Discharge of Conditions 9, & 10 (Details of Foul & Surface Water Drainage) Planning Approval DOV/20/00482

for

Proposed Holiday Accommodation
on land at Hockley Sole
Hockley Sole Lane, Capel Le Ferne
Kent, CT18 &EU

on behalf of

Mr & Mrs Snape

Document Control Sheet

Project Title Proposed Holiday Accommodation

Hockley Sole, Capel Le Ferne

Document Title Detailed Foul & Surface Water Drainage Design

Job No. T-2022-147

Revision 1.0

Status **Final**

Issue	Status	Author	Date	Check	Date	Authorised	Date
1.0	**Final**	P. Lavender	20.04.23	S. Carr	20.04.23	P. Lavender	20.04.23

Distribution List

Version	Issued to	Purpose	Date
1.0	Project Manager (via email)	Planning	20/04/2023

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CONTENTS

1.0 STATUS

1.1 This Report is prepared for the sole use of Mr & Mrs Snape Ltd and their agents in connection with the current planning application. No responsibility can be assumed for the Report if used by others.

1.2 For the purposes of the Contracts (Rights of Third Parties) Act 1999, nothing in this Report shall confer on any third party any right to enforce or benefit from any terms of this Report

2.0 INTRODUCTION

Background

2.1 Tridax Ltd have been commissioned by Alastair Cracknell on behalf of Mr & Mrs Snape Ltd and requested to prepare the detailed foul & surface water drainage design for the proposed holiday accommodation on land at Hockley Sole, Hockley Sole Lane, Capel Le Ferne, CT18 7EU for the discharge of conditions 9 & 10 of the planning approval DOV/20/00482 to Dover District Council.

9 No development above ground shall take place until a detailed scheme for the disposal of the site's surface water has been submitted to and approved in writing by the local planning authority. The details shall include the principles of SUDS as set out in the application documentation together with details of an implementation programme and maintenance schedule thereafter. No drainage systems for the infiltration of surface water to the ground are permitted other than with the written consent of the local planning authority. Any proposals for such systems must be supported by an assessment of the risks to controlled waters.
Reason: To ensure the development is served by satisfactory arrangements for the disposal of surface water.

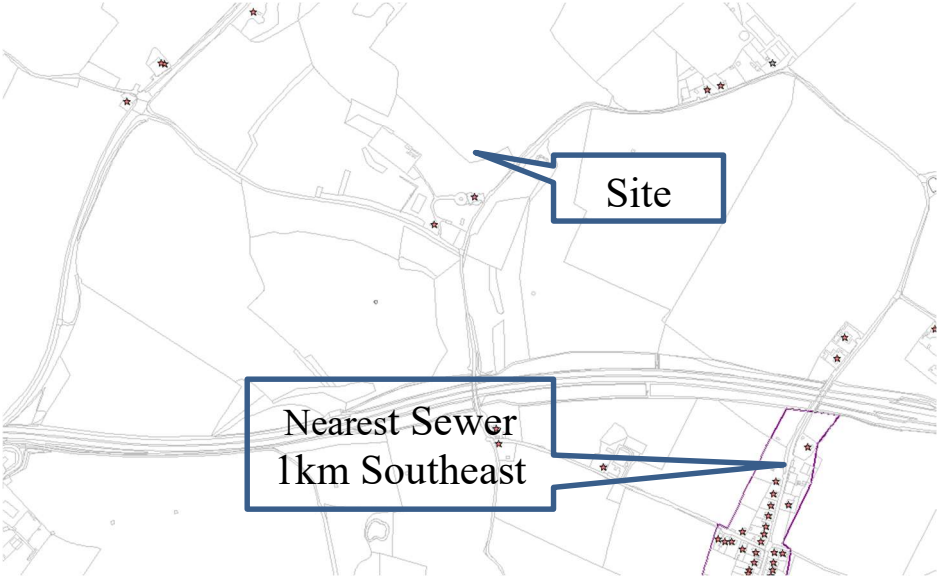
10 No development shall take place until a detailed scheme for the disposal of foul sewage, which shall include provision for works on site and works off site as required, together with a programme for implementation and long term maintenance, has been submitted to and approved in writing by the local planning authority. The approved scheme shall be fully implemented and operational before any of the dwellings hereby permitted are first occupied and shall be maintained in accordance with the approved scheme thereafter.
Reason: These details are required prior to the commencement of the development to ensure the development is served by satisfactory arrangements for the disposal of foul sewage.

Frame 1 ~ Extract of Planning Conditions

3.0 FOUL WATER DRAINAGE

Existing Discharge

3.1 There is no existing drainage on the site. Inspection of the public sewer records that the nearest foul water sewer is approximately 1km southeast of the site as shown in frame 2 below.



Frame 2 ~ Extract of Public Sewer Catchment Area

Proposed Discharge

3.2 Due to there being no public foul water sewers local to the site, it is intended to use a septic tank with the treated effluent discharging to a shallow field drainage system complying to Part H3 of the Building Regulations.

3.3 The discharge of the effluent to field drainage system calculated in accordance with 'British Water Flow & Loads' is a total daily flow of 0.9m³ (3bed/6person dwelling x 150litres/head/day). As the total daily discharge to ground is less than 2m³/day; a permit for the discharge of the treated effluent will not be required from the Environment Agency and the following general binding rules apply for discharge to ground.

1. Discharge to ground must be 2m³ or less per day in volume
3. Sewage must only be domestic
4. The discharge must not cause pollution of surface water or groundwater
5. The discharge must receive treatment from a septic tank or sewage treatment plant and infiltration system
7. The Discharge must not be within a groundwater an Inner Source Protection Zone or within 50metres from any well, spring, or borehole

9. All works and equipment used for the treatment of sewage effluent and its discharge must comply with relevant design and manufacturing standards

10. The system must be installed and operated in accordance with the manufacturers specification
11. Maintenance must be undertaken by someone who is competent
12. Waste sludge from the system must be safely disposed of by an authorised person
13. If the property is sold, the operator must give the new operator a written notice stating that a small sewage discharge is being carried out, and giving description of the system and maintenance requirements
14. The operator must ensure the system is appropriately decommissioned where it ceases to be in operation
15. New discharges must not be within 30metres of a public foul sewer
16. For new discharges, the operator must ensure that necessary planning / building control approvals for the treatment system are in place
17. New discharges must not be in or within 500metres of SAC, SPA, SSS
20. For new discharges, any partial drainage field must not be installed within 10metres of the bank side of the watercourse

3.4 Detailed foul water drainage design drawings are included within Appendix A.

Consents

3.5 No formal consents are required for the foul water disposal other than compliance with the Building Regulations.

4.0 SURFACE WATER DRAINAGE

Proposed Discharge

4.1 The intention is for the surface water to be disposed via on site filtration using a conventional PCC ringed soakaway. To inform the detailed design the Client excavated a trial pit at the location of the proposed soakaway as shown in the photographs as frame3 below. Due to fractured nature and highly permeable nature of the underlying chalk, the Client was unable to raise the water above 150mm to complete a full test. 100 litre barrel of water discharged in 60 seconds (1.70 x 10^{-3} m/s) 6m/hr.

Frame 3 – Soakage Test Photographs

4.2 MicroDrainage Detailed Design calculations are enclosed within Appendix B to demonstrate that the proposed soakaways would be adequate to cater for a 1in100 year return period with a 40% allowance for climate change. The drainage calculations provided comply with the Kent County Council SUDS guidance;

- FSR manually increased to 26.25mm
- Design to accommodate 40% Climate Change
- Half-drain times for 30year return < 24 hours

4.3 Detailed surface water disposal design drawings are included within Appendix A.

Consents

4.4 No formal consents are required for the SUDS features included for the surface water disposal strategy apart from the discharge of the pre-commencement planning condition requiring approval of the detailed design.

4.5 The responsibility of the management and maintenance will remain with the property owner to meet the requirements of the Flood and Water Management Act.

5.0 OPERATION & MAINTENANCE STATEMENT

5.1 We recommend that an annual maintenance contract is entered for the desludging of the primary settlement tank.

5.2 The surface water system as indicated on the design drawings is a private Sustainable Urban Drainage System (SUDS) and the owner of the property will be responsible for the inspection and maintenance for this system.

5.3 It is recommended that the chambers and the soakaway are inspected as part of the general planned inspection and maintenance regime for the development, but certainly at no greater intervals than once a year.

5.4 Annual Inspection to include;

- Lift all manhole covers and check general condition an ensure no floating debris within the manholes.
- Note that the manhole upstream of the soakaway is a catchpit and should be dipped to check the level of any accumulated silt and emptied by gully sucker and disposed off-site by a licensed carrier.
- Check the overall integrity of the soakaway location looking for any ground settlement local to the tanks.
- Carry out works as identified from inspection.

5.5 Five year Inspection / Five Year Anniversary

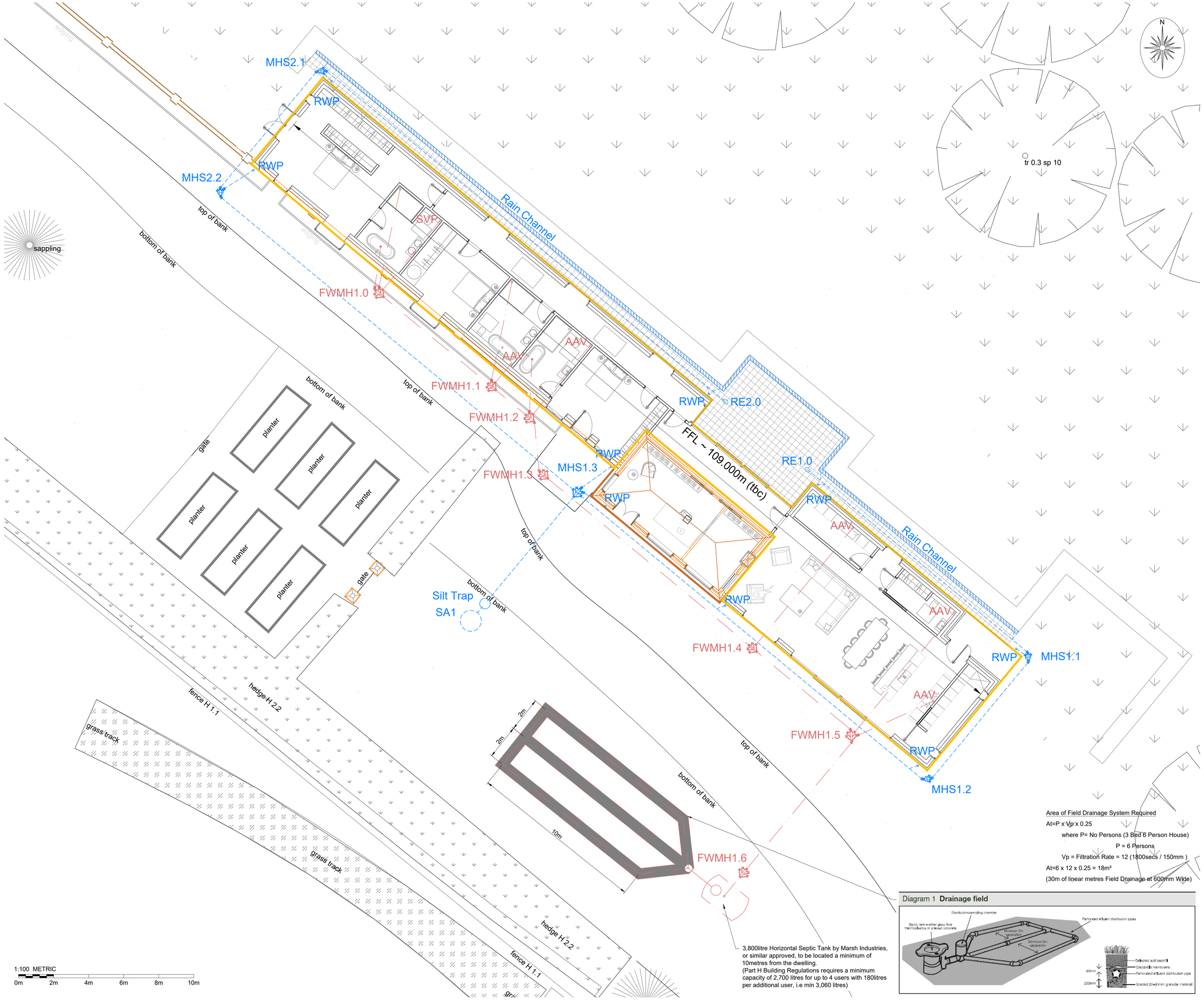
- Carry out a rapid 'Flush' through of the system (carry out works during a dry period) of all pipe work to ensure no blockages and free flow of water to the outfall and to check the overall integrity. Flushing of attenuation tank can be carried through the vent pipe.
- Empty all catchpits with a gully sucker and dispose off-site by a licensed carrier

Maintenance Records:

Record the date of each inspection along with a brief description of any works carried out

APPENDIX A

Tridax Drawings
T-2022-147-01 RevA Drainage Plan
T-2022-147-02 RevA Drainage Details



1:100 METRIC

0m 2m 4m 6m 8m 10m

3,800litre Horizontal Septic Tank by Marsh Industries, or similar approved, to be located a minimum of 10metres from the dwelling.
(Part H Building Regulations requires a minimum capacity of 2,700 litres for up to 4 users with 180litres per additional user, i.e min 3,060 litres)

DRAWING LEGEND

Site boundary line

PROPOSED PRIVATE DRAINAGE

Private foul water drainage 100mm Ø at min 1:60 Gradient

MH MH Private foul water manhole

SVP Soil vent pipe

AAV Stub stack with Air Admittance Valve

Private surface water drainage 100mm Ø at min 1:80 Gradient

MH MH Private surface water manhole

RWP Rainwater pipe (indicative, locations to be agreed)

RE Rodding Eye

46m² Existing Potting Shed Roof

326m² 'Greenroof' to Landscape Architects Details

82m² Flag paving falling from dwelling to channel

SA 454m² Contributing Area to PCC Ring Soakaway

As the total daily discharge to ground is less than 2m³/day a permit for the discharge of the treated effluent will not be required from the Environment Agency and the following general binding rules apply for discharge to ground;

1. Discharge to ground must be 2m³ or less per day in volume
3. Sewage must only be domestic
4. The discharge must not cause pollution of surface water or groundwater
5. The discharge must receive treatment from a septic tank or sewage treatment plant and infiltration system
7. The Discharge must not be within a groundwater Source Protection Zone or within 50metres from any well, spring, or borehole
9. All works and equipment used for the treatment of sewage effluent and its discharge must comply with relevant design and manufacturing standards
10. The system must be installed and operated in accordance with the manufacturers specification
11. Maintenance must be undertaken by someone who is competent
12. Waste sludge from the system must be safely disposed of by an authorised person
13. If the property is sold, the operator must be give the new operator a written notice stating that a small sewage discharge is being carried out, and giving description of the system and maintenance requirem
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17. New discharges must not be in or within 500metres of SAC, SPA, SSS
20. For new discharges, any partial drainage field must not be installed within 10metres of the bank side of the watercourse

Area of Field Drainage System Required

At=P x Vp x 0.25

where P= No Persons (3 Bed 6 Person House)

P = 6 Persons

Vp = Filtration Rate = 12 (1800secs / 150mm)

At=6 x 12 x 0.25 = 18m²

(30m of linear metres Field Drainage at 600mm Wide)

Diagram 1 **Drainage field**

Rev	Description	Date
A	First issue to client	20/04/2023

PROJECT
New Holiday Accomodation on land at Hockley Sole, Hockley Sole Lane, Capel-Le-Ferne, Kent, CT18 7EW

CLIENT
Mr & Mrs Snape

tridax
Suite 2, The Powder House, Menzies Road, White Cliffs Business Park, Whitfield, Dover, Kent, CT16 2HQ Tel: 01304 820777

DRAWING
Drainage Plan

SCALES 1:100 | DATE 17/04/2023 | SIZE A1

STATUS **APPROVAL**

Dwg No. **T-2022-147-01** | REV A

FOUL WATER MANHOLE SCHEDULE

Manhole Ref.	Cover Level (m)	Invert Level (m)	Backdrop Invert Lvl (m)	Manhole Depth (m)	Manhole Type	Manhole Ø (mm)	Cover/Frame Grade	Remarks
MHF1.0	108.850	108.250	-	0.600	PPIC	450	A15	-
MHF1.1	108.850	108.111	-	0.739	PPIC	450	A15	-
MHF1.2	108.850	108.065	-	0.785	PPIC	450	A15	-
MHF1.3	108.850	108.020	-	0.831	PPIC	450	A15	-
MHF1.4	108.850	107.761	-	1.089	PPIC	450	A15	-
MHF1.5	108.850	107.641	-	1.209	PPIC	450	A15	-
MHF1.6	107.900	107.423	-	0.477	PPIC	450	A15	-
Septic Tank	107.900	107.400	-	0.500	-	-	A15	installed to manufacturers details

FOUL WATER PIPE SCHEDULE

Pipe Ref.	Pipe Length (m)	Pipe Ø (mm)	Pipe Material	Gradient (1 in ?)	Bedding	Remarks
PNF1.0	8.33	100	UPVC	60	Class S	-
PNF1.1	2.80	100	UPVC	60	Class S	-
PNF1.2	2.70	100	UPVC	60	Class S	-
PNF1.3	15.50	100	UPVC	60	Class S	-
PNF1.4	7.20	100	UPVC	60	Class S	-
PNF1.5	9.30	100	UPVC	13.9	Class S	-
PNF1.6	1.40	100	UPVC	60	Class S	-

SURFACE WATER MANHOLE SCHEDULE

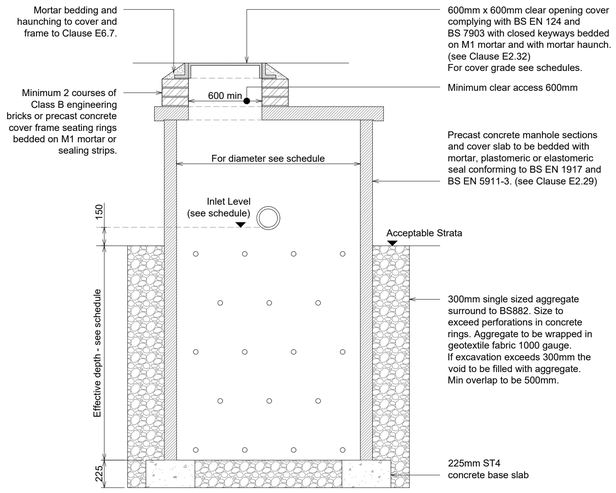
Manhole Ref.	Cover Level (m)	Invert Level (m)	Backdrop Invert Lvl (m)	Manhole Depth (m)	Manhole Type	Manhole Ø (mm)	Cover/Frame Grade	Remarks
RE1.0	108.850	108.500	-	0.350	Rodding Eye	-	A15	-
MHS1.1	108.850	108.297	-	0.553	SIC	300	A15	-
MHS1.2	108.850	108.191	-	0.659	SIC	300	A15	-
MHS1.3	108.850	107.700	-	1.150	PPIC	450	A15	-
RE2.0	108.850	108.500	-	0.350	Rodding Eye	-	A15	-
MHS2.1	108.850	108.131	-	0.719	SIC	300	A15	-
MHS2.2	108.850	108.025	-	0.825	SIC	300	A15	-
Soakaway SA1	107.700	105.200	107.200	2.500	PCC Ring	1200	D400	see detail

SURFACE WATER PIPE SCHEDULE

Pipe Ref.	Pipe Length (m)	Pipe Ø (mm)	Pipe Material	Gradient (1 in ?)	Bedding	Remarks
PNS1.0	16.24	100	UPVC	80	Class S	-
PNS1.1	8.48	100	UPVC	80	Class S	-
PNS1.2	25.20	100	UPVC	51.3	Class S	-
PNS1.3	8.58	100	UPVC	17.2	Class S	-
PNS2.0	29.52	100	UPVC	80	Class S	-
PNS2.1	8.46	100	UPVC	80	Class S	-
PNS2.2	26.00	100	UPVC	80	Class S	-

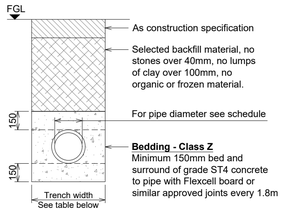
Typical PCC Soakaway Detail

scale 1:25



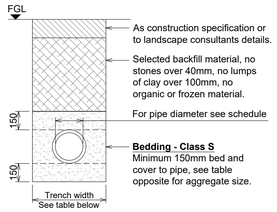
Pipe Bedding - Class Z

Areas subject to vehicle loadings.
Less than 1.2m cover to pipe.



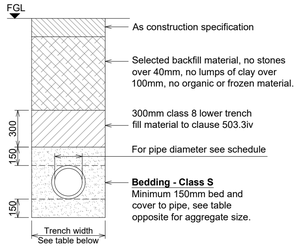
Pipe Bedding - Class S

Areas not subject to vehicle loadings.
Use in private gardens, landscaped areas etc.



Pipe Bedding - Class S

Areas subject to vehicle loadings.
Greater than 1.2m cover to pipe.



PIPE BEDDING MATERIAL - CLASS S

Pipe Ø (mm)	Suitable Materials: (Aggregate to BS 882)
100	10mm nominal single sized aggregate
150	10 to 14mm nominal single sized aggregate
225 to 525	10 to 14mm or 20mm nominal single sized aggregate
Over 525	10, 14 ,20 or 40mm nominal single sized crushed rock

TRENCH WIDTH

Pipe Ø (mm)	Trench Width (mm)
100	450
150	450
225	600
300	600
375	750
450	750
525	900
600	900
750	1200
900	1350
1050	1500

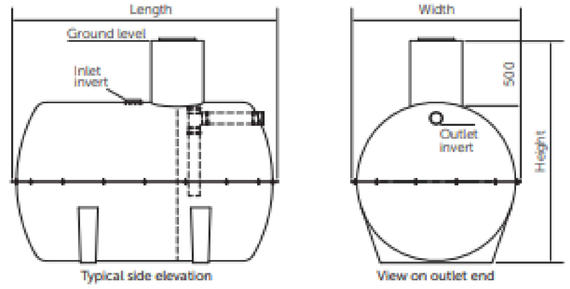
Pipe surround material shall where required, be placed and compacted over the full width of the trench in layers not exceeding 150mm before compaction, to a finished thickness of 300mm above the crown of the pipe.

Where excavations have been supported and the supports are removed they shall be withdrawn progressively as backfilling proceeds in a manner that minimises the danger of collapse, all voids formed behind the supports are to be carefully filled and compacted.

Pipe jointing surfaces and components shall be kept clean and free from extraneous matter until the joints have been made or assembled, care should be taken to ensure that there is no ingress of grout or other material into the joint after the joint has been made.

Pipes should be cut in accordance with the manufacturers recommendations to provide a clean square profile without splitting or fracturing the pipe wall and to ensure minimal damage to any protective coatings, where necessary, the cut ends of pipes shall be formed to the tapers and chamfers suitable for the type of joint to be used.

Horizontal septic tanks

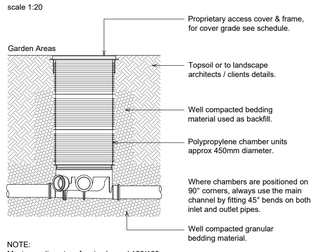


Size	Length +/-50mm	Width +/-50mm	Height +/-50mm	Inlet Invert	Inlet Ø	Outlet Invert	Outlet Ø
2800L	3000	1250	1750	500	110	800	110
3800L	4000	1250	1750	500	110	800	110
4500L	2650	1600	2100	500	110	800	110
6000L	2950	1900	2400	500	110	800	110
8000L	3640	1900	2400	500	160	800	160
10000L	4200	1900	2400	500	160	800	160
12000L	5200	1900	2400	500	160	800	160
14000L	5840	1900	2400	500	160	800	160
16000L	6700	1900	2400	500	160	800	160
18000L	7500	1900	2400	500	160	800	160
20000L	8100	1900	2400	500	160	800	160

Polypropylene Inspection Chamber (PPIC)

Use on private drainage works only

scale 1:20



NOTE:
Maximum diameter of main channel 150/160mm
Maximum pipe diameter of inlets 100/110mm

Unused inlets are to be sealed and made watertight.

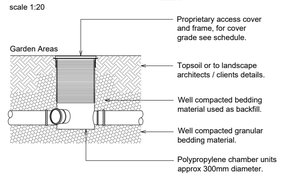
Backfill to be well compacted around shaft of chamber.

No incoming branch is to be less than 90° from the outgoing direction of flow, all pipes entering the bottom of the manhole are to have level soffits.

Shallow Inspection Chamber (SIC)

Use on private drainage works only

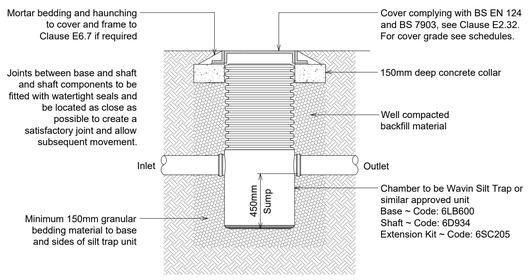
scale 1:20



Typical Type 3 Silt Trap Detail

scale 1:25

- **Sited in soft landscaped areas**



Rev	Description	Date
A	First issue to client	20/04/2023

PROJECT
New Holiday Accomodation on land at Hockley Sole, Hockley Sole Lane, Capel-Le-Ferne, Kent, CT16 7EW

CLIENT
Mr & Mrs Snape

DRAWING
Drainage Details

STATUS
APPROVAL

SCALES 1:100 | DATE 17/04/2023 | SIZE A1

Dwg No. **T-2022-147-02** | REV. A

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APPENDIX B

MicroDrainage Design Calculations
1. Foul Water Network Design Calculations
2. Surface Network Details & Simulation Results
3. 40% Sensitivity Test Results

FOUL SEWERAGE DESIGN

Design Criteria for Foul - Unit

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.00	Add Flow / Climate Change (%)	0
Industrial Peak Flow Factor	0.00	Minimum Backdrop Height (m)	0.600
Calculation Method	EN 752	Maximum Backdrop Height (m)	1.500
Frequency Factor	0.70	Min Design Depth for Optimisation (m)	0.500
Domestic (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	0.75
Domestic Peak Flow Factor	6.00	Min Slope for Optimisation (1:X)	100

Designed with Level Soffits

Network Design Table for Foul - Unit

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	8.330	0.139	60.0	0.000	5.0	0.0	1.500	o	100	Pipe/Conduit	
1.001	2.800	0.047	60.0	0.000	5.0	0.0	1.500	o	100	Pipe/Conduit	
1.002	2.700	0.045	60.0	0.000	5.0	0.0	1.500	o	100	Pipe/Conduit	
1.003	15.500	0.258	60.0	0.000	0.0	0.0	1.500	o	100	Pipe/Conduit	
1.004	7.200	0.120	60.0	0.000	1.5	0.0	1.500	o	100	Pipe/Conduit	
1.005	9.300	0.218	42.7	0.000	4.6	0.0	1.500	o	100	Pipe/Conduit	
1.006	1.400	0.023	60.0	0.000	0.0	0.0	1.500	o	100	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	108.250	0.000	0.0	5.0	0.0	33	0.70	0.86	6.8	1.6
1.001	108.111	0.000	0.0	10.0	0.0	39	0.77	0.86	6.8	2.2
1.002	108.065	0.000	0.0	15.0	0.0	44	0.81	0.86	6.8	2.7
1.003	108.020	0.000	0.0	15.0	0.0	44	0.81	0.86	6.8	2.7
1.004	107.761	0.000	0.0	16.5	0.0	45	0.82	0.86	6.8	2.8
1.005	107.641	0.000	0.0	21.1	0.0	44	0.96	1.02	8.0	3.2
1.006	107.423	0.000	0.0	21.1	0.0	49	0.85	0.86	6.8	3.2

Manhole Schedules for Foul - Unit

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
FWMH1.0	108.850	0.600	Open Manhole	1200	1.000	108.250	100				
FWMH1.1	108.850	0.739	Open Manhole	1200	1.001	108.111	100	1.000	108.111	100	
FWMH1.2	108.850	0.785	Open Manhole	1200	1.002	108.065	100	1.001	108.065	100	
FWMH1.3	108.850	0.831	Open Manhole	1200	1.003	108.020	100	1.002	108.020	100	
FWMH1.4	108.850	1.089	Open Manhole	1200	1.004	107.761	100	1.003	107.761	100	
FWMH1.5	108.850	1.209	Open Manhole	1200	1.005	107.641	100	1.004	107.641	100	
FWMH1.6	107.900	0.477	Open Manhole	1200	1.006	107.423	100	1.005	107.423	100	
Septic Tank	107.900	0.500	Open Manhole	1750		OUTFALL		1.006	107.400	100	

No coordinates have been specified, layout information cannot be produced.

PIPELINE SCHEDULES for Foul - Unit

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	100	FWMH1.0	108.850	108.250	0.500	Open Manhole	1200
1.001	o	100	FWMH1.1	108.850	108.111	0.639	Open Manhole	1200
1.002	o	100	FWMH1.2	108.850	108.065	0.685	Open Manhole	1200
1.003	o	100	FWMH1.3	108.850	108.020	0.731	Open Manhole	1200
1.004	o	100	FWMH1.4	108.850	107.761	0.989	Open Manhole	1200
1.005	o	100	FWMH1.5	108.850	107.641	1.109	Open Manhole	1200
1.006	o	100	FWMH1.6	107.900	107.423	0.377	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	8.330	60.0	FWMH1.1	108.850	108.111	0.639	Open Manhole	1200
1.001	2.800	60.0	FWMH1.2	108.850	108.065	0.685	Open Manhole	1200
1.002	2.700	60.0	FWMH1.3	108.850	108.020	0.731	Open Manhole	1200
1.003	15.500	60.0	FWMH1.4	108.850	107.761	0.989	Open Manhole	1200
1.004	7.200	60.0	FWMH1.5	108.850	107.641	1.109	Open Manhole	1200
1.005	9.300	42.7	FWMH1.6	107.900	107.423	0.377	Open Manhole	1200
1.006	1.400	60.0	Septic Tank	107.900	107.400	0.400	Open Manhole	1750

Free Flowing Outfall Details for Foul - Unit

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.006	Septic Tank	107.900	107.400	107.400	1750	0

Existing Network Details for Storm

* - Indicates pipe has been modified outside of System 1

	PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)	Section Type
	1.000	16.240	0.203	80.0	0.008	5.00	0.600	o	100	Pipe/Conduit
	1.001	8.480	0.106	80.0	0.004	0.00	0.600	o	100	Pipe/Conduit
	1.002	25.200	0.491	51.3	0.012	0.00	0.600	o	100	Pipe/Conduit
	2.000	29.520	0.369	80.0	0.008	5.00	0.600	o	100	Pipe/Conduit
	2.001	8.460	0.106	79.8	0.004	0.00	0.600	o	100	Pipe/Conduit
	2.002	26.000	0.325	80.0	0.004	0.00	0.600	o	100	Pipe/Conduit
	1.003	8.580	0.500	17.2	0.008	0.00	0.600	o	100	Pipe/Conduit
*	1.004	1.000	0.000	0.0	0.000	0.00	0.600	o	150	Pipe/Conduit

	PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
	1.000	RE1.0	108.850	108.500	0.250	108.850	108.297	0.453		0
	1.001	MHS1.1	108.850	108.297	0.453	108.850	108.191	0.559		300
	1.002	MHS1.2	108.850	108.191	0.559	108.850	107.700	1.050		300
	2.000	RE1.0	108.850	108.500	0.250	108.850	108.131	0.619		0
	2.001	MHS2.1	108.850	108.131	0.619	108.850	108.025	0.725		300
	2.002	MHS2.2	108.850	108.025	0.725	108.850	107.700	1.050		300
	1.003	MHS1.3	108.850	107.700	1.050	107.700	107.200	0.400		450
*	1.004	SA1	107.700	105.200	2.350	107.700	105.200	2.350	Pump	1200

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
RE1.0	108.850	0.350	Junction		1.000	108.500	100				
MHS1.1	108.850	0.553	Open Manhole	300	1.001	108.297	100	1.000	108.297	100	
MHS1.2	108.850	0.659	Open Manhole	300	1.002	108.191	100	1.001	108.191	100	
RE1.0	108.850	0.350	Junction		2.000	108.500	100				
MHS2.1	108.850	0.719	Open Manhole	300	2.001	108.131	100	2.000	108.131	100	
MHS2.2	108.850	0.825	Open Manhole	300	2.002	108.025	100	2.001	108.025	100	
MHS1.3	108.850	1.150	Open Manhole	450	1.003	107.700	100	1.002	107.700	100	
								2.002	107.700	100	
SA1	107.700	2.500	Open Manhole	1200	1.004	105.200	150	1.003	107.200	100	1950
filtration	107.700	2.500	Open Manhole	0		OUTFALL		1.004	105.200	150	

No coordinates have been specified, layout information cannot be produced.

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	100	RE1.0	108.850	108.500	0.250	Junction	
1.001	o	100	MHS1.1	108.850	108.297	0.453	Open Manhole	300
1.002	o	100	MHS1.2	108.850	108.191	0.559	Open Manhole	300
2.000	o	100	RE1.0	108.850	108.500	0.250	Junction	
2.001	o	100	MHS2.1	108.850	108.131	0.619	Open Manhole	300
2.002	o	100	MHS2.2	108.850	108.025	0.725	Open Manhole	300
1.003	o	100	MHS1.3	108.850	107.700	1.050	Open Manhole	450
1.004	o	150	SA1	107.700	105.200	2.350	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	16.240	80.0	MHS1.1	108.850	108.297	0.453	Open Manhole	300
1.001	8.480	80.0	MHS1.2	108.850	108.191	0.559	Open Manhole	300
1.002	25.200	51.3	MHS1.3	108.850	107.700	1.050	Open Manhole	450
2.000	29.520	80.0	MHS2.1	108.850	108.131	0.619	Open Manhole	300
2.001	8.460	79.8	MHS2.2	108.850	108.025	0.725	Open Manhole	300
2.002	26.000	80.0	MHS1.3	108.850	107.700	1.050	Open Manhole	450
1.003	8.580	17.2	SA1	107.700	107.200	0.400	Open Manhole	1200
1.004	1.000	0.0	filtration	107.700	105.200	2.350	Open Manhole	0

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)
1.004	filtration	107.700	105.200	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
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

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	26.250	Storm Duration (mins)	30
Ratio R	0.400		

Online Controls for Storm

Pump Manhole: SA1, DS/PN: 1.004, Volume (m³): 2.9

Invert Level (m) 105.200

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)
0.200	0.0000	1.400	0.0000	2.600	0.0000	3.800	0.0000	5.000	0.0000
0.400	0.0000	1.600	0.0000	2.800	0.0000	4.000	0.0000	5.200	0.0000
0.600	0.0000	1.800	0.0000	3.000	0.0000	4.200	0.0000	5.400	0.0000
0.800	0.0000	2.000	0.0000	3.200	0.0000	4.400	0.0000	5.600	0.0000
1.000	0.0000	2.200	0.0000	3.400	0.0000	4.600	0.0000	5.800	0.0000
1.200	0.0000	2.400	0.0000	3.600	0.0000	4.800	0.0000	6.000	0.0000

Storage Structures for Storm

Lined Soakaway Manhole: SA1, DS/PN: 1.004

Infiltration Coefficient Base (m/hr)	6.00000	Ring Diameter (m)	1.20
Infiltration Coefficient Side (m/hr)	6.00000	Pit Multiplier	1.5
Safety Factor	2.0	Number Required	1
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	105.200	Cap Infiltration Depth (m)	0.000

1 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	2.000
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	FSR	M5-60 (mm) 26.250	Cv (Summer) 0.750
Region	England and Wales	Ratio R 0.400	Cv (Winter) 0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 20

PN	Event	US/CL (m)	Water Level (m)	Flooded Volume (m³)	Flow / Cap.	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000	30 minute 1 year Summer I+0%	108.850	108.530	0.000	0.19	0.822	1.3	OK*
1.001	30 minute 1 year Summer I+0%	108.850	108.334	0.000	0.30	1.230	1.9	OK
1.002	30 minute 1 year Summer I+0%	108.850	108.237	0.000	0.43	2.461	3.5	OK
2.000	30 minute 1 year Summer I+0%	108.850	108.530	0.000	0.19	0.821	1.3	OK*
2.001	30 minute 1 year Summer I+0%	108.850	108.168	0.000	0.29	1.230	1.8	OK
2.002	30 minute 1 year Summer I+0%	108.850	108.067	0.000	0.36	1.639	2.4	OK
1.003	30 minute 1 year Summer I+0%	108.850	107.751	0.000	0.52	4.914	7.0	OK
1.004	30 minute 1 year Winter I+0%	107.700	105.572	0.000	0.00	0.000	0.0	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	2.000
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	FSR	M5-60 (mm) 26.250	Cv (Summer) 0.750
Region	England and Wales	Ratio R 0.400	Cv (Winter) 0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 20

PN	Event	US/CL (m)	Water Level (m)	Flooded Volume (m³)	Flow / Cap.	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000	30 minute 30 year Summer I+0%	108.850	108.548	0.000	0.46	1.963	3.1	OK*
1.001	30 minute 30 year Summer I+0%	108.850	108.498	0.000	0.71	2.943	4.4	SURCHARGED
1.002	30 minute 30 year Summer I+0%	108.850	108.453	0.000	0.97	5.886	8.0	SURCHARGED
2.000	30 minute 30 year Summer I+0%	108.850	108.548	0.000	0.45	1.963	3.1	OK*
2.001	30 minute 30 year Summer I+0%	108.850	108.258	0.000	0.70	2.943	4.4	SURCHARGED
2.002	30 minute 30 year Summer I+0%	108.850	108.211	0.000	0.83	3.924	5.4	SURCHARGED
1.003	30 minute 30 year Summer I+0%	108.850	107.987	0.000	1.17	11.765	15.9	SURCHARGED
1.004	30 minute 30 year Winter I+0%	107.700	106.636	0.000	0.00	0.000	0.0	SURCHARGED

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	2.000
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	FSR	M5-60 (mm) 26.250	Cv (Summer) 0.750
Region	England and Wales	Ratio R 0.400	Cv (Winter) 0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 20

PN	Event	US/CL (m)	Water Level (m)	Flooded Volume (m³)	Flow / Cap.	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000	30 minute 100 year Summer I+20%	108.850	108.600	0.000	0.68	3.099	4.6	FLOOD RISK*
1.001	30 minute 100 year Summer I+20%	108.850	108.848	0.000	1.13	4.649	7.1	FLOOD RISK
1.002	30 minute 100 year Summer I+20%	108.850	108.841	0.000	1.10	9.299	9.0	FLOOD RISK
2.000	30 minute 100 year Summer I+20%	108.850	108.600	0.000	0.62	3.101	4.2	FLOOD RISK*
2.001	30 minute 100 year Summer I+20%	108.850	108.709	0.000	0.89	4.651	5.5	FLOOD RISK
2.002	30 minute 100 year Summer I+20%	108.850	108.659	0.000	1.03	6.200	6.8	FLOOD RISK
1.003	30 minute 100 year Summer I+20%	108.850	108.352	0.000	1.43	18.599	19.4	SURCHARGED
1.004	30 minute 100 year Winter I+20%	107.700	107.318	0.000	0.00	0.000	0.0	SURCHARGED

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	2.000
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	FSR	Ratio R	0.400
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	26.250		

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Sensitivity flows(s) (%)	0, +40

PN	Event	US/CL (m)	Water Level (m)	Flooded Volume (m³)	Flow / Cap.	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000	30 minute 100 year Summer Q+0%	108.850	108.600	0.000	0.60	2.583	4.1	FLOOD RISK*
1.001	30 minute 100 year Winter Q+40%	108.850	108.849	0.000	1.20	6.095	7.5	FLOOD RISK
1.002	30 minute 100 year Summer Q+40%	108.850	108.843	0.000	1.13	10.882	9.3	FLOOD RISK
2.000	30 minute 100 year Summer Q+0%	108.850	108.600	0.000	0.57	2.583	3.8	FLOOD RISK*
2.001	30 minute 100 year Summer Q+40%	108.850	108.841	0.000	1.01	5.441	6.3	FLOOD RISK
2.002	30 minute 100 year Summer Q+40%	108.850	108.797	0.000	1.16	7.254	7.6	FLOOD RISK
1.003	30 minute 100 year Summer Q+40%	108.850	108.434	0.000	1.50	21.763	20.3	SURCHARGED
1.004	30 minute 100 year Winter Q+40%	107.700	107.422	0.000	0.00	0.000	0.0	FLOOD RISK