


Royal HaskoningDHV		Page 1
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SW 01

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	Foul Sewage (l/s/ha)	0.000	Maximum Backdrop Height (m)	1.500
M5-60 (mm)	21.000	Volumetric Runoff Coeff.	0.750	Min Design Depth for Optimisation (m)	1.200
Ratio R	0.423	PIMP (%)	100	Min Vel for Auto Design only (m/s)	1.00
Maximum Rainfall (mm/hr)	50	Add Flow / Climate Change (%)	0	Min Slope for Optimisation (1:X)	500
Maximum Time of Concentration (mins)	30	Minimum Backdrop Height (m)	0.200		

Designed with Level Soffits


Network Design Table for SW 01

« - Indicates pipe capacity < flow







PN	Length	Fall	Slope	I.Area	T.E.	Base	k	HYD	DIA	Section	Type	Auto
	(m)	(m)	(1:X)	(ha)	(mins)	Flow (l/s)	(mm)	SECT	(mm)			Design

Network Results Table

PN	Rain	T.C.	US/IL	Σ I.Area	Σ Base	Foul	Add Flow	Vel	Cap	Flow
	(mm/hr)	(mins)	(m)	(ha)	Flow (l/s)	(l/s)	(l/s)	(m/s)	(l/s)	(l/s)


Royal HaskoningDHV		Page 2
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

Network Design Table for SW 01






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
9.000	15.198	0.758	20.1	1.420	4.00	0.0	0.600	o	600	Pipe/Conduit	
10.000	56.042	0.958	58.5	0.000	8.00	0.0	0.600	o	225	Pipe/Conduit	
10.001	52.016	0.222	234.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.000	12.386	0.673	18.4	0.120	4.00	0.0	0.600	o	300	Pipe/Conduit	
12.000	13.151	0.560	23.5	0.240	4.00	0.0	0.600	o	375	Pipe/Conduit	
13.000	33.681	1.219	27.6	0.120	8.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
9.000	50.00	4.05	95.107	1.420	0.0	0.0	0.0	5.45	1542.3	192.3
10.000	45.40	8.55	96.414	0.000	0.0	0.0	0.0	1.71	68.1	0.0
10.001	42.81	9.57	95.456	0.000	0.0	0.0	0.0	0.85	33.8	0.0
11.000	50.00	4.06	95.988	0.120	0.0	0.0	0.0	3.68	260.3	16.2
12.000	50.00	4.06	96.476	0.240	0.0	0.0	0.0	3.75	414.5	32.5
13.000	46.29	8.22	97.966	0.120	0.0	0.0	0.0	2.50	99.4	15.0


Royal HaskoningDHV		Page 3
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

Network Design Table for SW 01







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
14.000	11.371	0.067	169.7	0.070	4.00	0.0	0.600	o	225	Pipe/Conduit	
13.001	26.562	0.681	39.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
12.001	45.749	0.526	87.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.002	16.953	0.058	292.3	0.120	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.003	14.643	0.058	252.5	0.000	0.00	0.0	0.600	o	450	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)
14.000	50.00	4.19	96.747	0.070	0.0	0.0	0.0	1.00	39.8	9.5
13.001	45.80	8.40	96.672	0.190	0.0	0.0	0.0	2.53	178.5	23.6
12.001	44.86	8.75	95.841	0.430	0.0	0.0	0.0	2.18	346.9	52.2
10.002	42.25	9.80	95.315	0.670	0.0	0.0	0.0	1.18	188.3	76.7
10.003	41.82	10.00	95.257	0.670	0.0	0.0	0.0	1.27	202.8	76.7


Royal HaskoningDHV		Page 4
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

Network Design Table for SW 01

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
9.001	41.847	0.001	41847.0	0.240	0.00	0.0	0.600	o	900	Pipe/Conduit	
9.002	5.305	0.001	5304.7	0.240	0.00	0.0	0.600	o	300	Pipe/Conduit	
9.003	23.396	0.080	292.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
9.004	20.601	0.211	97.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
9.005	15.899	0.078	203.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
9.006	9.981	0.050	199.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	


Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
9.001	33.42	14.85	95.200	2.330	0.0	0.0	0.0	0.14	91.5«	210.9
9.002	32.86	15.27	95.199	2.570	0.0	0.0	0.0	0.21	14.6«	228.7
9.003	32.33	15.70	95.198	2.570	0.0	0.0	0.0	0.91	64.6«	228.7
9.004	32.06	15.92	95.118	2.570	0.0	0.0	0.0	1.59	112.5«	228.7
9.005	31.77	16.16	94.907	2.570	0.0	0.0	0.0	1.10	77.6«	228.7
9.006	31.59	16.31	94.829	2.570	0.0	0.0	0.0	1.11	78.4«	228.7

Royal HaskoningDHV		Page 5
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	


Manhole Schedules for SW 01

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)
S1.01	96.433	1.326	Junction		9.000	95.107	600				
S1.02	98.041	1.627	Open Manhole	1200	10.000	96.414	225				
S1.03	97.292	1.836	Open Manhole	1200	10.001	95.456	225	10.000	95.456	225	
S1.04	97.074	1.086	Open Manhole	1200	11.000	95.988	300				
S1.05	98.051	1.575	Junction		12.000	96.476	375				
S1.06	99.391	1.425	Open Manhole	900	13.000	97.966	225				
S1.07	98.247	1.500	Open Manhole	900	14.000	96.747	225				
S1.08	98.547	1.875	Open Manhole	1200	13.001	96.672	300	13.000	96.747	225	
								14.000	96.680	225	
S1.09	98.051	2.210	Open Manhole	1350	12.001	95.841	450	12.000	95.916	375	
								13.001	95.991	300	
S1.10	97.000	1.766	Open Manhole	1350	10.002	95.315	450	10.001	95.234	225	
								11.000	95.315	300	
								12.001	95.315	450	
S1.11	97.000	1.743	Junction		10.003	95.257	450	10.002	95.257	450	
S1.12	97.000	2.651	Junction		9.001	95.200	900	9.000	94.349	600	
								10.003	95.199	450	
S1.13	97.000	1.801	Open Manhole	1800	9.002	95.199	300	9.001	95.199	900	

Royal HaskoningDHV		Page 6
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

Manhole Schedules for SW 01

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)
S1.14 FC	97.000	1.802	Open Manhole	1800	9.003	95.198	300	9.002	95.198	300	
S1.15	96.666	1.548	Open Manhole	1200	9.004	95.118	300	9.003	95.118	300	
S1.16	96.270	1.363	Junction		9.005	94.907	300	9.004	94.907	300	
S1.17	96.270	1.441	Junction		9.006	94.829	300	9.005	94.829	300	
S1.02	96.200	1.421	Open Manhole	1200		OUTFALL		9.006	94.779	300	

Royal HaskoningDHV		Page 7
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	


PIPELINE SCHEDULES for SW 01

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)
9.000	o	600	S1.01	96.433	95.107	0.726	Junction	
10.000	o	225	S1.02	98.041	96.414	1.402	Open Manhole	1200
10.001	o	225	S1.03	97.292	95.456	1.611	Open Manhole	1200
11.000	o	300	S1.04	97.074	95.988	0.786	Open Manhole	1200
12.000	o	375	S1.05	98.051	96.476	1.200	Junction	

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)
9.000	15.198	20.1	S1.12	97.000	94.349	2.051	Junction	
10.000	56.042	58.5	S1.03	97.292	95.456	1.611	Open Manhole	1200
10.001	52.016	234.3	S1.10	97.000	95.234	1.541	Open Manhole	1350
11.000	12.386	18.4	S1.10	97.000	95.315	1.385	Open Manhole	1350
12.000	13.151	23.5	S1.09	98.051	95.916	1.760	Open Manhole	1350

Royal HaskoningDHV		Page 8
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	


PIPELINE SCHEDULES for SW 01

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)
13.000	o	225	S1.06	99.391	97.966	1.200	Open Manhole	900
14.000	o	225	S1.07	98.247	96.747	1.275	Open Manhole	900
13.001	o	300	S1.08	98.547	96.672	1.575	Open Manhole	1200
12.001	o	450	S1.09	98.051	95.841	1.760	Open Manhole	1350

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)
13.000	33.681	27.6	S1.08	98.547	96.747	1.575	Open Manhole	1200
14.000	11.371	169.7	S1.08	98.547	96.680	1.642	Open Manhole	1200
13.001	26.562	39.0	S1.09	98.051	95.991	1.760	Open Manhole	1350
12.001	45.749	87.0	S1.10	97.000	95.315	1.235	Open Manhole	1350

Royal HaskoningDHV		Page 9
Blays House Wick Road Englefield Green Egham Surrey TW20 OHJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	


PIPELINE SCHEDULES for SW 01

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)
10.002	o	450	S1.10	97.000	95.315	1.235	Open Manhole	1350
10.003	o	450	S1.11	97.000	95.257	1.293	Junction	
9.001	o	900	S1.12	97.000	95.200	0.900	Junction	
9.002	o	300	S1.13	97.000	95.199	1.501	Open Manhole	1800
9.003	o	300	S1.14 FC	97.000	95.198	1.502	Open Manhole	1800
9.004	o	300	S1.15	96.666	95.118	1.248	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)
10.002	16.953	292.3	S1.11	97.000	95.257	1.293	Junction	
10.003	14.643	252.5	S1.12	97.000	95.199	1.351	Junction	
9.001	41.847	41847.0	S1.13	97.000	95.199	0.901	Open Manhole	1800
9.002	5.305	5304.7	S1.14 FC	97.000	95.198	1.502	Open Manhole	1800
9.003	23.396	292.5	S1.15	96.666	95.118	1.248	Open Manhole	1200
9.004	20.601	97.6	S1.16	96.270	94.907	1.063	Junction	

Royal HaskoningDHV		Page 10
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	


PIPELINE SCHEDULES for SW 01

Upstream Manhole

PN	Hyd Diam Sect (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
9.005	o 300	S1.16	96.270	94.907	1.063	Junction	
9.006	o 300	S1.17	96.270	94.829	1.141	Junction	


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)
9.005	15.899	203.8	S1.17	96.270	94.829	1.141	Junction	
9.006	9.981	199.6	S1.02	96.200	94.779	1.121	Open Manhole	1200

Royal HaskoningDHV		Page 11
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

Area Summary for SW 01

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
9.000	-	-	100	1.420	1.420	1.420
10.000	-	-	100	0.000	0.000	0.000
10.001	-	-	100	0.000	0.000	0.000
11.000	-	-	100	0.120	0.120	0.120
12.000	-	-	100	0.240	0.240	0.240
13.000	-	-	100	0.120	0.120	0.120
14.000	-	-	100	0.070	0.070	0.070
13.001	-	-	100	0.000	0.000	0.000
12.001	-	-	100	0.000	0.000	0.000
10.002	-	-	100	0.120	0.120	0.120
10.003	-	-	100	0.000	0.000	0.000
9.001	-	-	100	0.240	0.240	0.240
9.002	-	-	100	0.240	0.240	0.240
9.003	-	-	100	0.000	0.000	0.000
9.004	-	-	100	0.000	0.000	0.000
9.005	-	-	100	0.000	0.000	0.000
9.006	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				2.570	2.570	2.570

Royal HaskoningDHV		Page 12
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

Free Flowing Outfall Details for SW 01

Outfall Pipe Number	Outfall C. Level Name	I. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
--------------------------------	----------------------------------	-------------------------	-------------------------	---------------------------------	---------------------	-------------------

9.006	S1.02	96.200	94.779	0.000	1200	0
-------	-------	--------	--------	-------	------	---


Simulation Criteria for SW 01

Volumetric Runoff Coeff 0.840	Manhole Headloss Coeff (Global) 0.500	Inlet Coefficient 0.800
Areal Reduction Factor 1.000	Foul Sewage per hectare (l/s) 0.000	Flow per Person per Day (l/per/day) 0.000
Hot Start (mins) 0	Additional Flow - % of Total Flow 0.000	Run Time (mins) 60
Hot Start Level (mm) 0	MADD Factor * 10m ³ /ha Storage 4.000	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 M5-60 (mm) 21.000	Cv (Summer) 0.750
Return Period (years)	1	Ratio R 0.423
Region England and Wales	Profile Type Winter Storm	Duration (mins) 15

Royal HaskoningDHV		Page 13
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

Online Controls for SW 01

Complex Manhole: S1.13, DS/PN: 9.002, Volume (m³): 30.6


Hydro-Brake® Optimum

Unit Reference	MD-SHE-0114-5000-0400-5000	Sump Available	Yes
Design Head (m)	0.400	Diameter (mm)	114
Design Flow (l/s)	5.0	Invert Level (m)	95.199
Flush-Flo™	Calculated Minimum Outlet Pipe Diameter (mm)		150
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.400	5.0	Kick-Flo®	0.312	4.5
Flush-Flo™	0.169	5.0	Mean Flow over Head Range	-	4.0

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.0	0.500	5.5	1.200	8.3	2.000	10.6	3.000	12.9	5.000	16.4
0.200	5.0	0.600	6.0	1.400	9.0	2.200	11.1	3.500	13.9	5.500	17.3
0.300	4.6	0.800	6.9	1.600	9.6	2.400	11.6	4.000	14.8	6.000	18.0
0.400	5.0	1.000	7.7	1.800	10.1	2.600	12.0	4.500	15.6	6.500	18.8


Royal HaskoningDHV		Page 14
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

Hydro-Brake® Optimum

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)	Depth (m)	Flow (l/s)
7.000	19.5	7.500	20.2	8.000	20.9	8.500	21.5	9.000	22.1	9.500	22.7

Orifice

Diameter (m) 0.225 Discharge Coefficient 0.600 Invert Level (m) 96.129


Royal HaskoningDHV		Page 15
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

Storage Structures for SW 01

Tank or Pond Manhole: S1.13, DS/PN: 9.002

Invert Level (m) 95.199

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1231.0	0.500	1433.0	1.000	1655.0	1.500	1895.0
0.250	1330.0	0.750	1542.0	1.250	1772.0		

Royal HaskoningDHV		Page 16
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 01

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 4.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coefficient 0.800
Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 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) 21.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.430 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Pipe	Status
									Level (m)	Depth (m)	Volume (m³)			Flow (l/s)	
9.000	S1.01	15 Winter	2	+0%					95.707	0.000	0.000	0.24		211.1	SURCHARGED*

Royal HaskoningDHV		Page 17
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 01


	US/MH	Level
PN	Name	Exceeded
9.000	S1.01	

Royal HaskoningDHV		Page 18
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 01


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Pipe	
									Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)
10.000	S1.02	60 Winter	2	+0%	100/15 Summer				96.414	-0.225	0.000	0.00	0.0
10.001	S1.03	15 Winter	2	+0%	2/15 Summer				95.862	0.181	0.000	0.15	4.7
11.000	S1.04	15 Summer	2	+0%	30/15 Summer	100/15 Summer			96.057	-0.231	0.000	0.12	24.9
12.000	S1.05	15 Summer	2	+0%					96.579	-0.272	0.000	0.17	49.9
13.000	S1.06	15 Winter	2	+0%					98.033	-0.158	0.000	0.20	18.4
14.000	S1.07	15 Summer	2	+0%	100/15 Summer				96.850	-0.122	0.000	0.43	14.6
13.001	S1.08	15 Winter	2	+0%	100/15 Summer				96.763	-0.209	0.000	0.20	31.6
12.001	S1.09	15 Winter	2	+0%	30/15 Summer				95.997	-0.294	0.000	0.26	80.0
10.002	S1.10	15 Winter	2	+0%	2/15 Summer				95.864	0.099	0.000	0.73	107.7
10.003	S1.11	30 Winter	2	+0%					95.707	0.000	0.000	0.53	90.3
9.001	S1.12	15 Winter	2	+0%					95.719	-0.381	0.000	0.62	353.7
9.002	S1.13	960 Winter	2	+0%	2/240 Summer				95.590	0.091	0.000	0.11	5.0
9.003	S1.14 FC	960 Winter	2	+0%					95.257	-0.241	0.000	0.09	5.0
9.004	S1.15	1440 Summer	2	+0%					95.161	-0.257	0.000	0.05	5.0
9.005	S1.16	960 Winter	2	+0%					94.959	-0.248	0.000	0.07	5.0
9.006	S1.17	1440 Summer	2	+0%					94.886	-0.243	0.000	0.08	5.0

PN	US/MH Name	Status	Level Exceeded
10.000	S1.02	OK	
10.001	S1.03	SURCHARGED	

Royal HaskoningDHV		Page 19
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 01

PN	US/MH Name	Status	Level Exceeded
11.000	S1.04	OK	2
12.000	S1.05	OK*	
13.000	S1.06	OK	
14.000	S1.07	OK	
13.001	S1.08	OK	
12.001	S1.09	OK	
10.002	S1.10	SURCHARGED	
10.003	S1.11	SURCHARGED*	
9.001	S1.12	OK*	
9.002	S1.13	SURCHARGED	
9.003	S1.14 FC	OK	
9.004	S1.15	OK	
9.005	S1.16	OK*	
9.006	S1.17	OK*	

Royal HaskoningDHV		Page 20
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 01

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 4.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coefficient 0.800
Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 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) 21.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.430 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Pipe		Status
									Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	
9.000	S1.01	60 Winter	30	+0%					95.707	0.000	0.000	0.29	252.8	SURCHARGED*

Royal HaskoningDHV		Page 21
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 01


	US/MH	Level
PN	Name	Exceeded
9.000	S1.01	

Royal HaskoningDHV		Page 22
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 01


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Pipe Flow (l/s)	
									Level (m)	Depth (m)	Volume (m ³)		Flow / Cap. (l/s)
10.000	S1.02	60 Winter	30	+0%	100/15 Summer				96.414	-0.225	0.000	0.00	0.0
10.001	S1.03	15 Winter	30	+0%	2/15 Summer				96.393	0.712	0.000	0.23	7.5
11.000	S1.04	15 Winter	30	+0%	30/15 Summer	100/15 Summer			96.470	0.182	0.000	0.20	41.4
12.000	S1.05	15 Winter	30	+0%					96.622	-0.229	0.000	0.32	94.8
13.000	S1.06	15 Winter	30	+0%					98.061	-0.130	0.000	0.37	35.0
14.000	S1.07	15 Summer	30	+0%	100/15 Summer				96.903	-0.069	0.000	0.82	27.7
13.001	S1.08	15 Winter	30	+0%	100/15 Summer				96.800	-0.172	0.000	0.38	60.2
12.001	S1.09	15 Winter	30	+0%	30/15 Summer				96.584	0.293	0.000	0.46	142.5
10.002	S1.10	15 Winter	30	+0%	2/15 Summer				96.396	0.631	0.000	1.40	207.0
10.003	S1.11	60 Winter	30	+0%					95.707	0.000	0.000	0.72	121.5
9.001	S1.12	15 Winter	30	+0%					96.100	0.000	0.000	1.28	730.4
9.002	S1.13	960 Winter	30	+0%	2/240 Summer				95.903	0.404	0.000	0.14	6.2
9.003	S1.14	FC 960 Winter	30	+0%					95.264	-0.234	0.000	0.11	6.2
9.004	S1.15	960 Winter	30	+0%					95.167	-0.251	0.000	0.06	6.2
9.005	S1.16	960 Winter	30	+0%					94.967	-0.240	0.000	0.09	6.2
9.006	S1.17	960 Winter	30	+0%					94.893	-0.236	0.000	0.10	6.2

PN	US/MH Name	Status	Level Exceeded
10.000	S1.02	OK	
10.001	S1.03	SURCHARGED	

Royal HaskoningDHV		Page 23
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 01

PN	US/MH Name	Status	Level Exceeded
11.000	S1.04	SURCHARGED	2
12.000	S1.05	OK*	
13.000	S1.06	OK	
14.000	S1.07	OK	
13.001	S1.08	OK	
12.001	S1.09	SURCHARGED	
10.002	S1.10	SURCHARGED	
10.003	S1.11	SURCHARGED*	
9.001	S1.12	SURCHARGED*	
9.002	S1.13	SURCHARGED	
9.003	S1.14 FC	OK	
9.004	S1.15	OK	
9.005	S1.16	OK*	
9.006	S1.17	OK*	

Royal HaskoningDHV		Page 24
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 01

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 4.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coefficient 0.800
Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 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) 21.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.430 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Pipe Flow (1/s)	Status
									Level (m)	Depth (m)	Volume (m ³)		
9.000	S1.01	60 Winter	100	+30%					95.707	0.000	0.000	0.51	449.2 SURCHARGED*

Royal HaskoningDHV		Page 25
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 01

	US/MH	Level
PN	Name	Exceeded
9.000	S1.01	

Blays House Wick Road
 Englefield Green Egham
 Surrey TW20 0HJ

Haverhill
 Great Willsey Park
 Area 1 FSR Results



Date 4/7/2019
 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX

Designed by RMV
 Checked by DJ


Innovyze

Network 2018.1.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Surcharged Flooded			Pipe Flow (l/s)	
									Level (m)	Depth (m)	Volume (m³)		
10.000	S1.02	15 Winter	100	+30%	100/15 Summer				96.974	0.335	0.000	0.05	3.3
10.001	S1.03	15 Winter	100	+30%	2/15 Summer				96.980	1.299	0.000	0.38	12.3
11.000	S1.04	15 Winter	100	+30%	30/15 Summer	100/15 Summer			97.076	0.788	1.860	0.32	66.3
12.000	S1.05	15 Winter	100	+30%					96.851	0.000	0.000	0.43	124.9
13.000	S1.06	15 Winter	100	+30%					98.096	-0.095	0.000	0.63	59.2
14.000	S1.07	15 Winter	100	+30%	100/15 Summer				97.563	0.591	0.000	1.14	38.7
13.001	S1.08	15 Winter	100	+30%	100/15 Summer				97.483	0.511	0.000	0.60	95.8
12.001	S1.09	15 Winter	100	+30%	30/15 Summer				97.251	0.960	0.000	0.68	211.3
10.002	S1.10	15 Winter	100	+30%	2/15 Summer				96.996	1.231	0.000	2.11	311.7
10.003	S1.11	60 Winter	100	+30%					95.707	0.000	0.000	1.21	204.5
9.001	S1.12	60 Winter	100	+30%					96.100	0.000	0.000	1.26	719.4
9.002	S1.13	960 Winter	100	+30%	2/240 Summer				96.318	0.819	0.000	0.30	13.5
9.003	S1.14 FC	960 Winter	100	+30%					95.296	-0.202	0.000	0.24	13.5
9.004	S1.15	960 Winter	100	+30%					95.192	-0.226	0.000	0.14	13.5
9.005	S1.16	960 Winter	100	+30%					94.996	-0.211	0.000	0.19	13.5
9.006	S1.17	960 Winter	100	+30%					94.924	-0.205	0.000	0.22	13.5

PN	US/MH Name	Status	Level Exceeded
10.000	S1.02	SURCHARGED	
10.001	S1.03	SURCHARGED	

Royal HaskoningDHV		Page 27
Blays House Wick Road Englefield Green Egham Surrey TW20 0HJ	Haverhill Great Willsey Park Area 1 FSR Results	
Date 4/7/2019 File HAVERHILL. ALL NETWORKS FOR TENDER.MDX	Designed by RMV Checked by DJ	
Innovyze	Network 2018.1.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW 01

PN	US/MH Name	Status	Level Exceeded
11.000	S1.04	FLOOD	2
12.000	S1.05	SURCHARGED*	
13.000	S1.06	OK	
14.000	S1.07	SURCHARGED	
13.001	S1.08	SURCHARGED	
12.001	S1.09	SURCHARGED	
10.002	S1.10	FLOOD RISK	
10.003	S1.11	SURCHARGED*	
9.001	S1.12	SURCHARGED*	
9.002	S1.13	SURCHARGED	
9.003	S1.14 FC	OK	
9.004	S1.15	OK	
9.005	S1.16	OK*	
9.006	S1.17	OK*	