED	
3.000	J3	0.000	0.01			0.1	SURCHARGED*	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
3.001	10	0.000	0.29		38	4.9	FLOOD RISK	
3.002	11	0.000	0.19			2.9	SURCHARGED	
3.003	12	0.000	0.04		560	0.8	SURCHARGED	
3.004	13	0.000	0.04			0.8	OK	
1.006	14	0.000	0.02			2.5	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 6 Number of Storage Structures 6 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Catchment
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 522650 128400 TQ 22650 28400	Cv (Winter)	1.000

Actually FEH2022. Please refer to Section 7 of report for details.

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 720, 960, 1440, 2160, 2880, 4320, 5760
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 40, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	J1	15 Summer	100	+45%					104.620	0.000
1.001	2	180 Summer	100	+45%	2/120 Summer				104.859	0.339
1.002	3	480 Winter	100	+45%	30/720 Winter				104.786	0.458
1.003	4	480 Winter	100	+45%	30/480 Winter				104.787	0.576
1.004	5	480 Winter	100	+45%	2/60 Summer				104.787	1.912
1.005	6	480 Winter	100	+45%					102.642	-0.124
2.000	J2	15 Summer	100	+45%					104.620	0.000
2.001	7	480 Winter	100	+45%	30/15 Summer	100/480 Summer			105.001	0.431
2.002	8	720 Winter	100	+45%	30/360 Summer				104.983	0.641
2.003	9	720 Winter	100	+45%	2/60 Summer				104.983	1.692
3.000	J3	15 Summer	100	+45%					104.620	0.000
3.001	10	480 Winter	100	+45%	30/15 Summer				104.863	0.293
3.002	11	480 Winter	100	+45%	30/360 Summer				104.844	0.483
3.003	12	480 Winter	100	+45%	2/60 Summer				104.843	1.499
3.004	13	480 Winter	100	+45%					103.042	-0.130
1.006	14	480 Winter	100	+45%					102.525	-0.206

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	J1	0.000	0.00			0.0	SURCHARGED*	
1.001	2	0.000	0.25		144	1.9	FLOOD RISK	
1.002	3	0.000	0.10			1.7	FLOOD RISK	
1.003	4	0.000	0.04			1.7	FLOOD RISK	
1.004	5	0.000	0.06		912	0.9	FLOOD RISK	
1.005	6	0.000	0.07			0.9	OK	
2.000	J2	0.000	0.01			0.1	SURCHARGED*	
2.001	7	0.972	0.16		224	2.7	FLOOD	6
2.002	8	0.000	0.14			2.3	FLOOD RISK	
2.003	9	0.000	0.03		1092	1.0	FLOOD RISK	
3.000	J3	0.000	0.01			0.1	SURCHARGED*	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
3.001	10	0.000	0.21		184	3.6	FLOOD RISK	
3.002	11	0.000	0.24			3.6	FLOOD RISK	
3.003	12	0.000	0.05		864	0.9	FLOOD RISK	
3.004	13	0.000	0.04			0.9	OK	
1.006	14	0.000	0.02			2.8	OK	

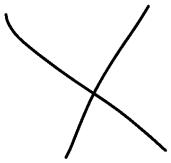
Appendix S

Package Sewage Treatment Plant Inspection Certificates

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

Customer	HUNTER GROUP - STONEHOUSE FARM	Resource	Ashley Headon
Contact	Lee Goossens		
Address	Handcross Road, Plummers Plain Horsham RH13 6NZ	Job type	Matrix Service
		Reference	SM0000-0377
		Date	01/10/2024 10:00
Billing address	Hunter Group - Parent Contact Lower Nash, Nutbourne Lane, Nutbourne PULBOROUGH RH20 2HS		

Notes Service the Office tank - JDK200 - Diaphragms last changed 28/12/23



Lee Goossens

Stock items

				Pickup		Drop-off	
Product category	**Model**	**Serial number**	**Usage**	**Quantity**	**Location**	**Quantity**	**Location**
Air Pump	Bibus SE41 Diaphragm Kit JDK 150 - 500 5700014					1.000	Hunter Group - Stonehouse Farm
Air Pump	Bibus SE42 JDK-150 - 500 Air Filters 5700012					1.000	Hunter Group - Stonehouse Farm

STP SERVICE REPORT

	Answer	Notes
Purpose of Visit	Routine Service	

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

Check Chamber, Kiosk & Manhole Security & Condition	Completed (All OK)
Visually Inspect System. Listen for Unusual Noises.	Completed (All OK)
Check for any significant odours	Completed (All OK)
Remove Cover from Plant	Yes
Take Sample of the Final Effluent and Visually Inspect	Visually Poor
Comments	Aeration poorly distributed. I have adjusted the aeration to each section
DMS/DMC/MATRIX: Check Colour of Aeration Chamber	Good
Check for Excessive Suds,Rags & Other Non-Biodegradable Material	Good
Check Sludge Density is Less than 70%	
Remove and Clean Diffuser	Completed
Remove Cover from Airbox	Yes
Existing Air Pump Type	JDK200
Existing Air Pump Serial Number	U2487
Carry out Air Pressure Test	0.22
Date of Last Overhaul or Replacement	Diaghragms replaced on this service
Replacement Air Pump Type	
Replacement Air Pump Serial No.	
Check Air Alarm	Checked
Clean Filter or Replace as Required	Replaced
Clean Out Airbox [END DMS/DMC/MATRIX]	Completed
Check Outlet Manhole	All Clear
Check Outlet to Ditch	N/A
Remove and Clean Submersible Pump	N/A
Replace all Covers	Yes
Site Cleaned & Tidied	Yes

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

Checked System is Operational	Yes
New Parts Fitted	Yes
Temporary Equipment Fitted	No
NOTES:	I've adjusted the aeration to improve how well its distributed across the plant. New diaghragms and air filter fitted to compressor. Working ok.
Engineer Signature	Ashley Headon [redacted]
Incident or First Aid To Report?	No

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_102642

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_102640

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_102108

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_102103

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_110211

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_104626

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_102646

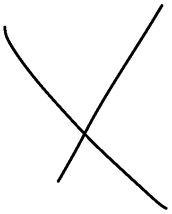
Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_102644

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

Customer	HUNTER GROUP - STONEHOUSE FARM	Resource	Ashley Headon
Contact	Lee Goossens		
Address	Handcross Road, Plummers Plain Horsham RH13 6NZ	Job type	Matrix Service
		Reference	SM0000-0378
		Date	01/10/2024 11:00
Billing address	Hunter Group - Parent Contact Lower Nash, Nutbourne Lane, Nutbourne PULBOROUGH RH20 2HS		

Notes: Complete service to Matrix system, ET60 - Service last changed 19/2/24 - the commercial yard W3W cadet.blaring.pitching



Lee Goossens

STP SERVICE REPORT

	Answer	Notes
Purpose of Visit	Routine Service	
Check Chamber, Kiosk & Manhole Security & Condition	Completed (All OK)	
Visually Inspect System. Listen for Unusual Noises.	Completed (All OK)	
Check for any significant odours	Completed (All OK)	
Remove Cover from Plant	Yes	
Take Sample of the Final Effluent and Visually Inspect	Visually Good	
Comments		

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

DMS/DMC/MATRIX: Check Colour of Aeration Chamber	Good
Check for Excessive Suds,Rags & Other Non-Biodegradable Material	Good
Decant Sludge into Aeration Chamber	Yes
Check Sludge Density is Less than 70%	
Remove and Clean Diffuser	Completed
Remove Cover from Airbox	Yes
Existing Air Pump Type	ET60
Existing Air Pump Serial Number	30/22/1475
Carry out Air Pressure Test	0.18
Date of Last Overhaul or Replacement	
Replacement Air Pump Type	
Replacement Air Pump Serial No.	
Check Air Alarm	Checked
Clean Filter or Replace as Required	Checked
Clean Out Airbox [END DMS/DMC/MATRIX]	Completed
Check Condition of the Pipework	OK
Check Outlet Manhole	All Clear
Check Outlet to Ditch	N/A
Remove and Clean Submersible Pump	N/A
Replace all Covers	Yes
Site Cleaned & Tidied	Yes
Checked System is Operational	Yes
New Parts Fitted	No
Temporary Equipment Fitted	No

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

NOTES:	Some damage inside the tank. The final chamber section wall has broken and now out of place. It is not movable so am unable to repair. Damage does not look repairable. Otherwise system working ok. Thin layer of sludge and clean effluent going out.
Engineer Signature	Ashley Headon 
Incident or First Aid To Report?	No

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_091851

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_090952

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_091236

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_091233

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_091006

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_090959

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_091808

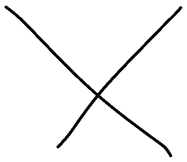
Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_091804

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

Customer	HUNTER GROUP - STONEHOUSE FARM	Resource	Ashley Headon
Contact	Lee Goossens		
Address	Handcross Road, Plummers Plain Horsham RH13 6NZ	Job type	Matrix Service
		Reference	SM0000-0379
		Date	01/10/2024 12:00
Billing address	Hunter Group - Parent Contact Lower Nash, Nutbourne Lane, Nutbourne PULBOROUGH RH20 2HS		

Notes: Complete service to the Matrix system and ET60 Compressor - Service kit last changed 19/2/24



Lee Goossens

Stock items

				Pickup		Drop-off	
Product category	**Model**	**Serial number**	**Usage**	**Quantity**	**Location**	**Quantity**	**Location**
Air Pump	Bibus SE41 Diaphragm Kit JDK 150 - 500 5700014					1.000	Hunter Group - Stonehouse Farm
Air Pump	Bibus SE42 JDK-150 - 500 Air Filters 5700012					1.000	Hunter Group - Stonehouse Farm

STP SERVICE REPORT

	Answer	Notes
Purpose of Visit	Routine Service	

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

Check Chamber, Kiosk & Manhole Security & Condition	Completed (All OK)
Visually Inspect System. Listen for Unusual Noises.	Completed (All OK)
Check for any significant odours	Completed (All OK)
Remove Cover from Plant	Yes
Take Sample of the Final Effluent and Visually Inspect	Visually Good
Comments	
DMS/DMC/MATRIX: Check Colour of Aeration Chamber	Good
Check for Excessive Suds,Rags & Other Non-Biodegradable Material	Good
Check Sludge Density is Less than 70%	
Remove and Clean Diffuser	Completed
Remove Cover from Airbox	Yes
Existing Air Pump Type	JDK200
Existing Air Pump Serial Number	T5012
Carry out Air Pressure Test	0.22
Date of Last Overhaul or Replacement	Diaghragms replaced on this service
Replacement Air Pump Type	
Replacement Air Pump Serial No.	
Check Air Alarm	Checked
Clean Filter or Replace as Required	Replaced
Clean Out Airbox [END DMS/DMC/MATRIX]	Completed
Check Outlet Manhole	All Clear
Check Outlet to Ditch	N/A
Remove and Clean Submersible Pump	N/A
Replace all Covers	Yes
Site Cleaned & Tidied	Yes
Checked System is Operational	Yes

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

New Parts Fitted	Yes
Temporary Equipment Fitted	No
NOTES:	I've adjusted the aeration for better distribution. Solenoid working ok. New diaghragms and air filter fitted to compressor. All ok.
Engineer Signature	Ashley Headon 
Incident or First Aid To Report?	No

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_113402

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_113110

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_120110

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_115120

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_113407

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_113406

Wendage Pollution Control Ltd
Rangeways Farm
Conford, Liphook
GU30 7QP

20241001_113107

Appendix T

SDS Aqua-Swirl Details

STORMWATER TREATMENT

SDS
Water Infrastructure Systems

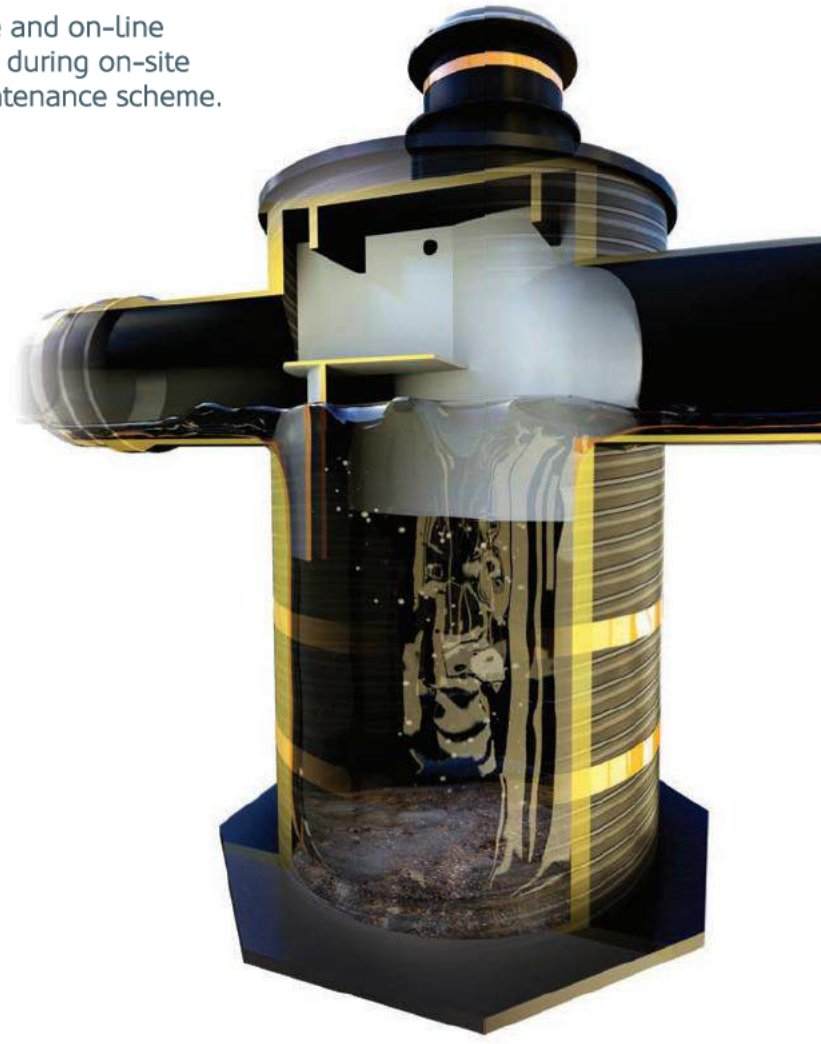
SDS Aqua-Swirl™

Hydrodynamic Vortex Separator

SDS Aqua-Swirl™ is a custom engineered, flow through water quality device that utilises hydrodynamic separation technology to maximise the removal of coarse sediment, debris and free floating oil within surface water runoff.

SDS Aqua-Swirl™ can be installed in both off-line and on-line configurations. It is suitable for use both after and during on-site construction, with the inclusion of a planned maintenance scheme.

- *No moving parts*
- *Sealed baffle vented to surface*
- *Large debris storage chamber*
- *Lifting supports*
- *HDPE plastic construction*
- *Compact dimensions*
- *Available in 9 different sizes*
- *Bespoke sizing available*



SDS Aqua-Swirl™ is sized according to water quality treatment flow rates which are based on the initial movement of pollutants into the storm drainage system. This flow rate typically represents approximately 90% to 95% of the total pollutants in the runoff volume. The treatment flow rate of the SDS Aqua-Swirl™ system is engineered to meet or exceed the local water quality treatment criteria and form an intrinsic part of the SuDS solution train.

sdslimited.com

SDS Ltd, Clearwater House, Castlemills, Biddisham, Somerset, BS26 2RE

T: +44 (0)1934 751303
E: info@sdslimited.com

Features	Benefits
Manufactured from high strength plastic components with no moving parts included.	Offers a durable, light weight and low cost alternative to concrete. Easy and quick to install resulting in substantial cost savings.
Specialised sealed baffle vented to the surface.	Delivers the most effective performance of any vortex separator.
Large debris and sediment storage capacity.	Limits the amount of maintenance required.
Single swirl chamber.	Simplifies inspection and maintenance facilities with no special equipment required.
Compact dimensions.	Reduces ground excavation and product installation costs.
Small footprint design.	Can be retro-fitted with minimal disruption to existing infrastructure utilities or surface features, extending the ability to meet new regulations.
Suitable for use during site construction programme.	Can be put into operation prior to completion of the site build, with the inclusion of a planned maintenance schedule.
Installation lifting supports.	Easy installation without the need for large, expensive cranes.
Available in 9 different standard sizes.	Provides greater design flexibility and assists the removal of sediments at a greater rate than comparable systems.
Bespoke units can be manufactured.	Satisfies even the most demanding installations.

SPECIFICATIONS

Aqua-Swirl Model No.	Aquashield Chamber Diameter mm	Swirl chamber diameter mm	Maximum internal diameter pipe connection mm		Water Quality Treatment Flowrate litres/sec	Oil/debris storage capacity litres	Sediment storage capacity m^3
			Off line	BYP[1]	*OK110		
AS-2	762	750	225	375	30	136	0.3
AS-3	991	1000	300	500	53	416	0.6
AS-4	1295	1200	300	600	77	644	0.8
AS-5	1524	1500	300	750	120	1382	1.3
AS-6	1829	1800	375	900	173	1439	1.8
AS-7	2134	2100	400	900	235	1987	2.5
AS-8	2438	2400	450	1200	307	2612	3.3
AS-9	2743	2800	600	1200	418	3596	4.4
AS-10	3048	3000	600	1500	480	4164	5.1

[1]BYP (Internal Bypass) provides full treatment of the first flush of water while the peak design storm is diverted and chanelled through the main conveyance pipe. SDS can supply further details.
*based on OK110 particle size (110 avg micron size).

Notes:
Details of mitigation indices available upon request.
Connection pipe sizes available (mm inner diameter): 150, 225, 300, 375, 400, 450, 500, 600, 750, 900, 1200, 1500.
The sediment storage capacity has been calculated in accordance with the relevant test protocol and is not a physical maximum; any additional sediment capacity required is achieved with bespoke deeper units.
For assistance in design and specific sizing using historical rainfall data, please contact SDS.
CAD details and specifications are available on request.

A-S DS/0818

SDS Ltd, Clearwater House, Castlemills, Biddisham, Somerset, BS26 2RE
T: +44 (0)1934 751303
E: info@sdslimited.com

Installation & Maintenance

SDS Aqua Swirl ™ Hydrodynamic Separator

Aqua-Swirl™ systems are fabricated from high performance HDPE materials; they are durable lightweight and can be installed without use of heavy lifting equipment.

Lifting support Straps are provided to allow easy off loading and installation, resulting in significantly reduced installation costs.

Installation:

1) Excavation to required size and depth allowing for 600mm around each side of the unit

2) Prepare the bed with 20-40mm clean stone to a depth of 300mm

3) Compacted in 150mm layers to ASTM D 2321 to a proctor density of 95%

4) Install the unit and backfill with 20-40mm clean stone in 150mm layers to ASTM D 2321 enough backfill should be placed over components prior to using heavy compaction or construction equipment to prevent damage.

5) Connect to drainage network pipework with rubber couplings like Fernco, Flex Seal or Band Seal.

6) The Aqua Swirl has a round base box section plate extending 100mm from the outside diameter to provide mitigation against buoyancy, concrete can be poured directly over and into the base plate if required to provide additional resistive force.

7) Aqua Swirls of AS-6 and above have both a base plate and top plate

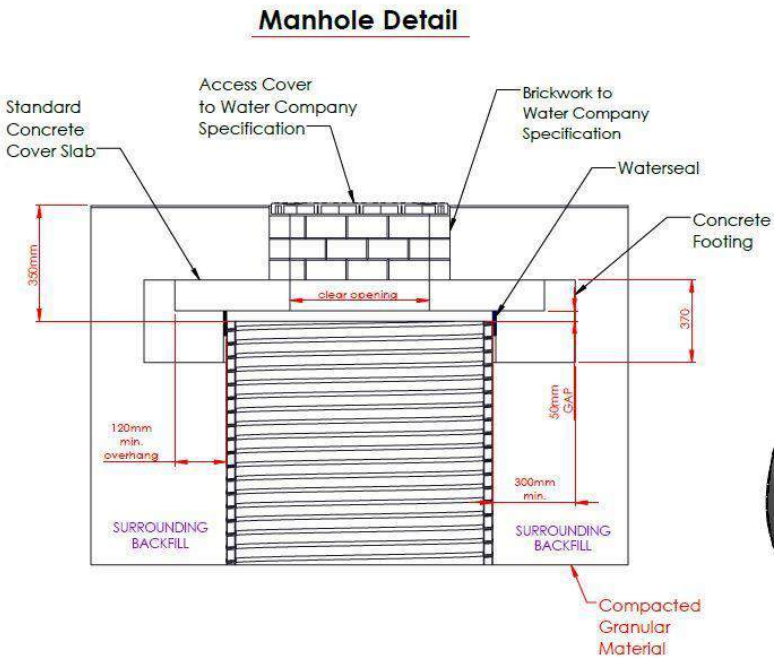
8) The riser pipe is supplied to the required length to allow for a standard UK man hole installation detail and can be cut to size on site to the required depth.

9) Where traffic loading is required a reinforced concrete pad must be placed over the entire Aqua swirl as per design calculated by engineer.

10) If traffic loading is not required, it's recommended that bollards are placed around access risers in non-traffic areas to prevent inadvertent loadings by maintenance vehicles.

Product illustration:



System Operation:

The Aqua-Swirl®

Can be installed in an “off-line” configuration. Or, depending on local regulations, an “in-line” (on-line) conveyance flow diversion system can be used. The CFD model allows simple installation by connecting directly to the existing storm conveyance pipe thereby providing full treatment of the “first flush,” while the peak design storm is diverted and channelled through the main conveyance pipe

The patented Aqua-Swirl® Stormwater Treatment System provides a highly effective means for the removal of sediment, floating debris, and free oil. Swirl technology, or vortex separation, is a proven form of treatment utilized in the Stormwater industry to accelerate gravitational separation.

The treatment operation begins when Stormwater enters the Aqua-Swirl® through a tangential inlet pipe that produces a circular (or vortex) flow pattern that causes contaminates to settle to the base of the unit. Since Stormwater flow is intermittent by nature, the Aqua-Swirl® retains water between storm events providing both dynamic and quiescent settling of solids. The dynamic settling occurs during each storm event while the quiescent settling takes place between successive storms.

A combination of gravitational and hydrodynamic drag forces encourages the solids to drop out of the flow and migrate to the center of the chamber where velocities are the lowest.

The treated flow then exits the Aqua-Swirl® behind the arched outer baffle. The top of the baffle is sealed across the treatment channel, thereby eliminating floatable pollutants from escaping the system. A vent pipe is extended up the riser to expose the backside of the baffle to atmospheric conditions, preventing a siphon from forming at the bottom of the baffle.

Maintenance:

Long term performance of the Aqua Swirl or any other device depends on inspection and maintenance program.

Recommended schedule in line with Ciria C753 guidance

On hand over – 3 months -6 months -12 months and then annually or as deemed necessary from details obtain from previous inspections.

Each site sediment loadings will be different and at its highest just after the build phase, hence why a more frequent visit is required at the start of the programme.

The Aqua-Swirl® has been designed to minimize and simplify the inspection and maintenance process. The single chamber system can be inspected and maintained entirely from the surface thereby eliminating the need for confined space entry. Furthermore, the entire structure (specifically, the floor) 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.

Inspection:

To inspect the Aqua-Swirl®, remove the manhole cover.

The only tools needed to inspect the Aqua-Swirl® system are a flashlight and a measuring device such as a stadia rod or pole. Given the easy and direct accessibility provided, floating oil and debris can be observed directly from the surface. Sediment depths can easily be determined by lowering a measuring device to the top of the sediment pile and to the surface of the water. When the sediment pile is within 42 to 48 inches of the water surface (or sediment pile thickness is 18 to 24 inches as measured from the base), the system should be maintained. The maximum Sediment storage capacity of the Aqua-Swirl® is reached when the sediment pile is within 30 inches of the water surface (or sediment accumulation is 36 inches thick as measured from the base).

It should be noted that to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile. Keep in mind that the finer sediment at the top of the pile may offer less resistance to the measuring device than the larger particles which typically occur deeper within the sediment pile.

The Aqua-Swirl® design allows for the sediment to accumulate in a semi-conical fashion as illustrated above. That is, the depth to sediment as measured below the water surface may be less in the center of the swirl chamber; and likewise, may be greater at the edges of the swirl chamber.

Removal:

Cleaning the Aqua-Swirl® is simple and quick. Free-floating oil and floatable debris can be observed and removed directly through the 750mm service access riser provided. A vacuum truck is typically used to remove the accumulated sediment and debris. An advantage of the Aqua-Swirl® design is that the entire sediment storage area can be reached with a vacuum hose from the surface (reaching all the sides). Since there are no multiple or limited (hidden or “blind”) chambers in the Aqua-Swirl®, there are no restrictions to impede on-site maintenance tasks.

Disposal:

All removed products should be disposed of in line with local council requirements

SDS Limited mitigation indices for stormwater treatment devices November 2018

The pollution mitigation indices are as follows:

Device	Total suspended solids mitigation index	Total metals mitigation index	Soluble metals mitigation index[1]	Hydrocarbons[3]
Aqua-swirl™ vortex grit separator	0.8 (0.5 on trunk roads and motorways where the suspended solids level is very high)	0.5[4]	The Aquaswirl™ is not designed to remove soluble pollutants	0.7[3]
Aqua-filter™ stormwater filtration unit	0.8	0.8	0.6	0.7[3]
Aqua-swirl™ and Aqua-filter™ in sequence	1.2[2]	0.9	0.6	1.0[2,3]
Aqua-Xchange™	0.8 when installed as a layer in a filter drain	0.9	1.0	0.6 when installed as a layer in a filter drain

These indices can only be assumed when the treatment device is properly sized for the anticipated rate of runoff and the level of pollution in the runoff is not unusually high.

[1] When drainage schemes are designed for road developments in accordance with the Design Manual for Roads and Bridges, the mitigation index for soluble metals is required because particulate metals are considered separately in the total suspended solids assessment

[2] When designing in accordance with the SuDS Manual (Ciria C753), when two devices are used in sequence to target the same pollutant, half of the mitigation index of the second component should be allowed in the calculation.

[3] The test procedures applied to manufactured treatment devices do not include measurement of hydrocarbon removal. Therefore, we have estimated that the Aqua-swirl™ removes free-phase hydrocarbons by flotation, and also removes hydrocarbons that are adhered to suspended solids. However, hydrocarbons are known to preferentially adhere to the smaller particles so the Aqua-filter™ will also remove a high proportion of those hydrocarbons as it is more effective at removing smaller suspended particles.

[4] Where metals are present in the runoff in particulate form, particularly from vehicle emissions, the Aqua-swirl™ will effectively remove those particles in admixture with other suspended solids.

Appendix U

Drainage Management and Maintenance Plan

Stonehouse Farm, Handcross Road, Horsham

Drainage Management & Maintenance Plan

For

Lake Investments Limited

motion

Document Control Sheet

Stonehouse Farm, Handcross Road, Horsham

Lake Investments Limited

This document has been issued and amended as follows:

Date	Issue	Prepared by	Approved by
26th February 2025	FINAL	Phil Allen MCIWEM C.WEM	Neil Jaques

Motion
84 North Street
Guildford
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W www.motion.co.uk

Contents

1.0 Introduction

1.1 This document sets out the suggested principles for the long-term management and maintenance of the surface water drainage systems on the proposed developments on Stonehouse Farm.

1.2 The purpose of this document is to ensure that Lake Investments Limited or the site management company has a robust inspection and maintenance plan in place for the lifetime of the development. This ensures the optimum operation of the surface water drainage system and that it will be maintained in perpetuity. This will contribute to reducing the risk of surface water flooding both on- and off-site.

1.3 All those responsible for maintenance should follow relevant health and safety legislation for all activities listed within this report (including lone working, if relevant). Method statements and risk assessments should always be undertaken and made available, if requested.

1.4 This document has been produced by Motion on behalf of their client, Lake Investments Limited. This document describes the typical management and maintenance tasks that are known at the design stage (maintenance frequencies and typical tasks, for example). These have been drawn from industry guidance such as CIRIA C753 - The SuDS Manual – and manufacturer's own guidance.

1.5 Maintenance is considered as a construction activity under the CDM Regulations 2015. Under the CDM Regulations, it is a requirement that a competent person be appointed to carry out a required role. CDM defines a competent person as an individual with sufficient knowledge of the specific tasks to be undertaken, as well as sufficient experience and ability to carry out their duties in relation to the task in a way that secures health and safety on site.

1.6 In recognition of the requirements of the CDM Regulations 2015, this drainage management and maintenance plan expects that the maintenance work will be carried out by a competent person who must have prior knowledge of the drainage components and SuDS systems on site.

1.7 There are limitations on what this document can prescribe at the planning stage (outline or full). This document cannot name the specific company or individuals who will carry out the maintenance and what equipment is to be used. Related to this, this document is unable to provide method statements for exactly how maintenance practices will be carried out. These can only be determined at the time of the maintenance being carried out through the exact maintenance need and the safe systems of work held by the company carrying out the work. Therefore, this is to be the responsibility of the site management company and/or the individuals carrying out the work. We urge those who are carrying out the maintenance to record this information and make it available to the Local Planning Authority (LPA), if required to do so. This drainage management and maintenance plan needs to be a living document that is owned and maintained by the adopting site management company and should be adhered to for the lifetime of the development.

2.0 Maintenance Categories

2.1 There are three categories of maintenance activities referred to in this report. These are:

Inspection and Monitoring

- Inspection and monitoring tasks should be carried out frequently, nominally once a month, and should include a visual inspection of all components including all inlets and outlets.

Regular Maintenance (Monthly)

- Regular maintenance consists of basic tasks done on a frequent and predictable schedule, including vegetation management and litter removal.

Seasonal Maintenance (Quarterly)

- Seasonal maintenance comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (leaf litter and sediment removal is an example).

Remedial Maintenance

- Remedial maintenance comprises of intermittent tasks that may be required to rectify faults associated with the system that have been identified through visual inspections. The likelihood of faults can be minimised by correct installation, regular inspection and timely maintenance. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events and, as such, timings are difficult to predict.

3.0 The Surface Water Drainage System

3.1 The proposed surface water drainage systems specified for the developments on Stonehouse Farm are made up of a number of components/structures. These include:

- Pipes
- Manholes
- Catchpit manholes/silt traps
- Geocellular attenuation tanks
- SuDS basins
- Hydrobrakes/Orifice flow controls
- Water butts (although these will be in private ownership)

3.2 All components should be installed in accordance with the manufacturer's instructions and to the levels/arrangement as defined on the designer's drawings. Not doing so will invalidate any warranty provided by the manufacturer.

3.3 All maintenance and cleaning must be carried out in accordance with manufacturer's recommendations and by competent and suitably qualified staff, as defined in the CDM regulations 2015.

3.4 This document should be read in conjunction with the design drawings of the drainage system, so that the location and type of each feature can be recognised and understood.

3.5 Manufacturer's instructions should be added to this document once specific products have been selected and installed by the contractor. This document will subsequently form the basis for a drainage maintenance regime.

4.0 General Maintenance Principles

4.1 All surface water drainage systems, whether piped gravity systems, Sustainable Drainage Systems (SuDS), or flow control devices and pumps, require regular maintenance to keep them working at optimum efficiency and capacity. The maintenance of the surface water drainage systems at Stonehouse Farm should be carried out alongside other regular maintenance tasks on site.

4.2 Timely and adequate maintenance will increase the lifespan of all the drainage components. Inadequate maintenance will do the reverse. Therefore, the projected lifespan and anticipated replacement date of each drainage component cannot be forecast at the time of this document being produced.

4.3 Lake Investments Limited or their site management agents will be responsible for the maintenance of the surface water drainage system for the lifetime of the development.

4.4 Construction activities can create and discharge significant quantities of sediment that will quickly clog the surface water drainage system. Therefore, construction-stage sediment removal is required immediately post-construction. The construction site manager should assess this and carry out cleaning as necessary.

4.5 Catchpit manholes/silt traps will be specified upstream of the permeable paved areas, as well as other locations on site. They will remove gross solids and the majority of silts. It is important that any debris build-up in the catchpit manholes/silt traps is removed at regular intervals. This will reduce the risk of the permeable paved areas becoming silted up. It will maintain the design capacity and function of this part of the drainage system.

4.6 Cleaning should also take place after large storms when there have been increased surface water flows and visible entrainment and deposition of debris.

4.7 An increased frequency of inspection and maintenance should be programmed into the autumn and winter months in acknowledgement that:

- Leaf fall from deciduous trees in autumn will result in an increased amount of leaf litter and an elevated blockage risk of drainage infrastructure.
- Increased rainfall during winter months will result in greater quantities of water moving through the drainage system and a greater input of silt and other debris.

4.8 Table 4.1, below, gives an overview of required maintenance tasks and the frequency at which they need to be undertaken. Section 5 – Inspection and Maintenance Frequency of Components – will assign typical maintenance frequencies and tasks to the specific components used within the surface water drainage systems proposed at Stonehouse Farm.

Table 4.1: Typical maintenance tasks and frequencies

Activity	Indicative Frequency	Typical Tasks
Inspection and Monitoring	Monthly	▸ Inspection of all inlets, outlets and control structures
Regular Maintenance	Monthly, for the lifetime of the development	▸ Litter picking and debris removal ▸ Weed removal and invasive plant control
Seasonal Maintenance	Quarterly, for the lifetime of the development	▸ Vegetation management around components ▸ Sweeping of pavement areas to remove surface silt ▸ Silt removal from system, including catchpits, cellular storage structures and control structures
Remedial maintenance	As required as a result of inspections, for the lifetime of the development.	▸ Inlet/outlet repairs ▸ Erosion repairs ▸ Reinstatement of edgings ▸ Reinstatement following pollution incidents ▸ Removal of silt build-up and leaf litter after storms ▸ Repair of vandalism ▸ Replacement of any blocked filter membranes/materials

5.0 Inspection and Maintenance Frequency of Components

5.1 Table 5.1 below lists each of the components used within Stonehouse Farm's surface water drainage systems. It suggests an indicative maintenance frequency for each component and ascribes typical maintenance tasks to them.

5.2 This list is not exhaustive, nor is it prescriptive. As mentioned in Section 3, additional, unscheduled maintenance may be required following adverse weather conditions or after autumn leaf falls. Additional maintenance tasks may be required to adequately clean and maintain individual components.

5.3 The list of components should be cross-referenced with the designer's drawings so that the location of each component can be identified.

5.4 It is the responsibility of Lake Investments Limited or their site management agents to ensure that all necessary maintenance activities are carried out in a timely manner and that the design performance of each drainage component is preserved.

5.5 If there is any uncertainty regarding the correct and safe methods of cleaning, or what equipment should be used, the manufacturer should be consulted.

Table 5.1: Maintenance Frequency and Task for Drainage Components

Activity	Indicative Frequency	Anticipated Tasks
Pipes	As required	▸ Identify any pipes that may not be operating properly and employ a competent, qualified contractor to inspect using CCTV. ▸ If the pipe is blocked with silt or debris, the pipe should be jetted clean from an upstream access point. All silt and debris should be captured and removed at a downstream access point. ▸ Inspect once clean. ▸ If any other defects are encountered (cracks, displaced joints, root ingress), appropriate solutions should be discussed with a competent and qualified contractor. These services are usually provided by the same companies that offer CCTV surveys and pipe jetting services.
Manholes	Annually and as required, for the lifetime of the development.	▸ Inspect/identify any damage or areas that are not operating correctly ▸ Remove silt, litter, leaves and other detritus. ▸ Inspect once clean.
Catchpit Manholes/Silt Traps	Annually and as required, for the lifetime of the development.	▸ Inspect/identify any damage or areas that are not operating correctly ▸ Remove silt, litter, leaves and other detritus. ▸ Inspect once clean.
Orifice Plates	Inspections at regular intervals (every 3 – 6 months).	▸ Orifice plates have no moving parts to fail and quality units are made of stainless steel to resist scour, degradation and chemical attack. ▸ The orifice plates in this scheme are to be downstream of the permeable paviours, so all contributing flows should be heavily filtered and free of any debris.

		▸ Debris and silt should be removed if present ▸ Check wear on orifice to ensure no enlargement is taking place. ▸ Any visible fixing bolts should be checked. ▸ If there is a suspected blockage, the housing chamber can be inspected internally, the blockage cleared and the orifice returned to its working position.
Hydrobrake chambers	Every three months for the first year, then annually thereafter for the lifetime of the development.	▸ Contact manufacturer for instruction on approved and safe inspection and maintenance practices. ▸ Inspect Hydrobrake and check functionality. Remove any detritus as required. ▸ Inspect once clean.
SuDS Basins	Monthly in Summer, as required in Winter	▸ Responsibility should be with landscape contractors. ▸ Maintenance tasks are not that different from standard public open space. ▸ Adequate access needs to be provided to the area. ▸ Regular mowing should take place across maintenance access routes, amenity areas, across embankments and the main storage area. Remaining areas can remain as 'meadow'. Mowed grass lengths of 75 – 100mm are appropriate. ▸ Grass clippings should be disposed of off-site. ▸ Any dead growth should be cleared before the start of the growing season. ▸ Any permanently wet areas with emergent aquatic vegetation should be managed as ponds or wetlands. ▸ Remove any sediment build-up as required. ▸ Check any inlets and outlets for blockages and clear as required. ▸ Check any flow control devices, if present.
Geocellular Attenuation Tanks	Annually	▸ Contact manufacturer for instruction on approved and safe inspection and maintenance practices. ▸ Inspect/identify any areas that are not operating correctly. ▸ Remove debris from catchment surface. ▸ Remove sediment from pre-treatment structures. ▸ Check for silt build-up and flush and remove as required (in accordance with manufacturer's instructions). ▸ Inspect once clean. ▸ See Table 21.3 of CIRIA C753 for more information. ▸ Most geocellular units have a 60-year creep limited life expectancy, so they should be planned for replacement by 2075 (approx.)

Water Butts (not the responsibility of the adopting site management agency, but individual homeowners)	Annually in Autumn to Winter	▸ Remove falling leaves and seeds from guttering or those that have found their way into the water butt. ▸ Water may stagnate slightly. If so, use a water butt cleaning disc into the tank. ▸ In autumn and winter, drain water off every 10 days (or less) to make sure that water butts don't overflow and that water is kept moving. This will stop larvae and flies from using the water butt. ▸ Use safe products such as vinegar to clean the outside of the tank and the inside of the lid and be careful not to contaminate water with chemicals. ▸ At least once a year, completely empty the water butt and scrub it out with warm soapy water and then rinse thoroughly. This is best done at a time when the water butt is already nearly empty (end of summer) or when it can readily refill (winter).

5.6 Upon completion of maintenance activities, a record should be kept of the work carried out. This should be retained and an annual maintenance report should be compiled, which should include the following:

- Observations resulting from inspections
- Maintenance and operation activities undertaken during the year
- Recommendations for inspections and maintenance programmes for the following year

5.7 On the next page is a table with suggested information should be recorded and included with the maintenance plan. As mentioned in the introduction to this document, this should be a living document and regularly updated, as required and should be kept for the lifetime of the development.

5.8 The Local Planning Authority (Horsham District Council) may request to check and sign off any maintenance activities. Therefore, it is the recommendation that the LPA is contacted prior to any scheduled routine maintenance. The table mentioned above and on the next page, as well as the annual maintenance report, should be offered to the LPA for their records and approval.

Date	Component requiring maintenance	Issues prompting maintenance	Scheduled maintenance (Y/N)	Maintenance carried out	Additional works required (Y/N). If yes, please detail	Next scheduled date of inspection and maintenance

Appendix V

Exceedance Plans

Notes

1. All levels and dimensions are to be checked on site before any work commences. All dimensions are in metres unless stated otherwise.
2. Any discrepancies shall be reported to the engineer immediately, so that clarification can be sought prior to the commencement of works.
3. This drawing shall be read in conjunction with all other relevant engineering details, drawings and specification.
4. The contractor is to keep a record of any variations made on site, including the relocation of sewers or drains, for their "as built" drawings to be prepared upon project completion.
5. All works to the adopted system are to be carried out in accordance with Sewers for Adoption, 7th Edition.
6. All works to the private drainage system to be in accordance with the Building Regulations Approved Document Part "H" 2015 edition.
7. 350mm min cover to be provided for private pipes laid in soft/paved areas. 900mm min cover to be provided for private pipes laid beneath roads/driveways unless not practicable. Where unachievable, shallow private drains may require protection using concrete surround or paving slabs bridging the trench, subject to the NHBC inspector's requirements.
8. All pipes shall be laid soffit to soffit with outgoing pipes unless otherwise stated.
9. Manholes situated within areas accessible to motor vehicles are to be fitted with suitable strength covers and frames. Please refer to the manhole schedule for guidance on this.

Legend

- New SuDS Basin
- New Surface Water Gravity Pipe
- Existing Surface Water Gravity Pipe
- New SW Inspection Chamber
- New Flow Control Structure

Rev.	Description	Drn	Chk	App	Date
P02	Second Issue	PA	PA	PA	28/02/2025
P01	First Issue	RW	PA	PA	26/02/2025

Drawing Status:

FOR PLANNING
NOT FOR CONSTRUCTION

motion
Guildford - Reading - London
www.motion.co.uk

Client:
Lakeside Investments Limited

Project:
Stonehouse Farm

Title:
Stonehouse Business Park
Drainage Strategy

Scale: 1:500 (@ A1)

Drawing: 2501022-0502
Revision: P02

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Notes

1. All levels and dimensions are to be checked on site before any work commences. All dimensions are in metres unless stated otherwise.
2. Any discrepancies shall be reported to the engineer immediately, so that clarification can be sought prior to the commencement of works.
3. This drawing shall be read in conjunction with all other relevant engineering details, drawings and specification.
4. The contractor is to keep a record of any variations made on site, including the relocation of sewers or drains, for their "as built" drawings to be prepared upon project completion.
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Legend

- Gecellular Attenuation Tank
- New SuDS Basin
- New Surface Water Gravity Pipe
- Existing Surface Water Gravity Pipe
- New SW Inspection Chamber
- New Flow Control Structure

Rev.	Description	Drn	Chk	App	Date
P02	Second Issue	PA	PA	PA	28/02/2025
P01	First Issue	RW	PA	PA	26/02/2025

Drawing Status:

FOR PLANNING
NOT FOR CONSTRUCTION

motion
Guildford - Reading - London
www.motion.co.uk

Client:
Lakeside Investments Limitied

Project:
Stonehouse Farm

Title:
Lot 8
Drainage Strategy

Scale: 1:500 (@ A1)

Drawing: 2501022-0501
Revision: P02

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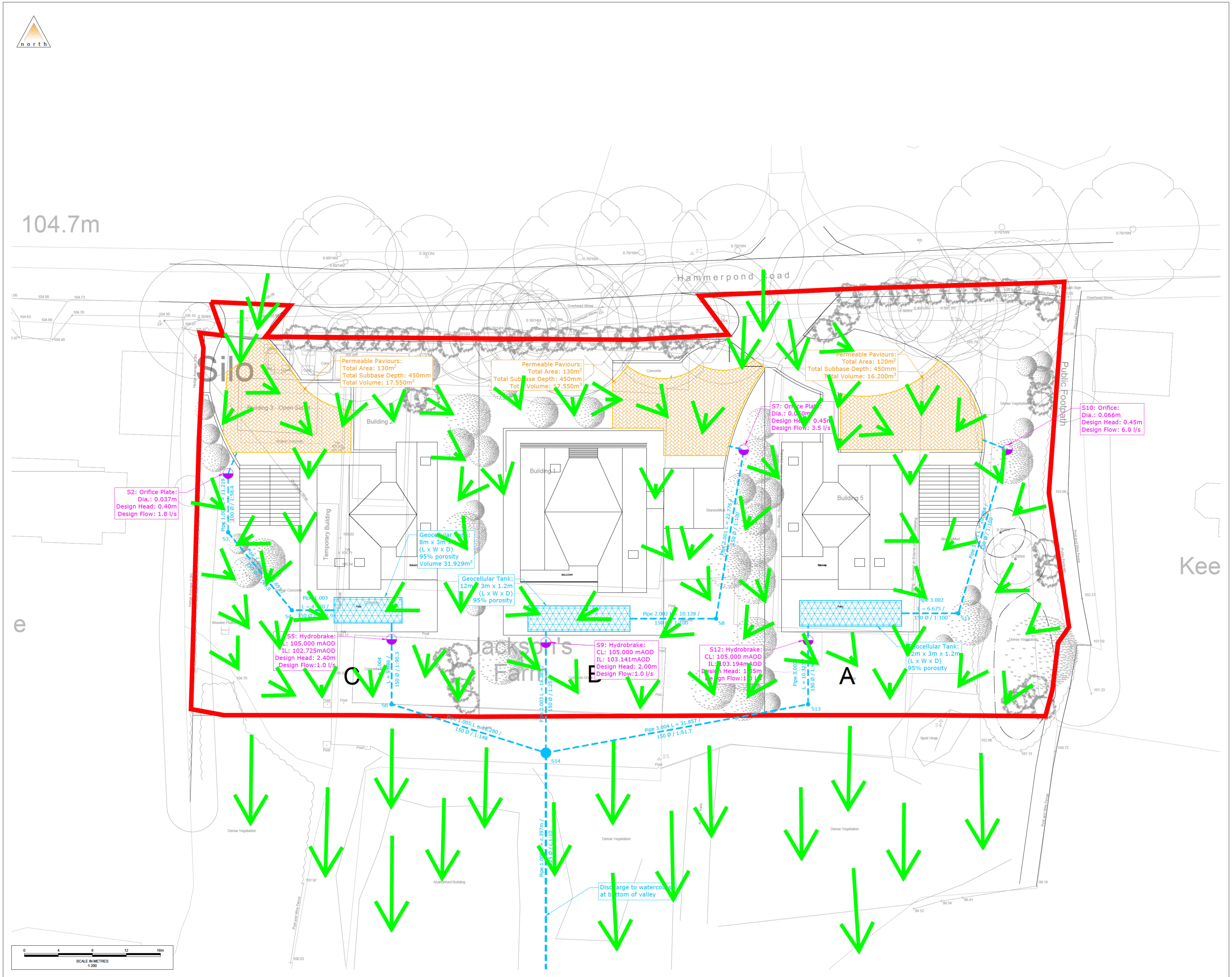

Notes

1. All levels and dimensions are to be checked on site before any work commences. All dimensions are in metres unless stated otherwise.
2. Any discrepancies shall be reported to the engineer immediately, so that clarification can be sought prior to the commencement of works.
3. This drawing shall be read in conjunction with all other relevant engineering details, drawings and specification.
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8. All pipes shall be laid soffit to soffit with outgoing pipes unless otherwise stated.
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Legend

- Permeable Paviours
- Geocellular Attenuation Tank
- New Surface Water Gravity Pipe
- New SW Inspection Chamber
- New Flow Control Structure
- New Manhole

Rev.	Description	Drn	Chk	App	Date
P01	First Issue	RW	PA	PA	26/02/2025

Drawing Status:

FOR PLANNING
NOT FOR CONSTRUCTION

motion
Guildford - Reading - London
www.motion.co.uk

Client:
Lakeside Investments Limited

Project:
Stonehouse Farm - Jacksons Ridge

Title:
Jackson's Farm
Drainage Strategy

Scale: 1:200 (@ A1)

Drawing: 2410067-0501

Revision: P01