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Woodvale House Woodvale Road Brighthouse HD6 4AB	Unit 24/25 Flush Mills Heckmondwike	
Date 07/02/2020 09:39 File B22621-MD01 REV A.MDX	Designed by NE Checked by BP	
Micro Drainage	Network 2018.1	

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)	19.000	Add Flow / Climate Change (%)	0
Ratio R	0.350	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
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.	0.750	Min Slope for Optimisation (1:X)	500


Designed with Level Soffits

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	5.310	0.258	20.6	0.091	4.00	0.0	0.600	o	150	Pipe/Conduit	
S2.000	35.840	0.448	80.0	0.093	4.00	0.0	0.600	o	225	Pipe/Conduit	
S2.001	35.840	0.485	73.9	0.093	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	9.697	0.121	80.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.002	23.006	1.181	19.5	0.089	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.000	35.180	0.440	80.0	0.117	4.00	0.0	0.600	o	225	Pipe/Conduit	
S3.001	10.321	0.325	31.8	0.017	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.003	13.202	0.455	29.0	0.032	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	16.878	1.510	11.2	0.035	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	4.04	65.015	0.091	0.0	0.0	0.0	2.23	39.4	12.3
S2.000	50.00	4.41	65.615	0.093	0.0	0.0	0.0	1.46	58.2	12.6
S2.001	50.00	4.80	65.167	0.186	0.0	0.0	0.0	1.52	60.6	25.2
S1.001	50.00	4.89	64.607	0.277	0.0	0.0	0.0	1.76	124.3	37.5
S1.002	50.00	5.00	64.486	0.366	0.0	0.0	0.0	3.58	253.0	49.6
S3.000	50.00	4.40	64.145	0.117	0.0	0.0	0.0	1.46	58.2	15.8
S3.001	50.00	4.47	63.705	0.134	0.0	0.0	0.0	2.33	92.6	18.1
S1.003	50.00	5.07	63.305	0.532	0.0	0.0	0.0	2.93	207.1	72.0
S1.004	50.00	5.13	62.850	0.567	0.0	0.0	0.0	4.73	334.2	76.8


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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
S1.005	2.000	0.200	10.0	0.016	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.000	35.989	0.565	63.7	0.127	4.00	0.0	0.600	o	225	Pipe/Conduit	
S4.001	1.000	0.100	10.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.006	2.991	0.030	99.7	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.007	1.500	0.015	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.008	2.679	0.027	99.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.009	13.639	0.136	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.010	50.956	0.543	93.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.011	12.825	0.128	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	


Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.005	50.00	5.14	61.340	0.583	0.0	0.0	0.0	5.00	353.4	78.9
S4.000	50.00	4.37	61.880	0.127	0.0	0.0	0.0	1.64	65.3	17.2
S4.001	50.00	4.37	61.315	0.127	0.0	0.0	0.0	4.16	165.5	17.2
S1.006	50.00	5.17	61.140	0.710	0.0	0.0	0.0	1.57	111.3	96.1
S1.007	50.00	4.02	61.110	0.000	5.0	0.0	0.0	1.00	17.8	5.0
S1.008	50.00	4.07	61.045	0.000	5.0	0.0	0.0	1.01	17.8	5.0
S1.009	50.00	4.30	61.018	0.000	5.0	0.0	0.0	1.00	17.8	5.0
S1.010	50.00	5.11	60.882	0.000	5.0	0.0	0.0	1.04	18.3	5.0
S1.011	50.00	5.33	60.339	0.000	5.0	0.0	0.0	1.00	17.8	5.0

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)
S2	66.365	1.350	Open Manhole	450	S1.000	65.015	150			
S3	66.390	0.775	Open Manhole	450	S2.000	65.615	225			
S4	66.540	1.373	Open Manhole	600	S2.001	65.167	225	S2.000	65.167	225
S5	66.365	1.758	Open Manhole	600	S1.001	64.607	300	S1.000	64.757	150
								S2.001	64.682	225
S7	66.355	1.869	Open Manhole	600	S1.002	64.486	300	S1.001	64.486	300
S8	65.570	1.425	Open Manhole	450	S3.000	64.145	225			
S9	65.170	1.465	Open Manhole	450	S3.001	63.705	225	S3.000	63.705	225
S10	64.805	1.500	Open Manhole	1200	S1.003	63.305	300	S1.002	63.305	300
								S3.001	63.380	225
S11	64.350	1.500	Open Manhole	600	S1.004	62.850	300	S1.003	62.850	300
S12	64.045	2.705	Open Manhole	1200	S1.005	61.340	300	S1.004	61.340	300
S13	63.230	1.350	Open Manhole	600	S4.000	61.880	225			
S14	63.540	2.225	Open Manhole	600	S4.001	61.315	225	S4.000	61.315	225
SAtt Tank	63.520	2.380	Open Manhole	1200	S1.006	61.140	300	S1.005	61.140	300
								S4.001	61.215	225
S15 - FCC	64.030	2.920	Open Manhole	1200	S1.007	61.110	150	S1.006	61.110	300
SOil Separator	64.050	3.005	Open Manhole	1200	S1.008	61.045	150	S1.007	61.095	150
S16	64.170	3.152	Open Manhole	1200	S1.009	61.018	150	S1.008	61.018	150
S17	63.740	2.858	Open Manhole	1200	S1.010	60.882	150	S1.009	60.882	150
S18	61.700	1.361	Open Manhole	1200	S1.011	60.339	150	S1.010	60.339	150
SCulvert	61.660	1.450	Open Manhole	0		OUTFALL		S1.011	60.210	150

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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., (mm)	L*W
S1.000	o	150	S2	66.365	65.015	1.200	Open Manhole	450	
S2.000	o	225	S3	66.390	65.615	0.550	Open Manhole	450	
S2.001	o	225	S4	66.540	65.167	1.148	Open Manhole	600	
S1.001	o	300	S5	66.365	64.607	1.458	Open Manhole	600	
S1.002	o	300	S7	66.355	64.486	1.569	Open Manhole	600	
S3.000	o	225	S8	65.570	64.145	1.200	Open Manhole	450	
S3.001	o	225	S9	65.170	63.705	1.240	Open Manhole	450	
S1.003	o	300	S10	64.805	63.305	1.200	Open Manhole	1200	
S1.004	o	300	S11	64.350	62.850	1.200	Open Manhole	600	
S1.005	o	300	S12	64.045	61.340	2.405	Open Manhole	1200	
S4.000	o	225	S13	63.230	61.880	1.125	Open Manhole	600	
S4.001	o	225	S14	63.540	61.315	2.000	Open Manhole	600	
S1.006	o	300	SAtt Tank	63.520	61.140	2.080	Open Manhole	1200	
S1.007	o	150	S15 - FCC	64.030	61.110	2.770	Open Manhole	1200	
S1.008	o	150	SOil Separator	64.050	61.045	2.805	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., (mm)	L*W
S1.000	5.310	20.6	S5	66.365	64.757	1.458	Open Manhole	600	
S2.000	35.840	80.0	S4	66.540	65.167	1.148	Open Manhole	600	
S2.001	35.840	73.9	S5	66.365	64.682	1.458	Open Manhole	600	
S1.001	9.697	80.1	S7	66.355	64.486	1.569	Open Manhole	600	
S1.002	23.006	19.5	S10	64.805	63.305	1.200	Open Manhole	1200	
S3.000	35.180	80.0	S9	65.170	63.705	1.240	Open Manhole	450	
S3.001	10.321	31.8	S10	64.805	63.380	1.200	Open Manhole	1200	
S1.003	13.202	29.0	S11	64.350	62.850	1.200	Open Manhole	600	
S1.004	16.878	11.2	S12	64.045	61.340	2.405	Open Manhole	1200	
S1.005	2.000	10.0	SAtt Tank	63.520	61.140	2.080	Open Manhole	1200	
S4.000	35.989	63.7	S14	63.540	61.315	2.000	Open Manhole	600	
S4.001	1.000	10.0	SAtt Tank	63.520	61.215	2.080	Open Manhole	1200	
S1.006	2.991	99.7	S15 - FCC	64.030	61.110	2.620	Open Manhole	1200	
S1.007	1.500	100.0	SOil Separator	64.050	61.095	2.805	Open Manhole	1200	
S1.008	2.679	99.2	S16	64.170	61.018	2.952	Open Manhole	1200	

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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)
S1.009	o	150	S16	64.170	61.018	3.002	Open Manhole	1200
S1.010	o	150	S17	63.740	60.882	2.708	Open Manhole	1200
S1.011	o	150	S18	61.700	60.339	1.211	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)
S1.009	13.639	100.0	S17	63.740	60.882	2.708	Open Manhole	1200
S1.010	50.956	93.8	S18	61.700	60.339	1.211	Open Manhole	1200
S1.011	12.825	100.0	SCulvert	61.660	60.210	1.300	Open Manhole	0

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.091	0.091	0.091
2.000	-	-	100	0.093	0.093	0.093
2.001	-	-	100	0.093	0.093	0.093
1.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.089	0.089	0.089
3.000	-	-	100	0.117	0.117	0.117
3.001	-	-	100	0.017	0.017	0.017
1.003	-	-	100	0.032	0.032	0.032
1.004	-	-	100	0.035	0.035	0.035
1.005	-	-	100	0.016	0.016	0.016
4.000	-	-	100	0.127	0.127	0.127
4.001	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
1.009	-	-	100	0.000	0.000	0.000
1.010	-	-	100	0.000	0.000	0.000
1.011	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.710	0.710	0.710

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)
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S1.011	SCulvert	61.660	60.210	59.460	0	0
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Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	0.000
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 Storage Structures 1
 Number of Online Controls 1 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.350
Return Period (years)	2	Profile Type	Summer
	Region England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.000	Cv (Winter)	0.840

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Synthetic Rainfall Details

Storm Duration (mins) 30

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Online Controls for Storm


Hydro-Brake® Optimum Manhole: S15 - FCC, DS/PN: S1.007, Volume (m³): 3.4

Unit Reference	MD-SHE-0099-5000-1450-5000
Design Head (m)	1.450
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	99
Invert Level (m)	61.110
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.450	5.0
Flush-Flo™	0.432	5.0
Kick-Flo®	0.882	4.0
Mean Flow over Head Range	-	4.4

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.2	1.200	4.6	3.000	7.0	7.000	10.5
0.200	4.5	1.400	4.9	3.500	7.5	7.500	10.8
0.300	4.9	1.600	5.2	4.000	8.0	8.000	11.2
0.400	5.0	1.800	5.5	4.500	8.5	8.500	11.5
0.500	5.0	2.000	5.8	5.000	8.9	9.000	11.8
0.600	4.9	2.200	6.1	5.500	9.3	9.500	12.1
0.800	4.4	2.400	6.3	6.000	9.7		
1.000	4.2	2.600	6.6	6.500	10.1		


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Storage Structures for Storm

Cellular Storage Manhole: SAtt Tank, DS/PN: S1.006

Invert Level (m) 61.140 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.94
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	266.5	0.0	1.471	0.0	0.0
1.470	266.5	0.0			

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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 0.000
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 Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.350
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 20


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow
S1.000	S2	15 Winter	1	+0%	100/15	Summer	
S2.000	S3	15 Winter	1	+0%	100/15	Summer	
S2.001	S4	15 Winter	1	+0%	30/15	Summer	
S1.001	S5	15 Winter	1	+0%	100/15	Summer	
S1.002	S7	15 Winter	1	+0%	100/15	Summer	
S3.000	S8	15 Winter	1	+0%	100/15	Summer	
S3.001	S9	15 Winter	1	+0%	100/15	Summer	
S1.003	S10	15 Winter	1	+0%	100/15	Summer	
S1.004	S11	15 Winter	1	+0%	100/15	Summer	
S1.005	S12	15 Winter	1	+0%	30/15	Summer	
S4.000	S13	15 Winter	1	+0%	100/15	Summer	
S4.001	S14	240 Winter	1	+0%	30/30	Summer	
S1.006	SAtt Tank	240 Winter	1	+0%	30/15	Summer	
S1.007	S15 - FCC	240 Winter	1	+0%	1/15	Summer	
S1.008	SOil Separator	240 Winter	1	+0%			
S1.009	S16	240 Winter	1	+0%			
S1.010	S17	240 Winter	1	+0%			
S1.011	S18	240 Winter	1	+0%			

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

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S1.000	S2		65.080	-0.085	0.000	0.39		12.3	OK
S2.000	S3		65.688	-0.152	0.000	0.23		12.5	OK
S2.001	S4		65.265	-0.127	0.000	0.39		22.1	OK
S1.001	S5		64.739	-0.168	0.000	0.39		34.1	OK
S1.002	S7		64.576	-0.210	0.000	0.19		43.4	OK
S3.000	S8		64.227	-0.143	0.000	0.29		15.8	OK
S3.001	S9		63.777	-0.153	0.000	0.23		17.6	OK
S1.003	S10		63.434	-0.171	0.000	0.38		64.0	OK
S1.004	S11		62.950	-0.200	0.000	0.24		68.2	OK
S1.005	S12		61.513	-0.127	0.000	0.63		70.2	OK
S4.000	S13		61.961	-0.144	0.000	0.28		17.1	OK
S4.001	S14		61.427	-0.113	0.000	0.08		3.6	OK
S1.006	SAtt Tank		61.427	-0.013	0.000	0.08		5.2	OK
S1.007	S15 - FCC		61.430	0.170	0.000	0.45		4.9	SURCHARGED
S1.008	SOil Separator		61.115	-0.080	0.000	0.45		4.9	OK
S1.009	S16		61.074	-0.094	0.000	0.30		4.9	OK
S1.010	S17		60.935	-0.097	0.000	0.27		4.9	OK
S1.011	S18		60.395	-0.094	0.000	0.30		4.9	OK

PN	US/MH Name	Level Exceeded
S1.000		S2
S2.000		S3
S2.001		S4
S1.001		S5
S1.002		S7
S3.000		S8
S3.001		S9
S1.003		S10
S1.004		S11
S1.005		S12
S4.000		S13
S4.001		S14
S1.006	SAtt Tank	
S1.007	S15 - FCC	
S1.008	SOil Separator	
S1.009	S16	
S1.010	S17	
S1.011	S18	

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet 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 Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.350
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 20


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S1.000	S2	15 Winter	30	+0%	100/15 Summer		
S2.000	S3	15 Winter	30	+0%	100/15 Summer		
S2.001	S4	15 Winter	30	+0%	30/15 Summer		
S1.001	S5	15 Winter	30	+0%	100/15 Summer		
S1.002	S7	15 Winter	30	+0%	100/15 Summer		
S3.000	S8	15 Winter	30	+0%	100/15 Summer		
S3.001	S9	15 Winter	30	+0%	100/15 Summer		
S1.003	S10	15 Winter	30	+0%	100/15 Summer		
S1.004	S11	15 Winter	30	+0%	100/15 Summer		
S1.005	S12	15 Summer	30	+0%	30/15 Summer		
S4.000	S13	15 Winter	30	+0%	100/15 Summer		
S4.001	S14	360 Winter	30	+0%	30/30 Summer		
S1.006	SAtt Tank	360 Winter	30	+0%	30/15 Summer		
S1.007	S15 - FCC	360 Winter	30	+0%	1/15 Summer		
S1.008	SOil Separator	1440 Winter	30	+0%			
S1.009	S16	960 Winter	30	+0%			
S1.010	S17	360 Winter	30	+0%			
S1.011	S18	1440 Winter	30	+0%			

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Woodvale House Woodvale Road Brighthouse HD6 4AB	Unit 24/25 Flush Mills Heckmondwike	
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S1.000	S2		65.130	-0.035	0.000	0.95	30.1		OK
S2.000	S3		65.736	-0.104	0.000	0.56	30.7		OK
S2.001	S4		65.432	0.040	0.000	1.03	59.0		SURCHARGED
S1.001	S5		64.867	-0.040	0.000	1.00	87.1		OK
S1.002	S7		64.640	-0.146	0.000	0.52	116.1		OK
S3.000	S8		64.285	-0.085	0.000	0.70	38.6		OK
S3.001	S9		63.827	-0.103	0.000	0.57	44.1		OK
S1.003	S10		63.587	-0.018	0.000	0.99	168.1		OK
S1.004	S11		63.024	-0.126	0.000	0.63	178.8		OK
S1.005	S12		61.980	0.340	0.000	1.64	184.3		SURCHARGED
S4.000	S13		62.017	-0.088	0.000	0.68	42.0		OK
S4.001	S14		61.956	0.416	0.000	0.13	5.8		SURCHARGED
S1.006	SAtt Tank		61.956	0.516	0.000	0.09	5.6		SURCHARGED
S1.007	S15 - FCC		61.976	0.716	0.000	0.46	5.0		SURCHARGED
S1.008	SOil Separator		61.116	-0.079	0.000	0.46	5.0		OK
S1.009	S16		61.075	-0.093	0.000	0.31	5.0		OK
S1.010	S17		60.935	-0.096	0.000	0.28	5.0		OK
S1.011	S18		60.395	-0.093	0.000	0.31	5.0		OK

PN	US/MH Name	Level Exceeded
S1.000	S2	
S2.000	S3	
S2.001	S4	
S1.001	S5	
S1.002	S7	
S3.000	S8	
S3.001	S9	
S1.003	S10	
S1.004	S11	
S1.005	S12	
S4.000	S13	
S4.001	S14	
S1.006	SAtt Tank	
S1.007	S15 - FCC	
S1.008	SOil Separator	
S1.009	S16	
S1.010	S17	
S1.011	S18	

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet 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 Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.350
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow
S1.000	S2	15 Winter	100	+20%	100/15 Summer		
S2.000	S3	15 Winter	100	+20%	100/15 Summer		
S2.001	S4	15 Summer	100	+20%	30/15 Summer		
S1.001	S5	15 Winter	100	+20%	100/15 Summer		
S1.002	S7	15 Winter	100	+20%	100/15 Summer		
S3.000	S8	15 Winter	100	+20%	100/15 Summer		
S3.001	S9	15 Winter	100	+20%	100/15 Summer		
S1.003	S10	15 Winter	100	+20%	100/15 Summer		
S1.004	S11	15 Winter	100	+20%	100/15 Summer		
S1.005	S12	480 Winter	100	+20%	30/15 Summer		
S4.000	S13	480 Winter	100	+20%	100/15 Summer		
S4.001	S14	480 Winter	100	+20%	30/30 Summer		
S1.006	SAtt Tank	480 Winter	100	+20%	30/15 Summer		
S1.007	S15 - FCC	480 Winter	100	+20%	1/15 Summer		
S1.008	SOil Separator	480 Winter	100	+20%			
S1.009	S16	480 Winter	100	+20%			
S1.010	S17	480 Winter	100	+20%			
S1.011	S18	480 Winter	100	+20%			

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Woodvale House Woodvale Road Brighthouse HD6 4AB	Unit 24/25 Flush Mills Heckmondwike	
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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S1.000	S2		65.620	0.455	0.000	1.46	46.3		SURCHARGED
S2.000	S3		66.386	0.546	0.000	0.79	43.5		FLOOD RISK
S2.001	S4		66.170	0.778	0.000	1.46	83.5		SURCHARGED
S1.001	S5		65.178	0.271	0.000	1.44	125.4		SURCHARGED
S1.002	S7		64.958	0.172	0.000	0.73	162.6		SURCHARGED
S3.000	S8		64.966	0.596	0.000	1.04	57.2		SURCHARGED
S3.001	S9		64.570	0.640	0.000	0.79	61.3		SURCHARGED
S1.003	S10		64.387	0.782	0.000	1.35	228.5		SURCHARGED
S1.004	S11		63.567	0.417	0.000	0.84	239.5		SURCHARGED
S1.005	S12		62.568	0.928	0.000	0.31	34.6		SURCHARGED
S4.000	S13		62.569	0.464	0.000	0.12	7.6		SURCHARGED
S4.001	S14		62.567	1.027	0.000	0.16	7.2		SURCHARGED
S1.006	SAtt Tank		62.567	1.127	0.000	0.10	6.1		SURCHARGED
S1.007	S15 - FCC		62.586	1.326	0.000	0.46	5.0		SURCHARGED
S1.008	SOil Separator		61.117	-0.078	0.000	0.46	5.0		OK
S1.009	S16		61.075	-0.093	0.000	0.31	5.0		OK
S1.010	S17		60.936	-0.096	0.000	0.28	5.0		OK
S1.011	S18		60.396	-0.093	0.000	0.31	5.0		OK

PN	US/MH Name	Level Exceeded
S1.000		S2
S2.000		S3
S2.001		S4
S1.001		S5
S1.002		S7
S3.000		S8
S3.001		S9
S1.003		S10
S1.004		S11
S1.005		S12
S4.000		S13
S4.001		S14
S1.006	SAtt Tank	
S1.007	S15 - FCC	
S1.008	SOil Separator	
S1.009	S16	
S1.010	S17	
S1.011	S18	