



Edward Parsley Associates Ltd		Page 1
Rayne Essex CM77 6RY		
Date 16/06/2023 16:21 File EPA RHF - PR DRAIN - C.MDX	Designed by Lewis Checked by	
Innovyze	Network 2020.1.3	

Existing Network Details 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
S1.000	15.267	0.070	218.1	0.057	5.00	0.0	0.600	o	600	Pipe/Conduit
S2.000	16.911	0.075	225.5	0.001	5.00	0.0	0.600	o	225	Pipe/Conduit
S2.001	24.626	0.145	169.8	0.019	0.00	0.0	0.600	o	375	Pipe/Conduit
S1.001	22.428	0.068	329.8	0.057	0.00	0.0	0.600	o	750	Pipe/Conduit
S1.002	22.022	0.229	96.2	0.081	0.00	0.0	0.600	o	750	Pipe/Conduit
S3.000	18.328	0.195	94.0	0.005	5.00	0.0	0.600	o	225	Pipe/Conduit
S3.001	28.017	0.264	106.1	0.036	0.00	0.0	0.600	o	375	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
S1.000	46.550	0.057	0.0	1.64	465.1
S2.000	47.075	0.001	0.0	0.87	34.5
S2.001	46.850	0.020	0.0	1.39	153.2
S1.001	46.333	0.134	0.0	1.54	678.3
S1.002	46.265	0.215	0.0	2.85	1260.9
S3.000	47.020	0.005	0.0	1.35	53.6
S3.001	46.675	0.041	0.0	1.76	194.2

Edward Parsley Associates Ltd		Page 2
Rayne Essex CM77 6RY		
Date 16/06/2023 16:21 File EPA RHF - PR DRAIN - C.MDX	Designed by Lewis Checked by	
Innovyze	Network 2020.1.3	

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S1.003	19.614	0.196	100.1	0.021	0.00	0.0	0.600	o	750	Pipe/Conduit
S4.000	13.337	0.075	177.8	0.005	5.00	0.0	0.600	o	375	Pipe/Conduit
S4.001	13.120	0.135	97.2	0.005	5.00	0.0	0.600	o	375	Pipe/Conduit
S1.004	23.932	0.040	598.3	0.040	0.00	0.0	0.600	o	900	Pipe/Conduit
S5.000	60.426	0.275	219.7	0.015	5.00	0.0	0.600	o	750	Pipe/Conduit
S5.001	21.580	0.225	95.9	0.098	0.00	0.0	0.600	o	750	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
S1.003	46.036	0.277	0.0	2.80	1236.0
S4.000	46.425	0.005	0.0	1.36	149.7
S4.001	46.350	0.010	0.0	1.84	203.0
S1.004	45.690	0.327	0.0	1.27	810.2
S5.000	46.300	0.015	0.0	1.88	832.3
S5.001	46.025	0.113	0.0	2.86	1262.6

Rayne
Essex
CM77 6RY

Date 16/06/2023 16:21

File EPA RHF - PR DRAIN - C.MDX

Designed by Lewis

Checked by

Innovyze

Network 2020.1.3



Existing Network Details for Storm

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S1.005	27.253	0.065	419.3	0.069	0.00	0.0	0.600	o	900	Pipe/Conduit
S1.006	14.680	0.045	326.2	0.018	0.00	0.0	0.600	o	900	Pipe/Conduit
S1.007	23.760	0.020	1188.0	0.053	0.00	0.0	0.600	o	900	Pipe/Conduit
S6.000	20.243	0.030	674.8	0.047	5.00	0.0	0.600	o	600	Pipe/Conduit
S1.008	7.213	0.010	721.3	0.053	0.00	0.0	0.600	o	900	Pipe/Conduit
S7.000	15.532	0.020	776.6	0.006	5.00	0.0	0.600	o	750	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
S1.005	45.650	0.509	0.0	1.52	969.4
S1.006	45.585	0.527	0.0	1.73	1100.1
S1.007	45.540	0.580	0.0	0.90	572.8
S6.000	45.850	0.047	0.0	0.93	262.9
S1.008	45.520	0.680	0.0	1.16	737.2
S7.000	45.680	0.006	0.0	1.00	440.1

Rayne
Essex
CM77 6RY

Date 16/06/2023 16:21

File EPA RHF - PR DRAIN - C.MDX

Designed by Lewis

Checked by

Innovyze

Network 2020.1.3



Existing Network Details 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
S8.000	16.050	0.020	802.5	0.006	5.00	0.0	0.600	o	750	Pipe/Conduit
S1.009	7.680	0.010	768.0	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit
S1.010	4.680	0.000	0.0	0.000	0.00	0.0	0.600	oo	450	Double Pipe

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
S8.000	45.680	0.006	0.0	0.98	432.9
S1.009	45.510	0.692	0.0	1.00	442.6
S1.010	45.500	0.692	0.0	0.00	0.0

Rayne
Essex
CM77 6RY

Date 16/06/2023 16:21

Designed by Lewis

File EPA RHF - PR DRAIN - C.MDX

Checked by

Innovyze

Network 2020.1.3



Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out		Pipes In			Backdrop (mm)
					PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	
S1	48.380	1.830	Open Manhole	1800	S1.000	46.550	600			
S3	48.295	1.220	Open Manhole	1200	S2.000	47.075	225			
S4	48.225	1.375	Open Manhole	1200	S2.001	46.850	375	S2.000	47.000	225
S2	48.278	1.945	Open Manhole	1800	S1.001	46.333	750	S1.000	46.480	600
								S2.001	46.705	375
S5	48.139	1.874	Open Manhole	1800	S1.002	46.265	750	S1.001	46.265	750
S14	47.995	0.975	Open Manhole	1200	S3.000	47.020	225			
S15	47.914	1.239	Open Manhole	1200	S3.001	46.675	375	S3.000	46.825	225
S6	48.002	1.966	Open Manhole	1800	S1.003	46.036	750	S1.002	46.036	750
								S3.001	46.411	375
S16	48.000	1.575	Open Manhole	1200	S4.000	46.425	375			
S17	47.952	1.602	Open Manhole	1200	S4.001	46.350	375	S4.000	46.350	375
S7	47.878	2.188	Open Manhole	1800	S1.004	45.690	900	S1.003	45.840	750
								S4.001	46.215	375
S19	48.191	1.891	Open Manhole	1800	S5.000	46.300	750			
S18	47.874	1.849	Open Manhole	1800	S5.001	46.025	750	S5.000	46.025	750
S8	47.884	2.234	Open Manhole	1800	S1.005	45.650	900	S1.004	45.650	900
								S5.001	45.800	750
S9	47.574	1.989	Open Manhole	1800	S1.006	45.585	900	S1.005	45.585	900

Rayne
Essex
CM77 6RY



Date 16/06/2023 16:21

Designed by Lewis

File EPA RHF - PR DRAIN - C.MDX

Checked by

Innovyze

Network 2020.1.3

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out			Pipes In			Backdrop (mm)
					PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	Diameter (mm)	
S10	47.485	1.945	Open Manhole	1800	S1.007	45.540	900	S1.006	45.540	900	
S13	47.500	1.650	Open Manhole	1800	S6.000	45.850	600				
S11	47.357	1.837	Open Manhole	1800	S1.008	45.520	900	S1.007	45.520	900	
								S6.000	45.820	600	
SACO01	47.211	1.531	Open Manhole	1800	S7.000	45.680	750				
SACO02	47.225	1.545	Open Manhole	1800	S8.000	45.680	750				
S12	47.271	1.761	Open Manhole	1800	S1.009	45.510	750	S1.008	45.510	900	
								S7.000	45.660	750	150
								S8.000	45.660	750	150
SFC01	47.280	1.780	Open Manhole	1800	S1.010	45.500	450	S1.009	45.500	750	
SBASIN	47.390	1.890	Open Manhole	1200		OUTFALL		S1.010	45.500	450	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
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S1 625533.938 277080.765 625533.938 277080.765 Required



Rayne
Essex
CM77 6RY



Date 16/06/2023 16:21

Designed by Lewis

File EPA RHF - PR DRAIN - C.MDX

Checked by

Innovyze

Network 2020.1.3

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S3	625494.195	277087.574	625494.195	277087.574	Required	
S4	625505.683	277075.165	625505.683	277075.165	Required	
S2	625523.630	277092.027	625523.630	277092.027	Required	
S5	625505.457	277105.171	625505.457	277105.171	Required	
S14	625469.524	277145.904	625469.524	277145.904	Required	
S15	625485.518	277136.954	625485.518	277136.954	Required	
S6	625483.769	277108.992	625483.769	277108.992	Required	
S16	625465.640	277122.835	625465.640	277122.835	Required	

Rayne
Essex
CM77 6RY



Date 16/06/2023 16:21

Designed by Lewis

File EPA RHF - PR DRAIN - C.MDX

Checked by

Innovyze

Network 2020.1.3

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S17	625455.865	277113.761	625455.865	277113.761	Required	
S7	625464.769	277104.124	625464.769	277104.124	Required	
S19	625501.844	277027.555	625501.844	277027.555	Required	
S18	625461.414	277072.462	625461.414	277072.462	Required	
S8	625446.788	277088.330	625446.788	277088.330	Required	
S9	625428.142	277108.205	625428.142	277108.205	Required	
S10	625417.894	277118.716	625417.894	277118.716	Required	
S13	625435.239	277151.830	625435.239	277151.830	Required	

Rayne
Essex
CM77 6RY



Date 16/06/2023 16:21

Designed by Lewis

File EPA RHF - PR DRAIN - C.MDX

Checked by

Innovyze

Network 2020.1.3

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S11	625417.291	277142.468	625417.291	277142.468	Required	
SACO01	625414.225	277164.743	625414.225	277164.743	Required	
SACO02	625402.443	277159.519	625402.443	277159.519	Required	
S12	625414.752	277149.219	625414.752	277149.219	Required	
SFC01	625421.805	277152.259	625421.805	277152.259	Required	
SBASIN	625418.339	277155.404			No Entry	

Rayne
Essex
CM77 6RY

Date 16/06/2023 16:21

File EPA RHF - PR DRAIN - C.MDX

Designed by Lewis

Checked by

Innovyze

Network 2020.1.3




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	600	S1	48.380	46.550	1.230	Open Manhole	1800	
S2.000	o	225	S3	48.295	47.075	0.995	Open Manhole	1200	
S2.001	o	375	S4	48.225	46.850	1.000	Open Manhole	1200	
S1.001	o	750	S2	48.278	46.333	1.195	Open Manhole	1800	
S1.002	o	750	S5	48.139	46.265	1.124	Open Manhole	1800	
S3.000	o	225	S14	47.995	47.020	0.750	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	15.267	218.1	S2	48.278	46.480	1.198	Open Manhole	1800	
S2.000	16.911	225.5	S4	48.225	47.000	1.000	Open Manhole	1200	
S2.001	24.626	169.8	S2	48.278	46.705	1.198	Open Manhole	1800	
S1.001	22.428	329.8	S5	48.139	46.265	1.124	Open Manhole	1800	
S1.002	22.022	96.2	S6	48.002	46.036	1.216	Open Manhole	1800	
S3.000	18.328	94.0	S15	47.914	46.825	0.864	Open Manhole	1200	

Edward Parsley Associates Ltd		Page 11
Rayne Essex CM77 6RY		
Date 16/06/2023 16:21 File EPA RHF - PR DRAIN - C.MDX	Designed by Lewis Checked by	
Innovyze	Network 2020.1.3	

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)
S3.001	o	375	S15	47.914	46.675	0.864	Open Manhole	1200
S1.003	o	750	S6	48.002	46.036	1.216	Open Manhole	1800
S4.000	o	375	S16	48.000	46.425	1.200	Open Manhole	1200
S4.001	o	375	S17	47.952	46.350	1.227	Open Manhole	1200
S1.004	o	900	S7	47.878	45.690	1.288	Open Manhole	1800

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)
S3.001	28.017	106.1	S6	48.002	46.411	1.216	Open Manhole	1800
S1.003	19.614	100.1	S7	47.878	45.840	1.288	Open Manhole	1800
S4.000	13.337	177.8	S17	47.952	46.350	1.227	Open Manhole	1200
S4.001	13.120	97.2	S7	47.878	46.215	1.288	Open Manhole	1800
S1.004	23.932	598.3	S8	47.884	45.650	1.334	Open Manhole	1800

Rayne
Essex
CM77 6RY

Date 16/06/2023 16:21

File EPA RHF - PR DRAIN - C.MDX

Designed by Lewis

Checked by

Innovyze

Network 2020.1.3



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)
S5.000	o	750	S19	48.191	46.300	1.141	Open Manhole	1800
S5.001	o	750	S18	47.874	46.025	1.099	Open Manhole	1800
S1.005	o	900	S8	47.884	45.650	1.334	Open Manhole	1800
S1.006	o	900	S9	47.574	45.585	1.089	Open Manhole	1800
S1.007	o	900	S10	47.485	45.540	1.045	Open Manhole	1800
S6.000	o	600	S13	47.500	45.850	1.050	Open Manhole	1800

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)
S5.000	60.426	219.7	S18	47.874	46.025	1.099	Open Manhole	1800
S5.001	21.580	95.9	S8	47.884	45.800	1.334	Open Manhole	1800
S1.005	27.253	419.3	S9	47.574	45.585	1.089	Open Manhole	1800
S1.006	14.680	326.2	S10	47.485	45.540	1.045	Open Manhole	1800
S1.007	23.760	1188.0	S11	47.357	45.520	0.937	Open Manhole	1800
S6.000	20.243	674.8	S11	47.357	45.820	0.937	Open Manhole	1800


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)
S1.008	o	900	S11	47.357	45.520	0.937	Open Manhole	1800
S7.000	o	750	SACO01	47.211	45.680	0.781	Open Manhole	1800
S8.000	o	750	SACO02	47.225	45.680	0.795	Open Manhole	1800
S1.009	o	750	S12	47.271	45.510	1.011	Open Manhole	1800
S1.010	oo	450	SFC01	47.280	45.500	1.330	Open Manhole	1800


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)
S1.008	7.213	721.3	S12	47.271	45.510	0.861	Open Manhole	1800
S7.000	15.532	776.6	S12	47.271	45.660	0.861	Open Manhole	1800
S8.000	16.050	802.5	S12	47.271	45.660	0.861	Open Manhole	1800
S1.009	7.680	768.0	SFC01	47.280	45.500	1.030	Open Manhole	1800
S1.010	4.680	0.0	SBASIN	47.390	45.500	1.440	Open Manhole	1200

Edward Parsley Associates Ltd		Page 14
Rayne Essex CM77 6RY		
Date 16/06/2023 16:21 File EPA RHF - PR DRAIN - C.MDX	Designed by Lewis Checked by	
Innovyze	Network 2020.1.3	

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)
S1.010	SBASIN	47.390	45.500	0.000	1200	0

Edward Parsley Associates Ltd		Page 15
Rayne Essex CM77 6RY		
Date 16/06/2023 16:21 File EPA RHF - PR DRAIN - C.MDX	Designed by Lewis Checked by	
Innovyze	Network 2020.1.3	

Online Controls for Storm

Hydro-Brake® Optimum Manhole: S12, DS/PN: S1.009, Volume (m³): 20.3

Unit Reference	MD-SHE-0090-4500-1700-4500	Sump Available	Yes
Design Head (m)	1.700	Diameter (mm)	90
Design Flow (l/s)	4.5	Invert Level (m)	45.510
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)	1.700	4.5	Kick-Flo®	0.806	3.2
Flush-Flo™	0.398	4.0	Mean Flow over Head Range	-	3.7

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	2.8	0.600	3.8	1.600	4.4	2.600	5.5	5.000	7.5	7.500	9.0
0.200	3.7	0.800	3.2	1.800	4.6	3.000	5.9	5.500	7.8	8.000	9.3
0.300	3.9	1.000	3.5	2.000	4.8	3.500	6.3	6.000	8.1	8.500	9.6
0.400	4.0	1.200	3.8	2.200	5.1	4.000	6.7	6.500	8.4	9.000	9.9
0.500	3.9	1.400	4.1	2.400	5.3	4.500	7.1	7.000	8.7	9.500	10.1