



PRELIMINARY LEVELS ASSESSMENT
SCALE 1:250

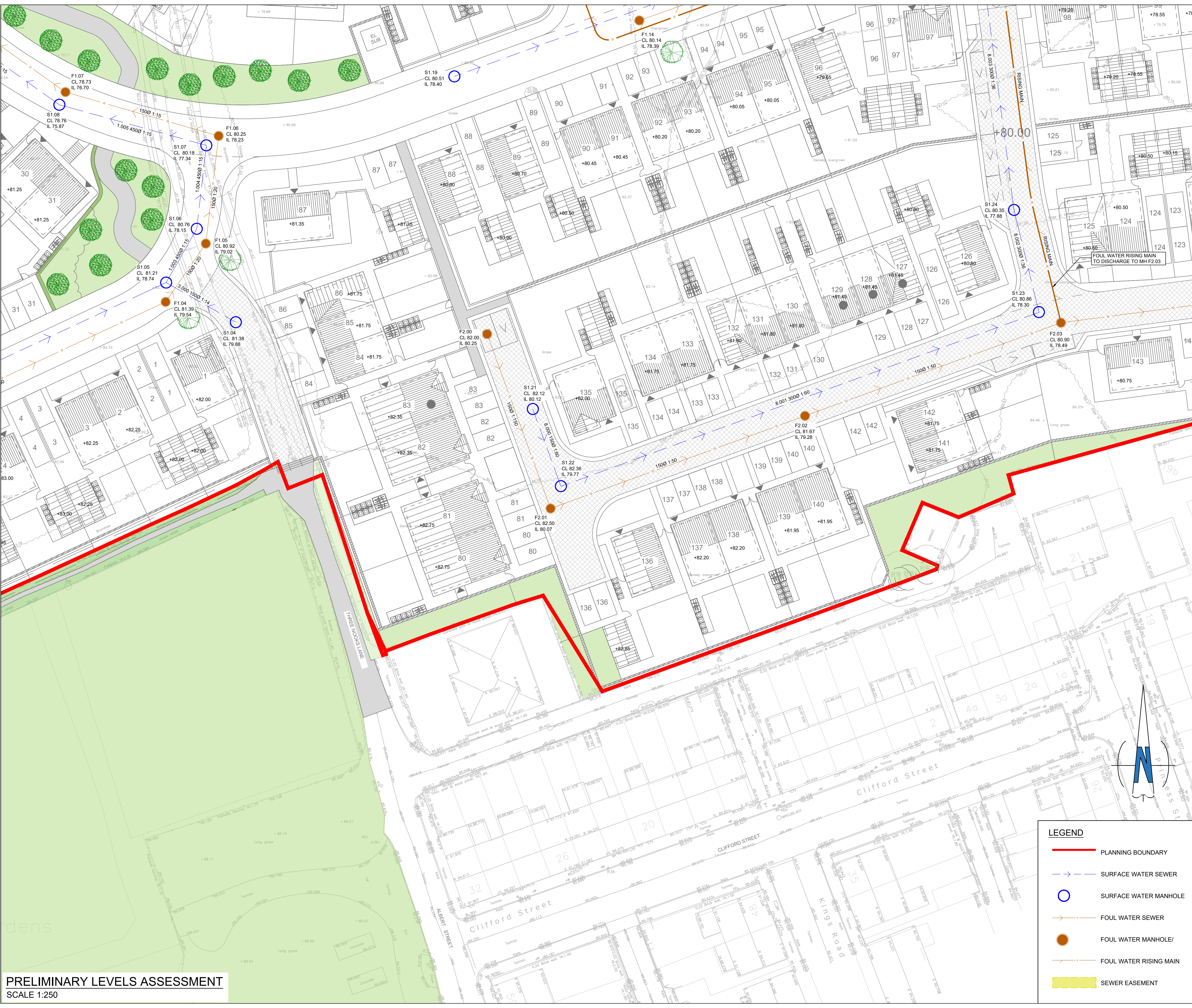
LEGEND

- PLANNING BOUNDARY
- SURFACE WATER SEWER
- SURFACE WATER MANHOLE
- FOUL WATER SEWER
- FOUL WATER MANHOLE/
- FOUL WATER RISING MAIN
- SEWER EASEMENT

NOTES

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- THE MINIMUM CRUSHING STRENGTH FOR CLAY PIPES SHOULD BE AS FOLLOWS: 100mm Ø 40N/m, 150mm Ø 40N/m, 225mm Ø 45N/m AND 300mm Ø 72N/m. THE MINIMUM CRUSHING STRENGTH FOR CONCRETE PIPES SHOULD BE CLASS 120 TO EN 1916/BS5911-1:2002. PLASTIC PIPES SHOULD CONFORM TO WIS 4-35-01 AND BS EN13476.
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JB	P1	FIRST ISSUE	05/05/26
Checked	Revisions	Description	Date
Client			
FENWOOD ESTATES			
Job Title			
LAND OFF CUDWORTH PARKWAY BARNSELEY			
BRIGHT YOUNG Consulting Limited Tel: 01484 487950 Fax: 01484 603519 The Media Centre, 7 Northumberland Street, Huddersfield, HD1 1RL Email: info@brightyoung.co.uk Web: www.brightyoung.co.uk			
Drawing Title			
FOUL & SURFACE WATER DRAINAGE STRATEGY SHEET 3			
Scale 1:250	Date APRIL 26	Drawn ARJ	Checked JB
Drg No. BYC/XX/XX/DR/C/0503			Rev P3



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Client

FENWOOD ESTATES

Job Title

**LAND OFF CUDWORTH PARKWAY
BARNSELY**

BRIGHT

YOUNG

Consulting Limited

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The Media Centre, 7 Northumberland Street, Huddersfield, HD1 1RL

Email: info@brightyoung.co.uk
Web: www.brightyoung.co.uk

Drawing Title

**FOUL & SURFACE WATER
DRAINAGE STRATEGY
SHEET 4**

Scale 1:250	Date APRIL 26	Drawn ARJ	Checked JB
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Drg No. BYC/XX/XX/DR/C/0504	Rev P2
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Drawing Title

**FOUL & SURFACE WATER
DRAINAGE STRATEGY
SHEET 5**

Scale 1:250	Date APRIL 26	Drawn ARJ	Checked JB
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Drg No. BYC/XX/XX/DR/C/0505	Rev P2
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APPENDIX L – Drainage Calculations

	Cudworth Parkway Preliminary SW Calcs	
Date 05/05/2026 File 260505 SW Net.MDX	Designed by A.James Checked by J.Bright	
XP Solutions	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales			
Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	18.800	Add Flow / Climate Change (%)	0
Ratio R	0.322	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	200	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min vel for Auto Design only (m/s)	1.00
volumetric Runoff Coeff.	1.000	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)
0-4	1.049	4-8	1.930	8-12	0.001

Total Area Contributing (ha) = 2.980

Total Pipe Volume (m³) = 147.029

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
S1.000	34.189	0.342	100.0	0.196	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	34.189	0.342	100.0	0.145	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.000	29.650	0.297	99.8	0.130	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.002	52.674	0.658	80.0	0.136	0.00	0.0	0.600	o	450	Pipe/Conduit	
S3.000	11.582	0.832	13.9	0.046	4.00	0.0	0.600	o	150	Pipe/Conduit	
S1.003	8.942	0.596	15.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.004	12.133	0.809	15.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.005	22.027	1.468	15.0	0.080	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.006	22.822	1.521	15.0	0.073	0.00	0.0	0.600	o	450	Pipe/Conduit	
S4.000	20.580	0.206	100.0	0.034	4.00	0.0	0.600	o	150	Pipe/Conduit	
S1.007	40.824	0.849	48.1	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S5.000	14.675	0.798	18.4	0.173	4.00	0.0	0.600	o	225	Pipe/Conduit	
S5.001	27.978	1.518	18.4	0.057	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)
S1.000	61.81	4.44	80.315	0.196	0.0	0.0	0.0	1.31	52.0	43.7
S1.001	60.01	4.80	79.898	0.341	0.0	0.0	0.0	1.57	111.2	73.9
S2.000	62.11	4.38	79.928	0.130	0.0	0.0	0.0	1.31	52.0	29.2
S1.002	58.22	5.18	79.406	0.607	0.0	0.0	0.0	2.27	361.8	127.6
S3.000	63.77	4.07	79.880	0.046	0.0	0.0	0.0	2.71	48.0	10.6
S1.003	58.10	5.21	78.748	0.653	0.0	0.0	0.0	5.27	838.1	137.0
S1.004	57.93	5.25	78.152	0.653	0.0	0.0	0.0	5.27	838.2	137.0
S1.005	57.62	5.32	77.343	0.733	0.0	0.0	0.0	5.27	838.0	152.5
S1.006	57.31	5.39	75.875	0.806	0.0	0.0	0.0	5.27	838.0	166.8
S4.000	62.30	4.34	74.859	0.034	0.0	0.0	0.0	1.00	17.8	7.6
S1.007	56.34	5.62	74.353	0.840	0.0	0.0	0.0	2.94	467.2	170.9
S5.000	63.72	4.08	76.690	0.173	0.0	0.0	0.0	3.07	121.9	39.8
S5.001	62.89	4.23	75.892	0.230	0.0	0.0	0.0	3.06	121.8	52.2

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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
S1.008	27.631	0.574	48.1	0.022	0.00	0.0	0.600	o	450	Pipe/Conduit	🟢
S1.009	7.547	0.155	48.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	🟢
S1.010	44.890	0.093	482.7	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	🟢
S6.000	44.672	2.234	20.0	0.049	4.00	0.0	0.600	o	150	Pipe/Conduit	🟡
S6.001	15.003	1.000	15.0	0.034	0.00	0.0	0.600	o	150	Pipe/Conduit	🟢
S6.002	12.606	0.840	15.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	🟢
S7.000	55.092	1.102	50.0	0.160	4.00	0.0	0.600	o	225	Pipe/Conduit	🟡
S7.001	23.908	0.478	50.0	0.141	0.00	0.0	0.600	o	450	Pipe/Conduit	🟢
S8.000	11.860	0.198	59.9	0.086	4.00	0.0	0.600	o	150	Pipe/Conduit	🟡
S8.001	73.503	1.470	50.0	0.269	0.00	0.0	0.600	o	300	Pipe/Conduit	🟢
S8.002	15.219	0.418	36.4	0.001	0.00	0.0	0.600	o	300	Pipe/Conduit	🟢
S8.003	41.580	1.139	36.5	0.026	0.00	0.0	0.600	o	300	Pipe/Conduit	🟢
S7.002	35.368	0.707	50.0	0.040	0.00	0.0	0.600	o	450	Pipe/Conduit	🟢
S7.003	35.379	0.708	50.0	0.199	0.00	0.0	0.600	o	525	Pipe/Conduit	🟢
S9.000	27.741	0.462	60.0	0.183	4.00	0.0	0.600	o	225	Pipe/Conduit	🟡
S9.001	46.819	1.003	46.7	0.041	0.00	0.0	0.600	o	300	Pipe/Conduit	🟢
S10.000	14.724	0.245	60.1	0.117	4.00	0.0	0.600	o	300	Pipe/Conduit	🟡
S9.002	33.997	0.850	40.0	0.029	0.00	0.0	0.600	o	450	Pipe/Conduit	🟢
S9.003	9.281	0.232	40.0	0.113	0.00	0.0	0.600	o	525	Pipe/Conduit	🟢
S9.004	10.747	0.308	34.9	0.019	0.00	0.0	0.600	o	525	Pipe/Conduit	🟢
S7.004	39.225	0.981	40.0	0.037	0.00	0.0	0.600	o	525	Pipe/Conduit	🟢
S7.005	12.311	0.308	40.0	0.089	0.00	0.0	0.600	o	525	Pipe/Conduit	🟢
S7.006	11.700	0.293	40.0	0.009	0.00	0.0	0.600	o	525	Pipe/Conduit	🟢
S7.007	18.939	0.473	40.0	0.012	0.00	0.0	0.600	o	525	Pipe/Conduit	🟢
S11.000	30.944	0.921	33.6	0.104	4.00	0.0	0.600	o	225	Pipe/Conduit	🟡
S11.001	30.955	0.919	33.7	0.077	0.00	0.0	0.600	o	225	Pipe/Conduit	🟢
S7.008	13.182	0.275	47.9	0.053	0.00	0.0	0.600	o	525	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)
S1.008	55.70	5.78	73.504	1.092	0.0	0.0	0.0	2.94	467.0	219.6
S1.009	55.53	5.82	72.930	1.092	0.0	0.0	0.0	2.92	464.3	219.6
S1.010	52.98	6.50	72.775	1.092	0.0	0.0	0.0	1.10	311.5	219.6
S6.000	62.37	4.33	78.020	0.049	0.0	0.0	0.0	2.26	40.0	11.0
S6.001	61.87	4.42	75.786	0.083	0.0	0.0	0.0	2.61	46.2	18.5
S6.002	61.46	4.51	74.786	0.083	0.0	0.0	0.0	2.61	46.2	18.5
S7.000	61.51	4.50	78.400	0.160	0.0	0.0	0.0	1.85	73.7	35.5
S7.001	60.81	4.63	77.073	0.301	0.0	0.0	0.0	2.88	458.1	66.1
S8.000	63.32	4.15	80.120	0.086	0.0	0.0	0.0	1.30	23.0	19.7
S8.001	60.48	4.70	79.772	0.355	0.0	0.0	0.0	2.23	157.5	77.5
S8.002	60.01	4.80	78.302	0.356	0.0	0.0	0.0	2.61	184.8	77.5
S8.003	58.77	5.06	77.884	0.382	0.0	0.0	0.0	2.61	184.5	81.1
S7.002	57.85	5.27	76.595	0.723	0.0	0.0	0.0	2.88	458.0	151.0
S7.003	57.05	5.45	75.813	0.922	0.0	0.0	0.0	3.17	687.1	189.9
S9.000	62.66	4.27	78.260	0.183	0.0	0.0	0.0	1.69	67.2	41.4
S9.001	60.92	4.61	77.723	0.224	0.0	0.0	0.0	2.31	163.1	49.3
S10.000	63.49	4.12	77.040	0.117	0.0	0.0	0.0	2.03	143.6	26.8
S9.002	60.06	4.79	76.570	0.370	0.0	0.0	0.0	3.22	512.5	80.2
S9.003	59.85	4.83	75.645	0.483	0.0	0.0	0.0	3.55	768.3	104.4
S9.004	59.63	4.88	75.413	0.502	0.0	0.0	0.0	3.80	822.8	108.1
S7.004	56.28	5.64	75.105	1.461	0.0	0.0	0.0	3.55	768.5	296.9
S7.005	56.04	5.70	74.124	1.550	0.0	0.0	0.0	3.55	768.3	313.7
S7.006	55.82	5.75	73.816	1.559	0.0	0.0	0.0	3.55	768.3	314.2
S7.007	55.46	5.84	73.524	1.571	0.0	0.0	0.0	3.55	768.3	314.6
S11.000	62.91	4.23	75.190	0.104	0.0	0.0	0.0	2.26	90.0	23.6
S11.001	61.71	4.46	74.269	0.181	0.0	0.0	0.0	2.26	89.9	40.3
S7.008	55.20	5.91	73.050	1.805	0.0	0.0	0.0	3.24	701.6	359.8

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
S7.009	92.991	0.093	1000.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.011	5.666	0.006	944.3	0.000	0.00	0.0	0.600	o	600	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)
S7.009	54.71	6.03	72.775	0.000	200.0	0.0	0.0	0.76	215.4	200.0
S1.011	63.49	4.12	72.682	0.000	200.0	0.0	0.0	0.78	221.7	200.0

Cudworth Parkway
Preliminary SW CalcsDate 05/05/2026
File 260505 SW Net.MDXDesigned by A.James
Checked by J.Bright

XP Solutions

Network 2020.1.3

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.196	0.196	0.196
1.001	-	-	100	0.145	0.145	0.145
2.000	-	-	100	0.130	0.130	0.130
1.002	-	-	100	0.136	0.136	0.136
3.000	-	-	100	0.046	0.046	0.046
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.080	0.080	0.080
1.006	-	-	100	0.073	0.073	0.073
4.000	-	-	100	0.034	0.034	0.034
1.007	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.173	0.173	0.173
5.001	-	-	100	0.057	0.057	0.057
1.008	-	-	100	0.022	0.022	0.022
1.009	-	-	100	0.000	0.000	0.000
1.010	-	-	100	0.000	0.000	0.000
6.000	-	-	100	0.049	0.049	0.049
6.001	-	-	100	0.034	0.034	0.034
6.002	-	-	100	0.000	0.000	0.000
7.000	-	-	100	0.160	0.160	0.160
7.001	-	-	100	0.141	0.141	0.141
8.000	-	-	100	0.086	0.086	0.086
8.001	-	-	100	0.269	0.269	0.269
8.002	-	-	100	0.001	0.001	0.001
8.003	-	-	100	0.026	0.026	0.026
7.002	-	-	100	0.040	0.040	0.040
7.003	-	-	100	0.199	0.199	0.199
9.000	-	-	100	0.183	0.183	0.183
9.001	-	-	100	0.041	0.041	0.041
10.000	-	-	100	0.117	0.117	0.117
9.002	-	-	100	0.029	0.029	0.029
9.003	-	-	100	0.113	0.113	0.113
9.004	-	-	100	0.019	0.019	0.019
7.004	-	-	100	0.037	0.037	0.037
7.005	-	-	100	0.089	0.089	0.089
7.006	-	-	100	0.009	0.009	0.009
7.007	-	-	100	0.012	0.012	0.012
11.000	-	-	100	0.104	0.104	0.104
11.001	-	-	100	0.077	0.077	0.077
7.008	-	-	100	0.053	0.053	0.053
7.009	-	-	100	0.000	0.000	0.000
1.011	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				2.980	2.980	2.980

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	2.000
Hot Start (mins)	0	Inlet Coefficient	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	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.800	Storm Duration (mins)	30
Ratio R	0.322		

Storage Structures for Storm

Complex Manhole: S1.41, DS/PN: S1.011

Cellular Storage

Invert Level (m) 72.775 Safety Factor 1.5
 Infiltration Coefficient Base (m/hr) 0.07236 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.07236

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	1260.0	1260.0	0.800	1260.0	1498.4	0.801	0.0	1498.4

Infiltration Basin

Invert Level (m) 73.600 Safety Factor 1.5
 Infiltration Coefficient Base (m/hr) 0.07236 Porosity 1.00
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1094.5	1.000	1394.0	1.001	0.0

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 2.000
Hot Start Level (mm) 0	Inlet Coefficient 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)	18.600 Cv (Summer) 1.000
Region England and Wales	Ratio R 0.300 Cv (Winter) 1.000

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

Profile(s)
 Duration(s) (mins)

Summer and Winter
 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,
 1440, 2160, 2880, 4320

Return Period(s) (years)
 Climate Change (%)

2, 30, 100
 0, 35, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	overflow Act.	Water Level (m)	Surcharged Depth (m)
S1.000	S1.00	15 Summer	2	+0%	30/15 Summer	100/15 Summer			80.477	-0.063
S1.001	S1.01	15 Summer	2	+0%	30/15 Summer				80.074	-0.124
S2.000	S1.02	15 Summer	2	+0%	30/15 Summer				80.051	-0.102
S1.002	S1.03	15 Summer	2	+0%	100/15 Summer				79.590	-0.266
S3.000	S1.04	15 Summer	2	+0%					79.929	-0.101
S1.003	S1.05	15 Summer	2	+0%					78.911	-0.286
S1.004	S1.06	15 Summer	2	+0%					78.302	-0.300
S1.005	S1.07	15 Summer	2	+0%					77.478	-0.315
S1.006	S1.08	15 Summer	2	+0%	100/15 Summer				76.015	-0.310
S4.000	S1.09	15 Summer	2	+0%	30/15 Summer	100/15 Summer			74.929	-0.080
S1.007	S1.10	15 Summer	2	+0%	30/15 Summer				74.542	-0.261
S5.000	S1.11	15 Summer	2	+0%	30/15 Summer				76.782	-0.133
S5.001	S1.12	15 Summer	2	+0%	30/15 Summer				75.993	-0.124
S1.008	S1.13	15 Summer	2	+0%	30/15 Summer				73.728	-0.226
S1.009	S1.14	15 Summer	2	+0%	30/15 Summer				73.278	-0.102
S1.010	S1.15	480 Summer	2	+0%	30/15 Summer				73.197	-0.178
S6.000	S1.16	15 Summer	2	+0%	100/15 Summer				78.073	-0.097
S6.001	S1.17	15 Summer	2	+0%	30/15 Summer				75.850	-0.086
S6.002	S1.18	15 Summer	2	+0%	30/15 Summer				74.851	-0.086
S7.000	S1.19	15 Summer	2	+0%	30/15 Summer				78.511	-0.114
S7.001	S1.20	15 Summer	2	+0%	100/15 Summer				77.190	-0.333
S8.000	S1.21	15 Summer	2	+0%	30/15 Summer	100/15 Summer			80.231	-0.039
S8.001	S1.22	15 Summer	2	+0%	30/15 Summer				79.907	-0.165
S8.002	S1.23	15 Summer	2	+0%	30/15 Summer				78.434	-0.168
S8.003	S1.24	15 Summer	2	+0%	30/15 Summer				78.013	-0.171
S7.002	S1.25	15 Summer	2	+0%	30/15 Summer				76.771	-0.274
S7.003	S1.26	15 Summer	2	+0%	30/15 Summer				76.000	-0.338
S9.000	S1.27	15 Summer	2	+0%	30/15 Summer				78.390	-0.095
S9.001	S1.28	15 Summer	2	+0%	100/15 Summer				77.836	-0.187
S10.000	S1.29	15 Summer	2	+0%	100/15 Summer				77.133	-0.207
S9.002	S1.30	15 Summer	2	+0%	30/15 Summer				76.694	-0.326
S9.003	S1.31	15 Summer	2	+0%	30/15 Summer				75.825	-0.345
S9.004	S1.32	15 Summer	2	+0%	30/15 Summer				75.583	-0.355
S7.004	S1.33	15 Summer	2	+0%	30/15 Summer	100/30 Summer			75.335	-0.295
S7.005	S1.34	15 Summer	2	+0%	30/15 Summer	100/15 Summer			74.435	-0.213
S7.006	S1.35	15 Summer	2	+0%	30/15 Summer				74.132	-0.209
S7.007	S1.36	15 Summer	2	+0%	30/15 Summer				73.797	-0.251
S11.000	S1.37	15 Summer	2	+0%	30/15 Summer				75.269	-0.146
S11.001	S1.38	15 Summer	2	+0%	30/15 Summer				74.370	-0.124
S7.008	S1.39	15 Summer	2	+0%	2/15 Summer				73.649	0.074
S7.009	S1.40	15 Summer	2	+0%	2/15 Summer				73.478	0.103
S1.011	S1.41	480 Summer	2	+0%	30/30 Summer				73.196	-0.087

PN	US/MH Name	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1.00	0.000	0.86		42.0	OK	1
S1.001	S1.01	0.000	0.64		64.9	OK	

Cudworth Parkway
Preliminary SW CalcsDate 05/05/2026
File 260505 SW Net.MDXDesigned by A.James
Checked by J.Bright

XP Solutions

Network 2020.1.3

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

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S2.000	S1.02	0.000	0.58			28.2	OK	
S1.002	S1.03	0.000	0.35			114.0	OK	
S3.000	S1.04	0.000	0.23			10.0	OK	
S1.003	S1.05	0.000	0.28			123.6	OK	
S1.004	S1.06	0.000	0.24			123.6	OK	
S1.005	S1.07	0.000	0.20			135.5	OK	
S1.006	S1.08	0.000	0.21			145.9	OK	
S4.000	S1.09	0.000	0.44			7.3	OK	3
S1.007	S1.10	0.000	0.36			151.3	OK	
S5.000	S1.11	0.000	0.35			37.6	OK	
S5.001	S1.12	0.000	0.41			46.9	OK	
S1.008	S1.13	0.000	0.50			196.6	OK	
S1.009	S1.14	0.000	0.88			195.0	OK	
S1.010	S1.15	0.000	0.17			45.9	OK	
S6.000	S1.16	0.000	0.27			10.6	OK	
S6.001	S1.17	0.000	0.38			16.2	OK	
S6.002	S1.18	0.000	0.38			16.1	OK	
S7.000	S1.19	0.000	0.49			34.7	OK	
S7.001	S1.20	0.000	0.15			57.9	OK	
S8.000	S1.21	0.000	0.90			18.7	OK	3
S8.001	S1.22	0.000	0.40			61.1	OK	
S8.002	S1.23	0.000	0.40			61.6	OK	
S8.003	S1.24	0.000	0.38			66.1	OK	
S7.002	S1.25	0.000	0.32			129.3	OK	
S7.003	S1.26	0.000	0.27			161.1	OK	
S9.000	S1.27	0.000	0.64			39.7	OK	
S9.001	S1.28	0.000	0.30			46.1	OK	
S10.000	S1.29	0.000	0.21			25.4	OK	
S9.002	S1.30	0.000	0.17			75.9	OK	
S9.003	S1.31	0.000	0.25			93.6	OK	
S9.004	S1.32	0.000	0.23			96.7	OK	
S7.004	S1.33	0.000	0.40			264.8	OK	
S7.005	S1.34	0.000	0.66			278.8	OK	5
S7.006	S1.35	0.000	0.67			278.4	OK	
S7.007	S1.36	0.000	0.53			278.1	OK	
S11.000	S1.37	0.000	0.27			22.6	OK	
S11.001	S1.38	0.000	0.42			35.2	OK	
S7.008	S1.39	0.000	0.78			314.4	SURCHARGED	
S7.009	S1.40	0.000	1.34			267.4	SURCHARGED	
S1.011	S1.41	0.000	0.00		344	0.0	OK	

	Cudworth Parkway Preliminary SW Calcs	
Date 05/05/2026 File 260505 SW Net.MDX	Designed by A.James Checked by J.Bright	
XP Solutions	Network 2020.1.3	

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 Coefficient 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) 18.600 Cv (Summer) 1.000
 Region England and Wales Ratio R 0.300 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status OFF
 Inertia 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
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 35, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	overflow Act.	Water Level (m)	Surcharged Depth (m)
S1.000	S1.00	15 Summer	30	+35%	30/15 Summer	100/15 Summer			81.727	1.187
S1.001	S1.01	15 Summer	30	+35%	30/15 Summer				80.638	0.440
S2.000	S1.02	15 Summer	30	+35%	30/15 Summer				80.459	0.306
S1.002	S1.03	15 Summer	30	+35%	100/15 Summer				79.733	-0.123
S3.000	S1.04	15 Summer	30	+35%					79.963	-0.067
S1.003	S1.05	15 Summer	30	+35%					79.026	-0.171
S1.004	S1.06	15 Summer	30	+35%					78.403	-0.199
S1.005	S1.07	15 Summer	30	+35%					77.568	-0.225
S1.006	S1.08	15 Summer	30	+35%	100/15 Summer				76.111	-0.213
S4.000	S1.09	15 Summer	30	+35%	30/15 Summer	100/15 Summer			75.637	0.628
S1.007	S1.10	15 Summer	30	+35%	30/15 Summer				75.565	0.762
S5.000	S1.11	15 Summer	30	+35%	30/15 Summer				76.927	0.012
S5.001	S1.12	15 Summer	30	+35%	30/15 Summer				76.349	0.232
S1.008	S1.13	15 Summer	30	+35%	30/15 Summer				74.945	0.991
S1.009	S1.14	15 Summer	30	+35%	30/15 Summer				74.167	0.787
S1.010	S1.15	600 winter	30	+35%	30/15 Summer				74.051	0.676
S6.000	S1.16	15 Summer	30	+35%	100/15 Summer				78.113	-0.057
S6.001	S1.17	15 Summer	30	+35%	30/15 Summer				76.031	0.094
S6.002	S1.18	15 Summer	30	+35%	30/15 Summer				74.973	0.037
S7.000	S1.19	15 Summer	30	+35%	30/15 Summer				79.022	0.397
S7.001	S1.20	15 Summer	30	+35%	100/15 Summer				77.496	-0.027
S8.000	S1.21	15 Summer	30	+35%	30/15 Summer	100/15 Summer			81.246	0.976
S8.001	S1.22	15 Summer	30	+35%	30/15 Summer				80.596	0.524
S8.002	S1.23	15 Summer	30	+35%	30/15 Summer				78.824	0.222
S8.003	S1.24	15 Summer	30	+35%	30/15 Summer				78.434	0.250
S7.002	S1.25	15 Summer	30	+35%	30/15 Summer				77.457	0.412
S7.003	S1.26	15 Summer	30	+35%	30/15 Summer				77.131	0.793
S9.000	S1.27	15 Summer	30	+35%	30/15 Summer				79.113	0.628
S9.001	S1.28	15 Summer	30	+35%	100/15 Summer				77.921	-0.102
S10.000	S1.29	15 Summer	30	+35%	100/15 Summer				77.197	-0.143
S9.002	S1.30	15 Summer	30	+35%	30/15 Summer				77.040	0.020
S9.003	S1.31	15 Summer	30	+35%	30/15 Summer				76.968	0.798
S9.004	S1.32	15 Summer	30	+35%	30/15 Summer				76.940	1.002
S7.004	S1.33	15 Summer	30	+35%	30/15 Summer	100/30 Summer			76.907	1.278
S7.005	S1.34	15 Summer	30	+35%	30/15 Summer	100/15 Summer			76.318	1.670
S7.006	S1.35	15 Summer	30	+35%	30/15 Summer				75.820	1.479
S7.007	S1.36	15 Summer	30	+35%	30/15 Summer				75.319	1.270
S11.000	S1.37	15 Summer	30	+35%	30/15 Summer				75.699	0.284
S11.001	S1.38	15 Summer	30	+35%	30/15 Summer				75.470	0.976
S7.008	S1.39	15 Summer	30	+35%	2/15 Summer				74.814	1.239
S7.009	S1.40	15 Summer	30	+35%	2/15 Summer				74.156	0.781
S1.011	S1.41	600 winter	30	+35%	30/30 Summer				74.048	0.766

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1.00	0.000	1.77			86.7	SURCHARGED	1
S1.001	S1.01	0.000	1.49			152.6	SURCHARGED	

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File 260505 SW Net.MDXDesigned by A.James
Checked by J.Bright

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

PN	US/MH Name	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S2.000	S1.02	0.000	1.39		67.6	SURCHARGED	
S1.002	S1.03	0.000	0.86		283.1	OK	
S3.000	S1.04	0.000	0.59		25.5	OK	
S1.003	S1.05	0.000	0.70		304.9	OK	
S1.004	S1.06	0.000	0.60		303.3	OK	
S1.005	S1.07	0.000	0.50		338.5	OK	
S1.006	S1.08	0.000	0.54		370.6	OK	
S4.000	S1.09	0.000	1.27		21.3	SURCHARGED	3
S1.007	S1.10	0.000	0.85		355.6	SURCHARGED	
S5.000	S1.11	0.000	0.85		91.3	SURCHARGED	
S5.001	S1.12	0.000	1.06		120.1	SURCHARGED	
S1.008	S1.13	0.000	1.16		459.8	SURCHARGED	
S1.009	S1.14	0.000	2.07		459.1	SURCHARGED	
S1.010	S1.15	0.000	0.22		59.8	SURCHARGED	
S6.000	S1.16	0.000	0.70		27.1	OK	
S6.001	S1.17	0.000	1.02		43.5	SURCHARGED	
S6.002	S1.18	0.000	1.03		43.1	SURCHARGED	
S7.000	S1.19	0.000	1.15		81.8	SURCHARGED	
S7.001	S1.20	0.000	0.41		155.8	OK	
S8.000	S1.21	0.000	1.99		41.5	SURCHARGED	3
S8.001	S1.22	0.000	1.13		170.2	SURCHARGED	
S8.002	S1.23	0.000	1.05		163.2	SURCHARGED	
S8.003	S1.24	0.000	0.98		169.0	SURCHARGED	
S7.002	S1.25	0.000	0.82		328.8	SURCHARGED	
S7.003	S1.26	0.000	0.67		396.3	SURCHARGED	
S9.000	S1.27	0.000	1.50		93.9	SURCHARGED	
S9.001	S1.28	0.000	0.75		114.3	OK	
S10.000	S1.29	0.000	0.54		64.7	OK	
S9.002	S1.30	0.000	0.42		189.1	SURCHARGED	
S9.003	S1.31	0.000	0.60		220.0	SURCHARGED	
S9.004	S1.32	0.000	0.48		204.5	SURCHARGED	
S7.004	S1.33	0.000	0.78		516.8	SURCHARGED	
S7.005	S1.34	0.000	1.27		539.4	SURCHARGED	5
S7.006	S1.35	0.000	1.30		539.8	SURCHARGED	
S7.007	S1.36	0.000	1.03		544.9	SURCHARGED	
S11.000	S1.37	0.000	0.65		55.1	SURCHARGED	
S11.001	S1.38	0.000	0.89		74.7	SURCHARGED	
S7.008	S1.39	0.000	1.54		620.6	SURCHARGED	
S7.009	S1.40	0.000	2.89		576.8	SURCHARGED	
S1.011	S1.41	0.000	0.00	564	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 Coefficient	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 Online Controls	1	Number of Time/Area Diagrams	0
		Number of Storage Structures	1
		Number of Real Time Controls	0
Synthetic Rainfall Details			
Rainfall Model	FSR M5-60 (mm)	18.600	Cv (Summer) 1.000
Region	England and Wales	Ratio R	0.300 Cv (Winter) 1.000
Margin for Flood Risk Warning (mm)			300.0
Analysis Timestep	2.5 Second	Increment (Extended)	
DTS Status			ON
DVD Status			OFF
Inertia 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		
Return Period(s) (years)			2, 30, 100
Climate Change (%)			0, 35, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	overflow Act.	Water Level (m)	Surcharged Depth (m)
S1.000	S1.00	15 Summer	100	+40%	30/15 Summer	100/15 Summer			82.711	2.171
S1.001	S1.01	15 Summer	100	+40%	30/15 Summer				81.140	0.942
S2.000	S1.02	15 Summer	100	+40%	30/15 Summer				80.891	0.738
S1.002	S1.03	15 Summer	100	+40%	100/15 Summer				79.939	0.083
S3.000	S1.04	15 Summer	100	+40%					79.981	-0.049
S1.003	S1.05	15 Summer	100	+40%					79.073	-0.124
S1.004	S1.06	15 Summer	100	+40%					78.442	-0.159
S1.005	S1.07	15 Summer	100	+40%					77.600	-0.192
S1.006	S1.08	15 Summer	100	+40%	100/15 Summer				77.000	0.675
S4.000	S1.09	30 Summer	100	+40%	30/15 Summer	100/15 Summer			76.204	1.195
S1.007	S1.10	15 Summer	100	+40%	30/15 Summer				76.413	1.609
S5.000	S1.11	15 Summer	100	+40%	30/15 Summer				77.887	0.972
S5.001	S1.12	15 Summer	100	+40%	30/15 Summer				77.278	1.161
S1.008	S1.13	15 Summer	100	+40%	30/15 Summer				75.573	1.619
S1.009	S1.14	480 winter	100	+40%	30/15 Summer				74.545	1.165
S1.010	S1.15	480 winter	100	+40%	30/15 Summer				74.542	1.167
S6.000	S1.16	15 Summer	100	+40%	100/15 Summer				78.231	0.061
S6.001	S1.17	15 Summer	100	+40%	30/15 Summer				76.721	0.784
S6.002	S1.18	15 Summer	100	+40%	30/15 Summer				75.287	0.350
S7.000	S1.19	15 Summer	100	+40%	30/15 Summer				80.148	1.523
S7.001	S1.20	30 Summer	100	+40%	100/15 Summer				78.570	1.047
S8.000	S1.21	15 Summer	100	+40%	30/15 Summer	100/15 Summer			82.123	1.853
S8.001	S1.22	15 Summer	100	+40%	30/15 Summer				81.850	1.778
S8.002	S1.23	15 Summer	100	+40%	30/15 Summer				80.066	1.464
S8.003	S1.24	15 Summer	100	+40%	30/15 Summer				79.624	1.440
S7.002	S1.25	30 Summer	100	+40%	30/15 Summer				78.503	1.458
S7.003	S1.26	30 Summer	100	+40%	30/15 Summer				78.062	1.724
S9.000	S1.27	15 Summer	100	+40%	30/15 Summer				79.867	1.382
S9.001	S1.28	15 Summer	100	+40%	100/15 Summer				78.596	0.573
S10.000	S1.29	30 Summer	100	+40%	100/15 Summer				78.008	0.668
S9.002	S1.30	30 Summer	100	+40%	30/15 Summer				77.958	0.938
S9.003	S1.31	30 Summer	100	+40%	30/15 Summer				77.824	1.654
S9.004	S1.32	30 Summer	100	+40%	30/15 Summer				77.775	1.837
S7.004	S1.33	30 Summer	100	+40%	30/15 Summer	100/30 Summer			77.720	2.090
S7.005	S1.34	30 Summer	100	+40%	30/15 Summer	100/15 Summer			76.790	2.141
S7.006	S1.35	30 Summer	100	+40%	30/15 Summer				76.261	1.920
S7.007	S1.36	15 Summer	100	+40%	30/15 Summer				75.738	1.690
S11.000	S1.37	15 Summer	100	+40%	30/15 Summer				76.759	1.344
S11.001	S1.38	15 Summer	100	+40%	30/15 Summer				76.381	1.887
S7.008	S1.39	15 Summer	100	+40%	2/15 Summer				75.199	1.624
S7.009	S1.40	480 winter	100	+40%	2/15 Summer				74.547	1.172
S1.011	S1.41	480 winter	100	+40%	30/30 Summer				74.538	1.256

PN	US/MH Name	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1.00	0.851	2.19		107.0	FLOOD	1
S1.001	S1.01	0.000	1.86		189.7	SURCHARGED	

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

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S2.000	S1.02	0.000	1.78			86.6	SURCHARGED	
S1.002	S1.03	0.000	1.05			347.8	SURCHARGED	
S3.000	S1.04	0.000	0.79			34.1	OK	
S1.003	S1.05	0.000	0.86			373.7	OK	
S1.004	S1.06	0.000	0.74			376.0	OK	
S1.005	S1.07	0.000	0.61			417.2	OK	
S1.006	S1.08	0.000	0.62			428.8	SURCHARGED	
S4.000	S1.09	3.786	2.38			39.8	FLOOD	3
S1.007	S1.10	0.000	0.99			411.8	SURCHARGED	
S5.000	S1.11	0.000	0.93			99.2	SURCHARGED	
S5.001	S1.12	0.000	1.12			127.2	SURCHARGED	
S1.008	S1.13	0.000	1.34			532.6	SURCHARGED	
S1.009	S1.14	0.000	0.42			93.1	SURCHARGED	
S1.010	S1.15	0.000	0.34			92.8	SURCHARGED	
S6.000	S1.16	0.000	0.88			34.0	SURCHARGED	
S6.001	S1.17	0.000	1.20			51.2	SURCHARGED	
S6.002	S1.18	0.000	1.19			50.2	SURCHARGED	
S7.000	S1.19	0.000	1.35			96.0	SURCHARGED	
S7.001	S1.20	0.000	0.43			163.0	SURCHARGED	
S8.000	S1.21	2.643	2.53			52.8	FLOOD	3
S8.001	S1.22	0.000	1.29			194.6	SURCHARGED	
S8.002	S1.23	0.000	1.04			160.9	SURCHARGED	
S8.003	S1.24	0.000	1.01			173.2	SURCHARGED	
S7.002	S1.25	0.000	0.83			333.2	SURCHARGED	
S7.003	S1.26	0.000	0.68			398.6	FLOOD RISK	
S9.000	S1.27	0.000	1.87			116.5	SURCHARGED	
S9.001	S1.28	0.000	0.88			135.3	SURCHARGED	
S10.000	S1.29	0.000	0.64			76.5	SURCHARGED	
S9.002	S1.30	0.000	0.43			191.0	SURCHARGED	
S9.003	S1.31	0.000	0.60			223.4	FLOOD RISK	
S9.004	S1.32	0.000	0.55			232.3	FLOOD RISK	
S7.004	S1.33	0.009	0.97			646.6	FLOOD	
S7.005	S1.34	20.135	1.39			590.5	FLOOD	5
S7.006	S1.35	0.000	1.43			592.4	FLOOD RISK	
S7.007	S1.36	0.000	1.14			603.5	SURCHARGED	
S11.000	S1.37	0.000	0.68			57.7	FLOOD RISK	
S11.001	S1.38	0.000	1.11			93.2	FLOOD RISK	
S7.008	S1.39	0.000	1.70			685.4	SURCHARGED	
S7.009	S1.40	0.000	0.78			154.9	SURCHARGED	
S1.011	S1.41	0.000	0.00		519	0.0	SURCHARGED	

