STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for HAZELHURST NURSERY.SWS

Pipe Sizes HAZELHURST NURSERY Manhole Sizes HAZELHURST NURSERY

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	35
Ratio R	0.300	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	0.75
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for HAZELHURST NURSERY.SWS

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
1.000	8.019	0.115	69.7	0.037	5.00	0.0	0.600	o	150	Pipe/Conduit
2.000	6.648	0.115	57.8	0.032	5.00	0.0	0.600	o	150	Pipe/Conduit
1.001	13.500	0.900	15.0	0.021	0.00	0.0	0.600	o	150	Pipe/Conduit
1.002	30.060	2.004	15.0	0.020	0.00	0.0	0.600	o	150	Pipe/Conduit
1.003	20.868	1.391	15.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
1.004	23.686	1.316	18.0	0.009	0.00	0.0	0.600	o	150	Pipe/Conduit
1.005	34.847	2.382	14.6	0.021	0.00	0.0	0.600	o	150	Pipe/Conduit
3.000	10.228	0.110	93.0	0.007	5.00	0.0	0.600	o	100	Pipe/Conduit
3.001	35.600	0.356	100.0	0.013	0.00	0.0	0.600	o	100	Pipe/Conduit

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.11	48.293	0.037	0.0	0.0	1.8	1.21	21.3	6.8
2.000	50.00	5.08	48.293	0.032	0.0	0.0	1.5	1.33	23.4	5.8
1.001	50.00	5.20	48.178	0.090	0.0	0.0	4.3	2.61	46.2	16.5
1.002	50.00	5.39	47.278	0.110	0.0	0.0	5.2	2.61	46.2	20.1
1.003	50.00	5.52	45.274	0.110	0.0	0.0	5.2	2.61	46.2	20.1
1.004	50.00	5.69	43.883	0.119	0.0	0.0	5.6	2.39	42.2	21.8
1.005	50.00	5.91	42.567	0.140	0.0	0.0	6.6	2.65	46.8	25.6
3.000	50.00	5.21	53.590	0.007	0.0	0.0	0.3	0.80	6.3	1.3
3.001	50.00	5.99	53.480	0.020	0.0	0.0	0.9	0.77	6.0	3.7

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Network Design Table for HAZELHURST NURSERY.SWS

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
3.002	11.231	0.391	28.7	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
4.000	19.884	0.658	30.2	0.015	5.00	0.0	0.600	o	100	Pipe/Conduit
4.001	2.756	0.199	13.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
3.003	10.542	1.054	10.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
3.004	12.427	1.243	10.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
3.005	16.040	0.183	87.7	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
3.006	23.154	2.315	10.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
3.007	18.139	1.814	10.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
1.006	46.231	1.156	40.0	0.021	0.00	0.0	0.600	o	225	Pipe/Conduit
1.007	9.269	0.618	15.0	0.054	0.00	0.0	0.600	o	225	Pipe/Conduit
1.008	53.869	2.693	20.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.009	53.399	1.335	40.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
1.010	37.797	0.630	60.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
1.011	15.303	0.383	40.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
5.000	16.652	0.162	102.8	0.005	5.00	0.0	0.600	o	100	Pipe/Conduit
5.001	16.854	0.164	102.8	0.015	0.00	0.0	0.600	o	100	Pipe/Conduit
5.002	21.156	0.237	89.3	0.015	0.00	0.0	0.600	o	150	Pipe/Conduit
5.003	27.599	0.158	174.7	0.015	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
3.002	50.00	6.11	53.124	0.020	0.0	0.0	0.9	1.45	11.4	3.7
4.000	50.00	5.24	53.590	0.015	0.0	0.0	0.7	1.41	11.1	2.7
4.001	50.00	5.26	52.932	0.015	0.0	0.0	0.7	2.09	16.4	2.7
3.003	50.00	6.19	49.502	0.035	0.0	0.0	1.7	2.46	19.3	6.4
3.004	50.00	6.27	48.448	0.035	0.0	0.0	1.7	2.46	19.3	6.4
3.005	50.00	6.60	45.900	0.035	0.0	0.0	1.7	0.82	6.5	6.4
3.006	50.00	6.75	44.364	0.035	0.0	0.0	1.7	2.46	19.3	6.4
3.007	50.00	6.88	42.049	0.035	0.0	0.0	1.7	2.46	19.3	6.4
1.006	50.00	7.25	40.110	0.196	0.0	0.0	9.3	2.07	82.5	35.8
1.007	50.00	7.29	38.954	0.250	0.0	0.0	11.8	3.40	135.0	45.7
1.008	50.00	7.60	38.336	0.250	0.0	0.0	11.8	2.94	116.9	45.7
1.009	50.00	7.95	35.568	0.250	0.0	0.0	11.8	2.49	176.2	45.7
1.010	50.00	8.26	34.233	0.250	0.0	0.0	11.8	2.03	143.7	45.7
1.011	50.00	8.37	33.603	0.250	0.0	0.0	11.8	2.49	176.2	45.7
5.000	50.00	5.37	49.000	0.005	0.0	0.0	0.2	0.76	6.0	0.9
5.001	50.00	5.74	48.838	0.020	0.0	0.0	0.9	0.76	6.0	3.7
5.002	50.00	6.07	48.624	0.035	0.0	0.0	1.7	1.06	18.8	6.4
5.003	50.00	6.68	48.387	0.050	0.0	0.0	2.4	0.76	13.4	9.1

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Network Design Table for HAZELHURST NURSERY.SWS

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
5.004	43.751	0.425	102.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
6.000	6.582	0.064	102.8	0.021	5.00	0.0	0.600	o	150	Pipe/Conduit
6.001	11.041	0.107	103.2	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit
6.002	51.035	0.975	52.3	0.017	0.00	0.0	0.600	o	150	Pipe/Conduit
5.005	3.386	0.339	10.0	0.015	0.00	0.0	0.600	o	150	Pipe/Conduit
5.006	22.129	2.213	10.0	0.028	0.00	0.0	0.600	o	150	Pipe/Conduit
5.007	53.504	5.350	10.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
5.008	4.214	0.280	15.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
1.012	43.454	0.966	45.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
1.013	5.637	0.110	51.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
1.014	5.637	0.056	100.7	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
1.015	33.964	0.242	140.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
5.004	50.00	7.41	48.229	0.050	0.0	0.0	2.4	0.99	17.5	9.1
6.000	50.00	5.11	49.000	0.021	0.0	0.0	1.0	0.99	17.5	3.8
6.001	50.00	5.30	48.936	0.029	0.0	0.0	1.4	0.99	17.5	5.3
6.002	50.00	5.91	48.829	0.046	0.0	0.0	2.2	1.39	24.6	8.4
5.005	50.00	7.43	45.000	0.111	0.0	0.0	5.3	3.21	56.7	20.3
5.006	50.00	7.54	43.000	0.139	0.0	0.0	6.6	3.20	56.6	25.4
5.007	50.00	7.82	39.000	0.139	0.0	0.0	6.6	3.20	56.6	25.4
5.008	50.00	7.85	33.650	0.139	0.0	0.0	6.6	2.61	46.1	25.4
1.012	50.00	8.68	33.220	0.389	0.0	0.0	18.4	2.35	166.1	71.1
1.013	50.00	8.72	32.254	0.389	0.0	0.0	18.4	2.20	155.6	71.1
1.014	50.00	8.78	32.144	0.389	0.0	0.0	18.4	1.57	110.8	71.1
1.015	50.00	9.21	32.088	0.389	0.0	0.0	18.4	1.33	93.7	71.1

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Manhole Schedules for HAZELHURST NURSERY.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	49.643	1.350	Open Manhole	1200	1.000	48.293	150				
26	49.819	1.526	Open Manhole	1200	2.000	48.293	150				
2	49.647	1.469	Open Manhole	1200	1.001	48.178	150	1.000	48.178	150	
								2.000	48.178	150	
3	48.962	1.684	Open Manhole	1200	1.002	47.278	150	1.001	47.278	150	
4	46.950	1.676	Open Manhole	1200	1.003	45.274	150	1.002	45.274	150	
5	45.572	1.689	Open Manhole	1200	1.004	43.883	150	1.003	43.883	150	
6	43.964	1.397	Open Manhole	1200	1.005	42.567	150	1.004	42.567	150	
16	54.490	0.900	Open Manhole	450	3.000	53.590	100				
17	54.490	1.010	Open Manhole	450	3.001	53.480	100	3.000	53.480	100	
18	54.490	1.366	Open Manhole	450	3.002	53.124	100	3.001	53.124	100	
24	54.490	0.900	Open Manhole	450	4.000	53.590	100				
25	54.490	1.558	Open Manhole	450	4.001	52.932	100	4.000	52.932	100	
19	54.490	4.988	Open Manhole	450	3.003	49.502	100	3.002	52.733	100	3231
								4.001	52.733	100	3231
20	51.060	2.612	Open Manhole	450	3.004	48.448	100	3.003	48.448	100	
21	48.338	2.438	Open Manhole	450	3.005	45.900	100	3.004	47.205	100	1305
22	46.069	1.705	Open Manhole	450	3.006	44.364	100	3.005	45.717	100	1353
23	43.101	1.052	Open Manhole	450	3.007	42.049	100	3.006	42.049	100	
7	41.717	1.607	Open Manhole	1200	1.006	40.110	225	1.005	40.185	150	
								3.007	40.235	100	
8	40.491	1.537	Open Manhole	1200	1.007	38.954	225	1.006	38.954	225	
9	39.864	1.528	Open Manhole	1200	1.008	38.336	225	1.007	38.336	225	
10	37.166	1.598	Open Manhole	450	1.009	35.568	300	1.008	35.643	225	
11	37.174	2.941	Open Manhole	450	1.010	34.233	300	1.009	34.233	300	
12	37.102	3.499	Open Manhole	450	1.011	33.603	300	1.010	33.603	300	
27	49.850	0.850	Open Manhole	450	5.000	49.000	100				
28	49.850	1.012	Open Manhole	450	5.001	48.838	100	5.000	48.838	100	
29	49.850	1.226	Open Manhole	450	5.002	48.624	150	5.001	48.674	100	
30	49.850	1.463	Open Manhole	450	5.003	48.387	150	5.002	48.387	150	
31	49.850	1.621	Open Manhole	450	5.004	48.229	150	5.003	48.229	150	
36	49.850	0.850	Open Manhole	450	6.000	49.000	150				
37	49.850	0.914	Open Manhole	450	6.001	48.936	150	6.000	48.936	150	
38	49.850	1.021	Open Manhole	450	6.002	48.829	150	6.001	48.829	150	
32	49.850	4.850	Open Manhole	1200	5.005	45.000	150	5.004	47.804	150	2804
								6.002	47.854	150	2854
33	46.500	3.500	Open Manhole	1200	5.006	43.000	150	5.005	44.661	150	1661

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Manhole Schedules for HAZELHURST NURSERY.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
34	41.750	2.750	Open Manhole	450	5.007	39.000	150	5.006	40.787	150	1787
35	36.000	2.350	Open Manhole	450	5.008	33.650	150	5.007	33.650	150	
13	35.190	1.970	Open Manhole	1200	1.012	33.220	300	1.011	33.220	300	
								5.008	33.370	150	
39	33.266	1.012	Open Manhole	1200	1.013	32.254	300	1.012	32.254	300	
14	33.144	1.000	Open Manhole	1200	1.014	32.144	300	1.013	32.144	300	
40	32.996	0.908	Open Manhole	1500	1.015	32.088	300	1.014	32.088	300	
15	32.270	0.424	Open Manhole	0		OUTFALL		1.015	31.846	300	

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PIPELINE SCHEDULES for HAZELHURST NURSERY.SWS

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)
1.000	o	150	1	49.643	48.293	1.200	Open Manhole	1200
2.000	o	150	26	49.819	48.293	1.376	Open Manhole	1200
1.001	o	150	2	49.647	48.178	1.319	Open Manhole	1200
1.002	o	150	3	48.962	47.278	1.534	Open Manhole	1200
1.003	o	150	4	46.950	45.274	1.526	Open Manhole	1200
1.004	o	150	5	45.572	43.883	1.539	Open Manhole	1200
1.005	o	150	6	43.964	42.567	1.247	Open Manhole	1200
3.000	o	100	16	54.490	53.590	0.800	Open Manhole	450
3.001	o	100	17	54.490	53.480	0.910	Open Manhole	450
3.002	o	100	18	54.490	53.124	1.266	Open Manhole	450
4.000	o	100	24	54.490	53.590	0.800	Open Manhole	450
4.001	o	100	25	54.490	52.932	1.458	Open Manhole	450
3.003	o	100	19	54.490	49.502	4.888	Open Manhole	450
3.004	o	100	20	51.060	48.448	2.512	Open Manhole	450
3.005	o	100	21	48.338	45.900	2.338	Open Manhole	450

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)
1.000	8.019	69.7	2	49.647	48.178	1.319	Open Manhole	1200
2.000	6.648	57.8	2	49.647	48.178	1.319	Open Manhole	1200
1.001	13.500	15.0	3	48.962	47.278	1.534	Open Manhole	1200
1.002	30.060	15.0	4	46.950	45.274	1.526	Open Manhole	1200
1.003	20.868	15.0	5	45.572	43.883	1.539	Open Manhole	1200
1.004	23.686	18.0	6	43.964	42.567	1.247	Open Manhole	1200
1.005	34.847	14.6	7	41.717	40.185	1.382	Open Manhole	1200
3.000	10.228	93.0	17	54.490	53.480	0.910	Open Manhole	450
3.001	35.600	100.0	18	54.490	53.124	1.266	Open Manhole	450
3.002	11.231	28.7	19	54.490	52.733	1.657	Open Manhole	450
4.000	19.884	30.2	25	54.490	52.932	1.458	Open Manhole	450
4.001	2.756	13.8	19	54.490	52.733	1.657	Open Manhole	450
3.003	10.542	10.0	20	51.060	48.448	2.512	Open Manhole	450
3.004	12.427	10.0	21	48.338	47.205	1.033	Open Manhole	450
3.005	16.040	87.7	22	46.069	45.717	0.252	Open Manhole	450

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PIPELINE SCHEDULES for HAZELHURST NURSERY.SWS

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)
3.006	o	100	22	46.069	44.364	1.605	Open Manhole	450
3.007	o	100	23	43.101	42.049	0.952	Open Manhole	450
1.006	o	225	7	41.717	40.110	1.382	Open Manhole	1200
1.007	o	225	8	40.491	38.954	1.312	Open Manhole	1200
1.008	o	225	9	39.864	38.336	1.303	Open Manhole	1200
1.009	o	300	10	37.166	35.568	1.298	Open Manhole	450
1.010	o	300	11	37.174	34.233	2.641	Open Manhole	450
1.011	o	300	12	37.102	33.603	3.199	Open Manhole	450
5.000	o	100	27	49.850	49.000	0.750	Open Manhole	450
5.001	o	100	28	49.850	48.838	0.912	Open Manhole	450
5.002	o	150	29	49.850	48.624	1.076	Open Manhole	450
5.003	o	150	30	49.850	48.387	1.313	Open Manhole	450
5.004	o	150	31	49.850	48.229	1.471	Open Manhole	450
6.000	o	150	36	49.850	49.000	0.700	Open Manhole	450
6.001	o	150	37	49.850	48.936	0.764	Open Manhole	450
6.002	o	150	38	49.850	48.829	0.871	Open Manhole	450

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)
3.006	23.154	10.0	23	43.101	42.049	0.952	Open Manhole	450
3.007	18.139	10.0	7	41.717	40.235	1.382	Open Manhole	1200
1.006	46.231	40.0	8	40.491	38.954	1.312	Open Manhole	1200
1.007	9.269	15.0	9	39.864	38.336	1.303	Open Manhole	1200
1.008	53.869	20.0	10	37.166	35.643	1.298	Open Manhole	450
1.009	53.399	40.0	11	37.174	34.233	2.641	Open Manhole	450
1.010	37.797	60.0	12	37.102	33.603	3.199	Open Manhole	450
1.011	15.303	40.0	13	35.190	33.220	1.670	Open Manhole	1200
5.000	16.652	102.8	28	49.850	48.838	0.912	Open Manhole	450
5.001	16.854	102.8	29	49.850	48.674	1.076	Open Manhole	450
5.002	21.156	89.3	30	49.850	48.387	1.313	Open Manhole	450
5.003	27.599	174.7	31	49.850	48.229	1.471	Open Manhole	450
5.004	43.751	102.9	32	49.850	47.804	1.896	Open Manhole	1200
6.000	6.582	102.8	37	49.850	48.936	0.764	Open Manhole	450
6.001	11.041	103.2	38	49.850	48.829	0.871	Open Manhole	450
6.002	51.035	52.3	32	49.850	47.854	1.846	Open Manhole	1200

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PIPELINE SCHEDULES for HAZELHURST NURSERY.SWS

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)
5.005	o	150	32	49.850	45.000	4.700	Open Manhole	1200
5.006	o	150	33	46.500	43.000	3.350	Open Manhole	1200
5.007	o	150	34	41.750	39.000	2.600	Open Manhole	450
5.008	o	150	35	36.000	33.650	2.200	Open Manhole	450
1.012	o	300	13	35.190	33.220	1.670	Open Manhole	1200
1.013	o	300	39	33.266	32.254	0.712	Open Manhole	1200
1.014	o	300	14	33.144	32.144	0.700	Open Manhole	1200
1.015	o	300	40	32.996	32.088	0.608	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)
5.005	3.386	10.0	33	46.500	44.661	1.689	Open Manhole	1200
5.006	22.129	10.0	34	41.750	40.787	0.813	Open Manhole	450
5.007	53.504	10.0	35	36.000	33.650	2.200	Open Manhole	450
5.008	4.214	15.1	13	35.190	33.370	1.670	Open Manhole	1200
1.012	43.454	45.0	39	33.266	32.254	0.712	Open Manhole	1200
1.013	5.637	51.2	14	33.144	32.144	0.700	Open Manhole	1200
1.014	5.637	100.7	40	32.996	32.088	0.608	Open Manhole	1500
1.015	33.964	140.3	15	32.270	31.846	0.124	Open Manhole	0

Free Flowing Outfall Details for HAZELHURST NURSERY.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.015	15	32.270	31.846	0.000	0	0

Simulation Criteria for HAZELHURST NURSERY.SWS

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	20.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Run Time (mins)	720
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	6

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

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Simulation Criteria for HAZELHURST NURSERY.SWS

Rainfall Model	FSR	Profile Type	Winter
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	360
Ratio R	0.300		

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Online Controls for HAZELHURST NURSERY.SWS

Hydro-Brake® Optimum Manhole: 40, DS/PN: 1.015, Volume (m³): 1.9

Unit Reference	MD-SHE-0098-5000-1500-5000
Design Head (m)	1.500
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	98
Invert Level (m)	32.088
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	5.0	Kick-Flo®	0.878	3.9
Flush-Flo™	0.431	4.9	Mean Flow over Head Range	-	4.3

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.2	1.200	4.5	3.000	6.9	7.000	10.3
0.200	4.4	1.400	4.8	3.500	7.4	7.500	10.7
0.300	4.8	1.600	5.1	4.000	7.9	8.000	11.0
0.400	4.9	1.800	5.4	4.500	8.4	8.500	11.3
0.500	4.9	2.000	5.7	5.000	8.8	9.000	11.6
0.600	4.8	2.200	6.0	5.500	9.2	9.500	11.9
0.800	4.3	2.400	6.2	6.000	9.6		
1.000	4.1	2.600	6.5	6.500	10.0		

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Storage Structures for HAZELHURST NURSERY.SWS

Tank or Pond Manhole: 14, DS/PN: 1.014

Invert Level (m) 32.144

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	400.0	0.500	400.0	0.501	0.0

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Summary of Results for 360 minute 100 year Winter (HAZELHURST NURSERY.SWS)

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	48.332	-0.111	0.000	0.15		2.8	OK
2.000	26	48.327	-0.116	0.000	0.12		2.4	OK
1.001	2	48.218	-0.110	0.000	0.16		6.8	OK
1.002	3	47.322	-0.106	0.000	0.19		8.3	OK
1.003	4	45.318	-0.106	0.000	0.19		8.3	OK
1.004	5	43.931	-0.102	0.000	0.22		8.9	OK
1.005	6	42.616	-0.101	0.000	0.23		10.5	OK
3.000	16	53.610	-0.080	0.000	0.09		0.5	OK
3.001	17	53.514	-0.066	0.000	0.25		1.5	OK
3.002	18	53.149	-0.075	0.000	0.14		1.5	OK
4.000	24	53.612	-0.078	0.000	0.11		1.1	OK
4.001	25	52.952	-0.080	0.000	0.09		1.1	OK
3.003	19	49.527	-0.075	0.000	0.15		2.6	OK
3.004	20	48.473	-0.075	0.000	0.14		2.6	OK
3.005	21	45.945	-0.055	0.000	0.43		2.6	OK
3.006	22	44.389	-0.075	0.000	0.14		2.6	OK
3.007	23	42.074	-0.075	0.000	0.14		2.6	OK
1.006	7	40.175	-0.160	0.000	0.19		14.7	OK
1.007	8	39.016	-0.163	0.000	0.17		18.8	OK
1.008	9	38.397	-0.164	0.000	0.17		18.8	OK
1.009	10	35.634	-0.233	0.000	0.11		18.8	OK
1.010	11	34.307	-0.225	0.000	0.14		18.8	OK
1.011	12	33.673	-0.229	0.000	0.13		18.8	OK
5.000	27	49.017	-0.083	0.000	0.07		0.4	OK
5.001	28	48.873	-0.065	0.000	0.26		1.5	OK
5.002	29	48.662	-0.112	0.000	0.15		2.6	OK
5.003	30	48.442	-0.095	0.000	0.29		3.8	OK
5.004	31	48.277	-0.102	0.000	0.22		3.8	OK
6.000	36	49.032	-0.118	0.000	0.11		1.6	OK
6.001	37	48.973	-0.113	0.000	0.14		2.2	OK
6.002	38	48.867	-0.112	0.000	0.14		3.5	OK
5.005	32	45.048	-0.102	0.000	0.23		8.3	OK
5.006	33	43.045	-0.105	0.000	0.19		10.4	OK
5.007	34	39.044	-0.106	0.000	0.19		10.4	OK
5.008	35	33.707	-0.092	0.000	0.31		10.4	OK
1.012	13	33.308	-0.212	0.000	0.19		29.2	OK
1.013	39	32.573	0.018	0.000	0.35		29.0	SURCHARGED
1.014	14	32.571	0.126	0.000	0.10		5.9	SURCHARGED
1.015	40	32.692	0.304	0.000	0.06		4.9	SURCHARGED

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