

HYDRAULIC CALCULATIONS

BREACHWOOD GREEN, HERTFORDSHIRE.

Project Ref: 1050

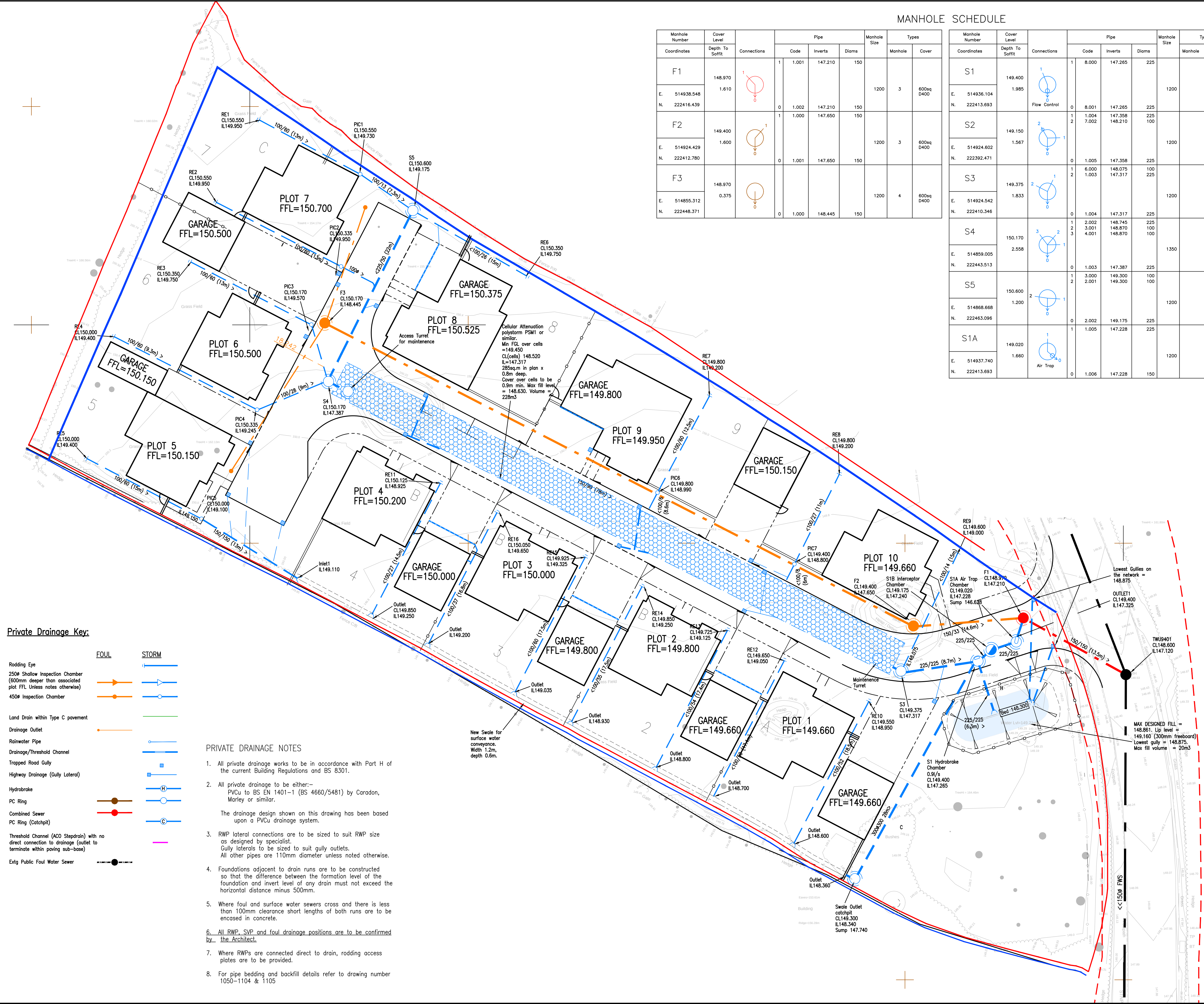
Calcs prepared by MS Aug 2024



Incuba Business Centre, 1 Brewers Hill Road, Dunstable, Beds, LU6 1AA

T 01582 879640
E info@chilterndesign.co.uk
W www.chilterndesign.co.uk





Private Drainage Key:

FOUL

Rodding Eye
250# Shallow Inspection Chamber (500mm deeper than associated plot FFL Unless notes otherwise)
450# Inspection Chamber

Land Drain within Type C pavement

Drainage Outlet

Rainwater Pipe

Drainage/Threshold Channel

Trapped Road Gully

Highway Drainage (Gully Lateral)

Hydrobrake

PC Ring

Combined Sewer

PC Ring (Catchpit)

Threshold Channel (ACO Stepdrain) with no direct connection to drainage (outlet to terminate within paving sub-base)

Extg Public Foul Water Sewer

STORM

250# Shallow Inspection Chamber (500mm deeper than associated plot FFL Unless notes otherwise)
450# Inspection Chamber

Land Drain within Type C pavement

Drainage Outlet

Rainwater Pipe

Drainage/Threshold Channel

Trapped Road Gully

Highway Drainage (Gully Lateral)

Hydrobrake

PC Ring

Combined Sewer

PC Ring (Catchpit)

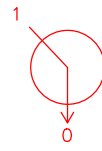
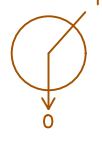
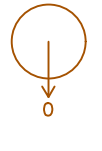
Threshold Channel (ACO Stepdrain) with no direct connection to drainage (outlet to terminate within paving sub-base)

Extg Public Foul Water Sewer

- PRIVATE DRAINAGE NOTES**
- All private drainage works to be in accordance with Part H of the current Building Regulations and BS 8301.
 - All private drainage to be either:-
PVCu to BS EN 1401-1 (BS 4660/5481) by Caradon, Marley or similar.

The drainage design shown on this drawing has been based upon a PVCu drainage system.
 - RWP lateral connections are to be sized to suit RWP size as designed by specialist.
Gully laterals to be sized to suit gully outlets.
All other pipes are 110mm diameter unless noted otherwise.
 - Foundations adjacent to drain runs are to be constructed so that the difference between the formation level of the foundation and invert level of any drain must not exceed the horizontal distance minus 500mm.
 - Where foul and surface water sewers cross and there is less than 100mm clearance short lengths of both runs are to be encased in concrete.
 - All RWP, SVP and foul drainage positions are to be confirmed by the Architect.
 - Where RWP's are connected direct to drain, rodding access plates are to be provided.
 - For pipe bedding and backfill details refer to drawing number 1050-1104 & 1105

MANHOLE

Manhole Number	Cover Level	Connections	Pipe			Manhole Size	Types		
Coordinates	Depth To Soffit		Code	Inverts	Diams		Manhole	Cover	
F1	148.970		1	1.001	147.210	150	1200	3	600sq D400
E. 514938.548 N. 222416.439	1.610		0	1.002	147.210	150			
F2	149.400		1	1.000	147.650	150	1200	3	600sq D400
E. 514924.429 N. 222412.780	1.600		0	1.001	147.650	150			
F3	148.970						1200	4	600sq D400
E. 514855.312 N. 222448.371	0.375		0	1.000	148.445	150			

Manhole Number		Cover Level	Connections	Pipe			Manhole Size	Types	
Coordinates		Depth To Soffit		Code	Inverts	Diams		Manhole	Cover
S1		149.400		1	8.000	147.265	225	1200	600sq B125
E.	514936.104	1.985							
N.	222413.693		Flow Control	0	8.001	147.265	225		
S2		149.150		1	1.004	147.358	225	1200	600sq B125
E.	514924.602	1.567		2	7.002	148.210	100		
N.	222392.471			0	1.005	147.358	225		
S3		149.375		1	6.000	148.075	100	1200	600sq D400
E.	514924.542	1.833		2	1.003	147.317	225		
N.	222410.346			0	1.004	147.317	225		
S4		150.170		1	2.002	148.745	225	1350	600sq D400
E.	514859.005	2.558		2	3.001	148.870	100		
N.	222443.513			3	4.001	148.870	100		
				0	1.003	147.387	225		
S5		150.600		1	3.000	149.300	100	1200	600sq B125
E.	514868.668	1.200		2	2.001	149.300	100		
N.	222463.096			0	2.002	149.175	225		
S1A		149.020		1	1.005	147.228	225	1200	600sq D400
E.	514937.740	1.660	Air Trap						
N.	222413.693			0	1.006	147.228	150		

- Notes:**
- DO NOT SCALE FROM THIS DRAWING.
 - In case of any discrepancies in drawings, details or bills, refer to engineers for clarification: unilateral decisions by the Contractor will not be accepted.
 - This drawing is to be read in conjunction with all related Architects, Consultants & Sub-Contractors drawings and specifications.
 - The Contractor is advised that all design drawings and information are to be read concurrently and any discrepancies or omissions reported directly to Chiltern Design Ltd
 - This drawing is based upon the survey by ? reference ? dated ? provided in digital format.
 - Levels are based on OSBM located on? value?
 - The grid is of local origin.
 - The Contractor must check the levels of all existing drainage outfalls prior to construction to ensure the proposed drainage design may be achieved.
 - Sulphates exist on site, therefore all concrete to be in accordance with Class ____ of BRE Special Digest 1.
 - All external building dimensions are to be checked against the Architects drawings prior to any construction commencing.
 - All adoptable highway works to be in accordance with the Local Authorities Specifications.
 - Formation to road/hardstanding to be proof rolled and any soft spots in subgrade of road/Hardstanding areas are to be excavated and replaced with well compacted sub-base or free draining granular material to Department of Transport Specification for Highway Works Part 2' Table 6/1 Class 1 (General Granular Fill) and compacted in accordance with Table 6/4.
 - This drawing is not to be redistributed or reproduced without the permission of Chiltern Design Ltd or its clients.

CHILTERN DESIGN
CONSULTING ENGINEERS

Chiltern Design Ltd, Incube Business Centre, 1 Brewers Hill Road, Dunstable, Bedfordshire, LU6 1AA, Tel: 01582 879640
E-mail: info@chilterndesign.co.uk, Web: www.chilterndesign.co.uk Registered in England and Wales 7873044

Drawing Status

PRELIMINARY

Client

BLAKENEY
ESTATES LTD

P03	Attenuation relocated to carriageway. Pond rotate to avoid existing trees to be retained	MS	18.10.24	MS
P02	Attenuation amended to pond and crates. Swale added. Interceptor added	MS	1.10.24	MS

Rev.	Description	By	Date	Chk'd
Project Title				
BREACHWOOD GREEN HERTFORDSHIRE				
Drawing Title				
SITE DRAINAGE				
Date	AUG24	Checked DO	Checked ENG	Sheet Size
Drawn	MS	MS	MS	A1
Scale	1:200@A1			
Project No.	1050	Drawing No.	1102	Rev.
				P03

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	3.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
RE1	0.021	3.00	150.550	1200	514850.857	222473.582	0.600
RE3	0.020	3.00	150.350	1200	514842.526	222456.153	0.600
RE4	0.020	3.00	150.000	1200	514836.688	222445.274	0.600
RE5	0.016	3.00	150.000	1200	514831.265	222435.323	0.600
RE6	0.024	3.00	150.350	1200	514881.934	222455.468	0.600
RE9	0.006	3.00	149.600	1200	514931.164	222424.090	0.600
S1	0.057	3.00	149.400	1200	514933.360	222411.493	2.135
S3	0.134	3.00	149.375		514924.542	222410.346	2.058
S4	0.000		150.170		514859.005	222443.513	2.783
S5	0.000		150.600	1200	514868.668	222463.096	1.425
PIC1	0.005	3.00	150.550	1200	514862.637	222467.253	0.820
PIC3	0.005	3.00	150.335	1200	514856.661	222449.083	0.765
PIC4	0.005	3.00	150.335	1200	514845.129	222441.049	1.090
PIC5	0.005	3.00	150.000	1200	514844.584	222428.308	0.900
F1	0.000		148.970	1200	514938.548	222416.439	1.724
S1A			149.020	1200	514937.740	222413.693	1.769
Swale Inlet	0.070	10.00	149.910		514855.445	222420.983	0.900
Swale Outlet	0.070	10.00	149.300		514923.743	222383.857	0.940
S1B	0.000		149.175	1200	514934.870	222412.808	1.918

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	RE5	PIC5	15.053	0.600	149.400	149.150	0.250	60.2	100	3.25	50.0
1.001	PIC5	Swale Inlet	13.100	0.600	149.100	149.010	0.090	145.6	100	3.60	50.0
1.002	Swale Inlet	Swale Outlet	77.736	0.030	149.010	148.360	0.650	119.6	600	11.09	47.6
1.003	Swale Outlet	S1	29.261	0.030	148.360	148.300	0.060	487.7	300	12.91	43.7
2.000	RE1	PIC1	13.373	0.600	149.950	149.730	0.220	60.8	100	3.23	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.994	7.8	2.9	0.500	0.750	0.016	0.0	42	0.916
1.001	0.635	5.0	3.8	0.800	0.800	0.021	0.0	65	0.699
1.002	1.189	535.0	15.6	0.300	0.340	0.091	0.0	118	0.495
1.003	0.268	19.0	25.4	0.640	0.800	0.161	0.0	300	0.272
2.000	0.989	7.8	3.8	0.500	0.720	0.021	0.0	50	0.986

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
2.001	PIC1	S5	7.325	0.600	149.730	149.300	0.430	17.0	100	3.29	50.0
3.000	RE6	S5	15.303	0.600	149.750	149.300	0.450	34.0	100	3.19	50.0
2.002	S5	S4	21.837	0.600	149.175	147.387	1.788	12.2	225	3.39	50.0
4.000	RE3	PIC3	15.805	0.600	149.750	149.570	0.180	87.8	100	3.32	50.0
4.001	PIC3	S4	6.043	0.600	149.570	148.870	0.700	8.6	100	3.36	50.0
5.000	RE4	PIC4	9.439	0.600	149.400	149.245	0.155	60.9	100	3.16	50.0
5.001	PIC4	S4	14.093	0.600	149.245	148.870	0.375	37.6	100	3.35	50.0
2.003	S4	S3	73.452	0.600	147.387	147.317	0.070	1049.3	800	4.11	50.0
6.000	RE9	S3	15.256	0.600	149.000	148.075	0.925	16.5	100	3.13	50.0
2.004	S3	S1	8.892	0.600	147.365	147.265	0.100	88.9	225	4.21	50.0
1.004	S1	S1B	2.002	0.030	147.265	147.257	0.008	250.3	225	13.01	43.5
1.005	S1B	S1A	3.003	0.030	147.257	147.251	0.006	500.6	225	13.24	43.1
1.006	S1A	F1	2.862	0.030	147.251	147.246	0.005	572.5	150	13.55	42.5

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
2.001	1.880	14.8	4.7	0.720	1.200	0.026	0.0	39	1.669
3.000	1.327	10.4	4.3	0.500	1.200	0.024	0.0	45	1.266
2.002	3.764	149.7	9.0	1.200	2.558	0.050	0.0	37	2.100
4.000	0.821	6.4	3.6	0.500	0.665	0.020	0.0	54	0.844
4.001	2.646	20.8	4.5	0.665	1.200	0.025	0.0	32	2.117
5.000	0.988	7.8	3.6	0.500	0.990	0.020	0.0	48	0.972
5.001	1.262	9.9	4.5	0.990	1.200	0.025	0.0	47	1.231
2.003	1.702	5447.0	18.1	1.983	1.258	0.100	0.0	21	0.205
6.000	1.911	15.0	1.1	0.500	1.200	0.006	0.0	18	1.112
2.004	1.387	55.1	43.4	1.785	1.910	0.240	0.0	151	1.531
1.004	0.309	12.3	72.0	1.910	1.693	0.458	0.0	225	0.315
1.005	0.219	8.7	71.3	1.693	1.544	0.458	0.0	225	0.223
1.006	0.156	2.8	70.3	1.619	1.574	0.458	0.0	150	0.159

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	15.053	60.2	100	Circular	150.000	149.400	0.500	150.000	149.150	0.750
1.001	13.100	145.6	100	Circular	150.000	149.100	0.800	149.910	149.010	0.800
1.002	77.736	119.6	600	CDL Swale	149.910	149.010	0.300	149.300	148.360	0.340
1.003	29.261	487.7	300	Circular	149.300	148.360	0.640	149.400	148.300	0.800
2.000	13.373	60.8	100	Circular	150.550	149.950	0.500	150.550	149.730	0.720
2.001	7.325	17.0	100	Circular	150.550	149.730	0.720	150.600	149.300	1.200
3.000	15.303	34.0	100	Circular	150.350	149.750	0.500	150.600	149.300	1.200
2.002	21.837	12.2	225	Circular	150.600	149.175	1.200	150.170	147.387	2.558
4.000	15.805	87.8	100	Circular	150.350	149.750	0.500	150.335	149.570	0.665
4.001	6.043	8.6	100	Circular	150.335	149.570	0.665	150.170	148.870	1.200
5.000	9.439	60.9	100	Circular	150.000	149.400	0.500	150.335	149.245	0.990
5.001	14.093	37.6	100	Circular	150.335	149.245	0.990	150.170	148.870	1.200
2.003	73.452	1049.3	800	polystorm	150.170	147.387	1.983	149.375	147.317	1.258
6.000	15.256	16.5	100	Circular	149.600	149.000	0.500	149.375	148.075	1.200
2.004	8.892	88.9	225	Circular	149.375	147.365	1.785	149.400	147.265	1.910
1.004	2.002	250.3	225	Circular	149.400	147.265	1.910	149.175	147.257	1.693

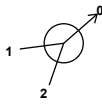
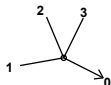
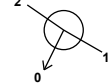
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	RE5	1200	Manhole	Adoptable	PIC5	1200	Manhole	Adoptable
1.001	PIC5	1200	Manhole	Adoptable	Swale Inlet		Junction	
1.002	Swale Inlet		Junction		Swale Outlet		Junction	
1.003	Swale Outlet		Junction		S1	1200	Manhole	Adoptable
2.000	RE1	1200	Manhole	Adoptable	PIC1	1200	Manhole	Adoptable
2.001	PIC1	1200	Manhole	Adoptable	S5	1200	Manhole	Adoptable
3.000	RE6	1200	Manhole	Adoptable	S5	1200	Manhole	Adoptable
2.002	S5	1200	Manhole	Adoptable	S4		Junction	
4.000	RE3	1200	Manhole	Adoptable	PIC3	1200	Manhole	Adoptable
4.001	PIC3	1200	Manhole	Adoptable	S4		Junction	
5.000	RE4	1200	Manhole	Adoptable	PIC4	1200	Manhole	Adoptable
5.001	PIC4	1200	Manhole	Adoptable	S4		Junction	
2.003	S4		Junction		S3		Junction	
6.000	RE9	1200	Manhole	Adoptable	S3		Junction	
2.004	S3		Junction		S1	1200	Manhole	Adoptable
1.004	S1	1200	Manhole	Adoptable	S1B	1200	Manhole	Adoptable

Pipeline Schedule

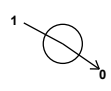
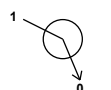
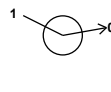
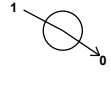
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.005	3.003	500.6	225	Circular	149.175	147.257	1.693	149.020	147.251	1.544
1.006	2.862	572.5	150	Circular	149.020	147.251	1.619	148.970	147.246	1.574

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.005	S1B	1200	Manhole	Adoptable	S1A	1200	Manhole	Adoptable
1.006	S1A	1200	Manhole	Adoptable	F1	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
RE1	514850.857	222473.582	150.550	0.600	1200		0	2.000	149.950	100
RE3	514842.526	222456.153	150.350	0.600	1200		0	4.000	149.750	100
RE4	514836.688	222445.274	150.000	0.600	1200		0	5.000	149.400	100
RE5	514831.265	222435.323	150.000	0.600	1200		0	1.000	149.400	100
RE6	514881.934	222455.468	150.350	0.600	1200		0	3.000	149.750	100
RE9	514931.164	222424.090	149.600	0.600	1200		0	6.000	149.000	100
S1	514933.360	222411.493	149.400	2.135	1200		1 2 0	2.004 1.003 1.004	147.265 148.300 147.265	225 300 225
S3	514924.542	222410.346	149.375	2.058			1 2 0	6.000 2.003 2.004	148.075 147.317 147.365	100 800 225
S4	514859.005	222443.513	150.170	2.783			1 2 3 0	5.001 4.001 2.002 2.003	148.870 148.870 147.387 147.387	100 100 225 800
S5	514868.668	222463.096	150.600	1.425	1200		1 2 0	3.000 2.001 2.002	149.300 149.300 149.175	100 100 225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
PIC1	514862.637	222467.253	150.550	0.820	1200		1	2.000	149.730	100
PIC3	514856.661	222449.083	150.335	0.765	1200		1	2.001	149.730	100
							0	4.001	149.570	100
PIC4	514845.129	222441.049	150.335	1.090	1200		1	5.000	149.245	100
PIC5	514844.584	222428.308	150.000	0.900	1200		1	1.000	149.150	100
							0	1.001	149.100	100
F1	514938.548	222416.439	148.970	1.724	1200		1	1.006	147.246	150
S1A	514937.740	222413.693	149.020	1.769	1200		1	1.005	147.251	225
Swale Inlet	514855.445	222420.983	149.910	0.900			1	1.001	149.010	100
							0	1.002	149.010	600
Swale Outlet	514923.743	222383.857	149.300	0.940			1	1.002	148.360	600
S1B	514934.870	222412.808	149.175	1.918	1200		1	1.004	147.257	225
							0	1.005	147.257	225

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	40	0	0
100	40	0	0

Node S1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	147.265	Product Number	CTL-SHE-0037-9000-2200-9000
Design Depth (m)	2.200	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	0.9	Min Node Diameter (mm)	1200

Node S1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	148.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	0

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1.0	0.0	0.900	80.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	RE1	9	150.009	0.059	4.7	0.1075	0.0000	OK
15 minute summer	RE3	9	149.815	0.065	4.5	0.1173	0.0000	OK
15 minute summer	RE4	9	149.457	0.057	4.5	0.1018	0.0000	OK
15 minute summer	RE5	9	149.448	0.047	3.6	0.0790	0.0000	OK
15 minute summer	RE6	9	149.801	0.051	5.4	0.0993	0.0000	OK
15 minute summer	RE9	9	149.020	0.020	1.3	0.0264	0.0000	OK
720 minute winter	S1	720	147.702	0.437	3.4	0.7272	0.0000	SURCHARGED
720 minute winter	S3	720	147.702	0.385	5.1	0.5010	0.0000	SURCHARGED
720 minute winter	S4	720	147.702	0.315	3.8	0.0000	0.0000	OK
15 minute summer	S5	9	149.222	0.047	10.5	0.0530	0.0000	OK
15 minute summer	PIC1	9	149.775	0.045	5.6	0.0559	0.0000	OK
15 minute summer	PIC3	10	149.605	0.035	5.3	0.0444	0.0000	OK
15 minute summer	PIC4	10	149.298	0.053	5.4	0.0645	0.0000	OK
15 minute summer	PIC5	10	149.174	0.074	4.4	0.0917	0.0000	OK
15 minute summer	F1	37	147.265	0.019	0.5	0.0000	0.0000	OK
15 minute summer	S1A	37	147.291	0.040	0.5	0.0449	0.0000	OK
15 minute winter	Swale Inlet	12	149.110	0.100	12.4	0.1561	0.0000	OK
15 minute winter	Swale Outlet	16	148.576	0.216	20.1	0.3217	0.0000	OK
15 minute summer	S1B	37	147.295	0.038	0.5	0.0430	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	RE1	2.000	PIC1	4.5	1.100	0.577	0.0545	
15 minute summer	RE3	4.000	PIC3	4.2	1.072	0.653	0.0621	
15 minute summer	RE4	5.000	PIC4	4.3	0.988	0.555	0.0412	
15 minute summer	RE5	1.000	PIC5	3.3	0.939	0.429	0.0538	
15 minute summer	RE6	3.000	S5	5.1	1.289	0.489	0.0605	
15 minute summer	RE9	6.000	S3	1.3	1.155	0.084	0.0166	
15 minute summer	S1	Hydro-Brake®	S1B	0.5				
30 minute winter	S3	2.004	S1	-19.4	-0.617	-0.352	0.3000	
15 minute winter	S4	2.003	S3	-29.7	-0.095	-0.005	35.6525	
15 minute summer	S5	2.002	S4	10.5	3.268	0.070	0.1271	
15 minute summer	PIC1	2.001	S5	5.4	1.672	0.368	0.0238	
15 minute summer	PIC3	4.001	S4	5.2	2.160	0.251	0.0146	
15 minute summer	PIC4	5.001	S4	5.3	1.269	0.531	0.0585	
15 minute summer	PIC5	1.001	Swale Inlet	4.4	0.666	0.890	0.0891	
15 minute summer	S1A	1.006	F1	0.5	0.192	0.169	0.0072	6.9
15 minute winter	Swale Inlet	1.002	Swale Outlet	11.5	0.335	0.021	3.9108	
15 minute winter	Swale Outlet	1.003	S1	16.3	0.440	0.860	1.0818	
15 minute summer	S1B	1.005	S1A	0.5	0.170	0.054	0.0137	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	RE1	10	150.238	0.288	12.6	0.5271	0.0000	SURCHARGED
15 minute summer	RE3	10	150.076	0.326	12.0	0.5856	0.0000	FLOOD RISK
15 minute summer	RE4	10	149.683	0.283	12.0	0.5091	0.0000	SURCHARGED
15 minute winter	RE5	11	149.664	0.264	8.9	0.4390	0.0000	SURCHARGED
15 minute summer	RE6	10	150.004	0.254	14.3	0.4909	0.0000	SURCHARGED
15 minute summer	RE9	9	149.033	0.033	3.6	0.0444	0.0000	OK
1440 minute winter	S1	1440	148.365	1.100	5.0	2.0858	0.0000	SURCHARGED
1440 minute winter	S3	1440	148.365	1.048	7.5	1.3650	0.0000	SURCHARGED
1440 minute winter	S4	1440	148.365	0.978	5.3	0.0000	0.0000	SURCHARGED
15 minute summer	S5	8	149.239	0.064	23.7	0.0723	0.0000	OK
15 minute summer	PIC1	10	149.809	0.079	12.4	0.0991	0.0000	OK
15 minute summer	PIC3	10	149.625	0.055	11.3	0.0699	0.0000	OK
15 minute summer	PIC4	11	149.437	0.192	11.6	0.2342	0.0000	SURCHARGED
15 minute winter	PIC5	11	149.458	0.358	9.2	0.4448	0.0000	SURCHARGED
1440 minute winter	F1	1440	147.269	0.022	0.7	0.0000	0.0000	OK
1440 minute winter	S1A	1440	147.297	0.046	0.7	0.0517	0.0000	OK
15 minute winter	Swale Inlet	13	149.175	0.165	31.1	0.2568	0.0000	OK
15 minute winter	Swale Outlet	16	148.781	0.421	53.5	0.6263	0.0000	SURCHARGED
1440 minute winter	S1B	1440	147.302	0.044	0.7	0.0503	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	RE1	2.000	PIC1	9.8	1.276	1.258	0.0967	
15 minute summer	RE3	4.000	PIC3	8.7	1.263	1.356	0.0970	
15 minute summer	RE4	5.000	PIC4	8.8	1.131	1.140	0.0739	
15 minute summer	RE5	1.000	PIC5	7.2	0.968	0.927	0.1178	
15 minute summer	RE6	3.000	S5	11.4	1.510	1.090	0.1197	
15 minute summer	RE9	6.000	S3	3.5	1.540	0.232	0.0345	
1440 minute winter	S1	Hydro-Brake®	S1B	0.7				
30 minute winter	S3	2.004	S1	-51.8	-1.322	-0.940	0.3536	
15 minute summer	S4	2.003	S3	-106.7	-0.215	-0.020	87.4127	
15 minute summer	S5	2.002	S4	23.7	3.763	0.158	0.4451	
15 minute summer	PIC1	2.001	S5	12.3	1.969	0.835	0.0458	
15 minute summer	PIC3	4.001	S4	11.3	2.621	0.545	0.0261	
15 minute summer	PIC4	5.001	S4	10.7	1.400	1.076	0.1098	
15 minute winter	PIC5	1.001	Swale Inlet	8.4	1.073	1.683	0.1025	
1440 minute winter	S1A	1.006	F1	0.7	0.217	0.237	0.0089	53.3
15 minute winter	Swale Inlet	1.002	Swale Outlet	30.5	0.378	0.057	11.1012	
15 minute winter	Swale Outlet	1.003	S1	41.1	0.671	2.163	1.5737	
1440 minute winter	S1B	1.005	S1A	0.7	0.116	0.075	0.0170	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	RE1	11	150.451	0.500	15.2	0.9163	0.0000	FLOOD RISK
15 minute winter	RE3	11	150.279	0.529	14.5	0.9514	0.0000	FLOOD RISK
15 minute winter	RE4	11	149.938	0.538	14.5	0.9677	0.0000	FLOOD RISK
15 minute winter	RE5	11	149.905	0.505	11.6	0.8403	0.0000	FLOOD RISK
15 minute winter	RE6	11	150.234	0.484	17.4	0.9342	0.0000	FLOOD RISK
15 minute summer	RE9	9	149.039	0.038	4.7	0.0512	0.0000	OK
1440 minute winter	S1	1440	148.630	1.365	6.2	7.3710	0.0000	SURCHARGED
1440 minute winter	S3	1440	148.630	1.313	9.6	1.7091	0.0000	SURCHARGED
1440 minute winter	S4	1440	148.630	1.243	6.8	0.0000	0.0000	SURCHARGED
15 minute winter	S5	11	149.240	0.065	27.2	0.0732	0.0000	OK
15 minute winter	PIC1	11	149.892	0.161	14.6	0.2023	0.0000	SURCHARGED
15 minute summer	PIC3	10	149.633	0.063	13.8	0.0798	0.0000	OK
15 minute winter	PIC4	11	149.607	0.362	13.5	0.4428	0.0000	SURCHARGED
15 minute winter	PIC5	11	149.604	0.504	11.1	0.6265	0.0000	SURCHARGED
1440 minute winter	F1	1440	147.270	0.024	0.7	0.0000	0.0000	OK
1440 minute winter	S1A	1440	147.299	0.048	0.7	0.0539	0.0000	OK
15 minute winter	Swale Inlet	13	149.196	0.186	39.7	0.2896	0.0000	OK
30 minute winter	Swale Outlet	25	148.901	0.541	65.5	0.8057	0.0000	SURCHARGED
1440 minute winter	S1B	1440	147.304	0.047	0.7	0.0526	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	RE1	2.000	PIC1	11.3	1.449	1.459	0.1046	
15 minute winter	RE3	4.000	PIC3	10.7	1.498	1.661	0.1030	
15 minute summer	RE4	5.000	PIC4	10.3	1.313	1.324	0.0739	
15 minute winter	RE5	1.000	PIC5	7.9	1.005	1.007	0.1178	
15 minute winter	RE6	3.000	S5	13.4	1.707	1.282	0.1197	
15 minute summer	RE9	6.000	S3	4.5	1.657	0.303	0.0419	
1440 minute winter	S1	Hydro-Brake®	S1B	0.7				
15 minute winter	S3	2.004	S1	-66.3	-1.668	-1.203	0.3536	
15 minute winter	S4	2.003	S3	-123.3	-0.233	-0.023	127.7917	
15 minute winter	S5	2.002	S4	27.2	3.705	0.182	0.5299	
15 minute winter	PIC1	2.001	S5	13.8	1.990	0.937	0.0524	
15 minute summer	PIC3	4.001	S4	13.8	2.734	0.664	0.0305	
15 minute winter	PIC4	5.001	S4	12.4	1.587	1.253	0.1093	
15 minute winter	PIC5	1.001	Swale Inlet	10.1	1.286	2.017	0.1025	
1440 minute winter	S1A	1.006	F1	0.7	0.225	0.261	0.0094	57.5
15 minute winter	Swale Inlet	1.002	Swale Outlet	39.0	0.387	0.073	16.3848	
30 minute winter	Swale Outlet	1.003	S1	48.9	0.778	2.578	1.6395	
1440 minute winter	S1B	1.005	S1A	0.7	0.120	0.083	0.0181	