Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Size (mm)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
S1	0.124	1500	Type C	15.120	13.530	1.365	516122.404	284039.426
S2	0.084	1350	Type C	14.439	12.845	1.294	516164.961	284069.381
S3	0.136	1500	Type C	15.266	13.780	1.261	516163.381	284130.193
S4	0.181	2100	Type C	14.180	12.300	1.430	516192.760	284090.029
S5	0.209	1800	Type C	13.712	12.010	1.252	516225.236	284114.167
S6	0.054	1350	Type C	13.516	11.800	1.266	516239.936	284097.493
S7	0.153	1500	Type C	13.329	11.610	1.269	516259.375	284087.202
S8	0.164	1500	Type C	12.946	11.242	1.254	516290.697	284116.765
S9	0.070	1500	Type C	11.886	10.390	0.971	516322.723	284082.588
S10	0.000	---	Unknown	11.519	10.300	0.694	516327.233	284072.478
S11	0.103	1500	Type C	15.591	14.158	1.208	516178.499	283958.457
S12	0.100	1500	Type C	15.410	13.985	1.200	516170.377	283970.252
S47	0.105	1350	Type C	13.835	12.479	1.131	516194.316	284027.189
S13	0.100	1350	Type C	13.510	11.805	1.330	516213.029	284000.183
S14	0.103	1500	Type C	13.102	11.420	1.307	516247.055	284022.868
S15	0.105	1800	Type C	13.150	11.700	1.225	516254.832	284045.658
S16	0.030	1350	Type C	13.030	11.265	1.315	516257.807	284025.080
S17	0.057	1350	Type C	15.659	14.150	1.284	516217.234	283903.248
S18	0.019	1350	Type C	15.018	13.480	1.313	516232.567	283915.243
S19	0.121	1350	Type C	13.683	12.140	1.318	516250.231	283948.086
S20	0.000	1500	Type C	13.097	11.485	1.312	516267.661	283975.668
S21	0.123	1500	Type C	12.937	11.335	1.302	516268.709	283989.860
S22	0.088	1500	Type C	12.717	10.965	1.302	516263.780	284005.479
S23	0.134	1500	Type C	12.173	10.435	1.288	516308.942	284022.917
S24	0.000	---	Unknown	11.519	10.300	0.769	516333.231	284029.800
S25	0.102	1350	Type C	13.340	11.900	1.215	516276.395	283933.026
S26	0.131	1500	Type C	13.122	11.575	1.247	516290.796	283924.878
S27	0.067	1500	Type B	12.647	10.710	1.637	516313.728	283954.763
S28	0.046	1200	Unknown	12.050	10.532	1.218	516341.097	283979.231
S29	0.000	---	Unknown	11.519	10.400	0.819	516346.221	283999.516
S30	0.000	---	Unknown	11.519	10.100	1.269	516359.339	284042.045
S31	0.000	---	Unknown	11.300	9.942	1.208	516379.388	284054.641
S32	0.145	1500	Type C	13.805	12.390	1.115	516297.439	284193.934
S33	0.000	1350	Type B	13.922	11.404	2.143	516269.263	284165.729
S34	0.000	1350	Type B	13.110	10.470	2.265	516304.548	284126.971
S35	0.686	1500	Type B	13.387	9.923	2.789	516333.857	284153.092
S36	0.164	1500	Type B	13.166	9.860	2.631	516317.416	284137.930
S37	0.000	---	Unknown	11.900	9.800	1.425	516328.074	284124.053
S38	0.000	---	Unknown	11.900	9.800	1.950	516332.566	284113.595
S39	0.000	---	Type B	11.581	9.700	1.731	516342.335	284102.481
S40	0.000	---	Unknown	11.581	9.700	1.731	516352.433	284092.876
S41	0.000	---	Unknown	11.300	9.600	1.550	516361.667	284083.447
S42	0.000	---	Unknown	11.300	9.600	1.025	516399.602	284047.112
S43	0.000	3000	Type B	11.767	9.580	1.962	516405.411	284043.638
S44	0.000	---	Type C	11.732	9.500	2.007	516410.535	284042.027

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (mm)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	S1	13.530	S2	12.920	Circ	225	52.043	85	0.600	1.365	1.294
1.001	S2	12.845	S4	12.450	Circ	300	34.628	88	0.600	1.294	1.430
2.000	S3	13.780	S4	12.525	Circ	225	49.762	40	0.600	1.261	1.430
1.002	S4	12.300	S5	12.010	Circ	450	40.464	140	0.600	1.430	1.252
1.003	S5	12.010	S6	11.800	Circ	450	22.230	106	0.600	1.252	1.266
1.004	S6	11.800	S7	11.610	Circ	450	21.994	116	0.600	1.266	1.269
1.005	S7	11.610	S8	11.242	Circ	450	43.070	117	0.600	1.269	1.254
1.006	S8	11.242	S9	10.465	Circ	450	46.838	60	0.600	1.254	0.971
1.007	S9	10.390	S10	10.300	Circ	525	11.070	123	0.600	0.971	0.694
1.008	S10	10.300	S30	10.100	Circ	600	44.238	221	0.600	0.619	0.819
3.000	S11	14.158	S12	13.985	Circ	225	14.321	83	0.600	1.208	1.200
3.001	S12	13.985	S13	11.955	Circ	225	52.106	26	0.600	1.200	1.330

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (mm)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
4.000	S47	12.479	S13	11.955	Circ	225	32.856	63	0.600	1.131	1.330
3.002	S13	11.805	S14	11.420	Circ	375	40.894	106	0.600	1.330	1.307
3.003	S14	11.420	S16	11.340	Circ	375	10.977	137	0.600	1.307	1.315
5.000	S15	11.700	S16	11.490	Circ	225	20.792	99	0.600	1.225	1.315
3.004	S16	11.265	S22	10.965	Circ	450	20.491	68	0.600	1.315	1.302
6.000	S17	14.150	S18	13.480	Circ	225	19.467	29	0.600	1.284	1.313
6.001	S18	13.480	S19	12.140	Circ	225	37.292	28	0.600	1.313	1.318
6.002	S19	12.140	S20	11.560	Circ	225	32.628	56	0.600	1.318	1.312
6.003	S20	11.485	S21	11.335	Circ	300	14.230	95	0.600	1.312	1.302
6.004	S21	11.335	S22	11.115	Circ	300	16.378	74	0.600	1.302	1.302
3.005	S22	10.965	S23	10.435	Circ	450	48.412	91	0.600	1.302	1.288
3.006	S23	10.435	S24	10.300	Circ	450	25.246	187	0.600	1.288	0.769
3.007	S24	10.300	S30	10.100	Circ	600	28.837	144	0.600	0.619	0.819
7.000	S25	11.900	S26	11.650	Circ	225	16.547	66	0.600	1.215	1.247
7.001	S26	11.575	S27	10.710	Circ	300	37.670	44	0.600	1.247	1.637
7.002	S27	10.710	S28	10.532	Circ	300	36.711	206	0.600	1.637	1.218
7.003	S28	10.532	S29	10.400	Circ	300	20.923	159	0.600	1.218	0.819
7.004	S29	10.400	S30	10.100	Circ	600	44.505	148	0.600	0.519	0.819
1.009	S30	10.100	S31	9.942	Circ	150	23.677	150	0.600	1.269	1.208
1.010	S31	9.942	S42	9.600	Circ	675	21.571	63	0.600	0.683	1.025
8.000	S32	12.390	S33	11.479	Circ	300	39.868	44	0.600	1.115	2.143
8.001	S33	11.404	S34	10.470	Circ	375	52.414	56	0.600	2.143	2.265
8.002	S34	10.470	S36	10.160	Circ	375	16.901	55	0.600	2.265	2.631
9.000	S35	9.923	S36	9.860	Circ	675	22.366	355	0.600	2.789	2.631
8.003	S36	9.860	S37	9.800	Circ	675	17.498	292	0.600	2.631	1.425
8.004	S37	9.800	S38	9.800	Circ	675	11.382	Flat	0.600	1.425	1.425
8.005	S38	9.800	S39	9.700	Circ	150	14.797	148	0.600	1.950	1.731
8.006	S39	9.700	S40	9.700	Circ	675	13.937	Flat	0.600	1.206	1.206
8.007	S40	9.700	S41	9.600	Circ	150	13.198	132	0.600	1.731	1.550
8.008	S41	9.600	S42	9.600	Circ	675	52.528	Flat	0.600	1.025	1.025
1.011	S42	9.600	S43	9.580	Circ	675	6.769	338	0.600	1.025	1.512
1.012	S43	9.580	S44	9.500	Circ	225	5.370	67	0.600	1.962	2.007

Outfall Details

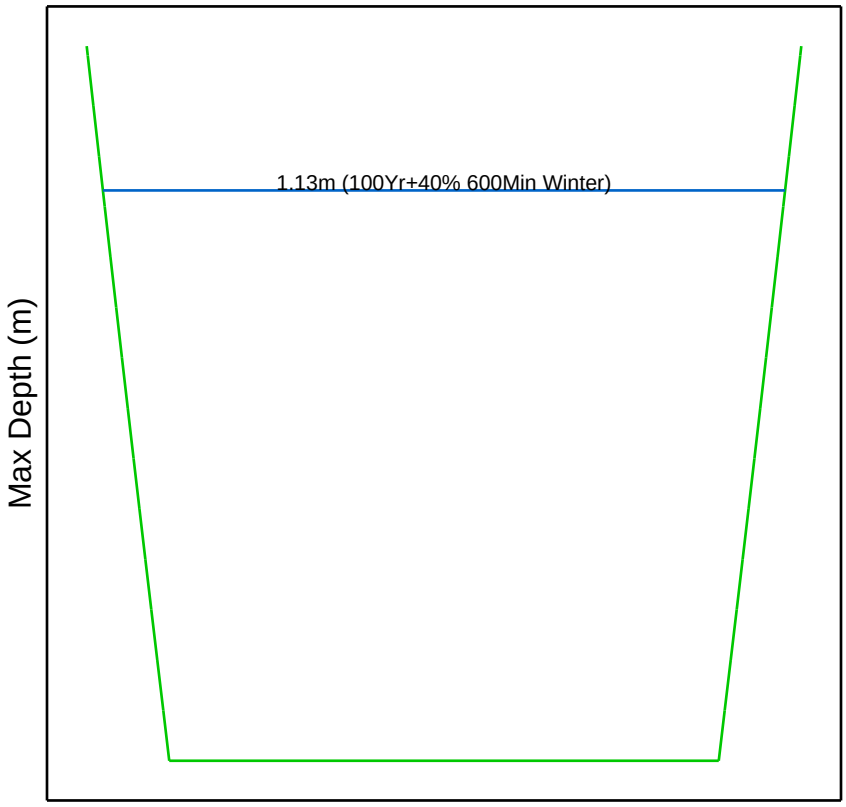
Outfall Manhole S44 : Free Discharge

Flow Control Details

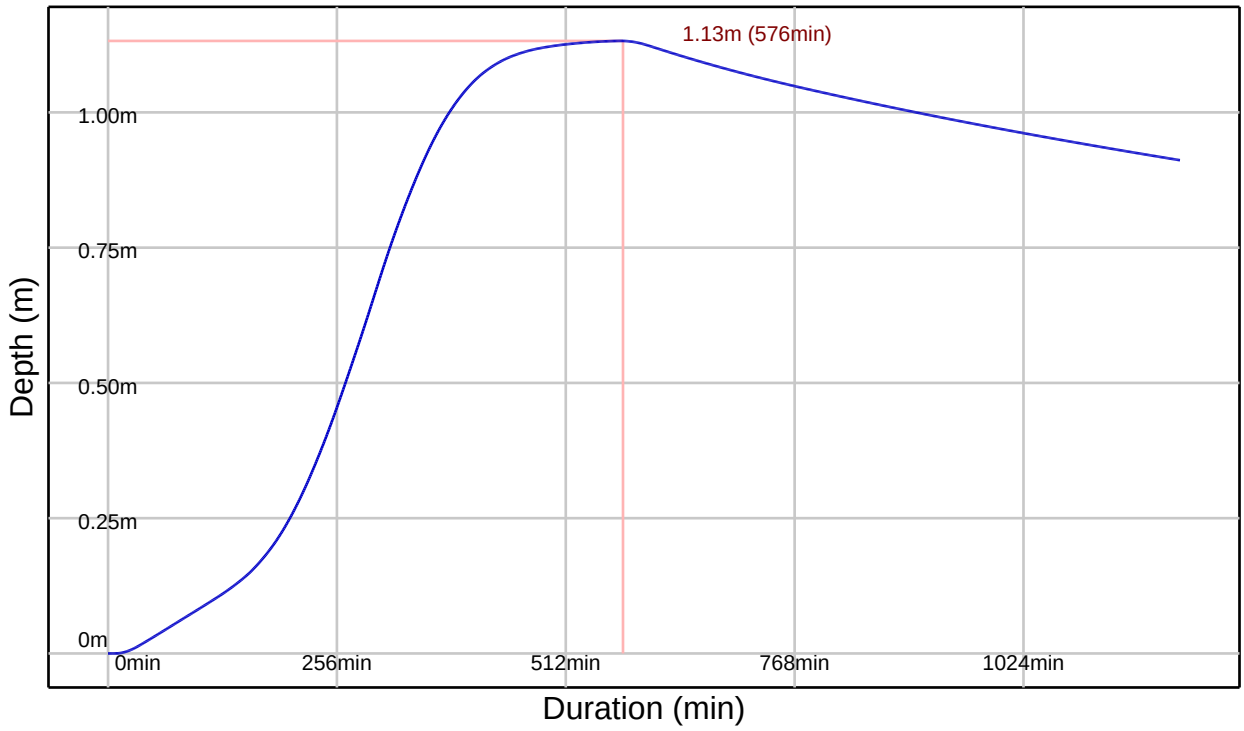
Pond Structure at Manhole S30

Pond Invert (m)	Max Depth (m)	Volume To Water Level (m3)	Water Level (m)	Freeboard (m)	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
10.100	1.419	2276.719	11.219	0.300	0.00000000	0.00000000	2.00

Pond Depth/Area Diagram at S30



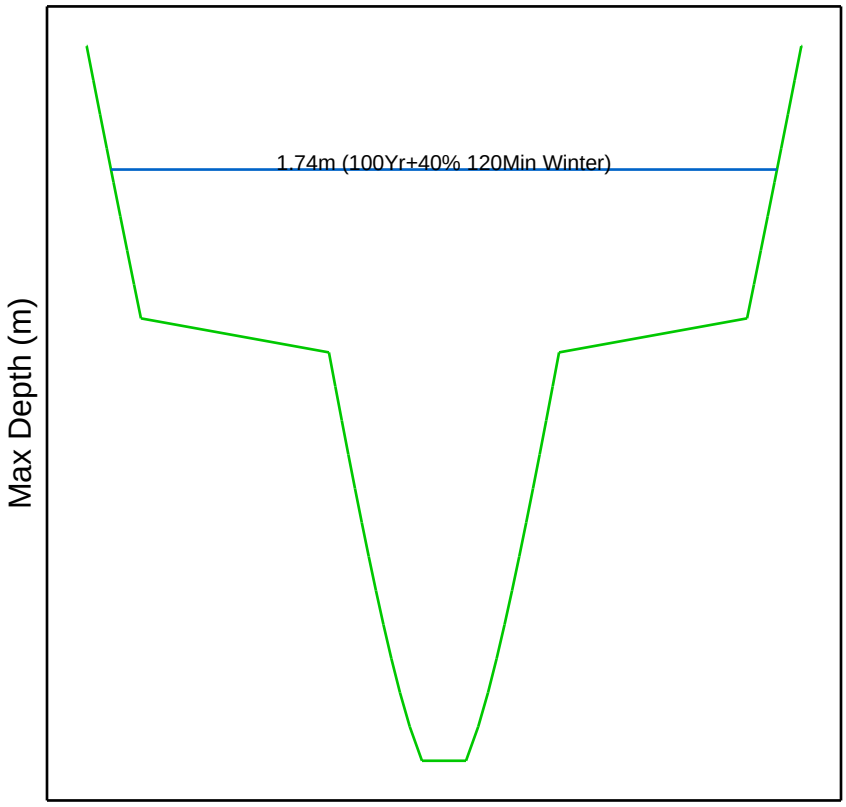
Pond 1 at S30 (100Yr+40% 600Min Winter)



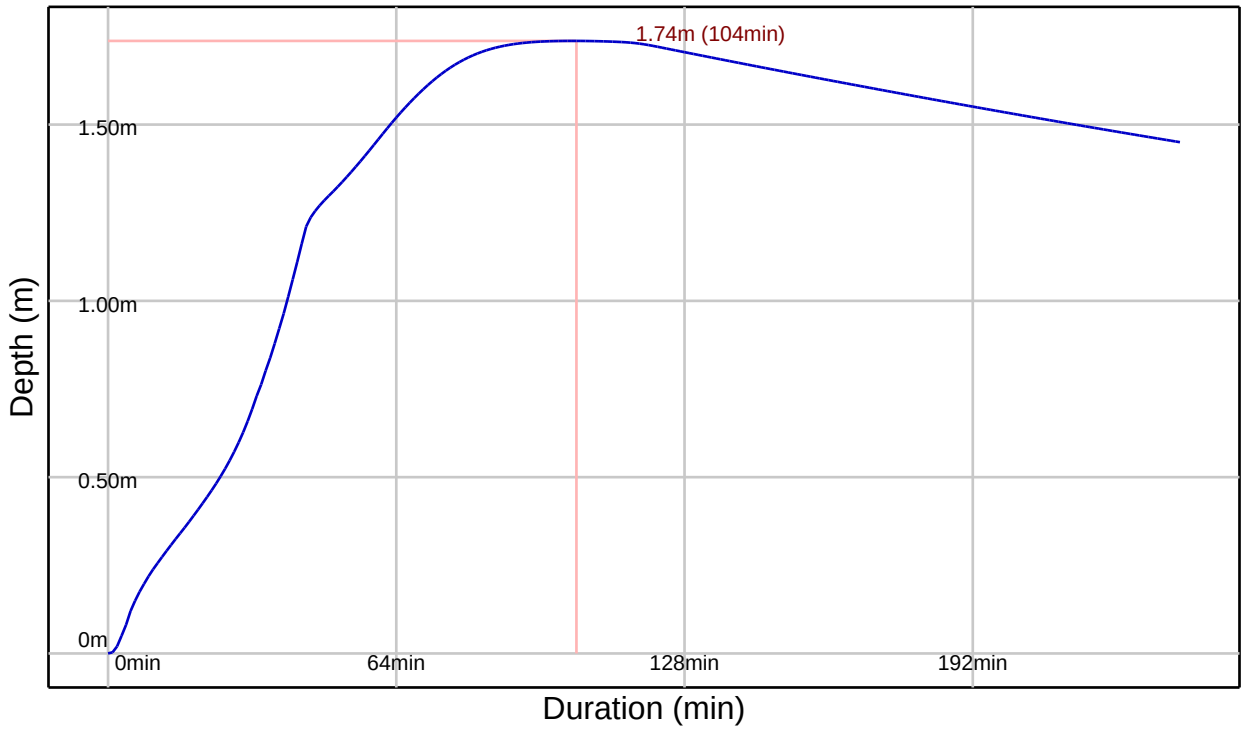
Pond Structure at Manhole S37

Pond Invert (m)	Max Depth (m)	Volume To Water Level (m3)	Water Level (m)	Freeboard (m)	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
9.800	2.100	576.403	11.600	0.300	0.00000000	0.00000000	2.00

Pond Depth/Area Diagram at S37



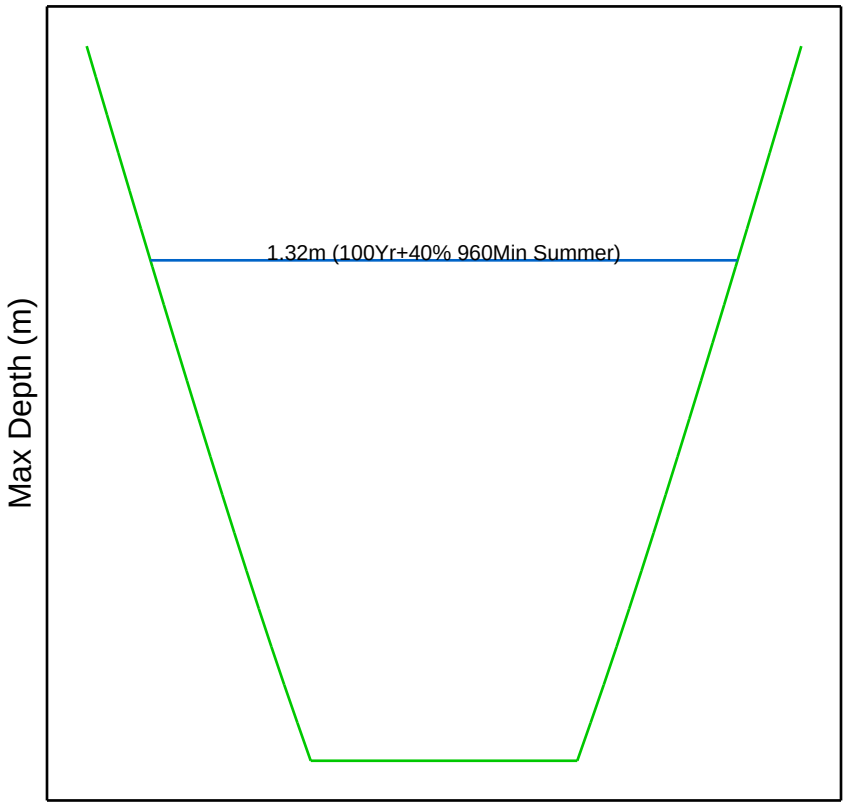
Pond 2 at S37 (100Yr+40% 120Min Winter)



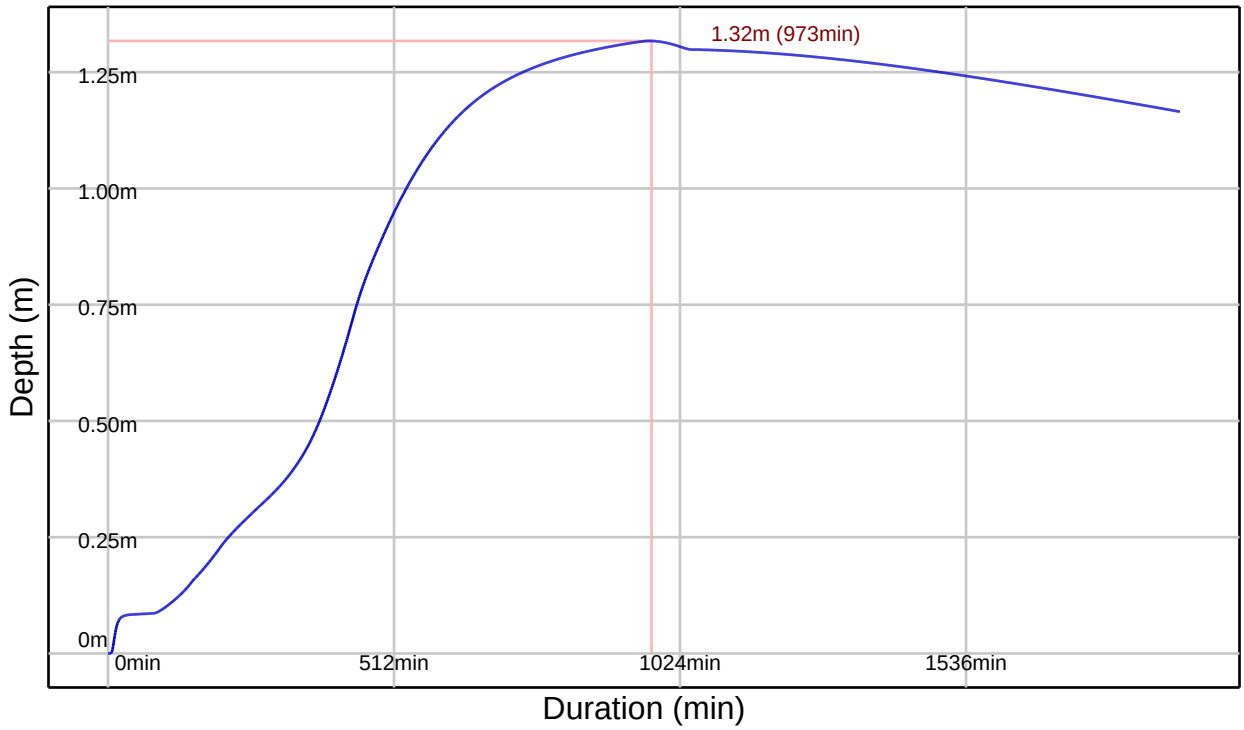
Pond Structure at Manhole S39

Pond Invert (m)	Max Depth (m)	Volume To Water Level (m3)	Water Level (m)	Freeboard (m)	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
9.700	1.881	219.429	11.281	0.300	0.00000000	0.00000000	2.00

Pond Depth/Area Diagram at S39



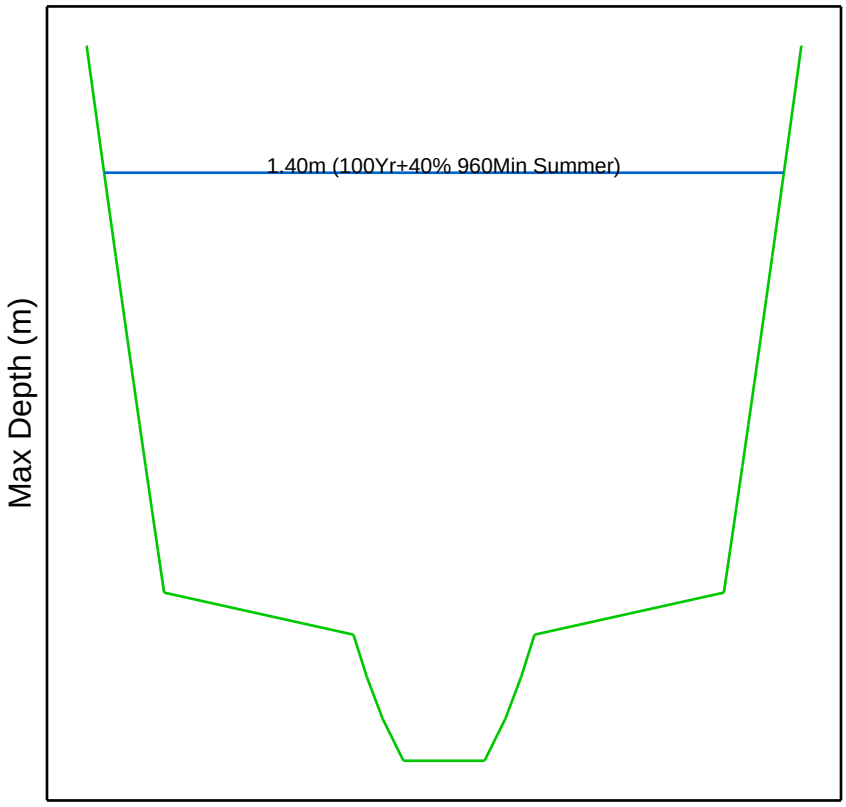
Pond 3 at S39 (100Yr+40% 960Min Summer)



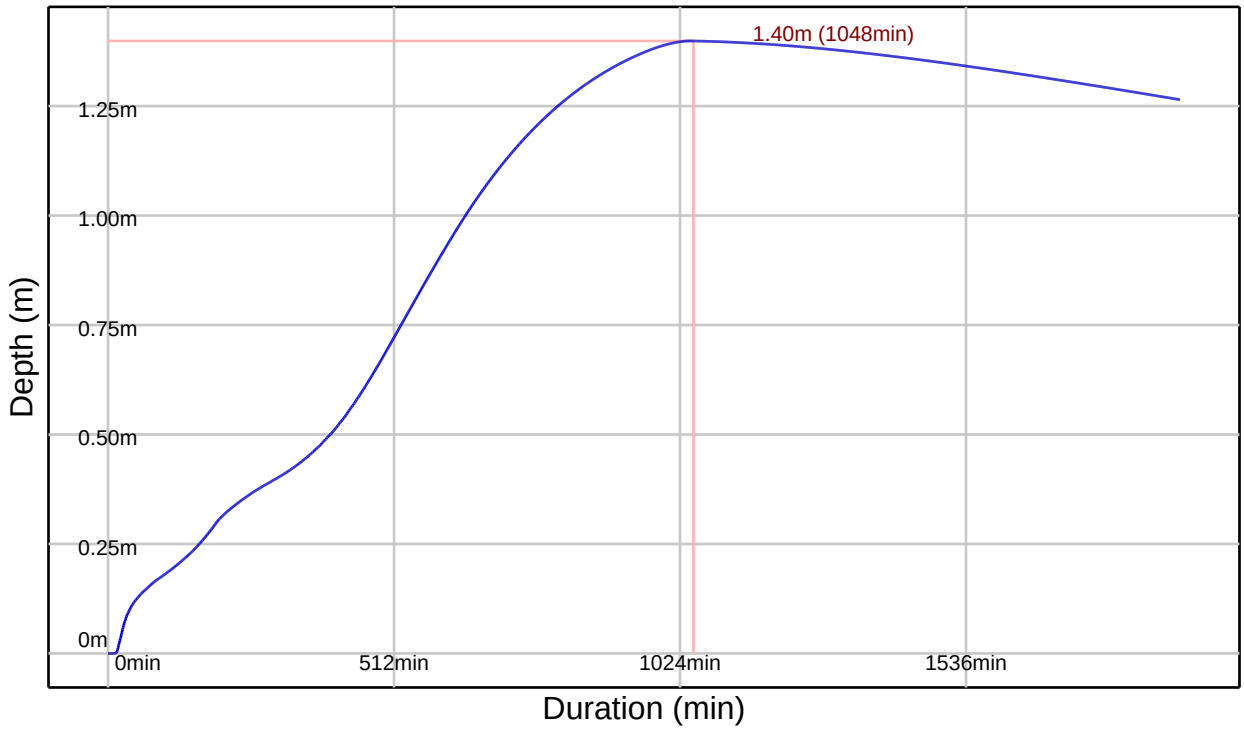
Pond Structure at Manhole S42

Pond Invert (m)	Max Depth (m)	Volume To Water Level (m3)	Water Level (m)	Freeboard (m)	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
9.600	1.700	1253.066	11.000	0.300	0.00000000	0.00000000	2.00

Pond Depth/Area Diagram at S42



Pond 4 at S42 (100Yr+40% 960Min Summer)

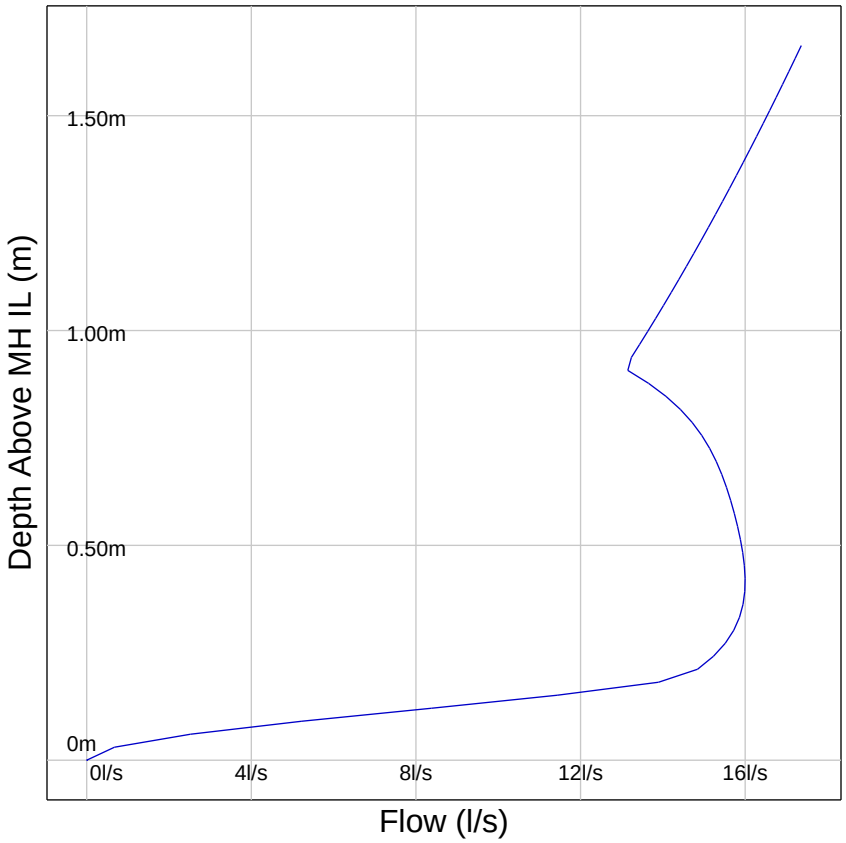


Controls within Manhole S43

Hydro-Brake® Optimum Control

Model Ref	Design Depth (m)	Design Flow (l/s)	Invert Offset (m)	FF Head (m)	FF Flow (l/s)	KF Head (m)	KF Flow (l/s)
SHE-0174-1600-1400-1600	1.400	16.000	0.000	0.416	15.999	0.911	13.056

Hydro-Brake® Optimum Control from S43 to S44



Simulation Settings

FEH2022 (point): Filename=FEH_Point_Descriptors_516225_283900_v5_1_0.xml

Summer (Cv: 1.00), Winter (Cv: 1.00)

Global Time of Entry: 5.0 mins

Durations (mins): 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440

Return Periods (yrs) + Climate Change: (100, +40%)

Manhole Flood Risk Freeboard: 0.300m

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
100Yr+40% 60Min Winter	65.609	0.00	0.92	100Yr+40% 480Min Summer	13.965	0.00	0.87
100Yr+40% 60Min Summer	65.609	0.00	0.85	100Yr+40% 480Min Winter	13.965	0.00	0.88
100Yr+40% 120Min Winter	40.146	0.00	1.01	100Yr+40% 600Min Summer	11.637	0.00	0.81
100Yr+40% 120Min Summer	40.146	0.00	0.99	100Yr+40% 600Min Winter	11.637	0.00	0.82
100Yr+40% 180Min Winter	29.906	0.00	1.03	100Yr+40% 720Min Summer	9.987	0.00	0.74
100Yr+40% 180Min Summer	29.906	0.00	1.01	100Yr+40% 720Min Winter	9.987	0.00	0.75
100Yr+40% 240Min Winter	23.993	0.00	0.99	100Yr+40% 960Min Summer	7.825	0.00	0.60
100Yr+40% 240Min Summer	23.993	0.00	0.98	100Yr+40% 960Min Winter	7.825	0.00	0.60
100Yr+40% 360Min Winter	17.529	0.00	0.91	100Yr+40% 1440Min Winter	5.506	0.00	0.36
100Yr+40% 360Min Summer	17.529	0.00	0.90	100Yr+40% 1440Min Summer	5.506	0.00	0.36

Simulation Results

Return Period (yrs) + Climate Change (%):

100yr+40%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	60 min Summer	34	14.896	1.366	56.292		Flood Risk
S2	60 min Summer	34	14.243	1.398	96.503		Flood Risk
S3	60 min Summer	33	14.777	0.997	71.625		Surcharged
S4	60 min Summer	34	13.964	1.664	247.565		Flood Risk
S5	60 min Summer	33	13.712	1.702	350.669	1.630	Flood
S6	60 min Summer	33	13.442	1.642	364.865		Flood Risk
S7	60 min Summer	33	13.125	1.515	441.395		Flood Risk
S8	60 min Summer	34	12.323	1.082	506.711		Surcharged
S9	600 min Winter	572	11.232	0.842	11.242		Surcharged
S10	600 min Winter	572	11.232	0.932	11.243		Flood Risk
S11	60 min Summer	34	15.402	1.244	46.810		Flood Risk
S12	60 min Summer	34	15.272	1.287	93.920		Flood Risk
S47	60 min Summer	33	13.811	1.332	55.248		Flood Risk
S13	60 min Summer	34	13.501	1.696	192.328		Flood Risk
S14	60 min Summer	34	13.102	1.682	242.134	0.220	Flood
S15	60 min Summer	33	13.115	1.415	55.324		Flood Risk
S16	60 min Summer	34	12.903	1.638	302.778		Flood Risk
S17	60 min Summer	31	14.241	0.091	35.124		OK
S18	60 min Summer	32	13.933	0.453	44.607		Surcharged
S19	60 min Summer	32	13.683	1.543	112.943	6.201	Flood
S20	60 min Summer	33	13.011	1.526	74.611		Flood Risk
S21	60 min Summer	33	12.937	1.602	138.823	0.412	Flood
S22	60 min Summer	34	12.691	1.726	473.729		Flood Risk
S23	60 min Summer	34	11.614	1.179	536.664		Surcharged
S24	600 min Winter	573	11.232	0.932	10.961		Flood Risk
S25	60 min Summer	33	12.794	0.894	53.593		Surcharged
S26	60 min Summer	33	12.602	1.027	124.422		Surcharged
S27	60 min Summer	33	12.111	1.401	162.023		Surcharged
S28	60 min Summer	33	11.316	0.784	186.246		Surcharged
S29	600 min Winter	573	11.232	0.832	3.138		Flood Risk
S30	600 min Winter	574	11.232	1.132	24.443		Flood Risk
S31	960 min Summer	1046	10.999	1.057	15.012		Surcharged
S32	60 min Summer	31	12.547	0.157	89.818		OK
S33	60 min Summer	32	11.570	0.166	86.504		OK
S34	120 min Winter	103	11.538	1.068	6.477		Surcharged
S35	120 min Winter	103	11.538	1.615	30.443		Surcharged
S36	120 min Winter	103	11.538	1.678	44.221		Surcharged
S37	120 min Winter	103	11.537	1.737	44.230		OK
S38	120 min Winter	103	11.537	1.737	44.185		Surcharged
S39	960 min Summer	970	11.017	1.317	9.791		OK
S40	960 min Summer	970	11.017	1.317	9.801		Surcharged
S41	960 min Summer	1044	10.999	1.399	0.562		OK
S42	960 min Summer	1044	10.999	1.399	15.619		Surcharged
S43	960 min Summer	1046	11.006	1.426	11.837		Surcharged
S44	180 min Summer	95	9.570	0.070	16.013		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	60 min Summer	29	S1	S2	0.225	1.610	59.171	1.052	OK
1.001	60 min Summer	34	S2	S4	0.300	1.834	98.900	0.834	Surcharged
2.000	60 min Summer	30	S3	S4	0.225	2.266	74.439	0.899	OK
1.002	60 min Summer	34	S4	S5	0.450	1.587	252.369	0.924	OK
1.003	60 min Summer	35	S5	S6	0.450	2.119	336.974	1.073	OK
1.004	60 min Summer	35	S6	S7	0.450	2.290	364.146	1.213	OK
1.005	60 min Summer	33	S7	S8	0.450	2.730	434.179	1.454	OK
1.006	60 min Summer	33	S8	S9	0.450	3.230	513.697	1.233	OK
1.007	60 min Summer	33	S9	S10	0.525	2.523	546.218	1.251	OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.008	60 min Summer	37	S10	S30	0.600	2.519	541.259	1.173	Surcharged
3.000	60 min Summer	31	S11	S12	0.225	1.523	53.240	0.932	OK
3.001	60 min Summer	29	S12	S13	0.225	2.894	99.762	0.968	OK
4.000	60 min Summer	32	S47	S13	0.225	1.723	53.480	0.814	OK
3.002	60 min Summer	34	S13	S14	0.375	1.771	195.605	1.008	Surcharged
3.003	60 min Summer	35	S14	S16	0.375	2.162	238.765	1.401	Surcharged
5.000	60 min Summer	32	S15	S16	0.225	1.449	53.735	1.030	OK
3.004	60 min Summer	34	S16	S22	0.450	1.910	303.833	0.776	OK
6.000	60 min Summer	31	S17	S18	0.158	1.981	35.124	0.363	OK
6.001	60 min Summer	33	S18	S19	0.225	1.263	42.592	0.430	OK
6.002	60 min Summer	31	S19	S20	0.225	2.170	86.274	1.243	OK
6.003	60 min Summer	38	S20	S21	0.300	1.249	86.062	0.755	Surcharged
6.004	60 min Summer	31	S21	S22	0.300	1.948	137.679	1.069	Surcharged
3.005	60 min Summer	34	S22	S23	0.450	2.992	475.916	1.407	OK
3.006	60 min Summer	33	S23	S24	0.450	3.411	542.473	2.302	OK
3.007	60 min Summer	39	S24	S30	0.600	2.602	539.607	0.943	Surcharged
7.000	60 min Summer	32	S25	S26	0.225	1.747	56.957	0.891	OK
7.001	60 min Summer	32	S26	S27	0.300	1.806	127.633	0.756	Surcharged
7.002	60 min Summer	33	S27	S28	0.300	2.292	161.993	2.103	Surcharged
7.003	60 min Summer	37	S28	S29	0.300	2.817	186.224	2.117	Surcharged
7.004	120 min Summer	88	S29	S30	0.600	1.461	134.764	0.239	Surcharged
1.009	180 min Winter	150	S30	S31	0.150	2.198	37.244	2.580	Surcharged
1.010	360 min Summer	384	S31	S42	0.675	0.578	127.212	0.108	Surcharged
8.000	60 min Summer	31	S32	S33	0.155	2.442	89.825	0.534	OK
8.001	60 min Summer	32	S33	S34	0.271	1.311	87.686	0.328	OK
8.002	60 min Summer	32	S34	S36	0.375	1.202	83.347	0.307	Surcharged
9.000	60 min Summer	31	S35	S36	0.675	1.180	422.170	0.853	Surcharged
8.003	60 min Summer	31	S36	S37	0.675	1.678	600.510	1.098	Surcharged
8.004	60 min Summer	36	S37	S38	0.675	0.472	49.617		Surcharged
8.005	60 min Summer	38	S38	S39	0.150	2.779	49.106	3.379	Surcharged
8.006	120 min Summer	131	S39	S40	0.675	0.362	34.212		Surcharged
8.007	120 min Winter	131	S40	S41	0.150	1.926	34.041	2.210	Surcharged
8.008	240 min Summer	201	S41	S42	0.675	0.622	39.636		Surcharged
1.011	180 min Summer	180	S42	S43	0.675	0.690	95.410	0.188	Surcharged
1.012	720 min Summer	255	S43	S44	0.073	1.420	16.011	0.252	OK