

Atkins (Epsom)		Page 1
Woodcote Grove	CORK NORTH WEST	
Ashley Road, Epsom	REGENERATION QUARTER	
Surrey, KT18 5BW	PHASE 3B DRAINAGE DESIGN	
Date 13/08/2021 15:44	Designed by JK	
File Phase 3B Drainage Design Model Rev2 - Upd...	Checked by MK	
Innovyze	Network 2018.1	

FOUL SEWERAGE DESIGN

Design Criteria for Foul - Main

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.00	Domestic (l/s/ha)	0.00	Maximum Backdrop Height (m)	1.600
Industrial Peak Flow Factor	0.00	Domestic Peak Flow Factor	6.00	Min Design Depth for Optimisation (m)	1.200
Calculation Method	BS 8301	Add Flow / Climate Change (%)	10	Min Vel for Auto Design only (m/s)	0.75
Frequency Factor	0.00	Minimum Backdrop Height (m)	0.650	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.000	25.052	0.512	48.9	0.000	112.0	0.0	1.500	o	225	Pipe/Conduit	
F1.001	76.492	1.620	47.2	0.000	182.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.000	124.952	0.000	0.0	112.0	0.4	40	0.94	1.64	65.3	4.4
F1.001	124.440	0.000	0.0	294.0	0.5	45	1.02	1.67	66.5	5.7

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.002	67.466	1.055	63.9	0.000	168.0	0.0	1.500	o	225	Pipe/Conduit	
F2.000	61.699	1.100	56.1	0.000	154.0	0.0	1.500	o	225	Pipe/Conduit	
F1.003	29.947	0.499	60.0	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F1.004	17.355	0.289	60.1	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F1.005	12.882	0.215	59.9	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F3.000	36.532	0.285	128.2	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit	
F3.001	44.460	0.539	82.5	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.002	122.820	0.000	0.0	462.0	0.6	52	0.96	1.44	57.1	6.6
F2.000	122.485	0.000	0.0	154.0	0.4	43	0.91	1.53	61.0	4.8
F1.003	120.985	0.000	0.0	658.0	0.7	54	1.01	1.48	59.0	7.5
F1.004	120.486	0.000	0.0	700.0	0.7	55	1.02	1.48	59.0	7.7
F1.005	118.775	0.000	0.0	742.0	0.7	55	1.03	1.48	59.0	7.8
F3.000	121.751	0.000	0.0	98.0	0.4	50	0.66	1.01	40.3	4.3
F3.001	120.530	0.000	0.0	140.0	0.4	46	0.79	1.26	50.3	4.7

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Network Design Table for Foul - Main

PN	Length	Fall	Slope	Area	Units	Base	k	HYD	DIA	Section Type	Auto Design
	(m)	(m)	(1:X)	(ha)		Flow (l/s)	(mm)	SECT	(mm)		
F3.002	8.216	0.198	41.5	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F3.003	16.974	0.268	63.3	0.000	28.0	0.0	1.500	o	225	Pipe/Conduit	
F3.004	34.519	0.777	44.4	0.000	70.0	0.0	1.500	o	225	Pipe/Conduit	
F1.006	61.036	0.763	80.0	0.000	126.0	0.0	1.500	o	225	Pipe/Conduit	
F4.000	53.673	1.579	34.0	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit	
F5.000	36.460	1.053	34.6	0.000	126.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F3.002	119.991	0.000	0.0	140.0	0.4	39	1.00	1.78	71.0	4.7
F3.003	119.793	0.000	0.0	168.0	0.4	45	0.88	1.44	57.4	4.9
F3.004	119.325	0.000	0.0	238.0	0.5	43	1.03	1.72	68.6	5.4
F1.006	118.560	0.000	0.0	1106.0	0.8	65	0.97	1.28	51.1	9.3
F4.000	119.376	0.000	0.0	140.0	0.4	37	1.08	1.97	78.4	4.7
F5.000	118.850	0.000	0.0	126.0	0.4	37	1.06	1.95	77.7	4.6

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.007	38.376	0.203	189.0	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit	
F1.008	14.168	0.075	189.0	0.000	28.0	0.0	1.500	o	225	Pipe/Conduit	
F1.009	19.050	0.314	60.7	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	
F6.000	46.044	1.993	23.1	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit	
F1.010	25.575	1.174	21.8	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F1.011	38.723	1.291	30.0	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit	
F1.012	21.189	0.918	23.1	0.000	112.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.007	117.797	0.000	0.0	1470.0	1.0	88	0.74	0.83	33.1	10.6
F1.008	117.594	0.000	0.0	1498.0	1.0	88	0.74	0.83	33.1	10.7
F1.009	117.519	0.000	0.0	1582.0	1.0	66	1.13	1.48	58.7	11.0
F6.000	119.198	0.000	0.0	98.0	0.4	33	1.20	2.39	95.2	4.3
F1.010	117.205	0.000	0.0	1736.0	1.0	52	1.65	2.47	98.0	11.5
F1.011	114.862	0.000	0.0	1876.0	1.1	58	1.49	2.10	83.5	12.0
F1.012	113.571	0.000	0.0	1988.0	1.1	55	1.65	2.39	95.2	12.4

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F7.000	50.261	1.140	44.1	0.000	182.0	0.0	1.500	o	225	Pipe/Conduit	
F7.001	22.860	0.523	43.7	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F8.000	29.693	1.188	25.0	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	
F8.001	21.057	0.880	23.9	0.000	28.0	0.0	1.500	o	225	Pipe/Conduit	
F7.002	10.927	0.380	28.8	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F7.003	16.379	0.199	82.3	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F9.000	74.944	1.500	50.0	0.000	168.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F7.000	117.060	0.000	0.0	182.0	0.5	41	1.00	1.73	68.8	5.0
F7.001	115.920	0.000	0.0	224.0	0.5	42	1.02	1.74	69.1	5.3
F8.000	117.778	0.000	0.0	84.0	0.4	33	1.16	2.30	91.5	4.2
F8.001	116.590	0.000	0.0	112.0	0.4	34	1.20	2.35	93.5	4.4
F7.002	115.397	0.000	0.0	392.0	0.6	41	1.25	2.15	85.3	6.2
F7.003	115.017	0.000	0.0	392.0	0.6	54	0.86	1.27	50.3	6.2
F9.000	116.631	0.000	0.0	168.0	0.4	42	0.96	1.63	64.7	4.9

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F7.004	17.208	0.319	53.9	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F7.005	27.110	0.559	48.5	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F7.006	23.807	0.749	31.8	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F7.007	15.194	0.576	26.4	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.013	32.780	0.998	32.8	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.014	53.685	2.868	18.7	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.015	38.476	1.977	19.5	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.016	14.946	0.217	68.9	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F7.004	114.818	0.000	0.0	560.0	0.6	51	1.04	1.56	62.2	7.0
F7.005	114.499	0.000	0.0	616.0	0.7	51	1.09	1.65	65.6	7.3
F7.006	113.940	0.000	0.0	672.0	0.7	46	1.28	2.04	81.1	7.5
F7.007	113.191	0.000	0.0	672.0	0.7	44	1.36	2.24	89.1	7.5
F1.013	112.398	0.000	0.0	2660.0	1.3	65	1.53	2.01	79.8	14.7
F1.014	111.400	0.000	0.0	2660.0	1.3	57	1.87	2.66	105.8	14.7
F1.015	108.532	0.000	0.0	2660.0	1.3	57	1.85	2.61	103.7	14.7
F1.016	106.555	0.000	0.0	2660.0	1.3	79	1.17	1.38	55.0	14.7

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
F10.000	19.564	0.444	44.1	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit		
F10.001	9.895	0.043	230.1	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit		
F10.002	47.831	0.846	56.5	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit		
F11.000	33.614	0.300	112.0	0.000	70.0	0.0	1.500	o	225	Pipe/Conduit		
F10.003	50.148	0.218	230.0	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit		
F10.004	11.170	0.274	40.8	0.000	112.0	0.0	1.500	o	225	Pipe/Conduit		

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F10.000	127.178	0.000	0.0	56.0	0.3	36	0.93	1.73	68.9	3.8
F10.001	126.734	0.000	0.0	112.0	0.4	58	0.54	0.75	30.0	4.4
F10.002	126.691	0.000	0.0	196.0	0.5	44	0.93	1.53	60.8	5.1
F11.000	124.940	0.000	0.0	70.0	0.4	46	0.68	1.08	43.1	4.0
F10.003	124.640	0.000	0.0	364.0	0.6	69	0.59	0.76	30.0	6.1
F10.004	124.422	0.000	0.0	476.0	0.6	46	1.13	1.80	71.6	6.7

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
F12.000	43.766	0.337	129.9	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit		
F10.005	14.526	0.063	230.6	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit		
F13.000	53.006	1.287	41.2	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit		
F10.006	26.123	0.773	33.8	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit		
F14.000	30.265	0.609	49.7	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit		
F14.001	40.185	0.470	85.5	0.000	28.0	0.0	1.500	o	225	Pipe/Conduit		

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F12.000	123.403	0.000	0.0	84.0	0.4	49	0.65	1.01	40.0	4.2
F10.005	123.066	0.000	0.0	560.0	0.6	74	0.62	0.75	30.0	7.0
F13.000	124.687	0.000	0.0	140.0	0.4	39	1.01	1.79	71.2	4.7
F10.006	123.003	0.000	0.0	700.0	0.7	47	1.25	1.98	78.7	7.7
F14.000	123.128	0.000	0.0	42.0	0.3	36	0.87	1.63	64.8	3.6
F14.001	122.519	0.000	0.0	70.0	0.4	43	0.74	1.24	49.4	4.0

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow	k (l/s)	HYD SECT	DIA (mm)	Section	Type	Auto Design
F14.002	11.638	0.051	228.2	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit		
F10.007	8.368	0.065	128.7	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit		
F10.008	16.352	0.136	120.2	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit		
F10.009	7.745	0.052	150.0	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit		
F10.010	37.683	0.238	158.3	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit		
F10.011	15.389	0.103	150.0	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit		
F15.000	32.579	0.652	50.0	0.000	70.0	0.0	1.500	o	225	Pipe/Conduit		
F15.001	20.070	0.313	64.1	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit		

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F14.002	121.895	0.000	0.0	70.0	0.4	56	0.53	0.76	30.1	4.0
F10.007	121.844	0.000	0.0	770.0	0.7	68	0.79	1.01	40.2	7.9
F10.008	121.779	0.000	0.0	812.0	0.7	67	0.81	1.05	41.6	8.1
F10.009	120.902	0.000	0.0	896.0	0.8	73	0.76	0.94	37.2	8.5
F10.010	120.850	0.000	0.0	896.0	0.8	74	0.74	0.91	36.2	8.5
F10.011	120.612	0.000	0.0	980.0	0.8	74	0.77	0.94	37.2	8.8
F15.000	126.400	0.000	0.0	70.0	0.4	38	0.90	1.63	64.7	4.0
F15.001	125.748	0.000	0.0	154.0	0.4	44	0.87	1.43	57.0	4.8

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F15.002	37.225	0.417	89.3	0.000	70.0	0.0	1.500	o	225	Pipe/Conduit		
F15.003	55.603	2.224	25.0	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit		
F10.012	57.904	1.298	44.6	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit		
F10.013	18.116	0.150	120.8	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit		
F16.000	61.195	1.550	39.5	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit		
F16.001	91.057	2.147	42.4	0.000	168.0	0.0	1.500	o	225	Pipe/Conduit		
F16.002	53.970	1.146	47.1	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit		
F16.003	10.580	0.195	54.3	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit		

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F15.002	124.043	0.000	0.0	224.0	0.5	50	0.80	1.22	48.3	5.3
F15.003	122.733	0.000	0.0	308.0	0.5	38	1.28	2.30	91.5	5.8
F10.012	120.509	0.000	0.0	1428.0	0.9	59	1.24	1.72	68.4	10.4
F10.013	119.211	0.000	0.0	1470.0	1.0	78	0.87	1.04	41.5	10.6
F16.000	138.169	0.000	0.0	140.0	0.4	39	1.02	1.83	72.8	4.7
F16.001	136.619	0.000	0.0	308.0	0.5	44	1.06	1.77	70.2	5.8
F16.002	134.472	0.000	0.0	406.0	0.6	47	1.05	1.68	66.6	6.3
F16.003	133.326	0.000	0.0	406.0	0.6	48	1.00	1.56	62.0	6.3

Atkins (Epsom)		Page 11
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Ashley Road, Epsom	REGENERATION QUARTER	
Surrey, KT18 5BW	PHASE 3B DRAINAGE DESIGN	
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Innovyze	Network 2018.1	

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
F17.000	47.840	1.139	42.0	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit		
F17.001	12.568	0.327	38.4	0.000	70.0	0.0	1.500	o	225	Pipe/Conduit		
F17.002	34.100	0.941	36.2	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit		
F16.004	44.125	0.956	46.2	0.000	126.0	0.0	1.500	o	225	Pipe/Conduit		
F16.005	9.847	0.245	40.2	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit		
F18.000	81.012	1.879	43.1	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit		

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F17.000	135.538	0.000	0.0	84.0	0.4	37	0.97	1.77	70.5	4.2
F17.001	134.399	0.000	0.0	154.0	0.4	39	1.04	1.85	73.7	4.8
F17.002	134.072	0.000	0.0	210.0	0.5	40	1.09	1.91	76.0	5.2
F16.004	133.131	0.000	0.0	742.0	0.7	52	1.13	1.69	67.3	7.8
F16.005	132.175	0.000	0.0	742.0	0.7	50	1.19	1.81	72.1	7.8
F18.000	133.809	0.000	0.0	140.0	0.4	40	0.99	1.75	69.6	4.7

Atkins (Epsom)		Page 12
Woodcoste Grove	CORK NORTH WEST	
Ashley Road, Epsom	REGENERATION QUARTER	
Surrey, KT18 5BW	PHASE 3B DRAINAGE DESIGN	
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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
F16.006	54.400	1.520	35.8	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit		
F19.000	20.394	0.160	127.5	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit		
F19.001	45.624	0.236	193.3	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit		
F16.007	32.879	0.143	229.9	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit		
F20.000	33.373	0.757	44.1	0.000	126.0	0.0	1.500	o	225	Pipe/Conduit		
F20.001	39.429	1.069	36.9	0.000	196.0	0.0	1.500	o	225	Pipe/Conduit		

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F16.006	131.410	0.000	0.0	966.0	0.8	51	1.28	1.92	76.4	8.7
F19.000	130.086	0.000	0.0	42.0	0.3	45	0.62	1.02	40.4	3.6
F19.001	129.926	0.000	0.0	140.0	0.4	57	0.58	0.82	32.8	4.7
F16.007	129.690	0.000	0.0	1190.0	0.9	87	0.67	0.76	30.0	9.6
F20.000	132.893	0.000	0.0	126.0	0.4	39	0.98	1.73	68.8	4.6
F20.001	132.136	0.000	0.0	322.0	0.5	43	1.12	1.89	75.3	5.9

Atkins (Epsom)		Page 13
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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F16.008	68.767	1.507	45.6	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F16.009	24.484	0.163	150.0	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F16.010	10.235	0.341	30.0	0.000	14.0	0.0	1.500	o	225	Pipe/Conduit	
F16.011	5.442	0.181	30.0	0.000	14.0	0.0	1.500	o	225	Pipe/Conduit	
F21.000	30.192	1.006	30.0	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F21.001	30.192	1.006	30.0	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F16.012	9.377	0.313	30.0	0.000	14.0	0.0	1.500	o	225	Pipe/Conduit	
F16.013	10.682	0.356	30.0	0.000	14.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F16.008	129.547	0.000	0.0	1568.0	1.0	61	1.25	1.70	67.7	10.9
F16.009	128.040	0.000	0.0	1610.0	1.0	84	0.82	0.94	37.2	11.1
F16.010	127.877	0.000	0.0	1624.0	1.0	56	1.46	2.10	83.5	11.1
F16.011	127.536	0.000	0.0	1638.0	1.0	56	1.46	2.10	83.5	11.2
F21.000	130.767	0.000	0.0	56.0	0.3	33	1.06	2.10	83.5	3.8
F21.001	128.361	0.000	0.0	56.0	0.3	33	1.06	2.10	83.5	3.8
F16.012	126.256	0.000	0.0	1708.0	1.0	56	1.47	2.10	83.5	11.4
F16.013	125.943	0.000	0.0	1722.0	1.0	56	1.47	2.10	83.5	11.5

Atkins (Epsom)		Page 14
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Ashley Road, Epsom	REGENERATION QUARTER	
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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow	k (l/s)	HYD SECT	DIA (mm)	Section	Type	Auto Design
F16.014	28.570	0.952	30.0	0.000	70.0	0.0	1.500	o	225	Pipe/Conduit		
F16.015	54.739	0.550	99.5	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit		
F16.016	17.366	0.600	28.9	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit		

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F16.014	125.587	0.000	0.0	1792.0	1.1	57	1.48	2.10	83.5	11.7
F16.015	124.635	0.000	0.0	1890.0	1.1	79	0.97	1.15	45.8	12.1
F16.016	124.085	0.000	0.0	1974.0	1.1	58	1.53	2.14	85.0	12.4

Manhole Schedules for Foul - Main

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)	
F1	126.377	1.425	Open Manhole	1200	F1.000	124.952	225				
F2	125.865	1.425	Open Manhole	1200	F1.001	124.440	225	F1.000	124.440	225	
F3	124.198	1.378	Open Manhole	1200	F1.002	122.820	225	F1.001	122.820	225	
F4	124.304	1.819	Open Manhole	1200	F2.000	122.485	225				
F5	123.189	2.204	Open Manhole	1200	F1.003	120.985	225	F1.002	121.765	225	780
								F2.000	121.385	225	400
F6	122.339	1.853	Open Manhole	1200	F1.004	120.486	225	F1.003	120.486	225	
F8	121.819	3.044	Open Manhole	1200	F1.005	118.775	225	F1.004	120.197	225	1422
F9A	123.176	1.425	Open Manhole	1200	F3.000	121.751	225				
F9	123.651	3.121	Open Manhole	1200	F3.001	120.530	225	F3.000	121.466	225	936
F10	121.416	1.425	Open Manhole	1200	F3.002	119.991	225	F3.001	119.991	225	
F11	121.218	1.425	Open Manhole	1200	F3.003	119.793	225	F3.002	119.793	225	
F12	120.950	1.625	Open Manhole	1200	F3.004	119.325	225	F3.003	119.525	225	200
F13	121.436	2.888	Open Manhole	1200	F1.006	118.560	225	F1.005	118.560	225	
								F3.004	118.548	225	
F14	123.017	3.641	Open Manhole	1200	F4.000	119.376	225				
F15A	120.275	1.425	Open Manhole	1200	F5.000	118.850	225				
F15	120.002	2.205	Open Manhole	1200	F1.007	117.797	225	F1.006	117.797	225	
								F4.000	117.797	225	

Manhole Schedules for Foul - Main

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out Invert Level (m) Diameter (mm)			Pipes In Invert Level (m) Diameter (mm)			Backdrop (mm)
F16	119.535	1.941	Open Manhole	1200	F1.008	117.594	225	F5.000	117.797	225	1169
F17	119.404	1.885	Open Manhole	1200	F1.009	117.519	225	F1.007	117.594	225	
F18	121.926	2.728	Open Manhole	1200	F6.000	119.198	225	F1.008	117.519	225	
F19	119.288	2.083	Open Manhole	1200	F1.010	117.205	225	F1.009	117.205	225	
F20	117.879	3.017	Open Manhole	1200	F1.011	114.862	225	F6.000	117.205	225	
F21	115.446	1.875	Open Manhole	1200	F1.012	113.571	225	F1.010	116.031	225	
F22	119.308	2.248	Open Manhole	1200	F7.000	117.060	225	F1.011	113.571	225	
F23	117.495	1.575	Open Manhole	1200	F7.001	115.920	225	F7.000	115.920	225	
F24	119.884	2.106	Open Manhole	1200	F8.000	117.778	225				
F25	118.016	1.426	Open Manhole	1200	F8.001	116.590	225	F8.000	116.590	225	
F26	117.093	1.696	Open Manhole	1200	F7.002	115.397	225	F7.001	115.397	225	313
F27	116.755	1.738	Open Manhole	1200	F7.003	115.017	225	F8.001	115.710	225	
F28	118.056	1.425	Open Manhole	1200	F9.000	116.631	225	F7.002	115.017	225	
F29	116.641	1.823	Open Manhole	1200	F7.004	114.818	225	F7.003	114.818	225	313
								F9.000	115.131	225	
F30	116.237	1.738	Open Manhole	1200	F7.005	114.499	225	F7.004	114.499	225	

Manhole Schedules for Foul - Main

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)
F53	126.418	1.731	Open Manhole	1200	F13.000	124.687	225				
F54	124.851	1.848	Open Manhole	1200	F10.006	123.003	225	F10.005	123.003	225	
								F13.000	123.400	225	397
F55	124.553	1.425	Open Manhole	1200	F14.000	123.128	225				
F56	123.944	1.425	Open Manhole	1200	F14.001	122.519	225	F14.000	122.519	225	
F57	123.474	1.579	Open Manhole	1200	F14.002	121.895	225	F14.001	122.049	225	154
F58	123.633	1.789	Open Manhole	1200	F10.007	121.844	225	F10.006	122.230	225	386
								F14.002	121.844	225	
F59	123.344	1.565	Open Manhole	1200	F10.008	121.779	225	F10.007	121.779	225	
F60	122.954	2.052	Open Manhole	1200	F10.009	120.902	225	F10.008	121.643	225	741
F60	122.802	1.952	Open Manhole	1200	F10.010	120.850	225	F10.009	120.850	225	
F61	122.177	1.565	Open Manhole	1200	F10.011	120.612	225	F10.010	120.612	225	
F62	129.273	2.873	Open Manhole	1200	F15.000	126.400	225				
F63	127.603	1.855	Open Manhole	1200	F15.001	125.748	225	F15.000	125.748	225	
F64	126.550	2.507	Open Manhole	1200	F15.002	124.043	225	F15.001	125.435	225	1392
F65	125.680	2.947	Open Manhole	1200	F15.003	122.733	225	F15.002	123.626	225	893
F65	122.672	2.163	Open Manhole	1200	F10.012	120.509	225	F10.011	120.509	225	
								F15.003	120.509	225	
F66	120.654	1.443	Open Manhole	1200	F10.013	119.211	225	F10.012	119.211	225	

Manhole Schedules for Foul - Main

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)
F15	134.330	1.437	Open Manhole	1200	F20.000	132.893	225				
F16	133.595	1.459	Open Manhole	1200	F20.001	132.136	225	F20.000	132.136	225	
F17	132.498	2.951	Open Manhole	1200	F16.008	129.547	225	F16.007	129.547	225	
								F20.001	131.067	225	1520
F19	129.475	1.435	Open Manhole	1200	F16.009	128.040	225	F16.008	128.040	225	
F20	129.508	1.631	Open Manhole	1200	F16.010	127.877	225	F16.009	127.877	225	
F21	129.163	1.628	Open Manhole	1200	F16.011	127.536	225	F16.010	127.536	225	
F22	134.139	3.372	Open Manhole	1200	F21.000	130.767	225				
F22A	131.952	3.591	Open Manhole	1200	F21.001	128.361	225	F21.000	129.761	225	1400
F23	128.909	2.653	Open Manhole	1200	F16.012	126.256	225	F16.011	127.355	225	1099
								F21.001	127.355	225	1099
F24	128.343	2.400	Open Manhole	1200	F16.013	125.943	225	F16.012	125.943	225	
F25	127.698	2.111	Open Manhole	1200	F16.014	125.587	225	F16.013	125.587	225	
F26	126.046	1.411	Open Manhole	1200	F16.015	124.635	225	F16.014	124.635	225	
F27	125.622	1.537	Open Manhole	1200	F16.016	124.085	225	F16.015	124.085	225	
F38	125.569	2.084	Open Manhole	1200		OUTFALL		F16.016	123.485	225	

Atkins (Epsom)		Page 21
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PIPELINE SCHEDULES for Foul - Main

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)
F1.000	o	225	F1	126.377	124.952	1.200	Open Manhole	1200
F1.001	o	225	F2	125.865	124.440	1.200	Open Manhole	1200
F1.002	o	225	F3	124.198	122.820	1.153	Open Manhole	1200
F2.000	o	225	F4	124.304	122.485	1.594	Open Manhole	1200
F1.003	o	225	F5	123.189	120.985	1.979	Open Manhole	1200
F1.004	o	225	F6	122.339	120.486	1.628	Open Manhole	1200
F1.005	o	225	F8	121.819	118.775	2.819	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)
F1.000	25.052	48.9	F2	125.865	124.440	1.200	Open Manhole	1200
F1.001	76.492	47.2	F3	124.198	122.820	1.153	Open Manhole	1200
F1.002	67.466	63.9	F5	123.189	121.765	1.199	Open Manhole	1200
F2.000	61.699	56.1	F5	123.189	121.385	1.579	Open Manhole	1200
F1.003	29.947	60.0	F6	122.339	120.486	1.628	Open Manhole	1200
F1.004	17.355	60.1	F8	121.819	120.197	1.397	Open Manhole	1200
F1.005	12.882	59.9	F13	121.436	118.560	2.651	Open Manhole	1200

Atkins (Epsom)		Page 22
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PIPELINE SCHEDULES for Foul - Main

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)
F3.000	o	225	F9A	123.176	121.751	1.200	Open Manhole	1200
F3.001	o	225	F9	123.651	120.530	2.896	Open Manhole	1200
F3.002	o	225	F10	121.416	119.991	1.200	Open Manhole	1200
F3.003	o	225	F11	121.218	119.793	1.200	Open Manhole	1200
F3.004	o	225	F12	120.950	119.325	1.400	Open Manhole	1200
F1.006	o	225	F13	121.436	118.560	2.651	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)
F3.000	36.532	128.2	F9	123.651	121.466	1.960	Open Manhole	1200
F3.001	44.460	82.5	F10	121.416	119.991	1.200	Open Manhole	1200
F3.002	8.216	41.5	F11	121.218	119.793	1.200	Open Manhole	1200
F3.003	16.974	63.3	F12	120.950	119.525	1.200	Open Manhole	1200
F3.004	34.519	44.4	F13	121.436	118.548	2.663	Open Manhole	1200
F1.006	61.036	80.0	F15	120.002	117.797	1.980	Open Manhole	1200

Atkins (Epsom)		Page 23
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN	
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PIPELINE SCHEDULES for Foul - Main

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)
F4.000	o	225	F14	123.017	119.376	3.416	Open Manhole	1200
F5.000	o	225	F15A	120.275	118.850	1.200	Open Manhole	1200
F1.007	o	225	F15	120.002	117.797	1.980	Open Manhole	1200
F1.008	o	225	F16	119.535	117.594	1.716	Open Manhole	1200
F1.009	o	225	F17	119.404	117.519	1.660	Open Manhole	1200
F6.000	o	225	F18	121.926	119.198	2.503	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)
F4.000	53.673	34.0	F15	120.002	117.797	1.980	Open Manhole	1200
F5.000	36.460	34.6	F15	120.002	117.797	1.980	Open Manhole	1200
F1.007	38.376	189.0	F16	119.535	117.594	1.716	Open Manhole	1200
F1.008	14.168	189.0	F17	119.404	117.519	1.660	Open Manhole	1200
F1.009	19.050	60.7	F19	119.288	117.205	1.858	Open Manhole	1200
F6.000	46.044	23.1	F19	119.288	117.205	1.858	Open Manhole	1200

Atkins (Epsom)		Page 25
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN	
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File Phase 3B Drainage Design Model Rev2 - Upd...	Checked by MK	
Innovyze	Network 2018.1	

PIPELINE SCHEDULES for Foul - Main

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)
F8.001	o	225	F25	118.016	116.590	1.201	Open Manhole	1200
F7.002	o	225	F26	117.093	115.397	1.471	Open Manhole	1200
F7.003	o	225	F27	116.755	115.017	1.513	Open Manhole	1200
F9.000	o	225	F28	118.056	116.631	1.200	Open Manhole	1200
F7.004	o	225	F29	116.641	114.818	1.598	Open Manhole	1200
F7.005	o	225	F30	116.237	114.499	1.513	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)
F8.001	21.057	23.9	F26	117.093	115.710	1.158	Open Manhole	1200
F7.002	10.927	28.8	F27	116.755	115.017	1.513	Open Manhole	1200
F7.003	16.379	82.3	F29	116.641	114.818	1.598	Open Manhole	1200
F9.000	74.944	50.0	F29	116.641	115.131	1.285	Open Manhole	1200
F7.004	17.208	53.9	F30	116.237	114.499	1.513	Open Manhole	1200
F7.005	27.110	48.5	F31	115.678	113.940	1.513	Open Manhole	1200

Atkins (Epsom)		Page 26
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN	
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Innovyze	Network 2018.1	

PIPELINE SCHEDULES for Foul - Main

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)
F7.006	o	225	F31	115.678	113.940	1.513	Open Manhole	1200
F7.007	o	225	F32	114.929	113.191	1.513	Open Manhole	1200
F1.013	o	225	F33	114.353	112.398	1.730	Open Manhole	1200
F1.014	o	225	F34	113.050	111.400	1.425	Open Manhole	1200
F1.015	o	225	F35	109.957	108.532	1.200	Open Manhole	1200
F1.016	o	225	F36	107.980	106.555	1.200	Open Manhole	1200
F10.000	o	225	F45	128.959	127.178	1.556	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)
F7.006	23.807	31.8	F32	114.929	113.191	1.513	Open Manhole	1200
F7.007	15.194	26.4	F33	114.353	112.615	1.513	Open Manhole	1200
F1.013	32.780	32.8	F34	113.050	111.400	1.425	Open Manhole	1200
F1.014	53.685	18.7	F35	109.957	108.532	1.200	Open Manhole	1200
F1.015	38.476	19.5	F36	107.980	106.555	1.200	Open Manhole	1200
F1.016	14.946	68.9	FEx CMH	107.530	106.338	0.967	Open Manhole	0
F10.000	19.564	44.1	F46	128.536	126.734	1.577	Open Manhole	1200

Atkins (Epsom)		Page 28
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN	
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PIPELINE SCHEDULES for Foul - Main

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
F10.005	o	225	F52	125.561	123.066	2.270	Open Manhole		1200
F13.000	o	225	F53	126.418	124.687	1.506	Open Manhole		1200
F10.006	o	225	F54	124.851	123.003	1.623	Open Manhole		1200
F14.000	o	225	F55	124.553	123.128	1.200	Open Manhole		1200
F14.001	o	225	F56	123.944	122.519	1.200	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)	I*W
F10.005	14.526	230.6	F54	124.851	123.003	1.623	Open Manhole		1200
F13.000	53.006	41.2	F54	124.851	123.400	1.226	Open Manhole		1200
F10.006	26.123	33.8	F58	123.633	122.230	1.178	Open Manhole		1200
F14.000	30.265	49.7	F56	123.944	122.519	1.200	Open Manhole		1200
F14.001	40.185	85.5	F57	123.474	122.049	1.200	Open Manhole		1200

Atkins (Epsom)		Page 29
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN	
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PIPELINE SCHEDULES for Foul - Main

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)
F14.002	o	225	F57	123.474	121.895	1.354	Open Manhole	1200
F10.007	o	225	F58	123.633	121.844	1.564	Open Manhole	1200
F10.008	o	225	F59	123.344	121.779	1.340	Open Manhole	1200
F10.009	o	225	F60	122.954	120.902	1.827	Open Manhole	1200
F10.010	o	225	F60	122.802	120.850	1.727	Open Manhole	1200
F10.011	o	225	F61	122.177	120.612	1.340	Open Manhole	1200
F15.000	o	225	F62	129.273	126.400	2.648	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)
F14.002	11.638	228.2	F58	123.633	121.844	1.564	Open Manhole	1200
F10.007	8.368	128.7	F59	123.344	121.779	1.340	Open Manhole	1200
F10.008	16.352	120.2	F60	122.954	121.643	1.086	Open Manhole	1200
F10.009	7.745	150.0	F60	122.802	120.850	1.727	Open Manhole	1200
F10.010	37.683	158.3	F61	122.177	120.612	1.340	Open Manhole	1200
F10.011	15.389	150.0	F65	122.672	120.509	1.937	Open Manhole	1200
F15.000	32.579	50.0	F63	127.603	125.748	1.630	Open Manhole	1200

Atkins (Epsom)		Page 30
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN	
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PIPELINE SCHEDULES for Foul - Main

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)
F15.001	o	225	F63	127.603	125.748	1.630	Open Manhole	1200
F15.002	o	225	F64	126.550	124.043	2.282	Open Manhole	1200
F15.003	o	225	F65	125.680	122.733	2.722	Open Manhole	1200
F10.012	o	225	F65	122.672	120.509	1.938	Open Manhole	1200
F10.013	o	225	F66	120.654	119.211	1.218	Open Manhole	1200
F16.000	o	225	F2	140.458	138.169	2.064	Open Manhole	1200
F16.001	o	225	F3	138.044	136.619	1.200	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)
F15.001	20.070	64.1	F64	126.550	125.435	0.890	Open Manhole	1200
F15.002	37.225	89.3	F65	125.680	123.626	1.829	Open Manhole	1200
F15.003	55.603	25.0	F65	122.672	120.509	1.938	Open Manhole	1200
F10.012	57.904	44.6	F66	120.654	119.211	1.218	Open Manhole	1200
F10.013	18.116	120.8	F70	120.652	119.061	1.366	Open Manhole	1200
F16.000	61.195	39.5	F3	138.044	136.619	1.200	Open Manhole	1200
F16.001	91.057	42.4	F4	135.897	134.472	1.200	Open Manhole	1200

Atkins (Epsom)		Page 31
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN	
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File Phase 3B Drainage Design Model Rev2 - Upd...	Checked by MK	
Innovyze	Network 2018.1	

PIPELINE SCHEDULES for Foul - Main

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)
F16.002	o	225	F4	135.897	134.472	1.200	Open Manhole	1200
F16.003	o	225	F5	134.751	133.326	1.200	Open Manhole	1200
F17.000	o	225	F6	136.963	135.538	1.200	Open Manhole	1200
F17.001	o	225	F7	135.961	134.399	1.337	Open Manhole	1200
F17.002	o	225	F8	135.497	134.072	1.200	Open Manhole	1200
F16.004	o	225	F9	134.556	133.131	1.200	Open Manhole	1200
F16.005	o	225	F10	133.600	132.175	1.200	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)
F16.002	53.970	47.1	F5	134.751	133.326	1.200	Open Manhole	1200
F16.003	10.580	54.3	F9	134.556	133.131	1.200	Open Manhole	1200
F17.000	47.840	42.0	F7	135.961	134.399	1.337	Open Manhole	1200
F17.001	12.568	38.4	F8	135.497	134.072	1.200	Open Manhole	1200
F17.002	34.100	36.2	F9	134.556	133.131	1.200	Open Manhole	1200
F16.004	44.125	46.2	F10	133.600	132.175	1.200	Open Manhole	1200
F16.005	9.847	40.2	F11	133.355	131.930	1.200	Open Manhole	1200

Atkins (Epsom)		Page 32
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN	
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Innovyze	Network 2018.1	

PIPELINE SCHEDULES for Foul - Main

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
F18.000	o	225	F1	135.234	133.809	1.200	Open Manhole		1200
F16.006	o	225	F11	133.355	131.410	1.720	Open Manhole		1200
F19.000	o	225	F12	131.487	130.086	1.176	Open Manhole		1200
F19.001	o	225	F13	131.426	129.926	1.275	Open Manhole		1200
F16.007	o	225	F14	131.620	129.690	1.705	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
F18.000	81.012	43.1	F11	133.355	131.930	1.200	Open Manhole		1200
F16.006	54.400	35.8	F14	131.620	129.890	1.505	Open Manhole		1200
F19.000	20.394	127.5	F13	131.426	129.926	1.275	Open Manhole		1200
F19.001	45.624	193.3	F14	131.620	129.690	1.705	Open Manhole		1200
F16.007	32.879	229.9	F17	132.498	129.547	2.726	Open Manhole		1200

Atkins (Epsom)		Page 33
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN	
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Innovyze	Network 2018.1	

PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd	Diam	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	Sect	(mm)	Name	(m)	(m)	(m)	Connection	(mm)
F20.000	o	225	F15	134.330	132.893	1.212	Open Manhole	1200
F20.001	o	225	F16	133.595	132.136	1.234	Open Manhole	1200
F16.008	o	225	F17	132.498	129.547	2.726	Open Manhole	1200
F16.009	o	225	F19	129.475	128.040	1.210	Open Manhole	1200
F16.010	o	225	F20	129.508	127.877	1.406	Open Manhole	1200
F16.011	o	225	F21	129.163	127.536	1.402	Open Manhole	1200

Downstream Manhole

PN	Length	Slope	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	(m)	(1:X)	Name	(m)	(m)	(m)	Connection	(mm)
F20.000	33.373	44.1	F16	133.595	132.136	1.234	Open Manhole	1200
F20.001	39.429	36.9	F17	132.498	131.067	1.206	Open Manhole	1200
F16.008	68.767	45.6	F19	129.475	128.040	1.210	Open Manhole	1200
F16.009	24.484	150.0	F20	129.508	127.877	1.406	Open Manhole	1200
F16.010	10.235	30.0	F21	129.163	127.536	1.403	Open Manhole	1200
F16.011	5.442	30.0	F23	128.909	127.355	1.329	Open Manhole	1200

Atkins (Epsom)		Page 34
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN	
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Innovyze	Network 2018.1	

PIPELINE SCHEDULES for Foul - Main

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)
F21.000	o	225	F22	134.139	130.767	3.147	Open Manhole	1200
F21.001	o	225	F22A	131.952	128.361	3.366	Open Manhole	1200
F16.012	o	225	F23	128.909	126.256	2.428	Open Manhole	1200
F16.013	o	225	F24	128.343	125.943	2.175	Open Manhole	1200
F16.014	o	225	F25	127.698	125.587	1.886	Open Manhole	1200
F16.015	o	225	F26	126.046	124.635	1.186	Open Manhole	1200
F16.016	o	225	F27	125.622	124.085	1.312	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)
F21.000	30.192	30.0	F22A	131.952	129.761	1.966	Open Manhole	1200
F21.001	30.192	30.0	F23	128.909	127.355	1.329	Open Manhole	1200
F16.012	9.377	30.0	F24	128.343	125.943	2.174	Open Manhole	1200
F16.013	10.682	30.0	F25	127.698	125.587	1.886	Open Manhole	1200
F16.014	28.570	30.0	F26	126.046	124.635	1.186	Open Manhole	1200
F16.015	54.739	99.5	F27	125.622	124.085	1.312	Open Manhole	1200
F16.016	17.366	28.9	F38	125.569	123.485	1.859	Open Manhole	1200

Atkins (Epsom)		Page 35
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN	
Date 13/08/2021 15:44	Designed by JK	
File Phase 3B Drainage Design Model Rev2 - Upd...	Checked by MK	
Innovyze	Network 2018.1	

Free Flowing Outfall Details for Foul - Main

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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F1.016	FEx CMH	107.530	106.338	106.335	0	0
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Free Flowing Outfall Details for Foul - Main

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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F10.013	F70	120.652	119.061	0.000	1200	0
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Free Flowing Outfall Details for Foul - Main

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

F16.016	F38	125.569	123.485	0.000	1200	0
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Atkins (Epsom)		Page 36
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN	
Date 13/08/2021 15:44	Designed by JK	
File Phase 3B Drainage Design Model Rev2 - Upd...	Checked by MK	
Innovyze	Network 2018.1	
Simulation Criteria for Foul - Main Volumetric Runoff Coeff 0.750 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) 60 Hot Start Level (mm) 0 MADD Factor * 10m³/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 0 Number of Storage Structures 0 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.750 Return Period (years) 2 Ratio R 0.238 Cv (Winter) 0.840 Region Scotland and Ireland Profile Type Summer Storm Duration (mins) 15		
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Atkins (Epsom)		Page 1
Woodcote Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:52 File Phase 3B Temporary Diversion Model Rev2 -...	Designed by JK Checked by MK	
Innovyze	Network 2018.1	

FOUL SEWERAGE DESIGN

Design Criteria for Foul - Main

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.00	Domestic (l/s/ha)	0.00	Maximum Backdrop Height (m)	1.600
Industrial Peak Flow Factor	0.00	Domestic Peak Flow Factor	6.00	Min Design Depth for Optimisation (m)	1.200
Calculation Method	BS 8301	Add Flow / Climate Change (%)	10	Min Vel for Auto Design only (m/s)	0.75
Frequency Factor	0.00	Minimum Backdrop Height (m)	0.650	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F2.000	29.947	0.499	60.0	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F2.001	17.355	0.289	60.1	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F2.000	120.985	0.000	0.0	42.0	0.3	38	0.81	1.48	59.0	3.6
F2.001	120.486	0.000	0.0	84.0	0.4	41	0.85	1.48	59.0	4.2

Atkins (Epsom)		Page 2
Woodcote Grove	CORK NORTH WEST	
Ashley Road, Epsom	REGENERATION QUARTER	
Surrey, KT18 5BW	PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:52	Designed by JK	
File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F2.002	12.882	0.215	59.9	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F3.000	36.532	0.285	128.2	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit	
F3.001	44.460	0.539	82.5	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit	
F3.002	8.216	0.198	41.5	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F3.003	16.974	0.268	63.3	0.000	28.0	0.0	1.500	o	225	Pipe/Conduit	
F3.004	34.519	0.777	44.4	0.000	70.0	0.0	1.500	o	225	Pipe/Conduit	
F2.003	61.036	0.763	80.0	0.000	126.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F2.002	118.775	0.000	0.0	126.0	0.4	42	0.88	1.48	59.0	4.6
F3.000	121.751	0.000	0.0	98.0	0.4	50	0.66	1.01	40.3	4.3
F3.001	120.530	0.000	0.0	140.0	0.4	46	0.79	1.26	50.3	4.7
F3.002	119.991	0.000	0.0	140.0	0.4	39	1.00	1.78	71.0	4.7
F3.003	119.793	0.000	0.0	168.0	0.4	45	0.88	1.44	57.4	4.9
F3.004	119.325	0.000	0.0	238.0	0.5	43	1.03	1.72	68.6	5.4
F2.003	118.560	0.000	0.0	490.0	0.6	55	0.89	1.28	51.1	6.7

Atkins (Epsom)		Page 3
Woodcote Grove	CORK NORTH WEST	
Ashley Road, Epsom	REGENERATION QUARTER	
Surrey, KT18 5BW	PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:52	Designed by JK	
File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F4.000	53.673	1.579	34.0	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit	🔒
F5.000	36.460	1.053	34.6	0.000	126.0	0.0	1.500	o	225	Pipe/Conduit	🔒
F2.004	38.376	0.203	189.0	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit	🔒
F2.005	14.168	0.075	189.0	0.000	28.0	0.0	1.500	o	225	Pipe/Conduit	🔒
F2.006	19.050	0.314	60.7	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	🔒
F6.000	46.044	1.993	23.1	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit	🔒

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F4.000	119.376	0.000	0.0	140.0	0.4	37	1.08	1.97	78.4	4.7
F5.000	118.850	0.000	0.0	126.0	0.4	37	1.06	1.95	77.7	4.6
F2.004	117.797	0.000	0.0	854.0	0.8	77	0.69	0.83	33.1	8.3
F2.005	117.594	0.000	0.0	882.0	0.8	77	0.70	0.83	33.1	8.4
F2.006	117.519	0.000	0.0	966.0	0.8	59	1.06	1.48	58.7	8.7
F6.000	119.198	0.000	0.0	98.0	0.4	33	1.20	2.39	95.2	4.3

Atkins (Epsom)		Page 4
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
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File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F2.007	25.575	1.174	21.8	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F2.008	38.723	1.291	30.0	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit	
F2.009	21.189	0.918	23.1	0.000	112.0	0.0	1.500	o	225	Pipe/Conduit	
F7.000	50.261	1.140	44.1	0.000	182.0	0.0	1.500	o	225	Pipe/Conduit	
F7.001	22.860	0.523	43.7	0.233	42.0	0.0	1.500	o	225	Pipe/Conduit	
F8.000	29.693	1.188	25.0	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	
F8.001	21.057	0.880	23.9	0.000	28.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F2.007	117.205	0.000	0.0	1120.0	0.8	47	1.55	2.47	98.0	9.3
F2.008	114.862	0.000	0.0	1260.0	0.9	52	1.41	2.10	83.5	9.8
F2.009	113.571	0.000	0.0	1372.0	0.9	50	1.56	2.39	95.2	10.2
F7.000	117.060	0.000	0.0	182.0	0.5	41	1.00	1.73	68.8	5.0
F7.001	115.920	0.233	0.0	224.0	0.5	42	1.02	1.74	69.1	5.3
F8.000	117.778	0.000	0.0	84.0	0.4	33	1.16	2.30	91.5	4.2
F8.001	116.590	0.000	0.0	112.0	0.4	34	1.20	2.35	93.5	4.4

Atkins (Epsom)		Page 5
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F7.002	10.927	0.380	28.8	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F7.003	16.379	0.199	82.3	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F9.000	74.944	1.500	50.0	0.000	168.0	0.0	1.500	o	225	Pipe/Conduit	
F7.004	17.208	0.319	53.9	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F7.005	27.110	0.559	48.5	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F7.006	23.807	0.749	31.8	0.000	56.0	0.0	1.500	o	225	Pipe/Conduit	
F7.007	15.194	0.576	26.4	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F7.002	115.397	0.233	0.0	392.0	0.6	41	1.25	2.15	85.3	6.2
F7.003	115.017	0.233	0.0	392.0	0.6	54	0.86	1.27	50.3	6.2
F9.000	116.631	0.000	0.0	168.0	0.4	42	0.96	1.63	64.7	4.9
F7.004	114.818	0.233	0.0	560.0	0.6	51	1.04	1.56	62.2	7.0
F7.005	114.499	0.233	0.0	616.0	0.7	51	1.09	1.65	65.6	7.3
F7.006	113.940	0.233	0.0	672.0	0.7	46	1.28	2.04	81.1	7.5
F7.007	113.191	0.233	0.0	672.0	0.7	44	1.36	2.24	89.1	7.5

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F2.010	32.780	0.998	32.8	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F2.011	53.685	2.868	18.7	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F2.012	38.476	1.977	19.5	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F2.013	14.946	0.217	68.9	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F10.000	22.251	0.148	150.3	0.000	2324.0	0.0	1.500	o	225	Pipe/Conduit	
F10.001	7.745	0.052	150.0	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	
F10.002	37.683	0.238	158.3	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F10.003	15.389	0.103	150.0	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F2.010	112.398	0.233	0.0	2044.0	1.1	60	1.46	2.01	79.8	12.6
F2.011	111.400	0.233	0.0	2044.0	1.1	52	1.79	2.66	105.8	12.6
F2.012	108.532	0.233	0.0	2044.0	1.1	53	1.76	2.61	103.7	12.6
F2.013	106.555	0.233	0.0	2044.0	1.1	73	1.12	1.38	55.0	12.6
F10.000	121.050	0.000	0.0	2324.0	1.2	94	0.86	0.94	37.2	13.6
F10.001	120.902	0.000	0.0	2408.0	1.3	95	0.87	0.94	37.2	13.8
F10.002	120.850	0.000	0.0	2408.0	1.3	96	0.85	0.91	36.2	13.8
F10.003	120.612	0.000	0.0	2492.0	1.3	96	0.87	0.94	37.2	14.1

Atkins (Epsom)		Page 7
Woodcoste Grove	CORK NORTH WEST	
Ashley Road, Epsom	REGENERATION QUARTER	
Surrey, KT18 5BW	PH3B TEMP DRAINAGE DIVERSION	
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Innovyze	Network 2018.1	

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
F11.000	37.225	0.417	89.3	0.000	70.0	0.0	1.500	o	225	Pipe/Conduit		
F11.001	55.603	2.224	25.0	0.000	84.0	0.0	1.500	o	225	Pipe/Conduit		
F10.004	57.904	1.298	44.6	0.000	140.0	0.0	1.500	o	225	Pipe/Conduit		
F10.005	18.116	0.150	120.8	0.000	42.0	0.0	1.500	o	225	Pipe/Conduit		
F12.000	54.739	0.550	99.5	0.000	98.0	0.0	1.500	o	225	Pipe/Conduit		
F12.001	17.366	0.600	28.9	0.000	125.9	0.0	1.500	o	225	Pipe/Conduit		

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F11.000	124.043	0.000	0.0	70.0	0.4	44	0.73	1.22	48.3	4.0
F11.001	122.733	0.000	0.0	154.0	0.4	35	1.21	2.30	91.5	4.8
F10.004	120.509	0.000	0.0	2786.0	1.4	72	1.38	1.72	68.4	15.1
F10.005	119.211	0.000	0.0	2828.0	1.4	94	0.96	1.04	41.5	15.3
F12.000	124.635	0.000	0.0	98.0	0.4	47	0.72	1.15	45.8	4.3
F12.001	124.085	0.000	0.0	223.9	0.5	38	1.18	2.14	85.0	5.3

Manhole Schedules for Foul - Main

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)
F20	117.879	3.017	Open Manhole	1200	F2.008	114.862	225	F6.000	117.205	225	1169
F21	115.446	1.875	Open Manhole	1200	F2.009	113.571	225	F2.007	116.031	225	
F22	119.308	2.248	Open Manhole	1200	F7.000	117.060	225	F2.008	113.571	225	
F23	117.495	1.575	Open Manhole	1200	F7.001	115.920	225	F7.000	115.920	225	
F24	119.884	2.106	Open Manhole	1200	F8.000	117.778	225				
F25	118.016	1.426	Open Manhole	1200	F8.001	116.590	225	F8.000	116.590	225	
F26	117.093	1.696	Open Manhole	1200	F7.002	115.397	225	F7.001	115.397	225	313
F27	116.755	1.738	Open Manhole	1200	F7.003	115.017	225	F8.001	115.710	225	
F28	118.056	1.425	Open Manhole	1200	F9.000	116.631	225	F7.002	115.017	225	
F29	116.641	1.823	Open Manhole	1200	F7.004	114.818	225	F7.003	114.818	225	313
F30	116.237	1.738	Open Manhole	1200	F7.005	114.499	225	F9.000	115.131	225	
F31	115.678	1.738	Open Manhole	1200	F7.006	113.940	225	F7.004	114.499	225	
F32	114.929	1.738	Open Manhole	1200	F7.007	113.191	225	F7.005	113.940	225	255
F33	114.353	1.955	Open Manhole	1200	F2.010	112.398	225	F7.006	113.191	225	
								F2.009	112.653	225	
F34	113.050	1.650	Open Manhole	1200	F2.011	111.400	225	F7.007	112.615	225	217
								F2.010	111.400	225	

Atkins (Epsom)					Page 10						
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW					CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION						
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Manhole Schedules for Foul - Main											
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)
F35	109.957	1.425	Open Manhole	1200	F2.012	108.532	225	F2.011	108.532	225	893
F36	107.980	1.425	Open Manhole	1200	F2.013	106.555	225	F2.012	106.555	225	
FEx CMH	107.530	1.192	Open Manhole	0		OUTFALL		F2.013	106.338	225	
F38	123.550	2.500	Open Manhole	1200	F10.000	121.050	225				
F60	122.954	2.052	Open Manhole	1200	F10.001	120.902	225	F10.000	120.902	225	
F60	122.802	1.952	Open Manhole	1200	F10.002	120.850	225	F10.001	120.850	225	
F61	122.177	1.565	Open Manhole	1200	F10.003	120.612	225	F10.002	120.612	225	
F64	126.550	2.507	Open Manhole	1200	F11.000	124.043	225				
F65	125.680	2.947	Open Manhole	1200	F11.001	122.733	225	F11.000	123.626	225	
F65	122.672	2.163	Open Manhole	1200	F10.004	120.509	225	F10.003	120.509	225	
								F11.001	120.509	225	
F66	120.654	1.443	Open Manhole	1200	F10.005	119.211	225	F10.004	119.211	225	
F70	120.652	1.591	Open Manhole	1200		OUTFALL		F10.005	119.061	225	
F26	126.046	1.411	Open Manhole	1200	F12.000	124.635	225				
F27	125.622	1.537	Open Manhole	1200	F12.001	124.085	225	F12.000	124.085	225	
F38	125.569	2.084	Open Manhole	1200		OUTFALL		F12.001	123.485	225	
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Atkins (Epsom)		Page 11
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
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PIPELINE SCHEDULES for Foul - Main

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)
F2.000	o	225	F5	123.189	120.985	1.979	Open Manhole	1200
F2.001	o	225	F6	122.339	120.486	1.628	Open Manhole	1200
F2.002	o	225	F8	121.819	118.775	2.819	Open Manhole	1200
F3.000	o	225	F9A	123.176	121.751	1.200	Open Manhole	1200
F3.001	o	225	F9	123.651	120.530	2.896	Open Manhole	1200
F3.002	o	225	F10	121.416	119.991	1.200	Open Manhole	1200
F3.003	o	225	F11	121.218	119.793	1.200	Open Manhole	1200
F3.004	o	225	F12	120.950	119.325	1.400	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)
F2.000	29.947	60.0	F6	122.339	120.486	1.628	Open Manhole	1200
F2.001	17.355	60.1	F8	121.819	120.197	1.397	Open Manhole	1200
F2.002	12.882	59.9	F13	121.436	118.560	2.651	Open Manhole	1200
F3.000	36.532	128.2	F9	123.651	121.466	1.960	Open Manhole	1200
F3.001	44.460	82.5	F10	121.416	119.991	1.200	Open Manhole	1200
F3.002	8.216	41.5	F11	121.218	119.793	1.200	Open Manhole	1200
F3.003	16.974	63.3	F12	120.950	119.525	1.200	Open Manhole	1200
F3.004	34.519	44.4	F13	121.436	118.548	2.663	Open Manhole	1200

Atkins (Epsom)		Page 13
Woodcoste Grove	CORK NORTH WEST	
Ashley Road, Epsom	REGENERATION QUARTER	
Surrey, KT18 5BW	PH3B TEMP DRAINAGE DIVERSION	
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PIPELINE SCHEDULES for Foul - Main

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
F2.006	o	225	F17	119.404	117.519	1.660	Open Manhole		1200
F6.000	o	225	F18	121.926	119.198	2.503	Open Manhole		1200
F2.007	o	225	F19	119.288	117.205	1.858	Open Manhole		1200
F2.008	o	225	F20	117.879	114.862	2.792	Open Manhole		1200
F2.009	o	225	F21	115.446	113.571	1.650	Open Manhole		1200
F7.000	o	225	F22	119.308	117.060	2.023	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)	I*W
F2.006	19.050	60.7	F19	119.288	117.205	1.858	Open Manhole		1200
F6.000	46.044	23.1	F19	119.288	117.205	1.858	Open Manhole		1200
F2.007	25.575	21.8	F20	117.879	116.031	1.623	Open Manhole		1200
F2.008	38.723	30.0	F21	115.446	113.571	1.650	Open Manhole		1200
F2.009	21.189	23.1	F33	114.353	112.653	1.475	Open Manhole		1200
F7.000	50.261	44.1	F23	117.495	115.920	1.350	Open Manhole		1200

Atkins (Epsom)		Page 14
Woodcote Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
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PIPELINE SCHEDULES for Foul - Main

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
F7.001	o	225	F23	117.495	115.920	1.350	Open Manhole		1200
F8.000	o	225	F24	119.884	117.778	1.881	Open Manhole		1200
F8.001	o	225	F25	118.016	116.590	1.201	Open Manhole		1200
F7.002	o	225	F26	117.093	115.397	1.471	Open Manhole		1200
F7.003	o	225	F27	116.755	115.017	1.513	Open Manhole		1200
F9.000	o	225	F28	118.056	116.631	1.200	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)	I*W
F7.001	22.860	43.7	F26	117.093	115.397	1.471	Open Manhole		1200
F8.000	29.693	25.0	F25	118.016	116.590	1.201	Open Manhole		1200
F8.001	21.057	23.9	F26	117.093	115.710	1.158	Open Manhole		1200
F7.002	10.927	28.8	F27	116.755	115.017	1.513	Open Manhole		1200
F7.003	16.379	82.3	F29	116.641	114.818	1.598	Open Manhole		1200
F9.000	74.944	50.0	F29	116.641	115.131	1.285	Open Manhole		1200

Atkins (Epsom)		Page 15
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:52	Designed by JK	
File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	

PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd	Diam	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	Sect	(mm)	Name	(m)	(m)	(m)	Connection	(mm)
F7.004	o	225	F29	116.641	114.818	1.598	Open Manhole	1200
F7.005	o	225	F30	116.237	114.499	1.513	Open Manhole	1200
F7.006	o	225	F31	115.678	113.940	1.513	Open Manhole	1200
F7.007	o	225	F32	114.929	113.191	1.513	Open Manhole	1200
F2.010	o	225	F33	114.353	112.398	1.730	Open Manhole	1200
F2.011	o	225	F34	113.050	111.400	1.425	Open Manhole	1200
F2.012	o	225	F35	109.957	108.532	1.200	Open Manhole	1200

Downstream Manhole

PN	Length	Slope	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	(m)	(1:X)	Name	(m)	(m)	(m)	Connection	(mm)
F7.004	17.208	53.9	F30	116.237	114.499	1.513	Open Manhole	1200
F7.005	27.110	48.5	F31	115.678	113.940	1.513	Open Manhole	1200
F7.006	23.807	31.8	F32	114.929	113.191	1.513	Open Manhole	1200
F7.007	15.194	26.4	F33	114.353	112.615	1.513	Open Manhole	1200
F2.010	32.780	32.8	F34	113.050	111.400	1.425	Open Manhole	1200
F2.011	53.685	18.7	F35	109.957	108.532	1.200	Open Manhole	1200
F2.012	38.476	19.5	F36	107.980	106.555	1.200	Open Manhole	1200

Atkins (Epsom)		Page 16
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:52	Designed by JK	
File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	

PIPELINE SCHEDULES for Foul - Main

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)
F2.013	o	225	F36	107.980	106.555	1.200	Open Manhole	1200
F10.000	o	225	F38	123.550	121.050	2.275	Open Manhole	1200
F10.001	o	225	F60	122.954	120.902	1.827	Open Manhole	1200
F10.002	o	225	F60	122.802	120.850	1.727	Open Manhole	1200
F10.003	o	225	F61	122.177	120.612	1.340	Open Manhole	1200
F11.000	o	225	F64	126.550	124.043	2.282	Open Manhole	1200
F11.001	o	225	F65	125.680	122.733	2.722	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)
F2.013	14.946	68.9	FEx CMH	107.530	106.338	0.967	Open Manhole	0
F10.000	22.251	150.3	F60	122.954	120.902	1.827	Open Manhole	1200
F10.001	7.745	150.0	F60	122.802	120.850	1.727	Open Manhole	1200
F10.002	37.683	158.3	F61	122.177	120.612	1.340	Open Manhole	1200
F10.003	15.389	150.0	F65	122.672	120.509	1.937	Open Manhole	1200
F11.000	37.225	89.3	F65	125.680	123.626	1.829	Open Manhole	1200
F11.001	55.603	25.0	F65	122.672	120.509	1.938	Open Manhole	1200

Atkins (Epsom)		Page 17
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:52	Designed by JK	
File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	

PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd	Diam	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	Sect	(mm)	Name	(m)	(m)	(m)	Connection	(mm)
F10.004	o	225	F65	122.672	120.509	1.938	Open Manhole	1200
F10.005	o	225	F66	120.654	119.211	1.218	Open Manhole	1200
F12.000	o	225	F26	126.046	124.635	1.186	Open Manhole	1200
F12.001	o	225	F27	125.622	124.085	1.312	Open Manhole	1200

Downstream Manhole

PN	Length	Slope	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	(m)	(1:X)	Name	(m)	(m)	(m)	Connection	(mm)
F10.004	57.904	44.6	F66	120.654	119.211	1.218	Open Manhole	1200
F10.005	18.116	120.8	F70	120.652	119.061	1.366	Open Manhole	1200
F12.000	54.739	99.5	F27	125.622	124.085	1.312	Open Manhole	1200
F12.001	17.366	28.9	F38	125.569	123.485	1.859	Open Manhole	1200

Atkins (Epsom)		Page 18
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
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File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	

Free Flowing Outfall Details for Foul - Main

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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F2.013	FEx CMH	107.530	106.338	106.335	0	0
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Free Flowing Outfall Details for Foul - Main

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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F10.005	F70	120.652	119.061	0.000	1200	0
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Free Flowing Outfall Details for Foul - Main

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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F12.001	F38	125.569	123.485	0.000	1200	0
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Atkins (Epsom)		Page 19
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:52	Designed by JK	
File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	
Simulation Criteria for Foul - Main Volumetric Runoff Coeff 0.750 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) 60 Hot Start Level (mm) 0 MADD Factor * 10m³/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 0 Number of Storage Structures 0 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.750 Return Period (years) 2 Ratio R 0.238 Cv (Winter) 0.840 Region Scotland and Ireland Profile Type Summer Storm Duration (mins) 15		
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Atkins (Epsom)		Page 1
Woodcoste Grove	CORK NORTH WEST	
Ashley Road, Epsom	REGENERATION QUARTER	
Surrey, KT18 5BW	PHASE 3B DRAINAGE DESIGN	
Date 13/08/2021 15:44	Designed by JK	
File Phase 3B Drainage Design Model Rev2 - Upd...	Checked by MK	
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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm Network

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	2	Foul Sewage (l/s/ha)	0.000	Maximum Backdrop Height (m)	1.600
M5-60 (mm)	17.000	Volumetric Runoff Coeff.	0.750	Min Design Depth for Optimisation (m)	1.200
Ratio R	0.238	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)	0.650		

Designed with Level Soffits

Network Design Table for Storm Network

« - 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 (mm/hr)	T.C. (mins)	US/IL 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)
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Network Design Table for Storm Network

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
S1.000	23.884	0.550	43.4	0.061	4.00	0.0	0.600	o	225	Pipe/Conduit		
S1.001	74.475	1.518	49.1	0.265	0.00	0.0	0.600	o	225	Pipe/Conduit		
S1.002	67.079	1.119	59.9	0.191	0.00	0.0	0.600	o	300	Pipe/Conduit		
S2.000	59.486	1.114	53.4	0.208	4.00	0.0	0.600	o	225	Pipe/Conduit		
S1.003	28.096	0.511	55.0	0.050	0.00	0.0	0.600	o	300	Pipe/Conduit		
S1.004	17.367	0.316	55.0	0.036	0.00	0.0	0.600	o	300	Pipe/Conduit		
S1.005	12.706	0.231	55.0	0.026	0.00	0.0	0.600	o	300	Pipe/Conduit		

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	4.20	124.877	0.061	0.0	0.0	0.0	1.99	79.1	8.3
S1.001	47.90	4.86	124.327	0.326	0.0	0.0	0.0	1.87	74.4	42.3
S1.002	46.13	5.41	122.734	0.517	0.0	0.0	0.0	2.03	143.8	64.6
S2.000	48.97	4.55	122.804	0.208	0.0	0.0	0.0	1.79	71.3	27.6
S1.003	45.47	5.63	120.947	0.775	0.0	0.0	0.0	2.12	150.2	95.4
S1.004	45.07	5.77	120.436	0.811	0.0	0.0	0.0	2.13	150.2	99.1
S1.005	44.79	5.87	119.470	0.837	0.0	0.0	0.0	2.12	150.2	101.8

Atkins (Epsom)		Page 3
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN	
Date 13/08/2021 15:44	Designed by JK	
File Phase 3B Drainage Design Model Rev2 - Upd...	Checked by MK	
Innovyze	Network 2018.1	

Network Design Table for Storm Network

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
S3.000	39.199	0.600	65.3	0.153	4.00	0.0	0.600	o	225	Pipe/Conduit	
S3.001	45.461	1.085	41.9	0.081	0.00	0.0	0.600	o	225	Pipe/Conduit	
S3.002	7.016	0.198	35.4	0.032	0.00	0.0	0.600	o	225	Pipe/Conduit	
S3.003	16.389	0.268	61.2	0.052	0.00	0.0	0.600	o	225	Pipe/Conduit	
S3.004	35.841	0.211	169.9	0.075	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.006	58.196	0.707	82.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S4.000	50.706	1.525	33.2	0.203	4.00	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)
S3.000	49.52	4.40	121.676	0.153	0.0	0.0	0.0	1.62	64.4	20.5
S3.001	48.19	4.78	121.076	0.234	0.0	0.0	0.0	2.03	80.6	30.5
S3.002	48.01	4.83	119.991	0.266	0.0	0.0	0.0	2.21	87.7	34.6
S3.003	47.46	4.99	119.793	0.318	0.0	0.0	0.0	1.68	66.6	40.9
S3.004	46.10	5.42	119.375	0.393	0.0	0.0	0.0	1.39	153.2	49.1
S1.006	43.47	6.35	119.164	1.230	0.0	0.0	0.0	2.00	220.7	144.8
S4.000	49.63	4.37	120.132	0.203	0.0	0.0	0.0	2.28	90.5	27.3

Network Design Table for Storm Network

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
S5.000	36.505	0.243	150.2	0.131	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.007	40.509	0.455	89.0	0.202	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.008	14.168	0.182	77.8	0.058	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.009	17.588	0.229	76.7	0.030	0.00	0.0	0.600	o	450	Pipe/Conduit	
S6.000	44.490	1.539	28.9	0.158	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.010	29.295	0.382	76.7	0.070	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.011	38.230	0.760	50.3	0.133	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)	
S5.000	48.91	4.57	118.850	0.131		0.0	0.0	0.0	1.06	42.3	17.3
S1.007	42.66	6.67	118.382	1.767		0.0	0.0	0.0	2.16	342.8	204.1
S1.008	42.41	6.77	117.927	1.824		0.0	0.0	0.0	2.31	366.8	209.6
S1.009	42.10	6.90	116.592	1.855		0.0	0.0	0.0	2.32	369.5	211.5
S6.000	49.89	4.30	119.202	0.158		0.0	0.0	0.0	2.44	97.1	21.4
S1.010	41.60	7.11	116.363	2.083		0.0	0.0	0.0	2.32	369.5	234.7
S1.011	41.09	7.33	114.381	2.216		0.0	0.0	0.0	2.87	456.8	246.6

Network Design Table for Storm Network

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.012	23.035	0.468	49.2	0.048	0.00	0.0	0.600	o	450	Pipe/Conduit	
S7.000	49.948	0.938	53.2	0.158	4.00	0.0	0.600	o	225	Pipe/Conduit	
S7.001	20.609	0.488	42.2	0.051	0.00	0.0	0.600	o	300	Pipe/Conduit	
S8.000	29.946	1.050	28.5	0.119	4.00	0.0	0.600	o	225	Pipe/Conduit	
S8.001	18.889	0.805	23.5	0.061	0.00	0.0	0.600	o	225	Pipe/Conduit	
S7.002	13.041	0.380	34.3	0.018	0.00	0.0	0.600	o	300	Pipe/Conduit	
S7.003	18.156	0.296	61.3	0.027	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.012	40.80	7.46	113.021	2.264	0.0	0.0	0.0	2.90	461.8	250.2
S7.000	49.30	4.46	117.213	0.158	0.0	0.0	0.0	1.80	71.4	21.1
S7.001	48.79	4.60	116.200	0.209	0.0	0.0	0.0	2.43	171.5	27.6
S8.000	50.00	4.20	117.565	0.119	0.0	0.0	0.0	2.46	97.8	16.1
S8.001	49.83	4.32	116.515	0.180	0.0	0.0	0.0	2.71	107.9	24.4
S7.002	48.50	4.69	115.710	0.407	0.0	0.0	0.0	2.69	190.3	53.5
S7.003	47.99	4.84	115.330	0.434	0.0	0.0	0.0	2.01	142.2	56.4

Network Design Table for Storm Network

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
S9.000	76.088	1.522	50.0	0.212	4.00	0.0	0.600	o	225	Pipe/Conduit	
S7.004	15.114	0.297	50.9	0.019	0.00	0.0	0.600	o	300	Pipe/Conduit	
S7.005	27.110	0.559	48.5	0.105	0.00	0.0	0.600	o	375	Pipe/Conduit	
S7.006	23.807	0.749	31.8	0.081	0.00	0.0	0.600	o	375	Pipe/Conduit	
S7.007	15.771	0.326	48.4	0.021	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.013	30.842	1.350	22.8	0.045	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.014	54.345	2.896	18.8	0.068	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)
S9.000	48.51	4.68	116.556	0.212	0.0	0.0	0.0	1.85	73.7	27.9
S7.004	47.60	4.95	115.034	0.665	0.0	0.0	0.0	2.21	156.2	85.7
S7.005	47.04	5.12	114.737	0.770	0.0	0.0	0.0	2.61	288.0	98.1
S7.006	46.65	5.25	114.178	0.851	0.0	0.0	0.0	3.22	356.1	107.5
S7.007	46.37	5.34	113.029	0.871	0.0	0.0	0.0	2.93	465.8	109.4
S1.013	40.53	7.58	112.553	3.180	0.0	0.0	0.0	4.27	678.8	349.1
S1.014	40.12	7.77	111.203	3.248	0.0	0.0	0.0	4.71	749.1	352.9

Atkins (Epsom)		Page 7
Woodcote Grove	CORK NORTH WEST	
Ashley Road, Epsom	REGENERATION QUARTER	
Surrey, KT18 5BW	PHASE 3B DRAINAGE DESIGN	
Date 13/08/2021 15:44	Designed by JK	
File Phase 3B Drainage Design Model Rev2 - Upd...	Checked by MK	
Innovyze	Network 2018.1	

Network Design Table for Storm Network

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
S1.015	35.114	1.341	26.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		🔒
S1.016	15.617	0.306	51.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		🔒
S10.000	31.941	0.198	161.3	0.092	4.00	0.0	0.600	o	225	Pipe/Conduit		🔒
S11.000	18.826	0.208	90.5	0.096	4.00	0.0	0.600	o	225	Pipe/Conduit		🔓
S11.001	8.764	0.150	58.5	0.053	0.00	0.0	0.600	o	225	Pipe/Conduit		🔓
S11.002	50.896	1.003	50.7	0.161	0.00	0.0	0.600	o	225	Pipe/Conduit		🔒
S10.001	52.448	0.450	116.6	0.147	0.00	0.0	0.600	o	300	Pipe/Conduit		🔓

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.015	39.72	7.96	108.057	3.248	0.0	0.0	0.0	3.08	218.1	352.9
S1.016	39.48	8.08	106.641	3.248	0.0	0.0	0.0	2.21	155.9	352.9
S10.000	49.10	4.52	125.172	0.092	0.0	0.0	0.0	1.03	40.8	12.2
S11.000	50.00	4.23	127.163	0.096	0.0	0.0	0.0	1.37	54.7	13.0
S11.001	49.85	4.31	126.955	0.149	0.0	0.0	0.0	1.71	68.1	20.1
S11.002	48.20	4.77	126.805	0.310	0.0	0.0	0.0	1.84	73.2	40.5
S10.001	46.25	5.37	124.899	0.549	0.0	0.0	0.0	1.46	102.9	68.8

Network Design Table for Storm Network

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
S14.000	30.942	0.463	66.8	0.068	4.00	0.0	0.600	o	225	Pipe/Conduit		🔒
S14.001	41.399	0.663	62.4	0.080	0.00	0.0	0.600	o	300	Pipe/Conduit		🔓
S14.002	10.338	0.062	166.7	0.011	0.00	0.0	0.600	o	375	Pipe/Conduit		🔒
S10.005	7.457	0.160	46.6	0.010	0.00	0.0	0.600	o	450	Pipe/Conduit		🔓
S10.006	14.674	0.480	30.6	0.066	0.00	0.0	0.600	o	450	Pipe/Conduit		🔓
S10.007	7.745	0.080	97.2	0.160	0.00	0.0	0.600	o	525	Pipe/Conduit		🔒
S10.008	38.023	0.428	88.8	0.081	0.00	0.0	0.600	o	525	Pipe/Conduit		🔒
S10.009	14.827	0.059	250.0	0.043	0.00	0.0	0.600	o	600	Pipe/Conduit		🔒

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S14.000	49.82	4.32	122.979	0.068	0.0	0.0	0.0	1.60	63.7	9.2
S14.001	48.57	4.67	122.441	0.148	0.0	0.0	0.0	1.99	140.9	19.5
S14.002	48.14	4.79	121.703	0.159	0.0	0.0	0.0	1.40	154.7	20.7
S10.005	45.13	5.75	121.566	1.105	0.0	0.0	0.0	2.98	474.6	135.1
S10.006	44.94	5.82	121.406	1.171	0.0	0.0	0.0	3.69	586.5	142.5
S10.007	44.78	5.87	120.851	1.331	0.0	0.0	0.0	2.27	491.9	161.4
S10.008	44.04	6.14	120.771	1.412	0.0	0.0	0.0	2.38	514.6	168.5
S10.009	43.61	6.30	119.593	1.455	0.0	0.0	0.0	1.54	434.2	171.9

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Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN	
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File Phase 3B Drainage Design Model Rev2 - Upd...	Checked by MK	
Innovyze	Network 2018.1	

Network Design Table for Storm Network

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
S15.000	33.739	1.411	23.9	0.097	4.00	0.0	0.600	o	225	Pipe/Conduit	
S15.001	20.519	0.980	20.9	0.062	0.00	0.0	0.600	o	225	Pipe/Conduit	
S15.002	37.006	0.370	100.0	0.058	0.00	0.0	0.600	o	225	Pipe/Conduit	
S15.003	55.145	0.551	100.0	0.194	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.010	58.107	0.232	250.0	0.166	0.00	0.0	0.600	o	600	Pipe/Conduit	
S10.011	19.056	0.112	170.1	0.233	0.00	0.0	0.600	o	600	Pipe/Conduit	
S16.000	46.778	2.425	19.3	0.250	4.00	0.0	0.600	o	225	Pipe/Conduit	
S16.001	9.390	0.417	22.5	0.003	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)
S15.000	50.00	4.21	127.173	0.097	0.0	0.0	0.0	2.69	106.8	13.1
S15.001	49.79	4.33	125.762	0.159	0.0	0.0	0.0	2.87	114.2	21.4
S15.002	48.11	4.80	123.782	0.217	0.0	0.0	0.0	1.31	52.0	28.2
S15.003	45.86	5.50	121.612	0.411	0.0	0.0	0.0	1.31	52.0	51.0
S10.010	42.02	6.93	119.534	2.032	0.0	0.0	0.0	1.54	434.2	231.2
S10.011	41.62	7.10	119.302	2.265	0.0	0.0	0.0	1.86	527.1	255.3
S16.000	50.00	4.26	122.017	0.250	0.0	0.0	0.0	2.99	119.0	33.9
S16.001	49.84	4.32	119.592	0.253	0.0	0.0	0.0	2.77	110.1	34.1

Network Design Table for Storm Network

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
S10.012	21.299	0.261	81.6	0.172	0.00	0.0	0.600	o	600	Pipe/Conduit		🔒
S10.013	36.323	1.044	34.8	0.097	0.00	0.0	0.600	o	600	Pipe/Conduit		🔒
S10.014	19.068	0.150	127.1	0.026	0.00	0.0	0.600	o	600	Pipe/Conduit		🔒
S17.000	61.337	1.566	39.2	0.184	4.00	0.0	0.600	o	225	Pipe/Conduit		🔒
S17.001	91.057	2.271	40.1	0.259	0.00	0.0	0.600	o	300	Pipe/Conduit		🔒
S17.002	52.867	1.199	44.1	0.140	0.00	0.0	0.600	o	375	Pipe/Conduit		🔒
S17.003	8.722	0.025	348.8	0.006	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)
S10.012	41.31	7.23	118.830	2.690	0.0	0.0	0.0	2.70	762.6	301.0
S10.013	40.98	7.38	118.569	2.787	0.0	0.0	0.0	4.14	1169.9	309.3
S10.014	40.65	7.53	117.525	2.813	0.0	0.0	0.0	2.16	610.3	309.7
S17.000	49.21	4.49	138.158	0.184	0.0	0.0	0.0	2.10	83.4	24.5
S17.001	47.12	5.10	136.517	0.443	0.0	0.0	0.0	2.49	176.0	56.5
S17.002	46.11	5.42	134.171	0.583	0.0	0.0	0.0	2.73	302.1	72.8
S17.003	45.71	5.55	132.897	0.589	0.0	0.0	0.0	1.08	172.2	72.9

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Ashley Road, Epsom	REGENERATION QUARTER	
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Network Design Table for Storm Network

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
S18.000	47.840	1.186	40.3	0.136	4.00	0.0	0.600	o	225	Pipe/Conduit		🔒
S18.001	12.568	0.387	32.5	0.023	0.00	0.0	0.600	o	300	Pipe/Conduit		🔒
S18.002	34.100	0.946	36.0	0.070	0.00	0.0	0.600	o	300	Pipe/Conduit		🔒
S17.004	46.224	0.912	50.7	0.171	0.00	0.0	0.600	o	450	Pipe/Conduit		🔒
S17.005	11.936	0.250	47.7	0.012	0.00	0.0	0.600	o	450	Pipe/Conduit		🔒
S19.000	84.437	1.890	44.7	0.256	4.00	0.0	0.600	o	225	Pipe/Conduit		🔒
S17.006	50.986	1.060	48.1	0.077	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)
S18.000	49.58	4.39	135.538	0.136	0.0	0.0	0.0	2.07	82.1	18.3
S18.001	49.30	4.46	134.277	0.159	0.0	0.0	0.0	2.77	195.6	21.2
S18.002	48.53	4.68	133.890	0.229	0.0	0.0	0.0	2.63	185.7	30.1
S17.004	44.92	5.82	132.722	0.989	0.0	0.0	0.0	2.86	455.0	120.3
S17.005	44.73	5.89	131.810	1.001	0.0	0.0	0.0	2.95	468.9	121.3
S19.000	48.40	4.72	133.813	0.256	0.0	0.0	0.0	1.96	78.0	33.6
S17.006	43.93	6.18	131.060	1.334	0.0	0.0	0.0	2.94	467.1	158.7

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Network Design Table for Storm Network

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
S20.000	20.535	0.122	168.3	0.158	4.00	0.0	0.600	o	225	Pipe/Conduit		
S20.001	44.352	0.385	115.2	0.131	0.00	0.0	0.600	o	375	Pipe/Conduit		
S17.007	32.214	0.250	128.9	0.088	0.00	0.0	0.600	o	525	Pipe/Conduit		
S21.000	33.248	0.619	53.7	0.202	4.00	0.0	0.600	o	225	Pipe/Conduit		
S21.001	43.475	1.200	36.2	0.191	0.00	0.0	0.600	o	300	Pipe/Conduit		
S17.008	71.739	1.275	56.3	0.219	0.00	0.0	0.600	o	525	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)
S20.000	49.75	4.34	129.994	0.158	0.0	0.0	0.0	1.00	40.0	21.3
S20.001	48.18	4.78	129.722	0.289	0.0	0.0	0.0	1.69	186.4	37.7
S17.007	43.21	6.45	129.337	1.711	0.0	0.0	0.0	1.97	426.9	200.2
S21.000	49.86	4.31	132.896	0.202	0.0	0.0	0.0	1.79	71.1	27.3
S21.001	48.85	4.59	132.202	0.393	0.0	0.0	0.0	2.62	185.2	52.0
S17.008	42.21	6.85	128.429	2.323	0.0	0.0	0.0	2.99	647.4	265.6

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Network Design Table for Storm Network

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
S17.009	24.392	0.163	149.6	0.037	0.00	0.0	0.600	o	675	Pipe/Conduit	
S17.010	10.270	0.100	102.7	0.030	0.00	0.0	0.600	o	675	Pipe/Conduit	
S17.011	7.483	0.095	78.8	0.009	0.00	0.0	0.600	o	675	Pipe/Conduit	
S22.000	31.018	0.777	39.9	0.203	4.00	0.0	0.600	o	225	Pipe/Conduit	
S22.001	31.018	0.778	39.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S17.012	7.362	0.075	98.2	0.008	0.00	0.0	0.600	o	675	Pipe/Conduit	
S17.013	10.682	0.090	118.7	0.035	0.00	0.0	0.600	o	675	Pipe/Conduit	
S17.014	28.570	0.393	72.7	0.048	0.00	0.0	0.600	o	675	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)
S17.009	41.76	7.04	127.004	2.360	0.0	0.0	0.0	2.14	765.9	266.9
S17.010	41.60	7.11	126.841	2.390	0.0	0.0	0.0	2.59	925.5	269.3
S17.011	41.50	7.15	126.741	2.399	0.0	0.0	0.0	2.96	1057.4	269.6
S22.000	50.00	4.25	130.094	0.203	0.0	0.0	0.0	2.08	82.6	27.5
S22.001	49.17	4.50	127.874	0.203	0.0	0.0	0.0	2.08	82.6	27.5
S17.012	41.39	7.20	125.683	2.610	0.0	0.0	0.0	2.65	946.6	292.6
S17.013	41.22	7.27	125.608	2.645	0.0	0.0	0.0	2.40	860.6	295.3
S17.014	40.87	7.43	124.083	2.693	0.0	0.0	0.0	3.08	1100.9	298.1

Network Design Table for Storm Network

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
S17.015	55.169	0.110	501.5	0.195	0.00	0.0	0.600	o	675	Pipe/Conduit		
S17.016	16.425	0.060	273.7	0.035	0.00	0.0	0.600	o	675	Pipe/Conduit		
S23.000	26.407	0.550	48.0	0.120	4.00	0.0	0.600	o	225	Pipe/Conduit		
S23.001	31.418	0.500	62.8	0.129	0.00	0.0	0.600	o	225	Pipe/Conduit		
S23.002	58.823	1.421	41.4	0.250	0.00	0.0	0.600	o	225	Pipe/Conduit		
S23.003	40.231	0.940	42.8	0.173	0.00	0.0	0.600	o	450	Pipe/Conduit		
S23.004	30.573	0.650	47.0	0.085	0.00	0.0	0.600	o	450	Pipe/Conduit		
S23.005	20.428	0.390	52.4	0.076	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)
S17.015	39.20	8.22	123.690	2.888	0.0	0.0	0.0	1.16	416.3	306.6
S17.016	38.86	8.39	123.580	2.923	0.0	0.0	0.0	1.58	565.1	307.6
S23.000	50.00	4.23	136.550	0.120	0.0	0.0	0.0	1.89	75.2	16.2
S23.001	48.99	4.55	136.000	0.249	0.0	0.0	0.0	1.65	65.7	33.0
S23.002	47.34	5.03	135.500	0.499	0.0	0.0	0.0	2.04	81.1	64.0
S23.003	46.65	5.25	133.854	0.672	0.0	0.0	0.0	3.11	495.4	84.9
S23.004	46.12	5.42	131.470	0.757	0.0	0.0	0.0	2.97	472.4	94.5
S23.005	45.75	5.54	129.735	0.833	0.0	0.0	0.0	2.81	447.6	103.2

Network Design Table for Storm Network

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
S24.000	35.423	0.784	45.2	0.133	4.00	0.0	0.600	o	225	Pipe/Conduit		
S23.006	34.302	0.737	46.5	0.142	0.00	0.0	0.600	o	450	Pipe/Conduit		
S23.007	40.260	0.869	46.3	0.152	0.00	0.0	0.600	o	450	Pipe/Conduit		
S17.017	56.747	0.986	57.6	0.251	0.00	0.0	0.600	o	675	Pipe/Conduit		
S17.018	17.822	0.150	118.8	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit		
S17.019	14.316	0.650	22.0	0.037	0.00	0.0	0.600	o	675	Pipe/Conduit		
S25.000	43.434	0.250	173.7	0.100	4.00	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)
S24.000	49.89	4.30	130.199	0.133	0.0	0.0	0.0	1.95	77.6	17.9
S23.006	45.19	5.73	127.643	1.108	0.0	0.0	0.0	2.99	474.9	135.5
S23.007	44.55	5.95	124.759	1.259	0.0	0.0	0.0	2.99	476.0	151.9
S17.017	38.33	8.66	122.816	4.433	0.0	0.0	0.0	3.46	1237.9	460.2
S17.018	38.10	8.79	121.750	4.433	0.0	0.0	0.0	2.40	860.1	460.2
S17.019	38.02	8.83	121.600	4.470	0.0	0.0	0.0	5.60	2003.9	460.3
S25.000	48.34	4.73	124.500	0.100	0.0	0.0	0.0	0.99	39.3	13.1

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Woodcoste Grove	CORK NORTH WEST	
Ashley Road, Epsom	REGENERATION QUARTER	
Surrey, KT18 5BW	PHASE 3B DRAINAGE DESIGN	
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Network Design Table for Storm Network

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
S25.001	22.809	1.940	11.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
S25.002	20.992	0.112	187.4	0.097	0.00	0.0	0.600	o	225	Pipe/Conduit		
S17.020	4.197	0.095	44.2	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit		
S17.021	59.629	0.150	397.5	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit		
S17.022	11.534	0.636	18.1	0.006	0.00	0.0	0.600	o	600	Pipe/Conduit		
S26.000	55.345	1.161	47.7	0.165	4.00	0.0	0.600	o	225	Pipe/Conduit		
S17.023	72.205	1.420	50.8	0.130	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)
S25.001	48.00	4.83	124.250	0.100	0.0	0.0	0.0	3.84	152.6	13.1
S25.002	46.80	5.20	122.310	0.197	0.0	0.0	0.0	0.95	37.8	25.0
S17.020	37.99	8.85	120.950	4.667	0.0	0.0	0.0	3.95	1413.4	480.2
S17.021	36.73	9.56	120.850	4.667	0.0	0.0	0.0	1.40	617.3	480.2
S17.022	36.68	9.59	120.700	4.673	0.0	0.0	0.0	5.74	1621.9	480.2
S26.000	49.22	4.49	121.181	0.165	0.0	0.0	0.0	1.90	75.5	22.0
S17.023	35.98	10.01	120.020	4.968	0.0	0.0	0.0	2.86	454.3	484.1

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Ashley Road, Epsom	REGENERATION QUARTER	
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Network Design Table for Storm Network

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
S17.024	1.395	0.003	498.4	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S17.024	35.95	10.03	116.220	4.968	0.0	0.0	0.0	1.08	306.5«	484.1

Manhole Schedules for Storm Network

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., I*W (mm)	Pipe Out			Pipes In			Backdrop (mm)
					PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	Diameter (mm)	
S1	126.377	1.500	Open Manhole	1050	S1.000	124.877	225				
S2	125.865	1.538	Open Manhole	1050	S1.001	124.327	225	S1.000	124.327	225	
S3	124.175	1.441	Open Manhole	1050	S1.002	122.734	300	S1.001	122.809	225	
S4	124.304	1.500	Open Manhole	1050	S2.000	122.804	225				
S5	123.146	2.199	Open Manhole	1200	S1.003	120.947	300	S1.002	121.615	300	668
								S2.000	121.690	225	668
S6	122.344	1.908	Open Manhole	1200	S1.004	120.436	300	S1.003	120.436	300	
S7	121.817	2.347	Open Manhole	1200	S1.005	119.470	300	S1.004	120.120	300	650
S9	123.176	1.500	Open Manhole	1050	S3.000	121.676	225				
S9	123.651	2.575	Open Manhole	1050	S3.001	121.076	225	S3.000	121.076	225	
S10	121.416	1.425	Open Manhole	1050	S3.002	119.991	225	S3.001	119.991	225	
S11	121.218	1.425	Open Manhole	1050	S3.003	119.793	225	S3.002	119.793	225	
S12	120.950	1.575	Open Manhole	1350	S3.004	119.375	375	S3.003	119.525	225	
S13	121.436	2.272	Open Manhole	1350	S1.006	119.164	375	S1.005	119.239	300	
								S3.004	119.164	375	
S14	123.018	2.886	Open Manhole	1200	S4.000	120.132	225				
S15A	120.275	1.425	Open Manhole	1200	S5.000	118.850	225				
S15	120.038	1.656	Open Manhole	1350	S1.007	118.382	450	S1.006	118.457	375	
								S4.000	118.607	225	

Manhole Schedules for Storm Network

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,I*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S11	133.348	2.288	Open Manhole	1500	S17.006	131.060	450	S17.005	131.560	450	500
								S19.000	131.923	225	638
S12	131.476	1.482	Open Manhole	1500	S20.000	129.994	225				
S13	131.401	1.679	Open Manhole	1500	S20.001	129.722	375	S20.000	129.872	225	
S14	131.591	2.254	Open Manhole	1500	S17.007	129.337	525	S17.006	130.000	450	588
								S20.001	129.337	375	
S15	134.306	1.410	Open Manhole	1500	S21.000	132.896	225				
S16	133.620	1.418	Open Manhole	1500	S21.001	132.202	300	S21.000	132.277	225	
S17	132.468	4.039	Open Manhole	1500	S17.008	128.429	525	S17.007	129.087	525	658
								S21.001	131.002	300	2348
S19	129.480	2.476	Open Manhole	1500	S17.009	127.004	675	S17.008	127.154	525	
S20	129.568	2.727	Open Manhole	1500	S17.010	126.841	675	S17.009	126.841	675	
S21	129.239	2.498	Open Manhole	1500	S17.011	126.741	675	S17.010	126.741	675	
S22	134.139	4.045	Open Manhole	1500	S22.000	130.094	225				
S22A	131.495	3.621	Open Manhole	1200	S22.001	127.874	225	S22.000	129.317	225	1443
S23	128.818	3.135	Open Manhole	1500	S17.012	125.683	675	S17.011	126.646	675	963
								S22.001	127.096	225	963
S24	128.341	2.733	Open Manhole	1500	S17.013	125.608	675	S17.012	125.608	675	
S25	127.662	3.579	Open Manhole	1500	S17.014	124.083	675	S17.013	125.518	675	1435

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PIPELINE SCHEDULES for Storm Network

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)
S1.000	o	225	S1	126.377	124.877	1.275	Open Manhole	1050
S1.001	o	225	S2	125.865	124.327	1.313	Open Manhole	1050
S1.002	o	300	S3	124.175	122.734	1.141	Open Manhole	1050
S2.000	o	225	S4	124.304	122.804	1.275	Open Manhole	1050
S1.003	o	300	S5	123.146	120.947	1.899	Open Manhole	1200
S1.004	o	300	S6	122.344	120.436	1.608	Open Manhole	1200
S1.005	o	300	S7	121.817	119.470	2.047	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	23.884	43.4	S2	125.865	124.327	1.313	Open Manhole	1050
S1.001	74.475	49.1	S3	124.175	122.809	1.141	Open Manhole	1050
S1.002	67.079	59.9	S5	123.146	121.615	1.231	Open Manhole	1200
S2.000	59.486	53.4	S5	123.146	121.690	1.231	Open Manhole	1200
S1.003	28.096	55.0	S6	122.344	120.436	1.608	Open Manhole	1200
S1.004	17.367	55.0	S7	121.817	120.120	1.397	Open Manhole	1200
S1.005	12.706	55.0	S13	121.436	119.239	1.897	Open Manhole	1350

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PIPELINE SCHEDULES for Storm Network

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
S3.000	o	225	S9	123.176	121.676	1.275	Open Manhole		1050
S3.001	o	225	S9	123.651	121.076	2.350	Open Manhole		1050
S3.002	o	225	S10	121.416	119.991	1.200	Open Manhole		1050
S3.003	o	225	S11	121.218	119.793	1.200	Open Manhole		1050
S3.004	o	375	S12	120.950	119.375	1.200	Open Manhole		1350
S1.006	o	375	S13	121.436	119.164	1.897	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., (mm)	I*W
S3.000	39.199	65.3	S9	123.651	121.076	2.350	Open Manhole		1050
S3.001	45.461	41.9	S10	121.416	119.991	1.200	Open Manhole		1050
S3.002	7.016	35.4	S11	121.218	119.793	1.200	Open Manhole		1050
S3.003	16.389	61.2	S12	120.950	119.525	1.200	Open Manhole		1350
S3.004	35.841	169.9	S13	121.436	119.164	1.897	Open Manhole		1350
S1.006	58.196	82.3	S15	120.038	118.457	1.206	Open Manhole		1350

Atkins (Epsom)		Page 29
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<u>PIPELINE SCHEDULES for Storm Network</u>		
<u>Upstream Manhole</u>		
PN	Hyd Diam MH C.Level I.Level D.Depth MH MH DIAM., L*W Sect (mm) Name (m) (m) (m) Connection (mm)	
S4.000	o 225 S14 123.018 120.132 2.661	Open Manhole 1200
S5.000	o 225 S15A 120.275 118.850 1.200	Open Manhole 1200
S1.007	o 450 S15 120.038 118.382 1.206	Open Manhole 1350
S1.008	o 450 S16 119.517 117.927 1.140	Open Manhole 1350
S1.009	o 450 S17 119.395 116.592 2.353	Open Manhole 1350
S6.000	o 225 S18 121.948 119.202 2.521	Open Manhole 1200
<u>Downstream Manhole</u>		
PN	Length Slope MH C.Level I.Level D.Depth MH MH DIAM., L*W (m) (1:X) Name (m) (m) (m) Connection (mm)	
S4.000	50.706 33.2 S15 120.038 118.607 1.206	Open Manhole 1350
S5.000	36.505 150.2 S15 120.038 118.607 1.206	Open Manhole 1350
S1.007	40.509 89.0 S16 119.517 117.927 1.140	Open Manhole 1350
S1.008	14.168 77.8 S17 119.395 117.745 1.200	Open Manhole 1350
S1.009	17.588 76.7 S19 119.311 116.363 2.499	Open Manhole 1350
S6.000	44.490 28.9 S19 119.311 117.663 1.424	Open Manhole 1350
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PIPELINE SCHEDULES for Storm Network

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)
S1.010	o	450	S19	119.311	116.363	2.498	Open Manhole	1350
S1.011	o	450	S20	117.776	114.381	2.945	Open Manhole	1350
S1.012	o	450	S21	115.398	113.021	1.927	Open Manhole	1350
S7.000	o	225	S22	119.471	117.213	2.033	Open Manhole	1200
S7.001	o	300	S23	117.484	116.200	0.984	Open Manhole	1200
S8.000	o	225	S24	119.791	117.565	2.001	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.010	29.295	76.7	S20	117.776	115.981	1.345	Open Manhole	1350
S1.011	38.230	50.3	S21	115.398	113.621	1.327	Open Manhole	1350
S1.012	23.035	49.2	S33	114.353	112.553	1.350	Open Manhole	1500
S7.000	49.948	53.2	S23	117.484	116.275	0.984	Open Manhole	1200
S7.001	20.609	42.2	S26	117.056	115.712	1.044	Open Manhole	1050
S8.000	29.946	28.5	S25	117.922	116.515	1.182	Open Manhole	1050

Atkins (Epsom)		Page 31
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PIPELINE SCHEDULES for Storm Network

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)
S8.001	o	225	S25	117.922	116.515	1.182	Open Manhole	1050
S7.002	o	300	S26	117.056	115.710	1.046	Open Manhole	1050
S7.003	o	300	S27	116.755	115.330	1.125	Open Manhole	1050
S9.000	o	225	S28	118.056	116.556	1.275	Open Manhole	1050
S7.004	o	300	S29	116.641	115.034	1.307	Open Manhole	1050
S7.005	o	375	S30	116.237	114.737	1.125	Open Manhole	1050

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)
S8.001	18.889	23.5	S26	117.056	115.710	1.121	Open Manhole	1050
S7.002	13.041	34.3	S27	116.755	115.330	1.125	Open Manhole	1050
S7.003	18.156	61.3	S29	116.641	115.034	1.307	Open Manhole	1050
S9.000	76.088	50.0	S29	116.641	115.034	1.382	Open Manhole	1050
S7.004	15.114	50.9	S30	116.237	114.737	1.200	Open Manhole	1050
S7.005	27.110	48.5	S31	115.678	114.178	1.125	Open Manhole	1050

Atkins (Epsom)		Page 32
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PIPELINE SCHEDULES for Storm Network

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)
S7.006	o	375	S31	115.678	114.178	1.125	Open Manhole	1050
S7.007	o	450	S32	114.929	113.029	1.450	Open Manhole	1050
S1.013	o	450	S33	114.353	112.553	1.350	Open Manhole	1500
S1.014	o	450	S34	113.050	111.203	1.397	Open Manhole	1500
S1.015	o	300	S35	109.957	108.057	1.600	Open Manhole	1500
S1.016	o	300	S36	107.980	106.641	1.039	Open Manhole	1500
S10.000	o	225	S49	126.597	125.172	1.200	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)
S7.006	23.807	31.8	S32	114.929	113.429	1.125	Open Manhole	1050
S7.007	15.771	48.4	S33	114.353	112.703	1.200	Open Manhole	1500
S1.013	30.842	22.8	S34	113.050	111.203	1.397	Open Manhole	1500
S1.014	54.345	18.8	S35	109.957	108.307	1.200	Open Manhole	1500
S1.015	35.114	26.2	S36	107.980	106.716	0.964	Open Manhole	1500
S1.016	15.617	51.0	SO/F 1	106.935	106.335	0.300	Open Manhole	1200
S10.000	31.941	161.3	S50	127.239	124.974	2.040	Open Manhole	1500

Atkins (Epsom)		Page 33
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PIPELINE SCHEDULES for Storm Network

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)
S11.000	o	225	S46	128.947	127.163	1.559	Open Manhole	1500
S11.001	o	225	S47	128.530	126.955	1.350	Open Manhole	1500
S11.002	o	225	S48	128.337	126.805	1.307	Open Manhole	1500
S10.001	o	300	S50	127.239	124.899	2.040	Open Manhole	1500
S10.002	o	300	S51	126.079	124.449	1.330	Open Manhole	1500
S12.000	o	225	S52	124.828	123.403	1.200	Open Manhole	1500

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)
S11.000	18.826	90.5	S47	128.530	126.955	1.350	Open Manhole	1500
S11.001	8.764	58.5	S48	128.337	126.805	1.307	Open Manhole	1500
S11.002	50.896	50.7	S50	127.239	125.802	1.212	Open Manhole	1500
S10.001	52.448	116.6	S51	126.079	124.449	1.330	Open Manhole	1500
S10.002	12.408	31.6	S53	125.488	124.056	1.132	Open Manhole	1500
S12.000	41.936	167.7	S53	125.488	123.153	2.110	Open Manhole	1500

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PIPELINE SCHEDULES for Storm Network

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
S10.003	o	300	S53	125.488	123.078	2.110	Open Manhole		1500
S13.000	o	225	S54	126.418	124.864	1.329	Open Manhole		1500
S10.004	o	375	S55	124.780	122.691	1.714	Open Manhole		1500
S14.000	o	225	S56	124.404	122.979	1.200	Open Manhole		1500
S14.001	o	300	S57	123.944	122.441	1.203	Open Manhole		1500

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
S10.003	14.715	47.2	S55	124.780	122.766	1.714	Open Manhole		1500
S13.000	54.445	37.3	S55	124.780	123.406	1.149	Open Manhole		1500
S10.004	26.052	40.3	S59	123.581	122.044	1.162	Open Manhole		1500
S14.000	30.942	66.8	S57	123.944	122.516	1.203	Open Manhole		1500
S14.001	41.399	62.4	S58	123.469	121.778	1.391	Open Manhole		1500

Atkins (Epsom)		Page 35
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PIPELINE SCHEDULES for Storm Network

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)
S14.002	o	375	S58	123.469	121.703	1.391	Open Manhole	1500
S10.005	o	450	S59	123.581	121.566	1.565	Open Manhole	1500
S10.006	o	450	S60	123.340	121.406	1.484	Open Manhole	1500
S10.007	o	525	S61	122.997	120.851	1.621	Open Manhole	1500
S10.008	o	525	S61	122.839	120.771	1.543	Open Manhole	1500
S10.009	o	600	S62	122.124	119.593	1.931	Open Manhole	1500
S15.000	o	225	S63	129.214	127.173	1.816	Open Manhole	1500

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)
S14.002	10.338	166.7	S59	123.581	121.641	1.565	Open Manhole	1500
S10.005	7.457	46.6	S60	123.340	121.406	1.484	Open Manhole	1500
S10.006	14.674	30.6	S61	122.997	120.926	1.621	Open Manhole	1500
S10.007	7.745	97.2	S61	122.839	120.771	1.543	Open Manhole	1500
S10.008	38.023	88.8	S62	122.124	120.343	1.256	Open Manhole	1500
S10.009	14.827	250.0	S68	122.637	119.534	2.503	Open Manhole	1500
S15.000	33.739	23.9	S64	127.569	125.762	1.582	Open Manhole	1500

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Innovyze	Network 2018.1	

PIPELINE SCHEDULES for Storm Network

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)
S15.001	o	225	S64	127.569	125.762	1.582	Open Manhole	1500
S15.002	o	225	S65	126.574	123.782	2.567	Open Manhole	1200
S15.003	o	225	S66	125.593	121.612	3.756	Open Manhole	1200
S10.010	o	600	S68	122.637	119.534	2.503	Open Manhole	1500
S10.011	o	600	S67	120.691	119.302	0.789	Open Manhole	1500
S16.000	o	225	S68	124.490	122.017	2.248	Open Manhole	1500
S16.001	o	225	S69	121.020	119.592	1.203	Open Manhole	1500

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)
S15.001	20.519	20.9	S65	126.574	124.782	1.567	Open Manhole	1200
S15.002	37.006	100.0	S66	125.593	123.412	1.956	Open Manhole	1200
S15.003	55.145	100.0	S68	122.637	121.061	1.351	Open Manhole	1500
S10.010	58.107	250.0	S67	120.691	119.302	0.790	Open Manhole	1500
S10.011	19.056	170.1	S71	120.650	119.190	0.860	Open Manhole	1500
S16.000	46.778	19.3	S69	121.020	119.592	1.203	Open Manhole	1500
S16.001	9.390	22.5	S71	120.650	119.175	1.250	Open Manhole	1500

Atkins (Epsom)		Page 37
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PIPELINE SCHEDULES for Storm Network

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)
S10.012	o	600	S71	120.650	118.830	1.220	Open Manhole	1500
S10.013	o	600	S72	120.371	118.569	1.202	Open Manhole	1500
S10.014	o	600	S72A	120.256	117.525	2.131	Open Manhole	1500
S17.000	o	225	S2	140.458	138.158	2.075	Open Manhole	1500
S17.001	o	300	S3	138.044	136.517	1.227	Open Manhole	1200
S17.002	o	375	S4	135.897	134.171	1.351	Open Manhole	1350
S17.003	o	450	S5	134.751	132.897	1.404	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)
S10.012	21.299	81.6	S72	120.371	118.569	1.202	Open Manhole	1500
S10.013	36.323	34.8	S72A	120.256	117.525	2.131	Open Manhole	1500
S10.014	19.068	127.1	S76	120.152	117.375	2.177	Open Manhole	0
S17.000	61.337	39.2	S3	138.044	136.592	1.227	Open Manhole	1200
S17.001	91.057	40.1	S4	135.897	134.246	1.351	Open Manhole	1350
S17.002	52.867	44.1	S5	134.751	132.972	1.404	Open Manhole	1350
S17.003	8.722	348.8	S9	134.519	132.872	1.197	Open Manhole	1500

Atkins (Epsom)		Page 38
Woodcoste Grove	CORK NORTH WEST	
Ashley Road, Epsom	REGENERATION QUARTER	
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PIPELINE SCHEDULES for Storm Network

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
S18.000	o	225	S6	136.963	135.538	1.200	Open Manhole		1500
S18.001	o	300	S7	135.961	134.277	1.384	Open Manhole		1500
S18.002	o	300	S8	135.497	133.890	1.307	Open Manhole		1500
S17.004	o	450	S9	134.519	132.722	1.347	Open Manhole		1500
S17.005	o	450	S10	133.607	131.810	1.347	Open Manhole		1500
S19.000	o	225	S1	135.238	133.813	1.200	Open Manhole		1500

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
S18.000	47.840	40.3	S7	135.961	134.352	1.384	Open Manhole		1500
S18.001	12.568	32.5	S8	135.497	133.890	1.307	Open Manhole		1500
S18.002	34.100	36.0	S9	134.519	132.944	1.275	Open Manhole		1500
S17.004	46.224	50.7	S10	133.607	131.810	1.347	Open Manhole		1500
S17.005	11.936	47.7	S11	133.348	131.560	1.338	Open Manhole		1500
S19.000	84.437	44.7	S11	133.348	131.923	1.200	Open Manhole		1500

Atkins (Epsom)		Page 39
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PIPELINE SCHEDULES for Storm Network

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
S17.006	o	450	S11	133.348	131.060	1.838	Open Manhole		1500
S20.000	o	225	S12	131.476	129.994	1.257	Open Manhole		1500
S20.001	o	375	S13	131.401	129.722	1.304	Open Manhole		1500
S17.007	o	525	S14	131.591	129.337	1.729	Open Manhole		1500
S21.000	o	225	S15	134.306	132.896	1.185	Open Manhole		1500

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
S17.006	50.986	48.1	S14	131.591	130.000	1.141	Open Manhole		1500
S20.000	20.535	168.3	S13	131.401	129.872	1.304	Open Manhole		1500
S20.001	44.352	115.2	S14	131.591	129.337	1.879	Open Manhole		1500
S17.007	32.214	128.9	S17	132.468	129.087	2.856	Open Manhole		1500
S21.000	33.248	53.7	S16	133.620	132.277	1.118	Open Manhole		1500

Atkins (Epsom)		Page 40
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PIPELINE SCHEDULES for Storm Network

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)
S21.001	o	300	S16	133.620	132.202	1.118	Open Manhole	1500
S17.008	o	525	S17	132.468	128.429	3.514	Open Manhole	1500
S17.009	o	675	S19	129.480	127.004	1.801	Open Manhole	1500
S17.010	o	675	S20	129.568	126.841	2.052	Open Manhole	1500
S17.011	o	675	S21	129.239	126.741	1.823	Open Manhole	1500
S22.000	o	225	S22	134.139	130.094	3.820	Open Manhole	1500
S22.001	o	225	S22A	131.495	127.874	3.396	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)
S21.001	43.475	36.2	S17	132.468	131.002	1.166	Open Manhole	1500
S17.008	71.739	56.3	S19	129.480	127.154	1.801	Open Manhole	1500
S17.009	24.392	149.6	S20	129.568	126.841	2.052	Open Manhole	1500
S17.010	10.270	102.7	S21	129.239	126.741	1.823	Open Manhole	1500
S17.011	7.483	78.8	S23	128.818	126.646	1.497	Open Manhole	1500
S22.000	31.018	39.9	S22A	131.495	129.317	1.953	Open Manhole	1200
S22.001	31.018	39.9	S23	128.818	127.096	1.497	Open Manhole	1500

Atkins (Epsom)		Page 41
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PIPELINE SCHEDULES for Storm Network

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)
S17.012	o	675	S23	128.818	125.683	2.460	Open Manhole	1500
S17.013	o	675	S24	128.341	125.608	2.058	Open Manhole	1500
S17.014	o	675	S25	127.662	124.083	2.904	Open Manhole	1500
S17.015	o	675	S26	126.080	123.690	1.715	Open Manhole	1500
S17.016	o	675	S27	125.608	123.580	1.353	Open Manhole	1500
S23.000	o	225	S29	138.207	136.550	1.432	Open Manhole	1500
S23.001	o	225	S30	137.950	136.000	1.725	Open Manhole	1500

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)
S17.012	7.362	98.2	S24	128.341	125.608	2.058	Open Manhole	1500
S17.013	10.682	118.7	S25	127.662	125.518	1.469	Open Manhole	1500
S17.014	28.570	72.7	S26	126.080	123.690	1.715	Open Manhole	1500
S17.015	55.169	501.5	S27	125.608	123.580	1.353	Open Manhole	1500
S17.016	16.425	273.7	S37	125.540	123.520	1.345	Open Manhole	1500
S23.000	26.407	48.0	S30	137.950	136.000	1.725	Open Manhole	1500
S23.001	31.418	62.8	S31	137.600	135.500	1.875	Open Manhole	1500

Atkins (Epsom)		Page 42																																																																																																																																																
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN																																																																																																																																																	
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Innovyze	Network 2018.1																																																																																																																																																	
PIPELINE SCHEDULES for Storm Network Upstream Manhole <table><tr><th>PN</th><th>Hyd Sect</th><th>Diam (mm)</th><th>MH Name</th><th>C.Level (m)</th><th>I.Level (m)</th><th>D.Depth (m)</th><th>MH Connection</th><th>MH DIAM., L*W (mm)</th></tr><tr><td>S23.002</td><td>o</td><td>225</td><td>S31</td><td>137.600</td><td>135.500</td><td>1.875</td><td>Open Manhole</td><td>1500</td></tr><tr><td>S23.003</td><td>o</td><td>450</td><td>S32</td><td>135.980</td><td>133.854</td><td>1.676</td><td>Open Manhole</td><td>1500</td></tr><tr><td>S23.004</td><td>o</td><td>450</td><td>S33</td><td>134.487</td><td>131.470</td><td>2.567</td><td>Open Manhole</td><td>1500</td></tr><tr><td>S23.005</td><td>o</td><td>450</td><td>S34</td><td>132.472</td><td>129.735</td><td>2.287</td><td>Open Manhole</td><td>1500</td></tr><tr><td>S24.000</td><td>o</td><td>225</td><td>S35</td><td>131.624</td><td>130.199</td><td>1.200</td><td>Open Manhole</td><td>1500</td></tr><tr><td>S23.006</td><td>o</td><td>450</td><td>S36</td><td>130.995</td><td>127.643</td><td>2.902</td><td>Open Manhole</td><td>1500</td></tr><tr><td>S23.007</td><td>o</td><td>450</td><td>S37</td><td>128.556</td><td>124.759</td><td>3.347</td><td>Open Manhole</td><td>1500</td></tr></table> Downstream Manhole <table><tr><th>PN</th><th>Length (m)</th><th>Slope (1:X)</th><th>MH Name</th><th>C.Level (m)</th><th>I.Level (m)</th><th>D.Depth (m)</th><th>MH Connection</th><th>MH DIAM., L*W (mm)</th></tr><tr><td>S23.002</td><td>58.823</td><td>41.4</td><td>S32</td><td>135.980</td><td>134.079</td><td>1.676</td><td>Open Manhole</td><td>1500</td></tr><tr><td>S23.003</td><td>40.231</td><td>42.8</td><td>S33</td><td>134.487</td><td>132.914</td><td>1.123</td><td>Open Manhole</td><td>1500</td></tr><tr><td>S23.004</td><td>30.573</td><td>47.0</td><td>S34</td><td>132.472</td><td>130.820</td><td>1.202</td><td>Open Manhole</td><td>1500</td></tr><tr><td>S23.005</td><td>20.428</td><td>52.4</td><td>S36</td><td>130.995</td><td>129.345</td><td>1.200</td><td>Open Manhole</td><td>1500</td></tr><tr><td>S24.000</td><td>35.423</td><td>45.2</td><td>S36</td><td>130.995</td><td>129.415</td><td>1.355</td><td>Open Manhole</td><td>1500</td></tr><tr><td>S23.006</td><td>34.302</td><td>46.5</td><td>S37</td><td>128.556</td><td>126.906</td><td>1.200</td><td>Open Manhole</td><td>1500</td></tr><tr><td>S23.007</td><td>40.260</td><td>46.3</td><td>S37</td><td>125.540</td><td>123.890</td><td>1.200</td><td>Open Manhole</td><td>1500</td></tr></table> ©1982-2018 Innovyze			PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)	S23.002	o	225	S31	137.600	135.500	1.875	Open Manhole	1500	S23.003	o	450	S32	135.980	133.854	1.676	Open Manhole	1500	S23.004	o	450	S33	134.487	131.470	2.567	Open Manhole	1500	S23.005	o	450	S34	132.472	129.735	2.287	Open Manhole	1500	S24.000	o	225	S35	131.624	130.199	1.200	Open Manhole	1500	S23.006	o	450	S36	130.995	127.643	2.902	Open Manhole	1500	S23.007	o	450	S37	128.556	124.759	3.347	Open Manhole	1500	PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)	S23.002	58.823	41.4	S32	135.980	134.079	1.676	Open Manhole	1500	S23.003	40.231	42.8	S33	134.487	132.914	1.123	Open Manhole	1500	S23.004	30.573	47.0	S34	132.472	130.820	1.202	Open Manhole	1500	S23.005	20.428	52.4	S36	130.995	129.345	1.200	Open Manhole	1500	S24.000	35.423	45.2	S36	130.995	129.415	1.355	Open Manhole	1500	S23.006	34.302	46.5	S37	128.556	126.906	1.200	Open Manhole	1500	S23.007	40.260	46.3	S37	125.540	123.890	1.200	Open Manhole	1500
PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)																																																																																																																																										
S23.002	o	225	S31	137.600	135.500	1.875	Open Manhole	1500																																																																																																																																										
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S23.005	o	450	S34	132.472	129.735	2.287	Open Manhole	1500																																																																																																																																										
S24.000	o	225	S35	131.624	130.199	1.200	Open Manhole	1500																																																																																																																																										
S23.006	o	450	S36	130.995	127.643	2.902	Open Manhole	1500																																																																																																																																										
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PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)																																																																																																																																										
S23.002	58.823	41.4	S32	135.980	134.079	1.676	Open Manhole	1500																																																																																																																																										
S23.003	40.231	42.8	S33	134.487	132.914	1.123	Open Manhole	1500																																																																																																																																										
S23.004	30.573	47.0	S34	132.472	130.820	1.202	Open Manhole	1500																																																																																																																																										
S23.005	20.428	52.4	S36	130.995	129.345	1.200	Open Manhole	1500																																																																																																																																										
S24.000	35.423	45.2	S36	130.995	129.415	1.355	Open Manhole	1500																																																																																																																																										
S23.006	34.302	46.5	S37	128.556	126.906	1.200	Open Manhole	1500																																																																																																																																										
S23.007	40.260	46.3	S37	125.540	123.890	1.200	Open Manhole	1500																																																																																																																																										

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PIPELINE SCHEDULES for Storm Network

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
S17.017	o	675	S37	125.540	122.816	2.049	Open Manhole		1500
S17.018	o	675	S37A	124.150	121.750	1.725	Open Manhole		1500
S17.019	o	675	S41	123.600	121.600	1.325	Open Manhole		1500
S25.000	o	225	S40	126.250	124.500	1.525	Open Manhole		1500
S25.001	o	225	S40A	126.000	124.250	1.525	Open Manhole		1500
S25.002	o	225	S41	124.570	122.310	2.035	Open Manhole		1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	I*W
S17.017	56.747	57.6	S37A	124.150	121.830	1.645	Open Manhole		1500
S17.018	17.822	118.8	S41	123.600	121.600	1.325	Open Manhole		1500
S17.019	14.316	22.0	S42A	123.398	120.950	1.773	Open Manhole		1500
S25.000	43.434	173.7	S40A	126.000	124.250	1.525	Open Manhole		1500
S25.001	22.809	11.8	S41	124.570	122.310	2.035	Open Manhole		1500
S25.002	20.992	187.4	S42A	123.398	122.198	0.975	Open Manhole		1500

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Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN	
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PIPELINE SCHEDULES for Storm Network

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)
S17.020	o	675	S42A	123.398	120.950	1.773	Open Manhole	1500
S17.021	o	750	S42	123.445	120.850	1.845	Open Manhole	1500
S17.022	o	600	S43	123.140	120.700	1.840	Open Manhole	1500
S26.000	o	225	S44	122.722	121.181	1.316	Open Manhole	1500
S17.023	o	450	S45	122.170	120.020	1.700	Open Manhole	1500
S17.024	o	600	S79	120.141	116.220	3.322	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)
S17.020	4.197	44.2	S42	123.445	120.855	1.915	Open Manhole	1500
S17.021	59.629	397.5	S43	123.140	120.700	1.690	Open Manhole	1500
S17.022	11.534	18.1	S45	122.170	120.064	1.506	Open Manhole	1500
S26.000	55.345	47.7	S45	122.170	120.020	1.925	Open Manhole	1500
S17.023	72.205	50.8	S79	120.141	118.600	1.091	Open Manhole	1800
S17.024	1.395	498.4	S94	117.117	116.217	0.300	Open Manhole	1500

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Ashley Road, Epsom	REGENERATION QUARTER	
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Innovyze	Network 2018.1	

Free Flowing Outfall Details for Storm Network

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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S1.016	SO/F 1	106.935	106.335	0.000	1200	0
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Free Flowing Outfall Details for Storm Network

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
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S10.014	S76	120.152	117.375	0.000	0	0
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Free Flowing Outfall Details for Storm Network

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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S17.024	S94	117.117	116.217	0.000	1500	0
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Atkins (Epsom)		Page 46
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN	
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Simulation Criteria for Storm Network Volumetric Runoff Coeff 0.750 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) 60 Hot Start Level (mm) 0 MADD Factor * 10m³/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 4 Number of Storage Structures 4 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.750 Return Period (years) 2 Ratio R 0.238 Cv (Winter) 0.840 Region Scotland and Ireland Profile Type Summer Storm Duration (mins) 15		
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Online Controls for Storm Network

Hydro-Brake® Optimum Manhole: S13, DS/PN: S1.006, Volume (m³): 7.9

Unit Reference	MD-CHE-0241-3500-1000-3500	Sump Available	No
Design Head (m)	1.000	Diameter (mm)	241
Design Flow (l/s)	35.0	Invert Level (m)	119.164
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	300
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)	1.000	35.0	Kick-Flo®	0.515	25.7
Flush-Flo™	0.395	34.9	Mean Flow over Head Range	-	25.6

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	6.5	0.600	27.2	1.600	44.1	2.600	55.9	5.000	77.1	7.500	94.1
0.200	19.9	0.800	31.4	1.800	46.7	3.000	60.0	5.500	80.8	8.000	97.2
0.300	29.9	1.000	35.0	2.000	49.2	3.500	64.7	6.000	84.4	8.500	100.1
0.400	34.9	1.200	38.3	2.200	51.5	4.000	69.1	6.500	87.8	9.000	103.0
0.500	25.8	1.400	41.3	2.400	53.8	4.500	73.2	7.000	91.0	9.500	105.7

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Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW				CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN																																																																																																																																																							
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Innovyze				Network 2018.1																																																																																																																																																							
<u>Hydro-Brake® Manhole: S34, DS/PN: S1.014, Volume (m³): 7.9</u> Design Head (m) 1.000 Design Flow (l/s) 260.0 Hydro-Brake® Type Md10 Diameter (mm) 434 Invert Level (m) 111.203 <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>16.1</td><td>0.600</td><td>161.1</td><td>1.600</td><td>332.4</td><td>2.600</td><td>423.7</td><td>5.000</td><td>587.6</td><td>7.500</td><td>719.6</td></tr><tr><td>0.200</td><td>41.3</td><td>0.800</td><td>215.7</td><td>1.800</td><td>352.5</td><td>3.000</td><td>455.1</td><td>5.500</td><td>616.2</td><td>8.000</td><td>743.2</td></tr><tr><td>0.300</td><td>70.1</td><td>1.000</td><td>259.1</td><td>2.000</td><td>371.6</td><td>3.500</td><td>491.6</td><td>6.000</td><td>643.6</td><td>8.500</td><td>766.1</td></tr><tr><td>0.400</td><td>100.5</td><td>1.200</td><td>287.8</td><td>2.200</td><td>389.7</td><td>4.000</td><td>525.5</td><td>6.500</td><td>669.9</td><td>9.000</td><td>788.3</td></tr><tr><td>0.500</td><td>131.2</td><td>1.400</td><td>310.9</td><td>2.400</td><td>407.1</td><td>4.500</td><td>557.4</td><td>7.000</td><td>695.2</td><td>9.500</td><td>809.9</td></tr></table> <u>Hydro-Brake® Manhole: S72A, DS/PN: S10.014, Volume (m³): 14.7</u> Design Head (m) 1.500 Hydro-Brake® Type Md5 SW Only Invert Level (m) 117.525 Design Flow (l/s) 300.0 Diameter (mm) 566 <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>20.0</td><td>0.600</td><td>231.4</td><td>1.600</td><td>298.6</td><td>2.600</td><td>320.7</td><td>5.000</td><td>431.2</td><td>7.500</td><td>528.0</td></tr><tr><td>0.200</td><td>57.8</td><td>0.800</td><td>277.3</td><td>1.800</td><td>298.5</td><td>3.000</td><td>338.7</td><td>5.500</td><td>452.2</td><td>8.000</td><td>545.3</td></tr><tr><td>0.300</td><td>103.2</td><td>1.000</td><td>297.5</td><td>2.000</td><td>301.1</td><td>3.500</td><td>362.6</td><td>6.000</td><td>472.3</td><td>8.500</td><td>562.1</td></tr><tr><td>0.400</td><td>150.0</td><td>1.200</td><td>302.6</td><td>2.200</td><td>306.1</td><td>4.000</td><td>386.3</td><td>6.500</td><td>491.6</td><td>9.000</td><td>578.4</td></tr><tr><td>0.500</td><td>193.9</td><td>1.400</td><td>300.9</td><td>2.400</td><td>312.8</td><td>4.500</td><td>409.3</td><td>7.000</td><td>510.1</td><td>9.500</td><td>594.3</td></tr></table> Pre-initialised control selected, excessive flows may result.												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	16.1	0.600	161.1	1.600	332.4	2.600	423.7	5.000	587.6	7.500	719.6	0.200	41.3	0.800	215.7	1.800	352.5	3.000	455.1	5.500	616.2	8.000	743.2	0.300	70.1	1.000	259.1	2.000	371.6	3.500	491.6	6.000	643.6	8.500	766.1	0.400	100.5	1.200	287.8	2.200	389.7	4.000	525.5	6.500	669.9	9.000	788.3	0.500	131.2	1.400	310.9	2.400	407.1	4.500	557.4	7.000	695.2	9.500	809.9	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	20.0	0.600	231.4	1.600	298.6	2.600	320.7	5.000	431.2	7.500	528.0	0.200	57.8	0.800	277.3	1.800	298.5	3.000	338.7	5.500	452.2	8.000	545.3	0.300	103.2	1.000	297.5	2.000	301.1	3.500	362.6	6.000	472.3	8.500	562.1	0.400	150.0	1.200	302.6	2.200	306.1	4.000	386.3	6.500	491.6	9.000	578.4	0.500	193.9	1.400	300.9	2.400	312.8	4.500	409.3	7.000	510.1	9.500	594.3
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)																																																																																																																																																
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Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PHASE 3B DRAINAGE DESIGN																																																																										
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Innovyze	Network 2018.1																																																																										
<u>Depth/Flow Relationship Manhole: S43, DS/PN: S17.022, Volume (m³): 30.0</u> Invert Level (m) 120.700 <table><tr><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td></tr><tr><td>0.100</td><td>160.3600</td><td>0.600</td><td>392.7900</td><td>1.100</td><td>531.8400</td><td>1.600</td><td>641.4300</td><td>2.100</td><td>34.8500</td><td>2.600</td><td>817.6600</td></tr><tr><td>0.200</td><td>226.7800</td><td>0.700</td><td>424.2600</td><td>1.200</td><td>555.4900</td><td>1.700</td><td>661.1700</td><td>2.200</td><td>752.1400</td><td>2.700</td><td>833.2400</td></tr><tr><td>0.300</td><td>277.7500</td><td>0.800</td><td>453.5600</td><td>1.300</td><td>578.1700</td><td>1.800</td><td>680.3400</td><td>2.300</td><td>769.0400</td><td>2.800</td><td>848.5300</td></tr><tr><td>0.400</td><td>320.7100</td><td>0.900</td><td>481.0700</td><td>1.400</td><td>6000.0000</td><td>1.900</td><td>698.9800</td><td>2.400</td><td>785.5800</td><td>2.900</td><td>863.5500</td></tr><tr><td>0.500</td><td>358.5700</td><td>1.000</td><td>507.0900</td><td>1.500</td><td>621.0600</td><td>2.000</td><td>717.1400</td><td>2.500</td><td>801.7800</td><td>3.000</td><td>878.3100</td></tr></table>				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	160.3600	0.600	392.7900	1.100	531.8400	1.600	641.4300	2.100	34.8500	2.600	817.6600	0.200	226.7800	0.700	424.2600	1.200	555.4900	1.700	661.1700	2.200	752.1400	2.700	833.2400	0.300	277.7500	0.800	453.5600	1.300	578.1700	1.800	680.3400	2.300	769.0400	2.800	848.5300	0.400	320.7100	0.900	481.0700	1.400	6000.0000	1.900	698.9800	2.400	785.5800	2.900	863.5500	0.500	358.5700	1.000	507.0900	1.500	621.0600	2.000	717.1400	2.500	801.7800	3.000	878.3100
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)																																																																
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Storage Structures for Storm Network

Tank or Pond Manhole: S13, DS/PN: S1.006

Invert Level (m) 119.164

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	600.0	0.200	600.0	0.400	600.0	0.600	600.0	0.800	600.0	1.000	600.0
0.100	600.0	0.300	600.0	0.500	600.0	0.700	600.0	0.900	600.0	1.001	0.0

Tank or Pond Manhole: S34, DS/PN: S1.014

Invert Level (m) 111.203

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	315.0	0.200	315.0	0.400	315.0	0.600	315.0	0.800	315.0	1.000	315.0
0.100	315.0	0.300	315.0	0.500	315.0	0.700	315.0	0.900	315.0	1.100	0.0

Tank or Pond Manhole: S72A, DS/PN: S10.014

Invert Level (m) 117.525

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	410.0	0.200	410.0	0.400	410.0	0.600	410.0	0.800	410.0	1.000	410.0
0.100	410.0	0.300	410.0	0.500	410.0	0.700	410.0	0.900	410.0	1.100	0.0

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<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm Network</u>															
<table><thead><tr><th>PN</th><th>US/MH Name</th><th>Status</th><th>Level Exceeded</th></tr></thead><tbody><tr><td>S1.000</td><td>S1</td><td>SURCHARGED</td><td></td></tr><tr><td>S1.001</td><td>S2</td><td>SURCHARGED</td><td></td></tr></tbody></table>				PN	US/MH Name	Status	Level Exceeded	S1.000	S1	SURCHARGED		S1.001	S2	SURCHARGED	
PN	US/MH Name	Status	Level Exceeded												
S1.000	S1	SURCHARGED													
S1.001	S2	SURCHARGED													
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Surrey, KT18 5BW					PHASE 3B DRAINAGE DESIGN									
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File Phase 3B Drainage Design Model Rev2 - Upd...					Checked by MK									
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Summary of Critical Results by Maximum Level (Rank 1) for Storm Network														
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)
S1.002	S3	15 Winter	100	+10%	100/15 Summer				123.359	0.325	0.000	0.94		129.6
S2.000	S4	15 Winter	100	+10%	100/15 Summer				123.261	0.232	0.000	0.95		65.6
S1.003	S5	15 Winter	100	+10%	30/15 Summer				122.424	1.177	0.000	1.55		195.7
S1.004	S6	15 Winter	100	+10%	30/15 Summer				121.201	0.465	0.000	1.58		203.1
S1.005	S7	15 Winter	100	+10%	30/15 Summer				120.229	0.459	0.000	1.74		209.5
S3.000	S9	15 Winter	100	+10%	100/15 Summer				121.972	0.071	0.000	0.85		51.8
S3.001	S9	15 Winter	100	+10%	100/15 Summer				121.629	0.328	0.000	0.91		69.7
S3.002	S10	15 Winter	100	+10%	30/15 Summer				120.733	0.517	0.000	1.26		79.3
S3.003	S11	15 Winter	100	+10%	30/15 Summer				120.422	0.404	0.000	1.58		93.2
S3.004	S12	120 Winter	100	+10%	100/120 Winter				119.793	0.043	0.000	0.39		54.0
S1.006	S13	240 Winter	100	+10%	30/120 Summer				119.784	0.245	0.000	0.18		34.9
S4.000	S14	15 Winter	100	+10%					120.295	-0.062	0.000	0.88		76.0
S5.000	S15A	15 Winter	100	+10%	100/15 Summer				119.157	0.082	0.000	1.14		45.7
S1.007	S15	15 Winter	100	+10%					118.675	-0.157	0.000	0.73		196.0
S1.008	S16	15 Winter	100	+10%					118.264	-0.113	0.000	0.90		217.5
S1.009	S17	15 Winter	100	+10%					116.911	-0.131	0.000	0.84		227.6
S6.000	S18	15 Winter	100	+10%					119.333	-0.094	0.000	0.64		59.2
S1.010	S19	15 Winter	100	+10%					116.718	-0.095	0.000	0.97		306.8
S1.011	S20	15 Winter	100	+10%					114.710	-0.121	0.000	0.87		351.2
S1.012	S21	15 Winter	100	+10%	100/15 Summer				113.604	0.133	0.000	0.95		361.8
S7.000	S22	15 Winter	100	+10%					117.375	-0.063	0.000	0.86		58.6
S7.001	S23	15 Winter	100	+10%	100/15 Summer				116.612	0.112	0.000	0.47		69.9
S8.000	S24	15 Winter	100	+10%					117.676	-0.114	0.000	0.49		44.6
S8.001	S25	15 Winter	100	+10%					116.706	-0.034	0.000	0.67		65.3
S7.002	S26	15 Winter	100	+10%	30/15 Summer				116.414	0.404	0.000	0.83		127.5
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S20.000	S12 15	Winter	100	+10%	30/15 Summer				130.545	0.326	0.000	1.38		50.0
S20.001	S13 15	Winter	100	+10%	30/15 Winter				130.481	0.384	0.000	0.49		83.3
S17.007	S14 15	Winter	100	+10%	30/15 Summer				130.345	0.483	0.000	1.46		528.1
S21.000	S15 15	Winter	100	+10%	100/15 Summer				133.181	0.060	0.000	1.05		69.9
S21.001	S16 15	Winter	100	+10%					132.409	-0.093	0.000	0.80		138.9
S17.008	S17 15	Winter	100	+10%	30/15 Summer				129.817	0.863	0.000	1.14		676.7
S17.009	S19 15	Winter	100	+10%	30/15 Summer				128.158	0.479	0.000	1.32		677.8
S17.010	S20 15	Winter	100	+10%	30/15 Summer				127.873	0.357	0.000	1.46		680.2
S17.011	S21 15	Winter	100	+10%	30/15 Summer				127.581	0.165	0.000	1.46		682.5
S22.000	S22 15	Summer	100	+10%					130.281	-0.038	0.000	0.99		76.8
S22.001	S22A 15	Winter	100	+10%					128.053	-0.046	0.000	0.99		76.7
S17.012	S23 15	Winter	100	+10%	30/15 Summer				126.807	0.449	0.000	1.54		719.2
S17.013	S24 15	Winter	100	+10%	30/15 Summer				126.486	0.203	0.000	1.55		723.4
S17.014	S25 30	Winter	100	+10%	30/15 Summer				125.796	1.038	0.000	0.87		695.4
S17.015	S26 30	Winter	100	+10%	30/15 Summer				125.498	1.133	0.000	1.99		722.1
S17.016	S27 30	Winter	100	+10%	30/15 Summer				125.056	0.801	0.000	1.86		728.6
S23.000	S29 15	Winter	100	+10%	30/15 Winter				137.406	0.631	0.000	0.50		35.2
S23.001	S30 15	Winter	100	+10%	30/15 Summer				137.332	1.107	0.000	0.89		54.8
S23.002	S31 15	Winter	100	+10%	30/15 Summer				136.989	1.264	0.000	1.37		107.3
S23.003	S32 15	Winter	100	+10%					134.045	-0.259	0.000	0.37		160.8
S23.004	S33 15	Winter	100	+10%					131.691	-0.229	0.000	0.47		191.1
S23.005	S34 15	Winter	100	+10%					129.996	-0.189	0.000	0.62		218.0
S24.000	S35 15	Winter	100	+10%					130.335	-0.089	0.000	0.68		49.7
S23.006	S36 15	Winter	100	+10%					127.945	-0.148	0.000	0.77		319.2
S23.007	S37 15	Winter	100	+10%					125.092	-0.117	0.000	0.88		373.9
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S23.007	S37	OK									
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Summary of Critical Results by Maximum Level (Rank 1) for Storm Network

										Water	Surcharged	Flooded			Pipe
	US/MH			Return	Climate	First (X)		First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow / Overflow	Flow
PN	Name	Storm	Period	Change		Surcharge		Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.	(l/s)
S17.017	S37	30	Winter	100	+10%	30/15		Winter			124.725	1.234	0.000	0.92	996.6
S17.018	S37A	30	Winter	100	+10%	30/15		Summer			123.891	1.466	0.000	2.03	995.2
S17.019	S41	30	Winter	100	+10%	30/15		Summer			123.274	0.999	0.000	0.98	1000.5
S25.000	S40	15	Winter	100	+10%						124.680	-0.045	0.000	0.96	35.8
S25.001	S40A	15	Winter	100	+10%						124.328	-0.147	0.000	0.26	36.1
S25.002	S41	15	Winter	100	+10%	30/15		Summer			122.866	0.331	0.000	2.00	68.7
S17.020	S42A	30	Winter	100	+10%	2/15		Winter			122.649	1.024	0.000	2.22	1035.6
S17.021	S42	30	Winter	100	+10%	30/15		Summer			121.979	0.379	0.000	1.93	1030.5
S17.022	S43	60	Winter	100	+10%	100/30		Summer			121.458	0.158	0.000	0.55	441.1
S26.000	S44	15	Winter	100	+10%						121.341	-0.065	0.000	0.84	61.0
S17.023	S45	60	Winter	100	+10%	100/30		Winter			120.657	0.187	0.000	1.07	454.3
S17.024	S79	60	Winter	100	+10%	30/15		Summer			116.992	0.173	0.000	1.92	454.2

PN	US/MH	Status	Level
	Name		Exceeded
S17.017	S37	SURCHARGED	
S17.018	S37A	FLOOD RISK	
S17.019	S41	SURCHARGED	4
S25.000	S40	OK	
S25.001	S40A	OK	
S25.002	S41	SURCHARGED	
S17.020	S42A	SURCHARGED	

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Date 13/08/2021 15:52 File Phase 3B Temporary Diversion Model Rev2 -...	Designed by JK Checked by MK																																															
Innovyze	Network 2018.1																																															
<u>STORM SEWER DESIGN by the Modified Rational Method</u> <u>Design Criteria for Storm Network</u> Pipe Sizes STANDARD Manhole Sizes STANDARD FSR Rainfall Model - Scotland and Ireland <table> <tr> <td>Return Period (years)</td> <td>2</td> <td>Foul Sewage (l/s/ha)</td> <td>0.000</td> <td>Maximum Backdrop Height (m)</td> <td>1.600</td> </tr> <tr> <td>M5-60 (mm)</td> <td>17.000</td> <td>Volumetric Runoff Coeff.</td> <td>0.750</td> <td>Min Design Depth for Optimisation (m)</td> <td>1.200</td> </tr> <tr> <td>Ratio R</td> <td>0.238</td> <td>PIMP (%)</td> <td>100</td> <td>Min Vel for Auto Design only (m/s)</td> <td>1.00</td> </tr> <tr> <td>Maximum Rainfall (mm/hr)</td> <td>50</td> <td>Add Flow / Climate Change (%)</td> <td>0</td> <td>Min Slope for Optimisation (1:X)</td> <td>500</td> </tr> <tr> <td>Maximum Time of Concentration (mins)</td> <td>30</td> <td>Minimum Backdrop Height (m)</td> <td>0.650</td> <td></td> <td></td> </tr> </table> Designed with Level Soffits			Return Period (years)	2	Foul Sewage (l/s/ha)	0.000	Maximum Backdrop Height (m)	1.600	M5-60 (mm)	17.000	Volumetric Runoff Coeff.	0.750	Min Design Depth for Optimisation (m)	1.200	Ratio R	0.238	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)	0.650																		
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<u>Network Design Table for Storm Network</u> « - Indicates pipe capacity < flow <table> <tr> <th>PN</th> <th>Length</th> <th>Fall</th> <th>Slope</th> <th>I.Area</th> <th>T.E.</th> <th>Base</th> <th>k</th> <th>HYD</th> <th>DIA</th> <th>Section Type</th> <th>Auto</th> </tr> <tr> <th>(m)</th> <th>(m)</th> <th>(1:X)</th> <th>(ha)</th> <th>(mins)</th> <th>Flow (l/s)</th> <th>(mm)</th> <th>SECT</th> <th>(mm)</th> <th></th> <th></th> <th>Design</th> </tr> </table> <u>Network Results Table</u> <table> <tr> <th>PN</th> <th>Rain</th> <th>T.C.</th> <th>US/IL</th> <th>Σ I.Area</th> <th>Σ Base</th> <th>Foul</th> <th>Add Flow</th> <th>Vel</th> <th>Cap</th> <th>Flow</th> </tr> <tr> <th>(mm/hr)</th> <th>(mins)</th> <th>(m)</th> <th>(ha)</th> <th>Flow (l/s)</th> <th>(l/s)</th> <th>(l/s)</th> <th>(m/s)</th> <th>(l/s)</th> <th>(l/s)</th> <th>(l/s)</th> </tr> </table>			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	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)	(l/s)
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																																					
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)	(l/s)																																						
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Network Design Table for Storm Network

Network Results Table

Network Design Table for Storm Network

Network Results Table

Network Design Table for Storm Network

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
S10.003	38.023	0.428	88.8	0.081	0.00	0.0	0.600	o	525	Pipe/Conduit		
S10.004	14.827	0.059	250.0	0.043	0.00	0.0	0.600	o	600	Pipe/Conduit		
S11.000	37.006	0.370	100.0	0.058	4.00	0.0	0.600	o	225	Pipe/Conduit		
S11.001	55.145	0.551	100.0	0.194	0.00	0.0	0.600	o	225	Pipe/Conduit		
S10.005	58.107	0.232	250.0	0.166	0.00	0.0	0.600	o	525	Pipe/Conduit		
S10.006	21.017	0.112	187.6	0.035	0.00	0.0	0.600	o	600	Pipe/Conduit		
S12.000	46.778	2.425	19.3	0.250	4.00	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)
S10.003	48.48	4.69	120.771	1.373	0.0	0.0	0.0	2.38	514.6	180.3
S10.004	47.93	4.85	119.593	1.416	0.0	0.0	0.0	1.54	434.2	183.8
S11.000	49.27	4.47	123.782	0.058	0.0	0.0	0.0	1.31	52.0	7.7
S11.001	46.87	5.17	121.612	0.252	0.0	0.0	0.0	1.31	52.0	31.9
S10.005	44.81	5.86	119.534	1.834	0.0	0.0	0.0	1.41	305.7	222.5
S10.006	44.26	6.06	119.302	1.869	0.0	0.0	0.0	1.77	501.7	224.0
S12.000	50.00	4.26	122.017	0.250	0.0	0.0	0.0	2.99	119.0	33.8

Network Design Table for Storm Network

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
S12.001	9.390	0.417	22.5	0.003	0.00	0.0	0.600	o	225	Pipe/Conduit	🔴
S10.007	21.299	0.261	81.6	0.172	0.00	0.0	0.600	o	600	Pipe/Conduit	🔴
S10.008	36.323	1.044	34.8	0.097	0.00	0.0	0.600	o	600	Pipe/Conduit	🔴
S10.009	19.068	0.150	127.1	0.026	0.00	0.0	0.600	o	600	Pipe/Conduit	🔴
S13.000	157.250	6.089	25.8	0.449	4.00	0.0	0.600	o	225	Pipe/Conduit	🟡
S13.001	43.115	2.420	17.8	1.704	0.00	0.0	0.600	o	375	Pipe/Conduit	🔴
S13.002	63.535	0.305	208.3	0.515	0.00	0.0	0.600	o	600	Pipe/Conduit	🔴
S13.003	17.633	0.085	207.4	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	🔴

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S12.001	49.84	4.32	119.592	0.253	0.0	0.0	0.0	2.77	110.1	34.2
S10.007	43.90	6.19	118.830	2.294	0.0	0.0	0.0	2.70	762.6	272.7
S10.008	43.51	6.34	118.569	2.391	0.0	0.0	0.0	4.14	1169.9	281.7
S10.009	43.13	6.48	117.525	2.417	0.0	0.0	0.0	2.16	610.3	282.3
S13.000	47.39	5.01	132.889	0.449	0.0	0.0	0.0	2.59	102.8	57.6
S13.001	46.86	5.18	126.800	2.153	0.0	0.0	0.0	4.31	476.1	273.2
S13.002	44.96	5.81	124.155	2.668	0.0	0.0	0.0	1.68	476.0	324.8
S13.003	44.47	5.98	123.850	2.668	0.0	0.0	0.0	1.69	477.0	324.8

Network Design Table for Storm Network

Network Results Table

Atkins (Epsom)		Page 10
Woodcote Grove	CORK NORTH WEST	
Ashley Road, Epsom	REGENERATION QUARTER	
Surrey, KT18 5BW	PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:52	Designed by JK	
File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	

Network Design Table for Storm Network

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
S13.009	4.197	0.095	44.2	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit		
S13.010	59.629	0.150	397.5	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit		
S13.011	11.534	0.636	18.1	0.006	0.00	0.0	0.600	o	600	Pipe/Conduit		
S15.000	55.345	1.161	47.7	0.165	4.00	0.0	0.600	o	225	Pipe/Conduit		
S13.012	72.205	1.420	50.8	0.130	0.00	0.0	0.600	o	450	Pipe/Conduit		
S13.013	1.395	0.003	498.4	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S13.009	40.92	7.40	120.950	3.347	0.0	0.0	0.0	3.95	1413.4	371.0
S13.010	39.40	8.12	120.850	3.347	0.0	0.0	0.0	1.40	617.3	371.0
S13.011	39.34	8.15	120.700	3.353	0.0	0.0	0.0	5.74	1621.9	371.0
S15.000	49.22	4.49	121.181	0.165	0.0	0.0	0.0	1.90	75.5	22.0
S13.012	38.51	8.57	120.020	3.648	0.0	0.0	0.0	2.86	454.3	380.5
S13.013	38.47	8.59	116.220	3.648	0.0	0.0	0.0	1.08	306.5	380.5

Manhole Schedules for Storm Network

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)
S20	117.776	3.395	Open Manhole	1350	S2.008	114.381	450	S6.000	117.663	225	1075
S21	115.398	1.827	Open Manhole	1350	S2.009	113.571	450	S2.007	115.981	450	1600
S22	119.471	2.258	Open Manhole	1200	S7.000	117.213	225	S2.008	113.621	450	50
S23	117.484	1.284	Open Manhole	1200	S7.001	116.200	300	S7.000	116.275	225	
S24	119.791	2.226	Open Manhole	1200	S8.000	117.565	225				
S25	117.922	1.407	Open Manhole	1050	S8.001	116.515	225	S8.000	116.515	225	
S26	117.056	1.346	Open Manhole	1050	S7.002	115.710	300	S7.001	115.712	300	2
								S8.001	115.710	225	
S27	116.755	1.425	Open Manhole	1050	S7.003	115.330	300	S7.002	115.330	300	
S28	118.056	1.500	Open Manhole	1050	S9.000	116.556	225				
S29	116.641	1.607	Open Manhole	1050	S7.004	115.034	300	S7.003	115.034	300	
								S9.000	115.034	225	
S30	116.237	1.500	Open Manhole	1050	S7.005	114.737	375	S7.004	114.737	300	
S31	115.678	1.500	Open Manhole	1050	S7.006	114.178	375	S7.005	114.178	375	
S32	114.929	1.900	Open Manhole	1050	S7.007	113.029	450	S7.006	113.429	375	325
S33	114.353	1.800	Open Manhole	1500	S2.010	112.553	450	S2.009	113.103	450	550
								S7.007	112.703	450	150
S34	113.050	1.847	Open Manhole	1500	S2.011	111.203	450	S2.010	111.203	450	

Manhole Schedules for Storm Network

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S35	109.957	1.900	Open Manhole	1500	S2.012	108.057	300	S2.011	108.307	450	400
S36	107.980	1.339	Open Manhole	1500	S2.013	106.641	300	S2.012	106.716	300	75
SO/F 1	106.935	0.600	Open Manhole	1200		OUTFALL		S2.013	106.335	300	
S40	126.580	2.200	Open Manhole	1350	S10.000	124.380	375				
SKNOCKNAHEENY AVENUE DIVERSION	123.520	2.450	Open Manhole	1500	S10.001	121.070	525	S10.000	121.070	375	
S61	122.997	2.146	Open Manhole	1500	S10.002	120.851	525	S10.001	120.851	525	
S61	122.839	2.068	Open Manhole	1500	S10.003	120.771	525	S10.002	120.771	525	
S62	122.124	2.531	Open Manhole	1500	S10.004	119.593	600	S10.003	120.343	525	675
S65	126.574	2.792	Open Manhole	1200	S11.000	123.782	225				
S66	125.593	3.981	Open Manhole	1200	S11.001	121.612	225	S11.000	123.412	225	1800
S68	122.637	3.103	Open Manhole	1500	S10.005	119.534	525	S10.004	119.534	600	
								S11.001	121.061	225	1227
S67	120.691	1.390	Open Manhole	1500	S10.006	119.302	600	S10.005	119.302	525	
S68	124.490	2.473	Open Manhole	1500	S12.000	122.017	225				
S69	121.020	1.428	Open Manhole	1500	S12.001	119.592	225	S12.000	119.592	225	
S71	120.650	1.820	Open Manhole	1500	S10.007	118.830	600	S10.006	119.190	600	360
								S12.001	119.175	225	
S72	120.371	1.802	Open Manhole	1500	S10.008	118.569	600	S10.007	118.569	600	

Atkins (Epsom)		Page 15
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
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File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	

Manhole Schedules for Storm Network

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)
S44	122.722	1.541	Open Manhole	1500	S15.000	121.181	225				
S45	122.170	2.150	Open Manhole	1500	S13.012	120.020	450	S13.011	120.064	600	194
								S15.000	120.020	225	
S79	120.141	3.922	Open Manhole	1800	S13.013	116.220	600	S13.012	118.600	450	2231
S48	117.170	0.953	Open Manhole	1500		OUTFALL		S13.013	116.217	600	

Atkins (Epsom)		Page 16
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
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PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd	Diam	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	Sect	(mm)	Name	(m)	(m)	(m)	Connection	(mm)
S2.000	o	300	S5	123.146	120.947	1.899	Open Manhole	1200
S2.001	o	300	S6	122.344	120.436	1.608	Open Manhole	1200
S2.002	o	300	S7	121.817	119.470	2.047	Open Manhole	1200
S3.000	o	225	S9	123.176	121.676	1.275	Open Manhole	1050
S3.001	o	225	S9	123.651	121.076	2.350	Open Manhole	1050
S3.002	o	225	S10	121.416	119.991	1.200	Open Manhole	1050
S3.003	o	225	S11	121.218	119.793	1.200	Open Manhole	1050
S3.004	o	375	S12	120.950	119.375	1.200	Open Manhole	1350

Downstream Manhole

PN	Length	Slope	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	(m)	(1:X)	Name	(m)	(m)	(m)	Connection	(mm)
S2.000	28.096	55.0	S6	122.344	120.436	1.608	Open Manhole	1200
S2.001	17.367	55.0	S7	121.817	120.120	1.397	Open Manhole	1200
S2.002	12.706	55.0	S13	121.436	119.239	1.897	Open Manhole	1350
S3.000	39.199	65.3	S9	123.651	121.076	2.350	Open Manhole	1050
S3.001	45.461	41.9	S10	121.416	119.991	1.200	Open Manhole	1050
S3.002	7.016	35.4	S11	121.218	119.793	1.200	Open Manhole	1050
S3.003	16.389	61.2	S12	120.950	119.525	1.200	Open Manhole	1350
S3.004	35.841	169.9	S13	121.436	119.164	1.897	Open Manhole	1350

Atkins (Epsom)		Page 18
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
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PIPELINE SCHEDULES for Storm Network

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
S2.006	o	450	S17	119.395	116.592	2.353	Open Manhole		1350
S6.000	o	225	S18	121.948	119.202	2.521	Open Manhole		1200
S2.007	o	450	S19	119.311	116.363	2.498	Open Manhole		1350
S2.008	o	450	S20	117.776	114.381	2.945	Open Manhole		1350
S2.009	o	450	S21	115.398	113.571	1.377	Open Manhole		1350
S7.000	o	225	S22	119.471	117.213	2.033	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)	I*W
S2.006	17.588	76.7	S19	119.311	116.363	2.499	Open Manhole		1350
S6.000	44.490	28.9	S19	119.311	117.663	1.424	Open Manhole		1350
S2.007	29.295	76.7	S20	117.776	115.981	1.345	Open Manhole		1350
S2.008	38.230	50.3	S21	115.398	113.621	1.327	Open Manhole		1350
S2.009	23.035	49.2	S33	114.353	113.103	0.800	Open Manhole		1500
S7.000	49.948	53.2	S23	117.484	116.275	0.984	Open Manhole		1200

Atkins (Epsom)		Page 19
Woodcote Grove	CORK NORTH WEST	
Ashley Road, Epsom	REGENERATION QUARTER	
Surrey, KT18 5BW	PH3B TEMP DRAINAGE DIVERSION	
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PIPELINE SCHEDULES for Storm Network

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
S7.001	o	300	S23	117.484	116.200	0.984	Open Manhole		1200
S8.000	o	225	S24	119.791	117.565	2.001	Open Manhole		1200
S8.001	o	225	S25	117.922	116.515	1.182	Open Manhole		1050
S7.002	o	300	S26	117.056	115.710	1.046	Open Manhole		1050
S7.003	o	300	S27	116.755	115.330	1.125	Open Manhole		1050
S9.000	o	225	S28	118.056	116.556	1.275	Open Manhole		1050

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
S7.001	20.609	42.2	S26	117.056	115.712	1.044	Open Manhole		1050
S8.000	29.946	28.5	S25	117.922	116.515	1.182	Open Manhole		1050
S8.001	18.889	23.5	S26	117.056	115.710	1.121	Open Manhole		1050
S7.002	13.041	34.3	S27	116.755	115.330	1.125	Open Manhole		1050
S7.003	18.156	61.3	S29	116.641	115.034	1.307	Open Manhole		1050
S9.000	76.088	50.0	S29	116.641	115.034	1.382	Open Manhole		1050

Atkins (Epsom)		Page 20
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:52	Designed by JK	
File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	

PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd	Diam	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	Sect	(mm)	Name	(m)	(m)	(m)	Connection	(mm)
S7.004	o	300	S29	116.641	115.034	1.307	Open Manhole	1050
S7.005	o	375	S30	116.237	114.737	1.125	Open Manhole	1050
S7.006	o	375	S31	115.678	114.178	1.125	Open Manhole	1050
S7.007	o	450	S32	114.929	113.029	1.450	Open Manhole	1050
S2.010	o	450	S33	114.353	112.553	1.350	Open Manhole	1500
S2.011	o	450	S34	113.050	111.203	1.397	Open Manhole	1500
S2.012	o	300	S35	109.957	108.057	1.600	Open Manhole	1500

Downstream Manhole

PN	Length	Slope	MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	(m)	(1:X)	Name	(m)	(m)	(m)	Connection	(mm)
S7.004	15.114	50.9	S30	116.237	114.737	1.200	Open Manhole	1050
S7.005	27.110	48.5	S31	115.678	114.178	1.125	Open Manhole	1050
S7.006	23.807	31.8	S32	114.929	113.429	1.125	Open Manhole	1050
S7.007	15.771	48.4	S33	114.353	112.703	1.200	Open Manhole	1500
S2.010	30.842	22.8	S34	113.050	111.203	1.397	Open Manhole	1500
S2.011	54.345	18.8	S35	109.957	108.307	1.200	Open Manhole	1500
S2.012	35.114	26.2	S36	107.980	106.716	0.964	Open Manhole	1500

Atkins (Epsom)		Page 21
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:52	Designed by JK	
File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	

PIPELINE SCHEDULES for Storm Network

Upstream Manhole

PN	Hyd	Diam		MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	Sect	(mm)		Name	(m)	(m)	(m)	Connection	(mm)
S2.013	o	300			S36	107.980	106.641	1.039	Open Manhole 1500
S10.000	o	375			S40	126.580	124.380	1.825	Open Manhole 1350
S10.001	o	525	SKNOCKNAHEENY AVENUE DIVERSION		S40	123.520	121.070	1.925	Open Manhole 1500
S10.002	o	525			S61	122.997	120.851	1.621	Open Manhole 1500
S10.003	o	525			S61	122.839	120.771	1.543	Open Manhole 1500
S10.004	o	600			S62	122.124	119.593	1.931	Open Manhole 1500
S11.000	o	225			S65	126.574	123.782	2.567	Open Manhole 1200

Downstream Manhole

PN	Length	Slope		MH	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W
	(m)	(1:X)		Name	(m)	(m)	(m)	Connection	(mm)
S2.013	15.617	51.0			SO/F 1	106.935	106.335	0.300	Open Manhole 1200
S10.000	56.333	17.0	SKNOCKNAHEENY AVENUE DIVERSION		S40	123.520	121.070	2.075	Open Manhole 1500
S10.001	21.284	97.2			S61	122.997	120.851	1.621	Open Manhole 1500
S10.002	7.745	97.2			S61	122.839	120.771	1.543	Open Manhole 1500
S10.003	38.023	88.8			S62	122.124	120.343	1.256	Open Manhole 1500
S10.004	14.827	250.0			S68	122.637	119.534	2.503	Open Manhole 1500
S11.000	37.006	100.0			S66	125.593	123.412	1.956	Open Manhole 1200

Atkins (Epsom)		Page 22
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:52 File Phase 3B Temporary Diversion Model Rev2 -...	Designed by JK Checked by MK	
Innovyze	Network 2018.1	
<u>PIPELINE SCHEDULES for Storm Network</u>		
<u>Upstream Manhole</u>		
PN	Hyd Diam MH C.Level I.Level D.Depth MH MH DIAM., L*W Sect (mm) Name (m) (m) (m) Connection (mm)	
S11.001	o 225 S66 125.593 121.612 3.756 Open Manhole	1200
S10.005	o 525 S68 122.637 119.534 2.578 Open Manhole	1500
S10.006	o 600 S67 120.691 119.302 0.789 Open Manhole	1500
S12.000	o 225 S68 124.490 122.017 2.248 Open Manhole	1500
S12.001	o 225 S69 121.020 119.592 1.203 Open Manhole	1500
S10.007	o 600 S71 120.650 118.830 1.220 Open Manhole	1500
<u>Downstream Manhole</u>		
PN	Length Slope MH C.Level I.Level D.Depth MH MH DIAM., L*W (m) (1:X) Name (m) (m) (m) Connection (mm)	
S11.001	55.145 100.0 S68 122.637 121.061 1.351 Open Manhole	1500
S10.005	58.107 250.0 S67 120.691 119.302 0.865 Open Manhole	1500
S10.006	21.017 187.6 S71 120.650 119.190 0.860 Open Manhole	1500
S12.000	46.778 19.3 S69 121.020 119.592 1.203 Open Manhole	1500
S12.001	9.390 22.5 S71 120.650 119.175 1.250 Open Manhole	1500
S10.007	21.299 81.6 S72 120.371 118.569 1.202 Open Manhole	1500
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Atkins (Epsom)		Page 24
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:52 File Phase 3B Temporary Diversion Model Rev2 -...	Designed by JK Checked by MK	
Innovyze	Network 2018.1	
<u>PIPELINE SCHEDULES for Storm Network</u>		
<u>Upstream Manhole</u>		
PN	Hyd Diam MH C.Level I.Level D.Depth MH MH DIAM., L*W Sect (mm) Name (m) (m) (m) Connection (mm)	
S13.006	o 675 S37 125.540 122.816 2.049 Open Manhole	1500
S13.007	o 675 S37A 124.150 121.750 1.725 Open Manhole	1500
S13.008	o 675 S41 123.600 121.600 1.325 Open Manhole	1500
S14.000	o 225 S40 126.250 124.500 1.525 Open Manhole	1500
S14.001	o 225 S40A 126.000 124.250 1.525 Open Manhole	1500
S14.002	o 225 S41 124.570 122.310 2.035 Open Manhole	1500
S13.009	o 675 S42A 123.398 120.950 1.773 Open Manhole	1500
<u>Downstream Manhole</u>		
PN	Length Slope MH C.Level I.Level D.Depth MH MH DIAM., L*W (m) (1:X) Name (m) (m) (m) Connection (mm)	
S13.006	56.747 57.6 S37A 124.150 121.830 1.645 Open Manhole	1500
S13.007	17.822 118.8 S41 123.600 121.600 1.325 Open Manhole	1500
S13.008	14.316 22.0 S42A 123.398 120.950 1.773 Open Manhole	1500
S14.000	43.434 173.7 S40A 126.000 124.250 1.525 Open Manhole	1500
S14.001	22.809 11.8 S41 124.570 122.310 2.035 Open Manhole	1500
S14.002	20.992 187.4 S42A 123.398 122.198 0.975 Open Manhole	1500
S13.009	4.197 44.2 S42 123.445 120.855 1.915 Open Manhole	1500
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Atkins (Epsom)		Page 25
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:52	Designed by JK	
File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	

PIPELINE SCHEDULES for Storm Network

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)
S13.010	o	750	S42	123.445	120.850	1.845	Open Manhole	1500
S13.011	o	600	S43	123.140	120.700	1.840	Open Manhole	1500
S15.000	o	225	S44	122.722	121.181	1.316	Open Manhole	1500
S13.012	o	450	S45	122.170	120.020	1.700	Open Manhole	1500
S13.013	o	600	S79	120.141	116.220	3.322	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)
S13.010	59.629	397.5	S43	123.140	120.700	1.690	Open Manhole	1500
S13.011	11.534	18.1	S45	122.170	120.064	1.506	Open Manhole	1500
S15.000	55.345	47.7	S45	122.170	120.020	1.925	Open Manhole	1500
S13.012	72.205	50.8	S79	120.141	118.600	1.091	Open Manhole	1800
S13.013	1.395	498.4	S48	117.170	116.217	0.353	Open Manhole	1500

Atkins (Epsom)		Page 27
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:52	Designed by JK	
File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	
Simulation Criteria for Storm Network Volumetric Runoff Coeff 0.750 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) 60 Hot Start Level (mm) 0 MADD Factor * 10m³/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 4 Number of Storage Structures 4 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.750 Return Period (years) 2 Ratio R 0.238 Cv (Winter) 0.840 Region Scotland and Ireland Profile Type Summer Storm Duration (mins) 15		
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Atkins (Epsom)		Page 28
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:52	Designed by JK	
File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	

Online Controls for Storm Network

Hydro-Brake® Optimum Manhole: S13, DS/PN: S2.003, Volume (m³): 7.9

Unit Reference	MD-CHE-0241-3500-1000-3500	Sump Available	No
Design Head (m)	1.000	Diameter (mm)	241
Design Flow (l/s)	35.0	Invert Level (m)	119.164
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	300
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)	1.000	35.0	Kick-Flo®	0.515	25.7
Flush-Flo™	0.395	34.9	Mean Flow over Head Range	-	25.6

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	6.5	0.600	27.2	1.600	44.1	2.600	55.9	5.000	77.1	7.500	94.1
0.200	19.9	0.800	31.4	1.800	46.7	3.000	60.0	5.500	80.8	8.000	97.2
0.300	29.9	1.000	35.0	2.000	49.2	3.500	64.7	6.000	84.4	8.500	100.1
0.400	34.9	1.200	38.3	2.200	51.5	4.000	69.1	6.500	87.8	9.000	103.0
0.500	25.8	1.400	41.3	2.400	53.8	4.500	73.2	7.000	91.0	9.500	105.7

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Atkins (Epsom)				Page 29																																																																																																																																																							
Woodcoste Grove				CORK NORTH WEST																																																																																																																																																							
Ashley Road, Epsom				REGENERATION QUARTER																																																																																																																																																							
Surrey, KT18 5BW				PH3B TEMP DRAINAGE DIVERSION																																																																																																																																																							
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Innovyze				Network 2018.1																																																																																																																																																							
<u>Hydro-Brake® Manhole: S34, DS/PN: S2.011, Volume (m³): 7.9</u> Design Head (m) 1.000 Design Flow (l/s) 260.0 Hydro-Brake® Type Md10 Diameter (mm) 434 Invert Level (m) 111.203 <table><thead><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>0.100</td><td>16.1</td><td>0.600</td><td>161.1</td><td>1.600</td><td>332.4</td><td>2.600</td><td>423.7</td><td>5.000</td><td>587.6</td><td>7.500</td><td>719.6</td></tr><tr><td>0.200</td><td>41.3</td><td>0.800</td><td>215.7</td><td>1.800</td><td>352.5</td><td>3.000</td><td>455.1</td><td>5.500</td><td>616.2</td><td>8.000</td><td>743.2</td></tr><tr><td>0.300</td><td>70.1</td><td>1.000</td><td>259.1</td><td>2.000</td><td>371.6</td><td>3.500</td><td>491.6</td><td>6.000</td><td>643.6</td><td>8.500</td><td>766.1</td></tr><tr><td>0.400</td><td>100.5</td><td>1.200</td><td>287.8</td><td>2.200</td><td>389.7</td><td>4.000</td><td>525.5</td><td>6.500</td><td>669.9</td><td>9.000</td><td>788.3</td></tr><tr><td>0.500</td><td>131.2</td><td>1.400</td><td>310.9</td><td>2.400</td><td>407.1</td><td>4.500</td><td>557.4</td><td>7.000</td><td>695.2</td><td>9.500</td><td>809.9</td></tr></tbody></table> <u>Hydro-Brake® Manhole: S72A, DS/PN: S10.009, Volume (m³): 14.7</u> Design Head (m) 1.500 Hydro-Brake® Type Md5 SW Only Invert Level (m) 117.525 Design Flow (l/s) 300.0 Diameter (mm) 566 <table><thead><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr></thead><tbody><tr><td>0.100</td><td>20.0</td><td>0.600</td><td>231.4</td><td>1.600</td><td>298.6</td><td>2.600</td><td>320.7</td><td>5.000</td><td>431.2</td><td>7.500</td><td>528.0</td></tr><tr><td>0.200</td><td>57.8</td><td>0.800</td><td>277.3</td><td>1.800</td><td>298.5</td><td>3.000</td><td>338.7</td><td>5.500</td><td>452.2</td><td>8.000</td><td>545.3</td></tr><tr><td>0.300</td><td>103.2</td><td>1.000</td><td>297.5</td><td>2.000</td><td>301.1</td><td>3.500</td><td>362.6</td><td>6.000</td><td>472.3</td><td>8.500</td><td>562.1</td></tr><tr><td>0.400</td><td>150.0</td><td>1.200</td><td>302.6</td><td>2.200</td><td>306.1</td><td>4.000</td><td>386.3</td><td>6.500</td><td>491.6</td><td>9.000</td><td>578.4</td></tr><tr><td>0.500</td><td>193.9</td><td>1.400</td><td>300.9</td><td>2.400</td><td>312.8</td><td>4.500</td><td>409.3</td><td>7.000</td><td>510.1</td><td>9.500</td><td>594.3</td></tr></tbody></table> Pre-initialised control selected, excessive flows may result.												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	16.1	0.600	161.1	1.600	332.4	2.600	423.7	5.000	587.6	7.500	719.6	0.200	41.3	0.800	215.7	1.800	352.5	3.000	455.1	5.500	616.2	8.000	743.2	0.300	70.1	1.000	259.1	2.000	371.6	3.500	491.6	6.000	643.6	8.500	766.1	0.400	100.5	1.200	287.8	2.200	389.7	4.000	525.5	6.500	669.9	9.000	788.3	0.500	131.2	1.400	310.9	2.400	407.1	4.500	557.4	7.000	695.2	9.500	809.9	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	20.0	0.600	231.4	1.600	298.6	2.600	320.7	5.000	431.2	7.500	528.0	0.200	57.8	0.800	277.3	1.800	298.5	3.000	338.7	5.500	452.2	8.000	545.3	0.300	103.2	1.000	297.5	2.000	301.1	3.500	362.6	6.000	472.3	8.500	562.1	0.400	150.0	1.200	302.6	2.200	306.1	4.000	386.3	6.500	491.6	9.000	578.4	0.500	193.9	1.400	300.9	2.400	312.8	4.500	409.3	7.000	510.1	9.500	594.3
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)																																																																																																																																																
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0.400	100.5	1.200	287.8	2.200	389.7	4.000	525.5	6.500	669.9	9.000	788.3																																																																																																																																																
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0.200	57.8	0.800	277.3	1.800	298.5	3.000	338.7	5.500	452.2	8.000	545.3																																																																																																																																																
0.300	103.2	1.000	297.5	2.000	301.1	3.500	362.6	6.000	472.3	8.500	562.1																																																																																																																																																
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Atkins (Epsom)		Page 30
Woodcote Grove	CORK NORTH WEST	
Ashley Road, Epsom	REGENERATION QUARTER	
Surrey, KT18 5BW	PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:52	Designed by JK	
File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	

Depth/Flow Relationship Manhole: S43, DS/PN: S13.011, Volume (m³): 30.0

Invert Level (m) 120.700

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	160.3600	0.600	392.7900	1.100	531.8400	1.600	641.4300	2.100	34.8500	2.600	817.6600
0.200	226.7800	0.700	424.2600	1.200	555.4900	1.700	661.1700	2.200	752.1400	2.700	833.2400
0.300	277.7500	0.800	453.5600	1.300	578.1700	1.800	680.3400	2.300	769.0400	2.800	848.5300
0.400	320.7100	0.900	481.0700	1.400	600.0000	1.900	698.9800	2.400	785.5800	2.900	863.5500
0.500	358.5700	1.000	507.0900	1.500	621.0600	2.000	717.1400	2.500	801.7800	3.000	878.3100

Atkins (Epsom)		Page 31	
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION		
Date 13/08/2021 15:52 File Phase 3B Temporary Diversion Model Rev2 -...	Designed by JK Checked by MK		
Innovyze	Network 2018.1		

Storage Structures for Storm Network

Tank or Pond Manhole: S13, DS/PN: S2.003

Invert Level (m) 119.164

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	600.0	0.200	600.0	0.400	600.0	0.600	600.0	0.800	600.0	1.000	600.0
0.100	600.0	0.300	600.0	0.500	600.0	0.700	600.0	0.900	600.0	1.001	0.0

Tank or Pond Manhole: S34, DS/PN: S2.011

Invert Level (m) 111.203

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	315.0	0.200	315.0	0.400	315.0	0.600	315.0	0.800	315.0	1.000	315.0
0.100	315.0	0.300	315.0	0.500	315.0	0.700	315.0	0.900	315.0	1.100	0.0

Tank or Pond Manhole: S72A, DS/PN: S10.009

Invert Level (m) 118.109

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	410.0	0.200	410.0	0.400	410.0	0.600	410.0	0.800	410.0	1.000	410.0
0.100	410.0	0.300	410.0	0.500	410.0	0.700	410.0	0.900	410.0	1.100	0.0

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Atkins (Epsom)		Page 32
Woodcote Grove	CORK NORTH WEST	
Ashley Road, Epsom	REGENERATION QUARTER	
Surrey, KT18 5BW	PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:52	Designed by JK	
File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	

Tank or Pond Manhole: S43, DS/PN: S13.011

Invert Level (m) 120.700

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	800.0	0.200	800.0	0.400	800.0	0.600	800.0	0.800	800.0	1.000	800.0
0.100	800.0	0.300	800.0	0.500	800.0	0.700	800.0	0.900	800.0	1.100	0.0

Atkins (Epsom)		Page 4
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:51 File Phase 3B Temporary Diversion Model Rev2 -...	Designed by JK Checked by MK	
Innovyze	Network 2018.1	
<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm Network</u>		

Atkins (Epsom)			Page 5												
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION														
Date 13/08/2021 15:51	Designed by JK														
File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK														
Innovyze	Network 2018.1														
<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm Network</u>															
<table><thead><tr><th></th><th>US/MH</th><th></th><th>Level</th></tr><tr><th>PN</th><th>Name</th><th>Status</th><th>Exceeded</th></tr></thead><tbody><tr><td>S7.005</td><td>S30</td><td>OK</td><td></td></tr></tbody></table>					US/MH		Level	PN	Name	Status	Exceeded	S7.005	S30	OK	
	US/MH		Level												
PN	Name	Status	Exceeded												
S7.005	S30	OK													
©1982-2018 Innovyze															

Atkins (Epsom)		Page 7
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:51	Designed by JK	
File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	

Summary of Critical Results by Maximum Level (Rank 1) for Storm Network

PN	US/MH Name	Flow / Overflow Cap.	(l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S7.006		S31	0.86	262.4	OK	
S7.007		S32	0.82	264.7	SURCHARGED	
S2.010		S33	1.07	628.8	SURCHARGED	
S2.011		S34	0.35	240.9	SURCHARGED	
S2.012		S35	1.19	239.1	SURCHARGED	
S2.013		S36	1.82	239.0	SURCHARGED	
S10.000		S40	0.00	0.0	OK	
S10.001	SKNOCKNAHEENY AVENUE DIVERSION		0.91	327.8	SURCHARGED	
S10.002		S61	1.52	377.1	SURCHARGED	
S10.003		S61	0.89	395.6	OK	
S10.004		S62	1.28	390.6	SURCHARGED	
S11.000		S65	0.44	21.6	OK	
S11.001		S66	1.67	83.5	SURCHARGED	
S10.005		S68	1.79	495.7	SURCHARGED	
S10.006		S67	1.44	498.9	SURCHARGED	
S12.000		S68	0.82	93.5	OK	
S12.001		S69	1.02	92.9	SURCHARGED	
S10.007		S71	1.15	590.5	SURCHARGED	
S10.008		S72	0.62	611.8	OK	
S10.009		S72A	0.77	298.1	SURCHARGED	
S13.000		S34	1.02	103.5	SURCHARGED	
S13.001		S39	1.03	447.6	SURCHARGED	
S13.002	SFOTA LAWN DIVERSION		1.31	558.3	SURCHARGED	
S13.003		S51	1.61	558.8	SURCHARGED	

Atkins (Epsom)				Page 8		
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW		CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION				
Date 13/08/2021 15:51		Designed by JK				
File Phase 3B Temporary Diversion Model Rev2 -...		Checked by MK				
Innovyze		Network 2018.1				
<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm Network</u>						
PN	US/MH Name	Flow / Overflow Cap.	Flow (1/s)	Pipe Flow (1/s)	Status	Level Exceeded
S13.004		S26	1.60	582.0	SURCHARGED	
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Atkins (Epsom)		Page 9
Woodcoste Grove	CORK NORTH WEST	
Ashley Road, Epsom	REGENERATION QUARTER	
Surrey, KT18 5BW	PH3B TEMP DRAINAGE DIVERSION	
Date 13/08/2021 15:51	Designed by JK	
File Phase 3B Temporary Diversion Model Rev2 -...	Checked by MK	
Innovyze	Network 2018.1	

Summary of Critical Results by Maximum Level (Rank 1) for Storm Network

										Water	Surcharged	Flooded			Pipe
	US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /	Overflow	Flow
PN	Name	Storm		Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.	(l/s)	(l/s)
S13.005	S27	30	Summer	100	+10%	30/15	Summer			124.390	0.135	0.000	1.48		581.8
S13.006	S37	30	Winter	100	+10%					123.191	-0.300	0.000	0.59		639.3
S13.007	S37A	15	Winter	100	+10%	30/15	Winter			122.512	0.087	0.000	1.29		635.5
S13.008	S41	30	Winter	100	+10%					122.222	-0.053	0.000	0.63		646.3
S14.000	S40	15	Winter	100	+10%					124.680	-0.045	0.000	0.96		35.8
S14.001	S40A	15	Winter	100	+10%					124.328	-0.147	0.000	0.26		36.1
S14.002	S41	15	Winter	100	+10%	30/15	Summer			122.866	0.331	0.000	2.00		68.7
S13.009	S42A	30	Winter	100	+10%	30/15	Summer			121.962	0.337	0.000	1.49		692.0
S13.010	S42	30	Winter	100	+10%	30/30	Winter			121.664	0.064	0.000	1.28		685.9
S13.011	S43	60	Winter	100	+10%					121.184	-0.116	0.000	0.44		352.4
S15.000	S44	15	Winter	100	+10%					121.341	-0.065	0.000	0.84		61.0
S13.012	S45	60	Winter	100	+10%					120.343	-0.127	0.000	0.86		365.6
S13.013	S79	60	Winter	100	+10%	30/30	Winter			116.920	0.100	0.000	1.54		365.6

	US/MH	Level
PN	Name	Status Exceeded
S13.005	S27	SURCHARGED
S13.006	S37	OK
S13.007	S37A	SURCHARGED
S13.008	S41	OK
S14.000	S40	OK
S14.001	S40A	OK

Atkins (Epsom)			Page 10																																
Woodcoste Grove Ashley Road, Epsom Surrey, KT18 5BW	CORK NORTH WEST REGENERATION QUARTER PH3B TEMP DRAINAGE DIVERSION																																		
Date 13/08/2021 15:51	Designed by JK																																		
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<table><thead><tr><th>PN</th><th>US/MH Name</th><th>Status</th><th>Level Exceeded</th></tr></thead><tbody><tr><td>S14.002</td><td>S41</td><td>SURCHARGED</td><td></td></tr><tr><td>S13.009</td><td>S42A</td><td>SURCHARGED</td><td></td></tr><tr><td>S13.010</td><td>S42</td><td>SURCHARGED</td><td></td></tr><tr><td>S13.011</td><td>S43</td><td>OK</td><td></td></tr><tr><td>S15.000</td><td>S44</td><td>OK</td><td></td></tr><tr><td>S13.012</td><td>S45</td><td>OK</td><td></td></tr><tr><td>S13.013</td><td>S79</td><td>SURCHARGED</td><td></td></tr></tbody></table>				PN	US/MH Name	Status	Level Exceeded	S14.002	S41	SURCHARGED		S13.009	S42A	SURCHARGED		S13.010	S42	SURCHARGED		S13.011	S43	OK		S15.000	S44	OK		S13.012	S45	OK		S13.013	S79	SURCHARGED	
PN	US/MH Name	Status	Level Exceeded																																
S14.002	S41	SURCHARGED																																	
S13.009	S42A	SURCHARGED																																	
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S13.012	S45	OK																																	
S13.013	S79	SURCHARGED																																	
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Cork NW Regeneration Quarter - Phase 3B

Stage 1 Road Safety Audit

Cork City Council

July 2021



Notice

This document and its contents have been prepared and are intended solely for Cork City Council's information and use in relation to the Cork North West Regeneration Quarter Phase 3B.

Atkins assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

Document history

Revision	Purpose description	Origin- ated	Checked	Reviewed	Author- ised	Date
Rev 0	Draft Issue	KB	EON	EON	KB	23/07/2021

Client signoff

Client	Cork City Council
Project	Cork North West Regeneration Quarter – Phase 3B
Job number	5206250

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1. Introduction

1.1. Background

This report describes the findings of a Stage 1 Road Safety Audit associated with the Cork North West Regeneration Quarter – Phase 3B.

The scheme involves the construction of new residential units on to the west of Knocknaheeny Ave. in Cork City. The site audited at this time is that site designated as Phase 3B under the City Northwest Quarter Regeneration Masterplan, Knocknaheeny.

This Stage 1 Audit has been completed in July 2021 by Atkins on behalf of Cork City Council.

1.2. Site Inspection

The site visit was undertaken on the 21st of July 2021. All necessary social distancing and travel precautions in line with current government Covid-19 guidance have been adhered to, i.e. team members travel in separate vehicles, social distancing observed on site and all post visit discussions were completed by telephone.

1.3. The Team

The Road Safety Audit Team members were as follows:

- Team Leader: **Keith Barry** BE (Hons) CEng MIEI
- Team Member: **Eileen O' Neill** CEng MIEI

A copy of the TII approval documentation for the audit team is included in Appendix A.

1.4. The Design

The following drawings were examined as part of the Road Safety Audit (RSA) process:

Table 1-1 - Drawing List

Drawing No	Drawing Title	Revision
CNW-P3B-ATK-P3B-Z0-DR-C-951200	Proposed Road Signs and Traffic Markings	P01
CNW-P3B-ATK-P3B-Z0-DR-C-950700	Proposed Pavement Layout	P01
CNW-P3B-ATK-P3B-Z0-DR-C-950705	Proposed Route Types	P01
CNW-P3B-ATK-P3B-Z0-DR-C-950710	Proposed Road Layout General Arrangement	P01
CNW-P3B-ATK-P3B-Z0-DR-C-950750	Proposed Pavement Layout	P01
5204404-SK-00006	Revised Phasing Boundaries	-
RK5137848/C/435	Vehicle Tracking Sheet	B

1.5. Road Safety Audit Compliance

Procedure and Scope

This Road Safety Audit has been carried out in accordance with the procedures and scope set out in TII publication number **GE-STY-01024 - Road Safety Audit**.

As part of the road safety audit process, the Audit Team have examined only those issues within the design which relate directly to road safety.

Compliance with Design Standards

The road safety audit process is not a design check, therefore verification or compliance with design standards has not formed part of the audit process.

Minimising Risk of Collision Occurrence

All problems described in this report are considered by the Audit Team to require action in order to improve the safety of the scheme and minimise the risk of collision occurrence.

1.6. Road Safety Audit Compliance

No existing collision statistical information was provided, and a review of the Road Safety Authority online collision database indicates that there were no recorded collisions within the scheme area between 2005 and 2016 inclusive. There are 4 no. collisions recorded on the adjacent Knocknaheeny Ave. One involved a pedestrian which resulted in minor injuries and the other three were vehicle incidents at the junction of Knocknaheeny Road and Harbour View Road. It should be noted that the RSA collision database is not a comprehensive record and does not include damage only collisions or any collisions recorded since 2016.

The location of these four collisions has been indicated in Figure 1-1, with the collision characteristics summarised in Table 1-2. Of the four recorded collisions one (25%) involved pedestrians or cyclists. As the scheme is replacing existing residential housing this particular phase of the regeneration project will not in itself contribute to additional pedestrian movements of in the area, however the overall regeneration project is likely to introduce increased VRU numbers on Knocknaheeny Avenue. For this reason, the interaction of this phase with future phases and the movements between them, particularly Phases 4A, 4E and 4F, should be considered carefully by the designers involved.

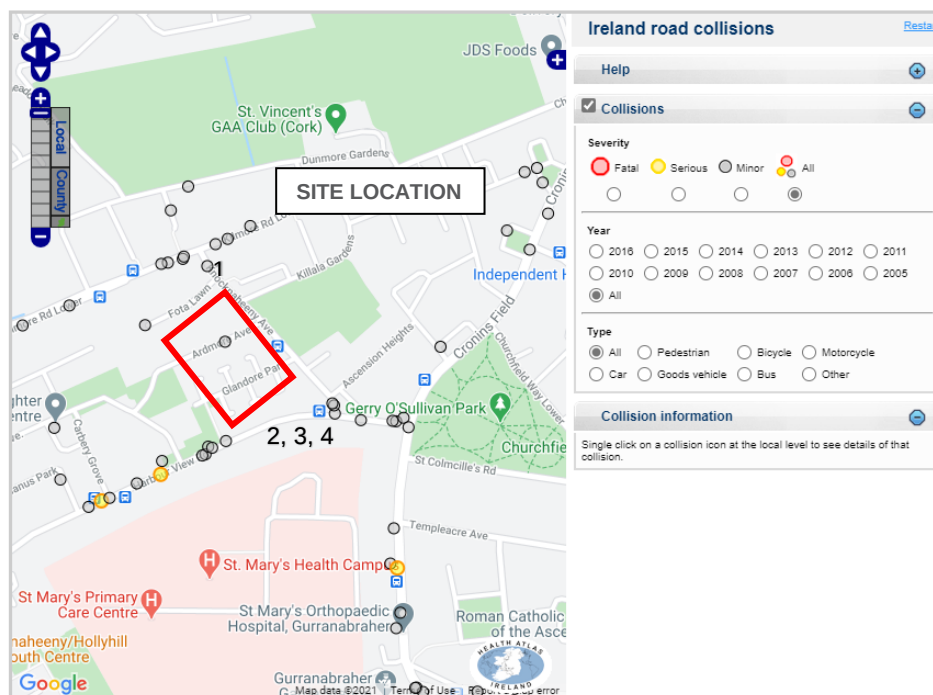


Figure 1-1 - RSA Collision Database 2005 - 2016

No.	Severity	Casualties	Year	Vehicle	Circumstances	Day	Time
1	Minor	1	2011	Car	Pedestrian	Tues	16.00-19.00
2	Minor	1	2007	Car	Other	Sun	16.00-19.00
3	Minor	2	2008	Car	Other	Wed	10.00-16.00
4	Minor	4	2012	Car	Rear end, straight	Mon	19.00-23.00

Table 1-2 - Summary of Collision Characteristics

2. Road Safety Issues Identified

2.1. Problem: Pedestrian Crossing on Knocknaheeny Avenue

Location: Knocknaheeny Avenue

Tactile paving and dropped kerbs are to be introduced to Knocknaheeny Avenue to facilitate access to the Bus Stop on the western side of the road. The Proposed Road Signs and Traffic Marking drawing indicates sets of W-140A signs on either side of the northern crossing but none between the southern crossing and Harbour View Road. Notwithstanding the fact that sightlines are good on Knocknaheeny Avenue vehicles travelling northbound may not expect pedestrians to be attempting to cross the road at this location.

Figure 2-1 – Signage at pedestrian crossings



Recommendation

It is recommended that the designer should relocate the signage between the two crossings to a location between Harbour View Road and the southern crossing.

2.2. Problem: Parking Bays

Location: Throughout Scheme

The edge detail for parallel parking spaces, throughout the scheme, is a kerbline perpendicular to the adjacent footpath. This detail can result in vehicles, who are exiting the parking bay, overrunning the footpath and potentially colliding with pedestrians.

Figure 2-2 – Parking Bay Detail



Recommendation

At detail design stage the Designer should consider a chamfered / splayed kerb detail which will reduce the risk of collisions with pedestrians.

2.3. Problem Drainage detail at ramps

Location: **Throughout Scheme**

The surface water layout drawing does not show gully locations. Care should be taken when designing the gully locations to ensure that areas likely to hold water are properly drained. Ponding water on the scheme can be a nuisance to pedestrians and also a skid hazard during cold winter conditions. Particular attention should be given to locating gullies at the upstream side of ramps, several which are indicated on the Proposed Pavement Layout drawing.

Recommendation

The Designer should ensure that gullies are located at all vulnerable areas including adjacent to ramps.

3. Audit Team Statement

3.1. Certification

We certify that we have examined the drawings and documents listed in Chapter 1 of this Report.

3.2. Sole Purpose

The Road Safety Audit has been carried out with the sole purpose of identifying any features of the design which could be removed or modified in order to improve the road safety aspects of the scheme.

3.3. Implementation of RSA Recommendations

The problems identified herein have been noted in the Report together with their associated recommendations for road safety improvements. We (the Audit Team) propose that these recommendations should be studied with a view to implementation.

3.4. Audit Team's Independence to the Design Process

No member of the Audit Team has been otherwise involved with the design of the measures audited.

3.5. Road Safety Audit Team Sign-Off

Keith Barry

Audit Team Leader
Road Safety Engineering Team

ATKINS

Signed:



Date: 23rd July 2021

Eileen O' Neill

Audit Team Member
Road Safety Engineering Team

ATKINS

Signed:



Date: 23rd July 2021

4. Designers Response

4.1. Preparing a Response to the Road Safety Audit

The Designer should prepare an Audit Response for each of the recommendations using the Road Safety Audit Feedback Form attached in Appendix A.

When completed, this form should be signed by the Designer and returned to the Audit Team.

4.2. Returning the Feedback Form

Please return the completed Road Safety Audit Feedback Form attached in Appendix A of this report to the following email or postal address:

Email address: Keith.Barry@atkinsglobal.com

Postal address: WS Atkins
Unit 2B
2200 Cork Airport Business Park
Cork
T12 R279

Telephone: 00 353 (0)21 429 0300

The Audit Team will consider the Designers response and reply indicating acceptance or otherwise of the Designers response to each recommendation.

4.3. Triggering the Need for an Exception Report

If the situation arises where the Designer and the Audit Team cannot agree on an appropriate means of addressing an underlying safety issue identified as part of the audit process, an Exception Report must be prepared by the Designer on each disputed item listed in the audit report.

Appendices



Appendix A. Audit Team Approvals

A.1. Team Leader

*Keith Barry
Atkins House
150 Lakeside Drive
Airside Business Park
Swords, Co.Dublin*

Date: 20/12/2019

Ref: KB217558

re: APPROVAL AS ROAD SAFETY AUDITOR

Dear Keith Barry,

You meet the qualification and experience requirements for Road Safety Audit as follows:

Scheme Category	Audit Team Status	Team Leader Expiry Date
Road Scheme	Team Leader	31/12/2021
Development Scheme	Team Leader	31/12/2021

The above assessment is based on information supplied and the qualification and experience requirements of National Roads Authority in accordance with HD 19 "Road Safety Audit". Further approval through RSAAS must be sought for the proposed road safety audit team for each audit undertaken on a National Road.

Yours sincerely,

Lucy Curtis

Regional Road Safety Engineer
roadsafetyaudits@tii.ie

A.2. Team Member

*Eileen O Neill
Atkins House
150 Lakeside Drive
Airside Business Park
Swords, Co.Dublin*

Date: 12/11/2020

Ref: EO109345

re: APPROVAL AS ROAD SAFETY AUDITOR

Dear Eileen O Neill,

You meet the qualification and experience requirements for Road Safety Audit as follows:

Scheme Category	Audit Team Status	Team Leader Expiry Date
Road Scheme	Team Leader	28/02/2022
Development Scheme	Team Leader	28/02/2022

The above assessment is based on information supplied and the qualification and experience requirements of National Roads Authority in accordance with HD 19 "Road Safety Audit". Further approval through RSAAS must be sought for the proposed road safety audit team for each audit undertaken on a National Road.

Yours sincerely,

Lucy Curtis

Regional Road Safety Engineer
roadsafetyaudits@tii.ie

Appendix B. Road Safety Audit Feedback Form

Scheme: Cork NW Regeneration Quarter - Phase 3B

Audit Stage: Stage 1 Road Safety Audit

Date Audit Completed: 23rd July 2021

To be completed by the Designer				To be completed by the Audit Team
Paragraph No. in Safety Audit Report	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Alternative measures or comments	Alternative Measures accepted by Auditors (yes/no)
2.1	Yes	Yes	Addressed as part of the Phase 4A development, however the designer will include the details in the Phase 3B pack for clarity	
2.2	Yes	Yes	To be addressed at detailed design and splayed kerb line to be introduced.	
2.3	Yes	Yes	To be addressed at detailed design.	

Signed by the Designer: *Martin O Sullivan*

Date: 26.07.2021

Signed by the Audit Team Leader:

Keith Barry

Date: 27/07/2021

Signed by the Employer:

Marain Hutnirk

Date: 28/07/2021

WS Atkins International Limited

Atkins House
150 Airside Business Park
Swords
Co. Dublin
K67 K5W4

Tel: +353 1 810 8000

DATE: 25 February 2022

DESIGNER: NS / AK

PROJECT No: 5206250

PROJECT NAME: CNW 3PB

**LIGHTING
REALITY**

Residential area designed in accordance with EN13201-2:2015
Category P3.

Fittings with the tag EX are existing fitting from a different phase and
are only included to generate lux levels.

Outdoor Lighting Report

PREPARED BY: Atkins Ireland.
Atkins House,
150 Airside Business Park,
Swords,
Co. Dublin

Layout Report

General Data

Dimensions in Metres Angles in Degrees
Grid Origin 565520.8m x 572865.8m
Area 189.4m x 171.2m
Sample Spacing 1.49m x 1.49m

Luminaires

Luminaire A Data

Supplier	
Type	P852-24-S1-NW-W7-0350-26W
Lamp(s)	740SS NW
Lamp Flux (klm)	3.55
File Name	P852-24-S1-NW-W7-0350-26W.Idt
Maintenance Factor	0.89
Imax70,80,90(cd/klm)	502.4, 86.5, 0.0
No. in Project	17



Luminaire C Data

Supplier	Urbis-Schreder
Type	AXIA 2.1 5166 - 16 NVSL219CT 480mA N W 230V Integrated lenses
Lamp(s)	16 NVSL219CT 480mA _NW
LampFlux(klm)/Colour	3.34 NW 4000K/70
File Name	AXIA 2.1 5166 16 NVSL219CT 480mA NW 26W 383322 Integrated lenses - 230V 25d...
Maintenance Factor	0.89
Imax70,80,90(cd/klm)	1056.5, 197.6, 0.0
No. in Project	6

Luminaire B Data

Supplier	Urbis-Schreder
Type	AXIA 2.1 5166 - 16 NVSL219CT 480mA N W 230V Integrated lenses
Lamp(s)	16 NVSL219CT 480mA _NW
LampFlux(klm)/Colour	3.34 NW 4000K/70
File Name	AXIA 2.1 5166 16 NVSL219CT 480mA NW 26W 383322 Integrated lenses - 230V 25d...
Maintenance Factor	0.89
Imax70,80,90(cd/klm)	1056.5, 197.6, 0.0
No. in Project	3



Luminaire D Data

Supplier	
Type	P852-24-S1-NW-W7-0350-26W
Lamp(s)	740SS NW
Lamp Flux (klm)	3.55
File Name	P852-24-S1-NW-W7-0350-26W.Idt
Maintenance Factor	0.89
Imax70,80,90(cd/klm)	502.4, 86.5, 0.0
No. in Project	1

Layout

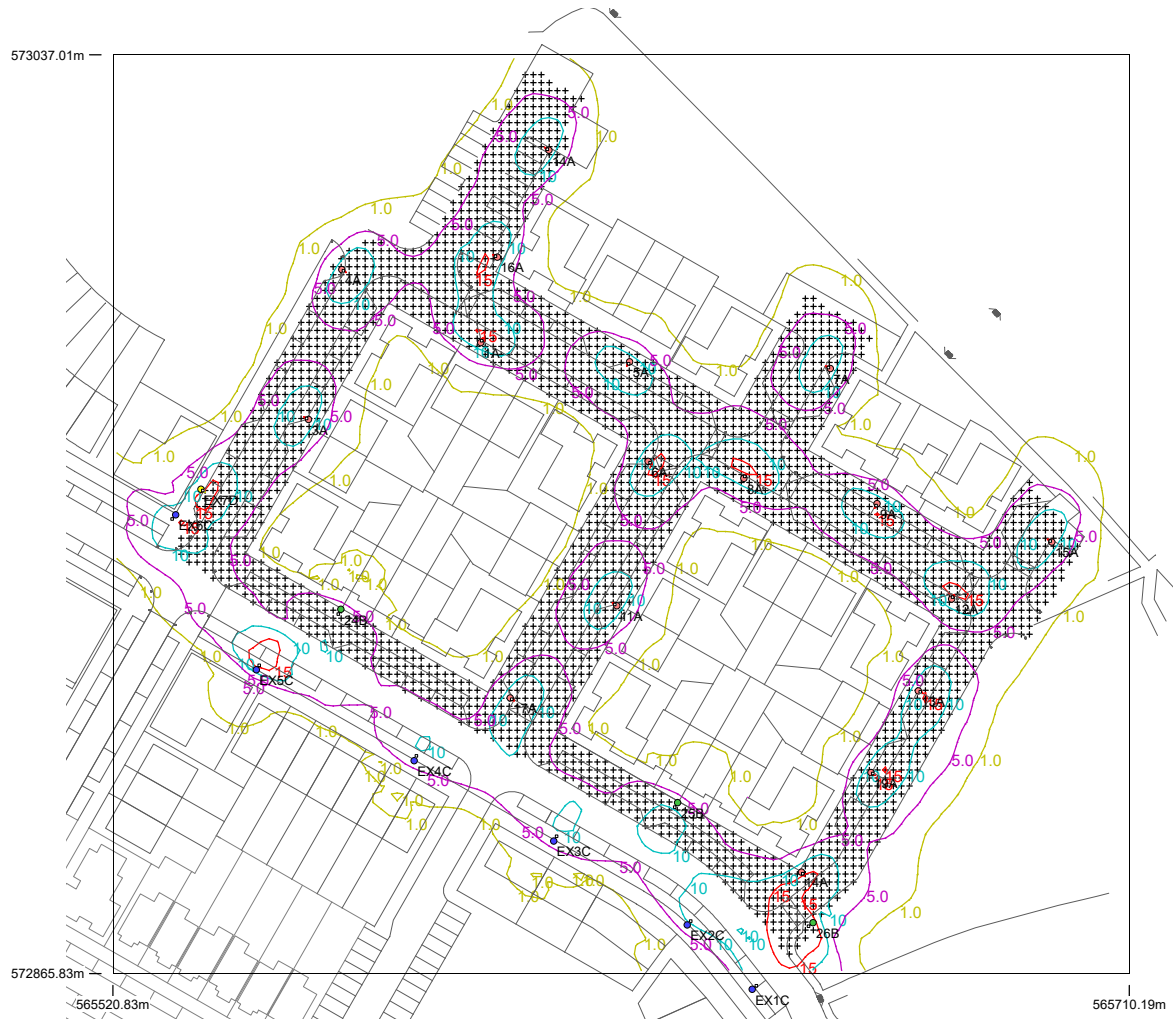
ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
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EX7	D	565537.23	572956.11	6.00	324.00	0.00	0.00	0.40			
3	A	565557.26	572969.10	6.00	152.00	0.00	0.00	0.40			
4	A	565563.45	572997.01	6.00	326.00	0.00	0.00	0.40			
5	A	565617.08	572979.82	6.00	236.00	0.00	0.00	0.40			
6	A	565620.54	572961.32	6.00	320.00	0.00	0.00	0.40			
7	A	565654.45	572978.61	6.00	153.00	0.00	0.00	0.40			
8	A	565638.32	572958.12	6.00	58.00	0.00	0.00	0.40			
9	A	565663.15	572953.40	6.00	240.00	0.00	0.00	0.40			
14	A	565602.05	573019.22	6.00	148.00	0.00	0.00	0.40			

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
11	A	565614.67	572934.41	6.00	147.00	0.00	0.00	0.40			
12	A	565677.01	572935.64	6.00	59.00	0.00	0.00	0.40			
13	A	565670.83	572918.56	6.00	332.00	0.00	0.00	0.40			
14	A	565649.08	572884.82	6.00	306.00	0.00	0.00	0.40			
15	A	565695.71	572946.24	6.00	145.00	0.00	0.00	0.40			
16	A	565592.42	572999.31	6.00	152.00	0.00	0.00	0.40			
17	A	565594.81	572917.25	6.00	324.00	0.00	0.00	0.40			
19	A	565662.02	572903.34	6.00	328.00	0.00	0.00	0.40			
EX1	C	565639.92	572862.98	8.00	39.00	0.00	0.00	1.00			
EX3	C	565602.95	572890.61	8.00	59.00	0.00	0.00	1.00			
EX2	C	565627.82	572874.94	8.00	49.00	0.00	0.00	1.00			
EX4	C	565576.92	572905.53	8.00	63.00	0.00	0.00	1.00			
EX5	C	565547.57	572922.47	6.00	58.00	0.00	0.00	1.00			
24	B	565563.30	572933.72	8.00	242.00	0.00	0.00	1.00			
25	B	565626.01	572897.72	8.00	237.00	0.00	0.00	1.00			
26	B	565651.20	572875.36	6.00	218.00	0.00	0.00	1.00			
EX6	C	565532.53	572951.31	8.00	230.00	0.00	0.00	1.00			

Horizontal Illuminance (lux)

Grid 1

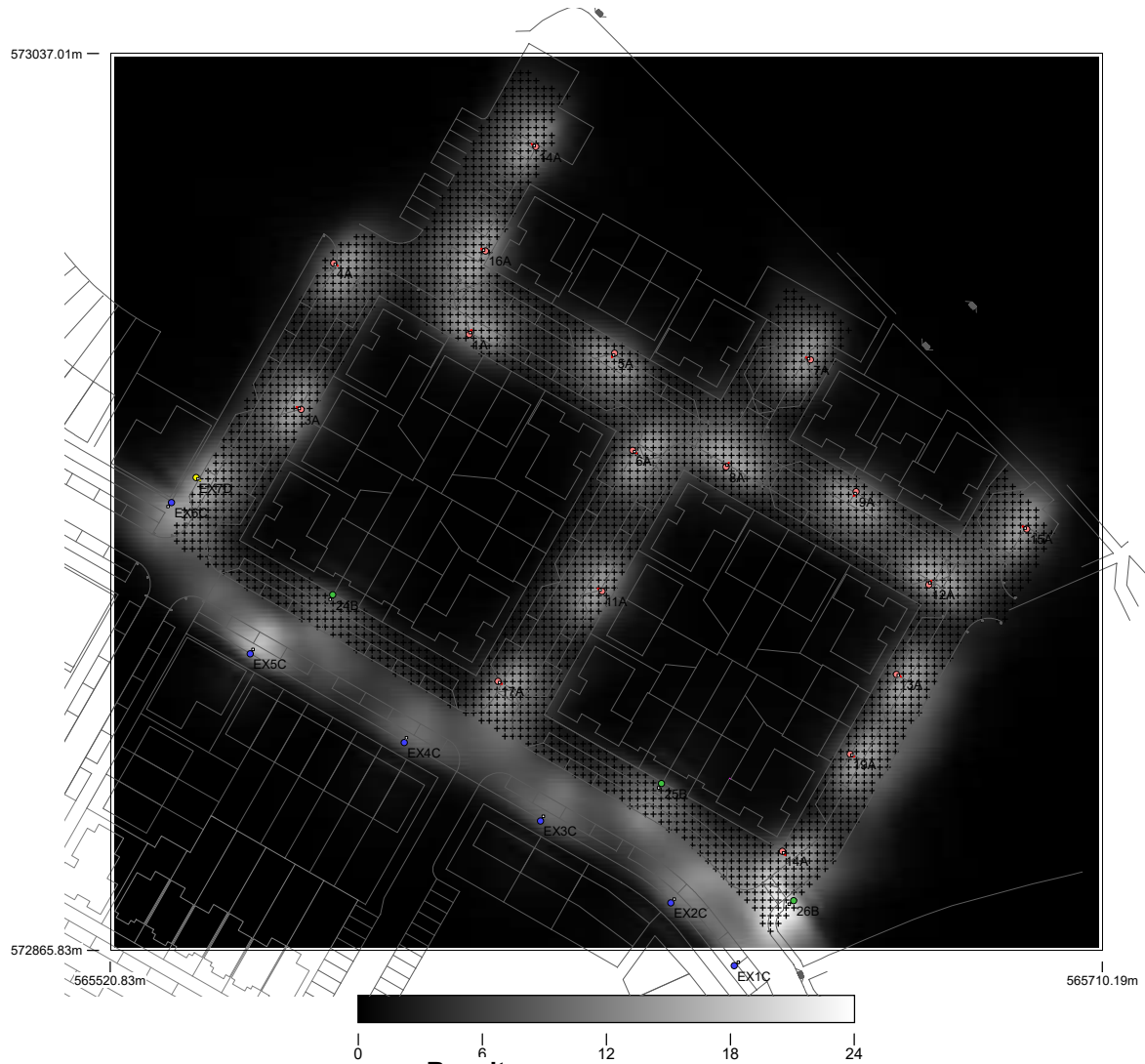


Results

Eav	7.78
Emin	1.61
Emax	23.62
Emin/Emax	0.07
Emin/Eav	0.21

Horizontal Illuminance (lux)

Grid 1



Results

Eav	7.78
Emin	1.61
Emax	23.62
Emin/Emax	0.07
Emin/Eav	0.21

Horizontal Illuminance (lux)

Grid 1



Results

Eav	7.78
Emin	1.61
Emax	23.62
Emin/Emax	0.07
Emin/Eav	0.21

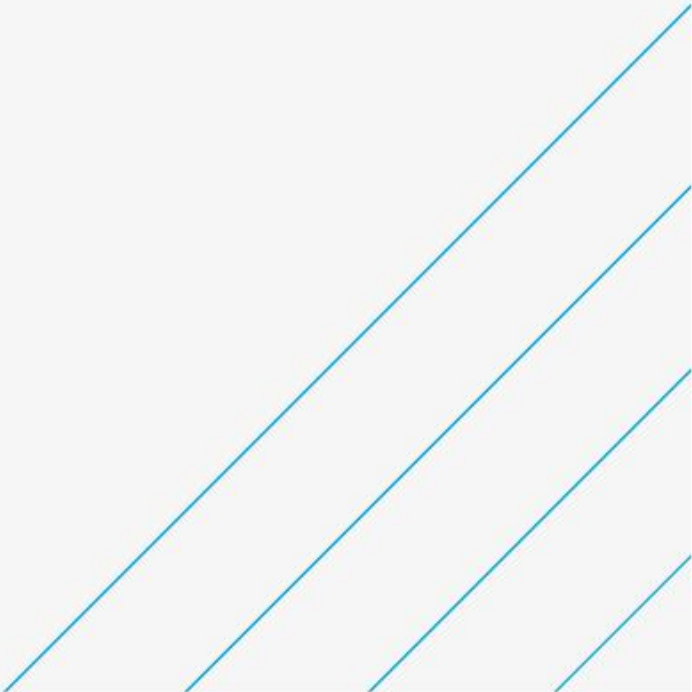
City Northwest Quarter Regeneration (CNWQR) Phase 3B

MEP Engineering Report & Energy Statement (Part L
Requirement)

Cork City Council

19 July 2021

62 Units Housing Development & Associated Works



Notice

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This document has 23 pages including the cover.

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 1.0	Pre-Planning (Stage 2A)	NS	AK/TOR	NS	MOS	20.07.21

Client signoff

Client	Cork City Council
Project	City Northwest Quarter Regeneration (CNWQR) Phase 3B
Job number	5206250
Document No.	CNW P3B-ATK-XX-RP-MEP-500001
Client signature / date	

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Outline

This document has been prepared and checked in accordance with Atkins BS OHSAS 18001:2007, EN ISO 9001:2015 and EN ISO 14001:2015. This document has been prepared by Atkins, with all practical experience, caution and persistent work within the terms of the Contract with the Client, take into account of the resources devoted to us by agreement with the Client. Atkins reject any responsibility to the Client and others in respect of any matters outside the scope of the above. This document is confidential to the Client and Atkins accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.

1. Public Lighting Design

This section outlines the proposed public lighting schemes for the proposed residential housing development for City Northwest Quarter Regeneration (CNWQR) Phase 3B.

The public lighting system will be a very high quality, energy efficiency and future proofed road lighting for housing development in compliance with Cork City Council (CCC) requirements.

1.1. Public Lighting Design Standards

Each category of roads, footpath, cycle track of the site development will be designed to its own specific requirements, illuminance level and uniformity to meet the lighting class for each area.

All works will comply with the latest editions of the relevant standards, in particular the works shall be designed to take full account of: -

- BS EN 13201 part 2 – Road Lighting Performance requirements.
- BS EN 13201 Part 3 – Road Lighting Details calculation of performance.
- BS EN 13201 Part 4 – Details methods of measuring light performance.
- The Current British Standards for Road Lighting are BS 5489 and BS EN 13201.
- Cork City Council Exterior Lighting Design Requirement
- BS EN 60529 - Specification for Degrees of Protection for enclosures.
- BS EN 60598-2-3 - Luminaires for Road and Street Lighting.
- BS 5489 -1 - Code of Practice for the design of road lighting.
- BS EN ISO 1461 Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods.
- IS EN 40-1 – Lighting Columns (Definitions and terms).
- IS EN 40-2- Lighting Columns (General requirements and dimensions).
- IS EN 40-3 - Lighting Columns (Design and verification and Verification by testing).
- IS EN 40-5 - Lighting Columns (Requirements for steel lighting columns).
- Roads Act, 1993. Road Traffic Act, 1994.
- Safety, Health and Welfare at Work Act 2005.
- Safety, Health and Welfare at Work Construction Regulations 2013.
- Building Control Act 2007.
- Road Traffic (Control of Traffic) Regulations 2006.
- ET 101 - National Rules for Electrical Installations published by ETCI.
- ET 211 - Code of Practice for Public Lighting Installations in Residential Areas published by ETCI.
- BS 7671 - Requirements for Electrical Installations. 7

Where a design standard has been revised, the latest edition will apply to all new lighting design / and installation.

1.2. Health & Safety

The attention of the Designer / Developer will be drawn to the obligations arising under the Safety, Health and Welfare at Work Act 2005 or latest approved version such as: -

- Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2012 or latest approved version.
- Safety, Health and Welfare at Work (Construction) regulations 2013 or latest approved version. Account will be taken of any traffic management measures that may be required during the installation of public lighting schemes including compliance with Chapter 8 of the Traffic Signals Manual published by the Department of Transport.

1.3. General Public Lighting Design Requirement

The site development public lighting installations will be designed by a competent public lighting engineer who has successfully completed the Institution of Lighting Professionals (ILP) Diploma in Exterior Lighting and is an active member of the Institution of Lighting Professionals, and as accepted by CCC public lighting department, to ensure that best practice is applied in the external lighting design of this residential development. This will include the requirement that public lighting schemes considers from junctions and traffic (both Pedestrian and Vehicular) conflict areas back i.e. T-junctions, pedestrian crossings, public and private car parking, as appropriate.

All new systems of public lighting of a new development will be designed and installed in accordance with the requirements and as accepted by CCC public lighting department.

The overall lighting requirements for a specific area will be identified within the British and European design code. This will then be expanded and refined to take account of an area's unique character and needs in terms of vehicular/ pedestrian activity, location of local amenities, etc by the design brief. However, generally the requirements of the specific design code as stated above in Public Lighting Standards will be met.

As a general rule, new luminaires will be of LED technology source although consideration to alternative light sources (particularly for the purposes of floodlighting) will be given where appropriate. Whether there may be situations in popular locations used heavily at night a higher level of illumination will be anticipated. For particularly sensitive vicinity locations it will be recommended to arrange for trial installations to demonstrate the effectiveness of the lighting and its impact on surrounding areas. All luminaires will be manufactured to a minimum of IP66 to BS EN 60590 for the lamp containment area and should be manufactured from vandal-resistant material. Lanterns will be designed and tested to provide a minimum normal operating life of 25years.

Construction of lighting columns and luminaire specifications shall comply with the CCC Public Lighting Manual and Product Specification 2021, the installation of schemes in residential areas guideline document.

Lighting control and installation details shall also comply with the above document.

In determining levels of illumination, lighting positions and styles, the design brief will consider pedestrian and vehicular uses/needs in relation to the following: -

- Areas of activity - Shops, School entrances, Creche entrance, Gym, bus stops (as appropriate), paths, etc and areas of conflict (junctions, etc).
- Building heights.
- Street features - crossing points, sitting areas, tree planting, pinch-points, materials / colours, etc.
- Ground form levels (important to people with disabilities), hazards, etc. Local knowledge, incidence of vandalism, accident black spots, etc.

1.3.1. Obtrusive Lighting

Considerations will be given to the restriction of obtrusive light by: -

- The control of the type of light source Restricting the level of light emitted by the luminaire at high angles usually between 70 and 90 degrees.
- The use of full horizontal cut off luminaires for mounting heights above 6m will have a substantial effect on restricting obtrusive light. Similarly, the use of shallow bowl luminaires for mounting heights of 6m or less will help to reduce the overall level of obtrusive light produced by road lighting installations, but may add to the numbers of lighting units required
- Careful consideration will be given to the design, installation, and maintenance of any lighting systems adjacent to the site to reduce the risk of damaging the night sight of the transport operators or reducing the visibility of signaling equipment.

1.4. Lighting Classes

The lighting classes assigned to the various locations within the development are outlined below and detailed in the public lighting report provided in Appendix A.

1.4.1. The Residential Areas

Residential areas will be designed using an 'P4' illuminance class derived from BS EN 13201. General street lighting will be installed on 6m columns and 8m where required.

1.4.2. Car Parks

Car parks are to be lit in accordance with BS5489-1:2013, recommendation as outlined in the CIBSE Lighting Guide and 'Secure by Design' guidance. The maintained illuminance level for the Car Park is proposed 20 lux. Car park luminaires will be installed on 6m columns and 8m where required. Group switching of car park lighting will be facilitated via an astro-timer and photocell and a suitably rated contactor located within a dedicated feeder pillar.

1.4.3. Pedestrian Crossings

Pedestrian crossings will be lit in accordance with BS5489-1:2013 and ILP Technical Report 12.

The maintained illuminance level for the pedestrian crossing is proposed as follows: -

- Average vertical illuminance on this axis of pedestrian crossing at a height of 1m: $E_v \geq 40$ lux
- Uniformity of vertical illuminance on lane in front of the driver ($E_{v \min}/E_{v \text{ av}}$): 0.20
- Average horizontal illuminance on pedestrian crossing at ground level: $E_h \geq 80$ lux
- Uniformity of horizontal illuminance ($E_{h \min}/E_{h \text{ av}}$): 0.30

Traffic route lighting and lighting of residential estates will be powered by local minipillars.

1.4.4. Cycleways

Cycleways will be lit in accordance with BS5489-1:2013 and BSEN 13201-2. Lighting columns positioned on cycleways will be set back a minimum of 0.5m to avoid contact with handlebars. Where the cycleway cannot be accessed by an elevated platform, raising and lowering columns will be installed. Raising and lowering columns shall be orientated so that the lantern head can be lowered safely without obstruction and, when in its collapsed position, shall not cause an obstruction to road users and pedestrians.

1.5. Trees & Arboriculture

Trees and other vegetation will not impede the functions of public lighting units. A separation of 5 metres between the lighting column and the outside of the crown will be allowed for the lighting to work as designed. Trees or vegetation will not be planted within 7 metres of a public light column.

The design will take into consideration the layout of the proposed public lighting column locations and the proposed landscape design. Both layouts will be coordinated to achieve the 7 metres separation between all trees and public lighting columns.

1.6. Public Lighting Layout

The public lighting layout is detailed in the public lighting report provided in Appendix A and on drawing number: - CNW P3B-ATK-P3B-ZODR-E-961300.

1.7. Access Chambers

Where appropriate, the access chambers for the site will be selected as per the table below standards and as appropriate.

Table – Chamber Type Description

Item	Chamber Type	Chamber Description
01	Large Inspection Chambers	All access chamber covers on the footpath to cater for a change of direction are proposed to be ductile iron with galvanized steel frame with frame opening 615mm x 615 mm to EN 124 B125 marked "Public Lighting" or "Traffic" with M16 stainless steel locking bolt
02	Medium Inspection Chambers	Access chamber covers on the footpath for straight through services are proposed to be ductile iron with galvanized steel frame with frame opening 720mm x 260 mm to EN 124 B125 marked "Public Lighting" or "Traffic" with M16 stainless steel locking bolt.
03	Small Inspection Chambers	Access chamber covers on the footpath for column connections shall be ductile iron with galvanized steel frame with frame opening 385mm x 260 mm to EN 124 B125 marked "Public Lighting" or "Traffic" with M16 stainless steel locking bolt or similar approved

2. Existing Utility Infrastructure

2.1. Identification of Utilities

A desk study of records from various utility companies was undertaken and the following utility holders were contacted, and records obtained / converted into digital format: -

- Irish Water (Foul and Watermain)
- ESB Networks
- Gas Networks Ireland (Transmission)
- Gas Networks Ireland (Distribution)
- Virgin Media
- BT
- Eir
- eNet

During the construction phases of the project, realignment, upgrade and replacement of services and utilities will be required in conjunction with and to accommodate the proposed works. These works will include: -

- Minor utility diversions in the region of the proposed junction as required
- Provision of new services to provide connections to the proposed development as per the overall masterplan designs

3. Proposed Utilities

This section outlines the proposed MEP utilities schemes for the proposed residential development on lands at City Northwest Quarter Regeneration (CNWQR) Phase 3B.

The Gas, Electricity and IT communications system will be designed and installed to the current guidelines.

3.1. Standards

All works will comply with the latest editions of the relevant standards, in particular the works shall be designed to take full account of: -

- Safety, Health and Welfare at Work Act 2005.
- Safety, Health and Welfare at Work Construction Regulations 2013.
- National Rules for Electrical Installations 4th Edition ET 101: 2008, including amendments, published by the Electro-Technical Council of Ireland (ETCI).
- Code of Practice for the Design, Selection and Erection of LV Switchboards for Residential Applications: ET 208: 2000 published by the ETCI.
- Code of Practice for Customer Interface, current edition published by ESB Networks (ESBN).
- ELECTRICAL SERVICES GUIDEBOOK – Housing Schemes, current edition published by ESB Networks.
- The Building Regulations published by the Department of Environment, Heritage and Local Government (DOEHLG).
- Code of Practice for Avoiding Danger from Underground Services published by the Health and Safety Authority (H.S.A.).
- Criteria document Cer/08/071 and any other requirements specified by the Commission for Energy Regulation (CER).
- BS 7671 - Requirements for Electrical Installations.

3.2. Electrical Infrastructure Preliminary Information (Phase 3B)

3.2.1. Primary Electrical Services

The total site electrical load is to be supplied by ESB Networks with a maximum estimated demand load of in the range of 560kVA (approximately).

The main ESB power cable will be buried in ducts or direct buried and specified as multicore XLPE/SWA/PVC. The electricity supply to each dwelling via standard ESB Networks standard LV minipillars scattered around the site.

Clarification:

The total estimated power electrical load for the phase 3B development have been based on BSRIA / Rules of Thumb Guidelines for building services (5th Edition) - CIBSE / Energy Benchmarks.

- A figure of 84(W/m²) is allowed for landlord areas. The figure is expressed in W/m² NIA, based on a net to gross ratio of 80% and mechanical power for plantrooms requirements (Rules of thumbs 5th edition / Energy Benchmarks).
- Predicting Electrical Future Load Growth - 10% power load growth factor is considered regarding future power expansion for the building associated with Building expansion and function of the building or facilities and Equipment technology within the building.
- Renewable Energy - Based on the Heat pumps systems.
- Rule of Thumb - Flats / Apartments 80(w/m²) electrical load. Note, Flat or apartment 7.5kw is employed with all electrical cooking and heating via heat pumps.
- Every house which has a parking space on curtilage to be allow for a possible charging point. 20% of visitor spaces to allow for a possible charging point. Within the apartment Blocks, 20% of spaces to allow for a possible charging point with capacity to bring this up to 50%.
- The target efficiency for the apartment Blocks is 75% gross to net.
- Houses and Apartment Blocks heating and domestic hot water production will be achieved with individual heat pumps.
- Apartments can be assumed as 60sqm for 1-bed, 85 sqm for 2-beds and 110 sqm for 3 beds.
- Allowances to be made for EV charging points for future proofing and based on a minimum charging power per active charging station.

3.3. Gas infrastructure (Phase 3B)

This section outlines the proposed Gas utilities schemes for the proposed residential development on lands at City Northwest Quarter Regeneration (CNWQR) Phase 3B.

The gas system will be designed and installed in accordance with the current guidelines, standards and industry regulations.

3.3.1. Standards

All works will comply with the latest editions of the relevant standards, in particular the works shall be designed to take full account of:

General

- Safety, Health and Welfare at Work Act 2005.
- Safety, Health and Welfare at Work Construction Regulations 2013.

For gas and main services

- Code of Practise for Gas Distribution Mains I.S. 329
- Installation of Gas Service Pipes I.S. 265
- Gas Infrastructure – Pipelines for maximum operating pressure up to and including 16 bar SR 12007-5
- Gas Supply Systems – Natural Gas Measuring Stations I.S. EN 1776
- Gas Pressure Testing, Commissioning and Decommissioning Procedures I.S. EN 12327#
- Gas infrastructure - Gas installation pipework I.S./ EN15001-2
- Gas Pressure Regulating Stations for Distribution I.S 821

For downstream of the meter

- Non-Domestic Gas Installations I.S. 820

3.3.2. Preliminary Total Estimated Gas Load

The total estimated gas load for the development were based: -

- BSRIA / Rules of Thumb Guidelines for building services (5th Edition) - CIBSE / Energy Benchmarks are used to determine estimated total electrical load requirements.

3.3.3. Meter Strategy

- Single Occupancy Dwellings - The meters supplying the dwelling will be located outside the building

4. Energy Statement/ Nearly Zero Energy Building (NZEB)

The NZEB standard will apply to all buildings owned and occupied as refer to Department of Housing, Planning and Local Government and as per the building regulations and DEAP methodology. This will be equivalent to a 25% improvement in energy performance on the 2011 Building Regulations.

The key to Part L for NZEB compliance will include a Maximum Energy Performance Coefficient of 0.3, a Maximum Carbon Performance of 0.35 and a renewable Energy Ratio of 20%.

The cost optimal level is a primary energy performance of less than 125 kWh/m²/yr, when calculated using DEAP or upgrade of roof insulation and heating system. The nearly zero or very low amount of energy required will be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby.

Proposed minimum threshold level compliance achieved with TGD L Dwellings as indicated below Fig 1: -

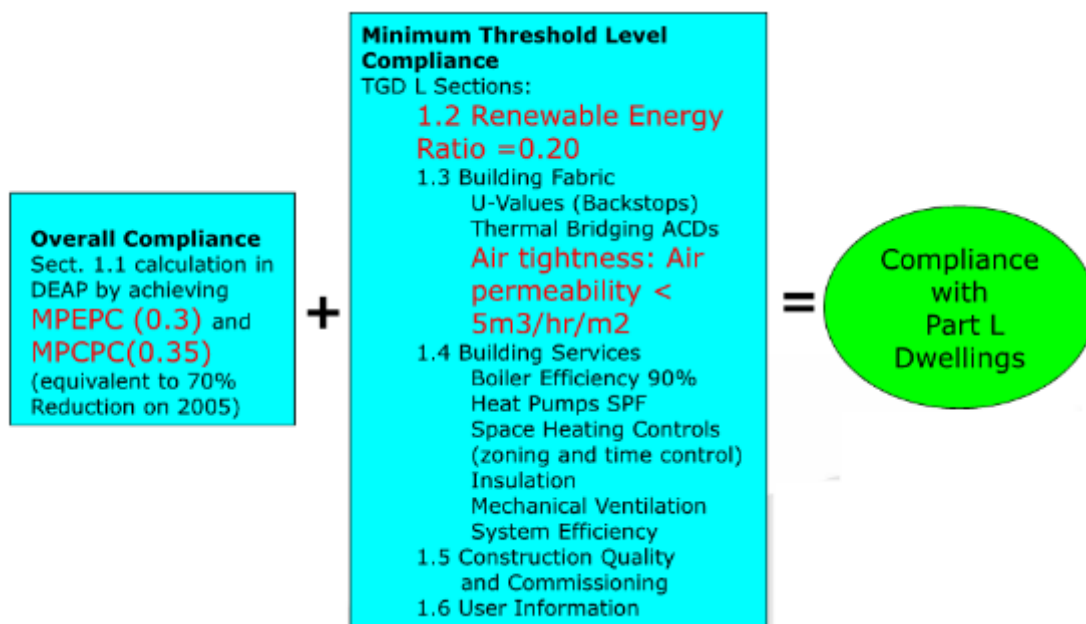


Figure 1 - Minimum Threshold Level Compliance

The design for the dwellings and apartments will include: -

- LED lighting accounted for in DEAP (A+ bulbs, 94 lumen/cW, 4 W/m²)
- Efficient hot water uses in showers/taps accounted for in DEAP (125 l/p/d and 6l/min flow restrictor)
- Individual heat pumps for space heating and hot water production
- Mechanical ventilation for houses and apartment

4.1. Energy Statement

The proposed design strategy will ensure sustainable energy efficiency to ensure low running cost of use and consideration of green energy.

Some of considerations are listed below: -

- Most of houses have been designed to have a compact and efficient form, such as semidetached building formations limiting the heat loss and, where appropriate, availing of the heat gains through the fabric of the building
- Highly insulated external building façade
- Materials with long time life expectancy and low embodied energy.
- Consideration of water saving measures including water saving devices and controls and limiting the heat loss from pipes, ducts and vessels used for the transport or storage of heated water or air.
- Providing energy efficient space heating and cooling systems, heating and cooling equipment, water heating systems, and ventilation systems, with effective controls.
- Providing energy efficient artificial lighting systems (LED) and adequate control of public and internal lighting systems.
- The guidance of the MEP design in compliance with Building Regulations Part L recommendations for conservation of fuel and energy setting of minimum energy performance requirements for building to achieve the Nearly Zero Energy Building, providing that the energy performance of the building is such as to limit the calculated primary energy consumption and related Carbon Dioxide (CO₂) emissions as is reasonably practicable.
- Limitation of Carbon Dioxide (CO₂) emissions to a Nearly Zero Energy Building level insofar as is reasonably practicable of for Landlord areas/ and Non-domestic buildings using the Non-domestic Energy Assessment Procedure (NEAP) published by Sustainable Energy Authority of Ireland.
- Ensuring that when a building element that forms part of the building envelope and has a significant impact on the energy performance of the building envelope, and the energy performance of the building element meets minimum energy performance requirements, functionally and economically feasible.
- The energy performance of each house/ and apartment will comply with the requirement of Part L building regulations and achieving no lower than a BER of A2.
- System design that provides to the building owner or occupants sufficient information about the building, the fixed building services, controls and their maintenance requirements so that the building can be operated in such a manner as to use no more fuel and energy than is reasonable.

4.2. E-Car Charging Provision

If required Electrical Car (E-Car) charging points will be provided in accordance with CCC Development Plan 2016-2022.

Appendices

5. Public Lighting Report

Outdoor Lighting Report – Readings

DATE: 20 July 2021
DESIGNER: NS / AK
PROJECT No: 5206250
PROJECT NAME: CNW 3PB



Residential area designed in accordance with EN13201-2:2015
Category P3.

Fittings with the tag EX are existing fitting from a different phase and
are only included to generate lux levels.

Outdoor Lighting Report

PREPARED BY: Atkins Ireland,
Atkins House,
150 Airside Business Park,
Swords,
Co. Dublin

DATE: 20 July 2021
PROJECT No: 5206250

DESIGNER: NS / AK
PROJECT NAME: CNW 3PB

ATKINS
Member of the SNC-Lavalin Group

Layout Report

General Data

Dimensions in Metres Angles in Degrees
Grid Origin 565520.8m x 572865.8m
Area 189.4m x 171.2m
Sample Spacing 1.49m x 1.49m

Luminaires

Luminaire A Data

Supplier	
Type	P852-24-S1-NW-W7-0350-26W
Lamp(s)	740SS NW
Lamp Flux (klm)	3.55
File Name	P852-24-S1-NW-W7-0350-26W Id
Maintenance Factor	0.89
Imax70,80,90(cd/klm)	502.4, 86.5, 0.0
No. in Project	17



Luminaire C Data

Supplier	Urbis-Schneider
Type	AXIA 2.1 5166 - 16 NVSL219CT 480mA N W 230V Integrated lenses
Lamp(s)	16 NVSL219CT 480mA_NW
LampFlux(klm)/Colour	3.34 NW 4000K/70
File Name	AXIA 2.1 5166 16 NVSL219CT 480mA NW 26W 383322 Integrated lenses - 230V 25d
Maintenance Factor	0.89
Imax70,80,90(cd/klm)	1056.5, 197.6, 0.0
No. in Project	6

Luminaire B Data

Supplier	Urbis-Schneider
Type	AXIA 2.1 5166 - 16 NVSL219CT 480mA N W 230V Integrated lenses
Lamp(s)	16 NVSL219CT 480mA_NW
LampFlux(klm)/Colour	3.34 NW 4000K/70
File Name	AXIA 2.1 5166 16 NVSL219CT 480mA NW 26W 383322 Integrated lenses - 230V 25d
Maintenance Factor	0.89
Imax70,80,90(cd/klm)	1056.5, 197.6, 0.0
No. in Project	3



Luminaire D Data

Supplier	
Type	P852-24-S1-NW-W7-0350-26W
Lamp(s)	740SS NW
Lamp Flux (klm)	3.55
File Name	P852-24-S1-NW-W7-0350-26W Id
Maintenance Factor	0.89
Imax70,80,90(cd/klm)	502.4, 86.5, 0.0
No. in Project	1

Layout

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	A	565591.20	572982.50	6.00	64.00	0.00	0.00	0.40			
EX7	D	565537.23	572956.11	6.00	324.00	0.00	0.00	0.40			
3	A	565558.49	572971.08	6.00	152.00	0.00	0.00	0.40			
4	A	565561.48	572996.86	6.00	310.00	0.00	0.00	0.40			
5	A	565618.90	572978.26	6.00	234.00	0.00	0.00	0.40			
6	A	565617.74	572960.91	6.00	319.00	0.00	0.00	0.40			
7	A	565656.04	572977.80	6.00	153.00	0.00	0.00	0.40			
8	A	565638.12	572955.87	6.00	58.00	0.00	0.00	0.40			
9	A	565660.62	572954.56	6.00	240.00	0.00	0.00	0.40			
14	A	565604.34	573022.42	6.00	148.00	0.00	0.00	0.40			

DATE: 20 July 2021
PROJECT No: 5206250

DESIGNER: NS / AK
PROJECT NAME: CNW 3PB



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Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
11	A	565614.28	572934.31	6.00	147.00	0.00	0.00	0.40			
12	A	565676.96	572933.88	6.00	59.00	0.00	0.00	0.40			
13	A	565671.21	572920.22	6.00	332.00	0.00	0.00	0.40			
14	A	565649.08	572884.82	6.00	306.00	0.00	0.00	0.40			
15	A	565696.50	572947.23	6.00	145.00	0.00	0.00	0.40			
16	A	565591.27	572999.92	6.00	152.00	0.00	0.00	0.40			
17	A	565595.04	572920.77	6.00	324.00	0.00	0.00	0.40			
19	A	565661.38	572902.25	6.00	328.00	0.00	0.00	0.40			
EX1	C	565639.92	572862.98	8.00	39.00	0.00	0.00	1.00			
EX3	C	565602.95	572890.61	8.00	59.00	0.00	0.00	1.00			
EX2	C	565627.82	572874.94	8.00	49.00	0.00	0.00	1.00			
EX4	C	565576.92	572905.53	8.00	63.00	0.00	0.00	1.00			
EX5	C	565547.57	572922.47	6.00	58.00	0.00	0.00	1.00			
24	B	565565.78	572932.23	8.00	240.00	0.00	0.00	1.00			
25	B	565624.68	572898.48	8.00	235.00	0.00	0.00	1.00			
26	B	565651.20	572875.36	6.00	218.00	0.00	0.00	1.00			
EX6	C	565532.53	572951.31	8.00	230.00	0.00	0.00	1.00			

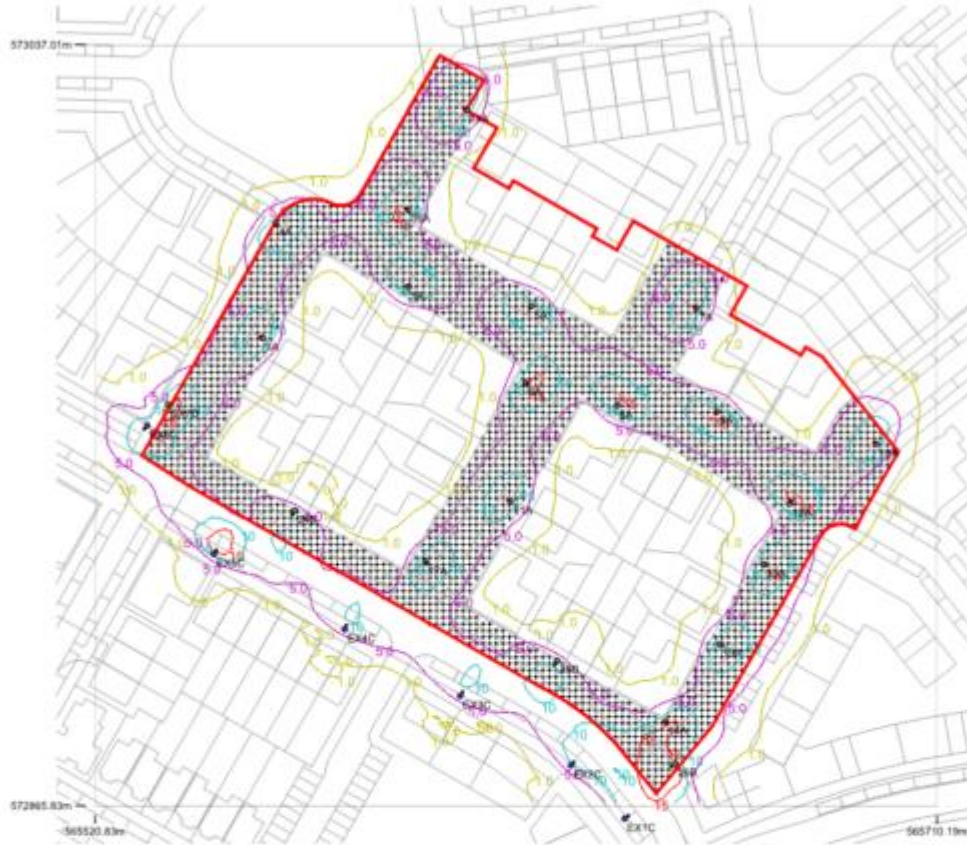
DATE: 20 July 2021
PROJECT No: 5206250

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Horizontal Illuminance (lux)

Grid 1



Results

Eav	7.70
Emin	1.59
Emax	23.52
Emin/Emax	0.07
Emin/Eav	0.21

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Grid 1



Results

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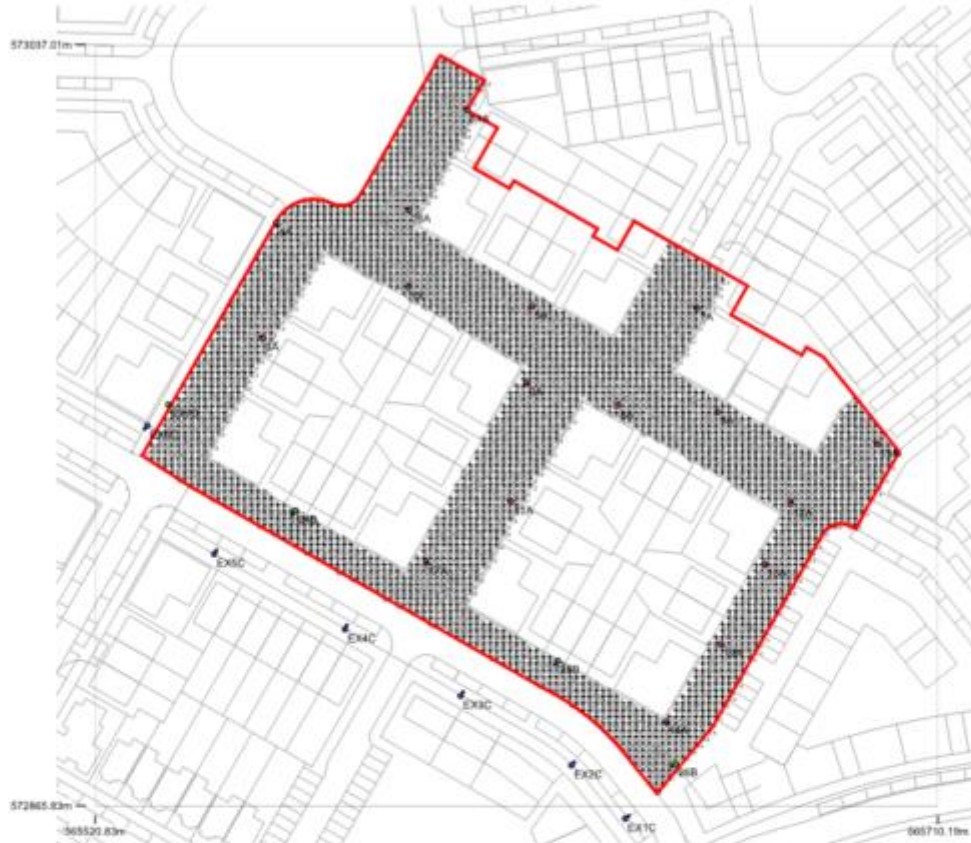
DATE: 20 July 2021
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Grid 1



Results

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Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

11 June 2021

Re: CDS21002937 pre-connection enquiry - Subject to contract | Contract denied

Connection for Housing Development of 62 unit(s) at Cork North West Quarter Regeneration, Kilmore Road Lower, Cork

Dear Sir/Madam,

Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at Cork North West Quarter Regeneration, Kilmore Road Lower, Cork (the **Premises**). Based upon the details you have provided with your pre-connection enquiry and on our desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, we wish to advise you that your proposed connection to the Irish Water network(s) can be facilitated at this moment in time.

SERVICE	OUTCOME OF PRE-CONNECTION ENQUIRY <u>THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.</u>
Water Connection	Feasible without infrastructure upgrade by Irish Water
Wastewater Connection	Feasible without infrastructure upgrade by Irish Water
SITE SPECIFIC COMMENTS	
Water Connection	The proposed development will involve the diversion of existing watermains and foul sewers. For design submissions and queries related to diversion/buildover please contact IW Diversion Team via email address diversions@water.ie. Please note that any redundant water main shall be traced back to the Irish Water Network by the Customer and shall be blanked off by Irish Water at the Customer's expense.
Wastewater Connection	The proposed development will involve the diversion of existing watermains and foul sewers. For design submissions and queries related to diversion/buildover please contact IW Diversion Team via email address diversions@water.ie.

The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this development shall comply with the Irish Water Connections and Developer Services Standard Details and Codes of Practice that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.

The map included below outlines the current Irish Water infrastructure adjacent to your site:



Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

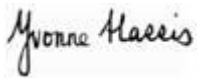
Whilst every care has been taken in its compilation Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

General Notes:

- 1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**
- 2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.
- 3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.
- 4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at <https://www.water.ie/connections/get-connected/>
- 5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.
- 6) Irish Water Connection Policy/ Charges can be found at <https://www.water.ie/connections/information/connection-charges/>
- 7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
- 8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
- 9) To access Irish Water Maps email datarequests@water.ie
- 10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

If you have any further questions, please contact Dario Alvarez from the design team on email dalvarez@water.ie For further information, visit **www.water.ie/connections**.

Yours sincerely,



Yvonne Harris

Head of Customer Operations