

East West Rail Phase 2

Compound A1 Drainage Schedule Summary

Discipline/Grip Stage: Drainage Detailed Design

Document Number: 133735_RW-EWR-XX-A1-SH-DH-001101

Rev B01




Notice

This Technical Note was produced by the Alliance for the specific purpose of the Alliance

This Technical Note may not be used by any person other than the Alliance without the Alliance's express permission. In any event, Alliance accepts no liability for any costs, liabilities or losses arising as a result of the use of or reliance upon the contents of this report by any person other than the Alliance.

Document History

Project Number: 133735			DOCUMENT REF: 133735_RW-EWR-XX-A1-SH-DH-001101		
Revision	Purpose and description	Originated	Checked	Reviewed	Date
B01	For issue to Local Planning Authority	R.Sastry	G.Aladakatti	A. Rose	29/10/2019
B02	For issue to Local Planning Authority	R Sastry	P Lawrence	A. Rose	11/02/2020

Atkins Global		Page 1
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions		Network 2018.1

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm A1.1

Pipe Sizes EWRP2 Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	Foul Sewage (l/s/ha)	0.000	Maximum Backdrop Height (m)	1.500
M5-60 (mm)	20.000	Volumetric Runoff Coeff.	0.750	Min Design Depth for Optimisation (m)	1.200
Ratio R	0.409	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 Inverts


Time Area Diagram for Storm A1.1 at outfall 1_A1.1_OF (pipe 1_A1.1_1.000)

Time Area
(mins) (ha)

0-4 0.000

Total Area Contributing (ha) = 0.000

Total Pipe Volume (m³) = 0.227

Atkins Global		Page 2
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions		Network 2018.1

Time Area Diagram at outfall 1_A1.1_24 (pipe 1_A1.1_2.009)


Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.397	4-8	0.468	8-12	0.495	12-16	0.091

Total Area Contributing (ha) = 1.451

Total Pipe Volume (m³) = 365.514

Network Design Table for Storm A1.1










« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1_A1.1_1.000	12.867	0.133	96.7	0.000	5.00	2.8	0.600		o	150	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)
1_A1.1_1.000	50.00	5.21	68.915	0.000	2.8	0.0	0.0	1.02	18.1	2.8

Network Design Table for Storm A1.1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1_A1.1_2.000	25.736	0.051	500.0	0.050	5.00	0.0	0.035	1	_/\	500	1:1 Ditch	
1_A1.1_2.001	28.847	0.157	183.7	0.029	0.00	0.0	0.035	1	_/\	500	1:1 Ditch	
1_A1.1_2.002	41.861	0.255	164.2	0.024	0.00	0.0	0.035	1	_/\	500	1:1 Ditch	
1_A1.1_2.003	43.092	0.664	64.9	0.152	0.00	0.0	0.035	1	_/\	500	1:1 Ditch	
1_A1.1_3.000	14.672	0.029	500.0	0.078	5.00	0.0	0.035	1	_/\	500	1:1 Ditch	
1_A1.1_3.001	15.297	0.031	500.0	0.156	0.00	0.0	0.035	1	_/\	500	1:1 Ditch	
1_A1.1_3.002	30.503	0.061	500.0	0.101	0.00	0.0	0.035	1	_/\	500	1:1 Ditch	
1_A1.1_3.003	17.876	0.036	500.0	0.001	0.00	0.0	0.035	1	_/\	500	1:1 Ditch	
1_A1.1_3.004	16.392	0.033	500.0	0.131	0.00	0.0	0.035	1	_/\	500	1:1 Ditch	

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)
1_A1.1_2.000	50.00	6.06	70.368	0.050	0.0	0.0	0.0	0.40	97.0	6.8
1_A1.1_2.001	50.00	6.78	70.317	0.079	0.0	0.0	0.0	0.67	160.1	10.7
1_A1.1_2.002	50.00	7.77	70.160	0.103	0.0	0.0	0.0	0.71	169.3	14.0
1_A1.1_2.003	50.00	8.41	69.905	0.255	0.0	0.0	0.0	1.12	269.3	34.5
1_A1.1_3.000	50.00	5.60	69.694	0.078	0.0	0.0	0.0	0.40	97.0	10.6
1_A1.1_3.001	50.00	6.24	69.665	0.235	0.0	0.0	0.0	0.40	97.0	31.8
1_A1.1_3.002	50.00	7.49	69.634	0.336	0.0	0.0	0.0	0.40	97.0	45.5
1_A1.1_3.003	50.00	8.23	69.573	0.337	0.0	0.0	0.0	0.40	97.0	45.7
1_A1.1_3.004	50.00	8.91	69.537	0.468	0.0	0.0	0.0	0.40	97.0	63.3

18th Fl, Tower C, Cyber Green Building
DLF Cyber City, DLF Phase - III
Gurgaon, Haryanan - 122 002, India / Tel. +911...

Date 11/02/2020 11:18

Designed by Rama Sastry

File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX

Checked by Paul Lawrence

XP Solutions

Network 2018.1









Network Design Table for Storm A1.1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1_A1.1_3.005	20.062	0.201	99.8	0.030	0.00	0.0	0.600		o	225	Pipe/Conduit	
1_A1.1_3.006	15.528	0.062	250.5	0.037	0.00	0.0		0.035	1 _/_	500	1:1 Ditch	
1_A1.1_2.004	58.198	0.116	501.7	0.035	0.00	0.0		0.035	1 _/_	500	1:1 Ditch	
1_A1.1_2.005	40.486	0.081	500.0	0.134	0.00	0.0		0.035	1 _/_	500	1:1 Ditch	
1_A1.1_2.006	2.882	0.029	99.4	0.000	0.00	0.0		0.035	1 _/_	500	1:1 Ditch	
1_A1.1_2.007	8.941	0.500	17.9	0.000	0.00	0.0		0.035	1 _/_	500	1:1 Ditch	
1_A1.1_4.000	12.680	0.025	500.0	0.121	5.00	0.0		0.035	1 _/_	500	1:1 Ditch	
1_A1.1_4.001	11.488	0.432	26.6	0.018	0.00	0.0		0.035	1 _/_	500	1:1 Ditch	

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)
1_A1.1_3.005	50.00	9.16	69.504	0.498	0.0	0.0	0.0	1.31	52.0«	67.5
1_A1.1_3.006	50.00	9.61	69.303	0.535	0.0	0.0	0.0	0.57	137.1	72.5
1_A1.1_2.004	50.00	12.02	69.241	0.825	0.0	0.0	0.0	0.40	96.9«	111.7
1_A1.1_2.005	50.00	13.69	69.125	0.959	0.0	0.0	0.0	0.40	97.0«	129.9
1_A1.1_2.006	50.00	13.74	69.044	0.959	0.0	0.0	0.0	0.91	217.6	129.9
1_A1.1_2.007	50.00	13.81	69.015	0.959	0.0	0.0	0.0	2.14	513.1	129.9
1_A1.1_4.000	50.00	5.52	69.752	0.121	0.0	0.0	0.0	0.40	97.0	16.4
1_A1.1_4.001	50.00	5.63	69.727	0.140	0.0	0.0	0.0	1.75	420.7	18.9

Network Design Table for Storm A1.1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1_A1.1_4.002	17.693	0.181	97.8	0.017	0.00	0.0	0.600		o	225	Pipe/Conduit	
1_A1.1_4.003	7.955	0.018	438.0	0.076	0.00	0.0	0.035	1 _/_/	500	1:1 Ditch		
1_A1.1_4.004	2.910	0.029	100.0	0.000	0.00	0.0	0.035	1 _/_/	500	1:1 Ditch		
1_A1.1_4.005	8.527	0.500	17.1	0.026	0.00	0.0	0.035	1 _/_/	500	1:1 Ditch		
1_A1.1_2.008	20.690	0.045	459.8	0.233	0.00	0.0	0.600		o	225	Pipe/Conduit	
1_A1.1_2.009	3.246	0.013	250.0	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)
1_A1.1_4.002	50.00	5.85	69.295	0.156	0.0	0.0	0.0	1.32	52.6	21.2
1_A1.1_4.003	50.00	6.16	69.114	0.233	0.0	0.0	0.0	0.43	103.7	31.5
1_A1.1_4.004	50.00	6.22	69.096	0.233	0.0	0.0	0.0	0.90	217.0	31.5
1_A1.1_4.005	50.00	6.28	69.067	0.259	0.0	0.0	0.0	2.19	525.4	35.1
1_A1.1_2.008	50.00	14.38	67.900	1.451	0.0	0.0	0.0	0.60	24.0<<	196.5
1_A1.1_2.009	50.00	14.47	67.859	1.451	0.0	0.0	0.0	0.63	11.2<<	196.5

Manhole Schedules for Storm A1.1

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
1_A1.1_1	69.415	0.500	Open Manhole	600	1_A1.1_1.000	68.915	150				
1_A1.1_OF	69.623	0.841	Open Manhole	0		OUTFALL		1_A1.1_1.000	68.782	150	
1_A1.1_2	70.868	0.500	Junction		1_A1.1_2.000	70.368	500				
1_A1.1_3	70.864	0.548	Junction		1_A1.1_2.001	70.317	500	1_A1.1_2.000	70.317	500	
1_A1.1_4	70.660	0.500	Junction		1_A1.1_2.002	70.160	500	1_A1.1_2.001	70.160	500	
1_A1.1_5	70.405	0.500	Junction		1_A1.1_2.003	69.905	500	1_A1.1_2.002	69.905	500	
1_A1.1_6	70.444	0.750	Junction		1_A1.1_3.000	69.694	500				
1_A1.1_7	70.456	0.791	Junction		1_A1.1_3.001	69.665	500	1_A1.1_3.000	69.665	500	
1_A1.1_8	70.525	0.891	Junction		1_A1.1_3.002	69.634	500	1_A1.1_3.001	69.634	500	
1_A1.1_9	70.626	1.053	Junction		1_A1.1_3.003	69.573	500	1_A1.1_3.002	69.573	500	
1_A1.1_10	70.622	1.085	Junction		1_A1.1_3.004	69.537	500	1_A1.1_3.003	69.537	500	
1_A1.1_11	70.507	1.003	Junction		1_A1.1_3.005	69.504	225	1_A1.1_3.004	69.504	500	
1_A1.1_12	70.212	0.909	Junction		1_A1.1_3.006	69.303	500	1_A1.1_3.005	69.303	225	
1_A1.1_13	70.091	0.850	Junction		1_A1.1_2.004	69.241	500	1_A1.1_2.003	69.241	500	
								1_A1.1_3.006	69.241	500	
1_A1.1_14	69.807	0.682	Junction		1_A1.1_2.005	69.125	500	1_A1.1_2.004	69.125	500	
1_A1.1_15	69.667	0.623	Junction		1_A1.1_2.006	69.044	500	1_A1.1_2.005	69.044	500	
1_A1.1_16	69.671	0.656	Junction		1_A1.1_2.007	69.015	500	1_A1.1_2.006	69.015	500	

Manhole Schedules for Storm A1.1

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
1_A1.1_17	70.252	0.500	Junction		1_A1.1_4.000	69.752	500				
1_A1.1_18	70.283	0.557	Junction		1_A1.1_4.001	69.727	500	1_A1.1_4.000	69.727	500	
1_A1.1_19	70.310	1.015	Junction		1_A1.1_4.002	69.295	225	1_A1.1_4.001	69.295	500	
1_A1.1_20	70.129	1.015	Junction		1_A1.1_4.003	69.114	500	1_A1.1_4.002	69.114	225	
1_A1.1_21	69.973	0.877	Junction		1_A1.1_4.004	69.096	500	1_A1.1_4.003	69.096	500	
1_A1.1_22	69.914	0.847	Junction		1_A1.1_4.005	69.067	500	1_A1.1_4.004	69.067	500	
1_A1.1_23D	69.402	1.502	Open Manhole	1200	1_A1.1_2.008	67.900	225	1_A1.1_2.007	68.515	500	690
								1_A1.1_4.005	68.567	500	742
1_A1.1_24	69.466	1.611	Open Manhole	1800	1_A1.1_2.009	67.859	150	1_A1.1_2.008	67.855	225	
1_A1.1_24	69.465	1.619	Open Manhole	600		OUTFALL		1_A1.1_2.009	67.846	150	

18th Fl, Tower C, Cyber Green Building
 DLF Cyber City, DLF Phase - III
 Gurgaon, Haryana - 122 002, India / Tel. +911...



Date 11/02/2020 11:18

Designed by Rama Sastry

File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX

Checked by Paul Lawrence








XP Solutions

Network 2018.1









Setting Out Information - True Coordinates (Storm A1.1)


PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
1_A1.1_1.000	1_A1.1_1	600		177252.501	141662.717	
1_A1.1_2.000	1_A1.1_2			177018.242	141645.694	
1_A1.1_2.001	1_A1.1_3			177023.008	141620.403	
1_A1.1_2.002	1_A1.1_4			177028.280	141592.043	
1_A1.1_2.003	1_A1.1_5			177068.129	141604.863	
1_A1.1_3.000	1_A1.1_6			177143.870	141726.332	
1_A1.1_3.001	1_A1.1_7			177134.989	141714.653	
1_A1.1_3.002	1_A1.1_8			177125.377	141702.753	

Setting Out Information - True Coordinates (Storm A1.1)



PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
1_A1.1_3.003	1_A1.1_9			177107.425	141678.093	
1_A1.1_3.004	1_A1.1_10			177092.909	141667.659	
1_A1.1_3.005	1_A1.1_11			177098.084	141652.106	
1_A1.1_3.006	1_A1.1_12			177104.325	141633.039	
1_A1.1_2.004	1_A1.1_13			177109.086	141618.259	
1_A1.1_2.005	1_A1.1_14			177164.375	141636.429	
1_A1.1_2.006	1_A1.1_15			177200.581	141654.547	
1_A1.1_2.007	1_A1.1_16			177202.317	141656.847	


Setting Out Information - True Coordinates (Storm A1.1)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
1_A1.1_4.000	1_A1.1_17			177169.906	141711.763	
1_A1.1_4.001	1_A1.1_18			177179.523	141703.498	
1_A1.1_4.002	1_A1.1_19			177180.383	141692.042	
1_A1.1_4.003	1_A1.1_20			177194.166	141680.948	
1_A1.1_4.004	1_A1.1_21			177199.245	141674.826	
1_A1.1_4.005	1_A1.1_22			177200.670	141672.288	
1_A1.1_2.008	1_A1.1_23D	1200		177205.445	141665.223	
1_A1.1_2.009	1_A1.1_24	1800		177225.458	141659.978	

Atkins Global		Page 11
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	


Setting Out Information - True Coordinates (Storm A1.1)

PN	DSMH Name	Dia/Len (mm)	Width (mm)	DS Easting (m)	DS Northing (m)	Layout (North)
1_A1.1_1.000	1_A1.1_OF	0		177264.971	141665.889	
1_A1.1_2.009	1_A1.1_24	600		177228.655	141660.542	

Atkins Global		Page 12
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryana - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	


Area Summary for Storm A1.1

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.000	0.000	0.000
2.000	Classification	Paved/Welfare Facilities	100	0.023	0.023	0.023
	Classification	Laydown (Granular)	50	0.047	0.023	0.046
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.009	0.004	0.050
2.001	Classification	Laydown (Granular)	50	0.052	0.026	0.026
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.005	0.003	0.029
2.002	Classification	Laydown (Granular)	50	0.037	0.019	0.019
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.011	0.006	0.024
2.003	Classification	Laydown (Granular)	50	0.216	0.108	0.108
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.009	0.004	0.112
	Classification	Paved/Welfare Facilities	100	0.040	0.040	0.152
3.000	Classification	Laydown (Granular)	50	0.009	0.005	0.005
	Classification	Paved/Welfare Facilities	100	0.065	0.065	0.070
	Classification	Laydown (Granular)	50	0.014	0.007	0.077
	Classification	Vegetation	15	0.006	0.001	0.078
	Classification	Vegetation	15	0.006	0.001	0.078
3.001	Classification	Laydown (Granular)	50	0.005	0.002	0.002
	Classification	Paved/Welfare Facilities	100	0.032	0.032	0.034
	Classification	Paved/Welfare Facilities	100	0.021	0.021	0.055
	Classification	Laydown (Granular)	50	0.016	0.008	0.063
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.124	0.062	0.125
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.062	0.031	0.156
3.002	Classification	Laydown (Granular)	50	0.009	0.004	0.004
	Classification	Paved/Welfare Facilities	100	0.022	0.022	0.027
	Classification	Paved/Welfare Facilities	100	0.033	0.033	0.060
	Classification	Laydown (Granular)	50	0.008	0.004	0.064
	Classification	Paved/Welfare Facilities	100	0.033	0.033	0.097

Atkins Global		Page 13
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryana - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions		Network 2018.1


Area Summary for Storm A1.1

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
	Classification	Laydown (Granular)	50	0.008	0.004	0.101
3.003	Classification	Laydown (Granular)	50	0.002	0.001	0.001
3.004	Classification	Topsoil Storage	40	0.016	0.006	0.006
	Classification	Paved/Welfare Facilities	100	0.093	0.093	0.100
	Classification	Laydown (Granular)	50	0.042	0.021	0.120
	Classification	Paved/Welfare Facilities	100	0.010	0.010	0.131
3.005	Classification	Topsoil Storage	40	0.076	0.030	0.030
3.006	Classification	Topsoil Storage	40	0.092	0.037	0.037
2.004	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.012	0.006	0.006
	Classification	Topsoil Storage	40	0.072	0.029	0.035
2.005	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.017	0.008	0.008
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.252	0.126	0.134
2.006	-	-	100	0.000	0.000	0.000
2.007	-	-	100	0.000	0.000	0.000
4.000	Classification	Laydown (Granular)	50	0.165	0.082	0.082
	Classification	Paved/Welfare Facilities	100	0.039	0.039	0.121
4.001	Classification	Laydown (Granular)	50	0.023	0.011	0.011
	Classification	Paved/Welfare Facilities	100	0.007	0.007	0.018
4.002	Classification	Laydown (Granular)	50	0.019	0.009	0.009
	Classification	Paved/Welfare Facilities	100	0.007	0.007	0.017
4.003	Classification	Paved/Welfare Facilities	100	0.076	0.076	0.076
4.004	-	-	100	0.000	0.000	0.000
4.005	Classification	Paved/Welfare Facilities	100	0.026	0.026	0.026
2.008	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.012	0.006	0.006
	Classification	Paved/Welfare Facilities	100	0.007	0.007	0.013
	Classification	Pond	100	0.058	0.058	0.071
	Classification	Pond	100	0.019	0.019	0.089

Atkins Global		Page 14
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	


Area Summary for Storm A1.1

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
	Classification		Pond 100	0.073	0.073	0.162
	Classification		Pond 100	0.070	0.070	0.233
2.009	-		- 100	0.000	0.000	0.000
				Total	Total	Total
				2.208	1.451	1.451

Atkins Global		Page 15
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions		Network 2018.1

Network Classifications for Storm A1.1

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
1_A1.1_1.000	1_A1.1_1	150	0.350	0.691	Unclassified	600	0	0.350	Unclassified
1_A1.1_2.000	1_A1.1_2	500	0.128	0.248	Unclassified				Junction
1_A1.1_2.001	1_A1.1_3	500	0.200	0.414	Unclassified				Junction
1_A1.1_2.002	1_A1.1_4	500	0.131	0.253	Unclassified				Junction
1_A1.1_2.003	1_A1.1_5	500	0.200	0.550	Unclassified				Junction
1_A1.1_3.000	1_A1.1_6	500	0.450	0.491	Unclassified				Junction
1_A1.1_3.001	1_A1.1_7	500	0.491	0.591	Unclassified				Junction
1_A1.1_3.002	1_A1.1_8	500	0.591	0.753	Unclassified				Junction
1_A1.1_3.003	1_A1.1_9	500	0.753	0.847	Unclassified				Junction
1_A1.1_3.004	1_A1.1_10	500	0.653	0.785	Unclassified				Junction
1_A1.1_3.005	1_A1.1_11	225	0.654	0.778	Unclassified				Junction
1_A1.1_3.006	1_A1.1_12	500	0.533	0.609	Unclassified				Junction
1_A1.1_2.004	1_A1.1_13	500	0.382	0.550	Unclassified				Junction
1_A1.1_2.005	1_A1.1_14	500	0.323	0.382	Unclassified				Junction
1_A1.1_2.006	1_A1.1_15	500	0.323	0.356	Unclassified				Junction
1_A1.1_2.007	1_A1.1_16	500	0.356	0.724	Unclassified				Junction
1_A1.1_4.000	1_A1.1_17	500	0.200	0.257	Unclassified				Junction
1_A1.1_4.001	1_A1.1_18	500	0.256	0.715	Unclassified				Junction
1_A1.1_4.002	1_A1.1_19	225	0.790	0.864	Unclassified				Junction
1_A1.1_4.003	1_A1.1_20	500	0.577	0.715	Unclassified				Junction
1_A1.1_4.004	1_A1.1_21	500	0.547	0.577	Unclassified				Junction
1_A1.1_4.005	1_A1.1_22	500	0.535	0.766	Unclassified				Junction
1_A1.1_2.008	1_A1.1_23D	225	1.277	1.496	Unclassified	1200	0	1.277	Unclassified
1_A1.1_2.009	1_A1.1_24	150	1.457	1.469	Unclassified	1800	0	1.457	Unclassified

Atkins Global		Page 16
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryana - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

Free Flowing Outfall Details for Storm A1.1

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1_A1.1_1.000	1_A1.1_OF	69.623	68.782	0.000	0	0

Free Flowing Outfall Details for Storm A1.1


Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1_A1.1_2.009	1_A1.1_24	69.465	67.846	0.000	600	0

Simulation Criteria for Storm A1.1

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)	1920
Hot Start Level (mm)	0	MADD Factor * 10m ³ /ha Storage	2.000	Output Interval (mins)	16
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 Return Period (years) 100 Region England and Wales

Atkins Global		Page 17
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

Synthetic Rainfall Details

M5-60 (mm) 20.000 Profile Type Winter Cv (Winter) 0.840
Ratio R 0.409 Cv (Summer) 0.750 Storm Duration (mins) 960


Atkins Global		Page 18
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryana - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

Online Controls for Storm A1.1

Pump Manhole: 1_A1.1_24, DS/PN: 1_A1.1_2.009, Volume (m³): 4.9

Invert Level (m) 67.859

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)
0.200	2.8000	0.600	2.8000	1.000	2.8000	1.400	2.8000	1.800	2.8000
0.400	2.8000	0.800	2.8000	1.200	2.8000	1.600	2.8000	2.000	2.8000


Atkins Global		Page 19
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryana - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

Storage Structures for Storm A1.1

Tank or Pond Manhole: 1_A1.1_23D, DS/PN: 1_A1.1_2.008

Invert Level (m) 67.900

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	364.0	1.500	732.0

Atkins Global		Page 20
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions		Network 2018.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.1

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 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) 20.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.409 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years) 1, 30, 50, 100
Climate Change (%) 10, 10, 10, 10

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Surcharged Flooded			Pipe Flow / Overflow Flow (1/s)	
									Level (m)	Depth (m)	Volume (m ³)		
1_A1.1_1.000	1_A1.1_1	720 Summer	1	+10%					68.956	-0.109	0.000	0.17	2.8
1_A1.1_2.000	1_A1.1_2	15 Winter	1	+10%					70.445	-0.423	0.000	0.03	7.6

Atkins Global		Page 21
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	


1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.1

PN	US/MH Name	Status	Level Exceeded
1_A1.1_1.000	1_A1.1_1	OK	
1_A1.1_2.000	1_A1.1_2	OK	

Atkins Global		Page 22
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	


1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.1

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap. (l/s)
1_A1.1_2.001	1_A1.1_3	15 Winter	1	+10%					70.382	-0.482	0.000	0.02
1_A1.1_2.002	1_A1.1_4	15 Winter	1	+10%					70.231	-0.429	0.000	0.03
1_A1.1_2.003	1_A1.1_5	15 Winter	1	+10%					69.994	-0.411	0.000	0.04
1_A1.1_3.000	1_A1.1_6	15 Winter	1	+10%					69.864	-0.580	0.000	0.02
1_A1.1_3.001	1_A1.1_7	15 Winter	1	+10%					69.859	-0.597	0.000	0.05
1_A1.1_3.002	1_A1.1_8	15 Winter	1	+10%					69.840	-0.685	0.000	0.04
1_A1.1_3.003	1_A1.1_9	15 Winter	1	+10%					69.783	-0.843	0.000	0.03
1_A1.1_3.004	1_A1.1_10	15 Winter	1	+10%					69.755	-0.867	0.000	0.04
1_A1.1_3.005	1_A1.1_11	15 Winter	1	+10%	30/15 Summer				69.716	-0.013	0.000	0.92
1_A1.1_3.006	1_A1.1_12	15 Winter	1	+10%					69.545	-0.667	0.000	0.04
1_A1.1_2.004	1_A1.1_13	15 Winter	1	+10%					69.530	-0.561	0.000	0.10
1_A1.1_2.005	1_A1.1_14	15 Winter	1	+10%					69.399	-0.408	0.000	0.16
1_A1.1_2.006	1_A1.1_15	15 Winter	1	+10%					69.216	-0.451	0.000	0.09
1_A1.1_2.007	1_A1.1_16	15 Winter	1	+10%					69.119	-0.552	0.000	0.04
1_A1.1_4.000	1_A1.1_17	15 Winter	1	+10%					69.871	-0.381	0.000	0.09
1_A1.1_4.001	1_A1.1_18	15 Winter	1	+10%					69.781	-0.502	0.000	0.02
1_A1.1_4.002	1_A1.1_19	15 Winter	1	+10%	30/15 Summer				69.399	-0.121	0.000	0.44
1_A1.1_4.003	1_A1.1_20	15 Winter	1	+10%					69.269	-0.860	0.000	0.03
1_A1.1_4.004	1_A1.1_21	15 Winter	1	+10%					69.198	-0.775	0.000	0.02
1_A1.1_4.005	1_A1.1_22	15 Winter	1	+10%					69.132	-0.782	0.000	0.01
1_A1.1_2.008	1_A1.1_23D	720 Winter	1	+10%	1/15 Winter	100/960 Winter			68.488	0.363	0.000	0.26
1_A1.1_2.009	1_A1.1_24	360 Winter	1	+10%	1/15 Summer				68.534	0.525	0.000	0.27

Atkins Global		Page 23
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions		Network 2018.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.1

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
1_A1.1_2.001	1_A1.1_3	11.0	OK	
1_A1.1_2.002	1_A1.1_4	13.5	OK	
1_A1.1_2.003	1_A1.1_5	31.1	OK	
1_A1.1_3.000	1_A1.1_6	11.2	OK	
1_A1.1_3.001	1_A1.1_7	28.9	OK	
1_A1.1_3.002	1_A1.1_8	39.2	OK	
1_A1.1_3.003	1_A1.1_9	37.0	OK	
1_A1.1_3.004	1_A1.1_10	47.9	OK	
1_A1.1_3.005	1_A1.1_11	48.0	OK*	
1_A1.1_3.006	1_A1.1_12	50.6	OK	
1_A1.1_2.004	1_A1.1_13	77.2	OK	
1_A1.1_2.005	1_A1.1_14	80.6	OK	
1_A1.1_2.006	1_A1.1_15	80.4	OK	
1_A1.1_2.007	1_A1.1_16	80.3	OK	
1_A1.1_4.000	1_A1.1_17	18.4	OK	
1_A1.1_4.001	1_A1.1_18	20.9	OK	
1_A1.1_4.002	1_A1.1_19	23.0	OK*	
1_A1.1_4.003	1_A1.1_20	32.5	OK	
1_A1.1_4.004	1_A1.1_21	32.3	OK	
1_A1.1_4.005	1_A1.1_22	35.6	OK	
1_A1.1_2.008	1_A1.1_23D	5.6	SURCHARGED	3
1_A1.1_2.009	1_A1.1_24	2.8	SURCHARGED	

Atkins Global		Page 24
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.1

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 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) 20.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.409 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years) 1, 30, 50, 100
Climate Change (%) 10, 10, 10, 10

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water			Flow / Overflow Cap.	Pipe Flow (l/s)
									Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)		
1_A1.1_1.000	1_A1.1_1	2160 Summer	30	+10%					68.956	-0.109	0.000	0.17	2.8
1_A1.1_2.000	1_A1.1_2	15 Winter	30	+10%					70.498	-0.370	0.000	0.07	18.6


Atkins Global		Page 25
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryana - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.1

PN	US/MH Name	Status	Level Exceeded
1_A1.1_1.000	1_A1.1_1	OK	
1_A1.1_2.000	1_A1.1_2	OK	


30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.1

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.
1_A1.1_2.001	1_A1.1_3	15 Winter	30	+10%					70.431	-0.433	0.000	0.05
1_A1.1_2.002	1_A1.1_4	15 Winter	30	+10%					70.286	-0.374	0.000	0.08
1_A1.1_2.003	1_A1.1_5	15 Winter	30	+10%					70.069	-0.336	0.000	0.12
1_A1.1_3.000	1_A1.1_6	15 Winter	30	+10%					70.092	-0.352	0.000	0.06
1_A1.1_3.001	1_A1.1_7	15 Winter	30	+10%					70.091	-0.365	0.000	0.14
1_A1.1_3.002	1_A1.1_8	15 Winter	30	+10%					70.089	-0.436	0.000	0.11
1_A1.1_3.003	1_A1.1_9	15 Winter	30	+10%					70.084	-0.542	0.000	0.06
1_A1.1_3.004	1_A1.1_10	15 Winter	30	+10%					70.082	-0.540	0.000	0.07
1_A1.1_3.005	1_A1.1_11	15 Winter	30	+10%	30/15 Summer				70.079	0.350	0.000	1.44
1_A1.1_3.006	1_A1.1_12	15 Winter	30	+10%					69.674	-0.538	0.000	0.06
1_A1.1_2.004	1_A1.1_13	15 Winter	30	+10%					69.667	-0.424	0.000	0.20
1_A1.1_2.005	1_A1.1_14	15 Winter	30	+10%					69.534	-0.273	0.000	0.35
1_A1.1_2.006	1_A1.1_15	15 Winter	30	+10%					69.308	-0.359	0.000	0.19
1_A1.1_2.007	1_A1.1_16	15 Winter	30	+10%					69.178	-0.493	0.000	0.09
1_A1.1_4.000	1_A1.1_17	15 Winter	30	+10%					69.953	-0.299	0.000	0.22
1_A1.1_4.001	1_A1.1_18	15 Winter	30	+10%					69.820	-0.463	0.000	0.04
1_A1.1_4.002	1_A1.1_19	15 Winter	30	+10%	30/15 Summer				69.594	0.074	0.000	1.08
1_A1.1_4.003	1_A1.1_20	15 Winter	30	+10%					69.381	-0.748	0.000	0.07
1_A1.1_4.004	1_A1.1_21	15 Winter	30	+10%					69.273	-0.700	0.000	0.04
1_A1.1_4.005	1_A1.1_22	15 Winter	30	+10%					69.178	-0.736	0.000	0.03
1_A1.1_2.008	1_A1.1_23D	1440 Winter	30	+10%	1/15 Winter	100/960 Winter			69.159	1.034	0.000	0.21
1_A1.1_2.009	1_A1.1_24	1440 Winter	30	+10%	1/15 Summer				69.179	1.170	0.000	0.27

Atkins Global		Page 27
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryana - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions		Network 2018.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.1

PN	US/MH Name	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1_A1.1_2.001	1_A1.1_3		28.3	OK	
1_A1.1_2.002	1_A1.1_4		35.3	OK	
1_A1.1_2.003	1_A1.1_5		88.2	OK	
1_A1.1_3.000	1_A1.1_6		27.3	OK	
1_A1.1_3.001	1_A1.1_7		76.4	OK	
1_A1.1_3.002	1_A1.1_8		98.9	OK	
1_A1.1_3.003	1_A1.1_9		63.5	OK	
1_A1.1_3.004	1_A1.1_10		80.1	OK	
1_A1.1_3.005	1_A1.1_11		75.2	SURCHARGED*	
1_A1.1_3.006	1_A1.1_12		79.1	OK	
1_A1.1_2.004	1_A1.1_13		157.4	OK	
1_A1.1_2.005	1_A1.1_14		172.3	FLOOD RISK*	
1_A1.1_2.006	1_A1.1_15		171.6	OK	
1_A1.1_2.007	1_A1.1_16		171.5	OK	
1_A1.1_4.000	1_A1.1_17		45.2	FLOOD RISK*	
1_A1.1_4.001	1_A1.1_18		52.2	OK	
1_A1.1_4.002	1_A1.1_19		56.9	SURCHARGED*	
1_A1.1_4.003	1_A1.1_20		83.3	OK	
1_A1.1_4.004	1_A1.1_21		83.1	OK	
1_A1.1_4.005	1_A1.1_22		92.2	OK	
1_A1.1_2.008	1_A1.1_23D		4.4	FLOOD RISK	3
1_A1.1_2.009	1_A1.1_24		2.8	FLOOD RISK	

Atkins Global		Page 28
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

50 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.1

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 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) 20.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.409 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years) 1, 30, 50, 100
Climate Change (%) 10, 10, 10, 10

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 / Overflow Flow	
									Level (m)	Depth (m)	Volume (m ³)		Flow / Cap. (l/s)
1_A1.1_1.000	1_A1.1_1	360 Winter	50	+10%					68.956	-0.109	0.000	0.17	2.8
1_A1.1_2.000	1_A1.1_2	15 Winter	50	+10%					70.506	-0.362	0.000	0.08	20.8


Atkins Global		Page 29
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

50 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.1

PN	US/MH Name	Status	Level Exceeded
1_A1.1_1.000	1_A1.1_1	OK	
1_A1.1_2.000	1_A1.1_2	OK	


50 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.1

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)	Flooded Volume (m ³)	Flow / Cap.
1_A1.1_2.001	1_A1.1_3	15 Winter	50	+10%					70.439	-0.425	0.000	0.06
1_A1.1_2.002	1_A1.1_4	15 Winter	50	+10%					70.295	-0.365	0.000	0.09
1_A1.1_2.003	1_A1.1_5	15 Winter	50	+10%					70.079	-0.326	0.000	0.14
1_A1.1_3.000	1_A1.1_6	15 Winter	50	+10%					70.141	-0.303	0.000	0.06
1_A1.1_3.001	1_A1.1_7	15 Winter	50	+10%					70.141	-0.315	0.000	0.16
1_A1.1_3.002	1_A1.1_8	15 Winter	50	+10%					70.139	-0.386	0.000	0.12
1_A1.1_3.003	1_A1.1_9	15 Winter	50	+10%					70.135	-0.491	0.000	0.06
1_A1.1_3.004	1_A1.1_10	15 Winter	50	+10%					70.133	-0.489	0.000	0.08
1_A1.1_3.005	1_A1.1_11	15 Winter	50	+10%	30/15 Summer				70.131	0.402	0.000	1.51
1_A1.1_3.006	1_A1.1_12	15 Winter	50	+10%					69.693	-0.519	0.000	0.06
1_A1.1_2.004	1_A1.1_13	15 Winter	50	+10%					69.685	-0.406	0.000	0.22
1_A1.1_2.005	1_A1.1_14	15 Winter	50	+10%					69.553	-0.254	0.000	0.38
1_A1.1_2.006	1_A1.1_15	15 Winter	50	+10%					69.320	-0.347	0.000	0.21
1_A1.1_2.007	1_A1.1_16	1440 Winter	50	+10%					69.273	-0.398	0.000	0.01
1_A1.1_4.000	1_A1.1_17	15 Winter	50	+10%					69.965	-0.287	0.000	0.25
1_A1.1_4.001	1_A1.1_18	15 Winter	50	+10%					69.826	-0.457	0.000	0.04
1_A1.1_4.002	1_A1.1_19	15 Winter	50	+10%	30/15 Summer				69.653	0.133	0.000	1.20
1_A1.1_4.003	1_A1.1_20	15 Winter	50	+10%					69.396	-0.733	0.000	0.08
1_A1.1_4.004	1_A1.1_21	15 Winter	50	+10%					69.282	-0.691	0.000	0.05
1_A1.1_4.005	1_A1.1_22	1440 Winter	50	+10%					69.273	-0.641	0.000	0.00
1_A1.1_2.008	1_A1.1_23D	1440 Winter	50	+10%	1/15 Winter	100/960 Winter			69.273	1.148	0.000	0.21
1_A1.1_2.009	1_A1.1_24	1440 Winter	50	+10%	1/15 Summer				69.281	1.272	0.000	0.27

Atkins Global		Page 31
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryana - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions		Network 2018.1

50 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.1

PN	US/MH Name	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1_A1.1_2.001	1_A1.1_3		31.5	OK	
1_A1.1_2.002	1_A1.1_4		39.3	OK	
1_A1.1_2.003	1_A1.1_5		98.2	OK	
1_A1.1_3.000	1_A1.1_6		30.3	OK	
1_A1.1_3.001	1_A1.1_7		84.3	OK	
1_A1.1_3.002	1_A1.1_8		107.3	OK	
1_A1.1_3.003	1_A1.1_9		65.2	OK	
1_A1.1_3.004	1_A1.1_10		85.0	OK	
1_A1.1_3.005	1_A1.1_11		78.5	SURCHARGED*	
1_A1.1_3.006	1_A1.1_12		82.7	OK	
1_A1.1_2.004	1_A1.1_13		171.4	OK	
1_A1.1_2.005	1_A1.1_14		188.4	FLOOD RISK*	
1_A1.1_2.006	1_A1.1_15		188.3	OK	
1_A1.1_2.007	1_A1.1_16		18.5	OK	
1_A1.1_4.000	1_A1.1_17		50.4	FLOOD RISK*	
1_A1.1_4.001	1_A1.1_18		58.3	OK	
1_A1.1_4.002	1_A1.1_19		63.0	SURCHARGED*	
1_A1.1_4.003	1_A1.1_20		91.3	OK	
1_A1.1_4.004	1_A1.1_21		91.4	OK	
1_A1.1_4.005	1_A1.1_22		5.0	OK	
1_A1.1_2.008	1_A1.1_23D		4.4	FLOOD RISK	3
1_A1.1_2.009	1_A1.1_24		2.8	FLOOD RISK	

Atkins Global		Page 32
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions		Network 2018.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.1

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 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) 20.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.409 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years) 1, 30, 50, 100
Climate Change (%) 10, 10, 10, 10

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 / Overflow Flow	
									Level (m)	Depth (m)	Volume (m ³)		Flow / Cap. (l/s)
1_A1.1_1.000	1_A1.1_1	360 Winter	100	+10%					68.956	-0.109	0.000	0.17	2.8
1_A1.1_2.000	1_A1.1_2	15 Winter	100	+10%					70.518	-0.350	0.000	0.09	24.1


Atkins Global		Page 33
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.1

PN	US/MH Name	Status	Level Exceeded
1_A1.1_1.000	1_A1.1_1	OK	
1_A1.1_2.000	1_A1.1_2	OK	


100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.1

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.
1_A1.1_2.001	1_A1.1_3	15 Winter	100	+10%					70.450	-0.414	0.000	0.07
1_A1.1_2.002	1_A1.1_4	15 Winter	100	+10%					70.307	-0.353	0.000	0.10
1_A1.1_2.003	1_A1.1_5	15 Winter	100	+10%					70.095	-0.310	0.000	0.16
1_A1.1_3.000	1_A1.1_6	30 Winter	100	+10%					70.219	-0.225	0.000	0.06
1_A1.1_3.001	1_A1.1_7	30 Winter	100	+10%					70.218	-0.238	0.000	0.14
1_A1.1_3.002	1_A1.1_8	30 Winter	100	+10%					70.216	-0.309	0.000	0.11
1_A1.1_3.003	1_A1.1_9	30 Winter	100	+10%					70.212	-0.414	0.000	0.06
1_A1.1_3.004	1_A1.1_10	30 Winter	100	+10%					70.210	-0.412	0.000	0.08
1_A1.1_3.005	1_A1.1_11	30 Winter	100	+10%	30/15 Summer				70.208	0.479	0.000	1.62
1_A1.1_3.006	1_A1.1_12	15 Winter	100	+10%					69.719	-0.493	0.000	0.07
1_A1.1_2.004	1_A1.1_13	15 Winter	100	+10%					69.713	-0.378	0.000	0.24
1_A1.1_2.005	1_A1.1_14	15 Winter	100	+10%					69.581	-0.226	0.000	0.43
1_A1.1_2.006	1_A1.1_15	1440 Winter	100	+10%					69.432	-0.235	0.000	0.02
1_A1.1_2.007	1_A1.1_16	1440 Winter	100	+10%					69.433	-0.238	0.000	0.01
1_A1.1_4.000	1_A1.1_17	15 Winter	100	+10%					69.983	-0.269	0.000	0.29
1_A1.1_4.001	1_A1.1_18	15 Winter	100	+10%					69.836	-0.447	0.000	0.05
1_A1.1_4.002	1_A1.1_19	15 Winter	100	+10%	30/15 Summer				69.744	0.224	0.000	1.36
1_A1.1_4.003	1_A1.1_20	1440 Winter	100	+10%					69.432	-0.697	0.000	0.00
1_A1.1_4.004	1_A1.1_21	1440 Winter	100	+10%					69.432	-0.541	0.000	0.00
1_A1.1_4.005	1_A1.1_22	1440 Winter	100	+10%					69.433	-0.481	0.000	0.00
1_A1.1_2.008	1_A1.1_23D	1440 Winter	100	+10%	1/15 Winter	100/960 Winter			69.433	1.308	22.397	0.26
1_A1.1_2.009	1_A1.1_24	1440 Winter	100	+10%	1/15 Summer				69.438	1.429	0.000	0.27

Atkins Global		Page 35
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:18 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions		Network 2018.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.1

PN	US/MH Name	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1_A1.1_2.001	1_A1.1_3		36.7	OK	
1_A1.1_2.002	1_A1.1_4		45.6	OK	
1_A1.1_2.003	1_A1.1_5		113.7	OK	
1_A1.1_3.000	1_A1.1_6		27.6	FLOOD RISK*	
1_A1.1_3.001	1_A1.1_7		72.9	FLOOD RISK*	
1_A1.1_3.002	1_A1.1_8		94.7	OK	
1_A1.1_3.003	1_A1.1_9		61.3	OK	
1_A1.1_3.004	1_A1.1_10		83.8	OK	
1_A1.1_3.005	1_A1.1_11		84.3	FLOOD RISK*	
1_A1.1_3.006	1_A1.1_12		87.8	OK	
1_A1.1_2.004	1_A1.1_13		192.6	OK	
1_A1.1_2.005	1_A1.1_14		213.7	FLOOD RISK*	
1_A1.1_2.006	1_A1.1_15		21.2	FLOOD RISK*	
1_A1.1_2.007	1_A1.1_16		21.2	FLOOD RISK*	
1_A1.1_4.000	1_A1.1_17		58.6	FLOOD RISK*	
1_A1.1_4.001	1_A1.1_18		68.1	OK	
1_A1.1_4.002	1_A1.1_19		71.4	SURCHARGED*	
1_A1.1_4.003	1_A1.1_20		5.1	OK	
1_A1.1_4.004	1_A1.1_21		5.1	OK	
1_A1.1_4.005	1_A1.1_22		5.7	OK	
1_A1.1_2.008	1_A1.1_23D		5.6	FLOOD	3
1_A1.1_2.009	1_A1.1_24		2.8	FLOOD RISK	

Atkins Global		Page 1
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm A1.2

Pipe Sizes EWRP2 Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	5	Foul Sewage (l/s/ha)	0.000	Maximum Backdrop Height (m)	1.500
M5-60 (mm)	20.000	Volumetric Runoff Coeff.	0.750	Min Design Depth for Optimisation (m)	1.200
Ratio R	0.409	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 Inverts


Time Area Diagram for Storm A1.2 at outfall 2_A1.2_OF (pipe 2_A1.2_1.000)

Time Area
(mins) (ha)

0-4 0.000

Total Area Contributing (ha) = 0.000

Total Pipe Volume (m³) = 0.122

Atkins Global		Page 2
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryana - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

Time Area Diagram at outfall 2_A1.2_17 (pipe 2_A1.2_2.006)


Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.339	4-8	0.165

Total Area Contributing (ha) = 0.505

Total Pipe Volume (m³) = 66.678

Network Design Table for Storm A1.2










« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
2_A1.2_1.000	6.913	0.328	21.1	0.000	5.00	1.5	0.600		o	150	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)
2_A1.2_1.000	50.00	5.05	69.779	0.000	1.5	0.0	0.0	2.20	38.9	1.5

Network Design Table for Storm A1.2





PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
2_A1.2_2.000	17.526	0.261	67.1	0.015	5.00	0.0		0.035	1 _/\	500	1:1 Ditch	
2_A1.2_2.001	15.121	0.208	72.7	0.015	0.00	0.0		0.035	1 _/\	500	1:1 Ditch	
2_A1.2_2.002	18.099	0.296	61.1	0.037	0.00	0.0		0.035	1 _/\	500	1:1 Ditch	
2_A1.2_2.003	25.082	0.120	209.0	0.000	0.00	0.0		0.035	1 _/\	500	1:1 Ditch	
2_A1.2_2.004	8.715	0.917	9.5	0.000	0.00	0.0		0.035	1 _/\	500	1:1 Ditch	
2_A1.2_3.000	10.798	0.022	500.0	0.078	5.00	0.0		0.035	1 _/\	500	1:1 Ditch	
2_A1.2_3.001	26.253	0.053	495.3	0.000	0.00	0.0		0.035	1 _/\	500	1:1 Ditch	
2_A1.2_3.002	17.600	0.312	56.4	0.082	0.00	0.0	0.600		o	225	Pipe/Conduit	
2_A1.2_3.003	19.822	0.323	61.4	0.095	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)
2_A1.2_2.000	50.00	5.26	70.733	0.015	0.0	0.0	0.0	1.10	264.8	2.0
2_A1.2_2.001	50.00	5.50	70.472	0.030	0.0	0.0	0.0	1.06	254.5	4.0
2_A1.2_2.002	50.00	5.76	70.264	0.067	0.0	0.0	0.0	1.16	277.5	9.1
2_A1.2_2.003	50.00	6.43	69.968	0.067	0.0	0.0	0.0	0.63	150.1	9.1
2_A1.2_2.004	50.00	6.48	69.848	0.067	0.0	0.0	0.0	2.76	558.9	9.1
2_A1.2_3.000	50.00	5.45	70.411	0.078	0.0	0.0	0.0	0.40	97.0	10.6
2_A1.2_3.001	50.00	6.52	70.389	0.078	0.0	0.0	0.0	0.41	97.5	10.6
2_A1.2_3.002	50.00	6.69	70.338	0.160	0.0	0.0	0.0	1.74	69.4	21.7
2_A1.2_3.003	50.00	6.89	69.904	0.255	0.0	0.0	0.0	1.67	66.5	34.6

Atkins Global		Page 4
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

Network Design Table for Storm A1.2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k	n	HYD SECT	DIA (mm)	Section Type	Auto Design
2_A1.2_3.004	20.685	0.041	500.0	0.076	0.00	0.0	0.600		o	300	Pipe/Conduit	
2_A1.2_3.005	9.024	0.874	10.3	0.019	0.00	0.0	0.600		o	225	Pipe/Conduit	
2_A1.2_2.005	10.951	0.022	500.0	0.087	0.00	0.0	0.600		o	225	Pipe/Conduit	
2_A1.2_2.006	1.871	0.007	264.0	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)
2_A1.2_3.004	50.00	7.38	69.581	0.332	0.0	0.0	0.0	0.70	49.2	44.9
2_A1.2_3.005	50.00	7.42	69.504	0.351	0.0	0.0	0.0	4.10	162.9	47.5
2_A1.2_2.005	50.00	7.74	68.431	0.505	0.0	0.0	0.0	0.58	23.0<<	68.3
2_A1.2_2.006	50.00	7.79	68.410	0.505	0.0	0.0	0.0	0.61	10.8<<	68.3

Manhole Schedules for Storm A1.2

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
2_A1.2_1	70.176	0.397	Open Manhole	600	2_A1.2_1.000	69.779	150				
2_A1.2_OF	70.141	0.690	Open Manhole	0		OUTFALL		2_A1.2_1.000	69.451	150	
2_A1.2_2	71.233	0.500	Junction		2_A1.2_2.000	70.733	500				
2_A1.2_3	70.972	0.500	Junction		2_A1.2_2.001	70.472	500	2_A1.2_2.000	70.472	500	
2_A1.2_4	70.764	0.500	Junction		2_A1.2_2.002	70.264	500	2_A1.2_2.001	70.264	500	
2_A1.2_5	70.468	0.500	Junction		2_A1.2_2.003	69.968	500	2_A1.2_2.002	69.968	500	
2_A1.2_6	70.113	0.265	Junction		2_A1.2_2.004	69.848	500	2_A1.2_2.003	69.848	500	
2_A1.2_7	70.911	0.500	Junction		2_A1.2_3.000	70.411	500				
2_A1.2_8	71.000	0.611	Junction		2_A1.2_3.001	70.389	500	2_A1.2_3.000	70.389	500	
2_A1.2_9	70.943	0.607	Junction		2_A1.2_3.002	70.338	225	2_A1.2_3.001	70.336	500	
2_A1.2_10	70.919	1.015	Junction		2_A1.2_3.003	69.904	225	2_A1.2_3.002	70.026	225	122
2_A1.2_11	70.596	1.015	Junction		2_A1.2_3.004	69.581	300	2_A1.2_3.003	69.581	225	
2_A1.2_12	70.347	0.843	Junction		2_A1.2_3.005	69.504	225	2_A1.2_3.004	69.540	300	36
2_A1.2_13D	69.931	1.500	Open Manhole	10000	2_A1.2_2.005	68.431	225	2_A1.2_2.004	68.931	500	575
								2_A1.2_3.005	68.630	225	274
2_A1.2_14	70.572	2.162	Open Manhole	1800	2_A1.2_2.006	68.410	150	2_A1.2_2.005	68.409	225	
2_A1.2_17	70.591	2.188	Open Manhole	0		OUTFALL		2_A1.2_2.006	68.403	150	

18th Fl, Tower C, Cyber Green Building
 DLF Cyber City, DLF Phase - III
 Gurgaon, Haryanan - 122 002, India / Tel. +911...



Date 11/02/2020 11:21

Designed by Rama Sastry

File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX

Checked by Paul Lawrence

XP Solutions


Network 2018.1

Setting Out Information - True Coordinates (Storm A1.2)


PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
2_A1.2_1.000	2_A1.2_1	600		176993.172	141747.667	
2_A1.2_2.000	2_A1.2_2			177051.449	141799.672	
2_A1.2_2.001	2_A1.2_3			177036.968	141809.544	
2_A1.2_2.002	2_A1.2_4			177025.750	141799.403	
2_A1.2_2.003	2_A1.2_5			177012.564	141787.005	
2_A1.2_2.004	2_A1.2_6			176994.785	141769.313	
2_A1.2_3.000	2_A1.2_7			177019.596	141661.665	
2_A1.2_3.001	2_A1.2_8			177017.193	141672.192	


Setting Out Information - True Coordinates (Storm A1.2)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Layout (North)
2_A1.2_3.002	2_A1.2_9			177011.405	141697.799	○
2_A1.2_3.003	2_A1.2_10			177007.227	141714.896	○
2_A1.2_3.004	2_A1.2_11			176999.152	141732.999	○
2_A1.2_3.005	2_A1.2_12			176993.541	141752.909	○
2_A1.2_2.005	2_A1.2_13D	10000		176990.869	141761.527	●
2_A1.2_2.006	2_A1.2_14	1800		177001.467	141758.770	●
PN	DSMH Name	Dia/Len (mm)	Width (mm)	DS Easting (m)	DS Northing (m)	Layout (North)
2_A1.2_1.000	2_A1.2_OF	0		176986.262	141747.458	●

Atkins Global		Page 8
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	


Setting Out Information - True Coordinates (Storm A1.2)

PN	DSMH Name	Dia/Len (mm)	Width (mm)	DS Easting (m)	DS Northing (m)	Layout (North)
2_A1.2_2.006	2_A1.2_17	0		177001.467	141756.898	

Atkins Global		Page 9
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	


Area Summary for Storm A1.2

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.000	0.000	0.000
2.000	Classification	Vegetation	15	0.033	0.005	0.005
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.004	0.002	0.007
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.003	0.001	0.008
	Classification	Vegetation	15	0.041	0.006	0.015
2.001	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.024	0.012	0.012
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.006	0.003	0.015
2.002	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.012	0.006	0.006
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.023	0.011	0.017
	Classification	Vegetation	15	0.026	0.004	0.021
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.032	0.016	0.037
2.003	-	-	100	0.000	0.000	0.000
2.004	-	-	100	0.000	0.000	0.000
3.000	Classification	Vegetation	15	0.014	0.002	0.002
	Classification	Paved/Welfare Facilities	100	0.026	0.026	0.028
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.053	0.026	0.054
	Classification	Paved/Welfare Facilities	100	0.000	0.000	0.055
	Classification	Paved/Welfare Facilities	100	0.000	0.000	0.055
	Classification	Paved/Welfare Facilities	100	0.005	0.005	0.060
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.034	0.017	0.078
	Classification	Paved/Welfare Facilities	100	0.001	0.001	0.078
3.001	-	-	100	0.000	0.000	0.000
3.002	Classification	Vegetation	15	0.014	0.002	0.002
	Classification	Paved/Welfare Facilities	100	0.015	0.015	0.018
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.038	0.019	0.037
	Classification	Paved/Welfare Facilities	100	0.019	0.019	0.056
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.052	0.026	0.082

Atkins Global		Page 10
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryana - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions		Network 2018.1

Area Summary for Storm A1.2

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
3.003	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.001	0.000	0.000
	Classification	Paved/Welfare Facilities	100	0.029	0.029	0.029
	Classification	Paved/Welfare Facilities	100	0.024	0.024	0.054
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.022	0.011	0.065
	Classification	Vegetation	15	0.007	0.001	0.066
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.053	0.026	0.092
	Classification	Paved/Welfare Facilities	100	0.001	0.001	0.093
	Classification	Paved/Welfare Facilities	100	0.003	0.003	0.095
3.004	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.098	0.049	0.049
	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.054	0.027	0.076
3.005	Classification	Granular Paved Areas (Walkways & Car Park)	50	0.038	0.019	0.019
2.005	Classification	Pond	100	0.049	0.049	0.049
	Classification	Pond	100	0.038	0.038	0.087
2.006	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.893	0.505	0.505


Atkins Global		Page 11
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryana - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions		Network 2018.1

Network Classifications for Storm A1.2

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
2_A1.2_1.000	2_A1.2_1	150	0.247	0.540	Unclassified	600	0	0.247	Unclassified
2_A1.2_2.000	2_A1.2_2	500	0.189	0.203	Unclassified				Junction
2_A1.2_2.001	2_A1.2_3	500	0.200	0.215	Unclassified				Junction
2_A1.2_2.002	2_A1.2_4	500	0.174	0.200	Unclassified				Junction
2_A1.2_2.003	2_A1.2_5	500	0.169	0.253	Unclassified				Junction
2_A1.2_2.004	2_A1.2_6	500	-0.035	0.700	Unclassified				Junction
2_A1.2_3.000	2_A1.2_7	500	0.200	0.311	Unclassified				Junction
2_A1.2_3.001	2_A1.2_8	500	0.188	0.311	Unclassified				Junction
2_A1.2_3.002	2_A1.2_9	225	0.376	0.668	Unclassified				Junction
2_A1.2_3.003	2_A1.2_10	225	0.788	0.790	Unclassified				Junction
2_A1.2_3.004	2_A1.2_11	300	0.495	0.715	Unclassified				Junction
2_A1.2_3.005	2_A1.2_12	225	0.543	1.001	Unclassified				Junction
2_A1.2_2.005	2_A1.2_13D	225	1.275	1.937	Unclassified	10000	0	1.275	Unclassified
2_A1.2_2.006	2_A1.2_14	150	2.012	2.038	Unclassified	1800	0	2.012	Unclassified

Free Flowing Outfall Details for Storm A1.2

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
2_A1.2_1.000	2_A1.2_OF	70.141	69.451	0.000	0	0

Atkins Global		Page 12
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryana - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

Free Flowing Outfall Details for Storm A1.2

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
2_A1.2_2.006	2_A1.2_17	70.591	68.403	0.000	0	0


Simulation Criteria for Storm A1.2

Volumetric Runoff Coeff	0.840	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	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)	1920
Hot Start Level (mm)	0	MADD Factor * 10m ³ /ha Storage	2.000	Output Interval (mins)	16

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)	20.000	Cv (Summer)	0.750
Return Period (years)	100	Ratio R	0.409	Cv (Winter)	0.840
Region	England and Wales	Profile Type	Winter Storm	Duration (mins)	960


Atkins Global		Page 13
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryana - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

Online Controls for Storm A1.2

Pump Manhole: 2_A1.2_14, DS/PN: 2_A1.2_2.006, Volume (m³): 5.7

Invert Level (m) 68.410

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)
0.200	1.5000	0.600	1.5000	1.000	1.5000	1.400	1.5000	1.800	1.5000
0.400	1.5000	0.800	1.5000	1.200	1.5000	1.600	1.5000	2.000	1.5000


Atkins Global		Page 14
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryana - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

Storage Structures for Storm A1.2

Tank or Pond Manhole: 2_A1.2_13D, DS/PN: 2_A1.2_2.005

Invert Level (m) 68.431

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	40.0	1.500	204.5

Atkins Global		Page 15
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions		Network 2018.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.2

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 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) 20.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.409 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years) 1, 30, 50, 100
Climate Change (%) 10, 10, 10, 10

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Surcharged Flooded			Pipe Flow / Overflow (l/s)	Pipe Flow (l/s)
									Level (m)	Depth (m)	Volume (m³)		
2_A1.2_1.000	2_A1.2_1	1440 Summer	1	+10%					69.799	-0.130	0.000	0.05	1.5
2_A1.2_2.000	2_A1.2_2	15 Winter	1	+10%					70.752	-0.481	0.000	0.00	2.2

Atkins Global		Page 16
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	


1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.2

PN	US/MH Name	Status	Level Exceeded
2_A1.2_1.000	2_A1.2_1	OK	
2_A1.2_2.000	2_A1.2_2	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.2


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)
									Level (m)	Depth (m)	Volume (m ³)		
2_A1.2_2.001	2_A1.2_3	15 Winter	1	+10%					70.500	-0.472	0.000	0.01	
2_A1.2_2.002	2_A1.2_4	15 Winter	1	+10%					70.306	-0.458	0.000	0.01	
2_A1.2_2.003	2_A1.2_5	15 Winter	1	+10%					70.028	-0.440	0.000	0.02	
2_A1.2_2.004	2_A1.2_6	15 Winter	1	+10%					69.872	-0.241	0.000	0.02	
2_A1.2_3.000	2_A1.2_7	15 Winter	1	+10%					70.513	-0.398	0.000	0.06	
2_A1.2_3.001	2_A1.2_8	15 Winter	1	+10%					70.487	-0.513	0.000	0.03	
2_A1.2_3.002	2_A1.2_9	15 Winter	1	+10%	50/15 Summer				70.425	-0.138	0.000	0.31	
2_A1.2_3.003	2_A1.2_10	15 Winter	1	+10%	30/15 Summer				70.018	-0.111	0.000	0.51	
2_A1.2_3.004	2_A1.2_11	15 Winter	1	+10%					69.816	-0.065	0.000	0.96	
2_A1.2_3.005	2_A1.2_12	15 Winter	1	+10%	100/240 Winter				69.595	-0.134	0.000	0.34	
2_A1.2_2.005	2_A1.2_13D	480 Winter	1	+10%	1/15 Summer				68.969	0.313	0.000	0.15	
2_A1.2_2.006	2_A1.2_14	480 Winter	1	+10%	1/15 Summer				68.967	0.407	0.000	0.14	

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
2_A1.2_2.001	2_A1.2_3	4.2	OK	
2_A1.2_2.002	2_A1.2_4	9.1	OK	
2_A1.2_2.003	2_A1.2_5	9.1	OK	
2_A1.2_2.004	2_A1.2_6	9.1	FLOOD RISK*	
2_A1.2_3.000	2_A1.2_7	11.7	OK	
2_A1.2_3.001	2_A1.2_8	11.5	OK	
2_A1.2_3.002	2_A1.2_9	21.7	OK*	

Atkins Global		Page 18
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.2

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
2_A1.2_3.003	2_A1.2_10	33.7	OK*	
2_A1.2_3.004	2_A1.2_11	42.9	OK*	
2_A1.2_3.005	2_A1.2_12	45.2	OK*	
2_A1.2_2.005	2_A1.2_13D	2.2	SURCHARGED	
2_A1.2_2.006	2_A1.2_14	1.5	SURCHARGED	

Atkins Global		Page 19
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions		Network 2018.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.2

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 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) 20.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.409 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years) 1, 30, 50, 100
Climate Change (%) 10, 10, 10, 10

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water			Pipe Flow / Overflow Flow	
									Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)		
2_A1.2_1.000	2_A1.2_1	2160 Summer	30	+10%					69.799	-0.130	0.000	0.05	1.5
2_A1.2_2.000	2_A1.2_2	15 Winter	30	+10%					70.765	-0.468	0.000	0.01	5.5

Atkins Global		Page 20
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	


30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.2

PN	US/MH Name	Status	Level Exceeded
2_A1.2_1.000	2_A1.2_1	OK	
2_A1.2_2.000	2_A1.2_2	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.2


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)
									Level (m)	Depth (m)	Volume (m ³)		
2_A1.2_2.001	2_A1.2_3	15 Winter	30	+10%					70.523	-0.449	0.000	0.02	
2_A1.2_2.002	2_A1.2_4	15 Winter	30	+10%					70.343	-0.421	0.000	0.04	
2_A1.2_2.003	2_A1.2_5	15 Winter	30	+10%					70.081	-0.387	0.000	0.07	
2_A1.2_2.004	2_A1.2_6	15 Winter	30	+10%					69.893	-0.220	0.000	0.05	
2_A1.2_3.000	2_A1.2_7	15 Winter	30	+10%					70.602	-0.309	0.000	0.14	
2_A1.2_3.001	2_A1.2_8	15 Winter	30	+10%					70.588	-0.412	0.000	0.06	
2_A1.2_3.002	2_A1.2_9	15 Winter	30	+10%	50/15 Summer				70.561	-0.002	0.000	0.76	
2_A1.2_3.003	2_A1.2_10	15 Winter	30	+10%	30/15 Summer				70.251	0.122	0.000	1.14	
2_A1.2_3.004	2_A1.2_11	60 Winter	30	+10%					69.881	0.000	0.000	1.42	
2_A1.2_3.005	2_A1.2_12	15 Winter	30	+10%	100/240 Winter				69.663	-0.066	0.000	0.84	
2_A1.2_2.005	2_A1.2_13D	720 Winter	30	+10%	1/15 Summer				69.602	0.946	0.000	0.16	
2_A1.2_2.006	2_A1.2_14	720 Winter	30	+10%	1/15 Summer				69.600	1.040	0.000	0.14	

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
2_A1.2_2.001	2_A1.2_3	11.6	OK	
2_A1.2_2.002	2_A1.2_4	26.6	OK	
2_A1.2_2.003	2_A1.2_5	26.5	OK	
2_A1.2_2.004	2_A1.2_6	26.6	FLOOD RISK*	
2_A1.2_3.000	2_A1.2_7	28.3	OK	
2_A1.2_3.001	2_A1.2_8	25.4	OK	
2_A1.2_3.002	2_A1.2_9	52.9	OK*	

Atkins Global		Page 22
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.2

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
2_A1.2_3.003	2_A1.2_10	75.8	SURCHARGED*	
2_A1.2_3.004	2_A1.2_11	63.5	SURCHARGED*	
2_A1.2_3.005	2_A1.2_12	110.4	OK*	
2_A1.2_2.005	2_A1.2_13D	2.5	SURCHARGED	
2_A1.2_2.006	2_A1.2_14	1.5	SURCHARGED	

Atkins Global		Page 23
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

50 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.2

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 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) 20.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.409 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years) 1, 30, 50, 100
Climate Change (%) 10, 10, 10, 10

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Surcharged Flooded			Pipe Flow (l/s)	
									Level (m)	Depth (m)	Volume (m ³)		Flow / Overflow Cap. (l/s)
2_A1.2_1.000	2_A1.2_1	360 Winter	50	+10%					69.799	-0.130	0.000	0.05	1.5
2_A1.2_2.000	2_A1.2_2	15 Winter	50	+10%					70.767	-0.466	0.000	0.01	6.1

Atkins Global		Page 24
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	


50 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.2

PN	US/MH Name	Status	Level Exceeded
2_A1.2_1.000	2_A1.2_1	OK	
2_A1.2_2.000	2_A1.2_2	OK	

50 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.2


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Flow / Overflow (l/s)
									Level (m)	Depth (m)	Volume (m ³)	
2_A1.2_2.001	2_A1.2_3	15 Winter	50	+10%					70.526	-0.446	0.000	0.02
2_A1.2_2.002	2_A1.2_4	15 Winter	50	+10%					70.348	-0.416	0.000	0.04
2_A1.2_2.003	2_A1.2_5	15 Winter	50	+10%					70.088	-0.380	0.000	0.07
2_A1.2_2.004	2_A1.2_6	15 Winter	50	+10%					69.896	-0.217	0.000	0.05
2_A1.2_3.000	2_A1.2_7	15 Winter	50	+10%					70.637	-0.274	0.000	0.15
2_A1.2_3.001	2_A1.2_8	15 Winter	50	+10%					70.629	-0.371	0.000	0.07
2_A1.2_3.002	2_A1.2_9	15 Winter	50	+10%	50/15 Summer				70.614	0.051	0.000	0.82
2_A1.2_3.003	2_A1.2_10	30 Winter	50	+10%	30/15 Summer				70.251	0.122	0.000	1.11
2_A1.2_3.004	2_A1.2_11	60 Winter	50	+10%					69.881	0.000	0.000	1.58
2_A1.2_3.005	2_A1.2_12	720 Winter	50	+10%	100/240 Winter				69.711	-0.018	0.000	0.09
2_A1.2_2.005	2_A1.2_13D	720 Winter	50	+10%	1/15 Summer				69.710	1.054	0.000	0.16
2_A1.2_2.006	2_A1.2_14	720 Winter	50	+10%	1/15 Summer				69.708	1.148	0.000	0.14

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
2_A1.2_2.001	2_A1.2_3	12.9	OK	
2_A1.2_2.002	2_A1.2_4	29.8	OK	
2_A1.2_2.003	2_A1.2_5	29.6	OK	
2_A1.2_2.004	2_A1.2_6	29.7	FLOOD RISK*	
2_A1.2_3.000	2_A1.2_7	30.8	FLOOD RISK*	
2_A1.2_3.001	2_A1.2_8	26.5	OK	
2_A1.2_3.002	2_A1.2_9	56.8	SURCHARGED*	

Atkins Global		Page 26
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

50 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.2

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
2_A1.2_3.003	2_A1.2_10	73.7	SURCHARGED*	
2_A1.2_3.004	2_A1.2_11	70.9	SURCHARGED*	
2_A1.2_3.005	2_A1.2_12	11.7	OK*	
2_A1.2_2.005	2_A1.2_13D	2.4	FLOOD RISK	
2_A1.2_2.006	2_A1.2_14	1.5	SURCHARGED	

Atkins Global		Page 27
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.2

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 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) 20.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.409 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years) 1, 30, 50, 100
Climate Change (%) 10, 10, 10, 10

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	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)
2_A1.2_1.000	2_A1.2_1	360 Winter	100	+10%					69.799	-0.130	0.000	0.05	1.5
2_A1.2_2.000	2_A1.2_2	15 Winter	100	+10%					70.770	-0.463	0.000	0.01	7.1

Atkins Global		Page 28
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	


100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.2

PN	US/MH Name	Status	Level Exceeded
2_A1.2_1.000	2_A1.2_1	OK	
2_A1.2_2.000	2_A1.2_2	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.2

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded	Flow / Overflow (l/s)
									Level (m)	Depth (m)	Volume (m ³)	
2_A1.2_2.001	2_A1.2_3	15 Winter	100	+10%					70.531	-0.441	0.000	0.02
2_A1.2_2.002	2_A1.2_4	15 Winter	100	+10%					70.356	-0.408	0.000	0.05
2_A1.2_2.003	2_A1.2_5	15 Winter	100	+10%					70.100	-0.368	0.000	0.08
2_A1.2_2.004	2_A1.2_6	15 Winter	100	+10%					69.901	-0.212	0.000	0.06
2_A1.2_3.000	2_A1.2_7	15 Winter	100	+10%					70.710	-0.201	0.000	0.17
2_A1.2_3.001	2_A1.2_8	15 Winter	100	+10%					70.706	-0.294	0.000	0.07
2_A1.2_3.002	2_A1.2_9	15 Winter	100	+10%	50/15 Summer				70.700	0.137	0.000	0.88
2_A1.2_3.003	2_A1.2_10	15 Winter	100	+10%	30/15 Summer				70.251	0.122	0.000	1.24
2_A1.2_3.004	2_A1.2_11	15 Winter	100	+10%					69.881	0.000	0.000	2.64
2_A1.2_3.005	2_A1.2_12	960 Winter	100	+10%	100/240 Winter				69.840	0.111	0.000	0.08
2_A1.2_2.005	2_A1.2_13D	960 Winter	100	+10%	1/15 Summer				69.870	1.214	0.000	0.15
2_A1.2_2.006	2_A1.2_14	960 Winter	100	+10%	1/15 Summer				69.868	1.308	0.000	0.14

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
2_A1.2_2.001	2_A1.2_3	15.0	OK	
2_A1.2_2.002	2_A1.2_4	34.6	OK	
2_A1.2_2.003	2_A1.2_5	34.0	OK	
2_A1.2_2.004	2_A1.2_6	34.2	FLOOD RISK*	
2_A1.2_3.000	2_A1.2_7	34.6	FLOOD RISK*	
2_A1.2_3.001	2_A1.2_8	28.5	FLOOD RISK*	
2_A1.2_3.002	2_A1.2_9	61.0	FLOOD RISK*	

Atkins Global		Page 30
18th Fl, Tower C, Cyber Green Building DLF Cyber City, DLF Phase - III Gurgaon, Haryanan - 122 002, India / Tel. +911...		
Date 11/02/2020 11:21 File 133735_RW-EWR-XX-XX-M2-DH-001102.MDX	Designed by Rama Sastry Checked by Paul Lawrence	
XP Solutions	Network 2018.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm A1.2

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
2_A1.2_3.003	2_A1.2_10	82.7	SURCHARGED*	
2_A1.2_3.004	2_A1.2_11	118.4	SURCHARGED*	
2_A1.2_3.005	2_A1.2_12	10.8	SURCHARGED*	
2_A1.2_2.005	2_A1.2_13D	2.2	FLOOD RISK	
2_A1.2_2.006	2_A1.2_14	1.5	SURCHARGED	